Conditional Use Permit Application

Dogwood Lane Solar Farm

Lunenburg County, VA

ACE VA DER, LLC

December 13, 2021

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1. Summary of Application

ACE VA DER, LLC ("the Applicant"), requests a Conditional Use Permit (CUP) for the construction and operation of Dogwood Lane Solar Farm, a 4 megawatt (MW) alternating current utility-scale solar facility on private land spanning two parcels in Lunenburg County, Virginia. The Project will be sited on County parcels 035-03-0-2C2 and 035-03-0-2C (the "Property"). The Property is currently zoned as R-1 Residential – Low Density. The Project is being developed by Apex Clean Energy and esaSolar. Apex is a renewable energy company based in Charlottesville, Virginia, with extensive experience developing, constructing and operating utility-scale wind and solar Projects nationwide. esaSolar is a solar energy development and engineering company headquartered in the Southeast with extensive experience in nearby North Carolina where the company successfully developed over forty 5 MW Projects throughout the past decade.

The Project is expected to bring significant economic benefits to Lunenburg County, and the Applicant has designed the Project with the following considerations:

- The Property is in a remote area, with natural vegetation and topography that minimizes visibility from neighboring parcels. The Project design provides a minimum 125-foot setback from all public rights of way and 400 feet from residential buildings on adjoining parcels; and a distance of at least 100 feet from adjacent property lines.

- The Property has been historically used for timber and the Project will not impact neighboring land uses in the area.

- The Project will produce the equivalent of up to 800 homes' worth of clean solar electricity.

- The Project represents an initial capital investment of over $5 million and will create approximately 25 full-time-equivalent (FTE) jobs during construction of the Project.

- In addition to expected increase in real estate income on the property, the Applicant proposes providing substantial cash payments to the County in the Conditions of Approval. Projects of this scale are exempt from machinery and tools taxation by state law, but the Applicant is proposing to provide additional payments as part of the greater economic benefit of hosting the Project, and to offset any public costs related to the Project. The Applicant anticipates making payments to the County that are approximately $1 million more than current taxes collected for the same parcel acreage (see Section 15).

- At the end of its operational life, the Applicant will decommission the Project in accordance with the steps outlined in this application, and County ordinance. The Applicant will provide surety in accordance with the County requirements to secure the decommissioning costs prior to operation of the Project. As part of decommissioning, the Applicant will return the land to silviculture, or another use permitted by the Zoning Ordinance and as desired by the Property owner.

2. Lunenburg County Conditional Use Application

Lunenburg Planning Office

Application for Conditional Use Permit

Case Number_____

SECTION 1

Applicant Name:	ACE VA DER, LLC, by Apex Clean Energy Finance, LLC, its Sole Member, by Apex GBR, LLC, its Sole Member, by Apex Clean Energy Holdings, LLC, its Manager.
Owner Name :	Richard W. Harris
Signature of Owner	Richard W. Harris
Contact name for Application	Charlie Johnson
Address	310 4th Street NE, Suite 300, Charlottesville, VA 22902
Telephone	434-220-7595
Email Address	charlie.johnson@apexcleanenergy.com
Fax	N/A
Power of Attorney Name	N/A
POA Signature	N/A

As owner or authorized agent of this property, I certify that this application is complete and accurate to the best of my knowledge, and I authorize Lunenburg County representatives' entry onto the property for purposes of reviewing this request.

Property Information

SECTION 2

Parcel Number(s)	035-03-0-2G2 and 035-03-0-2C
Area (ac. / sq. ft.)	32.48 ac
Magisterial District	Browns Store
Address	W on Main St (40) then North on Dogwood Lane. Access to property 552 feet on the left.
Existing Zoning	A-1 because they are located outside of Kenbridge
Requested Use	Medium Solar Energy Facility
Does this property have a historical designation?	No
If yes, describe	

The application deadline is the 1st of the month preceding the month in which the public hearing by the Planning Commission is to be he
The Planning Commission meets on the 3rd Tuesday of the month at 7 P.M. Applications must be submitted in completed form prior to scheduling for public hearing by the Planning Commission. Notice of incomplete applications will be sent to the applicant at the listed address in Section 1.

The site plan must be submitted as described in the site plan requirements at the time of application

Application fee or $400.00 must be paid at the time of application. Incomplete applications will be returned to the applicant and not docketed for a public hearing.

Certification of Adjoining Property Owners, Board of Supervisors, and Planning Commissioners

SECTION 3

Applicants Certification

I certify that I have notified all adjacent property owners to the property which is the subject of this application request that this application is being filed. Notifications to be by first class mail.

Yes

Adjacent property includes all property across roadways, watercourses, railroads, and/or municipal boundaries.

II further certify that the names and addresses below are those of the adjacent property owners as listed in the tax records of the Commissioner of Revenue of Louisburg County. Yes

Applicants Signature

Commonwealth of Virginia

TO-WIT:

COUNTY OF Albemarle)

The foregoing instrument was acknowledged before me this 10th day of December, 2021 by Tim Marrich (Applicant).

My commission expires: 11/30/2022

Karen H. Arehart

Notary Public

KAREN HANSEY AREHART
NOTARY PUBLIC
REG# 7769429
MY COMMISSION EXPIRES 11/30/2022
COMMONWEALTH OF VIRGINIA

Adjacent Property Owners See Attached

Notification of Application Submittal to Adjacent Property Owners

To: Adjacent Property Owner of Parcel 035-03-0-2C2 and 035-03-0-2C

From: ACE VA DER, LLC, by Apex Clean Energy Finance, LLC, its Sole Member, by Apex GBR, LLC, its Sole Member, by Apex Clean Energy Holdings, LLC, its Manager.

The following application will be submitted for review to the Lunenburg County Planning Office

Rezoning	
Conditional Use Permit	X
Special Exception	

Requested Use or Exception:

Medium Solar Energy Facility

The application will be available for viewing at the Lunenburg County Planning Office. The Planning Office shall notify all adjacent property owner of the time, day, and place of the public hearings to be held on this application. Should you have questions or comments, please contact the Planning Office at 434.696.2142.

3. List of Adjoining Property Owners

Owner	Secondary Owner	Street Address	City, State, and Zip Code	Parcel Number
James Bagley Jr		Po Box 493	Kenbridge, VA 23944	035-03-0-4A
Margaret Williams	Michael James	Po Box 166	Kenbridge, VA 23944	035-0A-0-24
Charles E Thomas	Dorothy J Thomas	896 Fletcher Chapel Road	Kenbridge, VA 23944	035-03-0-2D
Elizabeth Richardson	Robinson W Ethel	78 Epps Lane	Kenbridge, VA 23944	035-03-0-2C1
James Williams		Po Box 166	Kenbridge, VA 23944	035-0A-0-25
James Abernathy Jr		802 Ashton Road	Victoria, VA 23974	035-0A-0-23
Michael Figgatt	Felicia Figgatt	711 Logan Lane	Kenbridge, VA 23944	035-0A-0-29
Michael Moore	Carolyn L Moore	406 Dogwood Lane	Kenbridge, VA 23944	035-03-0-1E
Bessie E Carter		323 W 137Th St	New York, NY 10030	035-04-0-2
Georgia R Christopher	Gayl R Mary	328 Dogwood Lane	Kenbridge, VA 23944	035-03-0-1B
Annie B Donnell		328 Dogwood Lane	Kenbridge, VA 23944	035-03-0-1B-1
Wesley E Johnson		3404 K V Road	Kenbridge, VA 23944	035-0A-0-19A
Georgia R Christopher	Edmonds Samuel Jr	289 Dogwood Lane	Kenbridge, VA 23944	035-03-0-2B
Richard W Harris		Po Box 404	Kenbridge, VA 23944	035-03-0-2C2
James Williams	Camela S Williams	Po Box 166	Kenbridge, VA 23944	035-0A-0-28
Lunenburg County Public Schools		1009 Main Street P.O. Box 710	Kenbridge, VA 23944	035A4-0A-0-1
Richard S Jones	Pattie M Jones	328 Dogwood Lane	Kenbridge, VA 23944	035-03-0-2A
Alvester L Edmonds		Po Box 855	Victoria, VA 23974	035-0A-0-19
George Gayles	Heirs R Mary	328 Dogwood Lane	Kenbridge, VA 23944	035-03-0-1C
Anthony E Quinn	Deborah K Quinn	202 Flat Rock Road	Kenbridge, VA 23944	035-0A-0-30B
Michael Quinn	Betty M Quinn	756 Flat Rock Road	Kenbridge, VA 23944	035-0A-0-30
Jasper Rhodes	Tiser Rhodes	318 Erich Road	Richmond, VA 23225	035-03-0-2
Timothy Morgan Ii		1019 Main St	Kenbridge, VA 23944	035A4-01-0-2B
Alvester Edmonds		Po Box 855	Victoria, VA 23974	035-0A-0-20
Hendrick Elvira M Estate		Po Box 1004	Kenbridge, VA 23944	035-03-0-4
Alvester Edmonds	Arlene Edmonds	Po Box 855	Victoria, VA 23974	035-04-0-1
Ollie E Hopson		68 Wheeling Lane	Palm Coast, FL 32164	035-04-0-3
Timothy Morgan Ii		1019 Main St	Kenbridge, VA 23944	035A4-01-0-1
Jenisia Webb	Wallace W Jennifer	3312 K-V Road	Kenbridge, VA 23944	034-0A-0-89A
John J Moore	Cordelia G Moore	328 Dogwood Lane	Kenbridge, VA 23944	035-03-0-1C-1
Mary Studevant	Roger Studevant	8108 Langley Dr	Glen Allen, VA 23060	035-0A-0-21
John Rhoades Ii		840 Dogwood Lane	Kenbridge, VA 23944	035-03-0-1A
Bettie Eppes		Po Box 70182	Richmond, VA 23225	035-0A-0-16
Frances Pryor	Donnell Irby	Po Box 60	Kenbridge, VA 23944	035-0A-0-22
Gospel Baptist Tabernacle		1031 Main St	Kenbridge, VA 23944	035A4-01-0-2A
Jasper Rhodes	Tiser Rhodes	318 Erich Road	Richmond, VA 23225	035-03-0-1
Melissa Dolchan	Thomas Peter Jr	264 Flat Rock Road	Kenbridge, VA 23944	035-0A-0-30A
Clifton White	Ethel White	108 Epps Lane	Kenbridge, VA 23944	035-03-0-2E
Vanice Gayles		152 Johnny Lane	Blackstone, VA 23824	035-03-0-1D

4. Project Narrative

The Applicant requests a Conditional Use Permit (CUP) for Dogwood Lane Solar for the construction and operation of an approximately 4 MW alternating current (ac) *Solar Energy Facility, Medium-Scale* (the Project) on approximately 32 acres of private land located in Lunenburg County, Virginia (the Property). This Property is zoned R-1 Residential – Low Density, and the current use of the Property is silviculture.

This proposed Project has the potential to add 4 MW ac of renewable energy to Dominion Energy Virginia's power grid through participation in the Virginia Shared Solar Program. In general, shared solar, also known as community solar, allows a developer of small-scale solar projects to subscribe eligible customers –Virginians– to purchase a share of the output of the solar facility. The customer, through virtual net metering, gets a bill credit from their utility company for the energy being supplied by the shared solar project. This program has the potential to be open to Virginian municipalities, schools, and other organizations that do not have the capital budgets to outright purchase solar energy systems. Also, this program is open to residential and commercial companies who might be unable to access rooftop solar because they rent, live in multitenant buildings, or are unable to host a rooftop solar system

because their roof is shaded by trees or might not have the structural integrity to support the weight of the solar equipment. Lastly, the program has a Low to Moderate Income (LMI) component that incentivizes projects to seek subscribers that qualify for the LMI metric, thus providing them savings on their electricity bill.

The Project site is located just west of the border of Town of Kenbridge (two miles west of Town of Kenbridge center), and approximately four miles east of Victoria Town center, off of Main Street near the intersection of Dogwood Lane and Main Street. Given its proximity to the Town of Kenbridge, the Project has been in contact with Kenbridge's Town Manager in accordance with County ordinance requirements. Prior to the submission of this application, the Applicant confirms the Town Manager is aware of our Project's intentions and expressed no immediate concerns. The Town Manager confirmed Dogwood Lane is the first solar project the Town has been contacted by and the first project they are aware of in the one (1) mile proximity of the Town of Kenbridge. A Preliminary Site Plan along with site specific information can be found in Section 5. Note: The Project's layout will be finalized after field surveys are completed and will be submitted to the County along with all required construction plans as a part of the final site plan approval process. The array layout in the Preliminary Site Plan is correct in its representation of system size, its general location, and commitments to maintain perimeter buffer, slope, avoidance of wetlands as practicable, and other noted constraints.

Solar photovoltaic (PV) technology will power this electricity generator. The Project plans to utilize either fixed tilt or single-axis tracking panels mounted on a steel racking system less than 15 feet height from the natural grade below the solar panel. The "fenced in" Project area, as shown in the Preliminary Site Plan, covers about 15 acres however the final acreage will be determined after final engineering and field surveys are completed.

It is expected that construction might start as soon as early-to-mid 2023, with the Project reaching commercial operation within approximately six months of construction start. The Project is expected to be in operation for a minimum of 35 years. In addition to engaging the County on zoning, the Applicant has filed for interconnection through the Dominion Energy Virginia interconnection queue and is awaiting results of the studies.

4.1. Conformity with Lunenburg County Comprehensive Plan

Section 15.2-2232 of the Code of Virginia provides that any *"public utility facility or public service corporation facility … whether publicly or privately owned, shall [not] be constructed, established or authorized, unless and until the general location or approximate location, character, and extent thereof has been submitted to and approved by the [applicable Planning Commission] as being substantially in accord with the adopted comprehensive plan or part thereof."*

The Applicant requests that the Planning Commission determine that the Project is substantially in accord with the 2019 – 2024 Lunenburg/Kenbridge/Victoria Joint Comprehensive Plan (CP). The Project supports the County's vision values, and goals, as outlined in the CP. In short, the Project diversifies the local tax base and provides significant local revenue that are not offset by demand for public services. Key themes relating to solar land use in the CP:

1. **Promote the expansion of a diversified economy**

A primary goal of the CP is to *"Promote the expansion of a diversified economy"* (CP, pg. 123). Dogwood Lane Solar Farm will provide a significant boost to the local economy as evidenced by the construction of solar projects in the region including Halifax, Greensville, Sussex, and Southampton. Solar energy is among the fastest growing industries in the nation and is especially vibrant in the Commonwealth of Virginia. Further, most employers require access to non-fossil, renewable energy when deciding as to where to locate facilities.

The adoption of this growing field can lead to direct economic boosts during construction and long-term economic gains by the local economy and may serve to attract further business development to the region. Additionally, the Project will directly generate significant revenue for the County as described herein.

2. **Land Use: Promoting Balance and Clean-Living**

An additional goal and related objective of the CP is to "promote a balance of land uses that meet economic and demographic needs" (CP p. 125); and to "promote a clean living environment" (CP p. 126). As mentioned elsewhere in this application, the nature of Virginia's Shared Solar program is to provide affordable renewable energy to Virginian's, and the power generated by this Project can be subscribed to by Lunenburg County residents. In addition, the construction methodology for this Project will have very little impervious service, estimated to be approximately 1.5% of the entire acreage that is being dedicated to the Project (see Section 5, Site Plan). Furthermore, by establishing native ground cover, the Project has the potential to increase water infiltration in the area and boost soil organic matter. We will also keep in place and work around natural vegetative buffering as much as possible, and the Project will install vegetative screening in areas to protect public viewsheds.

3. **Protecting Natural Resources**

A primary goal of the CP is to *"Protect and preserve the natural resources of the community."* (CP p. 130). Embracing Projects like Dogwood Lane Solar Farm over higher-polluting alternatives helps to ensure a better quality of essential resources such as air and water. Solar facilities conform to the physical characteristics (including wetlands and topography) of the land. While they may displace agricultural or silviculture uses in their immediate footprint, they do not permanently alter the land in a way that would preclude it from returning to its current use at the end of the solar facility's life.

Part of protecting natural resources may also involve striking a balance between the economic benefits and environmental destructiveness that can come with harvesting merchantable resources such as timber and minerals. While often not considered, sunlight is a merchantable natural resource available to the County. Projects like Dogwood Lane Solar Farm harvest sunlight while significantly reducing harmful impacts associated with other resource cultivation, and the Project will increase the County's revenue.

4.2. Racking and Panels

Racking: The Project is expected use single-axis racking technology that allows the PV panels to track the sun throughout the day. Measurements for this system type are included on the Preliminary Site Plan, with specifications from a potential product manufacturer included in Section 16. A row of PV panels will be attached in a linear fashion to each of these racking systems. Other versions of tracking or fixed technology may be considered for the Project.

Panels: Based on current technology, the Project's site could contain around 15,000 photovoltaic solar panels, in total. It is possible that increases in the output per panel may reduce the number of panels needed for the Project. A preliminary site plan can be found in Section 4. For more details on these types of panels, see Section 16. That said, depending on final engineering, the exact manufacturer and model may be modified, and the final site plan will be submitted for review by the County as part of the Site Plan process prior to construction.

4.3. Inverter

The Project's preliminary design includes string inverters which typically have the following dimensions (W x H x D): 26.4'' x 35.5'' x 11.7''. These inverters are typically mounted to the single axis tracking system thus eliminating the requirement for inverter pads that are utilized on larger projects that interconnect to transmission networks. That said, there is the potential to utilizie central inverter(s) which typically have the following dimensions (W x H x D): 22' x 13' x 7'. These inverters are typically mounted on a concrete pad that will be strategically within the Project footprint where the cabling from the modules will be routed and connected. The final decision will be made during the site plan approval process. Both string and central inverters convert the direct-current energy generated by the panels to alternating-current energy that is ready to be transmitted onto the local distribution grid. While the exact manufacturer and model may vary as technology improves between now and the commencement of construction, Section 16 has an example equipment datasheet for one of the options. Again, depending on final engineering, this may be modified slightly, and the final site plan will be available to the County as part of the administrative permitting process.

4.4. Transformer and Interconnection

The Project will be interconnecting with Dominion Energy's existing three-phase distribution system at an on-site or nearby location. The Site Plan shows the expected point of interconnection, but the ultimate location will come during the site plan approval process after final consultation with the utility. The interconnection process will not require a new substation to be constructed on-site. Instead, the Project will be connected by increasing the Project voltage with a step-up transformer located within the Project and other associated equipment mounted on standard distribution poles so that it is compatible with the existing voltage of the distribution system. This Project is in Dominion Energy's interconnection queue and is pending results from the studies.

4.5. Neighbors and General Public

Once construction is complete, the Project is passive, imposing no impacts on the neighbors and producing no pollutants or other emissions. During operations, sound from this Project will not exceed the County requirements. At night, there will be no audible noise at the property line emanating from the solar facility components. The inverters produce a low-level hum (the Power Electronic model is listed as producing <79 dBA a 1m distance), only during daylight hours, when the system is generating energy. This noise level has been described as roughly equivalent to that of a dishwasher. Even in idealized sound-travel conditions, the inverse square law shows that, at 100 feet, the sound emitted from this inverter will be reduced to under 50 dBA or the equivalent of a modern refrigerator. As seen in the Preliminary Site Plan, the design positions the inverters at least 100 feet from the perimeter of the Property line. The inverters are the only components that produce any noticeable noise.

The Project will produce no hazardous glare. Solar panels, by design, absorb as much light as possible, and panels reflect/refract much less light than many materials broadly used throughout the area and the County, such as metal roofing on homes and accessory structures. Further, only specific angles between the sun, components of a solar facility, and the vantage point would have any potential of producing a diffused, unobtrusive glare. When employing the use of a tracking system, these angles are not achievable from the vantage of neighboring properties.

Landscape buffering will include existing vegetation and, where the existing vegetation is insufficient, additional vegetation will be planted to minimize the visibility from surrounding parcels. In accordance with the County ordinance, where additional vegetative buffering is required, for example, along Dogwood Lane, they will be

installed and maintained. Additionally, areas where pollinator friendly and wildlife-friendly native plants, shrubs, trees, grasses, forbs, and wildflowers required they will be installed and maintained. The Project will be set back a distance of at least 125 feet from all public rights-of-way and 400 feet from residential buildings on adjoining parcels, and a distance of at least 100 feet from adjacent property lines. Most adjoining properties are in timber or agricultural use.

Solar is a low-impact land use with minimal to no impact on the County's resources. Other forms of development (commercial, residential housing, etc.) require additional services such as roads, utilities, schools, and law enforcement. Solar and this Project will not place any material burden on the County's resources.

As seen on the Preliminary Site Plan, the Applicant currently proposes a single entry and exit for the facility. These locations make use of existing access points. Should the Project propose different points of ingress and egress, it will adhere to the CUP Conditions and will be designed in compliance with VDOT regulations.

Once operational, the Project will produce electricity during daylight hours. It will not require regular staff and will only be visited as needed for maintenance of the system or landscaping. After the construction phase, no impact on local traffic is expected from operations of this Project. The Applicant will implement measures to mitigate traffic impacts during the construction process.

4.6. Community Outreach

Community outreach is fundamental to the success of this Project. In coordination with the landowner, we are notifying nearby property owners about the Project application. Furthermore, we are planning a public meeting that will be held in the County and near the Project's location, and we will be notifying nearby property owners accordingly. This public meeting will review the following topics:

- Solar 101
- Construction Process
- Operations and Maintenance
- Health and Safety
- Economic and Fiscal Impacts
- Property Impact Analysis
- Landscape Architecture Plan
- Questions and Answers

This will occur prior to the public hearing per the County regulations. The Project will also make their Project leads contact information available for interested community members if they so wish to meet in person or speak over the phone prior to or after the meeting. It is our goal to take community outreach seriously and listen to the input from nearby residents.

5. Site Plan

5.1. Cover Sheet (11" x 17" Provided Separately)

APEX CLEAN ENERGY, INC.
310 4th St. NE, Ste 300
Charlottesville, VA 22902
(434) 282-2109

ESA SOLAR ENERGY, LLC
2250 Lucien Way Suite 305,
Maitland, FL 32751
(407) 270-1719

UNECLIPSED ENERGY, PLLC
2250 Lucien Way Suite 305,
Maitland, FL 32751
(407) 270-1719

PROJECT NAME:
DOGWOOD ROAD SOLAR FARM

AC POWER:
4.0 MW

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Location Map
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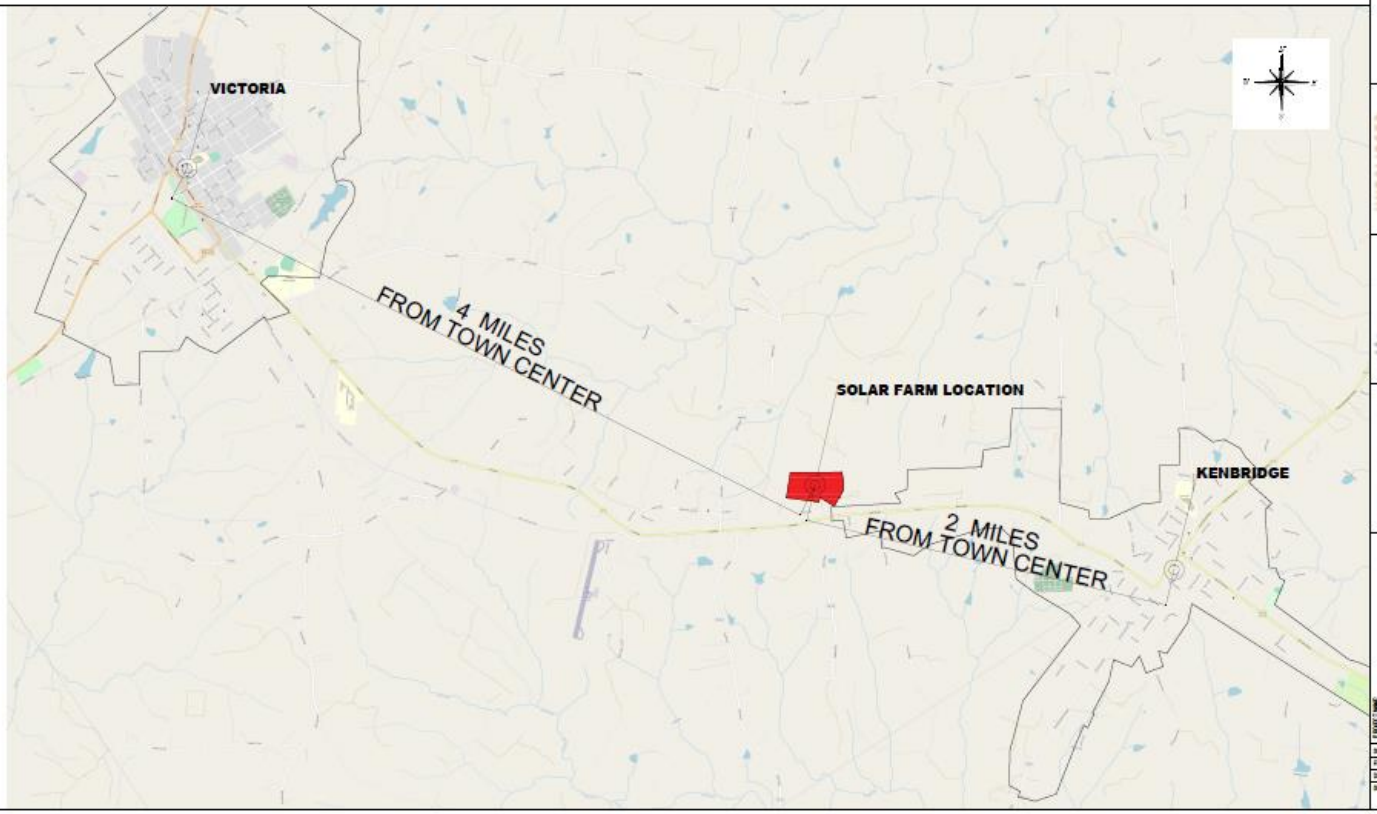
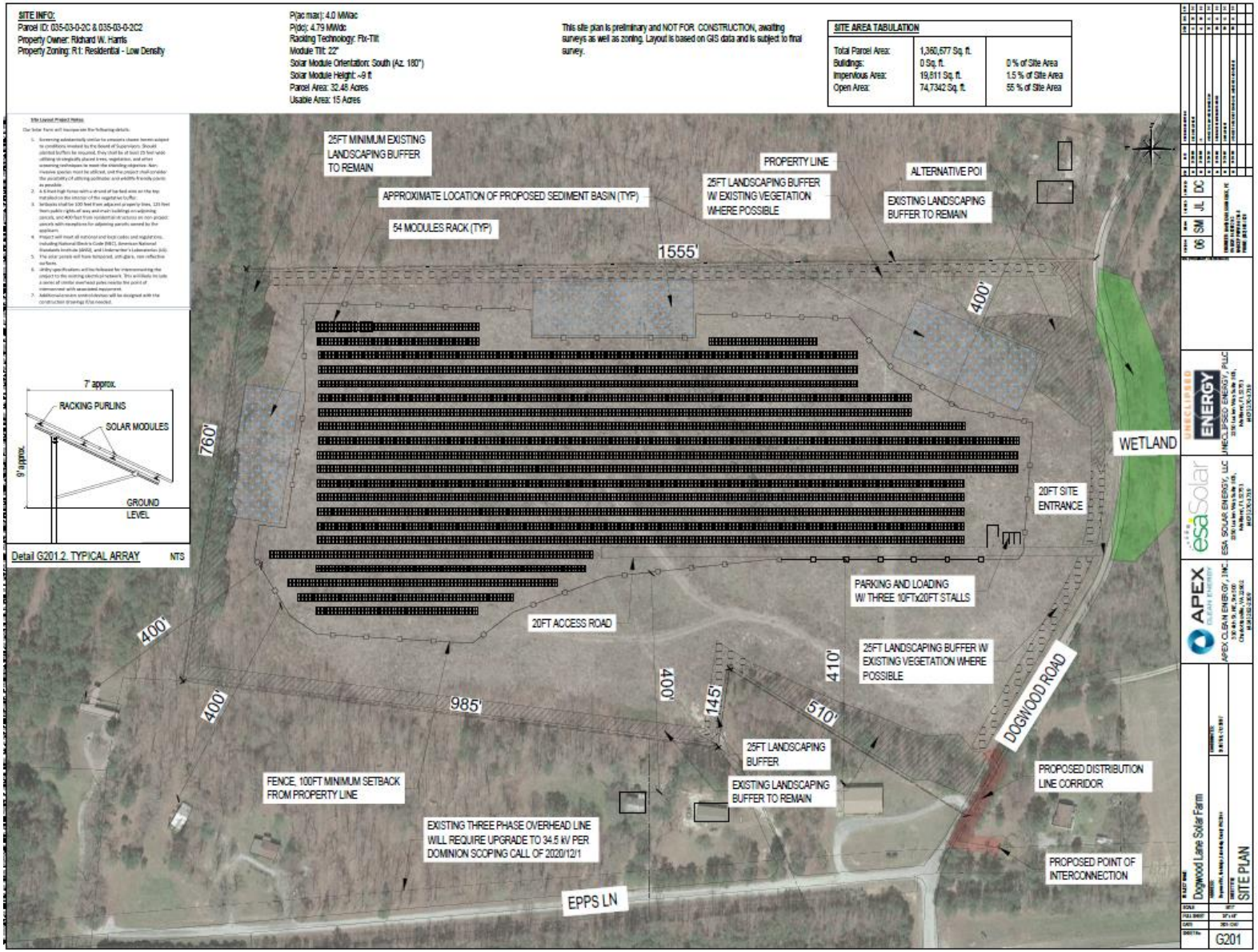
G201 - SITE PLAN SHEET

G204 - LANDSCAPING PLAN



Dogwood Road Solar Farm
COVER SHEET
G101

5.2. Preliminary Layout (11” x 17” Provided Separately)



*Site tabulation notes**

- *Buildings: there are not current buildings, and the Project will not construct any buildings*
- *Impervious area calculation includes the following: access road and parking/loading area; inverter pad and pilings*
- *Open area includes: parcel area outside Project fence line*

5.3. Landscape and Screening Plan (11” x 17” Provided Separately)

Existing landscaping, and as needed a planted buffer will shield the Project from public rights of way and neighboring properties. Minimizing impacts on viewsheds, including from residential areas and areas of scenic, historical, cultural, areological and recreational significance. This includes using panels that employ anti-glare technology and anti-reflective coatings and reduce glint and glare to levels that meet or exceed industry standards.

The Project area shall be setback at least 125 feet from all public rights of way and 400 feet from residential buildings on adjoining parcels and a distance of at least 100 feet from adjacent property lines. The site is bordered by property owned by the landowner to the northeast, southeast, south, and southwest. Most adjoining properties are also in timber or agricultural use. In the Preliminary Site Plan principal structures in the vicinity of the Project have been identified.

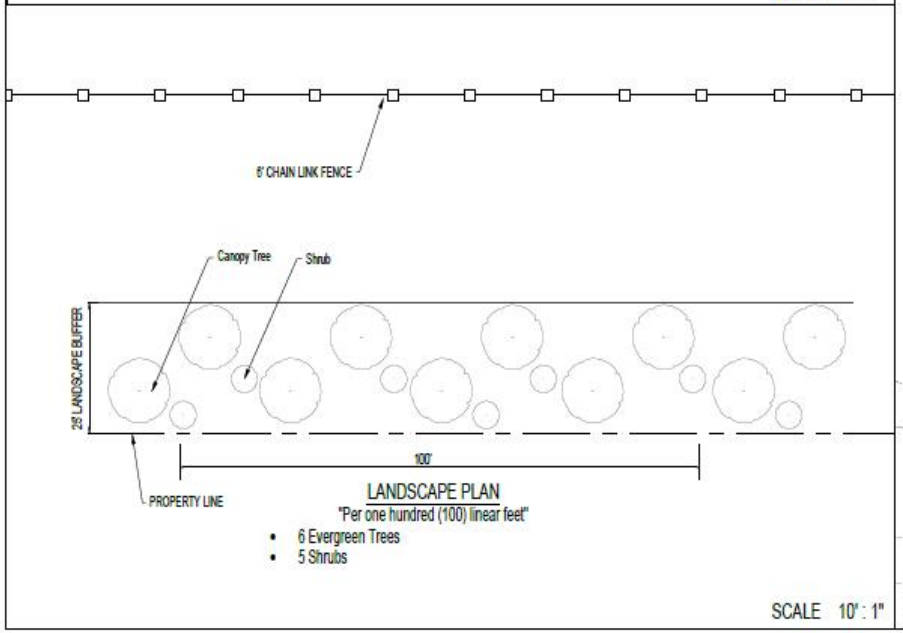
The Project area shall be enclosed by security fencing not less than six feet in height and equipped with an appropriate anti climbing device and installed on the interior of the vegetative buffer and maintained throughout the life of the Project.

Where determined necessary, the landscape buffer shall be at least 25 feet wide, located within the setbacks consisting of rows of staggard trees and other vegetation. This buffer will be made up of plant materials at least three feet high at time of planting and that are reasonably expected to grow to a minimum height of eight feet within three years. These will be non-invasive plant species, pollinator-friendly and wildlife-friendly native plants, shrubs, trees grasses, forbs, wildflowers. All cleared areas on the interior of the Project will be seeded with a native grass/wildflower mix (groundcover). The use of this native material will stabilize the site and prevent erosion and sediment transport as well as create habitat for small mammals and ground nesting birds.

Where a vegetative buffer is required, below is a general sample (11” x 17” Provided Separately):

Vegetated Buffer. A vegetated buffer sufficient to mitigate the visual impact of the facility is required. Existing vegetation will be used or supplemented where possible.

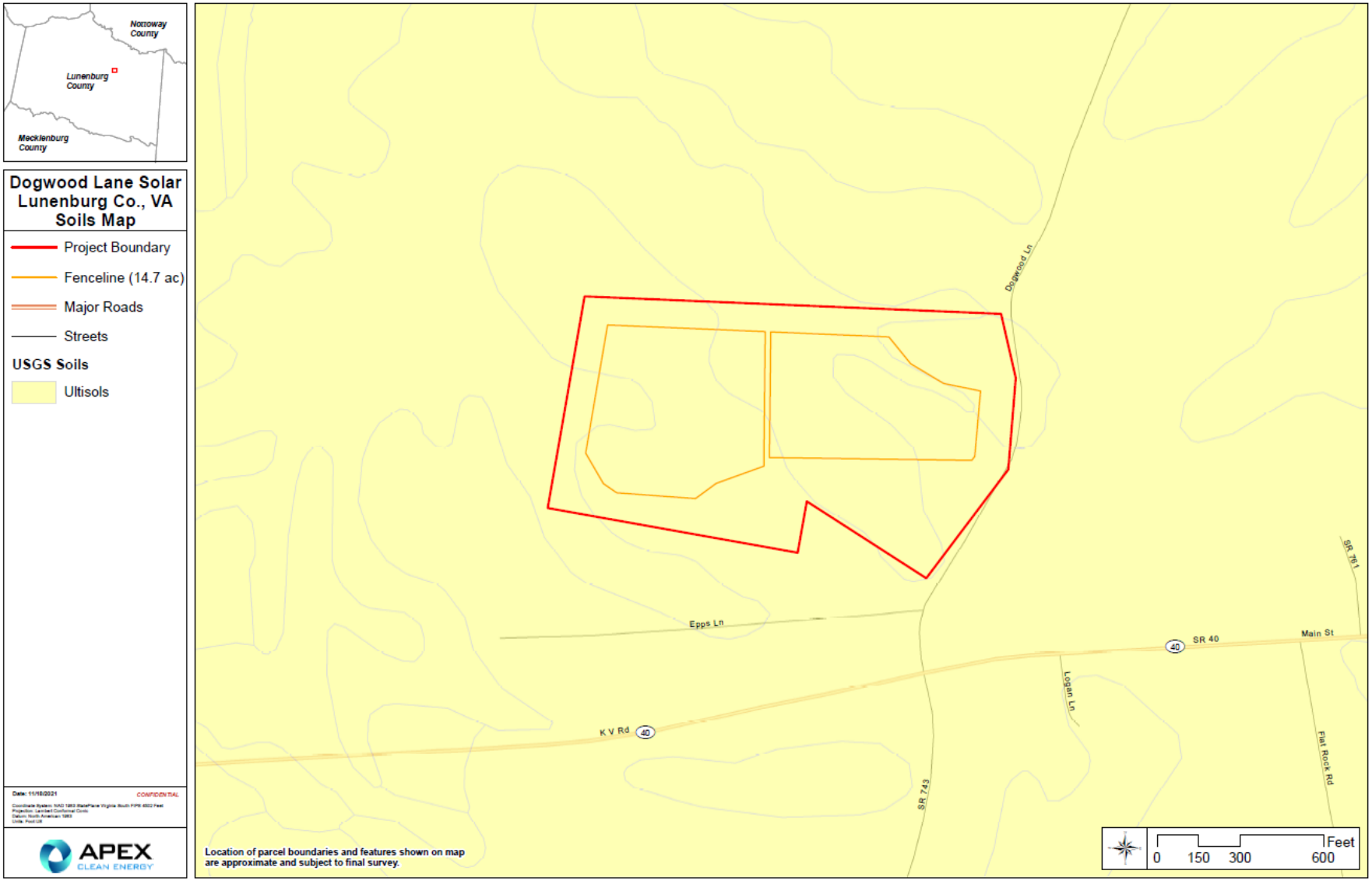
a. The buffer shall consist of a landscaped strip at least 25 feet wide, shall be located within the setbacks and outside of the security fencing required under this Section, and shall run around the entire perimeter of the property.
b. The buffer shall consist of existing vegetation and, if deemed necessary for the issuance of a Conditional Use Permit, an installed landscaped strip consisting of multiple rows of staggered trees and other vegetation. This buffer should be made up of plant materials at least three feet tall at the time of planting, and that are expected to grow to a minimum height of eight feet within three years.
c. Groundcover on site shall consist of pollinator plant, grasses, forbs, and wildflowers native to the County.
d. Landscaping intended for screening shall consist of non-invasive plant species and pollinator-friendly and wildlife-friendly native plants, shrubs, trees, grasses, forbs, and wildflowers native to the County. If sufficient quantities of native plants cannot be procured, non-invasive plants may be used. A list of appropriate plant materials shall be available at the Planning Office. Species listed on the DCR Virginia Invasive Plant Species List shall not be used.
e. The Planning Commission or Board of Supervisors may require increased setbacks and additional or taller vegetative buffering in situations where the height of structures or the topography affects the visual impact of the facility.
f. A recommendation that the screening and/or buffer creation requirements be waived or altered may be made by the Planning Commission when the applicant proposes to use existing wetlands or woodlands. The wetlands or woodlands shall be permanently protected for use as a buffer.
g. Existing trees and vegetation may be maintained within such buffer areas except where dead, diseased or as necessary for development or to promote healthy growth, and such trees and vegetation may supplement or satisfy landscaping requirements as applicable. If existing trees and vegetation are disturbed, new plantings shall be provided for the buffer.
h. The buffer shall be maintained for the life of the facility.

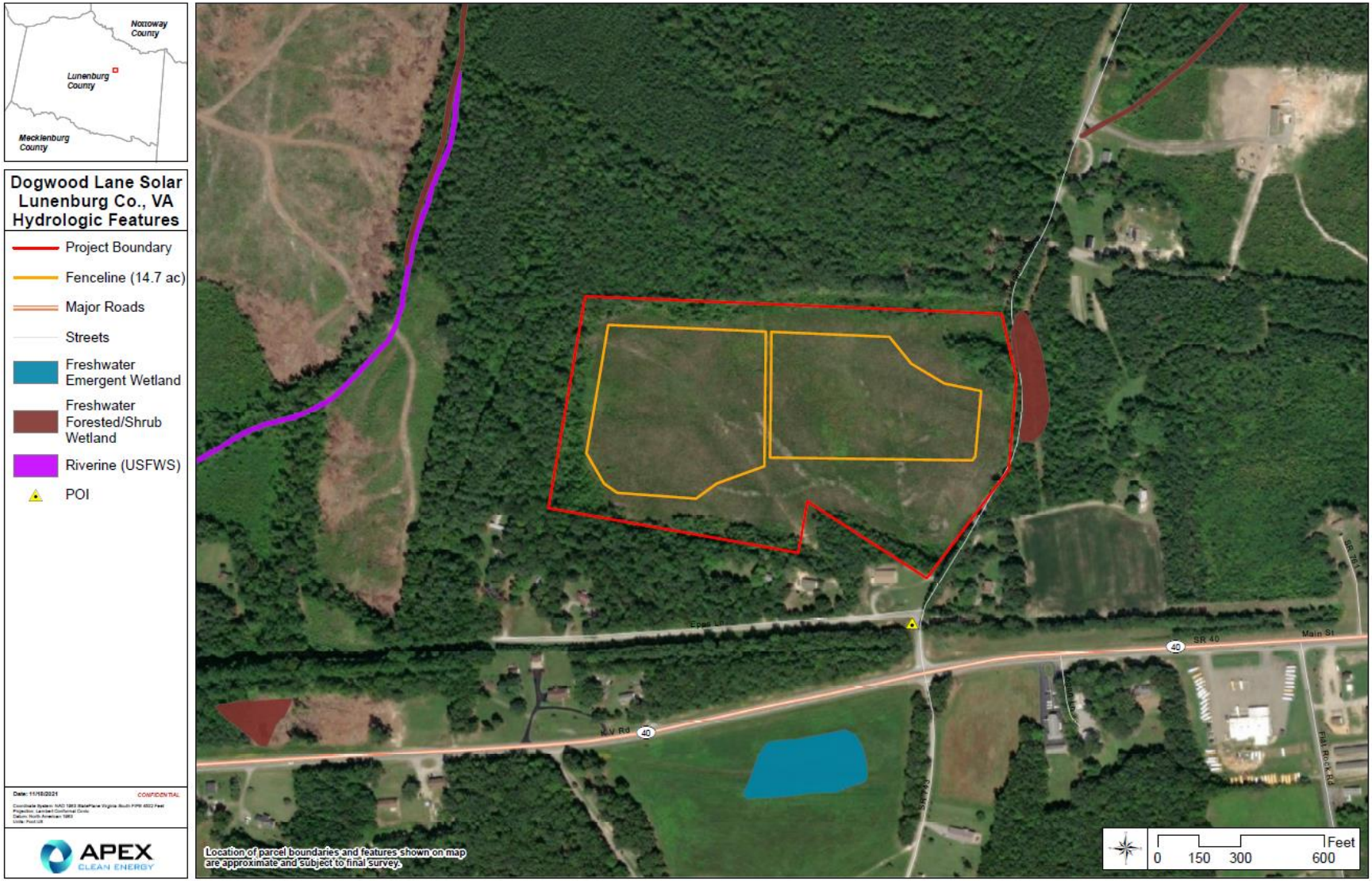


EXISTING VEGETATION

UNECLIPSED ENERGY, PLLC
ESA SOLAR ENERGY, LLC
APEX CLEAN ENERGY, INC.
PROJECT NAME: Dogwood Road Solar Farm
TITLE: LANDSCAPING PLAN
G204

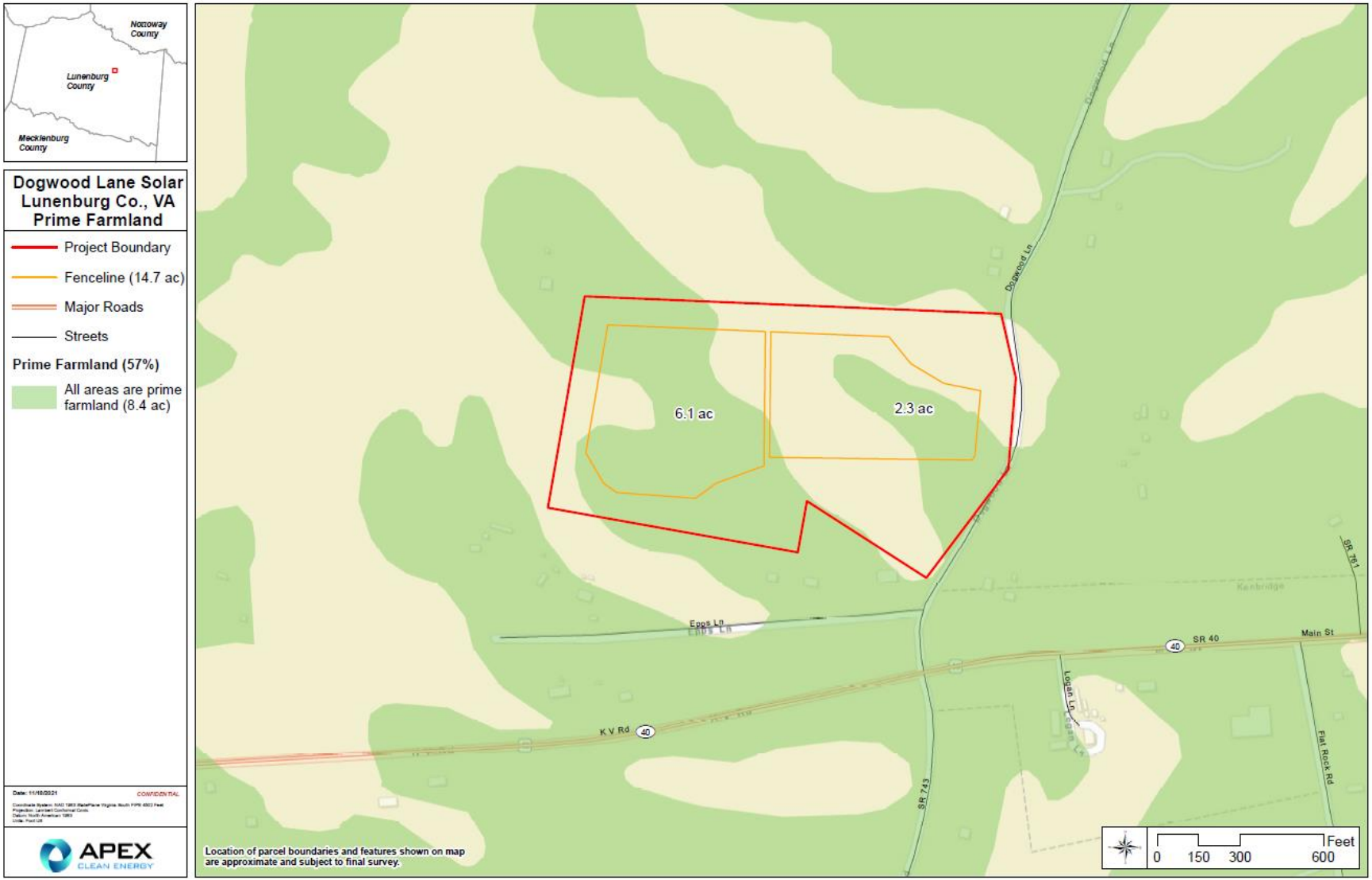
5.1. USGS Soils, USFWS and FEMA Flood Plain Layer




Nottoway County
Lunenburg County
Mecklenburg County
Dogwood Lane Solar
Lunenburg Co., VA
Hydrologic Features
Project Boundary
Fenceline (14.7 ac)
Major Roads
Streets
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Riverine (USFWS)
POI
Date: 11/18/2021
CONFIDENTIAL
APEX CLEAN ENERGY
Epes Ln
SR 40
Main St
N.V Rd
Feet
0 150 300 600
Location of parcel boundaries and features shown on map are approximate and subject to final survey.

5.2. Prime Farmland Report

It is worth noting that the land is not currently being farmed, nor has it been farmed recently, nor are there plans to farm it soon.

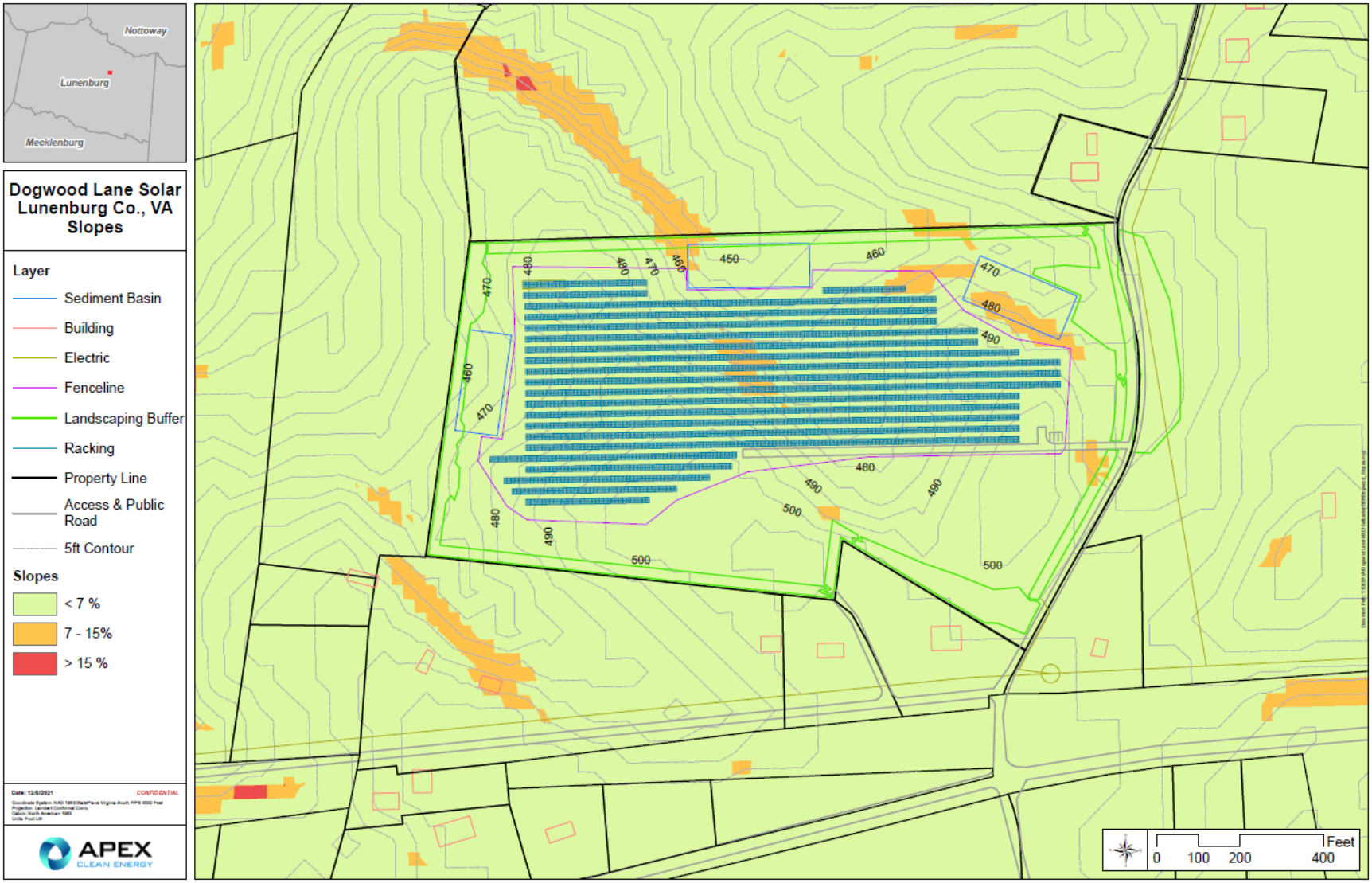


6. Draft Grading Plan

Solar construction does not utilize large-scale flattening of existing topography as seen in other types of large development. Recent advances in racking technology allow the systems to be used in areas of up to a 15% slope. As shown in the below map depicting Project area slopes, no part of the Project area exceeds a slope of 15%, only a small proportion of the site reaches 7%-15% slope, while most of the site consists of <7% slope. Given this reality, while there may be small amounts of localized leveling, which will be determined after field surveys and presented to the County as part of the construction plans, land preparation activities will largely maintain the current topography. Prior to grading of an area, the existing topsoil will first be stripped from the area to be graded, stockpiled, and then replace when final grade is achieved. This will assist in the establishment of vegetation and final site stabilization.

As is also seen in the below exhibit, the Project has identified approximate locations of potential stormwater (sediment) basin areas to proactively control for potential runoff. These locations are noted with rectangles outside the project fence area. Additional erosion control devices such as silt fence, diversion ditches, filter socks, check dams, hay/matting, temporary and permanent seeding, and construction entrances will be designed with more detailed construction drawings and submitted for approval prior to commencing construction.

Slopes Map with fence line, panel area and sediment basin overlay (11” x 17” Provided Separately)



6.1. Water Management

Stormwater and runoff management are regulated at the federal, state, and local level. Prior to construction, the Project's design and engineering must conform to all state laws and regulations. This includes providing appropriate methods to protect nearby waterways and neighboring property. Construction cannot begin until the Virginia Department of Environmental Quality (DEQ) has approved the Stormwater Management Plan and Southside Soil and Water Conservation District has approved the Project's soil and erosion control plan.

Prior to construction, the Southside Soil and Water Conservation District will review, approve, and oversee the Project's soil and erosion control plan. E&S designs and calculations are submitted to the County for approval as part of final permitting. Control devices, designed in accordance with the Virginia E&S Control Handbook, will be implemented to capture and treat runoff during construction phase. Common devices include silt fences, filter socks, check dams, diversion ditches, hay/matting, temporary and permanent seeding, sediment basins and traps (ponds), and construction entrance/exits. Often, the E&S ponds are converted to permanent stormwater detention ponds with onsite ditching directing water to the ponds.

Stormwater plans, designed in accordance with VSMP and the Virginia Runoff Reduction Method, will be implemented to capture and treat runoff during Project operations. The Golden Rule for engineering a stormwater plan is the quality of water leaving the site once the Project is operational will be as good or better than before construction of the Project commenced.
Stormwater design and calculations are reviewed and approved by DEQ prior to construction, with an ongoing maintenance agreement required between the Project owner and DEQ. Permanent stormwater management measures will be designed for conversion from the perimeter erosion and sediment control measures to meet state water Quantity standards. Typically, stormwater management measures consist primarily of permanent perimeter ditches to intercept and convey site runoff to dry detention basins. The detention basins are designed to provide rate control to meet downstream channel and flood protection requirements. The number and size of the detention basins is dependent upon the site topography and pre-development sub-drainage areas, with basin locations selected in an effort for post-development discharge locations to mimic pre-development locations.

Water Quality requirements are determined using the state's Volume Runoff Reduction Method (VRRM) and typically require preservation of undisturbed forested "open space" and/or proposed reforestation of open space that requires remediation from pre-development land management activities (i.e. farming or silviculture). A pre-development analysis is performed as part of the state's VRRM. Pre-development sub-drainage areas are delineated and considered in locating proposed basins, so post-development discharge conditions can mimic pre-development conditions. A post-development runoff analysis is also performed as part of the VRRM. DEQ Piedmont Regional Office (PRO) will perform the VSMP review. The PRO review typically requires a rigorous three to four-month review process with multiple submittals and technical engineering reviews. Virginia's regulations and processes for managing water flow during construction and throughout the operating life are tested by time and achieve the desired outcomes for water management. Furthermore, Virginia's approach to water management apply to all large-scale development with consistent approaches but flexible to address the unique attributes of the particular land use.

7. Decommissioning Plan

Prior to operation the Applicant shall post or arrange for the posting of surety equal to an updated estimate based on the final site plans prior to operation This surety is to ensure decommissioning of the Solar facility and removal of the improvements from the Property consistent with the Decommissioning Plan and standard industry practices. The amount of this surety will be based upon the estimate of cost of decommissioning. The estimated decommissioning cost will be updated upon the request of the zoning administrator, every five to ten years. Below is a Decommissioning Plan prepared by a Virginia-licensed Professional Engineer.

UNECLIPSED ENERGY

December 8, 2021

Solar Facility Analyzed:
Dogwood Lane Solar Farm
Dogwood Rd
Kenbridge, VA 23944

Project Owner:
ACE VA DER, LLC
310 4th St NE, Suite 300
Charlottesville, VA 22902
ATTN: Charlie Johnson

Plan Prepared By:
Uneclipsed Energy, PLLC
2250 Lucien Way, Suite 305
Maitland, FL 32751
407.232.7440

Firm Background:
Uneclipsed Energy, PLLC (Uneclipsed) is a licensed engineering firm affiliated with ESA Solar Energy, LLC and Solar Development Group, LLC (SDG) for solar projects in Florida, Michigan, and Virginia among other states. Since 2002, the team behind these three entities has gained expertise through developing, designing, constructing, operating and maintaining solar PV systems of all sizes, from residential, commercial and municipal projects to large ground-mount utility-scale systems in the United States, Spain, and Italy, totaling thousands of megawatts.

Facility Description:
The proposed solar farm is located on parcels 035-03-0-2C and 035-03-0-2C2 in Kenbridge (Lunenburg County), Virginia. The estimated 5.3 MWdc / 4.0 MWac solar farm is expected to include the following components:

- Approximately 12,000 PV modules
- Steel structural racking system, supported by driven piles
- Rack-mounted inverters to convert dc power to low-voltage (600V) ac power
- Concrete pad-mounted transformers and switchgear required to step up the voltage to medium voltage (distribution level, approximately 12.5kV)
- Underground and overhead wiring as appropriate for solar farm interconnection to electric grid

Uneclipsed Energy, PLLC
2250 Lucien Way, Suite 305 | Maitland, FL USA 32751
Page 1 of 6

Decommissioning Process:

The system is expected to be capable of operation for at least thirty-five years, with decommissioning at a time to be agreed upon by the system owner and the landowners leasing the land to the system owner. At the end of the project's life, the system owner shall complete the following list of activities to fully decommission the system. This list is prepared based on current procedures and experience, which will likely improve in the coming years as technology, construction processes and recycling infrastructures improve. Decommissioning activities shall be carried out according to applicable regulations and industry best practices, after obtaining any necessary permits for the decommissioning. The decommissioning activities are as follows, and shall be completed in accordance with the industry best practices, OSHA regulations, and state/federal requirements in effect at the time of decommissioning:

- Prepare a safety plan and train all site personnel as to appropriate safeguards and proper work techniques.
- Contact the Utility Company and communicate the cessation of business.
- Provide notice to the Zoning Administrator by certified mail and in person of the proposed date of discontinued operations and plan for removal.
- Disconnect site electric power at the Point of Common Coupling by the site owner or utility. The utility will be responsible for removing all conductors, power poles, and hardware that is under utility ownership.
- Disconnect all dc source circuit wiring from the combiner boxes.
- Disconnect all dc output circuit wiring from any combiner boxes to inverters.
- Unfasten PV modules from the structural racking system and stack in a staging area (this staging area will be used to store all equipment being removed from the site).
- Remove module home run wiring, raceways, and combiner boxes from the racking system.
- Unbolt the racking system components and stack and remove all driven piers.
- Dig up all buried conductors and backfill trenches.
- Coil and stack wire and conduits. Remove wire connectors and splices, dissemble, and sort as required to maximize recycling value.
- Dismantle Inverters, switchgear, and transformers on site when practical, or remove fully intact equipment pads from the site for off-site handling.
- Remove perimeter fencing and pole foundations.
- Sell to a recycling facility any material that can be recycled, unless the original equipment manufacturer or another organization offers a buy-back program for equipment.
- Dispose of all other materials at appropriate handling facilities.
- Dismantle any site roads and restore any compressed soils (under equipment pads, roads) with a subsoiler or flat lifter. Restore any compacted areas to the proper density and depth to remain consistent with the surrounding fields, adding new fill as necessary.

- Re-seed and re-vegetate disturbed areas of the site, ensuring that the land can return to its original state.

Decommissioning Cost Analysis:

The estimated costs or values for scrap material and disposal are provided in Figure 1 following. The projected estimated cost for each line item is rounded to the nearest $1,000. Prior to operation, the method of ensuring funds will be available for decommissioning and reclamation.

Component	Size	Material	Feet	Quantity	Weight/unit	Weight	2019 Scrap Value	Project Value
Array PV Wire	10 AWG	Copper	270,000		0.057	15,390	$1.60/lb	$ 25,000
Array Home Runs	250 kcmil	Alu	76,000		0.321	24,396	$0.60/lb	$ 15,000
Module Frames				17,000	2	34,000	$0.59/lb	$ 20,000
Posts and Rails			15	9,350	130	1,215,500	$0.05/lb	$ 61,000
							SCRAP VALUE	**$ 121,000**
Modules				17,000	50	850,000	($2.00/unit)	($34,000)
							NET SCRAP VALUE	$ 87,000

Figure 1: Decommissioning Costs and Values Breakdown

In 2019, the scrap value of the copper and aluminum wiring, aluminum solar module frames, steel posts and structural members is calculated at 75% of the commodity copper and aluminum pricing. It is conservatively assumed that this value will remain steady over time. Figure 2 and Figure 3 on the following page show Copper Pricing and Aluminum Pricing from 1989 through 2019. Steel is assumed to be valued at $100 per ton, or otherwise equal to $0.05 per lb. 2019 numbers are used here as they are considered more stable and consistent than those in 2020-2021, which have been more variable due to worldwide markets disruption from the COVID-19 pandemic. This brings the estimated scrap value of the system to approximately $84,000.

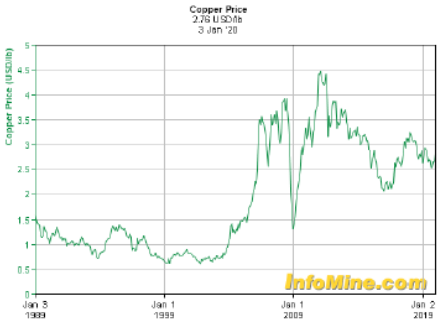


Figure 2: Copper Pricing in USD/lb, 1989-2019

Figure 3: Aluminum Pricing in USD/lb, 1989-2019

The weight of each of the 12,000 solar modules (panels) is due primarily to the top glass within the frame, and we anticipate that the modules will be mostly recyclable during the decommissioning. As there has been a relatively low number of failed modules worldwide, there has not yet been a high demand for module recycling facilities, however in Europe and in the United States programs have been announced and small facilities exist. We expect that as more solar power is deployed, the recycling opportunities will grow accordingly to meet the demand of equipment disposal. It is estimated that there will be a net cost of $2.00 per module for disposal, or $24,000 for this estimate.

Although the bulk of decommissioning tasks are expected to be carried out by laborers, there will also be equipment operators and supervisors. We assume these fully-burdened rates for personnel trained in demolition:

Labor Type	Rate
Supervisor	$65.00
Equipment Operator	$55.00
Laborer	$40.00

In an effort to provide a conservative labor and material cost estimate for the decommissioning of the project, below is a breakdown of the anticipated costs:

Cost Type	Headcount	Hours / Day	Rate	Days	Total Cost
Excavator	1	8	$ 125.00	20	$ 20,000
Skid Steer	2	8	$ 50.00	20	$ 16,000
Pick-up Trucks	2	8	$ 14.50	20	$ 5,000
Supervisor	1	8	$ 65.00	20	$ 11,000
Equipment Operator	3	8	$ 55.00	20	$ 27,000
Laborer	6	8	$ 40.00	20	$ 39,000
Trucking	5	8	$ 125.00	10	$ 50,000
Site Restoration					$ 30,000
Module Disposal					$ 34,000
Total Expenses					**$ 232,000**
Scrap Value Offset					$ (121,000)
Net Price					**$ 111,000**

Assuming roughly four weeks' effort for labor costs, equipment usage, transportation costs, appropriate recycling and disposal costs, and an additional $30,000 allowance for full site restoration (to include regrading, reseeding, and landscape repair), the costs of the decommissioning would total $204,000. Subtracting the estimated scrap value of $84,000, the decommissioning cost would yield a *net cost* of approximately $120,000.

All estimated costs were calculated using best industry standards and pricing currently available.

Given that 35 years of policy changes, technological improvements, and variable inflation rates have yet to occur, the accuracy of these estimates cannot be guaranteed and will be recalculated every 5 years.

Respectfully submitted by:

David K. Click, PE
President
Uneclipsed Energy, PLLC

David Click

Digitally signed by David Click
Date: 2021.12.08 16:19:21 -05'00'

COMMONWEALTH OF VIRGINIA
DAVID K. CLICK
Lic. No. 0402062143
PROFESSIONAL ENGINEER

8. Documentation of Right to Use Property for Proposed Facility

CLR210000694

Prepared by: Solar Development Group, LLC
Return to: **Apex Clean Energy**
Attn: Lori Carrara (Land)
310 4th Street N.E.
Charlottesville, VA 22902

COMMONWEALTH OF VIRGINIA)

MEMORANDUM OF GROUND LEASE)

COUNTY OF LUNENBURG)

THIS MEMORANDUM OF GROUND LEASE ("*Memorandum*") is dated as of the earliest date of acknowledgment set forth below, but made effective this 20th day of November, 2020, between Richard W. Harris (the "*Landlord*"), whose address is PO Box 404, Kenbridge, VA 23944, and Dogwood Lane Solar Farm, LLC, a Delaware limited liability company ("*Tenant*"), whose address is 108 Commerce St, Suite 105, Lake Mary, FL 32746 pursuant to and regarding that certain Lease Agreement dated November 20, 2020 (collectively, the "*Lease*") and as may be further amended from time to time, whereby Landlord leased to Tenant the real property described below upon the terms and conditions set forth in the Lease.
Capitalized terms used herein, and not otherwise defined, shall have the same meanings assigned to them in the Lease. All of the terms and conditions of the Lease are incorporated herein by this reference.

The initial term of this Lease (the "*Initial Term*") shall begin on the Effective Date and shall terminate on the date that is twentieth (20th) anniversary of the Placed in Service Date unless earlier terminated as provided in the Lease. Tenant may extend the Initial Term for three (3) additional five (5) years periods

The Lease obligates Landlord to lease to Tenant that certain property containing 32.48 acres, Parcel number(s) 035-03-0-2C2 and 035-03-0-2C , said leased premises being legally described as set forth on the attached **Exhibit A,** together with all improvements, fixtures, personal property and trade fixtures located thereon, together with all other appurtenances, tenements, hereditaments, rights and easements pertaining to the premises and the improvements now or in the future located thereon (collectively referred to as the "*Leased Premises*"), to be occupied and used upon the terms and conditions set forth in the Lease.

- 3 -

The solar photovoltaic power generating facility and all related equipment installed, owned and operated by Tenant and located at the Premises (collectively, the *Generating Facility*") shall not be deemed a fixture. The Generating Facility is Tenant's personal property and Landlord has no right, title or interest in the Generating Facility. Further, Landlord has waived any and all rights it may have to place a lien on the Generating Facility.

Pursuant to the terms of the Lease, Landlord has granted (i) a right of first offer to Tenant to purchase the Leased Premises during the Term (the terms of such right of first offer, including with respect to the purchase price for which Tenant may acquire the Leased Premises pursuant to such right of first offer, being set forth in the Lease), and (ii) certain easement rights over and across property.

Nothing contained herein shall modify the Lease, and in the event of a conflict between the provisions of the Lease and the provisions of this Memorandum, the provisions of the Lease shall control.

[SEPARATE SIGNATURE PAGE AND NOTARY PAGES ATTACHED]

SEPARATE SIGNATURE PAGE
TO
MEMORANDUM OF GROUND LEASE

IN WITNESS WHEREOF, the undersigned have executed this Memorandum of Lease by authority duly given and effective as of the date first written above.

LANDLORD:

Richard W. Harris

Richard W. Harris

LANDOWNER

COMMONWEALTH OF VIRGINIA

COUNTY OF Lunenburg

I certify that the following person personally appeared before me this day, acknowledging to me that he signed the foregoing instrument: Richard W. Harris.

WITNESS my hand and official stamp or seal, this 20 day of Nov, 2020.

Marsha A Nash

Notary Public

Printed Name: Marsha A. Nash

My Commission Expires:

2.28.2021

[AFFIX NOTARIAL STAMP OR SEAL]

MARSHA ALDER NASH
NOTARY PUBLIC
REG# 7729877
MY COMMISSION EXPIRES
02/28/2021
COMMONWEALTH OF VIRGINIA

IN WITNESS WHEREOF, the undersigned have executed this Memorandum of Lease by authority duly given and effective as of the date first written above.

TENANT:

Signature: Lindsay Latre

Printed Name: Lindsay Latre

Title: Manager

TENTANT

STATE OF FLORIDA

COUNTY OF Seminole

I certify that the following person personally appeared before me this day, acknowledging to me that he signed the foregoing instrument Lindsay Latre, manager of Dogwood Lane Solar Farm, LLC, a Delaware limited liability company.

WITNESS my hand and official stamp or seal, this 4 day of Dec, 2020

MORGAN McMAHON
NOTARY PUBLIC
STATE OF FLORIDA
Comm# GG250463
Expires 8/20/2022

Notary Public

Printed Name: Morgan McMahon

My Commission Expires:

8/20/22

[AFFIX NOTARIAL STAMP OR SEAL]

Memorandum of Ground Lease

Exhibit A - Legal Description

Property located in Lunenburg County, Virginia

All those two certain tracts or parcels of land situate, lying and being in Brown's Store Magisterial District, Lunenburg County, Virginia, containing 32.48 acres, in the aggregate, and designated as Parcel A, containing 17.24 acres, and the balance of Parcel B, originally containing 17.24 acre, the balance being 15.24 acre, on a plat of survey entitled "Plat showing part of Parcel No. 2 of the Burton Tract in Browns Store District, Lunenburg County, Virginia. Surveyed and divided for H. L. Hendrick," made by J. W. Blackburn, CLS, on November 10, 1980; said plat being recorded in Deed Book 145 at Page 644; Less and except from said original 17.24 acres, Parcel B, a certain 2.00 acre parcel conveyed unto Charles E. Thomas, et ux, by deed recorded in Deed Book 207 at Page 178; said 2.00 acre being shown on plat recorded at Deed Book 207 at Page 180.

AND BEING the same property conveyed Richard W. Harris from Crevon P. Hendrick, individually and as Co-Administrator of the Estate of Hayward L. Hendrick, Sr. and Crystal M. B. Rogers, individually and as Co-Administrator of the Estate of Hayward L. Hendrick, Sr. by Deed dated January 7, 2005 and recorded January 11, 2005 in Deed Book 302, Page 36.

Tax Parcel Nos. 035-03-0-2C and 035-03-0-2C2

INSTRUMENT 210000694
RECORDED IN THE CLERK'S OFFICE OF
LUNENBURG CIRCUIT COURT ON
JUNE 1, 2021 AT 02:04 PM
GORDON F. ERBY, CLERK
RECORDED BY: MAS

9. Liability Insurance

The applicant shall provide proof of insurance prior to the issuance of a building permit. The anticipated policy is as follows:

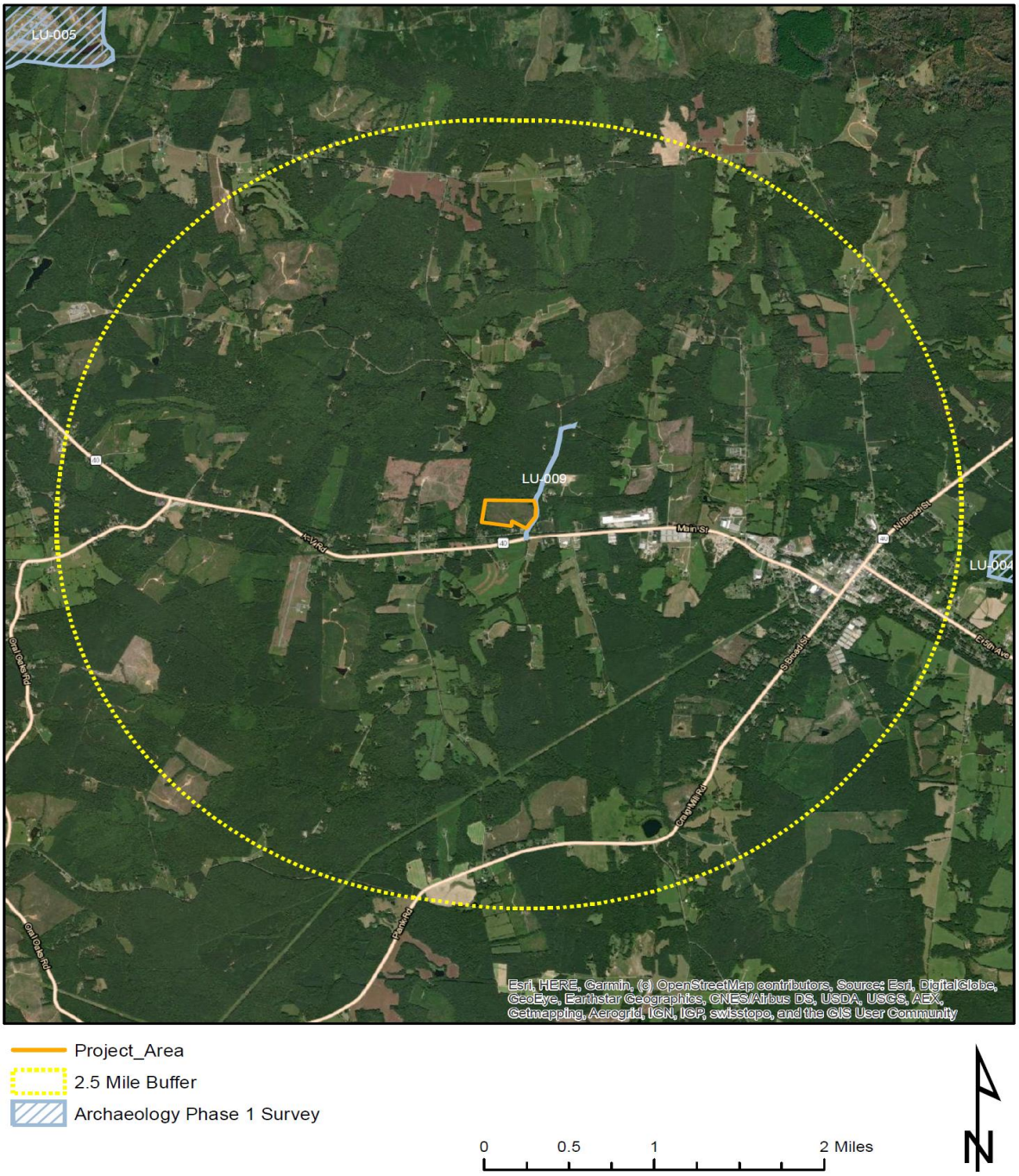
> Commercial General Liability Insurance with a limit of $5,000,000 per occurrence and $5,000,000 general and products/completed operations aggregate covering liability for bodily injury and property damage arising from premises, operations, independent contractors, personal injury/advertising injury, contractual liability, time element (sudden and accidental) pollution, and products/completed operations.

10. Virginia Cultural Resource Information System Report

The Project retained Dutton + Associates to utilize the Virginia Cultural Resource Information System, an electronic cultural resources GIS and database by the Department of Historic Resources (DHR), to identify historical, architectural, archeological, or other cultural resources on or near the proposed facility (study area). The results are as follows:

10.1. Previously Conducted Surveys

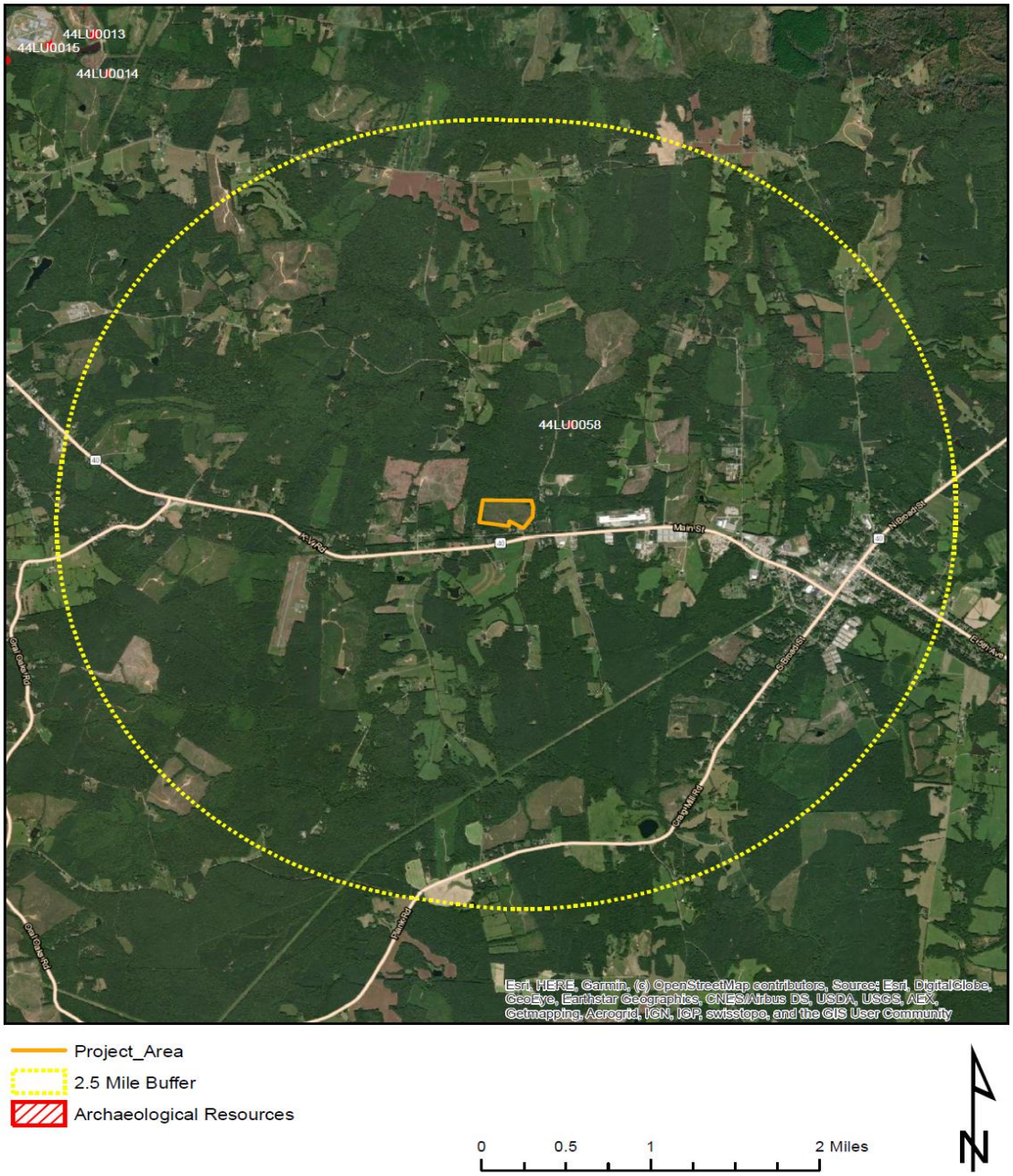
A table has been provided below the following image to identify the relevant data found within 2.5 miles of the study area.



DHR Report Number	County	DHR Report Title	Author Affiliation	DHR Report Year	DHR Project Review Number
LU-009	Lunenburg	An Archaeological Survey of Proposed Improvements to Route 710, Lunenburg County, Virginia	Virginia Department of Transportation (Highways and Transportation)	2003	2003-0089

10.2. Archaeological Resources

A table has been provided below the following image to identify the relevant data found within 2.5 miles of the study area.



Project_Area
2.5 Mile Buffer
Archaeological Resources

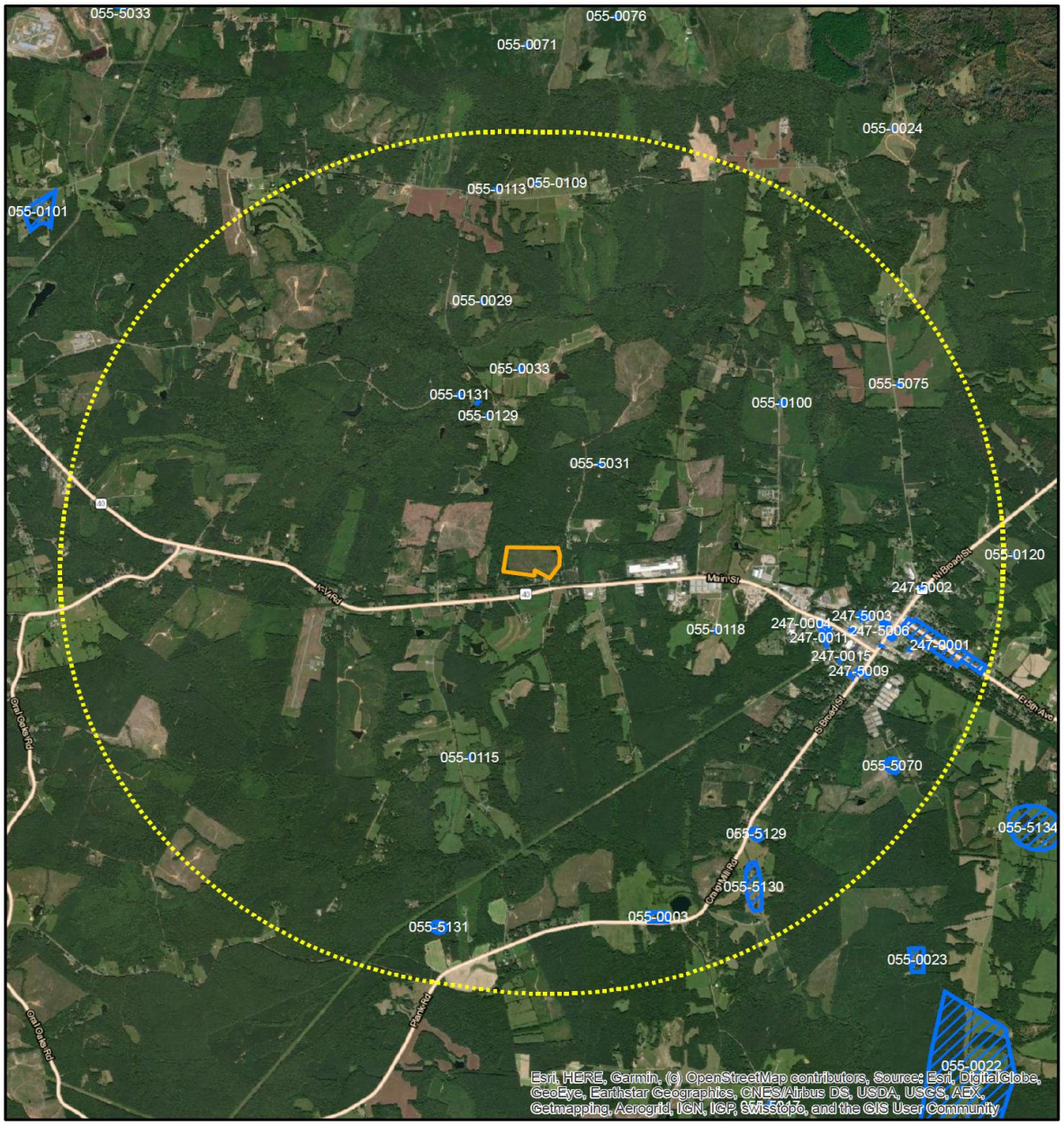
0 0.5 1 2 Miles

N

DHR ID	Site Categories	Site Types	Time Periods	Evaluation Status
44LU0058	Domestic, Industry/Processing/Extraction	Dwelling, single, Lithic scatter	Middle Archaic (6500 - 3001 B.C.), 19th Century: 2nd half (1850 - 1899), 20th Century: 1st half (1900 - 1949)	<Null>

10.3. Architectural Resources

A table has been provided below the following image to identify the relevant data found within 2.5 miles of the study area.



Project_Area

2.5 Mile Buffer

Architecture Resources

0 0.5 1 2 Miles

N

DHR ID	Property Names	Property Addresses	Historic District Name	Evaluation Status
055-0003	Flat Rock (Historic/Current), Kenrock (Historic/Current), Old Bagley House (Historic), Prospect Hill (Historic)	Route 655	<Null>	NRHP Listing, VLR Listing
055-0029	Breezy Valley (Historic/Current)	Route 652, Off Of	<Null>	<Null>
055-0033	White Hall (Historic/Current)	<Null>	<Null>	<Null>
055-0100	Crafton, Tom, Place (Current), Lelialand (Historic)	<Null>	<Null>	<Null>
055-0109	Joe Blackwell House (Missing), Lail House (Site) (Historic)	<Null>	<Null>	<Null>
055-0113	Thrift's Chapel	<Null>	<Null>	<Null>
055-0115	Oakes Farm (Current), Orgain Farm (Historic)	<Null>	<Null>	<Null>
055-0118	Spring Grove Farm (Current)	<Null>	<Null>	<Null>
055-0129	House, Route 663 (Function/Location)	Route 663	<Null>	<Null>
055-0130	Log Barn, Route 663 (Function/Location)	Route 663	<Null>	<Null>
055-0131	Bridge, Route 610 (Function/Location)	Route 610	<Null>	<Null>
055-5031	Blackwell Farm (Historic), Dabney Hardy/Tom Burton Place (Historic)	Dogwood Lane, Route 710	<Null>	<Null>
055-5070	Bridgforth House (Historic)	170 J W Bridgforth Road	<Null>	<Null>
055-5075	Almand, J. J. House (Historic)	8863 Poor House Road	<Null>	<Null>
055-5129	Craig-Love House (Historic), Virginius Love Place (Historic)	1171 S. Broad Street	<Null>	<Null>
055-5130	Bridgforth, Washington Maddux House (Historic), Oak Forest (Historic/Current)	12454 Craigs Mill Road	<Null>	<Null>
055-5131	Lone Oak (Historic)	12309 Plank Road	<Null>	<Null>
247-0001	Fifth Avenue Historic District (Historic)	Fifth Street	Fifth Avenue Historic District	NRHP Listing, VLR Listing
247-0002	Kimbrough House (Current)	Route 114	<Null>	<Null>
247-0003	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0004	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0005	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0006	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0007	Silverman House, Route 114 (Historic/Location)	Route 114	<Null>	<Null>
247-0008	Crenshaw House (Current)	Route 114	<Null>	<Null>
247-0009	Martin House (Current)	Route 114	<Null>	<Null>
247-0010	Crump House (Current)	Route 114	<Null>	<Null>
247-0011	Leonard House (Current)	Route 114	<Null>	<Null>
247-0012	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0013	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0014	Arthur House (Current)	Route 114	<Null>	<Null>
247-0015	Platner House (Current)	Route 114	<Null>	<Null>
247-0016	Brown House (Current)	Route 114	<Null>	<Null>
247-0017	House, Route 114 (Descriptive)	Route 114	<Null>	<Null>
247-0018	Clark House (Current)	Route 114	<Null>	<Null>
247-0019	St. Paul's Episcopal Church Parsonage (Historic)	Route 114	<Null>	<Null>
247-0020	Bridge, Route 40 over N&W Railway (Descriptive)	Route 40	<Null>	<Null>
247-5001	Kenbridge Railroad Station (Current)	<Null>	<Null>	<Null>
247-5002	St. Lukes Episcopal Church (Historic/Current)	409 N. Broad Street	<Null>	<Null>
247-5003	Farmers-Planters Tobacco Warehouse (Historic)	400 W. 6th Avenue	<Null>	<Null>
247-5004	Mason & Roby Mule Stable (Historic)	300 W. 6th Avenue	<Null>	<Null>
247-5005	Kenbridge Hotel (Historic)	200 W. 6th Avenue	<Null>	<Null>
247-5006	Farm All-Farm Implement Dealer (Historic)	112 W. 6th Avenue	<Null>	<Null>
247-5007	Ferguson and Allan Department Store (Historic)	201 S. Broad Street	<Null>	<Null>
247-5008	Kenbridge Baptist Church (Historic), Kenbridge Town Hall (Current)	116 E. 6th Avenue	<Null>	<Null>
247-5009	St. Paul Episcopal Church (Historic), The Episcopal Church of St. Paul & St. Andrew (Current)	512 S. Broad Street	<Null>	<Null>
247-5010	Kenbridge Christian Church (Historic)	600 S. Broad Street	<Null>	<Null>

11. Environmental Impacts Narrative

See Annex 1

12. Wildlife Impacts Narrative

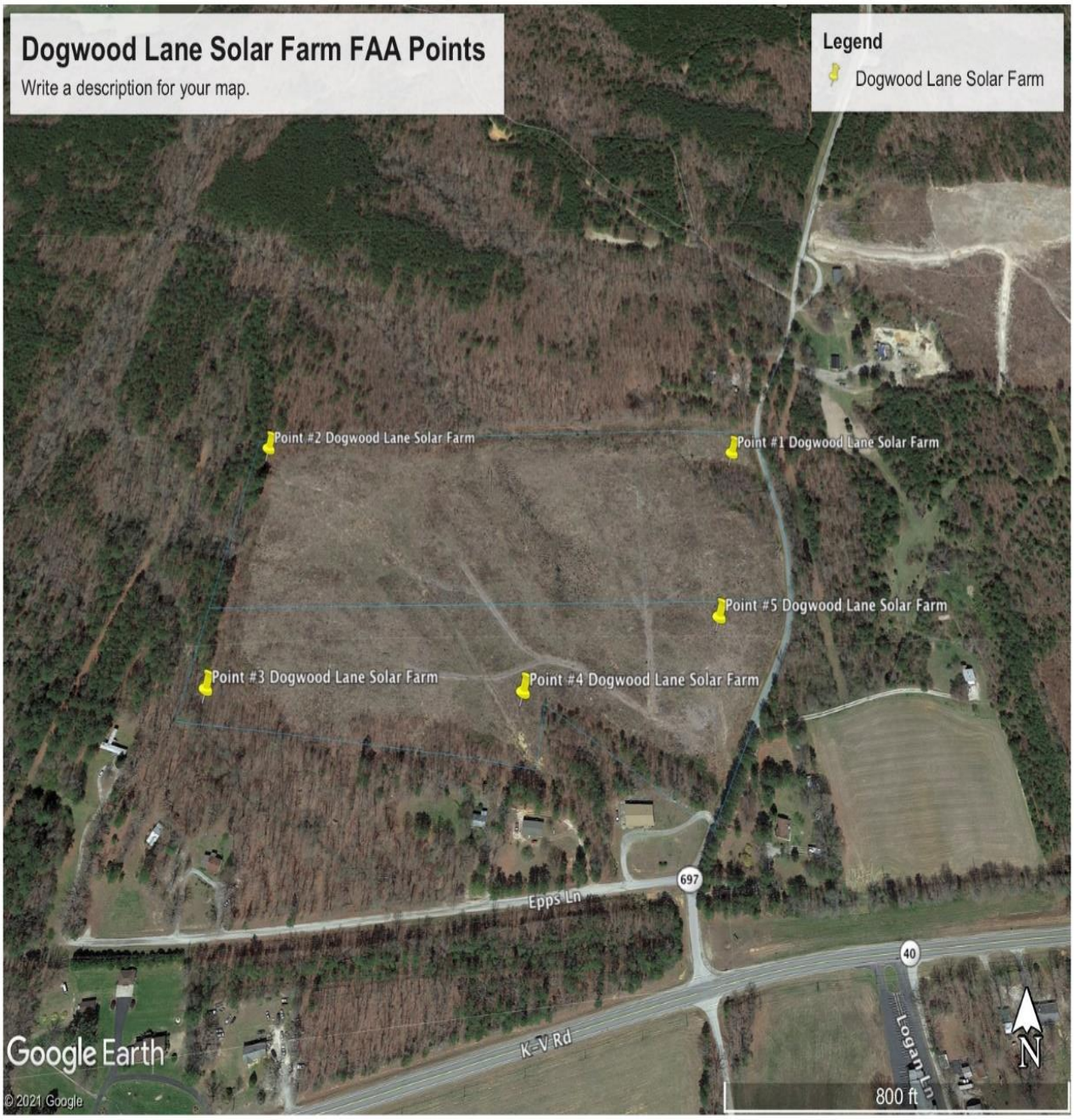
See Annex 2

13. Draft Traffic Study

See Annex 3

14. FAA Determination

The Project utilized the FAA's Notice Criteria Tool to determine if the Project would exceed the Notice Criteria and potentially result in any issues with air traffic. For all five points indicated in the map below, the results were the same: "You Do Not Exceed Notice Criteria".



Point 1 Result:

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	36 Deg 58 M 10.93 S N
Longitude:	78 Deg 9 M 33.11 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	515 (nearest foot)
Structure Height :	15 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	◉ No ○ Yes

Results

You do not exceed Notice Criteria.

Point 2 result:

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
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- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	36 Deg 58 M 11.24 S N
Longitude:	78 Deg 9 M 50.61 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	506 (nearest foot)
Structure Height :	15 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	◉ No ○ Yes

Results

You do not exceed Notice Criteria.

Point 3 Result:

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	36 Deg 58 M 4.88 S N
Longitude:	78 Deg 9 M 51.64 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	504 (nearest foot)
Structure Height :	15 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	◉ No ○ Yes

Results

You do not exceed Notice Criteria.

Point 4 Result:

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	36 Deg 58 M 4.53 S N
Longitude:	78 Deg 9 M 40.96 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	541 (nearest foot)
Structure Height :	15 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	◉ No ○ Yes

Results

You do not exceed Notice Criteria.

Point 5 Result:

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	36 Deg 58 M 6.25 S N
Longitude:	78 Deg 9 M 34.25 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	547 (nearest foot)
Structure Height :	15 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.

15. Potential Fiscal Impacts to Lunenburg County

As stated in the application summary, the Applicant expects to be providing substantial cash payments to the County in the Conditions of Approval. Projects of this scale (5MW ac and below) are exempt from machinery and tools taxation by state law, but the Applicant is proposing to provide additional payments as part of the greater economic benefit of hosting the Project, and to offset any public costs related to the Project.

For example, the Applicant estimates an increase in tax revenue of $629,000 over the current taxes collected for the same parcel acreage. In addition, the Applicant is prepared to propose substantial cash payments to the County on top of its proposed taxes totaling an additional estimated $434,000 over the life of Project. Collectively, the Applicant estimates a Project revenue increase for the County of $1.064 million over its anticipated 40 year life.

16. Equipment Specifications

16.1. Solar Module

CanadianSolar

HiKu

HIGH POWER POLY PERC MODULE

400 W ~ 425 W

CS3W-400|405|410|415|420|425P

MORE POWER

- 24 % higher power than conventional modules
- Up to 4.5 % lower LCOE
  Up to 2.7 % lower system cost
- Low NMOT: 42 ± 3 °C
  Low temperature coefficient (Pmax): -0.36 % / °C
- Better shading tolerance

MORE RELIABLE

- Lower internal current, lower hot spot temperature
- Minimizes micro-crack impacts
- Heavy snow load up to 5400 Pa, wind load up to 3600 Pa*

* For detailed information, please refer to Installation Manual.

12 Years Enhanced Product Warranty on Materials and Workmanship*

25 Years Linear Power Performance Warranty*

1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.55%

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

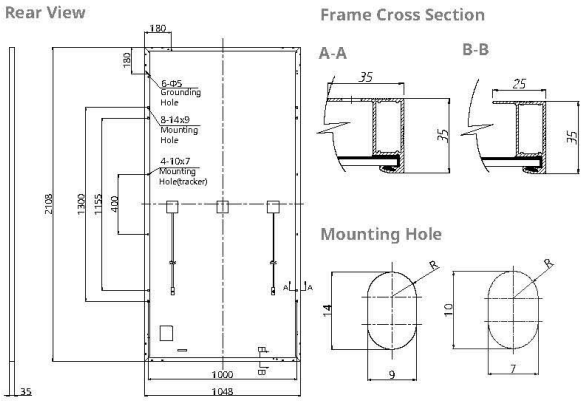
IEC 61215 / IEC 61730 / CE / MCS / INMETRO
CEC listed (US California) / FSEC (US Florida)
UL 61730 / IEC 61701 / IEC 62716
UNI 9177 Reaction to Fire: Class 1 / Take-e-way

* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your product and applicable in the regions in which the products will be used.

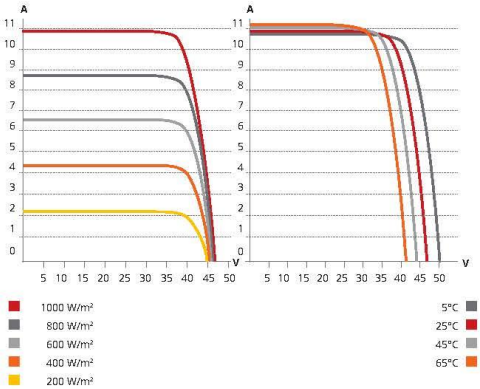
CSI Solar Co., Ltd. is committed to providing high quality solar products, solar system solutions and services to customers around the world. Canadian Solar was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey, and is a leading PV project developer and manufacturer of solar modules, with over 50 GW deployed around the world since 2001.

CSI Solar Co., Ltd.
199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, www.csisolar.com, support@csisolar.com

ENGINEERING DRAWING (mm)



CS3W-400P / I-V CURVES



ELECTRICAL DATA | STC*

CS3W	400P	405P	410P	415P	420P	425P
Nominal Max. Power (Pmax)	400 W	405 W	410 W	415 W	420 W	425 W
Opt. Operating Voltage (Vmp)	38.7 V	38.9 V	39.1 V	39.3 V	39.5 V	39.7 V
Opt. Operating Current (Imp)	10.34 A	10.42 A	10.49 A	10.56 A	10.64 A	10.71 A
Open Circuit Voltage (Voc)	47.2 V	47.4 V	47.6 V	47.8 V	48.0 V	48.2 V
Short Circuit Current (Isc)	10.90 A	10.98 A	11.06 A	11.14 A	11.26 A	11.29 A
Module Efficiency	18.1%	18.3%	18.6%	18.8%	19.0%	19.2%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)					
Module Fire Performance	TYPE 1 (UL 61730 1500V) or TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)					
Max. Series Fuse Rating	20 A					
Application Classification	Class A					
Power Tolerance	0 ~ + 10 W					

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline
Cell Arrangement	144 [2 X (12 X 6)]
Dimensions	2108 X 1048 X 35 mm (83.0 X 41.3 X 1.38 in)
Weight	24.3 kg (53.6 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	500 mm (19.7 in) (+) / 350 mm (13.8 in) (-) or customized length*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	30 pieces
Per Container (40' HQ)	660 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

ELECTRICAL DATA | NMOT*

CS3W	400P	405P	410P	415P	420P	425P
Nominal Max. Power (Pmax)	298 W	302 W	305 W	309 W	313 W	317 W
Opt. Operating Voltage (Vmp)	36.0 V	36.2 V	36.4 V	36.6 V	36.8 V	36.9 V
Opt. Operating Current (Imp)	8.27 A	8.33 A	8.39 A	8.45 A	8.51 A	8.57 A
Open Circuit Voltage (Voc)	44.3 V	44.5 V	44.7 V	44.9 V	45.1 V	45.3 V
Short Circuit Current (Isc)	8.79 A	8.86 A	8.92 A	8.99 A	9.08 A	9.11 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.36 % / °C
Temperature Coefficient (Voc)	-0.28 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement .CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.
Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

CSI Solar Co., Ltd.
199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, www.csisolar.com, support@csisolar.com

Mar. 2021. All rights reserved, PV Module Product Datasheet V5.62_EN

16.2. Inverter

SUNNY HIGHPOWER PEAK3 125-US / 150-US

Cost effective
- Modular architecture reduces BOS and maximizes system uptime
- Compact design and high power density maximize transportation and logistical efficiency

Maximum flexibility
- Scalable 1,500 VDC building block with best-in-class performance
- Flexible architecture creates scalability while maximizing land usage

Simple install, commissioning
- Ergonomic handling and simple connections enable quick installation
- Centralized commissioning and control with SMA Data Manager

Highly innovative
- SMA Smart Connected reduces O&M costs and simplifies field-service
- Powered by award winning ennexOS cross sector energy management platform

SUNNY HIGHPOWER PEAK3 125-US / 150-US

A superior modular solution for large-scale power plants

The PEAK3 1,500 VDC inverter offers high power density in a modular architecture that achieves a cost-optimized solution for large-scale PV integrators. With fast, simple installation and commissioning, the Sunny Highpower PEAK3 is accelerating the path to energization. SMA has also brought its field-proven Smart Connected technology to the PEAK3, which simplifies O&M and contributes to lower lifetime service costs. The PEAK3 power plant solution is powered by the ennexOS cross sector energy management platform, 2018 winner of the Intersolar smarter EAWARD.

Technical Data	Sunny Highpower PEAK3 125-US	Sunny Highpower PEAK3 150-US
Input (DC)		
Maximum array power	187500 Wp STC	225000 Wp STC
Maximum system voltage	1500 VDC	
Rated MPP voltage range	705 V ... 1450 V	880 V ... 1450 V
MPPT operating voltage range	684 V ... 1500 V	855 V ... 1500 V
MPP trackers	1	
Maximum operating input current	180 A	
Maximum input short-circuit current	325 A	
Output (AC)		
Nominal AC power	125000 W	150000 W
Maximum apparent power	125000 VA	150000 VA
Output phases / line connections	3 / 3-PE	
Nominal AC voltage	480 V	600 V
Compatible transformer winding configuration	Wye-grounded	
Maximum output current	151 A	
Rated grid frequency	60 Hz	
Grid frequency / range	50 Hz, 60 Hz / -6 Hz ... +6 Hz	
Power factor at rated power / adjustable displacement	1 / 0.0 leading ... 0.0 lagging	
Harmonics (THD)	<3%	
Efficiency		
CEC efficiency	98.5 %	99.0 %
Protection and safety features		
Ground fault monitoring: Riso / Differential current	● / ●	
DC reverse polarity protection	●	
AC short circuit protection	●	
Monitored surge protection (Type 2): DC / AC	● / ●	
Protection class / overvoltage category (as per UL 840)	I / IV	
General data		
Device dimensions (W / H / D)	770 / 830 / 444 mm (30.3 / 32.7 / 17.5 in.)	
Device weight	98 kg (216 lbs)	
Operating temperature range	-25° C ... +60° C (-13° F ... +140° F)	
Storage temperature range	-40° C ... +70° C (-40° F ... +158° F)	
Audible noise emission (full power @ 1m and 25° C)	< 69 dB(A)	
Internal consumption at night	< 5 W	
Topology	Transformerless	
Cooling concept	OptiCool (forced convection, variable speed fans)	
Enclosure protection rating	Type 4X (as per UL 50E)	
Maximum permissible relative humidity (non-condensing)	100%	
Additional information		
Mounting	Rack mount	
DC connection	Terminal lugs - up to 600 kcmil CU/AL	
AC connection	Screw terminals - up to 300 kcmil CU/AL	
LED indicators (Status/Fault/Communication)	●	
SMA Speedwire (Ethernet network interface)	● (2 x RJ45 ports)	
Data protocols: SMA Modbus / SunSpec Modbus	● / ●	
Integrated Plant Control / Q on Demand 24/7	● / ●	
Off-grid capable / SMA Hybrid Controller compatible	– / ●	
SMA Smart Connected (proactive monitoring and service)	●	
Certifications		
Certifications and approvals	UL 62109, UL 1998, CAN/CSA-C22.2 No.62109	
FCC compliance	FCC Part 15, Class A	
Grid interconnection standards	IEEE 1547, UL 1741 SA - CA Rule 21, HECO Rule 14H	
Advanced grid support capabilities	L/HFRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor	
Warranty		
Standard	5 years	
Optional extensions	10 / 15 / 20 years	
Type designation	SHP 125-US-20	SHP 150-US-20

Technical data as of May 2020 ● Standard features ○ Optional features – Not available

SHPUS-DS-en-17 Changes to products and services, including those resulting from country-specific requirements, as well as deviations from technical data are subject to change at any time without notice. SMA assumes no liability for typographical or other errors. Please visit www.SMA-Solar.com for the latest information.

Toll Free +1 888 4 SMA USA
www.SMA-America.com

SMA America, LLC

16.3. Fixed Tilt System

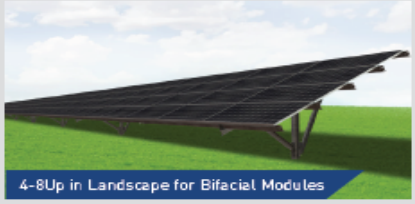
GAMECHANGE SOLAR
REPOWERING THE PLANET

FAST INSTALL + HANDLES SLOPING GROUND

LESS POSTS WITH UNMATCHED SPAN AND UP TO 15% TERRAIN SLOPES

- Supports all poly, glass, and thin film modules
- Rugged design enables 175 mph [78 m/s] wind and 90 psf [4,300 Pa] snow loads
- Pull test and geotech services available
- Galvanized Z purlins have integrated trays for easy wire management
- 10° to 35° tilt with multiple inter-row spacing options

2-4Up in Portrait Single Post System


4-8Up in Landscape for Bifacial Modules

2-4Up in Portrait and 4-8Up in Landscape

East/West Post System

GameChange Solar

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Norwalk, CT, USA
Phone: +1 (203) 769-3900
Fax: +1 (646) 607-2223
gamechangesolar.com
media@gamechangesolar.com

RESEARCH & DEVELOPMENT CENTER
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SERVICE SUPERCENTERS
Lakeland, FL, USA
Mesa, AZ, USA

EUROPE OFFICES
Dublin, Ireland
Zug, Switzerland
Madrid, Spain

ASIA OFFICES
Wuxi, China
Mumbai, India
Dubai, UAE

DISCLAIMER: GameChange Solar provides this documentation without warranty in any form either expressed or implied. GameChange Solar may revise this document at any time without notice.

Rev. 6-29-2021

FEATURES

- Industry's most flexible racking system handles undulating ground conditions
- Three axes of adjustability demanded by installers for navigating real world site conditions where significant adjustability in the field is required
- The unmatched span capability of MaxSpan™ means there are fewer foundations than competing systems, which means less posts and less post installation cost. As few as 180 posts per MW for 2 up in portrait. 130 posts per MW for 3 up in portrait.
- Over 5" [12.7 cm] vertical adjustment for fast top of post leveling
- Up to 4'-0" [122 cm] high ground clearance to allow for snow and vegetation
- 10° to 35° tilt with multiple inter-row spacing options
- Available for framed modules (including First Solar Series 6™) in 2 to 4 portrait and 4 to 8 landscape and for multiple glass on glass module configurations including First Solar Series 4™
- Full layout and engineering analysis for every project
- Integrated grounding and wire management
- WideFlange and roll formed posts available
- South facing and East/West system option
- Single and Dual Post configuration available
- StubPost™ - With adjustable extender to handle rolling ground without grading
  - 35% shorter and lighter stub posts for faster handling and faster post driving
  - Install StubPost™
  - Install extender and base bracket at the same time
- Pre-assembled "Swiss Army Knife" Beam:
  - One worker carry by weight
  - Just bolt it onto post extender, cut zip tie, swing braces and brackets into position, and bolt down
  - All hardware and brackets pre-attached and in assembly kit
  - Super simple staging: one unit replaces previous staging of nuts, bolts, brackets, braces, and beam
- MaxSpan™ with TwistClamps™
  - TwistClamps™ Increase Install Speed 400%
  - 400 modules per worker day versus 100 with nuts and bolts
  - One worker inserts and twists all preassembled TwistClamps™ into purlins
  - Follow-up workers slide modules under TwistClamps™
  - Workers then use torque wrenches to do just one final rotation on the pre-attached serrated flange nyloc nut to reach required torque and simultaneously grounds the module
  - Modules always align even if posts and beams are far out of alignment since workers can slide modules north and south under TwistClamps™
  - No power tools or hardware needed
  - No follow-up torquing operations required

TEST & CERTIFICATION

- Meet IBC and ASCE standards for structural loading
- Electrical bonding with GameChange top mount clamps or star washers included
- ETL / UL 2703 tested (similar to the relevant sections of IEC 61215 & 61730)
- Wind tunnel tested by industry leader CPP
- Independent assessment by Black & Veatch
- Warranty 20 years - Designed and engineered in USA

CALCULATIONS

- PE Stamped Drawings - Design loads according to local building codes: ASCE 7, NBC, Eurocode, AS1170, GB 50009
- 100% code compliant designs for any locality

PULL TEST & GEOTECH

- Vertical and lateral capacity of the post is determined by pull test
- Test data is then analyzed by our in-house engineering team in parallel with geotechnical report to give the most efficient embedment depths, spans and post type

MATERIAL

- Post: G235 [55 µm] galvanized steel (HDG ASTM A123 option also available)
- Galvanized Purlins, NS Beam, Brace: G90 [20 µm] galvanized steel. Standard up to G180 [40 µm] special order.
- Star bolt or ETL / UL top mount teethed module clamp: stainless steel & magnicoat
- Proprietary Integrated Hardware™: For faster structure assembly, module mounting and reduced O&M cost. Oversized Serrated Flange Nyloc Nut and Oversized Flange Star Bolt with integrated star washer eliminates the need for washers and star washers.

16.4. Single Axis Tracker

Nextracker NX Gemini

GENERAL AND MECHANICAL	
Tracking type	Horizontal single-axis, independent row
String voltage	1,500 V_{DC}
Typical row size	112 - 120 modules, depending on module string length
Drive type	NX patent-pending self-locking, distributed drive
Motor type	48 V brushless DC motor
Array height	Rotation axis elevation 1.9 to 2.5 m / 6'2" to 8'2"
Ground coverage ratio (GCR)	Typical range 28-50%
Modules supported	Mounting options available for most utility-scale crystalline modules
Bifacial features	Available with optimized central torque tube gap
Tracking range of motion	±50°
Operating temperature range	Array powered: -20°C to 55°C (-4°F to 131°F) AC powered: -40°C to 55°C (-40°F to 131°F)
Module configuration	2 in portrait. 4 x 1,500 strings per standard tracker. Partial length trackers available.
Module attachment	Self-grounding, electric tool-actuated fasteners standard. Clamping system optional.
Materials	Galvanized steel
Allowable wind speed	Configurable up to 235 kph (145 mph) 3-second gust
Wind protection	Intelligent wind stowing with self-locking, distributed drive system for maximum array stability in all wind conditions
Foundations	Standard W8 section foundation posts. Typically ~160 piers / MW.

ELECTRONICS AND CONTROLS	
Solar tracking method	Astronomical algorithm with backtracking. TrueCapture™ upgrades available for terrain adaptive backtracking and diffuse tracking mode
Control electronics	NX tracker controller with inbuilt inclinometer and backup battery
Communications	Zigbee wireless communications to all tracker rows and weather stations via network control units (NCUs)
Nighttime stow	Yes
Power supply	ARRAY POWERED: NX Integrated DC pre-combiner & power supply AC POWERED: Customer-provided AC circuit

INSTALLATION, OPERATIONS AND SERVICE	
PE stamped structural calculations and drawings	Included
Onsite training and system commissioning	Included
Installation requirements	Simple assembly using swaged fasteners and bolted connections. No field cutting, drilling or welding.
Monitoring	NX Data Hub™ centralized data aggregation and monitoring
Module cleaning compatibility	Compatible with virtually all standard cleaning systems
DC string monitoring	Available with array-powered option
Warranty	10-year structural, 5-year drive and control components
Codes and standards	UL 3703 / UL 2703 / IEC 62817

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6200 Paseo Padre Parkway | Fremont, CA 94555 | USA | +1 510 270 2500 | nextracker.com
MKT-000077-C

Annex I Environmental Impacts Narrative

The Project retained Timmons Group to conduct a full desktop analysis of potential environmental impacts in line with County Solar Ordinance requirements. The results are as follows:

Timmons Group has completed a desktop environmental impact review of the Dogwood Lane Solar project for a proposed solar electric power generation facility. The project is located on approximately 31.2 acres and is located in Lunenburg County, Virginia (see Figure 1: County Map). The study was developed as a preliminary planning tool to help identify potential constraints to assist in developing the proposed Dogwood Lane Solar facility (Site). The study consists of an analysis on the potential impacts of the Site on the environment, including water and air quality.

I. Water Quality Review

A limited water quality review was conducted to gain insight regarding the existing water quality in the vicinity of the Site using information retrieved from the U.S. Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (DEQ). EPA's How's My Waterway? Tool was quiered for information about Big Hounds Creek, the closest waterway to the Site. Immediately adjacent to the Site is an unsegmented portion of Watershed K14 (Waterbody Report included as Attachment 1), which has generally not been assessed. There are no probable sources of impairment identified for this waterbody. The closest waterbody that has been assessed is Big Hounds Creek (Waterbody Report included as Attachment 2), which is impaired. The impairment is for benthic macroinvertebrates and excessive *E. coli*. EPA has listed probable sources of impairment, including livestock, municipal point source discharges, unspecified domestic waste, pet waste, and wildlife other than waterfowl. Therefore, while no sampling has occurred on the Site, and while there is no publicly-available information about the immediate vicinity, there is some indication of contamination in the larger watershed.

Information from the Virginia Department of Conservation and Recreation (DCR) was obtained through a project review of the Natural Heritage Database Review (NHDE) (Attachment 3). No natural heritage resources were identified on the Site, and there are no protected lands indicated.

As a means of development, wetlands and streams on Site will be delineated. Assuming that delineated features (if present) will be avoided and/or impacts minimized, and that best management practices (BMPs) will be followed during construction/operation, the facility is not expect to impact on-site water resources. Based upon the desktop review of the surrounding area, impacts to water resources in the vicinity are also not expected as a result of the facility.

II. Air Quality Review

DEQ's Environmental Data Mapper was quiered to obtain information about air quality in the vicinity of the Site. Information regarding air quality was obtained, specifically showing active air sites and air facilities (facilities regulated by the state). There are three facilities operating along Main Street/Route 40 that are in the "true minor" category, meaning the facilities emit regulated pollutants in a minor category threshold. Two of the facilities are associated with a tobacco company, and the third is associated with pest control

products (Attachment 4). It is unlikely that the Site would affect, or be affected by, any of these regulated entities.

The facility, if it were to be built, would have no negative impact on ambient air quality. Indeed, compared with traditional fossil-fuel methods of generating electricity, the facility will avoid negative air quality impacts. EPA's Avoided Emissions and Generation Tool (AVERT)[1] was utilized to calculate the potential beneficial air quality impacts if the Site proceeds. Avoided emissions data was calculated using Mid-Atlantic Regional data assuming a 5 MW project. Annual avoided impacts are as follows:

Pollutant	Annual avoided impacts (lb)
Sulfur Dioxide (SO_2)	-10,780
Nitrous Oxide (NO_X)	-7,060
Particulate Matter ($PM_{2.5}$)	-920
Volatile Organic Compounds (VOCs)	-190

III. Summary and Conclusions

We have conducted a limited desktop review of water and air quality at the Site. Generally speaking, water quality is unknown in the immediate vicinity of the Site, and impaired surface water exists in the larger watershed. On-site water resources (if present) can be protected through avoidance and minimization of potential impacts to streams and wetlands, as well as the use of BMPs during construction and operation of the facility. Additionally, implementing the planned project will reduce air pollution, compared with traditional fossil-fuel burning methods to generate electricity.

We appreciate the opportunity to present this preliminary analysis for planning purposes. Please note that DCR recommends re-accessing the NHDE database every six months for current information.

If you have any questions, please contact me at (804) 200-6577 or julia.jenkins@timmons.com.

Sincerely,

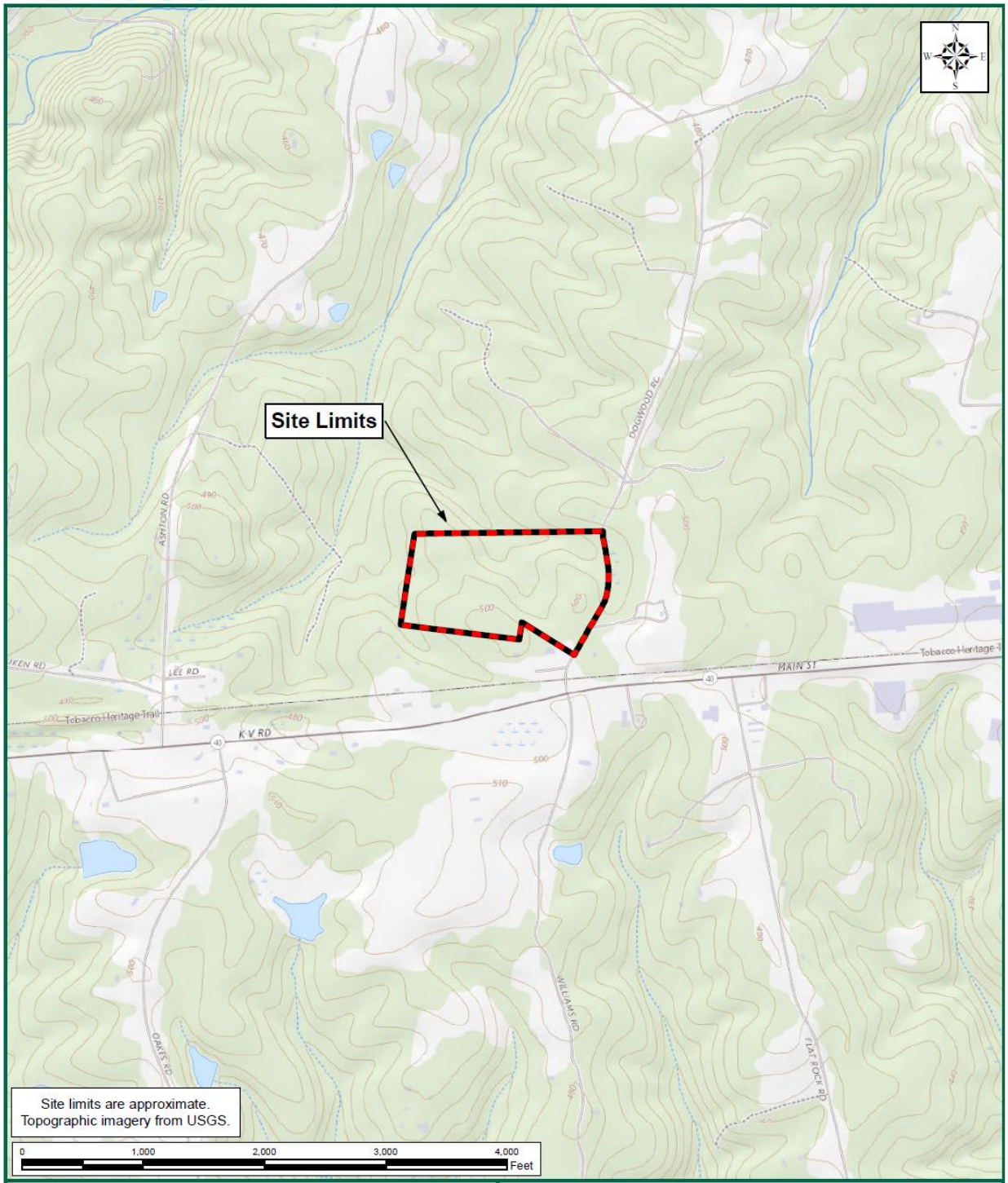
Julia Jenkins

Julia Jenkins

Attachments

Figure 1	Vicinity Map
Figure 2	Overview of DEQ's 'How's My Waterway?' Watershed
Attachment 1	Waterbody Report – Unsegmented Portion of Watershed K14
Attachment 2	Waterbody Report – Big Hounds Creek
Attachment 3	DCR Project Review
Attachment 4	DEQ – EDM – Active Air Sites

Path: Y:\852\99999-Dogwood_Lane_Apex\GIS\VIC.mxd



DOGWOOD LANE SOLAR
LUNENBURG, VIRGINIA
FIGURE 1: VICINITY MAP

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP JOB NUMBER:*41659.081*
PROJECT STUDY LIMITS:*31.24 ACRES*
LATITUDE:*36.968127*
LONGITUDE:*-78.161389*

U.S.G.S. QUADRANGLE(S):*KENBRIDGE WEST*
DATE(S):*2019*
WATERSHED(S):*NOTTOWAY (ALBEMARLE-CHOWAN RIVER BASIN)*
HYDROLOGIC UNIT CODE(S):*03010201*

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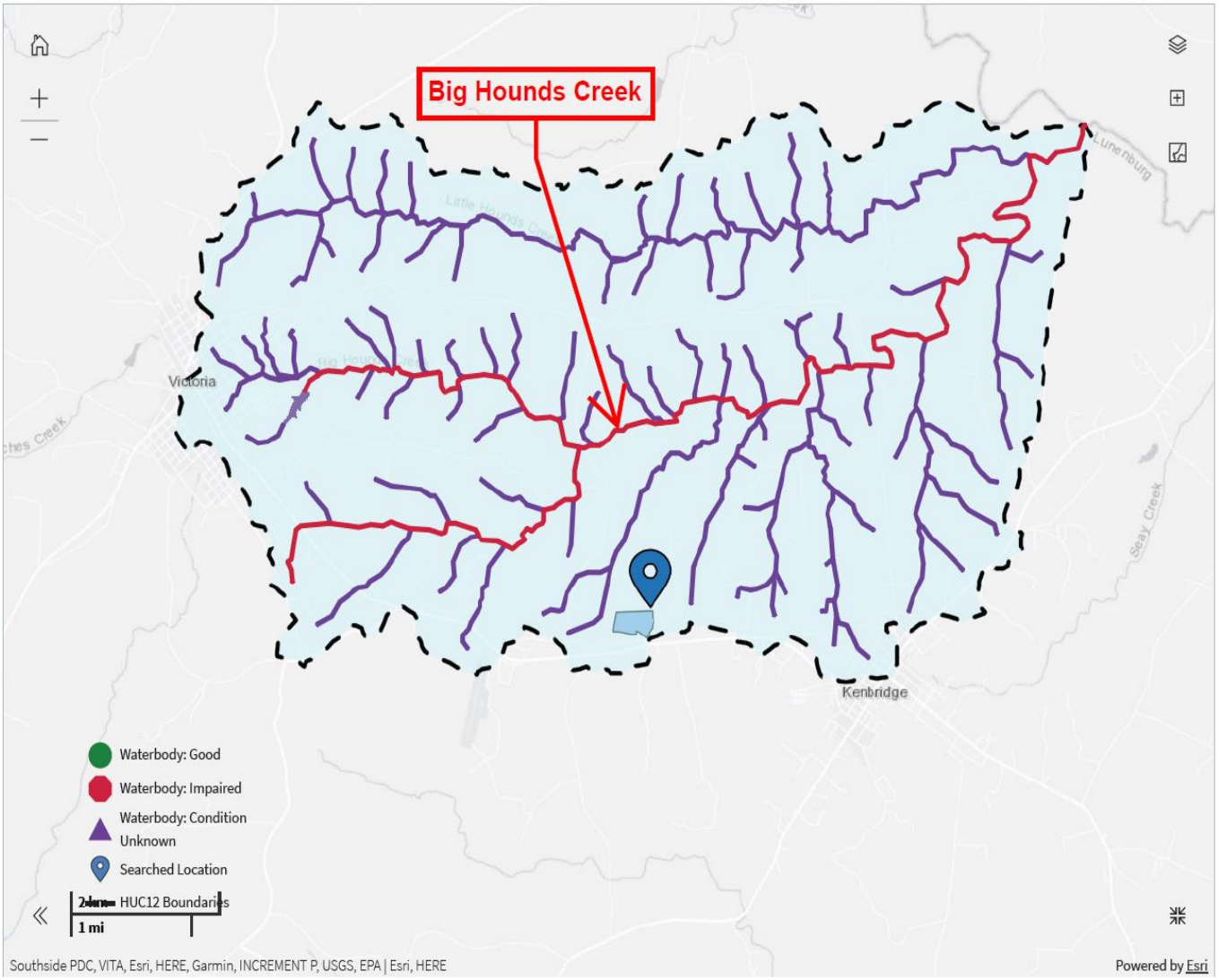
Glossary Data About Contact Us

How's My Waterway?

Informing the conversation about your waters.

Community | State | National



Attachment 1 Waterbody Report – Unsegmented Portion of Watershed K14

Waterbody Report

Unsegmented Portion of Watershed K14
Assessment Unit ID: VAP-K14R_ZZZ01B14

Waterbody Condition: Condition Unknown

Existing Plans for Restoration: No

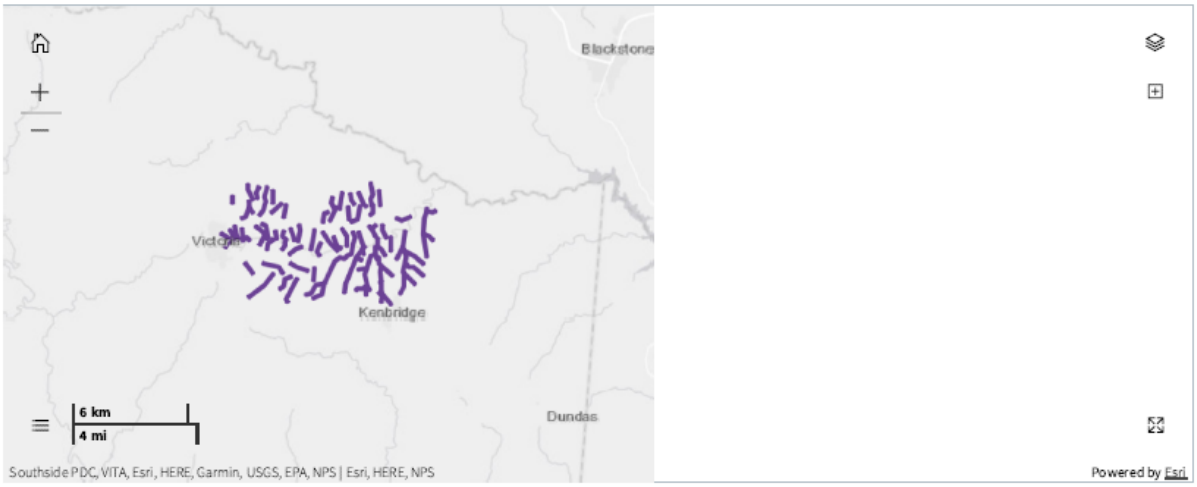
303(d) Listed: No

Year Reported: 2020

Organization Name (ID): Virginia (21VASWCB)

What type of water is this?
River (44.86 Miles)

Where is this water located?
Unnamed tributaries to Big Hounds Creek in CU03



Assessment Information from 2020

What is this water used for?

Collapse All

Aquatic Life Not Assessed

Impairments Evaluated
No impairments evaluated for this use.

Other Parameters Evaluated
No other parameters evaluated for this use.

Fish Consumption Not Assessed

Impairments Evaluated

No impairments evaluated for this use.

Other Parameters Evaluated

No other parameters evaluated for this use.

Recreation Not Assessed

Impairments Evaluated

No impairments evaluated for this use.

Other Parameters Evaluated

No other parameters evaluated for this use.

Wildlife Not Assessed

Impairments Evaluated

No impairments evaluated for this use.

Other Parameters Evaluated

No other parameters evaluated for this use.

Probable sources contributing to impairment from 2020:

No probable sources of impairment identified for this waterbody.

Plans to Restore Water Quality

What plans are in place to protect or restore water quality?

No plans for this waterbody.

Attachment 2 Waterbody Report – Big Hounds Creek

Glossary Data About Contact Us

How's My Waterway?

Informing the conversation about your waters.

Waterbody Report

Big Hounds Creek
Assessment Unit ID: VAP-K14R_BHC01B98

Waterbody Condition: Impaired

Existing Plans for Restoration: Yes

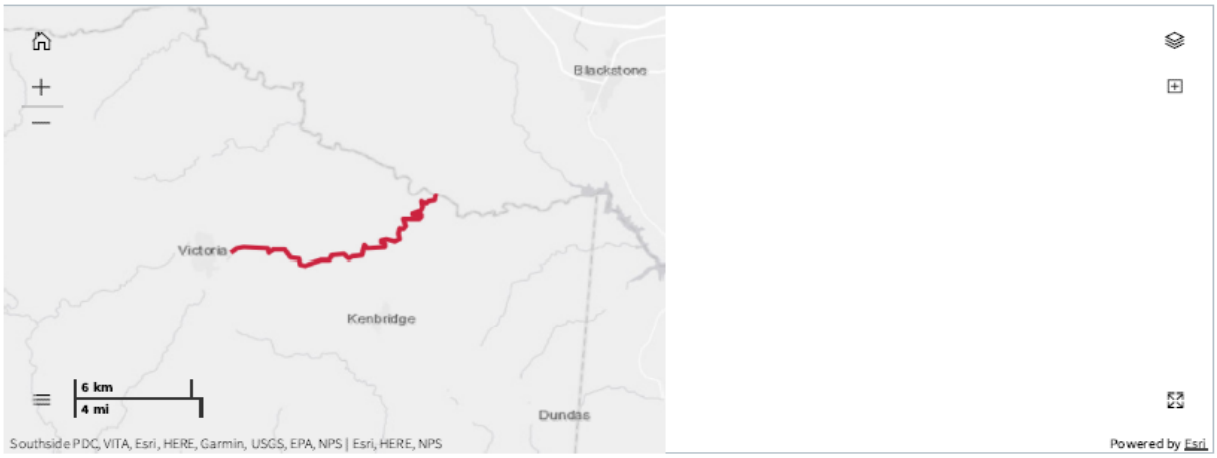
303(d) Listed: Yes

Year Reported: 2020

Organization Name (ID): Virginia (21VASWCB)

What type of water is this?
River (10.34 Miles)

Where is this water located?
From Lunenburg Lake dam to the Nottoway River.



Assessment Information from 2020

What is this water used for?

Collapse All

Aquatic Life Impaired

Impairments Evaluated

Impairment	Plan in Place
Benthic Macroinvertebrates Bioassessments	No

Other Parameters Evaluated
No other parameters evaluated for this use.

Fish Consumption Not Assessed

Impairments Evaluated

No impairments evaluated for this use.

Other Parameters Evaluated

No other parameters evaluated for this use.

Recreation Impaired

Impairments Evaluated

Impairment	Plan in Place
Escherichia Coli (E. coli)	Yes

Other Parameters Evaluated

No other parameters evaluated for this use.

Wildlife Not Assessed

Impairments Evaluated

No impairments evaluated for this use.

Other Parameters Evaluated

No other parameters evaluated for this use.

Probable sources contributing to impairment from 2020:

Source	Confirmed
Livestock (Grazing or Feeding Operations)	Yes
Municipal Point Source Discharges	Yes
Source Unknown	No
Unspecified Domestic Waste	Yes
Wastes From Pets	Yes
Wildlife Other Than Waterfowl	Yes

Plans to Restore Water Quality

What plans are in place to protect or restore water quality?

Links below open in a new browser tab.

Plan	Impairments	Type	Date
Big Hounds Creek	Escherichia Coli (E. coli), Fecal Coliform	TMDL	2005-10-14

Attachment 3 DCR Project Review

Department of Conservation & Recreation
CONSERVING VIRGINIAS NATURAL & RECREATIONAL RESOURCES

Web Project ID: WEB0000016773

Client Project Number: 99999

PROJECT INFORMATION

TITLE: Dogwood Solar Lunenburg

DESCRIPTION: Dogwood Solar is a proposed solar facility in Lunenberg County.

EXISTING SITE CONDITIONS: recently timbered

QUADRANGLES: Kenbridge West

COUNTIES: Lunenburg

Latitude/Longitude (DMS): 36° 58' 7.9581" N / 78° 9' 41.8329" W

Acreage: 30 acres

Comments:

REQUESTOR INFORMATION

Priority: N | **Tier Level:** Tier I | **Tax ID:** 54-1301413

Contact Name: Julia Jenkins

Company Name: Timmons Group

Address: 1001 Boulders Pkwy Ste 300

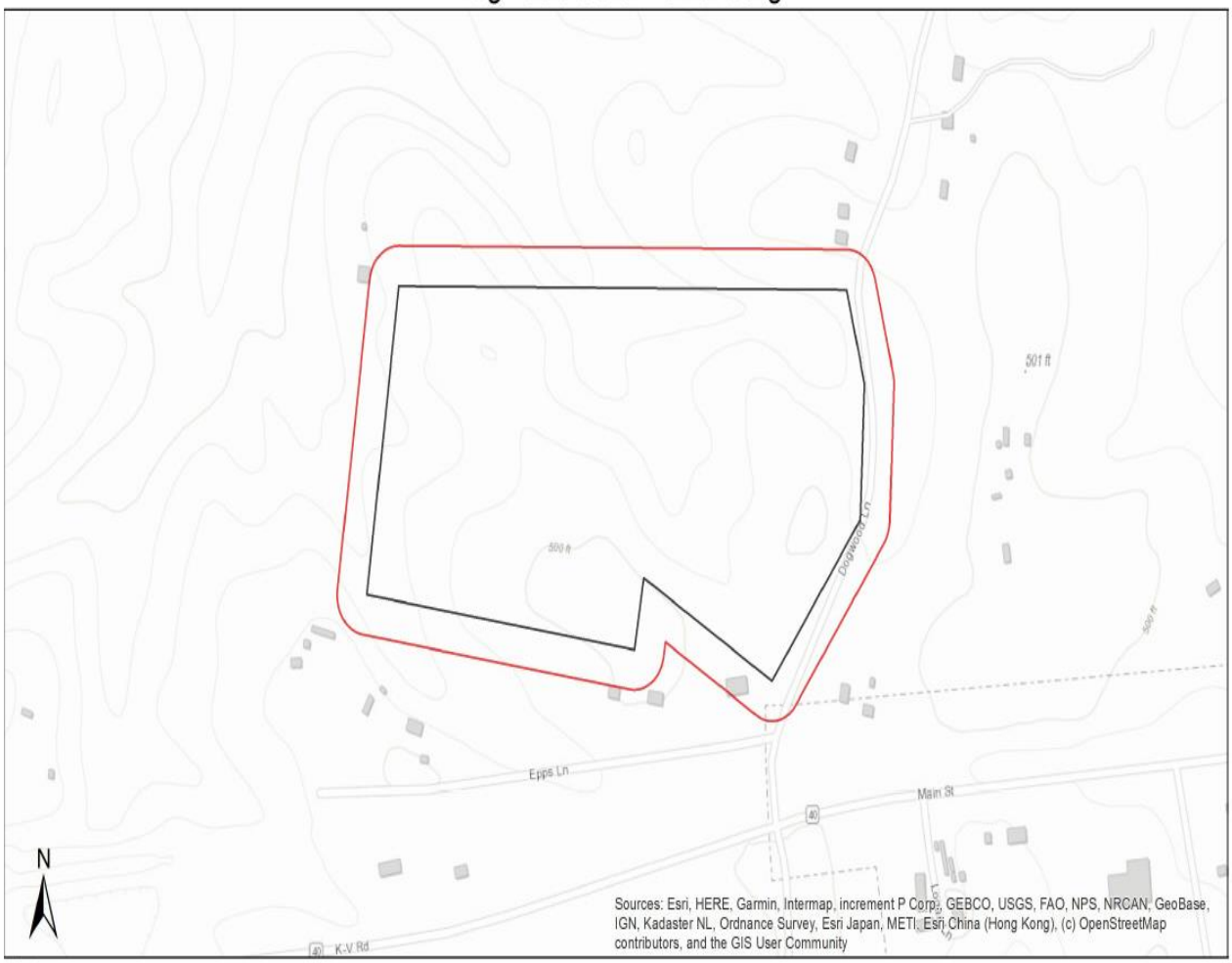
City: Richmond | **State:** VA | **Zip:** 23225

Phone: 8042006577 | **Fax:** | **Email:** julia.jenkins@timmons.com

Conservation Site	Site Type	Brank	Acreage	Listed Species Presence	Essential Conservation Site?
Natural Heritage Screening Features Intersecting Project Boundary					

Intersecting Predictive Models
Predictive Model Results

Dogwood Solar Lunenburg



Project Boundary

Buffered Project Boundary

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

Quads: Kenbridge West

Counties: Lunenburg

Company: Timmons Group

Lat/Long: 365807 / -780941

Ann Jennings
Secretary of Natural and Historic Resources and Chief
Resilience Officer

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

The project mapped as part of this report has been searched against the Department of Conservation and Recreation's Biotics Data System for occurrences of natural heritage resources in the vicinity of the area indicated for this project. 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. In addition, the project area does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (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.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks additional natural heritage resources. New and updated information is continually added to Biotics. Please revisit this website or contact DCR for an update on this natural heritage information if a significant amount of time passes (DCR recommends no more than six months) before it is utilized.

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

Thank you for submitting your project to the Virginia Department of Conservation and Recreation's Natural Heritage Data Explorer Web Service. Based on the preliminary screening results for this project, no further correspondence will be sent from this office. Should you have any questions or concerns about this report, the Data Explorer, or other Virginia Natural Heritage Program services, please contact the Natural Heritage Project Review Unit at 804-371-2708.

Attachment 4 DEQ – EDM – Active Air Sites

Environmental Data Mapper Air Layers

12/7/2021, 1:58:04 PM

ProjLimits Active Air Sites (Daily)

Major/Potential Major

Synthetic Minor

True Minor

1:36,112

0 0.25 0.5 1 mi

0 0.38 0.75 1.5 km

Virginia Department of Environmental Quality, This EPA Geospatial data set is generated from the following national environmental programs: Superfund National Priorities List (NPL) from the Superfund Enterprise Management System (SEMS); Resource Conservation and Recovery Act (RCRA); Air Facility

Provided by Virginia Department of Environmental Quality

Terms of use: https://geohub-vadeq.hub.arcgis.com/pages/terms-of-use

Annex II Wildlife Impacts Narrative

The Project retained Timmons Group to conduct a full desktop analysis of potential wildlife impacts in line with County Solar Ordinance requirements. The results are as follows:

Timmons Group has completed a desktop review of the Dogwood Lane Solar project for a proposed solar electric power generation facility. The project is located on approximately 31.2 acres and is located in Lunenburg County, Virginia (see Figure 1: County Map). The study was developed as a preliminary planning tool to help identify potential constraints to assist in developing the proposed Dogwood Lane Solar facility (Site). The study consists of desktop database searches, providing a comprehensive review of publicly available environmental mapping and database resources to identify local, state, and federally regulated resources that have the potential to significantly impact the feasibility of the Site.

I. Threatened and Endangered Species Database Search

An endangered species review was conducted to gain insight regarding the potential presence of Endangered Species Act (ESA) listed species as well as State listed species onsite or in the vicinity of the Site. The following agencies and associated databases were reviewed for threatened and endangered species:

- U.S. Fish and Wildlife Services (USFWS) – Information, Planning and Consultations system (IPaC)
- Virginia Department of Wildlife Resources (VDWR) – Wildlife Environmental Review Map Service (WERMS)
- Virginia Department of Wildlife Resources (VDWR) – Virginia Fish and Wildlife Information Service (VaFWIS)
- Virginia Department of Wildlife Resources (VDWR) – Northern Long Eared Bat (NLEB) Winter Habitat and Roost Tree Locator
- Virginia Department of Wildlife Resources (VDWR) – Little Brown Bat and Tri-colored Bat Winter Habitat & Roosts Locator
- Virginia Department of Conservation and Recreation (VDCR) – Natural Heritage Data Explorer (NHDE)
- Virginia Department of Environmental Quality (VDEQ) – Coastal Geospatial and Education Mapping System (GEMS)
- Center for Conservation Biology (CCB) – VaEagles Nest Locator
- U.S. Fish and Wildlife Services (USFWS) – Bald Eagle Concentration Areas

The comprehensive database search determined there is the potential for one species with federal and state protection to occur within the project area (see Attachment 1: Threatened and Endangered Database Searches). The potentially present species and their associated databases are listed below in Table 1.

Table 1. Threatened and Endangered Species Potentially Present at Dogwood Lane Solar

Common Name	Scientific Name	Status	Agency Source
Mammal			
Northern Long-eared Bat	*Myotis septentrionalis*	Federal Threatened State Threatened	USFWS
Butterfly			
Monarch Butterfly	*Danaus plexippus*	Candidate	USFWS

According to the USFWS IPaC results, the federally and state threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*) has the potential to occur on the Site. Based upon a review of available information, in particular the VDWR NLEB Winter Habitat and Roost Tree Locator, there are no known maternity roosts or hibernacula located within or in close proximity to the Site. Therefore, the Site will not likely affect any known NLEB areas and additional coordination with USFWS regarding this species is not anticipated. The Site may choose to implement voluntary conservation measures by conducting tree removal activities outside of the active season (April 15 – September 15) and/or outside of the pup season (June 1 – July 31). However, under the NLEB final 4(d) rule, the USFWS reserves the right to request additional studies or information during consultation with federal permitting agencies.

According to the USFWS IPaC results, the monarch butterfly (*Danaus plexippus*) has the potential to occur on the Site. The monarch butterfly is a candidate species, but it is not currently listed as federally or state threatened or endangered. Monarch butterflies are found across North America and are broken into two populations separated by the Rocky Mountains. Milkweed is the host plant of this species, and the monarch butterfly relies on this plant to complete its lifecycle. As the species is not listed as threatened or endangered, there is no time of year restrictions for this species, but USFWS recommends protective measures to enhance the butterfly habitat, including planting pollinator habitat.

According to the VDWR Little Brown Bat and Tri-colored Bat Winter Habitat & Roosts Locator, the little brown bat (*Myotis lucifugus*) and tri-colored bat (*Perimyotis subflavus*) do not have hibernacula within range of the Site.

According to VDCR results, there are no known natural heritage resource that occur onsite. The Project will not affect any documented state-listed plants or insects.

Information provided by VDEQ Coastal GEMS indicates that the Project is not located in part or in whole within a Coastal Area Protection Zone (CAPZ).

A search of known bald eagle nest locations/concentration areas utilizing the VDWR VaFWIS database, the CCB website, and USFWS Bald Eagle Concentration Areas mapping tool indicates there are no bald eagle nests or bald eagle concentration designated areas near the vicinity of the Site.

II. Summary and Conclusions

We have conducted queries of federal and state databases for the presence of threatened and endangered species.

If work is proposed in wetlands or waters of the U.S., then Section 401 and Section 404 Clean Water Act Permits will be required. Submittal of a Section 404 Clean Water Act Permit will provide a federal nexus

that will trigger a review of threatened and endangered species that could further impose timeline restrictions or reduce the developable footprint of the project.

The Site may choose to implement voluntary conservation measures for the Northern Long Eared Bat by conducting tree removal activities outside of the active season (April 15 – September 15) and/or outside of the pup season (June 1 – July 31). The monarch butterfly also has the potential to be present within the vicinity of the Site; however, this species is not listed and has no time of year restriction.

We appreciate the opportunity to present this preliminary analysis for planning purposes. Please note that threatened and endangered database searches must be current (data accessed within six months) to be considered by reviewing agencies.

If you have any questions, please contact me at (804) 200-6577 or julia.jenkins@timmons.com.

Sincerely,

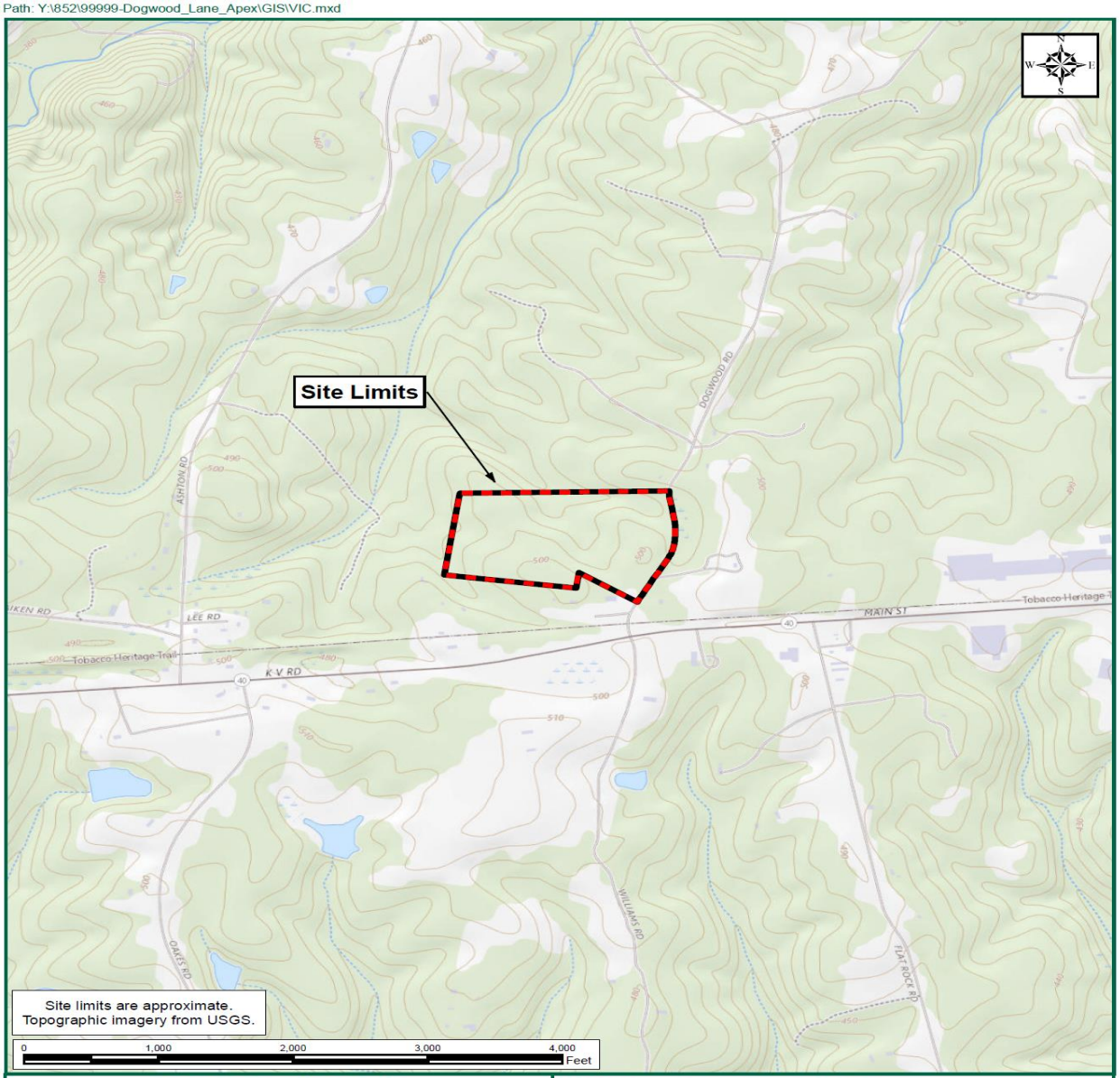
Julia Jenkins

Attachments

Figure 1 Vicinity Map

Attachment 1 Threatened and Endangered Species Database Searches

Path: Y:\852\99999-Dogwood_Lane_Apex\GIS\VIC.mxd



DOGWOOD LANE SOLAR
LUNENBURG, VIRGINIA
FIGURE 1: VICINITY MAP

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP JOB NUMBER:*41659.081*
PROJECT STUDY LIMITS:*31.24 ACRES*
LATITUDE:*36.968127*
LONGITUDE:*-78.161389*

U.S.G.S. QUADRANGLE(S):*KENBRIDGE WEST*
DATE(S):*2019*
WATERSHED(S):*NOTTOWAY (ALBEMARLE-CHOWAN RIVER BASIN)*
HYDROLOGIC UNIT CODE(S):*03010201*

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Attachment 1: Threatened and Endangered Species Database Searches

U.S. Fish and Wildlife Services (USFWS) – Information, Planning and Consultations System (IPaC)

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Lunenburg County, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NOT FOR CONSULTATION

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	**Threatened**

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	**Candidate**

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

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Kentucky Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

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Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in

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my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

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Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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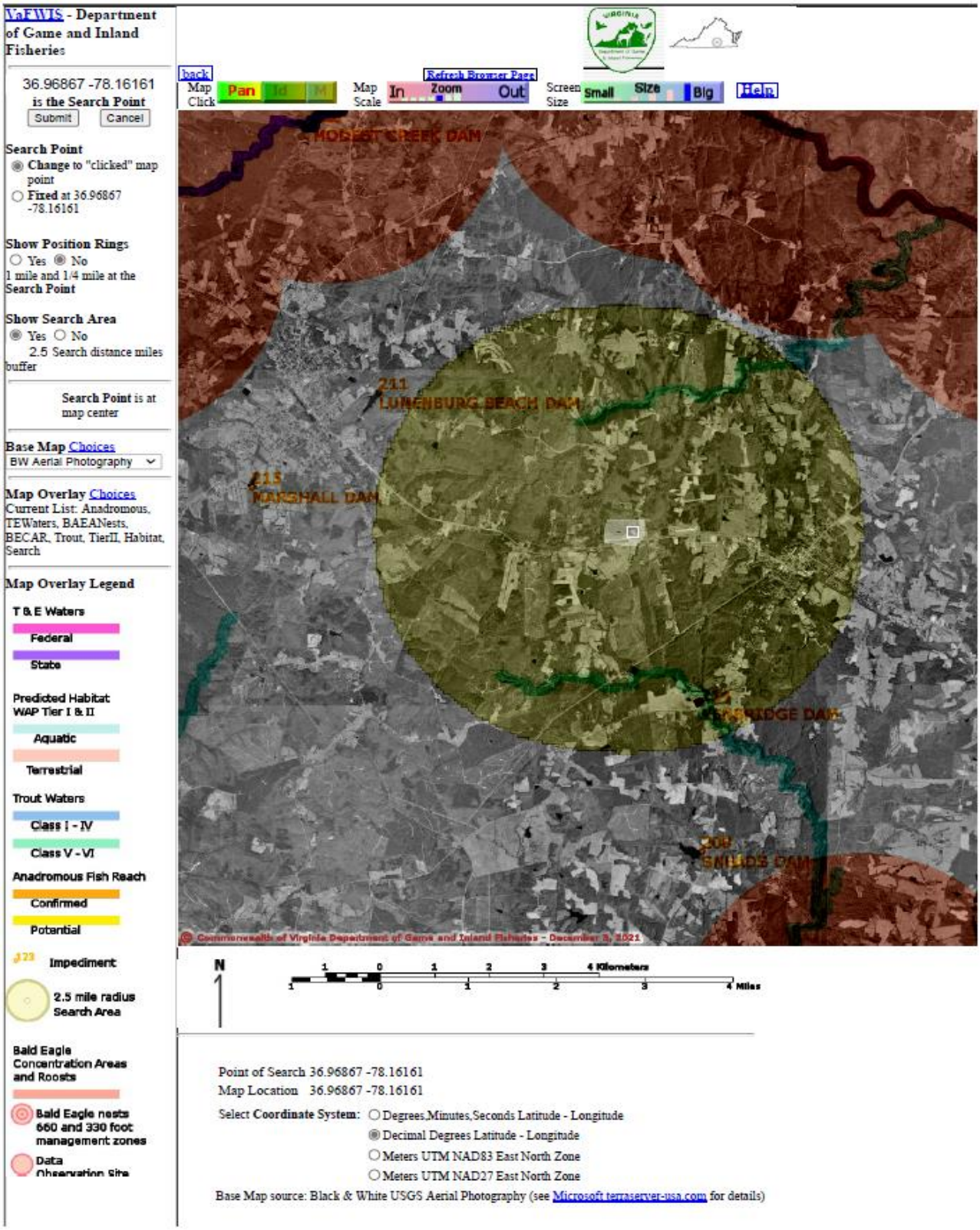
Virginia Department of Wildlife Resources (VDWR) – Wildlife Environmental Review Map Service (WERMS)

Species Observed within Two Miles		
Common Name	Federal Status	State Status
Dace, mountain redbelly	NT/NE	NT/NE
Madtom, margined	NT/NE	NT/NE
Sucker, white	NT/NE	NT/NE
Chub, bluehead	NT/NE	NT/NE
Darter, johnny	NT/NE	NT/NE
Bluegill	NT/NE	NT/NE
Darter, glassy	NT/NE	NT/NE
Chub, creek	NT/NE	NT/NE
Redhorse, golden	NT/NE	NT/NE
Dace, blacknose	NT/NE	NT/NE
Sunfish, green	NT/NE	NT/NE
Dace, rosyside	NT/NE	NT/NE
Darter, fantail	NT/NE	NT/NE
Warmouth	NT/NE	NT/NE
Sunfish, redbreast	NT/NE	NT/NE
Shiner, highfin	NT/NE	NT/NE
Eel, American	NT/NE	NT/NE
Perch, pirate	NT/NE	NT/NE
Darter, Roanoke	NT/NE	NT/NE
Shiner, golden	NT/NE	NT/NE
Shiner, crescent	NT/NE	NT/NE
Chubsucker, creek	NT/NE	NT/NE
Bullhead, flat	NT/NE	NT/NE
Bullhead, yellow	NT/NE	NT/NE
Mosquitofish, eastern	NT/NE	NT/NE
Shiner, swallowtail	NT/NE	NT/NE
Redhorse, notchlip	NT/NE	NT/NE
Shiner, white	NT/NE	NT/NE
Bass, largemouth	NT/NE	NT/NE
Shad, gizzard	NT/NE	NT/NE
Darter, tesselated	NT/NE	NT/NE
Darter, shield	NT/NE	NT/NE
Sumprock, black	NT/NE	NT/NE
Chub, bull	NT/NE	NT/NE
Shiner, satinfin	NT/NE	NT/NE
Mussel, eastern elliptio	NT/NE	NT/NE
Bullfrog, American	NT/NE	NT/NE
NT = Non-Threatened, NE = Non-Endangered		

Virginia Department of Wildlife Resources (VDWR) – Virginia Fish and Wildlife Information Service (VaFWIS)



Map projection is UTM Zone 17 NAD 1983 with left 744681 and top 4103163. Pixel size is 14. . Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 16000 meters east to west by 16000 meters north to south for a total of 256.0 square kilometers. The map display represents 52502 feet east to west by 52502 feet north to south for a total of 98.8 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2021-12-03 09:42:12 (qa/qc March 21, 2016 12:20 - tm=1151154 dist=4022.5 I)
$poi=36.9680000 -78.1591000

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VaFWIS Initial Project Assessment Report Compiled on 12/3/2021, 9:43:26 AM

Help

Known or likely to occur within a **2.5 mile buffer around polygon; center 36.9680000 -78.1590999** in **111 Lunenburg County, VA**

View Map of Site Location

395 Known or Likely Species ordered by Status Concern for Conservation (displaying first 21) (21 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA,Habitat
010214	FESE	IIa	Logperch, Roanoke	Percina rex		BOVA,Habitat
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040385	ST	Ia	Sparrow, Bachman's	Peucaea aestivalis		BOVA
060173	FPST	Ia	Pigtoe, Atlantic	Fusconaia masoni		BOVA,Habitat
060081	ST	IIa	Floater, green	Lasmigona subviridis		BOVA
010070	ST	IIc	Shiner, whitemouth	Notropis alborus		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA
010174		Ia	Bass, Roanoke	Ambloplites cavifrons		BOVA,Habitat
020002		IIa	Treefrog, barking	Hyla gratiosa		BOVA
040052		IIa	Duck, American black	Anas rubripes		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA
040140		IIa	Woodcock, American	Scolopax minor		BOVA
060071		IIa	Lampmussel, yellow	Lampsilis cariosa		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA

To view **All 395 species** View 395

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need;
IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

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)

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

Stream Name	Tier Species		View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name	
Big Hounds Creek (03010201)	FESE	010214 FESE IIa Logperch, Roanoke Percina rex	Yes
		060003 FESE Ia Wedgemussel, dwarf Alasmidonta heterodon	
		060173 FPST Ia Pigtoe, Atlantic Fusconaia masoni	
Flat Rock Creek	FPST	010174 Ia Bass, Ambloplites	Yes

(03010204)					Roanoke	cavifrons	
		060173	FPST	Ia	Pigtoe, Atlantic	Fusconaia masoni	
tributary (03010201)	FESE	010214	FESE	IIa	Logperch, Roanoke	Percina rex	Yes
		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
		060173	FPST	Ia	Pigtoe, Atlantic	Fusconaia masoni	
tributary (03010201)	FESE	010214	FESE	IIa	Logperch, Roanoke	Percina rex	Yes
		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
		060173	FPST	Ia	Pigtoe, Atlantic	Fusconaia masoni	

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Public Holdings:

N/A

Compiled on 12/3/2021, 9:43:26 AM I1151154.0 report=IPA searchType= P dist= 4022 poi= 36.9680000 -78.1590999 siteDD= 36.9680037 -78.1591008;36.9679332 -78.1591399;36.9679296 -78.1591574;36.9679293 -78.1591576;36.9678834 -78.1591916;36.9678209 -78.1592379;36.9676283 -78.1593783;36.9675194 -78.1594566;36.9674102 -78.1595341;36.9673008 -78.1596110;36.9672199 -78.1596672;36.9679628 -78.1611494;36.9675745 -78.1612220;36.9675720 -78.1612224;36.9676314 -78.1618011;36.9678301 -78.1637396;36.9679149 -78.1645674;36.9686728 -78.1644172;36.9686749 -78.1644168;36.9699667 -78.1641607;36.9699767 -78.1641587;36.9700078 -78.1597282;36.9700139 -78.1588430;36.9700040 -78.1588441;36.9699837 -78.1588457;36.9699633 -78.1588465;36.9699430 -78.1588467;36.9699227 -78.1588461;36.9699024 -78.1588447;36.9698720 -78.1588413;36.9695791 -78.1587759;36.9693845 -78.1587334;36.9692251 -78.1586996;36.9691862 -78.1586963;36.9691473 -78.1586937;36.9691083 -78.1586917;36.9690694 -78.1586906;36.9690304 -78.1586902;36.9689914 -78.1586906;36.9689524 -78.1586916;36.9689135 -78.1586934;36.9688746 -78.1586960;36.9688357 -78.1586993;36.9687968 -78.1587033;36.9687580 -78.1587081;36.9687193 -78.1587136;36.9686966 -78.1587173;36.9686807 -78.1587199;36.9686421 -78.1587268;36.9686036 -78.1587345;36.9685479 -78.1587333;36.9685241 -78.1587624;36.9685005 -78.1587721;36.9684772 -78.1587826;36.9684540 -78.1587937;36.9684310 -78.1588035;36.9684083 -78.1588179;36.9683858 -78.1588311;36.9683636 -78.1588449;36.9683416 -78.1588594;36.9683200 -78.1588745;36.9681854 -78.1589721;36.9680037 -78.1591008;

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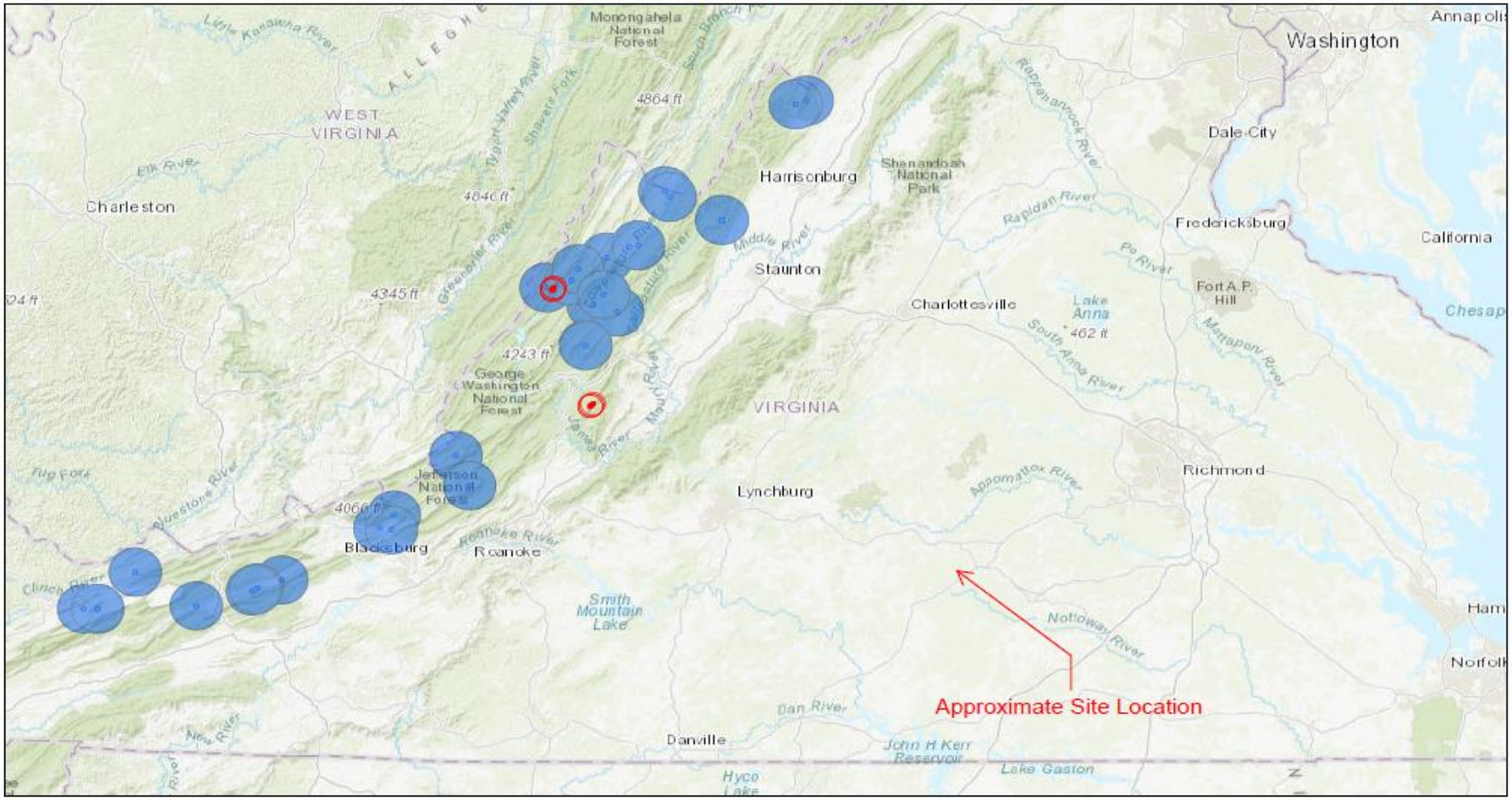
Virginia Department of Wildlife Resources (VDWR) – Northern Long Eared Bat (NLEB) Winter Habitat and Roost Tree Locator

NLEB Locations and Roost Trees



12/3/2021, 9:49:00 AM

- NLEB Known Occupied Maternity Roost (Summer Habitat)
- NLEB Hibernaculum 5.5 Mile Buffer
- NLEB Hibernaculum Half Mile Buffer

1:2,311,162

0 15 30 60 mi

0 25 50 100 km

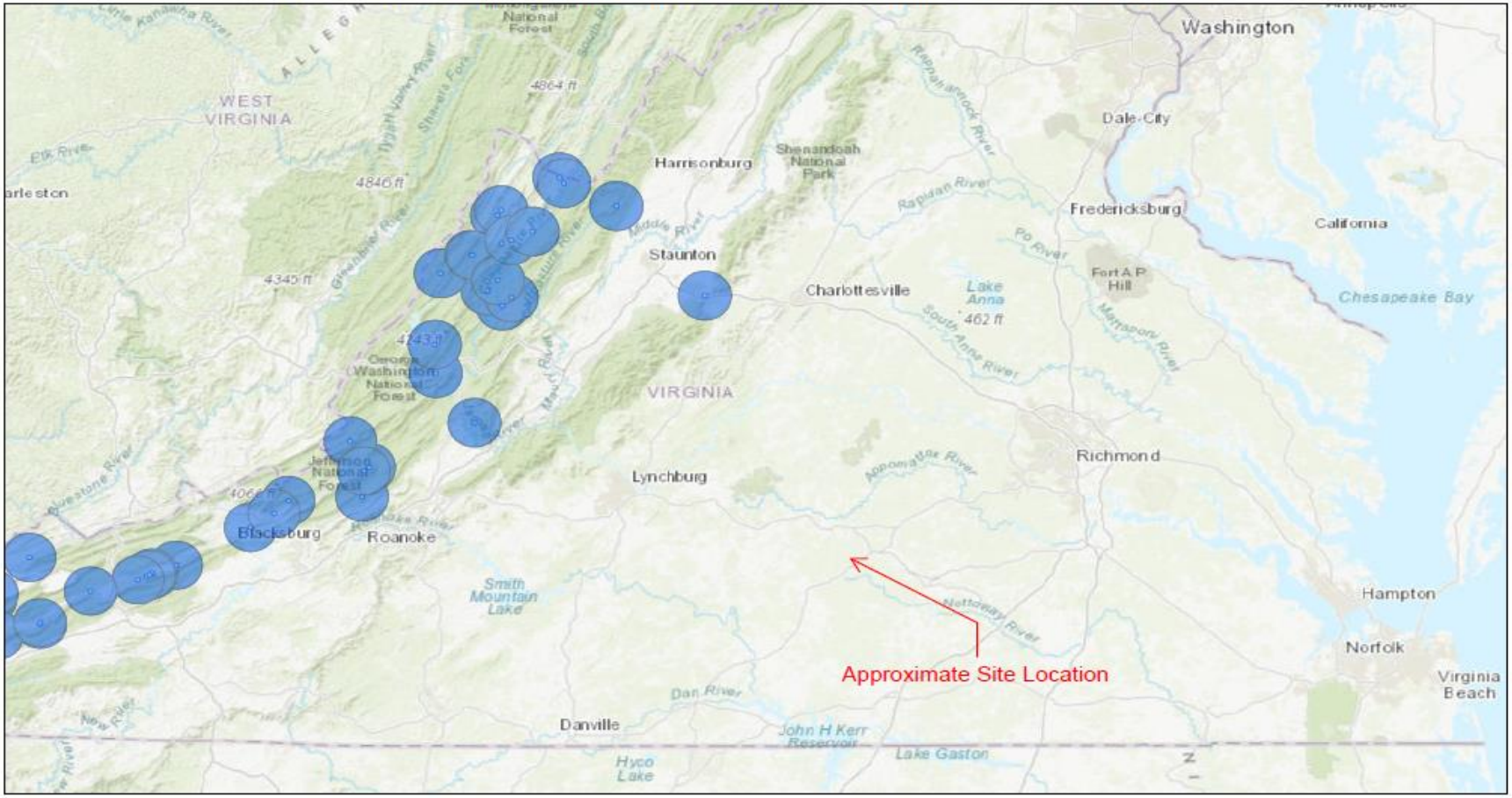
Esri, HERE, Garmin, FAO, USGS, EPA, NPS

VA Dept. Game & Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, EPA, NPS |

Virginia Department of Wildlife Resources (VDWR) – Little Brown Bat and Tri-colored Bat Winter Habitat & Roosts Locator

Tri-Colored and Little Brown Bat Locations and Roost Trees



12/3/2021, 9:51:41 AM

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:2,311,162

0 15 30 60 mi

0 25 50 100 km

Esri, HERE, Garmin, FAO, USGS, EPA, NPS

Dept. Game and Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, EPA, NPS |

Virginia Department of Conservation and Recreation (VDCR) – Division of Natural Heritage (DNH) Project Review

Department of Conservation & Recreation
CONSERVING VIRGINIAS NATURAL & RECREATIONAL RESOURCES

Web Project ID: WEB0000016773

Client Project Number: 99999

PROJECT INFORMATION

TITLE: Dogwood Solar Lunenburg

DESCRIPTION: Dogwood Solar is a proposed solar facility in Lunenberg County.

EXISTING SITE CONDITIONS: recently timbered

QUADRANGLES: Kenbridge West

COUNTIES: Lunenburg

Latitude/Longitude (DMS): 36° 58' 7.9581" N / 78° 9' 41.8329" W

Acreage: 30 acres

Comments:

REQUESTOR INFORMATION

Priority: N **Tier Level:** Tier I **Tax ID:** 54-1301413

Contact Name: Julia Jenkins

Company Name: Timmons Group

Address: 1001 Boulders Pkwy Ste 300

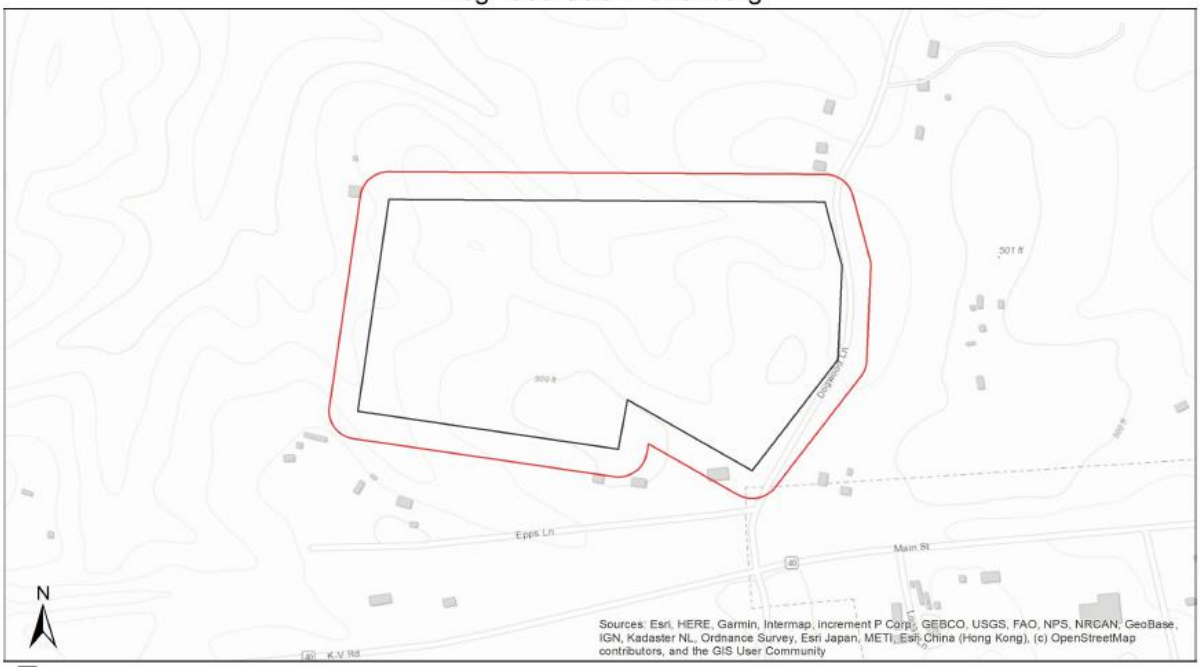
City: Richmond **State:** VA **Zip:** 23225

Phone: 8042006577 **Fax:** **Email:** julia.jenkins@timmons.com

Conservation Site	Site Type	Brank	Acreage	Listed Species Presence	Essential Conservation Site?
Natural Heritage Screening Features Intersecting Project Boundary					

Intersecting Predictive Models
Predictive Model Results

Dogwood Solar Lunenburg



Project Boundary

Buffered Project Boundary

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

Quads: Kenbridge West

Counties: Lunenburg

Company: Timmons Group

Lat/Long: 365807 / -780941

Ann Jennings
Secretary of Natural and Historic Resources and Chief
Resilience Officer

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

The project mapped as part of this report has been searched against the Department of Conservation and Recreation's Biotics Data System for occurrences of natural heritage resources in the vicinity of the area indicated for this project. 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. In addition, the project area does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

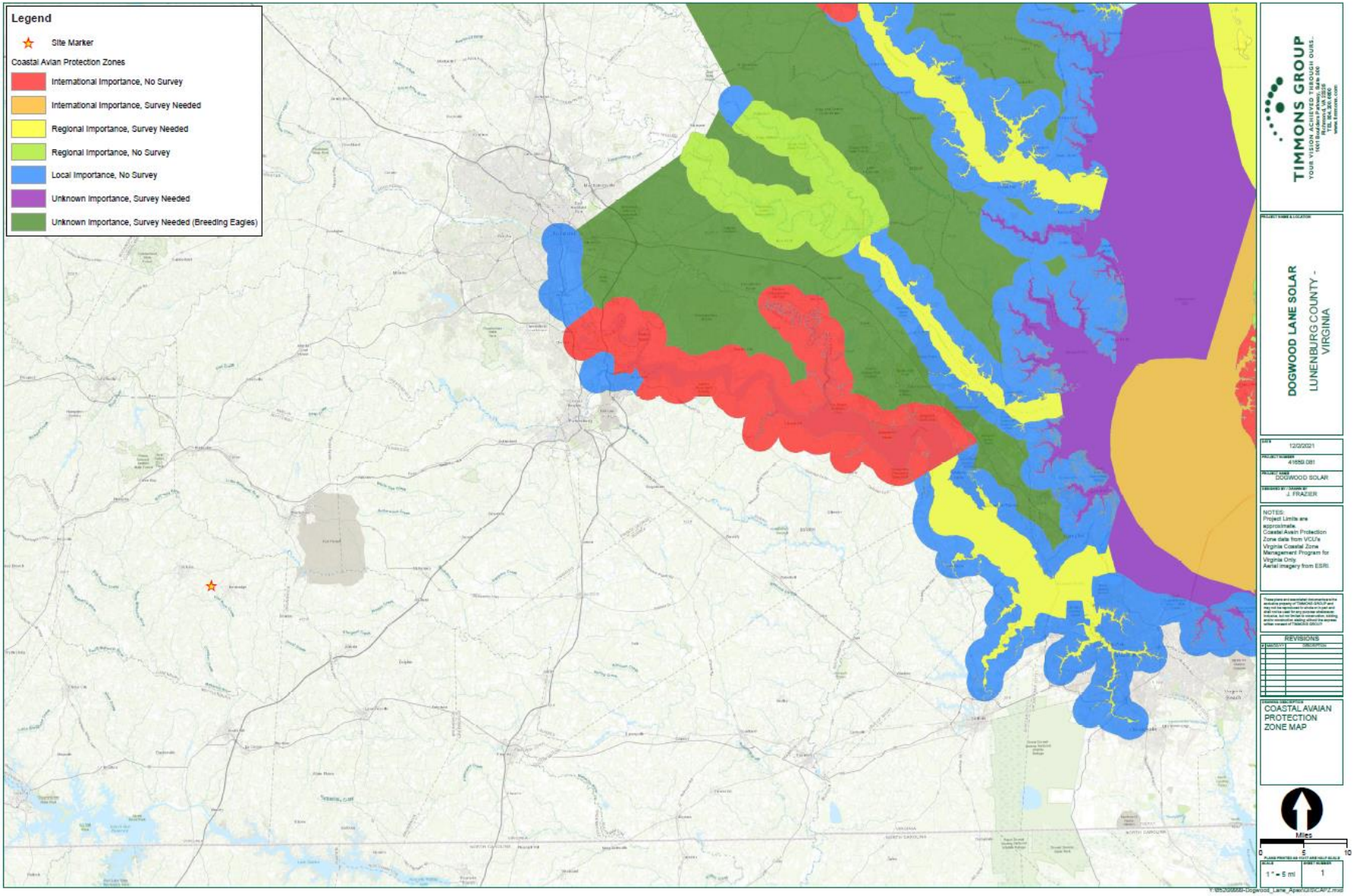
Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect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

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks additional natural heritage resources. New and updated information is continually added to Biotics. Please revisit this website or contact DCR for an update on this natural heritage information if a significant amount of time passes (DCR recommends no more than six months) before it is utilized.

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

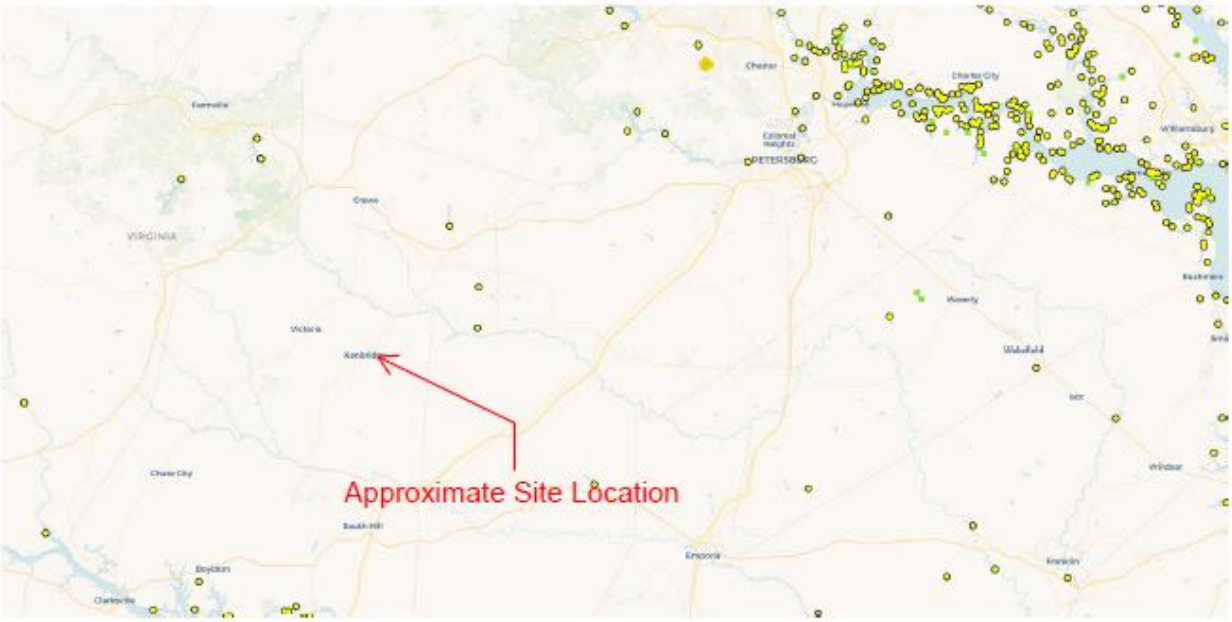
Thank you for submitting your project to the Virginia Department of Conservation and Recreation's Natural Heritage Data Explorer Web Service. Based on the preliminary screening results for this project, no further correspondence will be sent from this office. Should you have any questions or concerns about this report, the Data Explorer, or other Virginia Natural Heritage Program services, please contact the Natural Heritage Project Review Unit at 804-371-2708.

Virginia Department of Environmental Quality (VDEQ) – Coastal Geospatial and Educational Mapping System (GEMS)



Center for Conservation Biology (CCB) – VaEagles Nest Locator

CCB Mapping Portal



Layers: VA Eagle Nest Locator, VA Eagle Nest Buffers, Eagle Roosts, Eagle Roost Polygons, Eagle Roost Buffers

Map Center [longitude, latitude]: [-77.640380859375, 37.04202441635081]

Map Link:
https://www.ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&layer=Eagle+Roosts&layer=Eagle+Roost+Polygons&layer=Eagle+Roost+Buffers&zoom=10&lat=37.04202441635081&lng=-77.640380859375&legend=legend_tab_59557df6-c07b-11e5-a485-0e31c9be1b51&base=Street+Map+%28OSM%2FCarto%29

Report Generated On: 12/03/2021

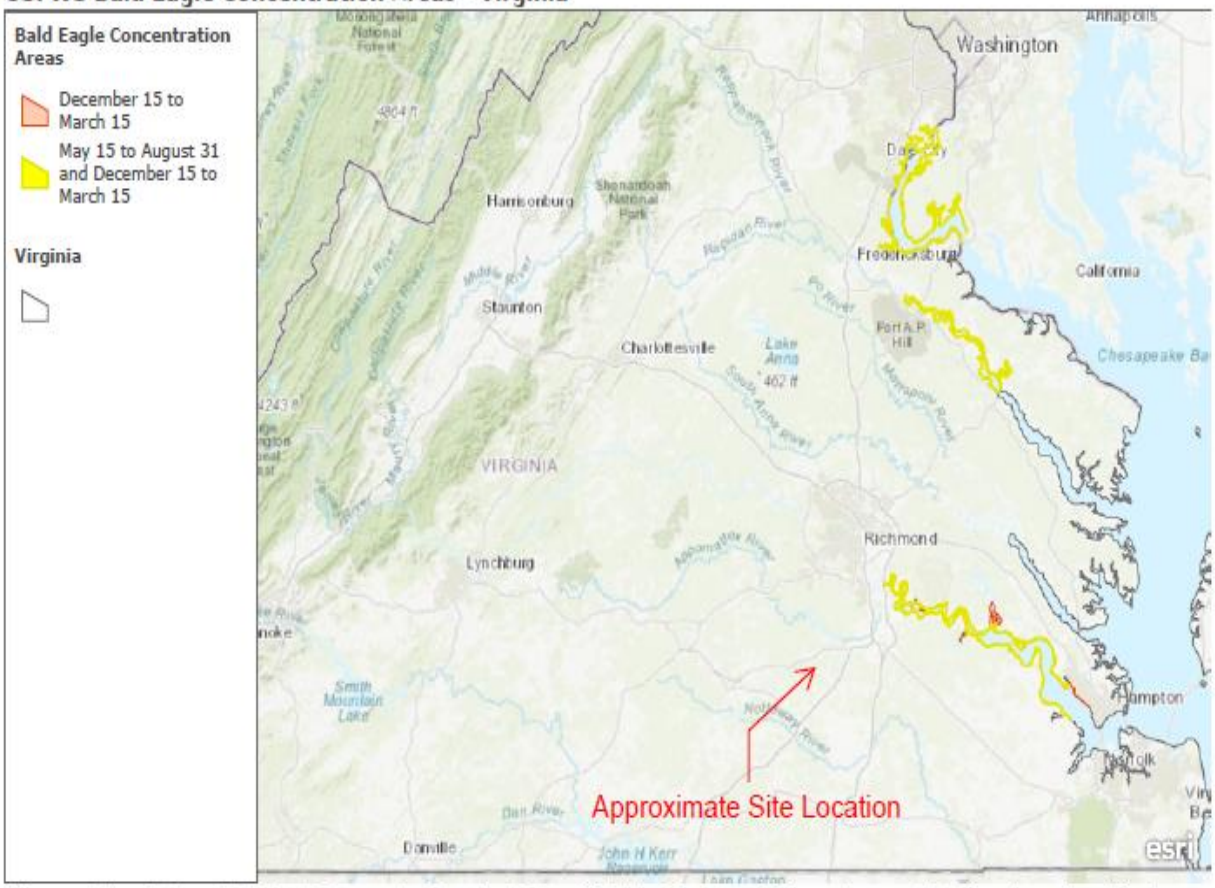
The Center for Conservation Biology (CCB) provides certain data online as a free service to the public and the regulatory sector. CCB encourages the use of its data sets in wildlife conservation and management applications. These data are protected by intellectual property laws. All users are reminded to view the Data Use Agreement to ensure compliance with our data use policies. For additional data access questions, view our Data Distribution Policy, or contact our Data Manager, Marie Pitts, at mlpitts@wm.edu or 757-221-7503.

Report generated by The Center for Conservation Biology Mapping Portal.

To learn more about CCB visit ccbbirds.org or contact us at info@ccbbirds.org

United States Fish and Wildlife Services (USFWS) – Bald Eagle Concentration Areas

USFWS Bald Eagle Concentration Areas - Virginia



This map depicts designated Bald Eagle Concentration Areas in the State of Virginia. The Intent of this map is to provide information to the public about shoreline areas that ar ...

Esri, HERE, Garmin, FAO, USGS, EPA, NPS

Annex III Draft Traffic Study

The Project retained Timmons Group to conduct a draft Traffic Study in line with County Solar Ordinance requirements. The results are as follows:

Traffic & Route Evaluation Study

Dogwood Solar Project

Lunenburg County, Virginia

December 9, 2021

Prepared For:

Apex Clean Energy, Inc

ESA Solar Energy, LLC

COMMONWEALTH OF VIRGINIA
12-9-21
STEPHEN O. SCHMIDT
Lic. No. 049985
PROFESSIONAL ENGINEER

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Contact: Scott Dunn, AICP, PTP

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(804) 200-6500 phone • (804) 560-1438 fax
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1 PROJECT OVERVIEW

Timmons Group, at the request of Apex Clean Energy and ESA Solar Energy, completed a transportation assessment for the proposed Dogwood Solar project, located in Lunenburg County, Virginia. This work has been prepared to identify any potential transportation issues associated with the construction or operation phases of the proposed project. The tasks associated with this assessment included:

- Review of data and documents provided by the Client relative to the project;
- Coordination with the Client on access, schedule, and other parameters that are reflected in the traffic assessment;
- Obtaining available geometric (roadway widths, intersection control, etc.) and speed limit data that is readily available via a review of available aerial imagery through Google Earth, Bing, or County GIS systems;
- Obtaining available VDOT traffic data for those roads adjacent to the site;
- Calculating site-generated traffic based on information provided;
- Completing a turn lane warrant and operational analysis of the adjacent Route 40/Dogwood Road/Williams Road intersection; and
- Preparing a narrative summarizing existing conditions and traffic along the adjacent roadway network, anticipated traffic generated by the proposed site – during and post construction, and impacts, if any, anticipated with the site-generated traffic along with potential mitigation measures.

2 EXISTING CONDITIONS

Timmons Group compiled existing roadway conditions and traffic data for facilities adjacent to the proposed Dogwood Solar site. The proposed 4 MW AC facility is located on Route 40 (K-V Road), just west of the border of Kenbridge Town (approximately two (2) miles west of Kenbridge Town Center) and approximately four (4) miles east of Victoria Town Center. Access to the site is proposed via a single entrance with direct access to Route 40 via Dogwood Road.

The project location is shown on Figure 1 (all figures are located at the end of the study) and a preliminary site plan can be found in Figure 2.

REGIONAL HAUL ROUTES

Timmons Group identified potential regional haul routes that could be utilized during construction to safely and effectively direct heavy vehicle traffic to and from the site. VDOT functional classification mapping (see Figure 3) was used to identify suitable secondary roads in vicinity of the site that provide connections to regional arterials.

Based on this effort, three (3) potential haul routes were identified:

- Haul Route #1 utilizes Route 49 From US Route 460 at Crewe to Victoria; vehicles would then proceed east on Route 40 (K-V Road) to the proposed site.
- Haul Route #2 utilizes Route 40 (and Route 606) from US Route 460 through Blackstone to Kenbridge; vehicles would then proceed west on Route 40 (K-V Road) to the proposed site.
- Haul Route #3 utilizes Routes 138/137 from South Hill/Interstate 85/US Route 1 Kenbridge; vehicles would then proceed west on Route 40 (K-V Road) to the proposed site.

These three (3) haul routes are shown graphically on Figure 4.

With respect to the identified routes, there are several items to note:

- It is not anticipated that two (2) routes from US Route 460 will be necessary.
- The recommended option from US Route 460 is Haul Route #2, which utilizes Route 606 and Route 40 via Blackstone and Kenbridge.
    - There is a grade-separated interchange at the US Route 460/Route 606 intersection (see inset, Figure 4).
    - The available road network allows heavy vehicle traffic to bypass the Downtown/South Main Street corridor in Blackstone.
    - Haul Route #2 is the shorter/more direct route from US Route 460 to the Dogwood Solar site.
- Haul Route #3 from the south, which utilizes Routes 138/137 from South Hill, is anticipated to be necessary to serve traffic from the south originating from Interstate 85 and US Route 1.

Whichever routes are agreed upon, it is recommended that the local communities (South Hill, Crewe, Victoria, Blackstone, Kenbridge) be coordinated with and consulted regarding potential traffic flows.

ADJACENT ROADWAYS AND INTERSECTIONS

There are a couple VDOT-maintained facilities in the immediate vicinity of the site that should be noted.

Route 40 (K-V Road) is a 2-lane, undivided, east/west minor arterial with 2 – 12' travel lanes and 4' paved shoulders. The posted speed limit in the vicinity of the Dogwood Road/Williams Road intersection is 55 mph; the speed limit drops to the east and west, as Route 40 enters Kenbridge and Victoria. Available 2019 VDOT traffic data indicates Route 40 carries 4,400 ADT and includes 9% heavy vehicles.

Dogwood Road (north) and Williams Road (south) are both 2 lane, undivided local roads that are approximately 18' wide with no shoulders. Available 2019 VDOT traffic data indicates Dogwood Road carries 70 ADT and Williams Road carries 60 ADT. Both roads are paved and stop bars are present at their termini with Route 40. Speed limits were not posted on either of these facilities.

At the Dogwood Road/Williams Road intersection, no auxiliary turn lanes are present on mainline Route 40 or the side street approaches.

Based on the available imagery, Route 40 is flat and straight in the vicinity of this intersection and sight distance appear to be acceptable.

Images of the Route 40/Dogwood Road/Williams Road intersection are shown on Figure 5.

3 SITE ACCESS

SITE ACCESS

Dogwood Solar will be served by a single entrance with direct access to Route 40 via Dogwood Road.

The site, along with the proposed entrance location, is shown on Figure 6.

New gravel access roads will be installed at the point of ingress/egress and throughout the site to facilitate construction and subsequent operations/maintenance traffic throughout the solar project. Temporary staging and assembly areas will be used during the construction period for the storage of construction vehicles and equipment, as well as staging of components of the solar facility. All temporary staging, parking, and assembly areas will be located within the project area boundaries.

PROXIMAL TRAFFIC ROUTES

Based on the existing road network and types of traffic associated with the site, it is anticipated that all construction equipment, aggregate, supplies and general construction traffic will access the site utilizing Route 40 and Dogwood Road.

The geometry and volumes present along these facilities do not prohibit the accommodation of site-generated traffic, during construction or operation/maintenance.

4 SITE-GENERATED TRAFFIC

General construction traffic will consist of the following:

- Component deliveries (i.e. solar panels, inverters, gravel/concrete trucks, construction equipment, etc.) via single-unit heavy vehicles; and
- Passenger vehicles (pick-up trucks) carrying personnel, tools and minor equipment to and around the construction site.

The following assumptions were used in calculating a truck load estimate for the proposed solar site:

- 12,000 total solar panels;
- Approximately 1 linear mile of 12' wide internal roadway;
- An anticipated six (6) month construction period (6/2023 – 12/2023) of :
    - 2 months of grading and site preparation;
    - 3 months of solar panel installation; and
    - 1 month of mechanical/electrical work and inspection.

Based on the above information and an assumed carrying capacity of 80,000 pounds for a standard tractor trailer (WB-50 or WB-62) and 15 cubic yards/dump truck for gravel, it is estimated that over the six (6) month construction period, the site will generate a total of approximately 525 truck trips.

Once this number is separated across site preparation (initial 15% of site-generated traffic), site construction (80% of site-generated traffic), and mechanical/electrical work/inspection (5% of site-generated traffic), it is estimated that the site will generate approximately two (2) truck trips/day during site preparation, seven (7) truck trips/day during panel installation, and one (1) truck trip/day during the mechanical/electrical inspection period.

Construction employees will consist of laborers, electricians, supervisory personnel, support personnel, and construction management personnel. It is anticipated that there will be an average of 25 workers on-site during the construction period with a maximum 50 workers for limited periods. Construction work generally will occur during daylight hours, with non-daylight hour work relating to the completion of critical construction activities that could not be completed during daylight hours.

Table 1 summarizes anticipated site-generated traffic by respective phase and classification based on the available information for this site.

Table 1
Site-Generated Traffic

Phase		Grading/Soil Preparation	Panel Installation	Mechanical/Electrical Inspection	Decommisioniong
Duration		2 months	3 months	1 month	1 month
Weeks (Average)		8	12	4	4
Total Work Days		40	60	20	20
Employee Traffic (Daily)		10	25- 50	25	20
Heavy Vehicle Traffic (loads)					
Land Clearing/Prep	10	10	-	-	-
Gravel/Concrete Delivery	150	50	85	15	-
Piles/Racks	325	-	325	-	-
Solar Panels	15	-	15	-	-
Electrical Equipment	12	-	-	10	-
Inverters	1	-	-	1	-
	513	60	425	26	
Average Heavy Vehicle Traffic (loads/day)		2	7	1	10

Following construction of the site, the operation and maintenance of Dogwood Solar will not generate significant volumes of traffic. Once the solar site is operational, daily traffic will be weekly visits by one (1) or two (2) vehicles for the purpose of inspection and maintenance.

For completeness, the table above also includes trip generation information for the anticipated decommissioning of the site. Based on the provided report, it is anticipated the site will be operable for at least 35 years, with a decommissioning date to be agreed upon by the system owner and the landowner. At that time, it is estimated that decommissioning will approximately four (4) weeks to complete and traffic flows will consist of up to 20 employees and 10 truck trips/day to remove equipment from the site and remediate any land disturbance.

In support of the project, Timmons Group estimated AM and PM peak hour traffic volumes for the Route 40/Dogwood Road/Williams Road intersection at peak construction. This was accomplished as follows:

- 2019 hourly directional traffic counts for Route 40 were obtained from VDOT Central Office
- 2019 ADT counts for Dogwood Road and Williams Road were obtained from the VDOT Central Office
- Traffic estimates for the heaviest construction phase were calculated based on data provided by the Client
    - 25 full time employees are assumed at the peak of construction. It is assumed that all 25 will arrive during the AM peak hour and leave during the PM peak hour. 55% will approach from/depart to the east and 45% will approach from/depart to the west; this split is based on existing peak hour traffic distribution on Route 40.

- Up to 7 trucks/day are expected at peak construction. For analysis purposes, it was assumed that 75% (5 trucks) will arrive during the AM peak and that two (2) trucks would depart the site during the PM peak hour.

- Background traffic volumes were combined with employee and heavy vehicle estimates for the site to estimate total peak construction traffic.

Total projected AM and PM peak hour construction volumes are shown on Figure 7.

TURN LANE WARRANT ANALYSIS

Using the peak hour volumes shown on Figure 7, left- and right-turn lane warrant analyses were completed for the Route 40/Dogwood Road/Williams Road intersection. Turn-lane nomographs from Appendix F of the VDOT *Road Design Manual* were utilized for the analysis.

The results of the turn lane warrant analyses indicate that neither a westbound right turn lane nor an eastbound left turn lane are warranted at the Route 40/Dogwood Road/Williams Road intersection based on the projected construction volumes.

The turn lane nomographs are shown on Figure 8.

As noted prior, traffic volumes associated with operations and maintenance will be less than those witnessed during construction and will also not warrant auxiliary turn lanes at the study intersection.

OPERATIONAL ANALYSIS

An operational and queuing analysis was performed using SYNCHRO Version 10 and HCM 6th Edition methodologies. The analysis assumed level terrain, exclusion of bus or parking impacts, exclusion of pedestrians, heavy vehicle percentages based on available traffic data, and use of a minimum of 0.92 peak hour factor for the opening day analysis.

The table below summarizes the opening day intersection level of service (LOS), delay, and 95th percentile queue lengths based on the traffic volumes shown on Figure 7 and the existing intersection geometry.

Table 2
Operational Summary – Route 40/Dogwood Road/William Road

Intersection and Type of Control	Movement and Approach	Effective Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	Delay [1] (sec/veh)	LOS [1]	SYNCHRO 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)
1. Route 40 (E-W) at	EB L-T-R		7.8	A	0	35	7.8	A	0	8
Dogwood Road/Williams Road (N-S)	*EB Approach*		*0.5*	*A*	--	--	*0.1*	*A*	--	--
Unsignalized	WB L-T-R		7.6	A	0	7	7.7	A	0	18
	WB Approach		*0.0*	*A*	--	--	*0.0*	*A*	--	--
	NB L-T-R		10.8	B	0	18	11.1	B	0	0
	NB Approach		*10.8*	*B*	--	--	*11.1*	*B*	--	--
	SB L-T-R		11.0	B	0	29	11.9	B	5	61
	SB Approach		*11.0*	*B*	--	--	*11.9*	*B*	--	--

As shown in the table, mainline Route 40 operates at a LOS A during both the AM and PM peak hours with no/minimal queuing. The stop-controlled side streets, Dogwood Road and Williams Road, operate at a LOS B during both the AM and PM peak hours, again, with minimal delay and queuing. Based on this analysis, no geometric improvements are necessary.

Traffic Mitigation

Throughout construction of the site, the contractor will coordinate with the representatives from Lunenburg County and VDOT to determine appropriate transportation management procedures which may include, but are not limited to, traffic control, lane closures, road access restrictions, truck restrictions, and temporary/short-term road closures.

Based on the existing roadway conditions, the locations for proposed access points, and the available average daily traffic number for the transport roads, the anticipated construction traffic volumes will not exceed available roadway capacities; the roadways should not be significantly impacted by standard construction traffic. During operation and maintenance, the facility will not generate a significant volume of traffic with the anticipation of only a few pickup trucks each week.

Construction-related traffic will access the Dogwood Solar site via state-maintained roadways. Given the existing posted speeds and anticipated slower entering/exiting traffic, temporary traffic control (TTC) measures may be necessary. Pertinent signage should be installed prior to the site preparation work and removed when mechanical/electrical work/inspections begin. It is not anticipated that daily vehicular traffic following construction will disrupt local traffic flows during normal peak hours.

Outside of the previously noted mitigation efforts, should a traffic issue arise during construction, the contactor will work Lunenburg County and VDOT to appropriately address the specific concern.

5 DECOMMISSIONING

The proposed solar facility is expected to be capable of operating for at least 35 years, with decommissioning at a time that is agreed upon by the system owner and the landowner who is leasing the land. At the end of the project's life , the system owner is ultimately responsible for the removal off all equipment from the site and returning the site to its "pre-developed" condition which includes re-seeding and re-vegetating the disturbed area to allow them to return to their original state.

It is anticipated that vacating and restoring the site will be a concise undertaking with a duration four (4) weeks. During that time there will be two (2) main traffic flows:

- Employee traffic – it is projected that there will be approximately 20 employees on site for the duration of decommissioning. This includes, supervisors, equipment operators, and general laborers. A portion of the employees are anticipated to carpool to the site and they are generally expected to arrive in the AM peak and depart in the PM peak; mid-day traffic is anticipated to minimal.

- Heavy vehicle traffic – initially, there will be the outfitting of the site with earthmoving/ excavation equipment. Subsequently, heavy vehicle traffic will shift to multi-axle trucks/trailers that will be responsible to removing equipment from the site and bringing any necessary agricultural supplies to grade/re-seed/re-vegetate the site. It is estimated that there will be up to five (5) trucks on the site for the 50% of the decommissioning period (i.e. 2 weeks) and that each truck will make two (2) trips per day.

Given the numbers above, it is expected that the heavy vehicle traffic will be heavier during decommissioning than during construction. This is due to the shorter time frame, combined with the amount of material that need to be moved. It should be noted that these numbers will not exceed the available capacity of the adjacent roads; however, consideration should be given to posting signs in the immediate vicinity of the site alerting drivers in the area to the presence of truck traffic.

6 CONCLUSIONS

Based on our review of the compilation of available data relating to the site, existing conditions, and estimated traffic, the following is offered:

- The proposed Dogwood Solar project is located on Route 40 (K-V Road), just west of the border of Kenbridge Town (approximately two (2) miles west of Kenbridge Town Center) and approximately four (4) miles east of Victoria Town Center (see Figure 1).

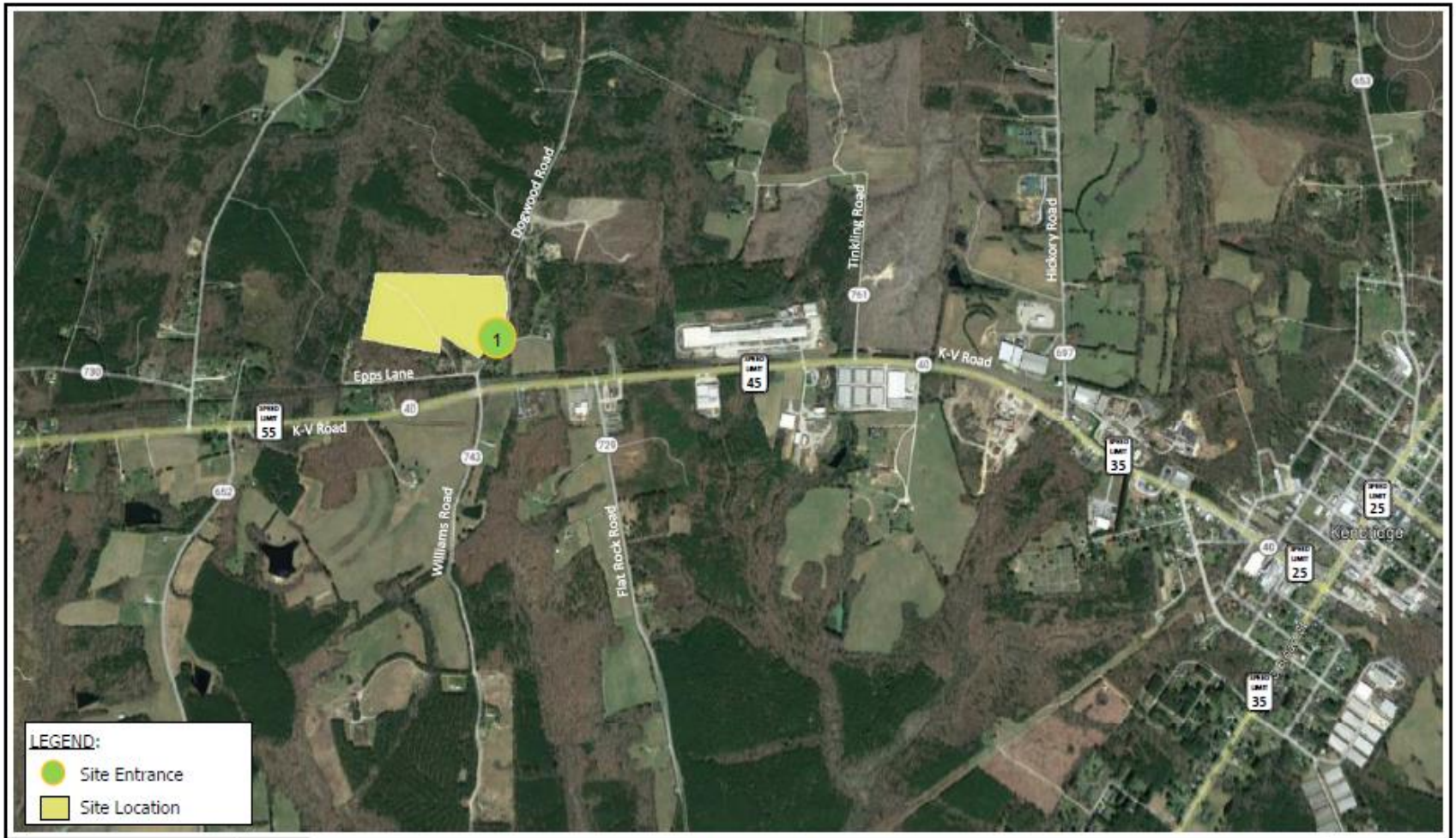
- Truck traffic associated with the site is estimated to range from two (2) trucks/day (during the site preparation and electrical/inspection stages) to seven (7) trucks/day during the peak construction period.

- Access to the site will be provided via Route 40 and Dogwood Road.

- Each of these roadway facilities has the available capacity to accommodate site generated traffic, both during construction and operations/maintenance activities based on existing ADTs.

- Assuming site-traffic is focused along Route 40 (K-V Road) and Dogwood Road, no improvements are necessary/anticipated to accommodate site-generated traffic; this was demonstrated through the turn lane warrant and operational analysis.

- It is recommended that temporary traffic control measures be considered for the duration of the site preparation/construction phase.



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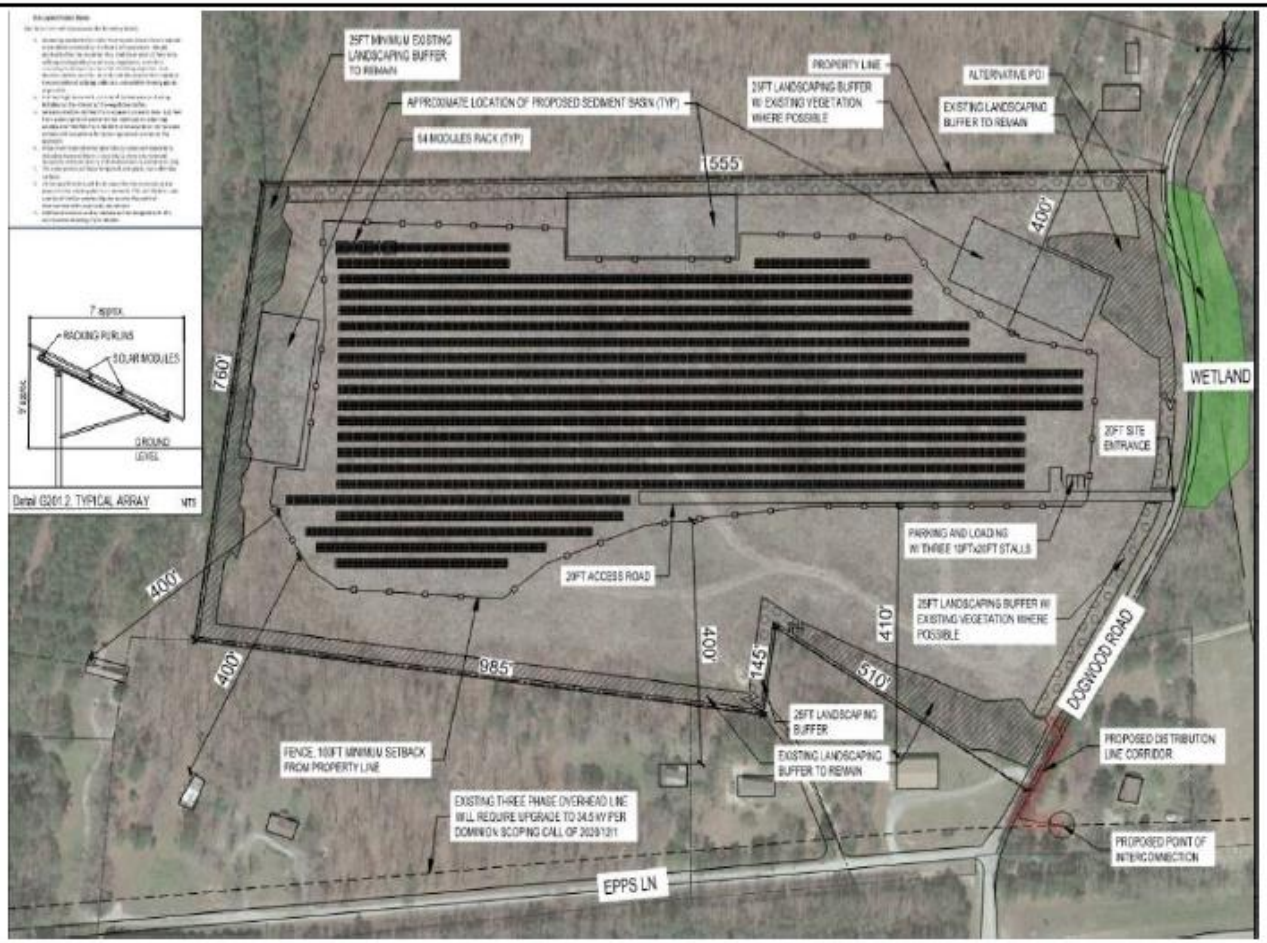
Vicinity Map
Dogwood Solar
Lunenburg County, Virginia

Figure
1



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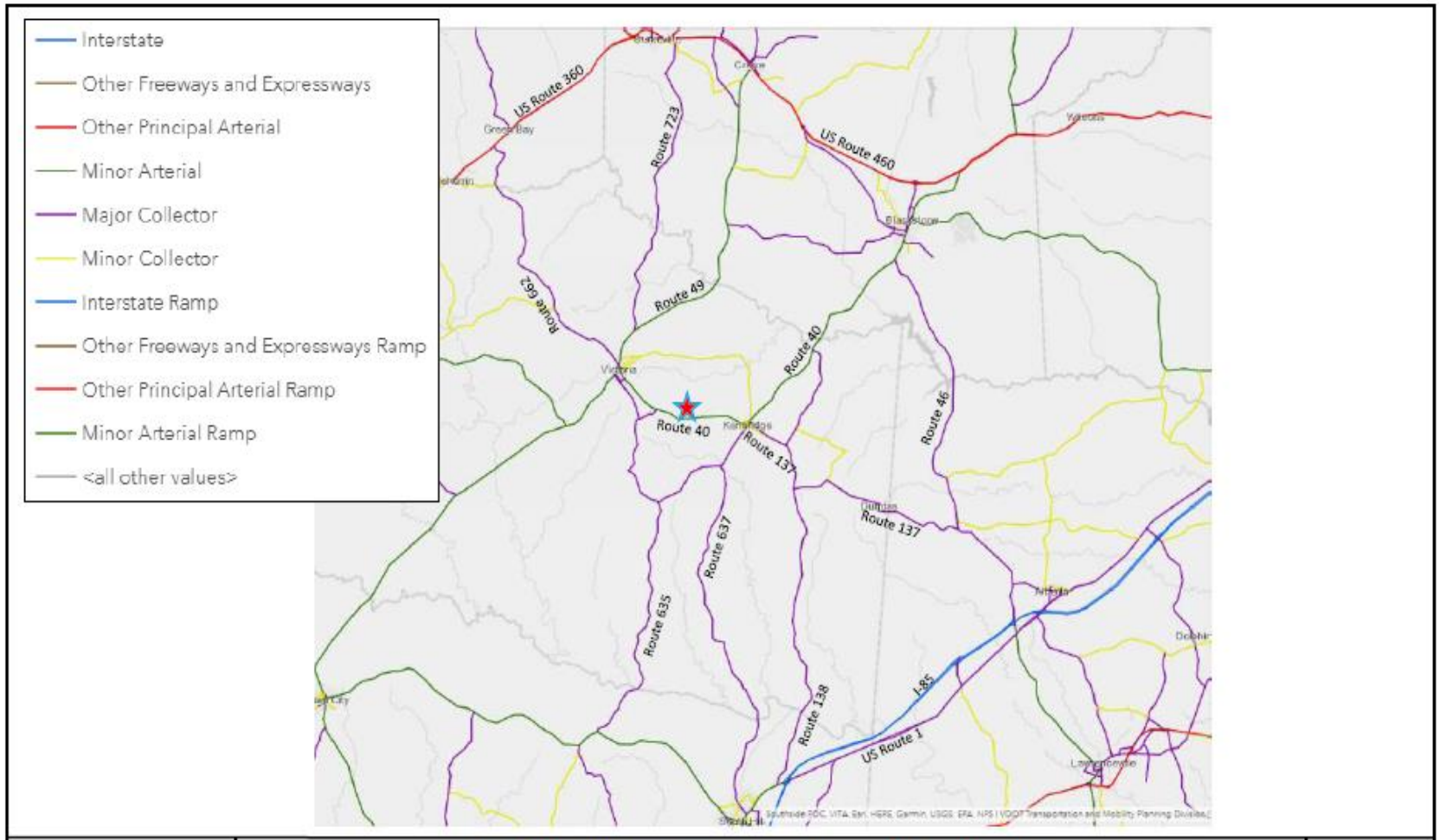
Preliminary Site Plan
Dogwood Solar
Lunenburg County, Virginia

Figure 2



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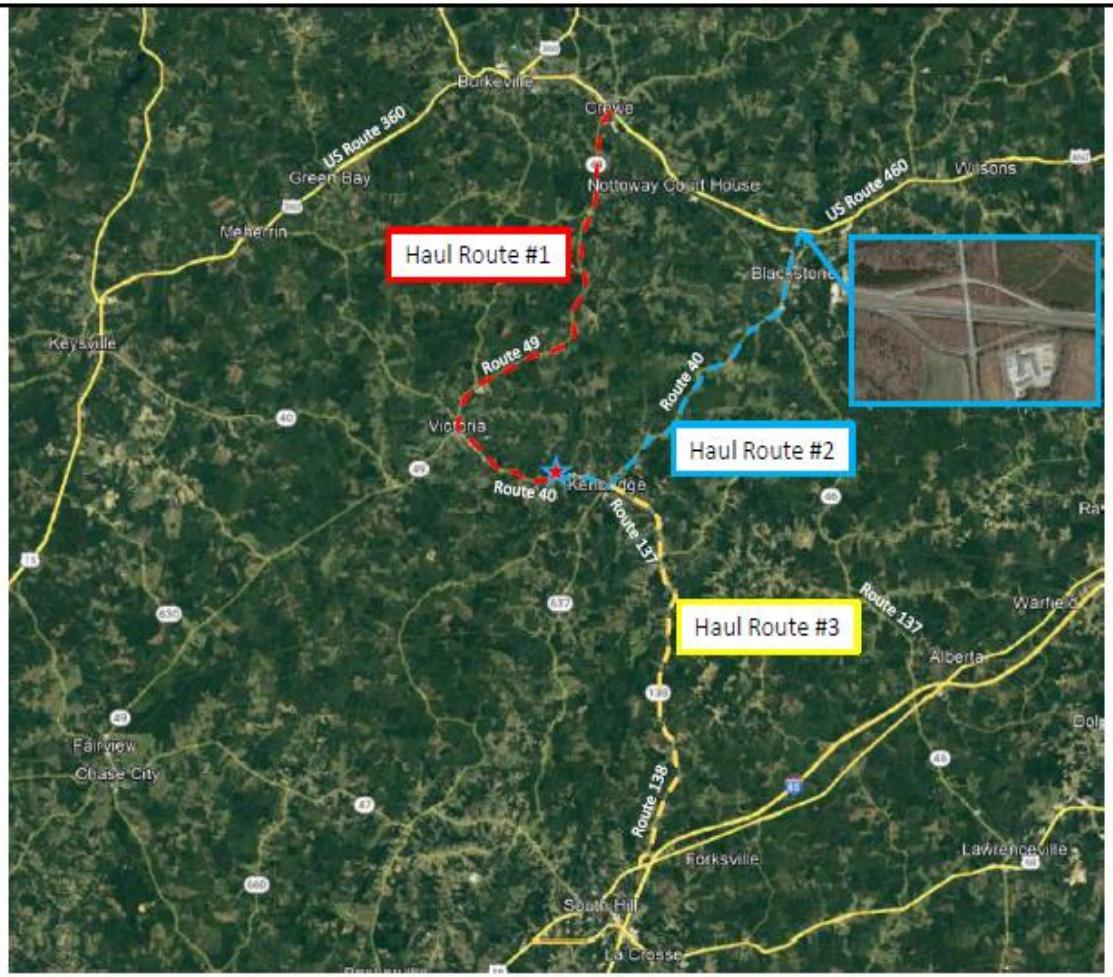
Roadway Network – Functional Classification
Dogwood Solar
Lunenburg County, Virginia

Figure 3



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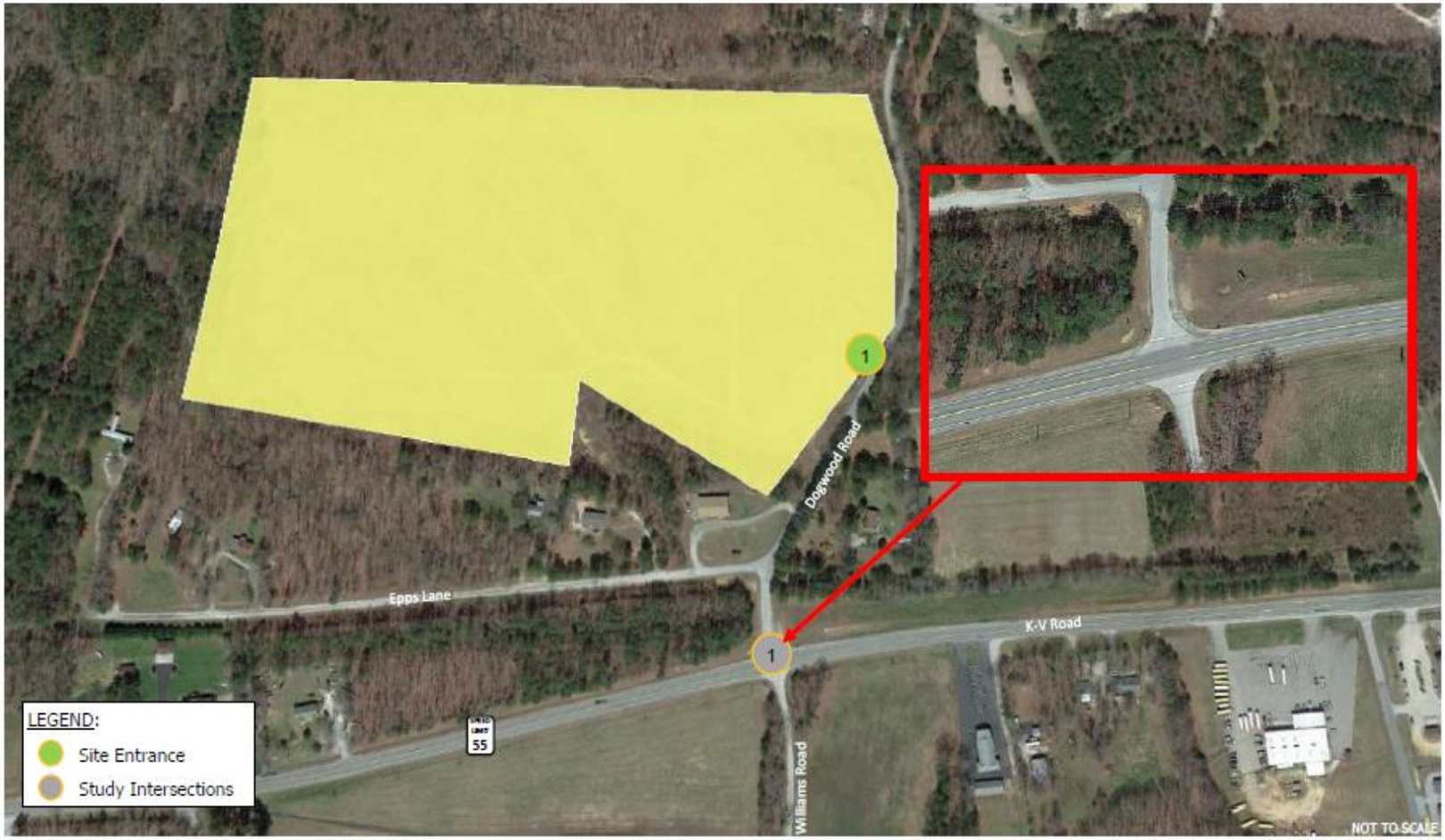
Potential Haul Routes
Dogwood Solar
Lunenburg County, Virginia

Figure
4



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Site Entrance and Study Intersection
Dogwood Solar
Lunenburg County, Virginia

Figure
5

Looking North,
Dogwood Road

Looking West,
Route 40

Looking East,
Route 40

Looking South,
Williams Road

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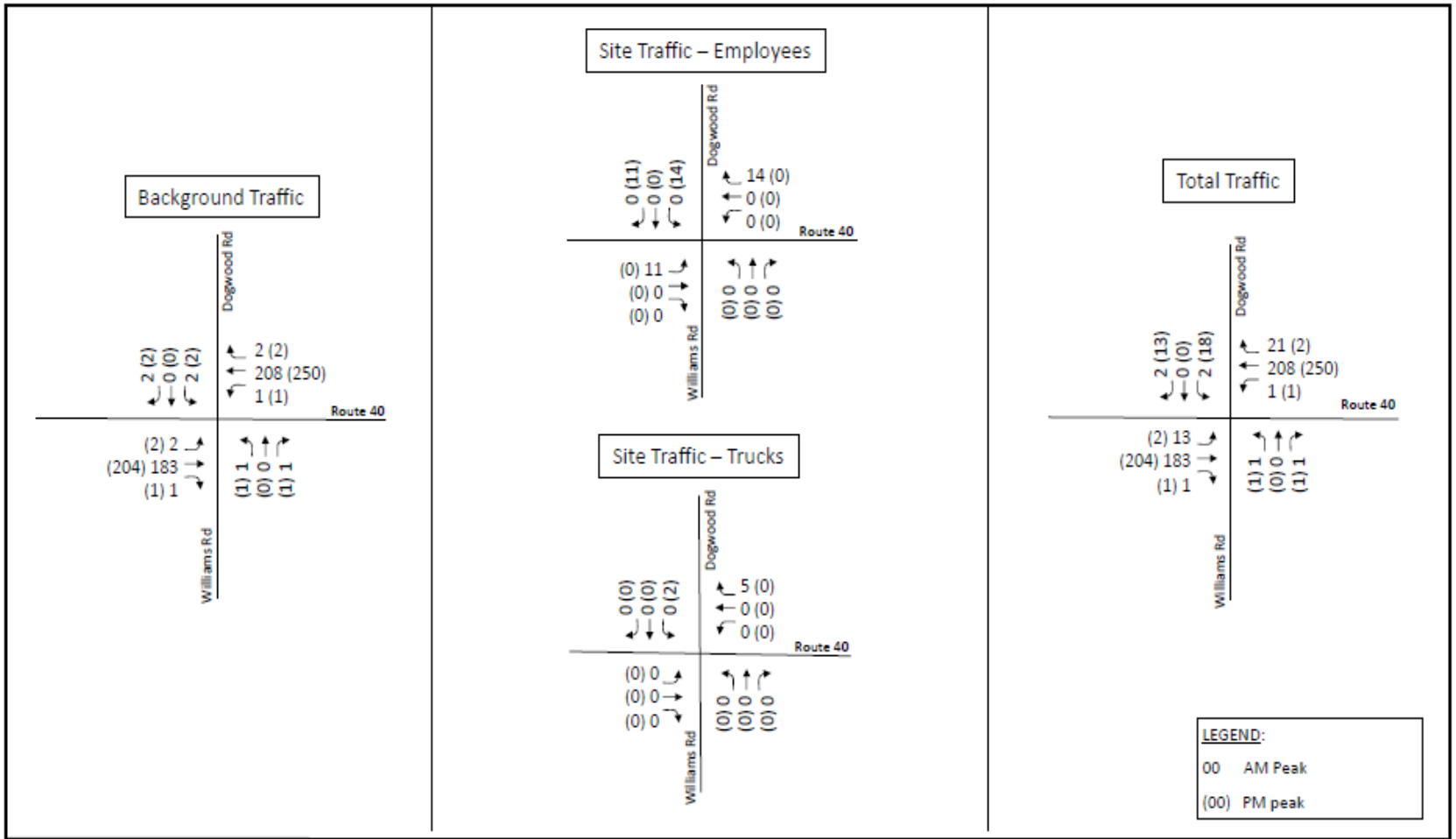
Route 40/Dogwood Road/Williams Road Intersection
Dogwood Solar
Lunenburg County, Virginia

Figure
6



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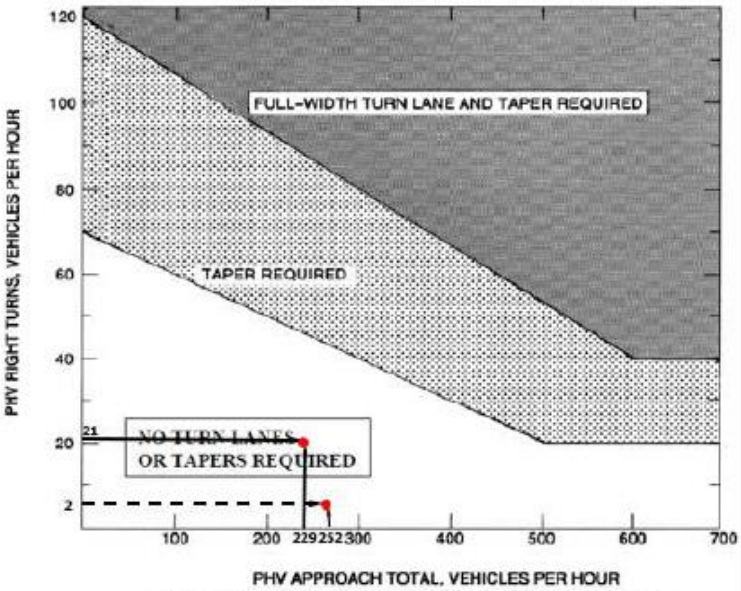
Peak Hour Traffic Volumes – Route 40/Dogwood Road/Williams Road
Dogwood Solar
Lunenburg County, Virginia

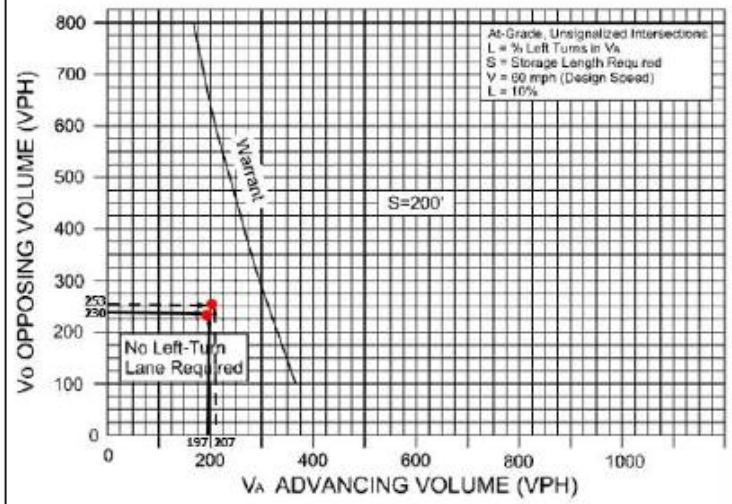
Figure 7

GUIDELINES FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)
FIGURE 3-26 VDOT ROAD DESIGN MANUAL APPENDIX F



NO RIGHT TURN LANE OR TAPER REQUIRED

WARRANT FOR LEFT-TURN STORAGE LANES
ON TWO-LANE HIGHWAYS (60 MPH)
FIGURE 3-18 VDOT ROAD DESIGN MANUAL APPENDIX F



NO LEFT TURN LANE REQUIRED

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Turn Lane Nomographs – Route 40/Dogwood Road/Williams Road
Dogwood Solar
Lunenburg County, Virginia

Figure
8

Annex IV: Copy of Cover Letter to Adjoining Neighbors

<Date>

<Name>
<Address>
<City, State, Zip Code>

RE: Notification of Application Submission for Dogwood Lane Solar Farm

Dear <Name>,

Apex Clean Energy and esaSolar are excited to let you know that we are working with a Lunenburg resident to build a small-scale community solar project, Dogwood Solar. The project will only produce around 4 Megawatt (MW) and it will only cover approximately 30.3 acres of private land; parcel numbers 035-03-0-2C2 and 035-03-0-2C. The parcels are located on Dogwood Lane in Lunenburg County, VA.

In accordance with county solar ordinances, the project will be screened to minimize public viewsheds. As we move forward with the application process, we will be holding an in-person community meeting, which you will receive a mailed invitation for. The nature of the meeting will be to answer any questions you may have about our project.

In compliance with Section 3 of the Lunenburg County Conditional Use Permit Application, ACE VA DER, LLC is notifying you of an application submission for Dogwood Lane Solar Farm. Per the County's Solar Ordinance in Section 2 (Definitions), the requested use is a for Medium Scale Solar Energy Facility.

Please let me know if you have any questions or would like to meet in person. You can contact me at 954-658-4531 or via email jvandenbroeck@esa-solar.com.

Thank you,

Justin Vandenbroeck

Justin Vandenbroeck
esaSolar