NEW YORK STATE BOARD ON ELECTRIC
GENERATION SITING AND THE ENVIRONMENT

CASE 14-F-0490 - Application of Cassadaga Wind LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article 10 to Construct a Wind Energy Project.

NOTICE OF SCHEDULE FOR FILING EXCEPTIONS

(Issued November 8, 2017)

Attached is the Recommended Decision of Presiding Examiner Dakin D. Lecakes, Administrative Law Judge of the Department of Public Service, and Associate Examiner P. Nicholas Garlick, Administrative Law Judge of the Department of Environmental Conservation, which is hereby issued for exceptions pursuant to 16 NYCRR §4.10. Briefs on exceptions are due electronically to the Secretary and to all parties on November 28, 2017.

Briefs opposing exceptions are due on December 13, 2017. The parties' briefs should adhere to the guidelines for filing documents with the Secretary (on the left of the home page, www.dps.ny.gov, click on "Filing Guidelines") and to the requirements of Rule 4.10.

(SIGNED) KATHLEEN H. BURGESS
Secretary

NEW YORK STATE BOARD ON ELECTRIC
GENERATION SITING AND THE ENVIRONMENT

CASE 14-F-0490 - Application of Cassadaga Wind LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article 10 to Construct a Wind Energy Project.

RECOMMENDED DECISION

BY

PRESIDING EXAMINER DAKIN D. LECAKES
ADMINISTRATIVE LAW JUDGE, DEPARTMENT OF PUBLIC SERVICE

AND

ASSOCIATE EXAMINER P. NICHOLAS GARLICK
ADMINISTRATIVE LAW JUDGE, DEPARTMENT OF ENVIRONMENTAL CONSERVATION

November 8, 2017

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RECOMMENDED DECISION

Presiding Examiner Dakin D. Lecakes
Administrative Law Judge, Department of Public Service

AND

Associate Examiner P. Nicholas Garlick
Administrative Law Judge, Department of Environmental Conservation

INTRODUCTION

This Recommended Decision (RD) considers the application of Cassadaga Wind LLC, (Cassadaga Wind or the Applicant) to construct and operate a proposed wind farm generating facility in Chautauqua County, New York. After considering the record compiled over seven days of evidentiary hearings in July 2017, briefs of the parties, the public comments, all applicable laws and regulations, and Article 10 of the New York Public Service Law (PSL), the presiding examiner, Dakin D. Lecakes of the Department of Public Service (DPS) and associate examiner P. Nicholas Garlick of the Department of Environmental Conservation (DEC)[1] recommend that the New York State Board on Electric Generation Siting and the Environment (the Board) issue a conditional certificate to the Applicant to

[1] In addition to Judge Lecakes and Judge Garlick, DPS Administrative Law Judge Kevin Casutto served as presiding examiner until his retirement in early 2017.

proceed with its proposal. This RD provides our reasoning for our recommendation and our recommended certificate conditions, attached as Appendix A.

BACKGROUND

Description of the Project

Initially planned in the Applicant's Preliminary Scoping Statement (PSS)[2] as a commercial-scale wind power project consisting of up to 62 wind turbines with a nameplate capacity of up to 126 megawatts (MW), after supplements and further amendments, Cassadaga Wind's proposal now consists of up to 48 wind turbines,[3] while retaining Cassadaga Wind's initial proposed total generating capacity of up to 126 MW (the Project or the Facility).

Turbines will be located in the Towns of Cherry Creek, Charlotte, and Arkwright. Cassadaga Wind has proposed to limit any turbine constructed to 500 feet in "tip" height, measured in a straight line from the base of the turbine tower through the hub to the blade tip.[4] Although the Applicant has committed to these measurements and certain other criteria, Cassadaga Wind has not yet selected the specific make and model for the actual turbines to be installed.

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[2] See PSL §163(1) (requiring that any party wishing to obtain a certificate to file, prior to submitting its application, submit a preliminary scoping statement describing, inter alia, "the proposed facility and its environmental setting").

[3] The precise number of turbines eventually constructed will depend on the final turbine model Cassadaga Wind selects, as different turbine models have different maximum capacity ratings. Hearing Exhibit 8 contains a map comparing Cassadaga Wind's turbine locations for its June 2017 revised proposal to the locations identified in its application proposal.

[4] Hrg. Ex. 99, Application Exs. 2(a) & 6(a).

As described in the application when Cassadaga Wind was proposing 58 turbines, the Project included the construction of approximately 16.6 miles of access roads to access the turbine locations and approximately 29.2 miles of overhead and underground 34.5 kV collection lines interconnecting the turbine locations. These total impacts have been reduced by the reduction in the number of turbines. Hearing Exhibit 9 contains the Applicant's latest revised layout. The Project still includes construction of a 5.5-mile above ground 115 kV generator lead line, a collection substation, a point of interconnection with the New York State electric grid through facilities owned and operated by Niagara Mohawk Power Corporation d/b/a National Grid, two permanent meteorological (met) towers, two temporary staging/laydown yards for construction, and an Operations and Maintenance (O&M) building.[5] Only one relatively short section of generator lead line and a point of interconnect substation will be located in Town of Stockton. The majority of Facility components will be located on private land, except a portion of the collection line located

[5] See Hrg. Ex. 99, Application Exs. 2, 3 & 11, and Application Appendices M and N. The description of the Project in this RD is often based on application materials and a layout that may not reflect the final design layout as it becomes more refined based on certificate conditions and other applicable siting criteria. Where we identify specific numerical impacts, they should be interpreted as maximum values, as we have no reason to believe that the final Project layout will increase the values cited. Even though the Project is still being refined, and will continue to be so refined after the Board's Order, the record does contain updated maps, design drawings and descriptions sufficient for the Board to make its findings and determinations under PSL Article 10. These revised materials are contained in Hearing Exhibits 5, 8, 9, 10, 11, and 12, and are discussed in various places in the transcript in Cassadaga Wind's rebuttal testimony.

on State-owned land in the Boutwell Hill State Forest pursuant to an easement granted by the State legislature.[6]

Procedural History

On November 5, 2014, Cassadaga Wind, a subsidiary of EverPower Wind Holdings, Inc. (EverPower), submitted a letter to the Secretary of the Board,[7] indicating its intent to apply for an Article 10 certificate for a proposed 126 MW wind energy project located in parts of the towns of Charlotte, Cherry Creek, Arkwright, and Stockton. The November 5, 2014, letter also served as a formal submittal, pursuant to §1000.4 of part 16 of the New York Code of Rules and Regulations (NYCRR), of the Applicant's Public Involvement Plan (PIP).[8] After amendment and

[6] See Hrg. Ex. 99, Application Ex. 2. See also Hrg. Ex. 53 (ACD-5) (containing a copy of New York Chapter 481 of the Laws of 2016).

[7] Under 16 NYCRR §1000.2(am), the Secretary to the Public Service Commission (PSC) serves as the Secretary to the Board.

[8] 16 NYCRR §1000.4 "Public Involvement" requires Article 10 applicants to submit a proposed Public Involvement Program plan to DPS for review as to its adequacy at least 150 days prior to the submittal of any preliminary scoping statement. Section 1000.4(a) states that the Public Involvement Process is intended "to ensure throughout the Article 10 process that the Board is fully aware of the concerns of stakeholders and that the Board's consideration of an application is not delayed." Thus, 16 NYCRR §1000.4(a) requires "applicants to actively seek public participation throughout the planning, pre-application, certification, compliance, and implementation process" and "to encourage stakeholders to participate at the earliest opportunity in the review of the applicant's proposal so that their input can be considered."

revision pursuant to DPS review,[9] the Applicant filed its final PIP on January 5, 2015.

On September 3, 2015, the Applicant submitted its PSS for a planned commercial-scale wind power project consisting of up to 62 wind turbines with approximately 34 miles of associated collection lines and other supporting temporary and permanent supporting infrastructure. Cassadaga Wind also indicated that the Project's output would interconnect with National Grid's existing Dunkirk-Moon 115 kV transmission line. As designed in the Applicant's PSS, the Project would have a nameplate capacity of up to 126 MW with an expected annual net capacity factor of approximately 36 percent.

The PSS is part of the pre-application procedures prescribed by the Board in 16 NYCRR §1000.5. During the pre-application scoping phase, the project applicant, DPS, other statutory parties, and interested participants determine the nature and scope of the studies that the applicant must conduct to support its Article 10 application. The scope of the studies, documented in written stipulations,[10] determine what information is necessary for a project applicant to include in its formal application. In general, the applicant's studies

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[9] Under 16 NYCRR §4.3(d) DPS counsel must submit a list of trial staff to the hearing officers. Pursuant to 16 NYCRR §1.2, persons so designated serve as an independent arm of DPS to prosecute a matter before the Commission. Generally, in the pre-application stage of an Article 10 matter, no trial staff is designated. Thus, during that stage, any actions taken by DPS may properly be considered actions of the entire Department. However, the trial staff team that is designated after an application is filed acts as any other party to the proceeding. In this RD, "DPS Staff" refers to positions taken by trial staff, as opposed to DPS in general. We are using same convention for other state agencies to note the same distinction.

[10] See 16 NYCRR §1000.5(j)&(k).

should evaluate the potential impacts of the project on the environment, public health, and other public interest factors. The provisions of 16 NYCRR Part 1001, detailing the required contents of an Article 10 application, contain the Board's general guidance for the stakeholders in fashioning the specifics of the stipulations. When the application is submitted, the stipulations are used in conjunction with 16 NYCRR Part 1001 to determine whether the application is in compliance with PSL §164.[11]

After receiving an extension of the time to file, on October 5, 2015, the stakeholders provided their respective comments on Cassadaga Wind's PSS.[12] Cassadaga Wind responded to the stakeholder comments on October 26, 2015. After conducting several meetings with the State agencies and the Joint Towns[13] to negotiate stipulations concerning the studies necessary to complete its application, Cassadaga Wind filed drafts of the stipulations, with the exception of a stipulation concerning noise and vibration, on March 2, 2016. After receiving comment on the draft stipulations,[14] on April 19, 2016, Cassadaga Wind

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[11] A determination by the Chair that an Article 10 application is compliant with PSL §164, requires that the Board make its final decision on that application within twelve months unless extended by the applicant. PSL §165(4)(a).

[12] Contemporaneously with the PSS and stipulations process, the hearing examiners considered pre-application requests for intervenor funding. See PSL §163(4). Three of the towns affected by Cassadaga Wind's proposal, Arkwright, Charlotte, and Cherry Creek (the Joint Towns), represented jointly, submitted the only pre-application request for funds. By ruling dated November 23, 2015, the Joint Towns' request for pre-application intervenor funding was granted in total in the amount of $44,100.

[13] Concerned Citizens was not created until January 2017 and, therefore, did not participate in negotiating stipulations.

[14] See 16 NYCRR §1000.5(j)(3).

filed its final, fully executed stipulations, again with the exception of a stipulation on noise and vibration, which was handled on a separate track.[15]

By letter dated April 27, 2016, Cassadaga Wind filed its draft stipulation on noise and vibration. The stipulation, numbered 19 to correspond with the PSS exhibit number for noise and vibration,[16] was issued for comment. The final, fully executed Stipulation 19 was filed on July 13, 2016.[17]

By letter dated May 27, 2016, Cassadaga Wind began the process of filing and supplementing its formal application for the Project.[18] On June 2, 2016, the Secretary issued a Notice indicating the availability of the intervenor funds for the post-application phase of the proceeding.[19]

In addition to its initial application materials, Cassadaga Wind filed supplements on October 7, 2016, and on

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15 Hrg. Ex. 136.

16 The PSS designations followed the Board's regulations in 16 NYCRR Part 1001. For example, 16 NYCRR §1001.19 contains the requirements for an application's noise and vibration information. This convention allows for easy comparison between the regulations, the stipulations, the PSS, and the application's exhibits.

17 Hrg. Ex. 137.

18 Hrg. Ex. 99.

19 Initially, only the Joint Towns requested funds. A second Notice was issued seeking further applications on November 30, 2016, when the examiners became aware of local residents wishing to intervene in the matter. Two local residents timely filed an application for funding. Eventually, other local residents joined them and they consolidated representation into a citizens' group, the Concerned Citizens of the Cassadaga Wind Project (Concerned Citizens). By rulings issued January 26, 2017 and February 6, 2017, we awarded funding for both the Joint Towns, in the amount of $69,000, and Concerned Citizens, in the amount of $57,000, thereby allocating all available intervenor funding.

October 28, 2016.[20] Thereafter, by letter dated November 28, 2016, the Chair sent formal notice to the Applicant that its application was deemed compliant with the requirements of PSL §164.[21] In accordance with PSL §165(1), the Chair set January 9, 2017 as the date for commencement of the public hearings.

On January 9, 2017, we held a public statement hearing in Sinclairville, New York, centrally located to the Project area. At the hearing, 21 members of the public spoke, 14 against and 6 in favor with one not taking a firm position for or against. On January 10, 2016, we conducted a procedural conference, also held in Sinclairville, to identify interested parties, identify issues for adjudication, and establish a schedule for the filing of testimony and exhibits and the evidentiary hearings. Although we had intended to narrow issues at the conference, the intervening parties, and particularly DPS Staff, indicated that they were not able to narrow any issues at that time, and were prepared to pursue any and all issues at the evidentiary hearings.

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[20] Hrg. Exs. 100 and 101. Additionally, the Applicant filed several updates between January and June 2017. See Hearing Exhibits 102 through 106.

[21] PSL §165(1) states that "After the receipt of an application filed pursuant to section one hundred sixty-four of this article, the chair of the board shall, within sixty days of such receipt, determine whether the application complies with such section and upon finding that the application so complies, fix a date for the commencement of a public hearing."

Including adjustments that were made through the various procedural rulings,[22] the procedural schedule called for the filing of party testimony and exhibits on the Project and Cassadaga Wind's application on May 12, 2017, and rebuttal testimony and exhibits on June 9, 2017. DPS Staff, DEC Staff, Department of Health (DOH) Staff, Department of Agriculture and Markets (DAM) Staff, and Concerned Citizens filed direct testimony and exhibits concerning the Project.[23] Cassadaga Wind and Concerned Citizens filed rebuttal testimony and exhibits.

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[22] In this case, the following Notices and Rulings were issued, a Ruling on Intervenor Funding and the Stipulations Process on September 9, 2015, a Notice of Pre-Application Conference to Consider Funding Requests and to Initiate the Stipulations Process, on September 16, 2015, a Notice Inviting Comments, on March 4, 2016, Notices for a Procedural Conference and a Public Statement Hearing, on November 30, 2016, Rulings on Schedule and on Party Status and Intervenor Funding, on January 26, 2017, Rulings on Intervenor Funds and an Extension of the Procedural Schedule, on February 6, 2017, a Ruling on a Request for Reconsideration of our intervenor funding awards, on March 2, 2017, a Ruling on Proposed Issues for Evidentiary Hearing, on March 20, 2017, a Notice of Technical Conference, on March 24, 2017 and corrected by Notice issued March 27, 2017 and then a Notice Cancelling the Technical Conference on April 3, 2017, a Ruling Adopting a Protective Order on April 11, 2017, a Ruling on DPS Staff's Motion to Compel Discovery Responses, on April 25, 2017, a Ruling modifying the procedural schedule on April 27, 2017, a Ruling further modifying the procedural schedule on May 5, 2017, a Ruling Modifying the Protective Order on May 15, 2017, a Ruling further extending the procedural schedule, on May 26, 2017, a Ruling on Motion to Exclude Testimony, on June 29, 2017, and a Notice of Evidentiary Hearing on July 7, 2017.

[23] PSL §166 lists the statutory parties to an Article 10 proceeding. Despite being listed therein, no appearance was made by the Department of Economic Development, the New York State Energy Research and Development Authority, the Department of State, or the Office of Parks, Recreation and Historic Preservation.

Evidentiary hearings were held in Sinclairville over seven days that included July 17 through 21, 2017, and July 26 and 27, 2017. The evidentiary record includes more than 2,700 pages of hearing transcripts and 146 exhibits, many of which are multipart. At the end of the hearings, we entertained proposals from the parties for a post-hearing briefing schedule. Pursuant to the schedule we adopted, Cassadaga Wind, DPS Staff, DEC Staff, DOH Staff, DAM Staff, and Concerned Citizens filed their initial post-hearing briefs on September 8, 2017, and their reply briefs on September 22, 2017.

Evidentiary Record Ruling

During the course of the hearings, Cassadaga Wind requested an opportunity to present supplemental rebuttal testimony and exhibits addressing DPS Staff's position regarding the grading of certain slopes. The Applicant contended that, on cross-examination, one of DPS Staff's witnesses raised new concerns about grading of land during turbine construction that supported his recommendation to either eliminate or relocate certain proposed turbines. In reviewing the DPS Staff witness's pre-filed testimony, we were unclear as to the scope of the testimony relative to the cross-examination and so allowed the Applicant to produce a supplemental rebuttal witness and granted parties the right to cross-examine. DPS Staff objected to this supplemental testimony and we reserved our ruling.[24]

We asked the parties to brief the objection and indicated that we would include our ruling in this RD. In its post-hearing brief, DPS withdrew its objection. With no other party expressing an objection, we rule on consent of the parties that the proceedings on transcript pages 2387 through 2401 and

[24] See Tr. 2385-87, ll. 12-3.

the associated exhibits received at that time are admitted and included in the evidentiary hearing record.

Public Involvement and Comment

The Board's regulations require applicants to promote public involvement throughout the entire Article 10 process to provide the Board with the complete context of local concerns. To ensure this, the regulations require applicants to produce a Public Involvement Plan (PIP) that is to be written in consultation with State agencies and other stakeholders.[25] A PIP should be designed to encourage stakeholder participation at the earliest opportunity, including the pre-application phase, and should continue through final certification and post-construction compliance activities. The PIP should also detail an applicant's plans to foster public involvement through education about both the proposed project and the Article 10 process.

Here, Cassadaga Wind submitted its proposed PIP to the DPS in November 2015. DPS and other interested parties reviewed the plan and provided comments. After considering comments and incorporating recommendations, the Applicant filed its revised PIP in January 2016 which was approved by DPS.

Pursuant to the PIP, the Applicant encouraged participation from affected local, State, and federal agencies. Cassadaga Wind also attended local town, zoning and school board meetings, communicated with certain stakeholders by letter and email, and hosted four open houses for the public between January 2015 and August 2016. To further educate the public and encourage participation, Cassadaga Wind posted notices of local meetings and Project milestone filings in local newspapers.

[25] 16 NYCRR §1000.4; 16 NYCRR §1001.2(c)&(d).

DPS Staff, however, did express concern in its testimony that the Applicant did not appear to use the stakeholder list sufficiently to ensure that interested and affected parties in the Project area, such as landowners, were made aware of the Project in the pre-application phase. At the Public Statement Hearing, several landowners stated that they did not know about the Project during the pre-application phase. Although the Applicant notified the general public of the filings by publishing summaries in local newspapers and insisting it mailed notification as required by the PIP, it did not include proof of service to the stakeholder list. After hearing these complaints, we required the Applicant to provide an affidavit of publication with a mailing list attached. We received that material on January 27, 2017. It is unclear as to why certain landowners claimed not to receive their notices and it does not appear to have reduced public participation in the case during the post-application stages.

DPS Staff's discussion in brief is quite general on this point and did not raise any particular part of the PIP it believes Cassadaga Wind did not follow. Despite this lack of specificity, in an abundance of caution, we recommend the Board adopt the DPS Staff's proposed certificate conditions that address future mailings and other outreach efforts. We have included those provisions in our recommended certificate conditions 13 and 14 which require the Certificate Holder to provide notice to several categories of interested persons and detail the specific information required for such notice. Recommended certificate condition 15 requires the Certificate Holder to provide additional information regarding the location of any posted Project information to the affected Town Boards.

During these proceedings, the Board also conducted public involvement activities, including maintaining a list on

the DPS Document and Matter Management (DMM) website of active parties and any other persons or organizations that requested to be informed of Project filings. Prior to the Public Statement Hearing on January 9, 2017, in Sinclairville, the Secretary mailed notice of the hearing, and information describing the Project, to approximately 150 municipal and elected officials, agencies, and community based organizations in the Project area.

In addition to statements provided at the Public Statement Hearing described above, DMM lists 67 public comments received since the earliest stages of the Applicant's pre-application proposals. The comments are of mixed nature, some in support and some in opposition.

Comments in support of the Project discuss the need for clean electric generation, the economic benefits to the local community in the form of jobs and payments from the Applicant to support schools and roads, the potential for decreased local taxes, and lease payments made to host landowners. The Towns of Cherry Creek and Charlotte also filed local Resolutions supporting the Project and urging the Board to grant Cassadaga Wind an Article 10 certificate.

Comments opposing the Project address environmental and health concerns, potential adverse financial and community impacts in the area, and the effects on communication. Residents expressed concern that the turbines will have negative impacts on wildlife, the local watershed, and recreational and agricultural land. Additional criticisms focus on potential impacts from noise, infrasound, vibration, electromagnetic fields and shadow flicker. Some of the opposition comments suggest mitigation or minimization of impacts through measures such as adjustments to the turbine layouts away from residences, rather than certificate denial. Comments in opposition also addressed the Project's impact on the rural, residential,

bucolic nature of the area and impact of large wind turbines on the local viewshed and decrease property values.

In particular, opposing commenters express concern about the cumulative impacts of this Project and other potential and proposed large scale wind projects nearby. Other commenters express concern about the potential for disruptive impacts on communications creating a risk to public health; the need for the Project; the proposed technology, including whether turbines actually provide clean energy; and the lack of public participation.

Concerned Citizens

Prior to joining together as a single organization represented by counsel, members of Concerned Citizens became parties to this proceeding as individuals. These individuals actively participated, expressing their concern about the impacts the Project will have on the local community and on their quality of life. In addition, these individuals have provided numerous comments supporting their contention that the Project may adversely impact their health, their enjoyment of their home and community, and their property values. We have reviewed their comments and, in essence, the residents' ultimate position is captured in the Concerned Citizens' initial post-hearing brief proposed findings of fact, particularly the last one, number seven, in which it contends that the negative impacts of the Facility cannot be minimized or otherwise mitigated by certificate conditions, and, therefore, the Project should not receive a certificate.

As we discuss herein, on weighing the costs and benefits of the Project and examining the impacts of the Facility as minimized and avoided by the proposed certificate conditions, we recommend that the Board issue Cassadaga Wind a conditional certificate of environmental compatibility and

public need. Essentially, the ramifications of the comments submitted by the members of Concerned Citizens are such that no wind farm would ever receive approval. The contention is that some of the impacts of the Project are of such an adverse nature that no measure of minimization or mitigation would make them acceptable. The concerns are often expressed in such general terms that they would apply to any proposed wind farm. While we acknowledge Concerned Citizens' contentions, the State legislature has enacted Article 10 and provided a process to ensure that the potential adverse health or community effects are avoided as much as possible, while recognizing the societal need for new power generation facilities.

FINDINGS AND DETERMINATIONS

Article 10 Standards

Between 1992 and 2003, the process applicable to siting major electric generating facilities in New York was contained in PSL Article X. Article X expired on January 1, 2003, subjecting proposed siting projects to decision-making and permitting under the State Environmental Quality Review Act (SEQRA). On August 4, 2011, Governor Andrew Cuomo signed into law the Power NY Act of 2011 creating a new PSL Article 10.[26]

The updated Article 10 recreates the New York State Board on Electric Generation Siting and the Environment charged with establishing rules and regulations relating to the procedures to be used in certifying major electric generating facilities. Recognizing the multi-disciplinary breadth of such

[26] L. 2011, c. 388 (effective August 4, 2011). NY Senate Bill No. S5844 and NY Assembly Bill No. A08510 of the 2011-12 Legislative Session. The Bill states that its purpose was, inter alia, to "reauthorize and modernize Article X of the Public Service Law, regarding siting of major electric generating facilities in a manner that enhances public participation and augments environmental justice."

a charge, the Board is comprised of five permanent members: the Chair of the DPS, who also serves as Chair for the Board; the Commissioner of the DEC; the Commissioner of the DOH; the Chair of the New York State Energy Research and Development Authority; and the Commissioner of the Department of Economic Development. To include local input into the Board's decisions, Article 10 also establishes two *ad hoc* board positions that are reserved for residents of the municipality in which a facility is proposed to be located, one appointed by the president *pro tem* of the Senate and the other by the speaker of the Assembly.[27]

Similarly, the updated Article 10 addresses the Legislature's desire to expand public participation in the process by providing intervenor funding earlier in the process and for legal fees. Additionally, the new Article 10 includes a lower production threshold to expand its application, from 80 MW to 25 MW.

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[27] NY PSL §160(4). Pursuant to PSL § 161(2), after receiving Cassadaga Wind's final Public Involvement Plan, the Secretary sent requests, dated January 23, 2015, to the municipal chief executive officers in the Project area seeking their nominations for ad hoc Board members. After receipt of the Applicant's Preliminary Scoping Statement, the Secretary, via letters dated September 9, 2015, requested that the president pro tem and the speaker of the assembly each appoint an ad hoc Board member from the lists of nominees that had been submitted by the municipal chief executive officers. On October 19, 2015, the president *pro tem* of the Senate initially appointed Jason R. Johnson, but, when Mr. Johnson became ineligible, appointed Karl Kelling by letter dated May 10, 2016. When the Speaker of the Assembly failed to appoint a Board member within 30 days of receiving the list of nominees, Governor Andrew Cuomo, in accordance with PSL §168(2), appointed Greg Gane by letter dated February 5, 2016 (filed with the Secretary on February 8, 2016). Both Mr. Kelling and Mr. Gane have actively participated in this proceeding, attending most of the conferences and the hearing.

Article 10 charges the Board to make specific findings before issuing a certificate. Specifically, PSL §168(2) requires that the Board, in any decision on an application, make explicit factual findings as to the probable environmental impacts of the construction and operation of the facility, including impacts on (a) ecology, air, ground and surface water, wildlife, and habitat; (b) public health and safety; (c) cultural, historic, and recreational resources, including aesthetics and scenic values; and, (d) transportation, communication, utilities and other infrastructure. The Board's findings must examine the cumulative impact of emissions on the local community to determine whether the construction and operation of the Facility will result in a significant and adverse disproportionate environmental impact.[28]

Section 168(3) prohibits the Board from issuing a certificate "unless the Board determines" that: the facility is a beneficial addition to, or substitution for, the electric generation capacity of the State; the adverse environmental impacts of the project's construction and operation have been adequately minimized or avoided to the maximum extent practicable; and, the construction and operation of the facility will serve the public interest. The Board must also determine that the facility is designed to operate in compliance with applicable State and local laws and regulations. To assist the Board in its local law determination, PSL §168(3) requires that the Board provide the affected municipalities an opportunity to present evidence on its own ordinances, laws, resolutions, regulations or other relevant local actions. PSL §168(3) states that the Board may not issue a certificate unless it determines either that the facility does not result in or contribute to a

[28] PSL §168(2)(d).

significant and adverse disproportionate environmental impact in the community in which it would be located, or, if it does create such an impact, that the applicant will avoid, offset or minimize such to the maximum extent practicable for the duration of the certificate.

Pursuant to PSL §168(4), the Board's conclusions under PSL §168(3) are to be supported by consideration of the state of available technology, the nature and economics of reasonable alternatives, the Board's PSL §168(2) findings on the project's environmental impacts, the impact of construction and operation of any related project facilities, the consistency of the construction and operation of the facility with the most recent State energy plan, and the impact on community character and whether the facility would affect communities that are disproportionately impacted by cumulative levels of pollutants. Finally, the Board may consider any other social, economic, visual or other considerations that it deems pertinent. We have examined the record evidence regarding these factors, where relevant, in our discussion of the PSL §168(3) determinations.

Electric Generation Capacity - PSL §168(3)(a)

Under PSL §168(3)(a), the Board, to issue a certificate, must find that the Facility will be a beneficial addition to the electric generation capacity of the State. To make the required finding, the Board is required to consider, among other things, in PSL §168(4) whether the proposals are consistent with the State's energy policy and planning objectives, particularly in the context of the latest State Energy Plan (SEP).

The parties do not contest Cassadaga Wind's assertion that the facility is a beneficial addition to New York's generating capacity. We agree with the parties that Hearing Exhibits 52, 99 and 104 demonstrate that the Project's output

will be a beneficial addition to New York's renewable energy generation fleet capacity. As evidenced by the PSC's Order Adopting a Clean Energy Standard (CES) in PSC Case 15-E-0302,[29] New York has adopted a broad view of the benefits of renewable energy and carbon emissions reductions. Hearing Exhibit 52 contains the 2015 New York SEP. The SEP specifies that "renewable resources will indeed play a critical role in shaping New York's energy future, providing resilient power, reducing fuel cost volatility, and lowering GHG [greenhouse gas] emissions. REV's[30] renewable energy initiatives will aim to accelerate deployment of a broad spectrum of renewable technologies at various scales ranging from rooftop solar to grid-scale wind farms, with a consistent emphasis on projects that provide benefits to the grid."[31] The SEP thus supports a determination that this Project, as a commercial-scale wind farm, is consistent with the State's policy goals.

We recommend that the Board determine that the Project is a beneficial addition to New York's electric generation capacity through the provision of renewable energy to the regional market, the diversification of New York's generation and the lowering greenhouse gas emissions based on Application Exhibit 10 (in Hearing Exhibit 99), and on Hearing Exhibit 104

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[29] Case 15-E-0302, Implementation of a Large-Scale Renewable Program and a Clean Energy Standard, Order Adopting a Clean Energy Standard (issued August 1, 2016) (CES Order).

[30] REV, Renewing the Energy Vision, is Governor Andrew M. Cuomo's comprehensive energy strategy for New York. REV's stated policy goals include helping consumers make more informed energy choices, developing new energy products and services, and protecting the environment while creating new jobs and economic opportunity throughout the State. See https://rev.ny.gov. See also Case 14-M-0101, Reforming the Energy Vision, Order Instituting Proceeding (issued April 25, 2014).

[31] Hrg. Ex. 58 at 68.

at pages 13 through 20. As DPS Staff acknowledges, "the Project will result in a modest beneficial addition of electric generation capacity in the State that will not inefficiently displace other beneficial generation."[32]

Cassadaga Wind's proposal also addresses the potential for an over-dependency on natural gas generated electricity. The Applicant maintains that such dependence can create financial problems for customers during cold weather events or even just result in unpredictability for budgeting purposes because of natural gas price volatility.[33] The Project creates a beneficial addition to the State's capacity inasmuch as it aids in diversifying fuel sources, increases grid reliability and resiliency, and supports the modernization of grid infrastructure, advancing State energy planning objectives of "improving the reliability of the state's energy systems . . . insulating customers from volatility in market prices" and "reducing the overall cost of energy in the state."[34]

In its CES Order, the PSC expressly declined to limit its consideration of public benefits to those "benefits experienced solely within New York" when determining whether a project advances State policy goals.[35] The CES Order states that when considering climate change impacts, requiring only local or in-State benefits "could lead to inaction not only in New York but in all other jurisdictions" and that "consequences of inaction on air pollution and climate change are not acceptable."[36] As the Applicant notes, this language supports

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[32] Tr. 1418, ll. 4-16.

[33] See SEP, Hrg. Ex. 52, at 25.

[34] NY Energy Law §6-102(5).

[35] CES Order at 71.

[36] Id.

its contention that the SEP policies are not aimed only at reducing New York's emissions or generating renewable energy consumed locally, but are part of New York's boarder shared national and international goals of transforming the production, delivery, and consumption of electricity placing New York as a leader in energy policy.[37] This is an important point because the Project has contracted to sell its energy in out-of-State energy markets.

The Article X Board's Order in its Athens Generating Case also supports the proposition that the addition of electric generation in New York is beneficial to New York regardless of where it is consumed.[38] In the Athens Generating Order, the Article X Board held that the proposed facility "would displace the production of other less efficient plants in New York regardless of whether [the Facility owner] has contracts to sell in New England or elsewhere. Commercial transactions do not govern the flow of electricity. [The Facility's] electricity production will physically remain in New York, requiring the [New York Independent System Operator (NYISO)] to ramp down less efficient generators."[39]

The Appellate Division specifically affirmed the Article X Board on this point, stating that "even if the plant's electricity were to be sold outside the State, transmission of the electricity through NYISO would commit generators to minimize costs and maintain reliability and the overall amount

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[37] See CES Order at 6 and 10.

[38] Case 97-F-1563, Athens Generating Company LP – Application to Construct and Operate a 1,080-Megawatt Natural Gas-Fired Combined Cycle Combustion Turbine Generating Facility in the Town of Athens, Greene County, Order Granting Certificate of Environmental Compatibility and Public Need (issued June 15, 2000) (Athens Generating Order).

[39] Id. at 94.

of electricity produced in the State would be increased, thereby resulting in lower electricity prices."[40] Thus, a proper evaluation of whether the Project is a beneficial addition to the State's generation capacity is made irrespective of the destination of the power. Based on the above, we recommend that the Board affirmatively find, pursuant to PSL §168(3), that the Facility will be a beneficial addition to the generation capacity of the state.

Environmental Impacts - PSL §168(2) & §168(3)(c)

Section 168(2) of the PSL requires the Board to make factual findings as to the probable environmental impacts from the construction and operation of the facility. After making such findings, the Board must then make a legal determination under PSL §168(3)(c) that any adverse environmental effects of the construction and operation of the facility will be minimized or avoided to the maximum extent practicable before it issues an Article 10 certificate.

To assist applicants in providing sufficient information to enable the Board to make its environmental impact factual findings, PSL §168(2) specifies a list of environmental concerns that must be addressed. Additionally, the Board's regulations located at 16 NYCRR §§1001.1 through 1001.41 contain

[40] Matter of Citizens for the Hudson Val. v. New York State Bd. on Elec. Generation Siting & Envt., 281 A.D.2d 89, 99 (3d Dept. 2001).

detailed application requirements for each area of environmental concern set forth in PSL §168(2).[41]

PSL §168(3)(c) explicitly prohibits the Board from issuing an Article 10 certificate unless it determines that the adverse environmental impacts of the project's construction and operation have been minimized or avoided to the maximum extent practicable. In making its determinations, the Board may impose, and monitor compliance with, any terms and conditions it deems necessary.[42]

The following sections will examine each of the environmental topics for which factual findings are required by

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[41] PSL §168(2) specifies that the Board make its environmental factual findings on impacts related to: (a) ecology, air, ground and surface water, wildlife, and habitat; (b) public health and safety; (c) cultural, historic, and recreational resources, including aesthetics and scenic values; and (d) transportation, communication, utilities and other infrastructure. While the Board's regulations provide more specifics required for the contents of an application on the foregoing subjects, the application exhibit headings of 16 NYCRR §§1001.1 et seq. do not track the PSL 168(2) term for term as they are designed to provide much more specificity, particularly for some areas that may be broken into even more component parts than the PSL §168(2) list, or where information is shared across more than one PSL §168(2) category.

In this case, Cassadaga Wind, in its post-hearing brief, discussed topics in a narrative that roughly followed the PSL list, whereas DPS Staff contextualized its discussion more closely tracking the regulations. While neither format could be said to be incorrect, we found the Applicant's format to be more useful inasmuch as the headings for each topic area in that brief were explicitly tied to the required findings of PSL §168(2). We have chosen to use a format more similar to that of the Applicant's post-hearing brief in this RD.

This being the first case to make its way through the Article 10 process, however, we did wish to describe our experience and express our personal presentation preference as potential guidance for future Article 10 parties.

[42] PSL §§162 & 168(5).

PSL §168(2). Then, we discuss the proposed minimization and avoidance measures and make our recommendations to the Board as to whether they have achieved minimization and avoidance to the maximum extent practicable, including our recommendations for resolving any disputes related to certificate conditions.

Ecology

Information regarding the probable impacts of construction and operation of the Project on the area's ecology is found in Application Exhibit 22, Application Appendix JJ, and Application Appendix MM (all contained in Hearing Exhibit 99). Further information on ecological impacts is in the record in the Applicant's Response to DPS IR-3 (included in Hearing Exhibit 133) and in Hearing Exhibits 11 and 13. The impacts to ecology largely consist of the temporary and permanent disturbance to plants, vegetation, and forests for construction of turbine locations, access roads, collection lines, the 115 kV generator lead line, and substations. The majority of issues related to findings of the impacts on ecology are undisputed, although the parties dispute the adequacy of the Applicant's minimization and avoidance efforts.

The Project area's predominant land types are forestland and agriculture. The application's proposed 58 turbine layout, reduced from the PSS's 62 turbine layout, identified a Project area that consisted of 5,142 acres of forest, 2,525 acres of active agriculture, 311 acres of successional shrubland, 223 acres of successional old field, 12 acres of open water and 113 acres of developed or disturbed land.[43] Approximately 64 percent of the Project area consists of large forest tracts, although the forest tracts are often bisected by agricultural lands, particularly in the western

[43] Hrg. Ex. 99, Application Ex. 22 at 1-9 and table 22-2.

portion of the Project area.[44] The Project area also does not contain any threatened, endangered, candidate, or rare plant species, or any significant ecological communities.[45]

Impacts from Project construction include permanent vegetation clearing and temporary disturbance from construction, as well as the permanent loss of vegetated habitats.[46] The revised Project, consisting of 48 turbines, results in disturbance of up to 522.9 acres of vegetation, of which 445.6 acres would be temporary, including areas where collection line will be buried, construction staging areas, and the margins of access roads and turbine construction workspaces.[47] Permanent vegetation disturbance will occur where permanent facility components are located, and could consist of approximately 77.3 acres of vegetation.[48]

Post-construction operational impacts to vegetation are expected to be limited, consisting mostly of disturbances to vegetation resulting from routine maintenance and occasional repairs.[49] Facility maintenance will create additional operational impacts for turbine sites, access road embankments, collection line routes, and the 115 kV generator lead line right-of-way. Such maintenance will impact low-growing vegetation and the Applicant does not anticipate using herbicides or pesticides other than within a small fenced substation enclosure area. Maintenance will also include

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[44] Hrg. Ex. 99, Application Ex. 22 at 1.

[45] Hrg. Ex. 133, Applicant's Response to DPS IR-3.

[46] Hrg. Ex. 99, Application Ex. 22 at 5-7.

[47] Hrg. Ex. 99, Application Ex. 22 at 6.

[48] See Hrg. Ex. 11.

[49] Tr. 315-16, Tr. 344; Hrg. Ex. 99, Application Ex. 22 at 7.

periodic vegetation management along collection line corridors, road shoulders and turbine sites.[50]

The Project will not result in any extirpation or significant reduction to any existing plant community. Additionally, Cassadaga Wind did not identify any threatened, endangered, candidate, rare plant species, or significant ecological communities through its database requests, or through on-site observations during its ecological surveys. Based on the above discussion, we recommend the Board find that Project construction and operation will not result in likely adverse impacts to protected plants or to significant ecological communities. To minimize any vegetation impacts, we recommend the Board adopt proposed certificate conditions 9, 69, 84, 100, 103, 115, 121, and 145 as set forth in Appendix A.

Invasive Species

Environmental Conservation Law (ECL) Article 9 provides DEC with the authority to review projects for any risks posed by invasive species to the State's environment, including the detrimental effect upon the State's "fresh and tidal wetlands, water bodies and waterways, forests, agricultural lands, meadows and grasslands, and other natural communities and systems." ECL §9-1701. Cassadaga Wind's evaluation of the Project's potential invasive species[51] impacts is contained in Application Exhibit 22(b) and Application Appendix FF (Hearing Exhibit 99), in Hearing Exhibit 7, and in the Applicant's Supplemental Response to DPS IR-2 (Hearing Exhibit 133). During

[50] Hrg. Ex. 99, Application Ex. 5(i)&(j).

[51] DEC defines an invasive species as a species that is non-native to the ecosystem under consideration, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. 6 NYCRR §575.2(s).

the fall of 2015, the Applicant performed a vascular plant species inventory of the local area that was based on the layout of its preliminary Project plans. Of the 200 plant species observed, 10 different species in the Project area are listed on the Prohibited and Regulated Invasive Species List for New York State.[52]

Cassadaga Wind prepared a detailed Invasive Species Survey Methodology Memorandum to establish the timing, scope and methodology to document baseline conditions prior to Project construction.[53] Pursuant to this memorandum, the invasive plant survey was conducted in May 2017 and June 2017 to enable the accurate identification of target species. The Applicant identified invasive plants in field notes and global positioning system point data.[54] The Applicant's survey results and data are summarized in its Invasive Plant Species Survey Baseline Report (Baseline Species Report), Cassadaga Wind's Second Supplemental Response to DPS-2 (Hearing Exhibit 133).

Approximately 40 percent of the survey area contains existing populations of plant species listed as "regulated" by DEC. The most common species are honeysuckle, multiflora rose, wineberry, and garlic mustard.[55] The location and density of these species is depicted in the Applicant's Baseline Species Report, as is the specific location of the Japanese knotweed and common reed populations within the Project survey area.[56] Various invasive species occur throughout the survey area at varying densities.[57]

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52 Hrg. Ex. 99, Application Ex. 22.

53 Hrg. Ex. 99, Application App. FF.

54 Hrg. Ex. 7 at 2-3.

55 Hrg. Ex. 133 at 267.

56 See Hrg. Ex. 133 at 271-311.

57 Hrg. Ex. 133 at 267.

Invasive species impacts occur when species are introduced into an area, or when existing non-native species are aggravated causing them to expand their presence in the area. Invasive plant species spread in a number of different ways, including wind, water, wildlife, vegetative reproduction, and human activity. Populations of invasive species typically establish most readily in places where soil has been disturbed and vegetation removed.[58] Construction will result in soil disturbance and vegetation clearing for Project components and workspaces. Approximately 389.5 acres of soil will be disturbed during construction, and approximately 522.9 acres of vegetation will be cleared. Approximately 77.3 acres of the disturbed areas will be converted to permanent facilities.[59] The remaining acreage will only be disturbed temporarily, ultimately allowed to return to a vegetation after construction ends. Invasive plant species can spread into temporarily disturbed areas through the movement of topsoil, fill, gravel, and construction equipment.[60]

Cassadaga Wind's Invasive Species Control Plan, Application Appendix FF (Hearing Exhibit 99), summarizes the Applicant's proposed control measures which include: the inspection of construction materials; targeted species treatment and removal; sanitation of construction equipment; and site restoration. The plan also details a two-year post-construction invasive species monitoring and response program.

The Baseline Species Report also commits the Applicant to follow the Invasive Species Control Plan throughout Project construction and decommissioning. Based on the results of the

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[58] Hrg. Ex. 99, Application App. FF at 1-2.

[59] Hrg. Ex 11.

[60] Hrg. Ex. 99, Application App. FF at 1.

survey and the recommendations set forth in the Baseline Species Report, the Applicant proposed revised certificate conditions 52 and 53, which are supported by DEC Staff. We have included those conditions as 53 and 54 in Appendix A. With the imposition of certificate conditions 53 and 54, we recommend the Board determine that the Project's impacts on invasive species have been minimized or avoided to the maximum extent practicable.

Forest Fragmentation and Slopes

As currently proposed with 48 turbines, the Project will result in permanent loss of 46.4 acres of forested land.[61] DPS Staff raises concerns that this loss will cause forest fragmentation.[62] Specifically, in its issues statement, Hearing Exhibit 143, DPS Staff noted that, when the Project consisted of 58 proposed turbines, 27 percent of the Project's forest clearing impacts would be associated with turbines T7, T22, T36, T42, T54 and T58. DPS Staff also testified that because local farming has created heavy fragmentation of the land in the Project area, conservation of existing forests is imperative.[63] DPS Staff also expressed some concern regarding the amount of "grading and earthwork" required for the construction of certain turbines.[64] No other party, including DEC Staff, takes a position on the forest fragmentation issue.

Cassadaga Wind contests DPS Staff's claims, maintaining that forest clearing and fragmentation will only be minor.[65] To support its contention, the Applicant points to the

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61 Hrg. Ex. 11 at 3.

62 Tr. 386-88, ll. 14-6.

63 Tr. 387, l. 4.

64 Tr. 388, ll. 7-15.

65 Tr. 246-48, ll. 1-3.

fact that the widths of buried utility collection systems and access roads through forested areas are relatively narrow and have been located, where possible, along existing disturbed corridors such as farm lanes, logging roads, and access roads associated with existing natural gas wells.[66] The Applicant also claims that the Project does not impact a significant overall amount of forest within the Project area or Chautauqua County, and that the impacted forests do not have any special designation or criteria for concern.[67]

Notwithstanding its disagreement with DPS Staff's assertions, in rebuttal, the Applicant voluntarily eliminated T54 and T58 to address some of the forest fragmentation concerns DPS Staff raised.[68] After eliminating the turbines, Cassadaga Wind assessed the potential fragmentation associated with construction of the remaining Project components, evaluating where such components were located in relation to interior forest within the Project area.[69] The Applicant's analysis, Hearing Exhibit 13, uses a methodology based on information from a DEC comment letter provided during the SEQRA process for another New York wind farm project.[70]

Cassadaga Wind maintains that because measurable impacts are generally found only up to 2,000 feet into the

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66 Hrg. Ex. 99, Application App. TT.

67 See Hrg. Ex. 13 at 2-3.

68 Tr. 245, ll. 7–11.

69 See Hrg. Ex. 13.

70 Hearing Exhibit 13 notes that DEC's comment for the Jericho Rise Wind Farm Supplemental Environmental Impact Statement issued on January 11, 2016 stated that "Indirect impacts to interior forests are difficult to quantify, though many studies have shown that measurable impacts are found at least 300 feet, and up to 2000 feet, into the forest from the boundary of a disturbance."

forest from the boundary of a disturbance, if the Project's facilities are mostly located on forest edges, then fragmentation will not occur. Cassadaga Wind's analysis, taking what it calls a "reasonable middle ground" in which it defines interior forest as anything beyond 1,000 feet, concludes that approximately 5.7 percent of the forestland within the Project area should be considered interior.[71] The Applicant notes that none of the turbines identified by DPS Staff exist within forest interiors. Based on this analysis, the Applicant argues that the Project will not result in significant adverse impacts to interior forest conditions and therefore is unlikely to exacerbate existing or current conditions with respect to forest fragmentation.[72]

At hearings, DPS Staff withdrew its recommendation for the removal of turbine T7.[73] DPS Staff did not challenge the Applicant's definition of interior forest or its claims that no facilities were located in, or likely to impact any, interior forest. Instead, DPS Staff clarified that its concern was of general forest conservation, and that the Project would exacerbate existing fragmentation caused by the long-existing land uses.[74] DPS Staff also "clarified" that its concern with grading and earthwork was specific to the slopes, contending that the slopes at turbines T22, T36, and T42 were steeper than

[71] Hrg. Ex. 13 at 2.

[72] Hrg. Ex. 13 at 2-3.

[73] Tr. 391, ll. 16-22.

[74] Tr. 393, ll. 3-25.

any other wind farm in New York.[75] When asked for specifics, DPS Staff responded that for the three remaining turbines at issue, forest fragmentation was not so much the issue but that the grading created unnecessary cuts and fills.[76]

In its supplemental rebuttal, Cassadaga Wind provided evidence that the slopes and grading required for the turbines DPS Staff identified were not unique to the Project. The Applicant provided Hearing Exhibit 139, construction drawings for the Hardscrabble wind facility and the Howard wind facility. The Applicant noted that the slopes for those turbines depicted on the drawings in Hearing Exhibit 139 were consistent with the proposed turbines T22, T36, and T42.[77]

Based on the record, we recommend the Board find that the slopes of certain access roads and facilities do not create any disproportionate or adverse environmental impact. However, we recommend the Board find that the Project has the potential to exacerbate existing forest fragmentation by clearing some trees to place facilities, creating larger open spaces between forested areas. The Applicant has demonstrated that it has taken measures to both minimize and avoid the forest fragmentation impacts. We now examine the adequacy of those measures.

The Applicant relies on its voluntary elimination of certain proposed turbines, at both the planning and development

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[75] Tr. 392-99, 407-10. Compare Tr. 388, ll. 7-15 with Tr. 392-99, 407-410. Given the lack of specificity in the initial testimony, we agree with Cassadaga Wind that DPS Staff interjected a new issue at this point in the cross-examination and would have ruled the supplemental testimony admissible irrespective of DPS Staff's withdrawal of its objection discussed in the Evidentiary Record Issues section, supra.

[76] Tr. 408, ll. 10-14.

[77] See Tr. 2395-99.

stage and the post-application refining stage, to demonstrate that the Project's impacts on forests have been avoided and minimized to the maximum extent practicable. Cassadaga Wind claims that its voluntary turbine reductions have avoided impacts to vegetation and ecology, while maintaining an output of energy from the project equal to that envisioned with the initial number of turbines.[78] Cassadaga Wind also indicates that it has proposed several certificate conditions that it maintains will result in the greatest practicable minimization and avoidance.

The revised application before the Board now shows that only 5.7 percent of the affected Project area consists of "interior forest" as defined by the Applicant.[79] Additionally, notwithstanding existing forests, the record does not identify any particularly sensitive forest community that would justify a recommendation that Cassadaga Wind should eliminate additional turbines. In particular, despite DPS Staff's generalized forest conservation claims, it offers no detailed explanation how the turbines would adversely impact the forests, such as degrading habitat or any other specific effect. Likewise, nothing in the record indicates how the Board's elimination of specific turbines would benefit the forest.

Even accepting that the impacts to the fringe of forests exacerbates existing forest fragmentation, Cassadaga Wind sought to avoid forest clearing as much as possible. No evidence in the record establishes specific effects that might result from the limited further fragmentation or why those effects, when balanced against other concerns, should result in the potential elimination of T22, T36, and T42 and their

[78] Tr. 240-45, ll. 15-5; see Hrg. Ex. 11.

[79] See Hrg. Ex. 13.

associated energy output. Although DPS Staff does attempt to supplement the lack of specifics in its post-hearing brief Appendix B, Proposed Findings, the Appendix lacks record support. For example, although Appendix B connects the idea of forest fragmentation to the potential impact on songbird and bat populations as well as wildlife travel corridors, no testimony supports these assertions.

As to DPS Staff's companion concern regarding the slopes on which some of the turbines are located and the amount of grading that will be necessary, the record indicates that, contrary to DPS Staff's assertions, the slopes and cuts associated with the three specific turbines identified were not unprecedented when compared to other operating wind farms in New York.[80] Therefore, we recommend the Board determine that the Applicant has sufficiently minimized and avoided land impacts to forests and slopes. Cassadaga Wind has voluntarily eliminated the turbines that created the most adverse impact, T54 and T58. Additionally, it eliminated eight other turbines reducing the impact of the Project on the local ecology. One could always continue to eliminate turbines on the grounds of avoidance. If no project were built, then all impacts would, of course, be avoided. However, no benefits would accrue either.

We also recommend the Board find that Cassadaga Wind appropriately worked with participating landowners to shift Project components close to forest edges where possible to try

[80] Tr. 2395-99, ll. 7-4; Hrg. Ex. 139.

to maintain existing farming operations in agricultural lands.[81] Relocating facilities away from the forest into existing clearings could exacerbate the problems we review in the next section And interfere with compliance for a number of other siting criteria such as those for setbacks, sound and vibration, and shadow flicker.[82] We recommend that the certificate allow construction of turbines T22, T36, and T42 and that the Board determine that the forest impacts and slopes have been minimized or avoided to the maximum extent practicable.

Agricultural Land

The Project proposal sites one turbine and a portion of an overhead electrical collection system sited within and abutting active agricultural fields. The fields are located in the southeastern portion of the Project area, north and south of Boutwell Hill Road in the Town of Cherry Creek (Boutwell Hill Road Property). The collection lines span the area between proposed turbines T31 and T12.[83] The field to the south of Boutwell Hill Road is rotation cropland, while the field to the north appears to be comprised of grass hay.[84] The agricultural land adjacent to Boutwell Hill Road has been designated by the State of New York as prime agricultural land of Statewide

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81 A "participating" landowner is one who is receiving compensation for return for some consideration such as providing an easement to allow the siting of facilities on the property, or, in some cases, as a mitigation for impacts to the land caused by the location of facilities near to, but not on, the property. In contrast, a "non-participant" receives no compensation from the Applicant. See Tr. 815, ll. 3-15.

82 Tr. 366-68, ll. 1-3; Hrg. Ex. 99, Application Exs. 6, 19 at 28 & 39, 24 at 17-21, and 31.

83 Tr. 1240, 1290.

84 Id.

significance, indicating that the soil on this particular land produces high yields of crops.[85]

The Project layout shows a turbine, an access road and the overhead collection system consisting of approximately six poles on the Boutwell Hill Road Property.[86] Approximately 10 square feet of clearing will be needed for a single stand-alone pole, while clearing of approximately 30 square feet would be needed for a single guyed pole.[87] The collection system poles will be approximately 50 to 60 feet tall in the area of the Boutwell Hill Road Property, spanning approximately 250 to 300 feet between poles.[88]

The record demonstrates that this aspect of the Project will result in a permanent conversion of some farmland to a non-agricultural use.[89] As proposed, the Project places both poles and guy wires in active croplands, restricting maneuverability of modern mechanized farming equipment.[90] DAM Staff explains that, as the size of the farming equipment has increased over the years, the turning radius for the equipment has also increased. DAM Staff's concern is that the placement of pole structures and other project related infrastructure in an agricultural field creates an obstacle for the farmer to avoid during field operations, especially given the increased size of modern equipment.[91]

Hearing Exhibit 72 contains a picture showing poles associated with an overhead collection system on the Bliss Wind

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85 Tr. 1257.

86 Tr. 1241.

87 Tr. 1241-42.

88 Tr. 1258-59.

89 Tr. 1286.

90 Tr. 1291, see Tr. 1286.

91 Tr. 1286-87.

Farm in the Town of Eagle, Wyoming County. DAM Staff notes that the poles were placed across prime tillable agricultural land with the result that the farmer now must work around each pole structure, decreasing efficiency.[92] DAM Staff is concerned that the owner of the agricultural fields in Hearing Exhibit 72 could eventually convert his prime agricultural land to permanent pasture, and that the same result could occur on the Boutwell Hill Road property if Cassadaga Wind is allowed to proceed with its current Project design.[93] DPS Staff has also expressed its concern with the amount of agricultural land impacted.[94]

The placement of utility structures and other infrastructure in agricultural fields can result in a loss of productive acreage and a decrease in field operation efficiency, both of which may be significant impacts.[95] Such impacts may be exacerbated if numerous collection line poles are staggered across the field, creating obstacles that significantly decrease the tillable acreage and farming efficiency. These impacts could result in the land being taken out of agricultural production permanently.[96] The use of guying wires, in particular, can disproportionately increase the adverse impacts of poles located in agricultural land. Guying wires are used to provide stability to poles where wires change direction and create angle structures that can render agricultural land untillable, permanently removing it from production.[97] Hearing Exhibit 73 effectively demonstrates the potential for the

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92 Tr. 1289.

93 Id.

94 See Tr. 792-93.

95 Tr. 1287.

96 Tr. 1288.

97 Tr. 1289.

Project's conversion of a portion of the Boutwell Hill Road Property to permanent non-agricultural use.[98]

DAM Staff prefers that a commercial wind energy generation facility place any electrical collector system wires in agricultural lands underground because it imposes only temporary impacts to the farming operations.[99] In contrast, overhead facilities create a permanent impact to mechanized farming.[100] The Applicant relies heavily on the property owner's expressed wishes as to where to site the facilities on his land.[101] Additionally, Cassadaga Wind maintains that burying the collection wires would be approximately five times the cost of constructing overhead.[102] Similarly, the Applicant asserts that because the line connects across Boutwell Hill Road, subsurface placement would require boring under the road, creating an additional cost of approximately $100,000.[103] Finally, Cassadaga Wind notes that the topography of the immediate area consists of a relatively steep slope potentially making the transport of trenching equipment more difficult and potentially even more expensive.[104]

Subsurface installation of the electrical collection system in agricultural fields exists for almost all New York wind projects and that subsurface placement complies with DAM

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98 See Tr. 1289-90; see also Tr. 1259, ll. 3-8.

99 Tr. 1287, ll. 15-23.

100 Tr. 1287-88, ll. 23-3.

101 Tr. 1240-44, ll. 13-5. Cassadaga Wind notes that the landowner has signed a contract to host facilities does not have any objection to the Applicant placing overhead collection wires on his property. Tr. 1241, ll. 3-15; 1242-44, ll. 22-5; Hrg. Ex. 120.

102 Tr. 1241-42, ll. 23-3.

103 Tr. 1242, ll. 4-8.

104 Tr. 1242, ll. 17-21.

Staff guidelines for windfarm construction in agricultural land.[105] DAM Staff contends that the additional expense to bury the collection wires is outweighed by the societal cost associated with permanently removing prime agricultural land from being used to farm cash crops now and in the future.[106] DAM Staff also notes that, despite the Applicant's claim of steep slopes presenting an impediment to burying the collection wires, Cassadaga Wind proposes to construct an access road on the slope where the collection line in the Boutwell Hill Road Property will run, already requiring a significant amount of cut and fill in that area.[107] DAM Staff demonstrates that other wind projects buried collection lines on steep slopes.[108] DAM Staff points out that the Applicant's only given reason for not co-locating the collection line with the planned access road was that the access road would not be straight. Consequently, the Applicant was concerned that such placement would require more wire and create additional costs.[109]

DAM Staff also challenges the Applicant's reliance on the landowner's purported wishes, noting that the landowner is financially motivated to support the proposed project and that he may not fully understand the impact that the proposed construction of the overhead collection system will have on his ability to continue to farm his land. DAM Staff states that, while it does consider landowner's wishes, its primary mission

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105 Tr. 1287, ll. 15-20; 1288, ll. 3-5.

106 See Tr. 1298-99, ll. 24–12; see also N.Y. Agriculture and Markets Law (A&ML) §321 (stating "It is hereby found and declared that agricultural lands are irreplaceable state assets.").

107 Tr. 1265, ll. 20-24; Tr. 1265-66, ll. 23–7.

108 Tr. 1300-01, ll. 18–10.

109 Tr. 1266-68, ll. 8-7.

is to protect the agricultural resource for future use and future generations inasmuch as the lease agreement runs with the land.[110] DAM Staff argues that such a long-term lease will, therefore, constitute a permanent impediment to mechanized farming.

Giving due consideration to the legitimate concerns expressed on both sides, we agree with DAM Staff's position and recommend the Board adopt a certificate condition that requires the collection lines proposed on the Boutwell Hill Road Property be buried in the agricultural field. In making this recommendation, we acknowledge that at the hearings, the Applicant made a suggestion that poles could be located closer to the road to minimize the above-surface impacts. This suggestion was not fully developed the record. The Board could include in its certificate condition, a requirement that the line be underground through the agricultural field and brought above ground to cross the road with the consent of DAM, the agricultural monitor discussed below, and DPS.

We appreciate the fact that we are potentially nullifying the express wishes of a landowner regarding the placement of facilities on the property. However, we are convinced by DAM Staff's position that the State of New York values the State's agricultural lands even to overrule a landowner's expressed preferences where those wishes conflict

[110] Tr. 1299, ll. 5-12; Tr. 1261, ll. 12-21.

with the ability "to sustain the state's valuable farm economy and the land base associated with it."[111]

Given the clear expression of the value ascribed to agricultural land by the legislature, we agree that this value is not outweighed by the Applicant's cost considerations, where the costs are not prohibitive but only not the most cost-effective option.[112] Nowhere does Cassadaga Wind credibly establish that subsurface placement of these particular collection lines is not practicable, particularly given DAM Staff's demonstration that the Applicant may very well be able

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[111] N.Y. AM&L Article 25-AAA contains New York's laws pertaining to Agricultural and Farmland Protection Programs. A&ML §321 "Statement of Legislative Findings and Intent" states, in part, that: It is hereby found and declared that agricultural lands are irreplaceable state assets. In an effort to maintain the economic viability, and environmental and landscape preservation values associated with agriculture, the state must explore ways to sustain the state's valuable farm economy and the land base associated with it. External pressures on farm stability such as population growth in non-metropolitan areas and public infrastructure development pose a significant threat to farm operations, yet are the pressures over which farmers have the least control.

Additionally, A&ML §322 defines "Agricultural and farmland protection" as "the preservation, conservation, management or improvement of lands which are part of viable farming operations, for the purpose of encouraging such lands to remain in agricultural production."

Moreover, Article XIV of the State Constitution, section 4 states, in part, that: "The policy of the state shall be to conserve and protect its natural resources and scenic beauty and encourage the development and improvement of its agricultural lands for the production of food and other agricultural products. The legislature, in implementing this policy, shall include adequate provision for . . . the protection of agricultural lands."

[112] See Hrg. Ex. 71. Here we are weighing the direct loss of approximately 240 square feet of agricultural land against the added cost to the Applicant.

to co-locate the facilities with its planned access road where it can take advantage of trenching and similar construction work. Moreover, DAM Staff's concern about the impact of utility poles on agricultural fields, particularly where those poles are guyed for support, is fully illustrated in the record in Hearing Exhibits 71-74. We recommend the Board find that the impacts to existing farming operations require avoidance in light of the State's policy objectives. Our recommended certificate condition to minimize this impact is in Appendix A, condition 135. With that condition imposed, we recommend the Board determine that the impacts to agricultural land have been minimized or avoided to the maximum extent practicable.

Agricultural and Environmental Monitoring

DAM Staff and Cassadaga Wind have reached agreement on language for a certificate condition concerning post-construction and operational monitoring. The condition requires the Certificate Holder to employ an independent, third party agricultural monitor, but acknowledges that this monitor can also act as an environmental monitor should DAM agree that the selected monitor is properly qualified.[113] We recommend the Board impose this condition as necessary to protect the agriculture resources and ensure that the impacts have been minimized or avoided to the maximum extent practicable. The condition is included as number 44 in Appendix A, hereto.

Air

One of the benefits of wind powered electric generation is that wind turbines generate electricity without combusting fossil fuel or releasing pollutants into the atmosphere. In fact, the record is devoid of any evidence that

[113] Tr. 1275-76, ll. 17-3.

the Project will have a significant negative impact on air quality. A negative impact to air quality will occur during the construction phase of the Project, mostly related to incidental vehicle emissions from the transport of materials and the operation of construction equipment. Construction is expected to last approximately one year.

The Project's operational phase will also produce some vehicle emissions from the use of service vehicles, insignificant in scope, particularly when measured against the construction phase. Cassadaga Wind argues that, on a net impact basis, Project operation will have a positive impact on air quality through the production of electricity without burning any fuel, displacing the need for additional generation capacity from fossil fuel plants.[114]

Neither DEC Staff nor DOH Staff address air impacts in any of their respective evidentiary filings in this matter. DPS Staff concludes that the Project will result in an overall air emission benefit.[115]

We recommend that the Board find that the Project will create temporary minor adverse impacts to air quality from engine exhaust emissions, and from the generation of airborne dust and debris during earth moving activities and travel on unpaved roads by construction equipment and vehicles.[116] Two other temporary emissions sources may be used during the construction phase, an on-site concrete batch plant and temporary fuel-fired generators. However, these potential emission sources will have minimal impact as they will not be

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[114] See Hrg. Ex. 99, Application Ex. 17.

[115] Hrg. Ex. 55; Tr. 103-04.

[116] Hrg. Ex. 99, Application Ex. 12(d)(3).

idling or remain operational for extended periods of time.[117] Based on the foregoing, we recommend the Board determine that the Project's impacts to air quality have been minimized or avoided to the maximum extent practicable.

Ground and Surface Water

Groundwater and Wells

Cassadaga Wind's application details the Project's probable impacts to groundwater and drinking water supplies from its construction and operation.[118] To determine the potential impacts, Cassadaga Wind identified existing private and public water supply wells within a one-mile radius of the Project's proposed facilities,[119] pursuant to the stipulations entered into prior to the submittal of the Application.[120]

The Project is not expected to result in significant impacts to groundwater quality or quantity or to any drinking water supplies, although as noted hereafter, DPS Staff argues for more stringent control measures to reduce the risks to three private drinking water wells. Short-term, minor adverse impacts to groundwater could occur from: accidental discharge of petroleum or other chemicals during construction, operation and maintenance; construction of the substation above a principal aquifer; construction of impervious surfaces reducing potential stormwater ground absorption; installation of turbine foundations; and, installation of buried interconnect lines.[121]

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[117] See Hrg. Ex. 99, Application Ex. 17(d).

[118] See Hrg. Ex. 99, Application Ex. 23, Figure 23-2 and Appendix SS.

[119] Hrg. Ex. 99, Application Ex. 23 at 1-6.

[120] See Hrg. Ex. 136.

[121] Hrg. Ex. 99, Application Ex. 23 at 3-6.

In addition, construction could result in certain localized impacts to groundwater and the use of that water by adjacent landowners, including: minor localized disruption of groundwater flows down-gradient of proposed turbine foundations; minor modification to surface runoff or stream-flow, thereby affecting groundwater recharge characteristics; minor degradation of groundwater chemical quality from accidental spills and installation of concrete foundations; impacts to wetland groundwater recharge areas; and, groundwater migration along collection line trenches.[122] Although the Applicant does not anticipate any significant impacts to drinking water from construction or operation of the Project,[123] DPS Staff notes that three private water wells are located within 100 feet of certain Project facilities creating the potential for impacts to the potability of such water.[124] No public wells are located within 100 feet of any Project facilities.[125]

The Project's temporary and permanent stream impacts are quantified and described in Hearing Exhibit 5. The Project's direct impacts on streams include: placement of fill in surface waters to accommodate road crossings, causing suspension of sediments and turbidity; disturbance of stream banks or substrates resulting from buried cable installation; an increase in water temperature and conversion of cover type due to clearing of vegetation; and siltation and sedimentation due to earthwork, such as excavating and grading activities.[126] Under 6 NYCRR §701.8, such impacts adversely affect the best

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[122] Hrg. Ex. 99, Application Exs. 22 & 23(b)-(d).

[123] Hrg. Ex. 99, Application Ex. 23 at 3, 9, & 13-14.

[124] Tr. 1403-05, ll. 18–7.

[125] See Tr. 38, ll. 13-18; Tr. 937, ll. 1-3.

[126] Tr. 1177.

usages of a stream, such as for fish propagation and survival.[127] In light of the foregoing impacts, we now examine the adequacy of minimization and avoidance.

The Applicant will minimize the potential impacts identified in the application through the implementation of spill control and other construction plans. The proposed avoidance and minimization measures are contained in the application.[128] Cassadaga Wind contends that any adverse impacts will not be significant, particularly when considered in the context of its stormwater pollution prevention plan and its other minimization and avoidance efforts.

Cassadaga Wind has proposed to meet with each of the owners of the three private water wells prior to the commencement of construction to confirm the existence of the wells and whether they are used for drinking water. The Applicant agrees to test water samples collected from any confirmed drinking water wells both before and after construction to ensure that construction activities did not have an impact on the potability of the water.[129] The Applicant maintains that its proposed approach is consistent with similar types of construction activity and provides adequate protection to the owners of these wells.[130] Finally, should construction activities damage a drinking water supply well, the Applicant will install a new drinking water supply well for the impacted landowner.[131]

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[127] Id.

[128] See Hrg. Ex. 99, Application Ex. 23 at 14-18.

[129] Tr. 1457-59.

[130] Tr. 38-39, ll. 13–12.

[131] Tr. 936-37.

To memorialize the Applicant's commitments, DPS Staff proposes certificate condition 60,[132] which we have included in Appendix A as recommended certificate condition 57. On review of this condition and Cassadaga Wind's commitments therein, we recommend the Board determine that the Applicant has minimized and avoided impacts to wells to the maximum extent practicable. In addition, Cassadaga Wind and DEC Staff have agreed on the language for several certificate conditions related to streams and stormwater pollution prevention. We have reviewed these conditions and have included them in Appendix A as our recommended conditions 58, 59, and 82 through 124. With those conditions, we recommend the Board determine that the impacts to groundwater, surface water, and streams have been minimized or avoided to the maximum extent practicable.

Freshwater Wetlands and Streams

ECL Article 24 and DEC's regulations in 6 NYCRR Parts 663 and 664 codify the State's public policy to preserve, protect, and conserve freshwater wetlands and the benefits that State-jurisdictional wetlands provide. New York's policy to preserve wetlands includes its charge to DEC to prevent the despoliation and destruction of wetlands, and to regulate the use and development of such wetlands consistent with the general welfare and beneficial economic, social and agricultural development of the State.

Cassadaga Wind employed environmental engineering firm, Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR), to conduct wetland and stream delineations during the fall of 2015, in accordance with the three-parameter methodology described in the U.S. Army Corps of Engineers (ACE) Wetland Delineation Manual

[132] See DPS Staff initial post-hearing brief at Appendix C.

(Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North Central and Northeastern Region.[133] The application contains EDR's evaluation of the probable wetland impacts associated with Project construction and operation of the Project, and the record also contains information to reflect the revised 48-turbine layout.[134]

During construction, potential direct or indirect impacts to wetlands and surface waters may occur as a result of: the installation of access roads and wind turbine foundations; the installation of overhead or buried electrical interconnects; the development and use of temporary workspaces around the turbine sites; the installation of the overhead 115 kV generator lead line; and, the use of temporary workspaces around substations. Direct impacts include: an increase in water temperature and conversion of cover type due to clearing of vegetation; siltation and sedimentation due to earthwork, such as excavating and grading activities; disturbance of stream banks or substrates resulting from buried cable installation; and, the direct placement of fill in wetlands and surface waters to accommodate road crossings. The Project's indirect wetland and water impacts include sedimentation and erosion caused by construction activities such as the removal of vegetation and disturbance of the soil.

To measure the impact area, EDR delineated wetlands and streams located within a 200 foot wide corridor centered around the proposed location of Project facilities.[135] Hearing Exhibit 99, Application Exhibit 22 and Appendix RR contain the

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[133] Tr. 164, ll. 6-12.

[134] Hrg. Ex. 99, Application Ex. 22 and Appendices M and RR. See Hrg. Exs. 3, 4 & 5; see also Tr. 162-236.

[135] Tr. 164, ll. 15-19.

results of the on-site delineations.[136] EDR conducted further delineations during the 2016 growing season in areas where lack of landowner access precluded delineations on specific parcels prior to submission of the Application.[137] In addition to its own surveys, the Applicant arranged field visits with DEC Staff and ACE to review both the delineation methodology and the results in October 2015, December 2016, and March 2017.[138]

DEC Staff determined that the Project area contains eight State-regulated wetlands: five mapped and three unmapped wetlands.[139] Construction of the Project will impact 8.09 acres of wetlands, 2.46 acres will be temporarily impacted and 5.63 acres will be permanently impacted.[140] Permanent impacts to freshwater wetland adjacent areas, those areas within 100 feet of DEC-regulated wetlands, will affect 11.47 acres.[141] Any identified permanent impacts to State-regulated wetlands and wetland adjacent areas require mitigation under 6 NYCRR §663.5(g).[142] We now turn to PSL 168(3) to determine whether such impacts have been minimized or avoided to the maximum extent practicable.

DEC Staff proposed multiple certificate conditions related to State-regulated wetlands to ensure compliance with all applicable State statutory and regulatory standards.[143] In

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136 Tr. 164-65, ll. 19–4.

137 Tr. 165, ll. 4-7.

138 Tr. 165-66, ll. 15-4.

139 Tr. 125-26.

140 Hrg. Ex. 117 at 4; Hrg. Ex. 5 at 2.

141 Id.

142 Tr. 134-35.

143 Tr. 139-51.

rebuttal, Cassadaga Wind agreed to the majority of those proposed certificate conditions.[144]

Prior to the hearing, DEC Staff and Cassadaga Wind continued to exchange information and the Applicant further refined its proposed certificate conditions regarding wetlands and invasive species.[145] DEC Staff indicates that it finds the revised certificate conditions acceptable. With those conditions imposed on the Project, the Board should determine that the Applicant has minimized or avoided the ecological impacts identified by DEC Staff to the maximum extent practicable. We have included those conditions in Appendix A at 82 through 124.[146] We turn now to detail some of the more significant provisions therein.

The Applicant's most recent proposed Conceptual Stream and Wetland Mitigation Plan is in the record as Hearing Exhibit 3, and provides the basis for our recommended certificate conditions 82 through 124. Cassadaga Wind has committed to construct and operate the Project in accordance with ECL Article 15 standards. Cassadaga Wind's proposed avoidance and minimization measures include installing collection lines by directional drilling at forested wetlands where the buried collection line is the only Project component. In other cases, such as streams regulated under ECL Article 15, the Applicant proposes overhead spans of facility components to eliminate the need for in-stream work.[147]

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144 See Tr. 946-49; Hrg. Ex. 52.

145 Tr. 15-21, Hrg. Ex. 97.

146 The ECL and DEC regulations address invasive species with wetlands so that some of our recommended conditions in 82 through 124 include provisions applying both to water and wetlands, and to invasive species which have discussed in the Ecology section of this RD.

147 See Tr. 288-89; Hrg. Ex. 99, Application Ex. 22(n).

The response to information request DPS-1, included in Hearing Exhibit 133, provides a detailed table identifying each wetland and stream crossing, explaining why the impacts to each resource could not be completely eliminated, and explains the actions taken to minimize each of the anticipated impacts. The Applicant evaluates 161 individual wetlands and stream crossings for impact avoidance and minimization. The Applicant's response to DPS-1 includes example photographs depicting locations where Project components would be sited on existing disturbances, such as existing farm roads and logging roads.

The Applicant's mitigation plan detailing Cassadaga Wind's performance standards, monitoring plan, maintenance and management plan, and other maps and figures depicting the location of its proposed conceptual site mitigation is included in a discovery response to information request DEC-3.[148] The Applicant's proposed certificate condition 55, our recommended certificate condition 56, requires submission of a Final Wetlands Mitigation Plan addressing impacts to federal and State wetlands, to be developed in coordination with DEC, DPS, and ACE.

Condition 56 includes provisions related to the storage of equipment, fuel and other items relative to a wetland or stream boundary, as well as requiring daily inspection for leaks and measures to address any spills. The condition imposes restrictions on trenching and discharges. Other conditions relate to soil and vegetation disturbance, as well as restoration after construction activities at the site have ceased. Certificate conditions also prescribe post-construction monitoring protocols and require the Applicant to prepare

[148] Hrg. Ex. 6.

remedial plans in the event the performance standards have been found to have not achieved adequate restoration.

We recommend the Board determine that, with conditions 82 through 124 imposed in the certificate, the Applicant has minimized or avoided the adverse environmental effects related to wetlands and streams to the maximum extent practicable.

Wildlife and Habitat

Cassadaga Wind's assessment of the Project's potential adverse impacts to wildlife and habitat is contained in Application Exhibit 22(d)-(h) and (o), and Appendix KK, all in Hearing Exhibit 99, in the Application Supplement designated as Hearing Exhibit 100, Appendix N, in the omnibus discovery responses Hearing Exhibit 133 as the Response and Supplemental Response to DEC IR-1, the Response to DPS IR-48, and in Hearing Exhibits 37 through 41. The Applicant employed environmental engineering firm Stantec Consulting Services Inc. (Stantec) to perform its preconstruction monitoring surveys for both birds and bats.[149] Stantec consulted with the U.S. Fish and Wildlife Service (USFWS) and DEC to design its studies which were planned in accordance with DEC Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects and USFWS Land-Based Wind Energy Guidelines.[150]

The Applicant's draft Work Plan for Pre-Construction Bird and Bat Studies was submitted to the USFWS and DEC in June 2013. After revisions based on USFWS and DEC comments, Cassadaga Wind provided a final version to the USFWS and DEC in July 2013. Cassadaga Wind's initial studies were conducted in 2013 and 2014. On January 25, 2016 the Applicant again met with DEC and USFWS as required by the Land-Based Wind Energy

[149] See Hrg. Ex. 36.

[150] See Tr. 442, ll. 12-19.

Guidelines.[151] Thereafter, the Applicant, DEC, and DPS executed the pre-application stipulations applicable to the scope and methodology of Cassadaga Wind's wildlife studies.[152]

Wildlife Other Than Bats

Stantec conducted five separate surveys to determine Project area usage by migratory birds.[153] The fall migration survey did not identify any federal or State threatened, endangered, or State species of special concern.[154] Stantec generally detected common, regionally abundant avian species, typical in the habitats in which they were observed. In addition to the fall surveys, Stantec conducted spring raptor migration surveys once every seven days from March 1 to May 26, 2014. Cassadaga Wind's Application Exhibit 22 details Stantec's specific observations and states that no federally listed threatened or endangered species were observed during spring raptor migration surveys.[155]

For State listed species, the Applicant's spring migration surveys documented one sighting of a State listed endangered species, a golden eagle, also federally protected under the Bald and Golden Eagle Protection Act (BGEPA), and six sightings of bald eagles, a State listed threatened species also protected under BGEPA. Based on these eagle sightings, the Applicant conducted additional surveys specifically designed to document the presence of bald and golden eagles. The only additional raptor Stantec observed during the eagle point count surveys not observed during spring raptor migration surveys was

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151 Hrg. Ex. 99, Application Ex. 22 at 10-11.

152 See Hrg. Ex. 136.

153 Hrg. Ex. 99, Application Ex. 22 at 12-13.

154 Hrg. Ex. 99, App. KK.

155 See Hrg. Ex. 99, Application Ex. 22 at 13-15.

a Cooper's hawk.[156] More specific information regarding Stantec's eagle studies on behalf of Cassadaga Wind is included in the application.[157]

Other State-listed species observed include one northern harrier, a State-listed threatened species, and three State species of special concern: osprey, red-shouldered hawk and sharp-shinned hawk. Stantec also documented 54 non-raptor avian species during its spring raptor migration surveys, none of which were federally or State-listed.[158] Cassadaga Wind's comprehensive list of species in the Project area is included in its application.[159] Based on Stantec's observations, the Applicant concludes that, inasmuch as raptor rates were comparable to those found in other studies conducted in New York and within the northeastern United States, raptor activity, passage rates, and species composition within the Project area is region-typical.[160]

Stantec also performed breeding bird point count surveys in May and June of 2014 at 85 bird point count locations along 16 survey transects. Stantec employed 59 survey points in close proximity to proposed turbine locations and 26 control points located in areas where it anticipated no Project impacts.[161] Stantec catalogued 2,461 individual birds, including flyovers and individuals greater than 100 meters from the observer, consisting of 72 distinct species.[162] Cassadaga Wind's listing of each avian species observed during the spring

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156 Id. at 15.

157 See id. at 17-19.

158 Id. at 15.

159 Hrg. Ex. 99, App. JJ.

160 Hrg. Ex. 99, Application Ex. 22 at 15-16.

161 Id. at 16.

162 Id. at 16-17.

breeding bird surveys is contained in its Bird and Bat Survey Report.[163]

Stantec's surveys were timed to coincide with the peak breeding season in May and June, targeted optimal weather conditions to facilitate the maximum detection of birds, and used standard point count survey methods. The species detected during Stantec's breeding bird surveys are generally common, regionally abundant, and typical in the habitats in which they were observed. Moreover, Stantec did not detect any State or federally listed endangered or threatened species, or any State species of special concern.[164] Specific information about the frequency of species' sightings is included in the Cassadaga Wind application.[165]

Regarding the potential risk of impacts associated with collision to operating turbines, average annual bird mortality is 4.0 bird fatalities per turbine for wind facility projects across New York State, and 5.1 birds per turbine for wind projects within 50 miles of the Project. The Project is expected to result in approximately 245 bird fatalities per year based on the revised proposal of 48 turbines.[166]

The Applicant's review of potential forest fragmentation and impacts on wildlife species is included in the application.[167] Specifically, the Applicant's fragmentation analysis, Application Appendix MM, notes that empirical studies of the effects of constructing wind projects on breeding bird populations with similar landscapes elsewhere in New York have

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[163] Hrg. Ex. 99, App. FF.

[164] Hrg. Ex. 99, Application Ex. 22 at 17.

[165] See id. at 16-17.

[166] Based on 48 turbines times 5.1 bird fatalities per year.

[167] Hrg. Ex. 99, Application Ex. 22 and Appendix MM.

not documented substantial shifts in species presence or distribution post-construction. Cassadaga Wind's materials indicate that a breeding bird study for the Howard Wind Project in Steuben County did not document systematic shifts in species composition or abundance based on proximity to turbines, nor did it document behavioral avoidance of turbines.[168] Cassadaga Wind's fragmentation analysis indicates that because a relatively small area of forest will be cleared, access roads will have low levels of vehicle use, and the pre-existing area consists of a patchwork of forested and non-forested habitats, the Project does not pose a significant risk of habitat-related impacts to bird communities. The Applicant predicts that interior forest dwelling species observed in the area will likely continue to persist during Project operation.

Cassadaga Wind's application identifies other mammals, fish species, amphibians, and reptiles located in and around the Project area. These non-avian animals are discussed in Hearing Exhibit 99, Application Exhibit 22 at 19-20. Those same pages also discuss a description and analysis of the Project's potential effects on wildlife habitat.

Construction impacts to wildlife consist of incidental injury and mortality due to building activities and vehicular movement, silt and sedimentation impacts on aquatic organisms, habitat disturbance or loss associated with clearing and earth-moving activities, and displacement of wildlife due to increased noise and human activities. None of the construction impacts described in the application will be significant enough to affect local populations of any resident or migratory wildlife species.

[168] Hrg. Ex. 99, Application Ex. 22 at 32.

Project operation is expected to result in approximately 245 bird fatalities per year, some of which could be the State-listed threatened species bald and golden eagles, or other species of concern that were observed in flight during surveys in the Project area. Despite instances of bird deaths, there is no evidence that existing wind energy facilities have caused any population-level impacts to bird species. Moreover, the cumulative impacts of future wind energy facilities in New York State are not expected to result in any population-level declines to avian species. Specific to the Project, Stantec sighted only ten eagle passes over 348 hours of its point count and raptor migration surveys, indicating that eagle activity in the Project area is expected to remain low.

In addition to the potential for avian mortality resulting from collisions with operating turbines, operational impacts to other wildlife will occur as habitat loss, habitat degradation through forest fragmentation, and disturbance or displacement due to presence of wind turbines. Based on Cassadaga Wind's currently proposed 48 turbine layout, the Project is expected to result in the permanent loss of a total of 77.3 acres of wildlife habitat. Therefore, even measured by the initial proposal, since reduced in scope, habitat loss can be expected to occur on only one percent of the Project site.[169] Approximately 18.9 acres of the expected loss will occur in agricultural lands that have limited wildlife habitat value. Approximately 220.7 acres of forest will be converted to a successional community, consisting of old field, shrubland, or saplings, that will continue to provide wildlife habitat. Given the foregoing, we recommend the Board find that the relatively

[169] Hrg. Ex. 99, Application Ex. 22 at 26.

small area of lost or converted natural communities is not significant.

Although the Project's risk to eagle mortality is relatively low, there is some degree of risk as experience at other operational wind farms has demonstrated. Accordingly, the Project includes an ongoing risk assessment of eagles in the Bird and Bat Conservation Study (BBCS) that will be conducted during Project operation. The BBCS requires post-construction carcass monitoring to document whether eagles are active within the area and whether eagles are killed.[170] Submittal of the BBCS is required by our proposed certificate condition 51 in Appendix A.

The Applicant's efforts to minimize bird mortality consist of: burying electrical collection lines between the turbines; minimizing guy wires where collection and transmission lines are above-ground; minimizing lighting to the extent allowed by the Federal Aviation Administration (FAA); and, employing lighting based on specific design guidelines to reduce collision risk. The risks to eagles from wind turbines is correlated with the proximity of facilities to nesting sites. In this case, no known eagle nests are located within the Project area, with the closest documented eagle nest more than three miles away.

DEC Staff proposed several stipulations designed to minimize impacts to birds. Cassadaga Wind provided its response, including its acceptance of some conditions, in rebuttal.[171] The Applicant agreed to incorporate certain measures including: clearing trees greater than three inches in diameter on a seasonal basis to avoid impacts to nesting birds;

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[170] See Hrg. Ex. 97.

[171] See Tr. 482–84.

conducting post-construction carcass monitoring to document species composition, seasonal timing, and levels of bird mortality; restoring any temporary impacts to grassland habitats; notifying DEC of any breeding behavior observed of threatened or endangered bird species; and, incorporating some other design measures. Our recommended conditions adopt DEC Staff's language and are included in Appendix A with those specific to eagles and threatened species numbered 79 through 81. These provisions relate to: notification and consultation with DEC should there be any discovery of an active nest belonging to a listed species; post-construction monitoring inspections; employee training in the identification of listed species; and, other reporting requirements. We recommend that with these conditions, the Board determine that the impacts to wildlife other than bats have been minimized or avoided to the maximum extent practicable.

Bats

Both DEC and the USFWS reviewed the proposed scope and methodology of Cassadaga Wind's pre-application bat surveys. During the course of the pre-application proceedings, the Applicant, DPS and DEC executed stipulations regarding the scope of the bat studies to be conducted for the information included in Cassadaga Wind's application.[172]

The Applicant's consultant, Stantec, conducted seasonal surveys in 2013 and 2014 to detect bat activity in the Project area.[173] Using acoustic detectors, Stantec measured a total of 2,771 bat call sequences over 843 nights. Stantec identified 58 percent of the recorded calls as originating from

[172] Hrg. Ex. 136.

[173] See Hrg. Ex. 99, Application Ex. 22 at 10-11 and App. KK; Hrg. Ex. 100, App. N.

the big brown/silver-haired bat guild, and also identified calls from the eastern red bat, tri-colored bat, hoary bat, and at least one species within the genus myotis.[174] DEC Staff notes that all New York resident bat species, except for the big brown bat, have been designated as species of concern. Additionally, the Indiana bat and northern long-eared bat (NLEB) have been granted protection under State threatened and endangered species statutes.[175]

Cassadaga Wind argues both that the recorded myotis calls are unlikely to have originated from Indiana bat, because the Project area is not within this species' known range,[176] and that there is no known NLEB habitat within 40 miles of the Project.[177] The Applicant also states that the numbers of bat calls recorded cannot be correlated with the population of bats in an area because acoustic detectors cannot differentiate between individuals.[178] Although the Applicant observes that the results of the acoustic surveys should not be used to determine the total number of bats inhabiting the area and that the presence of NLEB could not be confirmed or refuted by this study, for determining potential Project impacts, Cassadaga Wind

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[174] Although the Applicant notes that the myotis calls were not able to be further identified beyond the genus level, it reports that the genus myotis includes four species: Indiana bat (myotis sodalis); eastern small-footed bat (myotis leibii); little brown bat (myotis lucifugus); and, northern long-eared bat (myotis septentrionalis).

[175] 6 NYCRR §182.2(y)(2). The NLEB is also a federally-listed threatened species by the USFWS under 50 CFR §17.40(o). See Hrg. Ex. 113.

[176] See Case 15-E-0302, et al., Large-Scale Renewable Program and Clean Energy Standard, Final Supplemental Environmental Impact Statement at 5-35, Exhibit 5-18 (issued May 19, 2016) (CES FSEIS).

[177] Tr. 586; Hrg. Ex. 133, Applicant's Response to DEC IR-1.

[178] Hrg. Ex. 99, Application Ex. 22 at 13.

assumed the presence of NLEB in the area during fall migration periods.

To determine potential impacts to bats, Cassadaga Wind's cumulative impact analysis focused on overall mortality rates in New York and the Project specific contribution to the overall cumulative mortality rate.[179] The Applicant extrapolated the mortality rate across the installed wind energy capacity in New York and calculated the proportional contribution of the Project to cumulative mortality over a 30-year time frame. DEC Staff conducted a similar analysis.[180] The Applicant contends that its methodology is widely accepted and commonly used as the basis for "take" estimates[181] and cumulative assessments for wind farm projects in New York and elsewhere, and that the same methodology was used by the USFWS in its NLEB Biological Opinion.[182]

Absent measures to minimize potential impacts, the Applicant's analysis estimates that the Project would result in bat mortality of 516 bats annually and 15,480 bats over the life of the Project, approximately 77 percent of which will be migratory tree-roosting bats and 23 percent cave-hibernating bats.[183] Cumulative mortality at the Project would account for roughly 1.2 percent of the cumulative mortality of bats in the State during the assumed 30 years of Project operation.[184]

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179 Tr. 443; see Hrg. Ex. 39.

180 Tr. 443, ll. 10-12.

181 Under 6 NYCRR §182.2(x), a "take" of an endangered or threatened species includes the killing and capturing of such species, and also "lesser acts such as disturbing, harrying or worrying."

182 Hrg. Ex. 113; Tr. 443, ll. 12-16.

183 Hrg. Ex. 39 at 10-12.

184 Id. at 12.

The Applicant argues that it is impossible to determine to what extent the quantity of bat fatalities over the Project's life will cause population-level impacts, because no baseline population estimates exist for migratory tree bat species. Cassadaga Wind reports that the USFWS estimates there are 228,480 NLEB in New York State.[185] Importantly, the Applicant concedes that any project within the species' range has the potential to "take" NLEB, particularly during the fall migratory season. This concession is supported by the fact that post-construction monitoring in New York State has reported the discovery of at least eight NLEB fatalities at four wind energy facilities, two of which are within 50 miles of the proposed Project.[186]

DPS Staff raised an issue as to the adequacy of Cassadaga Wind's pre-application modeling methodology inasmuch as it did not include any population studies.[187] However, we do not believe that population studies are necessary to develop an adequate record here. DEC Staff has testified that all New York resident bat species, except for the big brown bat, have been designated as species of concern. The Applicant's pre-application study results document the existence of fairly extensive bat activity. Accordingly, we have a sufficient record to determine that some level of impact will occur that includes the likely taking of multiple species of bats, including some that are listed as threatened or as species of

185 Id. at 13.

186 Id.

187 See Tr. 536e-536g, ll. 1-2.

concern.[188] Our conclusion is supported by DPS in the CES FSEIS at pages 5-35 through 5-37.[189]

The Applicant claims that cumulative bat deaths at the Project and all other wind facilities in New York State is not likely to lead to population-level declines in any bat species, including the threatened NLEB. Cassadaga Wind supports its claim through reference to a 2016 USFWS determination that, although there may be adverse effects posed by wind-energy development to individual NLEB, there was no evidence that impacts from wind-energy development have led to significant declines in this species, or that regulating the incidental take of bat species would meaningfully change the conservation or recovery potential of the species. Cassadaga Wind insists that the likelihood of the Project killing NLEB is low, relying on the low incidence of recorded myotis calls, the lack of NLEB carcasses found in walkthroughs of existing wind farms and the behavioral characteristics of the species, such as its low foraging habit.

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[188] DEC and Cassadaga Wind also contest the applicability and effect of Article 11 of the Conservation Law on the Project, and, particularly, DEC's regulations for threatened species in 6 NYCRR Part 182. Resolution of this issue is not material to the Board's factual findings under PSL §168(2) as to the potential impacts to wildlife and habitat as it is clear and uncontested by the Applicant that construction and operation of the Project will result directly in some bat mortality. The issue of a Part 182 "taking" is discussed below with the examination of whether Cassadaga Wind has minimized or avoided the potential impacts to the maximum extent practicable.

[189] In particular, the CES FEIS states on page 5-36 that: "Given recent stressors including habitat loss and white nose syndrome, there is greater concern over the population of bats and their vulnerability to any additional stressors that may adversely impact survival rates." Citing US Dep't of Energy, Wind Vision: A New Era for Wind Power in the United States (2015).

According to DEC Staff, wind turbines are the single greatest known source of mortality for several bat species in North America.[190] New York operating wind farms alone kill an estimated 11,100 individual bats annually, based on a 2016 installed wind energy capacity of 1,821 MW.[191] DEC Staff estimates that, by 2030, between 24,400 and 36,000 bats will be killed annually by wind turbines in New York.[192] This corresponds with an estimated 4,000-5,900 MW of installed on-shore wind generating capacity.[193] In DEC Staff's opinion, current populations of the most commonly killed bat species cannot sustain the foregoing estimated levels of mortality.[194]

Based on the widespread nature of the distribution of NLEB in New York during both winter and summer, and the demonstrated susceptibility of the species to be taken at wind turbine facilities, in DEC Staff's opinion all on-shore wind turbine facilities in New York pose a threat to NLEB because operation of turbines is likely to result in a taking of NLEB.[195] Although Cassadaga Wind dismisses this assertion as speculative, we believe the record supports it. Accordingly, we agree that ECL Article 11 and the corresponding permitting provisions of 6 NYCRR Part 182 apply to the Project and support the Board's Article 10 findings.[196]

We recommend the Board adopt as its findings Cassadaga Wind's projections of the expected cumulative impacts on bat mortality, which are contained in Hearing Exhibit 39. The

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190 Tr. 583.

191 Tr. 585.

192 Tr. 585.

193 Tr. 585.

194 Tr. 584.

195 Tr. 584.

196 See Tr. 587.

Project can be expected to, at a minimum, kill 516 bats annually and 15,480 bats over the 30-year operational life of the Project. In addition, siting of Project facilities could permanently eliminate up to 77.3 acres of habitat and roosting areas from the Project area, including that used by bats. We now examine the issue of minimization and avoidance.

The Applicant's proposed minimization effort to curb bat mortality is one of the more contested issues in this proceeding, particularly with regard to operational curtailment to avoid such impacts. Cassadaga Wind has proposed several minimization measures in its Final Bird and Bat Conservation Strategy Plan, final Net Conservation Benefit Plan, and its Post Construction Avian and Bat Monitoring and Adaptive Management Plan, and has proposed certificate conditions 76 through 79, Hearing Exhibit 97, in its efforts to demonstrate that it has minimized or avoided potential adverse impacts to the maximum extent practicable.

Cassadaga Wind claims that it has proposed the most aggressive curtailment measures of any currently operating wind facility in New York, and that those measures are expected to reduce all bat mortality by 62 percent. The Applicant also contends that its curtailment will reduce NLEB mortality by 80 percent when compared to operating the Project without any curtailment program.[197] Cassadaga Wind asserts that its proposed curtailment and associated minimization measures comply with 6 NYCRR Part 182 such that it would be entitled to an incidental "take" permit under ECL Article 11.

ECL §11-0535 prohibits, inter alia, the "taking" of any threatened or endangered species and allows DEC to promulgate regulations to enforce its prohibitions. Under 6

[197] Tr. 434, ll. 12-17.

NYCRR §182.11, an incidental take permit is required "for any activity that is likely to result in the take or a taking of" any endangered or threatened species. Here, DEC Staff has demonstrated to our satisfaction that some take of NLEB is likely to occur during the life span of the Project. Under DEC Staff's interpretation of the take permit, §182.11 requires the Applicant to first avoid any take at all of the NLEB if possible and not overly burdensome, although that balance must be made in the context of the endangered or threated existence of a species. Only when the Applicant cannot avoid a complete taking does 6 NYCRR § 182.11(c) require that the Applicant prepare a plan to minimize impacts to the maximum extent practicable. We agree with DEC Staff's interpretation.

DEC Staff defines full avoidance as one or fewer kills every ten years.[198] The record supports DEC Staff's claim that Cassadaga Wind has not demonstrated that full avoidance is not practicable for the Project. Curtailment of wind turbine operations at relevant times can significantly reduce or avoid bat fatalities.[199] Based on the foregoing, DEC Staff recommends that the Board impose a condition requiring the Applicant to keep the turbine blades motionless, until the wind reaches a certain speed. The periods of slower rotation are the time periods when most bat fatalities occur. DEC Staff contends that curtailing operations from 30 minutes before sunset to 30 minutes after sunrise, every day during the period from July 1 through October 1 when the ambient air temperature is 50 degrees Fahrenheit or greater and when the wind speed is less than 6.9 meters per second (m/s) will fully avoid direct impacts to

[198] Tr. 591.

[199] Tr. 445-49, 590-91.

NLEB.[200] Additionally, using those parameters will also reduce fatalities to other bat species by more than 80 percent.[201]

In contrast, Cassadaga Wind's curtailment proposal in its rebuttal presents a staggered approach, allowing for different cut-in speeds based on the time of year. At no point does the Applicant propose a cut-in speed of 6.0 m/s or greater.[202] The Applicant's proposed curtailment does include a 5.0 m/s cut-in speed. Cassadaga Wind relies on DEC Staff's agreement that 5.0 m/s will reduce expected NLEB mortality by at least 80 percent. Although the Applicant maintains that actual reductions may be closer to 100 percent, based on NLEB's behavioral characteristics such as sub-canopy flight, gleaning foraging behavior, and wind morphology suited for slow flight at low wind speeds, there is no study that correlates these behaviors with reduced mortality.[203] Thus, we find it difficult to credit the Applicant's conclusions from these facts.

DPS Staff proposes curtailment of operations at wind speeds of less than 6.0 m/s during June 1 to October 1, half an hour before sunset to half an hour after sunrise when temperatures are greater than 50 degrees Fahrenheit.[204] DPS Staff contends that the Applicant's proposed curtailment regime does not afford adequate protection to migratory tree-roosting bats, which are of particular concern due to their suffering the

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200 Tr. 589-90, 593-94.

201 Tr. 589-90, 593-94.

202 Specific information regarding Cassadaga Wind's curtailment proposal has been granted confidential status in these proceedings. It can be found in the confidential transcript at pages 433c-434c.

203 See Tr. 473-75, 526-27.

204 DPS Staff initially proposed one hour before sunset and after sunrise, but shortened it to be consistent with DEC Staff's recommendations.

vast majority of mortality from wind turbines.[205] DPS Staff also criticizes Cassadaga Wind's reliance on site-specific acoustical modeling, opining that such modeling does not necessarily predict bat activity during Project operation or account for other factors that influence mortality such as the attraction of tree roosting bats to wind turbines during migration.[206] Finally, DPS Staff criticizes the Applicant's balance between reduced bat mortality and lost power generation as inappropriate for the conservation of a State-listed threatened species.[207] DPS Staff also notes that the Applicant's purported power loss is not provided in the proper context of total Project power production.[208]

Concerned Citizens also criticizes Cassadaga Wind's proposed curtailment as inadequate. Concerned Citizens states that the Applicant never specifies the point at which increased cut-in speeds inappropriately and improperly increases Project economic costs. Similar to DPS Staff, Concerned Citizens also argues that Cassadaga Wind's proposed minimization and avoidance is not based on how bats are attracted to turbines, but relies on deterring bats by mimicking their echolocation calls, a measure that has not been demonstrated to be effective.[209]

Wind turbine curtailment regimes are common in the industry to reduce bat impacts. Such operational controls are based on the time of day, the time of year, the ambient air temperature, and the minimum wind speed at which turbine operation can begin, or cut-in. The majority of bats are killed

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[205] Tr. 536h; Hrg. Ex. 61.

[206] Tr. 662-63.

[207] See Tr. 448-449, 562.

[208] Tr. 448-449, 562.

[209] Tr. 684-85.

on nights during the late summer and fall when the ambient temperature is 50 degrees Fahrenheit or greater, and at low wind speeds.[210] In New York, 83 percent of wind turbine bat kills are found between July 1 and October 1.[211] Implementing a cut-in speed of 6.9 m/s during these periods can substantially reduce the number of overall bat fatalities with a relatively small impact on potential electric generation output, while fully avoiding all impacts to NLEB under the DEC definition.[212]

DEC Staff admits that the necessary cut-in speed for full avoidance of direct impacts to NLEB is not as firmly established as the other variables listed above. However, data for all bat species demonstrates that as cut-in speed is increased, bat fatalities are reduced. We agree with DEC Staff that it is reasonable to assume that there is a cut-in speed where the estimated take of NLEB would drop below one bat in every ten years of Project operation.[213] Although DEC Staff does not provide any studies that estimate the specific fatality rates of NLEB with respect to various curtailment regimes, it relies on its institutional experience and the need to be as protective as possible given the Project's potential contribution to the mortality of an already threatened species. On the record before us, we agree that it is reasonable to assume that DEC Staff's proposed curtailment will reduce the risk of NLEB take to a negligible amount.

Because NLEB-specific information is scarce, statistics for closely related species in the genus myotis, the little brown bat and the Indiana bat, can be informative when

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[210] Tr. 590.

[211] Tr. 590.

[212] Tr. 593; Hrg. Ex. 65.

[213] See Tr. 593.

estimating fatality rates for NLEB.[214] Hearing Exhibit 114 summarizes all known fatalities of the NLEB and its two most closely related relatives from publicly available reports released between 1998 and 2014. This data also includes information on fatalities of myotis bats under varying cut-in speeds. The Hearing Exhibit shows that fatalities of the bats were reported at turbines employing cut-in speeds above 4.5 m/s in 4 different studies, with at least one study reporting multiple fatalities at 5.0 m/s. DEC Staff relies on these studies to argue that the Applicant's proposed curtailment regime is inadequate as it does not achieve the full avoidance required under 6 NYCRR Part 182. In contrast, Hearing Exhibit 114 contains at least one post-construction survey showing that a curtailment regime of 6.9 m/s resulted in no myotis bat fatalities.

Cassadaga Wind asserts that no take permit is required, arguing that no New York operating wind farm has been required to obtain such a permit directed exclusively at NLEB. The Applicant seeks to discredit DEC Staff's position by noting that the agency concedes that there is no project specific basis triggering the requirements of Part 182, but simply relies on the assumption that all on-shore wind project pose a risk to NLEB.[215] Cassadaga Wind maintains that there is no evidence in the record proving the Project area includes NLEB habitat or poses a greater risk of take than other currently operating wind projects in New York which were not required to get a take permit. The Applicant also states that DEC Staff applies an inappropriately reduced standard for take than that set forth in DEC's regulations at 6 NYCRR §182.11 inasmuch as DEC Staff has

[214] Tr. 657-58; Hrg. Exs. 37 & 114.

[215] See Tr. 587-89.

not shown a likelihood of take.[216] The Applicant contends that there is no case law or statutory support for DEC Staff's position that an assumption of take based on general State-wide species activity is sufficient to trigger the permitting regulations.

Cassadaga Wind argues that the increased operational curtailment will result in significant additional lost energy production with no corresponding benefit to bats.[217] The Applicant states that, because of this inappropriate balance, additional curtailment is not practicable and, therefore, not required by PSL §168(3).

ECL §1-0101's mandate to conserve State environmental resources demonstrates that it is the State's policy to seek complete avoidance of a take to threatened or endangered species. If Cassadaga Wind demonstrates that it has achieved complete avoidance, then it would not be required to apply for a Part 182 permit and be subjected to a rigorous balancing test in the context of preserving a State-listed species. Based on the record, a "take" here is likely unless the Board applies curtailment. Thus, the regulation is satisfied notwithstanding Cassadaga Wind's arguments to the contrary. In this instance, the Applicant is incorrect that it may demonstrate that it has minimized impacts if it cannot demonstrate complete avoidance. Rather, the regulations on threatened and endangered species require the Applicant to demonstrate that complete avoidance is not possible, and only then to demonstrate that full

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[216] 6 NYCRR 182.11 states that "A permit under this section is required for any activity that is likely to result in the take or a taking of any species listed."

[217] Tr. 436, ll. 7-15.

minimization will occur.[218] Here, Cassadaga Wind has not shown that DEC Staff's proposed curtailment is not reasonable, only that it is more stringent than any other existing wind farm, none of which were required to seek approval under Article 10, and, just as significant, none of which were subject to DEC reviewed after the NLEB was listed as a threatened species.

The two parties also dispute the "take" estimate, arguing over which provides more accurate data. However, as detailed in the foregoing discussion, we are persuaded by DEC Staff's position that the ECL is concerned with any take likely to result from a proposed action. While Cassadaga Wind maintains that its data, based, in part, on walking surveys of operating wind farms, shows no likely take will occur at its Project, DEC Staff has adequately explained why such survey results are not reliable.[219] Cassadaga Wind also argues that although NLEB mortality does occur occasionally, the low incidence of NLEB mortality at wind projects is consistent across the species' range and presumably related to behavioral characteristics such as their tendency to fly close to the ground and forage within the forest canopy.[220] The Applicant's position, however, only discusses NLEB mortality in terms of low incidences of mortality, not in terms of unlikely to occur under a rate of one death over 10 years.[221]

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[218] See 6 NYCRR §§182.8, 182.11 and 182.12. See also 6 NYCRR §617.11(d)(5) (requiring an applicant under State Environmental Quality Review to pursue every alternative to avoid impacts before seeking to mitigate them).

[219] Tr. 647-49.

[220] Tr. 527, 657.

[221] The Applicant's NLEB take estimate concluded that, based on an extrapolation of regional mortality estimates and assumed species composition, the Project is estimated to take 0.19 NLEB per year and 5.6 NLEB over an assumed 30-year operational life. Hrg. Ex. 40.

Accordingly, we recommend that the Board condition any Article certificate issued in this case on a curtailment program that requires a wind cut-in speed at hub height of 6.9 m/s, consistent with DEC Staff's position that such requirement is necessary to achieve full avoidance of direct impacts to the NLEB. In making this recommendation, we acknowledge the Applicant's concern over potential power losses and its opinion that such losses do not economically balance against what it considers to be a marginally more effective protection against NLEB take. We agree with DEC Staff, DPS Staff, and Concerned Citizens that where a threatened or endangered species is involved, such economic concerns are outweighed in a proper balancing test. We note that there is no evidence that the increased curtailment of operations renders the Project uneconomic.

Notwithstanding the dispute as to the proper curtailment to employ, the parties have committed to working on collaborative consensus for non-curtailment minimization measures.[222] The Applicant's proposed minimization includes some combination of protecting known hibernation habitat and roosts and mitigation through the provision of funding of white nose syndrome treatments.[223] Cassadaga Wind agrees with the imposition of a certificate condition that requires it to consult with DEC and DPS on measures to be included in its Net Conservation Benefit Plan that must be submitted at least 60 days prior to the Project operation.[224] As to the other certificate conditions related to the minimization and avoidance of impacts on wildlife and habitat, we do not see any

[222] Tr. 451-52.

[223] Hrg. Ex. 41.

[224] Tr. 445.

significant dispute and recommend they be adopted. Our recommended certificate condition for curtailment is included in Appendix A as condition 78. With these conditions, including required curtailment, we recommend the Board determine that the impacts to bats have been minimized or avoided to the maximum extent practicable and as required by 6 NYCRR Part 182.

Public Health and Safety

Collapse, Blade Throw and Operational Risks

Cassadaga Wind's assessment of the potential public health and safety impacts is in the record in Hearing Exhibit 99, including Application Exhibits 15, 19, 24, and Appendices U and Z, and in Hearing Exhibit 100 and Hearing Exhibit 12. The Applicant contends that because wind generated power does not generate hazardous wastes or pollutants, it is generally safer and healthier than other forms of electricity generation. To support its contention, the Applicant notes that wind energy produces no air emissions attributable to fossil fuel consumption and that it has little operational impact on surface and groundwater quality. Cassadaga Wind maintains that its Project can be viewed as a major public health benefit, citing its Application Exhibit 10, part of Hearing Exhibit 99, detailing the Project's consistency with the State's energy planning objectives.[225]

Although we do not wish to minimize the contribution that the Project might provide to New York's clean energy goals, they are detailed elsewhere in this RD, particularly in the section on air impacts, supra, and the public interest, infra, and afforded their proper balance. Suffice it to say that we agree with Cassadaga Wind that, presently, combustion of fossil fuels is the dominant source of energy-related emissions and

[225] Hrg. Ex. 99, Application Ex. 15 at 1.

that the kinds of health risks associated with the combustion of carbon-based fuels are not associated with solar energy, wind, and hydroelectric power. However, we also agree that the use of these non-combustion means of producing electric power are not risk-free. Accordingly, we are required by PSL §168(2)(b) to examine what the Project's probable adverse impacts might be to public health and safety.

The potential risks to public health and safety are generally limited in nature to effects associated with movement of the blades and electrical components within the nacelle.[226] As such, the Applicant details ice shedding, tower collapse, blade failure, stray voltage, and fire in the turbines as potential impacts.[227] Although these events have occurred at operating wind farms, such events are not common, and advances in technology have served to increase the safety of operating turbines.

There is a possibility of wind turbine tower collapse or of a rotor blade dropping or being thrown from the spinning nacelle to which it is attached. The Applicant notes that despite such events having occurred, it is unaware of any injury ever occurring to a member of the public as a result of these incidents. The reasons for a tower collapse or blade throw vary depending on conditions and tower type. The main causes of blade and tower failure are a control system failure leading to an over-speed situation, a lightning strike, or a manufacturing defect in the blade.[228] Technological improvements and mandatory safety standards during turbine design, manufacturing, and

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[226] The nacelle is the outer housing for the engine components of the turbine, parts of which connect to the blades to allow them to spin.

[227] Hrg. Ex. 99, App. Ex. 15.

[228] Id. at 3.

installation, as well as wind turbine design certification, have significantly reduced the instances of blade throw.[229]

Cassadaga Wind's assessment of ice shedding or ice throw is in Hearing Exhibit 99, Application Exhibit 15 at 6. Ice shedding and ice throw refer to the phenomena that can occur when ice accumulates on rotor blades and subsequently breaks free and falls to the ground. The Applicant provided studies demonstrating that ice fragments typically land within 410 feet of the wind turbine.[230] Accordingly, setback requirements have been effective in minimizing any risk of injury resulting from such an event.

Cassadaga Wind proposes certificate conditions to protect public health and safety from the operational issues identified as potential impacts. The record demonstrates that there are no known instances of a member of the general public being injured at an operating wind farm in the United States from operational malfunctions. Modern wind energy projects have been operating in New York for more than 15 years. During that time the risks associated with large scale wind energy production have become well known, as have the procedures and controls to minimize the likelihood of, and even prevent, incidents from occurring.

Providing for sufficient distance setbacks from dwellings, roads, and other existing utility and transmission facilities can be used effectively to minimize the potential risks from operational incidents.[231] Moreover, as production of turbines has proceeded on industrial scale, the industry has refined wind turbine technology and design to prevent the blades

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[229] Id.

[230] See id. at 7.

[231] See id. at Table 15-1.

from spinning or the turbine from operating in sub-optimal conditions that create operational risks. Consistent with the Board's regulations, Cassadaga Wind has proposed a thorough emergency response plan and procedures intended to address any reasonably anticipated scenario.[232]

Specifically, the Project's design includes provisions intended to protect against the potential harm from turbine collapse and blade throw. The Applicant's plans were prepared in accordance with industry developed local setbacks that have been demonstrated to effectively protect area residences and buildings and public roads.[233] Other public safety protections flow from international engineering standards by which modern turbines are certified.[234] Large utility-scale wind turbines employ braking systems, pitch controls, sensors, and speed controls on the turbines that have greatly reduced the risk of blade throw and turbine instability.[235]

Cassadaga Wind anticipates that its selected wind turbines will be equipped with two fully independent braking systems, a primary and fail-safe system, that will stop the rotor from spinning under all foreseeable conditions. The fail-safe automatically shuts down the turbines at wind speeds that exceed the manufacturer's recommended wind speed operational maximum speed. Additionally, the turbines will cease operating if significant vibration or rotor blade stress is sensed by the internal monitoring systems. In our opinion, the risk of catastrophic blade throw has been minimized. Additionally, adequate protections are in place to protect the public if such

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[232] See Hrg. Ex. 99, Application App. R-S and App. U-X.

[233] See Hrg. Ex. 99, Application Ex. 15 at 3.

[234] Id. at 3.

[235] Id. at 4.

an event occurs. To provide assurance to the Board that it will construct and operate the Project in a safe and proactive manner, the Applicant proposed certificate conditions numbered 34, 35, 97, and 153.[236] We have included those conditions in Appendix A as conditions 35, 36, 99, and 157.

In the event of an emergency, Cassadaga Wind will employ its emergency shutdown procedures and post-event site security measures. The Applicant will immediately notify State and local officials and implement other manufacturer specific safety procedures. Cassadaga Wind's application also details its annual training protocols. To provide adequate assurance to the Board regarding operational response and safety measures, the parties have proposed a number of certificate conditions related to the submission of a Final Emergency Action Plan, Final Site Security Plan, Final Health and Safety Plan, and a site-specific Quality Assurance and Quality Control Plan.[237] These certificate conditions are included in Appendix A as conditions 28 through 32.

The record demonstrates that no serious accidents at any operating wind farm have been reported as a result of ice thrown from a turbine.[238] The "Wind Turbine Health Impact Study" prepared by an independent expert panel for the Massachusetts Department of Public Health (Massachusetts DPH Study) concluded that "ice is unlikely to land farther from the turbine than its maximum vertical extent." The Applicant, acknowledging the

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[236] See Hrg. Ex. 97. For clarity, some of the certificate conditions were proposed by DPS in its initial testimony. In rebuttal, the Applicant agreed to the conditions without any edits and included them in its own comprehensive list of proposed certificate conditions, Hearing Exhibit 97 to which the numbering identified as the Applicant's corresponds.

[237] Hrg. Ex. 97, Proposed Certificate Conditions 27-31.

[238] Hrg. Ex. 99, Application Ex. 15 at 6-7.

Massachusetts DPH Study conclusions, commits to setbacks that are greater than its proposed maximum turbine height.

We have reviewed Cassadaga Wind's proposed certificate conditions and design commitments and recommend that the Board adopt them. With these conditions on the certificate, we recommend the Board find that the potential operational public health and safety impacts have been minimized and avoided to the maximum extent practicable.

Shadow Flicker

Cassadaga Wind's shadow flicker analysis is contained in Hearing Exhibit 99, Application Exhibits 15(e)(4) and 24(a)(9), and Application Appendix U. Shadow flicker results from shadows cast close to a turbine that are more intense, distinct, and focused because a greater proportion of the sun's light is intermittently blocked by the turbine.[239] Physical barriers and obstacles such as terrain, vegetation, or buildings occurring between receptors and wind turbines can reduce or eliminate shadow-flicker effects.

The Applicant updated its shadow flicker analysis in Hearing Exhibit 12 for its most currently proposed 48 turbine layout. Cassadaga Wind maintains that its shadow flicker analysis is a "conservative projection" of shadow flicker effects at ground level. Cassadaga Wind proposed an annual exposure threshold of greater than 30 hours as warranting mitigation for non-participating residents.[240] The Applicant bases its proposal on the practice employed at other operational

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[239] Hrg. Ex. 99, Application App. U. See Tr. 813, ll. 7-10. (explaining that shadow flicker as a wind turbine effect created by turning blades that interrupt sunlight, creating a repetitive shadow fluctuation across the area surrounding the turbine).

[240] Hrg. Ex. 99, Application App. U at 5.

New York State wind projects and in other jurisdictions, some of which have adopted 30 hours of exposure per year as a regulatory limit.[241]

The Applicant acknowledges claims that shadow flicker may cause or contribute to health effects associated with photosensitive epilepsy.[242] The Applicant counters that most people with photosensitive epilepsy are sensitive to flickering around 16-25 hertz (Hz), although some people may be sensitive to rates as low as 3 Hz and as high as 60 Hz, and notes that modern wind turbines typically operate at a frequency of 1 Hz or less. Regardless of whether any photosensitive epilepsy candidates reside in the area, residents in communities hosting wind turbines, both in New York and other jurisdictions, have described shadow flicker as annoying or a nuisance.[243] The record supports a finding that shadow flicker will occur from normal operation of the turbines and may create annoyance. As such, the effect should be minimized or avoided to the maximum extent practicable.

The Applicant claims that its 30 hour annual limit is only a Project design goal such that it would seek to minimize, or mitigate by other means, shadow flicker effects to any non-participating residence.[244] Notwithstanding the design goal, the record identified residential locations predicted to receive significant shadow flicker exposure, including many locations where exposure would exceed 30 hours per year.[245] While the Applicant committed to "minimizing predicted shadow flicker," it

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[241] See id.

[242] Hrg. Ex. 99, Application Ex. 15 at 16.

[243] Tr. 813 ll. 10-16.

[244] Tr. 814, ll. 5-16; Tr. 928, ll. 13-18.

[245] Tr. 822, ll. 3-11.

does not provide any commitment to curtail operations should exposure exceed 30 hours, even at a non-participating residence.[246] Instead, Cassadaga Wind offers to install physical barriers or employ other minimization measures intended to reduce the visual effect.

The local laws in the Towns of Charlotte and Cherry Creek require any wind farm operator to identify "measures that shall be taken to eliminate or mitigate" flicker problems. DPS Staff complains that the Applicant has ignored the Town laws' requirement to eliminate shadow flicker, if possible, before seeking to minimize through the use of physical barriers. DPS Staff contends that the Applicant's position improperly prioritizes mitigation over elimination.[247] DPS Staff also expresses its concern that despite Cassadaga Wind's desire to distinguish between participating and non-participating properties, the local laws make no such distinction.[248]

DPS Staff contends that the proper siting of wind turbines and the employment of operational controls are superior at avoiding flicker impacts in comparison to installing window blinds or landscape plantings.[249] DPS Staff asserts that Cassadaga Wind's proposed certificate condition is inadequate to assure local law compliance and to minimize annoyance. Accordingly, DPS Staff proposes an alternative shadow flicker certificate condition for Board consideration.[250] The major difference between the two proposals is in the specificity of the control measures to be employed should the Applicant's post-

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[246] Tr. 820.

[247] Tr. 826.

[248] Tr. 826-27.

[249] Tr. 822-23.

[250] Tr. 824-25; Hrg. Ex. 52.

construction monitoring determine that its 30-hour annual limit is exceeded. Cassadaga Wind's version states that its Shadow Flicker Mitigation Plan shall identify "turbines that will have shadow flicker mitigation operational controls, if necessary." The DPS Staff version lists specific control measures that should be used, including the curtailment of operations for offending turbines during times that produce shadow flicker.

Cassadaga Wind argues that no consistent national, state, county, or local standards exist for allowable frequency or duration of shadow flicker from wind turbines.[251] The Applicant asserts that the reason no uniform standards exist because studies have not shown shadow flicker to be a significant issue. Cassadaga Wind does concede that in New York, 30 hours of shadow flicker per year is a common standard for SEQRA review and has been applied at existing wind projects in New York State. The Applicant asserts, however, that its 30 shadow flicker hours per year threshold is not based on any health or specific impact concerns and so should be accorded the proper amount of deference as a goal, but not imposed as a regulatory limit on operations.[252]

The Applicant's initial layout results indicated that up to 55 receptors could exceed 30 hours per year, of which 32 are Project participants.[253] We share the concern expressed both by DPS Staff and Concerned Citizens that private contract rights should not be allowed to obviate local laws or other legal requirements where those requirements exist. The local laws at issue here, however, do not prescribe any applicable limit. Given that a local law is not clearly violated, we can agree

[251] See Hrg. Ex. 99, Application Ex. 15 at 9.

[252] Tr. 928.

[253] See Hrg. Ex. 99, Application Ex. 15 at 10.

with disparate treatment among participating and non-participating residences. Thus, we must rely on whether the Applicant's efforts minimize or avoid shadow flicker effect to the maximum extent practicable.

Cassadaga Wind's updated shadow flicker analysis still indicates that 28 receptors are predicted to experience more than 30 shadow flicker hours per year. Cassadaga Wind asserts that once its final Project layout is established, it will update the shadow flicker analysis again to determine the final number of non-participants predicted to receive more than 30 hours of shadow flicker per year.[254] Cassadaga Wind asserts that compensation payments to landowners are an effective mitigation measure for shadow flicker.

DPS Staff conceded at hearings that minimization measures, such as operational controls, should only be applied to turbines where shadow flicker will exceed the 30-hour limit at non-participating residences, and specifies non-participating receptors in its proposed certificate conditions appended to its brief.[255] Balancing the competing interests, we recommend that the Board adopt the DPS Staff proposed language that addresses specific operational shutdown measures, as well as landscaping and other physical blocking or screening measures. Our recommended certificate condition 48 allows the Board to determine that shadow flicker has been minimized or avoided to the maximum extent practicable.

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[254] Hrg. Ex. 99, Application App. U at 12.

[255] Tr. 1036-38, 1063; DPS Staff Initial Post-Hearing Brief, Appendix C, proposed certificate condition 50.

Noise and Vibration

Basic Noise Concepts[256]

An understanding of basic noise concepts is essential to fully appreciating many of the technical concepts presented in the record.[257] In general, the "loudness" of a sound depends on the change in amplitude of the sound wave as the wave travels through air. The sound wave is perceived by the human ear as a change in air pressure, and so the force with which the wave is transmitted to the ear is referred to as the sound pressure level. Thus, the sound pressure level of a noise event can roughly be analogized to the layman's understanding of loudness or volume.

Because the range of human hearing is remarkably vast, from very quiet to extremely loud sounds, the study of acoustics measures sound levels along a compressed scale, the numbers of which are termed as decibels, abbreviated dB.[258] Sound pressure level is expressed in sound measurements as L_p, where "L" stands

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256 Technically, noise is first defined in Webster's Dictionary as an unwanted sound, although the secondary definition is a sound of any sort. We use the terms noise and sound interchangeably in this RD and do not intend to express any value judgment simply by the selection of one term or the other in any particular passage herein. See Hrg. Ex. 99, App. Z at 143.

257 Cassadaga Wind provides a detailed primer on sound and noise in Hearing Exhibit 99, Appendix Z at 143.

258 The "B" is capitalized as a reference to Alexander Graham Bell, for whom the term was named "decibels." Decibels increase logarithmically such that the difference between 40 dB and 50 dB does not match value for value with the difference between 80 dB and 90 dB. Again, this convention is employed because of the vast range of audible sound power levels which would otherwise be measured in values of multiple millions at the high end, as they are when sound pressure is expressed as microPascals rather than decibels. Hrg. Ex. 99, App. Z at 143.

for Level and "p" is a numeric value expressing the degree of sound pressure level.[259]

Sound is a fluctuation of air pressure over time and distance, and the number of cycles over one second is the sound's frequency. The frequency of a sound is expressed in hertz.[260] Sounds consisting of a single frequency are called pure-tones.[261] Pure-tones are not common. Instead, most sounds are emitted across a spectrum of hertz, some of which are audible, and some which cannot be heard by the human ear.[262]

Industrial-sized wind turbines that produce energy measured in megawatts also produce substantial amounts of acoustic energy, *i.e.* noise.[263] Such noise can be perceived in different ways. Wind turbines propagate some noise as a steady effect of operations, such as the noise emitted from the turbine's moving mechanical components.[264] Other noise can, under specific meteorological conditions, be propagated as a variance in amplitude, creating a perception of a thumping or

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[259] Hrg. Ex. 99, App. Z at 143. Sound power and sound pressure are two distinct concepts. Sound power is the acoustical energy emitted by the sound source as an absolute value not affected by the environment. Sound pressure is the air pressure atmospheric disturbance, the intensity of which is influenced by the environment and other variables, such as the distance from the source to the receiver. Sound pressure is what our ears hear and what sound meters measure. Although we have attempted to present this material with precision, to the extent mistakes are made in this RD between identifying the two concepts, it should be considered an error of presentation only, not of substance.

[260] Hrg. Ex. 99, App. Z at 145, see Tr. 1609-12.

[261] See Tr. 1609-12.

[262] A whistle is an example of a pure-tone. A train whistle produces sound in an audible frequency, while the frequency of a dog whistle sound is inaudible.

[263] Tr. 1609-10.

[264] Tr. 1609-10.

whooshing sound due to acoustic pulsations.[265] Still other noise is produced at very low frequencies, inaudible to the human ear, but perceived in other ways.[266] Noise of such low frequency, generally acoustic energy below 20 Hz, is called infrasound.[267] Some people exposed to infrasound can perceive it as unpleasant physiological sensations such as that of being exposed to vibrations. Infrasound sensations can occur at significant distance from the source.[268]

Audible sound, frequencies at which the human ear hears a noise, is measured in A-weighted decibels. A-weighting means that the sound pressure level[269] is adjusted to report only the frequencies in the audible range.[270] Thus, an emitter could be producing a sound that is described as 40 dBA, but is actually producing sound pressure at all frequencies combined, in excess of 40 decibels.[271] The convention is used to indicate simply that humans hear 40 decibels of sound, and since the other frequencies are likely not perceived aurally, the additional decibels are irrelevant and so discarded in the description. The foregoing distinction is important because the World Health Organization (WHO) noise guidelines are written in terms of dBA. However, dBA results do not include or account for infrasound, despite the potential for such sounds to be perceived through non-aural physiological functions.

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265 Tr. 1609-10.

266 Hrg. Ex. 99, App. Z at 145; Tr. 1609-10.

267 Hrg. Ex. 99, App. Z at 145.

268 See Tr. 1611.

269 When expressed in terms of A-weighted decibels, sound power level can roughly be compared to the concept of volume.

270 Hrg. Ex. 99, App. Z at 145.

271 This could be expressed as either dB, or, for clarity to indicate that no weighting has been applied, dBZ. Hrg. Ex. 99, App. Z at 145.

Duration is an additional complicating factor to an analysis of noise.[272] To adequately address a particular issue, the measurement and condition must be expressed in the correct corresponding terms to ensure a shared context. One goal could be to try to minimize or avoid extremely loud sounds over a very limited duration from occurring, for example a gun shot. In such a case, a measurement that applied to a long-term mean would be inappropriate. Instead, one would need to measure the maximum loudness of a sound as it occurs over the appropriate duration. Such a goal could be expressed as keeping the maximum sound produced over a defined eight-hour period, for example nighttime sleeping periods, below 45 decibels in the audible frequency ranges, represented by the descriptor $L_{max(8\ hour)}$.[273] Whether the goal is achieved can be measured by recording the nighttime sounds, eliminating background noise[274] and determining whether the measured noise, the sound pressure level, exceeds 45 dBA.

A long-term mean measurement and condition would be appropriate in a case where the concern was about how loud the sound averaged over a definite period, for example night time, to make sure that the constancy of the sound is properly

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[272] Hrg. Ex. 99, App. Z at 145-46.

[273] L_{max} represents the maximum sound level produced during a single noise event. In contrast, $L_{eq}(T)$ is the equivalent sound level from cumulative exposure to all noise events over a period of time, T. The time variable can be expressed in numbers, for example (90) meaning 90 minutes, or more abstractly, for example (night).

[274] Another factor is the effect of ambient noise on perceived noise. In some instances, one would want to measure the complete noise environment to determine the cumulative impact of noise. In other instances, for example where trying to determine the maximum sound produced by a single source, background noise must be removed to provide accurate results.

minimized.[275] This type of measurement is illustrated by the Town Law limits applicable to the Project. Charlotte, Cherry Creek, and Arkwright limit sound pressure levels to 50 dBA L_{10}, meaning that noise is not in compliance where, during any hour of the day, the noise exceeds an audible range measurement greater than 50 decibels for more than 10 percent, six minutes, of that hour.[276]

Stipulation 19 and the Predictive Noise Model

The Board's regulations require all applications to include a study of the noise impacts of the construction and operation of the proposed generating facility, related

[275] See Hrg. Ex. 99, App. Z at 146.

[276] Tr. 2197. This measure is called a percentile sound level and describes the statistical distribution of sound levels over time. "L_N" is the level above which the sound spends "N" percent of the time. L_{90} represents the value for which measured sound is exceeded 90 percent of the time and as, therefore, sometimes referred to as the "residual base level." L_{50} is considered the median sound level such that the measured sound will be equally higher and lower than the sound level value. Hrg. Ex. 99, App. Z at 147.

facilities and ancillary equipment.[277] Cassadaga Wind's application includes an evaluation of the potential noise and vibration impacts associated with the Project in Application Exhibit 19 and Application Appendix Z, both in the record as part of Hearing Exhibit 99. Appendix Z, the Applicant's Preconstruction Noise Impact Assessment (PNIA) contains the results of the sound modeling performed pursuant to Pre-Application Stipulation 19 (Stipulation 19), in the record as Hearing Exhibit 137. Kenneth Kaliski and Isaac Old of RSG Inc. (RSG) prepared the PNIA, and Mr. Kaliski, Board Certified through the Institute of Professional Engineers and a licensed professional engineer, appeared as the Applicant's witness for noise issues in these proceedings. RSG, under contract with the Massachusetts Clean Energy Center and the Massachusetts Department of Environmental Protection, performed one of the most recent and comprehensive studies evaluating the validity

[277] 16 NYCRR §1001.19. Pursuant to the regulation, the study must include (a) a map of the study area showing the location of sensitive sound receptors in relation to the facility, (b) an evaluation of ambient pre-construction baseline noise conditions, (c) an evaluation of future noise levels during construction of the facility, (d) an estimate of the noise level to be produced by operation of the facility, (e) an evaluation of future noise levels during operation of the facility, (f) a table indicating the sound levels at the external property boundary lines of the facility under a number of different seasonal and time of day scenarios, (g) a description of the noise standards applicable to the facility, (h) a comparison of the noise standards applicable to the facility, noise design goals for the facility, and modeled compliance results, (i) an evaluation of reasonable noise abatement measures during construction, (j) an evaluation of reasonable noise abatement measures for the final design and operation of the facility, (k) an evaluation of the potential community noise impacts, (l) a description of post-construction compliance protocols, and (m) an identification of post-construction operational controls and mitigation.

and accuracy of sound propagation models for wind farms. The Massachusetts DEP study was admitted to the record as Hearing Exhibit 130.

RSG's sound propagation modeling for this proposed Project was conducted consistent with the methodology outlined in Stipulation 19. The Stipulation was executed by Cassadaga Wind, DPS, DEC, DAM, and by the Towns of Charlotte, Cherry Creek, and Arkwright. DPS Staff has raised objections to the PNIA fundamental to the Applicant's predicted noise impacts. According to DPS Staff, based on its objections to the PNIA, we should recommend that the Board find the record inadequate to make its PSL §168(2)(b) factual findings relating to noise, potentially leading to a remand or certificate denial.[278] As discussed below, we recommend the Board find that the record is adequate to support the necessary findings, which we set forth following this section.[279] We make our recommendation on two

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[278] Tr. 2279-80.

[279] We do find that the record on noise has been significantly improved through the participation of DPS Staff and Concerned Citizens, notwithstanding our rejection of DPS Staff's position on the PNIA. We reject Cassadaga Wind's contention that DPS Staff and Concerned Citizens' witnesses were not sufficiently qualified by training or experience to critique its application materials. The DPS Staff witness has more than 20 years of experience in the field of acoustics and noise control and is a full member of the Institute of Noise Control and Engineering (INCE). Hrg. Ex. 133, DPS Response to Cassadaga Wind IR-3; Tr. 2181-85. Moreover, despite some concerns we may have expressed at the hearings about the failure of DPS Staff to discuss its technical concerns directly with the Applicant prior to the hearing, to gain better understanding of the choices made by the Applicant for its model inputs, our perception is that the witness understood and appreciated all the concepts being discussed and had more than a sufficient knowledge base to review and comment on the application materials. Similarly, we found the Concerned Citizens' witnesses to be knowledgeable and credible in their respective fields.

grounds. While, we believe that DPS Staff's objections were improperly raised and, therefore, could be rejected on procedural grounds, we have reviewed DPS Staff's substantive positions and recommend that the Board find that the record supports Cassadaga Wind's presentation of the likely noise impacts from the Facility. We discuss each of these alternatives below.

i. Procedural Concerns

RSG exercised its professional judgment as to certain inputs and assumptions necessary to run the ISO 9613-2 noise model for the short-term analysis of noise impacts contained in the PNIA.[280] RSG also added meteorological inputs from a CONCAWE-published sound model as required by the terms of Stipulation 19.[281]

DPS Staff concedes that the PNIA complies with Stipulation 19.[282] Despite this concession, DPS Staff challenges the inputs and assumptions used in the models, adjustments to certain model results, the standards and Project goals to which the Applicant compares its modeling results, and the Applicant's

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[280] The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from various national standards organizations. It is the world's largest developer of voluntary international standards and has set over twenty thousand standards in numerous disciplines. For our purposes, the use of ISO 9613-2, titled "Acoustics – Attenuation of Sound During Propagation Outdoors - Part 2: General Method of Calculation" (see Hearing Exhibit 126), as the basis for RSG's predictive noise modeling was required by Stipulation 19. See n. 266, supra.

[281] CONCAWE, Conservation of Clean Air and Water in Europe, is a trade organization of European oil companies established in 1963 to research oil and energy related environmental issues.

[282] Tr. 2194, ll. 4-8.

conclusions regarding the likely noise impacts of the Project.[283] DPS Staff does admit, however, that its foregoing concerns with the application materials were not raised until it filed testimony.[284]

Cassadaga Wind takes issue with DPS Staff's objections to the methodology and scope of its predictive modeling and noise studies in the application.[285] Relying on 16 NYCRR §1000.5(k), the Applicant contends that DPS Staff is precluded from raising such objections because it signed Stipulation 19, which detailed the methodology for the modeling and studies, and DPS Staff has conceded that the modeling and studies conform to the stipulation requirements.[286] That regulation states, in pertinent part, "Any party that executed a pre-application stipulation may not raise objections at the hearing as to the methodology or scope of any study or program of studies performed in compliance with such stipulation." As detailed hereafter, we agree with Cassadaga Wind's procedural argument regarding Stipulation 19, but look beyond the procedural dispute to consider the substantive ones.

During the pre-application stage, DPS, with other State agencies and the Joint Towns, negotiated the content and scope of the application materials with Cassadaga Wind. These negotiations resulted in numerous signed stipulations, including a stipulation numbered 19, pertaining to the Applicant's predictive noise modeling.[287] On April 27, 2016, the Applicant filed with the Secretary a proposed draft of Stipulation 19.

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[283] Tr. 2194, ll. 9-22.

[284] Tr. 2454-55, ll. 17–8.

[285] See Applicant's Post-Hearing Reply Brief at 53.

[286] Tr. 2194, ll. 4-8.

[287] Hrg. Ex. 137.

This proposed draft was issued for comment pursuant to notice also dated April 27, 2016. Cassadaga Wind filed the final, fully executed version of Stipulation 19 on July 13, 2016.

Stipulation 19 is a five-page document prescribing the elements for a study of the noise impacts from the construction and operation of the Facility. It requires the Applicant to provide, among other things, an evaluation of ambient pre-construction baseline noise conditions, a modeled prediction of noise levels during construction of the Facility including predicted A-weighted sound levels at proximate potentially impacted and representative sensitive sound receptors, an estimate of the future noise level to be produced by operation of the Facility using computer noise modeling, a modeled prediction of future noise levels during operation of the Facility, including predicting A-weighted sound levels and un-weighted full octave band low frequency levels at all sensitive sound receptors, and a summary, in tabular and/or graphical format, of A-weighted sound levels indicated by measurements and computer noise modeling at the representative external property boundaries of the Facility. Each of the foregoing requirements

contains a detailed description of how such material should be produced.[288]

After the application was filed, DPS was responsible for the initial compliance review of the application. Although the Board's deficiency letter identified four deficiencies in the application materials on noise and vibration, no deficiency was noted regarding the noise study methodology or modeling inputs.[289] The Board sent no further deficiency letters and, on November 28, 2016, the Chair deemed the application to be compliant with the regulations of 16 NYCRR Part 1001.[290]

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[288] For example, the operational noise presentation requires the use of "computer noise modeling under the ISO 9613-2 conditions relating to a moderate nighttime inversion or, equivalently, downwind propagation, and the least attenuation due to temperature and humidity. Noise contours for these conditions representing the maximum one-hour equivalent average (Leq 1-h) sound levels for the highest wind turbine sound power levels will be provided. Noise modeling and calculation of the CONCAWE meteorological adjustments will include 64 different meteorological conditions and one year of turbine sound levels at each receiver by the use of computer noise model with estimates of hourly turbine power and one year of met tower data. These will be used to provide worst case (L 10) and typical (LSO) sound levels at all sensitive sound receptors, as required by Section (f) below. The model will also include relevant noise sources from substations. The Application will include a brief discussion about the accuracy of selected outdoor propagation models, methodologies, ground absorption values, assumptions and the correlation between measurements and predictions for documented cases as compared to other alternatives, if available."

[289] Tr. 2451-53, ll. 21–3; see Hrg. Ex. 142 at 6-7.

[290] See Letter from Audrey Zibelman to James Muscato, dated November 28, 2016.

At a January 10, 2017, procedural and issues conference[291] that we held pursuant to PSL §165(2), DPS Staff did not specify any issues with the Applicant's noise study methodology.[292] Acknowledging the parties' confusion as to our intent for issues identification on January 10, 2017,[293] we accepted the parties' proposal of a filed issues statement on February 8, 2017, later extended to February 21, 2017.

On February 21, 2017, DPS Staff filed its statement of proposed Article 10 issues. Therein, DPS Staff noted that it intended to "test the Applicant's assumptions of computer noise modeling" and that it "believes the modeling provided for in the Application may result in noise limits identified in local laws or the Applicant's proposed noise design goals being exceeded." No further information was provided as to which assumptions DPS Staff had concerns about. Cassadaga Wind, in its March 2, 2017, response to the parties' written issues statements, expressed its concern that the DPS Staff statement was too vague. The Applicant also noted then that DPS Staff had "signed a detailed stipulation regarding sound, including stipulating to certain noise modeling parameters" and, citing 16 NYCRR §1000.5(k), stated that "[t]o the extent DPS is attempting to contest any

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[291] Notice of this conference was issued November 30, 2016 and specified that the conference was being held, inter alia, to identify issues for adjudication.

[292] See Procedural Conference transcript, Tuesday January 10, 2017, at 92-93, ll. 16-3. Additionally, in its January 5, 2017, email requested by the hearing examiners prior to the conference to identify proposed issues for adjudication, DPS Staff identified its only noise issue as "Noise and vibration due to facility operation in relation to surrounding rural residential uses warrants additional evidence and consideration of reasonable alternatives and impact minimization measures."

[293] See id. at 73-78.

issue which has been previously stipulated to, such issue cannot be raised by DPS at a hearing."

In our ruling on the proposed issues,[294] we expressed our concern about the status of the proceedings in light of the non-specific nature of the parties' issues statements, although we deemed many of them sufficient enough, at a bare minimum, to advance them to an evidentiary hearing. Notably, our ruling reserved on the potential adjudication of DPS Staff's issues directed at the Applicant's noise modeling assumptions. Our reservations were based on Cassadaga Wind's claim that, as a stipulation signatory, DPS Staff was precluded from asserting issues criticizing the Applicant's modeling.[295] Our March 20 Ruling stated that DPS Staff should be prepared to respond to Cassadaga Wind's contentions during a technical conference we scheduled to further narrow issues.[296] However, we cancelled the technical conference at the request of DPS Staff and other State agency parties, and did not thereafter formally rule on whether the issues were judicable.[297]

The parties filed their testimony on May 12, 2017. At that time, DPS Staff filed noise testimony consisting of approximately 100 pages, the majority of which criticized the foundational basis of the Applicant's sound propagation modeling, either directly to state that the models were unreliable and should be rerun with completely new parameters, or indirectly to observe that Cassadaga Wind's proposed certificate conditions were inadequate inasmuch as they were

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294 Ruling on Proposed Issues for Evidentiary Hearing (issued March 20, 2017) (March 20 Ruling).

295 Id. at 12.

296 Id.

297 See email Confirmation of Oral Ruling of April 3, 2017 sent from Judge Casutto to the parties on April 4, 2017.

based on unreliable projections of the Project's noise impacts, due to faulty modeling.[298] Ultimately, DPS Staff recommended that the Board deny Cassadaga Wind an Article 10 certificate unless the Applicant performed completely new sound modeling.[299]

In its rebuttal filed June 9, 2017, Cassadaga Wind filed comprehensive testimony defending the application materials and inputs, and providing information about the effect that adjustments suggested by DPS Staff would have on the PNIA results. At hearings, DPS Staff introduced new concerns that were not raised in pre-filed testimony related, in part, to the noise modeling.[300] To not prejudice the Applicant, we allowed Cassadaga Wind to introduce sur-rebuttal testimony orally.[301] Then, in its post-hearing brief, DPS Staff altered its position again as to certain of its proposed certificate conditions as related to the new modeling it wanted the Applicant to

[298] See Tr. 2180-2280.

[299] Tr. 2279-80, ll. 12-17.

[300] See Tr. 2407-08, ll. 15-24.

[301] See Tr. 2408, ll. 6-9; Tr. 2687-703, ll. 19-22.

perform.[302] Cassadaga Wind posits that the change resulted from DPS Staff's realization that its hearing position seeking modeling based on the National Association of Regulatory Utility Commissions' (NARUC) guidelines would provide no change to the results.

The Board's regulations prohibit a party executing a pre-application stipulation from raising objections at the hearing as to the methodology or scope of any study or program of studies performed in compliance with such stipulation.[303] As mentioned above, DPS Staff concedes that the noise studies in the application materials comply with Stipulation 19.[304] DPS Staff takes the position, however, that because its testimony

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[302] Compare Hearing Exhibit 52 (Proposed Certificate Condition 79(d) requiring the Applicant to redesign the Facility according to NARUC 2011 guidelines "using appropriate assumptions and inputs") with DPS Staff's Post-hearing Brief, Appendix C (Proposed Certificate Condition 74(d) requiring that the Applicant redesign the Facility according to National Association of Regulatory Utility Commissions' (NARUC) 2011 guidelines and now specifying the modeling assumptions to be employed, assumptions that the Applicant has convincingly demonstrated are not contemplated by the NARUC guidelines). With such changes of position made at the briefing stage, the Applicant can legitimately claim that it was not provided an adequate opportunity to examine DPS Staff's position. To the extent DPS Staff would argue that the change in condition merely provides more specific information as to the original certificate condition, we think the original language drafted by DPS Staff was, at best, ambiguous, and the Applicant's professed understanding that appropriate assumptions and inputs meant those actually used in the NARUC guidelines, not those to be determined at a later date after DPS Staff had an opportunity to consider further what it deemed "appropriate," was a reasonable interpretation.

[303] 16 NYCRR §1000.5(k).

[304] Tr. 2194, ll. 4-8 (Q. Was the Applicant's Exhibit 19 submitted in compliance with "Stipulation 19-1001.19 Exhibit 19: Noise and Vibration," a stipulation to which Staff agreed? A. Yes.).

addresses "concerns regarding the inputs and assumptions the Applicant uses in the models" and "adjustments the Applicant made to certain model results," its testimony is not improper under the Board's regulations.

DPS Staff's position ignores its own role in executing a stipulation that, according to DPS Staff, left open so many variables as to be ineffective in limiting the scope of the issues for litigation or ensuring a reliable record for a Board determination. DPS Staff never gave an explanation for why DPS did not include in Stipulation 19 the specific modeling assumptions and inputs it now wishes to impose in its latest version of proposed certificate condition 74. In signing Stipulation 19, DPS also did not reserve its rights to challenge any underlying assumptions or inputs used in the modeling despite the very specific detail that is included in the stipulation. We do not find it credible that DPS was unaware when it entered into the stipulation that underlying assumptions and inputs would have to be employed to perform the modeling. Based on the foregoing, we believe that the Applicant is correct that DPS Staff's objections subvert the intent of 16 NYCRR 1000.5(k). Thus, we conclude that the Board could reject, on procedural grounds, DPS Staff's objections that Cassadaga Wind's modeling is unreliable and that it relies on flawed modeling parameters or assumptions. However, given the importance of the issue, we address the substance of DPS Staff's claims.

Moreover, Concerned Citizens did not sign Stipulation 19 and has raised some of the same objections raised by DPS Staff. Thus, we would have to address Concerned Citizens' claims even given our concerns about DPS Staff's procedural issue. We now address all the objections raised by DPS Staff and Concerned Citizens to provide our recommendation to the Board on the merits.

ii. Substantive Analysis

When we consider DPS Staff's criticism of the Applicant's noise study on the merits, we are not convinced that the inputs and assumptions made by RSG were inherently flawed. First, DPS Staff criticizes Cassadaga Wind for using modeling that it deems is inconsistent with the Project area's topography, asserting that concave terrain exists between as many as 31 residences and a proposed turbine site.[305] Based on an April 2012 article authored by Tom Evans and Jonathan Cooper (Evans and Cooper),[306] DPS Staff asserts that the Applicant's sound models underestimate noise impacts due to its alleged failure to consider concave topography. Similarly, Concerned Citizens also complains that RSG did not sufficiently account for the local topography in its modeling.[307]

In rebuttal, Cassadaga Wind explains that the assumptions employed in the RSG model were different than those underlying the Evans and Cooper results. Moreover, Cassadaga Wind shows that the assumptions used by RSG were, in fact, supported by a 2013 article by the same authors as an appropriate way to correct for the findings of potential inaccuracy in the April 2012 Evans and Cooper article cited by DPS Staff.[308]

DPS Staff based its conclusions for the existence of concave topography on a visual inspection aided by a site visit and Google Earth, with no foundation provided to explain why the use of Google Earth would be appropriate for such an exercise.[309]

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[305] See Hrg. Ex. 62 (MMC-10).

[306] Hrg. Ex. 62 (MMC-3).

[307] See Tr. 1725-26, 1765.

[308] Tr. 1846-48, ll. 5-4; Hrg. Ex. 145.

[309] Tr. 2626-28, ll. 25-4.

In contrast, Cassadaga Wind demonstrated that Evans and Cooper provided a specific formula for determining whether terrain was concave such that the modelling assumptions tested in the article would be rendered suspect. DPS Staff admitted that it was not aware of the formula and did not use it to create its hearing Exhibit 62 (MMC-10) list.[310] DPS Staff never addressed why a visual inspection was adequate rather than using the formula, or why the differences between the assumptions underlying the findings of Evans and Coopers and those employed by RSG were immaterial. Instead, DPS Staff admitted that its concern is actually that Cassadaga Wind's modeling is not conservative enough to produce absolute worst-case scenarios regardless of the actual site conditions, rather than the most reasonable worst-case results for the existing site conditions.

The record provides adequate support for RSG's assumptions. In our opinion, the model employed sufficiently considered the Evans and Cooper findings regarding topography and made appropriate adjustments. These adjustments were even supported by Evans and Cooper in a follow-up article exploring the same issue of concave terrain.[311]

A more general complaint DPS Staff raises regarding the Applicant's assumptions is related to the ability of the local ground to reflect or absorb sound. RSG's model used a ground factor that assumed the ground consisted roughly of half porous and half hard ground (G=0.5). DPS Staff asserted that such a selection could tend to under-predict sounds and argued

[310] Tr. 2628-34, ll. 5-24. Exhibit 62 (MMC-10) contains the list of turbines for which DPS Staff the sound impact was underestimated by the Applicant's modeling.

[311] Hrg. Ex. 145.

for the use of a completely reflective ground factor (G=0.0).[312] Specifically, DPS Staff states that G=0.5 is improper for determining the very short term 1-hour sound pressure level equivalents to determine Project compliance with the applicable local community laws. Cassadaga Wind notes that the Project area is primarily rural with very relatively few hard surfaces and asserts that it could have supported use of a completely absorptive ground factor (G=1.0). RSG instead used the G=0.5 factor to represent a midpoint between a completely hard ground area and a completely porous area, arguing that this is a conservative assumption. Using a hard ground factor of G=0.0 would only be appropriate in a developed urban environment with paved surfaces.

The 2011 NARUC guidelines support RSG's input selection.[313] While the 2011 NARUC guidelines apply to long-term mean predictions, Evans and Cooper show that ISO 9631-2 with a completely reflective ground factor will "significantly over-

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[312] The most porous, sound absorbing, ground is represented in the model inputs as G=1, such that using a modeling factor of G=1 would more rapidly reduce the modeled sound power level over distance from the sound emitting source as more of the sound is absorbed into the ground. In contrast, using G=0 produces comparatively less decrease in the modeled receptor results as the receptor increases in distance from the emitter, as the sound would still dissipate in the air as it travels from the emitter, but it would not be absorbed by the ground in any appreciable manner. A G=0.0 ground factor would be appropriate in an urban environment. See Tr. 1840-41.

[313] Hrg. Ex. 62 (MMC-2) at 3. Specifically, the 2011 NARUC guidelines state "Commercially available software packages based on ISO 9613-2 are suggested for noise modeling analyses. Recommended modeling procedures would consist of the following steps. . . . Assume a ground absorption coefficient (A_g from ISO 9613-2) appropriate to the site area (a moderate value of 0.5 generally works well as an annual average for rural farmland)."

predict [maximum L_{eq}] noise levels at sites with flat topography or steady downward slopes."[314] Cassadaga Wind also demonstrates that it took reasonable steps to address the potential for under-prediction by making adjustments to other inputs for the deficiencies identified by Evans and Cooper, such as adjusting the receptor height and adding a 2 decibel uncertainty correction.[315] We believe that the ground factor RSG chose to employ is sufficiently explained and supported in the record and is conservative enough to predict reasonable worst-case sound levels in the existing conditions. We do not believe that the regulations require an applicant to provide sound modeling for conditions that do not exist, for example, assuming that a rural landscape is an urban one.

DPS Staff also takes issue with RSG's use of the turbine manufacturers' warrantied sound power levels in its model. However, the record demonstrates that if, for some reason, the sound power level exceeds the warranty, a manufacturer is required to repair the turbine so that it meets its warrantied sound power level.[316] Additionally, any discrepancies that cause the turbine to exceed certificate conditions or local laws will require the Certificate Holder to shut down the turbine and bring it into compliance.[317] Therefore, we agree with the Applicant that the manufacturer has an interest in providing realistic, attainable results. We recommend the Board find it was appropriate for RSG to use the manufacturer's warrantied sound power level in its models.

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[314] Hrg. Ex. 62 (MMC-3) at 7.

[315] Tr. 1845-47, ll. 13-12.

[316] Tr. 1844, ll. 7-17.

[317] See Tr. 1844, l.17-2; Tr. 1972-75, ll. 23-25.

We also do not find any of the remaining DPS Staff criticisms of the inputs and assumptions used to create the PNIA sufficiently convincing for us to recommend that the Board reject the Applicant's modeling. In summary, although DPS Staff has raised several concerns questioning the modeling based on technical literature that shows certain potential deficiencies in the combination of some of the modeling inputs RSG selected, our review of the record is that RSG was well aware of the same articles and their findings and took appropriate steps to ensure that its modeled results would not under-predict expected sound levels.

Concerned Citizens criticizes RSG's use of CONCAWE data in its ISO 9613-2 noise model. We do not understand RSG to have borrowed some elements from an ISO 9613-2 noise model and some from an incompatible CONCAWE model to make an untested, and potentially suspect, hybrid model as Concerned Citizens alleges. Rather, the record demonstrates that RSG used the ISO 9613-2 noise model, but to determine inputs for meteorology, input data absent from the ISO 9613-2 noise model, it reasonably used the industry standard meteorological data available in the CONCAWE publications. Moreover, Stipulation 19 specifically requires the use of CONCAWE meteorological adjustments that include 64 different meteorological conditions.[318] Consequently, should we accept Concerned Citizens' objections, we would be invalidating the other parties' agreement. However, should Concerned Citizens' criticisms reveal deficiencies in the stipulation, we would not hesitate to recommend its position to the Board, but here we do not see such a need.

We do not recommend the Board require remodeling of the project based on the set of assumptions now proposed by DPS

[318] Concerned Citizens was not a party to Stipulation 19 and are not bound by it.

Staff to get an assessment of conditions that do not exist at the Project site. The Board could require remodeling if it wanted to have an extreme worst-case scenario on which to judge the Project. We are persuaded, however, that the PNIA provides an appropriate, conservative evaluation of the actual expected sound levels, including a likely worst-case scenario for the existing real-world conditions, over appropriate time intervals.[319] In our opinion, using DPS Staff's inputs would present an unrealistic worst-case scenario that is unlikely to happen. We do not think that is what is required by PSL §168 or the regulations.[320] We recommend the Board determine that the record is sufficient for it to make its factual findings regarding the likely impacts of noise and vibration from the Project.

Impact Findings

The Application materials on sound include, among other things, a discussion of the potential for the Project to result in hearing damage, the potential for indoor and outdoor speech interference, a review of published material specific to

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[319] See Tr. 1859, ll. 16-18.

[320] PSL §168(2) requires the Board to make "explicit findings regarding the nature of the probable environmental impacts," not all possible impacts. In our opinion, although one can reasonably differ over what constitutes probable, as the parties have with regard to adverse health conditions resulting from noise, there needs to be at least some recognition of likelihood in the definition of probable. Here, we do not see that the extreme modeling case urged by DPS Staff would be likely. For example, DPS Staff did not produce any operational results from existing wind farms that would demonstrate that RSG's projected results would be significantly less than the sound power levels measured under real world conditions. Thus, we are persuaded by Cassadaga Wind and its reasonable and thorough explanations for RSG's chosen modeling assumptions.

the relationship between annoyance attributed to wind turbine noise and complaints, the potential for sound-induced vibration and annoyance at the low frequency bands of 13, 31.5, and 63 Hz, the potential for structural damage, and the potential for interference with technological, industrial, or medical activities that are sensitive to vibration or infrasound.

In addition to the evaluation of audible sound, the PNIA contains an evaluation of the potential impacts from infrasound and low frequency sound. As noted therein, the human ear is relatively insensitive to low-frequency sound and infrasound, which is generally inaudible to humans unless it occurs at a very high decibel level.[321] The evidence suggests that such inaudible low-frequency sound may be perceived through vibration or other physiological functioning.

RSG's highest modeled sound level at a non-participating receptor is 51 dBA, six decibels above the design goal for the project and up to 3 dBA above the town ordinance level and daytime design goal. A total of 41 non-participating receptors exceeded 45 dBA. Assuming the use of noise reduction minimization measures, the highest one-hour nighttime L_{EQ} at a permanent non-participating residence is 45 dBA. The highest one-hour nighttime L_{EQ} at a seasonal home is 48 dBA.[322]

The Towns of Charlotte, Arkwright, and Cherry Creek specify their sound level regulations as a measure of L_{10}, that is, the sound measure should not exceed the applicable decibel level for more than 10 percent of the time, or six minutes of any hour.[323] Cassadaga Wind states that the L_{10} of wind turbine sound is typically less than two dB above the measured L_{EQ}.

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[321] Hrg. Ex. 99, App. Z at 111.

[322] Hrg. Ex. 99, App. Z at 117.

[323] Id.

Therefore, a 48 dBA L_{EQ} would result in compliance, as the equivalent L_{10} could be expected to be no greater than 50 dBA.[324]

As for infrasound, the PNIA states that while such low frequency sounds emitted from wind farms have not been shown to be audible by humans, infrasound and low frequency sound can create noise-induced vibration in lightweight structures.[325] The PNIA results show that the sound levels from the Project will be below the threshold for moderately perceptible vibration and rattle in all three frequency bands of 13, 31.5, and 63 Hz.[326]

In general, excessive exposure to noise can negatively impact health, potentially causing, at excessive levels, hearing loss, sleep disturbance, cardiovascular and pyscho-physiological conditions, interference with communication, reductions in cognitive performance, annoyance, and impaired social behavior.[327] To protect the public from such effects, the WHO produced noise guidelines in 1999, and updated those guidelines in 2009.[328] The guidelines establish an annual average of 40 dbA, and a one night maximum of 45 dbA, for outdoor nighttime noise.[329] The guidelines are intended to minimize sleep disturbance which has been shown to be correlated to declines in health and to susceptibility to disease.[330] Importantly, DOH Staff's evidence notes that the most comprehensive study regarding the WHO guidelines and wind turbine noise, published by Health Canada in 2016, concluded that annoyance was the only significant effect associated with turbine noise measured at a

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[324] Id. at 117-18.

[325] Id. at 31.

[326] Id. at 118.

[327] Tr. 1479-81, ll. 17–1.

[328] Tr. 1479-80, ll. 18–12.

[329] Tr. 1480, ll. 13-16.

[330] See Tr. 1481-82, ll. 1–20.

maximum annual average of 46 dbA, and, specifically, that sleep disturbance was not significant in the population studied.[331]

The Applicant asserts that annoyance is not a medically or scientifically recognized "adverse health effect" in that it has not been shown to cause harm to human health.[332] DOH Staff, however, explicitly lists annoyance among the "recognized health-related effects" for which it seeks to protect the public.[333] DPS Staff also recognizes annoyance as a potential health and safety impact of the Project, noting that the PNIA states that the incidence of annoyance increases with sound levels and, at sufficient levels, can have a detrimental effect on sleep quality.[334] DPS Staff notes that the 1999 WHO guidelines list the same potential health effects as those identified by DOH Staff.[335] DPS Staff contends that noise impacts are a critical component of evaluating the public health and safety impacts of an Article 10 proposal.

Similarly, Concerned Citizens notes that the WHO guidelines include both the direct impacts indicated by DOH Staff, as well as secondary effects including reduced perceived sleep quality, increased fatigue, depressed mood or well-being, and decreased performance.[336] Concerned Citizens demonstrates that the purpose of the 1999 WHO recommendations is to present guidelines "for the onset of health effects from noise exposure"[337] and quotes the WHO to note that sleep disturbance from intermittent noise events increases with the maximum noise

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331 Tr. 1483-84, ll. 12-7.

332 See Tr. 1506-07, ll. 10-8.

333 Tr. 1479, ll. 3-6.

334 See Hrg. Ex. 99, App. Z at 2.

335 Hrg. Ex. 62 (MMC-8) at 98.

336 Hrg. Ex. 67 at ix-x.

337 Id. at 38.

level. As for the ability of wind turbine noise to cause annoyance, Concerned Citizens again cites the WHO to show that the capacity of a noise to induce annoyance depends upon its physical characteristics, including the sound pressure level, spectral characteristics and variations of these properties with time, and that for intermittent noise, it is necessary to take into account both the maximum sound pressure level and the number of noise events.[338]

DOH Staff's position is reasonable, despite the Applicant's evidence showing no direct association between wind turbine noise and any disease or harm to health.[339] In fact, the Board's regulations require that the application contain an evaluation of "potential community noise impacts," including broad impacts such as interference with speech or the use of public facilities, and the potential for community complaints, all of which could be considered forms of annoyance.[340] Additionally, Cassadaga Wind's witness acknowledged that studies have recognized the potential for a "cascade of annoyance leading to stress and stress leading to sleep disturbance and sleep disturbance leading to health effects" as a "reasonable pathway."[341]

In addition to suggesting that annoyance is not a recognized health impact, Cassadaga Wind also presents evidence that self-reports of annoyance are better correlated to subjects who admit to pre-existing attitudes about wind turbines and to visual effects than to objective sound measurements.[342] However,

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[338] Concerned Citizens Initial Post-Hearing Brief at 5-6. See Hrg. Ex. 62 (MMC-8) at 9-12 (of 161).

[339] See Tr. 1203-04, ll. 15–4.

[340] 6 NYCRR §1001.19(k).

[341] Tr. 1583-84, ll. 12–5.

[342] See Hrg. Ex. 28 at 10.

that same evidence shows that factors such as the intermittent or rhythmic characteristics of wind turbine noise or the context in which wind turbine noise is emitted can influence perceptibility and annoyance.[343] Hearing Exhibit 28 also recognizes reports of sleep disturbance with excessive sound pressures at night and that annoyance has been associated with stress.[344]

We agree with DOH Staff, DPS Staff and Concerned Citizens that noise impacts are critical to an evaluation of the public health and safety impacts under Article 10 and that noise presents issues both of direct and indirect harms. We also agree with DOH Staff and DPS Staff that the Project should not exceed the WHO 1999 and 2009 guidelines and that the noise impacts from facility components should not exceed, at a minimum, 50 dbA $L_{night,outside}$ at any existing residence.[345]

Given the results of the PNIA demonstrating that the Project's modeled sound pressure levels are near the WHO thresholds, we turn to an examination of the Applicant's proposed minimization and avoidance measures, set forth in the next three subsections.

Design Goals and Regulatory Limits

Cassadaga Wind has agreed to design the Project adhering to the design goals of 45 dBA $L_{(8\ hr)}$[346] at all non-participating seasonal and permanent receptors, 40 dBA

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343 Id.

344 Id.

345 Tr. 1485-88, ll. 4-5. 50 dbA $L_{night,outside}$ indicates that the cumulative sound should not exceed 50 decibels of audible frequencies at night outside of any residence. It is a sound equivalent value.

346 An audible sound pressure level of 45 decibels over any measured eight-hour period.

$L_{night,outside}$[347] at all non-participating receptors, 55 dBA $L_{(8hr)}$[348] at participating receptors, 50 dBA $L_{night,outside}$[349] at participating receptors, and 65 dBZ at the 16 Hz, 31.5 Hz, and 63 Hz octave bands[350] at non-participating receptors.[351] The Applicant states that the limits were derived from the WHO 1999 Guidelines for Community Noise and 2009 Night Noise Guidelines for Europe;[352] and from ANSI S12.9 Part 4 Annex D[353] for low frequency noise thresholds.[354] DOH Staff has testified that these source documents are the most relevant noise level guidelines applicable to the Project.[355]

DPS Staff requests that the Board require further "design and regulatory goals." We evaluate DPS Staff's requests as establishing regulatory goals that, if adopted as certificate conditions, may require Cassadaga Wind to redesign portions of its Project to ensure compliance therewith.

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347 An audible sound pressure level of 40 decibels measured overnight outside.

348 An audible sound pressure level of 55 decibels over any measured eight-hour period.

349 An audible sound pressure level of 40 decibels measured overnight outside.

350 An unfiltered (all frequencies combined, or the entire amount of sound) sound pressure level of 65 decibels to cover the low frequency and infrasound ranges.

351 Tr. 1870, ll. 5-15.

352 Hearing Exhibits 62, MMC-8 and MMC-9, respectively.

353 Hearing Exhibit 126.

354 The American National Standards Institute (ANSI) is a private non-profit organization that oversees the development of voluntary consensus standards in the United States.

355 Tr. 1480, ll. 13-16.

DPS Staff notes that although the Applicant has agreed to adopt a long-term design goal of 50 dBA $L_{eq\text{-}1\text{-}year}$[356] for the nighttime period at all participant receptors' property lines, Cassadaga Wind limits the design goal to apply only to that portion of a real property plot that is within 150 feet of an existing roadway.[357] DPS Staff contests the 150-foot condition as not being protective enough of potential future development.[358] DPS Staff contends that the Applicant has not provided any data or other supporting information for its assertion that houses or other sensitive receptors will only be constructed within 150 of any existing roadway. DPS Staff instead proposes that the limit apply across the entire property, arguing that the Applicant's restriction does not minimize the impacts sufficiently to preserve the enjoyment of the property.

Given the WHO guidelines, we believe that DPS Staff's request is reasonable, particularly to the extent that applicable local law requirements are at issue.[359] Contrary to the Applicant's position, such a concern is not necessarily directed only to speculative future development, but is also aimed at preserving the present use and enjoyment of land regardless of participation status. To the extent that the Applicant's modeling supporting a 55 dBA one-hour L_{eq} is shown to be equivalent or better than 50 dBA in a year, then the Applicant should have no objection to this condition.

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[356] An equivalent sound pressure level of 50 decibels in the audible frequency range over an entire year.

[357] Tr. 1872, ll. 7-13; Tr. 1886, ll. 7-11.

[358] Tr. 2602, ll. 4-13.

[359] See Concerned Citizens, Initial Post-hearing Brief at 21-27 (questioning the propriety of allowing "participants" to waive local law requirements by contract).

Cassadaga Wind, citing the WHO 1999 guidelines, proposes that the Board institute a short-term noise limit on the Project of 45 dBA $L_{(8\ hr)}$. DPS Staff asserts that the proposed short-term limit is insufficient to protect human health, arguing that the Applicant's reliance on the 1999 WHO guidelines is misplaced inasmuch as the limit was modified in the 2009 WHO guidelines. DPS Staff maintained that the Applicant's design goal was insufficient to protect human health and argued that the Board should impose a regulatory limit of 40 dBA L_{night}.[360] Concerned Citizens agreed with DPS Staff's position.[361]

On reviewing the record, we agree with Cassadaga Wind that the parties' objections are based on a misunderstanding of the WHO 2009 guidelines, confounding averaging periods and measurement locations. DPS Staff omitted relevant language from its examination of those 2009 WHO guidelines in making its 40 dBA $L_{night,outside}$ recommendation. The WHO 2009 guidelines specifically state that the 2009 guidelines are "complementary to the 1999 guidelines" and are not intended to replace the 1999 guidelines.[362] DOH Staff interprets the guideline standards in the same manner as Cassadaga Wind, noting its understanding that the 40 dBA $L_{night,outside}$ guideline is an annualized average, not intended as a substitute for the short term 45 dBA guideline.[363]

DPS Staff also proposes that the Applicant redesign the Project so that no non-participating residence be located in the 42 dBA noise contour of the Applicant's modeling results.[364]

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360 Tr. 2217-19, ll. 4-13.

361 See Concerned Citizens Post-Hearing Brief at 6-7, citing Hrg. Ex. 67 at xvi.

362 Tr. 1873-74, ll. 3-2.

363 Tr. 1481-82, ll. 16-20.

364 Tr. 2241, ll. 1-3.

DPS Staff's recommendation, however, appears to be based on a misinterpretation of a NARUC metric for a long-term mean sound level measured over the course of several weeks as a substitute for the Applicant's proposed short-term 45 dBA $L_{(8\ hr)}$.[365] As Cassadaga Wind's witness explained "for a given multi-week sample of wind turbine noise, the maximum 8-hour nighttime period will always be higher than the multi-week mean, so a multi-week 42 dBA may not be more conservative than a single-night 45 dBA."[366] The 2011 NARUC guidelines indicate that 45 dBA as a long-term mean sound level will result in few complaints.[367] On balancing the parties' positions, we are persuaded by the Applicant and DOH Staff that their proposed short-term and long-term standards are appropriate.

Low Frequency Noise and Infrasound

Although Cassadaga Wind agrees with DPS Staff to a design goal of 65 dB or lower for the 16, 31.5, 63 Hertz full-octave frequency bands, it contests these limits as inappropriate as a certificate condition.[368] The Applicant bases its opposition to the proposed condition on the fact that turbine manufacturers only warranty a turbine's overall A-weighted sound level and that imposing a regulatory limit for which the Applicant has no recourse is not fair.[369] Cassadaga Wind proposes an alternative certificate condition roughly based on ANSI S2.71-1983 such that if a complaint arises related to vibration impacts, then vibration will be monitored and

365 See Tr. 1878, ll. 1-20.

366 Tr. 1878, ll. 7-10.

367 Tr. 1878, ll. 14-19.

368 Tr. 1884, ll. 8-19.

369 Tr. 1184, ll. 16-19.

minimization controls will be implemented to meet the ANSI standard.[370]

DPS Staff does not accept the Applicant's alternative, as it views the condition as only addressing the higher sound power levels required to create vibrations, while lower sound pressure levels may cause annoyance of the building occupants without inducing vibrations in the building itself.[371] Thus, DPS Staff persists in its position that the ANSI 12.9 Part 4 standard of 65dB be imposed to protect against annoyance from vibrations on persons rather than buildings. Concerned Citizens raises identical concerns regarding the proper ANSI standard that should be used to establish regulatory limits.[372]

We agree with Concerned Citizens and DPS Staff that an ANSI standard applicable to human responses to low frequency noise and vibration is more appropriate than one relating to building vibration. In making this recommendation, we agree with DPS Staff that the lack of a manufacturer's warranty on the relevant full octave frequency bands of 16, 31.5, and 63 hertz is insufficient justification to eliminate a certificate condition on measurable low frequency sounds and requiring minimization and operational controls to protect the local residents.

Post-Construction Monitoring Protocols

Finally, DPS Staff questions the effectiveness of the Applicant's proposed post-construction monitoring and compliance protocol.[373] DPS Staff contends that Cassadaga Wind's first post-construction compliance test should be performed within six

[370] Tr. 1885, ll. 1-7; Hrg. Ex. 25, Con. 73(d).

[371] Tr. 2531-33, ll. 17–10.

[372] Tr. 1757, ll. 1-20.

[373] Tr. 2268-72, ll. 18–11.

months of facility operation, with a second test after 12 months, rather than waiting for 12 months for the initial test as the Applicant has proposed.[374] Additionally, DPS Staff expresses concerns with the Applicant's selection of monitoring equipment locations. DPS Staff insists that the protocol should require the Applicant to place its monitoring equipment at locations expected by the modeling to have the most significant impacts, rather than Cassadaga Wind's proposal for using four non-participant permanent receptor locations at increasing distances away from the turbine.[375] DPS Staff, relying on the NARUC 2011 guidelines, would have the Applicant perform long-term testing of two weeks that would be extended to four if weather conditions change significantly during the first two weeks.[376] Cassadaga Wind has proposed a testing period of 12 hours over a single night.[377] DPS Staff also takes exception to the Applicant's plan to only do retesting after a five-year interval.[378]

The Applicant's main criticism is that DPS Staff's proposed long-term testing is mismatched to the proposed applicable short-term standard of 45 dBA $L_{(8\ hr)}$.[379] Cassadaga Wind maintains that Article 10 and the stipulations are intended to consider the overall impact of the Project and evaluate pre- and post-construction conditions, not just to determine the maximum sound levels emitted from the Project. The Applicant argues that the only way in which an even comparison can be made is to conduct post-construction monitoring at the same locations

[374] Tr. 2269, ll. 8-14.

[375] Tr. 2269-70, ll. 17–16.

[376] Tr. 2271, ll. 4-16.

[377] Tr. 2270, ll. 17-18.

[378] Tr. 2271-72, ll. 17–11.

[379] Tr. 1882-83, ll. 14–5.

used during pre-construction.[380] Cassadaga Wind also notes that its proposed protocol allows for up to three additional locations that would be chosen post-construction based upon any received sound complaints, a fact that is not addressed in DPS's testimony.[381] To accommodate portions of DPS Staff's testimony with which it agreed, the Applicant proposed revised conditions to reflect its post-construction noise and vibration monitoring protocols.[382] During cross-examination, Cassadaga Wind sought a compromise for a proposed certificate condition that would require it to first try to locate appropriate proxy locations, but if the Applicant were to demonstrate that no reasonably representative locations could be found, then, on DPS's consent, the Applicant would be allowed to pursue its proposed monitoring plan.[383]

DPS Staff does not consent to such a condition. Instead, DPS Staff urges that its condition be adopted as drafted and, if demonstrated to not be possible, the Certificate Holder should consult with DPS to determine how to proceed. We think that position is unreasonable and does not give adequate assurance to the Certificate Holder or to the Board that the issue has properly been resolved.

Cassadaga Wind convincingly demonstrates that DPS Staff's monitoring protocol is designed for a NARUC methodology for measuring long-term noise levels, when it is supposed to be monitoring against a short-term regulatory noise standard. We recommend that the Board adopt the Applicant's revised monitoring protocol as contained in Hearing Exhibit 22 and

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380 Tr. 1883, ll. 9-17.

381 Tr. 1883-84, ll. 18–2.

382 Tr. 1884, ll. 3-7, Hrg. Ex. 25.

383 Tr. 2347-51, ll. 16–23.

proposed conditions related thereto in Hearing Exhibit 25. We have included all of our recommended certificate conditions to be applied to noise in Appendix A, conditions 70 through 77 for the Board to adopt in its final Order. Having examined the record on the noise issues presented in this matter, we recommend that the Board determine that, with our recommended conditions imposed in the certificate, the noise and vibration impacts from the Facility have been minimized or avoided to the maximum extent practicable.

Cultural, Historic and Recreational Resources

Boutwell Hill State Forest

While the Project does not include any wind turbines in the Boutwell Hills State Forest (BHSF), it does place a 1.2 mile overhead three circuit collection line along East Road and Boutwell Hill Road through the forest.[384] The collection line connects turbine T41, located in the eastern portion of the Town of Cherry Creek, with T15 located in the western portion of the Town of Charlotte. The line consists of three overhead circuits using a support configuration of two parallel wood poles.[385]

Because the collection line runs through a New York State Forest, a State law authorizing DEC to grant an easement is required for placement of the facilities. In 2016, Governor Cuomo signed into law legislation authorizing DEC to grant an easement for the placement of a collection line in BHSF (BHSF

[384] See Hrg. Ex. 99, Application Ex. 11; Hrg. Ex. 133, Response to DPS IRs 7, 8, 20, 29, 30, 31, 32, and 41.

[385] Tr. 969, ll. 9-20.

law).[386] The BHSF law specifies that the easement is for "an electric collection or distribution line" that must be placed within 50 feet of the center line of certain roads in the forest, and does not allow for cutting trees greater than 50 feet from the line. Thus, the BHSF law allows for a usable portion of easement equal to 37.5 feet.[387]

DPS Staff provides several criticisms of the Applicant's planned facilities to be sited in BHSF. DPS Staff notes that the proposed facilities will require an overly large multi-pole support structure for the lines that will create an even larger footprint, because the use of wood poles will, in certain instances, require the placement of guy wires for additional support. DPS Staff alleges that this multi-pole configuration will create unacceptable adverse impacts to wildlife habitat, public safety, land use, recreational resources, aesthetics, and scenic values. Additionally, DPS Staff contends that the Project's facilities in BHSF are not designed in compliance with the BHSF law and other local laws prohibiting the use of guy wires.

Irrespective of the BHSF law, the Project will impact the existing character of the State forest. The record demonstrates that adverse impacts to BHSF include the Project's visibility from parts of BHSF including recreation trails, as well as potential interference with movement and activities within the BHSF. The impacts will occur both during

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386 Chapter 481 of the Laws of 2016, An Act to authorize an easement on a portion of real property within the Boutwell Hill state forest in the county of Chautauqua for the location of electric collection or distribution facilities in connection with a wind powered electric generation project located in the towns of Charlotte and/or Cherry Creek (effective November 28, 2016). Hrg. Ex. 53 (ACD-5).

387 Tr. 909.

construction and operation. Other impacts have already been detailed in this RD in more general areas, such as impacts to vegetation and freshwater wetlands in the BHSF. For those impacts we have not yet addressed, we now turn to our examination of proposals to minimize and avoid such impacts.

DPS Staff recommends siting realignments and alternative facility structure designs for the Applicant to implement to avoid or minimize land use impacts.[388] DPS Staff states that the Applicant's proposed guying wires increase the impact area of the facilities, resulting in reduced areas of forest production and recreational use. DPS Staff advocates for a condition requiring the Applicant to place the facilities in the BHSF underground to the maximum extent achievable, or to use structures, such as a steel monopole, that avoid a need for guy wires.[389] DPS Staff also claims that the use of guy wires is prohibited by the local laws of Charlotte and Cherry Creek.[390] DPS Staff also criticizes Cassadaga Wind's proposed overhead electrical collection line design for multiple-circuit segments in BHSF, stating that the design imposes adverse impacts on recreational and other existing land uses.[391]

Cassadaga Wind argues that DPS Staff misapprehends both the BHSF law and the local laws. Cassadaga Wind maintains that it will construct the line to conform to the requirements of the BHSF law. The Applicant notes that the BHSF law includes a temporary easement to remove certain trees located 100 feet from the easement. Cassadaga Wind argues that the foregoing

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388 Tr. 792-93.

389 Tr. 792-93.

390 Tr. 840. The Joint Towns did not any submit testimony in this proceeding and so have not taken a position on DPS Staff's interpretation of their local laws.

391 Tr. 791.

provision indicates that the BHSF law contemplates an overhead collection line because underground lines do not require a 100-foot clearing easement. Additionally, the Applicant claims that the local law provisions relating to the use of guy wires only prohibit their use for turbine towers, not for utility poles. Cassadaga Wind also maintains that DPS Staff's recommendations are not cost effective.[392]

DPS Staff does not dispute the cost differences but, consistent with its position on costs elsewhere in this case, contests the Applicant's implication that any increase in cost above the lowest cost alternative is not practicable. DPS Staff also contends that Cassadaga Wind exaggerates the number of locations in which it seeks the use of an alternative structure. DPS Staff identifies six locations where guy wires at angle structures on the proposed 115 kV generator lead line are likely to have land use effects that warrant adoption of alternative structure designs.[393] DPS Staff's recommendations actually allow for either underground installations or, in many cases, an alternative consisting of steel poles rather than wood.

At the hearing, DPS Staff demonstrated that the Applicant's design document depiction of the relative location of the three-circuit collection facility is not accurate inasmuch as it attempts to represent the proposed offset of the collection facility poles from the edge or centerline of the public road. This calls into question whether the Project's design conforms with the requirements of the BHSF law easement. DPS Staff challenges the Applicant's planned use of multiple lines, arguing that the law allows only for a single collection line, not multiple lines. Similarly, DPS Staff notes that a

[392] Tr. 924-925 & 1001.

[393] Tr. 841.

third pole would need to be added to some of its dual pole structures at turning points including locations immediately adjoining the public roads, exacerbating the impacts of those facilities.[394]

The use of guy wires at certain locations potentially interferes with emergency access along existing utility rights-of-way, clearances from existing utility infrastructure and any associated facilities' protection systems. Additionally, construction of guyed facilities in freshwater wetlands requires significant additional site disturbance that would not attend to un-guyed structures. We are persuaded in part by the positions of both parties. We agree with Cassadaga Wind that the local laws do not apply here. However, even without the local law provisions, we are cognizant of the need to protect recreational land use, especially in State resources like BHSF. We think the Applicant should give due consideration to burying the lines where it is technically feasible and not cost prohibitive, but then use other alternative pole configurations that avoid the conspicuous placement of guy wires, in accordance with DPS Staff's recommended certificate condition 66. With that condition, we recommend the Board determine that the impacts to BHSF are minimized or avoided to the maximum extent practicable.

Other Cultural, Scenic and Historic Resources

The Project will impact viewsheds in and around the Project area, including changing the visual character of existing historical and cultural resources in the area. The Project's 115 kV generator lead line and appurtenant facilities will be visible from sites eligible for placement on the National Register of Historic Places. Noise and vibration may also impact historical resources. These potential impacts are

[394] Tr. 860-61; Hrg. Ex. 53 (ACD-2 & ACD-3).

identified in its application, particularly in Application Exhibits 4, 20 and 24 and Appendices AA, BB, CC, DD, EE and VV, all included in Hearing Exhibit 99.

Cassadaga Wind states that it consulted the New York State Office of Parks, Recreation, and Historic Preservation's (OPRHP) Guidelines for Wind Farm Development Cultural Resources Survey Work to develop the scope and methodology for its application studies. Cassadaga Wind conducted cultural resources studies including a Phase 1B archaeological survey. The Applicant submitted the survey results to OPRHP on April 21, 2016. The Phase 1B survey identified six prehistoric-period archaeological sites and 10 historic-period archaeological sites consisting of seven historic farmsteads, three prehistoric lithic scatters, two isolated prehistoric flakes, one isolated prehistoric tool, one historic debris scatter, one historic depression/possible foundation, and one historic rubble mound. The survey demonstrates the project will have no direct physical impacts on historic architectural resources.[395]

Because of the size of the turbines and the need to site them above the tree line to achieve maximum effectiveness, the Project will create visual impacts on other historic and scenic local resources. The Project will also impact active forest management, by requiring the cutting of existing trees in some locations. The Project's electric collection and transmission facility design configurations can impact public recreational activities, essential utility uses, and safe clearances at public roadways.[396]

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[395] Hrg. Ex. 99, Application Ex. 20 and App. EE.

[396] Tr. 790–92.

The Applicant filed its Cultural Resource Mitigation Plan (CRMP) on March 31, 2017.[397] The CRMP includes memoranda regarding impacts and minimization to archaeological sites and historic properties. The Applicant commits during construction and operation of the Project to avoiding any archaeological sites identified within the Project area. From review of the Applicant's commitment documents, we find them sufficient to recommend that the Board find that archeological impacts are avoided to the maximum extent practicable.[398] The Applicant notes that, although it is still waiting on federal input, it has included mitigation proposals in its CRMP and that it agrees to a certificate condition requiring Cassadaga Wind to submit a final cultural resources mitigation and offset plan after completing consultation under the National Historic Preservation Act §106 and with SHPO.

Cassadaga Wind indicates that minimization options for visual impacts on historic property are limited by the nature of wind farms as tall structures and by other siting criteria. Because minimization options are limited, SHPO has approved mitigation plans for operating wind farms consisting of off-set projects that provide benefits to the community's cultural resources. Consistent with SHPO's actions for other wind farms, Cassadaga Wind's CRMP proposes several off-set projects. No party has disputed any aspect of the Applicant's off-set proposals. We recommended the Board determine that certificate condition 49 in Appendix A minimizes and avoids the impacts to historic resources to the maximum extent practicable.

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[397] Hrg. Ex. 103, Updated Application Ex. 20.

[398] See Hrg. Ex. 99, Application Ex. 20; Hrg. Ex. 103.

Other Visual Impacts

With respect to other visual impacts, DPS Staff urges the Board to impose certificate conditions addressing the use of non-reflecting, glare-reducing conductors on overhead electric lines, decommissioning to remove visible Project elements and underground installation of collection lines through the Boutwell Hills State Forest.[399] The Applicant asserts that DPS Staff's recommended measures will create unnecessary cost increases. We do not agree, however, that a showing of cost increases alone, even substantial ones, necessarily indicates that proposed minimization is impracticable. Instead, such concerns must be properly balanced against the public interest in maintaining the character of the community as much as possible in light of the abrupt introduction to that community of numerous 500-foot-tall wind turbines and other associated collection and transmission facilities.

Here, we agree with DPS Staff that the Applicant's complaint of cost increases does not properly account for the potential adverse conditions that will affect visual enjoyment or, potentially, public safety. Some visual impacts are considered in more detail elsewhere, particularly the siting of facilities in BHSF and in decommissioning. DPS Staff requests the Board include a condition related to visual impacts including requiring the use of specular conductors to reduce glare. We agree and recommend to the Board the certificate condition proposed by DPS Staff included as condition 61 in Appendix A. With this condition in place, we recommend that the Board find that the impacts to cultural, historic, and scenic resources have been minimized or avoided to the maximum extent practicable.

[399] Tr. 1005-06.

Infrastructure Impacts

Transportation

During Project construction, there will be a temporary increase in truck traffic on area roadways. The Applicant's traffic analysis is included in Application Exhibit 31 of Hearing Exhibit 99. Cassadaga Wind will need to receive from Chautauqua County and the Towns of Charlotte, Cherry Creek, Arkwright, and Stockton highway work permits for work performed on Town roads or within the Towns' right-of-way, and special haul permits for oversized and overweight vehicles.

The Applicant's construction fleet will consist of conventional construction trucks, crane transporters, concrete trucks, and oversized semi-trailers. Installation of each wind turbine will require the use of approximately 11 oversize trucks. Local traffic will be subject to potential delays during delivery of components on oversized vehicles.

The Project will not have any impact on nearby airports or heliports. The Federal Aviation Administration issued to the Applicant Determinations of No Hazard to Air Navigation (DNH) for Cassadaga Wind's initial 62 turbine proposal. Given this action, we see no impact to commercial air traffic because we would not expect that the Applicant's revised proposal consisting proposed 48 turbines would change the FAA's prior determination. Likewise, the record contains no evidence of potential adverse impacts to recreational air traffic notwithstanding the height of the turbines.

Existing local area traffic volumes are relatively low, although the roads are, in places, narrow with limited shoulder area. However, the Applicant concludes that local traffic flow should not be significantly impacted by the normal construction traffic or during turbine delivery. This evidence is uncontroverted in the record.

Additionally, although the Applicant does not anticipate any damage to roads, any damage to local, County, or State roads caused by the construction and operation will be repaired at the Applicant's expense. The Applicant has committed to entering into Road Use Agreements with the local communities. Cassadaga Wind includes a Draft Road Use Agreement as Application Appendix XX in Hearing Exhibit 99.

Communications

The Project will not adversely impact any federal communications systems. Likewise, no Project-related impacts are expected to NEXRAD (next-generation radar), or to Doppler weather radar operated by the National Weather Service. To verify its analysis, Cassadaga Wind sent a written notification of the Project to the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce. Cassadaga Wind states that NTIA identified one potential area of concern, the Buffalo WSR-88D radar. Due to the distance and terrain drop-off from the radar, impacts to radar data should be low and confined to the Project area. NTIA has determined that no further minimization for radar impacts is needed.

The closest air traffic control tower is located in Cheektowaga, New York, at the Buffalo Niagara International Airport, approximately 47 miles north-northeast of the Project area. The nearest armed forces installation to the Project area is in Niagara County at the Niagara Falls Air Force Reserve, located approximately 54 miles north of the Project area. NTIA has not identified any concerns with air traffic control, global positioning satellite operations, or other federal communication systems.

Cassadaga Wind's communication analysis demonstrates that, although the Project will not have a major impact on

communications, it may create minor local interference with some off-air television station reception. Up to twelve licensed full-power off-air television stations and one Class C station may be impacted by reception disruptions. Off-air television stations broadcast signals from terrestrially-based facilities directly to television receivers. Off-air reception does not include cable or satellite television reception. Residents that experience degraded off-air television service from Project operation can file a formal complaint that Cassadaga Wind will address through its complaint resolution procedures.[400] Through the complaint resolution process, if the Applicant receives a complaint and determines that the Project has resulted in impacts to existing off-air television coverage, Cassadaga Wind will first investigate improving reception. The Applicant will provide cable television or direct broadcast satellite reception systems where reception cannot be improved. We have recommended the Board adopt the Applicant's proposed 59 as Appendix A certificate condition 60 to address any reception complaints.

Utilities

Cassadaga Wind's description of the proposed electric interconnection is contained in Application Exhibit 34 of Hearing Exhibit 99. The Project will interconnect to the State's transmission and distribution grid using multiple systems. Wind turbines produce power at a low voltage, which is then stepped up to a medium voltage at the output of each turbine. The 34.5 kV collection system transmits the power to a collection substation. The substation steps the voltage up to 115 kV for transmission to a National Grid point of interconnection station.

[400] Hrg. Ex. 99, Application Ex. 26.

The only potential issue related to impacts to utilities was raised by DPS Staff. The collection and transmission lines will run parallel to natural gas lines in certain portions of the system. DPS Staff notes that, under some circumstances, gas infrastructure might be damaged or otherwise adversely affected by lightning strikes or by a high fault current in the ground resulting from a fallen conductor.[401] DPS Staff recommends that the Applicant pay for a study, completed by a third party, in conjunction with National Fuel Gas Company (NFG) and any other gas utilities affected in the area of the Project, to determine how best to mitigate fault current and lightning strike events.[402]

Cassadaga Wind contends that DPS Staff's requirement of a third-party consultant to perform the study is unnecessary inasmuch as NFG has primary responsibility for its infrastructure and can best determine what actions need be taken to protect the pipes.[403] DPS Staff replies that NFG might lack adequate resources to conduct the study and so a third-party must be required, but has offered no evidentiary support for what appears to be mere speculation.

We believe that NFG is in the best position to assess the potential impacts to its infrastructure, and that it is in the best position to determine whether its resources are adequate or to resort to a third-party consultant. While DPS Staff's assertion that utility workers are already assigned to more traditional tasks makes sense, we regard the protection of its infrastructure relative to new construction projects as one of the gas utility's traditional tasks.

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401 Tr. 1075-76.

402 Tr. 1075-76.

403 Tr. 1010.

We are concerned about DPS Staff's contention that multiple gas line operators are located in the Project area other than NFG.[404] Should that prove to be the case, and should those operators not have the same resources as a utility the size of NFG, we could see a requirement that such a study be performed by a third party. As the record contains no identification of any other specific gas utility, we recommend a certificate condition that states that any such study may be performed by the utility, or by a third party qualified to perform such study pursuant to applicable corrosion control standards, to be determined by the utility in consultation with DPS Gas Safety staff and the Certificate Holder. Our recommended certificate condition is in Appendix A as condition 31.

Electric and Magnetic Fields

Cassadaga Wind's Electric and Magnetic Field (EMF) study is in Application Appendix GGG of Hearing Exhibit 99. The EMF study models the strength and locations of magnetic fields to be generated by Project operation. The Applicant's study concludes that the calculated field strengths are below any federal or State standard or guidelines both at maximum value and at the edge of the 100 foot right-of-way.

During discovery, DPS Staff identified an error in the EMF study, in that it modeled a National Grid 115kV generator lead line as a 66kV line. The Applicant submitted a revised study as Hearing Exhibit 15. Cassadaga Wind notes that the results of the study did not materially change after it made the correction. The Applicant's calculated EMF levels remain below the maximum levels discussed in New York state guidelines. The

[404] Tr. 1109-15.

record demonstrates that any Project produced EMF fields will not create impacts.

Interconnections

Cassadaga Wind submitted information as to the probable cumulative environmental impacts of the Project and any related facilities such as electric lines, gas lines, water supply lines, waste water or other sewage treatment facilities, communications and relay facilities, access roads, rail facilities, or steam lines. As a wind-powered electric generating facility, the Project will not include any wastewater or water supply needs beyond household-type usage. The only identified water service line or wastewater service line that may be used would be connected to the Project's Operations and Maintenance (O&M) building. Cassadaga Wind notes, however, that it is likely that O&M building supply needs will be addressed through an on-site water well and that its wastewater disposal needs will be addressed through an on-site septic system.

The Project will not have any telecommunication interconnections. The application describes the communication methods at the O&M building for transmitting information to the NYISO, the utility, and other parties. The Project will not have any communications equipment that poses any potential for adverse environmental impacts.

Additional Design Disputes

DPS Staff contends that lines on private property should comply with the National Electric Safety Code's (NESC) ground clearance requirements for the collector and transmission lines, alleging that it is common for larger than expected vehicles to travel underneath these lines.[405] Cassadaga Wind claims that its design is based on typical considerations such

[405] Tr. 1073-75.

as easement requirements and existing infrastructure below the lines.[406] The Applicant's position assumes that the areas below the lines would be utilized in a manner consistent with private use only. As DPS Staff notes, Cassadaga Wind has not accounted for potential use of the right-of-way by loggers, off-road vehicle enthusiasts, and tractor trailers as experienced at other line locations. In addition, the possibility that the land use may change during the operational life of the Project is a legitimate concern.[407]

We defer to DPS Staff's experience with lines over private property pursuant to easements. Given the experience of DPS Staff in monitoring activity at other utility rights-of-way, we agree that it is likely that people will use the Applicant's rights-of-way for other purposes. Accordingly, we recommend adopting DPS Staff's position that the Board require the Applicant to provide for ground clearance assuming that an active road is located underneath the line as contained in the DPS Staff proposed certificate condition 67. We have included it in Appendix A as condition 69.

DPS Staff also initially recommended two certificate conditions that provided for safe operation of the 115 kV lines up to 257 degrees Fahrenheit (°F). Cassadaga Wind responded in rebuttal testimony that such design was unnecessary and impractical given that the planned line would consist of "a typical conductor type of 11 overhead electric lines – Aluminum Conductor Steel Reinforced (ACSR). The materials comprising ACSR can become compromised or permanently damaged if operated above 212°F, which is the common and appropriate design

[406] Tr. 1007.

[407] Tr. 1074-75.

temperature for this conductor type."[408] Cassadaga Wind's assertion is unchallenged in the record.

In its post-hearing brief, DPS Staff referenced 257°F only once with no explanation or support for why it remained a necessary requirement given the Applicant's position.[409] In that same brief, Appendix C includes proposed certificate conditions 8 and 67 in which DPS Staff apparently adopts the Applicant's position and states 212°F. While it is unclear whether the mistake was made in the body or the appendix of the DPS Staff brief, on the record before us, we find the Applicant's position convincing and adopt it as consistent with DPS Staff's certificate condition language. Our recommended certificate conditions are included in Appendix A as conditions 8 and 64.

Environmental Justice - PSL §168(2)(d)&(3)(d)

Cassadaga Wind identified potential Environmental Justice Areas based on DEC's Geographic Information System (GIS) Tools for Environmental Justice website. The closest Environmental Justice community is approximately three miles from any turbine. No party raised an issue regarding the scope of the study area, the Project's proximity to Environmental Justice areas or any potential impacts on Environmental Justice communities.

The Applicant maintains that because the Project is not in close proximity to any recognized Environmental Justice area, and because the Project will not produce emissions or air quality impacts, it will not have a disproportionate impact on any Environmental Justice community. We agree that the record is complete and supports Cassadaga Wind's assertion as to no Environmental Justice impacts. Accordingly, we recommend that

[408] Tr. 1015, ll. 11-15.

[409] DPS Initial Post-Hearing Brief at 70-71.

the Board determine the Project will result in no adverse Environmental Justice community impacts; consequently, no mitigation is necessary.

State and Local Laws - PSL §168(3)(c)

Other than the disputes of interpretation for laws such as ECL Article 11 and the BHSF legislative easement, discussed above, no party has raised any issue in this case regarding the Applicant's compliance with State laws. The record demonstrates that Cassadaga Wind will construct and operate the Project consistent with the substantive State laws.

Pursuant to 16 NYCRR §1001.31(a), an Article 10 applicant must identify all procedural local legal requirements such as ordinances, laws, resolutions, regulations, standards, and other requirements, that would be applicable to the construction or operation of the proposed major electric generating facility. Article 10 preempts any procedural provisions so identified unless the Board expressly authorizes the enacting authority to exercise such requirement.

Under 16 NYCRR §1001.31(d), an Article 10 applicant must identify all substantive local legal requirements. Once such requirements are identified, the applicant must provide a statement to the Board that the proposed facility will comply with such substantive requirements, or make a request to the Board for a waiver. To demonstrate that a waiver is in the public interest, the requesting applicant must explain why the particular requirement is "unreasonably burdensome in view of the existing technology or the needs of or costs to ratepayers whether located inside or outside of such municipality." The regulations are clear that any Article 10 applicant requesting a

local law waiver bears the burden of justifying its waiver requests.[410]

Cassadaga Wind's application includes the required list of applicable procedural and substantive laws.[411] The Applicant has requested waivers of certain substantive requirements of some of those local laws.

Initially, the Applicant requested waivers as to certain elements of the Town of Cherry Creek local laws. DPS Staff testified against the waivers, opining that Cassadaga Wind submitted insufficient justification. DPS Staff identified certain substantive provisions that it determined should apply, including a prohibition on guy wires, a limitation on construction hours and a height restriction on wind turbines.

At hearings, Cassadaga Wind presented a Town of Cherry Creek resolution adopting Local Law No. 1 of 2017.[412] The Cherry Creek resolution amends its local laws applicable to Wind Energy Facilities. Those amendments specifically allow for the use of guy wires on electrical line and wind measurement towers, while continuing to prohibit their use on turbine towers. The amendments also increase the maximum allowable height of a turbine tower to 500 feet. Finally, the amendments extend the limit on construction hours for a wind energy facility to between 6:00 a.m. and 9:00 p.m., with an allowance for an extension to be provided by the Town Highway Superintendent for good cause.

A local law properly passed by resolution only becomes effective when it is filed with the New York Secretary of

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410 16 NYCRR §1001.31(e).

411 Hrg. Ex. 99, Application Ex. 31 & App. FFF; Hrg. Ex. 100, Attachment M; Hrg. Ex. 105; Hrg. Ex. 133, DPS IR 49.

412 Hrg. Ex. 121.

State.[413] We take administrative notice from the Department of State (DOS) legal records that Local Law No. 1 of 2017 was duly filed and accepted for filing by DOS as of August 31, 2017, and that certification by the Cherry Creek Clerk occurred on September 14, 2017. Given the foregoing, we determine that a waiver from the substantive provisions related to the use of guy wires, the applicable construction hours, or the maximum height for turbines in Cherry Creek is not needed because the Project does not conflict with those provisions.

The Applicant previously requested a waiver of certain local law sections of the Towns of Cherry Creek, Arkwright, and Charlotte, that required an application for the creation of a Wind Overlay District and a special use permit. After receiving clarification regarding the specifics of those district provisions, the Applicant determined that the permit and district creation provisions were procedural, and thus preempted by Article 10. The Applicant properly acknowledges that the substantive provisions within the special use permit provisions, however, remain applicable to the Project.

Cassadaga Wind states that the Project will comply, for the most part, with the substantive requirements contained in the local wind facility zoning laws. The Applicant requests waivers from the provisions of those laws that limit construction activity to between 7:00 a.m. and 8:00 p.m. in Arkwright and Charlotte.[414] DPS Staff opposes what it terms as a blanket request for waiver of the construction hours provisions and establishment of alternative standards in contravention of

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[413] N.Y. Mun. Home Rule §27(3).

[414] Although DPS Staff also briefs on a waiver request related to decommissioning provisions in the local laws, Cassadaga Wind indicates in its initial post-hearing brief and its reply that it has withdrawn the waiver request and will comply with those local law requirements.

the requirement that a request for a waiver be supported by a demonstration that the law is unreasonably burdensome. We agree with DPS Staff that the Board intended its standard of "unreasonably burdensome" to require more than a demonstration of inconvenience. Rather, we would expect a showing of some type of necessity.

The Towns of Charlotte and Arkwright both have passed resolutions specifying that they have waived the construction hours provisions. The Applicant maintains that this action eliminates any need for the Board to waive the provisions. The Applicant states that Arkwright's local laws specifically allow the Town Board to waive local law provisions, and so there is no question that the waiver is effective. For Charlotte, the town law states that a waiver may only be granted by the Zoning Board of Appeals, and as Article 10 preempts the procedural requirements that would bring the Project before the Zoning Board, the Board here should allow the waiver as, at the very least, an expressed desire of the local home ruling body.

In our opinion, these arguments would undermine the Article 10 process by allowing the local municipalities to preempt the Board's waiver authority. Unlike the laws of Cherry Creek, the substantive provisions of the law still exist, but the Towns are signaling that they do not wish to enforce those laws in this one situation. We see that Town action as providing useful information to the Board that the Towns consent to a waiver, but not as controlling the outcome of the Board's decision. To render the waiver provisions inapplicable, the Towns would need to change the law such that the substantive requirements no longer conflict and the Applicant can represent that it will be in compliance with the local laws.

The Applicant also contends that even if the Board does not view the Town's resolutions as eliminating the

substantive requirements, it has fully justified its waiver request under the Board's regulations. Cassadaga Wind alleges that the laws limiting construction hours are unreasonably burdensome in view of the existing technology associated with wind farm construction, including the construction capabilities, limitations and scheduling of work for wind turbine construction for the Facility.[415] The Applicant states that experience developing wind farms across the United States demonstrates that a facility similar in size to the Cassadaga Facility and location can be constructed in approximately 12-18 months, given the limitations associated with shorter construction seasons in this part of New York. Cassadaga Wind claims that increasing the available hours can allow for a reduced duration of construction, thereby minimizing potential construction related impacts to local residents. Additionally, the Applicant notes that the additional hours are necessary to ensure construction completion on schedule to meet critical contractual commitments.

Cassadaga Wind also argues that the increased construction hours allow for flexibility during construction. The Applicant maintains that weather and other factors affect turbine construction inasmuch as turbine construction has to occur during lower temperatures and low wind conditions, and these conditions are most often present in the evening hours. The Applicant states that high heat and high winds that can occur during the day make evening construction safer.

In our view, these arguments establish inconvenience to the Applicant, but not a complete demonstration on whether the local laws are unreasonably burdensome. We agree with DPS Staff that appropriate limitations can, and should, be placed on the requested waivers where warranted to preserve the community

[415] See Hrg. Ex. 99, Application Ex. 31; Hrg. Ex. 104.

character that relies on its local laws for its preservation. As DPS Staff notes, a Board waiver can be narrowly tailored to meet the Applicant's needs without completely eliminating the substantive requirements. Therefore, we recommend that Board grant a limited waiver extending the Towns' hours of construction to those stages and aspects of construction specifically identified by Cassadaga Wind. To satisfy this purpose, we recommend certificate condition 129 in Appendix A, adopting language proposed by DPS Staff. Condition 129 allows a waiver of the construction hours in the two Towns for wind turbine construction activities that may be affected by high wind conditions, and only on an as-needed basis.[416] The condition seeks to minimize the impact of the waiver by enforcing the restrictions on other construction work activities including delivery and unloading of materials, and maintenance and repairs of construction equipment at outdoor locations, as such activities can result in extensive noise, large vehicles idling for extended periods at roadside locations, and other potential community disturbances.[417] With the exception of the two Town laws about construction hours, which we agree should be waived in the limited fashion discussed here, we recommend the Board find that Cassadaga Wind will comply with all other local law substantive provisions.

Additional Certificate Conditions

Cassadaga Wind has proposed a certificate condition that purports to require notice to certain persons and the general public of pending construction activities.[418] Although DPS Staff agrees with the need for such a condition, it does not

[416] See Tr. 829-30.

[417] See Tr. 830.

[418] Hrg. Ex. 51 at 14.

agree that the language proposed is adequate. DPS Staff is concerned that the Applicant's definition of "construction activities" is too narrow. If the language is ambiguous regarding what constitutes construction activities, DPS Staff notes that the parties will not receive notice in some circumstances where the Applicant believes that the work being done does not constitute activities for which notice is required. The potential for confusion is compounded because the notice can trigger the applicability of controls, environmental requirements, restrictions, and limitations contained in other proposed certificate conditions. DPS Staff also states that the expectations of other agencies and parties to this proceeding will be undermined by the simplified definition proposed by the Applicant. To illustrate its point, DPS Staff points to the transcript where the Applicant attempted to distinguish tree clearing activities as not being "construction of the Facility" included in the proposed certificate condition.[419]

In its post-hearing brief, DPS Staff clearly makes its point by way of example. DPS Staff states that "the distinction between minor vegetation cutting to establish a survey line-of-sight through a wooded stand, or to enable access by a portable geo-technical drilling rig to do preliminary testing for determining foundation design, and wholesale site clear-cutting to develop access roads, turbine sites, or a right-of-way for a major transmission line needs to be established."[420] We agree, as does Cassadaga Wind in its reply brief where it offers language to clarify that particular point.[421] DPS Staff provided its own proposed certificate condition 13. We have reviewed the

[419] See Tr. 1372-76.

[420] DPS Initial Post-Hearing Brief at 102.

[421] Cassadaga Wind LLC Reply Brief at 50-51.

language there and recommend its adoption by the Board. We have included it in Appendix A as our recommended condition 13.

DPS Staff also has proposed certificate condition 28, which would require Cassadaga Wind to provide all manufacturer documentation of machine characteristics for installed equipment at the Project. Cassadaga Wind objects that DPS Staff's phrasing is vague and that "machine characteristics" is an undefined term with no professional or industry established definition. In its brief, DPS Staff characterizes the Applicant's opposition as against a condition that would require the Applicant to provide manufacturer's design, safety, and testing information regarding the specific generating and related equipment to be installed, either as initially installed or in any future replacement of potentially failed or outdated equipment. That language, however, is not used in DPS Staff's proposed condition. We understand the Applicant's concern regarding vagueness and, therefore, recommend a certificate condition that eliminates the term "machine characteristics" and instead incorporates the clearer statement in the DPS Staff brief. We have taken that specific language and incorporated it into our recommended certificate condition 27 in Appendix A.

Cassadaga Wind states that, in some instances of construction activities, it might need flexibility for an informal consultation with DPS field staff to make quick changes. The Applicant maintains that without this authority, it will have to resort to a cumbersome formal process of filing with the Secretary a change request that will cause undue delay and lengthen the duration of the construction-related impacts on the community.

DPS Staff takes issue with the Applicant's proposed language in certificate condition 42, arguing that it improperly seeks to delegate authority to DPS field staff to allow changes

in construction techniques for underground electric collection facilities. DPS Staff contends that such delegation does not conform to the regulatory compliance filing change provisions in 16 NYCRR §1002.2(j). DPS Staff states that it has plans to use information gathered from the formal filing process to identify installation methods and appropriate controls for eventual publication and codification in a standards and practices document.[422]

Cassadaga Wind contends that it does not intend to use the authority in condition 42 in an unreasonable manner, but that the language is intended to address a situation where construction uncovers an unexpected condition affecting underground installation of collection lines. The Applicant provides as an example the situation where horizontal directional drilling for a certain location on the map is planned, but, at the time of construction, it is determined that a different alternative method is necessary. The Applicant notes that all alternative methods so used will be included in its compliance filing made after the change, providing DPS with the information it seeks to collect. Cassadaga Wind maintains that the flexibility is necessary because underground conditions are largely an unknown and sometimes contain different subsurface conditions than anticipated, such as unidentified rock. We agree with the Applicant that field correction should not be subject to a formal filing with the Secretary for such a situation. However, we recommend that the flexibility not eliminate DPS Staff's desire to collect data, such that the condition should require that any changes made in the field in consultation with the environmental monitor and DPS field staff be documented as they occur and that the information be filed

[422] See Hrg. Ex. 52, SPP-4.

with the Secretary within 48 hours. Our recommended certificate condition is in Appendix A, condition 43.

Decommissioning and Restoration - 16 NYCRR §1001.29

Cassadaga Wind's decommissioning and site restoration plan was included in Application Exhibit 29, Hearing Exhibit 99. Cassadaga Wind commits in Application Exhibit 29 that, in decommissioning the Facility, it will remove all above-ground structures, including the turbines, blades, nacelles, towers, transformers, collection cables and poles, permanent meteorological towers, and the collection substation.[423] Although the Applicant's plan sets forth its proposals for scheduling of decommissioning and restoration activities and a general method for funding them, Cassadaga Wind did not provide any estimates for decommissioning costs at the time of the application. Instead, Application Exhibit 29 stated that Cassadaga Wind would provide an initial decommissioning estimate prior to Facility construction, with a second estimate after one year of operation, and subsequent estimates every fifth year thereafter.[424]

DPS Staff attempted to get specific cost information prior to the hearing through its information request DPS-45 to the Applicant. In that request DPS Staff asked for the Applicant's calculation and support for a per turbine decommissioning estimate based on all the different wind turbine models that Cassadaga Wind had identified as potential candidates for the Project.

Cassadaga Wind's initial response to DPS-45 was provided on April 12, 2017. The Applicant responded that cost estimates for turbine models that may not be chosen for the

[423] Hrg. Ex. 99, Application Ex. 29 at 1.

[424] Hrg. Ex. 99, Application Ex. 29 at 2.

Project would not yield relevant data and would be costly to produce. Rather than providing DPS Staff with the requested specific information, Cassadaga Wind provided amounts for anticipated decommissioning and site restoration based upon an unnamed "similar project" estimate. Cassadaga Wind estimated that removal and restoration would cost approximately $90,000 per turbine. Cassadaga Wind also stated that its estimate did not include salvage value and was highly variable depending on topography, depth of removal, the number of turbines, and the turbine model ultimately selected.[425]

Thereafter, the Joint Towns hired GHD, a licensed professional engineering firm, to calculate a decommissioning cost estimate. GHD estimates a per turbine decommissioning cost of approximately $98,000 and a per linear foot cost for access road restoration of decommissioning $25.[426] In summary, GHD estimates a total decommissioning cost of $8 million. GHD also estimates a salvage value based on current commodity prices, mostly for steel and copper components, of $7,800,000.[427] In GHD's calculations, the net decommissioning costs after accounting for scrap total approximately $194,000, or $4,000 per turbine.[428] The Applicant provided DPS Staff with the GHD estimate by supplementing its response to DPS-45, adopting the amounts therein as its own.

DPS Staff and, to a certain extent, Concerned Citizens, have challenged Cassadaga Wind's plans as inadequate. DPS Staff takes issue with the Applicant's estimate of costs as not sufficiently representative or tied to Project specifics.

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[425] Hrg. Ex. 133, Response to IR DPS-45.

[426] Hrg. Ex. 133, Supplemental Response to IR DPS-45.

[427] GHD notes that its salvage value is based solely on scrap prices and weights of a representative turbine. Id.

[428] Hrg. Ex. 133, Supplemental Response to IR DPS-45.

DPS Staff submits that the total cost for site restoration and decommissioning should be set at a minimum of $16 million and argues that the Board should not allow any offsets for salvage.[429] DPS Staff notes that the GHD estimate is flawed in that GHD does not necessarily use the actual turbine model Cassadaga Wind will employ as it has not yet been selected. To account for its concerns, DPS Staff took Cassadaga Wind's initial $90,000 per turbine estimate and multiplied it by the number of proposed turbines to arrive at a figure of $8 million, and then doubled the amount as a 100 percent contingency factor to reach a total estimate of $16 million.[430]

DPS Staff also does not agree with the Applicant's reliance on salvage and resale values for funding site restoration and decommissioning of the Project. DPS Staff counters that allowing for salvage credits does not provide adequate assurance if problems later arise regarding the Applicant's ability to maximize salvage and resale value.[431] DPS Staff contends that in such an instance, the local communities would be left with the problem of abandoned infrastructure. DPS Staff also states that crediting salvage and resale under-finances decommissioning if initial construction of the Project is stopped due to unforeseen circumstances prior to commercial operation.[432] Moreover, despite having received GHD's estimate through Cassadaga Wind's supplemental response to DPS-45, DPS Staff did not change its position on requiring $16 million with no offset for salvage as a minimum acceptable amount for the

[429] Tr. 1093.

[430] Tr. 1093-95.

[431] Tr. 1127.

[432] Tr. 1093.

decommissioning costs it seeks to secure through a letter of credit.

To support its rejection of any offset for salvage, DPS Staff relies on its cross-examination of Cassadaga Wind where it conceded that salvage and resale values are not guaranteed to remain fixed for the life of the Project.[433] DPS Staff asserts that, the amount Cassadaga Wind proposes to post as financial assurance for decommissioning, should it be based on an offset for salvage, could be significantly less than actual costs that will be incurred. DPS Staff expresses the concern that if salvage cannot cover the anticipated offset amount, then the Towns will be left with unsightly infrastructure that it will have to remove at its own expense.

As it stated at the hearing, Cassadaga Wind does not disagree that fluctuating values can affect decommissioning funding. The Applicant notes that it proposed reevaluating the amount set aside for decommissioning periodically to determine if any adjustments were necessary, in part because of the potential fluctuation of salvage and resale value. Cassadaga Wind argues that DPS Staff's broad rejection of any salvage offset is inconsistent with the Board's regulations, which recognize salvage value in a site restoration and decommissioning plan.[434]

The Applicant also protests DPS Staff's 100 percent contingency addition to the estimated decommissioning costs as arbitrary and having no factual or evidentiary foundation. Cassadaga Wind argues that the 100 percent contingency is not based upon any sound engineering standards and is an unprecedented requirement in the wind industry or, to its

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[433] Tr. 1128-29.

[434] See 16 NYCRR § 1001.29(a)(4).

knowledge, any construction industry.[435] Finally, the Applicant notes that DPS Staff's recommendation rejects a decommissioning estimate prepared by a qualified and independent engineer hired by the Towns, the entities DPS Staff claims to be protecting.

We are concerned with DPS Staff's complete rejection of salvage and resale value as a legitimate revenue source to offset decommissioning costs. The idea that salvage and resale values can fluctuate over time is not novel, but that fact did not prevent the Board from including reference to such value in its decommissioning plan regulations. Effective and more reasonable measures can be employed to account for such fluctuation, such as reevaluating the estimate and reserve on a regular basis. The timing of reevaluation can be tightened from Cassadaga Wind's five-year proposal, if necessary. Moreover, nothing in the regulations requires that the amount posted for decommissioning costs need consider 100 percent of the calculated salvage or scrap value. We do agree with the implication of DPS Staff's testimony that when faced with potential decommissioning costs of $8 million, even a letter of credit securing slightly less than $200,000 appears inadequate, and does not account for the time and process involved in securing recovery of the salvage or resale income. On balance, however, we remain concerned that DPS Staff's complete discounting of salvage is not supported by the regulations.

In addition, DPS Staff's minimum decommissioning estimate of $16 million ignores an independent estimate prepared on behalf of the local entities that will have to bear the burden of inadequacy. We believe that the independent estimate deserves more consideration. Additionally, we are troubled by the lack of record basis for the selection of 100 percent as the

[435] Tr. 940-41.

applied contingency factor. The record contains no reason for why 100 percent is more reasonable than 50 percent or, for that matter, 200 percent. Cassadaga Wind contends that a 100 percent contingency factor is unprecedented in the wind farm industry or construction projects in general. In contrast, DPS Staff stated that it selected 100 percent not because it necessarily believed 100 percent was the correct amount, but because it believed there were a lot of uncertainties in estimating the costs that were yet to be defined and that it was unclear as to how decommissioning would take place.[436]

DPS Staff explains that its reference to "uncertainties" mostly stem from the lack of selection of a final turbine model, and possibly other facility components.[437] In addition, we recognize that DPS Staff also was faced with the potential that some less reliable guarantee of decommissioning funding might be allowed than its proposed letter of credit arrangement, as discussed below. We agree with DPS Staff that some contingency factor is appropriate, but the amount of the contingency should be supported by an appropriate rationale. Accordingly, we recommend that the Board require Cassadaga Wind to provide a more accurate estimate, in consultation with DPS, once the final Project components are identified, as the Applicant has promised to provide in its multiple responses to DPS Staff's discovery requests. Additionally, we invite the parties on exceptions to provide the Board with appropriate citations or references to the use of contingency factors on decommissioning estimates.

Having considered the amount of reserve, we turn to the dispute regarding the instrument to secure the required

[436] Tr. 1130-31.

[437] Tr. 1131-32.

funding. Cassadaga Wind's application states that decommissioning and restoration "[f]inancial assurance may be in the form of a letter of credit, a bond, escrow account, a parent guarantee or other forms as agreed to by the Towns and DPS Staff."[438] DPS Staff recommends that financial assurance be provided as letters of credit in the full estimated amount to be held by the Towns of Arkwright, Cherry Creek, and Charlotte.

DPS Staff contends that other forms of financial assurance are less secure or present access barriers when needed quickly.[439] DPS Staff states that letters of credit are its preferred financial instrument to ensure that funds will be available should the Applicant default on its decommissioning or site restoration obligations, in that they provide ease and certainty that the holder can recover the funds from the bank holding the credit letters.[440] The ease of access to a letter of credit is favorably contrasted with performance bonds and other forms of financial assurance that can often be tied up in protracted litigation, because the bond holder has the right to challenge the calling of the bond.

Cassadaga Wind opposes a letter of credit arrangement as too costly. The Applicant argues that a bond or parental guarantee is adequate to provide assurance to the Towns.[441] Cassadaga Wind maintains that letters of credit require 100 percent collateralization in comparison to 50 percent collateralization for a performance bond.[442] Cassadaga Wind also

[438] Hrg. Ex. 99, Application App. EEE at 8.

[439] Tr. 1093-97.

[440] Tr. 1130, 1139.

[441] Tr. 944.

[442] Tr. 1156.

states that the Towns have indicated their willingness to accept a bond.

Even assuming the Applicant's representations are correct, the relative collateralization levels support DPS Staff's position that a letter of credit is a more secure financial instrument for the beneficiary than is a bond. We note that by the Applicant's own proposal, DPS's agreement to the financial instrument is essential.[443] Moreover, we agree that the Applicant's collateralization argument lends significant credence to DPS Staff's concern regarding the effectiveness of a bond.

The Board has required a letter of credit or standby trust in other Article X Certificates to fund site restoration and decommissioning.[444] Similarly, the PSC has indicated a preference for letters of credit to secure financial assurances.[445] We recommend that the Board require, after an appropriate decommissioning estimate is prepared in consultation with DPS, security in the form of letters of credit in the full estimated amount less a reasonable offset for salvage, also to be arrived at in consultation with DPS. The letters of credit should be held during the existence of the Project facilities by the Towns of Arkwright, Cherry Creek, and Charlotte. Our

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443 See Hrg. Ex. 99, Application App. EEE at 8.

444 See 97-F-1563, Athens Generating Company, L.P. – Application for Article X Certificate, Opinion and Order Granting Certificate of Environmental Compatibility and Public Need (issued June 15, 2000).

445 See Case 99-F-1625, Application by KeySpan Energy for a Certificate of Environmental Compatibility and Public Need, Opinion and Order Granting Certificate of Environmental Compatibility and Public Need (issued September 7, 2001); Case 17-C-0050, Joint Petition of FairPoint Communications, Inc., et al. for Approval of Proposed Transactions, Order Approving Joint Petition Subject to Conditions (issued June 15, 2017).

recommendation for a certificate condition is contained in Appendix A, condition 23.

Public Interest Review - PSL §168(3)(b)

Under PSL §168(3)(b), the Board must make an affirmative determination that construction and operation of the Project will serve the public interest. The Board's other PSL §168(3) determinations are helpful in informing the public interest standard. We have discussed our recommendations for Board determinations that the Project, pursuant to PSL §168(3)(a), is a beneficial addition to the electric generation capacity of the State and that, pursuant to PSL §168(3)(d), it does not present any environmental justice concerns that must be mitigated. We have also recommended that the Board, after the adoption of certain certificate conditions, determine both that, pursuant to PSL §168(3)(c), the potential adverse environmental impact findings required by PSL §168(2) have been minimized or avoided to the maximum extent practicable, and that, pursuant to PSL §168(3)(e), the Project is designed to operate in compliance with the applicable State and local laws.

Cassadaga Wind maintains that the record demonstrates that the Project is in the public interest. The Applicant cites PSL §66-c to demonstrate the Legislature's clear policy declaration to encourage the development of alternate energy production facilities to pursue energy conservation and environmental protection goals. Based on such policy, Cassadaga Wind contends that the Project is in the public interest in that it provides public health, environmental, and socioeconomic benefits.[446] The record contains evidence that, as a competitive renewable energy generator, the Project serves the public

[446] See CES Order at 3-13; State Energy Plan at 70-72, 111-13; Hrg. Ex. 99, Application Ex. 10 at 1-3, 7, 11; Hrg. Ex. 104 at 13-15).

interest and furthers New York's policy goals.[447] No party to the proceeding has contested Cassadaga Wind's assertions in any significant manner.[448]

Cassadaga Wind provides a comprehensive overview of the Project in the context of important regional, national, and global issues such as climate change and air quality.[449] The Applicant asserts that because the Project contributes to regional greenhouse gas emissions reduction goals, it is in the public interest.[450]

Cassadaga Wind maintains that the Project will contribute to the Regional Greenhouse Gas Initiative (RGGI) emissions reduction targets.[451] Cassadaga Wind, citing the New York State Climate Action Council's "Climate Action Plan Interim Report" of November 9, 2010 (Climate Action Plan), claims that to assist the transportation and building sectors to reach their carbon reduction goals, New York will need to install greater amounts of low-carbon electricity generation to meet the expected demand for electricity to power electric vehicles and

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447 Tr. 1418-20; Hrg. Ex. 99, Application Exs. 10 & 27; Hrg. Ex. 104 at 13-20.

448 Concerned Citizens has questioned the need for the facility, but it has not directly asserted that the Project is not in the public interest.

449 Hrg. Ex. 99, Application Exs. 2, 10 & 17; Hrg. Ex. 104 at 13-20.

450 Tr. 1420; see Hrg. Ex. 99, Application Exs. 2, 10 & 17; Hrg. Ex. 104 at 13-20; CES Order at 2-7, 9-11, 13, 110-11.

451 Tr. 1420; see Hrg. Ex. 99, Application Exs. 10 at 1, 3, 9-10 & 17 at 1; Hrg. Ex. 104 at 17-20. See www.rggi.org for general information regarding the Regional Greenhouse Gas Initiative and how it works. See also https://www.rggi.org/design/overview/cap for specific information on the CO2 emissions caps adopted for the program.

other similar technologies.[452] The Applicant points to the Climate Action Plan's conclusion that the primary method for achieving emissions reductions is to substantially increase renewable generation.[453] The Applicant also cites the CES Order, stating that CES seeks to promote and incentivize renewable generation in a manner "untethered to a generator's wholesale market participation."[454]

Because the Project will operate without generating any direct greenhouse gas emissions, it will help New York achieve the SEP's goal of reducing greenhouse gas emissions 40% by 2030, and the RGGI's regional emissions goals.[455] Unlike fossil fuel based generators, the Project will help protect New York's natural resources, especially the State's air and water resources, by avoiding the use of resources that would otherwise be used or damaged in the extraction, processing, transportation, and burning of fossil fuels, and by reducing effects like acid rain.[456]

In addition to the environmental benefits, the Project advances New York's environmental justice policy goals by avoiding disproportionate impacts on environmental justice communities. The Project will also reduce the need for power produced by fossil fuel burning generators located in

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[452] See Climate Action Plan at 8-9 (stating "over the next 40 years, New York will need to replace most of the existing fossil fuel-fired sources of electricity – coal, gas and oil-fired power plants – with low-carbon sources of power").

[453] Climate Action Plan at 8-10.

[454] CES Order at 69.

[455] Hrg. Ex. 99, Application Exs. 2 & 10.

[456] See Hrg. Ex. 104 at 13-15; see also Hrg. Ex. 99, Application Exs. 2 & 10; Hrg. Ex. 104 at 17-20.

environmental justice communities.[457] The Applicant cites the SEP to observe that fossil fuel-fired energy power generation facilities have often been located in environmental justice communities that have borne a disproportionate share of the environmental impacts.[458] Cassadaga Wind states that given the foregoing, environmental justice benefits are associated with transitioning away from fossil fuel generation to cleaner, renewable sources.[459] Renewable energy development, such as the Project, can advance environmental justice by displacing major sources of air pollution that are frequently concentrated in environmental justice communities.

The Project will also bring at least some modest economic benefits to the local community. A guiding principle of the past decade's State energy policies, and of the 2015 SEP, is to increase private investment in New York's clean energy economy. The development of renewable energy generation in New York will create direct and indirect socioeconomic benefits, including new jobs and business opportunities. This is also true of the Cassadaga Wind Project.[460] Cassadaga Wind's application materials detail the influx of monetary payments to the local citizens through rents and other arrangements, as well as to the host Towns, mostly in the form of payments-in-lieu-of-taxes (PILOTs).[461]

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[457] See Hrg. Ex. 99, Application Exs. 10 & 17; Hrg. Ex. 104 at 18.

[458] See The Energy to Lead Volume 2, Impacts and Considerations of 2015 New York State Energy Plan at 97-126.

[459] See The Energy to Lead: 2015 New York State Energy Plan Volume 1 at 39.

[460] See Hrg. Ex. 99, Application Exs. 10 & 27, Application App. DDD; Hrg. Ex. 104 at 13-20.

[461] See Hrg. Ex. 99, Application Ex. 2 at 13-14, Application Ex. 27, Application App. DDD; Hrg. Ex. 104 at 13-15.

Based on our review of the record, we recommend that the Board find that the Project is in the public interest. The evidence shows that the Project is consistent with the State Energy Plan and other State energy policy goals and initiatives, will, at the very least, not impact environmental justice communities, and will have some economic benefit. Although we are aware of the concerns expressed by local residents opposed to the Project, and especially those involved with Concerned Citizens, when we balance the demonstrated benefits and recognize that the area is particularly suited to wind generation, we recommend that the Board issue an Article 10 certificate to Cassadaga Wind as included in Appendix A.

CONCLUSION

Based on the extensive record in this proceeding, we recommend that the Board issue a certificate authorizing Cassadaga Wind to proceed with the Project. To ensure that the Project's impacts, identified in this RD, are minimized and avoided to the maximum extent practicable, the Board should adopt the recommended certificate conditions in Appendix A.

CONCURRENCE

P. NICHOLAS GARLICK, Associate Examiner:

My conclusions and recommendations are fully incorporated in the recommended decision, except that I offer the following additional comments.

As noted in the Recommended Decision (RD), this case is the first proposed project to be reviewed by the Board since Article 10 was enacted in August 2011. The process in this case raises questions that, if addressed now, may allow future cases to be adjudicated and decided more efficiently. While I concur in all aspects of the RD in this matter prepared by Presiding Examiner Lecakes, this concurrence brings to the attention of the permanent members of the Board certain procedural questions.

The first question relates to when and how the staffs of the State agency parties should identify issues for adjudication. As noted in the RD, a procedural conference was held on January 10, 2017. The November 30, 2016 notice stated that one of the purposes of this conference was to identify issues for adjudication. The examiners were expecting to conduct an issues conference, as set forth in 16 NYCRR 1000.12. However, at the issues conference the state agency parties were either not present or not prepared to discuss proposed issues. Thereafter, the examiners issued two rulings that established a schedule requiring the filing of written issues statements by the parties, a subsequent response by the Applicant, and an issues ruling.

Each of the State agency parties timely filed issues statements in the third week of February 2017. In its response, the Applicant argued that DPS Staff, DAM Staff, and DOH Staff failed to adequately specify issues and explain why litigation of these issues was necessary to develop the record. As a

result, the Applicant argued that it did not have enough detail to substantively respond or prepare an appropriate response. The Applicant also asserted that the failure to identify issues at this point in the process could lead to needless hearings on matters not in dispute and requested that a technical conference be scheduled to attempt to narrow outstanding issues.

In our March 20, 2017 issues ruling, we expressed concerns that, although the parties had been given additional time following the issues conference to negotiate with the intent to narrow the issues in dispute, little progress had been made. Given the circumstances of the case, we advanced most of the issues to adjudication and scheduled a technical conference for April 6, 2017 to discuss those issues. Following a conference call on April 3, 2017, the technical conference was cancelled at the request of the State agency parties because they argued that the conference would be disruptive to ongoing discovery and the preparation of testimony. DPS Staff counsel suggested that the conference might be rescheduled for later in the process, after direct testimony was filed. Another rationale offered for the cancellation of the conference was the need to fully develop the record for the Board's action and that conducting discussions with other parties to narrow issues would interfere with this goal. The technical conference was not rescheduled and the first time the Applicant, the other parties, and the examiners were made aware of the exact concerns of various State agencies was in the direct testimony filed in the second week of May 2017.

The first question I wish to present to the Board for consideration is when and how should State agency parties be required to propose specific issues for adjudication. I suggest that specific issues be identified earlier in the process than occurred in this case.

The second, related question is when and under what circumstances may a State agency party, or any other party, engage in settlement discussions with an applicant and other parties. This question arises in two forms in this case: DPS Staff's refusal to enter into settlement discussions with the Applicant; and a dispute between DPS Staff and DEC Staff regarding discussions DEC Staff engaged in with the Applicant.

In its brief, the Applicant states that all requests made to DPS Staff to enter into settlement discussions were summarily dismissed. The Applicant claims that DPS Staff's posture eliminated the opportunity for the parties to narrow issues and clarify the scope of issues actually in dispute, leading to lengthy evidentiary hearings, extensive briefing, and a more time-consuming, expensive siting process. It is my impression that DPS Staff's refusal to work to refine issues, engage in a dialogue to reduce misunderstandings, and attempt to settle outstanding issues, unnecessarily increased the number of days spent adjudicating the case. One result was that Concerned Citizens was forced to use its limited resources to pay its attorney to attend these extra days of hearings. This may have limited its expenditures on other matters, such as consultation with experts and briefing the case. It certainly added to the strain on Concerned Citizen's resources as shown by its pending motion for additional funds.

DPS Staff's refusal to negotiate under Article 10 is apparently at odds with its approach under Article X. I served as associate examiner on several Article X cases that were settled completely as a result of negotiations among the parties, eliminating the need for the adjudication of any issue.

Unlike DPS Staff, DEC Staff did meet with the Applicant, after the filing of direct testimony, to discuss revisions to proposed certificate conditions regarding wetlands,

streams, and invasive species in order to narrow the scope and time necessary for cross-examination at the evidentiary hearing (t. 15-16). When the revised, agreed-to stipulations were offered into the record as Hearing Exhibit 97, DPS Staff objected, arguing that the discussions between DEC Staff and the Applicant were tantamount to settlement, had not been properly noticed, and were undertaken without DPS Staff's knowledge. DPS Staff argued that Article 10 envisions a full and open process, and asserted that this partial settlement was improper (t. 17-18). The Applicant responded that its negotiations were consistent with guidance provided by the examiners, and that the Applicant had hoped to have similar discussions with DPS Staff to narrow and resolve issues, but that these discussions had not occurred (t. 18-19).

DEC Staff took the position that the purpose of the negotiations was to narrow the scope of cross-examination and that the proposed revised certificate conditions achieved DEC's aims, thus avoiding redundant and unnecessary testimony. DEC Staff concluded that the issues addressed in these conditions would still be subject to litigation, and that no party would be precluded from raising issues in post-hearing briefs (t. 20-21). The examiners reserved ruling on DPS Staff's objection (t. 19-20) and admitted Hearing Exhibit 97 into the record later that day (t. 375).

In its brief, DPS Staff again raises the issue and states that settlement discussions should be avoided in future Article 10 proceedings in keeping with the intent of the statute to provide for full and fair public participation. Further, DPS Staff contends that all conferences and meetings scheduled for the specific purpose of negotiating or settling issues must be on notice to all parties. To support this position, DPS Staff cites guidelines adopted by the Public Service Commission in

1992[462] and 16 NYCRR §3.9, the PSC's regulations regarding settlement procedures. In doing so, DPS Staff adopted the position that any discussions involving substantive issues were in the nature of settlement and, therefore, prohibited without providing notice to all parties.[463] The Applicant argues that the PSC's guidelines apply to rate-making cases for utilities and may not be applicable in this Article 10 siting case.

My understanding of DPS Staff's objection is that to the extent some wetland, stream, or invasive species certificate condition language was discussed and refined, such discussions were only "improper" to the extent that the parties did not file formal notice with the Secretary pursuant to 16 NYCRR §3.9(a)(1). However, this regulation allows for exploratory discussions without notice to determine the limits of another party's positions, and whether there is any room for settlement.[464] Moreover, nothing prevents parties from having

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[462] See, Cases 90-M-0255 and 92-M-0138, Settlement Procedures and Guidelines, Opinion, Order and Resolution Adopting Settlement Procedures and Guidelines (issued March 24, 1992), p. 13; (16 NYCRR §3.9).

[463] In fact, DPS Staff's position in this regard was so encompassing that it stated on a prehearing conference call its concern that on cross-examination, its witnesses might be asked whether they had reviewed the modifications the Applicant made to its proposal in the rebuttal case and whether the witnesses agreed that such changes were acceptable. DPS Staff opined that cross-examination of this sort would be an improper exploration of settlement. The presiding examiner disagreed that such questions would be improper in an evidentiary hearing or that they would be in the nature of settlement discussions, noting that the parties had a right to test whether positions raised in initial testimony were still relevant given new information that had been supplied in the rebuttal. At hearing, DPS Staff did not, to my recollection, raise this particular objection to any questions asked by Applicant.

[464] See Opinion 92-2 at 14.

technical discussions on the issues raised to determine the points of contention. Indeed, such discussions are actually encouraged by the Public Service Commission in 16 NYCRR §5.2.[465]

As I understand it, DEC Staff's discussions were consistent with past practices under Article X and current practices in DEC permit proceedings. I believe these discussions were helpful in resolving some issues and defining others which could not be settled. These discussions did not preclude other parties from contesting aspects of the agreements or from initiating their own discussions.

In light of this disagreement between DPS Staff and DEC Staff regarding if and under what circumstances substantive discussions may occur in an Article 10 proceeding, I respectfully request that the Board consider providing guidance on the issue.

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[465] 16 NYCRR §5.2, Informal Discovery, states that
(a) Parties are encouraged to communicate and exchange information informally, including by telephone or by meeting, and to use the formal procedures provided for below only as necessary.
(b) Material or information provided by one party to another through informal discovery need not, for that reason alone, be made available to third parties. Nevertheless, no party may refer to, introduce into evidence, or otherwise use at a hearing, except in its prefiled written testimony or in response to cross-examination, any information obtained through informal discovery unless that party first shows that all other active parties received or had a reasonable opportunity to receive that response reasonably in advance of the hearing at which such use is proposed.

APPENDIX A

RECOMMENDED CERTIFICATE CONDITIONS

Appendix A

Recommended Certificate Conditions

I. Project Authorization

1. The Certificate Holder is authorized to construct and operate the Facility (or the Project), as described in the Application by Cassadaga Wind LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article 10 of the New York State Public Service Law (PSL) (the Application) and clarified by the Certificate Holder's supplemental filings, updates and replies to discovery data requests, additional exhibits, and the Siting Board's Order Granting Certificate.

2. The Certificate Holder is responsible for obtaining all necessary permits and any other approvals (including those pursuant to PSL §§68, 69 and 70), land easements, and rights-of-way that may be required for this Facility and which the New York State Board on Electric Generation Siting and the Environment (Siting Board) is not empowered to provide.

3. Facility construction is authorized for up to 48 wind turbines in the Towns of Cherry Creek, Charlotte and Arkwright, access roads, above and underground 34.5 kilovolt (kV) collection lines, an above-ground 115kV generator lead line, collection and point-of-interconnect (POI) substations, two permanent meteorological towers, one operations and maintenance (O&M) building, and two temporary staging/laydown areas. The POI substation and a small portion of the 115kV generator lead line are located in the Town of Stockton. The total generating capacity of the Facility shall not exceed 126 megawatts (MWs).

4. The Certificate Holder is authorized to construct electric transmission facilities and interconnect those facilities to the existing Dunkirk-Moon station, owned by Niagara Mohawk Power Corporation, d/b/a National Grid, in the Town of Stockton.

II. General Conditions

5. Prior to the commencement of construction of the Facility, as defined in condition 13, the Certificate Holder shall file a request/application for a Water Quality Certification with the Secretary to the Siting Board (Secretary), which shall be filed and served and noticed pursuant to 16 New York Codes, Rules and Regulations (NYCRR) 1000.8(8). This request shall be filed concurrently with the permit application filed with the United States Army Corps of Engineers pursuant to Section 404 of the Clean Water Act. Upon receipt of any and all permits, the Certificate shall file notice of receipt of the permit(s) with the Secretary as soon as practical. Should any permits be denied, the Certificate Holder shall file with the Secretary documentation demonstrating the reasons for the denial and how it plans to proceed with its Project plans in light of the denial.

6. The Certificate Holder shall implement the minimization and mitigation measures as described in the Application and clarified by the Certificate Holder's supplemental filings, updates and replies to discovery data requests or additional exhibits, and the Siting Board's Order Granting Certificate.

7. The Certificate Holder shall construct and operate the Facility in accordance with the substantive provisions of the applicable local laws as identified in Exhibit 31 of the Application, except for those local laws the Siting Board waives as unreasonably burdensome, as stated in the Siting Board's Order Granting Certificate.

8. The Certificate Holder shall construct the 115kV transmission facility in accordance to the latest edition of American National Standards Institute (ANSI) C-2 for operation at 212 degrees Fahrenheit. The Certificate Holder shall construct the collector lines in accordance to the latest edition of ANSI C-2.

9. The Certificate Holder shall incorporate and implement as appropriate, in all compliance filings and construction activities, the ANSI standards and measures for engineering

design, construction, inspection, maintenance and operation of its authorized Facility, including features for facility security and public safety, utility system protection, plans for quality assurance and control measures for facility design and construction, utility notification and coordination plans for work in close proximity to other utility transmission and distribution facilities, vegetation and facility maintenance standards and practices, emergency response plans for construction and operational phases, and complaint resolution measures.

10. Certificate Holder shall work with National Grid, and any successor Transmission Owner (as defined in the New York Independent System Operator (NYISO) Agreement), to ensure that, with the addition of the Facility (as defined in the Interconnection Agreement (IA) between the Company and National Grid), the system will have power system relay protection and appropriate communication capabilities to ensure that operation of the National Grid transmission system is adequate under Northeast Power Coordinating Council (NPCC) standards, and meets the protection requirements at all times of the North American Electric Reliability Corporation (NERC), NPCC, New York State Reliability Council (NYSRC), NYISO, and National Grid, and any successor Transmission Owner (as defined in the NYISO Agreement). Certificate Holder shall demonstrate compliance with applicable NPCC criteria and shall be responsible for the costs to verify that the relay protection system is in compliance with applicable NPCC, NYISO, NYSRC and National Grid criteria.

11. The authority granted in the Certificate and any subsequent Order(s) in this proceeding is subject to the following conditions necessary to ensure compliance with such Order(s):

    a) sixty (60) days prior to commencement of construction, as defined in condition 13, the Certificate Holder Shall provide DPS Staff and the Siting Board a construction organizational structure, contact list, and protocol for communication between parties.

b) The Certificate Holder shall regard the Department of Public Service Staff (Staff or DPS Staff) representatives, authorized pursuant to PSL §66(8), as the Siting Board's representatives in the field and, after the Siting Board's jurisdiction has ceased, as the Public Service Commission's (Commission) representatives in the field. In the event of any emergency resulting from the specific construction or maintenance activities that violate, or may violate, the terms of the Certificate, Compliance Filings, or any other order in this proceeding, such DPS Staff representatives may issue a stop work order for that location or activity.

c) A stop work order shall expire 24 hours after issued unless confirmed by the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased including by Order issued by the Chair of the Siting Board or by one Commissioner of the Commission. DPS Staff shall give the Certificate Holder notice by electronic mail of any application to the Siting Board or Commissioner to have a stop work order confirmed. If a stop work order is confirmed, Certificate Holder may seek reconsideration from the confirming Commissioner, Siting Board or the whole Commission. If the emergency prompting the issuance of a stop work order is resolved to the satisfaction of the DPS Staff field representative, the stop work order will be lifted. If the emergency has not been satisfactorily resolved, the stop work order will remain in effect.

d) Stop work authority will be exercised sparingly and with due regard to potential environmental impact, economic costs involved, possible impact on construction activities, and whether an applicable statute or regulation is violated. Before exercising such authority, DPS Staff representatives will consult wherever practicable with the Certificate Holder's representative(s) possessing comparable authority. Within reasonable time constraints, all attempts will be made to address any issue and resolve any dispute in the field. In the event the dispute cannot be resolved, the matter will be brought immediately to the attention of the Certificate Holder's Project Managers and the

Director of the DPS Office of Electric, Gas and Water. In the event that a DPS Staff representative issues a stop work order, neither the Certificate Holder nor the Contractor will be prevented from undertaking any safety-related activities as they deem necessary and appropriate under the circumstances. The issuance of a stop work order or the implementation of measures as described below may be directed at the sole discretion of the DPS Staff representative during these discussions.

e) If a DPS Staff representative discovers a specific activity that represents a significant environmental threat that is, or immediately may become, a violation of the Certificate, Compliance Filings, or any other Order in this proceeding, the DPS Staff representative may -- in the absence of responsible Certificate Holder supervisory personnel, or in the presence of such personnel who, after consultation with the DPS Staff representative, refuse to take appropriate action -- direct the field crews to stop the specific potentially harmful activity immediately. If responsible Certificate Holder personnel are not on site, the DPS Staff representative will immediately thereafter inform the Certificate Holder's Construction Inspector(s) and/or Environmental Monitor(s) of the action taken. The stop work order may be lifted by the DPS Staff Representative if the situation prompting its issuance is resolved.

f) If the DPS Staff representative determines that a significant threat exists such that protection of the public or the environment at a particular location requires the immediate implementation of specific measures, the DPS Staff representative may, in the absence of responsible Certificate Holder supervisory personnel, or in the presence of such personnel who, after consultation with the DPS Staff representative, refuse to take appropriate action, direct the Certificate Holder or the relevant Contractors to implement the corrective measures identified in the approved Certificate or Compliance Filings. However, all directives must follow the protocol established for communication between parties as required by subpart (a) above. The field crews shall immediately comply with the

DPS Staff representative's directive as provided through the communication protocol. The DPS Staff representative will immediately thereafter inform that Certificate Holder's Construction Inspector(s) and/or Environmental Monitor(s) of the action taken.

g) DPS Staff will promptly notify the New York State Department of Environmental Conservation (DEC) Region 9 representative of any activity that involves a violation of the Certificate within DEC's jurisdictional areas (e.g., a State-regulated wetland or its adjacent area, a protected stream or other waterbody, or a threatened or endangered species).

12. The Certificate Holder shall construct and operate the Facility in a manner that conforms to all substantive State requirements as identified in Exhibit 32 of the Application.

III. Notifications

13. At least 14 days prior to the Certificate Holder's commencement of construction date, defined as the anticipated beginning of unlimited and continuous construction of the Facility but not including tree-clearing activities or testing or surveying (such as geotechnical drilling and meteorological testing) to determine the adequacy of the site for construction or tree clearing activities, the Certificate Holder shall notify the public as follows:

a) Provide notice by mail to host landowners, adjacent landowners within 5,000 feet of the final layout to be constructed, and persons who reside on such property (if different from the landowner);

b) Provide notice to local Town and County officials and emergency personnel;

c) Publish notice in the local newspapers of record for dissemination;

d) Provide notice for display in public places, which will include the Town Halls of the host communities, at least one library in each host community, at least one post office in each host community, the Facility website, and the Facility construction trailers/offices; and

e) File notice with the Secretary for posting on the DPS Document Matter Management website.

14. The Certificate Holder shall write the notice(s) required in paragraph 13 in language reasonably understandable to the average person and shall ensure that the notice(s)contain:

a) A map of the Project;

b) A brief description of the Project;

c) The construction schedule and transportation routes;

d) The name, mailing address, local or toll-free telephone number, and email address of the Project Development Manager and Construction Manager;

e) The procedure and contact information for registering a complaint; and

f) Contact information for the Siting Board and Commission.

15. Upon distribution, and prior to commencement of construction, the Certificate Holder shall notify the Town Boards of all areas where information regarding the Project, Project activities, and Project contact information have been posted.

16. The Certificate Holder shall file with the Secretary, at least seven (7) business days prior to commencement of construction, an affirmation that it has provided the notifications required by this Section III, and include a copy of the notice(s) under this Section as well as a distribution list.

17. Prior to the end of construction, the Certificate Holder shall notify the entities identified in Condition 13 (a) and 13(b) with the contact name, telephone number, and address of the Operations Manager, and shall file the same with the Secretary.

18. The Certificate Holder shall file a written notice with the Secretary within 14 days of the completion of construction and provide an anticipated date of commencement of commercial operation of the Facility.

IV. Compliance Filings

The following plans, drawings, and other documents shall be filed for approval by the Siting Board in accordance with the rules for submittal, public comment, and decisions set forth in 16 NYCRR §1002. The Certificate Holder shall implement all requirements of the compliance filings, as approved or amended by the Siting Board. Required compliance filings shall be filed with the Secretary at least 45 days prior to the commencement of construction date, as defined in Certificate Condition 13, unless otherwise noted.

General

19. Copies of all federal permits and/or approvals required to conduct jurisdictional activities associated with certain aspects of construction and operation of the Facility, including but not limited to the Federal Aviation Administration determination that construction and operation of the Facility shall have no adverse effects on, or interference with, radar or instrument systems used for air traffic control, guidance, weather, or military operations including training.

20. Copies of any discretionary local or state permits and/or approvals required for construction and operation of the Facility if such approvals were authorized by the Siting Board.

21. Documentation demonstrating that all necessary agreements are in place for use of the Facility Site for construction

and operation (e.g., landowner agreements, easements, setback waivers, or Good Neighbor Agreements).

22. Documentation demonstrating that the final Facility design meets or exceeds the turbine setback requirements set forth in the zoning regulations for the Towns of Arkwright, Charlotte, and Cherry Creek, unless written consent has been obtained from affected property owners. Proofs of consent shall be provided and indicated on the final design drawings.

23. A Final Decommissioning Plan and proof of financial security as required by the Siting Board. The decommissioning estimate shall be updated by a qualified independent engineer licensed to practice engineering in the State of New York to reflect inflation and any other changes after one year of Facility operation, and every fifth year thereafter. The Applicant shall work with DPS Staff and the Towns of Arkwright, Cherry Creek, and Charlotte on an acceptable form of letter or letters of credit and the Applicant shall file with the Secretary with the Towns' approvals within 90 days prior to construction. The Applicant shall also file with the Secretary proof that the letter or letters of credit have been obtained in the decommissioning estimate amount, as calculated pursuant to the Siting Board's direction. The letter or letters of credit should remain active for the life of the Facility, until it is decommissioned, as adjusted every fifth year in consultation with the Towns and DPS Staff. The Towns of Arkwright, Cherry Creek, and Charlotte shall hold the letters of credit with each letter representing that portion of the respective Town's decommissioning cost. The Applicant shall execute decommissioning agreements with the respective Towns establishing a right for them to draw on the letters of credit if the Applicant defaults on its decommissioning obligations.

24. A copy of the Interconnection Agreement between NYISO, National Grid, and the Certificate Holder. Any updates or revisions to the IA shall be submitted throughout the life of the Project. Additionally, except in the event of an emergency, if any equipment or control system with different characteristics is installed throughout the life

of the Project, the Certificate Holder shall, at least three months before any such change is made, provide information regarding the need for, and the nature of, the change to National Grid and file such information with the Secretary.

25. All Facilities Studies issued by the NYISO shall be provided within 14 days of receipt of the final study. Any updated facilities agreements will also be filed throughout the life of the Facility.

26. Any System Reliability Impact Study (SRIS) performed in accordance with the NYISO Open Access Transmission Tariff (OATT) approved by the Federal Energy Regulatory Commission, and all appendices thereto, reflecting the interconnection of the Facility.

27. Any manufacturer provided information regarding the design, safety and testing information for the specific generating and related facilities equipment to be installed during construction, or as related to any equipment installed during Facility operation as a replacement of failed or outdated equipment. All such updates will be submitted to the Siting Board, or to the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary throughout the life of the plant.

Health and Safety

28. The Final Emergency Action Plan that shall be implemented during Facility construction, operation, and decommissioning. Training drills with emergency responders shall occur at least once per year. Copies of the final plan shall be provided to DPS Staff, the NYS Division of Homeland Security and Emergency Services, and local emergency responders that serve the Facility.

29. The Final Site Security Plan for Facility Operations. Copies of the final plan shall be provided to the DPS Staff, NYS Division of Homeland Security and Emergency Services and local emergency responders that serve the Facility.

30. The Final Health and Safety Plan that shall be implemented during Facility construction, operation, and decommissioning.

31. The Certificate Holder shall contact all pipeline operators in the area and develop a scope of work with each operator to ensure that the electric transmission line will not damage the pipeline's cathodic protection system or produce damage to the pipeline, either with fault current or from a direct strike of lightning to the transmission line, and should include both the 115 kV lines and the 34.5 kV collection lines, specifically addressing 16 NYCRR section 255.467(g) (External corrosion control; electrical isolation). The scope of work will be provided to both the pipeline operator, and to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary prior to the start of the study so that the proposed scope can be reviewed for comment. The study may be performed by the utility, or by a third-party qualified to perform such a study under the applicable corrosion control standards. Selection of the party to perform the study should be made by the utility in consultation with DPS Gas Safety staff and the Certificate Holder. A copy of the final study report of findings and recommendations shall be provided to the pipeline operator, and to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary.

32. A final site-specific construction Quality Assurance and Quality Control Plan (QA/QC Plan), to be developed in coordination with the selected Balance of Plant (BOP) contractor.

Transportation

33. A final Traffic Control Plan that will be developed in order to minimize potential delays to local traffic during construction. The Certificate Holder shall coordinate with the State, County, and local municipalities to respond to any locations that may experience any traffic flow or capacity issues. The Traffic Control Plan shall include copies of Host Community Agreements and/or Road Use

Agreements with the County and Towns where the local roads are being used for delivery and construction vehicle transport routes.

Plans, Profiles, and Detail Drawings

34. Maps, site plans and profile figures, and construction details for the Facility to be constructed. Shapefile data shall be provided to DPS Staff for the locations of turbines, collection lines, transmission lines, designated construction and laydown areas, access ways, and other Project facilities. Final design drawings, site plans, and construction details will include setback dimensions that adhere to the following requirements for turbine locations:

    a) 1.5 times the turbine tip blade height from the substation;

    b) 1.5 times the turbine tip blade height from the 115 kV generator lead line;

    c) 1.1 times the turbine tip blade height from gas wells (unless waived by landowner and gas well operator);

    d) 550 feet from public roads;

    e) 550 feet from State lands;

    f) 550 from non-residential structures;

    g) 1,500 feet from non-participating residences;

    h) 1,000 feet from participating residences;

    i) 550 feet from non-participating parcels; and

    j) 100 feet from State jurisdictional wetlands, unless otherwise permitted pursuant to this Certificate.

35. Details and specifications of the selected turbine model (including cut sheets, and blade details (including length and thickness), including third-party certification documenting that the turbine model meets international

design standards); the technical/safety manual for the turbine; foundation drawings (including plan, elevation, and section details); and manufacturer spec sheet and warranty that the selected turbine model does not exceed the total height and sound level output of the turbines presented in the Application.

36. Description of the wind turbine blade installation process, identifying the anticipated installation method for each wind turbine and indicating which wind turbine site locations will require the use of the entire rotor laydown area. Details showing typical laydown space required for installation will be provided.

37. Maps showing the location for the selected Operations and Maintenance (O&M) building. If an existing building is not utilized, the Certificate Holder shall provide the final O&M building details and construction drawings.

38. If an on-site concrete batch plant is to be utilized during construction, the Certificate Holder shall provide:

    a) final details of the concrete batch plant layout, location, and access;

    b) temporary lighting that avoids offsite light trespass;

    c) copies of required permits; and

    d) initial concrete batch plant set-up plan with references of conformance to ACI (American Concrete Institute), ASTM (American Society for Testing and Materials); and

    e) plan or description of the Certificate Holder's monitoring and testing of concrete in conformance with the Building Code of New York State, ACI, ASTM, and any other applicable specifications.

39. Final design plans and profile drawings of the 115 kV transmission line and termination structures to the substation. Certificate Holder shall also provide the Facilities Study, Interconnection Agreement, and Facilities Agreement. Minor activities required for testing and

development of final engineering and design information may be performed prior to commencement of construction.

40. Final plan for the collection substation and collection line circuits' configuration and location map, indicating locations of overhead and underground installations and the number of required circuits per circuit-run. A breakdown of the number of miles per installation shall be included as a legend (including installation distances for single, double, triple, etc. runs).

41. Final details of single and multiple-circuit overhead 34.5 kV electric collection line layouts. Each Project circuit layout (single, double, triple, etc.) shall include, if applicable, the following drawings:

    a) "Right-of-Way Clearing Diagram";

    b) "Riser Dead-End Structure Diagram";

    c) "Tangent Structure Diagram";

    d) "Heavy Angle Dead-End Structure Detail"; and

    e) "Clearing Diagram-Adjacent to Roadway Detail"

    The above listed drawings shall include final layout details of any required guy support systems.

42. Final design and details of single and multiple electric circuit underground collection lines. Each Project circuit layout (single, double, triple, etc.) shall include a cross-section and clearing and ROW widths needed for accommodating circuit installations.

43. Maps showing all locations where anticipated alternative installation methods (i.e., alternative to the "rip" method, including subsurface bores/horizontal directional drilling) shall be utilized during construction of underground collection lines; alternative methods will be identified in the plans. To the extent the contractor determines, during construction activities, that installation methods should differ from that which is

depicted on the maps, such change shall be permitted following on-site consultation with, and verbal approval by, the DPS Staff representative and the Environmental Monitor. Such changes will be subject to formal filing with the Secretary within 48 hours from the agreement to make the change in installation method.

Environmental

44. An Environmental Compliance Program Plan, including:

a) Establishment of funding for an independent, third-party environmental monitor to oversee compliance with environmental commitments and permit requirements. The environmental monitor shall perform daily inspections of construction work sites and, in consultation with DPS Staff, issue regular reporting and compliance audits. The Certificate Holder shall identify and provide qualifications and contact information for the independent, third-party monitor for environmental compliance monitoring; there shall be an independent, third party agricultural monitor. If the Department of Agriculture and Markets (DAM) agrees that the independent third party monitor is qualified on agricultural issues, one monitor can act as both environmental and agricultural monitor.

b) A Final Environmental Compliance Manual, which will serve as the basis for contractor training. The manual will identify construction organizational structure, contact list, and protocol for communication between parties.

c) Mandatory training requirements for all contractors and subcontractors;

d) Pre-construction coordination; and

e) Construction and restoration inspection standards.

45. Final Detailed Geotechnical Engineering Report verifying subsurface conditions at each turbine location, and horizontal directional drilling locations. The report shall identify appropriate mitigation measures required in

locations of highly corrosive soils or soils with a high frost risk, and confirm whether blasting operations will be required in areas of shallow bedrock.

46. Frac-Out Risk Assessment and Contingency Plan where horizontal directional drilling is proposed. Biodegradable drilling solutions shall be used for horizontal directional drilling (HDD) to minimize harm to aquatic species in the event of a drilling frac-out. Exit and entry points shall be located a minimum of 20 feet from the edge of the stream or wetland to minimize disturbance to the extent practicable. All equipment and provisions of the plan shall be readily accessible at the locations where HDD technology is used during construction. If inadvertent drilling fluid surface returns occur in wetlands or streams, the DEC and DPS Staff shall be notified immediately and a written monitoring report describing the location, estimated volume, and cleanup efforts shall be submitted within 24 hours of the occurrence.

47. Dust Control Procedures Plan for minimizing the amount of dust generated by construction activities, consistent with the Standards and Specifications for Dust Control, as outlined in the *New York State Standards and Specifications for Erosion and Sediment Controls*.

48. Shadow Flicker Impacts Analysis, Control, Minimization and Mitigation Plan. Shadow flicker caused by wind turbine operations shall be limited to a maximum of 30 hours annually at any nonparticipating residential receptor, subject to verification using shadow detection and operational controls at appropriate wind turbines. The Shadow Flicker Impacts Minimization and Mitigation Plan shall include:

    a) updated analysis of realistic and receptor-specific predicted flicker based on final proposed design;

    b) a protocol for monitoring operational conditions and potential flicker exposure at the wind turbine locations identified in the updated analysis, based on meteorological conditions;

c) details of the shadow detection and prevention technology that will be adopted for real-time meteorological monitoring and operational control of turbines;

d) temporary turbine shutdowns during periods that produce flicker; and

e) shielding or blocking measures (such as landscape plantings and window treatments) for receptor locations that submit complaints for exposures that are not subject to the 30-hour annual limit.

Details of flicker control, minimization and mitigation measures shall be indicated on final design drawings and standards, and site plans as appropriate.

49. Final Cultural Resources Mitigation and Offset Plan, either as adopted by federal permitting agency in subsequent National Historic Preservation Act (NHPA) §106 review, or as proposed in the April 3, 2017 Application supplement and as revised in further consultation with the State Historic Preservation Office in the event that the NHPA §106 review does not require that the mitigation plan be implemented, or as further supplemented pending any negotiations among parties. Proof of mitigation funding awards for offset project implementation to be provided within two years of the start of construction of the Facility shall be included.

50. Final Unanticipated Discovery Plan, establishing procedures in the event that resources of cultural, historical, or archaeological importance are encountered during Facility construction. The plan will include a provision for immediate work stoppage upon the discovery of possible archaeological or human remains. Evaluation of such discoveries, if warranted, shall be conducted by a professional archaeologist, qualified according to New York Archaeological Council Standards. Work shall not resume in the area of such remains until written permission is received from the NYSOPRHP.

51. A Final Bird and Bat Conservation Strategy (BBCS) will be developed in consultation with DEC, DPS and the United

State Fish and Wildlife Service (USFWS). A copy of the Final BBCS will be provided to DEC and DPS at the same time it is submitted to USFWS but not less than 45 days prior to the commencement of construction.

52. A final Net Conservation Benefit Plan which will include a curtailment regime proposed by DEC During the period June 1 through October 1, a minimum curtailment of 6.9 m/s, 30 minutes prior to sunset through 30 after sunrise, when temperatures are greater than 10 degrees Celsius. Any additional minimization will be developed in consultation with and accepted by DEC and DPS Staff, for minimizing potential take of Northern Long Eared Bat.

53. Final Invasive Species Control Plan (ISCP). Control measures shall include construction materials inspection and sanitation, invasive species treatment and removal, and site restoration in accordance with the Facility's final approved Storm Water Pollution Prevention Plan (SWPPP). A post-construction monitoring program (MP) shall be conducted in year 1, year 3 and year 5 following completion of construction and restoration. The MP shall collect information to facilitate evaluation of ISCP effectiveness. At the conclusion of the MP, a report shall be submitted to DPS Staff, DEC, and DAM, and filed with the Secretary, that assesses how well the goal of no net increase of invasive species per the recommendation of the Invasive Plant Species Survey Baseline Report ("Baseline Species Report"), due to construction of the Facility, is achieved. In the event that the report concludes that ISCP goals are not met, and there is an increase of invasive species due to Facility construction, the Certificate Holder, DPS, DEC and DAM will meet to consider why initial control measures were ineffective and the probability of successful additional treatment measures without the need for perpetual treatments.

54. Site-specific plans for management of Japanese knotweed and common reed and areas with high concentrations of invasive species identified in the Baseline Species Report as well as all areas of disturbance in Boutwell Hill State Forest shall be included in the Final ISCP.

55. Final wetland and stream impact drawings, site plans, and construction details shall incorporate and accurately depict methods for minimization of impacts to each wetland and stream. The plan shall include a table that identifies all wetlands and streams within the Project area and provides the following information for each individual resource:

    a) Wetland delineation types and DEC stream classifications;

    b) Assessment of reasonable avoidance measures;

    c) Identification and assessment of methods to minimize impacts; and

    d) References to the location of each resource where shown in the final design drawings, site plans, and construction details.

56. A Final Wetlands Mitigation Plan addressing impacts to federal and State wetlands shall be developed in coordination with DEC, DPS Staff, and the Corps to satisfy applicable federal and State regulations.

57. The Certificate Holder shall file with the Secretary a notice confirming that no wind turbine is sited within 100 feet of an existing water supply well, and identifying any instances where environmental or engineering constraints require siting of any other Project facilities within 100 feet of an existing water supply well. For those wells so identified, the Certificate Holder shall perform pre- and post-construction testing of the potability of water wells within 100 feet of construction disturbance before commencement of construction and after completion of construction shall be performed by a qualified third party, to ensure the wells are not impacted. Should the third party conclude that the Facility Construction has an impact on the potability of a water well based on the test results, the Certificate Holder shall cause a new water well to be constructed, more than 100 feet from a collection line or access road.

58. Final approved Storm Water Pollution Prevention Plan (SWPPP). Impacts to soil resources shall be minimized by adherence to best management practices that are designed to avoid or control erosion and sedimentation and stabilize disturbed areas. Erosion and sedimentation impacts during construction shall be minimized by the implementation of an erosion and sedimentation control plan developed as part of the State Pollution Discharge Elimination System General Permit for the Facility. Erosion and sediment control measures shall be constructed and implemented in accordance with the SWPPP.

59. Final Spill Prevention, Containment and Counter Measures (SPCC) Plan to minimize the potential for unintended releases of petroleum and other hazardous chemicals during Facility construction and operation. The SPCC Plan shall be applied to all relevant construction activities and contain information about water bodies, procedures for loading and unloading of oil, discharge or drainage controls, procedures in the event of discharge discovery, a discharge response procedure, a list of spill response equipment to be maintained on-site (including a fire extinguisher, shovel, tank patch kit, and oil-absorbent materials), methods of disposal of contaminated materials in the event of a discharge, and spill reporting information. Any spills shall be reported in accordance with State and/or federal regulations.

60. A Final Complaint Resolution Plan for both construction and operation phases (a separate plan will be submitted for operational noise), which shall be developed in consultation with the Towns. A copy of the Final Complaint Resolution Plan shall be submitted to the Towns and filed at the Facility document repositories. The plan shall address complaint reporting and resolution procedures for all construction and operation issues. The plan shall include protocols for:

    a) Registering a complaint;

    b) Notifying the public of the complaint procedures;

c) Responding to and resolving complaints in a consistent and respectful manner;

d) Logging and tracking of all complaints received and resolutions achieved;

e) Reporting to DPS Staff any complaints not resolved within 60 days of receipt;

f) Arbitrating complaints not resolved within 60 days; and

g) Providing an annual report of complaint resolution tracking to DPS Staff that shall also be filed with the Secretary.

If the Complaint Resolution process determines that Facility operation has resulted in impacts to existing off-air television coverage, the Certificate Holder shall address each individual problem by investigating methods of improving the television reception system. Should this prove ineffective, cable television hookups shall, at the Certificate Holder's expense, be provided (in areas where cable service is available), or in areas where cable service is not available or not practical, direct broadcast satellite reception systems to any affected resident so desiring this compensation.

V. Requirements Prior to Operation

61. The final Facility design shall incorporate the following measures for Visual Impact minimization:

a) Advertisements, conspicuous lettering, or logos identifying the Facility owner, turbine manufacturer, or any other entity on the turbines shall not be allowed;

b) White or off-white color of wind turbines, towers and blades (as required by the FAA to avoid the need for daytime aviation hazard lighting) shall be utilized; and non-reflective finishes used on wind turbines to minimize reflected glare;

c) Medium-intensity red strobe lights on turbines for aviation hazard marking, and the extent of lighting will be minimized to the extent allowable by the FAA;

d) Lighting controls at substations, turbines and turbine sites shall be maintained;

e) Non-specular conductors shall be used for overhead portions of the generator lead line and the electric collection system;

f) Facility decommissioning program funds shall be established to assure removal of visible components;

g) The electric collection system facilities to be located along Boutwell Hill Road, Mill Road and East Road within properties comprising the Boutwell Hill State Forest shall be located in conformance with any easement granted by the NYSDEC. The facilities shall be designed, installed and maintained in an underground configuration to the maximum extent achievable; and

h) Overhead-to-underground transition structures may be sited within 100 feet of the entry point of the State Forest near East Road and exit point westerly of Housington Road.

62. A detailed Facility Exterior Lighting Plan Compliance Filing shall be filed as a Compliance Filing for review and approval within 30 days of the commencement of construction. The Lighting Plan shall address:

a) security lighting needs at wind turbine sites, substation and switchyard sites, the facility Operations and Maintenance building site and any exterior equipment storage yards;

b) plan and profile figures to demonstrate the lighting area needs and proposed lighting arrangement at the substation and switchyard sites, the facility Operations and Maintenance building site, any exterior equipment storage yards; and typical figure(s) for wind turbine sites;

c) lighting should be designed to provide safe working conditions at appropriate locations;

d) exterior lighting design shall be specified to avoid off-site lighting effects, by:

(i) use of task lighting as appropriate to perform specific tasks; task lighting shall be designed to be capable of manual or auto-shut off switch activation rather than motion detection;

(ii) for lighting other than turbine door safety lighting, full cutoff fixtures, with no drop-down optical elements (that can spread illumination and create glare), shall be required for permanent exterior lighting; and

(iii) manufacturer's cut sheets of all proposed lighting fixtures shall be provided.

(e) lighting of the wind turbine nacelles shall be implemented as per the current requirements of the Federal Aviation Administration (FAA) Advisory Circular 70/7460-IL, Chapter 13 (Marking and Lighting Wind Turbines) or as updated, as of the time of Compliance Filing submittal. Revised Determinations of No Hazard to Air Navigation addressing final facility design shall be provided as supporting documentation.

63. A Post Construction Avian and Bat Monitoring and Adaptive Management Plan shall be filed at least 60 days prior to the start of commercial operation of the Facility. The plan will include direct impact fatality studies and habituation/avoidance studies. The details of the post-construction studies (i.e., the start date, number and frequency of turbine searches, search area, bat monitoring, further monitoring beyond the second year, etc.), will be described following DEC's June 2016 *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, for Standard Post-Construction Studies and through consultation between the certificate holder, USFWS, and DEC. Post-construction monitoring will be conducted

for a minimum period of at least two (2) years but no more than three (3) years.

64. The Certificate Holder shall file a certification within 60 days of the commercial operation date that the collector lines and the 115 kV transmission facilities were constructed to the latest editions of ANSI standards and that the 115 kV lines were constructed to meet the minimum clearance requirements at 212 degrees Fahrenheit conductor operating temperature under short term emergency conditions. The Facility's electrical collection system shall be designed in accordance with applicable standards, codes, and guidelines as specified in Exhibit 5 of the Application.

65. No less than 60 days prior to commercial operation date, the Certificate Holder shall file with the Secretary, Operation and Maintenance Plan(s) for the Facility. The Company shall file with the Secretary complete documentation of its emergency procedures and list of emergency contacts. Certificate Holder shall file annually with the Secretary an updated copy of its emergency procedures and list of emergency contacts and with documentation of any modifications.

66. Should the final Facility design require a Special Protection System, the Certificate Holder shall file a report with the Secretary regarding implementation of such system, which is designed to avoid possible overloads from certain transmission outages, as well as copies of all studies that support the design of such a system. In addition, Certificate Holder shall provide all documentation for the design of special protection system relays, with a complete description of all components and logic diagrams. Prior to commencement of operations, Certificate Holder shall demonstrate through appropriate plans and procedural requirements that the relevant components of the Special Protection System will provide effective protection.

67. A Relay Coordination Study shall be filed at least four months prior to the projected date for commencement of commercial operation of the facilities.

68. As-built drawings in both hard and electronic copies shall be filed within six months following the commercial operation date of the Facility. Drawings will include final locations of all Project components, final grading, elevation plan of switchyard and collection substation, and a profile of the final transmission and collection line locations.

69. Long-range Electric Transmission Facility and Corridors Management Plan shall be filed within one year of the commercial operation date. The plan shall address specific standards, protocols, procedures and specifications for:

a) Vegetation management recommendations, based on on-site surveys of vegetation cover types and growth habits of undesirable vegetation species;

b) Herbicide use and limitations, specifications and control measures;

c) Wire Security Clearance Zone specifications, indicating applicable safety, reliability and operational criteria;

d) Inspection and target treatment schedules and exceptions;

e) Standards and practices for inspection of facilities easements for erosion hazard, failure of drainage facilities, hazardous conditions after storm events or other incidents;

f) Review and response procedures to avoid conflicts with future use encroachment or infrastructure development;

g) Wetland and stream protection areas, principles and practices;

h) Landowner notification procedures.

VI. Noise and Vibration

70. Noise levels from all noise sources from the Wind Generating Facility, related facilities and ancillary equipment shall:

a) Comply with a maximum noise limit of 45 (dBA) L_{eq} (8-hour) nighttime (11 pm to 7 am) at any non-participant residence existing as of the issuance date of this Certificate and 55 dBA L_{eq} (8-hour) nighttime for any participant residence existing as of the issuance date of this Certificate.

b) Not produce any audible prominent tones, as defined under ANSI S12.9 Part 4-2005 Annex C at any non-participant residences existing as of the issuance date of this Certificate. Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated position shall be increased by 5 dBA for evaluation of compliance with sub-condition 70(a).

c) Comply with a maximum noise limit of 65 dB L_{eq} at the full octave frequency bands of 16, 31.5, and 63 Hertz outside of any non-participant residence existing as of the issuance date of this Certificate.

d) Not produce human perceptible vibrations inside any non-participant residence existing as of the issuance date of this Certificate that exceed the limits for residential use recommended in ANSI Standard S2.71-1983 "Guide of evaluation of human exposure to vibration in Buildings."

e) Comply with a limit of 40 dBA L_{eq}(1-hour) at the outside of any non-participating residence from the collector substation equipment, and subject to the tonal penalties of sub-condition 70(b).

Emergency situations are exempt from any of these limits.

71. The Certificate Holder shall present to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary at a minimum 120 days prior to the start of construction:

a) Final drawings and details of the Wind Generating Facility, as well as final construction drawings incorporating any appropriate changes to the design and details, including:

   (i) Location of the turbines identified with Geographic Information System (GIS) coordinates and GIS files.

   (ii) Turbine dimensions to include hub height and diameter of tip blades rotation.

   (iii) Proposed grading and turbine ground elevations.

b) Site plan and elevation details, of substations as related to the location of all relevant noise sources (transformers, emergency generator, reactors, if any), any identified mitigations, specifications, and appropriate clearances for sound walls, barriers, mufflers, silencers, and enclosures, if any. Sound information from the manufacturers for all relevant noise sources shall also be presented.

c) Sound Power levels from the turbines by following these provisions:

   (i) Sound Power levels from the turbines selected for the project shall be documented with information from the manufacturers based on tests that determined sound power levels following the International Electrotechnical Commission (IEC) TS 61400-14 standard, if available. Sound Power Information will be reported associated with wind speed magnitudes, angular speed of the rotor, and rated power to the extent this information is available. The Sound Power Information will include specifications for Noise Reduced Operations or Low-Noise Trailing Edges if these are required to meet the noise conditions of this Certificate.

(ii) Sound Power levels from the turbines shall not exceed 106.6 dBA overall, 122 dBZ at the 16 Hz full octave band, 119 dBZ at the 31.5 Hz full octave band, and 115 dBZ at the 63 Hz full octave band, to the extent this information is available or can be calculated.

d) Revised sound modeling using the same methodology as the Application but with the specifications of the wind turbine model selected for construction to demonstrate that the project is modeled to meet the Local Laws on Noise for the Towns of Charlotte, Cherry creek and Arkwright and the regulatory limits of Conditions 78(a), 78(b), and 78(e). In addition, the revised sound modeling will show conformance with the following non-regulatory, non-enforceable design goals, except as imposed by the Siting Board:

(i) 40 dBA $L_{(night\text{-}outside)}$, annual equivalent continuous average nighttime sound level from the Facility outside any existing non-participating residence.

(ii) 50 dBA $L_{(night\text{-}outside)}$, annual equivalent continuous average nighttime sound level from the Facility outside any existing participating residence

(iii) 65 dBZ $L_{(1\text{-}hour)}$, maximum 1-hour equivalent continuous average sound level from the Facility at the 16 Hz, 31 Hz, and 63 Hz full octave bands outside any existing non-participating residence.

72. Compliance with Certificate Conditions for the Facility shall be evaluated by the Certificate Holders by following a Sound Testing Compliance and Noise Complaint Protocol that shall:

a) Follow the provisions and procedures for post-construction noise performance evaluations indicated in the Application and include testing for the limits

imposed by the Siting Board in these Certificate Condition.

b) Be presented to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary for review within 90 days after the issuance date of this Order but no later than 90 days before the start of construction.

c) Include, among other items, sound instrumentation specifications and calibration requirements; equipment settings; noise and vibration descriptors to be evaluated; weather conditions to be tested and to be excluded; seasons and time frames for testing; testing procedures, provisions for audible prominent tones, low frequency noise, and vibrations; provisions for processing test results, reporting, and documentation.

d) Include provisions for First-Year Compliance Testing and testing in response to noise and vibration complaints.

e) Include provisions to notify and request permission for access from property owners to conduct noise or vibration measurements at outdoor or indoor private property locations, provided the property owners are willing to grant permission.

73. At least two sound compliance tests conforming to the compliance protocol required by the Certificate Conditions shall be performed by the Certificate Holders after the commercial operations date of the Facility: One during the "leaf-off" season and one during the "leaf-on" season.

a) Within the first seven (7) months of the commercial operations date of the Facility, the Certificate Holders shall perform and complete the first Sound Compliance Test and the results shall be submitted to the Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary a report from an independent acoustical or noise consultant, no later than eight (8) months after the commercial operations date, specifying whether or not the Facility is found in compliance with all Certificate Conditions on noise of

this Certificate during the "leaf-on" or "leaf-off" season as applicable.

b) The second Sound Compliance Test shall be performed and results shall be submitted to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary subject to the same conditions contained in sub-condition 73(a), but no later than thirteen (13) months after the commencement of operations of the Facility.

74. If the results of the first or the second Sound Compliance Tests, or any subsequent Compliance or Violation Tests or any test performed in response to complaints, indicate that the Facility, related facilities and ancillary equipment do not comply with all Certificate Conditions on noise contained in this Certificate, the Certificate Holders shall:

a) Present minimization options to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary within 60 days after the filing of a noncompliance test result or the finding of a non-compliance or violation of Certificate Conditions on noise of this Certificate:

(i) Operational minimization options related to noise or vibrations caused by the wind turbines that shall be considered including, at a minimum, modifying or reducing time of turbine operation, incorporating noise reduced operations, shutting down relevant turbines, and modifying operational conditions of the turbines.

(ii) Physical minimization options related to noise or vibration caused by the wind turbines that shall be considered, including installation of serrated edge trails on the turbine blades, replacement or maintenance of noisy components of the equipment, and any other measures as feasible and appropriate.

(iii) if applicable, any minimization measures related to noise from transformers (such as walls or barriers) and emergency generators (such as installation of noise walls or barriers, adding or replacing enclosures or silencers to the emergency generator) if any, or any other mitigation measures as appropriate.

b) Implement any operational noise mitigation measures within 90 calendar days after the finding of a non-compliance or violation situation, as necessary to achieve compliance.

c) Implement any physical noise mitigation measures within 150 days after the finding of a non-compliance or violation situation, as necessary to achieve compliance.

d) Not operate the turbines of the Facility that caused the violation if the minimization measures are not implemented within the schedules specified in this certificate condition, and not operate the turbines without the operational or physical minimization measures that are presented and approved by the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased after they are implemented as specified in these Certificate Conditions.

e) Test, document and present to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary results of any minimization measures and compliance with all Certificate Conditions on noise of this Certificate, no later than 90 days after the minimization measures are implemented.

75. The Certificate Holder shall adhere to the following condition regarding Complaints:

a) The Certificate Holder is required to maintain a log of complaints received relating to noise and vibrations caused by the operation of the Facility, related facilities and ancillary equipment. The log shall include name and contact information of the person that

lodges the complaint, name of the property owner(s), address of the residence where the complaint was originated, the date and time of the day underlying the event complained of, and a summary of the complaint.

b) The Certificate Holder shall provide the Towns of Charlotte, Cherry Creek and Arkwright with a phone number, email address and mailing address where complaints can be notified, along with a form to report complaints designed according to the details required in subsection (a) of this condition.

c) All complaints received shall be reported monthly during the first full year of commercial operations and quarterly beyond the first full year to the Board, or the Commission after the Board's jurisdiction has ceased, by filing with the Secretary during the first 10 calendar days of each month, including copies of the complaints and if available, a description of the probable cause (outdoor or indoor noise, tones, low frequency noise, amplitude modulation, vibrations, rumbles, rattles, etc.); the status of the investigation, summary of findings and whether the Facility has been tested and found in compliance with applicable noise Certificate Conditions or minimization measures have been implemented. If no noise or vibration complaints are received, the filing is not required for that period.

d) For complaints regarding amplitude modulation, the Certificate Holder shall adhere to the noise limits adopted by the Siting Board in these Certificate Conditions, and as further adopted in this sub-condition. Should complaints related to amplitude modulation (e.g. swishing, thumping) occur at any non-participant residence existing as of the issuance date of this Certificate, the Certificate Holder shall investigate and measure amplitude modulation at the affected receptors during the time frame when the worst conditions are known, or, if not known, expected, to occur. If the $L_{90\text{-}10\ minute}$ noise levels (dBA), including any amplitude modulation and prominent tone penalties to the broad band levels, exceed a noise level of 45 dBA at the evaluated receptor(s) for more than 5% of the time during the

identified time frame of evaluation, the Certificate Holder shall continue with the investigation, identify frequency of occurrence and the conditions that may be favorable for its occurrence, and propose minimization measures to avoid or minimize the impacts. Minimization measures that avoid, minimize, resolve or mitigate the amplitude modulation impacts shall be identified and reported to the Siting Board, or the Commission after the Siting Board's jurisdiction has ceased, by filing with the Secretary and implemented after review and approval. Compliance with this Certificate Condition shall be finally demonstrated by conducting a test that shows that the L90-10-minute sound levels (dBA), including any penalties for amplitude modulation and prominent tones, are lower than or equal to 45 dBA for at a minimum 95% of the time frame when the worst amplitude modulation conditions occur or used to occur.

e) The Certificate Holder shall investigate all other noise and vibration complaints by following the Complaint Protocol in, and consistent with the limits imposed by, the Certificate Conditions.

76. The Certificate Holder is required to maintain a log of operational conditions of all the turbines with a 10-minute time interval to include at a minimum wind velocity and wind direction at the hub heights, angular speed of the rotors and generated power and notes indicating operational conditions that could affect the noise levels (e.g. maintenance, shutdown, etc.). A schedule of Noise Reduced Operations for individual turbines shall also be kept and updated as necessary.

77. The Certificate Holder shall comply with the following conditions regarding construction noise:

a) Comply with all local laws regulating construction noise;

b) Maintain functioning mufflers on all transportation and construction machinery;

c) Respond to noise and vibration complaints according to the Protocols established in the Certificate Conditions.

VII. Threatened and Endangered Species

78. The Certificate Holder shall implement the curtailment regime proposed by DEC as follows: During the period June 1 through October 1, a minimum curtailment of 6.9 m/s, 30 minutes prior to sunset through 30 after sunrise, when temperatures are greater than 10 degrees Celsius.

79. Excluding bald eagles (*Haliaeetus leucocephalus*), if at any time during the life of the Project an active nest of any federally, or State, listed threatened or endangered bird species is discovered within an active construction, ground clearing, grading, or maintenance site, the regional DEC Natural Resource Supervisor will be notified within forty-eight (48) hours of discovery, and the nest site will be marked. An area five hundred (500) feet in radius around the nest will be avoided until notice to continue construction at that site is granted by the regional DEC Natural Resource Supervisor.

80. If at any time during the life of the Project a bald eagle nest is located, the regional DEC Natural Resource Supervisor will be notified within forty-eight (48) hours of discovery, and prior to any disturbance of the nest or immediate area. An area six hundred sixty (660) feet in radius from the nest tree will be posted and avoided until notice to continue construction at that site is granted by the regional DEC Natural Resources Supervisor. The nest tree will not be approached under any circumstances unless authorized by the regional DEC Natural Resource Supervisor.

81. During construction, maintenance, and operation of the Facility, the Certificate Holder shall maintain a record of all observations of New York State threatened or endangered (TE) species as follows:

    a) Construction: During construction the onsite environmental monitors and environmental compliance manager identified in the Environmental Compliance Manual shall be responsible for recording all occurrences of TE species. All occurrences shall be reported in the bi-weekly monitoring report submitted to the NYSDEC and

shall include the information described below. If a TE avian species is demonstrating breeding behavior it should be reported to the Natural Resources Supervisor within twenty-four (24) hours.

b) Post-construction: During post-construction wildlife monitoring inspections, the environmental contractor shall be responsible for recording all occurrences of TE species. Occurrences of TE during wildlife surveys shall be reported as required in the construction monitoring and adaptive management plan.

c) Operation and Maintenance (O&M): During O&M the Certificate Holder shall be responsible for training O&M staff to focus on identifying the following bird species: bald eagle, golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*) and upland sandpiper (*Bartramia longicauda*). The Certificate Holder shall report all occurrences to the Region 9 Natural Resource Supervisor within one week of the event.

d) Reporting Requirements: All reports of TE species shall include the following information: species, observation date and time; GPS coordinates of each individual observed (if O&M staff do not have GPS available the report should include the nearest turbine number and cross roads location); behavior observed; identification and contact information of the observer; and the nature of and distance to any project construction or maintenance activity.

e) If at any time during the life of the Project any dead, injured or damaged State-listed TE species, or their parts, eggs, or nests are discovered within the Project Area (defined for the purpose of this condition as leased land or property parcels containing Project components) by the Certificate Holder, its designated agents, or a third party that reports to the Certificate Holder, the certificate holder shall immediately (within twenty four (24) hours) contact the regional NYSDEC Region 9 Natural Resource Supervisor (716.372.0645) and United States Fish and Wildlife Service (607.753.9334) to arrange for

recovery and transfer of the specimen(s). The following information pertaining to the find shall be recorded: species, the date the animal or nest was discovered; the GPS coordinates of the location of discovery, the name(s) and contact information of the person(s) involved with the incident(s) and find(s); and, if known, an explanation of how the mortality/injury/damage occurred. This record shall be kept with the container holding the specimen and given to the DEC at the time of transfer. If the discovery is followed by a non-business day, the Certificate Holder shall ensure the location of the find is marked, GPS data recorded, detailed photographs of the carcass(es) or nest(s) taken and surrounding landscape relative to the Project and components, and the specimen(s) placed in a freezer until it can be retrieved by the proper authorities.

VIII. Wetlands and Streams, Vegetation and Invasive Species

82. All necessary precautions shall be taken to preclude contamination of any wetland or waterway by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate or any other environmentally deleterious materials associated with the Project.

83. The Certificate Holder shall submit a Notice of Intent to Commence Work to the Region 9 Supervisor of Natural Resources, NYSDEC Region 9 Allegany Sub-Office, 182 East Union Street, Suite 3, Allegany, NY 14706 at least 72 hours in advance of the commencement of construction and shall also notify him/her immediately in writing of the completion of work.

84. All construction activity, including operation of machinery, excavation, filling, grading, clearing of vegetation, disposal of waste, street paving, and stockpiling of material, is to take place within the project site as depicted on project plans. No construction activity is to take place within areas to be left in a natural condition or areas not specifically designated by this certificate. Staking and/or flagging construction

limits (i.e., ROW, off-ROW access roads, and extra work areas) shall occur prior to any ground disturbance.

85. During construction, erosion control devices such as straw bales or silt fences shall be used to prevent erosion of the dredged material or disturbed soil along with other measures as described in the SWPPP. The straw bales or silt fence shall be installed in accordance with construction techniques described in 2016 New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), including placing the straw bales and silt fence in a shallow trench, backfilling the toe of the silt fence and securing the straw bales with stakes. All erosion and sediment control practices shall be installed prior to any grading or filling operations, or other ground disturbance. They shall remain in place until construction is completed and the area is completely stabilized. Use of hay bales is strictly prohibited to minimize the risk of introduction of invasive species.

86. All equipment and machinery shall be stored and safely contained more than 100 feet landward of the regulated wetland or water body at the end of each work day. This will serve to avoid the inadvertent leakage of deleterious substances into the regulated area.

87. Fuel or other chemical storage tanks shall be contained and located at all times in an area more than 300 feet landward of the regulated wetland or water body. If the above requirement cannot be met by the Certificate Holder, then the storage areas must be designed to completely contain any and all potential leakage. Such a containment system must be approved by NYSDEC staff in writing prior to equipment, machinery or tank storage.

88. All mobile equipment, excluding dewatering pumps, must be fueled in a location at least 100 feet to the top of stream bank, wetland, or other waterbody. Dewatering pumps operated closer than 100 feet from the stream bank, wetland, or waterbody, must be on an impervious surface and absorbents capable of containing any leakage of petroleum products.

89. Spillage of fuels, waste oils, other petroleum products or hazardous materials shall be reported to the NYSDEC's Spill Hotline (1-800-457-7362) within two hours according to the NYSDEC Spill Reporting and Initial Notification Requirements Technical Field Guidance.

90. All equipment used within bed or banks of streams or in wetlands and adjacent areas must be inspected daily for leaks of petroleum, other fluids, or contaminants and may only enter a stream channel if found to be free of any leakage. A spill kit must be on site and any leaks must be stopped and cleaned up immediately.

91. All fill shall consist of clean soil, sand and/or gravel that is free of the following substances: asphalt, slag, fly ash, broken concrete, demolition debris, garbage, household refuse, tires, woody materials including tree or landscape debris, metal objects, and all invasive species. The introduction of materials toxic to aquatic life is expressly prohibited.

92. Any stream crossing determined to not be feasibly crossed trenchlessly by the Site Specific Constructability Assessment shall be opened for the installation and backfilled in one continuous operation. Before trenching through stream banks or wetlands occurs, upland sections of the trench shall be backfilled or plugged to prevent drainage of possible turbid trench water from entering the stream or wetland. Trench breakers/plugs shall be used at the edges of wetlands as needed to prevent draining of an entire wetland during construction. If there is an inadvertent puncturing of a hydrologic control for a wetland, then the puncture shall be immediately sealed, and no further activity shall take place until NYSDEC is notified and a remediation plan to restore the wetland and prevent future dewatering of the wetland has been approved by DEC. Only the excavated wetland topsoil and subsoil shall be utilized as backfill. In wetland areas, the topsoil shall be removed and stored separate from subsoil. When backfilling occurs, the subsoil shall be replaced as needed, and then covered with the top soil, such that the restored top soil is the same depth as prior to

disturbance. Depth of buried cables must be sufficient to prevent exposure during future high flow events.

93. No turbid water resulting from dewatering operations, including water that has infiltrated the construction site, shall be discharged directly to or allowed to enter any wetland, stream or water body within the Project area. All other necessary measures shall be implemented to prevent any visible increase in turbidity or sedimentation downstream of the work site. Turbid water resulting from dewatering operations shall be discharged directly to settling basins, filter bags, or other approved device or to an upland vegetated area prior to discharge to any wetland, stream or other water body within the Project area. All other necessary measures shall be implemented to prevent any visible increase in turbidity or sedimentation downstream of the work site.

94. Discharges from dewatering operations shall be baffled or otherwise diffused in order to prevent erosion or turbid water from entering wetlands and waterbodies.

95. Visibly turbid discharges from blasting, land clearing, grading or excavation and construction activities, or dredging operations shall not enter any surface water body. All necessary measures shall be implemented to prevent any visible increase in turbidity or sedimentation downstream of the work site, including but not limited to the use of:

a) appropriately maintained upland settling basins;

b) crushed stone, sand, straw bales, or silt screening (maximum opening size of U.S. Sieve Number 20) to filter turbid waters;

c) "silt-bags" or similar pre-constructed structure designed to remove silt and sediment particles before they are discharged, or;

d) grassy upland areas at a sufficient distance from the receiving water body to prevent a visually discernible turbid discharge to the receiving water.

96. Markers used to delineate/define the boundary of the wetland or the extent of the structures allowed by the Certificate shall be left in place and remain undisturbed until completion of construction activities and restoration of the impacted area.

97. All disturbed soils within regulated freshwaters wetlands and the associated adjacent areas must be seeded with a native seed mix and mulched with straw only (hay is prohibited). Mulch shall be maintained until the disturbed area is heavily revegetated. Additional seeding shall be completed as necessary to achieve an 85% vegetative cover across all disturbed areas.

98. All areas of temporary disturbance to regulated Freshwater Wetlands and 100-foot adjacent areas must be restored and appropriately graded upon completion of temporary work items.

99. A minimum of 85% vegetative cover across all disturbed soil areas must be established by the end of the first full growing season following construction.

100. All wetland and NYSDEC adjacent areas disturbed during installation of buried interconnects shall be restored in accordance with the following requirements:

    a) Restoration to pre-construction contours must be completed within 48 hours of final backfilling of the trench within the wetland and State-regulated adjacent area boundary. Immediately upon completion of grading, the area shall be seeded with native herbs at densities as existed prior to construction. Seeding with an appropriate native wetland species mix such as an Ernst Wetland Mix (OBL-FACW Perennial Wetland Mix, OBL Wetland Mix, Specialized Wetland Mix for Shaded OBL-FACW, or equivalent) shall be completed to help stabilize the soils. Restored areas shall be monitored for the longer of 5 years or until an 85% cover of native species has been reestablished over all portions of the replanted area, unless the invasive species baseline survey indicates a smaller percentage of native species exists prior to construction. Because of the limited areas of

impact of the Facility to forested adjacent areas that will only be cleared, the Applicant and NYSDEC will agree on appropriate restoration measures which may include natural revegetation. In those areas where relevant, monitoring for woody vegetation establishment will take place during the growing season over a 5-year period. Random sample points will be established within temporarily disturbed wetlands and adjacent areas. At each sample point, absolute cover for each plant species present within a one-by-one-meter plot will be visually estimated and recorded. Cover estimates for woody species will then be totaled for each sample plot. Cover data collected at these sample points will be averaged and extrapolated to the entire area of temporary disturbance within a given wetland or adjacent area. Vegetation reestablishment will be considered successful once 85% absolute cover of woody species is achieved. If at the end of the fifth year of monitoring, 85% absolute cover of woody species is not achieved, then the Certificate Holder must evaluate the reasons for these results and submit an approvable "Wetland Planting Remedial Plan" for NYSDEC approval. The "Wetland Planting Remedial Plan" must describe the reasons for not achieving the goal, describe the actions necessary to correct the situation to ensure a successful restoration, and the schedule for conducting the remedial work. Once approved, the "Wetland Planting Remedial Plan" will be implemented according to the approved schedule. Performance requirements contained in the approved "Invasive Species Monitoring and Control Plan" must also be achieved.

b) These replanted areas shall also be monitored for invasive species to ensure there is zero percent net increase (or other "reasonable definition" as agreed upon following the baseline survey) in areal coverage of invasive species compared with pre-construction conditions. If at any time during the monitoring the invasive species criteria above are not met, the Certificate Holder shall take immediate action to ensure control of the invasive species. Such actions shall be part of an invasive species control plan approved by the DEC.

c) If at the end of five years the restored areas do not meet the above criteria for success, then monitoring and corrective action shall continue until the criteria are met.

101. Overhead transmission lines and interconnects in wetland and State-regulated adjacent areas shall be completed in accordance with the following requirements:

a) Swamp mats must be used in wetlands for installation of utility poles and overhead lines;

b) Prior to installation in wetlands and adjacent areas, swamp mats must be cleaned of invasive species following protocols described in the approved "Invasive Species Monitoring and Control Plan";

c) Swamp mat removal must be conducted from adjacent mats (i.e., removal equipment always stationed on a mat) as soon as practicable, but no later than four months following installation of the overhead line. The Environmental Monitor shall provide notification to the DEC when compliance with this condition has been achieved.

d) Disturbed areas will be monitored for 5 years following the installation of overhead lines or interconnects to assure an 85% cover of native species, unless the invasive species baseline survey indicates a smaller percentage of native species exists prior to construction. If after one complete growing season the pre-construction percentage of native species is not achieved, the Certificate Holder must evaluate the reasons for these results and submit an approvable "Wetland Planting Remedial Plan" for NYSDEC approval. The "Wetland Planting Remedial Plan" must describe the reasons for poor survival, describe the actions necessary to correct the situation to ensure a successful restoration, and the schedule for conducting the remedial work. Once approved, the "Wetland Planting Remedial Plan" will be implemented according to the approved schedule.

102. Any debris or excess material from construction of the Project shall be completely removed from the wetland or adjacent area (upland) and removed to a facility duly authorized to receive such material. No debris is allowed to remain in wetlands and/or regulated adjacent areas.

103. Cleared vegetation and slash from wetland and adjacent areas will not be burned or buried within the wetland or adjacent area. The vegetation must be disposed of outside of the wetland and adjacent area, but slash that is cut may be left in place (drop and lop or piled in dry or seasonally saturated portions of freshwaters wetlands and 100-foot adjacent areas to create wildlife brush piles).

104. This Certificate does not authorize any permanent alteration of wetland hydrology.

105. No disturbance to wetlands or regulated adjacent areas is allowed until the "Wetland Mitigation Plan" has been approved in writing by DEC. All measures and requirements included in the approved "Wetland Mitigation Plan" shall be enforceable conditions of the Certificate.

106. If, after five years post-construction, all wetland performance standards have not been achieved, the Certificate Holder must evaluate the likely reasons for these results and submit an approvable "Wetland Mitigation Remedial Plan" for NYSDEC approval. The "Wetland Mitigation Remedial Plan" must describe the likely reasons for not achieving performance standards, describe the actions necessary to correct the situation to ensure a successful mitigation, and the schedule for conducting the remedial work. Once approved, the "Wetland Mitigation Remedial Plan" will be implemented according to the approved schedule.

107. If, after five years post-construction, all invasive species control requirements have not been achieved, the Certificate Holder must evaluate the likely reasons for these results and submit an approvable "Invasive Species Remedial Plan" for NYSDEC approval. The "Invasive Species Remedial Plan" must describe the likely reasons for not

achieving NYSDEC requirements, describe the actions necessary to correct the situation, and the schedule for conducting the remedial work. Once approved, the "Invasive Species Remedial Plan" will be implemented according to the approved schedule.

108. To control the spread of invasive insects, the Certificate Holder will:

a) coordinate with outside logging contractors for sale and use of the merchantable timber; and provide unmerchantable timber as firewood to adjacent landowners or the general public pursuant to the NYSDEC's firewood restrictions to protect forests from invasive species found in 6 NYCRR Part 192.5; and

b) make sure crews are trained to identify the Asian Longhorned Beetle and the Emerald Ash Borer and any other insects that the NYSDEC identifies as a potential problem. If these insects are found, they must be reported to the NYSDEC regional forester.

109. Waste concrete or concrete from truck clean out activity and/or any wash water from trucks, equipment or tools if done on site, must be contained in a manner that will prevent it from escaping into the streambank or into the stream channel and entering the stream, or entering wetland, or any other waterbody. If a discharge occurs, NYSDEC Region 9 Supervisor of Natural Resources shall be contacted within 2 hours. Disposal of waste concrete or wash water must occur greater than 100 feet from any waterbody.

110. If a one-time crossing of a stream occurs as part of an installation of a temporary bridge and a tire mat is used, the following restrictions apply:

a) The mat must follow the contour of the streambed and allow for a low flow channel and not change the flow path of the stream thalweg.

b) The mat shall be removed immediately after the crossing of the stream occurs.

111. In-stream work shall only occur in the dry. Trenchless methods or dewatering measures (e.g., dam and pump or flume) must be used. If approved measures fail to divert all flow around the work area, in-stream work must immediately stop until dewatering measures are in place and properly functioning again.

112. Prior to installation of any permanent road/stream crossings, a site specific "Stream Crossing Plan" shall be submitted to the Department for approval. The "Stream Crossing Plan" must include detailed site-specific plans that describe and illustrate the layout and alignment of each crossing, and the proposed crossing method. At a minimum, the plan must include:

a) the alignment of roads, bridges, and culverts;

b) the location, quantity, and type of any fill associated with construction;

c) the location and installation details of any dewatering measures; and
d) a description of the dry crossing methods that will be used to install the crossing.

These plans must be approved by DEC prior to construction.

113. The restored stream channel shall be equal in width, depth, gradient, length and character as the pre-existing stream channel and tie in smoothly to profile of the stream channel upstream and downstream of the project area. The planform of any stream shall not be changed.

114. If any trees and shrubs growing within 50 feet of streams need to be cut in the process of constructing overhead power line crossings, they shall be cut off with at least two feet of the stump remaining. Stumps and root systems shall not be damaged to facilitate stump sprouting. Trees shall not be felled into any stream or onto the immediate stream bank. All trees and shrubs cut within the 50 foot buffer area shall be left on the ground.

115. Clearing of natural vegetation shall be limited to that material which poses a hazard or hindrance to the construction activity. Snags which provide shelter in streams for fish shall not be disturbed unless they cause serious obstructions, scouring or erosion. Trees shall not be felled into any stream or onto the immediate stream bank.

116. All crossings of buried cables under state-protected streams (C(T/TS) or above) must be conducted using trenchless crossing methods, such as horizontal directional drilling (HDD), to avoid impacts on water quality, habitat, and stream bed stability. If trenchless methods are not constructible or not feasible, the Certificate Holder must provide an approvable "Site-Specific Constructability Assessment" for NYSDEC approval. The "Site-Specific Constructability Assessment" must be conducted by an experienced and qualified, professional engineer licensed in New York State and must include a detailed analysis of the site-specific conditions that lead to the conclusion that all trenchless crossing methods are not constructible or not feasible at the particular stream crossing. If, based on results of the "Site-Specific Constructability Assessment", the Department approves stream crossings using trenched methods, all stream crossings must be done in the dry. Intermittent and ephemeral streams must be crossed during times of no flow, while perennial streams must be crossed using a temporary water control device such as a dam and pump or cofferdam to isolate the work area and redirect the water around the work site. Temporary water control devices/cofferdams for perennial streams must adhere to the following:

a) Specifications: Any temporary cofferdam shall be constructed of clean materials such as sheet piling, jersey barriers, inflatable dams, or sandbags that will not contribute to turbidity or siltation of the waterbody or wetland, and non- erodible materials, so that failure will not occur at Q2 or higher flow conditions. Where practicable, an upstream or interior membrane shall be installed to control percolation and erosion. Sandbags shall be of the filter fabric type, double bagged and individually tied to prevent sand leakage and only clean

sand (e.g. free of debris, silt, fine particles or other foreign substance) shall be used as fill. They shall be placed and removed manually to prevent spillage. Straw bale sediment control basins are prohibited.

b) Fill materials must not come from the waterbody or wetland.

c) The water control structure/cofferdam shall not impair downstream water flow in the waterbody or water flow into and/or out of a wetland.

d) If exposed for an extended period of time, excavated or temporarily stockpiled soils or other materials should be covered and protected to reduce runoff of fines which may cause a turbidity problem and to prevent rainwater from soaking the materials and rendering them unsuitable for backfill.

e) The work area shall remain isolated from the rest of the stream or wetland until all work in the streambed or bank, or wetland is completed, concrete is thoroughly set and the water clarity in the coffered area matches that of the open water.

f) If a dam and pump diversion is used as part of a dry open-cut crossing, the pump and diversion must be monitored continuously from time of installation until crossing is completed, streambed restored, and diversion is removed.

g) Dewatered sections of stream cannot exceed 50 linear feet (measured from the inside edges of the cofferdams) for each stream crossing unless the Certificate Holder has prior written approval from the NYSDEC Region 9 Supervisor of Natural Resources.

h) All temporary water control structures shall be removed in their entirety upon completion.

i) All fish trapped within the cofferdam shall be netted and returned, alive and unharmed, to the water outside the

confines of the cofferdam, in the same stream, before the dewatering process.

117. Dewatering within the coffer(s) shall be performed so as to minimize siltation and turbidity. Water taken from the coffered area will be passed through settling basins, filter bag, or a well-vegetated upland areas more than 100 feet from the stream bank to prevent the discharge of turbid water into any wetland, stream or river. The pump discharge must be directed against a solid object (concrete slab, stone or steel container), or other effective method to prevent erosion by dissipating energy.

118. Erosion and sediment control will be used at the point of drilling, so that sediment laden runoff shall not escape the drill site and enter streams or wetlands. The disturbed area will be restored to original grade and reseeded upon project completion.

119. Drilling fluid circulation shall be maintained to the extent practical. If inadvertent surface returns occur in upland areas, the fluids shall be immediately contained and collected. If the amount is not enough to allow practical collection, the affected area will be diluted with freshwater and allowed to dry and dissipate naturally. If the amount of surface return exceeds that which can be collected using small pumps, drilling operations shall be suspended until surface volumes can be brought under control. If inadvertent drilling fluids surface returns occur in an environmentally sensitive area (i.e. wetlands and water bodies) the returns shall be monitored and documented. Drilling operations must be suspended if the surface returns pose a threat to the resource or to public health and safety. Removal of released fluids from environmentally sensitive areas will take place only if the removal does not cause additional adverse impacts to the resource. If inadvertent drilling fluids surface returns occur in an environmentally sensitive area the Department shall be notified immediately and a monitoring report summarizing the location of surface returns, estimated quantity of fluid and summary of cleanup efforts shall be submitted within 48 hours of the occurrence.

120. While HDDing under wetlands, adjacent areas, and streams, the Certificate Holder will maintain close monitoring for possible "frac-outs" that would result in the release of drilling fluids to sensitive areas. The Certificate Holder will maintain a HDD spill response plan and the necessary response equipment will be kept on-site for the duration of the drilling. All releases of drilling fluids to sensitive areas (e.g., freshwater wetlands, 100-foot adjacent areas, waterbodies) shall be reported to the NYSDEC Region 9 Supervisor of Natural Resources within 2 hours.

121. To reduce thermal impacts to exposed streams, native woody plants such as shrub willows, dogwoods, appropriate native trees, or other native riparian species will be planted at all stream crossings, which have less than 50% cover due to construction impact of any such vegetation and is to be restored following a temporary impact, to shade the project area. Planting may be done at top of bank and/or among rocks along toe of slope.

122. During periods of work activity, flow immediately downstream of the work site shall equal flow immediately upstream of the work site.

123. Any in stream work or restoration authorized by the Certificate, including the installation of structures and bed materials, shall not result in an impediment to passage of native aquatic organisms, including fish. Any in-stream work (excluding dewatering practices associated with dry trench crossings) and restoration shall be constructed in a manner which maintains low flow conditions and preserves water depths and velocities similar to undisturbed upstream and downstream reaches necessary to sustain the movement of native aquatic organisms. Any in-stream structures placed in a stream must not create a drop height greater than 6".

124. All disturbed stream banks below the normal high water elevation must be graded no steeper than 1 vertical to 2 horizontal slope, or to the original grade as appropriate, and adequately stabilized. All other areas of soil disturbance above the ordinary high water elevation, or elsewhere, shall be stabilized with natural fiber matting, seeded with an appropriate perennial native conservation

seed mix, and mulched with straw within two (2) days of final grading. Mulch shall be maintained until suitable vegetation cover is established. Destroyed bank vegetation shall be replaced with shrub willow or silky dogwood planting, native trees, or other suitable species.

IX. Facility Construction

125. At least 60 days prior to the start of construction, the Certificate Holder shall become a member of Dig Safely New York. The Certificate Holder shall require all contractors, excavators, and operators associated with its facilities to comply with the requirements of the Commission's regulations regarding the protection of underground facilities (16 NYCRR Part 753).

126. The Certificate Holder shall design, install and maintain ground grids for the wind turbines, coordinating them with the gas transmission pipelines, plastic pipe locator wires and gas wells. Such grounding is to be in full conformance with Institute of Electrical and Electronics Engineers (IEEE) 80 and IEEE 100, unless after consultation with DPS Office of Electric, Gas and Water staff, the Applicant receives affirmative confirmation in writing that DPS has reviewed the turbine manufacturer's grounding requirements and that it accepts such requirements as a suitable substitution for the IEEE standards.

127. The Certificate Holder shall require all contractors, excavators, and operators associated with its facilities to comply with all requirements of the Commission's regulations regarding identification and numbering of above ground utility poles (16 NYCRR Part 217).

128. At least 14 days before the commencement of construction, the Certificate Holder shall hold a pre-construction meeting with DPS Staff, DAM, New York State Department of Transportation (DOT), Town Supervisors and Highway Superintendents, and DEC. The BOP construction contractor and the environmental compliance monitor shall be required to attend the preconstruction meeting.

a) An agenda, the location, and an attendee list shall be agreed upon between DPS Staff and the Certificate Holder prior to the meeting;

b) Maps showing designated travel routes, construction worker parking and access road locations and a general project schedule will be available at the meeting for the attendees;

c) The Certificate Holder shall supply draft minutes from this meeting to a representative of DPS Staff, DAM, DOT, Towns and the DEC for corrections or comments, and thereafter the Certificate Holder shall issue the finalized meeting minutes to all attendees;

d) If, for any reason, the BOP Contractor cannot finish the construction of the Project, and one or more new BOP contractors are needed, there shall be another preconstruction meeting with the same format as outlined above.

e) Throughout construction, the Environmental Compliance Monitor will notify the NYSDEC Regional Natural Resource Supervisor of any refinements in the schedule of construction activities in regulated wetland and adjacent areas as they are identified.

129. Construction work hours shall be limited to 7:00 a.m. to 8:00 p.m., on Monday through Saturday, and 8:00 a.m. to 8:00 p.m. on Sunday, with the exception of wind turbine construction activities which may need to occur during extended hours beyond this schedule on an as-needed basis to address unusual circumstances. Construction work hour limits apply to facility construction, and to construction-related activities including the delivery and unloading of materials, and maintenance and repairs of construction equipment at outdoor locations, since these activities can result in extensive noise, large vehicles idling for extended periods at roadside locations, and related disturbances.

a) The Certificate Holder shall alert the Town and On-Site Monitor when wind turbine construction activities will be

required to occur past 8:00 p.m. DPS Staff shall be notified if such extensions are being considered prior to extending construction work hours.

b) Notice of planned extra-hours construction shall be provided to residents of areas that may be affected by the noise, traffic or other aspects of construction, and appropriate measures taken to avoid, minimize and mitigate such impacts.

130. Construction in streams protected under Environmental Conservation Law (ECL) Article 15 shall comply with work period restrictions established in consultations with NYSDEC that are protective of fish spawning and migration. In protected streams classified as C(T or TS), B(T or TS), A(T or TS), or AA((T or TS), all instream work, as well as any work that may result in the suspension of sediment, is prohibited during the trout spawning and incubation period commencing October 1 and ending May 31, unless the Certificate Holder receives prior approval from the NYSDEC Regional Supervisor of Natural Resources.

131. Dates for the seasonal work period restrictions on in-stream work during Facility construction, established in consultation with NYSDEC, shall be included in the plan and noted on final construction detail drawings.

132. At least 10 days before construction, copies of all necessary transportation permits from the affected State, County, and Town agencies. Such permits shall include, but not be limited to: Highway Work Permit to Work Within Right-of-Way (ROW), Highway Utility Permit to Work Within ROW, Permit to Exceed Posted Weight Limit Roads, Traffic Signal Permit to Work Within ROW, Special Haul Permit for Oversized/Overweight Vehicles, and Divisible Load Overweight Permit.

133. At least 10 days before construction, copies of all necessary agreements with local utility companies for raising overhead wires where necessary to accommodate the oversized/overweight delivery vehicles.

134. The Certificate Holder will provide DPS Staff copies of all applicable local code requirements for the O&M building (i.e., building permits, certificate of occupancy, etc.) at least 10 days before construction.

135. The Applicant shall construct the Facility consistent with the DAM *Guidelines for Agricultural Mitigation for Wind Power Projects*, to the maximum extent practicable. This condition also requires the Certificate Holder to locate collection wires and facility components underground in prime agricultural land except where, in consultation with DPS and DAM, the parties agree that subsurface placement is impracticable. The Certificate Holder and/or Environmental Monitor will consult with DAM and DPS Staff during construction when deviation from the Guidelines is necessary. Mitigation measures shall include full restoration of temporarily disturbed agricultural land.

136. Post-construction monitoring and remediation of agricultural land impacted by the Facility will be conducted for a period of no less than two years following completion of initial restoration. The monitoring and remediation phase shall be used to identify lingering agricultural impacts associated with construction requiring mitigation and/or follow-up restoration.

137. Impacts to archeological and historic resources shall be avoided or minimized to the extent practicable. Construction, including site clearing or other disturbance, shall not be allowed in any areas that have not been reviewed and approved for the presence of cultural resources. The Certificate Holder shall indicate on final Site Engineering and Environmental Plans measures for avoidance of archaeological sites identified within the Facility site. The mapped locations of all identified archaeological sites within 100 feet (31 meters) of proposed Facility-related impacts shall be identified as "Environmentally Sensitive Areas" or similar on the final Facility construction drawings, and marked in the field by construction fencing with signs that restrict access. If complete avoidance of archaeological sites is not possible, the Certificate Holder shall consult with the New York State Office of Parks, Recreation and Historic Preservation

(NYSOPRHP) and DPS Staff to determine if Phase II investigations or mitigation is warranted. The results of any Phase II investigations and/or identification of mitigation measures will be included in the plans.

138. Except where crossed by permitted access roads or through use of temporary matting, streams shall be designated "No Equipment Access" or similar on the final Facility construction drawings and ROW clearing plans, and marked in the field. The use of motorized equipment shall be prohibited in these areas.

139. A buffer zone of 100 feet, referred to as "Restricted Activities Area" or similar on the final Facility construction drawings and ROW clearing plans, shall be established where Facility construction traverses streams, wetlands and other bodies of water. Restricted Activities Areas shall be marked in the field. Restrictions will include: no deposition of slash within or adjacent to a waterbody; no accumulation of construction debris within the area; herbicide restrictions within 100 feet of a stream or wetland (or as required per manufacturer's instructions); no degradation of stream banks; no equipment washing or refueling within the area; no storage of any petroleum or chemical material; and no disposal of excess concrete or concrete wash water.

140. The creation, modification or improvement of any permanent road/stream crossing must meet the following requirements:

a) Culvert pipes shall be designed to safely pass the 2% annual chance storm event;

b) Culvert pipes must be embedded beneath the existing grade of the stream channel;

c) Width of the structure must be a minimum of 1.25 times (1.25X) width of the mean high water channel; and

d) The culvert slope shall remain consistent with the slope of the adjacent stream channel. For slopes greater than 3%, an open bottom culvert must be used.

e) Before any such work, proposed plans must be submitted to NYSDEC for approval prior to construction. The requirements above may be adjusted, if agreed to by the NYSDEC, on a case-by-case basis.

141. As set forth in the approved Environmental Compliance Manual, legible "protected area" signs, exclusionary fencing, colored flagging, and/or erosion controls pursuant to the approved Storm Water Pollution Prevention Plan (SWPPP) shall be installed along the approved work area to protect and clearly identify the boundaries of non-work areas associated with wetlands, waterbodies, and wetland/waterbody setbacks (e.g., Additional Temporary Work Space setbacks, refueling restrictions, etc.). This shall be done prior to any disturbance or vehicular traffic through such areas. Signs, fencing, and silt fence must be removed following completion of the project and after all disturbed areas are appropriately stabilized and planted as described in the SWPPP and in certificate conditions.

142. Where underground collection lines will be installed in wetlands by open trenching, the top 12 inches of wetland top soil shall be removed first and temporarily placed onto a geo-textile blanket running parallel to the trench, if necessary. Wide-track or amphibious excavators shall be used for wetland installations. Subsoil dug from the trench shall be sidecast on the opposite side of the trench on another geo-textile blanket running parallel to the trench, if necessary. The length of the trench to be opened shall not exceed the length that can be completed in one day. This length of trench generally shouldn't exceed 1,500 feet in a wetland. Trench shall be backfilled with the wetland subsoil and the wetland top soil shall be placed back on top. All excess materials shall be completely removed to upland areas more than 100 feet from the wetland and suitably stabilized.

143. Where access roads are to be constructed through wetlands, a layer of geotextile fabric shall be placed across the wetland after removal of vegetation and before any backfilling occurs. The final road surface shall be covered with a minimum 1-inch depth of gravel in the area of the wetland crossing.

144. No turbid water resulting from dewatering operations, including water that has infiltrated the construction site, shall be discharged directly to or allowed to enter any wetland, stream or water body within the project area. All other necessary measures shall be implemented to prevent any visible increase in turbidity or sedimentation downstream of the work site. Turbid water resulting from dewatering operation shall be discharged directly to settling basins, filter bags, or other approved device or to an upland vegetated area prior to discharge to any wetland, stream or other water body within the project area. All other necessary measures shall be implemented to prevent any visible increase in turbidity or sedimentation downstream of the work site.

    Visibly turbid discharges from blasting, land clearing, grading or excavation and construction activities, or dredging operations shall not enter any surface water body. All necessary measures shall be implemented to prevent any visible increase in turbidity or sedimentation downstream of the work site, including but not limited to the use of:

    a) appropriately maintained upland settling basins;

    b) crushed stone, sand, straw bales, or silt screening (maximum opening size of U.S. Sieve Number 20) to filter turbid waters;

    c) "silt-bags" or similar pre-constructed structure designed to remove silt and sediment particles before they are discharged, or;

    d) grassy upland areas at a sufficient distance from the receiving water body to prevent a visually discernible turbid discharge to the receiving water.

145. Tree and vegetation clearing shall be limited to the minimum necessary for Facility construction. Surrounding trees and vegetation will not be cut down on any property solely to reduce turbulence or increase wind flow to the Facility. To reduce mortality to nesting/roosting birds and bats, all tree clearing activities (except for hazard

tree removal) shall be conducted between November 1 and April 1 and does not include tress less than or equal to 3 inches in diameter at breast height (DBH).

X. Facility Operation

146. The Certificate Holder shall operate the Facility in accordance with the IA, approved tariffs and applicable rules and protocols of National Grid, NYISO, NYSRC, NPCC, NERC and successor organizations.

147. The Certificate Holder shall operate the Facility to be in full compliance with the applicable reliability criteria of National Grid, NYISO, NPCC, NYSRC, NERC and successors. If it fails to meet the reliability criteria at any time, the Company shall notify the NYISO immediately, in accordance with NYISO requirements, and shall simultaneously provide the Board, or the Commission after the Board's jurisdiction has ceased, by filing with the Secretary and National Grid with a copy of the NYISO notice.

148. The Certificate Holder shall obey unit commitment and dispatch instructions issued by NYISO, or its successor, in order to maintain the reliability of the transmission system. In the event that the NYISO System Operator encounters communication difficulties, Cassadaga shall obey dispatch instructions issued by the National Grid Control Center, or its successor, in order to maintain the reliability of the transmission system.

149. After commencement of construction of the point of interconnection substation, the Certificate Holder shall file with the Secretary and provide to National Grid a monthly report on the progress of construction of the point of interconnection substation and an update of the construction schedule, and file copies of current construction progress reports during all phases of construction. In the event the Commission determines that construction is not proceeding at a pace that is consistent with the Interconnection Agreement between National Grid and the Certificate Holder ("Interconnection Agreement"), and that a modification, revocation, or suspension of the Certificate may therefore be warranted, the Commission may issue a show cause order requiring the Certificate Holder

to explain why construction is behind schedule and to describe such measures as are being taken to get back on schedule. The Order to Show Cause will set forth the alleged facts that appear to warrant the intended action. The Certificate Holder shall have thirty days after the issuance of such Order to respond and other parties may also file comments within such period. Thereafter, if the Commission is still considering action with respect to the Certificate, a hearing will be held prior to issuance of any final order of the Commission to amend, revoke or suspend the Certificate. It shall be a defense in any proceeding initiated pursuant to this condition if the delay of concern to the Commission:

a) arises in material part from actions or circumstances beyond the reasonable control of the Certificate Holder (including the actions of third parties);

b) is not in material part caused by the fault of the Certificate Holder; or

c) is not inconsistent with a schedule set forth in the Interconnection Agreement.

150. For purposes of this condition, Good Utility Practice shall mean any of the applicable acts, practices or methods engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability and safety. Good Utility Practice is not intended to be limited to the optimum practice, method, or act, to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region in which the Company is located. Good Utility Practice shall include, but not be limited to, NERC criteria, rules, guidelines and standards, NPCC criteria, rules, guidelines and standards, NYSRC criteria, rules, guidelines and standards, and NYISO criteria, rules, guidelines and standards, where applicable, as they may be

amended from time to time (including the rules, guidelines and criteria of any successor organization to the foregoing entities). When applied to the Company, the term Good Utility Practice shall also include standards applicable to an independent power producer connecting to the distribution or transmission facilities or system of a utility. Except for periods during which the authorized facilities are unable to safely and reliably convey electrical energy to the New York transmission system (e.g., because of problems with the authorized facilities themselves or upstream electrical equipment) Cassadaga shall be exclusively connected to the New York transmission system over the facilities authorized herein.

151. The Certificate Holder shall work with National Grid engineers and safety personnel on testing and energizing equipment in the authorized interconnection substation. A testing protocol shall be developed and provided to National Grid for review and acceptance. The Certificate Holder shall file with the Secretary a copy of the final testing design protocol within 30 days of National Grid acceptance.

    The Certificate Holder shall make a good faith effort to notify DPS Staff of meetings related to the electrical interconnection of the project to the National Grid transmission system and provide the opportunity for DPS Staff to attend those meetings.

152. The Certificate Holder shall call the Bulk Electric System Section within one hour to report any transmission related incident that affects the operation of the Facility. The Certificate Holder shall file with the Secretary a report on any such incident within seven days and provide to National Grid. The report shall contain, when available, copies of applicable drawings, descriptions of the equipment involved, a description of the incident and a discussion of how future occurrences will be prevented. The Certificate Holder shall work cooperatively with National Grid, NYISO, NYSRC, NERC and the NPCC to prevent any future occurrences.

153. If National Grid or the NYISO bring concerns to the Commission, the Certificate Holder shall be obligated to address those concerns, and shall make any necessary modifications to its Interconnection Facility if the NYISO or National Grid find such facilities are causing, or have caused, reliability problems to the New York State Transmission System.

154. If, subsequent to construction of the Facility, no electric power is generated and transferred out of such plant for a period of more than a year, the Commission may consider advising the Siting Board that the amendment, revocation or suspension of the Certificate may be appropriate.

155. In the event that a malfunction of the Facility causes a significant reduction in the capability of such Facility to deliver power, the Certificate Holder shall promptly file with the Secretary and provide to National Grid copies of all notices, filings, and other substantive written communications with the NYISO as to such reduction, any plans for making repairs to remedy the reduction, and the schedule for any such repairs. The Certificate Holder shall provide monthly reports to the Secretary and National Grid on the progress of any repairs. If such equipment failure is not completely repaired within nine months of its occurrence, the Certificate Holder shall provide a detailed report to the Secretary, within nine months and two weeks after the equipment failure, setting forth the progress on the repairs and indicating whether the repairs will be completed within three months; if the repairs will not be completed within three months, the Certificate Holder shall explain the circumstances contributing to the delay and demonstrate why the repairs should continue to be pursued.

156. In the event of a blade failure, fire or other catastrophic event involving a wind turbine and its associated equipment, the Department’s Chief of Bulk Systems shall be notified no later than 12 hours following such an event.

157. The Certificate Holder shall have an inspection program for the wind turbine blades and provide reports to the Secretary monthly on any damage, defects or any other

problems with the wind turbine blades. The report should include any photographs of the area in question, the repairs under taken and the diagram of the wind turbine blade.

158. The Certificate Holder shall conduct yearly ground testing of all wind turbine ground grids that are within 600 feet of gas lines or gas wells. The Certificate Holder shall provide the test results to the Secretary and the gas line operator.

159. The Certificate Holder shall file with the Secretary of the DPS, within one year after the Project becomes operational, a tracking report of the actual number of direct jobs created during the construction and operational phases of the Project, as well as the actual tax payments to local jurisdictions made during the Project.

APPENDIX B

CERTIFICATE CONDITIONS

REFERENCE CHART

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APPENDIX C

HEARING EXHIBIT LIST

14-F-0490

Cassadaga Wind LLC – Article 10 Application

Evidentiary Hearing Exhibit List

Hearing Exhibit No.	Date pre-filed or offered	Sponsoring Party	Pre-filed Designation and Short Exhibit Description	No. of Pages	DMM Filing No(s).
1.	6/16/2017	Brazell (Applicant)	(BRB-1) Pre-Filed Testimony	6	276
2.	6/16/2017	Brazell (Applicant)	(BRB-2) Wind Power Experience	5	276
3.	6/16/2017	Brazell (Applicant)	(BRB-3) DPS IR_1 Wetlands, Streams, and Environmental Sensitive Areas Supplement (filed as two separate parts)	52	276
4.	6/16/2017	Brazell (Applicant)	(BRB-4) DPS IR_46 Wetlands, Streams, and Environmental Sensitive Areas	39	276
5.	6/9/2017	Brazell (Applicant)	(BRB-5) Updated Wetland-Stream Impact Drawings	36	271
6.	6/9/2017	Brazell (Applicant)	(BRB-6) Applicant Response to DEC IR_3	47	271
7.	6/9/2017	Brazell (Applicant)	(BRB-7) DPS IR_2 and Supplement	8	271
8.	6/9/2017	Brazell (Applicant)	(BRB-8) Updated Layout Maps	2	271
9.	6/9/2017 &6/16/2017	Brazell (Applicant)	(BRB-9) Updated Preliminary Design Drawings	118	271 & 276
10.	6/9/2017	Brazell (Applicant)	(BRB-10) Updated Visual Assessment	49	271
11.	6/9/2017	Brazell (Applicant)	(BRB-11) Updated Impact Tables	3	271
12.	6/9/2017	Brazell (Applicant)	(BRB-12) Updated Shadow Flicker Analysis	223	271
13.	6/9/2017	Brazell (Applicant)	(BRB-13) Interior Forest Analysis	223	271

14.	6/9/2017	Nadeau (Applicant)	(MJN-1) Pre-Filed Testimony	4	271
15.	6/9/2017	Nadeau (Applicant)	(MJN-2) Updated EMF	77	271
16.	6/9/2017	Nadeau (Applicant)	(MJN-3) DPS Response to Applicant IR_4	23	271
17.	6/16/2017	Kaliski (Applicant)	(KK-1 / (a/i/a DMM filed title - RSG-1)) Pre-Filed Testimony	7	276
18.	6/16/2017	Kaliski (Applicant)	(KK-2 / RSG-2) Stipulation 19	6	276
19.	6/16/2017	Kaliski (Applicant)	(KK-3 / RSG-3) DPS Response to Applicant IR_2	4	276
20.	6/16/2017	Kaliski (Applicant)	(KK-4 / RSG-4) Environmental Sound Survey and Noise Impact Assessment (Arkwright)	61	276
21.	6/16/2017	Kaliski (Applicant)	(KK-5 / RSG-5) Environmental Sound Survey and Noise Impact Assessment (Jericho)	60	276
22.	6/16/2017	Kaliski (Applicant)	(KK-6 / RSG-6) Supplemental Sound Modeling Report	73	276
23.	6/16/2017	Kaliski (Applicant)	(KK-7 / RSG-7) Monitoring and Compliance Protocol	14	276
24.	6/16/2017	Kaliski (Applicant)	(KK-8 / RSG-8) Boone County ZBA Minutes (6/23/15)	26	276
25.	6/16/2017	Kaliski (Applicant)	(KK-9 / RSG-9) Suggested Certificate Conditions	21	276
26.	6/9/2017	Troy (Applicant)	Pre-Filed Testimony (DJT-1)	7	271
27.	6/9/2017	Mundt (Applicant)	CV (KM-1)	17	271
28.	6/9/2017	Mundt (Applicant)	Wind Turbines and Health Article (KM-2)	23	271
29.	6/9/2017	Mundt (Applicant)	Memo Regarding Epidemiology (KM-3)	21	271
30.	6/9/2017	Mundt (Applicant)	List of Testimony in Prior Matters (KM-4)	3	271
31.	6/9/2017	Mundt (Applicant)	Reference List (KM-5)	6	271

32.	6/9/2017	Mundt (Applicant)	Memo Regarding Updated Review and Synthesis of Epidemiological Literature on Wind Turbines and Human Health (KM-6)	27	271
33.	6/9/2017	McCunney (Applicant)	CV (RJM-1)	21	271
34.	6/9/2017	McCunney (Applicant)	References (RJM-2)	6	271
35.	----------	----------	----------Not Used----------		
36.	6/9/2017	Peterson (Applicant)	Pre-Filed Testimony (TSP-1)	8	271
37.	6/9/2017	Peterson (Applicant)	Memo Regarding NLEB Take Estimate (2/17) (TSP-2)	11	271
38.	6/9/2017	Peterson (Applicant)	Memo Regarding NLEB Take Estimate (5/17) (TSP-3)	5	271
39.	6/9/2017	Peterson (Applicant)	Cumulative Effects Analysis (TSP-4)	15	271
40.	6/9/2017	Peterson (Applicant)	Memo Regarding NLEB Take Estimate (6/17) (TSP-5)	10	271
41.	6/9/2017	Peterson (Applicant)	Memo Regarding NLEB Take and Net Conservation Benefit Plan (TSP-6)	3	271
42.	6/9/2017	Rice (Applicant)	Resume (JER-1)	5	271
43.	6/9/2017	Rice (Applicant)	JEDI Model (JER-2)	2	271
44.	6/9/2017	Rice (Applicant)	MRG & Associates Presentation (JER-3)	25	271
45.	6/9/2017	Wilmore (Applicant)	Pre-Filed Testimony (SW-1)	5	271
46.	6/9/2017	Wilmore (Applicant)	Updated Facility Map Reflecting the Elimination of six turbines (SW-2)	2	271
47.	6/9/2017	Wilmore (Applicant)	Correspondence from National Fuel (SW-3)	3	271
48.	6/9/2017	Wilmore (Applicant)	Applicant's Response to DEC IR_4 (SW-4)	10	271

49.	6/9/2017	Wilmore (Applicant)	Applicant's Update to the Application for Exhibit 10, 31 and 33 (SW-5)	33	271
50.	6/9/2017	Wilmore (Applicant)	Town Resolutions (SW-6)	8	271
51.	6/9/2017	Wilmore (Applicant)	Proposed Certificate Conditions (SW-7)	109	271
52.	05/12/17	DPS	Staff Policy Panel_Exhibit_14-F-0490_(SPP) – State Energy Plan - DPS Staff Certificate Conditions Tracking Sheet – PROPOSED CERTIFICATE CONDITIONS – APPENDIX A – GUIDELINES FOR THE DEVELOPMENT OF SITE ENGINEERING AND ENVIRONMENTAL PLAN COMPLIANCE FILINGS	187	244
53.	05/12/17	DPS	Andrew Davis_14-F0490_ Exhibit (ACD) - Andrew Davis CV – IR DPS 29 (Response) – Letter from Parks and Historic Preservation – Vestas Brochure – Laws of New York CHAPTER 481 – Map Boutwell Hill State Forest – Photograph of two circuit pole – Photo of undergrounding alternative – Photo of three circuit alternative	47	244
54.	05/12/17	DPS	Caitlyn Edmundson_14-F-0490_Exhibit_(ECC) – DPS 4, 38, 47	49	244
55.	05/12/17	DPS	Cary-Wheat Panel_ 14-F-0490_Exhibit_(CW)_[REDACTED] - DPS 33, 44, 51 -New York State Impacts on Wholesale Energy Market Prices & Air Emissions, based on DPS Staff Zonal Forecasts - Derivation of New York State Wholesale Energy Price Impacts, based on DPS Staff Zonal Forecasts (Backup for Exhibit_(CW-1)) -New York State Impacts on Wholesale EnergyMarket Prices & Air Emissions, based on Ever Power's Zonal Forecasts - Derivation of New York State Wholesale Energy Price Impacts, based on EverPower Zonal Forecasts (Backup for Exhibit_(CW-3))	13	244
56.	05/12/17	DPS	Consumer Services Panel-14-F-0490_Exhibit_(CSP) – DPS 53 - Stakeholder List and Public Notifications	212	244
57.	05/12/17	DPS	Daniel Connor_14-F-0490_Exhibit_(DRC) – DPS 10 - Preliminary Design Drawings -	8	244
58.	05/12/17	DPS	Edward C. Schrom_Exhbit_14-F-0490)(ECS) – DPS 20 & 26 -Electric Interconnection	9	244
59.	05/12/17	DPS	Engineering Panel_Exhibit_14-F-0490_(EP) – DPS 45 & 42 – Decommissioning	8	244
60.	05/12/17	DPS	Jeremy Flaum_Exhibit_14-F-0490_(JDF) – DPS 5 - Water Well Data, 6 - Horizontal Directional Drilling Locations, 11 - Existing Water Supply Well CU2387, 14 - Appendix HH - Draft Inadvertent Return Plan, 36 - Soils Characteristics	52	244

61.	05/12/17	DPS	Jeremy Rosenthal_Exhibit_14-F-0490_(JR)_[REDACTED] – DPS 1 – Wetlands, Streams, and Environmental Sensitive Areas, DPS 2 - Invasive Species, DEC 1 - Northern Long-Eared Bat (NLEB)	49	244
62.	05/12/17	DPS	Miguel Moreno-Caballero_Exhibit_14-F-0490_(MMC) – Informal information request – NARUC 2011 Report – Evans and Cooper Article – Kaliski and Duncan (Report on modeling parameters) – NARUC 2012 Report – List of DPS cases referenced – WSP Parsons Brinkerhoff 2016 Phase 2 Report - Guidelines for Community Noise, Berglund, Lindvall, Schwela (WHO Report) – Nighttime Noise Guidelines for Europe (2009 WHO Report) – Map showing mitigated sound levels -	781	244
63.	5/12/17	DEC	Resume of Brianna Denoncour	2	245
64.	5/12/17	DEC	Resume of Carl Herzog	2	245
65.	5/12/17	DEC	List of References Relied Upon by DEC	8	245
66.	5/12/17	DEC	Resume of Anne Rothrock	5	245
67.	5/12/17	DEC	Resume of Chris Legard	6	245
68.	5/12/17	DOH	HS-1 Company Responses to Staff Information Request DOH IR 1	27	247
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76.	05/25/17	CCCWP	Ex. B to same, Punch J, James R (2016) ("Wind Turbine Noise and Human Health: A Four-Decade History of Evidence that Wind Turbines Pose Risks", *The Journal* at Hearing Health & Technology Matters, available at <http://hearinghealthmatters.org/ journalresearchposters/>)	11	261
77.	05/25/17	CCCWP	Ex. C to same, Abrose, J, et al. (2016) (Comments to the Editor, Journal of the Acoustical Society of America, "Concerns regarding Health Canada's Community Noise Health Study (CNHS) design and conclusions in March 2016 Special Edition of JASA")	4	261
78.	05/31/17	CCCWP	Response to CW IR-1[5], (Punch J, James R, Pabst D (2010), "Wind turbine noise: What audiologists should know", *Audiology Today*) (Included in Exhibit 133, *infra*)	13	341
79.	05/31/17	CCCWP	Response to CW IR-1[6], Punch Supplementary References (Supplementary References to pre-filed direct testimony of Dr. Jerry L. Punch) (Included in Exhibit 133, *infra*)	6	341
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81.	05/15/17	CCCWP	Ex. RJ-1 to pre-filed direct testimony by Richard R. James, Resume for Richard R. James	8	248
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83.	05/15/17	CCCWP	Ex. RJ-3 to same, Punch J, James R, "40 Years of Wind Turbine Noise" ("Wind Turbine Noise and Human Health: A Four-Decade History of Evidence that Wind Turbines Pose Risks", *The Journal* at Hearing Health & Technology Matters (2016), available at <http://hearinghealthmatters.org/ journalresearchposters/>)	11	248
84.	05/15/17	CCCWP	Ex. RJ-4 to same, Kelley ND (1987) ("A Proposed Metric Assessing the Potential of Community Annoyance from Wind Turbine Low Frequency Noise Emissions", paper presented at *WindPower '87 Conference and Exposition*, USDOE Contract No. DE-AC02-82CH10093)	11	248
85.	05/15/17	CCCWP	Ex. RJ-5 to same, Hubbard HH (1982) ("Noise Induced House Vibrarions and Human Perception", *Noise Control Engineering Journal*)	7	248

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87.	05/15/17	CCCWP	Ex. RJ-7 to same, Swinbanks MA (2015) ("Direct Experience of Low Frequency Noise and Infrasound within a Windfarm Community", paper presented at *6th International Meeting on Wind Turbine Noise*, Glascow)	12	248
88.	05/15/17	CCCWP	Ex. RJ-8 to same, Bray W, James R (2011) ("Dynamic measurements of wind turbine acoustic signals, employing sound quality engineering methods considering the time and frequency sensitivities of human perception", paper presented at *NOISE-CON 2011*, Portland)	18	248
89.	05/15/17	CCCWP	Ex. RJ-9 to same, Schomer PD et al. (2015) ("A theory to explain some physiological effects of the infrasonic emissions at some wind farm sites", *J. Acoust. Soc. Am.*)	10	248
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92.	05/15/17	CCCWP	Ex. RJ-12 to same, Cooper S (2016) ("Reproducing wind farm infrasound for subjective testing – Just how accurate is the reproduced signal?", paper presented at the *171st Meeting of the Acoustical Society of America*)	15	248
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