North Seneca Solar Project

ORES Permit Application No. 23-00036

1100-2.9 Exhibit 8

Visual Impacts

Revision 1

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EXHIBIT 8 VISUAL IMPACTS

(a) Visual Impact Assessment

On behalf of North Seneca Solar Project, LLC (the Applicant), Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services D.P.C. (EDR) completed a Visual Impact Assessment (VIA; see Appendix 8-A) and a Visual Impact Minimization and Mitigation Plan (VIMMP; see Appendix 8-B) for the North Seneca Solar Project (the Facility). The VIA and VIMMP were prepared in support of the Facility's review under Title 16 of New York Code, Rules and Regulations (19 NYCRR) Section 1100-2.9 and Article VIII of the New York State Executive Law, hereafter referred to as Article VIII. It is intended to assist the Office of Renewable Energy Siting (ORES), other state agencies, interested stakeholders, and the public in their review of the proposed Facility in accordance with the requirements of Article VII. The purpose of the VIA and VIMMP are to describe the appearance of the visible components of the proposed Facility, define the aesthetic character of the visual study area, inventory and evaluate existing visual resources and viewer groups within the 2-mile visual study area (VSA), evaluate potential Facility visibility within the VSA, identify representative views for visual assessment, assess the visual impacts associated with the proposed Facility, and discuss measures that have been proposed or considered to minimize or mitigate visual impacts. These reports were submitted to ORES on March 4, 2024. On May 3, 2024, ORES issued a Notice of Incomplete Application (NOIA) detailing additional information requirements related to Facility visibility, visual impacts, and visual mitigation measures. To provide additional information in response to the NOIA, EDR prepared a revised VIA and VIMMP (Appendix 8-A VIA – Revision 1 and Appendix 8-B VIMMP – Revision 1).

(1) Character and Visual Quality of the Existing Landscape

The character and visual quality of the existing landscape is described in Section 3 of the VIA. This section of the report provides details on the physiographic/visual setting, distance zones, landscape similarity zones, viewer/user groups, and visually sensitive resources within the VSA.

The VSA is located within the Eastern Great Lakes Lowlands Ecoregion that extends across northern New York and surrounds Lake Ontario. This ecoregion consists of flat lake plains that have been shaped by glacial lakes and episodic glacial flooding. Due to the presence of productive, loamy soils, much of the region was cleared for agriculture or development and mostly small, scattered woodlots remain today. Although dairy and livestock farming are most common, the soils and climate of the Ontario Lowlands are also suitable for growing fruit, vegetables, and other specialty crops. Water features within the VSA consist primarily of creeks, small ponds and lakes, and wetlands. Creeks in the VSA are characterized by narrow creek beds lined with dense forest vegetation, or broader, less well-defined channels surrounded by wetland vegetation. The most significant water feature is the Cayuga and Seneca Canal, which angles southwest through the Village of Waterloo and forested land in the southern portion of the VSA, and Junius Ponds, which are located in the northwest portion of the VSA. For information on landform, land use, and water features in the VSA, see Section 3.2 of the VIA.

Distance zones are typically defined in visual studies to divide the VSA into distinct sub-areas based on the various levels of landscape and project detail available to the viewer. Due to the characteristics of the landscape and project being evaluated, EDR defined the following distance zones: near-foreground (0 to 300 feet), foreground (300 feet to 0.5 mile), middle ground (0.5 to 4.0 miles), and background (over 5.0 miles). For information on distance zones, see Section 3.1.1 of the VIA.

Landscape similarity zones (LSZs) provide a useful framework for the analysis of a project's potential visual effect and were used to define distinct landscape types within the VSA based on the similarity of various landscape characteristics, including landform, vegetation, water, and land use patterns. Six distinct LSZs were identified within the VSA: Agricultural/Rural Residential, Forest, Village, Open Water, Transportation, and Commercial. Descriptions of these LSZs, information on data sources used for delineation, and locations within the VSA are included in Section 3.3 of the VIA. Attachment A of the VIA includes figures showing the extent of each LSZ overlaid with viewpoint locations and the viewshed analysis results at 1:24,000 map scale.

Visually sensitive resources within the VSA are discussed in Section (a)(10) herein and Section 3.5 of the VIA.

(2) Visibility of the Facility

A description of all visible components of the proposed Facility is included in Section 2.2 of the VIA. These components include the photovoltaic (PV) panels, their racking/support systems, inverters, security fencing, access roads, a collection substation and point of interconnection (POI) substation, a short length of overhead transmission line, six transmission structures near the POI, and a storage trailer. In addition, vegetation clearing proposed to accommodate installation of the various Facility components is illustrated in the photographic simulations (photosimulations) assessed in the VIA and is considered in the viewshed analysis. See Section (b) for information regarding the methodology and results of the viewshed analyses conducted for Facility components and Sections (a)(5) and (a)(9) for information regarding Facility lighting and glare.

(3) Visibility of all Above-Ground Interconnections and Roadways

See Section (b) for information regarding the methodology and results of the viewshed analysis conducted for the collection substation, POI substation, and transmission structures (collectively referred to as the interconnection facility in the VIA).

As discussed in Section 2.2.4 of the VIA, the proposed Facility includes a network of new or improved access roads to allow for delivery of Facility components during construction and access to the Facility for maintenance purposes during operation. The access roads are anticipated to be surfaced with crushed stone or gravel and will be 16 to 20 feet wide. Permanent access roads and the interconnection facility are shown in the photosimulations where they will be visible (see Attachment D in the VIA).

(4) Appearance of Facility upon Completion

Representative elevations of Facility components with dimensions are included in Section 2.2 of the VIA. As described in Section (a)(6) of this Exhibit and Section 4.2.2 of the VIA, three-dimensional modeling software was used to create realistic photographic simulations to illustrate the appearance of the Facility upon completion.

(5) Proposed Facility Lighting

Permanent light sources anticipated at the Facility are safety/security lighting to be installed at the site of the collection substation and POI substation. Lighting will use the lowest intensity required to assure safety and security. Permanent lighting at these Facility components is discussed in greater detail in the VIMMP, and photometric plans are included in Appendix 5-B.

(6) Representative Views (Photographic Overlays) of the Facility

To show anticipated visual changes associated with the operational Facility, three-dimensional (3D) modeling software was used to create realistic photosimulations of the proposed Facility from 11 viewpoints. The model creation and camera alignment process is described in Section 4.2.2 of the VIA. Representative elevations of Facility components with dimensions are included in Section 2.2 of the VIA.

As described in Section 4.2.2 of the VIA, 12 viewpoints were initially selected for photosimulation development. However, Facility components were determined to be substantially screened in one of the views. For this view (Viewpoint 47 from State Route 318), a wireframe rendering was prepared to illustrate the degree of screening provided by existing landscape features within the photograph. The photosimulations and wireframe renderings are included in Attachment D of the VIA. The viewpoint selection criteria used to determine which viewpoints were selected for photosimulation and wireframe rendering development is discussed in Section 4.2.1 of the VIA and in Section (b)(4) herein.

(7) Visual Change Resulting from Construction of the Facility and Above-Ground Interconnections

Temporary visual impacts associated with the construction of the Facility are described and illustrated with representative photographs in Section 5.2.4 of the VIA. These impacts will be relatively minor and temporary in nature. Anticipated visual effects during construction will include a temporary increase in traffic, gravel-surfaced temporary laydown areas, temporary erosion control measures, temporary soil disturbance, and addition of construction workers, equipment, and materials to certain views. Large construction equipment, including dump trucks, concrete trucks, excavators, and delivery vehicles will be present over the course of several months. All temporary site disturbance resulting from Facility construction will be restored and revegetated after construction activity is complete.

(8) Visual Change Resulting from Operation of the Facility and Above-Ground Interconnections

To evaluate anticipated visual change associated with the Facility, photosimulations of the operational Facility were compared to photos of existing conditions by a rating panel of visual professionals. The rating process is described in greater detail in Section (c)(3) herein and Section 4.2.3 of the VIA.

The potential cumulative visual effect of the Facility with other renewable energy projects currently operating or proposed in the surrounding region are evaluated in Section 5.2.5 of the VIA.

(9) Analysis of Related Operational Effects of the Facility

A glare analysis was completed to assess the potential for reflected glare and glint from the proposed PV panels to occur at sensitive observation points (such as residences and commercial buildings, airports, and roadways) surrounding the Facility. This analysis was conducted using Sandia National Laboratories Solar Glare Hazard Analysis Tool (SGHAT) methodology. The results of this analysis indicate that none of the identified potentially sensitive receptors will receive glare associated with the PV panels. For additional information on the glare analysis, see Attachment C of the VIMMP.

(10) Visually Sensitive Resources

Visually Sensitive Resources (VSRs) within the VSA were identified in accordance with guidance provided by New York State Department of Environmental Conservation (NYSDEC) Program Policy *DEP-00-2 Assessing and Mitigating Visual and Aesthetic Impacts* and the requirements of Section 94-c. The categories of VSRs identified and evaluated in the VIA include properties of historic significance, designated scenic resources, public lands and recreational resources, high-use public areas, native American lands, and resources identified during visual outreach. Sources consulted to identify resources include publicly available geospatial databases, the Historic Resources Survey Report and Effects Assessment prepared for the Facility (Appendix 8-D of the 94-c Application), local and regional planning documents, and agency and stakeholder outreach. A total of 45 VSRs were identified in the VSA: 20 properties of historic significance, 15 public lands and recreational resources, 7 high-use public areas, and 3 resources identified during visual outreach.

Significant resources beyond the VSA were identified within a 5-mile radius area of the Facility. The category of resources identified is based upon the NYSDEC definition of aesthetic resources of statewide significance. A total of 25 significant visual resources were identified, including one historic landmark, one state historic site, one state park, and 22 properties/districts listed on the State or National Register of Historic Places (S/NRHP).

For additional information on VSRs identified in the VSA, see Section 3.5 of the VIA. See Attachment G of the VIA for an overview of the comments received and actions taken as part of the visual stakeholder outreach process.

An evaluation of potential visual effects of the Facility on VSRs within the VSA was completed based upon 1) viewshed analysis, which was used to determine the geographic area of potential Facility visibility within each resource and the distance zone(s) in which these views will occur, 2) the photosimulation visual contrast evaluation results, 3) line-of-sight cross section analysis, which was used to determine the source and extent of PV panel visibility that is likely to occur in views from VSRs where no photosimulation was produced, and 4) field review results. For information on potential visual effects associated with the Facility from VSRs identified in the VSA, see Section 5.2.2 of the VIA.

(b) Viewshed Analysis

(1) Viewshed Mapping

Maps with the viewshed results overlaid with VSRs, viewpoint locations, distance zones, and LSZs are presented at 1:24,000 map scale in Attachment A of the VIA. Potential visibility of the PV panels and interconnection facility for each VSR is also indicated in tabular format in Attachment C of the VIA. As described in Section 4.1 and 5.1.3 of the VIA, field review was completed to confirm the results of the viewshed analysis. Field review largely confirmed the accuracy of the viewshed results. It was observed during field review that areas where viewshed analysis suggested large contiguous areas of visibility in the near-foreground and foreground distance zones generally provided the most open and uninterrupted views towards the Facility Site.

(2) Viewshed Methodology

The viewshed analysis methodology is described in Section 4.1.1 of the VIA. Digital Surface Model (DSM) based viewshed analyses, which consider the screening effects of topography, structures, and vegetation, were conducted to identify areas where the PV panels and interconnection facility would potentially be visible. The analyses were prepared using Digital Elevation Model (DEM) and DSM data derived from publicly available light detection and ranging system (LIDAR) data, an assumed eye-level viewer height of six feet, sample points representing the Facility components based upon location and height data provided by the Applicant, and Environmental Systems Research Institute (ESRI) ArcGIS Pro® software with the Spatial Analyst extension. Because it accounts for screening provided by topography, vegetation, and structures, the DSM viewshed analysis is the best available representation of potential visibility of the proposed PV panels and interconnection facility.

(3) Viewshed Mapping and Viewpoint Selection

As described in Section (b)(4) herein and Section 4.2.1 of the VIA, potential visibility of the Facility based on the results of the viewshed analysis were one of many factors considered in the selection of viewpoints for the development of photosimulations and subsequent evaluation by a rating panel of visual professionals. Maps with the viewshed results overlaid with VSRs, viewpoint locations, distance zones, and LSZs are presented at 1:24,000 map scale in Attachment A of the VIA.

(4) Viewpoint Selection and Stakeholder Outreach

As described in Section 4.2.1 of the VIA, photosimulations were developed from 11 viewpoints based upon the following criteria:

- They provide open views of the proposed PV panels and/or interconnection facility.
- They illustrate different amounts of PV panel visibility from a variety of viewing distances and geographic locations to represent the range of visual change that will occur with the Facility in place.
- They illustrate views from significant locations including:
    - VSRs and LSZs where open views will be available
    - Locations with a high degree of visual exposure for representative viewer/user groups, such as densely populated areas or highly trafficked roadways
    - Locations recommended by state agencies, municipal representatives, and/or local stakeholders.
- They illustrate views of the Facility from locations representative of existing and future land uses within the VSA.
- They illustrate views where there is potential for cumulative impacts with other existing or proposed renewable energy facilities.

The viewpoints selected for photosimulation development and subsequent rating panel assessment are listed in Table 4.2-1 of the VIA. The visual outreach process, including an overview of the recommendations received from stakeholders for locations suitable for the development of photosimulations, is included in Attachment G of the VIA.

(i) Representative of typical views or direct line-of-sight views

As discussed in Section 4.2.1 and Section 4.2.2 of the VIA, the photograph selected for photosimulation development provided the most open and unobstructed views available toward the Facility from each location.

(ii) Significance of Viewpoint and Designated Scenic Resources

As discussed, VSRs were one criterion considered during the viewpoint selection process, which is described in Section 4.2.1 of the VIA. Table 4.2-1 of the VIA identifies if the viewpoint is representative of views that are available from identified VSRs. Additional contextual information is also included in the cover sheets for each photosimulation included in Attachment D of the VIA.

(iii) Level of Viewer Exposure

Viewer/user groups identified in the VSA are described in Section 3.4 of the VIA based on activity, duration of views, exposure to the Facility, and likely sensitivity to visual change. Viewer/user groups include local residents, through-travelers, and tourists and recreational users. A building density analysis was conducted to determine where viewer exposure is highest for local residents. This analysis indicates that viewer exposure for local residents will be highest in and near the Village of Waterloo. To determine where viewer exposure would be highest for through-travelers, the New York State Department of Transportation average daily traffic count data was consulted. These data suggest that viewer exposure will be highest for travelers on Interstate 90, US Route 20, and several state routes, which occur throughout the VSA. Tourist and recreational users within the VSA are assumed to be concentrated in parks, trails, and resources that accommodate recreational activities, which are identified as VSRs. VSRs that are likely to receive the highest visitation include Women's Rights National Historic Park (VSR ID # 11), Seneca-Cayuga Canal Trail (VSR ID # 15), Oak Island Park (VSR ID # 18), and Waterloo Community Center (VSR ID # 20), which are concentrated in or near the Village of Waterloo. Tourists and recreational users may also occasionally visit other VSRs in the study area, but visitation at these sites would likely be significantly lower. Locations with high viewer exposure (highways, villages and higher density residential areas, and VSRs) and potential Facility visibility were considered during the viewpoint selection as described in Section 4.2 and summarized in Table 4.2-1 of the VIA.

(iv) Proposed Land Uses

As discussed in Section 3.2.3 of the VIA, EDR consulted town planning and zoning documents to define future land use areas for towns within the VSA. Agriculture and low-density residential development are the predominant future land uses anticipated within the Facility Site and the VSA. As described in town planning and zoning documents, these lands are desired to remain in active agricultural production, low density rural residential development, and/or open space use. Due to the location of the Facility on agricultural land, potential Facility visibility is anticipated to be concentrated to agriculture/rural residential future land use areas. Consequently, the majority of the viewpoints that were selected for the development of photosimulations fall within these areas, as indicated in Table 4.2-1 in the VIA.

(v) Local Laws and Ordinances

As discussed in Section 4.2.4 of the VIA, relevant local laws and ordinances of host communities were reviewed to identify any potential requirements pertaining to the assessment of visual impacts that are applicable to the proposed Facility. One requirement from for site plan review pertaining to screening was identified in Chapter 134 of the Town of Waterloo Town Code. The viewshed analysis and visual contrast evaluation conducted as part of the VIA allows concerns of the Town of Waterloo regarding screening of the Facility to be taken into consideration during the Section 94-c review process.

(c) Visual Contrast Evaluation

As described and Section 4.2.2 of the VIA and Section (b)(4) herein, 3D modeling software was used to create realistic photosimulations from 11 viewpoints and a wireframe rendering from one viewpoint. The rating panel evaluation process and results are described in Sections 4.2.3 and 5.2.1 of the VIA and summarized in Section (c)(3) of this Exhibit.

(1) Photographic Simulations of the Facility and Vegetation Screening

As described in Section (b)(4) herein, photograph(s) selected for photosimulation development from each viewpoint illustrate the most direct and unobstructed view available towards the Facility Site from each location. It should be noted that some of the baseline photography was taken during leaf-on conditions. However, existing vegetation in these photographs would have minimal to negligible effects to Facility visibility, and leaf-off photographs from these vantage points are not expected to affect the results of the VIA.

(2) Additional Revised Simulations illustrating Mitigation Measures

All proposed minimization and/or mitigation measures that were proposed for the Facility and evaluated in the VIA, were included in the photosimulations in Attachment D of the VIA. Following the completion of the VIA, the mitigation planting plan was enhanced to provide increased screening/softening views of the Facility from VSR ID # 39 (Quaker Cemetery, Viewpoint 41). Updated photosimulations have been prepared for Viewpoint 41 depicting the updated plantings (see Attachment H of the VIA). The planting plan was also revised to soften the views along the perimeter of VSR ID # 33 (Farmstead at 1067 Route 96, Viewpoint 13). Module 4 is proposed in this location to maintain the agricultural context of the resource, while screening/softening the view of the Facility. The enhanced plantings would not be visible from Viewpoint 13 and therefore updated photosimulations from this viewpoint were not prepared. The VIMMP provides additional information on mitigation measures proposed for the Facility.

(3) Photographic Simulations Visual Impact Rating

To evaluate anticipated visual change associated with the Facility, the visual simulations of the operational Facility were compared to photos of existing conditions at each of the 11 selected viewpoints. These "before" and "after" photographs, identical in every respect except for the Facility components and vegetative clearing shown in the simulated views, were provided to a rating panel of visual professionals.

The rating panel evaluation results indicate that the visual impact associated with the proposed PV panels will be variable and strongly related to distance of the viewer and the expansiveness of PV panel visibility. Based on the contrast rating scores and comments, greater levels of contrast can be anticipated where open views of PV panels are available from close distance, which tended to heighten the Facility's contrast with existing elements of the landscape in terms of line, form, and color.

Conversely, contrast is reduced when the PV panels are partially screened or viewed at greater distances. At viewing distances greater than 0.3 miles from the Facility, insignificant to minimal/moderate visual contrast is anticipated. The rating panel results suggest that the proposed mitigation was most effective in reducing visual contrast when the plant material provided effective screening of large portions of the Facility without screening/blocking distant landscape features, or when they introduced a new aesthetic feature into the view that provided additional interest. The plantings were least effective in locations where environmental constraints prevented the installation of taller growing species and in long distance views where only a small portion of the PV arrays are screened.

The methodology and results of the visual contrast evaluation conducted for the Facility are included in Sections 4.2.3 and 5.2.1 of the VIA. The rating panel instructions along with the completed rating forms and resumes of the rating panel members are included in Attachment F of the VIA. Attachment D of the VIA includes the photosimulations, contextual information sheets, written summaries of the existing and proposed views, and tables summarizing the rating panel scores.

Following completion of the VIA and rating panel evaluation, the photosimulations were updated where proposed layout changes are proposed or where the mitigation planting plan was revised to provide increased screening/softening views of the Facility from sensitive areas. Updated photosimulations were prepared for Viewpoints 25 and 26, which include the interconnection facility and revised PV panel layout near Ninefoot Road, and Viewpoint 41, which includes the revised mitigation plantings along the perimeter PV array located on Ninefoot Road near Quaker Cemetery (VSR ID # 39). These photosimulations are included in Attachment H. As discussed in Section 5.2.1 of the VIA, visual contrast at Viewpoint 25 may be somewhat lower without the substation, a commensurate increase can be anticipated resulting from the addition of the substation in Viewpoint 26.

(d) Visual Impact Minimization and Mitigation Plan

The VIMMP outlines the various measures proposed or considered by the Applicant to avoid, minimize, and mitigate potential adverse visual impacts associated with the Facility. The mitigation measures required for consideration in Section 1100-2.9(d) are listed in tabular format and discussed. Studies and plans that provide information on the conceptual planting plan, glare, and lighting are included as Attachments to the VIMMP.