N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species (3 Reaches)

	Tier Species						
Stream Name	Highest TE [*]	BOVA	Code, S	Status	[*] , Tier ^{**} , Commo	n & Scientific Name	View Map
Crooked Creek (03010204)	FTST	060173	FTST	la	Pigtoe, Atlantic	Fusconaia masoni	<u>Yes</u>
Flat Rock Creek (03010204)	FTST	010174		la	<u>Bass, Roanoke</u>	Ambloplites cavifrons	Yes
	1151	060173	FTST	la	Pigtoe, Atlantic	Fusconaia masoni	103
tributary (03010204)		010174		la	Bass, Roanoke	Ambloplites cavifrons	<u>Yes</u>
tributary (03010204)		010174		la	Bass, Roanoke	Ambloplites cavifrons	<u>Yes</u>

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Public Holdings:

N/A

Completion 1/5/2022, 1127/33 PM 1156083.0 report-PA searchType= P dist 3218 poil= 36.54 560, 78,10.26.0 sileDD= 38,3653811 -72,1456532.36,0367222 - 78,157472136,025138 - 78,1598332,36,02707833 - 78,16581943,36,0264373 - 78,167829 - 78,1772721 dist 199611 - 73,16524,36,3459000 - 74,165032,36,0367777 - 78,157472136,032778 - 78,1772721 dist 199611 - 73,16524,36,3459000 - 78,165243,32,34590000 - 78,165243,34,3459000 - 78,165243,34,9459000 - 78,165523,34,9459000 - 78,165523,34,9459000 - 78,165523,34,9459000 - 78,165523,34,9459000 - 78,165523,34,9459000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,94590000 - 78,165523,34,945900000 - 78,165523,34,945900000 - 78,165523,34,945900000 - 78,165523,34,945900000 - 78,165523,34,945900000 - 78,165523,34,945900000 - 78,165523,34,9459000

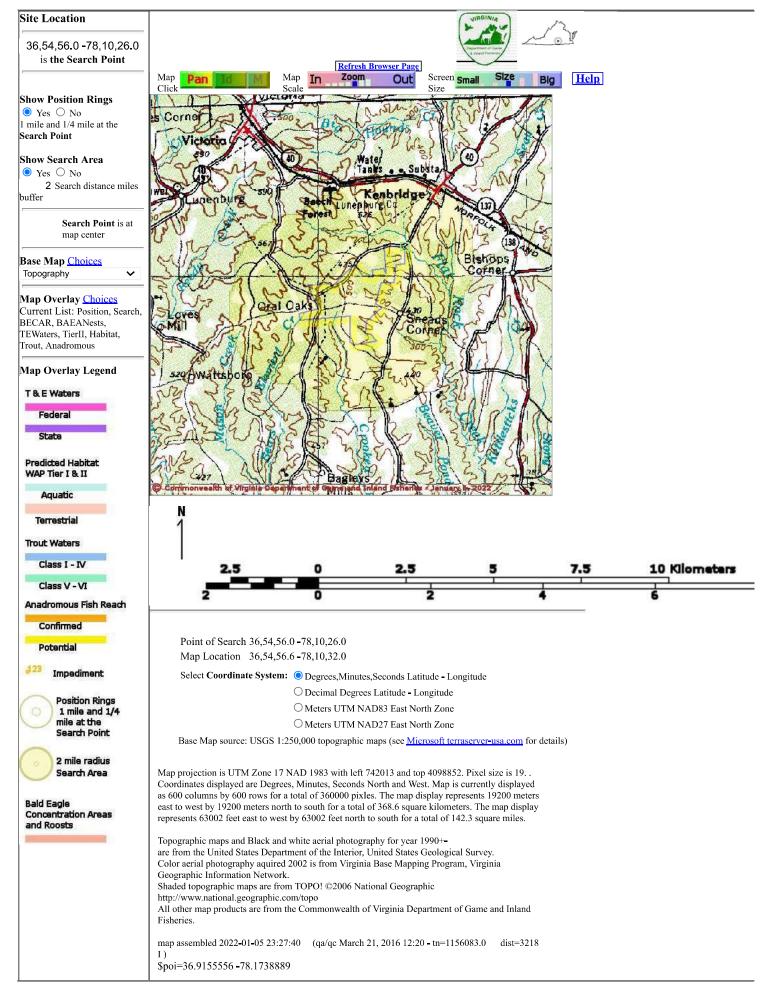
| 1/5/2022, 11:27:33 PM | DGIF | Credits | Disclaimer | Please view our privacy policy | © 1998-2022 Commonwealth of Virginia Department of Game and Inland Fisheries I 1156083

If you have difficulty reading or accessing documents, please **<u>Contact Us</u>** for assistance.

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

1/5/22, 11:27 PM

VaFWIS Map



VaFWIS Map

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Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Global Conservation Status Rank: Select All

State Conservation Status Rank: Select All

Federal Legal Status: Select All

State Legal Status: Select All

County: Lunenburg

Watershed (8 digit HUC): 03010204 - Meherrin River

Subwatershed (12 digit HUC): CM08 - Meherrin River-Mason Creek, CM09 - Meherrin River-Crooked Creek, CM10 - Flat Rock Creek

Search Run: 12/5/2021 9:00:46 AM **Result Summary**

Total Species returned: 2

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community Lunenburg Meherrin	Scientific Name	Scientific Name Linked	Global Conservation Status Rank	Global Conservation State Conservation Status Rank Status Rank	Federal Legal Status State Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Flat Rock Creek BIRDS								
Loggerhead Shrike Lanius Meherrin River-Mason Creek BIVALVIA (MUSSELS)	-oggerhead Shrike Lanius Iudovicianus Lanius Iudovicianus Meherrin River-Mason Creek 3IVALVIA (MUSSELS)	Lanius Iudovicianus	G4	S1B,S2N	None	LT	40	z
Atlantic Pigtoe	Fusconaia masoni	Fusconaia masoni	G1	S2	PT	LT	29	z

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an information request.

To Contribute information on locations of natural heritage resources, please fill out and submit a rare species sighting form.



Clyde E. Cristman Director

COMMONWEALTH of VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION

January 12, 2022

Jennifer D'Augustine Tetra Tech Inc. 4101 Cox Road, Suite 120 Glen Allen VA, 23060

Re: Laurel Branch Solar Project

Dear Ms. D'Augustine:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Please note, the project area intersects a DCR predictive suitable habitat model for the Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*, G3G4T3/S2/NL/LE). There is potential for the rare bat to occur in the project area if suitable habitat exists on site. The Eastern big-eared bat is named for its enormous ears twice the length of its head, is extremely rare in Virginia and is currently known only from the southeastern portion of the state. Although widespread throughout the southeast, they are never found in large numbers. These bats roost singly or in small groups in hollow trees or abandoned buildings. They forage only after dark primarily in mature forests of both upland and lowland areas along permanent bodies of water (NatureServe, 2009). The details of this bat's feeding behavior and much of its natural history remain a mystery. Lack of information regarding the ecology of the Eastern big-eared bat, and their sensitivity to disturbance, make them particularly vulnerable to destruction of roost sites and feeding areas where their presence goes undetected (Handley and Schwab 1991, Harvey 1992).

Threats to this species include forest destruction, particularly hollow tree removal, decreasing availability of abandoned buildings, and possibly, insecticides. Please note that this species is currently classified as endangered by the Virginia Department of Wildlife Resources (VDWR).

DCR recommends avoiding tree removal in bottomland habitats along Bear Elements Creek and assessing any large potential roost trees and/or abandoned structures on the property for bat presence/absence. DCR also recommends coordination with DWR if removal of potential roost habitat for the Eastern big-eared bat becomes necessary to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

In addition, the proposed project will fragment Ecological Cores (C3, C4, and C5) as identified in the Virginia Natural Landscape Assessment (<u>https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla</u>), one of a suite

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

State Parks • Soil and Water Conservation • Outdoor Recreation Planning Natural Heritage • Dam Safety and Floodplain Management • Land Conservation of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://wanhde.org/content/map.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

Furthermore, DCR recommends the development of an invasive species management plan for the project and the planting of Virginia native pollinator plant species that bloom throughout the spring and summer, to maximize benefits to native pollinators. DCR recommends planting these species in at least the buffer areas of the planned facility, and optimally including other areas within the project site. For screening zones outside the perimeter fencing, DCR recommends native species appropriate for the region be used. Guidance on plant species can be found here: http://www.dcr.virginia.gov/natural-heritage/solar-site-native-plants-finder. In addition, Virginia native species alternatives to the non-native species listed in the Virginia Erosion and Sediment Control Handbook (Third Edition 1992), can be found in the 2017 addendum titled "Native versus Invasive Plant Species", here: https://www.deq.virginia.gov/home/showpublisheddocument?id=2466. Page 3 of the addendum provides a list of native alternatives for non-natives commonly used for site stabilization including native cover crop species (i.e. Virginia wildrye).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months (June 12, 2022) has passed before it is utilized.

A fee of \$1000.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty

days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <u>http://vafwis.org/fwis/</u> or contact Amy Martin at 804-367-2211 or <u>amy.martin@dwr.virginia.gov</u>.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

Rem' Hy

S. René Hypes Natural Heritage Project Review Coordinator

Cc: Amy Martin, VDWR Susan Trip, DEQ Tracy M Gee, Lunenburg County Administrator

Literature Cited

Handley, C.O., and D. Schwab. 1991. Eastern big-eared bat. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. p. 571-573.

Harvey, M.J. 1992. Bats of the Eastern United States. Arkansas Game and Fish Commission, Little Rock, Arkansas. pp.46

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <u>http://www.natureserve.org/explorer</u>. (Accessed: March 31, 2010)

ATTACHMENT C: CULTURAL RESOURCES DESKTOP REVIEW MEMO

Cultural Resources Desktop Review

Laurel Branch Solar Project

March 3, 2022

Prepared for



600 E Canal Street Richmond, VA 23219

Prepared by



4101 Cox Road, Suite 120 Glen Allen, VA 23060

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1.0 INTRODUCTION

This report provides a summary of the cultural resource management events registered at the Virginia Department of Historic Resources (VDHR) through January 2022 that have taken place to date within the proposed Laurel Branch Solar Project area. Additionally, all previously identified architectural resources and archaeological sites located within the project area, as well as within 0.5 mile of the project area, are provided. Information on previously conducted surveys and previously identified resources and sites were accessed through VDHR's Virginia Cultural Resources Information System (VCRIS) on January 5, 2022. The memo was drafted based off the current Laurel Branch Solar Project boundary.

2.0 PREVIOUS SURVEYS RELEVANT TO THE PROJECT AREA

Research undertaken through VDHR's VCRIS demonstrated that no surveys have been conducted within 0.5 mile of the project area (Figure 1).

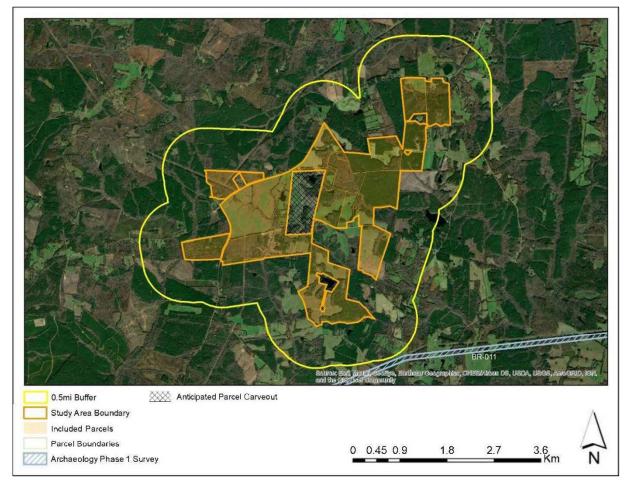


Figure 1. Previous surveys (gray) conducted in relation to the 0.5-mile buffer (yellow) around the project area (orange). Source: VCRIS 2022

3.0 PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES WITHIN 0.5 MILE OF THE PROJECT AREA

There are no previously recorded archaeological sites located within 0.5 mile of the project area (Figure 2). No archaeological sites are located within the project area.

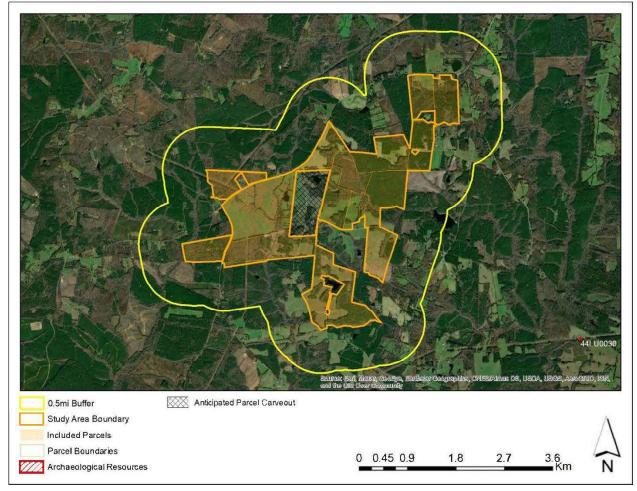


Figure 2. Archaeological resources (red) in relation to the 0.5-mile buffer (yellow) around the project area (orange). Source: VCRIS 2022.

Review of VDHR VCRIS records identified 13 previously recorded architectural resources within 0.5 mile of the project area (Figure 3, Table 1). Among the resources are 10 dwellings, a wagon shed, a church/chapel, and a school. The resources range in date from the late-eighteenth century to the mid-twentieth century. VDHR #055-0003, Flat Rock, a circa 1780 farmhouse, is additionally listed in the National Register of Historic Places (NRHP) (NRHP; reference number 79003051) and the Virginia

Landmarks Register (VLR). VDHR #055-5132 (Good Hope Christadelphian Chapel) has been determined to be eligible for inclusion in the NRHP.

Two resources are located partially within the project area. These resources include: VDHR #055-5132 (Good Hope Christadelphian Chapel) and VDHR #055-5138 (Samuel A. Wallace, Jr. House). As mentioned above, VDHR #055-5132 (Good Hope Christadelphian Chapel) has been determined to be eligible for inclusion in the NRHP and VDHR #055-5138 has been determined to not be eligible for inclusion in the NRHP.

As demonstrated in Figure 4, the project area excludes the majority of VDHR #055-5132 and VDHR #055-5138 (Figure 4). Likewise, VDHR #055-0117 is located within a parcel which is excluded from the project area, as shown in Figure 5 (Figure 5).

VDHR ID#	Property Name	NRHP Eligibility Status	Туре	Year
055-5139	Charles E. Wallace House (Current)	DHR Staff: Not Eligible	Single Dwelling	1955a
055-5138	Samuel A. Wallace, Jr., House (Current)	DHR Staff: Not Eligible	Single Dwelling	1953
055-5140	Wagon shed (Descriptive)	DHR Staff: Not Eligible	Wagon Shed	1925Ca
055-0028	Bell House (Historic/Current), Colonial Oaks (Historic), Eddie Bell Place (Descriptive)	<null></null>	Single Dwelling	1825Ca
055-5133	House on Route 655 (Function/Location), Wathall House (Historic)	DHR Staff: Not Eligible	Single Dwelling	1860Ca
055-5132	Good Hope Christadelphian Chapel (Historic)	DHR Staff: Eligible	Church/Chapel	1825Ca
055-0117	Oral Oaks (Historic/Current)	<null></null>	Single Dwelling	1840
055-0011	Laurel Branches (Historic)	<null></null>	Single Dwelling	1790Ca
055-0155	House, Route 637 (Function/Location)	DHR Staff: Not Eligible	Single Dwelling	1870Ca
055-5105	Unity School (Historic)	<null></null>	School	1873
055-5131	Lone Oak (Historic)	<null></null>	Single Dwelling	1810Ca
055-0003	Flat Rock (Historic/Current), Kenrock (Historic/Current), Old Bagley House (Historic), Prospect Hill (Historic)	NRHP Listing, VLR Listing	Single Dwelling	1780Ca
055-5130	Bridgforth, Washington Maddux House (Historic), Oak Forest (Historic/Current)	<null></null>	Single Dwelling	1936

Table 1. Previously identified architectural resources located within 0.5 mile of the project area.¹

1 Resources highlighted in orange are eligible for listing in the NRHP or have a NRHP and VLR listing. Bolded resources are partially within the project area boundary.

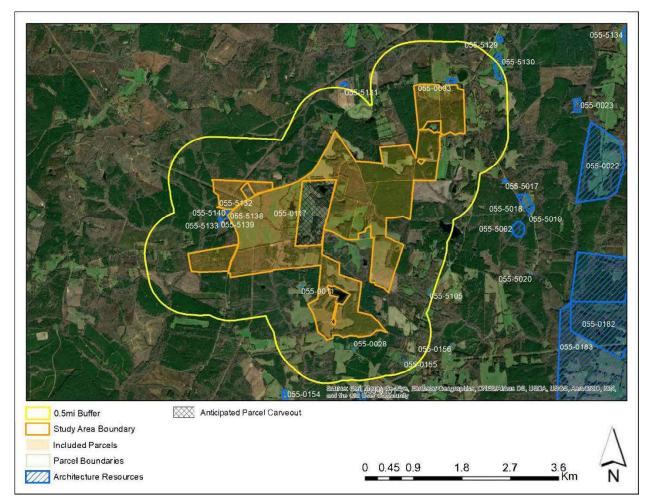


Figure 3. Map detailing all architectural resources (blue hatched) within 0.5 mile (yellow) of the project area (orange). Source: VCRIS 2022.



Figure 4. Detail of architectural resources (blue hatched) which are partially within the project area (orange). Source: VCRIS 2022.

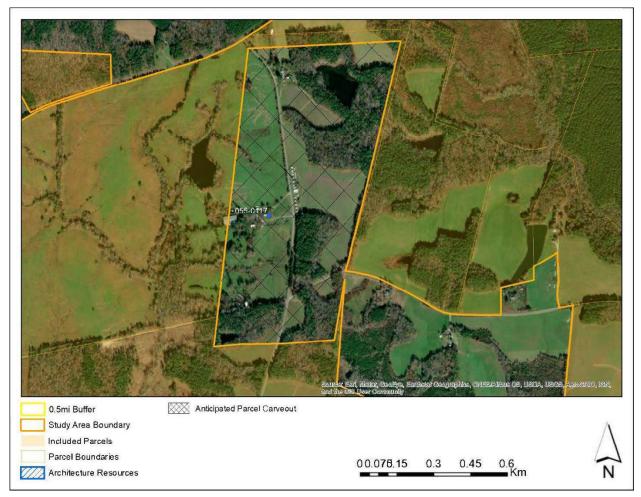


Figure 5. Detail of the proposed carved out area in which VDHR #055-0117 is located. The orange outlined proposed carved out area is not included within the project area. Source: VCRIS 2022.

5.0 RECOMMENDED NEXT STEPS

Preparation of a Phase IA cultural resources assessment (Phase IA), including a research design to guide a subsequent Phase I identification survey, is recommended for the Laurel Branch Solar Project area. The Phase IA should include further consideration of site soils, historic maps, and existing field conditions and result in the development of a stratified testing strategy for identifying archaeological resources within the project area. The completed Phase IA should be submitted to the VDEQ and VDHR for review and comment prior to initiation of Phase I identification survey of the site in accordance with the recommended testing strategy.

ATTACHMENT D: VISUAL IMPACT ASSESSMENT

Visual Impact Assessment

Laurel Branch Solar Project

March 3, 2022

Prepared for



600 E Canal Street Richmond, VA 23219

Prepared by



4101 Cox Road, Suite 120 Glen Allen, VA 23060

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Acronyms and Abbreviations

AC	alternating current
CUP	Conditional Use Permit
DC	direct current
КОР	key observation point
Project Area	the approximately 1,969 acres of privately-owned land where the proposed Project is located
Project	Laurel Branch Solar Project
Tetra Tech	Tetra Tech, Inc.
USGS	U.S. Geological Survey

1.0 OVERVIEW

Dominion Energy Virginia (Dominion) is proposing to develop a commercial solar energy project, Laurel Branch Solar Project (Project), on private land encompassing approximately 1,969 acres. The Project will be located along Sneads Store and Laurel Branch Roads in Lunenburg County, Virginia (Project). The Project Area consists of predominantly rural undeveloped and agricultural or timber production land. The Project Area is shown on the orthoimagery and U.S. Geological Survey (USGS) Project location maps (Figures 1 and 2).

The Project is located in a rural setting, southwest of Kenbridge, Virginia, (pop. 1,188 in 2021 [World Population Review 2022]) between VA 655 (Plank Road) and VA 637 (Craig Mill Road). The Project extends to the north and south of VA 647 (Sneads Store Road).

The predominant landcover of the Project Area is agricultural fields (forage/hay and pine timber production dominate) interspersed with large patches of mixed pine and deciduous forest and populated by isolated rural residences. Crooked Creek and numerous small ponds are also present in the Project Area.

The Project will consist of solar arrays and associated infrastructure, consisting of the following components:

- A solar field of photovoltaic panels producing direct current (DC) electricity mounted on solar module racking systems and foundations;
- Inverters within boxes on concrete pads situated amongst the solar arrays to convert DC electricity to alternating current (AC) electricity;
- A voltage cable collection system that will extend underground to aggregate the AC output from the inverters;
- A small internal substation that will feed the collected power to the existing electric grid; and
- Internal infrastructure including permanent paved and gravel access roads and security fencing.

Tetra Tech, Inc. (Tetra Tech), on behalf of Dominion, prepared this Visual Assessment to support the Laurel Branch Solar Project Conditional Use Permit (CUP) application.

2.0 METHODOLOGY

The Project Visual Study Area was defined as the area within 2 miles of the Project. Refer to Figures 1 to 3. No visual study area distance is prescribed by Lunenburg County ordinances or CUP documentation; therefore, the 2-mile radius was deemed appropriate by the authors to identify locations from which the Project components (i.e., solar arrays) could potentially be visible and noticeable to the casual observer, categorized according to their activity. The "casual observer" is considered an observer who is not actively looking or searching for the Project facilities, but who is engaged in activities at locations with potential views of the Project, such as walking or hiking along a trail or driving along a road. If the Project components are not noticeable to the casual observer, or if

resources in the Visual Study Area are not managed for visual quality, visual impacts can be considered minor to negligible.

A preliminary viewshed analysis was completed to identify Project visibility. A viewshed analysis is a graphic representation of the theoretical seen and unseen areas adjacent to the Project based on topography within the Visual Study Area. The viewshed analysis was conducted using the Google Earth Viewshed tool with a height of the solar arrays above ground surface (10 feet with the panels of the solar array standing vertically). The viewshed assumed "bare earth" conditions and was run from multiple points around the edges and in the middle of the Project to roughly determine areas with potential visibility. Given the limited views with the bare-earth analysis, it was determined that a viewshed accounting for vegetation was not required because it would not identify many more areas other than what is visible on aerials and the photography, and that the field visit would best determine actual areas of visibility.

A review of potential visual resources within the Visual Study Area was also conducted and included, but was not limited to, travel routes, recreation areas, local community resources (e.g., schools, parks, places of worship), and other scenic resources. No specific locations or resources within the Visual Study Area were identified as specifically managed for scenic quality. After review of potentially sensitive visual resources in the Visual Study Area, 13 key observation points (KOPs) were identified from which to potentially develop photographic simulations. The inventory considered 1) the most critical viewpoints (i.e., views from communities, residential areas, travel routes, and recreational areas), and 2) views that best represent the general area or landscape setting including anticipated views of the Project. KOPs were selected to represent typical views of residents, travelers, and recreationalists, primarily from public roads through and adjacent to the Project Area, because these routes would provide the most typical opportunities for views. Following KOP selection, fieldwork was conducted in January 2022 to collect site photography from each identified KOP location. Technical photographs from the field visit are included in Appendix A.

2.1 Evaluation of Solar Facilities Within the 2-Mile Buffer

Desktop research was conducted on existing and proposed solar facilities within the Visual Study Area No proposed or existing solar collection projects were identified within the Visual Study Area, based on an evaluation within the Virginia Department of Environmental Quality records (Virginia Department of Environmental Quality 2022).

2.2 Viewer Groups

Following KOP identification, viewer groups were identified to understand the types of receptors in this area. Viewer groups are specific users associated with various land uses who have unique expectations based on their activity and who could notice and could be impacted by landscape change, and therefore could be adversely affected by the construction and operation of the Project.

As described above, viewing locations are selected based on the results of the viewshed analysis, land uses, and viewer groups associated with key travel routes, recreation areas, and residential areas. KOPs represent critical or typical viewpoints within a land use and associated view group used to assess the visual effect of a proposed project. The visual impact to viewers at each KOP is based on the type of use and expected concern for aesthetics. Identifying groups of individuals who would likely be perceptive to visual changes is an important part of the visual assessment process and helps to define specific locations from which to assess changes to the visual character of the landscape.

2.3 Residents

The residential viewer group consists of people who live within the 2-mile buffer area of the Project. Many local residents are present on a year-round basis. Generally, they view the landscape from their homes, yards properties, and from places of employment while engaged in daily activities. Residents of primary interest for this analysis are located near the Project that may have views of the Project components. KOPs 2, 12, and 13 were selected, in part, to represent views from residences within proximity to the Project.

Regardless of their proximity to the Project, residents may have similar reactions to views of the Project facilities. Residents' threshold for visual quality can be variable and may be tempered by the visual character and setting of their area. It is assumed that residents are generally familiar with the local landscape and may not be tolerant of changes to views that are important to them.

2.4 Commuters/Travelers

Travelers passing through an area typically view the landscape from motor vehicles on their way to work, errands, or other destinations. Travelers include daily commuters and people engaged in various types of business or personal travel. Commuters traveling within the 2-mile buffer view the landscape from motor vehicles on their way to work or other business and service destinations. Commuters do not tend to stop along their travel routes, have a relatively narrow field of view because they are focused on road and traffic conditions, and are destination oriented.

Commuters may be more likely to notice visual change because they view this environment regularly. Passengers in commuter vehicles would have greater opportunities for prolonged off-road views toward landscape features and, accordingly, may have greater perception of changes in the visual environment. Roads in and around the Project are primarily rural, narrow, and unpainted roads. All KOPs selected for this analysis are located along public roads traversing through or adjacent to the Project Area.

2.5 Tourists and Recreational Users

This viewer group includes local and potentially seasonal residents engaged in recreational activities, and tourists and recreational users visiting from outside the local area. Viewers in this group can also be tied to both traveler and residential, depending on the type of recreation.

Relevant recreation activities in Lunenburg County include hunting, fishing, canoeing, and cycling, among others. Hunting of deer, turkey, and bear is popular in forested areas surrounding the Project Area. Cycling is also available: VA 635 (Oral Oaks Road) is part of U.S. Bicycle Route 1, which is a designated route connecting public roads from Maine to Florida.

Recreational users' perception of visual quality and landscape character is variable, depending on their reason for visiting the area and expectations for their experience. For some recreational viewers,

scenery is a very important part of their recreational experience, and recreational users often have continuous views of landscape features over relatively long periods of time. Recreators are generally considered to be highly perceptive to changes in scenic quality and landscape character.

2.6 Key Observation Points and Photo Simulations

13 KOPs were identified to evaluate potential effects from which to conduct fieldwork and capture site photography. Fieldwork was conducted in January 2022. Following the fieldwork and an analysis of Project visibility, five simulation locations were selected to illustrate views of the landscape following the Project installation. KOPs selected for simulations were evaluated to determine if the Project would be visible and the context that view would be in. Table 1 shows a summary of the 13 identified KOPs, and the KOPs are mapped on Figure 3. Of the 13 identified KOPs, five were found to have no views of the Project due to distance to Project elements, intervening forest or topography, or a combination of these factors.

Appendix A includes photos of existing conditions and photo simulations from KOPs 1, 2, 3, 12, and 13. KOP location 11 was determined to be inaccessible during the field reconnaissance and therefore, no photographs are included for this KOP. Appendix B shows the photography captured at each of the remaining 12 viewing locations visited in the field.

KOP No.	Name	Viewing Direction	Distance to Nearest Project Element	Primary Viewer Group(s)	Visibility ^{1/}
01 ^{2/}	Oral Oaks Road/VA 635/U.S. Bicycle Route 1	East	350 ft.	Commuters/Travelers; Tourists/Recreationalists	+
02 ^{2/}	Plank Road near Flat Rock Historic Site	Southwest	1,140 ft.	Residents; Commuters/Travelers	+/-
03 ^{2/}	Laurel Branch Road, South	Northwest	320 ft.	Commuters/Travelers	+
04	Plank Road, South	Northeast	500 ft.	Commuters/Travelers	-
05	Sneads Store Road, East A	West, Southwest	595 ft.	Commuters/Travelers	-
06	Laurel Branch Road, North	East	450 ft.	Commuters/Travelers	+
07	Sneads Store Road, West	North, Northeast	450 ft.	Commuters/Travelers	+/-
08	Craig Mill Road/VA 637	West	1,050 ft.	Commuters/Travelers	-
09	Plank Road, Central	Southeast	690 ft.	Commuters/Travelers	+/-
10	Sneads Store Road, East B	South	260 ft.	Commuters/Travelers	-
11 ^{3/}	Hilltop Road	North, South	565 ft.	Commuters/Travelers	-
12 ^{2/}	Oral Oaks Road at Plank Road	East	495 ft.	Residents; Commuters/Travelers	+
13 ^{2/}	Sneads Store Road	North	490 ft.	Residents; Commuters/Travelers	+/-

Table 1. Key Observation Points

1 + Visible; - Not Visible; +/- Partially Visible

2 Indicates a photo simulation was prepared for this KOP

3 No photographs are included from this KOP location

2.6.1 KOP 1- Oral Oaks Road/VA 635/U.S. Bicycle Route 1

This viewpoint faces east and is located along Oral Oaks Road/VA 635. It is representative of the commuter/traveler viewer group having foreground views. The existing landscape is characterized by

fairly flat to gently rolling terrain in the immediate foreground (zero to 0.5 mile) and middleground (0.5 to 3 miles). Background views (beyond 3 miles) are screened by dense mixed woods and a low hillside. While most outward-looking views from VA 635 are limited by dense woods on either side of the road, KOP 1 has open views to the east across an agricultural field covered by coarse dry grass. Oral Oaks Road is a narrow, unstriped road, and an existing overhead utility line follows the roadway corridor to the west. A wire fence with rustic wood fenceposts can be seen in the foreground, and another transmission line is seen in the distance.

This portion of VA 635 is also a designated segment of U.S. Bicycle Route 1, which was established by the American Association of State Highway and Transportation Officials in 1982 (VDOT 2019). Currently, the U.S. Bicycle Route 1 route through Virginia is managed by Virginia Department of Transportation in partnership with local governments and cycling advocates. In addition to low traffic volumes, low posted speeds and access to services, unique natural and cultural scenery is a common feature for route designation (U.S. Task Force on Numbered Bicycle Routes 2006). The existing condition and a photo simulation illustrating with-Project conditions from KOP 1 are included in Appendix A.

Despite the open view seen from the KOP 1 location, where the Project would be briefly visible to passersby, most of the Project along Oral Oaks Road would be screened by evergreen vegetation, as demonstrated by Inset 1, from Google Maps, captured just south of the KOP location along Oral Oaks Road. In addition, the Project will maintain a 50-foot vegetation offset from the roadway intended to allow volunteer vegetation to grow to further screen views of the Project from the roadway.



Inset 1. Image Source: Google Maps

2.6.2 KOP 2 – Plank Road Near Flat Rock Historic Site

This viewpoint faces southwest and is located along the northern Project boundary, off Plank Road/VA 655, west of the intersection with Craig Mill Road. It primarily represents views seen by commuters/travelers. This KOP was selected to consider visual effects in proximity of a listed site on the National Register of Historic Places: Flat Rock (NRHP Ref. Number 79003051), a home constructed in the late eighteenth century (Virginia Department of Historic Resources 2020). However, this analysis does not intend to specifically evaluate impacts to historic or cultural resources, including Flat Rock. Fieldwork conducted for this analysis confirmed that existing dense pine woodlands south of Plank Road screens views of the Project from the historic site.

The landscape surrounding KOP 2 is characterized by undulating topography and a mosaic of open agricultural fields and dark, dense mixed woodlands and hedgerows. Like Oral Oaks Road, Plank Road is a narrow, unstriped roadway, and an overhead utility transmission line parallels the roadway to the south. A small residence and an outbuilding can be seen from KOP 2. The existing condition and a photo simulation illustrating with-Project conditions from KOP 2 are included in Appendix A.

Along Plank Road, the same 50-foot vegetation offset as described for KOP 1 will be applied, allowing for vegetation to grow naturally between the roadway and the Project. As shown by Inset 2, captured near the KOP 2 location, a rise in topography naturally screens views from Plank Road into the field where the panels will be installed, and vegetation will be allowed to establish in the offset beyond the existing slope, further screening views from the roadway.



Inset 2. Image Source: Google Maps

2.6.3 KOP 3 – Laurel Branch Road, South

This viewpoint faces northwest and is located along Laurel Branch Road, in the southern portion of the Project Area. It primarily represents views seen by commuters/travelers with foreground views, although more forest can be seen in the distance.

The landscape surrounding KOP 3 is characterized by flat topography and open pastures, with a backdrop of dense mixed woodlands and cultivated stands of pine trees. Laurel Branch Road is a narrow, unstriped roadway, passing between open fields to the north and south at this location. An existing overhead utility line is partially visible to the north. The existing condition and a photo simulation illustrating with-Project conditions from KOP 3 are included in Appendix A.

No vegetation offset within the Project is proposed at KOP 3, due to existing utilities present next to Laurel Branch Road. However, no residences or visually sensitive resources were identified nearby which would have this view; it would be seen briefly by travelers using the roadway.

2.6.4 KOP 12 – Oral Oaks Road at Plank Road

This viewpoint faces northeast and is located off Plank Road, just east of the intersection with Oral Oaks Road at the western edge of the Project Area. It primarily represents views seen by residents (several residences are clustered nearby) and commuters/travelers of Plank Road.

The landscape surrounding KOP 12 is also characterized by level topography in the foreground and a mosaic of open agricultural fields and dark, dense mixed woodlands on the low hills in the distance. Like other roads in the Project Area, Plank Road is a narrow, unstriped roadway, and an overhead utility transmission line passes within view from this location. A wire fence with round wood posts and some young evergreen trees can be seen paralleling the road to the north. The existing condition and photo simulation illustrating with-Project conditions from KOP 12 are included in Appendix A.

Similarly, to viewing conditions at KOP 1, much of the Project along Plank Road would be screened from view by existing roadside vegetation, and existing young evergreen trees are seen in the KOP photos. In addition, the 50-foot vegetation offset would be applied for the entirety of the Project in this area along Plank Road to allow for natural attenuation for vegetative screening.

2.6.5 KOP 13 – Sneads Store Road

KOP 13 faces north and is located along Sneads Store Road, centrally positioned within the Project Area. It primarily represents views seen by residents with middleground views (two rural residences are located south of Sneads Store Road) and commuters/travelers with foreground views. Like other roads in the Project Area, Sneads Store Road is a narrow, unstriped roadway, and is primarily used for local access.

The landscape shown in KOP 13 is characterized by gently rolling topography in the foreground comprised of an open field and a small pond, and dark, dense mixed woods beyond. A dirt vehicle track and utility pole can be seen to the east. The existing condition and photo simulation illustrating with-Project conditions from KOP 13 are included in Appendix A.

As described for the other KOP locations above, the Project area near KOP 13 would also have the 50foot vegetation offset applied to allow vegetation to naturally establish between Sneads Store Road and the Project. Over time, the open views shown in the simulation would be partially to fully screened by vegetation.

3.0 CONCLUSIONS

As illustrated by the photo simulations, the Project would introduce a series of low vertical, geometric elements that are gray in color (e.g., solar panel arrays, fencing) into a rolling terrain landscape dominated by green or golden agricultural fields and large patches of dense trees. The solar arrays would vary in size across the Project Area: from less than 10 acres to more than 80 acres. In most cases, large swathes of mixed forest would surround the arrays, screening many viewing opportunities. However, as represented by the photo simulations, some arrays situated in open fields would be briefly visible to passing motorists (or cyclists, pedestrians) from roadways. Refer to photo simulations created for KOPs 1, 2, 3, 12, and 13 in Appendix A.

Visual impacts would vary depending on several factors, such as the distance of the viewer from the Project, whether the viewer is stationary or in motion, and whether views toward the Project are unobstructed or screened by vegetation, topography, or existing structures. Project views can be very different from one location to another, including in proximity, because of the rolling terrain and dense vegetation. In all cases, the Project would be located 200 feet or more from public roadways, limiting viewing opportunities. In very limited instances where arrays are positioned at a slightly higher elevation than the viewer, such as a driver on a roadway, the panels are seen protruding above the background forest. In such instances, the panels could be perceived as more visually impactful compared to when they are viewed below background vegetation, because the panels would become more dominant in the landscape from such viewpoints.

Public roadways adjacent to the Project would offer the most common opportunities for views. Viewers in proximity to the Project may have brief unobstructed or partially screened views (primarily along Plank, Sneads Store, and Laurel Branch roads). Most panels and fencing would be placed in existing open agricultural fields; however, some patches of forest would be cut and converted to solar arrays. While removal of woodlands would create new viewsheds within the Project Area, this is consistent with the existing practice in this area of cultivated pine forests removed for timber.

Commuters and travelers moving along roadways adjacent to or passing through the Project would have limited intermittent views of arrays. For example, a motorist or cyclist traveling south on Plank Road may briefly see a solar array surrounded by fencing to the south, but the view would quickly pass again to a forested roadside or open pasture. No views of the Project were found from Craig Mill Road/VA 637, the primary north-south route to or from Kenbridge, because of dense forest present between the highway and the Project.

Few residences would have views of the Project because of dense vegetation surrounding most of the arrays. It is anticipated that views of the Project from surrounding communities (e.g., Kenbridge, located more than 2 miles to the northwest) would be screened by vegetation, topography, and existing development.

Tourists and recreationalists would most commonly experience views from the same locations as travelers—from roadways adjacent to and traversing through the Project Area. Cyclists following U.S. Bicycle Route 1 along Oral Oaks Road/VA 635 would observe solar arrays, partially to well-screened by roadside vegetation, to the east near the intersection with Plank Road. Refer to the photo simulation for KOP 1 in Appendix A. From locations along Oral Oaks Road where the Project could be seen, it would present an opportunity for cyclists to view a unique type of working landscape and does not conflict with the stated goals or objectives of the cycling route.

4.0 **REFERENCES**

U.S. Task Force on Numbered Bicycle Routes. 2006. Corridor and Route Criteria for U.S. Bike Route System. Accessible at:

https://www.adventurecycling.org/sites/default/assets/File/USBRS/USBRSCorridorCriteria.pd f. Accessed January 25, 2022.

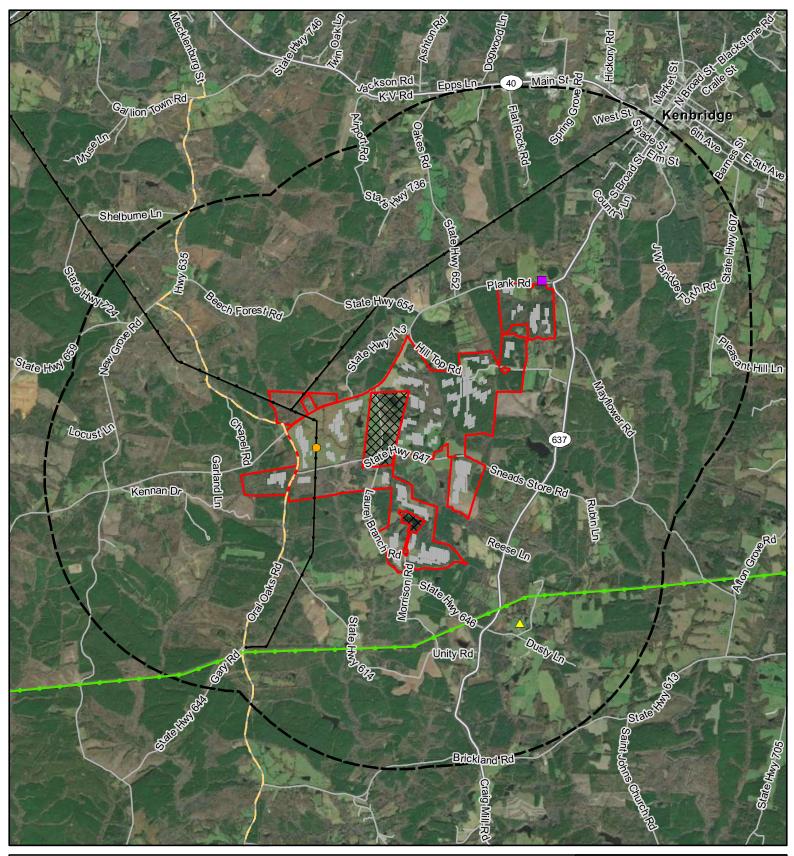
- Virginia Department of Environmental Quality. 2022. Renewable Energy Project Status. Accessible at: https://www.deq.virginia.gov/permits-regulations/permits/renewable-energy/renewableenergy-project-statusewable Energy Project Status | Virginia DEQ. Accessed January 25, 2022.
- Virginia Department of Historic Resources. 2020. VLR Online and National Register Listings. Accessible at: DHR – Virginia Department of Historic Resources » 055-0003 Flat Rock. Accessed February 3, 2022.
- VDOT (Virginia Department of Transportation). 2019. Bicycling and Walking in Virginia. Accessible at: Bicycling and Walking in Virginia – Programs | Virginia Department of Transportation (virginiadot.org). Accessed January 25, 2022.
- World Population Review. 2022. Kenbridge, Virginia Population 2022. Accessible at: Kenbridge, Virginia Population 2022 (Demographics, Maps, Graphs) | worldpopulationreview.com. Accessed: February 3, 2022.

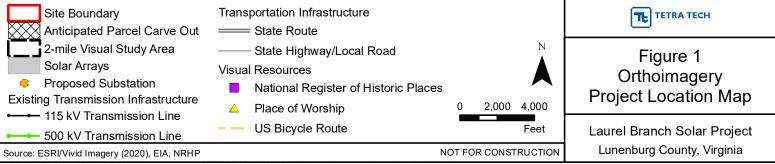
FIGURES

Figure 1: Orthoimagery Project Location Map

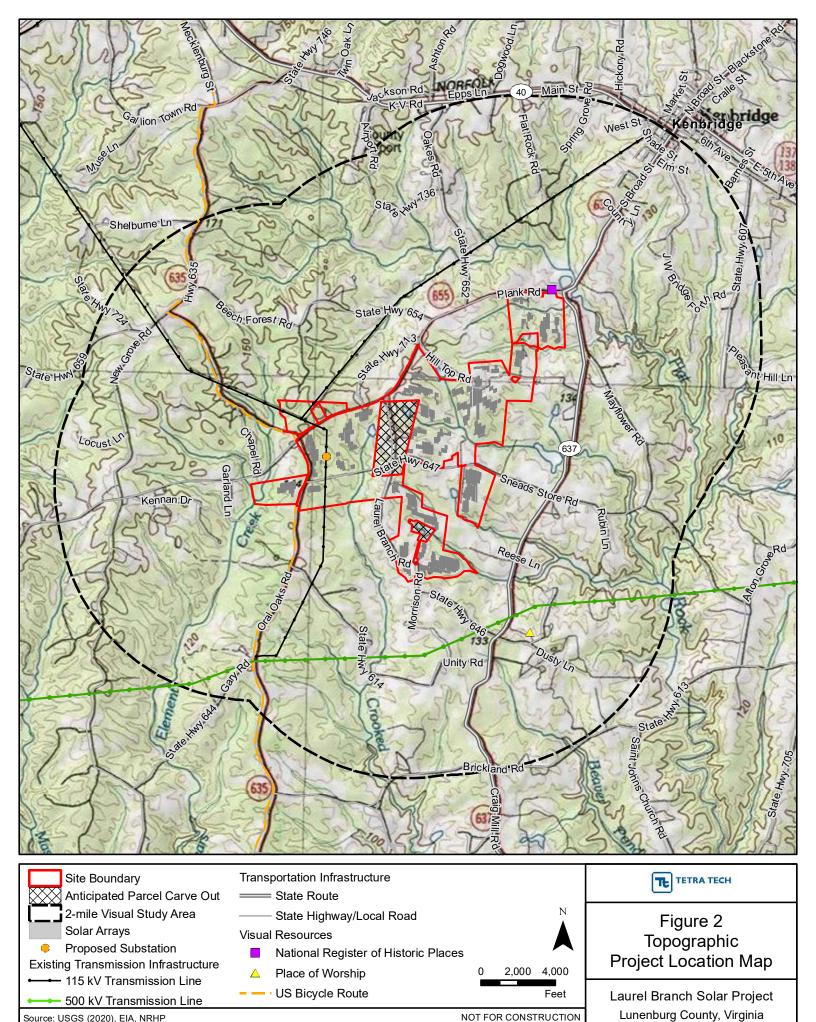
Figure 2: Topographic Project Location Map

Figure 3: Project Key Observation Point Map



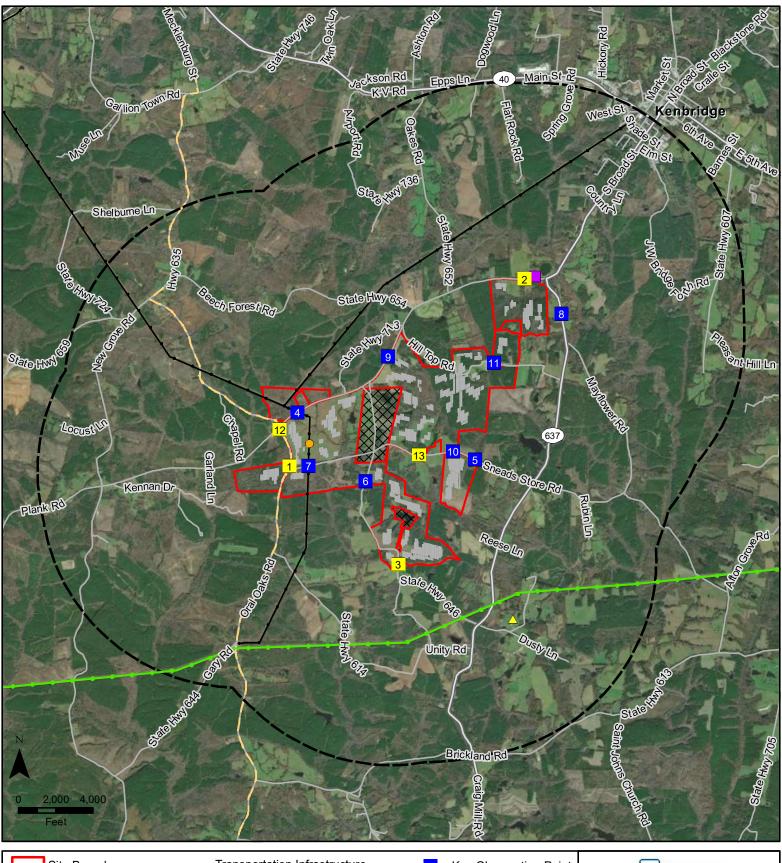


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Source: USGS (2020), EIA, NRHP

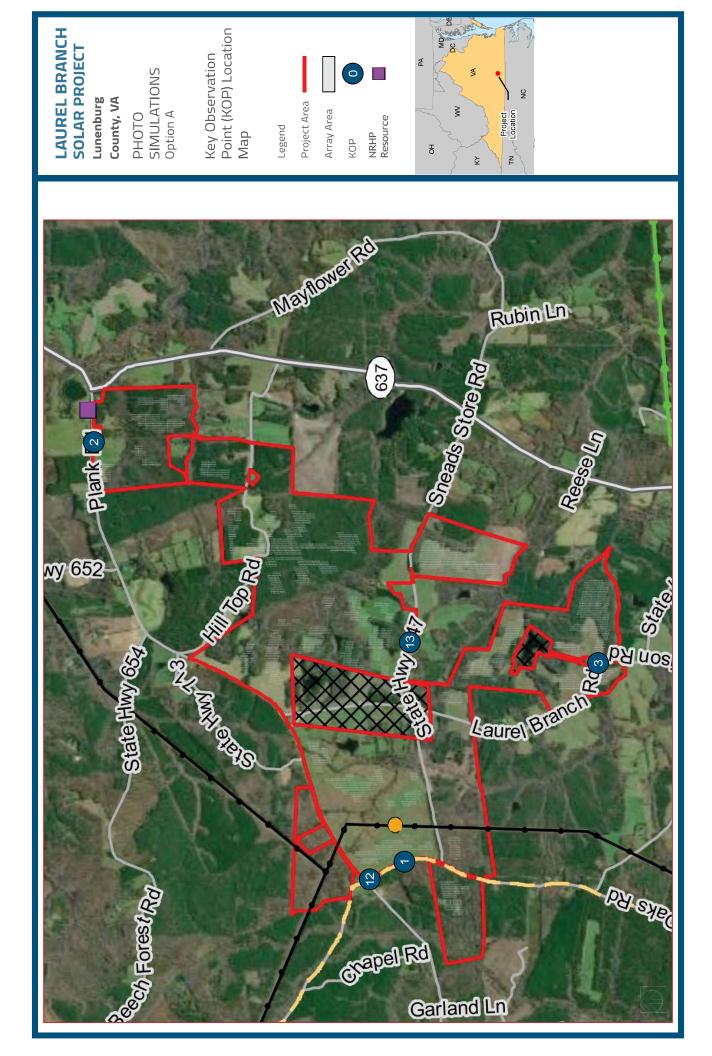
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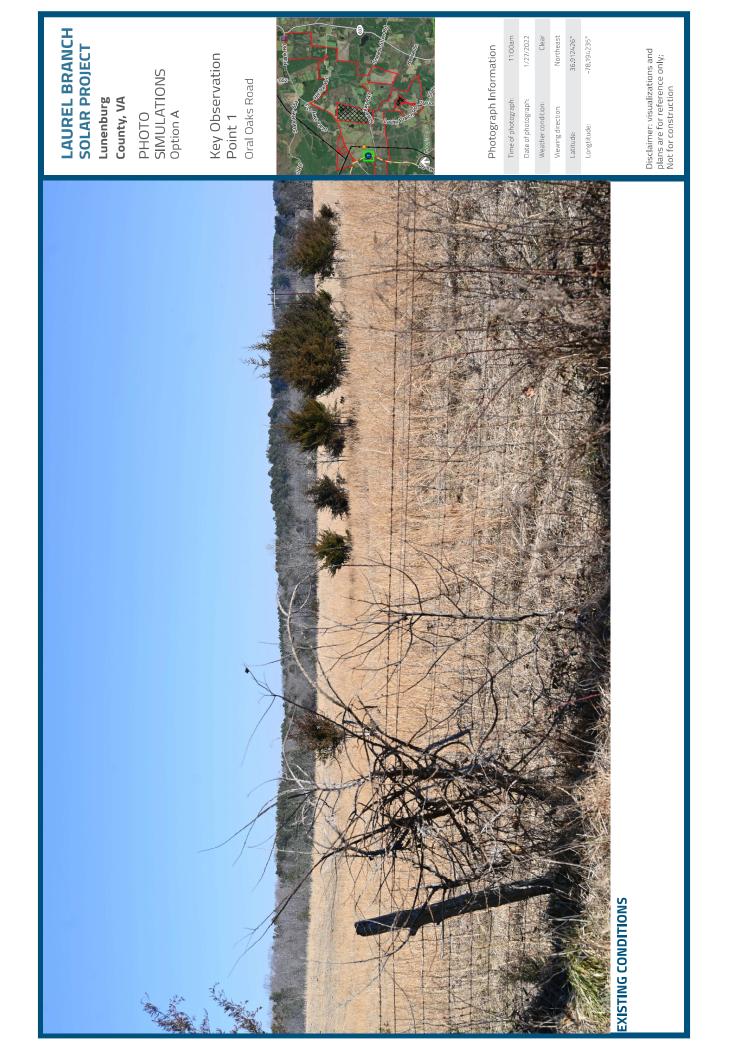


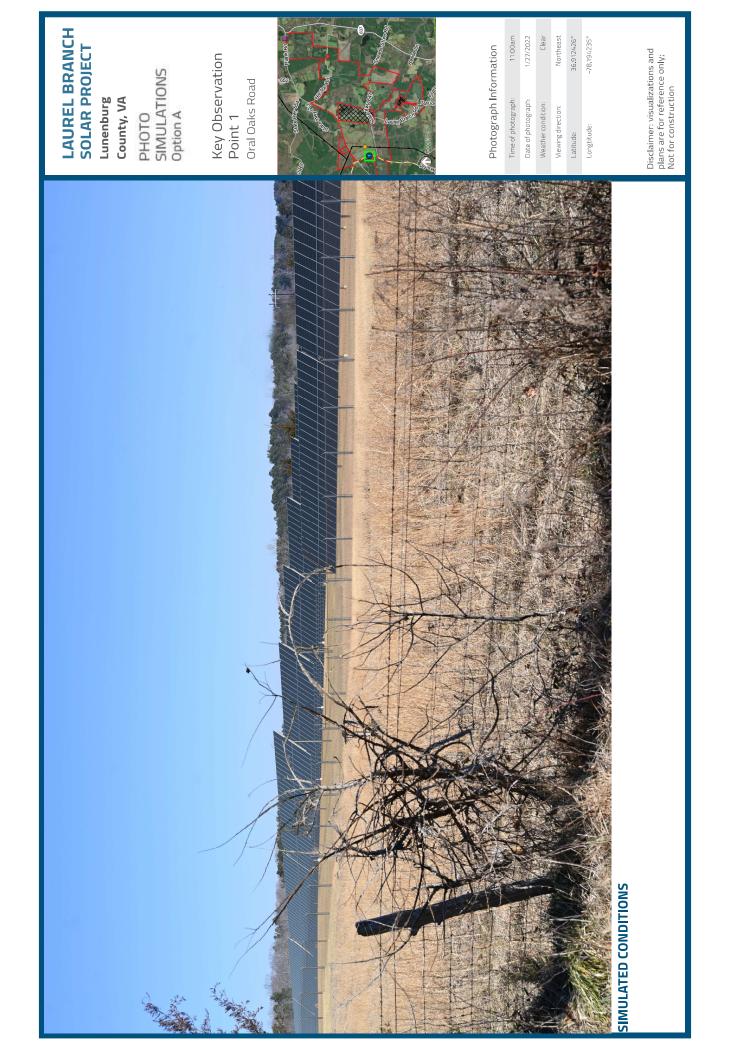
Site Boundary	Transportation Infrastructure	Key Observation Point	TETRA TECH
Anticipated Parcel Carve Out	State Route State Highway/Local Road	Key Observation Point with Photo Simulation	Cimuma 2
 Solar Arrays Proposed Substation Existing Transmission Infrastructure 	Visual Resources National Register of Historic Places Place of Worship 		Figure 3 Project Key Observation Point Map
← 115 kV Transmission Line ← 500 kV Transmission Line	US Bicycle Route		Laurel Branch Solar Project
Source: ESRI/Vivid Imagery (2020)		NOT FOR CONSTRUCTION	Lunenburg County, Virginia

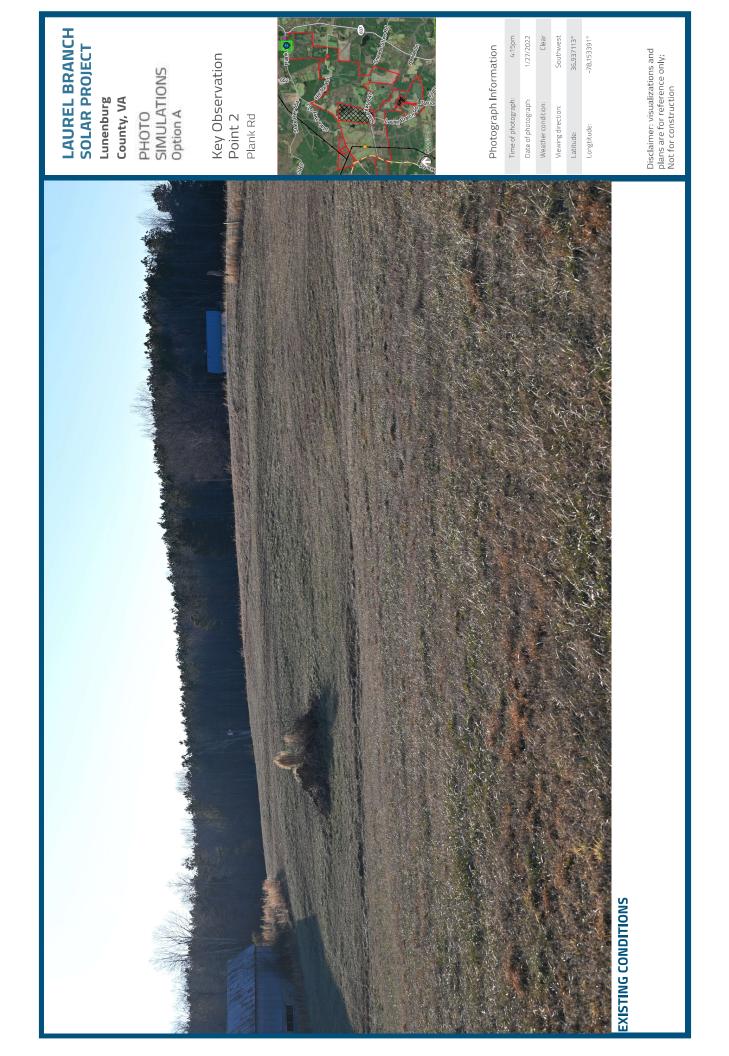
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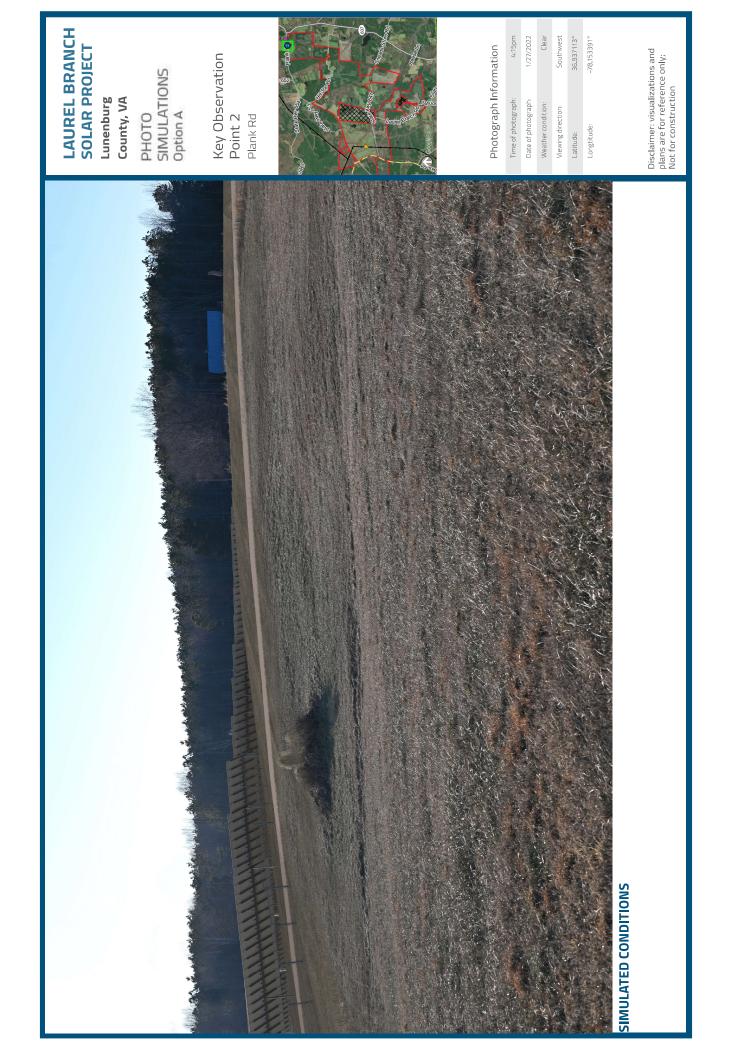
APPENDIX A: PHOTO SIMULATIONS

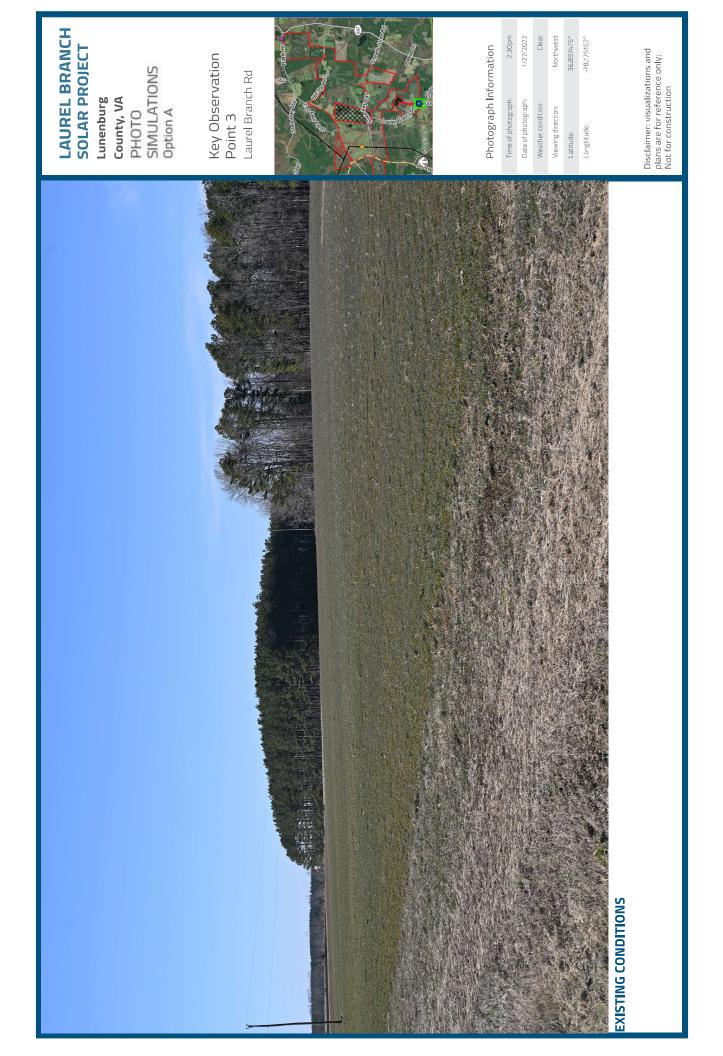


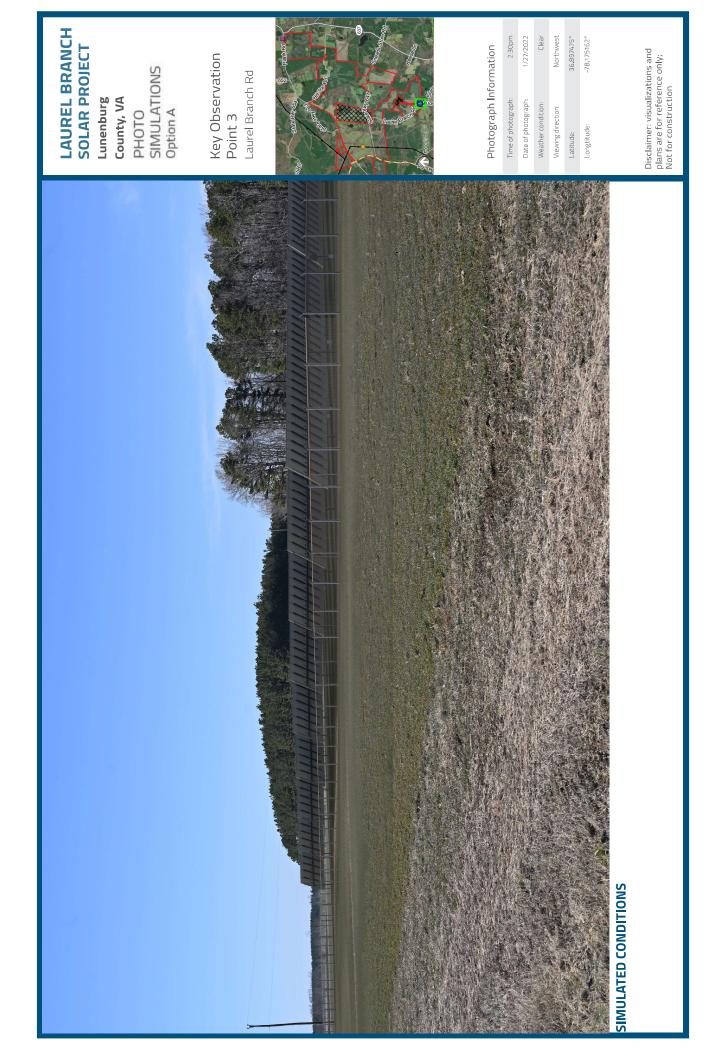




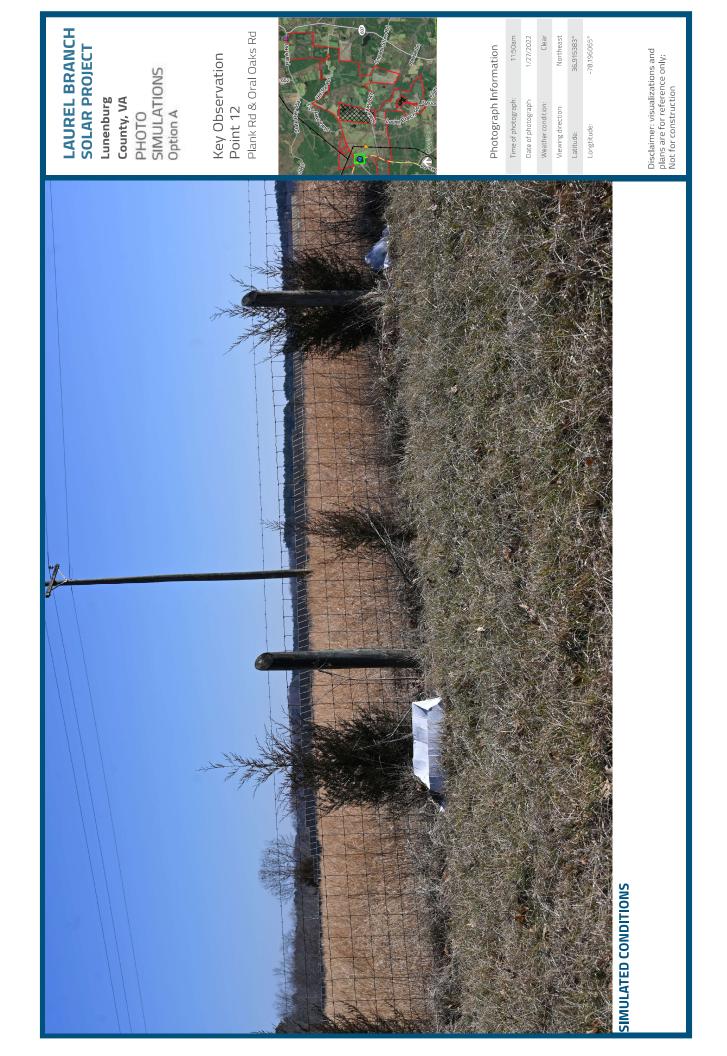


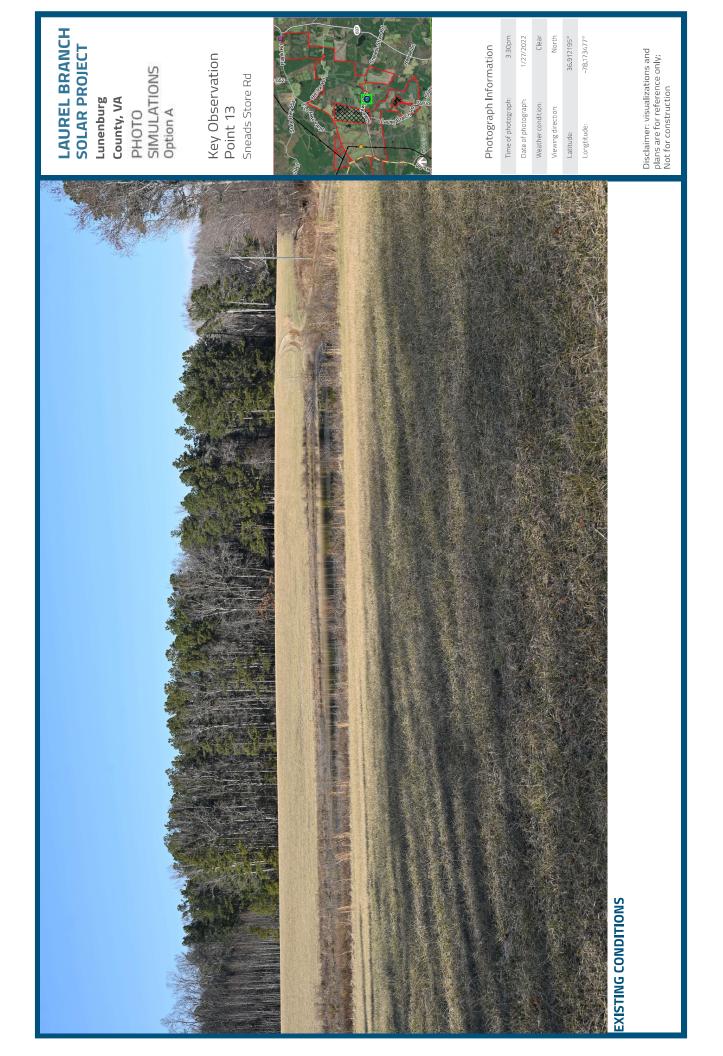


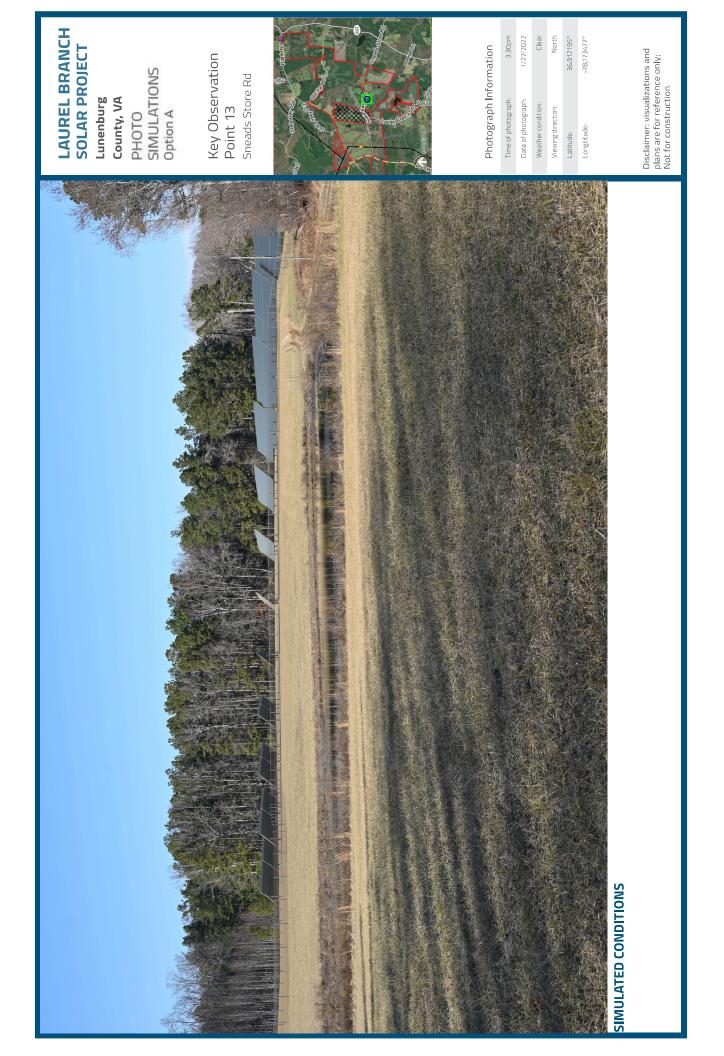












APPENDIX B: PROJECT PHOTOLOG



KOP 1: ORAL OAKS ROAD/VA 635/ US BICYCLE ROUTE 1

PHOTO INFOR	rmation
Date Taken:	1/27/2022
Time:	11:00am
Latitude:	36.9124°
Longitude:	-78.1942°
View Direction:	East

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 2: PLANK ROAD NEAR FLAT ROCK HISTORIC SITE

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	4:15pm
Latitude:	36.7051°
Longitude:	-78.0038°
View Direction:	Southwest

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 3: LAUREL BRANCH ROAD, SOUTH

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	2:30pm
Latitude:	36.8975°
Longitude:	-78.1752°
View Direction:	Northwest

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 4: PLANK ROAD, SOUTH

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	10:45am
Latitude:	36.9177°
Longitude:	-78.193°
View Direction:	Northeast

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 5: SNEADS STORE ROAD, EAST A

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	3:00pm
Latitude:	36.9115°
Longitude:	-78.1665°
View Direction:	West, Southwest

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 6: LAUREL BRANCH ROAD, NORTH

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	2:00pm
Latitude:	36.9082°
Longitude:	-78.1802°
View Direction:	East

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 7: SNEADS STORE ROAD, WEST

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	10:00am
Latitude:	36.9094°
Longitude:	-78.1929°
View Direction:	North, Northeast

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 8: CRAIG MILL ROAD/VA 637

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	8:30am
Latitude:	36.9321°
Longitude:	-78.1442°
View Direction:	West

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 9: PLANK ROAD, CENTRAL

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	12:30pm
Latitude:	36.9275°
Longitude:	-78.1749°
View Direction:	Southeast

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 10: SNEADS STORE ROAD

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	3:15pm
Latitude:	36.9116°
Longitude:	-78.1657°
View Direction:	South

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 12: ORAL OAKS ROAD AT PLANK ROAD

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	11:50am
Latitude:	36.9156°
Longitude:	-78.1961°
View Direction:	East

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia







KOP 13: SNEADS STORE ROAD

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	3:30pm
Latitude:	36.9122°
Longitude:	-78.1735°
View Direction:	North

LAUREL BRANCH SOLAR PROJECT Lunenburg County, Virginia





TAB G Preliminary Site Plan

