Visual Impact Assessment

October 2019

High River Energy Center

Town of Florida, New York

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ATTACHMENTS

1.0 INTRODUCTION

High River Energy Center, LLC, (HREC) a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC is proposing to construct, operate and maintain the High River Energy Center (Project), and is submitting an Article 10 application to the NYS Department of Public Service in pursuit of a Certificate of Public Need and Compatibility.

HREC is providing herein a Visual Impact Assessment (VIA) that addresses the visual impacts from the major components of the Project. The focus of this VIA includes the visual impacts from the proposed solar panels 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
- Assess the visual impacts associated with the proposed Project

The VIA was performed according to the requirements in 16 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 fenceline of the Facility.

2.0 THE PROJECT

The Project will have a generating capacity of 90 MW and will be located on land either leased or purchased from owners of private property in the Town of Florida, Montgomery County, New York. See Figure C-001, Attachment 1 and Figure 1, Attachment 2 for Project location and VSA. Project facilities will include commercial-scale solar arrays, access roads, buried electric collection lines, and electrical interconnection facilities. The High River Energy Center interconnection facilities will include a collection substation and point of interconnection (POI) switchyard, which will be transferred to National Grid to own, maintain, and operate. The proposed collection substation and POI switchyard will be located on land within the Project Area in relative proximity to National Grid's existing Stoner – Rotterdam #12 115 kilovolt (kV) transmission line which will be connected to the POI switchyard.

The Project proposes to install fixed, tracker, or a combination of both types of racking systems. 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 this Application to evaluate both types of racking systems, with the final decision to be made and detailed in the Compliance Filing. The tracking and fixed array racking systems to be utilized would be similar to the Gamechange Solar Genius Tracker™ and the Gamechange

Maxspan™ Pile Driven System, respectively, specification sheets of which have been included in Appendix 2-2 and Appendix 2-3. 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. A specification sheet for this module has been included in Appendix 2-1. Only selected elements of the Project would change based upon the combination of array racking system types used, but all changes would be within the component fenceline and to the same land uses shown in the Proposed Layout. The location of interior access roads and inverters, depending upon the final locations, could differ from that shown in the Exhibit 11 plans. Land coverage ratios will also be adjusted but they are not expected to be substantial or significant. Again, land uses are the same in all locations.

Accordingly, the drawings, plans, and maps required by Exhibit 11 depict a combination of both panel types, fixed and tracker. Approximately 50% of the panels are fixed and 50% are trackers. As part of the alternative layout evaluation, Exhibit 9 presents a site plan depicting all fixed panels. Consistent with that potential layout, the glare analysis contained in this VIA is premised upon an all-fixed layout in order to present results that do not understate potential glare visibility, which will be mitigated to the maximum extent practicable.

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

Project: the proposed High River Energy Center solar energy facility.

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, electrical interconnection facilities, and laydown areas.

Visual Study Area: A five-mile radius around the fenceline of the Facility specifically designated for the study of visual impacts.

Solar Arrays: As solar technology is rapidly advancing, it is not possible to determine the exact module type that will be utilized for a project with a commercial operation date of 2021. However, the Applicant intends to utilize a module similar to the Jinko Solar Eagle 72HM G2 380-400 Watt Mono Perc Diamond Cell. The Project will utilize both fixed tilt and tracking array systems, similar to the Gamechange Maxspan™ Pile Driven System and the Gamechange Solar Genius Tracker™, respectively.

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.

Access Roads: Roads used to access solar arrays will follow existing farm roads and trails, where practicable, to minimize the need for new roads. Temporary access roads used during construction will be gravel surfaced and approximately 16 feet (4.88 meters) wide. The total length of access roads is approximately 6.56 miles.

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 7.86 miles (12,649.44 meters). Collection lines will be installed underground (approximately 40,885 miles [12,462 meters]) via direct burial and horizontal directional drilling (HDD) (approximately 638 feet [194 meters]).

Fencing: Fencing will be placed around the perimeter of the arrays and associated structures. Fencing will be chain-link and eight feet in height per local regulations and will only be topped with barbed wire around the perimeter of the substation.

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 115 kV. The collection substation will be located north of Pattersonville Road. The construction of the collection substation is anticipated to occupy approximately 0.85 acres (3,440 square meters) of agricultural land.

Project Interconnection Facilities: Power from the collection substation will be transported to an immediately adjacent switchyard and then interconnect to the existing National Grid Stoner – Rotterdam #12 transmission line. The switchyard will be transferred to National Grid to own and operate.

3.0 VISUAL CHARACTER OF THE EXISTING LANDSCAPE

Solar panels are proposed in the Town of Florida, NY. The VSA is a 5-mile radius and primarily includes Montgomery and Schenectady Counties with a small corner of Saratoga County in the northeast segment near the VSA boundary. The definition of the VSA is five miles around the fenceline 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 Florida, NY.

Towns that fall within One Half Mile Distance Zone: Florida.

Towns that fall within Two Mile Distance Zone: Town of Amsterdam, City of Amsterdam, Duanesburg, Florida, Glenville, Princetown, and Rotterdam.

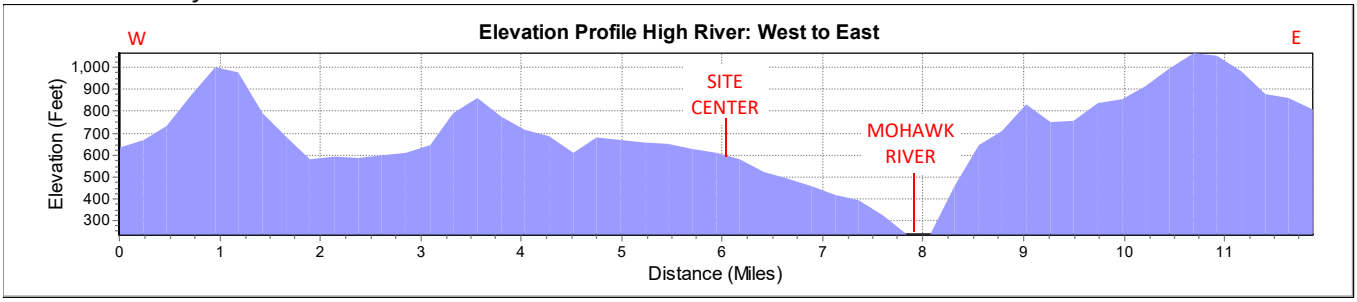
Towns that fall between Two and Five Mile Distance Zone: Town of Amsterdam, City of Amsterdam, Charlton, Duanesburg, Florida. Glenville, Princetown, and Rotterdam.

3.1 PHYSIOGRAPHY AND LANDFORM

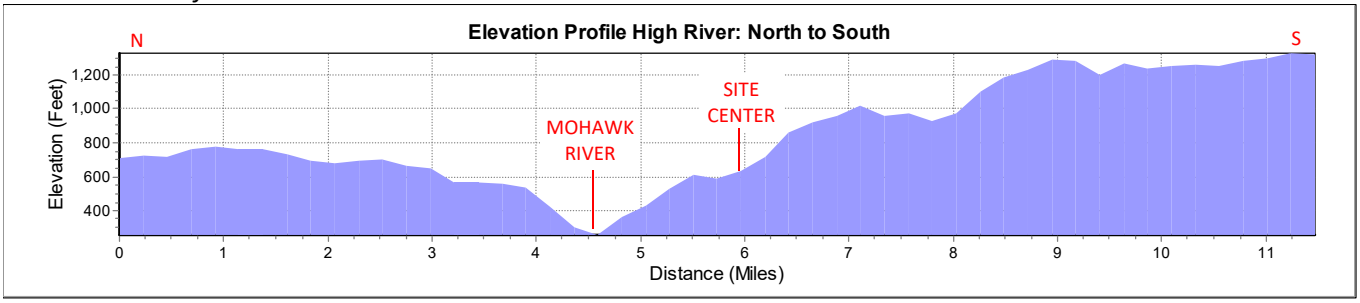
Topography is an important feature that can determine sightlines to a project. Physiographically, the site is approximately 0.6 miles south of the Mohawk River in a toe slope location. As Elevation Profiles 1 and 2 show, several small hills are located within the VSA. The VSA is within the confluence of several physiographic provinces. The site is within the glaciated Allegheny Plateau province indicating less variable relief. Just north of the site a small band of the Hudson-Mohawk Lowlands straddles the Mohawk River and encompasses the associated valley. The southern edge of the Adirondack Mountain province is north of the river in Glenville and north Amsterdam. South of the site lies the northern edge of the Catskill Mountains province.

Approximate elevations within the VSA range between 200 and 1300 feet above mean sea level (msl) as noted with terrain Elevation Profiles 1-2 below.

Elevation Profile 1



Elevation Profile 2



A map showing colorized graduated ground elevations is presented to visually understand terrain over a regional area (Figure 2, Attachment 2). Stream valleys and high points can be clearly discerned.

3.2 LAND USE PATTERNS

The Town of Florida is located south of the Mohawk River while the City of Amsterdam and Town of Amsterdam lie north of the river. The Mohawk River flows east-west approximately 0.6 miles north of the site and historically formed part of the Erie Canal in the New York State Canal System. The City of Amsterdam lies 2 miles northwest of the site and consists of low to medium intensity

urban development with an estimated 2017 population of 17,974. The Town of Amsterdam is primarily suburban in character with an estimated population of 6,001. The Town of Florida where the Project is located, is a rural, agricultural community as is reflected with a population of approximately 2,718.

I-90 NY State Thruway, a major east-west travel corridor crosses the VSA and lies adjacent to and north of the northern most part of the Project. Routes 5N and 5S are two state highways that are major travel corridors located north and south of the Mohawk River respectively, and generally run east-west paralleling the river. Aside from the Thruway and within the City of Amsterdam, most other roads in the VSA are local rural roads.

The landscape in the VSA south of the river and Thruway where the Project is located is primarily a rural mix of rolling farmland consisting of cultivated crops and hay-pasture land with small intermittent and isolated forest groups, several of which serve as vegetated riparian zones for local streams. Within the VSA, aside from the urban characteristic of the City of Amsterdam, housing in Florida reflects its mostly rural character. Residences are generally on large lots with many being farmsteads. Dense rural forested areas become more predominant trending easterly between 2 and 5 miles in Princetown, Glenville, and Rotterdam.

The following inset photos show the character of the area. Insets 1-7 illustrate the farmsteads and agricultural land use with intermittent forested areas. One can also discern the terrain characteristic and flat to gently sloping of the Project in most of the photos. Insets 2, 3, and 7 show photos at distance illustrating steeper valley topography. Inset 1, 2, 5, 6, and 7 show the show the rural nature of the county roads.

Inset 1. Thayer Rd, Florida.

Inset 2. Fuller Road, Florida.

Inset 3. Swart Hill Road, Amsterdam.

Inset 4. Pattersonville Road, Florida.

Inset 5. Thayer Road, Florida.

Inset 6. Belldons Road, Florida.

Inset 7. Mohr Road, Florida. View northwest with the City of Amsterdam in the background.

Inset 8 provides an examples of smaller village areas but with a larger aggregation of population and neighborhood type streets. Insets 9, 10, and 12 illustrate the type of aggregated higher density urban development in the City of Amsterdam.

Inset 8. Florida, Route 30.

Inset 9. City of Amsterdam to the right, and Mohawk River.

3.3 WATER RESOURCES

Few water resources are within the VSA. Most are small unnamed tributary streams that drain into the larger Mohawk River that is located 0.6 miles to the north. One of the more substantial named streams in the vicinity is Terwilliger Creek 0.2 miles to the west. Other larger creeks are Sandsea Kill that is 1.8 miles to the east and South Chuctanunda Creek that is 3.1 miles to the west. There are no DEC Fishing Areas within the VSA. Few water bodies exist as well. Mariaville Lake is a larger water body that is 4 miles to the south and will not have views of the Project.

Insets 9-12 show the character of the Mohawk River within the VSA. Inset 13 is a photo of Mariaville Lake.

Inset 10. Mohawk River view east from Highway 30 bridge City of Amsterdam.

Inset 11. Mohawk River state boat launch, north bank, Town of Amsterdam.

Inset 12. Mohawk River north bank, view south from Route 5N (Revolutionary Trail NYS Scenic Byway), Town of Amsterdam.

Inset 13. Riverview Drive north bank of Mohawk River (Route 5N Revolutionary Trail NYS Scenic Byway is road in middleground), Town of Amsterdam.

Inset 14. Mariaville Lake and Historic District.

3.4 TRAVEL CORRIDORS AND SCENIC ROADS

I-90 NY State Thruway, a major east-west expressway, crosses the VSA and lies adjacent to and north of northern most part of the Project. Routes 5N and 5S are two state highways that allow for through travelling, located 0.8 miles north and 0.5 miles south of the Mohawk River respectively, and generally run east-west, paralleling the river. NY-30 is another highway located 2.0 miles west of the Project that provides high travel speeds with minimal disruption to the through traveling vehicles. NY-165 (Thayer Road) and CR 151 (Bulls Head Road) are perimeter roads around the arrays and have more drive access points and generally operate at lower operating speeds. The remaining roadways within the Project Area are classified as local roads and account for the largest percentage of total roadway miles. These roadways are short and facilitate direct access to adjacent property owners with many driveways and access points.

The Revolutionary Trail Scenic Byway, designated a New York State Scenic Byway, is NY Route 5N paralleling the Mohawk River on the north side. The Byway overall is 158 miles long and runs east-west between Albany and the shores of the Great Lake Ontario. About 12.2 miles of the Byway runs through the VSA.

Other local routes are less travelled, but they are vital corridors for local residents in getting from Point A to Point B. To help describe the rural nature in the vicinity of the panel locations versus other highways at the periphery of the Project and at distance from the site of the area, annual average daily traffic (AADT) counts (2015) are provided in the Table 1 listing of roadways as available with the VSA. 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. Table 1 can also provide an understanding of the intensity of vehicle travel (a category of viewer group as noted in Section 8.0). Because of the numerous roads in the area, especially north of the Mohawk River and in the City of Amsterdam, only those

roads with Distance Zone 1 of 0.5 miles and Zone 2 between 0.5 to 2 miles are listed. Roads outside of 2 miles are not listed.

The AADT measured roads that run through the heart of the Project are Bulls Head Road and Thayer Road both of which by comparison have low numbers. For perspective Highway 5 north and south of the Mohawk River have larger traffic counts and I-90 NYS Thruway located north and adjacent to the site has an AADT of 27,415.

Table 1. Major Roads

ROUTE	AADT*	BEGIN SEG	END SEG	TOWN	DISTANCE ZONE
NY 5S	2,583	Amsterdam Cl / Florida Tl	Mont/Schen Co Line	Florida	1
90, NYS Thruway	27,415	Inter 27 - Rt 30 Over	Mont/Schen Co Line	Florida	1
Bulls Head Rd	68	Pattersonville Rd.	NY 5S	Florida	1
Bulls Head Rd	224	NY 30	Thayer Rd	Florida	1
Bulls Head Rd	199	Thayer Rd	Pattersonville Rd.	Florida	1
Langley Rd	182	NY 30	Thayer Rd	Florida	1
Langley Rd	72	Thayer Rd	Ny 5S	Florida	1
Thayer Rd	634	Thayer Rd Spur	Ny 5S	Florida	1
NY 5N (Revolutionary Trail Scenic Byway)	12,147	Town Of Amsterdam	Mont/Schen Co Line	Amsterdam	2
Chapman Dr	488	Amsterdam Ctyl	Widow Susan Rd	Amsterdam	2
Cranes Hllw Rd	132	Maclachlan Rd	Ny 67	Amsterdam	2
Edson St	915	C/L	Widow Susan Rd	Amsterdam	2
Widow Susan Rd	2,061	Chapman Dr	Park Dr	Amsterdam	2
Widow Susan Rd	1,975	Park Dr	NY 67 Church St	Amsterdam	2
160 (Scotch Church Rd)	401	RT 159	Schen/Mont Co Line	Duanesburg	2
NY30	4098	RT 161	Amsterdam-Florida Co Line	Florida	2
160 (Sulphur Springs Rd)	680	Schen/Mont Co Line	Mont/Schen Co Line	Florida	2
Schuyler Rd	0	Langley Rd	Bulls Head Rd	Florida	2
Sulphur Sprigs	293	NY 30	Ny 160	Florida	2
NY 5S	12,462	Mont/Schen Co Line	RT 103 JCT	Glenville	2
160 (Scotch Church Rd)	494	Mont/Schen Co Line	CR 117	Princetown	2
160 (Scotch Church Rd)	640	CR 117	RT 5S END RT 160	Princetown	2
Ptersnvl Rnx Cr	536	County Rte. 72	5S	Princetown	2

ROUTE	AADT*	BEGIN SEG	END SEG	TOWN	DISTANCE ZONE
NY 5S	4,193	Rt 160 Pattersonville	Rt 103	Rotterdam	2
NY 5S	2,341	Mont/Schen Co Line	Rt 160 Pattersonville	Rotterdam	2

**Annual average daily traffic count*

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 (1995). The effects of distance are highly dependent 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 (proposed 8 feet high for fixed arrays and 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 act as a visual obstruction for locations farther out. Solar projects typically have lateral breadth but as such, visibility of solar projects in the northeast, because of frequent and highly vegetated narrow ridge 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 is 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 as 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 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 is 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 (LSZ) 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 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 Figure 3, Attachment 2 and include the following:

Zone 1 - Agricultural/Open Field

Agricultural and open field consists of cultivated crops, hay, or pasture or general open land. Views from this zone are typically from larger open areas along roadsides and can include homes offset farther from the road that are not included in the Zone 3 Developed category. Frequently there are hedgerows or small tree groups that provide intermittent screening.

Zone 2 - Forested

Views from inside the Forest Zone are highly limited since it is assumed that tree canopy precludes outward views unless there are intermittent gaps in trees. Forested areas may include roadway segments where there are permanent residents.

Zone 3 - Developed

The City of Amsterdam falls under this category. However generally in the VSA residential housing consists of single-family dwellings or a larger farm complex. The Developed Zone in towns outside of the city also includes the local roadways where rural residential development is intermittently established adjacent and along the existing road network as well as accounting for roadway travelers. Often adjacent buildings in this zone are visual impediments for views as well as roadside vegetation. However, there may be open road corridors with less screening that could afford longer distant views.

Zone 4 – Mohawk River Corridor

This LSZ is a major water feature that runs east-west through the VSA. This Zone is constrained to the Mohawk River and shoreline areas.

Table 2 summarizes the percentage of LSZs in the VSA.

Table 2. Percentage of Landscape Similarity Zones within Five Mile VSA

	Distance Zone 1 0.5 Miles		Distance Zone 2 0.5-2.0 Miles		Distance Zone 3 2.0-5.0 Miles			
LSZ	**Square Miles**	**% of LSZ w/in VSA**	**Square Miles**	**% of LSZ w/in VSA**	**Square Miles**	**% of LSZ wi/in VSA**	**Total Square Miles of LSZ**	**Total Percent of LSZ in VSA**
Zone 1 Agricultural/Open Land	4.11	3.67%	10.32	9.21%	33.92	30.28%	48.35	**43.16%**
Zone 2 Forested	1.90	1.70%	9.02	8.05%	44.54	39.75%	55.46	**49.51%**
Zone 3 Developed	0.17	0.15%	1.14	1.02%	5.39	4.81%	6.70	**5.98%**
Zone 4 Mohawk River Corridor	0.00	0.00%	0.74	0.66%	0.77	0.69%	1.52	**1.35%**
Totals	**6.18**	**5.52%**	**21.23**	**18.95%**	**84.62**	**75.53%**	**112.03**	**100.00%**

Landscape Similarity Zones 1 and 2 are comprised of fairly similar area percentages within the VSA. Zone 2 Forested is the dominant LSZ found within the 5-mile VSA, comprising 49.5% of the land area and appears the most in Distance Zone 3 out beyond 2 miles. LSZ 1 Agricultural/Open accounts for 43.2% of the total VSA land area and occurs the most in Distance Zones 1 and 2. Zone 3 Developed areas consist of approximately 6% of the VSA. LSZ 4 Mohawk River Corridor is a prominent feature but only comprises 1.4% of the VSA. It does not appear within 0.5 miles of the Project but passes through Distance Zones 2 and 3.

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, state, and federal visual resources were investigated per 16 NYCRR §1001.24. 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.

According to 16 NYCRR §1001.24, the following were reviewed:

1) Landmark landscapes;

    - There are no landmark landscapes found within 5 miles of the Project.

2) Wild, scenic or recreational rivers administered respectively by either the NYSDEC or the APA pursuant to ECL Article 15 or Department of Interior pursuant to 16 USC Section 1271;

    - There are no NYSDEC or APA wild, scenic or recreational rivers found within 5 miles of the Project.

3) Forest preserve lands, conservation easement lands, scenic byways designated by the federal or state governments;

    - There are no federal or state forest preserve lands in the 5-mile VSA.

    - Four federal conservation easements are held by Natural Resources Conservation Service. One each in:
        a. Amsterdam, Unique Identification Number 963020: 3 miles north of site on Mannys Corners Road
        b. Florida, 964588: 1.9 miles west near Fuller Road
        c. Glenville, 964577: 4.5 miles northeast on Hart Road
        d. Rotterdam, 956915: 3.6 miles southeast of site at Turnbull Lane

    - Route 5, The Revolutionary Trail, which runs east west in the Town of Amsterdam paralleling the north side of the Mohawk River located approximately one mile north of the site is designated as a New York State Scenic Byway.

4) Scenic districts and scenic roads, designated by the Commissioner of Environmental Conservation pursuant to ECL Article 49 scenic districts;

    - Scenic districts and scenic roads have been investigated.

5) Scenic Areas of Statewide Significance;

    - There are no Scenic Areas of Statewide Significance found within the 5-mile VSA.

6) State parks;

- There are no State parks managed by the Office of Parks, Recreation and Historic Preservation (OPRHP).

7) Sites listed on National or State Registers of Historic Places (NRHP);

- The evaluation for Exhibit 24 is focused on listed NRHP and potentially eligible historic sites using Distance Zones around the fenceline (visible elements of the Project). As noted above, listed National Register of Historic Places (NRHP) and eligible historic properties for Exhibit 24 purposes were obtained from CRIS. CRIS listed NRHP sites, historic districts, and potentially eligible historic sites are found in Table 3.

- A Historic Architecture Reconnaissance Survey for the Project has been completed for the Section 106 process. The goal of this survey is to document all previously recorded and newly identified above-ground architectural resources 50 years of age or older within the Project's historic designated APE of 5 miles and evaluate their eligibility for listing in the NRHP in consultation with OPRHP. Further detail on Cultural Studies for the Project can found in Exhibit 20.

8) Areas covered by scenic easements, public parks or recreation areas;

- There are no scenic easements found in the VSA.

- There are several public parks and recreation areas in the VSA. Veteran's Memorial Park is 3.0 miles to the west on Fort Hunter Road in Florida, Lock 9 State Canal Park in Glenville is 4 miles to the east, Moccasin Kill County Sanctuary is 4.5 miles to the southeast, Sanders Town Preserve is 4.9 miles to the east, Featherstonaugh State Forest is 4.9 miles south, and Indian Lookout Country Club is 4.4 miles south of the Project. There are fifteen local city parks in the City of Amsterdam and one in Rotterdam. Please refer to Table 3 and Figure 4 in Attachment 2.

- Various, unnamed snowmobile trails are located in Amsterdam, Charlton, Duanesburg, Florida, Glenville traversing within Distance Zone 3 between 2 and 5 miles from the Project.

- There are two state boat launches north of the Project along the Mohawk River, one in the Town of Amsterdam 1.4 miles northwest and one in Florida 0.9 miles north of the site.

- There are three state bikeways that run east to west crossing the VSA, generally paralleling the Mohawk River approximately 0.5 miles north of the site. These are the Erie Canal Trailway and Bikeway, and State Bikeway Route 5 and the Mohawk Hudson Bike Hike Trail.

- There are two trails highlighted within the VSA. The Chuctanunda Creek Trail is a mixed used recreational and educational trail located in the City of Amsterdam. It starts south of the Mohawk River, crosses the river north on the pedestrian Mohawk Valley Gateway Overlook Bridge, follows the waterfront to Riverlink Park where the trail then goes north along a greenway into the city terminating at the Mohasco Powerhouse.

  The second are the trails at the Strawberry Fields Nature Preserve. The Valley View Trail is located in the south fields approximately 1.4 miles from the Project.

- Six local conservation easements held by the Mohawk Hudson Land Conservancy are found in the VSA:
  a. Crauer Easement in Glenville, Unique Identification Number 64066: 1.8 miles east on Touareuna Road
  b. John Szurek Farm in Charlton, 29148: 4.9 mile northeast on Western Avenue
  c. Schmidt Easement in Glenville, 64070: 3.7 miles northeast on Potter Road
  d. Schenectady County Preservation parcel in Glenville, 29128: 2 miles from the Project on Touareuna Road
  e. Strawberry Field Preserve in Amsterdam, 29093: 1.4 miles north of Project on Cranes Hollow Road
  f. One parcel in Princetown, 64067: 3 miles southeast on Ennis Road
  g. Mosher Marsh Preserve in Amsterdam, 3.2 miles north on Manny's Corners Road.

9) Locally designated historic or scenic districts and scenic overlooks;

- There are no locally known scenic districts or overlooks in the 5-mile VSA.
- Several cemeteries and facilities are listed out as having local historic or community importance (these are listed in Table 3 and appear in Figure 4, Attachment 2):
  a. St. Casimer's Cemetery: 1.7 miles northwest on 98 Cemetery Road, Amsterdam
  b. Fairview Cemetery: 4.8 miles northwest on Upper Steadwell Avenue, Amsterdam

c. St. John's Cemetery: 1.5 miles northwest off of Widow Susan Road, Amsterdam

d. Crane Cemetery: 2.5 miles north on Cranes Hollow Road, Amsterdam

e. St. Mary's Cemetery: 4.9 miles northwest off of 29 East Main Street, Fort Johnson

f. Mariaville Lake Bed and Breakfast: 3.9 miles south in Pattersonville

10) High-use public areas;

- The Heritage Area System (formerly known as the Urban Cultural Park System) is a state-local partnership established to preserve and develop areas that have special significance to New York State. The Erie Canal Heritage Corridor includes the City of Amsterdam and the Towns of Amsterdam, Florida, Glenville and Rotterdam and follow the Mohawk River approximately 0.6 miles north of the Project.

Table 3 provides the results of this investigation listing the resources found within the full 5-mile VSA with other information regarding location characteristics such as Distance Zones, landscape similarity zones, and potential for visibility.

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 1 and 4 in Attachment 2 show resource locations.

Table 3. Inventory of Visual Resources

Resource Name	Town/City	Distance Zone	LSZ	Expected Visibility
Federal/State/County Recreation Lands				
Featherstonhaugh State Forest	Duanesburg	3	2	No
Lock 9 State Canal Park	Glenville	3	1	No
Indian Lookout Country Club	Pattersonville	1	1,3	No
Moccasin Kill County Sanctuary	Rotterdam	3	2	No
Local Parks				
Coessans Park	City of Amsterdam	2	2,3	No
5th Avenue Park	City of Amsterdam	3	1,2,3	No
Amsterdam Municipal Golf Course	City of Amsterdam	3	2	No
Arnold Avenue Park	City of Amsterdam	3	1,3	No
Bergen Park	City of Amsterdam	3	1,3	No

Resource Name	Town/City	Distance Zone	LSZ	Expected Visibility
Guy Park	City of Amsterdam	3	1,3	No
Isabel's Park	City of Amsterdam	3	1,3	No
Kirk Douglas Park	City of Amsterdam	3	1,3	No
Osone Park	City of Amsterdam	3	1,3	No
Riverlink Park	City of Amsterdam	3	1,3	Possible
Sassafrass Park	City of Amsterdam	3	1,3	No
Shuttleworth Park	City of Amsterdam	3	1,3	No
Sirchia Park	City of Amsterdam	3	1,3	No
Southside Boat Launch (Port Jackson Bocce Club	City of Amsterdam	3	1,3	No
Veterans Field (Bigelow Sanford Field)	City of Amsterdam	3	1,3	No
Veteran's Memorial Park	Florida	3	1,3	No
Sanders Town Preserve	Glenville	3	2	No
Woestina Park	Rotterdam	2	1,3	No
Heritage Sites				
Erie Canalway National Heritage Corridor	Amsterdam, City of Amsterdam, Florida, Glenville, Rotterdam	1,2,3	1,2,3	Yes
Community Concern				
St. Casimer's Cemetery, 98 Cemetery Rd	Amsterdam	2	1	No
Fairview Cemetery, Upper Steadwell Ave	Amsterdam	3	1	No
St John's Cemetery	Amsterdam	2	1	No
Crane Cemetery	Amsterdam	3	1	No
St. Mary's Cemetery, 29 E Main St	Fort Johnson	3	1	No
Mariaville Lake Bed & Breakfast	Pattersonville	3	3	No
Conservation Easements				
Federal Held by NRCS (4 parcels)	Amsterdam (1), Florida (1), Glenville (1) Rotterdam (1)	2,3	1	No
NGO held by Mohawk Hudson Land Consrv. – Strawberry Field Nature Preserve	Amsterdam	2	1,2	Yes, isolated segment of trail (see Trails)
NGO held by Mohawk Hudson Land Consrv. – Mosher Marsh Preserve	Amsterdam	3	1,2	No
NGO held by Mohawk Hudson Land Consrv.	Princeton	3	2	No

Resource Name	Town/City	Distance Zone	LSZ	Expected Visibility
NGO held by Mohawk Hudson Land Consrv. – Crauer Easement	Glenville	3	2	No
NGO held by Mohawk Hudson Land Consrv. – John Szurek Farm	Charlton	3	2	No
NGO held by Mohawk Hudson Land Consrv. – Schmidt Easement	Glenville	3	1,2	No
NGO held by Mohawk Hudson Land Consrv. – Schenectady County Preservation	Glenville	3	1,2	No
State Bikeways and Trails				
Erie Canal Trailway & Bikeway	City of Amsterdam, Florida, Glenville, Rotterdam	1,2,3	1,2,3	No
State Bikeway Route 5	City of Amsterdam, Florida, Glenville, Rotterdam	1,2,3	1,2,3	No
Mohawk Hudson Bike Hike Trail	Rotterdam	3	2,3	No
Chuctanunda Creek Trails	City of Amsterdam	3	3,4	Unlikely (See L8 Attachment 4)
Trail at Strawberry Fields Nature Preserve (Valley View Trail)	Amsterdam	2	1	Yes, isolated segment of trail
Scenic Byways				
Revolutionary Trail (Route 5)	Amsterdam, City of Amsterdam, Glenville	1,2,3	3	Possible, few, minimal
Snowmobile Trails				
Various, unnamed	Amsterdam, Charlton, Duanesburg, Florida, Glenville	2,3	1,2,3	Yes
State Boat Launch				
State Boat Launch	Amsterdam	2	1	No
State Boat Launch	Florida	1	1	No

Resource Name		Town/City	Distance Zone	LSZ	Expected Visibility
Historic NRHP Sites					
5701.000024	Jones Farmhouse	Amsterdam	3	1,2	No
5701.000048	Hurricana Farm (Sanford Stud Farm)	Amsterdam	3	1,3	No
5740.000001	Guy Park Manor	City of Amsterdam	3	3	No
5740.000009	US Post Office	City of Amsterdam	3	3	No
5740.000019	Amsterdam City Hall (Sanford Mansion)	City of Amsterdam	3	3	No
5740.000020	Greene Mansion	City of Amsterdam	3	3	No
5740.000058	Vrooman Avenue School	City of Amsterdam	2	3	No
5740.000228	Temple Of Israel	City of Amsterdam	3	3	No
5740.000231	Amsterdam Castle (46th Separate Company) Armory	City of Amsterdam	3	3	No
5740.000232	Samuel Sweet Canal Store	City of Amsterdam	3	3	No
5740.000233	Guy Park Ave Elementary School (Walter Elwood Museum)	City of Amsterdam	3	3	No
5740.000265	St Stanislaus Roman Catholic Church	City of Amsterdam	3	3	No
5740.000266	St Stanislaus School	City of Amsterdam	3	3	No
5740.000267	St Stanislaus Convent	City of Amsterdam	3	3	No
5740.000268	Rectory St Stanislaus Parish	City of Amsterdam	3	3	No
5740.000348	Gray Jewett House	City of Amsterdam	3	3	No
5740.000378	Green Hill Cemetery	City of Amsterdam	3	3	No
9301.000122	George Lasher Home	Duanesburg	3	1	No
9301.000147	Joseph Greene Farm House	Duanesburg	3	1,2	No
9302.000011	Swart House And Tavern	Glenville	3	3	No
9305.000163	Mabee House	Rotterdam	3	1,3	No
05745.000001	Fort Johnson	Fort Johnson	3+	3	No
Historic Districts					
5740.000480	***Sanford Mills Historic District***	**City of Amsterdam**	**3**	**3**	***No***

Resource Name		Town/City	Distance Zone	LSZ	Expected Visibility
5740.000406	Sanford Co. Office (former); Noteworthy Indian Museum	100 Church Street, City of Amsterdam			
5740.000481	Clock Tower Building	37 Prospect Street, City of Amsterdam			
5740.000513	***West End Historic District***	***City of Amsterdam***	***3***	***3***	***No***
5740.000010	Schuyler (Heath Res)	263 Guy Park Ave, City of Amsterdam			
5740.000233	Guy Park Ave Elementary School (Walter Elwood Museum)	300 Guy Park Ave, City of Amsterdam			
5740.000329	Unnamed	243 Division St, City of Amsterdam			
5740.000330	Unnamed	352 Guy Park Ave, City of Amsterdam			
5740.000512	Residence	237 Guy Park Ave., City of Amsterdam			
9301.000053	***Mariaville Historic District***	***Duanesburg***	***3***	***1,3***	***No***
9301.000054	First Presbyterian Church Of Duanesburg	8800 Ny 159, Duanesburg			
9301.000055	First Presbyterian Church Parsonage	8812 Ny 159, Duanesburg			
9301.000056	Hiram Hansett Home	8822 Ny 159, Duanesburg			
9301.000057	Frost Homestead	8840-886 Ny 159, Duanesburg			
9301.000058	Silas March General Store	Ny 159, Duanesburg			
9301.000059	Silas Marsh Home	216 Batter St, Duanesburg			
9301.000157	A-Frame	176 Batter St, Duanesburg			
9301.000158	J. Conner House	8915 Mariaville Rd, Duanesburg			
Historic Eligible					

Resource Name		Town/City	Distance Zone	LSZ	Expected Visibility
5701.000045	Movable Dam #6 at Lock E-10	City of Amsterdam	2	1	No
5701.000131	Manny Corners Cemetery	Amsterdam	3	1	No
5704.000001	Schoharie Crossing State Historic Site	Florida	3	1,3	No
5704.000119	Fosgate House And Farmstead	Florida	3	1	No
5704.000145	NYSDOT Bridge BIN 1002970	Florida	2	3	No
5740.000010	Schuyler (Heath Res)	City of Amsterdam	3	3	No
5740.000013	St. Ann's Church;	City of Amsterdam	3	3	No
5740.000016	First National Bank Bldg	City of Amsterdam	3	3	No
5740.000171	Unnamed	City of Amsterdam	3	3	No
5740.000229	YMCA	City of Amsterdam	3	3	No
5740.000234	Unnamed	City of Amsterdam	3	3	No
5740.000260	Amsterdam Free Library	City of Amsterdam	3	3	No
5740.000297	Unnamed	City of Amsterdam	3	3	No
5740.000300	Unnamed	City of Amsterdam	3	3	No
5740.000301	Unnamed	City of Amsterdam	3	3	No
5740.000318	Culvert	City of Amsterdam	3	3	No
5740.000319	World War I Memorial	City of Amsterdam	3	3	No
5740.000321	Moveable Dam 7/Lock E-11	City of Amsterdam	3	3	No
5740.000329	Unnamed	City of Amsterdam	3	3	No
5740.000330	Unnamed	City of Amsterdam	3	3	No
5740.000360	285 E. Main	Amsterdam	2	3	No
5740.000361	Unnamed	City of Amsterdam	3	3	No
5740.000362	Unnamed	City of Amsterdam	3	3	No
5740.000365	Unnamed	City of Amsterdam	3	3	No
5740.000366	Unnamed	City of Amsterdam	3	3	No
5740.000367	Unnamed	City of Amsterdam	3	3	No
5740.000380	First National Bank Bldg	City of Amsterdam	3	3	No
5740.000386	Lynch Literacy Academy	City of Amsterdam	3	3	No
5740.000387	Unnamed	City of Amsterdam	3	3	No
5740.000388	Unnamed	City of Amsterdam	3	3	No
5740.000389	Unnamed	City of Amsterdam	3	3	No
5740.000394	McClumpha Block	City of Amsterdam	3	3	No

Resource Name		Town/City	Distance Zone	LSZ	Expected Visibility
5740.000397	[Former Wrestling Hall of Fame]	City of Amsterdam	3	3	No
5740.000406	Sanford Co. Office (former); Noteworthy Indian Museum	City of Amsterdam	3	3	No
5740.000433	Barge/Erie Canal	Amsterdam, City of Amsterdam, Florida, Glenville, Rotterdam	3	3	No
5740.000438	Farmers' National Bank. 1875.	City of Amsterdam	3	3	No
5740.000439	Stephen Sanford Apartments	City of Amsterdam	3	3	No
5740.000440	2 story 1950 Colonial Revial; brick	City of Amsterdam	3	3	No
5740.000441	2.5 story; late 19thc; shingle style; cross gable; diamond trace windows	City of Amsterdam	3	3	No
5740.000442	1917 Gardiner Cooper House	City of Amsterdam	3	3	No
5740.000443	1930s Colonial Revival	City of Amsterdam	3	3	No
5740.000444	1952 house	City of Amsterdam	3	3	No
5740.000445	Geo. Striker House	City of Amsterdam	3	3	No
5740.000446	Trinity Lutheran Church & Parsonage; 1887; brick	City of Amsterdam	3	3	No
5740.000447	YMCA	City of Amsterdam	3	3	No
5740.000449	Amsterdam Savings Bank; 1913; sandstone; neoclassical; columned porch	City of Amsterdam	3	3	No
5740.000468	late 19th c	City of Amsterdam	3	3	No
5740.000469	late 19th c	City of Amsterdam	3	3	No
5740.000470	late 19th c	City of Amsterdam	3	3	No
5740.000471	Former Key Bank	City of Amsterdam	3	3	No
5740.000473	Lustron house	City of Amsterdam	3	3	No
5740.000474	Lustron house with garage	City of Amsterdam	3	3	No
5740.000475	Lustron house	City of Amsterdam	3	3	No

Resource Name		Town/City	Distance Zone	LSZ	Expected Visibility
5740.000481	Clock Tower Building	City of Amsterdam	3	3	No
5740.000512	Residence	City of Amsterdam	3	3	No
9302.000092	Moveable Dam 4 Lock E-8	Glenville	3	1	No
9302.000129	Five	Glenville	3	3	No
9302.000130	Frame Farmhouse and Barn	Glenville	3	1	No
9302.000147	Movable Dam #5	Glenville	3	1	No
9304.000061	Vedder House 300p	Princetown	2	3	No
9305.000001	Van Slyke House	Rotterdam	2	3	No
9305.000048	Sandsea Kill Aqueduct	Rotterdam	2	3	No
9305.000078	Aaron Bradt House/Keepers of the Circle	Rotterdam	3	1	No

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

A viewshed analysis out to the 5-mile VSA extents was performed. This analysis used Light Detection and Ranging (LiDAR) data for Schoharie-Montgomery (2014), Capital District (2008), and Mohawk (2007), 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 heights and individual tree heights that offer realistic physical visual impediments in the landscape. ESRI Spatial and 3D Analyst GIS software was used to develop the viewshed model.

For the analysis, data was controlled within the model to ensure that the vertical offsets of the solar panels were embedded properly against the LiDAR surface elevation and existing trees. As noted in Section 2.0, the Project will utilize both fixed and tracking array systems. Panel heights

of 8 and 13 feet was used, respectively. The site layout in Figure C-001, Attachment 1 shows that the tracking array system will be placed at Areas 2, 2a, and 3 located north of Bulls Head Road and between Thayer and Pattersonville Road as well as Areas 6 and 6a east of Pattersonville Road and adjacent to the Thruway. Fixed panels will occur in Area 1 west of Thayer Road and Areas 4, and 5 that are located east of Thayer Road and south of Bulls Head Road.

The viewshed model was further developed by establishing an observer height of 5.5 feet, and the assumption that the Project would not be visible to a viewer who is standing amongst trees in a forested area. The final resulting output identified those areas from which viewers would potentially see all or some part of the proposed solar panels.

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. solar panel). The analysis is a clear line of sight and 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 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.

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 profiles were performed for some viewpoints where there is limited or questionable visibility. On occasion at distance, even photosimulations may not adequately or clearly depict the visibility of a project. Lines of Sight analyses are able to provide the viewer with information that assists in examining the reasons why objects such as solar arrays 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.

Lidar data obtained for the Project noted in Section 7.1.1 was used for an elevation 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 results discussion and Attachment 4 contains the profiles.

7.3 PHOTOGRAPHIC SIMULATIONS

Field surveys were conducted in late April 2018 and January 2019 in order to acquire photographs for simulations during leaf-off conditions. Attempts were made to take photographs that provided the most unobstructed views possible at north, south, east, and west positions and/or in areas where the viewshed maps represent visibility and that which offers varying representation from Landscape Similarity and Distance Zones. Simulations are presented in Attachment 4.

7.3.1 Methodology

Coordinates of camera locations intended for simulations as well as other reference points within the view were collected via GPS as well as other reference points within the view. These reference locations were later used to refine the placement of the facility within the simulation photographs. Heights of select high reference points were measured with a Nikon Forestry 550 digital rangefinder.

To create visual simulations, 3DS MAX 2016 visualization software was used to correctly dimension the 3d models into the digital photographic image from each viewpoint location. The 3d model of the solar layout was created by TRC using engineering specifications. 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. Reference locations, which are existing visible objects in the photograph such as light posts, building corners, placed stakes, gate posts or utility

poles were obtained by GPS to assist with refined placement of the proposed Project within the photograph. GIS terrain modeling and analysis helped in accurately locking the 3d facility model within the photograph. Ground point elevations of the camera location and other referenced objects were obtained from the LiDAR data.

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 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 initial 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. In April 2018, the Applicant began site visits to acquire on-the-ground information to support the VIA and the photosimulation site selection process.

Visibility as noted by the viewshed results in Figures 1 and 4, Attachment 2 shows the most prominent visibility is within 0.5 miles of the Project. Outside of 0.5 miles there are isolated areas that may have views of solar arrays that are generally within open agricultural areas where most of the public will not be. These are located to the west and small areas in elevated areas just north of the Mohawk River. Some of those areas will be along public roadways having short duration views.

As noted in Table 3 Visual Resources Inventory, few of the listed visual receptors may experience views of the Project save for snowmobile trails, a small isolated area at Strawberry Fields Nature Preserve Valley View Trail and possibly minor portions of the Revolutionary Trail NYS Scenic Byway, Riverlink Park, or the Mohawk River may have partial views. Therefore, most of the photo viewpoints that show a good part of the Project with clearer and unobstructed lines of site are from interior or Project perimeter roads. 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. As well, most recreational and public (state) forest parcels are outside of two miles and several are at the five-mile perimeter, all of which do not expect to have visibility of the Project. Most viewpoints then are taken in the remaining two but abundant LSZs which is agricultural open land and roads and closer to the Project. A few 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".* On July 10, 2019 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 municipalities to suggest additional and reasonable candidate locations for photosimulations or append additional visual resources of concern to the inventory. Correspondence can be found in Attachment 6.

In summary, viewpoints were selected based on representations of the Project as well as the need to incorporate the LSZs, inventoried locations, different distance zones as best as Project views allowed, different viewer types, varying lighting conditions, views that offered a clear unobstructed sightline and consideration of DPS comments and stakeholder and agency consultations.

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. 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 (USFS), United States Department of Agriculture 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 visual impact assessment (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 regards 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.

This form has been developed by TRC for efficient and streamlined use with projects that undergo state environmental permitting processes. It is assumed that visual resource inventories, terrain analyses, development of landscape similarity zones 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 *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 *Viewpoint Sensitivity Rating*. This section 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, as well as general scenic quality. The higher the rating total, the more sensitive the viewpoint is. Part 3 is an overall *General Scenic Quality of the View* which rates the view of existing conditions only without the influence of the project.

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.

9.1 PART 1 VISUAL CONTRAST RATING

Form Contrast: Form in this sense generally means the shape of an object or unification of shapes massed together by perceived pattern or color. In many rural undeveloped areas, the landscape may consist of homogenous or visually restful views of large shapes or shapes of color belonging to expanses of open field or forested areas. New project elements may provide a contrast or interruption against existing homogenous shapes within the view (strong). Conversely, there may be much visual existing clutter comprised of multiform shapes found in developed or urban areas where newly introduced project elements may better be visually absorbed in the view (weak).

Line Contrast: Line generally refers to the perceived edges of shapes as well as the orientation of these line edges. An undeveloped area at distance may be mostly horizontal line comprised of distant ridges or forest treetops as well as forest and field interfaces. New project elements may disrupt some of the line or they may introduce new vertically oriented lines as such as from a transmission line or wind farm (strong).

Texture Contrast: Trees and their leaves or buildings at close proximity will offer higher detail (strong). Texture and the level of discernible detail decreases with distance (weak). Objects at distance may appear as one homogenous texture or shape.

Color Contrast: Does the project color contrast greatly against color in the existing view (strong)? Color contrast may occur with the terrestrial background or the sky.

Project Scale Contrast/Spatial Dominance: Is the project size and scale dominant (strong), co-dominant, or subordinate (weak) in the view in relation to the rest of the surroundings?

Broken Horizon Line: Does the project remain below the horizon line (weak) or is the horizon line broken by project elements (strong)?

Visual Acuity: Visual acuity is the acuteness or clarity of vision, most often related to the amount of discernible detail or contrast with distance. Atmospheric conditions may also decrease visual acuity, especially on humid days.

Amount of Project Clearing Perceived: The With Project (After) simulation may show extensive clearing that has occurred compared to existing conditions, thereby showing a large visual change from the project (strong). In many cases, no clearing is required (none), or minimal clearing might be seen from a viewpoint location (weak or moderate).

Screening/Mitigation Needed: This category is treated in two ways. 1) Is the project at a particular viewpoint seen because of being mostly in the open which would require some type of vegetative or structural mitigation (strong) to obscure direct views? Conversely, is there some type of existing screening that blocks partial or whole views such as trees, buildings, or topography that act as visual impediments in the landscape (weak). Or 2) How important is it to mitigate at a

certain area or how high is the visual absorption capacity? For example there may be a clear unobstructed view of a new transmission structure in the view, but if there are existing transmission poles or cell towers, or distribution lines along the street in a more urban area providing similar utility development it may not be necessary to mitigate (weak). Is a substation being proposed where there is a clear view but within industrial development (weak)? Or, there may be visible modifications to an existing substation, but proposed elements are visually absorbed by the substation because of "like" components and thereby requires no mitigation (weak).

9.2 PART 2 VIEWPOINT SENSITIVITY RATING

Within a Visual Resource: Is the viewpoint located within a visual resource as listed in the Visual Resources Inventory section of the VIA? This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied. If yes, then viewer expectations and sensitivity may be higher.

View of Other Visual Resources: Can you see a visual resource listed in the Visual Resources Inventory from the viewpoint location in combination with the Project? This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied.

A Listed/Known Scenic Area of Visual Quality: Is the viewpoint located within a listed or known scenic area of visual quality? This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied. If yes, this location would also be identified as a visual resource as listed in the Visual Resources Inventory section of the VIA. It is evaluated in the Viewpoint Sensitivity Rating because there are often town by-laws, master plans, or regional planning documents that call out specifically named locations that have been designated as a scenic viewing area and is important to note. It means that the location has added importance to the community and if yes, then viewer expectations and sensitivity are likely higher. This will be used infrequently.

Number of Viewers/High Use Activity: An area of high use and high number of viewers will incur a greater amount of visual impact to the community (strong). These areas may consist of high destination type locales visited by the public such as recreational areas, shopping centers, densely populated areas, or highways with large traffic counts. A roadway may not always be considered as high use. There may be viewpoints along local rural roadways that have relatively very low traffic counts. This category accounts for the immediate vicinity; the simulation might only show a roadway, but a resident may be very nearby or behind the viewer.

Duration of View: The duration of views is categorized as Long Duration (strong), Short Duration (weak) or Infrequent (weak). Residents or workers with views from the workplace or day long use at a picnic area would be a long duration view. Short duration views imply movement and are transient, such as passing the site on a highway, glimpsing a project from an open area on a hiking or snowmobile trail. A moderate duration view might be a destination type location such

as a summit or historic landmark where the visitor seeks the location with purpose but only stays for a few hours. However, care must be taken when attributing an area to a short duration view. There could be short duration views encountered frequently over distance, such as a snowmobile trail.

Presence of Existing Development: For this category we are looking at intactness and how much the landscape has been altered by the presence of people. Is there much existing development consisting of commercial, utility, or industrial development or densely populated residential or urban neighborhoods in the photo or near vicinity? If so, then the sense of place or importance may be diminished and decreases viewer sensitivity as a place that does not have high value and should be rated as weak. Conversely, the lack of existing development contributes to the intactness of a more undisturbed natural environment a gives a sense of greater value. However, development is not all negative. Some development may have altered the environment but has only "somewhat" changed the view over time and may not be as visually impactful, such as a farm and associated farm fields. In this case, the Presence of Existing Development could be rated as moderate.

Uniqueness of Landscape Compared to Region: Photographs for project simulations are generally taken within a designated VSA. Landscape features or scenic quality shown in simulations may be found to be consistently similar or unvaried (weak). If the viewpoint shows a view that is unique to the area such as an outstanding water feature, a series of dramatic cliffs, or mountain views not typically found elsewhere in the vicinity then it should be rated as strong.

Presence of Water: Generally, the presence of water implies greater scenic quality or importance. This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied. If there is the presence of water and it is not very discernible in the view, then a rating of 2 (moderate) can be applied.

9.3 PART 3 SCENIC QUALITY OF THE VIEW

Note that a higher rating of scenic quality does not always have to be within natural or rural environments. This can also occur within urban or other man-made cultural type environments that consist of pleasing building structures, hardscaping, or landscaping.

Landscape Diversity: The degree of existing scenic quality is usually correlated with landscape diversity – the more natural diversity, generally, the greater the scenic quality. For example, landscapes with greater diversity in vegetation and topography are more likely to be scenic than flat landscapes with uniform vegetation. Water features such as rivers or ponds tend to add diversity as do natural rock outcroppings. High scenic quality often results from the contrast among landscape features such as field and forest, steep and flat or rolling, village and countryside.

Intactness: Another relevant factor in determining scenic quality is the intactness of the landscape. A lack of landscape degradation contributes to the "intactness" of the landscape. Landscapes where there is a clear underlying order or logic tend to be more visually appealing. Natural landscapes exhibiting little evidence of human alteration (e.g. an intact prairie landscape) are likely to have high visual as well as natural value. In the human (built) landscapes too much diversity can lead to visual chaos or clutter, for example strip development in which every business vies for one's attention by looking different from its neighbor. But landscapes which retain 19th early 20th century landscape patterns, places with split-rail fencing or stone walls are often visually appealing in their simplicity and clear connections of use to the land itself.

Focal Point: Focal points are elements in the landscape that stand out due to their contrasting shape (form), color or pattern. Often distinct focal points enhance scenic quality. They can be natural elements such as a lake, river or mountain; or they can be built elements such as an important public building, or a central green.

Unity in a landscape provides a sense of order.

Harmony exhibits a combination of parts of a landscape into a pleasing or orderly whole and a state of agreement, congruity, or proportionate arrangement of form, line, color, and texture.

Pattern includes pleasing repetitions and configurations of line, form, color, or textures.

Strong values might consist of areas where landform, vegetation patterns, water characteristics, and cultural features combine to have unique and strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

Moderate values are generally areas where landform, vegetation patterns, water characteristics, and cultural features use combine to provide ordinary or common scenic quality. These landscapes have generally positive, yet common, attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance. Normally they would form the basic typical matrix within the VSA.

Weak values are areas where landform, vegetation patterns, water characteristics, and cultural land use have lower scenic quality. Often water and rock form of any consequence are missing in these landscapes. These landscapes have weak or missing attributes of variety, unity, vividness, mystery, intactness, order, -harmony, uniqueness, and balance.

9.4 ASSESSING THE OUTCOME OF THE RATING

The rating system and those developed by the other aforementioned agencies are designed to guide a subjective process (visual observation) objectively, by using straightforward common

language that involves the discussion of compositional elements. A rating system is applied from low to high with the intent to provide consistent comparison between or across subject matter.

The simulations show varying distance zones and landscape zones. The rating is also meant to provide comparison of the project within these zones as seen across the VSA. The rating form is not meant as a public survey or to assess or appeal to how one feels about the development at a more emotional level.

However it should be noted that when evaluating the outcome of the ratings, a high rating of form or texture contrast for example, does not necessarily imply a negative or disturbing result. Nor may the project be offensive to the average person. As well, there may be visual impacts implied by the rating forms but they may not be adverse.

In many cases the building design or choice of building material can be aesthetic and visually pleasing to the viewer and/or remain consistent with other development in the area. With utility development for example, a battery storage facility that may have a high texture, line, or form rating that is proposed within a seaside environment may incorporate weathered cedar shakes, white trim, and dormers into the building design in order to remain similar to cape style houses in the area. Although compositionally it may have a high contrast rating against what is currently there, the project may be considered to be aesthetically pleasing and interesting to look at. Similarly, a converter building project in a rural area may elect to design the building to look like a red barn. Although the proposed building may provide a large form with new vertical elements against the current landscape, and its red color may contrast highly against either green vegetation or white winter snow, the design choice of a red barn could be considered aesthetically pleasing and suitable while also remaining consistent with other large development (farms) in the area. Or perhaps there are brick materials proposed as building materials or hardscape for a project which could be considered aesthetically pleasing and visually interesting. In the case of solar development, although a solar panel could provide color contrast, the look of a solar panel itself may not be displeasing. Although basic solar panel design cannot be changed, the project can be combined with vegetative mitigation of native flowering and pollinator species implemented and spaced in a naturalized manner resulting in overall aesthetic and interesting landscape screening.

The rating forms are not standalone nor are results provided without context. The rating results are typically accompanied by a summary discussion that considers project design aspects as noted in the above examples as well as how the overall project fits within the landscape.

10.0 VISUAL IMPACT ANALYSIS RESULTS

10.1 VIEWSHED RESULTS AND DISCUSSION

The viewshed analysis results (Figures 1 and 4, Attachment 2), or that area colored in pink, show areas of expected visibility. For the analysis, available Light Detection and Ranging (LiDAR) data

was obtained from the New York State GIS Program website. LiDAR data is the best available elevation data as it includes high resolution accurate ground elevations in addition to building heights and individual tree heights that offer physical visual impediments. For the solar arrays that have proposed tracker racking systems, the top of the panels was set at 13 feet in height above ground surface and placed within the LiDAR tree and building modeling environment. For those arrays that have proposed fixed panels the top of panel was set at 8 feet above ground surface.

As expected, visibility is generally concentrated within the 0.5-mile Distance Zone as noted by the results, with the most visibility expected in the open farmland Project parcels themselves as well as adjacent open land. The Project will utilize both fixed and tracking array systems with maximum panel heights above ground at 8 and 13 feet, respectively. Although the panels are sited in open farmland, the low-profile panels set against existing riparian tree buffers, hedgerows, and tree groups that frame the panel locations begin to obscure many views outside of one-half mile. Because of a 8 or 13-foot panel maximum height in relation to the mature vegetation, there are minimal far reaching views outside of the general array locations. Many of these far views are in farm fields and open land where the public is not expected to be while short segments of roadway may have transient and distant intermittent views. Predicted views that are in outer Distance Zones south of the river tend to be smaller isolated blocks of visibility mainly occurring west of the Project. In some upper valley locations north of the Mohawk River in the Town of Amsterdam there will be visibility from fields, along roadways, and at some residences (predominantly from the Swart Hill Road area) with open views facing the Project (see Simulation VP26). The New York State Thruway lies north and adjacent to the site. Minimal and transient views are expected along the Thruway. As noted by the results, the most visibility is expected along the roads interior and/or adjacent to the Project such as Pattersonville Road, Bulls Head Road, Mohr Road, Thayer Road, and Persons Road.

Visual changes with respect to the visual resources listed in Table 3 are minimal to none, as most of these receptors lie outside of 2 miles, predominantly in the City of Amsterdam area to the northwest. Impacts to historic sites are not expected. The Erie Canal Trailway runs east-west approximately 2200 feet north of the Project. Views are not expected from this resource since the Trailway is lined by trees and there are also trees that exist between the Trailway and the site.

Visibility is not relatively extensive or abundant outside of the general project area and this therefore limits the choice of numerous and diverse locations for photosimulations in publicly accessible places. Therefore, most of the photo viewpoints that show a good part of the Project with clearer and unobstructed lines of site are from interior or Project perimeter roads. 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. As well, most recreational and public (state) forest parcels are outside of two miles and several are at the five-mile perimeter, all of which do not expect to have

visibility of the Project. Most viewpoints then are taken in the remaining two but abundant LSZs which is agricultural open land and roads and closer to the Project. Refer to Tables 4 and 5 for percent visibility within the 5-Mile VSA.

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. Those resources that may experience some level of visibility per viewshed results are itemized out below.

10.1.1.1 Federal Scenic Resources

Federal visual resources consist of the Erie Canalway National Heritage Corridor, four NRCS owned conservation easements and fifty National Register of Historic Places sites and three historic districts. There will be areas within the geographic demarcation of the Erie Canalway Heritage Corridor that will have views since the Heritage site within the VSA is all of the land area for the Town of Amsterdam, City of Amsterdam, Florida, Glenville, and Rotterdam. None of NRCS conservation easements will have views of the Project nor are there any historic sites and districts with expected views (listed in Table 3). Eligible historic sites as obtained from CRIS will also not have views of the Project.

10.1.1.2 State and County Scenic Resources

The Mohawk River – New York State Barge Canal may have a view of solar arrays as a result of the viewshed analysis but several Line of Sight profiles in some locations on the water and near the shore suggest no views. Discrepancies between viewshed and Line of Sight analyses are suggestive of views that are so minimal that extremely minor portions of the tops of some panels might be seen due to very minor differences in the shape of the upper tree foliage and would likely be too difficult to discern in a simulation. The Revolutionary Trail NYS Scenic Byway (Route 5N) may also have few extremely small isolated views (possible noise in the results), although a Line of Sight analysis was performed near an area of predicted visibility that did not show views. Other state or county visual receptors such as Featherstonhaugh State Forest, Lock 9 State Canal Park, Moccasin Kill County Sanctuary, Erie Canal Trailway & Bikeway, State Bikeway Route 5, Mohawk Hudson Bike Hike Trail, Chuctanunda Creek Trail, and two state boat launches in Amsterdam and Florida are not expected to see the solar arrays.

10.1.1.3 Local Scenic Resources

There are seven conservation easements held by the Mohawk Hudson Land Conservancy within the VSA. Six will not have views but intermittent areas at the Strawberry Fields Nature Preserve

will likely experience distant views from the southern fields. There is an isolated area along the Valley View Trail in the southern field which may experience views.

Several snowmobile trails that cross in the VSA in the towns of Amsterdam and Florida will likely have short duration intermittent views in a few isolated areas as they pass through open land in Distance Zone 3 between two and five miles.

The remaining local receptors are local parks in the VSA, the majority of which are located in the City of Amsterdam (see Table 3) where there are no expected views of the Project except for possibly a portion of Riverlink Park. There is also Sanders Town Preserve in Glenville and Woestina Park in Rotterdam. Both of these resources will not have views of the Project. Several local areas of community concern such as Indian Lookout Country Club in Pattersonville, Mariaville Lake and Bed and Breakfast, and five cemeteries as listed in Table 3 do not expect visibility of the Project.

10.1.2 Visibility Within Landscape Similarity Zones

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

- LSZ Percent of 5 Miles
  Zone 1 Agricultural/Open: 43.16%
  Zone 2 Forested: 49.51%
  Zone 3 Developed: 5.98%
  Zone 4 Mohawk River Corridor: 1.35%

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

LSZ	Total LSZ Acres Within 5 Miles	Total LSZ Sq Miles Within 5 Miles	LSZ Sq Miles of Visibility	% Visibility within LSZ	% Visibility Within VSA
Zone 1 Agriculture/Open Land	30,945.38	48.35	3.07	**6.35%**	**2.74%**
Zone 2 Forested	35,496.39	55.46	0.40	**0.72%**	**0.36%**
Zone 3 Developed	4,287.02	6.70	0.10	**1.54%**	**0.09%**
Zone 4 Mohawk River Corridor	971.47	1.52	0.10	**6.80%**	**0.09%**
Total VSA	**71,700.26**	**112.03**	**3.68**	**3.28%**	**3.28%**

One can use the results in a variety of ways. For example, when using Table 4 one can begin to distinguish or make assumptions on which viewer types may be impacted visually. For example, Table 2 (recap above) states that 6% of the land area within 5 miles falls in the Developed Zone which is fairly low. Section 5.0 describes this zone as primarily single-family dwellings or a larger farm complex. The Developed Zone also includes the small villages or local roadways where residential development is intermittently established along the existing road network as well as accounting for roadway travelers. Note that calculated percentages do not indicate the actual percentage of viewers that would be impacted. The percentage numbers indicate how much within a designated area outlined by LSZs the physical areas where visual change could take place. Table 1 provides the types of roads and traffic counts within the Project Area and indicates the roads are 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 is low. As Table 4 notes, there will be 1.5% visibility within the LSZ itself (all developed areas) but it accounts for less than 1% of visibility within the entire VSA.

Comparing the Agricultural/Open Field category is a similar exercise. Agricultural/Open Fields comprise about 43.2% of the 5-mile VSA however only 2.7% of the land area within 5-miles may experience visibility of the Project. As described in Section 5.0 this LSZ predominantly consists of large farm complexes with 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 active 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 larger properties at all times. So although the amount of visibility is comparatively higher than that of Developed areas, the number of viewers is likely low. However, caution in assumptions still need to be taken. If one reviews the visual resources in the area, other viewer activities may be taking place in open areas such as snowmobiling in the winter. This activity would be expected to provide intermittent visibility of short duration compared to a person at home. Snowmobilers infer a lower number of seasonal viewers likely of a local constituency. 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 49.5% of the land area belongs to the Forested LSZ. Although this is over a third of the 5-mile VSA, Table 4 shows that 0.4% 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 Mohawk River Corridor will have very low visibility comprising less than 1% of the entire VSA.

10.1.3 Visibility Within Distance Zones

Table 5 shows that based on the land area of each Distance Zone, the highest amount of visibility occurs within Zone 1 at 32.7%. This makes sense because there is a concentrated amount of visibility in proximity to the Project within the half mile acreage, much of it within the solar array parcels themselves. There is an abrupt difference once one travels outside of a half mile where visibility for respective Distance Zones trends downward to less than 3.5% as distance increases into the larger acreages of Zones 2 and 3. There is approximately 3.7 square miles of total visibility within the entire 112.03 square miles that comprises the VSA, or rather, 3.3% of the VSA is predicted to experience partial, close, or distant views of the Project.

Table 5. Percent Visibility within Distance Zones

Distance Zone	Total Area Comprising Distance Zone Acres	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	3,956.74	6.18	2.02	**32.71%**	**1.80%**
Zone 2 0.5-2.0 Miles	13,585.45	21.23	0.72	**3.41%**	**0.65%**
Zone 3 2.0-5.0 Miles	54,158.07	84.62	0.93	**1.10%**	**0.83%**
Total	**71,700.26**	**112.03**	**3.68**	**3.28%**	**3.28%**

10.2 PHOTOSIMULATION AND LINE OF SIGHT 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 level 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 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. Line of Sight analysis was performed for additional and/or questionable areas. Table 6 summarizes information for each simulation and line of sight viewpoint.

Table 6. Summary Table Simulation and Line of Sight Viewpoints

Viewpoint	Location	Significance	Landscape Similarity Zone	Distance Zone	Viewer Type
Simulation					
12	Bulls Head Road	Proximal view in farmland looking E at fixed arrays at southern section of Project.	1,3	1	Local traveler
15c	Mohr Rd	Proximal view in farmland looking W at fixed arrays at southern section of Project.	1.3	1	Local traveler
26	Swart Hill Road	Higher elevation and distance view of fixed arrays from across valley, north of Mohawk River. View SW.	1, (2), 3	2	Residence, local traveler
27	Bulls Head Road	Landowner concern. Representative view across open land to tracker arrays. View N.	1,3	1	Residence, local traveler

Viewpoint	Location	Significance	Landscape Similarity Zone	Distance Zone	Viewer Type
28	Bulls Head Road	Landowner concern. Representative view across open land to tracker arrays. View N.	1,3	1	Residence, local traveler
29	Pattersonville Road	Landowner concern. Representative view of fixed arrays at northern section of Project. View S.	1,3	1	Residence, local traveler
30	Thayer Road	Proximal open view from road towards fixed arrays located farthest west. View S.	1,3	1	Local traveler
Line of Sight					
L1	NYS Thruway to Collection Substation	Line of sight to collection substation from busy public interstate	3	1	Local traveler, commuter, through-traveler, tourist
L2	Pattersonville Road to Collection Substation	Line of sight to collection substation from local road	1,3	1	Local traveler, commuter
L3	Revolutionary Trail Scenic Byway (Route 5N)	Line of sight to Project from scenic byway	3	2	Local traveler, commuter, tourist

Viewpoint	Location	Significance	Landscape Similarity Zone	Distance Zone	Viewer Type
L4	Strawberry Fields Nature Preserve	Line of sight to Project from higher elevation location at distance, north of Mohawk River	1,2	2	Local traveler, through-traveler, tourist
L5	Mohawk River	Line of sight to Project from Mohawk River near City of Amsterdam	4	3	Recreation, water related activity
L6	Denice Road	Line of sight to Project at distance near residential	1,3	3	Residence, local traveler
L7	Fuller Road	Line of sight to Project at distance near residential	1,3	3	Residence, local traveler
L8	Riverlink Park, City of Amsterdam	Waterfront Park	3, 4	3	Recreational, Tourist, Local

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 (viewpoint) number and can be found in Attachment 4.

10.2.1.1 VP12 Bulls Head Road, View Southeast – Florida (LSZ 1,3; Distance 380 feet)

VP12 is along Bullshead Road approximately 1500 feet west of Mohr Road. The viewer is approximately 380 feet from the fenceline and looking at the proposed fixed arrays. The Project side of the road is vegetated. The view is looking southeast through a gap in roadside vegetation to a level field that is generally surrounded by trees rows. Existing conditions show several bands of horizontal shapes sweeping across the view consisting of the field as well as the distant

background trees. From this location, the sight lines show clear views of solar panels. The arrays in general are somewhat consistent with this pattern providing similar narrow horizontal shapes in relation to the view. Color contrasts are weak to moderate as color values are similar to that of the wood line. The panels fall well under the horizon line and the arrays hold a shape and pattern similar to the horizontal sweep of the foreground as well as background vegetation. Due to proximity, the Project is apparent and is co-dominant in the view.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. In order to assess the potential visibility of the arrays, the proposed vegetative screening is not depicted in the simulation. Accordingly, there will be limited to no views of the arrays from this location due to the proposed landscaping.

10.2.1.2 VP15c Mohr Road – Florida (LSZ 1,3; Distance 437 feet)

VP15c was taken to show a view in close proximity to the Project approximately 437 feet from the fenceline. As VP15c indicates, not all views in close proximity are full-on views. Although the (fixed) panels can be seen through the gap in the treerow and partial views of panels on the hill can be seen, much of the Project is behind the existing treerow. However, the arrays that are visible provides visual contrasts with new form, line, and color introduced into the environmental. The partial views of the panels at this location are dominant in the view due to the close and proximal distance.

10.2.1.3 VP26 Swart Hill Road, Amsterdam (LSZ 1,(2),3; Distance 1.5 miles)

VP26 was taken to show a distant higher elevation view looking at the hillsides where the Project is located approximately 1.5 miles away. The viewpoint is at an available publicly accessible open point along Swart Hill Road north of the Mohawk River in the Town of Amsterdam where there is a view across a farm field to the Project located on the south side of the river. The view primarily shows the fixed arrays proposed along Pattersonville and Persons Roads (and depicted in VP29). The Project will have no more development to the left (east) than that which is seen in the simulation. The view does include some of the tracker arrays located north of Bulls Head Road and near Hutchinson Road but those are partially blocked by vegetation on the right side of the photograph.

Existing conditions show north facing valley hillsides with a mosaicked pattern of field interspersed with forest groups and tree rows. While the level of discernible detail is low and there is no horizon line interrupted for proposed conditions, there is a new color contrast made by the introduction of the darker arrays against lighter colored ochre (and green) fields. The solar arrays are similar in color and value to that of the trees at this time of year. The placement of the panels in geometric arrangement as well as providing gaps within the arrays is similar to, and mimics the existing field-forest pattern and line. However, while not all of the open fields have

solar arrays, the lateral extent of the Project occupies a portion of the view and will show a visual change in color and pattern. The view from this roadside location will be of short duration for travelers on Swart Hill Road with a focus on driving while some nearby residences with open sight lines will have longer duration views.

10.2.1.4 VP27 Bulls Head Road, View North – Florida (LSZ 1,3; Distance 0.7 miles)

This VP was taken due the concern of homeowner views. It is a view from Bulls Head Road approximately 400 feet east of the intersection with Thayer Road. The view is looking north to the tracker arrays at a distance of approximately 0.7 miles. The existing view shows a contrasting pattern of light-colored fields against dark colored tree groups. Residential houses are in view in the fore to middleground and the City of Amsterdam can be seen in the left background. The proposed panels appear in the middleground within an open, light-colored field. The size and scale of the Project has a small low-profile appearance in comparison to the trees that surround the field with a horizontal linear flow that conforms to the topography. There are no proposed vertical elements from the Project that interrupt the horizon line. The largest contrast that the Project provides is a lateral breadth of color change from light to dark. The color contrast is apparent against the field color itself and changes the look of the middleground. However, the new color is fairly compatible against the existing trees that the panels are visually set against. Although the Project appears somewhat small vertically, it is co-dominant in the view because of the horizontal breadth and color change.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. In order to assess the potential visibility of the arrays, the proposed vegetative screening is not depicted in the simulation. The proposed landscaping will obstruct the view of portions of the arrays, primarily in the foreground.

10.2.1.5 VP28 Bulls Head Road, View North – Florida (LSZ 1,3; Distance 0.3 miles)

Similar to VP27, VP28 photo was taken due to the concern of homeowner views. It is a view of tracker arrays from Bulls Head Road looking north at approximately 0.3 miles near Leahy Road. The existing view shows mostly open land consisting of a contrasting pattern of light-colored fields against dark colored tree groups. A farm is seen in the left middleground and the City of Amsterdam can be seen behind the farm. The proposed panels appear in the middleground within open land. The size and scale of the Project has a small low-profile appearance in comparison to the trees that surround the field with a horizontal shape that conforms to the topography. There are no proposed vertical elements from the Project that interrupt the horizon line. The largest contrast that the Project provides is a lateral breadth of color change from light to dark. The color contrast the panels provide is apparent against the field and vegetation colors and changes the look of the middleground by disrupting the existing color and shape patterns. The viewer is 0.4 miles closer at this location than at VP27 but the level of discernible detail is still low. Although low-profile, the Project could be considered as dominant in the view because

of the amount of “space” the panels take up in the view in addition to lateral breadth and color contrast.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. In order to assess the potential visibility of the arrays, the proposed vegetative screening is not depicted in the simulation. The proposed landscaping will obstruct the view of portions of the arrays, primarily in the foreground.

10.2.1.6 VP29 Pattersonville Road, View South – Florida (LSZ 1,3; Distance 0.2 miles)

VP29 photo was taken due to a concern for homeowner views and to represent a viewpoint from Pattersonville Road which runs east-west and adjacent to Project fixed arrays. At this viewpoint sightlines are unimpeded with roadside open views to the Project approximately 0.2 miles from the viewer. Forest land in the background and the open field is viewed as large homogeneous shapes where existing form and color are prominent in the view. The proposed Project is seen on the hill at the wood line and follows the contours down the hill.

The long horizontal shape and line of the arrays visually mimics both the color and horizontal landscape shape of the trees at the top of the hill and seemingly merges into the wood line. The dark color of the panels shows weak to moderate contrast against the darker trees. The low profile of the panels does not interrupt the horizon line. Setback distance from the road helps with offsetting visibility as the arrays appear smaller at distance. Overall, the panels are subordinate in the view. There will be long duration views held by a few nearby residents that are adjacent to the field. There will be shorter duration views to motorists associated with local or commuter viewer types.

For this VP representative mitigation is show where the effects of screening can be seen at planting time and 5 years into the future. For this location, a robust Special Planting Area (SPA) mitigation effort is proposed where there will be a maximum visual screening effort along Pattersonville Road using mature nursery stock. Tree heights at planting time will be 7-8 feet. Please refer to Section 12.2 on vegetative mitigation.

10.2.1.7 VP30 Thayer Road – Florida (LSZ 1,3; Distance 648 feet)

VP30 photo was taken to show a representative view of the western-most fixed arrays located on Thayer Road. As this location shows, there is no existing roadside vegetation that would block views and the simulation shows views of the solar panels. However, the panels are distant from the road approximately 648 feet away from the viewer. There is vegetative screening proposed, however for clarity purposes and presenting the worse-case scenario, the simulation is rendered without mitigation. Here at VP30 one can observe the effectiveness of road offsets combined with placement against existing tree rows at field edges. In the view, the arrays appear as a

distant narrow horizontal band of color set against the forest at the edge of field. The horizontal band, shape, and look of the panels mimics that of horizontal brown-green field-forest interface as well as the existing tree row in the middle ground and the ridge in the background. The low profile of the Project does not provide a vertical interruption of the ridgeline. Color contrast is apparent but contrasts moderately against the summer vegetation. Overall the Project is subordinate in the view. There will be limited to no views of the arrays from this location due to the proposed landscaping.

10.2.2 Discussion – Line of Sight Results

Line of Sight profiles can be found in Attachment 4.

10.2.2.1 L1 - NYS Thruway to Collection Substation, Florida (LSZ 3; Profile Line Length 1300 feet)

The proposed collection substation and switchyard has been sited in an open field approximately 575 feet southwest of the NYS Thruway. Short duration views of the collection substation site are expected from this location. Two sixty-foot lightning masts are proposed within the fenceline that will be 32 inches in diameter at the base tapering to 18 inches in diameter at the top. Terrain is generally level with little topographic variation. The highest switchyard component will be an A frame that is 55 feet high with a 10-foot lightning arrester. The next highest switchyard component is 26 feet high. There will also be one 50-foot wood pole with affixed lighting and a control building that will be 14.5 feet high.

Line of Sight L1 in Attachment 4 shows the various component profile heights as well as visibility of solar panels. and switchyard components in view of the L1 location. Generally from this Thruway location, the profile shows most of the collection substation site will be visible. However, view duration will be limited due to the viewers rate of speed from this Interstate Highway viewpoint.

10.2.2.2 L2 - Pattersonville Road to Collection Substation, Florida (LSZ 1,3; Profile Line Length 700 feet)

Line of Sight L2 is a second profile to the collection substation with a location from Patterson Road, a residential road that is southwest of the site. There are several residential houses located along this road. L2 is approximately 283 feet to the fenceline, 480 feet to switchyard equipment, and 617 feet to a lightning mast. The terrain drops slightly from L2 to the station site and components are expected to be visible following construction. However, vegetative mitigation is proposed at the fenceline as the L2 profile indicates. Visibility of the shorter switchyard components would still be visible at planting time and as the plantings grow. At about 5 years, the landscape plantings are expected to block views to the lower components, leaving approximately 20 feet of the upper part of lightning masts and the upper portion of the A frame

visible. The lightning masts will be similar in appearance to the numerous existing transmission poles that are located within this area.

Tree and shrub plantings are predicted to reach heights from 8-17 feet within 5 years. Several of the deciduous and coniferous tree species could reach 25 feet in height by ten years thereby reducing the visibility of the lightning masts even further.

10.2.2.3 L3 - Revolutionary Trail Scenic Byway (Route 5N), Town of Amsterdam (LSZ 3; Profile Line Length 1.6 miles)

The Revolutionary Trail is a New York State Scenic Byway which runs east-west from Albany to Lake Ontario and is approximately 158 miles long. In the vicinity of the Project the Byway is on Route 5N and parallels the north bank of the Mohawk River. About 12.2 miles of the Byway runs through the VSA with approximately 5.9 linear miles within Distance Zone 2 between 0.5 and 2 miles. The Byway does not appear within 0.5 miles. Few if any small isolated spots along the highway will have views to the Project because of a low valley location, intervening vegetation and topography that impedes as demonstrated by Insets 12 and 13 in Section 3.3. Both Insets 12 and 13 show photos and the character of views from the scenic byway looking towards the Project from across the Mohawk River. An attempt was made for a simulation using Inset 12 but there were no arrays in the view. L3 is a Line of Sight profile from a different location showing visibility of the Project is not expected. L3 profile line is 1.6 miles.

10.2.2.4 L4 – Strawberry Fields Nature Preserve, Town of Amsterdam (LSZ 1,2; Profile Line Length 2.9 miles)

Strawberry Fields Nature Preserve is in the Town of Amsterdam off of Cranes Hollow Road. It is 118 acres of protected land that includes the nature preserve, a family homestead, and a working farm made available to the public in 2017. The preserve consists of open fields surrounded by forested areas and tree rows. The majority of the property will not have views due to the trees acting as an obstruction. The main (northern) property where there are ponds, the working farm, and visitors parking will not have views of the Project as this section is enclosed by trees. See VP24 of the Project Photolog in Attachment 3 which shows the view of a forested area to the south looking towards the Project.

There are open fields at the southern section of the property on the opposite and southern side of the forested areas (those of which impedes the view at VP24). These fields will have few views however, in this southern property location there is a short, isolated section of a walking trail that may have a limited view of some solar arrays as shown in L4 Line of Sight Profile (See also Figure 4, Attachment 2). L4 profile line is 2.9 miles.

10.2.2.5 L5 – Mohawk River, City of Amsterdam (LSZ 4; Profile Line Length 3.7 miles)

The Mohawk River is expected to have limited to no views of the Project due to the low valley location in relation to topography or vegetation existing on the northern and southern sides. Photo Insets 10-13 show the character and general views looking south towards the Project. L5 is a Line of Sight profile taken from the water at the City of Amsterdam where visibility analysis predicts there may be views. L5 Line of Sight profile (approximately 3.7 miles) however, shows that there will likely not be views of the Project at this location due to vegetative obstructions.

10.2.2.6 L6 – Denice Road, Florida (LSZ 1,3; Profile Line Length 5.7 miles)

There are few areas beyond the two-mile Distance Zone where there may be views of the Project in public locations. Figure 4 in Attachment 4 viewshed analysis indicates several views beyond 2 miles may be obtained. L6 Line of Sight profile is at Denice Road at a location within a small isolated area of predicted visibility as a result of the viewshed analysis. Denice Road and nearby Morris Road areas lie within open field and farmland where there are few residents save for two large farm type properties that are in the vicinity. L6 location is approximately 420 feet from the nearest residential property on Denice Road. Views of the Project may be experienced at open portions of the property but views are not expected from the house itself as there are existing privacy hedgerows and trees that surround the house on several sides.

The L6 profile for Denice Road however shows a view that overlooks a valley area that is lower in terrain that increases with elevation as the profile distance approaches the Project. There is vegetation at the crest of the hill where there may be some distant views to solar arrays approximately 5.7 miles away that can be seen just above the vegetation.

10.2.2.7 L7 – Fuller Road, Florida (LSZ 1,3; Profile Line Length 3.6 miles)

Inset 2 in Section 3.2 shows a picture from Fuller Road looking east to the northern arrays (2.4 miles away) that are south of the Thruway. There will be no views to these northern arrays. Viewshed results show some level of visibility is predicted at Fuller Road. The L7 Line of Sight profile indicates potential views southeasterly to the far side of the Project where arrays and a partial view of the Project located at Mohr and Bulls Head Road might be seen. L7 profile distance is approximately 3.6 miles.

10.2.2.8 L8 – Riverlink Park, City of Amsterdam (LSZ 3,4; Profile Line Length 3.5 miles)

Riverlink Park is a local waterfront park located in the City of Amsterdam just south of the railroad tracks and Front Street. Viewshed results suggest there could be views to some panels. L8 Line of Sight demonstrates a profile obtained from Riverlink Park where views are not predicted from the L8 location due to vegetative obstructions. L8 profile is approximately 3.5 miles.

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. 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 5. 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.

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						
12	Bulls Head Rd	12.5	4.5	2.0	10.0	5.0	1.5	13.0	6.0	2.0	11.8	1.2	5.2	0.6	1.8	0.2
15c	Mohr Rd	14.5	3.0	1.5	15.0	6.0	1.5	14.5	4.5	2.0	14.7	0.2	4.5	1.0	1.7	0.2
26	Swart Hill Rd	11.0	9.0	2.0	6.0	6.0	2.0	13.5	7.5	2.5	10.2	2.8	7.5	1.0	2.2	0.2
27	Bulls Head Rd	14.0	7.0	1.5	6.0	5.0	1.5	13.5	7.5	2.5	11.2	3.4	6.5	1.0	1.8	0.4
28	Bulls Head Rd	14.0	7.0	1.5	8.0	6.0	1.5	14.4	6.5	2.0	12.1	2.8	6.5	0.3	1.7	0.2
29	Patterson ville Rd	11.0	7.0	1.5	11.0	5.5	2.0	14.0	7.0	2.0	12.0	1.3	6.5	0.7	1.8	0.2
30	Thayer Rd	10.5	3.5	2.0	12.5	4.5	1.0	13.5	4.5	1.0	12.2	1.1	4.2	0.4	1.3	0.4

10.3.1 Part 1 Contrast Rating

Part 1 Contrast as outlined in Section 9.0 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 9 categories to rate where the total rating ranges from 0 to 27. The viewpoint with the highest Part 1 Contrast is VP15c on Mohr Road with an average rating of 14.5. This simulation shows the panels 437 feet offset from the road with partial views to the Project. The majority of the arrays are behind existing vegetation but can be seen through a gap in the vegetation as well as partial views of panels on the hill behind the shrubs and trees. Although much of the arrays are mitigated by the flora, the contrast rating is high due to new form, color, line, and texture contrasts of discernible detail and proximity to the viewer, compared to what is currently there.

VPs 29, 28, and 30 basically have the same average ratings with 12.0, 12.1 and 12.2, respectively. VPs 28 and 29 are at similar distances at 0.3 and 0.2 miles while VP30 is 648 feet (0.12 miles) from the viewer. Much of the Project is nestled against existing forest in VPs 28 and 29 and do not show much discernible detail at the viewer distances however the horizontal extent of the arrays and color change likely provides the largest contrasts against the existing ochre colored fields. Interestingly, VP30 where the fenceline is only 648 feet from the viewer is has a similar contrast rating to those arrays that are approximately a quarter mile away. This could be the difference in season but the view in VP30 shows the Project as fairly small and subordinate in the view, suggesting that offsets of several hundred feet placed against existing tree lines can be effective in reducing visual contrasts and impacts.

VP12 shows the project viewed through a gap in roadside vegetation with clear lines of sight. VP12 is rated at 11.8 with an average Part 1 contrast rating close to VPs 28-30. The viewer is 380 feet to the fenceline and discernible detail is observed but again with a comparatively lower contrast rating, placing arrays at offsets from the road nearing edges of opposing fields and against existing tree lines in the background appears to be effective at reducing visibility.

VPs 26 and 27, the VPs most distant from the Project have the lowest contrast ratings of the simulation suite with average ratings of 10.2 and 11.2 respectively. VP26 is 1.5 miles away while VP27 is 0.7 miles away. VP26 shows a view from across the Mohawk River on the north side at an elevated valley slope location. The view shows an extensive open panoramic view of the hills and mosaicked field-forest pattern. Although there is an open view and clear sight-line to the Project and color contrast can be noted against existing conditions, the contrast rating might be on the relatively lower side because the array color resembles that of the forested areas in view. The gaps and spacing of array groups on the hills resembles that of the forest group and field pattern at distance. VP27 has a similar view as that of VP28 but is 0.4 miles away from the viewer. At VP27 the arrays are nestled within and behind existing forested areas and are lower than the trees and do not break the horizon line. The rating forms indicate that the contrasts are attributed to color and form against existing conditions yet are somewhat mitigated by the placement of the panels against the existing forested areas.

Mean deviations were calculated to observe the level of variance between the panelists within each simulation evaluation. Mean deviations ranged between 0.2 and 3.4. It appears panelist opinion varied the most regarding contrast changes when assessing VP27 that had the highest

mean deviation of 3.4. As noted above panelists observed Project contrast against the existing open ochre colored field while one panelist thought that placement of arrays nestled within trees reduced contrast. There is very little difference in panelist opinion with VP15c with a mean deviation of 0.2. The remaining mean deviations of VP12, 26, 28, 29, and 30 lie in between the extremes where there might be slight differences in opinion when it came to how much form, line, and color contrast the panels provided against existing conditions.

10.3.2 Part 2 Viewer Sensitivity

There are 8 categories under Part 2 to rate where the total rating ranges from 0 to 24. 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. Since Table 3 indicates minimal views of the Project will occur at visual receptors most of the viewer sensitivity issues focus on viewer groups related to the community travelers or residents. The highest Part 2 viewer sensitivity is at VP26, likely because of its elevation view towards the project across the Mohawk River at an upper valley slope location with a more panoramic view over other viewpoints.

VP 27, 28, and 29 resulted in an average rating of 6.5. These three simulations are similar in that they are representative of longer duration homeowner views at distance.

VP12 and 15c were somewhat similar with an average sensitivity rating of 5.2 and 4.5. These two are similar in that they are proximal views along a local road.

VP30 had the lowest viewer sensitivity rating as it is also not listed as a scenic receptor and is located along a general local travel corridor with expected low number of viewers.

Mean deviations for Part 2 Viewer Sensitivity do not show a lot of variance between panelist opinion, with ratings between 0 and 1.0. This can be somewhat expected as the Part 2 categories are less subjective than Part 1. VPs 15c, 26, and 27 has the highest mean deviation all at 1.0. The remaining mean deviations are less than 0.8 indicating similar agreement.

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 Section 9.3). 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; 3 is strong.

VP 26 was rated highest with an average scenic quality value of 2.2. It is likely the highest because of the upper elevation panoramic distance view over the valley towards agricultural fields and forest. Remaining VPs are rated similarly with average ratings of 1.3 to 1.8. Overall, the ratings indicate moderate to weak scenic quality indicating that either views are not outstanding according to criteria in Section 9.3 and/or are typical of the area

Mean deviations for Part 3 are comparatively very low, ranging between 0.2 and 0.4. This suggests the panelist's opinions on scenic quality regarding each viewpoint were very similar.

11.0 LIGHTING

Lighting is not proposed for the solar arrays. Lighting is only proposed at the Project interconnection facilities and is only for security, safety and maintenance purposes. Details regarding the Project's Lighting Plan are included in Appendix 11-1, Preliminary Design Drawings. This includes details regarding lighting for the collection substation and switchyard. Manually-operated security lighting is proposed at the collection substation and switchyard. This plan was developed to minimize fugitive light while meeting lighting standards established by the National Electric Safety Code (NESC). The collection substation and switchyard will normally be unoccupied. At the perimeter of the interconnection facilities, lighting will be turned on manually by a switch. In work areas, lighting will be activated manually turned on by a switch. Lighting will consist of full cutoff fixtures and will be installed facing downward to minimize potential impacts to the surrounding public. Lighting has been designed to provide a 2.4 foot-candle average, to eliminate unnecessary light trespass beyond the collection substation and switchyard, and will be equipment or pole structure mounted. During unoccupied periods, lighting will not be illuminated. All lighting for the Project will be full cut off fixtures with no drop-down optical elements.

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; 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 use of overhead interconnection lines.

12.1 Siting and Design

Current siting is optimized such that attempts to minimize visibility have been created by the placement of the arrays in certain ways. Roadside vegetation has been used in some areas that

offer minimal open gaps to the Project where views are obtained as in for example, Simulations VP12 and 15c. Siting against tree lines and within forested areas (Simulation VP27) as well as setback distances of several hundred feet (Simulation VP30) are effective in reducing visibility. Also, placing panels forming array groups that are similar to existing forest and field patterns where there may be higher elevation views is shown in Simulation VP26.

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

- Use of surrounding woodlands, hedgerows, and topography as existing visual barriers.
- Setbacks and offsets: panels proposed on interior fields as opposed to adjacent roadways to further the distance from travel corridors or those areas that may experience glare.
- Solar photovoltaic panels are designed to absorb light, not reflect light, and therefore produce minimal glare.
- Use of antireflective coatings on solar panels.
- When employed, tracker technology keeps panel at a 90-degree angle from sun reflecting any glare back towards the sky.
- Strong regular geometry was reduced by providing an overall shape that follows the edges of natural forested areas or create patterns that mimic existing landscape patters at distance.
- General site location placed far from sensitive 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.
- Collection substation located proximal to existing National Grid substation.
- Vegetative buffers: plantings of native pollinator species included in proposed buffer.
- Additionally, collection lines have been placed underground to the maximum extent practicable to decrease additional aboveground impacts. This configuration allows continued use of the land within the Project Site and will not impede the land uses that have created the rural character of the VSA.
- Minimized vegetation clearing outside of the arrays.

12.2 Vegetative Mitigation

Both the solar array themselves and their ancillary infrastructure (electricity transmission lines, collection substations) can affect the character of a landscape. From a scenery point of view, methods and techniques of hiding/screening solar farms can be quite effective. 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 can be found in Exhibit 11 Attachment 11-1. The following items and concepts were applied to the plan:

- The Town of Florida Land Use Code and Zoning Law was reviewed to understand how and where to apply visual screening. The screening proposed herein complies with any substantive requirements of that Code.

- Native evergreen and deciduous shrubs and trees were chosen for the vegetative barriers. Species chosen needed 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: Black Gum (Nyssa Sylvatica), Balsam Fir (*Abies balsamea*), Eastern Red Cedar (*Juniperus virginiana*), White Spruce (*Picea glauca*), Northern White Cedar (*Thuja occidentalis*), Black Cherry (*Prunus serotina*), and Downy Shadbush (*Amelanchier arborea*). Shrub species include: Red Chokeberry (*Aronia arbutifolia*), Red Twig Dogwood (*Cornus sericea*), Common Witch Hazel (*Hamamelis*), Common Snowberry (*Symphoricarpos*), and Highbush Blueberry (*Vaccinium corymbosum*). Pollinator species were also considered. Of the above listing, the following are pollinator species:

  Black Cherry (Prunus serotina)

  Downy Shadbush (Amelanchier arborea)

  Red Chokeberry (Aronia arbutifolia)

  Common Witch Hazel (Hamamelis virginiana)

  Common Snowberry (Symphoricarpos)

  Highbush Blueberry (Vaccinium corymbosum)

- Three types of planting "templates" are proposed. Type 1 is a robust planting scheme that will provide a maximum buffer screening of the Project. Type 2, proposes a reduced buffer screening effort and is primarily used to supplement visual mitigation in areas with existing vegetation (i.e. existing wooded hedgerows consisting primarily of deciduous vegetation) or to provide screening where limited residential receptors are located. A third planting area, referred to as the Special Planting Area (SPA), is proposed where there will be a maximum visual screening effort along Pattersonville Road using mature nursery stock.
  - Areas 2, 2a, and 3: Both Type 1 robust screening and Type 2 reduced planting schedule will occur for the tracking system arrays at the northern part of the project north of Bulls Head Road and between Pattersonville and Thayer Roads.
  - Area 6 at the switchyard location and tracker arrays will have Type 1 plantings on the Pattersonville Road side of the Project.
  - Areas 1 and 4: Type 2 planting schedule will occur for the fixed arrays that are proposed south of Bulls Head Road in Area 1 west of Thayer Road and Area 4 between Thayer and Mohr Roads.

- Area 5: These are all fixed arrays. The northern and northeastern portion of Area 5 adjacent to and south of Pattersonville Road are robust SPA locations. The remaining Area 5 plantings will predominantly be Type 1 plantings with Type 2 at the northwestern edge.

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; potentially removing some vegetation from 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) and installing power-conducting cables (typically buried). Additional construction activities may also be necessary at very remote locations or for very large projects; they may include constructing temporary offices or sanitary facilities. 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 makes it clear that there is minimal expected visibility (3.3%) within the overall VSA but there would be limited areas from which the Project would be visible and, in contrast, a multitude of areas from which it would not be seen. There is existing topography and many tree groups surrounding the Project that will block views. There are also significant 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 Mitigation Section 12.0.

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 at distance which consists of a strong new horizontal pattern similar 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 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 Facility. 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. Contrast may also occur for short durations for travelers in vehicles on roads that are not heavily traveled as say, Interstate 90.

With respect to anticipated visibility from the collection substation site, as a result of Line of Sight viewpoint L1 (Attachment 4) it is expected that there will be short duration intermittent views from the New York State Thruway. Most station components such as electrical equipment will likely be visible in the early years from locations on Pattersonville Road prior to the growth of landscape mitigation that is proposed at the fenceline. Line of Sight viewpoint L2 shows in later years following vegetative mitigation growth, the upper portions of some lightning masts (~18 inches in diameter) and an A-frame electrical component may be visible in the near vicinity from Pattersonville Road as the roadway passes by the Project. The lightning masts will be similar in look to other utility poles in the area.

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

- 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 region. Farming practices will continue on portions of the Project Area not utilized for the Project Components and in fact, 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 both fixed and tracking solar arrays where best suited due to existing topography, the Applicant is able to limit the ground cover required to achieve its objective of a 90 MW 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 utilize the land for agricultural purposes in the future following decommissioning.

- The AC collection lines will be placed underground for the entirety of their length and installed primarily via direct trenching with some portions to be proposed via horizontal direction drill (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 landscape characteristics.

- The Project does not always appear as a dominant feature in a view and due to limited and/or long-range visibility, 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 appealing 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 AADTs in Table 1) except for the NYS Thruway, the public areas nearest to the Facility 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, including the Mohawk River.

- The Project does not create a new source of substantial light which would adversely affect nighttime views in the area. Glare from the solar modules and associated equipment would be negligible as they would consist of a non-reflective coating and would be at least partially screened by the proposed fencing and perimeter landscaping.

15.0 GLARE

15.1 INTRODUCTION

The Project is not anticipated to emit significant 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).

A Glint and Glare Analysis was performed in order to identify any potential impacts on nearby residences and roads. 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.

As noted above, the Project proposes to install fixed, tracker, or a combination of both types of racking systems. The glare analysis has been performed assuming an all-fixed layout in order to present results that do not understate potential glare visibility.

15.2 REGULATORY THRESHOLDS

There are no applicable quantitative standards for glare, but scientific literature suggests that doubling the annual 30-hour shadow flicker standard (adopted by the Siting Board applicable to wind facilities) could be used as a benchmark, i.e. 60 hours per year (Pager Power, January 2017).

15.3 GLARE ANALYSIS

Based on the viewshed analysis included as Figure 4 in Attachment 2 of this VIA, non-participating residential receptors and points along local roadways (both referred to herein as "observation points") identified as having visibility of the Project were assessed for glare. The overall Project

array was divided into nine separate areas identified as arrays A1 through A7 and P1, P2. An additional viewshed analysis was then performed to determine which of these separate array areas are visible from each observation point with predicted visibility. Proposed landscaping was not accounted for in the viewshed analysis and, therefore, the predicted visibility is overestimated.

For residential observation points, the analysis conservatively assumed a second-story observer height of 16 feet. Twenty-five residential observation points were assessed. Similarly, for road observation points, a truck observer height of eight feet was assumed. Twelve roadway observation points were assessed.

The glare analysis was then conducted to determine the potential duration of glare that could occur at each observation point and the portion of each array area determined to have a potential to result in glare. The results of this analysis are included in Appendix 24-2. While the results indicate there is the potential for glare at a number of observation points, further analysis was required to determine if the portion of each array area determined to have the potential to create glare at an observation point is actually visible at each observation point. As noted in Section 7.1.2 above, because an area may show visibility in the viewshed analysis, it does not mean the entirety of the array area 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 view.

Therefore, for observation points that have the potential for greater than 30 hours of glare annually (eight residences and two road points), but less than 60 hours annually, a separate line of sight analysis was completed to confirm visibility of the array. Table 8 below provides a summary of this analysis.

Table 8. Glare Analysis Results

Observation Point	Type	Array(s) Assessed	Potential for Glare >30 Hours Annually	Line of Sight Analysis Results	Predicted Glare Duration
OP-2	Residence	A-1	Yes	Existing vegetation and proposed landscaping block visibility	0 hours
OP-10	Residence	A-2	Yes	Confirmed visibility	42.48 hours annually possible; additional landscape buffer to south of Array 2 should help minimize potential glare duration
OP-11	Residence	A-2 & A-3	Yes	A-2: Confirmed visibility; A-3: Existing vegetation and proposed landscaping block visibility	A-2: 38.72 hours annually possible; additional landscape buffer to south of Array 2 should help minimize potential glare duration; A-3: 0 hours

Observation Point	Type	Array(s) Assessed	Potential for Glare >30 Hours Annually	Line of Sight Analysis Results	Predicted Glare Duration
OP-14	Residence	P-1	Yes	Proposed landscaping will block array visibility	0 hours
OP-16	Residence	P-1	Yes	Proposed landscaping will block array visibility	0 hours
OP-29	Residence	A-5	Yes	Proposed landscaping will block array visibility	0 hours
OP-33	Residence	A-2	Yes	Existing vegetation blocks visibility	0 hours
OP-51	Residence	P-1 & P-2	Yes	P-1: Existing vegetation blocks visibility; P-2: Existing hedgerow vegetation blocks array visibility	P-1: 0 hours P-2: 0 hours
OP-66	Road	A-2	Yes	Existing vegetation blocks visibility	0 hours
OP-74	Road	A-2	Yes	Existing vegetation and proposed landscaping block visibility	0 hours

As indicated in Table 8 above, for those observation points with the potential for greater than 30 hours of glare annually, but less than 60 hours annually, all but two are confirmed to have existing vegetation and/or proposed landscaping that will mitigate the potential for glare. Two additional locations (OP-10 & OP-11) can likely be mitigated with the addition of a landscape buffer along the southern perimeter of array A-2.

Of the remaining 17 residential observation points not included in Table 8, five have no potential for glare and the remaining 12 observation points have the potential for glare less than 30 hours annually with the maximum duration of potential glare ranging from five to 20 minutes per day during select summer months. For the remaining 10 road observation points, six have no potential for glare and the remaining four have the potential for glare less than 30 hours annually with the maximum duration ranging from one to fifteen minutes per day during select summer months. Similar to the observation points listed in Table 8, this analysis is very conservative in that the portions of the arrays that have the potential to create glare may not be visible. Additionally, proposed landscaping is not accounted for in the viewshed analysis and, as noted above, the analysis assumes that the sun is shining 365 days per year, which means days with no glare (cloudy or rainy days) are most likely contributing to the predicted glare duration. Similarly, buildings and existing tree cover may block otherwise predicted glare duration. Proposed landscape areas in combination with existing vegetation along the perimeter of the site will further reduce the potential from glare associated with the proposed arrays.

Proposed mitigation measures in place for observation points with less than 30 hours of potential glare annually include:

- Landscaping along southernmost portion of Array A-2 and A-3
- Special Planting Area proposed along northern and western portions of Array A-7
- Landscaping along perimeter of Array P-1
- Landscaping along northern perimeter of Array A-5

Based on the results of the analysis and the proposed mitigation measures, no significant impacts from glare are expected as a result of the Project.

Refer to Appendix 24-2 to see the SGHAT data sheets prepared by Capitol Airspace Group.

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