Appendix 24-1:

Visual Impact Assessment

Visual Impact Assessment

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Excelsior Energy Center
Town of Byron, New York

Prepared For:

Excelsior Energy Center, LLC
700 Universe Boulevard
Juno Beach, Florida 33408

Prepared By:

TRC
650 Suffolk Street
Lowell, Massachusetts 01854

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ATTACHMENTS

1.0 INTRODUCTION

Excelsior Energy Center, LLC, a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC is proposing to construct, operate, and maintain the Excelsior Energy Center (Project), and is submitting an Article 10 application to the New York State Board on Electric Generation Siting and the Environment in pursuit of a Certificate of Environmental Compatibility and Public Need.

Provided herein is a Visual Impact Assessment (VIA) that addresses the potential for visual impacts from the major components of the Project. The focus of this VIA includes the assessment of potential visual impacts from the proposed solar panels, energy storage system and the Project collection substation.

Within the framework of the Article 10 process, the purpose of this VIA is to:

- Describe the visual character of the Visual Study Area (VSA),
- Perform a visual resources inventory that identifies potentially sensitive receptors,
- Evaluate potential Project visibility within the VSA,
- Provide the results of computerized visualization studies that support the evaluation of Project visibility as well as field observations during the site visits, and
- Assess the visual impacts associated with the proposed Project.

The VIA was performed according to the requirements in 16 New York Codes, Rules and Regulations (NYCRR) §1001.24 with results included within Exhibit 24 in the Article 10 application. The VSA for the Project is a 5-mile radius around the fence line of the Facility.

2.0 THE PROJECT

The Excelsior Energy Center (the Project) will have a generating capacity of 280 megawatts (MW) in addition to a 20 MW/4-hour duration energy storage system. The Project will be located on land leased from owners of private property in the Town of Byron, Genesee County, New York. Proposed Project Components include commercial-scale solar arrays, access roads, inverters, fencing, buried electric collection lines, energy storage system, and electrical interconnection facilities.

The Project also includes a proposed collection substation and interconnection facilities to be located on land within the Project Area adjacent to the New York Power Authority's (NYPA's) 345-kilovolt (kV) Line #DH2 between the Niagara and N. Rochester substations. The proposed interconnection facilities will include a 345-kV switchyard that will be transferred to NYPA to own and operate. Figure C.200 in Attachment 1 shows the site plan and Figure 1 in Attachment 2 shows the site location on an aerial photo.

Solar Arrays: The Project proposes to install a tracker racking system. As the technology is rapidly evolving for solar panel technology, and market conditions at the time procurement decisions need to be made are unknown at this time, the Applicant is proposing in the Article 10 Application to evaluate both tracking and fixed racking systems, with the final decision to be made and detailed in a compliance filing.

However, for the purposes of assessing visual impacts, the VIA analyses and discussion focuses on the tracker layout, which has the higher aboveground height of the two systems and evaluates the worst-case scenario. The tracker system in all analyses is set at 13 feet above ground surface (height at maximum tilt).

The tracking system to be utilized would be similar to the Gamechange Solar Genius Tracker™, specification sheets of which have been included in Appendix 2-1 of Exhibit 2. Regardless of the type of array racking system ultimately selected for the Project, the Applicant intends to utilize a solar module similar to the Jinko Solar Eagle 72HM G2 380-400 Watt Mono Perc Diamond Cell. Specification sheets for this module as well as the tracker system has been included in Appendix 2-1 of the Application.

Inverters: Inverters will be located throughout the solar arrays. Their purpose is to convert direct current (DC) electricity generated by the solar modules into alternating current (AC) electricity. Cables from the solar modules are run to the inverters using a CAB® cabling system or underground lines. From the inverters, underground collection lines then convey electricity to the Project collection substation and ultimately to the existing electric transmission system. The Applicant intends to use a Power Electronics HEM inverter, or a similar inverter. A specification sheet has been included in Appendix 2-2 in Exhibit 2 of the Application.

Access Roads: Roads within the Project Area used to access solar arrays will follow existing farm roads and trails, where practicable, to minimize the need for new roads. The same access roads used during construction will be used during operation of the Project and will be gravel surfaced and approximately 16 feet wide.

Collection Lines: The 34.5-kV collection lines will connect the solar arrays with the Project collection substation. The total length of collection line being included as part of the Application for the Project is approximately 37.73 miles. Collection lines will be installed underground via direct burial (approximately 196,304 feet) and horizontal directional drilling (HDD) (approximately 2,929 feet).

Fencing: Fencing will be placed around the perimeter of the arrays and associated structures. Fencing will be chain-link and seven feet in height and will only be topped with barbed wire around the perimeter of the collection substation and switchyard.

Project Collection Substation: The 34.5-kV collection lines within the Project Area will gather power from the solar arrays and transport it to a new collection substation that will step up the

voltage to 345 kV. The collection substation will be located adjacent to solar panels off of Batavia-Byron Road (CR 19A).

Project Interconnection Facilities: Power from the collection substation will be transported to an immediately adjacent switchyard and then interconnected via two proposed 160-foot 345-kV transmission lines to the existing NYPA 345-kV Line #DH2 between Niagara and N. Rochester substations.

Energy Storage Systems: The Project also includes an energy storage system with a capacity of 20 MW for a 4-hour duration. There are 11 energy storage systems located throughout the Project Area adjacent to Project inverters. The energy storage systems are anticipated to be approximately 11 feet 4 inches in height, thus, are approximately 1 foot 8 inches lower in height against the proposed 13-foot-high solar arrays. The final specifications for energy storage systems to be used will be detailed in a compliance filing. The Samsung SDI lithium ion energy storage system, detailed in Appendix 2-3 in Exhibit 2 of the Application, is being evaluated.

The following definitions will be used to describe various areas or boundaries of the Project:

Project: the proposed Excelsior Energy Center solar facility.

Project Area: the 3,418-acre area encompassing all Project parcels located within the Town of Byron.

Component or Facility: an individual piece, or collection of equipment or improvement of the Project, including a solar array, access road, fencing, inverters, buried electric collection lines, energy storage system, electrical interconnection facilities, and laydown areas.

VSA: A 5-mile radius around the fence line of the Facility specifically designated for the study of visual impacts.

3.0 CHARACTER OF THE EXISTING LANDSCAPE

Solar panels are proposed in the Town of Byron, New York. The VSA is a 5-mile radius and includes Genesee and Orleans Counties. The definition of the VSA is 5 miles around the fence line of the solar arrays. As a result of the larger Study Area under consideration, a number of additional towns are included over that of the Project location in Byron, New York.

Distance Zones are assigned within the VSA as required by Article 10. Currently, Distance Zones of 0.5 miles, 2 miles, and 5 miles are proposed. The towns within the VSA include:

- Towns Within 0.5-Mile Distance Zone: Byron, Elba, and Stafford.
- Towns within 2-Mile Distance Zone: Batavia, Bergen, Byron, Elba, LeRoy, and Stafford.

- Towns within 5-Mile Distance Zone: Batavia, Bergen, Byron, Elba, LeRoy, and Stafford; City of Batavia; and Villages of Bergen, Elba, and LeRoy in Genesee County; and Towns of Barre, Clarendon, and Sweden in Orleans County.

3.1 Physiography, Landform, and Land Use Patterns

The Project is in the Town of Byron and is located in the northeastern part of Genesee County. It is in the Erie-Ontario Lowlands and Finger Lakes Region Major Land Resource Area. The northern half of the VSA is within the Erie-Ontario Lowlands Physiographic Province, while the southern half lies within the Allegheny Plateau. These province demarcations are influenced in part by terrain. Within the VSA, terrain elevations trend higher from north to south as one moves from the Erie-Ontario Lowlands to the Allegheny Plateau.

Elevations within the entire VSA from the Project out to 5 miles range from 565 to 1,000 feet mean sea level (msl). However, elevations over the entire site where arrays are located only range from 605 to 755 feet msl. Within Distance Zone 1 elevation changes are moderate ranging from 590 feet to 796 feet msl. Byron is included in most of Distance Zone 1. In Distance Zone 2 between 0.5 and 2 miles, which still includes much of Byron, elevations range from 577 to 914 feet msl with elevations trending higher to the south generally in Elba, Batavia, and Stafford. Elevation ranges in Distance Zone 3 between 2 and 5 miles are from 565 to 1,000 feet msl where terrain is highest in the Towns of Batavia, Stafford, and LeRoy and the City of Batavia.

The landscape in the VSA and in the central portion where the project is located is primarily a rural mix of open farmland consisting of hay, corn, silage corn, wheat, barley, rye, oats, soybeans, sweet corn, beets, cabbage, dry beans, snap beans, lima beans, spinach, carrots, green peas, squash, pumpkins, potatoes, and onions. Farmland exists with several small intermittent blocks of forest groups interspersed throughout. The majority of the VSA lies within Agricultural District #4. The Town of Byron has a population of approximately 2,400 people. Residential development is scattered throughout the VSA with areas of denser developed hamlets such as Byron Center and South Byron. However, approximately 3.2 miles to the southwest is the City of Batavia with a population of approximately 15,000 people.

The Byron-Bergen Swamp is national natural landmark consisting of approximately 2,000 acres of land within the Towns of Byron and Bergen. The swamp is located less than 1 mile from the nearest parcel in the northeastern section of the Project just north of Swamp Road. This area provides recreational land to the community as well as a supporting environment for breeding birds and high plant diversity.

Several named streams cross the Town. The most notable is Black Creek, which enters the Town from Stafford to the south and turns easterly just north of Byron (Center), then meanders through the Byron-Bergen Swamp on its way to Bergen and eventually the Genesee River. There are several named tributary streams to Black Creek, including Spring Creek, Bigelow Creek and

Robins Brook. Several other unnamed tributaries, most draining to either Black Creek or one of its named tributaries, exist throughout the Town.

Roadways in a Project Area ultimately are important to understand since they are one of several viewer groups that may receive visual impacts. This viewer group could consist of local community, commuter, or tourist constituency on a daily or infrequent basis. To help describe the rural nature of the area and thus provide an understanding of the quantity of viewers by road travel, annual average daily traffic (AADT) counts are provided in the Table 1 listing of roadways in the area. AADT is a measure used primarily in transportation planning and transportation engineering. Traditionally, it is the total volume of vehicle traffic of a highway or road for a year divided by 365 days. For perspective, highways such as Interstate 90 (I-90) have an AADT of 40,041, while Byron-Elba Road, a local road running through the Project, has an AADT of 2,676. Other local roads that run through the Project, such as Caswell and Cockram Roads, have AADTs of 196 and 458, respectively.

Table 1. Available Traffic Data within the VSA

Route/ Road Name	From	To	AADT	Count Year
Bank State Road (CR 13)	Byron TL	NY 262	3,387	2014
Batavia Byron Road (CR 19A)	Byron Road	Walkers Corners Road	1,573	2015
Byron Elba Road East (NY 262)	Rt 237	Junction Rt 19 End Rt 262	2,676	2014
Byron Elba Road – West (NY 262)	NY 262 Ford Road	Start 98/262 OLAP	1,890	2014
Byron Holley Road (NY 237)	Rt 33	Rt 262 Byron	1,178	2014
Caswell Road	CR19/Walkers Corners	Cockram Road	196	2011
Clinton Street (NY 33)	CR 19B Prole Road	Rt 237	6,441	2015
Cockram Road	CR 19A	Caswell Road	458	2010
Cole Road – East	NY 237	Swamp Road	149	2011
Tower Hill Road	CR 42	SR 237	169	2010
Transit Road (CR 42)	Watson Road	Elba T/L	223	2016
Walkers Corner Road (CR 19)	Caswell Road	NY 237	748	2011

Table 1. Available Traffic Data within the VSA

Route/ Road Name	From	To	AADT	Count Year
NY-19	Acc Routes 90I 490I	Rt 33	1,423	2015
NY-98	Batavia CL/Batavia TL	Start 98/262 OLAP	9,023	2016
NY-33A	Rt 19	Rt 33A	9,674	2015

Most of the roadways in the VSA are generally rural in nature and generally provide one travel lane in each direction with limited shoulder and roadside treatments. The following roadways are itemized below:

Principal Arterial Interstate – The two Principal Arterial Interstates found within the VSA are I-90 to the south and Interstate 490 to the east. Principal Arterial Interstates are roadways classified as an interstate that carry multiple travel lanes and are designated for high rates of speed between major points.

Minor Arterial – There are two Rural Minor Arterial roadways classified by the New York State Department of Transportation (NYSDOT) in the vicinity of the Project Area: NY Route 19 and NY Route 33 are both south of the Project. Minor Arterials are often moderate length and usually provide a connection to a higher-level roadway, such as a Principal Arterial. In rural areas, such as the Project Area, Minor Arterials provide high travel speeds with minimal disruption to the through traveling vehicles.

Major Collector – The Major Collector roadways within the Project Area, as classified by the NYSDOT, are NY Route 237 and NY Route 262. Major Collectors generally have few driveways and allow for minimal disruption to the through traveling vehicles. Major Collectors can be shorter in length and have less daily traffic than Minor Arterials.

Minor Collector – The Minor Collector roadways within the Project Area as classified by the NYSDOT are NY Route 6 and NY Route 31. Minor Collectors generally are spaced at intervals to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road, while providing service to the remaining smaller communities and linking the locally important traffic generators with their rural areas.

Local Road – The remaining roadways within the Project Area are identified as Local Roads. These roads account for the largest percentage of total roadway miles. These roadways are short and are intended for specific local access. Local Roads primarily facilitate direct access to adjacent property owners with many driveways and access points.

4.0 DISTANCE ZONES

Distance Zones are based on Project distances to an observer. Three distance zones are applied to the Project: foreground, middleground, and background. Each of these areas will determine the level of detail and acuity of objects. Distance Zones are often identified by the definitions in *The US Forest Service Landscape Aesthetics – A Handbook for Scenery Management* (US Forest Service Handbook) (1995). The effects of distance highly depend on the characteristics of the landscape; however, size, level of visibility perceived for this particular type of project (solar panels), and panel position in the landscape should also be considered in determining zones. Distance Zones for this Project have been reasonably modified from the US Forest Service Handbook to accommodate the VSA radius, limitations of human vision and perceptible detail of the low profile of the Project components, and how much of the Project can actually be seen. Solar panels are not wind turbines or tall buildings. They are of a different character with a low vertical height profile (13 feet high for tracker arrays) in comparison to other larger objects found in the landscape such as houses, barns, and trees, in addition to the rolling topography in the area that could easily visually obstruct farther locations. Solar projects typically have lateral breadth but the visibility of solar projects in the northeast, because of frequent and highly vegetated narrow ridges and valleys and dense forest areas surrounding agricultural lands, often do not offer substantial far-reaching vistas of many miles. Distance Zones for this project are as follows:

- Distance Zone 1: Foreground (up to 0.5 miles from the viewer). This is the closest distance at which details of the landscape and the solar panels can be seen. Individual landscape forms are typically dominant and individual panel strings and racking system detail may be seen. The concentration of predicted visible areas lies within this zone.

- Distance Zone 2: Middleground (0.5 to 2 miles from the viewer). At this distance, individual tree forms and building detail can still be distinguished at, for example, 1 mile. The outer boundary of this distance zone, however, is defined as the point where the texture and form of individual plants are no longer visibly acute in the landscape. In some areas, atmospheric conditions can reduce visibility and shorten the distance normally covered by each zone. Solar panels lose their level of detail and are seen as a continuous mass of form and/or color.

- Distance Zone 3: Background (2 to 5 miles from the viewer to the horizon). At the extent of background distances, texture disappears, and color flattens but large light and dark patterns of vegetation or open land due to shape or color are distinguishable and ridgelines and horizon lines are the dominant visual characteristics. Landscapes are simplified and are viewed in groups or patterns. Solar panels can be detected as a distant form and color change but are not as discernible.

Further discussion on the percentages of visibility for each Distance Zone can be found in Section 10.1.3 and Table 5.

5.0 LANDSCAPE SIMILARITY ZONES

Landscape Similarity Zones (LSZs) are areas of similar landscape and aesthetic character based on patterns of landform, vegetation, water resources, land use, and user activity. These zones provide additional context for evaluating viewer circumstances and visual experiences. Land cover classification datasets from the 2016 United States Geological Survey (USGS) National Land Cover Dataset (NLCD) is available for GIS analysis and was used for an initial establishment of LSZs as they provide distinct and usable landscape categories. These NLCD land cover groupings were then refined based on aerial photo interpretation and general field review. This effort resulted in the definition of four final LSZs within the VSA as depicted in Table 2 and on Figure 3, Attachment 2 and include the following:

Zone 1: Agricultural – This zone includes cultivated land and that which is used for row crops, hay or pasture.

Zone 2: Forested – This zone includes mature deciduous and coniferous tree groups.

Zone 3: Developed – This zone includes villages, towns, cities, rural residential abutting roadways, and transportation corridors.

Zone 4: Open – This zone includes miscellaneous other open parcels that may have minor development with less visually obstructive features as well as other open lands with few visual obstructions such as minor expanses of open water, barren land, land with short scrub-shrub vegetation, and emergent wetlands.

Table 2 summarizes the percentage of LSZs in the VSA.

Table 2. Percentage of Landscape Similarity Zones within 5-Mile VSA

LSZ	Distance Zone 1 0.5 Miles		Distance Zone 2 0.5 - 2 Miles		Distance Zone 3 2 - 5 Miles		Total Square Miles of LSZ	Total Percent of LSZ in VSA
	Square Miles	% of LSZ w/in VSA	Square Miles	% of LSZ w/in VSA	Square Miles	% of LSZ w/in VSA		
Zone 1 Agricultural	10.47	7.25%	19.84	13.73%	61.77	42.75%	92.08	**63.73%**
Zone 2 Forested	2.62	1.81%	7.44	5.15%	26.63	18.43%	36.69	**25.39%**
Zone 3 Developed	0.31	0.21%	0.80	0.55%	5.07	3.51%	6.17	**4.27%**
Zone 4 Open	0.71	0.49%	1.85	1.28%	6.99	4.84%	9.54	**6.60%**
Totals	**14.11**	**9.76%**	**29.93**	**20.71%**	**100.45**	**69.52%**	**144.49**	**100.00%**

LSZ 1 Agricultural is the dominant LSZ found within the 5-mile VSA comprising 63.7% of the land area and appears as the greatest percentages in all three Distance Zones. Zone 2 Forested accounts for the next highest acreage resulting in 25.4% of the land area. Zone 3 Developed occurs the least overall in the VSA at 4.37%. Zone 4 Open is land with few visual obstructions such as minor expanses of barren land, land with short scrub-shrub vegetation, and emergent wetlands and comprises 6.6% of the VSA.

6.0 SCENIC RESOURCE INVENTORY

An inventory of publicly available and accessible visual resources out to the 5-mile VSA was explored through the acquisition of GIS data, review of town, county, and agency reports, topographic data, and site visits along with photographic documentation. Visual resources within 5 miles of the Project are listed in Table 3.

Local, county, state, and federally recognized visual resources were compiled under the provision of 16 NYCRR §1001.24 (b)(4)(ii).

The preceding paragraph has been parsed and assigned numerical Visual Resource Category (VRC) numbers in the order in which they appear in 16 NYCRR §1001.24 (b)(4)(ii). The following have been reviewed for their appearance within the VSA:

1) Landmark landscapes;
2) Wild, scenic or recreational rivers;
3) Forest preserve lands, scenic vistas specifically identified in the Adirondack Park State Land Master Plan, conservation easement lands, scenic byways designated by the federal or state governments;
4) Scenic districts and scenic roads;
5) Scenic Areas of Statewide Significance;
6) State parks or historic sites;
7) Sites listed on National or State Registers of Historic Places;
8) Areas covered by scenic easements, public parks or recreation areas;
9) Locally designated historic or scenic districts and scenic overlooks; and
10) High-use public areas.

For historic sites, listed National Register of Historic Places (NRHP) and eligible historic properties obtained from New York State Cultural Resource Information System (CRIS) are addressed in this report. Refer to Exhibit 20 of the Article 10 Application for greater detail on cultural resources investigations.

6.1 Results of Article 10 Scenic Resources Investigation

Table 3 shows results of the investigatory findings of scenic resources that are required by the regulatory guidelines set forth for Article 10 (Section 6.0). Figures 2 and 4 in Attachment 2 show resource locations.

Table 3. Inventory of Visual Resources

VRC	ID No.	Resource Name	Town	Distance (miles)	Expected Visibility*
Federal, State, County, Municipal Recreation Lands					
8	1	Batavia Soccer Park	Batavia	2.1	No
8	2	Genesee County Fairgrounds	Batavia	4.2	No
8	3	Seekers Community Gathering Place	Batavia	2.4	No
8	4	War of 1812 Bicentennial Peace Garden	Batavia	5.9	No
8	5	Drew's Nature Center	Bergen	3.5	No
8	6	Gillam Grant Community Center	Bergen	1.9	No
8	7	Robins Brook Park	Bergen	2.7	No
8	8	Genesee County Fish and Game	Bergen	0.9	No
8	9	Village of Bergen Disc Golf Course	Bergen	4.9	No
8	10	Byron Community Park	Byron	0.4	No
8	11	Southwoods RV Resort	Byron	0.4	Partial
8	12	Trestle Park	Byron	0.4	No
8	13	Turtle Park	Byron	0.2	Yes
8	14	Austin Park	City of Batavia	4.7	No
8	15	Centennial Park	City of Batavia	4.5	No
8	16	DeWitt Recreation Area	City of Batavia	4.2	No
8	17	Lambert Park	City of Batavia	4.4	No
8	18	Lions Park	City of Batavia	4.7	No
8	19	MacArthur Park	City of Batavia	3.9	No
8	20	Wommack Pond	City of Batavia	4.5	No
8	21	Veterans Memorial Park	Elba	3.7	No
8	22	Emery Park	Stafford	4.0	No
Locations of Community Importance					
9	23	Morganville Cemetery	Stafford	2.4	No
9	24	Walkers Cemetery	Byron	0.8	No
9	25	Sodom Cemetery (Old Walker Cemetery)	Byron	962 ft	Yes
9	26	Elmwood Cemetery	City of Batavia	4.6	No

Table 3. Inventory of Visual Resources

VRC	ID No.	Resource Name	Town	Distance (miles)	Expected Visibility*
9	27	St. Joseph's Cemetery	City of Batavia	4.7	No
9	28	Grandview Cemetery	Batavia	3.6	No
9	29	Daws Cemetery	Batavia	3.6	No
9	30	Mount Rest Cemetery	Bergen	4.9	No
9	31	Stafford Rural Cemetery	Stafford	4.3	No
9	32	Langworthy Cemetery	LeRoy	4.2	No
9	33	Byron Cemetery	Byron	0.25	Yes
National Natural Landmark					
8	Bergen Swamp		Byron	0.2	No
Trails and Bikeways					
8	West Shore Trail		Bergen, Byron, Elba	<0.1	Yes
8	State Bike Route 19		Bergen, LeRoy	3.6	No
8	Various snowmobile trails (Sleds of Stafford)		Barre, Batavia, Bergen, Byron, Elba, LeRoy, Stafford	<0.1	Yes

Table 3. Inventory of Visual Resources

ID	USN	Historic Site	Town	Distance (miles)	Expected Visibility*
Historic National Register of Historic Places					
A	3704.000003	Gifford-Walker Farm	Bergen	3.5	No
B	3740.000665	Batavia Cemetery	City of Batavia	4.6	No
C	3740.000009	Batavia Club	City of Batavia	4.8	No
D	3740.000082	Batavia Veterans Administration Hospital	City of Batavia	4.9	No
E	3740.000671	First Presbyterian Church	City of Batavia	4.7	No
F	3740.000057	Genesee County Courthouse	City of Batavia	5.0	No
G	3740.000731	Genesee County Courthouse Historic District	City of Batavia	4.9	No
H	3740.000007	Holland Land Office	City of Batavia	5.0	No
I	3740.000308	Newberry Building	City of Batavia	4.9	No
J	3740.00008	Richmond Memorial Library	City of Batavia	4.6	No
K	3740.000333	Saint James' Episcopal Church	City of Batavia	4.6	No
L	53741.000048	Augustus S. Tryon House	LeRoy	4.9	No
M	3713.000025	Stafford Village Four Corners Historic District	Stafford	4.4	No

Table 3. Inventory of Visual Resources

ID	USN	Historic Site	Town	Distance (miles)	Expected Visibility*
CRIS Listed Historic Eligible - Please refer to Attachment 3 for a full listing					
* Expected visibility is based on viewshed analysis results (refer to Sections 7.1 and 10.1)					

7.0 GIS AND 3D ANALYSIS FOR VISUAL IMPACT EVALUATION - METHODOLOGY

7.1 Viewshed Analysis

A viewshed analysis is a computerized GIS analytical technique that illustrates the predicted visibility that may potentially be expected for a project. It allows one to determine if and where an object, such as a solar project, can geographically be seen within a larger regional area. The viewshed model accounts for topography, vegetation, and the height of the solar panels. The results of the viewshed analysis, typically displayed over a USGS topographic map or aerial photo, are combined with other sensitive location information such as historic places, national forests, or state parks, etc. Incorporating GIS-integrated data along with a viewshed analysis assists in understanding the potential for project visibility at sensitive receptors.

7.1.1 Methodology

Two viewshed analyses have been produced to illustrate predicted visibility within the VSA:

- Topography-Only: Results from a topography-only viewshed analysis are not considered representative of the surrounding landscape. However, the analysis illustrates the effects of the surrounding terrain and determines if landform is responsible for obscuring some of the views. Trees and buildings are not incorporated in this analysis.

- Incorporated Trees: A second viewshed analysis that accounts for the heights of existing trees with the inclusion of larger buildings. This contributes to a more realistic representation of landscape conditions over the topography-only analysis and is the analysis that is emphasized in this report with respect to potential visual impacts. It should be noted that this analysis does not account for proposed landscaping that would serve as additional visual mitigation where proposed.

The analysis used Light Detection and Ranging (LiDAR) datasets for United States Department of Agriculture (USDA) Genesee (2011-2012) and Federal Emergency Management Agency Great Lakes (2014), provided by the New York State GIS Program Office as point cloud .las datasets. LiDAR data is the best available elevation data for this analysis as it includes high resolution ground elevations in addition to building and individual tree heights that offer realistic physical

visual impediments in the landscape. LiDAR elevation data was used for the topography-only analysis as well; however, only the ground elevations were used without trees.

For the analysis, the top of the panels was set at a maximum of 13 feet in height above ground surface to represent tracker arrays and placed within the viewshed modeling environment. The viewshed model was further developed by establishing an observer height of 6 feet, and the assumption that the Project would not be visible to a viewer who is standing amongst trees in a forested area for the viewshed analysis that incorporated trees. The final resulting output identified those areas from which viewers would potentially see all or some part of the proposed solar panels. ESRI Spatial and 3D Analyst GIS software were used to develop the viewshed model.

7.1.2 Assumptions and Limitations of the Viewshed Model

The viewshed analysis identifies cells (image pixels) that contain elevation information and computes the differences along the terrain surface between an observer in the landscape and a target (e.g., a solar panel). The analysis is a clear line of sight; therefore, certain factors in the interpretation of results need to be considered:

1. The model, because of its computerized aspect, assumes the observer to have perfect vision at all distances. Therefore, a certain amount of reasonable interpretation needs to be considered because of the limitations of human vision at greater distances or those atmospheric/meteorological conditions that may cause imperfect vision, such as haze or inclement weather. Additionally, an object is naturally smaller and shows much less detail at distances and will have less visual impact. These aspects cannot be conveyed with this analysis.

2. Because an area may show visibility, it does not mean the entirety of the Project will be seen. The viewshed analysis depicts areas of visibility over a regional area. It can only predict geographically on a map, areas where some part of the solar panels might be seen. It does not and cannot determine if it is seeing a full-on view or a partial view. Additionally, if visibility is occurring in an area, it may sometimes only be a result of glimpsing a portion of the Project over undulating treetops between gaps of trees, or visibility of the tops of panels and not a full-on view. Likewise, there may be understory tree gaps where there may be visibility of the Project.

3. The viewshed model when trees are incorporated, assumes that any vegetation is opaque and therefore, represents a leaf-on condition. By nature of the software model and available parameters, the trees are treated as an opaque object and therefore, leaf-on conditions are assumed. Transparency predictions through something similar to bare-branched trees under leaf-off conditions cannot be made. A topography-only analysis has been included to help understand some of the visual environment in the absence of trees.

4. The model was developed with the assumption that a viewer would not see the panels if standing amongst trees in forested areas as it is assumed the tree canopy would preclude outward-looking views.

7.2 Line of Sight Analysis

Line of Sight (LOS) profiles were performed for the collection substation. LOS analyses are able to provide the viewer with information that assists in examining the reasons why objects such as substation components may have impeded views or no views. The underlying topography of a sight line in addition to vegetative obstructions can be produced as well as an estimated amount of visibility of the upper portion of an object if it is visible.

Elevation data obtained for the Project noted in Section 7.1.1 was used for the data source. ArcGIS ESRI 3D Analyst was used to produce elevation samples across select sight lines for bare earth topography and for vegetation. Section 10.2.2 provides a discussion of results and Attachment 4 contains the profiles.

7.3 Photographic Simulations

In December 2019 and in January and March of 2020, site visits were made to obtain photos during leaf-off conditions in order to depict worst-case scenario. See the Project Photolog in Attachment 5. Photographs were taken that attempts to provide the most unobstructed views possible at north, south, east, and west positions and/or in areas where the viewshed maps represent potential visibility and that which offers varying representation from Landscape Similarity and Distance Zones. Simulations are presented in Attachment 4.

7.3.1 Methodology

High resolution digital cameras (Canon EOS Rebel T6 , Nikon D3100) were used to obtain Project photographs. Coordinates of camera locations intended for simulations as well as other reference points within the view were collected using survey grade sub-meter accuracy Trimble or Juniper Geode global-positioning system units. Reference locations were noted and were later used to refine the placement of the facility within the simulation photographs.

To create visual simulations, Autodesk 3DS MAX visualization software was used to correctly dimension the Project 3D models onto the digital photographic image from each viewpoint location. TRC created the 3D model of the solar layout by using engineering specifications obtained from Westwood, the design engineers for the Project. The terrain elevation data (z value) needed to place the panels correctly on the surface of the earth was derived from the LiDAR sources noted in Section 7.1.1. Using the engineering site plan and LiDAR terrain surface data in GIS, each x, y, z coordinate location of each proposed solar array was obtained and imported into Autodesk 3DS MAX visualization software including the terrain surface itself. A 3D model of every proposed individual solar array was then physically constructed according to the proposed panel specifications and tilt angle along with the proposed racking system. The proposed tracker arrays

were built as double-portrait panels with a height of 13 feet above ground surface with array axis oriented north-south. Since tracker arrays track and follow the maximum sun angle, they can be facing east, west, or up depending on the time of day. The tracker panel orientations depicted in the simulations and which way they might face was based on the time of day the photo was taken to determine if they faced east or west, but then were depicted at their maximum tilt angle to show worst case. In most cases closer to noon, the tracker panels would actually be more horizontal and parallel to the ground in order to face noontime sun angles. The simulation model was further developed to position the viewer at the selected vantage point. For a given vantage point, the visualization software is capable of providing and adjusting a camera view that matches that of the actual photograph. From the field effort, the documented camera coordinate (x, y, z) positions were entered into the model along with other camera information. Reference locations, which are existing visible objects in the photograph, such as light posts, building corners, placed stakes, gate posts, or utility poles, were used to assist with refined placement of the proposed Project within the photograph as well as other standard terrain-matching methodologies. For the landscaping simulations, a CAD version of the proposed landscaping plan obtained directly from the Landscape Architect was imported into the MAX modeling environment where subsequently each proposed tree and shrub species was then translated and built into 3D, growth heights set and placed in with the Project along the fence line according to the landscape plan. The day and time of the photographs were also recorded and typically exist as electronic information embedded in the respective digital photograph files. This information was used to adjust for the sun angle in the simulation software in order to represent lighting conditions for the time of day and year.

7.3.2 Viewpoint Selection for Photosimulations

Integrating the results of the GIS resources inventory data along with the viewshed analysis results provided desktop reconnaissance for recognizing areas with potential visibility and identifying candidate locations for photosimulations. While focusing on inventoried locations as listed in Section 6.0, an additional objective in the viewpoint selection process is to also choose locations for simulations that represent the various LSZs as well as Distance Zones. As well, site field visits are necessary for ground-truthing and increasing the understanding of the visual environment.

Visibility as noted by the viewshed results in Figures 2 and 4, Attachment 2 guided the photo acquisition in selecting candidate locations for simulations viewpoints. Attachment 2 visibility mapping shows the most prominent visibility is within Distance Zone 1 (0.5 miles) of the Project, with some minor predicted visibility in Distance Zones 2 and 3. It is often difficult to obtain representative simulation photos at distance as there are often minimal locations with far reaching views of solar projects in the northeast. Therefore, much of the focus for viewpoint locations are closer to the Project.

As noted in Table 3 Visual Resources Inventory, few of the listed visual receptors may experience views of the Project. Attempts to represent all LSZs are typically made however obtaining photo

viewpoints from a representative forested area is often moot, since there are not expected to be outward views from within a forested area. Most viewpoints then are taken in the remaining two but abundant LSZs which is agricultural open land and developed roads and closer to the Project. Several viewpoint photos were taken to represent views from residential areas.

16 NYCRR § 1000.24(b)(4) requires both general and specific consultations with affected agencies and municipalities. *"The applicant shall confer with municipal planning representatives, DPS, DEC, OPRHP, and where appropriate, APA in its selection of important or representative viewpoints that may be subject to project visibility."* Per Project stipulations dated July 6, 2020, an added stipulation 24(b)(6)(i) states that the Applicant will provide simulations from representative viewpoints as determined through additional consultations, having direct line-of-sight visibility of the proposed Project and viewing circumstance with respect to vegetative obstructions.

On June 9 and June 17, 2020, an information request was sent out to stakeholders. In this request, a preliminary visual report was provided, indicating the extent and findings of visibility studies at that point in time which consisted of identified visual resources as well as the result of the trees-only viewshed analysis. Opportunity was provided for stakeholders, including local municipalities with predicted visibility of the project, to suggest additional and reasonable candidate locations for photosimulations or append additional visual resources of concern to the inventory. This request to stakeholders was specific to locations that were publicly accessible. Correspondence is included in Attachment 6.

In a letter dated July 16, 2020, the Town of Byron responded to the Project outreach solicitation letter that included comments from Byron's Town Board as well as from general public commentary resulting from a town meeting held in July 2020. As noted, the Applicant's solicitation letter was for possible viewpoint locations that had public access only. The Town of Byron response letter (Town Letter) summarizes numerous additional simulation requests not in areas of public access but on private properties. In the Applicant's selection of representative simulations for the Project for this Application, several of the simulation viewpoints from the Project Photolog were chosen, as they were already very close to properties noted in the Town Letter. These include VPs 2b, 3, 7, and 9. VPs 1 and 14a could be used for representative size and scale for those residents with similar distances to the Project. Therefore, in summary, the Applicant has prepared simulations that are representative of the Project with respect to LSZs, inventoried locations, different distance zones as best as Project views allowed, different viewer types, varying lighting conditions, and views that offered as much of a clear, unobstructed sightline as possible with consideration of the Town Letter response comments.

8.0 ADDITIONAL APPLICABLE VISUAL CONCEPTS TO CONSIDER: VIEWER CHARACTERISTICS

Sensitivity levels are a measure of public concern for scenic quality. Visual sensitivity is dependent upon user or viewer attitudes, the amount of use and the types of activities in which people are engaged when viewing an object. Overall, higher degrees of visual sensitivity are

correlated with areas where people live and with people who are engaged in recreational outdoor pursuits or participate in scenic driving. Conversely areas of industrial or commercial use are considered to have low to moderate visual sensitivity because the activities conducted are not significantly affected by the quality of the environment.

These concepts are applied when evaluating the visual landscape and assessing the importance of a viewpoint location if it falls in an area of visibility. Viewer groups and associated responses to visual changes are analyzed from a variety of factors including:

Viewer group – Types of viewers will vary by geographic region, as well as by travel route or use areas, such as a developed recreation site, urban area, or back yard. Viewer groups include:

- *local constituency*: People living in the local area and/or surrounding communities who interpret the significance of where they live and interact with others; these people may include local residents and members of groups to which the local area is important in different ways.

- *commuter constituency*: People who use or are generally restricted to travel corridors that are destination oriented towards places of employment. These people generally have transient short duration views.

- *visitor or recreational constituency*: Individuals who visit the area to experience its natural appearance, cultural landscape qualities or recreational opportunities. Visitors may be of local, regional, or national origin.

Context of viewer – The viewer group and associated viewer sensitivity is distinguished among viewers in residential, recreational/open space, tourist commercial establishments, and workplace areas, with the first two having relative high sensitivity.

Number of viewers – The number of viewers is established by the amount of people estimated to be exposed to the view. In comparing viewing locations to each other, one can consider if the area is a high public use area or if it is a location that is less frequently visited or more inaccessible where the public is not expected to be present (such as marshes or swamps).

Duration of view – Duration of view is the amount of time a viewer would actually be looking at a particular site. Use areas are locations that receive concentrated public-use viewing with views of long duration such as residential back yards. Recreational long duration views include picnic areas, favorite fishing spots, campsites, or day use in smaller local parks. Comparatively, drivers, hikers, snowmobilers, or canoeists will likely encounter a shorter, more rapid transient experience as a person transitions from one linear segment to the next but will encounter more visually varied experiences.

Viewer activities – Activities can either encourage a viewer to observe the surrounding area more closely (hiking) or discourage close observation (commuting in traffic).

9.0 VISUAL IMPACT RATING

TRC has developed a visual impact rating form for use in comparing project photosimulations as required by Article 10. This form is a simplified version of various federal agency visual impact rating systems. It includes concepts and applications sourced from:

- U.S. Bureau of Land Management (BLM), Handbook H-8431: Visual Contrast Rating, January 1986 (USDOI, 1986).
- Visual Resources Assessment Procedure For U.S. Army Corps Of Engineers, March 1988 (Smardon, et al., 1988).
- National Park Service Visual Resources Inventory View Importance Rating Guide, 2016 (NPS, 2016c).
- USDA Forest Service, Landscape Aesthetics: A Handbook for Scenery Management. USDA Forest Service Agriculture Handbook No. 701, 1995 (USDA, 1995).

Depending on the project location, a variety of VIA guidance and established procedures exist as noted above that apply to management of federal lands that fall under a specific agency such as the U.S. Forest Service or Bureau of Land Management. These guidance documents vary in regard to agency specific rating systems or procedures and often begin with the evaluation of existing conditions such as scenic quality or presence of sensitive resource locations.

TRC has developed this form for efficient and streamlined use with projects that undergo state environmental permitting processes. It is assumed that visual resource inventories, terrain analyses, development of LSZs or viewshed analyses have already been performed in the Project VIA according to state regulatory requirements or other visual policy. This form was developed to be used as a numerical rating system for the comparison of Existing Conditions (before) vs. With Project (after) photosimulations of final selected viewpoint locations and is meant to accompany the Project VIA.

For evaluating visual change there are two parts to the form. Part 1 is the *Visual Contrast Rating,* which rates the Project as it contrasts against compositional visual elements of the viewpoint scene. This includes compositional contrasts against the existing and natural environment such as vegetation, water, sky, landform, or structures. The higher the rating total the higher the contrast. Part 2 is the *Viewpoint Sensitivity Rating*. This section incorporates the concepts in Section 8.0. It rates the sensitivity of the viewpoint location which inherently considers the importance of the viewpoint (if it falls within a visual resource area), duration of view, if it is a high use area, or if there is the presence of water. The higher the rating total, the more sensitive the viewpoint is. Part 3 does not rate change but is an overall *General Scenic Quality of the View* which rates the view of existing conditions only, without the influence of the Project.

Please refer to Attachment 7 for more comprehensive guidelines on how the contrast ratings were assessed and applied within each category.

The rating scale is as follows:

Rating Scale	
0	None
0.5	
1	Weak
1.5	
2	Moderate
2.5	
3	Strong

Degree of Contrast Criteria

None The element contrast is not visible or perceived.

Weak The element contrast can be seen but does not attract attention.

Moderate The element contrast begins to attract attention and begins to dominate the characteristic landscape.

Strong The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

10.0 VISUAL IMPACT ANALYSIS RESULTS

10.1 Viewshed Results and Discussion

The viewshed analysis showing areas of potential visibility can be found in Figures 2 and 4 in Attachment 2). As noted in Section 7.1.1, two viewshed analyses were performed, one with topography only and one with vegetation included, with panel heights set at 13 feet above ground surface.

Viewshed Results– Topography Only

As described in Section 7.1.1, viewshed analysis with bare earth topography without trees is recognized as not being a realistic representation of potential visibility. However, the analysis was performed as it is a useful tool in understanding the influence that terrain has on blocking views to the Project.

The bare earth topography-only viewshed analysis result shows that without the presence of existing vegetation the Project is visible in nearly the entire VSA and is predominant within 2 miles. However unrealistic this result may be, it indicates that topography is generally quite level at least within 2 miles and there are minimal areas where the terrain is high enough to block views. The topography-only result also must not be fully interpreted as representing visibility during leaf-off conditions, since even leaf-off bare branched tree groups act as a solid mass where lines of sight

to objects are screened. Under some circumstances, there possibly may be visibility through bare-branched trees only if the trees are sparse, that this sparse tree row is the only existing vegetation between the viewer and the site, and that the viewer is in fairly close proximity to the Project.

Some topographic-only screening does occur and is present in select areas between 2 and 5 miles. Refer to Figure 2 in Attachment 2. There is an area in the northwest region of the VSA in the Town of Elba where there are views obstructed by topography. There are also larger contiguous areas of obstructed views due to topography in the southeast quadrant of the VSA in both the Town and City of Batavia, to the south in the Town of Stafford, in the Town of LeRoy, and in a narrow area to the east in the Town of Bergen, all occurring between 2 and 5 miles.

Viewshed Results –Trees Included

Figure 1 in Attachment 2 shows the Project Area. The viewshed analysis results (Figures 2 and 4, Attachment 2) show areas of expected visibility.

When vegetation is included to present a more realistic depiction of the landscape, potential visibility decreases substantially. The majority of visibility that is expected occurs mostly in a focused location inside the 0.5 mile Distance Zone 1 within the Project parcels themselves and in nearby open farm fields. The majority of visibility that is expected occurs mostly in a focused location inside the 0.5-mile Distance Zone 1 within the Project parcels themselves and in nearby open farm fields.

Although the panels are sited in open farmland, the low profile panels set against existing tree buffers, hedgerows, and tree groups that frame some of the panel locations is enough to obscure many views from the outer limits of Distance Zone 1 to extent of the VSA. Because of a 13 foot maximum panel height in relation to the mature vegetation, there are minimal far reaching views outside of the general array locations as noted in the Attachment 2 visibility maps. Because of a 13-foot maximum panel height in relation to the mature vegetation, there are minimal far reaching views outside of the general array locations as noted in the Attachment 2 visibility maps. Between 0.5 and 2 miles, in Distance Zone 2, the visibility lessens and is sporadic, occurring in mainly in open private farm fields generally not accessible to the public, while also occurring in short segments of roadways and at residences in discrete locations. The majority of visibility in Distance Zone 2 is south of the Project. Between 2 and 5 miles in Distance Zone 3, there are few, if any, views predicted save for three areas to the south appearing to be within open, private land in the Town of Stafford in the vicinity of Horseshoe Lake and Randall Roads. Several viewpoint locations are depicted in outer regions between 2 and 5 miles such as VP11 and VPs 23 to VP32 where existing views and character of the area can be obtained in the Project Photolog in Attachment 5.

Visual changes with respect to the visual resources listed in Table 3 are few. Sodom Cemetery (Old Walker Cemetery), which is a location of community importance in proximity to the site on Batavia Byron Road (CR 19A) will have views as well as Byron Cemetery on Swamp Road. Partial visibility is predicted at Southwoods RV Resort 0.4 miles to the east as well as intermittent and transient views from local snowmobile trails. Turtle Park near Mill Pond is expected to have

visibility of a part of the Project. The West Shore Trail, a multi-use trail runs east-west and follows the former West Shore railroad bed located north of the Project, contains frequent existing vegetation on both sides of the trail which will serve to block views, but conversely there are frequent gaps in the vegetation that will offer partial and intermittent views to solar arrays. Impacts to listed NRHP historic sites are not expected. There are four eligible historic sites that may have views (names unknown): one is at 6674 Griswold Rd in Bergen 0.4 miles away to the southeast, one is located 0.7 miles northeast at 5633 Tower Hill Road in Byron, and two are located at 6322 and 6332 Byron Holley Road (NY 237) 1.25 miles to the north. The 6332 address is the North Byron Cemetery.

The New York State Thruway runs east-west through the VSA and is approximately 1.6 miles from the Project at its closet point to the south. Out of 12.6 miles of highway that is within the VSA there is only one contiguous segment of about 0.6 miles that may have short duration, partial, and intermittent views of arrays. As noted by the results, the most visibility is expected along the perimeter Project roads including Tower Road, Townline Road, Bank Street Road, Ivison Road, and Griswold Road, and the interior Project roads namely, Batavia-Byron Road (CR 19A), Starowitz Road, Walkers Corner Road (CR 19), Freeman Road, Cockram Road, Caswell Road, Byron Holley Road (NY 237), Gillete Road, and Byron Elba Road (NY 262).

Refer to Section 10.1.2 and 10.1.3 for tables and more detailed discussion of the percentages of land area that may experience visual change as a result of the viewshed visibility analysis. In summary however as noted in these Sections, the viewshed analysis results show that 8.0% of the land area within the 5-mile VSA will have either a full or partial view of the Project.

10.1.1 Article 10 Resources

Visibility results from the viewshed analysis is explained in the previous Section 10.1. The viewshed visibility results indicate that most of the listed Table 3 visual receptors will not have views of the Project. Aside from Byron-Bergen Swamp and National Register of Historic Places sites, most of the resources are state and locally designated. Those resources that may experience some level of visibility per viewshed results are itemized out below.

10.1.1.1 Federal Scenic Resources

There are no federally designated resources that will have a view of the Project.

10.1.1.2 State and County Scenic Resources

There are no state resources with a view of the Project. However, four eligible historic sites listed on the New York Cultural Resources Information System may potentially have views and are listed under this section. These eligible sites (names unknown) have not been approved yet; one is at 6674 Griswold Rd in Bergen 0.4 miles away to the southeast, one is located 0.7 miles northeast at 5633 Tower Hill Road in Byron, and two are located at 6322 and 6332 Byron Holley Road (NY 237) 1.25 miles to the north. The 6332 address is the North Byron Cemetery.

The West Shore Trail is a county-oriented multi-town multi-path trail. The Town of Byron maintains the section of trail located in Byron in the vicinity of several of the arrays. The trail runs east-west just north of the Project with varying distances from arrays ranging from 340 feet to 0.5 miles away. Parts of this trail is expected to experience intermittent or partial visibility of solar panels but with short duration views at some points where there are gaps in the vegetation or where the trail crosses a road that has a line of sight. However, there is also quite a bit of vegetative growth on either side of the trail in many areas that will help block views as well.

10.1.1.3 Local Scenic Resources

Two cemeteries listed as sites of community importance will experience views of the Project. Sodom Cemetery (Old Walker Cemetery) on Batavia Byron Road (CR 19A) will have views as well as Byron Cemetery on Swamp Road. Partial visibility is predicted at Southwoods RV Resort, a local campground 0.4 miles to the east. There are several snowmobile trails within the VSA, but the primary two trails that may experience views as a result of their proximity to arrays is a north-south trail in the vicinity of Batavia-Byron Road (CR 19A) designated as C4E and a second one that uses the multi-path West Shore Trail for snowmobiling that is designated as C4D. Both are maintained by the Sleds of Stafford. (See Figures 2 and 4 in Attachment 2). Turtle Park near Mill Pond is also expected to have visibility of a part of the Project.

However, not classed specifically as an agency listed scenic resource it is recognized that local town residents and local roadway traffic will experience views of the Project in varying locations. Several locations of roadways with nearby residences are represented in the Project photosimulations.

10.1.2 Visibility Within LSZ

For reference, a reiteration of the total percentage of LSZ within 5 miles outlined in Table 2 of Section 5.0 is reiterated as follows:

- LSZ Percent of 5 Miles

  Zone 1 Agricultural: 63.73%
  Zone 2 Forested: 25.39%
  Zone 3 Developed: 4.27%
  Zone 4 Open: 6.60%

Table 4. Percent Visibility within Landscape Similarity Zones Within 5-Mile VSA

LSZ	Total LSZ Sq Miles Within 5 Miles	LSZ Sq Miles of Visibility	% Visibility within LSZ	% Visibility within VSA

Zone 1 Agricultural	92.08	10.68	**11.60%**	**7.39%**
Zone 2 Forested	36.69	0.13	**0.35%**	**0.09%**
Zone 3 Developed	6.17	0.29	**4.77%**	**0.20%**
Zone 4 Open	9.54	0.48	**5.02%**	**0.33%**
Total VSA	**144.49**	**11.58**	**8.02%**	**8.02%**

One can use the results in a variety of ways. For example, when using Table 4 one can begin to distinguish or make assumptions about which viewer types may be impacted visually. For example, Table 2 and the list above states that 4.3% of the land area within 5 miles falls in the Developed Zone, which is fairly low. Section 5.0 describes this zone as primarily residential groupings within the towns but includes villages (Village of Bergen and Village of Elba, towns, cities (City of Batavia), rural residential abutting roadways that are intermittently established along the existing road network as well as accounting for roadway travelers, and larger transportation corridors.

Note that calculated percentages do not indicate the actual percentage of viewers that would be impacted. The percentage numbers indicate how much physical area within a designated LSZ where visual change could occur. Table 1 provides the types of roads and traffic counts within the Project Area and indicates most roads are generally rural low traffic types of roads. One may assume then, that upon land area relative to viewer types (inferred by LSZ category) and location density, resident numbers that may see some portion of the Project are low. As Table 4 notes, there will be 4.8% visibility within the LSZ itself (all developed areas) but it accounts for less than 1% of visibility within the entire VSA.

Comparing the Agricultural category is a similar exercise. The Agricultural LSZ comprises about 63.7% of the 5-mile VSA, however only 7.4% of the land area within 5 miles may experience visibility of the Project. As described in Section 5.0 this LSZ predominantly consists of land consisting of cultivated crops, hay, or pasture. Frequently, there are hedgerows or small tree groups that provide intermittent screening. One can infer which viewer type might be affected (refer to Section 8.0 for discussion of viewer groups and other factors that assist in evaluating visual change). Much of this land is farmland infrequently visited and not accessible to the public. It belongs to private landowners or rather, the local constituency viewer type who themselves may not access parts of their properties at all times. Although the amount of land area that receives visibility is comparatively higher than that of Developed areas, the number of viewers is likely low. However intermittent or low the exposure is or where the constituency is from, visibility may diminish the viewer experience depending on viewer expectations or reactions to solar development.

In using the 5-mile VSA again, Table 2 shows that approximately 25.4% of the land area belongs to the Forested LSZ. Although this is 25% of the 5-mile VSA, Table 4 shows that 0.1% of the 5-mile land area will have visibility from forested areas. This low number in part is due to the fact that the viewshed model assumes that viewers in the interior of tree groups will not have outward views through the density of tree trunks or through the canopy above.

The Zone 4 Open category classes as miscellaneous other open parcels that may have minor development with less visually obstructive features as well as other open lands with few visual obstructions such as minor expanses of open water, barren land, land with short scrub shrub vegetation, and emergent wetlands will have very low visibility comprising less than 1% of the entire VSA at 0.3%.

10.1.3 Visibility Within Distance Zones

Table 5 shows that when considering visibility between Distance Zones, the highest amount of visibility occurs within the 0.5-mile radius of Zone 1, comprising at 57.1% of the land area. This is because there is a concentrated amount of visibility in proximity to the Project within the 0.5-mile radius, much of it within the solar array parcels themselves in open land. There is an abrupt difference once outside of the 0.5 mile radius where visibility within Distance Zones trends downward to 9.0% between 0.5 to 2.0 miles in Distance Zone 2. There is an abrupt difference once outside of the 0.5- mile radius where visibility within Distance Zones trends downward to 9.0% between 0.5 to 2.0 miles in Distance Zone 2. Percentages of visibility in Distance Zone 3 outside 2.0 miles drops to 0.8%. There is approximately 11.6 square miles of total visibility within the entire 144.49 square miles that comprises the VSA; therefore 8.0% of the VSA is predicted to experience partial, close, intermittent, or distant views of the Project.

Table 5. Percent Visibility within Distance Zones

Distance Zone	Total Area Comprising Distance Zone Square Miles	Visibility Within Distance Zone Square Miles	% Visibility Within Distance Zone	% Visibility Within Full VSA
Zone 1 0-0.5 Miles	14.11	8.05	**57.10%**	**5.57%**
Zone 2 0.5-2.0 Miles	29.93	2.68	**8.96%**	**1.86%**
Zone 3 2.0-5.0 Miles	100.45	0.85	**0.84%**	**0.59%**
Total	**144.49**	**11.58**	**8.02%**	**8.02%**

10.2 Photosimulation and LOS Results and Discussion

The discussion of predicted visibility in Section 10.1 focuses on relative quantities of visibility (how much is seen and where) under various conditions such as within LSZs and Distance Zones all in an effort to understand the amount of change in the landscape. Summaries of the few visual receptors that might experience visibility of the Project were discussed.

Photosimulations from representative vantage points at varying distances have been developed to provide the quality of the view that will be obtained as a result of the Project (what does it look like). Typically, representative simulations are often obtained from visual receptors in the area where visual change will occur. However, since there will be few to no sensitive resources impacted by the Project that are listed in Table 3 in Section 6.0, most of the focus on representative simulations was directed to what the immediate community would experience such as travelers on local roads and near residences and farmlands.

Photos then were taken to show the most unobstructed views as possible representing the compass points around the Project and along roads. A LOS analysis was performed for the collection substation. Table 6 summarizes information for each simulation and LOS viewpoint.

Table 6. Summary Table Simulation and LOS Viewpoints

Viewpoint ID	Location	Town	Distance to Fence Line	Landscape Similarity Zone	Comment
1	Caswell Rd	Byron	209 ft	1	View toward Project located on Caswell Rd.
2b	Walkers Corner Rd (CR 19)	Byron	326 ft	1,3	View toward Project near residence and along road.
3	Walkers Corner Rd (CR 19)	Byron	270 ft	1,3	View toward Project near residence and along road.
7	Cockram Rd	Byron	293 ft	1, 3	View toward Project near residences and along road.
9	Cockram Rd	Byron	407 ft	1,3	View toward Project near residence and along road.
14a	Batavia Byron Rd (CR 19A)	Byron	302 ft	1,3	View toward Project near residence and along road.
15a	Cockram Rd	Byron	288 ft	1,3	View toward Project near residence and along road.
21b	Swamp Rd	Byron	1327 ft	1,2	View toward Project along road from Byron Cemetery.
23*	Bridge Rd	Elba	1.8 mi	1,3	View toward Project near residence and along road.

24*	Transit Rd (CR 42)	Byron	1.5 mi	1,3	View toward Project near residence and along road.
25*	Watson Rd	Elba	4.1 mi	1,3	View toward Project near residence and along road.
27*	W Sweden Rd	Bergen	3.5 mi	1,3	View toward Project near denser residential location.
29*	Buckley Rd	Stafford	2.2 mi	1,3	View toward Project near residence and along road.
30*	Byron Stafford Rd (CR 237)	Stafford	1.4 mi	1,3	View toward Project along road near commercial area.
33	West Shore Trail	Byron	655 ft	1,4	View from nearby multipath trail west of Byron Rd.
L1	Byron Elba Road (NY 262)	Byron	0.35 mi	1,3	Line of Sight for proposed collection substation from local road near resident.
L2	Batavia Byron Rd (CR 19A)	Byron	0.5 mi	1,3	Line of Sight for proposed collection substation from local road near resident.
*These simulation locations in Distance Zones 2 and 3 were checked and verified during the simulation process where it was determined that these viewpoints will not have a view of the Project. Please refer to the Project Photolog in Attachment 5 to see the current (and thus proposed) viewpoint photo.					

10.2.1 Discussion of Simulations

The following discusses the visibility of the Project to viewers at or in the immediate vicinity of the photo viewpoint. Simulations are presented as sets of Existing Conditions and Proposed Conditions based on VP number and can be found in Attachment 4. Proposed mitigation vegetation at 5 years is anticipated to range between 5 to 15 feet in height and is depicted in the simulations where vegetative landscaping is proposed. According to the Landscape Plan presented in Appendix 11-1, fully mature heights of the year-round coniferous species could possibly reach heights up to 40 feet in future years.

10.2.1.1 VP1 Caswell Road, View East – Byron (LSZ 1; Distance 209 feet)

The viewer is on Caswell Road looking east approximately 209 feet from the Project fence line. This viewpoint was chosen to represent views of arrays of what the community would experience along a local road at the southeastern portion of the Project. Existing conditions shows a large farm field occupying the view with a forested area far in the distance. Visually the photo shows horizontal forms of field, sky, and trees sweeping across the view. From this location, the sight lines show clear views of solar panels due to proximity of the Project in an open field. The overall form and line that the arrays provide as seen in the proposed view mimics the existing terrain and is consistent with the horizontal landscape patterns by providing a similar shape. However, new form, line, and color contrasts are introduced that although are low profile, have uninterrupted lateral breadth in the view and changes the visual character of the field. Project contrasts overall are rated moderate. Viewer groups affected are local motorists and several residents.

10.2.1.2 VP2b Walkers Corner Road (CR 19), View Northeast – Byron (LSZ 1,3; Distance 326 feet)

The photo was taken to represent a view of the Project in the vicinity of residences on Walkers Corner Road in the southwestern portion of the site. County Road 19 is classed as a minor arterial. They are often moderate length and usually provide a connection to a higher-level roadway. In rural areas, such as the Project Area, minor arterials provide high travel speeds with minimal disruption to the through traveling vehicles.

The view is looking northeast, and a resident is behind the viewer. The Project is approximately 326 feet from the fence line. Existing conditions show large horizontal shapes of sky and level field with a horizontal band of trees in the background on the opposing end of the field. The trees in the background provide a shape that is darker in contrast and color. Proposed conditions show a portion of the Project at close range with levels of visual acuity. The line of the array field runs with the line in the roadway creating a symmetry with less contrast. Features such as the fence, panels, and racking system have moderate discernible detail and combined with a repetitive pattern provides some texture contrast. Although the photo depicts a winter day with snow on the ground color contrasts are somewhat visually absorbed and moderated by the color of the background trees. Project contrasts overall are rated moderately weak. Viewer groups affected are motorists and several residents.

10.2.1.3 VP3 Walkers Corner Road (CR 19), View North – Byron (LSZ 1,3; Distance 270 feet)

VP3 is on Walkers Corner Road, approximately 850 feet east of Starowitz Road which defines the Byron-Elba town boundary in that area. This road is classed as a minor arterial. They are often moderate length and usually provide a connection to a higher-level roadway. In rural areas, such as the Project Area, minor arterials provide high travel speeds with minimal disruption to the through traveling vehicles.

The photo was taken to represent a view of the Project in the vicinity of residences on Walkers Corner Road in the southwestern portion of the site. The view is north, and the residences are behind the viewer. The Project is approximately 270 feet from the fence line. The existing conditions view shows large shapes of field and sky with a narrow line of trees in the background as well as an area that has several tractor trailer units that can be seen on the far edge of the field. Proposed conditions show the Project at close proximity that stretches across the view. The Project is apparent due to proximity with discernible detail. While most of the tops of the panels remain even with the tree line there are some that minimally interrupt the horizon line. Color and contrasts are strongly moderate. Viewer groups affected are motorists and several residents.

10.2.1.4 VP7 Cockram Road, View Southeast – Byron (LSZ 1,3; Distance 293 feet)

VP7 is on Cockram Road and is chosen for its location in the western-northwestern portion of the Project and is representative of views for a selection of residences in the area along a local road.

The view is southeast and is 293 feet from the fence line. Existing conditions are similar to VP1 and VP3 where large horizontal shapes consisting of field and sky occur in the view with a narrow band of tree line in the background. A house that is located on Bank Street Road can be seen in the very left of the photo. The viewer is fairly proximal to the Project, however, the solar arrays are similar in color and value to that of the background trees at this time of year and are somewhat visually absorbed by the vegetation. The size and scale of the Project have a low-profile appearance and have a similar horizontal shape as the landscape. The lateral extent of the Project occupies the view due to proximity and wide angle of view and shows a moderate to strong visual change in color and pattern. However, overall average Project contrasts are rated moderately weak. Viewer groups affected are local motorists and several residents. There are likely a low number of viewers because of the rural location and few residences.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views as the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With the inclusion of vegetative mitigation, views are softened and moderated as the trees and shrubs are more congruous with the existing environment and Project color and value contrasts are reduced. Views of the mitigation for motorists will be intermittent and of short duration while longer duration views will be obtained by residences.

10.2.1.5 VP9 Cockram Road, View Northwest – Byron (LSZ 1,3; Distance 407 feet)

VP9 is located on Cockram Road with views to the northwest. This VP was chosen as it is representative of views of the Project for residents along a local road in the vicinity. Here the viewpoint is approximately 407 feet to the Project fence line. Existing conditions show field and sky as large dominant horizontal shapes in the view. Trees are present in the background running parallel with the field and also presents as a similar horizontal shape. Proposed conditions show the that the overall form and line of the array field mimics the ground elevation and terrain but still contrasts with the existing landscape due to proximity and presence of discernible detail such as the fence, panels, and racking system. Although the Project is low profile and there is no interruption of horizon line, the arrays stretch across the field and becomes the focal point in the field. However, color contrasts are moderated and blends in with the similar colors of the trees in the background. Overall average Project contrasts are rated moderately weak. Viewer groups affected are local motorists and several residents. There are likely a low number of viewers because of the rural location and few residences.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views as the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With the inclusion of vegetative mitigation, views are softened and moderated as the trees and shrubs are more congruous with the existing environment and Project color and value contrasts are reduced. Views of the mitigation for motorists will be intermittent and of short duration while longer duration views will be obtained by residences.

10.2.1.6 VP14a Batavia Byron Road (CR 19A), View Northeast – Byron (LSZ 1,3; Distance 302 feet)

VP14a is located on Byron Road which is a local interior road that runs north-south through the middle of the Project between proposed array locations. There are arrays proposed on both sides of the road at this location and is in the vicinity of a large farm complex with the name of L Brooke Farms, Inc. VP14a is looking northeast where an open view of the Project will be obtained. Existing conditions show parts of the farming complex to the left. The remaining area is open field with a narrow band of forested area on the far edge of the limits of the field and occupies the majority of the view. Proposed conditions in the simulation shows a partial view of a portion of the arrays 302 feet from the viewer. Under the mowed winter conditions a small section of a proposed access road can be seen as well. The low profile panels show the Project below the horizon line and color contrasts are moderated by the dark colors of the tree line in the background. Due to a proximal distance and partial views the Project remains apparent but is co-dominant in the view from the road location in combination with other development visible in the view. Overall average Project contrasts are rated moderately weak. Viewer groups affected are local motorists and several residents. There are likely a low number of viewers because of the rural location and few residences.

10.2.1.7 VP15a Cockram Road, View North – Byron (LSZ 1,3; Distance 288 feet)

VP15a is located on Cockram Road 765 feet east of the intersection with Byron Road. This photograph was taken to represent views of nearby residences. The view is north, and the fence line is approximately 288 feet from the camera location. The existing view shows a light-colored field against a sky background with existing transmission lines also in the background. The proposed panels appear in the foreground on an up-slope stretching across the view. The Project provides a lateral breadth of color change from light to dark with an interruption of the skyline and changes the look of the middleground. Due to proximity, the Project is dominant in the view although the overall average Project contrasts are rated as moderate. Viewer groups affected are local motorists and several residents. There are likely a low number of viewers because of the rural location and few residences.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views as the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With the inclusion of vegetative mitigation, views are softened and moderated as the trees and shrubs are more congruous with the existing environment and Project color and value contrasts are reduced. There are likely a low number of viewers because of the rural location and few residences. Views of the mitigation for local motorists will be intermittent and of short duration while longer duration views will be obtained by residences.

10.2.1.8 VP21b Swamp Road – Byron Cemetery, View Southeast – Byron (LSZ 1,2; Distance 1,327 feet)

VP21b is a visual resource listed in Table 3 that will have a partial view of the Project. The photo is representative of a view from Byron Cemetery located on Swamp Road. Swamp Road is a small local road and the viewpoint itself has several residences within 350 feet. The view is looking southeast and is approximately 0.25 miles (1,327 feet) from the Project fence line. The existing view looks across Townline Road in the foreground to series of open fields with 345kV NYPA transmission lines and lattice towers in the background. Only a portion of the Project is in view. The area around the fields is wooded and blocks some of the view while there are arrays that are visible through a large gap in the tree line. The horizontal shape of the arrays is compatible with the horizontal aspect of the tree line and serves as a continuum for the eye to follow. The low profile of the panels places the Project below the tree line where there are no vertical objects interrupting the skyline. Color contrasts are not strong due to similar color value to that of the background trees. Overall, the Project contrast is moderately weak and is subordinate in the view.

10.2.1.9 VP33 West Shore Trail, View South – Byron (LSZ 1 2; Distance 655 feet)

The West Shore Trail, a multi-use trail runs east-west and follows the former West Shore railroad bed located north of the Project and contains frequent existing vegetation on both sides of the trail which will serve to block views, but conversely there are frequent gaps in the vegetation that will offer partial and intermittent views to solar arrays. The trail is located at varying distances from arrays ranging from 340 feet to 0.5 miles away. VP33 shows a view in an area with one of the more proximal views to the Project from the trail and is 655 feet from the Project fence line. Existing conditions here shows the trail as being fairly well-vegetated at eye level where the tops of the panels can be seen. A different viewpoint from the trail to nearby arrays can be obtained as VP34 in the Project Photolog in Attachment 5. That photo was not used for a simulation because the vegetation is even denser and obscures more views from that location. Overall, at VP33 average Project contrasts are rated as weak. Viewer groups affected are of a recreational constituency throughout each season as the trail is also a snowmobile trail in the winter.

10.2.1.10 Viewpoints 23, 24, 25, 27, 29, and 30

Thus far all the simulation locations with representative views of the Project are within Distance Zone 1 within 0.5 miles because that is where Project views will be predominantly obtained. VPs within other Distance Zones were examined through the simulation visualization software process both in areas near residences and/or in areas where the viewshed analysis results show potential visibility and were confirmed that they had no views.

Viewpoints VP23, 24, and 30 in Distance Zone 2 between 0.5 and 2 miles were examined through the simulation process and resulted in no views. No simulations therefore are depicted for this zone. Please refer to the Project Photolog in Attachment 5 to see the existing, and thus the proposed view.

Viewpoints VP25, 27, and 29 in Distance Zone 3 between 2 and 5 miles were examined through the simulation process and resulted in no views. No simulations therefore are depicted for this zone. Again, please refer to the Project Photolog in Attachment 5 to see the existing, and thus the proposed view.

10.2.2 Discussion – LOS Results

LOS profiles can be found in Attachment 4.

10.2.2.1 L1 – Byron Elba Road (NY 262) to Collection Substation (LSZ 1, 3; Distance 0.35 miles)

L1 LOS is located at an open area along Byron Elba Road (NY262) and with a large road offset is approximately 0.35 miles north of the collection substation. There is a resident just north of the viewpoint as well as approximately 368 feet east of the LOS location. The collection substation is adjacent to the existing NYPA's 345 kV Line #DH2 transmission line and is consistent and compatible with the existing transmission line infrastructure where highest vertical proposed heights of substation components are similar. The height of the existing NYPA transmission towers are 90 feet high. The existing 345 kV line with large lattice tower structures present in the right-of-way is located between the viewpoint L1 viewer and the substation and both will be in view. The substation will be behind and south of the transmission line. The highest components at the collection substation includes several 76-foot tall surge arrestors and a 55-foot lightning mast within the fence line. Other station components with less vertical height include transformers, bus equipment, and breakers ranging from 25 to 27 feet high. A control building is proposed that will be 12.5 feet high.

LOS L1 in Attachment 4 shows the various component profile heights as well as visibility of station components along the L1 profile. Generally, from the L1 location, the profile shows that most of the collection substation site will be visible from this vantage point.

10.2.2.2 L2 – Batavia Byron Road (CR 19A) to Collection Substation (LSZ 1, 3; Distance 0.5 miles)

L2 LOS is located at the nearest resident southwest of the collection station on Batavia Byron Road approximately 0.5 miles from the Project. As noted in Section 10.2.2.1, highest components will be surge arrestors at 76 feet high and other low components range from 25 to 27 feet high. At the time of construction, residents along this road will have visibility of the arrays and probable partial views of the upper parts of the substation might be visible, as the arrays themselves will likely block views of lower portions. However, L2 LOS Profile in Attachment 4 represents a view from Batavia Byron Road at the nearest resident to the southwest. There is proposed vegetative landscaping along the road at the fence line and it is expected that this mitigation will screen views not only to the arrays but also to the lower and upper station components. While L2 shows heights of mitigation may reach 5 to 15 feet in 5 years, fully mature heights of the year-round coniferous species may reach up to 40 feet high.

10.3 Visual Impact Rating Results

Section 9.0 describes the concepts and methodology applied to rating visual change incurred by the proposed Project by evaluating the Project photosimulations. Only the simulations without mitigation were rated to understand contrasts under worst-case conditions. Descriptions of the moderating effects of mitigation are discussed in Section 10.2.1 while simulations showing mitigation are presented in Attachment 4. Three panelists evaluated and scored the simulations where there were views of the Project. Panelist 1 has been trained in the visual arts with a B.F.A. with a minor in art history as well as having an environmental background with an M.S. in Soil Science. Panelist 2 is a landscape architect. Panelist 3 has no visual arts study or landscape architecture experience but understands solar projects in addition to the Article 10 process. The raw evaluation forms for each viewpoint can be found in Attachment 7. However, Table 7 below summarizes the final scores and averages for Part 1 Visual Contrast, Part 2 Viewpoint Sensitivity and Part 3 Existing Scenic Quality. Here trends of contrast ratings where those VP locations that are considered to have the highest or lowest visual change in relation to each other can be obtained. Mean deviations are also calculated to gauge the variation between each of the panelists.

10.3.1 Part 1 Contrast Rating

Part 1 Contrast is fully described in Attachment 7 and rates proposed visual change with respect to compositional elements such as newly introduced line, shape, color, project scale, broken horizon lines, etc. Under Part 1 there are nine categories to rate where the total rating ranges from 0 to 27. When the rating contrast scale outlined in Section 9.0 is rescaled to account for the averages found in Table 7 with respect to the nine categories, the scale is thus:

Contrast Rating Scale	
0	None
4.5	
9	Weak
13.5	
18	Moderate
22.5	
27	Strong

The viewpoint with the strongest Part 1 Contrast is VP3 on Walkers Corner Road with an average rating of 19.8. This simulation shows the viewer approximately 270 feet from the Project. The Project will not be seen in its entirety as only several of the arrays in the southeastern section are visible from this location. However, the proposed view results in a moderate strong contrast rating due to new form, color, line, and texture contrasts of discernible detail and proximity to the viewer, compared to what is currently there.

The next highest contrast groupings are VP 1 and VP15a average ratings of 17.5 and 17.3 respectively. These VPs lower to just under a moderate contrast rating. Both show a clear sight line however here the road offsets are a little larger where Project distances from the viewer range from 675 to 685 feet away. However, form and line contrasts are apparent as is the level of discernible detail at this distance.

The next similarly grouped simulations are assigned a Part 1 contrast rating of weakly moderate. They are VPs 2b, 7, 9, 14a, and 21b and where average rating range from 11.0 to 14.3. While road offsets vary, each of these views has trees in the background that moderate the views where they appear visually absorbed; the arrays have a similar color to the tree groups in the background and generally stay at or below the horizon line.

Table 7. Visual Impact Rating Results

VP	Location	Contrast Rating Panelist 1			Contrast Rating Panelist 2			Contrast Rating Panelist 3			Avg Part 1	Mean Dev* Part 1	Avg Part 2	Mean Dev* Part 2	Avg Part3	Mean Dev* Part 3
		Part 1	Part 2	Part 3	Part 1	Part 2	Part 3	Part 1	Part 2	Part 3						
1	Caswell Road	17.5	4.0	2.0	17.5	4.0	1.0	17.5	5.5	1.0	17.5	0.0	4.5	0.7	1.3	0.4
2b	Walkers Corner Road (CR 19)	13.5	4.0	2.0	11.0	5.5	1.0	14.5	6.0	1.0	13.0	1.3	5.2	0.8	1.3	0.4
3	Walkers Corner Road (CR 19)	21.5	6.0	2.0	17.5	5.5	1.0	20.5	6.0	0.5	19.8	1.6	5.8	0.2	1.2	0.6
7	Cockram Road	15.5	5.5	2.0	14.0	5.0	1.0	13.5	7.5	1.0	14.3	0.8	6.0	1.0	1.3	0.4
9	Cockram Rd	14.5	5.0	1.5	11.0	5.5	1.0	15.5	4.5	0.5	13.7	1.8	5.0	0.3	1.0	0.3
14a	Batavia Byron Rd (CR 19A)	10.5	4.4	1.5	14.0	5.0	1.0	14.5	8.5	0.5	13.0	1.7	6.0	1.7	1.0	0.3
15a	Cockram Road	20.0	6.0	2.0	15.5	5.0	1.0	16.5	5.5	0.5	17.3	1.8	5.5	0.3	1.2	0.6
21b	Byron Cemetery	10.0	8.5	1.5	12.5	9.0	1.5	10.5	12.0	1.5	11.0	1.0	9.8	1.4	1.5	0.0
33	West Shore Trail	5.0	6.5	1.0	6.5	8.0	1.0	1.5	4.0	0.5	4.3	1.9	6.2	1.4	0.8	0.2

VP33 along the West Shore Trail has the weakest contrast with an average rating of 4.3. This is due to the vegetation along the trail that screens the view.

Mean deviations were calculated to observe the level of variance between the panelists within each simulation evaluation. Mean deviations ranged between 0.0 and 1.9. It appears panelist opinion varied the most regarding contrast changes when assessing VPs 9, 15a, and 33. VP9 has a mean deviation of 1.9 where two panelist rated contrasts similarly as weak to moderate while one panelist rated the visual change as moderate with an opinion that contrasts were higher. VP15a and VP33 both have a mean variance of 1.8. Two panelists rated the contrast lower (weak to strong) while the third panelist gave the contrast a higher rating of moderate to strong. The closest agreement was for VPs 1, 7, and 21b where the assessment of visual change appeared more straightforward to the panelists.

10.3.2 Part 2 Viewer Sensitivity

There are eight categories under Part 2 to rate where the total rating ranges from 0 to 24. When the rating contrast scale outlined in Section 9.0 is rescaled to account for the averages found in Table 7 with respect to the eight categories, the scale is thus:

Contrast Rating Scale	
0	None
4	
8	Weak
12	
16	Moderate
20	
24	Strong

Part 2 takes into account viewer sensitivity, in particular if the VP falls within or has a view of an existing visual receptor as well as the character of viewer groups such as number of viewers, duration of view, presence of existing development, etc.

Because Table 3 indicates minimal views of the Project will occur at the listed visual receptors, most of the viewer sensitivity issues focus on viewer groups related to the community travelers or residents as opposed to recreational or tourists. One simulation, VP21b at Byron Cemetery, was rated as weakly moderate. This had the highest Part 2 Viewer Sensitivity because of a cemetery but also because there are residents near the cemetery that may have longer duration views on some part of their property. The remaining viewer sensitivity ratings for the Project simulations were rated as weak as there were no views that were considered to be recognized as highly unique to the area nor do the simulations have the presence of water within the view. Out of this remaining group, VP33 at the West Shore Trail was assigned the next highest rating at 6.2. Although this is within a visual resource listed in Table 3 and may have any number of people

using it in a given week it likely has a lower rating because of its capacity for transient short duration views

Mean deviations for Part 2 Viewer Sensitivity show variance ranging between 0.2 and 1.7. Generally, Part 2 is less subjective. However, in reading the raw data form comments in some instances there were differences of opinion on how panelists rated duration of view and numbers of viewers based on observations in the view and the location of the viewpoint.

10.3.3 Part 3 Scenic Quality

Part 3 Scenic Quality is a standalone single rating that assesses the overall scenic quality of the VP's existing conditions (see also Attachment 7). Here there is no evaluation of visual change but a simple appraisal of the scenic quality of the view. A rating of 1 is weak, 2 is moderate, and 3 is strong.

Scenic quality for the simulation VPs were generally rated as weak to moderate. However, this is not to imply that views are not pretty, restful, or important to the community. Although there are restful, unchaotic and harmonious pastoral views of open fields with little development, panelists felt the views were average and typical of the area and that views did not offer a high degree of visual interest such as landscape diversity, show distinct focal points that enhance scenic quality or offer other types of outstanding views according to criteria in Attachment 7. There is a sameness of large horizontal shapes to each of the views consisting of level fields in the bottom third of the photo, a band of background trees in the middle and the upper third of the photos showing sky. However, the intent was to provide simulations of the Project from visual resources but mostly to have representative views of what the community would experience from residents and roadways.

Mean deviations for Part 3 are comparatively very low, ranging between 0.0 and 0.6. This suggests the panelist's opinions on scenic quality regarding each viewpoint were very similar.

11.0 LIGHTING

The collection substation and switchyard outdoor lighting systems will be designed to provide adequate illumination for security, emergency egress within the Point of Interconnection facilities, and an indication of the position of disconnect switch blades. The illumination levels shall meet levels identified in the National Electric Safety Codes.

Lighting is only proposed at the Project interconnection facilities and is only for security, safety, and maintenance purposes; no lighting is proposed within the solar arrays or at the energy storage systems. A lighting plan for the collection substation and switchyard is provided as Appendix 11-3 of the Application and includes the type, number, and location of exterior lighting fixtures and indicated measures to prevent or mitigate, to the maximum extent practicable, unnecessary light trespass beyond the Project property line. The lighting plan includes photometrics and manufacturer cut sheets. The collection substation and switchyards will normally be unoccupied.

Lighting will be activated manually turned on by a switch. Lighting will be installed facing downward to minimize potential impacts to the surrounding public. Lighting has been designed to eliminate light trespass beyond the substation and switchyard, will be equipment or pole structure mounted, and will not exceed a 3.4 foot-candle average. During unoccupied periods, lighting will not be illuminated. The collection substation and switchyard will use full cut-off fixtures, no drop-down optics, and task lighting wherever feasible, specified in the Lighting Plan.

12.0 MITIGATION

Mitigation includes siting and design and vegetative plantings to help moderate visibility. To maximize the benefits of siting renewable energy facilities on agricultural lands, solar installations can also be co-located with ongoing agricultural operations for the parcel owner. Solar facilities can be designed to be compatible with continued farming practices in order to limit the amount of land taken out of agricultural production.

When a solar farm is decommissioned and removed, the land can be returned to other productive use, including farming. In this way, a solar lease can be a way to preserve land for potential future agricultural use. Large-scale solar projects can be made less visible from roads or other public vantage points. Several techniques for minimizing and mitigating visibility from large-scale solar projects can be made such as keeping facility components at low profile and site and designing the site to take advantage of natural topographic and vegetative screening; road setbacks; siting against tree lines; and avoiding the use of overhead interconnection lines.

12.1 Siting and Design

Current siting is optimized so as to minimize visibility by placing the arrays in certain ways. Siting against tree lines as well as setback distances of several hundred feet are effective in reducing visibility.

Siting layout and design considerations that offer mitigation are summarized as follows:

- Use of surrounding woodlands and hedgerows as existing visual barriers as much as possible.
- Panels proposed against background trees to reduce visual contrasts, as color contrasts are absorbed and moderated by the background trees.
- Setbacks and offsets: 300 feet of minimum setback are used for residential buildings while other adjacent parcels have a 200-foot setback. Setbacks and offsets: 300 feet of minimum setback are used for residential buildings while other adjacent parcels have a minimum 200-foot setback.
- Use of antireflective coatings on solar panels. Solar photovoltaic panels are also designed to absorb light, not reflect light, therefore, produce minimal glare. Solar photovoltaic panels are also designed to absorb light, not reflect light, therefore, produce minimal, if any, glare.

- When employed, tracker technology keeps panels at a 90-degree angle from the sun reflecting any potential glare back towards the sky.
- General site location placed far from sensitive agency recognized and listed visual receptors.
- The Project has been sited away from the population centers in order to minimize potential visibility by a relatively larger number of viewers.
- The collection substation located proximal to the existing transmission right-of-way within similar utility infrastructure and for minimally distant new interconnect to the electric grid.
- Vegetative buffers: plantings of native pollinator species are included in the proposed buffer.
- Collection lines have been placed underground to decrease additional aboveground impacts. This configuration allows continued use of the land within the Project area.
- Minimized vegetation clearing outside the arrays.
- There is the possibility of existing agricultural practices to resume in agricultural fields adjacent to arrays, such as the planting of row crops, where plantings such as corn could provide screening during a portion of the year.

12.2 Vegetative Mitigation

Both the solar array themselves and their ancillary components can affect the character of a landscape. From a scenery point of view, methods and techniques of hiding/screening solar farms can be effective in moderating views. Typically, selected landscaping is chosen to provide year-round screening, provide a long-lived, resilient and dense bank of vegetation, and be a native and/or pollinator species readily available in the area.

The Landscaping Plan for vegetative mitigation can be found in Attachment 11-1 of Exhibit 11. The following items and concepts were applied to the plan:

- The Town of Byron Land Use Code and Zoning Law was reviewed to understand how and where to apply visual screening.

- Native evergreen and deciduous shrubs and trees as well as pollinator species were chosen for the vegetative barriers. Species chosen will need to reach an adequate height and width to provide visual screening yet not be too high at maturity that could ultimately produce shade over the Project in later years. Deciduous and evergreen tree species include: eastern red cedar (*Juniperus virginiana*), white spruce (*Picea glauca*), blue spruce (*Picea pungens*), flowering dogwood (*Cornus florida*), and downy shadbush (*Amelanchier arborea*). Shrub species include: red chokeberry (*Aronia arbutifolia*), red twig dogwood (*Cornus sericea*), common witch hazel (*Hamamelis virginiana*), American cranberry

(*Viburnam triloblum)*, nannyberry (*Viburnam lentago*), and highbush blueberry (*Vaccinium corymbosum*).

- Three types of planting "templates" are proposed along the outside fence line in locations noted on the Landscape Plan in Appendix 11-1. Each template level maintains a similar planting density but each one utilizes a certain average number of evergreens per 100 linear foot of planting to increase year round visual mitigation.
    - Type 1 is a minimum planting screening effort that utilizes an average of 6 to 7 evergreen tree species per every 100 linear feet.
    - Type 2 is a typical visual buffer screening effort that utilizes an average of 8 to 9 evergreen tree species per every 100 linear feet.
    - Type 3 is a maximum visual screening effort that utilizes an average of 12 to 13 evergreen tree species per every 100 linear feet.
- Expected growth heights depending on the specific tree or shrub are expected to be between 5 to 15 feet at 5 years. However, fully mature heights of the year-round coniferous species may reach up to 40 feet high.

13.0 VISUAL IMPACTS DURING CONSTRUCTION

Visual impacts during construction are anticipated to be minor and temporary in nature. Construction activities for a solar facility are site and project dependent; however, construction of a typical facility would normally involve the following major actions with potential visibility: building/upgrading roads; constructing laydown areas; removing some vegetation from areas of construction; transporting components and other materials and equipment related to the solar site; assembling the solar panels; constructing ancillary structures (e.g., collection substation, fences, energy storage system) and installing power-conducting cables (typically buried). Potential visual contrasts that could result from construction activities include contrasts in form, line, color, and texture resulting from road upgrading; construction and use of staging and laydown areas; vehicular, equipment, and worker presence and activity; dust; and emissions.

Construction visual contrasts would vary in frequency and duration throughout the course of construction; there may be periods of intense activity followed by periods with less activity and associated visibility would vary in accordance with construction activity levels. Construction schedules are project dependent.

14.0 CONCLUSIONS – VISUAL IMPACTS DURING OPERATION

The information in this visual impact assessment can provide an understanding of the particular issues involved in the visual relationship between the Project and its surrounding context. In-depth compilation of computerized analysis results and corresponding discussion was provided

in Section 10.0. The viewshed analysis results show that there is minimal expected visibility (8.0%) within the overall VSA and there would be limited areas from which the Project would be visible but, in contrast, a multitude of areas from which it would not be seen. A majority of the overall visibility will occur within 0.5 miles of the arrays (5.6%) although there are several tree groups surrounding the Project that will block views. There are also attributes of the design of this solar project and its relationship to its particular surroundings that would minimize the Project's impacts as discussed in Section 12.0 Mitigation.

The arrays will be located on parcels of land currently used for agricultural purposes. The general visual appearance of the low-profile panels as a group contribute to a homogenous form with low discernible detail at distance which consists of a new horizontal pattern similar in color, shape, and size to the background forested areas and field edges found in many views. The horizontal shapes en masse in many instances provides a visual flow that is repeated or similar to what is in the landscape as the panels follow the existing ground contours. Color differences between the Project and the landscape may provide some contrast but will vary throughout the seasons. Overall Project contrast and the overall visual effect will vary depending on the extent of panel visibility (partial or full), distance of the arrays from the viewer, and if the panels are seen in the context of other existing noticeable modifications to the local natural landscape. The Applicant is proposing to install landscaping along portions of the Project to provide nearby residences with screened views towards the Project. Landscaping will consist of a variety of evergreen trees and shrubs that will provide year-round screening. Visual Project contrast from solar panels is anticipated to be avoided or minimized in areas where landscaping is proposed.

Due to the placement and road offset, the collection substation will not be visible from all areas in the vicinity as well as within the overall VSA. The collection substation is adjacent to the existing NYPA's 345 kV Line #DH2 transmission line and is consistent and compatible with the existing transmission line infrastructure where highest vertical proposed heights of substation components are similar. The existing NYPA lattice transmission towers are 90 feet high while the highest components of the station will be several surge arrestors at 76-feet high and a small diameter lightning mast at 55-feet high. Lower station components range from 25 to 27 feet high and include transformers, bus equipment, and breakers. The station will be surrounded by the 13 foot arrays on its western and southern sides. The station will be surrounded by the 13-foot arrays on its western and southern sides. The most prominent views of the collection substation are anticipated to be directly north along a 1 mile stretch of Byron Elba Road (NY262) as represented by LOS L1. The most prominent views of the collection substation are anticipated to be directly north along a 1-mile stretch of Byron Elba Road (NY262) as represented by LOS L1. L1 LOS Profile in Attachment 4 is located at an open area along Byron Elba Road and with a large road offset is approximately 0.35 miles from the collection substation. The substation will be behind and south of the transmission line and most components will be in view but at distance. At the time of construction, the upper portions of the substation may visible in limited areas along Batavia Byron and Cockram Roads. However, mitigation is proposed at the array fence line near the roadside edge on Batavia Byron and Cockram Roads. L2 LOS in Attachment 4 represents a view from Batavia Byron Road and demonstrates that it is expected that proposed mitigation will screen

views not only to the arrays but also to the lower and upper station components. There is expected to be limited views of the lower station components from the east along Caswell Road 0.3 miles away, as there are several tree groups and tree rows. However, several segments along Caswell Road may have visibility of both the lower and higher station components. There are sections of Caswell Road that will not have mitigation and there are some open views towards the station that looks down the existing NYPA's 345 kV Line #DH2 transmission line right-of-way that is approximately 280 feet wide.

Other factors assessing the degree of visual change other than percentages of visibility expected as a result of the Project can be considered:

- Except for the City of Batavia, the towns that fall within the 5-mile VSA are rural with an agricultural economy. Agricultural practices and revenue will not be degraded in the overall region. Farming practices may continue on portions of the Project Area not utilized for the Project Components and participating landowners will continue to receive consistent income throughout the economic useful life of the Project.
- Project Facilities are set back from property lines to both reduce visibility and to not disturb surrounding agricultural activities on adjacent parcels.
- Through the use of efficient solar panels, the Applicant is able to limit the ground cover required to achieve its objective of 280MW generating capacity. Additionally, solar farms typically result in a minimal amount of ground disturbance for the installation of racking and mounting posts thereby preserving the ability to use the land for agricultural purposes in the future following decommissioning.
- The Alternating Current (AC) collection lines will be placed underground for the entirety of their length and installed primarily via direct burial or trenching with some portions to be proposed via HDD in order to avoid wetland resources and roadways.
- While the Project area consists of many pastoral views, landscape features are similar to each other and landscape characteristics are typical of what you would find in a rural area in this part of New York. The Project will not impair these surrounding regional landscape characteristics.
- The Project will not always appear as a dominant feature in a view and due to limited to no long-range visibility and the fact that most visual resources are at distance to the Project, it should not interfere with the general enjoyment of recreational resources in the area.
- The Applicant has employed reasonable mitigation measures in the overall design and layout of the proposed Project so that it fits reasonably well into the available parcels and landscape.
- Vertical scale is typically not an issue in relation to surrounding features such as trees, hills, and barns. Lateral extent may be an issue if the arrays appear to overwhelm a ridgeline, scenic water body, or cultural feature that appears diminished in prominence.

The Project solar arrays, considering their layout, spacing and the topography and resources in the area, do not overwhelm such physical geographic areas.

- Visual clutter often is adversely perceived and commonly results from the combination of human-made elements in close association that are of differing shapes, colors, forms, patterns, or scales. Generally, solar farms offer simple and uniform or geometrically patterned arrays or groupings that may be more visually consistent than mixed types and sizes of objects. At distance, the arrays usually appear as a continuous nearly homogenous shape or color following the grade as opposed to randomly scattered objects.
- Aside from normal road traffic (see also AADTs in Table 1), the public areas in proximity to the Project Area are not exceedingly high-use destination areas.
- The Project does not have an adverse effect on a known listed scenic vista.
- The Project does not damage or degrade existing scenic resources.
- The Project will not impede the use of recreational activities.
- The Project does not create a new source of substantial light which would adversely affect nighttime views in the area. Potential glare from the solar modules and associated equipment would be negligible as they would consist of a non-reflective coating. In the case of tracker arrays, the face of the solar panel surface is programmed to follow the movement of the sun.

15.0 GLARE

The Project is not predicted to emit glare into the existing environment. Panels are designed to absorb sunlight and will be treated with anti-reflective coatings that will absorb and transmit light rather than reflect it. In general, solar panels are less reflective than window glass or water surfaces (NYSERDA, 2019) and any reflected light from solar panels will have a significantly lower intensity than glare from direct sunlight (Mass. Department of Energy Resources, 2015).

The Applicant prepared a Glint and Glare Analysis, included as Appendix 24-2, to identify any potential glint/glare impacts on nearby residences and roads and the need for any necessary mitigation. The analysis was prepared by Capitol Airspace Group utilizing the Solar Glare Hazard Analysis Tool (SGHAT). The results of the analysis conform to, and are in accordance with, the FAA's interim policy for Solar Energy System Projects on Federally Obligated Airports (78 FR 63271, October 2013), although this policy is only applicable for projects proposing to install solar panels at federally funded airports. SGHAT is a very conservative tool in that:

- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions;

- The glare analysis assumes clear, sunny skies for 365 days of the year and does not take into account meteorological conditions that would nullify predicted glare such as clouds, rain or snow; and,

- Although only a portion of a modeled array may have the potential to produce glare, the results are provided as if the receptor has visibility of the entire array.

The results of the analysis indicate there is no predicted glare for the proposed arrays. Based on the results of the analysis, no significant impacts from glare are expected as a result of the Project.

Refer to Appendix 24-2 for full details on the glint and glare analysis.

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