



County of Sussex, Virginia

Planning Commission Meeting

**Monday, April 5, 2021
6 p.m.**

Planning Commission Members

J. Lafayette Edmond, Chairperson
Terry Massenburg, Vice Chairperson
Kevin Bracy
Brenda Burgess
Frank Irving
Roger King
Dennis Mason
Andrew Mayes
Rudolph Shands
Robert Young, Jr.

Agenda

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DEPARTMENT OF PLANNING
Beverly Walkup, Director of Planning
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Sussex County Planning Commission Meeting
Monday, April 5, 2021 - 6:00 P. M.
General District Courtroom – Sussex Judicial Center
15098 Courthouse Road, Sussex VA 23884

AGENDA

- A. CALL TO ORDER**
- B. ELECTION OF OFFICERS**
 - 1) Chairman
 - 2) Vice Chairman
 - 3) Secretary
- C. ADOPTION OF AGENDA**
- D. APPROVAL OF MINUTES**
- E. OLD BUSINESS**
- F. NEW BUSINESS**
 - 1) Flatfact Solar – Public Facility Application Review for 2021-01, Code of Virginia Section 15.2-2232
 - 2) Blue Star Solar, Site 1 - Public Facility Application Review for 2021-02, Code of Virginia Section 15.2-2232
 - 2) Blue Star Solar, Site 2 - Public Facility Application Review for 2021-03, Code of Virginia Section 15.2-2232
- G. ADJOURNMENT**

"Good things are happening in Sussex County... Join Team Sussex!"

Draft Minutes of October 5, 2020

**Minutes of the
SUSSEX COUNTY PLANNING COMMISSION MEETING**

**Monday, October 5, 2020 at 6:00 P. M.
Social Services Department, Conference Room
20103 Princeton Road
Sussex, VA 23884**

PLANNING COMMISSIONERS PRESENT

J. Lafayette Edmond, Chairperson
Terry Massenburg, Vice Chairperson

Frank Irving
Roger King
Dennis P. Mason
Robert Young, Jr.
Rudolph Shands

PLANNING COMMISSIONERS ABSENT

Brenda Burgess
Kevin Bracy
Andrew Mayes

STAFF PRESENT

Bart Nuckols, Interim Director of Planner
Beverly Walkup, Interim Assistant to the Planner Director

CALL TO ORDER:

COMMISSIONER EDMOND, called the Planning Commission Meeting to order.

ADOPTION OF AGENDA:

ON MOTION OF COMMISSIONER MASSENBURG, seconded by COMMISSIONER IRVING and carried: RESOLVED that the agenda of the October 5, 2020 meeting of the Sussex County Planning Commission is hereby adopted.

Voting aye: Commissioners Edmond, Irving, King, Mason, Massenburg, Young, and Shands.

Voting nay: None

Absent: Commissioners Burgess, Bracy and Mayes

APPROVAL OF MINUTES:

ON MOTION OF COMMISSIONER KING, seconded by COMMISSIONER MASSENBURG and carried: RESOLVED that the minutes of the August 3, 2020 Planning Commission is hereby adopted.

Voting aye: Commissioners Edmond, Irving, King, Mason, Massenburg, Young, and Shands.

Voting nay: None

Absent: Commissioners Burgess, Bracy and Mayes

OLD BUSINESS:

A. ATLANTIC WASTE DISPOSAL:

- 1) Zoning Text Amendment #2020-03
- 2) Conditional Use Permit Application #2020-02

1) Atlantic Waste Disposal Zoning Text Amendment #2020-03

STAFF REPORT

Bart Nuckols briefly reminded the Planning Commission that a public hearing was held on this item at the Commission's last meet on August 3, 2020. The Commission deferred action on the item which was further delayed due to the COVID-19 pandemic. A staff report prepared by the Sussex County Planning Department and other information presented at your August meeting is provided as information to the Planning Commission to assist in making a recommendation on this application, as well as to provide information to the general public interested in this application.

In summary, pursuant to Article II, Section 34-222, subsection (e) of the Zoning Ordinance, the applicant, Atlantic Waste Disposal seeks a zoning text amendment to read as follows: "Any sanitary landfill operation shall be located at least one mile from any residence, school

or business, public facility and church and at least 1,000 feet from any property line," adding the following language, "except that this distance may be reduced to one-half mile provide no more than five (5) such uses are less than a mile from the landfill. A sanitary landfill operation must be setback at least 750 feet from any property lines."

ISSUES AND CONCERNS FROM THE COMMISSION

There were no new concerns raised by the Planning Commission.

COMMISSION'S ACTION ON PUBLIC HEARING ITEM ZTA #2020-03

ON MOTION OF COMMISSIONER IRVING, seconded by COMMISSIONER KING and carried: RESOLVED that the Planning Commission forward ATLANTIC WASTE DISPOSAL Zoning Text Amendment #2020-03 to the Board of Supervisors for approval.

Voting aye: Commissioners Edmond, Irving, King, Mason, Massenburg, Young, and Shands.

Voting nay: None

Absent: Commissioners Burgess, Bracy and Mayes

2) Atlantic Waste Disposal Conditional Use Permit #2020-02

STAFF REPORT

Bart Nuckols briefly reminded the Planning Commission that a public hearing was held on this Item at the Commission's last meet on August 3, 2020. The Commission deferred action on the item which was further delayed due to the COVID-19 pandemic. A staff report prepared by the Sussex County Planning Department and other information presented at your August meeting is provided as information to the Planning Commission to assist in making a recommendation on this application, as well as to provide information to the general public interested in this application.

In summary, pursuant to Article II Section 34-217, subsection (29) of the Zoning Ordinance, the applicant, Atlantic Waste Disposal, Inc., seeks a conditional use permit for expansion of the existing land fill site to the following parcels: 15-A-4, 15-A-6, and 15-A-8. The new parcels will add approximately 570 acres to the existing land fill site. The project is located in the

Blackwater/Waverly districts, east of U. S. 460, fronting on State Route 602 and is part of the current 1,315-acre existing Atlantic Waste Disposal landfill site. The proposal is to add the additional acreage for construction of 3 new disposal cells.

ISSUES AND CONCERNS FROM THE COMMISSION

Mr. Nuckols advised that the property owner objection that was raised at the August public hearing is no longer an issue and a mutual agreement has been reached.

There were no new concerns raised by the Planning Commission.

COMMISSION'S ACTION ON PUBLIC HEARING ITEM CLP #2020-02

ON MOTION OF COMMISSIONER MASSENBURG, seconded by COMMISSIONER SHANDS and carried: RESOLVED that the Planning Commission forward ATLANTIC WASTE DISPOSAL Conditional Use Permit #2020-02 to the Board of Supervisors for approval.

Voting aye: Commissioners Edmond, Irving, King, Mason, Massenburg, Young, and Shands.

Voting nay: None

Absent: Commissioners Burgess, Bracy and Mayes

NEW BUSINESS -

1) Reschedule the Planning Commission's November 2020 regular meeting date from Monday, November 2, 2020 to Monday, November 9, 2020

ON MOTION OF COMMISSIONER KING, seconded by COMMISSIONER MASSENBURG and carried: RESOLVED that the Planning Commission move its regular meeting date in November to November 9, 2020.

Voting aye: Commissioners Edmond, Irving, King, Mason, Massenburg, Young, and Shands.

Voting nay: None

Absent: Commissioners Burgess, Bracy and Mayes

2) Planning Department Hours of Operation and Staff Changes

Commissioner Massenburg questioned the hours of operation during the COVID-19 pandemic. Richard Douglas the new County Administrator introduced himself to the Commission and advised The Berkley Group is currently staffing the Planning Department during the staff transition. He advised that Mr. Nuckols will continue to serve as Interim Director of Planning until December and begin to phase out, leaving Ms. Beverly Walkup to take the position as Interim Planning Director for the remainder of the fiscal year. He advised that Ms. Walkup would be in the office three (3) days a week and that the department will be advertising for a Planner position in the next couple of weeks that would be in the office five (5) days a week.

ADJOURNMENT – The meeting adjourned at 6:20 P. M.

ON THE MOTION OF COMMISSIDNER KING, seconded by COMMAISSIONER MASSENBURG and carried: RESOLVED that the Sussex County Planning Commission is hereby adjourned.

Voting aye: Commissioners Edmond, Irving, King, Mason, Massenburg, Young, and Shands.

Voting nay: None

Absent: Commissioners Burgess, Bracy and Mayes

Flatfoot Solar

Public Facility Application Review for 2021-01
Code of Virginia Section 15.2-2232

**Staff Report
Flatfoot Solar
Public Facility Application Review for 2021-01
Code of Virginia § 15.2-2232
Sussex County, Virginia**

**Report Date: March 23, 2021
Planning Commission Meeting Date: April 5, 2021**

APPLICATION SUMMARY

Project:	Flatfoot Solar, 1.62 MW _{ac}
Location:	Located within the Stony Creek district on the southern side of Sussex Drive (Route 40), west of Concord Sappington Road, and 2.8 miles west of Stony Creek in Sussex County, Virginia.
Parcel Record Numbers:	65-A-45 and 65-A-37
Proposal:	Applicant's request for review of the Flatfoot Solar pursuant to Virginia Code Section 15.2-2232
Application Submitted:	August 31, 2020 Revised February 9, 2021
Applicant:	Flatfoot Solar, LLC Hexagon Energy, LLC 722 Preston Ave., Suite #102 Charlottesville, VA 22903
Representative:	Brendan Grajewski 434-326-4405 BGrajewski@hexagon-energy.com
Owners:	Ananias Jones and Vinco Enterprises, Inc.

PLANNING COMMISSION ACTION

The Applicant has requested that the Planning Commission review its proposed solar energy facility, as a "public utility facility" under Virginia Code Section 15.2-2232(A), to determine whether the general or approximate location, character, and extent of the proposed facility is substantially in accord with the County's Comprehensive Plan. As required by the Zoning Ordinance, the Applicant submitted a 2232 Review Application (County reference number: 2021-01) that was deemed complete on February 22, 2021 (Attachment A).

Staff has recommended that the Planning Commission review the request for determination under Virginia Code Section 15.2-2232 prior to any review of a conditional use permit (CUP) application. Subject to the Planning Commission's 2232 decision, the Planning Commission will separately review and consider the merits of any associated CUP Application.

PURPOSE OF THE REVIEW UNDER VIRGINIA CODE SECTION 15.2-2232

Virginia Code Section 15.2-2232 requires that the Planning Commission review all proposed developments that include a "public utility facility" prior to the construction or authorization of such facility. The purpose of the Planning Commission's review is to determine whether the general or approximate location, character, and extent of the proposed public utility facility is substantially in accord with the Sussex County Comprehensive Plan or part thereof. The Planning Commission has set aside time at its April 5, 2021, meeting to afford citizens an opportunity to offer their comments to the Planning Commission. The Planning Commission must advise the Board of Supervisors of its determination. If appealed by the Applicant, the Board of Supervisors may overrule the action of the Planning Commission.

RELEVANT CONSIDERATIONS

Solar facilities less than or equal to 5 MW are:

- Subject to 2232 review (Virginia Code § 15.2-2232).
- Subject to a CUP review.
- Required to send DEQ a notification of intent and certification from a locality showing compliance with land use ordinances (9VAC15-60).
- Eligible to agree to a reasonable cash payment (Virginia Code § 15.2-2288.8).

Solar facilities less than or equal to 5 MW are NOT:

- Subject to DEQ's Permit by Rule process (9VAC15-60).
- Taxed on M&T (Virginia Code § 58.1-3660).
- Eligible for revenue under a revenue share ordinance (Virginia Code § 58.1-2636).
- Eligible for a siting agreement (Virginia Code § 15.2-2316.6).

PROPOSED DEVELOPMENT

The Applicant proposes to construct a 1.62 megawatt (alternating current) photovoltaic solar energy generation facility on 10 of 84 acres from 2 parcels. The project infrastructure will consist primarily of solar photovoltaic modules (PV panels) mounted on steel racking structures, inverters, a transformer, and control cabinet, switch gear, meter, interconnection, and security fencing. PV panels will cover 35% of the 10-acre project area. The racking system piles will be approximately 10 feet deep, and the wires will be buried 36 to 48 inches deep. No new buildings will be constructed, and no existing buildings utilized or expanded. Energy storage battery facilities are not proposed.

The project is generally bound to the north by Sussex Drive (Route 40), to the east by Concord Sappony Road, to the south by Sappony Creek, and to the west by an agricultural road on parcel 65-A-45. Energy generated will be connected to the grid at an existing 34.5 kV distribution line on the north side of Sussex Drive (Route 40). The Applicant has an executed interconnection agreement with Dominion Energy and has submitted a proposal for a power purchase agreement for this project. A transmission line will be installed along the road and across Sussex Drive to the point of interconnection.

The project is setback over 900 feet from surrounding dwellings and roads and offers existing vegetative buffers for screening. The project will upgrade an existing farm road to access the site. This road is adjacent to a residence and crosses a stream with wetlands. The applicant will comply with all relevant wetlands regulations and permitting.

The Applicant forecasts construction to begin in 2021 and last one to two months, dependent on weather. Following construction, the project will undergo testing and commissioning in coordination with Dominion Energy. The project is estimated to commence operations in December 2021. The project will create approximately 20 construction and 1-2 operations positions in the local community. The project will generate roughly \$2,645,000 in total capital investment for construction, material, labor, and professional services, and construction will contribute over \$600,000 in direct spending in the local economy.

EXISTING CONDITIONS AND ZONING

The project area is located entirely in the General Agricultural (A-1) zoned section of the parcels. The A-1 zoned section of the parcels has primarily been used for agricultural and timber uses production. The remainder of the parcels is zoned Rural Residential (R-1) and Manufactured/Mobile Home Park (R-2) (see Attachment B – Maps).¹ The northeastern section of the Vinco Enterprises, Inc. parcel is the location of the Sappony Mobile Village. Currently, the Zoning Ordinance requires that solar facilities be set back 200 feet from a property with a dwelling. The proposed project does not meet this requirement, and the Applicant intends to submit a zoning text amendment.

The project is in the Stony Creek Planning Area. The future land use designation of the project area is agricultural/forested/open space (see Attachment B – Maps); however, the draft of the future land use map currently under development shows the parcel frontage on Sussex Drive (Route 40) as “mixed use” for commercial and residential.

The project area is setback an adequate distance from Sussex Drive (Route 40) and the residences along Sussex Drive. The section of agricultural use land selected for the project site is surrounded on all sides by waterways and wetlands, thus isolating it from the other uses on the project and adjacent parcels (see Application Site Plan Sheet L1.1). Approximately seven (7) acres of the 10-acre project area will be cleared of trees for the project. The existing trees, wetlands, and wetland buffer vegetation surrounding the project area will provide natural screening.

The project area is relatively flat and will require minimal grading and minimal new stormwater infrastructure.

ADJACENT AND SURROUNDING USES

The project area is adjacent to nine (9) parcels (Attachment A) that are zoned A-1, R-1, and R-2 and include residences, agricultural and forestry uses, and a church. The project area is just over two (2) miles from the Sappony Solar project and 2.8 miles from the town boundary of Stony Creek (see Attachment B – Maps).

The future land use map designates the parcels along Sussex Drive (Route 40) as residential or apartments/mobile home parks and the remaining surrounding uses as agricultural (see Attachment B – Maps).

The Applicant contacted DCR for a review of potential natural heritage resources in and around the project area. DCR found that *Alasmidonta heterodon* (Dwarf wedgemussel) and *Percina rex* (Roanoke longperch) are associated with the Nottoway River. Both are classified as endangered species by at the state and federal level. In addition, the Nottoway River is documented as an Aquatic Natural Community with regional significance, a “healthy” designation, and high Biological Integrity. Sappony Creek has been designated as a “Threatened and Endangered Species Water” by VDWR for Atlantic Pigtoe. To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow. Due to the legal status of the Dwarf wedgemussel and Roanoke longperch, DCR recommends coordination with USFWS and VDWR to ensure compliance with protected species legislation. Due to the legal status of Atlantic pigtoe, DCR recommends coordination with Virginia’s regulatory authority for the management and protection of this species, the VDWR, to ensure compliance with the Virginia Endangered Species Act. DCR recommends the development of an invasive species management plan for these projects and the planting of Virginia native pollinator plant species that bloom throughout the spring and summer, to maximize benefits to native pollinators. DCR recommends planting these species in at least the buffer areas of the planned facility, and optimally including other areas within the project site.

There is one Virginia Department of Forestry (DOF) conservation easement present on a property approximately 1.7 miles northeast of the Site, on the border of Sussex County and Dinwiddie County. There are 39 architectural and 52 archaeological resources within an approximate 3-mile radius of the project area. The Applicant will perform required investigations and create mitigation plans, as necessary, for review and approval prior to the issuance of a building permit.

COMPREHENSIVE PLAN CITATIONS

The Comprehensive Plan 2004-2005 update was adopted on October 20, 2005. The plan was amended April 2, 2019, to specifically address solar generating facilities. The plan describes the general trends and future preferences for development with emphasis on maintaining the rural character of the county.

Chapter III: Concerns and Aspirations, section B: Issues and Existing and Emerging Conditions (p.II-12), item 23. Utility-scale Solar Facilities states:

As used in this Comprehensive Plan, a utility-scale solar facility is a facility that generates electricity from sunlight which will be used to provide electricity to a utility provider or a large private user with a generating capacity in excess of one megawatt (1 MW). Sussex’s abundant agricultural and forest land combined with its electrical infrastructure and transportation system appear to be attractive to the solar industry. These facilities are an industrial scale land use that occupy significant acreage. Many utility-scale solar facilities are located on agricultural or forested land that may have had other future land use potential or land use designations.

The County will consider solar facilities in districts zoned agricultural or industrial with preference for brownfields and County-owned capped landfills. The following site features should be addressed to mitigate the potential negative impacts of utility-scale solar facilities on County land use patterns as part of the evaluation of a Conditional Use Permit (CUP) application:

- The total size shall be larger than two (2) acres but less than 1,500 contiguous acres with no more than 65% PV panel coverage;
- Located outside planning areas or community hubs;
- Located outside forested areas to preserve forest resources;
- Further than three (3) miles from any village or town boundary;
- Further than two (2) miles from other existing or permitted solar facilities; and
- Proximity to residences; historic, cultural, recreational, or environmentally sensitive areas; and scenic viewsheds.

Chapter II: Concerns and Aspirations, section C. County Vision, item 2. Vision Statement on p.II-13 states:

Sussex County seeks to maintain its rural character and natural beauty. The County is intent upon protecting its forest resources, agricultural lands, and natural environmental systems. It will accomplish its objectives by: concentrating commercial and industrial development along US 460 and the I-95/US 301 corridor and in other areas where adequate infrastructure exist to support such development; balancing residential and commercial land uses; protecting and preserving viewsheds; protecting and preserving the natural environment and surface and ground waters; promoting smart growth practices and prudent land use decisions; and discouraging over development and strip development along State maintained roads.

Chapter IX: Land Use and Development, section B. Land Use Conflicts (p.IX-2) lists several issues to consider in addressing land use conflicts:

Land use conflicts that occur in Sussex County are typical of similar Virginia counties that must balance the needs of, and activities associated with, agriculture, forestry, and conservation uses with residential, commercial, industrial, and public uses. With respect to land uses and development, the County must remain cognizant and carefully consider a variety of issues when making land use decisions. Issues relevant to solar facilities include:

- Encroachment of residential and other urban-level land uses into traditional agricultural and forestry areas.
- The balance between needed commercial and industrial development and the conversion of vacant land.

Chapter X: Plan for the Future, section A. Introduction provides guidance for each land use type. Item 1. Agricultural and Forested Lands (p.X-1) states:

Agricultural land is one of the most valuable of all-natural resources. Of major importance, and an objective of land use planning in Sussex County is to identify prime agricultural land and to preserve it from being developed for residential or other land uses. Once developed, it cannot easily be restored to its original condition (nature).

Item 3. **Industrial Development** (p.X-2) states:

Industry, which will provide much of the basic employment needed for anticipated growth, has more critical location requirements than other major land uses. Prime industrial sites should be located where they can be served by major transportation facilities, including major highways, railroads, and airports. Industries dependent upon the transportation of heavy materials and products require locations served by railroad facilities. Other types of industry may prefer locations near major highways to facilitate truck service and access by employees, and still others may seek location near the airport. In addition to transportation facilities, industries should be in locations where adequate public utilities and services can be provided. Other requirements include suitability of sites with respect to slope, drainage, and soil bearing capacity, and suitable buffering from residential or other incompatible uses.

Potential industrial sites are located on the fringe of the existing towns, along the corridors of U.S. 301, I-95, and the CSX Railroad, in the western portion of the County, and along the U.S. 460 and Norfolk Southern Railroad in the eastern portion of the County. Also, areas on the north side of Cabin Point Road (State Route 602) may be suitable for industrial development. Sussex County is one of the few localities in Virginia that have been identified as having the potential and available acreage necessary to develop a mega industrial site.

This chapter also includes section C. **County-wide Goals and Objectives** clearly delineating 22 issues, each with one or two goals and several objectives (tactics). There are seven (7) issues and ten (10) goals relevant to the subject of solar facility siting.

Issue 1 Commercial and Industrial Development (p.X-10)

Goal 1: Promote economic development that will assure employment stability and provide ready access to needed goods and services in the County. Encourage local expansion and new industry location in the County to broaden the tax base and increase employment opportunities.

Goal 2: Sustainable commercial and industrial development in areas where such activities already occur or can be reasonably accommodated by public facilities and the County's natural systems and to encourage local support and patronage of County business.

Issue 2 Community Appearance (p.X-12)

Goal 1: Guide and support sound and attractive land use development with the County that will result in the least possible adverse fiscal and environmental impact.

Goal 2: Remain aesthetically pleasing while maintaining rural atmosphere, open spaces, and natural areas.

Issue 6 Growth Management (p.X-14)

Goal 2: Promote environmentally friendly development that is sustainable, aesthetically pleasing, and consistent with the County's rural image and character.

Issue 8 Infrastructure Carrying Capacity and Provision for Facilities and Services (p.X-16)

Goal 2: Ensure that public systems and services are sized, located, and managed to protect or restore the quality of areas of environmental concern or other fragile areas while providing adequate levels of service to meet the needs of citizens.

Issue 10 Land Development and Land Use Compatibility (p.X-18)

Goal 2: Ensure that development and use of resources or preservation of land minimizes direct and secondary environmental impacts, avoids risks to public health, safety and welfare and is consistent with the capability of the land based on considerations of interactions of natural and man-made features.

Issue 11 Natural Systems (p.X-20)

Goal 1: Preserve and develop forestry, agriculture, and related industry as important economic components of the County. Provide for the wise use of the County's nonrenewable earth and mineral resources, while protecting the beauty of the landscape.

Goal 2: Conserve protective functions of wetlands, flood plains, and other shoreline features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

Issue 21 Water Quality (p.X-26)

Goal: Maintain, protect, and where possible, enhance water quality of public waters.

In this chapter, section D. Planning Areas' Goals and Objectives provides specific goals and objectives under the 22 issues for each planning area. The Stony Creek/I-95/U.S. 30/VA Route 40 Planning Area goals and objectives relevant to the subject of solar facility siting are below.

Issue 1 Commercial and Industrial Development (p.X-10)

Objective 4. Provide and maintain natural buffers such as open spaces, trees, and shrubbery between industrial and residential areas.

Issue 2 Community Appearance (p.X-12)

Objective 1. Utilize the County's Zoning Ordinance to prevent the location of incompatible land uses or other potential nuisances in the planning area.

Issue 11 Natural Systems (p.X-20)

Goal: To preserve and protect the predominately agricultural, forestall, and rural character of the Stony Creek/I-95/U.S. 30/VA Route 40 Planning Area.

Chapter XI: Tools for Managing Development, section A. Guide for Land Use Decision-Making (p.XI-2) offers general criteria to consider when evaluating a proposed development or ordinance amendment.

The Commission, however, should also look beyond the plan and consider whether proposed developments, even if consistent with the plan, advance the best interests of public health, safety, and general welfare. This very general criterion calls for consideration of a wide range of issues, including, but not limited to the potential impact of a development on:

- **The natural environment** – i.e., how a proposed development might affect air quality, water quality, flooding, erosion, important natural areas, etc.;
- **Important natural resources** – i.e., how a proposed development might threaten or enhance the continued availability and efficient use of finite natural resources for agriculture or forestry;
- **The transportation system** – i.e., whether any additional traffic generated by a proposed development can be safely and efficiently accommodated by the County's transportation facilities;
- **The provision of utilities and services** – i.e., whether an additional demand for water supply, electricity, refuse collection, fire and police protection, education, health care, recreation, etc. generated by a proposed development can be safely and efficiently accommodated by public, community, or private utility and service systems;
- **The County economy** – i.e., how a proposed development might affect employment opportunities and the general health of the Sussex County economy;
- **Important historical, architectural, archeological, and cultural resources** – i.e., how a proposed development might threaten or enhance the continued existence and integrity of resources of architectural, archeological, or cultural significance;
- **Neighboring development** – i.e., how a proposed development or development allowed by an amendment might affect living or working conditions in neighboring areas (including whether development might deter or enhance the appropriate development or conservation of neighboring property);
- **Community function, character, and attractiveness** – i.e., how a proposed development or development allowed by an amendment might enhance the attractiveness and functional mix of land uses needed to meet the needs of future populations and avoid adverse impacts; and,
- **Provision of affordable and convenient housing** – i.e., how a proposed development might affect people's ability to find affordable housing reasonably accessible to their place of employment.

STAFF COMMENTS AND ANALYSIS

A. Applicant's Position

In the application materials dated August 31, 2020 and revised February 9, 2021 (Attachment A), the Applicant set forth its reasons why the proposed project is substantially in accord with the Comprehensive Plan.

The Applicant identifies the following items in support of its project:

- The proposed project is
 - Located in an agricultural district
 - Less than 1,500 contiguous acres
 - Less than 65% solar panel coverage
 - Greater than two (2) miles from a permitted solar facility

- Adjacent to a few residential properties with existing forest buffers
- Not proximate to eligible historic, cultural, or recreational areas or scenic viewsheds
- Adjacent to surface waters and wetlands, but mitigation measures are proposed to protect these areas
- A Dominion transmission line is near the property for interconnection to the grid.
- The project will generate minimal offsite noise, little glare, and no emissions or safety hazards.
- After the construction is complete, there will be limited ongoing maintenance, and the ingress/egress traffic will remain similar to current use patterns.
- The project will generate tax revenue and create temporary construction jobs.
- Solar facilities are a low intensity use that do not require county infrastructure or resources.

Staff Analysis

Staff has analyzed the proposed project considering the recently approved amendments and other relevant sections of the County's Comprehensive Plan, primarily:

- Chapter II, section B, item 23. Utility-scale Solar Facilities
- Chapter II, section C, item 2. Vision Statement
- Chapter IX, section B. Land Use Conflicts
- Chapter X, section D. Stony Creek/I-95/U.S. 30/VA Route 40 Planning Area goals and objectives

In addition to the items identified by the Applicant above, analysis considerations include:

- The project is 2.8 miles from the town boundary for Stony Point.
- The project is in the Stony Creek/I-95/U.S. 30/VA Route 40 planning area.
- The project is located on land partially used for timber production, but the surrounding wetlands make seven (7) acres of timberland challenging to harvest.
- The project is proximate to one Virginia Department of Forestry (DOF) conservation easement.
- The project is proximate to 52 archaeological resources and 39 architectural resources within a 3-mile buffer of the project limits.

The location, character, and extent of the proposed utility-scale solar project are **in accord with these guidelines** set forth in the Comprehensive Plan, Chapter II, section B, item 23. Utility-scale Solar Facilities.

- The project section of the parcels is zoned agricultural.
- The total size is less than 1,500 contiguous acres.
- There is no more than 65% solar panel coverage.
- The location is further than two (2) miles from other existing or permitted solar facilities.

The location, character, and extent of the proposed utility-scale solar project are **not in accord with these guidelines** set forth in the Comprehensive Plan, Chapter II, section B, item 23. Utility-scale Solar Facilities.

- The frontage of the project parcels is zoned residential, and the draft small area plan proposes mixed uses for the frontage.
- The project is less than three (3) miles from the town boundary for Stony Point.
- The project is in the Stony Creek/I-95/U.S. 30/VA Route 40 planning area.
- The project is located on seven (7) acres primarily used for timber production.
- The project is adjacent to a residential land use and near (within a 3-mile buffer of the project limits) a Virginia Department of Forestry conservation easement, 39 architectural resources, and 52 archaeological resources.

Staff has analyzed the Comprehensive Plan elements, and the proposed project does not meet the Comprehensive Plan's land use goals, objectives, and strategies. **Staff finds that the proposed utility-scale solar facility is not substantially in accord with the Sussex County Comprehensive Plan, or parts thereof.**

As recommended in the Comprehensive Plan, the Commission, however, should look beyond the plan and consider whether proposed developments, even if consistent with the plan, advance the best interests of public health, safety, and general welfare. This very general criterion calls for consideration of a wide range of issues, including, but not limited to the potential impact of a development on:

- The natural environment
- Important natural resources
- The County economy
- Important historical, architectural, archeological, and cultural resources
- Neighboring development
- Community function, character, and attractiveness

The question before the Planning Commission with this 2232 application is:

Whether the general location or approximate location, character, and extent of the proposed solar energy facility is substantially in accord with the Comprehensive Plan or part thereof.

- The Planning Commission should consider all relevant portions of the Comprehensive Plan in its analysis.
- The Planning Commission should carefully and thoroughly document its reasons for whatever conclusion it reaches.
- The Planning Commission has three options:
 - a. Determine that the application is substantially in accord with the Comprehensive Plan with written reasons for its decision.
 - b. Determine that the application is not substantially in accord with the Comprehensive Plan with written reasons for its decision.
 - c. Defer making a decision on the comprehensive plan compliance review for further discussion and consideration (within the 60-day window).

Attachments:

A – CUP Application, submitted August 31, 2020 and revised February 9, 2021

B – Maps

DRAFT PLANNING COMMISSION ACTIONS

Staff Recommendation: Option 1 – Applicant’s proposal is not substantially in accord with the Comprehensive Plan.

I move that the Flatfoot Solar, LLC’s proposed 1.62 megawatt photovoltaic solar energy facility as described in the conditional use permit application 2021-01, is not substantially in accord with the Sussex County Comprehensive Plan for the following reasons:

1. The location is less than three (3) miles from any village or town boundary.
2. The project area is in the Stony Creek/I-95/U.S. 30/VA Route 40 planning area.
3. The project is located on land primarily used for timber production.
4. The project is adjacent to a residential land use and near (within a 3-mile buffer of the project limits) a Virginia Department of Forestry conservation easement, 39 architectural resources, and 52 archaeological resources.

The Secretary of the Planning Commission is directed to communicate the Planning Commission’s findings to the Board of Supervisors.

Option 2 – Applicant’s proposal is substantially in accord with the Comprehensive Plan.

I move that the Flatfoot Solar, LLC’s proposed 1.62 megawatt photovoltaic solar energy facility as described in the conditional use permit application 2021-01, is substantially in accord with the Sussex County Comprehensive Plan or parts thereof for the following reasons:

1. The project parcels are zoned agricultural or industrial.
2. The total size is less than 1,500 contiguous acres.
3. There is no more than 65% solar panel coverage.
4. The location is further than two (2) miles from other existing or permitted solar facilities.
5. The proposed project involves only a small part of the total agricultural land in the County and will have setbacks and buffers which, if adequate in scope and required in the Conditional Use Permit, could afford protection for adjacent properties.

The Secretary of the Planning Commission is directed to communicate the Planning Commission’s findings to the Board of Supervisors.

Option 3 – Deferral of the application.

I move that the Planning Commission defer a decision on Flatfoot Solar, LLC’s request under Va. Code § 15.2-2232 regarding its proposed 1.62 megawatt photovoltaic solar energy facility as described in the conditional use permit application 2021-01, until the Planning Commission meeting scheduled to begin at ____ p.m. on _____, in the Board of Supervisors meeting room.

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CUP Number: _____
 Date Application Filed: _____
 \$500 Processing Fee Received By: _____



Sussex County Planning Department
 Post Office Box 1397
 21095 Princeton Road
 Sussex, Virginia 23884
 Phone: 434-246-1043
 Fax: 434-246-2175

CONDITIONAL USE PERMIT APPLICATION

Owner Information:

Name: Antonia Jones And Viner Enterprises, Inc.
 Address: 2404 Jockey Hill And 101 Wakeford Ave.
Pring Creek, VA 23842 And Kingsport, VA 23880
 Phone Number: _____

Applicant Information:

Name: Fordham Solar, LLC
 Address: 7211 Princeton Ave, Suite 103
Charlottesville, VA 22901
 Phone Number: (434) 326-4408

Legal Description of Property:

Tax Map Number: 65-4-41 And 65-4-37
 Zoning District: A-1/R-1 And A-1/R-1/R-2
 Block Number: N/A
 Lot Size (Acres): 21.33 Ac. And 62.26 Ac.

Election District: 4 - Pring Creek
 Subdivision: N/A
 Lot Number: 4 And 37
 Square Footage: N/A

Please answer the following:

- When was property acquired by applicant? 02 / 11 / 2019 And 01/12/2017
- Are there any deed restrictions on the property in question? Yes No
 (If yes, attach a copy of restrictions).
- What is the proposed use of property or type of improvement? Please be detailed and specific in your description. (For example: new construction, addition or demolition, agricultural, residential or commercial use)
2404 Jockey Hill - Solar Solar Energy Facility
- What is the Fair market value of improvements? \$ 2,445,000
 (Value must include all buildings, electrical, plumbing, and mechanical work to be performed).
- Describe briefly the type of use and improvements proposed. State whether new buildings are to be constructed, existing buildings are to be used, or additions made to existing buildings.
Solar Energy Facility (panels, inverters) and transform the energy into electricity. The electricity will be sold to the local electric energy company if there are no up buildings associated with this lot. Solar Panels are for Project Finance for further development. Project Subgrants and equity given
- Describe how the proposed use and improvements are to be designed and arranged to fit into the development of adjacent property of the neighborhood.
Project Solar will be designed and constructed in full compliance with Sussex County Code. The footprint of the Project shall not be in excess of 300 feet in any direction, and will be a local or local after completion of construction. The array is particularly sited to preserve the character of the lot and the surrounding area.
- Furnish plot plan, preliminary site plan, and/or preliminary subdivision plat showing boundaries and dimensions of property, width of boundary sheets, location and size of buildings on site, roadways, walks, off street parking and loading space, landscaping and the like. Architect's/Engineer's sketches showing elevations of proposed buildings and complete plans are also desirable and if available should be filed with application.
See Appendix D and Appendix E Attached
- I hereby certify that I have the authority to make the foregoing application and that the application is complete and correct and that the conditional use permit is in accordance with section Article 200B: Solar Facilities of the Zoning Ordinance.

Owner Signature: Antonia Jones (ve, i) Date: 8/4/2020
 Applicant Signature: [Signature] Date: 7/28/2020

GUP Number: _____
 Date Application Filed: _____
 \$500 Processing Fee Received By: _____



*Sussex County Planning Department
 Post Office Box 1397
 21035 Princeton Road
 Sussex, Virginia 23854
 Phone: 434-246-1043
 Fax: 434-246-2175*

CONDITIONAL USE PERMIT APPLICATION

Owner Information:

Name: Amanda Jones And Thom Energy LLC
 Address: 2424 Jones Rd, Apt 100, Henric, VA 23112
And 6470 Hwy, VA 23047

Phone Number: _____

Applicant Information:

Name: Robert S. M. LLC
 Address: 722 Franklin Ave, Belle Meade, TN 37019
Charlottesville, VA 22904

Phone Number: _____

Legal Description of Property:

Tax Map Number: 65-A-48 And 65-A-37
 Zoning District: A-1 / H-1 And A-1 / R-1 / H-1
 Block Number: N/A
 Lot Size (Acreage): 21.23 Ac. And 66.31 Ac.

Election District: A - Henry Creek
 Subdivision: N/A
 Lot Number: 48 And 37
 Square Footage: N/A

Please answer the following:

- When was property acquired by applicant? 06 / 18 / 2019 And Continued
- Are there any deed restrictions on the property in question? Yes No
 (If yes, attach a copy of restrictions).
- What is the proposed use of property or type of improvement? Please be detailed and specific in your description. (For example: new construction, addition or demolition, agricultural, residential or commercial use)
2474 DC / 15401 POLG DR 111 - Solar Solar Energy Facility
- What is the Fair market value of improvements? \$ 2,500,000
 (Value must include all buildings, electrical, plumbing, and mechanical work to be performed).
- Describe briefly the type of use and improvements proposed. State whether new buildings are to be constructed, existing buildings are to be used, or additions made to existing buildings.
Solar Energy Facility to be constructed and to install the solar panels. The facility will use the (and described) Energy-related grid. There will be no buildings, electrical, plumbing, or mechanical work to be performed.
- Describe how the proposed use and improvements are to be designed and arranged to fit into the development of adjacent property of the neighborhood.
Electric Solar will be designed and constructed in full compliance with Sussex County Code. The footprint of the project shall be no larger than 200 ft x 200 ft. The solar panels will be installed in a way that will be aesthetically pleasing and will not be a visual distraction to the surrounding area.
- Furnish plot plan, preliminary site plan, and/or preliminary subdivision plat showing boundaries and dimensions of property, width of boundary sheets, location and size of buildings on site, roadways, walks, off street parking and loading spots, landscaping and the like. Architect's/Engineer's sketches showing elevations of proposed buildings and complete plans are also desirable and if available should be filed with application.
See Appendix D and Appendix B Attached
- I hereby certify that I have the authority to make the foregoing application and that the application, is complete and correct and that the conditional use permit is in accordance with section Article XVIII - Solar Facilities of the Zoning Ordinance.

Owner Signature: Amanda Jones Date: 07/28/2020
 Applicant Signature: Robert S. M. Date: 7/28/2020



County of Sussex

SECTION 15.2-2232 REVIEW APPLICATION

SUSSEX COUNTY COMMUNITY DEVELOPMENT OFFICE

APPLICATION NUMBER: _____

(Assigned by Sussex County Community Development Office)

GENERAL INFORMATION

1. Applicant/Agent(s): Platinum Solar, LLC

Address: 722 Preston Ave. 8th Floor

Charlottesville, VA 22907

Daytime Phone: (803) 336-4466

FAX Number: _____

E-mail address: BOC@platinumenergy.com

DESCRIPTION OF PROPERTY

1. Tax map number(s):

65-A-45

65-A-37

2. Street address, if applicable (or common description if no street address is available):

Sussex Dr. / Route 40, West of Concord Sappony Rd.

3. Planning Area: Stony Creek/ I-95/ U.S. 301

4. Comprehensive Land Use Plan Designation:

Agricultural/Forested/Open Space

ACKNOWLEDGEMENT

DECLARATION OF ACCURACY:

I, the undersigned, certify that this application is complete, accurate and contains all required and requested information, documents and other submittals, and that all statements made herein are, to the best of my knowledge, true and correct. I further certify that I have exercised due diligence to obtain the most recent, complete and correct information available. I understand that wrongful certification or failure to provide required or requested documents that become available after the initial submittal of this application may result in a delay in, or invalidation of, any official governmental action taken. Fraudulent representations may lead to additional penalties under law.

DECLARATION OF CONSENT:

I, the undersigned, consent to entry upon the subject property by public officers, employees, and agents of the County of Sussex wishing to view the site for purposes of processing, evaluating or deciding this application.

Yes



Applicant/Agent:

SECTION 15.2-2232 REVIEW APPLICATION CHECKLIST

The following items are required as part of the Section 15.2-2232 Review application:

- The original application, including all required information. All information must be typed or clearly printed on the application and 8½" x 11" paper as needed. *Please include this checklist with the original application.*
- Sixteen (16) copies of the completed application. *Please copy only the application including this completed checklist.*
- Sixteen (16) copies of a map showing the location of the proposed improvement, or if available, sixteen (16) copies of a site sketch drawn to scale, showing all existing and proposed structures, and other structures and features located on the site. Copies of the map and/or site plan reduced to 11" x 17" paper.
- Sixteen (16) copies of the tax map parcel on 8½" x 11" paper with the parcel highlighted.
- Any additional drawings, pictures, or information, which will assist the Planning Commission in making their decision.

HEXAGON ENERGY

APPLICATION FOR
FLATROOF SOLAR
CONDITIONAL USE PERMIT

PURSUANT TO

CODE OF THE COUNTY OF
SUSSEX, VIRGINIA

FEBRUARY 1ST, 2021

Prepared for:
Sussex County
Planning Commission
15098 Courthouse Rd.
Sussex, VA 22684

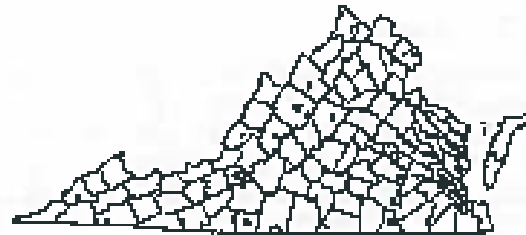
Prepared by:
Hexagon Energy, LLC
722 Preston Ave. | Suite 102 | Charlottesville, VA 22903
Tel: 434-227-5090 | hexagon-energy.com

NOTICE OF RESTRICTIONS

This document includes data that shall not be disclosed outside of Sussex County and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this information. This restriction does not limit Sussex County's right to use information contained in this data if it is obtained from another legitimate source without restriction. The data subject to this restriction are contained in all sheets marked with the following legend: "Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation."

PROJECT NARRATIVE

FLATFOOT SOLAR – 2 MW_{DC}
STONY CREEK, VA
SUSSEX COUNTY



- ✓ **WELL-SITED**
The project is set back 800+ feet from roads and homes, and offers natural visual buffers on all sides.
- ✓ **LOW IMPACT**
Low profile, low traffic, low sound-levels. No odor, hazardous materials, nor light pollution. No permanent structures.
- ✓ **ECONOMIC DEVELOPMENT**
Local labor and materials will be used to the extent they are available. Virginia now has over 4,400 solar jobs and the industry continues to grow faster than the overall economy (15.4% increase in 2019).
- ✓ **BASED IN VIRGINIA**
We are a locally-owned Virginia company based in Charlottesville and have partnered with SVCC to create a solar jobs training program, SHINE.
- ✓ **PROVEN DESIGN & EQUIPMENT**
Fully meets Dominion's equipment and design requirements, including industry standard Tier 1 components backed by bankable warranties.



OVERVIEW

Hexagon Energy is pleased to apply for a Conditional Use Permit for Flatfoot Solar (the Project), a 2-megawatt (MW) direct-current (DC) solar photovoltaic (PV) project located in Sussex County, Virginia. The Project will be located at Parcel IDs 65-A-45 and 65-A-37 (the Property), on the southern side of Sussex Drive (Route 40), west of Stony Creek. The Project will encompass approximately 10 acres of field and forest on two greater properties totaling 83.68 acres, and will be located in the A-1 Agricultural District. The project has been designed in full compliance with Sussex County and Virginia permitting and approval requirements.

APPLICANT & FACILITY OWNER

Flatfoot Solar, LLC is both the applicant and facility owner for the Project. Flatfoot Solar, LLC is a wholly-owned subsidiary of Hexagon Energy, LLC (Hexagon Energy), a Virginia Limited Liability Company. Hexagon Energy is located in Charlottesville, Virginia—with our owners and all but two of our employees residing in Virginia.

Hexagon Energy is an independent, privately owned energy development firm that believes the path to a clean energy future requires a range of new sources and technologies. We develop projects across six diverse energy solutions with one common goal—powering a clean future.

Over the past 18 years, Hexagon Energy's principals have played a central role in building the renewable energy industry in Virginia and bringing renewable energy jobs to the Commonwealth. Our principals have advised Dominion on 232 MW of renewable energy purchases and developed over 660 MW of solar projects across the U.S., including some of the first utility-scale projects in Virginia. We are excited to work with Sussex County to develop a locally-based solar project that benefits Virginia communities, rate payers, and land owners.

AT A GLANCE

- Established in 2015
- Developing energy projects since the early 1990s
- 2,875 MW of energy development experience across 17 states
- Representing over \$1.5 Billion USD in invested capital

LOCATION & CONTACT INFO

722 Preston Ave. | Suite 102
Charlottesville, VA 22903
info@hexagon-energy.com

ENERGY DEVELOPMENT EXPERIENCE

Hexagon Energy's principals have been developing energy projects since 2000 and have a wide range of experience that guides our work. Over the past 20 years, Hexagon Energy's principals have developed and financed nearly 3,000 MW of energy projects in 17 U.S. states, representing over \$1.5 billion in invested capital. The projects include utility scale wind and solar projects ranging from a few megawatts to over a gigawatt. The following table summarizes the energy development experience of Hexagon Energy's principals, both at Hexagon and prior companies.

TYPE	SINCE	ADVISORY	OPERATING	UNDER DEVELOPMENT
Solar PV	2008	232 MW	587 MWac	2,317 MWac
Wind	2000	400 MW	2,278 MWac	550 MWac
Energy Storage	2013	20 MW	—	44 MWac
TOTAL		652 MW	2,875 MWac	2,976 MWac

Table 1: Hexagon Energy's Project Development Experience



PROJECT DESIGN

Hexagon Energy proposes to develop and construct Flatfoot Solar, with a nameplate capacity of 2MW_{ac} (1.62MW_{dc}). All of the clean energy generated by the facility will be interconnected to the Dominion power grid (the Grid) at the existing 34.5 kilovolt (kV) distribution line on the north side of Sussex Drive/Route 40. The Project has executed an Interconnection Agreement with Dominion Energy, and has an electrical offtake proposal under consideration.

Flatfoot Solar will consist of approximately 5,500 crystalline silicon solar PV panels sourced from Tier 1 manufacturers. Additional equipment will include single axis tracker components, DC to AC string inverters, a medium voltage transformer and a control cabinet, project switch gear, a meter, and the interconnection to the existing distribution system.

To support the PV panels, the Project will utilize a single-axis tracking system designed to optimize power production of the panels by rotating them to follow the path of the sun. The single-axis tracker design consists of a series of mechanically linked horizontal steel support beams known as torque tubes, with a drive train system usually located in the center of the rows. The rows will be placed 18.5 feet apart (center to center) and the panels will cover approximately 35% of the Project area. The racking system will be supported by metal piles driven or screwed into the ground by a pile-driving machine to a depth of approximately 10 feet.

The PV panels in each row will be wired together into a circuit (string). There will be a DC to AC string inverter for approximately every 3 rows, typically mounted on a piling adjacent to the tracker structure. AC Power will be transmitted from the string inverters via three-phase direct-buried cables, buried at a depth of approximately 36 to 48 inches, and aggregated at the AC collection switch gear and then on to the medium voltage transformer. The transformer will be mounted on a concrete slab with the project switchgear and control cabinet. The transformer steps up the voltage of the electrical power to 34.5kV to match the Grid. The power is transmitted from the transformer to the Project's protective recloser and metering equipment before interconnecting with Dominion's existing infrastructure along Sussex Drive/Route 40.

An internet access drive, consisting of an all-weather aggregate base, will allow access to the PV panels. Site security will consist of a 7-foot-high chain-link fence with barbed wire installed around the perimeter of the solar panel array. Pursuant to Sec 16-406 (f), a performance bond reflecting the costs of anticipated fence maintenance shall be posted prior to commencement of construction, and maintained throughout the duration of the project. The fence area will be screened on all sides from view with existing natural forest vegetation. Manual swing gates will be constructed at the main entrance and in strategic areas, as required for access by maintenance crews. National Electric Code standards for safety and signage will be met or exceeded.

HEALTH & SAFETY

The project will utilize passive photovoltaic (PV) cells to generate electricity and inverters to change the direct current into alternating current. They consist of common materials including glass, polymer, aluminum, copper, and silicon semi-conductor material. Solar PV panels function as a solid state, inert crystal composed of non-toxic materials and are most similar to a pane of solid glass. There are no chemicals, fluids, or materials that are capable of entering the environment. The PV and inverter technology have been utilized and studied for over 30 years and are not known to pose any significant health dangers to neighbors. Instead, the reduction in pollution from fossil-fuel-fired electric generators make solar farms a positive impact on human health.

In May 2017, researchers at NC State University published a detailed review of the Health and Safety Impacts of Solar Photovoltaics that "utilizes the latest scientific literature and knowledge of solar practices in N.C. to address the health and safety risks associated with solar PV technology. These risks are extremely small, far less than those associated with common activities such as driving a car, and vastly



outweighed by health benefits of the generation of clean electricity.⁸ The full report can be found attached in Appendix I attached.

SITE LOCATION AND CHARACTERISTICS

Flatfoot Solar will encompass approximately 10 acres in the middle of a larger, 63.69-acre property cluster (the Site). The Site is located in the A-1 Agricultural District-zoned portion of the Property, and has historically served agricultural and wooded timber uses. A portion of the Property is zoned R-1 and R-2, and the northeastern portion of the Property is currently the location of the Sappony Mobile Village. The small field on a portion of the Site is currently rented out for farming, while the forested areas remain undeveloped. The topography of the Property is predominantly flat to gently rolling.

Approximately 7 acres of trees will be cleared to accommodate the array area and prevent shading. Any site grading will create finished grade slopes suitable for racking installation and storm water management improvements. Flatfoot Solar, LLC shall submit a grading plan for approval by the County prior to the issuance of a Building Permit. A storm water pollution prevention plan specific to the Project will be developed as well, and best management practices will be implemented and inspected regularly to ensure erosion and sedimentation is avoided.

The Site is naturally buffered by existing tree-line and forested areas on all sides, and the array will be set back over 300 feet from Sussex Drive/Route 40 and nearby residences. As depicted in the attached Location Map and Adjacent Property Owner List, the Property is abutted by A-1 agricultural parcels in addition to R-1 and R-2 zoned residences.

In 2019, Sussex County had updated its Comprehensive Plan to further address the development of utility-scale solar facilities. These updates identified preferences for the location and size of future proposed development. Flatfoot Solar is located in excess of the preferred two-mile setback from the existing Sappony Solar Project, also along Sussex Drive/Route 40. Using publicly available data, there are no other known solar projects within a 4-mile radius of the project. Additionally, we estimate that the Site is located approximately 2.78 miles from the town boundary of Stony Creek, which is within the preferred three-mile setback identified in the Comprehensive Plan update. To mitigate the potential impacts of town proximity, Flatfoot Solar shall be screened from Route 40, one of the thoroughfares leading to the Town.

ENVIRONMENTAL AND CULTURAL IMPACT

WETLANDS

The Site is located near Sappony Creek. Hexagon Energy has partnered with Timmons Group to perform a field assessment and delineation of the wetlands on the Property. We plan to have this delineation verified by the US Army Corps of Engineers. The site area will be designed and constructed to setback from, and not impact delineated wetlands.

Site access will utilize an existing pathway located on parcel ID 65-A-45. While this pathway will be improved, we have identified that a wetland crossing is required. Flatfoot Solar will obtain all requisite state and local wetland permits and mitigation compliance prior to facility construction.

WILDLIFE HABITATS

The Property has been screened, via desktop review, for known critical habitats for threatened and endangered species, and none are known to be present on the Property. Hexagon has generated an official species list using the US Fish and Wildlife Service's Information for Planning and Consultation (IPaC) tool to confirm that there are no known critical habitats. We will further engage US Fish and



Wildlife Services and the Virginia Department of Wildlife Resources in a critical habitat field assessment to ensure our site has no impact to threatened and endangered species.

ENVIRONMENTALLY SENSITIVE AREAS

There is one Virginia Department of Forestry (DOF) conservation easement present on a property approximately 1.7 miles northeast of the Site, on the border of Sussex County and Dinwiddie County. There are no state or nationally registered forests, recreational areas, wildlife management areas, nor environmental protection zones within a 3-mile radius of the Project. The Property abuts Sappony Creek on the south and southeastern sides, and the Site shall be set back to avoid these areas.

We have reviewed the Property using the Virginia Department of Conservation and Recreation Natural Heritage Database Explorer Tool. Preliminary findings identified that the Property is within the Northway County – Stony Creek Stream Conservation Unit (SCU). This SCU has been given a biodiversity ranking of B2, representing an area of very high significance. The Property was further reviewed by the agency. The report can be found in Appendix J. VADCR recommended that the Project adhere to applicable state and local erosion and sediment control/storm water management laws and best practices. Further, the agency recommended that the project establish and enhance natural riparian buffers with native plant species and maintain natural stream flow. We will coordinate with VADCR and VADWR to ensure that any impacts are mitigated.

CULTURALLY AND HISTORICALLY SIGNIFICANT RESOURCES

The Property has been screened for cultural and architectural sites via desktop analysis. A review of Virginia Cultural Resources Information System report (V-CRIS) data indicates there are 39 architectural and 52 archaeological resources within an approximate 3-mile radius of the Site. We have identified that the Property intersects an area identified as a potential battlefield approach area for the Battle of Stony Creek Depot / Sappony Church Battlefield. In previous study reports, research staff concluded that the battlefield area is likely eligible for listing in the National Register of Historic Places. As of the submission of this application, this area is not listed in the NRHP. The Site does not intersect this potential battlefield approach or core area. Flatfoot Solar shall be visually screened from these resources.

COUNTY IMPACT

Once constructed, Flatfoot Solar will be virtually unnoticeable and will not require any additional use of County law enforcement or resources.

SECURITY

The Site will be fenced in by a 7-foot-high chain-link fence topped with strands of barbed wire to deter any unauthorized access to the site. After construction concludes, the gates will remain locked, access will be coordinated by authorized operations and maintenance personnel. The Site will also include a "Knox Box" on the gate to provide 24/7 emergency access for fire and police personnel.

ACCESS & ATTACHMENT FACILITIES

Ingress and egress will be improved and maintained via the existing driveway off of Sussex Drive/Route 40, and will ensure suitable access for fire and other emergency vehicles. As identified in Appendix D, the proposed access pathway and grid attachment line cross an area designated as a Freshwater Forested/Shrub Wetland in the U.S. Fish and Wildlife Service National Wetlands Inventory. Flatfoot Solar LLC will comply with State and Federal regulations regarding wetland crossings, and will obtain the requisite Nationwide Permit from the US Army Corp of Engineers prior to any land disturbance.

The electrical attachment lines that span from the Site to Sussex Drive/Route 40 shall be overhead. Approximately two to three pole spans, or 280-300 feet, will be visible from Sussex Drive/Route 40, where



The path crosses a clearing from the woods on the Property. Visualizations of the attachment line can be found in Appendix D of this application.

WATER

An on-site source of potable water will not be required during construction or operation of Flatfoot Solar. Any on-site water required will be supplied by Flatfoot Solar, LLC. No well-digging will be required.

SOUND

From Sussex Drive/Route 40, the array will be virtually inaudible. The Project is planned to feature Solecra PV/80TL (50kWac) inverters and DuraTrack HZ v3 racking equipment that will produce a small amount of sound (<60dBA at 1 meter away) within the Site.

GLARE

In addition to being visually screened from Sussex Drive/Route 40, the panels are designed to absorb as much sunlight as possible, and are treated with an anti-glare coating. The Project is more than three miles from any major airport, and an FAA Hazard analysis is not required.

CONSTRUCTION

Based on the current project schedule, construction is forecasted to begin in the early spring of 2022. Construction is estimated to take one to two months, dependent on weather. Following construction, the Project will undergo testing and commissioning in coordination with Dominion Energy. The Project is estimated to commence operations in the early summer of 2022.

Hexagon estimates there will be 18 deliveries by full size tractor trailers to deliver the solar panels, racking, and wiring equipment. Construction will involve minimal ground disturbance, and Hexagon shall submit a detailed traffic study to the County prior to the issuance a Building Permit. The study shall model the construction and decommissioning processes, to be reviewed by County staff in cooperation with VDOT. Ingress and egress of heavy equipment and traffic will be restricted to the existing driveway on the Property off of Sussex Drive/Route 40.

A detailed erosion and sediment control plan will be developed and implemented to prevent runoff from entering the surrounding environment. Erosion and sediment control measures may include straw bales, hay coils, logs, run-off channels, silt fencing, and sediment basins.

Natural vegetative ground cover will be established across the Site upon construction completion. The vegetative ground cover will include native grasses and ensure erosion and sediment control throughout the life of the Project. The ground cover shall be maintained in compliance with Section 16-408 (g). If required by the County, Hexagon shall submit a landscaping maintenance plan prior to the issuance of a Building Permit.

OPERATIONS AND MAINTENANCE

Once constructed, the Project will require very little maintenance and therefore traffic to the Site. Electrical engineers will service the inverters and transformers on average once per quarter. The solar panels have very low failure rates of approximately 1 in 10,000 per year. The Project output is monitored remotely and defective panels are easily replaced from inventory stores. The Project does not require on-site water or chemicals to keep the panels clean. Rain occurs with sufficient frequency and quantity in Sussex County to naturally keep the panels clean. Native vegetation will be maintained under and between the panels with periodic mowing during the growing season. The Site maintenance is typically contracted and performed by local companies.

ECONOMIC DEVELOPMENT



Local materials and labor will be used for the construction and maintenance of the Project to the extent that they are available. The solar industry in Virginia is growing faster than the overall economy and presents new career opportunities throughout the Commonwealth. Hexagon Energy is on the Leadership Council of SHINE, a Virginia Solar Workforce Initiative partnered with Southside Virginia Community College. The program not only trains new workers, but pairs the training with an upcoming solar installation job. The program is aligned with upcoming solar projects and the first classes commenced in the fall of 2019.

Flatfoot Solar will create approximately 20 construction, and 1-2 operations positions in the local community. Flatfoot Solar will also make roughly \$2,845,000 in total capital investment for construction, material, labor, and professional services and the construction will contribute over \$800,000 in direct spending in the local economy. The array will produce enough energy to power roughly 140 homes after it is completed.

DECOMMISSIONING

Facility decommissioning is generally described as the removal of all system components and the rehabilitation of the site to pre-construction conditions. The goal of project decommissioning and reclamation is to remove the installed power generation equipment and return the site to a condition as close to a pre-construction state as feasible. Pursuant to Section 16-404 (f) and Section 16-407, Hexagon proposes to provide a surety bond for the cost of facility decommissioning. The bond will be made available prior to any land disturbances associated with Project construction. The cost of facility decommissioning shall be recalculated every five (5) years to factor changes in removal costs, without any reduction for salvage value, by a professional approved by the County. The value of the surety bond will be updated to match the recalculated decommissioning cost estimate. Hexagon will engage a certified engineer to develop a full decommissioning plan detailing the amount of surety to be posted. This decommissioning plan shall be submitted to the County prior to receiving a Building Permit. The bond shall be maintained in full compliance with Section 16-404 (f) and 16-407 of the Sussex County Code.

Effectively, the decommissioning of the solar plant proceeds in reverse order of the installation.

1. The PV facility shall be disconnected from the utility power grid.
2. PV modules shall be disconnected, collected, and recycled off-site by an approved recycling facility. If no recycling facility is available, PV modules are deemed non-hazardous wastes by EPA guidelines and can be landfilled.
3. Above ground and underground electrical interconnection and distribution cables shall be removed and salvaged or recycled off-site by an approved facility.
4. PV module support aluminum racking shall be removed and recycled off-site by an approved recycler.
5. PV module support steel and support posts shall be removed and recycled off-site by an approved metal recycler.
6. Electrical and electronic devices, including transformers and inverters shall be removed and recycled off-site by an approved recycler.
7. Concrete foundations shall be removed and recycled off-site by a concrete recycler.
8. Fencing shall be removed and will be recycled off-site by an approved recycler.
9. The interior roads can remain onsite should the landowner choose to retain them or be removed, and the gravel repurposed either on or off-site.
10. The Project Site may be converted to other uses in accordance with applicable land use regulations in effect at that time of decommissioning. There are no permanent changes to the site, and it can be restored to its original condition including re-vegetation. Any soil removed for construction purposes will be relocated on the site or used for landscaping after construction is complete.

Pursuant to the requirements set forth in Article XXIII of Sussex County's Zoning Ordinance, Flatfoot Solar shall be subject to the following additional decommissioning requirements:

- Within a period of six (6) months after the Project has ceased continuous service, or as otherwise specified within Section 16-407(a), the Project shall be removed;



- Pursuant to Sec. 16-407 (c) and (d) the Site shall be graded and re-seeded or replanted with pine seedlings, where appropriate, and
- Activities to re-grade and re-seed or replant the Site shall be initiated within six (6) months of Project removal, and be completed within 12 months after Project removal.

REGULATORY CONFORMANCE

Flatfoot Solar has been designed to be in substantial accord with the Comprehensive Plan and conform with the all requirements set forth in the County's Zoning Ordinance.

CONFORMANCE WITH COMPREHENSIVE PLAN

The character and extent of Flatfoot Solar are substantially in accord with the County's Comprehensive Plan. The Project intends to provide locally generated, clean energy to Dominion customers as a part of Dominion's Community Solar program, promoting infrastructure service to the county and beyond. The Project will be clean, non-disturbing, and support local job training and educational opportunities through SHINE, the Virginia Solar Workforce Initiative hosted by Southside Virginia Community College. Specifically, Flatfoot Solar meets the following requirements and goals contained within the Comprehensive Plan:

Chapter II: Concerns and Aspirations, Section B. Issues and Existing and Emerging Conditions (p. 11-12)

23. Utility-Scale Solar Facilities

Chapter X: Plan for the Future, Issue 6. Growth Management Goal:

Goal 2: Promote environmentally friendly development that is sustainable, aesthetically pleasing, and consistent with the County's rural image and character



REQUEST FOR ADDITIONAL CONSIDERATION

Concurrently with this Conditional Use Permit Application, Flatfoot Solar, LLC ("Applicant") requests additional consideration of the Zoning Ordinance via text amendment application.

Pursuant to Sec. 16-406: Minimum Development Standards, utility-scale solar facilities are subject to regulations that "are intended to mitigate the adverse effects of such uses on adjoining property owners, the area, and the County." Sec. 16-405 (c) sets the minimum setback to property lines of parcels with dwellings at 200 feet. Due to the Project's size and proposed location, the Applicant requests this standard be reduced to a 150ft setback from the parcel abutting the Property to the West (parcel ID 65-A-46).

The Applicant has included additional photos illustrating the current visual screenings present throughout the surrounding area in Appendix D. Setback #2 depicts the current visual characteristics of the parcel abutting the Property to the West. This parcel (parcel ID 65-A-46) contains a dwelling off of Sussex Drive, and would therefore require a buffer of 200 feet from all sides in compliance with the Zoning Ordinance.

The dwelling located on Parcel ID 65-A-46 is situated over 1,100 feet from the Site. This includes approximately 884 feet of visual screening from the Site to the tree line closest to the dwelling. Almost all viewsheds of the western property boundary are screened by at least 300 feet of vegetation present on Parcel ID 65-A-46. This buffer is further compounded with existing vegetation that will not be cleared for Project construction. The forested areas on Parcel ID 65-A-46 have been identified as a likely location of wetlands, which we believe will deter future clearing. Once installed, Flatfoot Solar will be nearly invisible under the current buffer conditions to adjoining property owners.

The Applicant asks that the Planning Commission and Board of Supervisors consider this request favorably in conjunction of reviewing this Conditional Use Permit Application.



APPENDIX A: PARCEL OWNERSHIP DOCUMENTATION

Enclosed.



Property Identification Card

Preview

Property Address
 10000 VINCO CIRCLE
 STONY CREEK, VA

Owner Name/Address
 VINCO ENTERPRISES INC
 109 HICKSFORD AVENUE
 EMPORIA VA 23847

Map ID: 65 A 37
 Axl Num: 4626-1

Legal Description: SAPHY MOBILE VILLAGE RT 40 & 681

Local Book/Page: 113 / 602
Will Book/Page: 33 / 633

Occupancy: OTHER

Dwelling Type: TRAILER PK

Use/Class: AGRICULTURAL- 20-100 AC **Acres:** 21.360

Year Assessed: 2018

Year Built:

Land Use: 0

Zoning:

Year Remodeled:

Total Acreage:

District: 03 STONY CREEK

Year Effective:

Total Land: 100000

MH/Type:

On Site Date: 02/16/2017 **Total Improvements:** \$119,700

Condition: AVERAGE

Relev Date:

Total Value: \$220,000

Improvement Description		
Structure	Interior	Site
		STREET-PAVED
		TOP-LEVEL
		CYCL-GRILL
		CYCL-SRPTIC
		CYCL-SLCPRPG

Other Improvements Valuation								
Base	Length	Width	Site	Grade	Rate	FV/Fsq	Value	
MC HOOD-U	1.0	32.0	32		3500.00		112000	
BUSH	1.0	1.0	1				200	
WELL HOUB	1.0	1.0	1				500	
WELL HOUB	1.0	1.0	1				700	
SECK-WOOD	1.0	26.0	26		100.00		2500	
BHEP							700	
BHEP							5000	
BHEP							200	
BHEP							5000	
BHEP							5000	
BHEP							100	
Total Imp Value							119700	

Land Valuation												
M Cls	Desc	Q	Area	Dpth	Rate	FV/Fsq	Value	Sec	Type	Site	Description	Area
A	40 COMB/TREES	A	12.0000		5200.00		62400	Total Square Feet				
T	22 H-SECONDRY	A	40.3600		756.00		30512					
A	00 MIXED TREES	B	40.3600		226.00		9081					
Total Land Value							100300	Land		100500	20200	
								Improvements		119700	119700	
								Total		220000	212000	
								Average Price Per Acre			1342	
								Sale Date/Amount		3/01/2017	150000	

Comments
 SAPHY TRAILER PARK
 01/16/2018 TO 10150 VINCO CIRCLE LOT 14 BHEP
 REPLACED BY ANOTHER SECK ON PIER8.

Real Estate Public Inquiry

Name: VINCO ENTERPRISES INC

	Dept	Ticket No.	Seq.	Account No.	Dns Exp.	Name	Description	Balance
Details	RE2014	8232	1	4626	12/5/2014	VINCO ENTERPRISES INC	SAPONY MOBILE VILLAGE	\$0.00
Details	RE2015	8225	1	4626	12/7/2015	VINCO ENTERPRISES INC	SAPONY MOBILE VILLAGE	\$0.00
Details	RE2016	8232	1	4626	12/5/2016	VINCO ENTERPRISES INC	SAPONY MOBILE VILLAGE	\$0.00
Details	RE2017	8254	1	4626	12/5/2017	VINCO ENTERPRISES INC	SAPONY MOBILE VILLAGE	\$0.00
Details	RE2018	8255	1	4626	12/5/2018	VINCO ENTERPRISES INC	SAPONY MOBILE VILLAGE	\$0.00
Details	RE2019	8232	1	4626	12/5/2019	VINCO ENTERPRISES INC	SAPONY MOBILE VILLAGE	\$0.00

1

[Show Description](#) [Show Map#](#)

Total Due: \$0.00

Note: If payment was received within the past 10 business days, any returned items may not be posted yet.

[Previous](#)

Real Estate Public Inquiry Ticket Detail

REAL ESTATE 2019

Department: RE2019 Ticket No: 82320001 Frequency: 1 Supplement No: 0

Name: VINCO ENTERPRISES INC Account No: 4626

Name 2: Map No: 65 A 37

Address: District: 03

109 HICKSFORD AVENUE Description: SAPONY MOBILE VILLAGE
 EMPORIA VA 23847 RT 40 & 68J

Bill Date: 09/13/2019

Due Date: 12/05/2019

Land Value: \$100,300

Improvement Value: \$119,700

Original Bill: \$1,276.00 Acres: 52.3600 Last Date: 12/02/2019

Payments: \$1,276.00- Penalty Paid: \$0.00 Interest Paid: \$0.00

Amount Owed: \$0.00

Total Owed: \$0.00 Penalty: \$0.00 Interest: \$0.00

Note: If payment was received within the past 10 business days,
 then any returned items may not be posted at this time.

Date	Type	Transaction No.	Amount	Balance
09/13/2019	Charge	0	\$ 1276.00	\$ 1276.00
12/02/2019	Payment	87318	\$ -1276.00	\$ 0.00

[New Search](#)

[Previous](#)

Vol. 113 No. 602

THIS DEED, made and entered into this 1st day of September, 1947,
by and between W. H. CHAMBERS, married, party of the first part,
and VINCO ENTERPRISES, INC., a Virginia Corporation, party of the
second part,

WITNESSETH: That for and in consideration of the sum of Ten (\$10.00)
Dollars and other good and valuable consideration, cash in hand paid, the
receipt of which is hereby acknowledged, the party of the first part does
hereby grant, bargain, sell and convey with GENERAL WARRANTY AND
ENGLISH COVENANTS OF TITLE, unto the said Vinco Enterprises, Inc.,
a Virginia corporation, all the following described real estate, to-wit:

ALL that certain tract, piece or parcel of land lying
and being situate in Spotsy Creek Magisterial District,
Sussex County, Virginia, containing 84.8 acres, more or
less, being described as "Parcel B" on a "Plan of Survey
of Property Owned by Herbert Pughen - South of Route
44", made by S. W. Reddick, C.L.S., dated March 2,
1946, which plan is recorded in the Clerk's Office of the
Circuit Court of Sussex County, Virginia, in Deed Book
10, at page 254 and on which said tract is shown as
being bounded on the North by State Highway Route No.
40 and a portion of Parkton View Subdivision; on the East
by State Highway Route No. 401; on the South by Spotsy
Creek; and on the West by the lands of Amelia Jones
(South Tract) and "Parcel A", reference to the above
plan is hereby made for a more detailed description of
the real estate hereby conveyed. LESS AND EXCEPT
1.15 acres conveyed herebefore to Edward Pughen and
wife by deed dated the 23rd day of July, 1937, and record-
ed in the aforesaid Clerk's Office in Deed Book 75, at page
511, and 8.481 acre acquired by the Commonwealth of Vir-
ginia by purchase dated the 24th day of November, 1918,
and recorded in the aforesaid Clerk's Office in Deed Book
10, at page 473; SAIDING in all respects the same property
as conveyed to W. H. Chambers by deed dated June 28,
1947, of record in the Office of the Clerk of the Circuit
Court of Sussex County, Virginia in Deed Book 113, at
page 278.

WITNESSETH:
H. BENJAMIN VINCENT
SHERIFF, VIRGINIA

Mailed: SEP 14 1947
H. Benjamin Vincent, Atty.
109 Hicksford Avenue
Emporia, VA 23847

This conveyance is made subject, however, to all easements, conditions, restrictions and reservations appearing of record which affect the said property.

The grantor hereby expressly reserves unto himself the right to cut and remove all merchantable timber situated on the aforesaid property which shall be cut and removed within two (2) years from the date of this deed.

WITNESS the following signature and seal.

W. H. Chamberlin (SEAL)
W. H. Chamberlin

STATE OF VIRGINIA, AT LARGE.

CITY OF EMPORIA, to-wit:

The foregoing instrument, dated 1 September 1987, was acknowledged before me by W. H. Chamberlin, unmarried, this 26th day of August, 1987.

My commission expires: 8-29-91

Richard A. Moulton
Notary Public

VIRGINIA: In the Clerk's Office of the Circuit Court of James City. The foregoing instrument was this day presented to the office aforesaid and is, together with the certificate of acknowledgment attached, submitted to record this 1st day of SEPTEMBER, 1987, at 2:50 A. M. The tax imposed by §80.1-601 of the Code has been paid to the clerk of \$ 1.50,00.

TESTE: Raymond Williams Clerk

Property Identification Card

Previous

Property Address: **Owner Name/Address**
 JONES ANANIAS
 24201 JONES ROAD
 STONY CREEK VA 21832

Map ID: 67 A 43
 Acre Age: 4991-1

Legal Description: S K ELLIS
 Deed Book/Pages: 61 / 638

Occupancy: VACANT
 Dwelling Type:

Use/Class: AGRICULTURAL - 20-100-AC Acreage: 31.330
 Year Assessed: 2013 Year Built: Land Use: 0
 Zoning: Year Remodeled: Total Minerals:
 District: 03 STONY CREEK Year Effective: Total Land: 40400
 MH/Type: On Site Date: 02/19/2013 Total Improvements:
 Condition: Reval Date: Total Value: \$43,400

Extension	Improvement Description	Date
	SEWER-SEWER	
	TURF-LAYED	
	WELL-ELECTRIC	

Land Valuation							
---	THUS:	11.330			Rate	100%	Value
R	11	0-PRIMARY	A	6.0000	1881.00	100%	11626
T	17	W-PRIMARY	A	25.3300	883.00	100%	39391
A	04	MINOR	TERR	F	25.3300	150.00	4322
Total Land Value		31.330					40400
Total Property Value							40400

Seq	Type	Sq	Description	Area
Total Square Feet				
			Cur. Value	Prev. Value
			40400	37800
			Improvements	
			Total	40400
			Average Price Per Acre	1084

Real Estate Public Inquiry

Name: JONES ANANIAS

	Dept	Ticket No.	Seq.	Account No.	Due Date	Name	Description	Balance
Details	RE2014	4035	1	4991	12/5/2014	JONES ANANIAS	S K ELLIS	\$0.00
Details	RE2015	4033	1	4991	12/7/2015	JONES ANANIAS	S K ELLIS	\$0.00
Details	RE2016	4044	1	4991	12/5/2016	JONES ANANIAS	S K ELLIS	\$0.00
Details	RE2017	4056	1	4991	12/5/2017	JONES ANANIAS	S K ELLIS	\$0.00
Details	RE2018	4058	1	4991	12/5/2018	JONES ANANIAS	S K ELLIS	\$0.00
Details	RE2019	4015	1	4991	12/5/2019	JONES ANANIAS	S K ELLIS	\$0.00

Show Description Show Map#

Total Due: \$0.00

Note: If payment was received within the past 10 business days, any returned items may not be posted.

[Previous](#)

Real Estate Public Inquiry Ticket Detail

REAL ESTATE 2019

Department: RE2019 Ticket No: 40150001 Frequency: 1 Supplement No: 0

Name: JONES ANANIAS

Account No: 4991

Name 2:

Map No: 65 A 45

Address:

District: 03

24205 JONES ROAD

Description: S K ELLIS

STONY CREEK VA 23082

Bill Date: 09/13/2019

Due Date: 12/05/2019

Land Value: \$40,400

Original Bill: \$234.32 Acres: 31.3300 Last Date: 12/03/2019

Payments: \$234.32- Penalty Paid: \$0.00 Interest Paid: \$0.00

Amount Owed: \$0.00

Total Owed: \$0.00 Penalty: \$0.00 Interest: \$0.00

**Note: If payment was received within the past 30 business days,
then any returned items may not be posted at this time.**

Date	Type	Transaction No.	Amount	Balance
09/13/2019	Charge	0	\$ 234.32	\$ 234.32
12/03/2019	Payment	015	\$ -234.32	\$ 0.00

[New Search](#) [Previous](#)

REAL ESTATE TITLE REPORT

FILE NO.: 3153351B-1

LOCATION: Sussex County, Virginia

CURRENT OWNER: 1) Ananias Jones, fee title

2) Theo Booth and Otelia Booth, life estate

2019 LAND ASSESSMENT:

MPN: 65-A-45

31.330 acres

Land: \$40,400

Imp: 0

Total: 40,400

2019 Real estate tax: \$234.32 (due annually on December 5)

DESCRIPTION:

All that certain tract or parcel of land lying and being situate in Stony Creek Magisterial District, Sussex County, Virginia, containing thirty-three and a third acres, more or less, and being bounded as follows: On the North by Cabin Point Road, on the East by the lands of John _____, on the South by Sappony Creek, and on the West by the lands of Thomas Foster.

Being the same real estate conveyed to Ananias Jones by Deed from Theo Booth and Otelia Booth, his wife, dated November 1, 1963 and recorded December 18, 1964 in the Clerk's Office of the Circuit Court of Sussex County, Virginia in Deed Book 65, page 638. The said Theo Booth and Otelia Booth having reserved a life estate.

William Jones
YR - 11/28/88
Serving Justice

THIS DEED, Made this 1st day of November, 1963, by and between TROY BOOTH and MELBA BOOTH, HIS WIFE, parties of the first part, and ABRAHAM JONES, party of the second part.

WITNESSETH That for and in consideration of the sum of TWENTY-FIVE HUNDRED & NO/100THS (\$2,500.00) DOLLARS, cash in hand paid, at and before the delivery of this deed, receipt of which is hereby acknowledged, the said parties of the first part do hereby grant, bargain, sell and convey, with General Warranty, but subject to the conditions hereinafter set forth, unto the said party of the second part, the following described real estate, to-wit:

All that certain tract or parcel of land lying and being situate in Steep Creek Magisterial District, Swain County, Virginia, containing thirty-three and a third acres, more or less, and being bounded as follows: On the North by Cabin Point Road, on the East by the lands of John _____ on the South by Sycamore Creek, and on the West by the lands of Thomas Forester and being in all respects the identical real estate that was conveyed to Robert Booth by deed from E. A. Hartley and others, dated December 6, 1906, and duly recorded in the Clerk's Office of the Circuit Court of Swain County, Virginia, in Deed Book 18, at page 201. Robert Booth departed this life intestate, leaving surviving him as his sole heir-at-law and next-of-kin the said Troy Booth.

This conveyance is made with the reservation that the parties of the first part for and during the terms of their natural lives shall have the exclusive right to use and occupy the dwelling house and out buildings located on the above described real estate and the further right to cut and use whatever firewood is required for their comfort.

The said parties of the first part hereby covenant that they have the right to convey the said real estate unto the said grantee; that they have done no act to encumber the same; that the said grantee shall have quiet and peaceable possession of the real estate hereby conveyed, free from all incumbrances whatsoever, and that they, the said parties of the first part, will execute such further assurances as may be requisite.

Witness the following signatures and seals:

Robert Booth (REAL.)

Melba Booth (REAL.)

STATE OF VIRGINIA

COUNTY OF SUSSEX, TO-WIT:

I, John A. Ridley, a Commissioner in Chancery for the Circuit Court of the county aforesaid, in the State of Virginia, do hereby certify that Theo Booth and Stella Booth, whose names are signed to the hereto-attached writing, bearing date on the 1st day of November, 1963, have each acknowledged the same before me, in my county and state aforesaid.

Given under my hand this 2nd day of November, 1963.

John A. Ridley
Commissioner in Chancery
for Sussex Circuit Court

VIRGINIA: Clerk's Office of the Circuit Court of Sussex County
DEC 18 1964

19... at 11:30 o'clock A.M. the deed was received and with the certificate attached, admitted to record.

John A. Ridley Clerk

4275
RECEIVED STATE ARCHIVES
AND CANCELLED



APPENDIX B: APPLICANT AUTHORIZATION DOCUMENTATION

Enclosed.

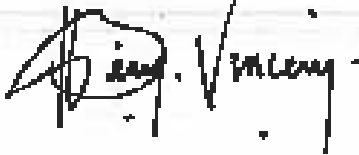


HEXAGON
ENERGY

July 28, 2020

I, H. Benjamin Vincent Jr., President of Vinco Enterprises, Inc. do hereby allow Hexagon Energy LLC, its Developers, and subsidiaries, to represent my property in Stony Creek, Virginia for purposes of obtaining a Conditional Use Permit for a Community Solar Facility with Sussex County.

Signed:




Date Signed: 8/4/2020



July 28, 2020

I, Ananias Jones, do hereby allow Hexagon Energy LLC, its Developers, and subsidiaries, to represent my property in Story Creek, Virginia for purposes of obtaining a Conditional Use Permit for a Community Solar Facility with Sussex County.

Signed:



Date Signed: 07/28/2020



APPENDIX C: ADJACENT PROPERTY OWNER LIST

Enclosed



<i>Parcel ID</i>	<i>Name</i>	<i>Address</i>	<i>City/State/Zip</i>	<i>Existing Use</i>
65C-1-S-3	Tameka D. Blount	819 ZIRON COURT	VIRGINIA BEACH VA 23462	Residence/ House
65-A-43	Kathleen J. Cook	P O BOX 206	STONY CREEK, VA 23882	Residence/ House
65C-1-S-4	Sheila & Sierra Gurtley	2122 CLOVERDAL E AVENUE	HOPEWELL, VA 23860	Residence/ House
65-A-36	Barry & Pauline Kennedy	10057 PALESTINE ROAD	STONY CREEK, VA 23882	Vacant/Timber/Farmin g
65C-1-S-2	Rosa Ann May C/O Katrina Pearson	1331 MANNING DRIVE	VALENTIN, VA 23887	Residence/ House
65-A-46	Charlie Neaves Jr. & Winnie Neaves	2235 WALTON STREET	PETERSBURG, VA 23805	Residence/Farming
65-A-44	Clifton Owens & Lorine Moore	9362 SUSSEX DR	STONY CREEK, VA 23882	Residence/ House
65-A-38	Calvin Pegram	9458 SUSSEX DRIVE	STONY CREEK, VA 23882	Residence/ House

65-A-42

St. Johns
Baptist Church

12364 ST
JOHN
CHURCH
ROAD

STONY CREEK, VA
23882

Church/ Place of
Worship

APPENDIX D: SITE LOCATION MAP

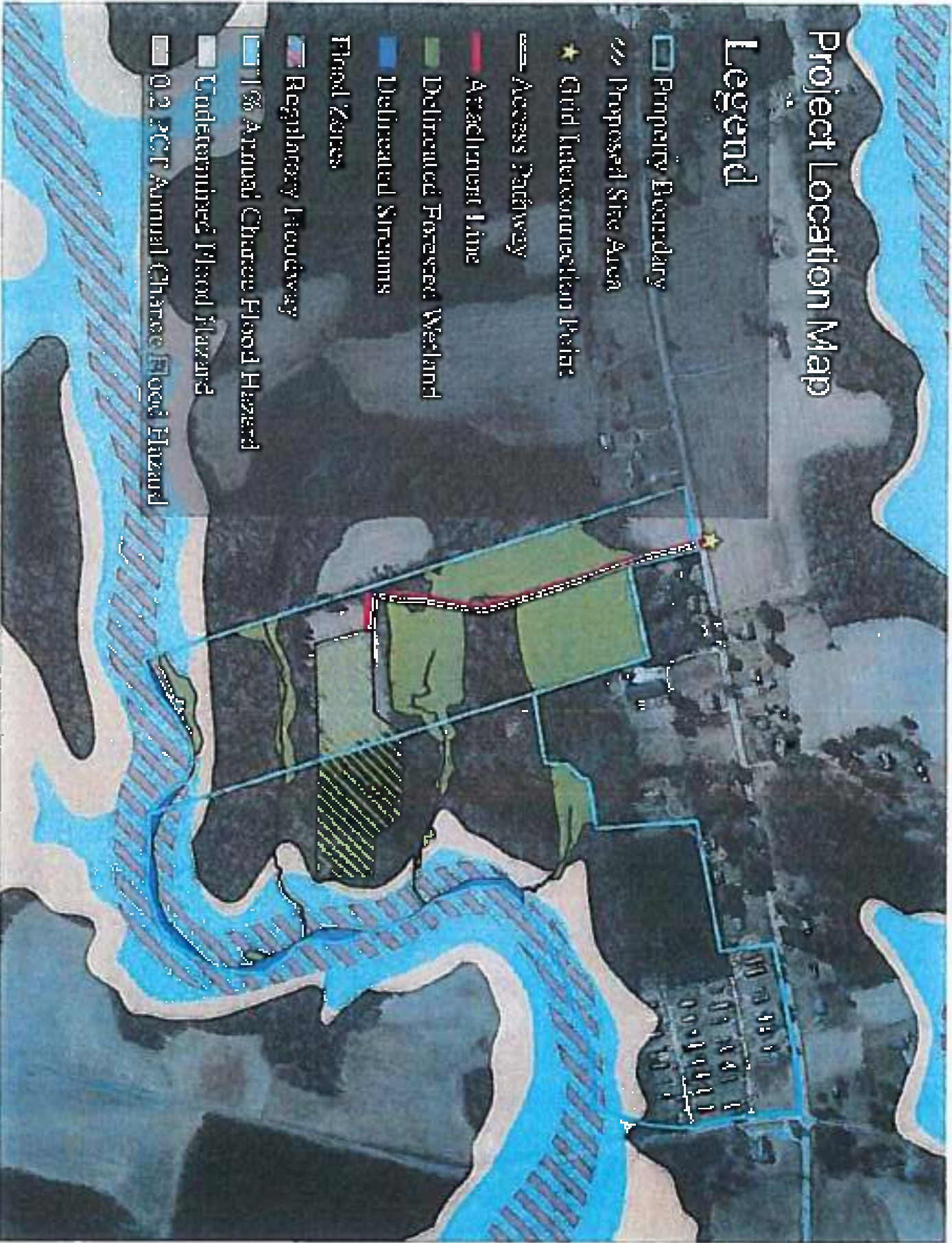
Enclosed.



Project Location Map

Legend

- Property Boundary
- Proposed Site Area
- Grid Interconnection Point
- Access Pathway
- Attachment Line
- Delimited Foresee Wetland
- Delimited Streams
- Flood Zones
- Regulatory Floodway
- 1% Annual Chance Flood Hazard
- Undetermined Flood Hazard
- 0.2 PCF Annual Chance Flood Hazard



Site Proximity Map

Legend

- Property Boundary
- Proposed Site Area
- Setback Distances from Site
- 163.38 ft.
- 210.14 ft.
- 656.13 ft.
- 792.55 ft.
- 1090.40 ft.
- 1124.90 ft.
- 1288.00 ft.
- 1424.70 ft.
- 1503.80 ft.





940 ft. Setback

Setback #1

Indicating visual buffer distance from treeline of adjacent property to Site Area. Total Buffer Distance: 940ft



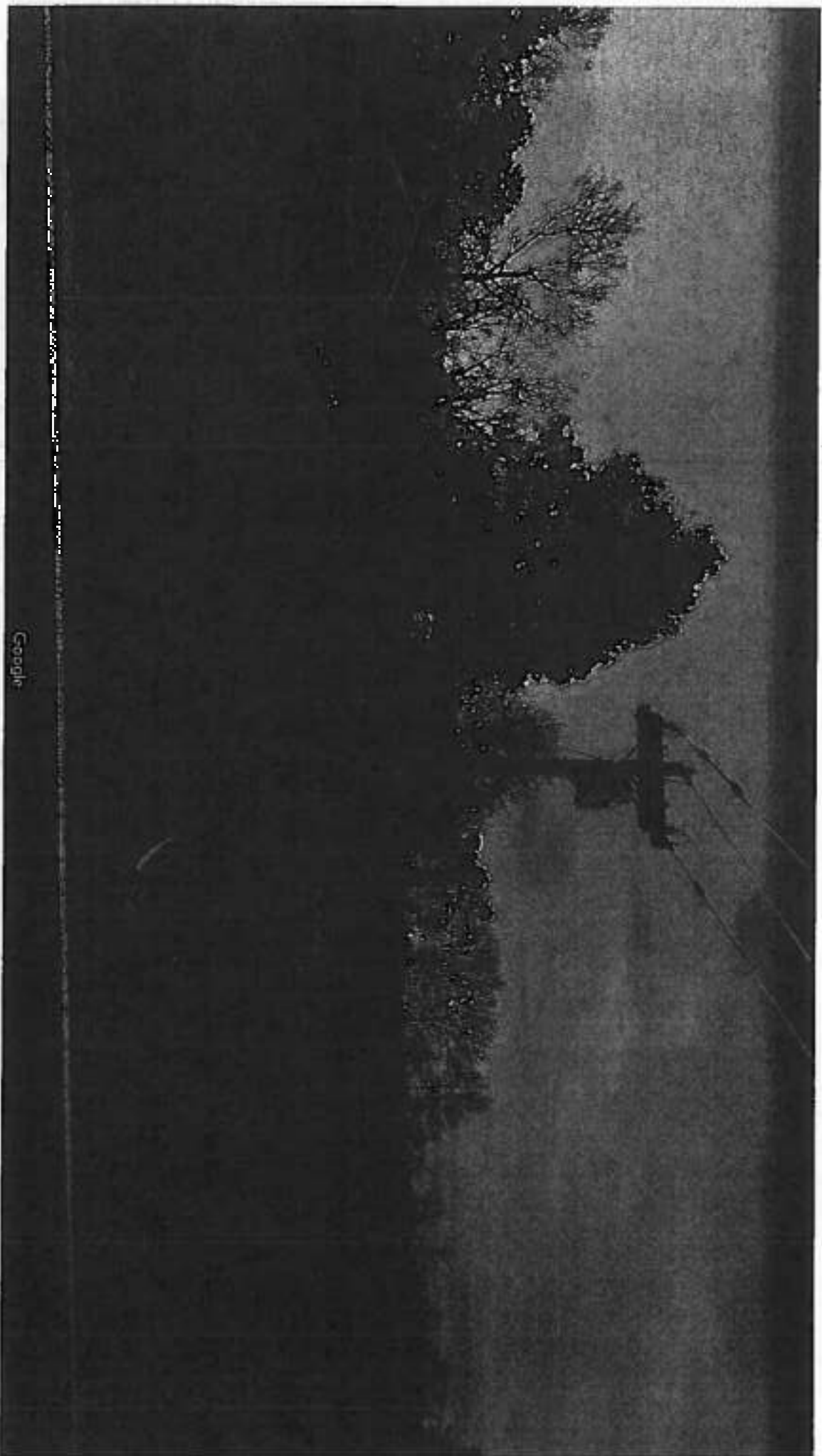


1095.9 ft. Setback

Setback #2

Indicating visual buffer distance from treeline of closest dwelling.
Total Buffer Distance: 1095.9ft





Google



563 ft. Setback

Setback #3

Indicating visual buffer distance from residentially zoned property to Site Area. Total Buffer Distance: 563ft

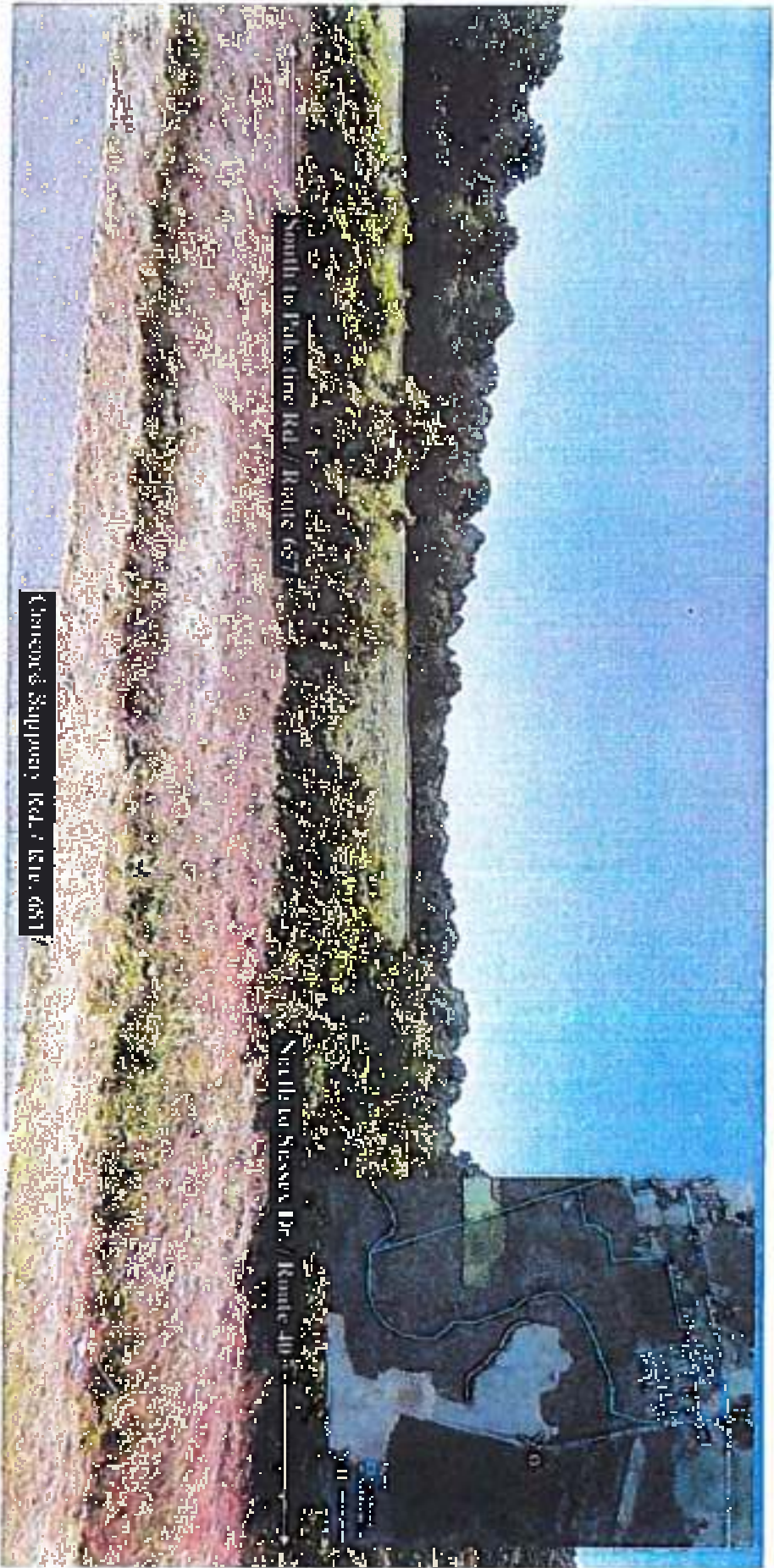




Setback #4

Indicating total buffer from closest treeline of residentially zoned property to Site Area. Total Buffer Distance: 385.98ft





South to Paley Line Rd. / Route 657

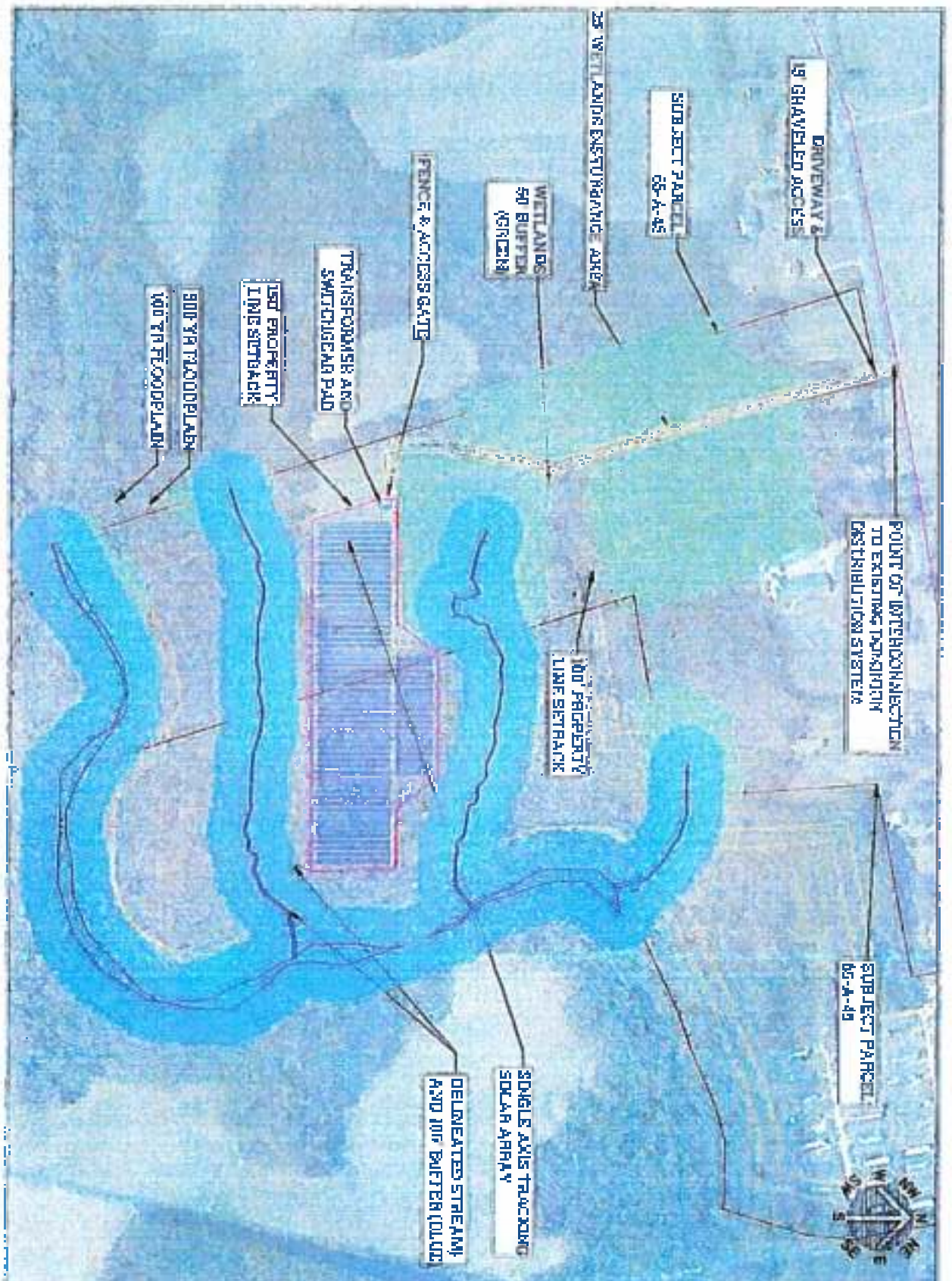
North to Messy Dr. / Route 40

Cherokee Sandpiper's Rd. / Rte. 687

APPENDIX E: CONCEPT PLAN

Enclosed.





HEXAGON
ENERGY

HEXAGON ENERGY, LLC
20000 W. 10TH AVENUE
DENVER, CO 80202
PH: 303.733.1100
WWW.HEXAGONENERGY.COM

DATE: 10/15/2014
PROJECT: FLATFOOT SOLAR, LLC
SHEET: 1 OF 1

FLATFOOT SOLAR, LLC
SUNBELT DRIVE
STONEY CREEK, VA 23862
36.843° N, -77.482° W

SITE PLAN

Scale: 1" = 100'

APPENDIX F: DECOMMISSIONING PLAN

To Be Provided Prior to Issuance of Building Permit.



APPENDIX G: TRAFFIC STUDY

To be Provided Prior to Issuance of Building Permit.



APPENDIX H: WETLANDS DELINEATION

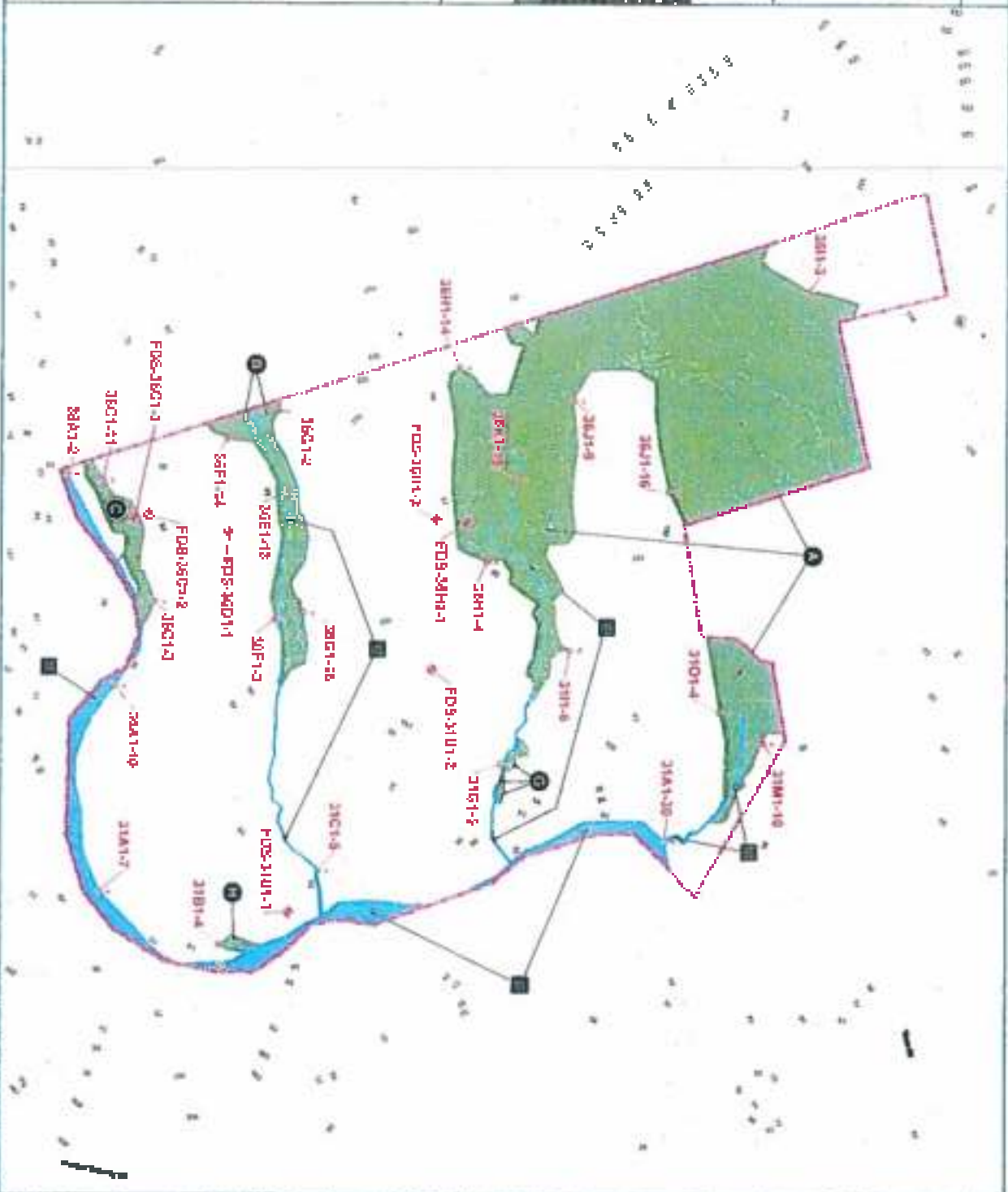
Enclosed.





NO.	DESCRIPTION	DATE	BY	CHECKED
1	ISSUED FOR PERMITTING	08/15/2011	J. W. TIMMONS	
2	ISSUED FOR CONSTRUCTION	08/15/2011	J. W. TIMMONS	
3	ISSUED FOR RECORD	08/15/2011	J. W. TIMMONS	
4	ISSUED FOR AS-BUILT	08/15/2011	J. W. TIMMONS	
5	ISSUED FOR FINAL	08/15/2011	J. W. TIMMONS	
6	ISSUED FOR CLOSURE	08/15/2011	J. W. TIMMONS	
7	ISSUED FOR ABANDONMENT	08/15/2011	J. W. TIMMONS	
8	ISSUED FOR DECOMMISSIONING	08/15/2011	J. W. TIMMONS	
9	ISSUED FOR REMEDIATION	08/15/2011	J. W. TIMMONS	
10	ISSUED FOR RESTORATION	08/15/2011	J. W. TIMMONS	
11	ISSUED FOR RECONSTRUCTION	08/15/2011	J. W. TIMMONS	
12	ISSUED FOR REPAIR	08/15/2011	J. W. TIMMONS	
13	ISSUED FOR REPLACEMENT	08/15/2011	J. W. TIMMONS	
14	ISSUED FOR REINFORCEMENT	08/15/2011	J. W. TIMMONS	
15	ISSUED FOR REPAIR AND REINFORCEMENT	08/15/2011	J. W. TIMMONS	
16	ISSUED FOR REPAIR AND REPLACEMENT	08/15/2011	J. W. TIMMONS	
17	ISSUED FOR REPAIR AND REINFORCEMENT AND REPLACEMENT	08/15/2011	J. W. TIMMONS	
18	ISSUED FOR REPAIR AND REINFORCEMENT AND REPLACEMENT AND RECONSTRUCTION	08/15/2011	J. W. TIMMONS	
19	ISSUED FOR REPAIR AND REINFORCEMENT AND REPLACEMENT AND RECONSTRUCTION AND RESTORATION	08/15/2011	J. W. TIMMONS	
20	ISSUED FOR REPAIR AND REINFORCEMENT AND REPLACEMENT AND RECONSTRUCTION AND RESTORATION AND REMEDIATION	08/15/2011	J. W. TIMMONS	

- Legend**
- ▭ Project Study Limits - 2017 Permit
 - Stream Location
 - Wetland Boundary
 - Fault
 - F-41 Lava Station
 - BIV02-09
 - ▭ Palustrine Forested (PFR) Wetlands
 - Topographic Contour
 - Water - 10 Feet
 - Water - 1 Foot



MIRANDA DE PORTUGAL BOLLAL - PLAT FOOT
SUSSEX COUNTY
VIRGINIA

TIMMONS GROUP
THE ENGINEERS AND ARCHITECTS

APPENDIX I:

NC State: Health and Safety Impacts of Solar Photovoltaics attached on following page.





**NC CLEAN ENERGY
TECHNOLOGY CENTER**

**Health and Safety Impacts of Solar
Photovoltaics
MAY 2017**



Health and Safety Impacts of Solar Photovoltaics

The increasing presence of utility-scale solar photovoltaic (PV) systems (sometimes referred to as solar farms) is a rather new development in North Carolina's landscape. Due to the new and unknown nature of this technology, it is natural for communities near such developments to be concerned about health and safety impacts. Unfortunately, the quick emergence of utility-scale solar has cultivated fertile grounds for myths and half-truths about the health impacts of this technology, which can lead to unnecessary fear and conflict.

Photovoltaic (PV) technologies and solar inverters are not known to pose any significant health dangers to their neighbors. The most important dangers posed are increased highway traffic during the relative short construction period and dangers posed to trespassers of contact with high voltage equipment. This latter risk is mitigated by signage and the security measures that industry uses to deter trespassing. As will be discussed in more detail below, risks of site contamination are much less than for most other industrial uses because PV technologies employ few toxic chemicals and those used are used in very small quantities. Due to the reduction in the pollution from fossil-fuel-fired electric generators, the overall impact of solar development on human health is overwhelmingly positive. This pollution reduction results from a partial replacement of fossil-fuel fired generation by emission-free PV-generated electricity, which reduces harmful sulfur dioxide (SO₂), nitrogen oxides (NO_x), and fine particulate matter (PM_{2.5}). Analysis from the National Renewable Energy Laboratory and the Lawrence Berkeley National Laboratory, both affiliates of the U.S. Department of Energy, estimates the health-related air quality benefits to the southeast region from solar PV generators to be worth 8.0 ¢ per kilowatt-hour of solar generation.¹ This is in addition to the value of the electricity and suggests that the air quality benefits of solar are worth more than the electricity itself.

Even though we have only recently seen large-scale installation of PV technologies, the technology and its potential impacts have been studied since the 1950s. A combination of this solar-specific research and general scientific research has led to the scientific community having a good understanding of the science behind potential health and safety impacts of solar energy. This paper utilizes the latest scientific literature and knowledge of solar practices in N.C. to address the health and safety risks associated with solar PV technology. These risks are extremely small, far less than those associated with common activities such as driving a car, and vastly outweighed by health benefits of the generation of clean electricity.

This paper addresses the potential health and safety impacts of solar PV development in North Carolina, organized into the following four categories:

- (1) Hazardous Materials
- (2) Electromagnetic Fields (EMF)
- (3) Electric Shock and Arc Flash
- (4) Fire Safety

1. Hazardous Materials

One of the more common concerns towards solar is that the panels (referred to as "modules" in the solar industry) consist of toxic materials that endanger public health. However, as shown in this section, solar energy systems may contain small amounts of toxic materials, but these materials do not endanger public health. To understand potential toxic hazards coming from a solar project, one must understand system installation, materials used, the panel end-of-life protocols, and system operation. This section will examine these aspects of a solar farm and the potential for toxicity impacts in the following subsections:

(1.2) Project Installation/Construction

(1.2) System Components

1.2.1 Solar Panels: Construction and Durability

1.2.2 Photovoltaic technologies

(a) Crystalline Silicon

(b) Cadmium Telluride (CdTe)

(c) CIS/CIGS

1.2.3 Panel End of Life Management

1.2.4 Non-panel System Components

(1.3) Operations and Maintenance

1.1 Project Installation/Construction

The system installation, or construction, process does not require toxic chemicals or processes. The site is mechanically cleared of large vegetation, fences are constructed, and the land is surveyed to layout exact installation locations. Trenches for underground wiring are dug and support posts are driven into the ground. The solar panels are bolted to steel and aluminum support structures and wired together. Inverter pads are installed, and an inverter and transformer are installed on each pad. Once everything is connected, the system is tested, and only then turned on.



Figure 1: Utility-scale solar facility (AP100) located in Cherokee County. Source: StreetView

1.2 System Components

1.2.1 Solar Panels: Construction and Durability

Solar PV panels typically consist of glass, polymer, aluminum, copper, and semiconductor materials that can be recovered and recycled at the end of their useful life.² Today there are two PV technologies used in PV panels at utility-scale solar facilities, silicon, and thin film. As of 2016, all thin film used in North Carolina solar facilities are cadmium telluride (CdTe) panels from the US manufacturer First Solar, but there are other thin film PV panels available on the market, such as Solar Frontier's CIGS panels. Crystalline silicon technology consists of silicon wafers which are made into cells and assembled into panels, thin film technologies consist of thin layers of semiconductor material deposited onto glass, polymer or metal substrates. While there are differences in the components and manufacturing processes of these two types of solar technologies, many aspects of their PV panel construction are very similar. Specifics about each type of PV chemistry as it relates to toxicity are covered in subsections a, b, and c in section 1.2.2; on crystalline silicon, cadmium telluride, and CIS/CIGS respectively. The rest of this section applies equally to both silicon and thin film panels.

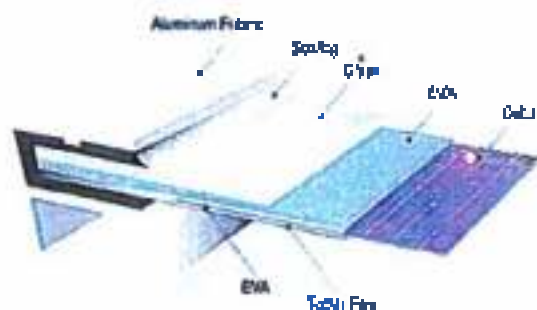


Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the top side with an aluminum frame providing structural support. Image Source: www.ritakrystal.com.au

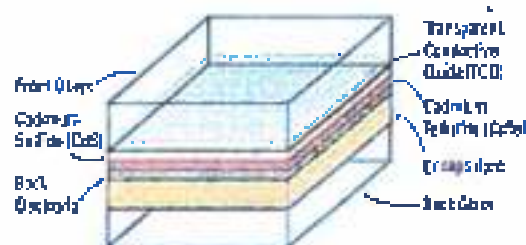


Figure 3: Layers of a common frameless thin film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: www.hundpower.com

To provide decades of corrosion-free operation, PV cells in PV panels are encapsulated from air and moisture between two layers of plastic. The encapsulation layers are protected on the top with a layer of tempered glass and on the backside with a polymer sheet. Frameless modules include a protective layer of glass on the rear of the panel, which may also be tempered. The plastic ethylene-vinyl acetate (EVA) commonly provides the cell encapsulation. For decades, this same material has been used between layers of tempered glass to give car windshields and hurricane windows their great strength. In the same way that a car windshield cracks but stays intact, the EVA layers in PV panels keep broken panels intact (see Figure 4). Thus, a damaged module does not generally create small pieces of debris; instead, it largely remains together as one piece.



Figure 4: The tangled PV panels in this picture illustrate the nature of broken solar panels, the glass cracks but the panel is still in one piece. Image Source: http://img.cdn.solar.com/p/ma/118259576/broken_solar_panel.jpg

PV panels constructed with the same basic components as modern panels have been installed across the globe for well over thirty years.³ The long-term durability and performance demonstrated over these decades, as well as the results of accelerated lifetime testing, helped lead to an industry-standard 25-year power production warranty for PV panels. These power warranties warrant a PV panel to produce at least 80% of their original nameplate production after 25 years of use. A recent SolarCity and DNV GL study reported that today's quality PV panels should be expected to reliably and efficiently produce power for thirty-five years.⁶

Local building codes require all structures, including ground mounted solar arrays, to be engineered to withstand anticipated wind speeds, as defined by the local wind speed requirements. Many racking products are available in versions engineered for wind speeds of up to 150 miles per hour, which is significantly higher than the wind speed requirement anywhere in North Carolina. The strength of PV mounting structures were demonstrated during Hurricane Sandy in 2012 and again during Hurricane Matthew in 2016. During Hurricane Sandy, the many large-scale solar facilities in New Jersey and New York at that time suffered only minor damage.⁵ In the fall of 2016, the US and Caribbean experienced destructive winds and torrential rains from Hurricane Matthew, yet one leading solar tracker manufacturer reported that their numerous systems in the impacted area received zero damage from wind or flooding.⁶

In the event of a catastrophic event capable of damaging solar equipment, such as a tornado, the system will almost certainly have property insurance that will cover the cost to cleanup and repair the project. It is in the best interest of the system owner to protect their investment against such risks. It is also in their interest to get the project repaired and producing full power as soon as possible. Therefore, the investment in adequate insurance is a wise business practice for the system owner. For the same

reasons, adequate insurance coverage is also generally a requirement of the bank or firm providing financing for the project.

1.2.2 Photovoltaic (PV) Technologies

a. Crystalline Silicon

This subsection explores the toxicity of silicon-based PV panels and concludes that they do not pose a material risk of toxicity to public health and safety. Modern crystalline silicon PV panels, which account for over 90% of solar PV panels installed today, are, more or less, a commodity product. The overwhelming majority of panels installed in North Carolina are crystalline silicon panels that are informally classified as Tier I panels. Tier I panels are from well-respected manufacturers that have a good chance of being able to honor warranty claims. Tier I panels are understood to be of high quality, with predictable performance, durability, and content. Well over 80% (by weight) of the content of a PV panel is the tempered glass front and the aluminum frame, both of which are common building materials. Most of the remaining portion are common plastics, including polyethylene terephthalate in the backsheet, EVA encapsulation of the PV cells, polyphenyl ether in the junction box, and polyethylene insulation on the wire leads. The active, working components of the system are the silicon photovoltaic cells, the small electrical leads connecting them together, and to the wires coming out of the back of the panel. The electricity generating and conducting components makeup less than 5% of the weight of most panels. The PV cell itself is nearly 100% silicon, and silicon is the second most common element in the Earth's crust. The silicon for PV cells is obtained by high-temperature processing of quartz sand (SiO_2) that removes its oxygen molecules. The refined silicon is converted to a PV cell by adding extremely small amounts of boron and phosphorus, both of which are common and of very low toxicity.

The other minor components of the PV cell are also generally benign; however, some contain lead, which is a human toxicant that is particularly harmful to young children. The minor components include an extremely thin antireflective coating (silicon nitride or titanium dioxide), a thin layer of aluminum on the rear, and thin strips of silver alloy that are screen-printed on the front and rear of cell.⁷ In order for the front and rear electrodes to make effective electrical contact with the proper layer of the PV cell, other materials (called glass frit) are mixed with the silver alloy and then heated to etch the metals into the cell. This glass frit historically contains a small amount of lead (Pb) in the form of lead oxide. The 60 or 72 PV cells in a PV panel are connected by soldering thin solder-covered copper tabs from the back of one cell to the front of the next cell. Traditionally a tin-based solder containing some lead (Pb) is used, but some manufacturers have switched to lead-free solder. The glass frit and/or the solder may contain trace amounts of other metals, potentially including some with human toxicity such as cadmium. However, testing to simulate the potential for leaching from broken panels, which is discussed in more detail below, did not find a potential toxicity threat from these trace elements. Therefore, the tiny amount of lead in the glass frit and the solder is the only part of silicon PV panels with a potential to create a negative health impact. However, as described below, the very limited amount of lead involved and its strong physical and chemical attachment to other components of the PV panel means that even in worst-case scenarios the health hazard it poses is insignificant.

As with many electronic industries, the solder in silicon PV panels has historically been a lead-based solder, often 36% lead, due to the superior properties of such solder. However, recent advances in lead-free solders have spurred a trend among PV panel manufacturers to reduce or remove the lead in their panels. According to the 2015 Solar Scorecard from the Silicon Valley Toxics Coalition, a group that tracks environmental responsibility of photovoltaic panel manufacturers, fourteen companies (increased from twelve companies in 2014) manufacture PV panels certified to meet the European Restriction of

Hazardous Substances (RoHS) standard. This means that the amount of cadmium and lead in the panels they manufacture fall below the RoHS thresholds, which are set by the European Union and serve as the world's de facto standard for hazardous substances in manufactured goods.⁸ The Restriction of Hazardous Substances (RoHS) standard requires that the maximum concentration found in any homogenous material in a produce is less than 0.01% cadmium and less than 0.10% lead, therefore, any solder can be no more than 0.10% lead.⁹

While some manufacturers are producing PV panels that meet the RoHS standard, there is no requirement that they do so because the RoHS Directive explicitly states that the directive does not apply to photovoltaic panels.¹⁰ The justification for this is provided in item 17 of the current RoHS Directive: "The development of renewable forms of energy is one of the Union's key objectives, and the contribution made by renewable energy sources to environmental and climate objectives is crucial. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (4) recalls that there should be coherence between those objectives and other Union environmental legislation. Consequently, this Directive should not prevent the development of renewable energy technologies that have no negative impact on health and the environment and that are sustainable and economically viable."¹¹

The use of lead is common in our modern economy. However, only about 0.5% of the annual lead consumption in the U.S. is for electronic solder for all uses; PV solder makes up only a tiny portion of this 0.5%. Close to 90% of lead consumption in the US is in batteries, which do not encapsulate the pounds of lead contained in each typical automotive battery. This puts the lead in batteries at great risk of leaching into the environment. Estimates for the lead in a single PV panel with lead-based solder range from 1.6 to 24 grams of lead, with 13g (less than half of an ounce) per panel seen most often in the literature.¹¹ At 13 g/panel,¹¹ each panel contains one-half of the lead in a typical 12-gauge shotgun shell. This amount equates to roughly 1/750th of the lead in a single car battery. In a panel, it is all durably encapsulated from air or water for the full life of the panel.¹⁴

As indicated by their 20 to 30-year power warranty, PV modules are designed for a long service life, generally over 25 years. For a panel to comply with its 25-year power warranty, its internal components, including lead, must be sealed from any moisture. Otherwise, they would corrode and the panel's output would fall below power warranty levels. Thus, the lead in operating PV modules is not at risk of release to the environment during their service lifetime. In extreme experiments, researchers have shown that lead can leach from crushed or pulverized panels.^{15, 16} However, more real-world tests designed to represent typical trash compaction that are used to classify waste as hazardous or non-hazardous show no danger from leaching.^{17, 18} For more information about PV panel end-of-life, see the Panel Disposal section.

As illustrated throughout this section, silicon-based PV panels do not pose a material threat to public health and safety. The only aspect of the panels with potential toxicity concerns is the very small amount of lead in some panels. However, any lead in a panel is well sealed from environmental exposure for the operating lifetime of the solar panel and thus not at risk of release into the environment.

b. Cadmium Telluride (CdTe) PV Panels

This subsection examines the components of a cadmium telluride (CdTe) PV panel. Research demonstrates that they pose negligible toxicity risk to public health and safety while significantly reducing the public's exposure to cadmium by reducing coal emissions. As of mid-2016, a few hundred MWs of

cadmium telluride (CdTe) panels, all manufactured by the U.S. company First Solar, have been installed in North Carolina.

Questions about the potential health and environmental impacts from the use of this PV technology are related to the concern that these panels contain cadmium, a toxic heavy metal. However, scientific studies have shown that cadmium telluride differs from cadmium due to its high chemical and thermal stability.¹⁹ Research has shown that the tiny amount of cadmium in these panels does not pose a health or safety risk.²⁰ Further, there are very compelling reasons to welcome its adoption due to reductions in unhealthy pollution associated with burning coal. Every GWh of electricity generated by burning coal produces about 4 grams of cadmium air emissions.²¹ Even though North Carolina produces a significant fraction of our electricity from coal, electricity from solar offsets much more natural gas than coal due to natural gas plants being able to adjust their rate of production more easily and quickly. If solar electricity offsets 90% natural gas and 10% coal, each 5-megawatt (5 MW_{AC}, which is generally 7 MW_{DC}) CdTe solar facility in North Carolina keeps about 157 grams, or about a third of a pound, of cadmium *out of our environment*.^{22, 23}

Cadmium is toxic, but all the approximately 7 grams of cadmium in one CdTe panel is in the form of a chemical compound cadmium telluride,²⁴ which has 1/100th the toxicity of free cadmium.²⁵ Cadmium telluride is a very stable compound that is non-volatile and non-soluble in water. Even in the case of a fire, research shows that less than 0.1% of the cadmium is released when a CdTe panel is exposed to fire. The fire melts the glass and encapsulates over 99.9% of the cadmium in the molten glass.²⁷

It is important to understand the source of the cadmium used to manufacture CdTe PV panels. The cadmium is a byproduct of zinc and lead refining. The element is collected from emissions and waste streams during the production of these metals and combined with tellurium to create the CdTe used in PV panels. If the cadmium were not collected for use in the PV panels or other products, it would otherwise either be stockpiled for future use, cemented and buried, or disposed of.²⁶ Nearly all the cadmium in old or broken panels can be recycled which can eventually serve as the primary source of cadmium for new PV panels.²⁹

Similar to silicon-based PV panels, CdTe panels are constructed of a tempered glass front, one instead of two clear plastic encapsulation layers, and a rear heat strengthened glass backing (together >98% by weight). The final product is built to withstand exposure to the elements without significant damage for over 25 years. While not representative of damage that may occur in the field or even at a landfill, laboratory evidence has illustrated that when panels are ground into a fine powder, very acidic water is able to leach portions of the cadmium and tellurium,³⁰ similar to the process used to recycle CdTe panels. Like many silicon-based panels, CdTe panels are reported (as far back as 1998³¹) to pass the EPA's Toxic Characteristic Leaching Procedure (TCLP) test, which tests the potential for crushed panels in a landfill to leach hazardous substances into groundwater.³² Passing this test means that they are classified as non-hazardous waste and can be deposited in landfills.^{33, 34} For more information about PV panel end-of-life, see the Panel Disposal section.

There is also concern of environmental impact resulting from potential catastrophic events involving CdTe PV panels. An analysis of worst-case scenarios for environmental impact from CdTe PV panels, including earthquakes, fires, and floods, was conducted by the University of Tokyo in 2013. After reviewing the extensive international body of research on CdTe PV technology, their report concluded, "Even in the worst-case scenarios, it is unlikely that the Cd concentrations in air and sea water will exceed the environmental regulation values."³⁵ In a worst-case scenario of damaged panels abandoned on the ground, insignificant amounts of cadmium will leach from the panels. This is because this scenario is

much less conducive (larger module pieces, less acidity) to leaching than the conditions of the EPA's TCLP test used to simulate landfill conditions, which CdTe panels pass.³⁶

First Solar, a U.S. company, and the only significant supplier of CdTe panels, has a robust panel take-back and recycling program that has been operating commercially since 2005.³⁷ The company states that it is "committed to providing a commercially attractive recycling solution for photovoltaic (PV) power plant and module owners to help them meet their module (end of life) EOL obligation simply, cost-effectively and responsibly." First Solar global recycling services to their customers to collect and recycle panels once they reach the end of productive life whether due to age or damage. These recycling service agreements are structured to be financially attractive to both First Solar and the solar panel owner. For First Solar, the contract provides the company with an affordable source of raw materials needed for new panels and presumably a diminished risk of undesired release of Cd. The contract also benefits the solar panel owner by allowing them to avoid tipping fees at a waste disposal site. The legal contract helps provide peace of mind by ensuring compliance by both parties when considering the continuing trend of rising disposal costs and increasing regulatory requirements.

c. CIS/CIGS and other PV technologies

Copper indium gallium selenide PV technology, often referred to as CIGS, is the second most common type of thin-film PV panel but a distant second behind CdTe. CIGS cells are composed of a thin layer of copper, indium, gallium, and selenium on a glass or plastic backing. None of these elements are very toxic, although selenium is a regulated metal under the Federal Resource Conservation and Recovery Act (RCRA).³⁸ The cells often also have an extremely thin layer of cadmium sulfide that contains a tiny amount of cadmium, which is toxic. The promise of high efficiency CIGS panels drove heavy investment in this technology in the past. However, researchers have struggled to transfer high efficiency success in the lab to low-cost full-scale panels in the field.³⁹ Recently, a CIGS manufacturer based in Japan, Solar Frontier, has achieved some market success with a rigid, glass-faced CIGS module that competes with silicon panels. Solar Frontier produces the majority of CIS panels on the market today.⁴⁰ Notably, these panels are RoHS compliant,⁴¹ thus meeting the rigorous toxicity standard adopted by the European Union even though this directive exempts PV panels. The authors are unaware of any completed or proposed utility-scale system in North Carolina using CIS/CIGS panels.

1.2.3 Panel End-of-Life Management

Concerns about the volume, disposal, toxicity, and recycling of PV panels are addressed in this subsection. To put the volume of PV waste into perspective, consider that by 2050, when PV systems installed in 2020 will reach the end of their lives, it is estimated that the global annual PV panel waste tonnage will be 10% of the 2014 global e-waste tonnage.⁴² In the U.S., end-of-life disposal of solar products is governed by the Federal Resource Conservation and Recovery Act (RCRA), as well as state policies in some situations. RCRA separates waste into hazardous (not accepted at ordinary landfill) and solid waste (generally accepted at ordinary landfill) based on a series of rules. According to RCRA, the way to determine if a PV panel is classified as hazardous waste is the Toxic Characteristic Leaching Procedure (TCLP) test. This EPA test is designed to simulate landfill disposal and determine the risk of hazardous substances leaching out of the landfill.^{43,44,45} Multiple sources report that most modern PV panels (both crystalline silicon and cadmium telluride) pass the TCLP test.^{46,47} Some studies found that some older (1990s) crystalline silicon panels, and perhaps some newer crystalline silicon panels (specifics are not given about vintage of panels tested), do not pass the lead (Pb) leachate limits in the TCLP test.⁴⁸

⁴⁹

The test begins with the crushing of a panel into centimeter-sized pieces. The pieces are then mixed in an acid bath. After tumbling for eighteen hours, the fluid is tested for forty hazardous substances that all must be below specific threshold levels to pass the test. Research comparing TCLP conditions to conditions of damaged panels in the field found that simulated landfill conditions provide overly conservative estimates of leaching for field-damaged panels.⁵⁰ Additionally, research in Japan has found no detectable Cd leaching from cracked CdTe panels when exposed to simulated acid rain.⁵¹

Although modern panels can generally be landfilled, they can also be recycled. Even though recent waste volume has not been adequate to support significant PV-specific recycling infrastructure, the existing recycling industry in North Carolina reports that it recycles much of the current small volume of broken PV panels. In an informal survey conducted by the NC Clean Energy Technology Center survey in early 2016, seven of the eight large active North Carolina utility-scale solar developers surveyed reported that they send damaged panels back to the manufacturer and/or to a local recycler. Only one developer reported sending damaged panels to the landfill.

The developers reported at that time that they are usually paid a small amount per panel by local recycling firms. In early 2017, a PV developer reported that a local recycler was charging a small fee per panel to recycle damaged PV panels. The local recycling firm known to authors to accept PV panels described their current PV panel recycling practice as of early 2016 as removing the aluminum frame for local recycling and removing the wire leads for local copper recycling. The remainder of the panel is sent to a facility for processing the non-metallic portions of crushed vehicles, referred to as "fluff" in the recycling industry.⁵² This processing within existing general recycling plants allows for significant material recovery of major components, including glass which is 80% of the module weight, but at lower yields than PV-specific recycling plants. Notably almost half of the material value in a PV panel is in the few grams of silver contained in almost every PV panel produced today. In the long-term, dedicated PV panel recycling plants can increase treatment capacities and maximize revenues resulting in better output quality and the ability to recover a greater fraction of the useful materials.⁵³ PV-specific panel recycling technologies have been researched and implemented to some extent for the past decade, and have been shown to be able to recover over 95% of PV material (semiconductor) and over 90% of the glass in a PV panel.⁵⁴

A look at global PV recycling trends hints at the future possibilities of the practice in our country. Europe installed MW-scale volumes of PV years before the U.S. In 2007, a public-private partnership between the European Union and the solar industry set up a voluntary collection and recycling system called PV CYCLE. This arrangement was later made mandatory under the EU's WEEE directive, a program for waste electrical and electronic equipment.⁵⁵ Its member companies (PV panel producers) fully finance the association. This makes it possible for end-users to return the member companies' defective panels for recycling at any of the over 300 collection points around Europe without added costs. Additionally, PV CYCLE will pick up batches of 40 or more used panels at no cost to the user. This arrangement has been very successful, collecting and recycling over 13,000 tons by the end of 2015.⁵⁶

In 2012, the WEEE Directive added the end-of-life collection and recycling of PV panels to its scope.⁵⁷ This directive is based on the principle of extended-producer-responsibility. It has a global impact because producers that want to sell into the EU market are legally responsible for end-of-life management. Starting in 2018, this directive targets that 85% of PV products "put in the market" in Europe are recovered and 80% is prepared for reuse and recycling.

The success of the PV panel collection and recycling practices in Europe provides promise for the future of recycling in the U.S. In mid-2016, the US Solar Energy Industry Association (SEIA) announced that they are starting a national solar panel recycling program with the guidance and support of many

leading PV panel producers.⁵⁸ The program will aggregate the services offered by recycling vendors and PV manufacturers, which will make it easier for consumers to select a cost-effective and environmentally responsible end-of-life management solution for their PV products. According to SELA, they are planning the program in an effort to make the entire industry landfill-free. In addition to the national recycling network program, the program will provide a portal for system owners and consumers with information on how to responsibly recycle their PV systems.

While a cautious approach toward the potential for negative environmental and/or health impacts from retired PV panels is fully warranted, this section has shown that the positive health impacts of reduced emissions from fossil fuel combustion from PV systems more than outweighs any potential risk. Testing shows that silicon and CdTe panels are both safe to dispose of in landfills, and are also safe in worst case conditions of abandonment or damage in a disaster. Additionally, analysis by local engineers has found that the current salvage value of the equipment in a utility scale PV facility generally exceeds general contractor estimates for the cost to remove the entire PV system.^{59, 60, 61}

1.2.4 Non-Panel System Components (racking, wiring, inverter, transformer)

While previous toxicity subsections discussed PV panels, this subsection describes the non-panel components of utility-scale PV systems and investigates any potential public health and safety concerns. The most significant non-panel component of a ground-mounted PV system is the mounting structure of the rows of panels, commonly referred to as "racking". The vertical post portion of the racking is galvanized steel and the remaining above-ground racking components are either galvanized steel or aluminum, which are both extremely common and benign building materials. The inverters that make the solar generated electricity ready to send to the grid have weather-proof steel enclosures that protect the working components from the elements. The only fluids that they might contain are associated with their cooling systems, which are not unlike the cooling system in a computer. Many inverters today are RoHS compliant.

The electrical transformers (to boost the inverter output voltage to the voltage of the utility connection point) do contain a liquid cooling oil. However, the fluid used for that function is either a non-toxic mineral oil or a biodegradable non-toxic vegetable oil, such as BIOTEMP from ABB. These vegetable transformer oils have the additional advantage of being much less flammable than traditional mineral oils. Significant health hazards are associated with old transformers containing cooling oil with toxic PCBs. Transformers with PCB-containing oil were common before PCBs were outlawed in the U.S. in 1979. PCBs still exist in older transformers in the field across the country.

Other than a few utility research sites, there are no batteries on- or off-site associated with utility-scale solar energy facilities in North Carolina, avoiding any potential health or safety concerns related to battery technologies. However, as battery technologies continue to improve and prices continue to decline we are likely to start seeing some batteries at solar facilities. Lithium ion batteries currently dominate the world utility-scale battery market, which are not very toxic. No non-panel system components were found to pose any health or environmental dangers.

1.4 Operations and Maintenance – Panel Washing and Vegetation Control

Throughout the eastern U.S., the climate provides frequent and heavy enough rain to keep panels adequately clean. This dependable weather pattern eliminates the need to wash the panels on a regular basis. Some system owners may choose to wash panels as often as once a year to increase production, but most in N.C. do not regularly wash any PV panels. Dirt build up over time may justify panel washing a few times over the panels' lifetime; however, nothing more than soap and water are required for this activity.

The maintenance of ground-mounted PV facilities requires that vegetation be kept low, both for aesthetics and to avoid shading of the PV panels. Several approaches are used to maintain vegetation at NC solar facilities, including planting of limited-height species, mowing, weed-eating, herbicides, and grazing livestock (sheep). The following descriptions of vegetation maintenance practices are based on interviews with several solar developers as well as with three maintenance firms that together are contracted to maintain well over 100 of the solar facilities in N.C. The majority of solar facilities in North Carolina maintain vegetation primarily by mowing. Each row of panels has a single row of supports, allowing sickle mowers to mow under the panels. The sites usually require mowing about once a month during the growing season. Some sites employ sheep to graze the site, which greatly reduces the human effort required to maintain the vegetation and produces high quality lamb meat.⁶²

In addition to mowing and weed eating, solar facilities often use some herbicides. Solar facilities generally do not spray herbicides over the entire acreage; rather they apply them only in strategic locations such as at the base of the perimeter fence, around exterior vegetative buffer, on interior dirt roads, and near the panel support posts. Also unlike many row crop operations, solar facilities generally use only general use herbicides, which are available over the counter, as opposed to restricted use herbicides commonly used in commercial agriculture that require a special restricted use license. The herbicides used at solar facilities are primarily 2-4-D and glyphosate (Round-up®), which are two of the most common herbicides used in lawns, parks, and agriculture across the country. One maintenance firm that was interviewed sprays the grass with a class of herbicide known as a growth regulator in order to slow the growth of grass so that mowing is only required twice a year. Growth regulators are commonly used on highway roadsides and golf courses for the same purpose. A commercial pesticide applicator license is required for anyone other than the landowner to apply herbicides, which helps ensure that all applicators are adequately educated about proper herbicide use and application. The license must be renewed annually and requires passing of a certification exam appropriate to the area in which the applicator wishes to work. Based on the limited data available, it appears that solar facilities in N.C. generally use significantly less herbicides per acre than most commercial agriculture or lawn maintenance services.

2. Electromagnetic Fields (EMF)

PV systems do not emit any material during their operation; however, they do generate electromagnetic fields (EMF), sometimes referred to as radiation. EMF produced by electricity is non-ionizing radiation, meaning the radiation has enough energy to move atoms in a molecule around (experienced as heat), but not enough energy to remove electrons from an atom or molecule (ionize) or to damage DNA. As shown below, modern humans are all exposed to EMF throughout our daily lives without negative health impact. Someone outside of the fenced perimeter of a solar facility is not exposed to significant EMF from the solar facility. Therefore, there is no negative health impact from the EMF

produced in a solar farm. The following paragraphs provide some additional background and detail to support this conclusion.

Since the 1970s, some have expressed concern over potential health consequences of EMF from electricity, but no studies have ever shown this EMF to cause health problems.⁶³ These concerns are based on some epidemiological studies that found a slight increase in childhood leukemia associated with average exposure to residential power-frequency magnetic fields above 0.3 to 0.4 μT (microteslas) (equal to 3.0 to 4.0 mG (milligauss)). μT and mG are both units used to measure magnetic field strength. For comparison, the average exposure for people in the U.S. is one mG or 0.1 μT , with about 1% of the population with an average exposure in excess of 0.4 μT (or 4 mG).⁶⁴ These epidemiological studies, which found an association but not a causal relationship, led the World Health Organization's International Agency for Research on Cancer (IARC) to classify ELF magnetic fields as "possibly carcinogenic to humans". Coffee also has this classification. This classification means there is limited evidence but not enough evidence to designate as either a "probable carcinogen" or "human carcinogen". Overall, there is very little concern that ELF EMF damages public health. The only concern that does exist is for long-term exposure above 0.4 μT (4 mG) that may have some connection to increased cases of childhood leukemia. In 1997, the National Academies of Science were directed by Congress to examine this concern and concluded:

"Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects."⁶⁵

There are two aspects to electromagnetic fields, an electric field and a magnetic field. The electric field is generated by voltage and the magnetic field is generated by electric current, i.e., moving electrons. A task group of scientific experts convened by the World Health Organization (WHO) in 2005 concluded that there were no substantive health issues related to *electric* fields (0 to 100,000 Hz) at levels generally encountered by members of the public.⁶⁶ The relatively low voltages in a solar facility and the fact that electric fields are easily shielded (i.e., blocked) by common materials, such as plastic, metal, or soil means that there is no concern of negative health impacts from the electric fields generated by a solar facility. Thus, the remainder of this section addresses magnetic fields. Magnetic fields are not shielded by most common materials and thus can easily pass through them. Both types of fields are strongest close to the source of electric generation and weaken quickly with distance from the source.

The direct current (DC) electricity produced by PV panels produce stationary (0 Hz) electric and magnetic fields. Because of minimal concern about potential risks of stationary fields, little scientific research has examined stationary fields' impact on human health.⁶⁷ In even the largest PV facilities, the DC voltages and currents are not very high. One can illustrate the weakness of the EMF generated by a PV panel by placing a compass on an operating solar panel and observing that the needle still points north.

While the electricity throughout the majority of a solar site is DC electricity, the inverters convert this DC electricity to alternating current (AC) electricity matching the 60 Hz frequency of the grid. Therefore, the inverters and the wires delivering this power to the grid are producing non-stationary EMF, known as extremely low frequency (ELF) EMF, normally oscillating with a frequency of 60 Hz. This frequency is at the low-energy end of the electromagnetic spectrum. Therefore, it has less energy than

other commonly encountered types of non-ionizing radiation like radio waves, infrared radiation, and visible light.

The wide use of electricity results in background levels of ELF EMFs in nearly all locations where people spend time – homes, workplaces, schools, cars, the supermarket, etc. A person's average exposure depends upon the sources they encounter, how close they are to them, and the amount of time they spend there.⁶⁸ As stated above, the average exposure to magnetic fields in the U.S. is estimated to be around one mG or 0.1 μ T, but can vary considerably depending on a person's exposure to EMF from electrical devices and wiring.⁶⁹ At times we are often exposed to much higher ELF magnetic fields, for example when standing three feet from a refrigerator the ELF magnetic field is 6 mG and when standing three feet from a microwave oven the field is about 50 mG.⁷⁰ The strength of these fields diminish quickly with distance from the source, but when surrounded by electricity in our homes and other buildings moving away from one source moves you closer to another. However, unless you are inside of the fence at a utility-scale solar facility or electrical substation it is impossible to get very close to the EMF sources. Because of this, EMF levels at the fence of electrical substations containing high voltages and currents are considered "generally negligible"^{71, 72}

The strength of ELF-EMF present at the perimeter of a solar facility or near a PV system in a commercial or residential building is significantly lower than the typical American's average EMF exposure.^{73, 74} Researchers in Massachusetts measured magnetic fields at PV projects and found the magnetic fields dropped to very low levels of 0.5 mG or less, and in many cases to less than background levels (0.2 mG), at distances of no more than nine feet from the residential inverters and 150 feet from the utility-scale inverters.⁷⁵ Even when measured within a few feet of the utility-scale inverter, the ELF magnetic fields were well below the International Commission on Non-Ionizing Radiation Protection's recommended magnetic field level exposure limit for the general public of 2,000 mG.⁷⁶ It is typical that utility scale designs locate large inverters central to the PV panels that feed them because this minimizes the length of wire required and shields neighbors from the sound of the inverter's cooling fans. Thus, it is rare for a large PV inverter to be within 150 feet of the project's security fence.

Anyone relying on a medical device such as pacemaker or other implanted device to maintain proper heart rhythm may have concern about the potential for a solar project to interfere with the operation of his or her device. However, there is no reason for concern because the EMF outside of the solar facility's fence is less than 1/1000 of the level at which manufacturers test for ELF EMF interference, which is 1,000 mG.⁷⁷ Manufacturers of potentially affected implanted devices often provide advice on electromagnetic interference that includes avoiding letting the implanted device get too close to certain sources of fields such as some household appliances, some walkie-talkies, and similar transmitting devices. Some manufacturers' literature does not mention high-voltage power lines, some say that exposure in public areas should not give interference, and some advise not spending extended periods of time close to power lines.⁷⁸

3. Electric Shock and Arc Flash Hazards

There is a real danger of electric shock to anyone entering any of the electrical cabinets such as combiner boxes, disconnect switches, inverters, or transformers; or otherwise coming in contact with voltages over 50 Volts.⁷⁹ Another electrical hazard is an arc flash, which is an explosion of energy that can occur in a short circuit situation. This explosive release of energy causes a flash of heat and a shockwave, both of which can cause serious injury or death. Properly trained and equipped technicians and electricians know how to safely install, test, and repair PV systems, but there is always some risk of

injury when hazardous voltages and/or currents are present. Untrained individuals should not attempt to inspect, test, or repair any aspect of a PV system due to the potential for injury or death due to electric shock and arc flash. The National Electric Code (NEC) requires appropriate levels of warning signs on all electrical components based on the level of danger determined by the voltages and current potentials. The national electric code also requires the site to be secured from unauthorized visitors with either a six-foot chain link fence with three strands of barbed wire or an eight-foot fence, both with adequate hazard warning signs.

4. Fire Safety

The possibility of fires resulting from or intensified by PV systems may trigger concern among the general public as well as among firefighters. However, concern over solar fire hazards should be limited because only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire. Flammable components of PV panels include the thin layers of polymer encapsulates surrounding the PV cells, polymer backsheets (framed panels only), plastic junction boxes on rear of panel, and insulation on wiring. The rest of the panel is composed of non-flammable components, notably including one or two layers of protective glass that make up over three quarters of the panel's weight.

Heat from a small flame is not adequate to ignite a PV panel, but heat from a more intense fire or energy from an electrical fault can ignite a PV panel.³⁰ One real-world example of this occurred during July 2015 in an arid area of California. Three acres of grass under a thin film PV facility burned without igniting the panels mounted on fixed-tilt racks just above the grass.³¹ While it is possible for electrical faults in PV systems on homes or commercial buildings to start a fire, this is extremely rare.³² Improving understanding of the PV-specific risks, safer system designs, and updated fire-related codes and standards will continue to reduce the risk of fire caused by PV systems.

PV systems on buildings can affect firefighters in two primary ways, 1) impact their methods of fighting the fire, and 2) pose safety hazard to the firefighters. One of the most important techniques that firefighters use to suppress fire is ventilation of a building's roof. This technique allows superheated toxic gases to quickly exit the building. By doing so, the firefighters gain easier and safer access to the building. Ventilation of the roof also makes the challenge of putting out the fire easier. However, the placement of rooftop PV panels may interfere with ventilating the roof by limiting access to desired venting locations.

New solar-specific building code requirements are working to minimize these concerns. Also, the latest National Electric Code has added requirements that make it easier for first responders to safely and effectively turn off a PV system. Concern for firefighting a building with PV can be reduced with proper fire fighter training, system design, and installation. Numerous organizations have studied fire fighter safety related to PV. Many organizations have published valuable guides and training programs. Some notable examples are listed below.

- The International Association of Fire Fighters (IAFF) and International Renewable Energy Council (IREC) partnered to create an online training course that is far beyond the PowerPoint click-and-view model. The self-paced online course, "Solar PV Safety for Fire Fighters," features rich video content and simulated environments so fire fighters can practice the knowledge they've learned. www.iaff.org/pvsafetytraining
- [Photovoltaic Systems and the Fire Code](#): Office of NC Fire Marshal
- [Fire Service Training](#), Underwriter's Laboratory

- [Firefighter Safety and Response for Solar Power Systems](#), National Fire Protection Research Foundation
- [Bridging the Gap: Fire Safety & Green Buildings](#), National Association of State Fire Marshalls
- [Guidelines for Fire Safety Elements of Solar Photovoltaic Systems](#), Orange County Fire Chiefs Association
- [Solar Photovoltaic Installation Guidelines](#), California Department of Forestry & Fire Protection, Office of the State Fire Marshall
- [PV Safety & Firefighting](#), Matthew Paiss, Homepower Magazine
- [PV Safety and Code Development](#), Matthew Paiss, Cooperative Research Network

Summary

The purpose of this paper is to address and alleviate concerns of public health and safety for utility-scale solar PV projects. Concerns of public health and safety were divided and discussed in the four following sections: (1) Toxicity, (2) Electromagnetic Fields, (3) Electric Shock and Arc Flash, and (4) Fire. In each of these sections, the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts.

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APPENDIX J: VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION NHDE REPORT

Enclosed.





Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Web Project ID: WEB0000014420

Client Project Number:

PROJECT INFORMATION

TITLE: Flatfoot Solar

DESCRIPTION: Flatfoot Solar will be a 1 MWac solar photovoltaic project. The site area will encompass approximately 8-10 acres of cleared farm and forested land. Approximately 4-5 acres on the western site area will need to be cleared. Project is expected to begin construction in late 2021/early 2022

EXISTING SITE CONDITIONS: Vacant, Wooded, and Farmed

QUADRANGLES: Stony Creek

COUNTIES: Sussex

Latitude/longitude (DNMS): 38° 58' 31.7354" N / 77° 27' 27.2722" W

Average: 61 acres

Comments:

REQUESTOR INFORMATION

Priority: N

Tier Level: Tier 1

Tax ID: 64-A45, 65-A-37

Contact Name: Brendan Girejewski

Company Name: Hexagon Energy, LLC

Address: 722 Preston Avenue Suite 102

City: Charlottesville

State: VA

Zip: 22903

Phone: 4343264405

Fax:

Email: BGirejewski@hexagon-energy.com

Characterization E 1c	Site Type	BIOT	Category	Final Response Response	Final Disposition Date
NOTTOWAY RIVER - STONY CREEK SOU	SCU	B2	70	FL	YES

Intersecting road(s) include:
Roanoke Logperch

Matthew J. Silliker
Secretary of Natural Resources



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 Biodiversity Data System for occurrences of natural heritage resources from 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 **Biodiversity, NATURAL HERITAGE RESOURCES HAVE BEEN DOCUMENTED WITHIN THE SUBMITTED PROJECT BOUNDARY** including a 100 foot buffer and/or **PREDICTED HABITAT MODELS FOR NATURAL HERITAGE RESOURCES** inside the project area.

You have submitted this project to DCR for a more detailed review for potential impacts to natural heritage resources. DCR will review the submitted project to identify the specific natural heritage resources within the proposed project area including a 100 foot buffer. Using the expertise of our biologists, DCR will evaluate whether your specific project is likely to impact these resources. DCR's response will indicate whether any negative impacts are likely and, if so, make recommendations to avoid, minimize and/or mitigate these impacts. If the potential negative impacts are to species that are state- or federally-listed as threatened or endangered, DCR will also recommend coordination with the appropriate regulatory agencies: the Virginia Department of Wildlife Resources for state-listed animals, the Virginia Department of Agriculture and Consumer Services for state-listed plants and insects, and the United States Fish and Wildlife Service for federally listed plants and animals. If your project is expected to have positive impacts we will report those to you with recommendations for enhancing these benefits.

There will be a charge for this service for "for profit companies": \$80, plus an additional charge of \$35 for 1-5 occurrences and \$80 for 6 or more occurrences.

Please allow up to 30 calendar days for a response, unless you requested a priority response of 5 business days at an additional surcharge of \$500 or 15 calendar days at an additional surcharge of \$300. An invoice will be provided with your response.

We will review the project based on the information you included in the Project Info submitted form, which is included in this report. Also any additional information including photographs, survey documents, etc. attached during the project submittal process and/or sent via email referencing the project title (from the first page of the report).

Thank you for submitting your project for review to the Virginia Natural Heritage Program through the NH Data Explorer. Should you have any questions or concerns about DCR, the Data Explorer, or this report, please contact the Natural Heritage Project Review Unit at 804-371-2708.

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director



Rochelle Adams
Agency Director of
Administration and Finance

Russell W. Davis
Agency Director of
Land, SOG & Fisheries
Manager of the State Game
Preserves

Michael Burell
Agency Director of
Conservation and Community Relations

Thomas L. Smith
Agency Director of
Operations

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

December 21, 2020

Brendan Grajewski
Hexagon Energy, LLC
722 Preston Avenue Suite 102
Charlottesville, Virginia 22903

Re: Flatfoot Solar

Dear Mr. Grajewski:

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

According to the information currently in our files, the Nottoway River – Stony Creek Stream Conservation Unit (SCU) is located within and immediately adjacent to the project site. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Nottoway River – Stony Creek SCU has been given a biodiversity ranking of B2, which represents a site of very high significance. The natural heritage resources associated with this site are:

<i>Alasmidonta heterodon</i>	Dwarf wedgemussel	G1G2/S1/L1/L1
<i>Percina rex</i>	Roanoke logperch	G1G2/S1/S2/L1/L1
Aquatic Natural Community (Nottoway Fifth Order Stream)		G1G2/S1/S2/NL/NL

The Dwarf wedgemussel grows to a length of approximately 30 mm. This species inhabits creeks of varying sizes, residing in muddy sand, sand, and gravel bottoms, in areas of slow to moderate current and little silt deposition (USFWS, 1993). Currently, this species exists in widely scattered, small populations in the Chowan, James, York, Rappahannock, and Potomac River drainages. Its native host fishes include Mottled sculpin (*Cottus bairdi*), Johnny darters (*Etheostoma nigrum*), Tessellated darters (*Etheostoma olmstedt*) and Sculpins (*Cottus* sp.) (Michaelson and Neves, 1995). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF).

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

The Roanoke logperch is endemic to the Roanoke and Chowan River drainages in Virginia (Burkhead and Jenkins, 1991) and inhabits medium and large, warm and usually clear rivers with sandy to boulder spotted

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Natural Heritage • Dam Safety and Floodplain Management • Land Conservation

bottoms (NatureServe, 2009). Please note that this species is currently classified as endangered by the USFWS and the Virginia Department of Wildlife Resources (VDWR). The Roanoke logperch is threatened by channelization, siltation, impoundment, pollution, and de-watering activities (Burkhead & Jenkins, 1991).

The documented Aquatic Natural Community is based on Virginia Commonwealth University's INSTAR (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade AB, as per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds as a "Healthy" stream designation as per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (5th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present.

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species.

In addition, Sappony Creek has been designated as a "Threatened and Endangered Species Water" by VDWR for the Atlantic Pigtoe.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow. Due to the legal status of the Dwarf wedgemussel and Roanoke logperch, DCR recommends coordination with USFWS and VDWR to ensure compliance with protected species legislation. Due to the legal status of Atlantic pigtoe, DCR recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDWR, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

DCR recommends the development of an invasive species management plan for these projects and the planting of Virginia native pollinator plant species that bloom throughout the spring and summer, to maximize benefits to native pollinators. DCR recommends planting these species in at least the buffer areas of the planned facility, and optimally including other areas within the project site. Guidance on plant species can be found here: <http://www.dcr.virginia.gov/natural-heritage/solar-site-native-plants-finder>. In addition, Virginia native species alternatives to the non-native species listed in the Virginia Erosion and Sediment Control Handbook (Third Edition 1992), can be found in the 2017 addendum titled "Native versus Invasive Plant Species", here: <https://www.dcr.virginia.gov/Pwtsals/W/DEQ/Water/Publications/NativeInvasive/AO.pdf>. Page 3 of the addendum provides a list of native alternatives for non-natives commonly used for site stabilization including native cover crop species (i.e. Virginia wildrye).

If tree removal is proposed for the project, it will fragment an Ecological Core (EC) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaonvisvnl>), one of a suite of tools in Virginia Conservation Vision that identify and prioritize lands for conservation and protection.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The

cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats or natural heritage resources they contain.

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

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: <http://vnhde.org/content/map>.

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

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

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the projects change and/or six months (June 21, 2021) has passed before it is utilized.

A fee of \$ 125.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The VDWR maintains a database of wildlife locations, including threatened and endangered species, low streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <https://vdfwis.org/lwis/> or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dwr.virginia.gov.

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

Sincerely,



S. René Hypes
Natural Heritage Project Review Coordinator

Cc: Ernie Aschenbach, DWR
Troy Andersen, USFWS
Mary Major, DEQ

APPENDIX K: VIRGINIA DEPARTMENT OF HISTORICAL RESOURCES V-CRIS INVENTORY AND REPORT FOR STONY CREEK BATTLEFIELD

Enclosed



3-Mile V-CRIS Archaeological Resources Inventory

DHR_ID	Site Categories	Site Types	Time Periods	Evaluation Status	Restricted	Archaeology Site Survey ID	OBJECT ID
44DW0004	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	8868	151341
44DW0007	null	null	Woodland (1200 B.C. - 1606 A.D.)	null	null	8718	154350
44DW0024	null	null	Archaic (8500 - 1201 B.C.)	null	null	8704	158158
44DW0025	null	null	Middle Archaic (6500 - 3001 B.C.), Late Archaic (3000 - 1201 B.C.)	null	null	8703	155018
44DW0031	null	null	Middle Archaic (6500 - 3001 B.C.), Late Archaic (3000 - 1201 B.C.), Woodland (1200 B.C. - 1606 A.D.)	null	null	8917	150198
44DW0033	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	8854	152731
44DW0039	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	8848	151142
44DW0040	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	8846	163434
44DW0082	null	null	Woodland (1200 B.C. - 1606 A.D.)	null	null	8626	143611
44DW0086	null	null	Archaic (8500 - 1201 B.C.), Woodland (1200 B.C. - 1606 A.D.)	null	null	8616	146851
44DW0039	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	8994	150920
44DW0040	null	null	Middle Archaic (6500 - 3001 B.C.)	null	null	8993	148554
44DW0041	null	null	Archaic (8500 - 1201 B.C.)	null	null	3770	147830
44DW0042	DSS Legacy	Grave/burial	20th Century (1900 - 1999)	null	null	8876	154404
44DW0072	null	null	Late Archaic (3000 - 1201 B.C.)	null	null	10472	149678

44DW01 73	null	null	Woodland (1200 B.C. - 1606 A.D.)	null	null	10471	143762
44DW01 80	null	null	Late Archaic (3000 - 1201 B.C.)	null	null	10465	149677
44DW04 68	Domestic	Camp	Middle Archaic Period (6500 - 3001 B.C.E), Late Archaic Period (3000 - 1201 B.C.E), Early Woodland (1200 B.C.E - 299 C.E)	DHR Staff: Potenti ally Eligible	null	312808	465553
44SX003 0	DSS Legacy	Camp	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	25149	155709
44SX003 1	DSS Legacy	Camp	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	25147	148879
44SX006 9	null	null	Middle Archaic (6500 - 3001 B.C.), Woodland (1200 B.C. - 1606 A.D.)	null	null	25276	147089
44SX014 2	null	null	Middle Archaic (6500 - 3001 B.C.), Late Archaic (3000 - 1201 B.C.), Woodland (1200 B.C. - 1606 A.D.)	null	null	25199	153894
44SX020 D	DSS Legacy	Camp	Archaic (8500 - 1201 B.C.)	null	null	25370	142397
44SX020 8	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	25386	155156
44SX020 9	null	null	null	null	null	25385	158724
44SX021 0	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	1952	143720
44SX021 1	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	3390	144870
44SX021 2	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	25384	159281
44SX022 6	null	null	Historic/Unknown, Paleo-Indian (15000 - 8501 B.C.)	null	null	25358	159622
44SX022 7	null	null	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	null	null	25357	159621

445X022	8	null	null	Early Archaic (8500 - 6501 B.C.)	null	null	25356	153557
445X022	9	null	null	Prehistoric/Unknown [15000 B.C. - 1906 A.D.]	null	null	25354	154999
445X023	0	null	null	Prehistoric/Unknown [15000 B.C. - 1806 A.D.]	null	null	25353	154998
445X023	1	null	null	Paleo-Indian (15000 - 8501 B.C.)	null	null	25110	154997
445X023	2	null	null	Middle Archaic (6500 - 3001 B.C.)	null	null	25108	152305
445X023	3	null	null	Prehistoric/Unknown (15000 B.C. - 1806 A.D.), 19th Century (1800 - 1899), 20th Century (1900 - 1999)	null	null	5891	152304
445X023	4	Quarry	Quarry	Prehistoric/Unknown (15000 B.C. - 1806 A.D.)	null	null	25107	155292
445X023	5	null	null	19th Century: 1st quarter (1800 - 1825)	null	null	25106	154617
445X023	6	null	null	Early Archaic (8500 - 6501 B.C.), Middle Archaic (6500 - 3001 B.C.), 19th Century: 2nd half (1850 - 1899), 20th Century: 1st half (1900 - 1949)	null	null	25105	150176
445X041	6	Domestic	Dwelling, single	Reconstruction and Growth (1865 - 1916)	null	null	308726	442748
445X041	7	Domestic	Artifact scatter	Early Archaic Period (8500 - 6501 B.C.E), Middle Archaic Period (6500 - 3001 B.C.E), Late Archaic Period (3000 - 1201 B.C.E), Reconstruction and Growth (1866 - 1916)	null	null	308727	442749
445X041	8	Domestic	Dwelling, single	Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945), The New Dominion (1946 - 1981), Post Cold War (1992 - Present)	null	null	308728	442750

44SX041	Domestic	Dwelling, single	Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991)	null	null	308729	442751
44SX042	Domestic	Dwelling, single	Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991)	null	null	308730	442752
44SX042	Domestic	Dwelling, single	Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991)	null	null	308731	442753
44SX042	Domestic	Dwelling, single	World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991)	null	null	308732	442754
44SX042	Domestic	Dwelling, single	World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991)	null	null	308733	442755
44SX042	Domestic	Artifact scatter	Early Archaic Period (8500 - 6500 B.C.E), Middle Archaic Period (6500 - 3000 B.C.E), Late Archaic Period (3000 - 1201 B.C.E)	null	null	308734	442756
44SX042	Domestic	Dwelling, single	Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991), Post Cold War (1992 - Present)	null	null	308735	442757
44SX042	Domestic	Dwelling, single	Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945), The New Dominion (1946 - 1991)	null	null	308736	442758
44SX042	Domestic	Outbuildings	Reconstruction and Growth (1866 - 1916)	null	null	308737	442759

445X0M2 B	Domestic, Industry/Processing/Ex traction	Artifact scatter, Lithic scatter	Pre-Contact, Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945)	NUM	null	308738	442760
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3-Mile V-CRIS Architectural Resource Inventory

DHR ID	Other DHR IDs	Incorporated Town	Jurisdictions	Property Names	Property Addresses	Historic District Name	Evaluation Status	Survey ID	Survey Update Date	OBJECTID
026-0222	440VAC021	NUM	Dermwilde (County)	Millkew (Historic/Current)	23905 Winfield Road - All Route 850	NUM	DHR Staff: Not Eligible	311555	8/16/27, 10/09/44 AM	749618
026-5236	NUM	NUM	Dermwilde (County)	House, 24712 Mortar Branch Road (Foundation/Location)	24712 Mortar Branch Road	NUM	DHR Staff: Not Eligible	312748	8/27/27, 10/17/26 AM	749611
026-5238	NUM	NUM	Dermwilde (County)	Farm, Mortar Branch Road (Foundation/Location)	Mortar Branch Road	NUM	DHR Staff: Not Eligible	312790	8/27/17, 10/29/19 AM	749614
026-5239	NUM	NUM	Dermwilde (County)	House, 24827 Black Branch Road (Foundation/Location)	24827 Black Branch Road	NUM	DHR Staff: Not Eligible	312751	8/27/27, 10/19/46 AM	749615
026-5240	NUM	NUM	Dermwilde (County)	House, 24919 Black Branch Road (Foundation/Location)	24905 Black Branch Road	NUM	DHR Staff: Not Eligible	312752	8/27/27, 10/20/17 AM	749616
026-5241	NUM	NUM	Dermwilde (County)	House, 24902 Black Branch Road (Foundation/Location)	24907 Black Branch Road	NUM	DHR Staff: Not Eligible	312753	8/27/27, 10/20/51 AM	749617
026-5242	NUM	NUM	Dermwilde (County)	House, 24904 Black Branch Road (Foundation/Location)	24904 Black Branch Road	NUM	DHR Staff: Not Eligible	312754	8/27/27, 10/21/20 AM	749618

026-5243	null	null	Orwiddle (County)	Tucker House and Cemetery, 23613 Flatfoot Road (Function/Location)	23613 Flatfoot Road	null	DHR Staff: Not Eligible	312755	8/27/17, 10:21:52 AM	749619
026-5244	null	null	Orwiddle (County)	The Pegram's Memorial and Family Cemetery, Flatfoot Road (Function/Location)	Flatfoot Road	null	DHR Staff: Not Eligible	312756	8/27/17, 10:22:29 AM	749620
026-5245	null	null	Orwiddle (County)	House, 23012 Flatfoot Road (Function/Location)	23012 Flatfoot Road	null	DHR Staff: Not Eligible	312757	8/27/17, 10:23:00 AM	749621
026-5246	null	null	Orwiddle (County)	House, 22309 Flatfoot Road (Function/Location)	22309 Flatfoot Road	null	DHR Staff: Not Eligible	312758	8/27/17, 10:23:29 AM	749622
026-5247	null	null	Orwiddle (County)	House, 22306 Flatfoot Road (Function/Location)	22306 Flatfoot Road	null	DHR Staff: Not Eligible	312759	8/27/17, 10:23:56 AM	749623
026-5248	null	null	Orwiddle (County)	House, 22501 Flatfoot Road (Function/Location)	22501 Flatfoot Road	null	DHR Staff: Not Eligible	312760	8/27/17, 10:24:25 AM	749627
026-5249	null	null	Orwiddle (County)	House, 22505 Flatfoot Road (Function/Location)	22505 Flatfoot Road	null	DHR Staff: Not Eligible	312761	8/27/17, 10:25:02 AM	749624
026-5250	null	null	Orwiddle (County)	House, 23317 Flatfoot Road (Function/Location)	23317 Flatfoot Road	null	DHR Staff: Not Eligible	312762	8/27/17, 10:25:31 AM	749625
026-5251	null	null	Orwiddle (County)	Udall Bethel Baptist Church, 23503 Flatfoot Road (Function/Location)	23503 Flatfoot Road	null	DHR Staff: Not Eligible	312763	8/16/17, 10:23:03 AM	752465

026-5252	null	null	Dimwiddle (County)	Little Baptist Baptist Church Cemetery, Rayfoot Road (Function/Location)	Rayfoot Road	null	DHR Staff: Not Eligible	312764	8/16/17, 10-23:34 AM	752466
026-5253	null	null	Dimwiddle (County)	House, 23705 Rayfoot Road (Function/Location)	23705 Rayfoot Road	null	DHR Staff: Not Eligible	312765	8/16/17, 10-24:03 AM	752467
026-5254	null	null	Dimwiddle (County)	House, 22919 McKenney Highway (Function/Location)	22919 McKenney Highway - All Route 40	null	DHR Staff: Not Eligible	312766	8/16/17, 10-24:30 AM	752468
091-0080	null	null	Sussex (County)	Sappony Baptist Church (Historic/Current)	Route 40, Route 581	null	null	2016266	9/16/13, 4:55:24 PM	2016296
091-5025	null	Sispy Creek	Greenville (County), Sussex (County)	Sappony Church Battlefield (Historic), Sispy Creek Depot Battlefield (Historic)	Concord Sappony Road - All Route 681, Sussex Drive - All Route 40	null	DHR Staff: Potentially Eligible	3018625	4/23/17, 2:34:09 PM	717178
091-5181	null	null	Sussex (County)	Hunt Club, 21600 Gorch Road (Function/Location)	11600 Gorch Road - All Route 659	null	DHR Staff: Not Eligible	305163	4/23/17, 2:34:09 PM	693720
091-5192	null	null	Sussex (County)	Hunt Club, 11479 Beach Road (Function/Location)	11479 Beach Road - All Route 659	null	DHR Staff: Not Eligible	305164	4/23/17, 2:34:09 PM	693721

091-5163	null	null	Sussex (County)	House, 12312 Booth Road (Function/Location)	12312 Booth Road - Alt Route 658	null	DHR Staff: Not Eligible	305165	4/23/17, 2:34:09 PM	693722
091-5184	null	null	Sussex (County)	House, 11523 Sussex Drive (Function/Location)	11523 Sussex Drive - Alt Route 40	null	DHR Staff: Not Eligible	305186	4/23/17, 2:34:09 PM	693727
091-5185	null	null	Sussex (County)	House, 12085 Booth Road (Function/Location)	12085 Booth Road - Alt Route 658	null	DHR Staff: Not Eligible	305170	4/23/17, 2:34:09 PM	693728
091-5186	null	null	Sussex (County)	House, 12450 Booth Road (Function/Location)	12450 Booth Road - Alt Route 658	null	DHR Staff: Not Eligible	305171	4/23/17, 2:34:09 PM	693729
091-5187	null	null	Sussex (County)	House, 12443 Lee Avenue (Function/Location)	12443 Lee Avenue - Alt Route 40	null	DHR Staff: Not Eligible	305173	4/23/17, 2:34:09 PM	693731
091-5188	null	null	Sussex (County)	House, 12427 Lee Avenue (Function/Location)	12427 Lee Avenue - Alt Route 40	null	DHR Staff: Not Eligible	305174	4/23/17, 2:34:09 PM	693732
091-5199	null	null	Sussex (County)	Burley Lumber Company (Current Name)	13056 Parham Lane - Alt	NULL	DHR Staff: Not Eligible	307476	4/23/17, 2:34:09 PM	708379

091-5190	null	null	Sauzeek (County)	House, 12096 Palestine Road (Function/Location)	Route 1206 Palestine Road - Alt Route 657	null	DHR Staff: Met Eligible	307477	4/23/17, 2:34:09 PM	708380
091-5193	null	null	Sauzeek (County)	House, 12098 Palestine Road (Function/Location), Maggie's Hair Salon (DHR/Relief)	12098 Palestine Road - Alt Route 657	null	DHR Staff: Met Eligible	307478	4/23/17, 2:34:09 PM	708381
091-5192	null	null	Sauzeek (County)	House, 12090 Palestine Road (Function/Location)	12090 Palestine Road - Alt Route 657	null	DHR Staff: Met Eligible	307479	4/23/17, 2:34:09 PM	708382
091-5199	null	null	Sauzeek (County)	House, 11565 Palestine Road (Function/Location)	11565 Palestine Road - Alt Route 657	null	DHR Staff: Met Eligible	307480	4/23/17, 2:34:09 PM	708383
091-5194	null	null	Sauzeek (County)	House, 11467 Palestine Road (Function/Location)	11467 Palestine Road - Alt Route 657	null	DHR Staff: Met Eligible	307481	4/23/17, 2:34:09 PM	708384
205-5001	null	Stony Creek	Sauzeek (County)	House, 12400 Lane Avenue (Function/Location)	12400 Lane Avenue - Alt Route 40	null	DHR Staff: Met Eligible	305172	4/23/17, 2:34:09 PM	693730
205-5002	null	Stony Creek	Sauzeek (County)	Agnes Helena Jones Elementary School (Court Name)	12508 Lane Avenue	null	DHR Staff: Met Eligible	305175	4/23/17, 2:34:09 PM	693732

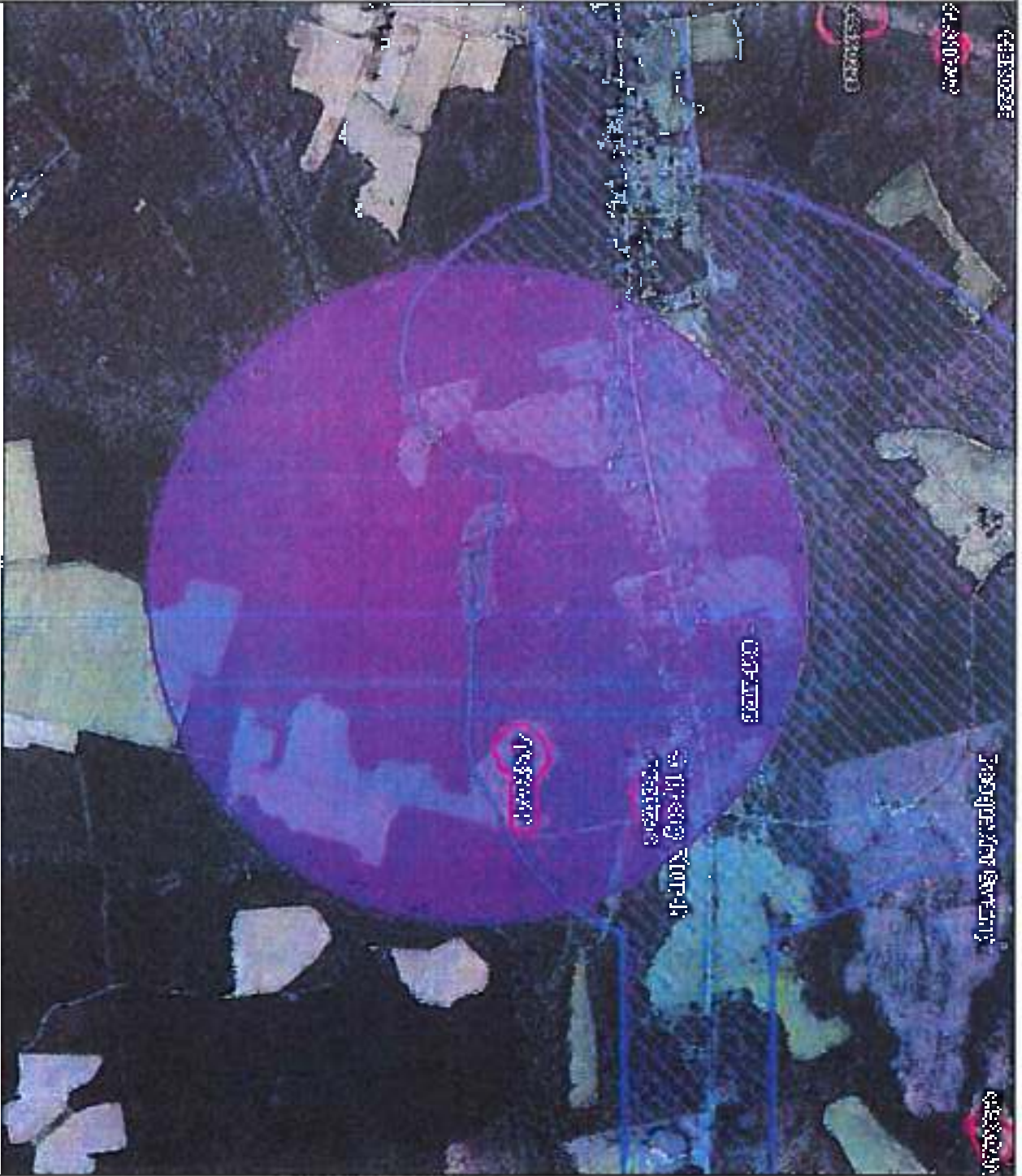
				Ehretsbary School, 12508 Lee Avenue {Function/Location}	All House 40					
305- 5008	null	Stony Creek	Sauzeur {Country}	House, 12497 Lee Avenue {Function/Location}	12497 Lee Avenue - All House 40	null	OHN Staff: Met Eligible	305176	4/23/17, 2-9:40P PM	093724
305- 5027	null	Stony Creek	Sauzeur {Country}	House, 12597 Flatfoot Road {Function/Location}	12597 Flatfoot Road - All Route 558	null	OHN Staff: Potentially Eligible	305209	4/23/17, 2-9:09 PM	093764

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Esplanade
- USGS GIS Place names
- County Boundaries

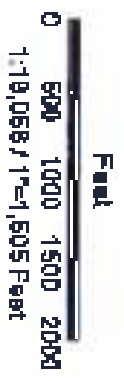


Title: Flatfoot Solar VCRIS Map

Date: 12/28/2020

Data Sources: Most data of the Virginia Department of Historic Resources (VDHRS) have been gathered over many years from a variety of sources and the representation depicted is a composite view of all available information over the study area. Only one official source of ground truth data has been used for general information purposes and is not intended for engineering, legal or other site specific uses. Any study conducted should use all provided data. More information is available in the VCRIS Manual located at www.dhr.virginia.gov.

Notice of A/E/C Responsibilities: Archaeological sites may be sensitive to the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Title of Virginia § 2-2306.2 (10). Review of permit locations may include archaeological sites and historic resources.



Property Information

Property Name		Property Evaluation Status DHR Staff Potentially Eligible
Name Explanation	Name	
Historic Historic	Sappony Church Battlefield Stony Creek Depot Battlefield	
Property Address		
Current - Sussex Drive Route 40 Alternate - Concord Sappony Road Route 651		
County/Independent City(s)	Greensville (County), Sussex (County)	
Incorporated Town(s)	Stony Creek	
Zip Code(s)	24367, 23682	
Magisterial District(s)	No Data	
Tax Parcel(s)	No Data	
USGS Quad(s)	CHERRY HOLL, PURDY, STONY CREEK	

Additional Property Information

Architecture Setting	Rural
Acres	No Data
Site Description:	
<p>Peterburg's 10-month siege took place over a county-sited tract east, south and southwest of the city. Peterburg National Battlefield preserves much of the siege lines to the east - including the initial assaults, the Charter, and Fort Steadman. A patch of commercial and residential development has eroded nearly all historic resources along Carter Road, the main road to the south. Many fortifications eastward of the city are preserved by the NPS or the City of Peterburg on land transferred by the NPS. Except for being sparsely dotted by modern residences, this large southwestern area remains remarkably unspoiled.</p> <p>August 2016: The area of the battlefield surveyed at this time consists of approximately 371 acres located roughly 1/2 mile west of Stony Creek. The area is bordered by Route 40 to the north, Philistine Road to the south, and rural agricultural homes to the west and east.</p> <p>August 2020: The area of the battlefield surveyed at this time consists of approximately 19.00 acres. The area is bordered by rural farmed lands to the north, east, and west, and by Sussex Drive to the south. The tract is situated in the Upper Coastal Plain region and is comprised of a broad, flat expanse to the north of Sappony Creek. Elevations range from 132 feet above mean sea level (AMSL) to 144 feet AMSL. Much of the project area has been timbered, and the stumps cleared, with bulldozed piles of timber debris evident. A power line runs north to south across the western portion of the project area, and a utility line runs roughly northwest to southeast across the southern portion of the project area. A substation is located within an adjacent.</p>	
Surveyor Assessment:	
<p>Major General William H.F. "Rutsey" Lee's cavalry division pursued Wilson and Kautz's riders who failed to destroy the Staunton River Bridge on June 25. Wilson and Kautz headed east and, on June 28, crossed the Nottoway River at the Double Bridges and headed north to the Stony Creek Depot on the Weldon Railroad. Here, they were attacked by Major General Wade Hampton's cavalry division. Later in the day, William J. Lee's Division arrived to join forces with Hampton, and the Federals were heavily pressured. During the night, Wilson and Kautz disengaged and pressed north on the Bullock Road for the supposed security of Resaca Station, abandoning many fleeing slaves who had sought security with the Federal riders.</p> <p>August 2016: According to the 2009 Civil War Sites Advisory Commission (CWSAC) report, this resource is potentially eligible for listing on the National Register of Historic Places. Approximately 1000 acres within the battlefield are protected or publicly accessible. The update also noted that portions of the landscape have been altered, but most of the essential features remain. The project area surveyed at this time falls within an avenue of approach for the battle and partially within the area determined potentially eligible for the National Register of Historic Places, although not within the core battlefield area.</p> <p>August 2020: The project area falls within an avenue of approach for the battle and partially within the area determined potentially eligible for the National Register of Historic Places, however, not within the core battlefield area. The project area is situated in an avenue of approach for a Civil War battle. The battlefield is considered potentially eligible for listing on the National Register of Historic Places. However, the shovel testing and metal-detecting survey did not record any artifacts, earthworks, or other Civil War related elements within the project area. The proposed development will not impact the viewshed of the battlefield, as the area is only partially within the battlefield boundaries and located on an avenue of approach that has been changed during the 20th century with residential development, overhead utility lines, a substation, and landscape changes. Considering this, CWSAC recommends that the project will not adversely affect the battlefield or the battlefield landscape, and no further survey work of the battlefield within the project area is warranted.</p>	
Surveyor Recommendation:	Recommended Potentially Eligible
Ownership	
Ownership Category	Ownership Entity
Private	No Data

Primary Resource Information

Resource Category: Defense
Resource Type: Battle Site
NR Resource Type: Site
Historic District Status: No Data
Date of Construction: ca. 1864
Data Source: Written Data
Historic Time Period: Civil War (1861 - 1865)
Historic Context(s): Military/Defense
Other ID Number: No Data
Architectural Style: No discernible style
Form: No Data
Number of Stories: No Data
Condition: Good
Threats to Resources: Development

Architectural Description:

January 1991: no description provided.

August 2016: Within the battlefield boundaries, no archaeological resources and no architectural remains related to the Sapping Creek Battlefield have been previously identified. Because the current project area falls in the boundaries of a Civil War battlefield, Circa- conducted a metal-detecting survey of the area within the battlefield boundaries along the south side of Route 40. Circa- staff did not notice any previous metal-detecting activities from relic hunters in the area. Vegetation was extremely thick in the western section of the project area, where the trees had been recently harvested. There was some difficulty in getting the head close to the ground in this area due to the vegetation in the 300-foot long section. In addition, a 500-foot wide wetland was not surveyed. Circa- used the Mini Wolf detector in this area as the depth to the object is greater (four feet) along the Fisher model. The remaining 2,250-foot long section of the area within the battlefield consisted of a plowed agricultural field. The metal-detecting survey recorded nine hits along Route 40. The artifacts consisted of two iron wire fragments, one aluminum pin pull tab fragment, one aluminum foil fragment, and five aluminum cans. No artifacts clearly associated with or tied date to the Civil War were recovered from the metal-detecting survey.

August 2020: Because a portion of the project area falls in the boundaries of a Civil War battlefield, Circa- conducted a metal-detecting survey of the area within the battlefield boundaries along Route 40. Circa- staff did not notice any previous metal-detecting activities from relic hunters in the area.

Using Fisher Model #1266-XB Deep Search and Mini Wolf all-metal metal detectors, Circa- archaeologists slowly walked within the boundaries of the battlefield, and they slowly swung the head of the metal detector perpendicular with each forward being walked. Each time the metal detector alerted the archaeologist to the presence of a ground surface or sub-ground surface metallic object, a non-metallic pin flag was placed on the suspect location. After metal survey completion, each suspect area and the ground surface immediately surrounding the suspect area was again metal detected for additional hits. Following the completion of this procedure, each suspect area was excavated using a round shovel or trowel, and all soils were screened through 1/8-inch hardware cloth until artifacts were recovered. All excavated soils and all areas surrounding the excavation were continually surveyed using the metal detector until the unit registered no alerts as to the presence of metallic objects. At that point, or quit location, the metal detector survey was concluded. The vegetation within the battlefield area is thick, and it was challenging to get the head of the machine near the ground surface.

The metal-detecting survey recorded three hits. The artifacts consisted of two metal pin flags and one iron ball. No artifacts associated with or tied date to the Civil War were recovered from the metal-detecting survey.

Secondary Resource Information

Historic District Information

Historic District Name: No Data
Local Historic District Name: No Data
Historic District Significance: No Data

CRM Events

Event Type: Survey/Phase I/Reconnaissance

Project Review File Number: 2020-0715
Investigator: Dawn Muir
Organization/Company: Circo- Cultural Resource Management, LLC
Photographic Media: Digital
Survey Date: 8/19/2020
DHR Library Report Number: SX-042

Project Summary/Notes:

August 2020: In August 2020, Circo- Cultural Resource Management, LLC (Circo-), conducted a Phase I cultural resources survey of the Shands Energy Center in Sussex County, Virginia. The project area, which encompasses approximately 19.00 acres, is bordered by rural forested lands to the north, east, and west, and by Sussex Drive to the south. The Area of Potential Effect (APE) for archeological and architectural resources in the approximately 19.00-acre project area.

At Circo-, Carol D. Tyler, Registered Professional Archaeologist (RPA), served as Project Manager for the project. Skye Hughes, MA, served as the Principal Investigator and was assisted in the field by Diane Johnson, Seady McElroy, and Shylene Spaura, Field Archaeologists. Dawn M. Muir, RPA, served as the Historical and Architectural Historian for the project and completed the historical context and architectural survey. Debrae Senter, Archaeological Lab Technician, assisted in the processing of artifacts, Skye Hughes, Dawn M. Muir, and Carol D. Tyler prepared the report. The successful completion of the Phase I survey for the proposed development was made possible by the contribution of many individuals. Jayne Guthrie with East Point Energy ensured that project information and maps were always available for the study. Dawn M. Muir entered the information into the V-CRIS system and Carol D. Tyler photographed the resources.

Project Bibliographic Information:

Circo-
2020 Phase I Cultural Resources Survey of the Shands Energy Center, Sussex County, Virginia.
SX-042

Karen Hurdins-Kelso, Jean M. Cascardi
Peer Review of Phase I Archaeological Survey of Shands Energy Center, LLC
(Letter report, November 25, 2020, Rummel, Klepper, and Kahl, LLP (RKK&K))
SX-043

Surveyor's NR Criteria Assessment: A - Associated with Broad Patterns of History

Event Type: DHR Staff: Potentially Eligible

DHR ID: 091-5025
Staff Name: Adrienne Barge-Wilson
Event Date: 9/28/2016
Staff Comment:
DHR File No.: 2016-0941

Event Type: Survey: Phase I/Reconnaissance

Project Review File Number: 2016-0941
Investigator: Dawn Muir-Frost
Organization/Company: Circo- Cultural Resource Management, LLC
Photographic Media: Digital
Survey Date: 9/24/2016
DHR Library Report Number: SX-037

Project Summary/Notes:

July 2016: In the spring of 2016, Circo- Cultural Resource Management, LLC (Circo-) conducted a Phase I archaeological survey of the Sappony Property in Sussex County, Virginia. The project area encompasses approximately 37.1 acres. The Area of Potential Effect (APE) for archeological resources in the approximately 37.1-acre project area. Architectural resources were not included in this survey and will be surveyed under a separate cover. However, the project area does fall within a Civil War Battlefield, which was included in the archaeological survey.

At Circo-, Carol D. Tyler served as Project Manager and Principal Investigator for the project and was assisted in the field by Charlie Raladge, Eric Hill, Matt Cain, and Mackenzie Kyger, Field Archaeologists. Dawn M. Muir-Frost served as the Historian for the project and completed the historic context. Mackenzie Kyger, Archaeological Lab Technician, assisted in the processing of artifacts. Dawn M. Muir-Frost and Carol D. Tyler prepared the report. Carol D. Tyler photographed the resources and Dawn M. Muir-Frost entered the information into the V-CRIS system.

Project Bibliographic Information:

Circo-
2016 Phase I Cultural Resources Survey of the Shands Energy Center, Sussex County, Virginia.
SX-042

Karen Hurdins-Kelso, Jean M. Cascardi
Peer Review of Phase I Archaeological Survey of Shands Energy Center, LLC
(Letter report, November 25, 2020, Rummel, Klepper, and Kahl, LLP (RKK&K))

SK-043

Surveyor's NR Criteria: A - Associated with Broad Patterns of History
Resource condition:

Event Type: DHR Staff: Potentially Eligible

DHR ID: 091-5025

Staff Name: ARPP

Event Date: 1/24/2007

Staff Comment:

Preliminary survey data from the American Battlefield Protection Program (ABPP) indicates that this historic Civil War battlefield is likely eligible for listing in the National Register of Historic Places and likely deserving of future preservation efforts. This survey information should be managed during future Section 106/NEPA compliance reviews.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: No Data

Investigator: CWSAC

Organizational Company: National Park Service

Photographic Media: No Data

Survey Date: 1/11/1992

DHR Library Report Number: No Data

Project Staff Notes:

CWSAC - VA067
Civil War Sites Advisory Commission Survey Form - no photos submitted - not dated or signed, but surveys occurred during the period between 1991 and 1993.

Project Bibliographic Information:

Citation:
2020 Phase I Cultural Resources Survey of the Shands Energy Center, Spotsylvania County, Virginia
SK-043

Kevin Hutchins Kaim, Jean M. Cascardi
Two-Week Phase I Archaeological Survey of Shands Energy Center, LLC
(Letter report, November 23, 2020, Rummel, Klepper, and Kahl, LLP (RKK&K))
SK-043

Surveyor's NR Criteria: A - Associated with Broad Patterns of History
Resource condition:

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Legend

- Architecture Points
- Archeology Points
- Country Boundaries



Title: Architecture Labels

Date: 1/30/2021

DISCLAIMER: Records of the Virginia Department of Historic Resources (VDHR) have been gathered over many years from a variety of sources and the representation depicted is a cumulative view of that information over time and may not reflect current ground conditions. The map is for general information purposes and is not intended for engineering, legal or other site-specific uses. Any user makes errors and is provided "as-is". More information is available in the Data Archives located at [VDHR's Recordspoint.org](#).

Notice of All other locations of archaeological sites may be recorded by National Historic Preservation Act (NHPA), and the Antiquities Act (AWA), and Code of Virginia §2.2-3705.3 (19). Release of specific location may depend on land-registry and used historic properties.



Miles



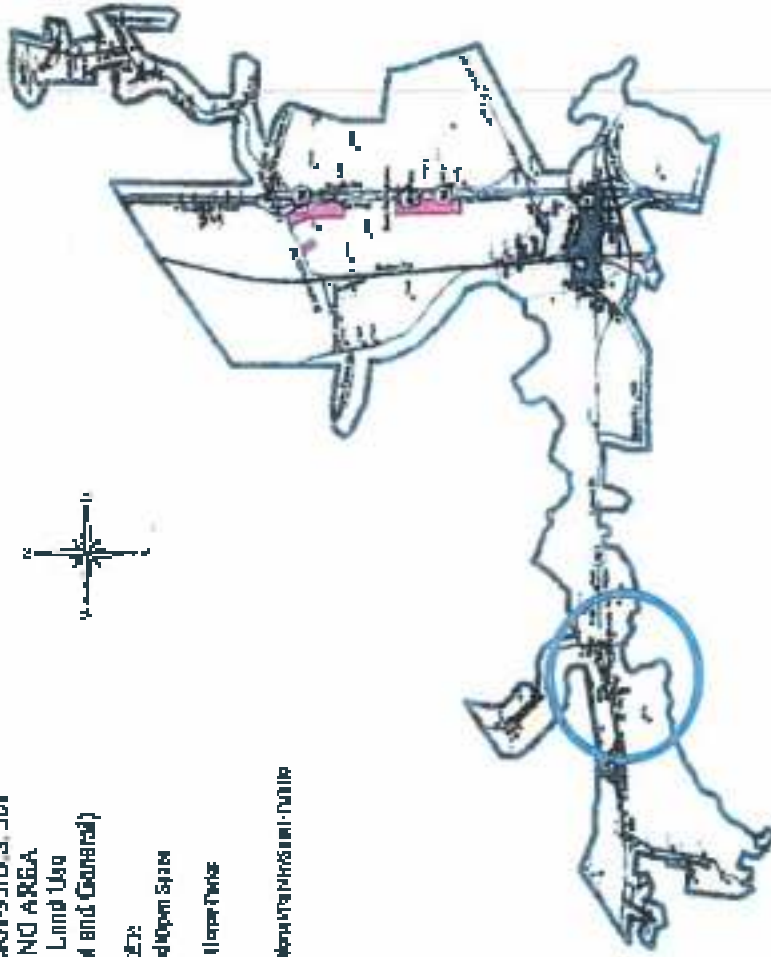
1:200,000 / 1"=4 Miles

Attachment B – Stony Creek Existing Land Use

EXHIBIT IX-C
STONY CREEK 930 S. 301
PLANNING AREA
Existing Land Use
(Predominant and General)



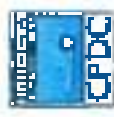
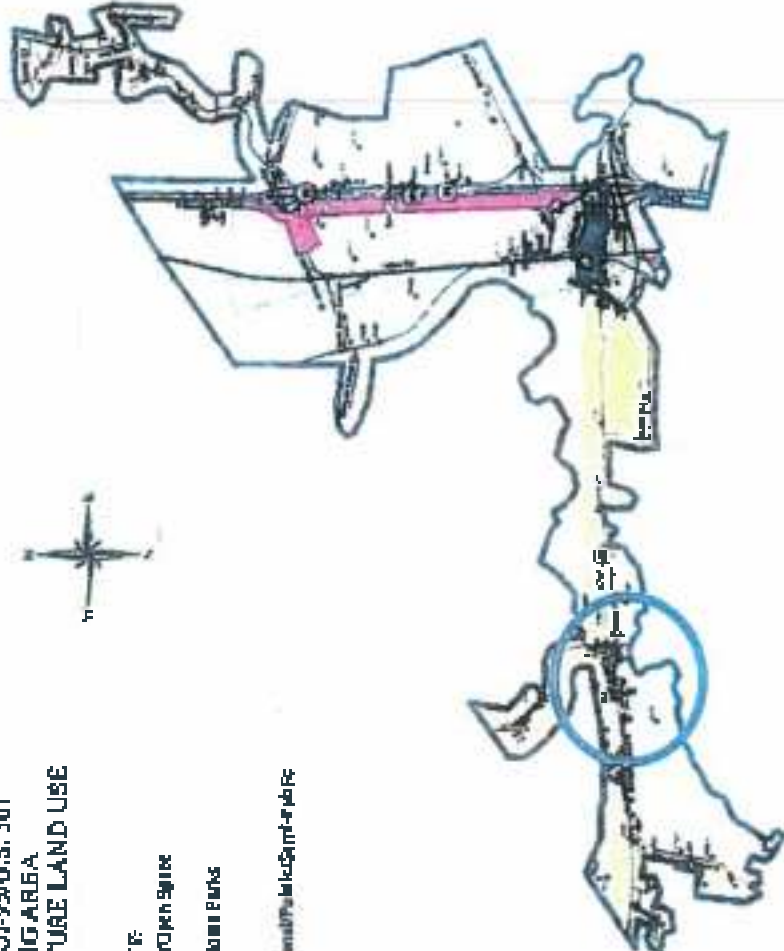
- LEGEND
- Agri (light blue) / Town (red) / Open Space (green)
 - Residential (yellow)
 - Agri (dark blue) / Water (light blue) / Other (grey)
 - Commercial (orange)
 - Industrial (purple)
 - Conservation (dark green) / Wetlands (light green) / Utilities (pink)
 - Town (red)



By Order of the Board
Stony Creek Planning Area
Stony Creek, Tennessee, 37172-3001

Attachment B - Stony Creek Future Land Use

**EXHIBIT X-B
STONY CREEK-9500 S. 301
PLANNING AREA
PROJECTED FUTURE LAND USE**



STONY CREEK-9500 S. 301
PLANNING AREA
PROJECTED FUTURE LAND USE

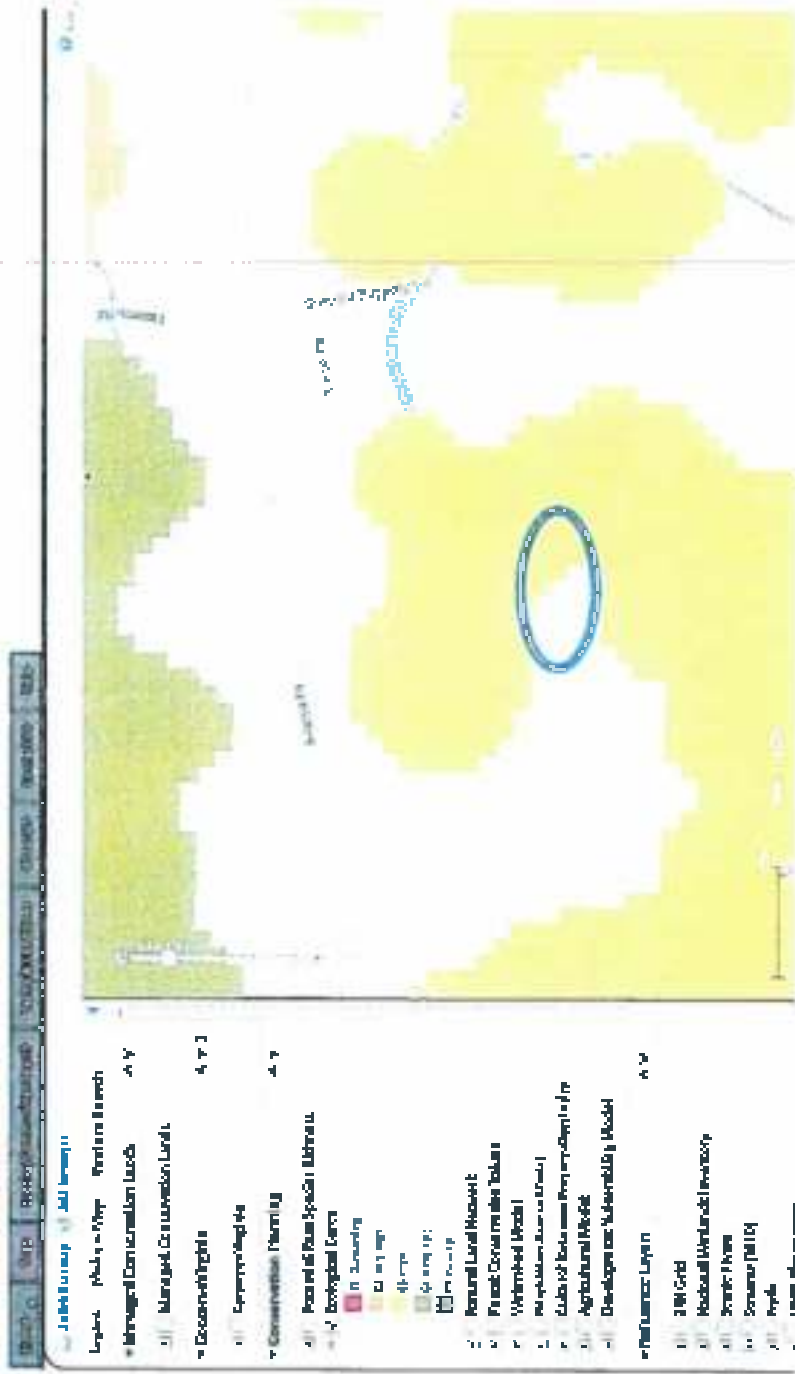
Attachment B – Stony Creek Region



Attachment B – Ecological Cores



Virginia Department of Conservation and Forestry



Blue Star Solar, Site 1

Public Facility Application Review for 2021-02

Code of Virginia Section 15.2-2232



**Staff Report
Blue Star Solar 1
Public Facility Application Review for 2021-02
Code of Virginia § 15.2-2232
Sussex County, Virginia**

**Report Date: March 23, 2021
Planning Commission Meeting Date: April 5, 2021**

APPLICATION SUMMARY

Project:	Blue Star Highway Solar 1, 3MW _{AC}
Location:	Located along Blue Star Highway (Route 301), immediately west of Interstate 95, 2 miles north of Jarratt, Sussex County.
Parcel Record Numbers:	138-A-1
Proposal:	Applicant's request for review of the Blue Star Hwy Solar 1 pursuant to Virginia Code Section 15.2-2232
Application Submitted:	February 17, 2021
Applicant(s):	Blue Star Hwy Solar 1, LLC, c/o Borrego Solar Systems, Inc. 55 Technology Drive, Suite 102 Lowell, MA 01853
Representative:	Alexander E. Deuson, PE, Civil Engineer Borrego Solar Systems, Inc.
Parcel Owner(s):	Molly P. Johnson

PLANNING COMMISSION ACTION

The Applicant has requested that the Planning Commission review its proposed solar energy facility, as a "public utility facility" under Virginia Code Section 15.2-2232(A), to determine whether the general or approximate location, character, and extent of the proposed facility is substantially in accord with the County's Comprehensive Plan. As required by the Zoning Ordinance, the Applicant submitted a 2232 Review Application (County reference number: 2021-02) that was deemed complete on February 25, 2021 (Attachment A).

Staff has recommended that the Planning Commission review the request for determination under Virginia Code Section 15.2-2232 prior to any review of a conditional use permit (CUP) application. Subject to the Planning Commission's 2232 decision, the Planning Commission will separately review and consider the merits of any associated CUP Application.

PURPOSE OF THE REVIEW UNDER VIRGINIA CODE SECTION 15.2-2232

Virginia Code Section 15.2-2232 requires that the Planning Commission review all proposed developments that include a "public utility facility" prior to the construction or authorization of such facility. The purpose of the Planning Commission's review is to determine whether the general or approximate location, character, and extent of the proposed public utility facility is substantially in accord with the Sussex County Comprehensive Plan or part thereof. The Planning Commission has set aside time at its April 5, 2021, meeting to afford citizens an opportunity to offer their comments to the Planning Commission. The Planning Commission must advise the Board of Supervisors of its determination. If appealed by the Applicant, the Board of Supervisors may overrule the action of the Planning Commission.

RELEVANT CONSIDERATIONS

Solar facilities less than or equal to 5 MW are:

- Subject to 2232 review (Virginia Code § 15.2-2232).
- Subject to a CUP review.
- Required to send DEQ a notification of intent and certification from a locality showing compliance with land use ordinances(9VAC15-60).
- Eligible to agree to a reasonable cash payment (Virginia Code §15.2-2288.3).

Solar facilities less than or equal to 5 MW are NOT:

- Subject to DEQ's Permit by Rule process(9VAC15-60).
- Taxed on M&T (Virginia Code § 58.1-3660).
- Eligible for revenue under a revenue share ordinance (Virginia Code § 58.1-2636).
- Eligible for a siting agreement (Virginia Code § 15.2-2316.6).

PROPOSED DEVELOPMENT

The Applicant is proposing two adjacent 3 megawatt (alternating current) photovoltaic solar energy generation facilities on 50 acres of a 142 acre parcel. This 2232 application (2232 2021-02) is for the rear/northern 3 MW facility (site #1). A second 2232 application (2232 2021-03) is for the front/southern 3 MW facility (site #2). The Applicant is proposing the two separate facilities to meet the Dominion Energy request for proposals for 3 MW facilities. Dominion allows the 3 MW facilities to be sited adjacent to each other as in these two proposals (they use the term "stacking"). If approved by the county, the Applicant will submit both projects to Dominion who may choose to purchase one, both, or none. If both facilities are constructed, they will effectively look and operate as a 6 MW facility.

The project infrastructure will consist primarily of solar photovoltaic modules (PV panels) mounted on steel racking structures, inverters, a transformer, and control cabinet, switch gear, meter, interconnection, and security fencing. Portions of the equipment will be mounted on concrete pads. No new buildings will be constructed, and no existing buildings utilized or expanded. Energy storage battery facilities are not proposed. Each project will include PV panels on approximately 17% of the 142 acre parcel.

The project is generally bound to the south by Route 301, to the west by a CSX Railroad line, to the east by a residential drive/right-of-way, and to the southwest by an unimproved agricultural road with residences off Wyche Ln beyond. There is an existing access road on the property.

According to the Applicant, energy generated will be connected to the grid at an existing 3-phase distribution line on Route 301.

The project is setback at least 150 feet from all property lines, with proposed vegetative buffers. The nearest residence would be 950 feet from the nearest solar panels.

The Applicant forecasts construction to begin in 2022 and last six to eight months, dependent on weather. The proposed plans for vegetative buffers include many non-native, potentially invasive plants such as Japanese cedar (*Cryptomeria japonica*), Japanese cherry (*Prunus x yedoensis*), Chinese holly (*Ilex x "Nellie R. Stevens"*), Chinese elm (*Ulmus parvifolia*), Asian sycamore hybrids (*Platanus x acerifolia "bloodgood"*), and Indian crepe myrtle (*Lagerstroemia indica*).

EXISTING CONDITIONS AND ZONING

The project is contained within the Jarratt/I-95/US 301 planning area. The project area is located in the A-1 Agricultural zoned section of the parcels. The A-1 Agricultural zoned section of the parcels has primarily been used for agricultural production. The future land use designation of the project area is a combination of residential and agricultural/forested/open space.

The project area is setback an adequate distance from Route 301 and the nearby residences. The parcel is bordered on the opposite side by a CSX railroad, and there is forested buffer between the site and residences to the northeast.

The Applicant contracted ECS Mid-Atlantic, LLC to make a determination on whether there are any recognized wetlands according to federal guidelines. They identified three (3) areas which would meet the criteria set by the Army Corps of Engineers as protected wetland habitat in an area totaling less than 1 acre. ECS expects this will likely require a wetlands permit from the Corps at the time of final construction permitting.

The Applicant contracted ECS Mid-Atlantic LLC to determine whether there are any recognized environmental conditions (RECs) on the site. They found no concerns.

The Applicant contracted the James River Institute for Archeology, Inc. to determine whether there are any cultural resources on or near the project site. None were found concurrently or historically. Site 1 will require tree removal on the majority of the 25 acre project area (Site 2 will require minimal tree removal). The existing trees and wetland vegetation surrounding the project area will provide natural screening.

The project area is relatively flat and will require minimal grading and minimal new stormwater infrastructure. The Applicant is proposing 3 new bioretention ponds for stormwater management.

ADJACENT AND SURROUNDING USES

The project is roughly 2 miles from the town boundary of Jarratt. The project area is adjacent to five (5) parcels (Attachment A) with 4 others nearby that are all agriculturally zoned and include residences, agricultural and forestry uses, and a railroad. The future land use map designates these parcels as agricultural/forested/open space and residential.

The Applicant contracted ECS Mid-Atlantic, LLC for a review of potential natural heritage resources in and around the project area. Using DCR's database, they found no natural heritage sites on the property. There are a number of state and federally threatened species which have potential habitat within a 2-mile radius, but most are aquatic and should not see significant or any impact if proper sediment and erosion control measures are taken. One species, the state-threatened Mabee's salamander (*Ambystoma mabeei*), may have only marginal habitat on the project parcel's identified wetlands, but there have been no confirmed sightings within 2 miles. Of bigger concern is the state-endangered Rafinesque's eastern big-eared bat (*Corynorhinus rafinesquii macrotis*), which has confirmed sightings within 2 miles and has potential habitat on the project site. Coordination with the Virginia Department of Wildlife Resources may be required to ensure potential habitat is not destroyed.

COMPREHENSIVE PLAN CITATIONS

The Comprehensive Plan 2004-2005 update was adopted on October 20, 2005. The plan was amended April 2, 2019, to specifically address solar generating facilities. The plan describes the general trends and future preferences for development with emphasis on maintaining the rural character of the county.

Chapter II: Concerns and Aspirations, section B. Issues and Existing and Emerging Conditions (p. II-12), item 23. Utility-scale Solar Facilities states:

As used in this Comprehensive Plan, a utility-scale solar facility is a facility that generates electricity from sunlight which will be used to provide electricity to a utility provider or a large private user with a generating capacity in excess of one megawatt (1 MW). Sussex's abundant agricultural and forest land combined with its electrical infrastructure and transportation system appear to be attractive to the solar industry. These facilities are an industrial scale land use that occupy significant acreage. Many utility-scale solar facilities are located on agricultural or forested land that may have had other future land use potential or land use designations.

The County will consider solar facilities in districts zoned agricultural or industrial with preference for brownfields and County-owned capped landfills. The following site features should be addressed to mitigate the potential negative impacts of utility-scale solar facilities on County land use patterns as part of the evaluation of a Conditional Use Permit (CUP) application:

- The total size shall be larger than two (2) acres but less than 1,500 contiguous acres with no more than 65% PV panel coverage;
- Located outside planning areas or community hubs;
- Located outside forested areas to preserve forest resources;
- Further than three (3) miles from any village or town boundary;
- Further than two (2) miles from other existing or permitted solar facilities; and

- Proximity to residences; historic, cultural, recreational, or environmentally sensitive areas; and scenic viewsheds.

Chapter II: Concerns and Aspirations, section C. County Vision, item 2. Vision Statement on p.II-13 states:

Sussex County seeks to maintain its rural character and natural beauty. The County is intent upon protecting its forest resources, agricultural lands, and natural environmental systems. It will accomplish its objectives by: concentrating commercial and industrial development along US 460 and the I-95/US 301 corridor and in other areas where adequate infrastructure exist to support such development; balancing residential and commercial land uses; protecting and preserving view sheds; protecting and preserving the natural environment and surface and ground waters, promoting smart growth practices and prudent land use decisions; and discouraging over development and strip development along State maintained roads.

Chapter IX: Land Use and Development, section B. Land Use Conflicts (p.IX-2) lists several issues to consider in addressing land use conflicts:

Land use conflicts that occur in Sussex County are typical of similar Virginia counties that must balance the needs of, and activities associated with, agriculture, forestry, and conservation uses with residential, commercial, industrial, and public uses. With respect to land uses and development, the County must remain cognizant and carefully consider a variety of issues when making land use decisions. Issues relevant to solar facilities include:

- Encroachment of residential and other urban-level land uses into traditional agricultural and forestry areas.
- The balance between needed commercial and industrial development and the conversion of vacant land.

Chapter X: Plan for the Future, section A. Introduction provides guidance for each land use type. **Item 1. Agricultural and Forested Lands (p.X-1)** states:

Agricultural land is one of the most valuable of all-natural resources. Of major importance, and an objective of land use planning in Sussex County is to identify prime agricultural land and to preserve it from being developed for residential or other land uses. Once developed, it cannot easily be restored to its original condition (natures).

Item 3. Industrial Development (p.X-2) states:

Industry, which will provide much of the basic employment needed for anticipated growth, has more critical location requirements than other major land uses. Prime industrial sites should be located where they can be served by major transportation facilities, including major highways, railroads, and airports. Industries dependent upon the transportation of heavy materials and products require locations served by railroad facilities. Other types of industry may prefer locations near major highways to facilitate truck service and access by employees, and still others may seek location near the airport. In addition to transportation facilities, industries should be in locations where adequate public utilities and services can be provided. Other requirements include suitability of sites with respect to slope, drainage, and soil bearing capacity, and suitable buffering from residential or other incompatible uses.

Potential industrial sites are located on the fringe of the existing towns, along the corridors of U.S. 301, I-95, and the CSX Railroad, in the western portion of the County, and along the U.S. 460 and Norfolk Southern Railroad in the eastern portion of the County. Also, areas on the north side of Cabin Point Road (State Route 602) may be suitable for industrial development. Sussex County is one of the few localities in Virginia that have been identified as having the potential and available acreage necessary to develop a mega industrial site.

This chapter also includes section C. **County-wide Goals and Objectives** clearly delineating 22 issues, each with one or two goals and several objectives (tactics). There are seven (7) issues and ten (10) goals relevant to the subject of solar facility siting.

Issue 1 Commercial and Industrial Development (p.X-10)

Goal 1: Promote economic development that will assure employment stability and provide ready access to needed goods and services in the County. Encourage local expansion and new industry location in the County to broaden the tax base and increase employment opportunities.

Goal 2: Sustainable commercial and industrial development in areas where such activities already occur or can be reasonably accommodated by public facilities and the County's natural systems and to encourage local support and patronage of County business.

Issue 2 Community Appearance (p.X-13)

Goal 1: Guide and support sound and attractive land use development with the County that will result in the least possible adverse fiscal and environmental impact.

Goal 2: Remain aesthetically pleasing while maintaining rural atmosphere, open spaces, and natural areas.

Issue 6 Growth Management (p.X-14)

Goal 2: Promote environmentally friendly development that is sustainable, aesthetically pleasing, and consistent with the County's rural image and character.

Issue 8 Infrastructure Carrying Capacity and Provision for Facilities and Services (p.X-16)

Goal 2: Ensure that public systems and services are sized, located, and managed to protect or restore the quality of areas of environmental concern or other fragile areas while providing adequate levels of service to meet the needs of citizens.

Issue 10 Land Development and Land Use Compatibility (p.X-18)

Goal 2: Ensure that development and use of resources or preservation of land minimizes direct and secondary environmental impacts, avoids risks to public health, safety and welfare and is consistent with the capability of the land based on considerations of interactions of natural and man-made features.

Issue 11 Natural Systems (p.X-20)

Goal 1: Preserve and develop forestry, agriculture, and related industry as important economic components of the County. Provide for the wise use of the County's nonrenewable earth and mineral resources, while protecting the beauty of the landscape.

Goal 2: Conserve protective functions of wetlands, flood plains, and other shoreline features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

Issue 21 Water Quality (p.X-26)

Goal: Maintain, protect, and where possible, enhance water quality of public waters.

In this chapter, **Section D. Planning Areas' Goals and Objectives** provides specific goals and objectives under the 22 issues for each planning area. The **Jarratt/I-95/U.S. 301 Planning Area goals and objectives relevant to the subject of solar facility siting are below.**

Issue 1 Commercial and Industrial Development (p.X-31)

Objective 5/Objective 14: Provide and maintain natural buffers such as open spaces, trees, and shrubbery between industrial and residential areas.

Issue 2 Community Appearance (p.X-32)

Objective 1: Utilize the County's Zoning Ordinance to prevent the location of incompatible land uses or other potential nuisances in the planning area.

Issue 11 Natural Systems (p.X-20)

Goal: To preserve and protect the predominately agricultural, forestall, and rural character of the Jarratt/I-95/U.S. 301 Planning Area.

Objective 1: Protect the agricultural and forestall areas by discouraging premature conversion of prime farmland and woodlands for residential, commercial, or industrial development.

Objective 3: Prevent incompatible land uses from locating in the vicinity of prime agricultural areas.

Objective 7: Identify the environmentally sensitive areas that pose constraints to development such as floodplains, wetlands, areas with steep slopes, and areas with undesirable soil conditions.

Objective 11: Continue to provide for soil erosion and sediment control as land is developed.

Objective 12: Maintain the rural character of the planning area.

Chapter XI: Tools for Managing Development, section A. Guide for Land Use Decision-Making (p.XI-2) offers general criteria to consider when evaluating a proposed development or ordinance amendment.

The Commission, however, should also look beyond the plan and consider whether proposed developments, even if consistent with the plan, **advance the best interests of public health, safety, and general welfare.** This very general criterion calls for consideration of a wide range of issues, including, but not limited to the **potential impact of a development on:**

- **The natural environment** – i.e., how a proposed development might affect air quality, water quality, flooding, erosion, important natural areas, etc.;
- **Important natural resources** – i.e., how a proposed development might threaten or enhance the continued availability and efficient use of finite natural resources for agriculture or forestry;
- **The transportation system** – i.e., whether any additional traffic generated by a proposed development can be safely and efficiently accommodated by the County's transportation facilities;
- **The provision of utilities and services** – i.e., whether an additional demand for water supply, electricity, refuse collection, fire and police protection, education, health care, recreation, etc. generated by a proposed development can be safely and efficiently accommodated by public, community, or private utility and service systems;
- **The County economy** – i.e., how a proposed development might affect employment opportunities and the general health of the Sussex County economy;
- **Important historical, architectural, archeological, and cultural resources** – i.e., how a proposed development might threaten or enhance the continued existence and integrity of resources of architectural, archeological, or cultural significance;
- **Neighboring development** – i.e., how a proposed development or development allowed by an amendment might affect living or working conditions in neighboring areas (including whether development might deter or enhance the appropriate development or conservation of neighboring property);
- **Community function, character, and attractiveness** – i.e., how a proposed development or development allowed by an amendment might enhance the attractiveness and functional mix of land uses needed to meet the needs of future populations and avoid adverse impacts; and,
- **Provision of affordable and convenient housing**– i.e., how a proposed development might affect people's ability to find affordable housing reasonably accessible to their place of employment.

STAFF COMMENTS AND ANALYSIS

A. Applicant's Position

In the application materials (Attachment A), the Applicant set forth its reasons why the proposed project is substantially in accord with the Comprehensive Plan.

The Applicant identifies the following items in support of its project:

- The proposed project is:
 - Located in an agricultural district
 - Less than 1,500 contiguous acres
 - Less than 65% solar panel coverage
 - Adjacent to a few residential properties with existing forest buffers
 - Not proximate to eligible historic, cultural, or recreational areas or scenic viewsheds
 - Adjacent to surface waters and wetlands, but mitigation measures are proposed to protect these areas
- A Dominion transmission line is near the property for interconnection to the grid.

- The project will generate minimal offsite noise, little glare, and no emissions or safety hazards.
- After the construction is complete, there will be limited ongoing maintenance, and the ingress/egress traffic will remain similar to current use patterns.
- The project will generate tax revenue and create temporary construction jobs.
- Solar facilities are a low intensity use that do not require county infrastructure or resources.

B. Staff Analysis

Staff has analyzed the proposed project considering the recently approved amendments and other relevant sections of the County's Comprehensive Plan, primarily:

- Chapter II, section B, item 23. Utility-scale Solar Facilities
- Chapter II, section C, item 2. Vision Statement
- Chapter IX, section B. Land Use Conflicts
- Chapter X, section D. Jarratt/I-95/Route 301 Planning Area goals and objectives

In addition to the items identified by the Applicant above, staff analysis considerations include:

- The project is 2 miles from the town boundary for Jarratt. The guidelines recommend greater than three (3) miles from the closest town boundary to allow for future growth and urbanization.
- The project is within the Jarratt/I-95/Route 301 Planning area.
- The project is located in an area designated for residential and agricultural/open space use in the Jarratt/I-95/Route 301 Future Land Use map.
- This project is proposed at the same time as an identical project on the same parcel (2232 2021-03). The two facilities would be closer than two (2) miles from each other and would essentially appear as one six (6) MW facility.
- There are wetlands directly abutting the project site which will require careful consideration.
- The majority of the 25 acre project area will need to have trees cleared.
- Non-native plants were proposed. Native plants that preserve the rural character of Sussex and enhance natural resources and habitats should be considered.
- The project site is located within 0.5 miles of the Interstate 95 and Route 301 interchange and will utilize land near a key transportation network that would be more suitable for higher intensity development, such as commercial or industrial uses that could generate revenue and jobs.

The location, character, and extent of the proposed utility-scale solar project are in accord with these guidelines set forth in the Comprehensive Plan, Chapter II, section B, item 23. Utility-scale Solar Facilities.

- The project section of the parcels is zoned agricultural.
- The total size is less than 1,500 contiguous acres.

- There is no more than 65% solar panel coverage.

The location, character, and extent of the proposed utility-scale solar project are not in accord with these guidelines set forth in the Comprehensive Plan, Chapter II, section B, item 23, Utility-scale Solar Facilities.

- The project is less than three (3) miles from the town boundary for Jarratt.
- The project is within the Jarratt/I-95/Route 301 Planning area.
- The project is located in an area designated for residential and agricultural/open space use in the Jarratt/I-95/Route 301 Future Land Use map.
- Forestland will need to be cleared for the project.
- Non-native plants in the project proposal are not in keeping with the rural character of Sussex.

Staff has analyzed the Comprehensive Plan elements, and the proposed project does not appear to meet the Comprehensive Plan's land use goals, objectives, and strategies. Based on the information reviewed for this report, staff finds that the proposed utility-scale solar facility is not in accord with the Sussex County Comprehensive Plan, or parts thereof. The proposed project does not meet the use criteria set for the given planning area.

As recommended in the Comprehensive Plan, the Commission, however, should look beyond the plan and consider whether proposed developments, even if consistent with the plan, advance the best interests of public health, safety, and general welfare. This very general criterion calls for consideration of a wide range of issues, including, but not limited to the potential impact of a development on:

- The natural environment
- Important natural resources
- The County's economy
- Important historical, architectural, archeological, and cultural resources
- Neighboring development
- Community function, character, and attractiveness

The question before the Planning Commission with this 2232 application is:

Whether the general location or approximate location, character, and extent of the proposed solar energy facility is substantially in accord with the Comprehensive Plan or parts thereof.

- The Planning Commission should consider all relevant portions of the Comprehensive Plan in its analysis.
- The Planning Commission should carefully and thoroughly document its reasons for whatever conclusion it reaches.
- The Planning Commission has three options:

- a. Determine that the application is not substantially in accord with the Comprehensive Plan with written reasons for its decision.
- b. Determine that the application is substantially in accord with the Comprehensive Plan with written reasons for its decision.
- c. Defer making a decision on the comprehensive plan compliance review for further discussion and consideration (within the 60-day window).

Attachment:

A – CUP Application 2021-02, submitted February 17, 2021.

DRAFT PLANNING COMMISSION ACTIONS

Staff Recommendation: Option 1 – Applicant’s proposal is not substantially in accord with the Comprehensive Plan

I move that Blue Star Hwy Solar 1, LLC’s proposed 3 megawatt photovoltaic solar energy facility as described in application 2021-02, is not substantially in accord with the Sussex County Comprehensive Plan for the following reasons:

1. The project is adjacent to a residential land use and is not further than three (3) miles from the nearest town boundary.
2. The project area is in the Jarratt/I-95/U.S. 301 planning area.
3. This project is proposed at the same time as an identical project on the same parcel (2232 2021-03). The two facilities would be closer than two (2) miles from each other and would essentially appear as one six (6) MW facility.
4. The project will clear forested land.
5. The project site is located within .5 miles of the Interstate 95 and Route 301 interchange and will utilize land near a key transportation network that would be more suitable for higher intensity development, such as commercial or industrial uses that could generate revenue and jobs.

The Secretary of the Planning Commission is directed to communicate the Planning Commission’s findings to the Board of Supervisors.

Option 2 – Applicant’s proposal is substantially in accord with the Comprehensive Plan

I move that Blue Star Hwy Solar 1, LLC’s proposed 3 megawatt photovoltaic solar energy facility as described in application 2021-02, is substantially in accord with the Sussex County Comprehensive Plan or parts thereof for the following reasons:

1. The project parcels are zoned agricultural or industrial.
2. The total size is less than 1,500 contiguous acres.
3. There is no more than 65% solar panel coverage.
4. The proposed project involves only a small part of the total agricultural land in the County and will have setbacks and buffers which, if adequate in scope and required in the Conditional Use Permit, could afford protection for adjacent properties.

The Secretary of the Planning Commission is directed to communicate the Planning Commission’s findings to the Board of Supervisors.

Option 3 – Deferral of the application

I move that the Planning Commission defer a decision on Blue Star Hwy Solar 1 LLC’s request under Va. Code § 15.2-2232 regarding its proposed 3 megawatt photovoltaic solar energy facility as described in application 2021-02, until the Planning Commission meeting scheduled to begin at ____ p.m. on _____, in the Board of Supervisors meeting room.



Borrego Solar Systems, Inc.
55 Technology Drive, Suite 102
Lowell, MA 01851
804-904-7068

January 29, 2021

Sussex County Planning Department
21035 Princeton Road
Sussex, VA 23884
Attention: Ms. Beverly Walkup
Phone: 434-246-1043

Re: Conditional Use Permit Application Submittal
20201 Blue Star Highway (Site 1) - Proposed 3MW AC Solar Facility
Parcel Number: 138-A-1

Dear Ms. Walkup:

On behalf of Blue Star Hwy Solar 1, LLC (Project Company), Borrego Solar Systems, Inc. (Borrego) respectfully submits the enclosed Conditional Use Permit (CUP) Application to construct and operate a proposed small-scale solar facility located at 20201 Blue Star Highway in Sussex County, Virginia. Molly P. Johnson owns the subject property (Parcel Number 138-A-1) and authorizes Borrego to seek land use entitlements supporting the proposed project, refer to Attachment 7.

The following Attachments support Borrego's CUP application in compliance with County Ordinances and discussions with County representatives:

Attachments

1. CUP Application
2. Permit Fee Check
3. Conceptual Landscaping Plan
4. Project Narrative
5. CUP Permit Plans
6. Decommissioning Estimate
7. Owner Authorization & Signature

Also enclosed for your reference are the following Exhibits documenting due diligence efforts undertaken by Borrego to date:

Exhibits

- A. Waters of the US Delineation Report
- B. Phase I Environmental Site Assessment
- C. Threatened and Endangered Species Review
- D. Preliminary Cultural Assessment

The proposed project site has been conceptually designed as a "stacked" solar facility, defined as two (2) separate and independent projects each of 3mw AC nameplate capacity. Stacked solar facilities are proposed throughout the Commonwealth, including at the proposed project site, to meet the capacity requirements of the Virginia Clean Economy Act. Pairing identically sized solar facilities in one project location enables cost-sharing of interconnection expenses and other synergies, and is a widely accepted mechanism of Distributed Generation electrical capacity construction.

At the proposed project site, Blue Star Highway Solar 1 and Blue Star Highway Solar 2 are proposed. The proposed project site and facilities may also be eligible for participation in a Community Solar or other program format given refinement in the understanding of renewable energy requirements in the Commonwealth. Refer to Attachment 4 for additional information.

Borrego endeavors to meet the requirements of Sussex County's CUP process and has met with County Staff at various times in late 2020 to review the proposed projects. For transparency and in respect of the community, Borrego has notified neighbors of the proposed project's application for entitlements. Borrego is working to schedule and hold a meeting with the community to discuss the project in an appropriate and safe format given the uncertainty of current global events.

Borrego proffers compliance with the County's governing Ordinance Section 16-404 of Article XXIII *Solar Facilities* as follows:

- (a) *Pre-application meeting.* Held with County Staff on December 18, 2020.
- (b) *Comprehensive Plan Review.* Refer to Attachment 4. Through the use of appropriate landscaping and vegetative screening, the projects' location is compliant with the character and extent of the adopted Comprehensive Plan, and substantially in accordance with regional goals outlined in the approved document conforming with Sec. 15.2-2232 of the Virginia Code.
- (c) *CUP Application.* Refer to Attachment 1 and Attachment 2.
- (d) *Concept plan.* Refer to Attachment 5. The guidance set forth in Section 16-404 has been demonstrated in Borrego's conceptual plans.
- (e) *Concept plan compliance.* The proposed projects are individually beneath the threshold to qualify for DEQ's Permit By Rule (PBR); this section is not applicable.
- (f) *Decommissioning plan.* Refer to Attachment 6. The guidance set forth in Section 16-404 has been adhered to in Borrego's analysis.
- (g) *Decommissioning escrow/surety.* To be determined upon consideration by the County.
- (h) *Traffic study.* Refer to Attachment 4. Minimal traffic is anticipated during the operational life of the project.
- (i) *Estimated construction schedule.* Refer to Attachment 4. Borrego expects the project to be operational by 12/31/2022, with construction occurring during the summer of 2022.
- (j) *Wetlands and waterways delineation.* Refer to Exhibit A.
- (k) *Environmental Inventory.* Refer to Exhibit D.
- (l) *Visual Impact analysis.* Refer to Attachment 3.

Section 16-409 of Article XXIII of the Sussex County Ordinances, as adopted, outlines conditions the Board of Supervisors may find appropriate in granting land use entitlements for solar facilities. As discussed with County planning Staff on December 18, 2020, the proposed projects' nameplate capacities are below the threshold of eligibility for a Siting Agreement under VA Code 15.2-2316.7.

Borrego. Powering your Growth.

Borrego looks forward to discussions with Sussex County regarding the potential appropriateness of utilizing Title 15.2, Article 7 of the VA Code in accommodating the proposed project.

Outside of direct economic benefit at the governmental level, solar facilities at the scale of the proposed projects provide diverse advantages to Sussex County. Increased property value with associated assessments, local spending during construction, and lease payments to property owners throughout the facility lifecycle work to create diversity in the local economy without straining existing infrastructure. The proposed project requires no utility services, does not utilize existing water resources, and generates no air emissions.

Should you have any questions or require additional information, please contact me at adeuson@borregosolar.com or 804-904-7068. Thank you for your consideration of the proposed permit application.

Very Truly Yours,



BORREGO SOLAR SYSTEMS, INC.
Alexander E. Deuson, PE
Civil Engineer

Cc: BOX File, John Bennett, PE (AES)

Procedure for Conditional Use Permit Applications

- STEP ONE.** Applicant completes the appropriate application furnishing information as requested on application and pays the appropriate fees.
- STEP TWO.** Director of Planning reviews the application and accompanying materials. The request is scheduled for public hearing with the Planning Commission.
- STEP THREE.** The first public hearing is advertised as required by local and state ordinances.
- STEP FOUR.** Official notice of the public hearing date will be provided to the applicant and adjacent property owners by the county.
- STEP FIVE.** The planning commission holds a public hearing. A determination is made and a recommendation is forwarded to the Board of Supervisors.
- STEP SIX.** The second public hearing is advertised as required by local and state ordinances and an official notice given to the applicant and adjacent property owners by the County.
- STEP SEVEN.** The Board of Supervisors holds public hearing. A final determination is made by the Board.

Site 1 (Northern Site)

CUP Number: _____
Date Application Filed _____
\$500 Processing Fee Received By: _____



Sussex County Planning Department
Post Office Box 1397
21035 Princeton Road
Sussex, Virginia 25884
Phone: 434-246-1043
Fax: 434-246-2176

CONDITIONAL USE PERMIT APPLICATION

Owner Information:

Name: Molly P Johnson
Address: 4503 Coventry Road
Richmond, VA 23221
Phone Number: (804)513-3170

Applicant Information:

Name: Blue Star Hwy Solar 1, LLC
Address: c/o Borego Solar Systems, Inc.
55 Technology Drive, Suite 102 Lowell, MA 01853
Phone Number: (804)904-7088

Legal Description of Property:

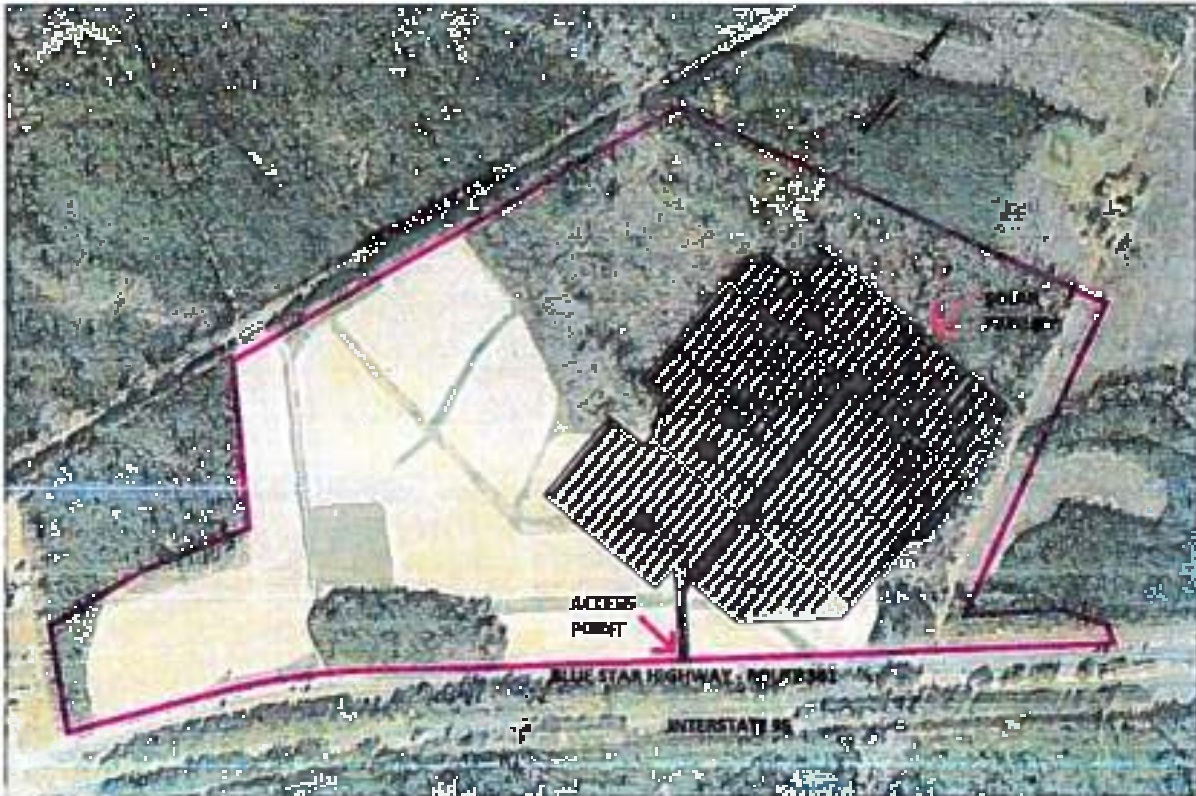
Tax Map Number:	<u>138-A-1</u>	Election District:	<u>5-Henry</u>
Zoning District:	<u>A-1</u>	Subdivision:	<u>N/A</u>
Block Number:	<u>N/A</u>	Lot Number:	<u>N/A</u>
Lot Size (Acreage):	<u>142.14</u>	Square Footage:	<u>6,181,618</u>

Please answer the following:

- When was property acquired by applicant? N/A (Lease agreement with owner)
- Are there any deed restrictions on the property in question? Yes No
(If yes, attach a copy of restrictions).
- What is the proposed use of property or type of improvement? Please be detailed and specific in your description. (For example: new construction, addition or demolition, agriculture, residential or commercial use)
Utility Scale Solar
- What is the Fair market value of improvements \$ 5,000,000
(Value must include all buildings, electrical, plumbing, and mechanical work to be performed).
- Describe briefly the type of use and improvements proposed. State whether new buildings are to be constructed, existing buildings are to be used, or additions made to existing buildings.
Proposed solar farms development, refer to attached drawings and reports.
- Describe how the proposed use and improvements are to be designed and arranged to fit into the development of adjacent property of the neighborhood.
Refer to attached Project Narrative.
- Furnish plot plan, preliminary site plan, and/or preliminary subdivision plat showing boundaries and dimensions of property, width of boundary sheets, location and size of buildings on site, roadways, walks, off street parking and loading space, landscaping and the like. Architect's/Engineer's sketches showing elevations of proposed buildings and complete plans are also desirable and if available should be filed with application.
Refer to attached drawings and renderings.
- I hereby certify that I have the authority to make the foregoing application and that the application, is complete and correct and that the conditional use permit is in accordance with section 18-403 & 404 of the Zoning Ordinance.

Owner Signature: _____ Date: 1/4/20
Applicant Signature: Alexander Dusa Date: 1/4/20

Project Narrative
for
Conditional Use Permit Application
Proposed Solar Site
20201 Blue Star Highway
Sussex, VA



Borrego Solar Systems, Inc.
55 Technology Drive, Suite 102
Lowell, MA 0185

Prepared by AES Consulting Engineers
4120 Cox Rd, Suite D
Glen Allen, VA 23060

December 16, 2020



PROJECT NARRATIVE

The project is located along Blue Star Highway (Route 301), west of Interstate 95. The total site area is approximately 142 acres, per the Sussex County Geographical Information System (GIS) website. The agriculturally zoned parcel is identified as tax map number 138-A-1. The site will consist of two separate projects. Both projects are nearly identical in nature and have been entered into the interconnection queue with the local utility (Dominion). Blue Star Highway Solar 1 LLC and Blue Star Highway Solar 2 LLC, c/o Borego Solar Systems Incorporated (BSSI) seeks to separately permit these projects at the County level to insulate against the possibility of one project being eliminated from consideration during the selection process with Dominion, which will not be determined until 2021 or later. Figure 2 below depicts site 1 which sits directly north of site 2. Figure 3 depicts site 2 which is set approximately 150 feet from the property line along Blue Star Highway.

The proposed leased area currently consists of existing forested conditions and active agricultural uses. The site is generally situated atop a ridge, with slopes approximately ranging between 1-5%. The parcel is bounded by Route 301 to the southeast. The parcel located to the northeast of the site is zoned A-1 and is of residential use. The parcel directly west of the site is occupied by CSX railroad. The parcel southwest of the site is also zoned A-1 and is currently completely forested. Lastly, the parcel south of the project is zoned A-1 and is of residential use. Refer to Figure 1 for the surrounding zonings.

Both proposed projects are 3 mega-watt utility-scale solar electricity generating. The proposed facility footprints are each expected to cover approximately 25 acres of land area (for each project). Each project will contain approximately 9,000 solar modules (panels), and generate approximately three (3) megawatts AC of electricity. The facilities will interconnect with the electrical grid via the existing three-phase lines at Route 301. Both sites will be encompassed by one continuous chain link fence and have a single access road. The solar facilities combined will encompass approximately 50 acres.

Once the sites are operational there will be virtually no personnel on-site. Maintenance for landscaping would be required approximately three times a year. The site is generally self-sufficient and unless the plant or any of the panels are malfunctioning, personnel will not be on-site.

- A-1, General Agriculture
- R-R, Rural Residential
- R-1, General Residential
- R-2, Manufactured/Mobile Home Park
- B-1, Limited Business
- B-2, General Business
- B-3, Shopping Center
- I-1, Limited Industrial
- I-2, General Industrial
- PUD - Planned Unit Development



Figure 1

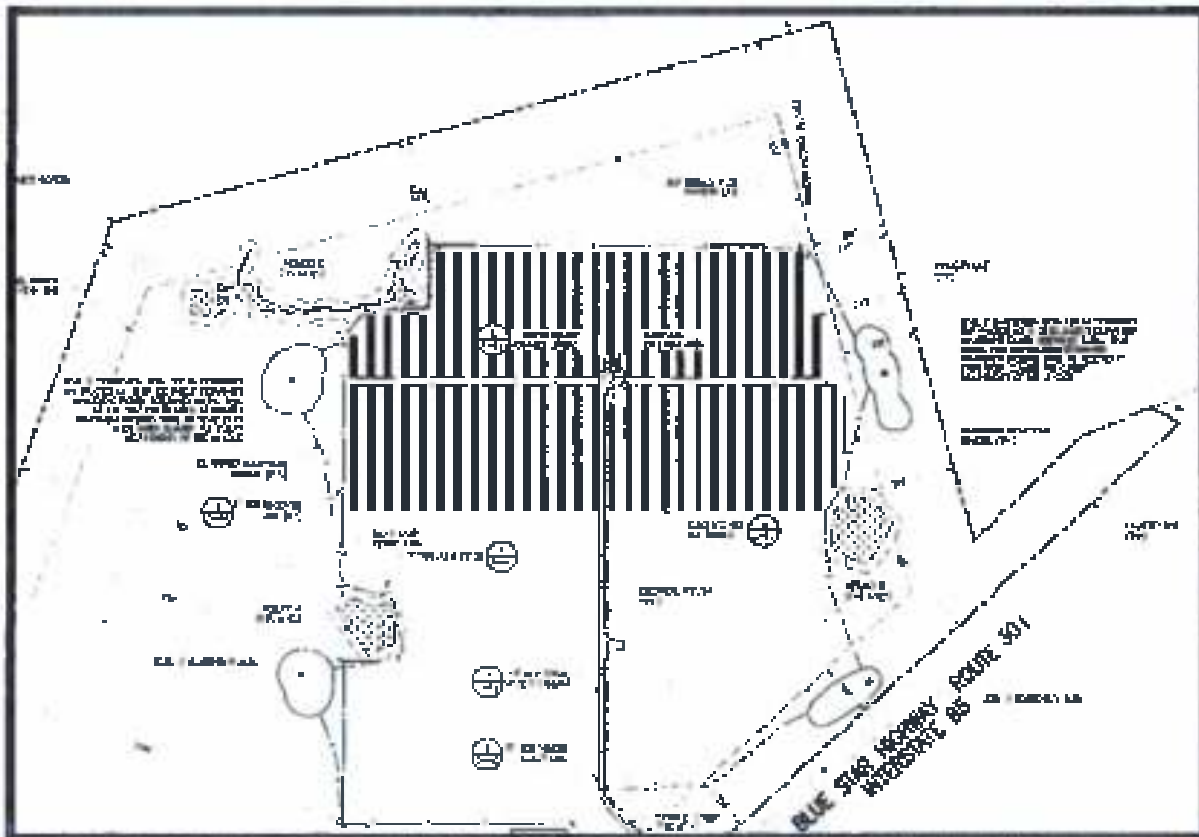


Figure 2

SITE 1

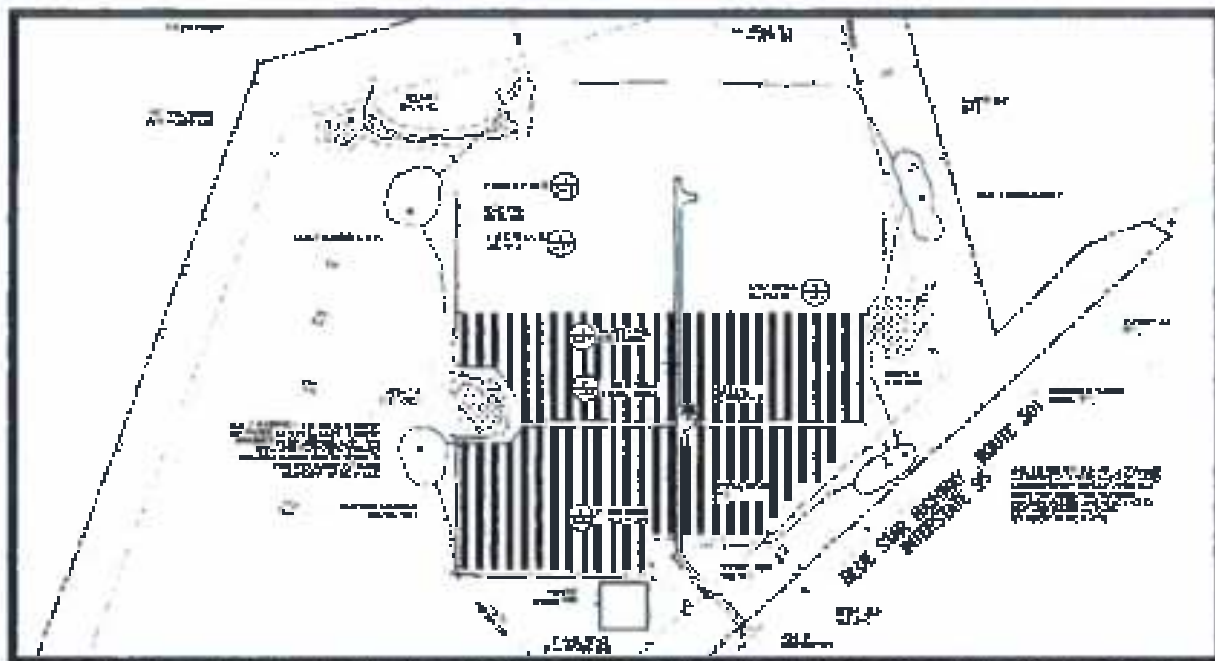


Figure 3

SITE 2

The project sponsor and applicants are Blue Star Highway Solar 1 LLC and Blue Star Highway Solar 2 LLC,

c/o Borrego Solar Systems Incorporated (BSSI). Consistent with industry standard, separate operating companies for each project are required for contractual terms with electrical utilities. BSSI proposes to lease land owned by Molly Prince Johnson, Trustee of the Alese H. Prince Exemption Trust for the temporary installation of the facilities, targeting a lifespan of approximately 30 years. At the conclusion of the projects' lifecycle the facilities will be decommissioned, removed, and the land use, cover types, lines and grades, and character of the leased area restored to pre-project condition.

Environmental Inventory

A "Waters of the U.S. Study" (WOUS) was performed by ECS Mid-Atlantic, LLC dated September 30, 2020. The study has been submitted for your review. The wetlands are delineated on the Conditional Use Permit Site Plan, which was also submitted with the application package. The wetlands will not be impacted by the proposed development.

Additionally, a "Phase I Environmental Site Assessment" was performed ECS Mid-Atlantic, LLC dated September 14, 2020. The assessment concluded that there is no evidence of recognized conditions for the subject parcel.

ECS Mid-Atlantic, LLC also performed a Threatened and Endangered (T&E) Species database review for the site dated September 9, 2020. The review included conducting a search of the Virginia Department of Wildlife Resources (VDWR), Fish and Wildlife Information Services (FWIS) threatened and endangered species within a two-mile radius of the site. There were several species listed in the review. However, the habitat for most of the species does not appear to be present on the site or the development doesn't appear to pose adverse effects on the species. State endangered big-eared bat may be present; therefore, if any impacts to wetlands are proposed a VDWR review may be required. The review also included a U.S. Fish and Wildlife Services (USFWS) review and three species were listed as potentially inhabiting the site, but adverse effects to the species are not anticipated. ECS Mid-Atlantic, LLC also conducted a review of the DCR Heritage Data Explorer database and concluded that natural heritage resources are not present on the site. The studies mentioned have been submitted for your reference.

Per the Federal Management Agency (FEMA) mapping, there are no floodplains on the site. The development will not directly or indirectly impact national forests, state forests, national parks, or state parks.

Traffic Information

The site is located along Blue Star Highway (Route 301). It primarily runs north-south, is a two-lane, undivided, asphalt surfaced roadway with approximately 12 foot-wide travel lanes without shoulders. Ditches are located along both sides of Blue Star highway and the posted speed limit is 55 miles per hour. The closest intersecting road is Wyche Lane, approximately 200 feet from the southernmost corner of the property. There are a few residential drives that also connect to Blue Star Highway within 1,000 feet of the site.

The Average Daily Traffic Volume for this section of Blue Star Highway is 900 vehicles per day as determined by the Virginia Department of Transportation (VDOT) and published in their 2019 Annual Average Traffic Volume Estimates by Section of Route for Sussex County. Based on recent IRC design

service volume recommendations, the capacity of this section of Blue Star Highway is approximately 21,400 vehicles per day.

Based upon an analysis of the Virginia Department of Transportation (VDOT) Annual Average Traffic Volume Estimates by Section of Route for the Sussex County from 2005 to 2019, a fifteen (15) year period, the daily traffic volume has decreased from 1,000 to 900 vpd range. Since the traffic volumes have changed very little in the past 15 years, and there are no substantial changes anticipated in proposed land uses in this area based on the current Comprehensive Plan, it is reasonable to project no significant change in the future traffic volumes in this area for the analysis period extending out 10 years.

The solar facility is unmanned and there are few regular daily vehicle trips to the site anticipated, the traffic impacts of the proposed solar facility once it is up and running is nearly zero. There would only be less than ten trips generated per month anticipated for maintenance of the site. The frequency and number of additional vehicle trips daily and at the peak hour are so low the impact will be nearly imperceptible given the existing and anticipated traffic along this section of Blue Star Highway.

The traffic impacts during construction must be accommodated during the construction period as recommended above. However, the additional traffic anticipated during construction, estimated to be 6 to 8 months, will have a temporary impact on the daily traffic as well as the peak hour volumes. As such, the following items are recommended immediately preceding and following the construction period: 1) 1200' feet in either direction from the access point, along Blue Star Highway, on the site must be clearly marked as a Construction Zone using all appropriate signage in accordance with VDOT's construction zone guidelines; and 2) The roadway speed limit 1200' feet in either direction from the access point on the site must be temporarily reduced to 40 mph (from the current 55 mph) for at least one month before the construction work begins, in order to help drivers acclimate to the reduced speed limit before the construction traffic begins to arrive at the site, until one month after the construction ends.



Figure 4 – Blue Star Highway adjacent to subject parcel

Compliance with Comprehensive Plan

20201 Blue Star Highway Site 1 and 2 are designed to be in substantial accordance with the comprehensive plan. As previously mentioned, the site is approximately 342 acres and the projects will take up about 50 acres of the site. Hence, the total combined PV panel coverage will be approximately 35%. The site is located approximately two miles from the town boundary of Jarratt and within the Jarratt/ I-95/ U.S. 301 Planning Area. The parcel's projected use per the projected future land use based on the planning area is residential, agricultural, forested, and/or open space.

James River Institute for Archaeology, Inc performed a preliminary cultural resources assessment of the site and concluded that there are no recorded archaeological sites on or within a half-mile radius of the site.

Natural Environment

The projects seek to have little to no negative effects on the environment, including air quality, water quality, flooding and erosion. A typical concern that may arise with solar developments is water quality and erosion. There is no mass grading proposed for these projects, and they will adhere to VA DEQ regulations for stormwater and erosion control. Complete stabilization of the land will be ensured to minimize the risks of erosion. There are no known floodplains on the property.

Additionally, several BMP's will be included in the final design as needed to treat any run-off prior to leaving the site and to achieve compliance with the VA stormwater regulations. The Virginia Department of Environmental Quality (DEQ), has determined that solar arrays are not considered an impervious surface unless the solar array is so close to the ground that storm water cannot flow freely beneath. The single axis tracking panels will be placed so that water will flow freely beneath the installed panels. Planted ground cover will be established and maintained under the panel arrays. The only impervious area associated with the solar arrays will be items physically attached to the ground (pilings, posts, equipment, etc.) and any supporting structures or access roads. Stormwater is proposed to be treated on site utilizing stormwater Best Management Practices. The proposed facility is anticipated to generate less than 2 acres of impervious area, including the initial construction laydown area, and will be treated for both water quality and quantity as required. As such, at the time of Site Plan submittal, calculations will be provided to confirm that the stormwater treatment is sufficient to meet design requirements established within the Virginia Stormwater Management Program regulations.

As previously mentioned, the projects will require minimal grading. Minimal grading will allow the possibility to return the land to its original state at the end of the project's life.

Neighboring Development

The property to the north and south of the site both contain residences. The development will produce little to no sound, hence, posing no noise impacts on the surrounding residents. The project is proposing a setback of 150 feet or more from all property lines. The closest resident to the project lies to the north and would be approximately 950 feet from the closest panel on the project.

Community Function, Character and Attractiveness, Visual Impact

One major goal of this development is to minimize the visual impacts the solar panels may pose on the community. In order to minimize the visual impact, plantings along Blue Star Highway are being proposed. A landscape plan and color perspective rendering are provided with the application to represent the existing and proposed views from Route 301 adjacent to the site.

Fiscal Impact Analysis

The proposed solar facility will be constructed using private funds and there are no public infrastructure required to support the facility. As such, there will be no capital, operations, maintenance, or replacement costs for public facilities needed to service the project.

Decommissioning Plan

Refer to the attached "Decommissioning Estimate/ Plan" for an analysis on the total cost of decommissioning the site.

Estimated Construction Schedule

If the Conditional Use Permit is granted by the County and approved for interconnection by Dominion, BSI proposes to submit ministerial permit applications by mid-2021, aiming to have permits in hand by early 2022. The facility would be constructed and commissioned by late 2022 and fully operational by 12/31/2022.

EXHIBIT F

7 / 8 / 2020

To Whom It May Concern:

Borrego Solar Systems, Inc. and its employees and affiliates are hereby authorized to act as our agent for submission of applications and related plans and documents, and to appear before boards and other officials, with respect to obtaining approvals for solar installations to be constructed on my property located at Blue Star Hwy., Jarratt, VA (Parcel: 138-A-1).

Sincerely,

DocuSigned by:

Molly Prince Johnson

7020200708102

Molly Prince Johnson

DocuSigned by:

Molly Prince Johnson

7020200708102

Molly Prince Johnson, as Trustee of
the Alese H. Prince Exemption
Trust



ADJACENT PROPERTY OWNERS
SUSSEX COUNTY

4120 Cox Road, Suite 0
Claremont, Virginia 23060
Phone (804) 530-6040
besv.com

Project Manager: John Bennett
Project Number: R01708-07
Project Name: 20201 Blue Star Highway
County: Sussex
Tax Map No.: 138-A-1

Adjacent Property Owners

Property Address	Owner	Owner Address	Tax Map No.
10469 WYCHE LANE, JARRATT VA 23867	STITH EUNICE	10469 WYCHE LANE, JARRATT VA 23867	137-A-35
NOT AVAILABLE	JOHNSON MDILY PRINCE	4503 COVENTRY ROAD, RICHMOND, VA	137-A-34
NOT AVAILABLE	RAILROAD R/W*	NO INFORMATION AVAILABLE	N/A
NOT AVAILABLE	FULLER, JOSEPH H JR & GEOFFREY H	4208 QUEBEC AVENUE, PRINCE GEORGE, VA 23875	123-A-6
NOT AVAILABLE	WALLER CLAUDIA F TEMPLE ET AL	PO BOX 384, JARRATT VA, 23867	138-A-3

*Amtrak and CSX Railroad

Other Nearby Owners

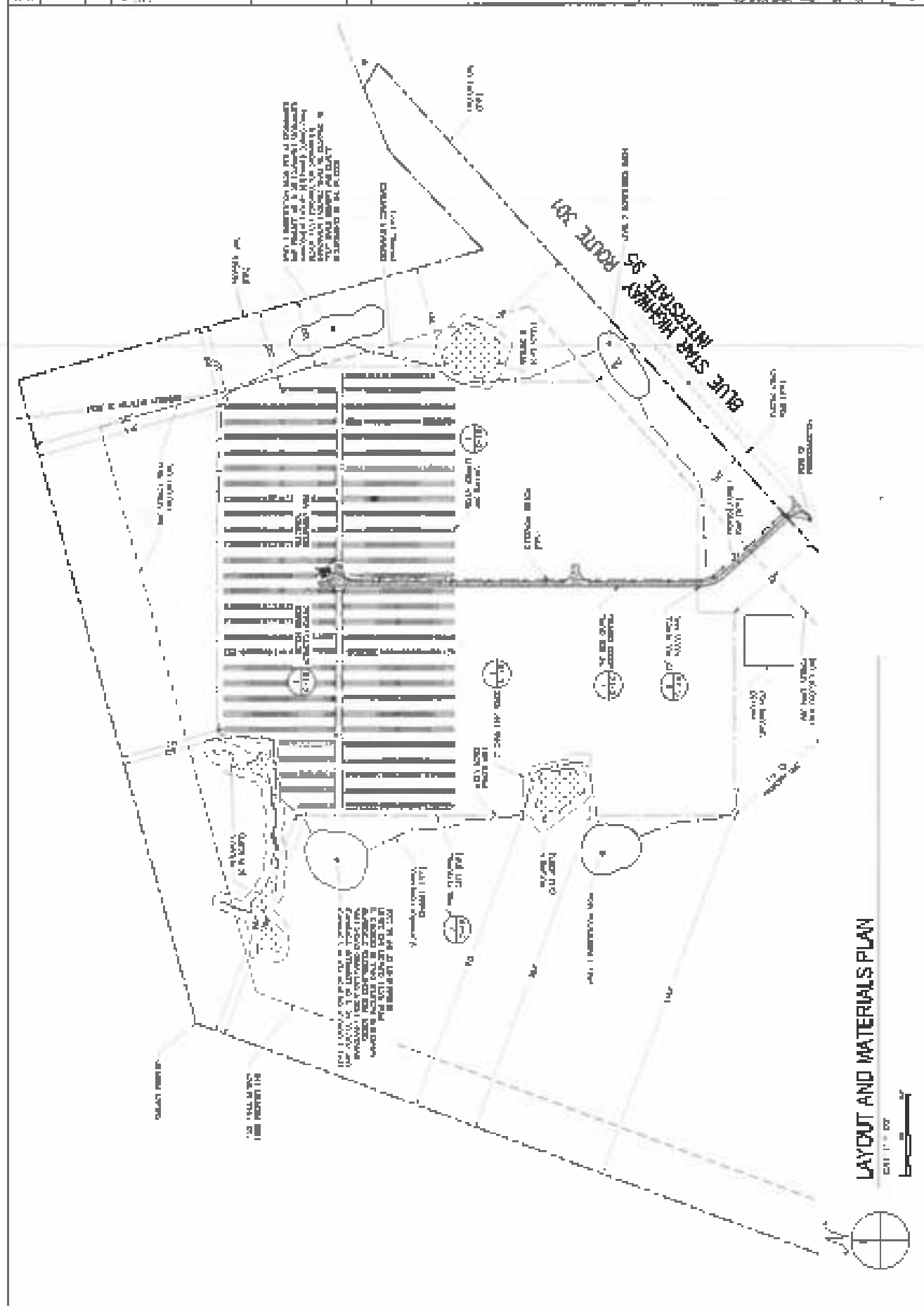
Property Address	Owner	Owner Address	Tax Map No.
NOT AVAILABLE	LUCILLE C. DARDEN	PO BOX 334, Emporia, VA	137-A-32
10437 WYCHE LANE, JARRAT, VA 23867	RICKY & VERONICA OWENS REMIND	10437 WYCHE LANE, JARRAT, VA 23867	137-A-33
NOT AVAILABLE	KELLEY TIMBER LLC	12909 BRADFORD LANDING WAY	138-A-1A

CONTRACT NO. 2010-0000000000
 PROJECT NO. 2010-0000000000
 SHEET NO. 2010-0000000000
 DATE: 10/10/2010

CONCRETE USE PERMITS
 BLUE STAR HIGHWAY - BRIDGE - 5-2-1
 PROJECT NO. 2010-0000000000
 SHEET NO. 2010-0000000000

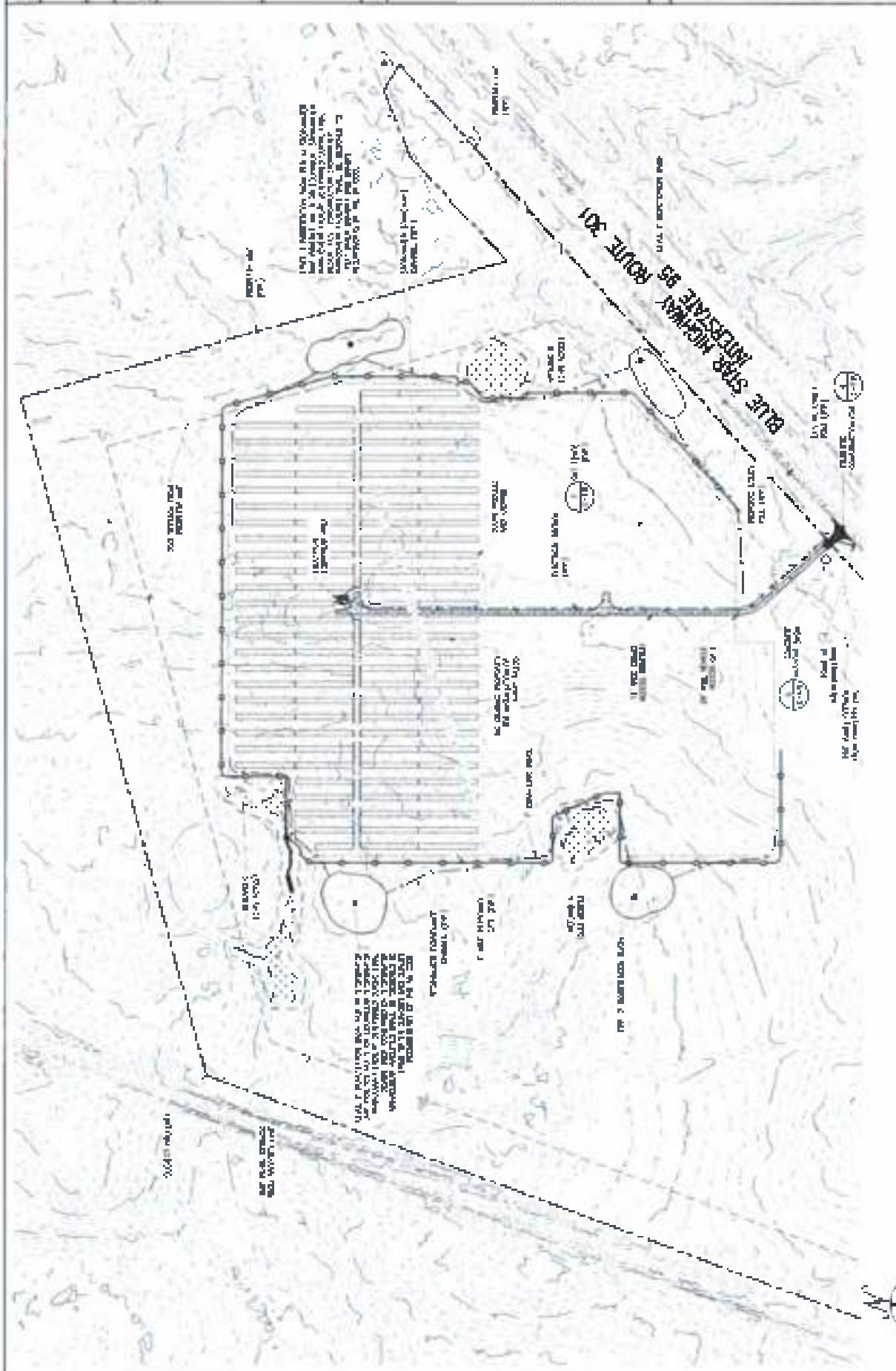
NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMITS	10/10/2010
2	REVISED PERMITS	10/10/2010
3	REVISED PERMITS	10/10/2010
4	REVISED PERMITS	10/10/2010
5	REVISED PERMITS	10/10/2010

0-2.0
 SCALE: 1" = 100'



LAYOUT AND MATERIALS PLAN
 DATE: 10/10/2010

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	10/15/2010
2	REVISED PER PERMIT	10/15/2010
3	REVISED PER PERMIT	10/15/2010
4	REVISED PER PERMIT	10/15/2010
5	REVISED PER PERMIT	10/15/2010
6	REVISED PER PERMIT	10/15/2010
7	REVISED PER PERMIT	10/15/2010
8	REVISED PER PERMIT	10/15/2010
9	REVISED PER PERMIT	10/15/2010
10	REVISED PER PERMIT	10/15/2010



WATERS OF THE U.S. STUDY



BLUE STAR HIGHWAY SOLAR SITE
20201 BLUE STAR HIGHWAY
JARRATT, SUSSEX COUNTY, VIRGINIA

ECS PROJECT NO. 47:10699-A

FOR

BORREGO SOLAR SYSTEMS, INC.

SEPTEMBER 30, 2020





ECS Mid-Atlantic, LLC

"Setting the Standard for Service"

Geotechnical • Construction Materials • Environmental • Facilities

September 30, 2020

Mrs. Melissa Samaroo
Borrego Solar Systems, Inc.
1 N. State Street
Chicago, Illinois 60602

ECS Project No. #7:10699-A

Reference: Waters of the U.S. Study, Blue Star Highway Solar Site, 20201 Blue Star Highway, Jarratt, Sussex County, Virginia

Dear Mrs. Samaroo:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide you with the results of our Waters of the U.S. (WOUS) Delineation Report for the referenced site. ECS services were provided in general accordance with ECS Proposal No. 47:15555-EP-EP authorized on July 27, 2020 and generally meet the requirements of the 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual, and on the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 dated November 2010.

If there are questions regarding this report, or a need for further information, please contact the undersigned.

Sincerely,

ECS Mid-Atlantic, LLC

Camille VanSkiver
Environmental Staff Project Manager
cvanskiver@ecslimited.com
804-353-6333

Garnett B. Williams, C.P.G.
Principal Geologist
gwilliams@ecslimited.com
804-353-6333

1.0 INTRODUCTION

This report presents the findings of a Waters of the U.S. study conducted by ECS Mid-Atlantic, LLC (ECS) for Borrego Solar Systems, Inc. at the Blue Star Highway Solar Site located at 20201 Blue Star Highway, Jarratt, Sussex County, Virginia (Latitude: 36.847978 N, Longitude: -77.435201 W); the site is further identified by the Sussex County Parcel No. 138-A-1. The site includes approximately 65-acres, as shown on the Site Location Map (Appendix I). The site consists of a mixed landscape of agricultural crop fields and undeveloped forest.

ECS conducted the Waters of the U.S. Study on August 10, 2020. The purpose of this study was to identify and delineate potentially jurisdictional Waters of the U.S. (WOU.S.) within the proposed project site. ECS observed and delineated features that, in our professional opinion, meet jurisdictional parameters of a regulated wetland feature.

2.0 METHODOLOGY

This wetland delineation is based on ECS' professional judgment and application of the technical criteria presented in the 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual, and on the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 dated November 2010. Wetland boundaries were delineated using the routine onsite determination method described in the USACE Manual and Regional Supplement. In conjunction with the Atlantic and Gulf Coastal Plain 2016 Regional Wetland Plant List, and the USDA Soil Survey. Field work was completed on August 10, 2020 by Camille VanSkiver and Kara Ellis.

ECS completed the following tasks to identify and delineate potentially jurisdictional wetland boundaries onsite:

Desktop Review: ECS wetland scientists reviewed the U.S. Geological Survey (USGS) topographic map, U.S. Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) Soil Survey of Sussex County, Virginia, U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) floodplain maps, and available aerial photographs to identify potentially jurisdictional Waters of the U.S. (i.e., streams, wetlands, natural ponds, lakes). Please reference Appendix I for the above-mentioned maps.

Field Investigation: ECS performed onsite wetland delineations as described above. First, site hydrology was observed and the plant community within the data plot was characterized. The dominant plant species within each community were then identified, and it was determined whether or not hydrophytic (wetland) plants dominated the plant community. The USFWS has defined the following wetland plant indicator categories:

- Obligate wetland (OBL) – has >99% probability of occurring in wetlands
- Facultative wetland (FACW) – has 66% to 99% chance of occurring in wetlands
- Facultative (FAC) – has 33% to 66% chance of occurring in wetlands
- Facultative upland (FACU) – has 1 to 33% chance of occurring in wetlands
- Upland (UPL) – has <1% chance of occurring in wetlands
- No indicator (NI) – no wetland indicator for the specified species

Plants identified as OBL, FACW, or FAC are considered wetland plants (or hydrophytes) by USACE.

In areas determined to have hydrophytic vegetation and potential wetland hydrology, an approximately 16-20 inch soil test hole was completed with a hand auger to determine if hydric soils were present. The soil boring was also inspected to determine if indicators of wetland hydrology (inundation, soil saturation, etc.) were present.

Once an area is determined to be a wetland, further testing was performed to locate the wetland/upland (non-wetland) boundary. A second test hole was completed in the upland area to document non-wetland conditions. Wetland boundaries were marked with consecutively numbered surveyor's ribbon flags. The wetland flags were surveyed as part of this assessment using a sub-meter accuracy GPS unit.

Data forms specified in the Regional Supplement were completed for each wetland and non-wetland test hole location, referred to as data points. The data forms recorded the vegetation, soils, and hydrology observations used in making the wetland determinations. ECS did identify areas during the site reconnaissance which, in our professional opinion, would be considered jurisdictional wetlands by the USACE.

2.1 Methodology for Delineating Streams

During the field evaluation for wetlands, ECS observed the site for streams that would potentially be considered jurisdictional by state and federal regulatory agencies. ECS used field indicators such as the presence of an ordinary high water mark (OHWM) and continuous bed and banks to delineate stream channels and also observed characteristics such as flow, substrate composition, presence/absence of defined bed and banks, origin of hydrologic source, presence/absence of vegetation in the stream channel, and composition and relative abundance of resident benthic macroinvertebrates to classify onsite streams into three stream types: ephemeral, intermittent, and perennial.

Streams were not identified within the project limits during this assessment.

3.0 FINDINGS

3.1 Desktop Review

The USGS Jarratt 2019 quadrangle map shows that the subject site slopes generally towards the northwest. The site drains to unnamed tributaries of Nottoway Creek and is located within the Nottoway watershed, identified as Hydrologic Unit Code (HUC) 02010201. The NWI map depicts a PFO1B feature located within the southeastern forested section of the subject property. According to FEMA, the site is not mapped within the 100-year floodplain. The weather at the time of the site reconnaissance was 90 degrees Fahrenheit and sunny. The last precipitation event prior to the site reconnaissance was on August 6, 2020 and approximately 0.3-inches of rain was recorded according to data obtained from the Richmond International Airport Station.

3.2 Site Soils

A review of the USDA Soil Survey for the project site identified seven mapping units within the site boundaries. These soil mapping units are: 12A - Emporia-Slagle complex, 0 to 2 percent slopes; 13B - Eulonia fine sandy loam, 2 to 6 percent slopes; 22A - Roanoke loam, 0 to 2 percent slopes, frequently flooded; 25A - Slagle fine sandy loam, 0 to 2 percent slopes; 25B - Slagle fine sandy loam, 2 to 6 percent slopes; 29B - Uchee loamy sand, 0 to 6 percent slopes; and 31 - Udorthents, 0 to 25 percent slopes.

Units 13B—Eulonia fine sandy loam, 2 to 6 percent slopes; 22A—Roanoke loam, 0 to 2 percent slopes, frequently flooded; 25A—Slagle fine sandy loam, 0 to 2 percent slopes; 25B—Slagle fine sandy loam, 2 to 6 percent slopes; and, 29B—Uchee loamy sand, 0 to 6 percent slopes are classified as hydric by the NRCS.

3.3 Waters of the U.S.

Three potentially jurisdictional wetland areas totaling 0.63-acres were identified and delineated within the study area. The size and USFWS Cowardin classifications are summarized below (Table 1), and the locations are illustrated on the Waters of the U.S. Delineation Map (Appendix IV).

Hydrologic features within the study area are governed primarily by topography and surface water flow, as these areas contain slopes and various wetland features at the toe of the slopes.

Table 1: WOUS Summary Table

WOUS	Cowardin Classification	Onsite Linear Feet (LF)	Onsite Acreage (AC)	Onsite Square Footage (Sq. Ft.)
Wetland A	PFO	-	0.23	12,402
Wetland B	PFO	-	0.18	7,664

WOUS	Cowardin Classification	Onsite Linear Feet (LF)	Onsite Acreage (AC)	Onsite Square Footage (Sq. Ft.)
Wetland C	PFD	-	0.17	7,251
TOTAL	-	-	0.63	27,317

4.0 REGULATORY DISCUSSION

The WDUS are regulated by Sections 401 and 404 of the Clean Water Act. State and Federal law dictates that any disturbance to WDUS must be permitted through the appropriate agencies.

Upon your request, we will contact the USACE to schedule a field meeting to conduct a wetlands and Waters boundary confirmation and preliminary jurisdictional determination. This process takes an average of three to four months depending on the availability of USACE personnel. If any potential impacts are proposed, we can assist you with permitting options and support to complete the process. In the interim, we recommend further review of state and federal agency records pertaining to Section 7 (Federal Endangered Species Act) and Section 106 (National Historic Preservation Act). These reviews will generally be required to verify compliance with either the Nationwide Permit (NWP) or General Permit conditions and early coordination may help prevent potential permitting delays.

If jurisdictional wetlands and streams are present at the site, planned land disturbance in these areas would likely require a permit from the U.S. Army Corps of Engineers and/or the Virginia Department of Environmental Quality (VDEQ). The Virginia Water Protection Program (VWP) serves as Virginia's Section 401 Water Quality Certification program for Federal Section 404 permits issued under the authority of the Clean Water Act. For those projects impacting less than 0.1-acre of non-tidal wetlands and less than 300 linear feet of stream bed, a Nationwide permit from the USACE can typically be issued for certain commercial, transportation, agricultural and utility-related impacts for which DEQ Section 401 Water Quality Certifications have been granted.

VWP General Permits can also be used for permanent or temporary impacts in non-tidal surface Waters (i.e., streams) and wetlands. There are four General Permits available. General Permit WP1 can be used for impacts not exceeding one-half acre of non-tidal surface Waters, including up to 300 linear feet (lf) of non-tidal stream channel. WP2 is applicable to "Facilities and Activities of Utilities" impacting up to 1,500 lf of non-tidal stream and up to one acre of non-tidal wetlands. WP3 is for linear transportation projects impacting up to two acres of non-tidal wetlands and up to 1,500 lf of stream bed. WP4 is for impacts from "Development and Certain Mining Activities" and authorizes impacts up to two acres in wetlands and 1,500 lf of non-tidal stream bed. For activities exceeding the maximum allowable disturbances (two acres and 1,500 lf), a VWP Individual Permit may be required.

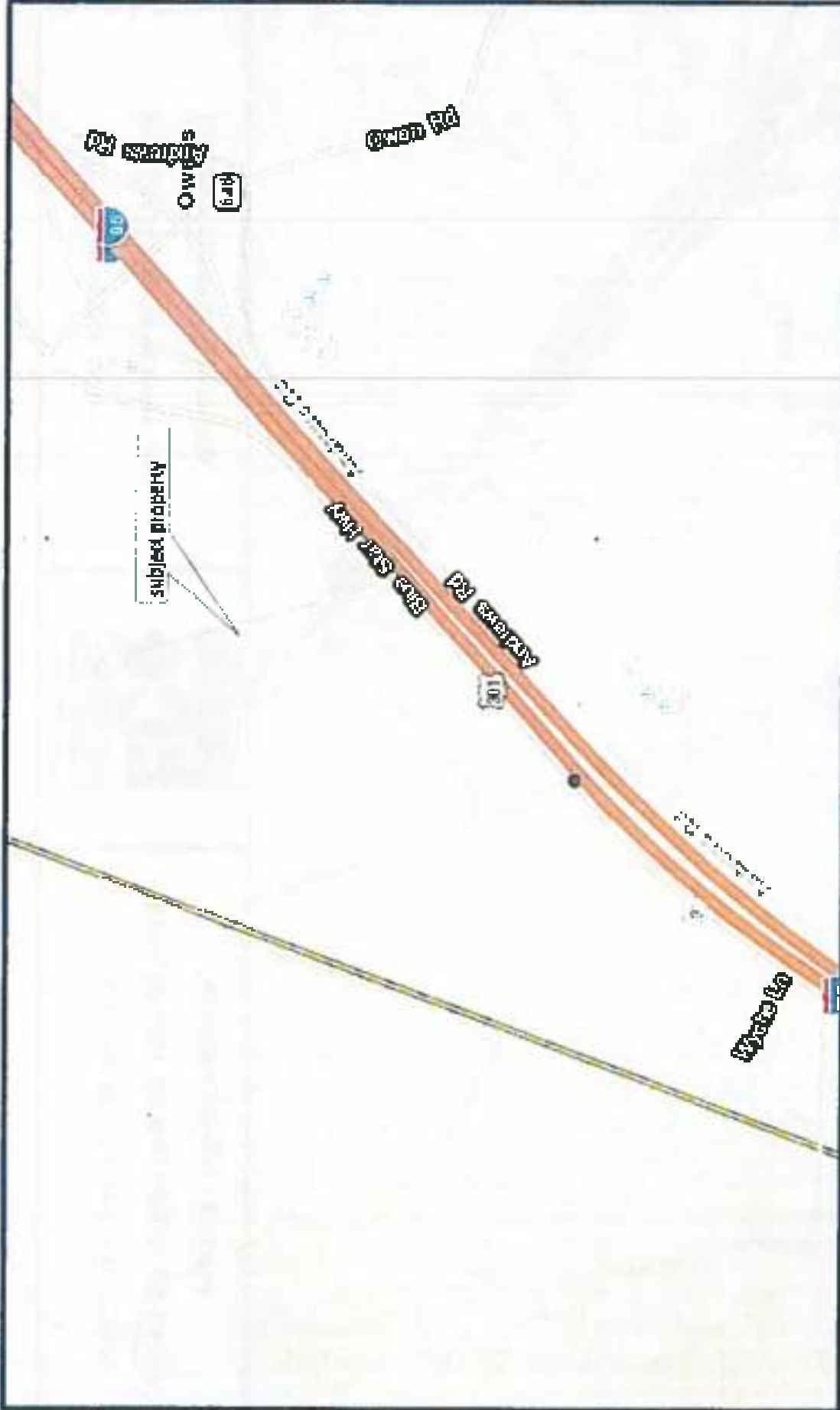
The USACE-Norfolk District and the VDEQ have also implemented the State Programmatic General Permit (17-SPGP-01) program to further streamline the permit process and avoid duplication of agency review; this program replaces certain Nationwide Permits. The 17-SPGP-01 authorizes discharge of dredged or fill material impacting up to one acre of non-tidal wetlands and 2,000 lf of non-tidal stream bed for certain residential, commercial and institutional developments and up to 1/3 acre of non-tidal Waters for linear transportation projects. If the project does not qualify for 17-SPGP-01, or there are unresolved resource issues (e.g., endangered species impact, historic resources), a separate Individual Permit from the Corps will likely be required.

5.0 CONCLUSIONS

Three potentially jurisdictional PFO wetland areas totaling 0.63-acres were identified and delineated within the study area. The locations and boundaries of potentially jurisdictional Waters are illustrated on the attached Waters of the U.S. Delineation Map (Appendix IV).

The flagged WQOUS boundaries may be subject to change during the jurisdictional determination meeting with the USACE. Therefore, ECS cannot guarantee that field conditions and/or WQOUS boundaries will not change over time.

Appendix I: Figures



Wetland Delineation Report
 For Borrego Solar Systems, Inc.
 Source: Pointfinder Suite



Figure 1: Site Location Map
 Project #47-10888-A Blue Star Highway Property
 20201 Blue Star Highway, Jamail, Virginia

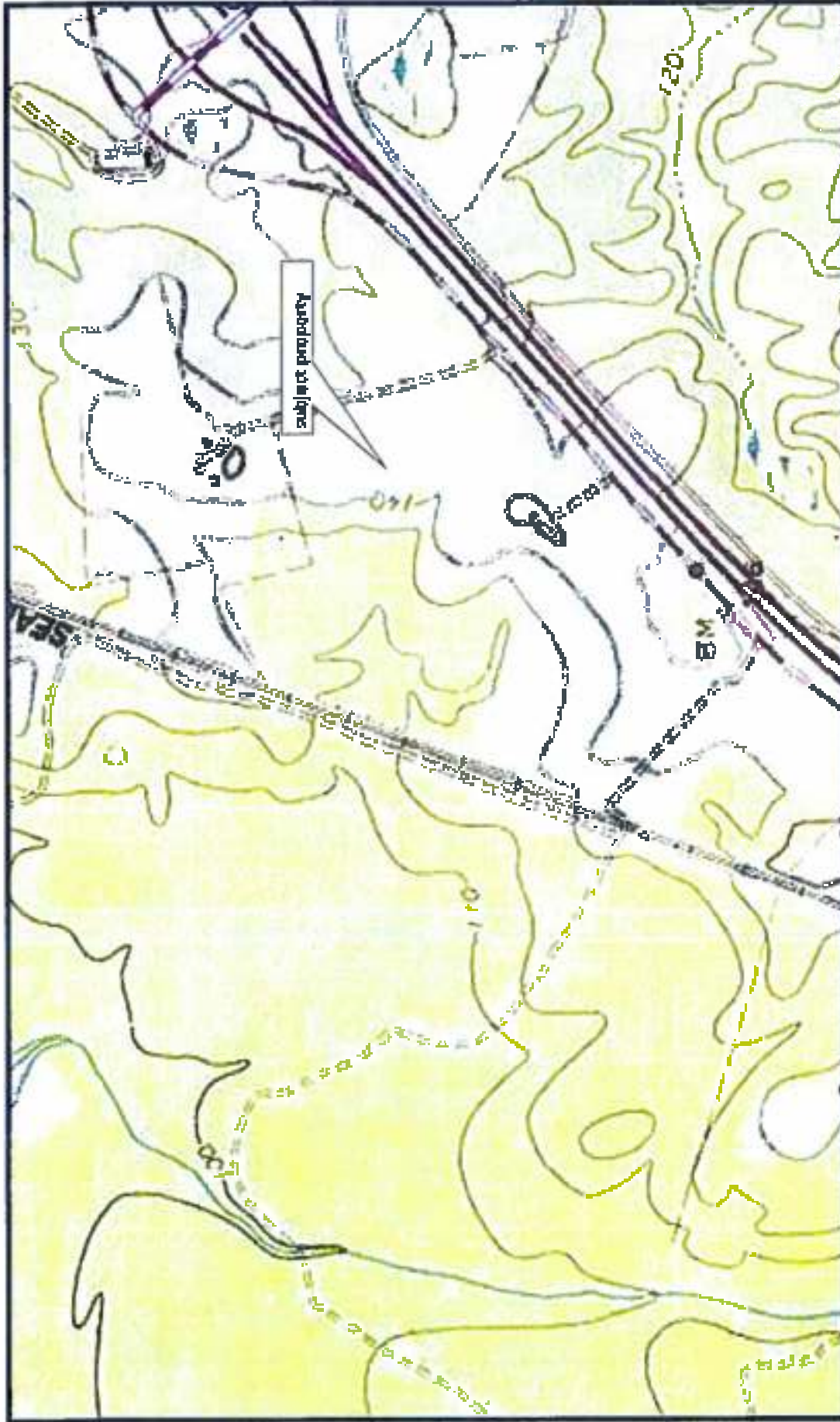


Figure 2: USGS Topography
 Project #47:10699-A Blue Star Highway Property
 2020 1 Blue Star Highway, Jarratt, Virginia



Wetland Delineation Report
 For Borrego Solar Systems, Inc.
 Source: The National Map



Wetland Delineation Report
 For Borrego Solar Systems, Inc.
 Source: NRCS Web Soil Survey



Figure 3: USDA Soils Map
 Project #47-10888-A Blue Star Highway Property
 20201 Blue Star Highway, Jarrett, Virginia



Figure 4: National Wetland Inventory
Project #47:10699-A Blue Star Highway Property
20201 Blue Star Highway, Jarrett, Virginia



Wetland Delineation Report
For Borrego Solar Systems, Inc.
Source: USFWS Wetlands Mapper



Wetland Delineation Report
 For Borrego Solar Systems, Inc.
 Source: FEMA Flood Map Service Center

ECS
www.ecsintertec.com

Figure 5: FEMA Floodplain Map
 Project #47-10899-A Blue Star Highway Property
 20201 Blue Star Highway, Jarratt, Virginia

Appendix II: USACE Wetland Data Forms and Stream Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Title: Blue Star Highway Solar Site City/County: Sussex County Sampling Date: 8/10/2020
 Applicant/Owner: Bonago Solar Systems, Inc. State: VA Sampling Point: WDP-1
 Investigator(s): CY, KE Section, Township, Range: 0909
 Landform (hill/slope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2%
 Subregion (LRR or MLRA): LRR P Lat: 38.848521 Long: -77.437329 Datum: NAD83
 Soil Map Unit name: Single fine sandy loam, 0 to 2 percent slopes NWI classification: PFC

Are climate/hydrologic conditions on this site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any anomalies in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply):	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Mud Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B8) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquifer (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D6) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches) 0"	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	--

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: WDP-1

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red maple (<i>Acer rubrum</i>)	80	x	FAC
2. Sweet bay magnolia (<i>Magnolia virginiana</i>)	10		FACW
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

105 = Total Cover

50% of total cover: 58 20% of total cover: 21

Sapling/Shrub Stratum (Plot size: 5)

1	2	3	4	5	6	7	8
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species _____	x 1 = _____
FACW species <u>145</u>	x 2 = <u>290</u>
FAC species <u>100</u>	x 3 = <u>300</u>
FACU species <u>5</u>	x 4 = <u>20</u>
OPL species _____	x 5 = _____
Column Totals: <u>250</u>	(A) 010 (B)

Prevalence Index = B/A = 2.44

Herb Stratum (Plot size: 0)

1	2	3	4	5	6	7	8	9	10	11	12
1. Spotted fern (<i>Onoclea sensibilis</i>)	60	x	FACW								
2. New York fern (<i>Thelypteris noveboracensis</i>)	40	x	FACW								
3. Nettle (<i>Urtica dioica</i>)	30	x	FACW								
4. Greenbrier (<i>Smilax rotundifolia</i>)	5		FAC								
5. Mayapple (<i>Podophyllum peltatum</i>)	5		FACU								
6. Poison Ivy (<i>Toxicodendron radicans</i>)	5		FAC								
7. _____											
8. _____											
9. _____											
10. _____											
11. _____											
12. _____											

145 = Total Cover

50% of total cover: 73 20% of total cover: 29

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is >3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: 30)

1	2	3	4	5
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (X observed, list morphological adaptations below)

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Blue Star Highway Solar Site City/County: Sussex County Sampling Date: 8/10/2020
 Applicant/Owner: Bonaga Solar Systems, Inc State: VA Sampling Point: LDP-2
 Investigator(s): CV, KE Section, Township, Range: N01W
 Landform (hill/slope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0%
 Subregion (LRR or MUR): LRR P Lat: 38.848372 Long: -77.437124 Datum: NAD83
 Soil Map Unit Name: Single fine sandy loam, 2 to 6 percent slopes NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	
Hydric Soil Present?	Yes _____ No <u>X</u>		Yes _____ No <u>X</u>
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks:			

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required, check all that apply)</u></p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Calcified Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drill Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Calcified Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drill Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<p><u>Secondary Indicators (minimum of two required)</u></p> <table style="width:100%;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Mousse Film Lines (B14)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquifers (C6)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D4) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Mousse Film Lines (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquifers (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D4) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
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<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Calcified Rhizospheres along Living Roots (C3)																															
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)																															
<input type="checkbox"/> Drill Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5)																															
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)																															
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																																
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<input type="checkbox"/> Sphagnum moss (D4) (LRR T, U)																																
<p>Field Observations:</p> <table style="width:100%;"> <tr> <td>Surface Water Present?</td> <td>Yes _____ No <u>X</u></td> <td>Depth (inches): _____</td> </tr> <tr> <td>Water Table Present?</td> <td>Yes _____ No <u>X</u></td> <td>Depth (inches): _____</td> </tr> <tr> <td>Saturation Present?</td> <td>Yes _____ No <u>X</u></td> <td>Depth (inches): _____</td> </tr> </table> <p>(includes capillary fringe)</p>	Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches): _____	Water Table Present?	Yes _____ No <u>X</u>	Depth (inches): _____	Saturation Present?	Yes _____ No <u>X</u>	Depth (inches): _____	<p>Wetland Hydrology Present? Yes _____ No <u>X</u></p>																						
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches): _____																														
Water Table Present?	Yes _____ No <u>X</u>	Depth (inches): _____																														
Saturation Present?	Yes _____ No <u>X</u>	Depth (inches): _____																														
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UDP-2

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. American holly (<i>Ilex opaca</i>)	70	x	FAC
2. Red maple (<i>Acer rubrum</i>)	70	x	FAC
3. Tulip poplar (<i>Liriodendron tulipifera</i>)	30		FACU
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

170 = Total Cover
 50% of total cover: 85 20% of total cover: 34

Sapling/Shrub Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. Japanese honeysuckle (<i>Lonicera japonica</i>)	5	x	FACU
2. Trumpet creeper (<i>Campsis radicans</i>)	5	x	FAC
3. Fox grape (<i>Vitis labrusca</i>)	3	x	FAC
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

13 = Total Cover
 50% of total cover: 7 20% of total cover: 3

Woody Vine Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	<u>4</u>	(A)
Total Number of Dominant Species Across All Strata:	<u>6</u>	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>83%</u>	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species <u>148</u>	x 3 =	<u>444</u>
FACU species <u>35</u>	x 4 =	<u>140</u>
OPL species _____	x 6 =	_____
Column Totals: <u>183</u>	(A)	<u>584</u> (B)

Prevalence Index = B/A = 3.19

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is <3.0¹
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes x No _____

Remarks: (If observed, list morphological adaptations below)

SOIL

Sampling Point: UDF-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10 YR 4/3	100						
4-18+	10 YR 8/4	90	10 YR 4/3	10	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MB=Mashed Sand Grains.

²Location: PL=Para Line, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils:

- Histic A1
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Striped Layers (A5)
- Organic Bedrock (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Plain Redox (A16) (MLRA 160A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR D)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Maf (F10) (LRR U)
- Depleted Gchic (F11) (MLRA 151)
- Iron-/Manganese Masses (F12) (LRR O, P, T)
- Umbic Surface (F13) (LRR P, T, U)
- Dstic Gchic (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 150C, 150D)

- 1 cm Muck (A9) (LRR D)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 149B)
- Red Parent Mineral (TF2)
- Very Shallow Dark Surface (TF13)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/site: Blue Star Highway Solar Site City/County: Stafford County State: VA Sampling Date: 6/10/2020
 Applicant/Owner: Borago Solar Systems, Inc. State: VA Sampling Point: UDP-3
 Invertebrate(s): CV, KE Section, Township, Range: none
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MURA): LRR P Lat: 38.850473 Long: -77.437254 Datum: NAD83
 Soil Map Unit Name: Single fine sandy loam, 2 to 8 percent slopes NWI classification: LPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required, check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Mud Deposits (B15) (LRR U) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C8) <input type="checkbox"/> Thin Black Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recent Data (stream gauge, monitoring well, aerial photo, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: UDP-9

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
1. Red maple (<i>Acer rubrum</i>)	70	x	FAC	
2. Tulip poplar (<i>Liriodendron tulipifera</i>)	40	x	FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
3. American holly (<i>Ilex opaca</i>)	30		FAC	
4. Sweetgum (<i>Liquidambar styraciflua</i>)	30		FAC	OBL species _____ x 1 = _____
5. _____				FACW species _____ x 2 = _____
6. _____				FAC species <u>140</u> x 3 = <u>420</u>
7. _____				FACU species <u>63</u> x 4 = <u>252</u>
8. _____				UPL species _____ x 5 = _____
	<u>180</u> = Total Cover			Column Totals: <u>203</u> (A) <u>672</u> (B)
	50% of total cover: <u>90</u>	20% of total cover: <u>36</u>		Prevalence Index = B/A = <u>3.31</u>
Shrub/Strub Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators:
1. _____				<input type="checkbox"/> 1 - Rep of Test for Hydrophytic Vegetation
2. _____				<input checked="" type="checkbox"/> 2 - Dominance Test is >30%
3. _____				<input type="checkbox"/> 3 - Prevalence Index is >3.0 ¹
4. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation ² (Explain)
5. _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. _____				Definitions of Four Vegetation Strata:
7. _____				Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
8. _____				Shrub/Strub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
9. _____				Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
10. _____				Woody vine - All woody vines greater than 3.28 ft in height.
11. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
12. _____				
	<u>33</u> = Total Cover			Hydrophytic Vegetation Present? Yes <u>X</u> No _____
	50% of total cover: <u>7</u>	20% of total cover: <u>3</u>		
Woody Vine Stratum (Plot size: <u>30</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1. _____				
2. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
3. _____				
4. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____				
	_____ = Total Cover			Hydrophytic Vegetation Present? Yes <u>X</u> No _____
	50% of total cover: _____	20% of total cover: _____		

Remarks: (If observed, list morphological adaptations below)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10 YR 3/1	100					silt loam	
4-18*	10 YR 8/3	100					silt loam	

¹Type: C=Concentration, D=Discoloration, FM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pipe Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|---|---|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Polyvalue Below Surface (B9) (LRR E, T, U) | <input type="checkbox"/> 1 cm Muck (A8) (LRR O) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U) | <input type="checkbox"/> 2 cm Muck (A10) (LRR S) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O) | <input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A, B) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 153B) |
| <input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Red Pantel Mirella (TF2) |
| <input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Muck Presence (A8) (LRR U) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> 1 cm Muck (A9) (LRR P, T) | <input type="checkbox"/> Marl (F14) (LRR U) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Gohite (F11) (MLRA 154) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T) | |
| <input type="checkbox"/> Coarse Prairie Redox (A16) (MLRA 150A) | <input type="checkbox"/> Umbria Surface (F13) (LRR P, T, U) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S) | <input type="checkbox"/> Delta Gohite (F17) (MLRA 154) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 153B) | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A) | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) | |
| <input type="checkbox"/> Dark Surfaces (S7) (LRR P, S, T, U) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Reductive Layer (if observed):

Type: _____
 Depth (Inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Blue Star Highway Solar Site City/County: Sussex County Sampling Date: 8/10/2020
 Applicant/Owner: Bornego Solar Systems, Inc. State: VA Sampling Point: WDP-5
 Investigator(s): CV, KE Section, Township, Range: n00W
 Landform (hilltops, terraces, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR P Loc: 36 849937 Long: -77 483142 Datum: NAD83
 Soil Map Unit Name: Udinee (sandy sand, 0 to 8 percent slopes NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (if no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposition (B5) <input type="checkbox"/> Mounds (as Visible on Aerial Imagery) (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B8) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Clayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C8) <input type="checkbox"/> Geographic Position (D2) <input type="checkbox"/> Shallow Aquifers (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
Aquatic Fauna (B13) Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Filled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (Includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorder Data (stream gauge, monitoring well, aerial photos, previous inspections), if available.	
Remarks: 	

SOIL

Sampling Point: WDP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	7.5 YR 2.5/1	100						
3-18+	7.5 YR 4/1	95	7.5 YR 4/8	5	C	PL	clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MB=Masked Sand Grains

²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils:

- Histosol (A1)
- Mosaic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR D, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (SS)
- Stripped Matrix (SS)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (SS) (LRR S, T, U)
- Thin Dark Surface (SR) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR D)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F8)
- Depleted Dark Surface (F7)
- Redox Depressions (F9)
- Marl (F10) (LRR U)
- Depleted Gchric IF11) (MLRA 15F)
- Iron-Manganese Masses (F12) (LRR Q, P, T)
- Umric Surface (F13) (LRR P, T, U)
- Dark Gchric (F17) (MLRA 154)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

- 1 cm Muck (A9) (LRR D)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153E)
- Red Perani Matrices (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Blue Star Highway Solar Site City/County: Sussex County Sampling Date: 8/10/2020
 Applicant/Owner: Boniego Solar Systems, Inc. State: VA Sampling Point: UDP-6
 Investigator(s): CV, KE Section, Township, Range: None
 Landform (hill slope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR P Lat: 36.850922 Long: -77.433549 Datum: NAD83
 Soil Map Unit Name: Uchee loamy sand, 0 to 6 percent slopes NWI classification: UPL

Are climate / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks:			

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Mire Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Phosphates along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B6)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Ironization Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B8)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Mire Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Phosphates along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Ironization Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B8)		<p>Secondary Indicators (minimum of two required)</p> <table style="width:100%;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B8)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B9)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crawfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquifer (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D6) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B8)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B9)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crawfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquifer (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D6) (LRR T, U)
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<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D6) (LRR T, U)																																

<p>Field Observations:</p> <p>Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____</p> <p>Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____</p> <p>Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ <small>(Includes capillary fringe)</small></p>	<p>Wetland Hydrology Present? Yes _____ No <u>X</u></p>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: UDP-4

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Loblolly pine (Pinus taeda)</u>	<u>80</u>	<u>x</u>	<u>FAC</u>
2. <u>Sweetgum (Liquidambar styraciflua)</u>	<u>15</u>		<u>FAC</u>
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

85 = Total Cover
 50% of total cover: 43 20% of total cover: 17

Sapling/Shrub Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Miscanthus sinensis</u>	<u>3</u>	<u>x</u>	<u>FAC</u>
2. <u>Cyperus rotundus</u>	<u>3</u>	<u>x</u>	<u>FAC</u>
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

6 = Total Cover
 50% of total cover: 3 20% of total cover: 2

Woody Vine Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

_____ = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Remarks: (If observed, list morphological adaptations below).

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC	<u>3</u>	(A)
Total Number of Dominant Species Across All Strata:	<u>3</u>	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100%</u>	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	Result
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	<u>303</u>
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	<u>303</u> (B)

Prevalence Index = BIA = 3

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >80%
 - 3 - Prevalence Index is >2.0¹
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes x No _____

SOIL

Sampling Point: UDP-8

Profile Description: (Describes to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Moisture		Redox Features				Texture	Remarks
	Color (Munsell)	%	Color (Munsell)	%	Type ¹	Loc ²		
0-15+	7.5 YR 4/3	70	7.5 YR 5/3	30	C	M	silty sand	

Type: C-Concentration, D-Depletion, R&M-Reduced Moisture, MS-Mixed Sand Grains. ²Location: FL-Flare Lining, MS-Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histo (A1)
- Histo Epipedon (A2)
- Black Histo (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surfaces (A11)
- Thick Dark Surface (A12)
- Coast Profile Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, E, T, U)

- Polyvalue Below Surface (B9) (LRR S, T, U)
- Thin Dark Surface (B9) (LRR S, T, U)
- Loamy (Mucky Mineral) (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Oehric (F11) (MLRA 151)
- Iron-Manganese Mosses (F12) (LRR O, P, T)
- Ustic Surface (F13) (LRR P, T, U)
- Oehic Oehric (F17) (MLRA 151)
- Reduced Vetric (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vetric (F18) (MLRA 150A, B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Residual/ve Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No ^X _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Blue Star Highway Solar Site City/County: Sussex County Sampling Date: 8/10/2020
 Applicant/Owner: Barrago Solar Systems, Inc. State: VA Sampling Point: UDP-7
 Investigator(s): CV, KE Section, Township, Range: NONE
 Landform (hilltop, terrace, etc.): Tst Local relief (concave, convex, none): NONE Slope (%): 0-1%
 Subregion (LRR or MLRA): LRR P Lat: 36.850683 Long: -77.437122 Datum: NAD83
 Soil Map Unit Name: Single fine sandy loam, 2 to 8 percent slopes FWS classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain why answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	
Remarks:			

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required, check all that apply)</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C8)</td> </tr> <tr> <td><input type="checkbox"/> Algal Water Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks):</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B6)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C8)	<input type="checkbox"/> Algal Water Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks):	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B6)		<p>Secondary Indicators (minimum of two required)</p> <table style="width:100%;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B5)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Mosa Trim Lines (B18)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C6)</td></tr> <tr><td><input type="checkbox"/> Saprophytic Odor on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquifer (D3)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B5)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Mosa Trim Lines (B18)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C6)	<input type="checkbox"/> Saprophytic Odor on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquifer (D3)	<input type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks):																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																																
<input type="checkbox"/> Water-Stained Leaves (B6)																																
<input type="checkbox"/> Surface Soil Cracks (B6)																																
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B5)																																
<input type="checkbox"/> Drainage Patterns (B10)																																
<input type="checkbox"/> Mosa Trim Lines (B18)																																
<input type="checkbox"/> Dry-Season Water Table (C2)																																
<input type="checkbox"/> Crayfish Burrows (C6)																																
<input type="checkbox"/> Saprophytic Odor on Aerial Imagery (C9)																																
<input type="checkbox"/> Geomorphic Position (D2)																																
<input type="checkbox"/> Shallow Aquifer (D3)																																
<input type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																
<p>Field Observations:</p> <p>Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____</p> <p>Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____</p> <p>Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (Include capillary fringe)</p>	<p>Wetland Hydrology Present? Yes _____ No <u>X</u></p>																															
<p>Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:</p>																																
Remarks:																																

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UDP-7

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. American beech (<i>Fagus grandifolia</i>)	80	X	FACU
2. American holly (<i>Ilex opaca</i>)	30	X	FACU
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	110 = Total Cover		
	50% of total cover: <u>33</u>	20% of total cover: <u>22</u>	

Sapling/Shrub Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fox grape (<i>Vitis labrusca</i>)	5	x	FAC
2. Japanese hemiphyllite (<i>Lonicera japonica</i>)	5	x	FACU
3. Brambleberry (<i>Smitax reticulata</i>)	5	x	FAC
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	15 = Total Cover		
	50% of total cover: <u>8</u>	20% of total cover: <u>3</u>	

Woody Vine Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species <u>10</u>	x 3 = <u>30</u>
FACU species <u>115</u>	x 4 = <u>460</u>
UPI species _____	x 5 = _____
Column Totals: <u>125</u>	(A) <u>490</u> (B)

Prevalence Index = B/A = 3.92

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is >3.0¹
 - Problematic Hydrophytic vegetation¹ (Explain):
- ¹Indicators of hydric soil and wetland hydrology must be present, unless excluded or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 5 ft (1.5 m) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 5 ft DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ² _____

Remarks: (If observed, list morphological adaptations below)

SOIL

Sampling Point: UOP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Moisture		Redox Features				Texture	Remarks
	Color (mud)	%	Color (mud)	%	Type ¹	Loc ²		
0-10+	7.5 YR 4/1	95	7.5 YR 8/4	5	C	M	silty loam	

¹Type: C=Concentration, D=Depletion, RH=Reduced Matrix, MS=Masked Sand Grains

²Locations: PL=Pore Linings, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

Indicators for Problematic Hydric Soils:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodins (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A8) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coastal Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (B1) (LRR D, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)
- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR D)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Mox (F10) (LRR U)
- Depleted Ochre (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR D, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochre (F17) (MLRA 194)
- Reduced Vertic (F18) (MLRA 190A, 190B)
- Piedmont Floodplain Soils (F19) (MLRA 140A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 163D)

- 1 cm Muck (A8) (LRR D)
- 2 cm Muck (A10) (LRR E)
- Reduced Vertic (F18) (outside MLRA 190A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer? (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Blue Star Highway Solar Site City/County: Buena Vista County Sampling Date: 8/19/2020
 Applicant/Owner: Bontego Solar Systems, Inc. State: VA Sampling Point: UDP-8
 Investigator(s): CV, KE Section, Township, Range: none
 Landform (hillslope, terrace, etc.): drainage pattern Local relief (concave, convex, none): CONCAVE Slope (%): 0-2%
 Subregion (LRR or MLRA): LRR P Lat: 36.850666 Long: -77.437702 Datum: NAD83
 Soil Map Unit Name: Sflaggs fine sandy loam, 2 to 5 percent slopes NWI classification: UPL

Are climate/hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	
Hydric Soil Present?	Yes _____ No <u>X</u>		Yes _____ No <u>X</u>
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks:			

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required; check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surfaces (C7) <input type="checkbox"/> Other (Explain in Remarks) 	<p>Secondary Indicators (minimum of two required)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B8) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D6) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
---	--

<p>Field Observations:</p> <p>Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____</p> <p>Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____</p> <p>Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ <small>(includes capillary fringe)</small></p>	<p>Wetland Hydrology Present? Yes _____ No <u>X</u></p>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UDP-5

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red maple (<i>Acer rubrum</i>)	80	x	FAC
2. American holly (<i>Ilex opaca</i>)	40	x	FACU
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (AB)

_____ = Total Cover

50% of total cover: 60 20% of total cover: 24

Sapling/Shrub Stratum (Plot size: 5)

1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species <u>100</u>	x 3 = <u>300</u>
FACU species <u>40</u>	x 4 = <u>160</u>
UPL species _____	x 5 = _____
Column Totals: <u>140</u>	(A) <u>460</u> (B)

Prevalence Index = B/A = 3.29

Herb Stratum (Plot size: 5)

1. New York fern (<i>Thelypteris noveboracensis</i>)	13	x	FAC
2. Greenbrier (<i>Smilax mundifolia</i>)	5	x	FAC
3. Poison ivy (<i>Toxicodendron radicans</i>)	5	x	FAC
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

_____ = Total Cover

50% of total cover: 10 20% of total cover: 4

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is <3.0*

Problematic Hydrophytic Vegetation* (Explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: 30)

1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Definitions of Four Vegetation Strata:

Tree – woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – woody plants, including vines, less than 3 in. DBH and greater than 3.29 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.29 ft tall.

Woody vine – All woody vines greater than 3.29 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (If observed, list morphological adaptations below):

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Blue Star Highway Solar Site City/County: Sussex County Sampling Date: 8/10/2020
 Applicant/Owner: Bonago Solar Systems, Inc. State: VA Sampling Point: WDP-8
 Investigator(s): CV, KE Ection, Township, Range: 10NR
 Landform (hilltops, barrens, etc.): drainage pattern Local relief (concave, convex, none): concave Slope (%): 0-2%
 Subregion (LRR or MLRA): LRR P Lat: 36.850614 Long: -77.438454 Datum: NAD83
 Soil Map Unit Name: Roskoche loam, 0 to 2 percent slopes, frequently flooded NWI classification: PFO
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	In the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	
Remarks			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required, check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B8)	<input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Muck Deposits (B15) (LRR U) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C8) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B9) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Muck Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crawfish Burrows (C9) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C8) <input type="checkbox"/> Geomorphic Position (C9) <input type="checkbox"/> Shallow Aquifer (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input checked="" type="checkbox"/> Sphagnum Moss (D9) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches) _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches) _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches) _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available		
Remarks		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WDP-9

Total Stratum (Plot size: <u>99</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red maple (<i>Acer rubrum</i>)	90	x	FAC
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

50% of total cover: 45 20% of total cover: 18

Sapling/Shrub Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. New York fern (<i>Thelypteris novboracensis</i>)	8	x	FAC
2. False nettle (<i>Basella cylindrica</i>)	8	x	FACW
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

50% of total cover: 8 20% of total cover: 4

Woody Vine Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u>	(A)
Total Number of Dominant Species Across All Strata:	<u>9</u>	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100%</u>	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	<u>1</u> = _____
FACW species	<u>2</u> = <u>16</u>
FAC species	<u>99</u> <u>x 3</u> = <u>297</u>
FACU species	<u>x 4</u> = _____
OBL species	<u>x 5</u> = _____
Column Totals:	<u>106</u> (A) <u>310</u> (B)
Prevalence Index = B/A = <u>2.82</u>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >60%
 - 3 - Prevalence Index is >3.0¹
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, including vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (If observed, list morphological adaptations below.)

Appendix III: Photographic Log



1 - View of access road, towards northern section of site



2 - General view of cleared cropland on subject site, towards northeast



3 - WDP-1



4 - Wetland A (PFO)



5 - UDP-2



6 - UDP-3



7 - View of access road, towards Blue Star Highway



B - UDP-E



9 - UDP-7



10 - UDP-8



11 - WDP-5



12 - View of Wetland B (PFO), including WDP-5



13 - View of Wetland C (PFD)

Appendix IV: Waters of the U.S. Delineation Map

PHASE I ENVIRONMENTAL SITE ASSESSMENT



BLUE STAR HIGHWAY SOLAR SITE

20201 BLUE STAR HIGHWAY
JARRATT, SUSSEX COUNTY, VIRGINIA 23882
ECS PROJECT NO. 47:10699

FOR

BORREGO SOLAR SYSTEMS, INC.

SEPTEMBER 14, 2020





ECS Mid-Atlantic, LLC

"Setting the Standard for Service"

Geotechnical • Construction Materials • Environmental • Facilities

September 14, 2020

Melissa Samaroo
Borrego Solar Systems, Inc.
1 N. State Street
Suite 1500
Chicago, Illinois 60602

ECS Project No. 47: 10689

Reference: Phase I Environmental Site Assessment Report, Blue Star Highway Solar Site, 20201 Blue Star Highway, Jarratt, Sussex County, Virginia 23882

Dear Ms. Samaroo:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide you with the results of our Phase I Environmental Site Assessment (ESA) for the referenced site. ECS services were provided in general accordance with the Master Service Agreement between Borrego and ECS, dated May 4, 2020 and ECS Proposal No. 47:15555-EP, authorized on July 27, 2020 and generally meet the requirements of ASTM E1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process and EPA Standards and Practices for All Appropriate Inquiries contained in 40 CFR Part 312.

If there are questions regarding this report, or a need for further information, please contact the undersigned.

Sincerely,

ECS Mid-Atlantic, LLC

Alexandra Moon
Senior Project Manager
amoan@ecslimited.com
540-362-7000

Garnett B. Williams, C.P.G.
Principal Geologist
gwilliams@ecslimited.com
703-471-8400

Project Summary

Blue Star Highway Solar Site
 20201 Blue Star Highway
 Jarratt, Virginia 23882

Report Section	No Further Action	REC	CREC	HREC	BER	Comment
<u>4.0</u> User Provided Information	✓					
<u>5.1</u> Federal ASTM Databases	✓					
<u>5.2</u> State ASTM Databases	✓					
<u>5.3</u> Additional Environmental Record Sources	✓					
<u>6.0</u> Historical Use Information	✓					
<u>7.0</u> Site and Area Reconnaissance	✓					
<u>8.0</u> Additional Services	✓					
<u>9.0</u> Interviews	✓					

ENVIRONMENTAL PROFESSIONAL STATEMENT

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Alexandra Moon
Senior Project Manager
September 14, 2020



Garnett B. Williams, C.P.G.
Principal Geologist
September 14, 2020

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1.0 EXECUTIVE SUMMARY

ECS Mid-Atlantic, LLC (ECS) was contracted by Borrego Solar Systems, Inc. to perform an ASTM E1527-13, Phase I Environmental Site Assessment (ESA) of the Blue Star Highway Solar Site located at 20201 Blue Star Highway in Jarratt, Sussex County, Virginia (i.e. subject property). This Executive Summary is an integral part of the Phase I ESA report. ECS recommends that the report be read in its entirety.

The subject property is identified by Sussex County as parcel number 138-A-1 and owned by Molly Prince Johnson. The subject property is an approximately 65-acre portion of a larger 142.14 acre parent parcel. The subject site is undeveloped wooded and agricultural land.

The subject property is located in a rural area of Jarratt, Virginia. The subject property is bound on the north by undeveloped forested land, on the east by a rural residential structure with a dirt access road, on the south by Interstate-95 followed by undeveloped forested land, and on the west by agricultural fields and undeveloped forested land followed by a railway line. ECS did not identify environmental issues at adjoining or nearby properties that are believed to present a recognized environmental condition (REC) at the subject property.

According to historical research, the subject property has been mostly wooded and agricultural land with a small homestead and several structures located on the south-central portion of the site from at least 1919 until around 1994. The surrounding area has generally remained undeveloped wooded and agricultural land with a scattering of residential type structures. No obvious indications of RECs were identified in the historical data review. Historical records prior to 1919 were not reasonably ascertainable for the subject property.

A regulatory database search report was provided by Environmental Data Resources, Inc. (EDR). The database search involves researching a series of Federal, State, Local, and other databases for facilities and properties that are located within specified minimum search distances from the subject property. The report did not identify the subject property or off-site properties within the minimum ASTM search distances.

ASTM E1527-13 defines a "data gap" as: "A lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information." Data gaps which would be expected to impact our ability to render a professional opinion concerning the subject property were not identified.

We have performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM E1527-13 of the Blue Star Highway Solar Site located at 20201 Blue Star Highway in Jarratt, Sussex County, Virginia. Exceptions to, or deletions from, this practice are described in Section 2.6 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property.

Opinion

It is the opinion of ECS Mid-Atlantic, LLC that additional assessment of this site is not warranted at this time.

2.0 INTRODUCTION

2.1 Purpose and Reason for Performing Phase I ESA

The purpose of the ESA was to:

- evaluate the probability of impact to the surface water, groundwater and/or soils within the property boundaries through a review of regulatory information and a reconnaissance of the subject property and vicinity;
- evaluate historical land usage to identify previous conditions that could potentially impact the environmental condition of the subject property;
- conduct all appropriate inquiry as defined by ASTM E1527-13 and 40 CFR Part 312;
- evaluate the potential for on-site and off-site contamination; and,
- provide a professional opinion regarding the potential for environmental impact at the site and a list of Recognized Environmental Conditions (RECs).

The ESA should allow the Users the opportunity to qualify for landowner liability protection under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provided certain stipulations are met. The landowner liability protections are: an innocent landowner, a contiguous property owner, or a bona fide prospective purchaser. The User must meet the protection stipulations detailed in CERCLA to qualify as well as meet the User Obligations contained within the ASTM E1527-13 standard.

The reason for conducting this ESA is to perform all appropriate inquiries into the uses and prior ownership of the subject property to support due diligence for construction of a solar electrical generating facility.

2.2 Scope of Services

The environmental assessment was conducted in general accordance with ASTM E1527-13 and EPA Standards and Practices for All Appropriate Inquiry (40 CFR §312.10). The environmental assessment was conducted under the supervision or responsible charge of an individual that qualifies as an environmental professional, as defined in 40 CFR §312.10.

ECS was contracted by Borrego Solar Systems, Inc. to perform an ASTM E1527-13, Phase I Environmental Site Assessment (ESA) of the Blue Star Highway Solar Site located at 20201 Blue Star Highway in Jarratt, Sussex County, Virginia. ECS was contracted to provide services in addition to the ASTM standard scope of service in accordance with our proposal. This additional information, including a wetland delineation and threatened and endangered species review, is presented under separate cover.

2.3 Definitions

ASTM E1527-13 defines a "recognized environmental condition (REC)" as "the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: 1) due to release to the environment, 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment." For the

purposes of this practice, "migrate" and "migration" refer to the movement of hazardous substances or petroleum products in any form including solid and liquid at the surface or subsurface and vapor in the subsurface.

ASTM E1527-13 defines a "business environmental risk" (BER) as "a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice". ECS also uses the term "Other Environmental Considerations" to discuss BERs and environmental concerns outside of the ASTM E1527-13 requirements (radon, asbestos, lead, wetlands, etc.). Client-imposed limitations and site condition limitations, if encountered, are detailed in Section 7.1 Methodology and Limiting Conditions.

ASTM E1527-13 defines a "de minimis condition" as a condition that generally does not represent a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. De minimis conditions are not recognized environmental conditions nor controlled recognized environmental conditions.

ASTM E1527-13 defines a "controlled recognized environmental condition (CREC)" as a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example property use restrictions, activity and use limitations, institutional controls, or engineering controls). A condition identified as a controlled recognized environmental condition does not imply that the Environmental Professional has evaluated or confirmed the adequacy, implementation or continued effectiveness of the required control that has been, or is intended to be, implemented.

ASTM E1527-13 defines a "historical recognized environmental condition (HREC)" as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted residential use criteria established by a regulatory authority, without subjecting the property to any required controls (for example property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a historical recognized environmental condition, the Environmental Professional must determine whether the past release is a recognized environmental condition at the time the Phase I Environmental Site Assessment is conducted (for example, if there has been a change in the regulatory criteria).

2.4 Limitations

The ESA involved a reconnaissance of the subject property and contiguous properties and a review of regulatory and historical information in general accordance with the ASTM standard and EPA regulation referenced herein. No non-scope considerations or additional issues such as asbestos, radon, wetlands or mold were investigated, unless otherwise described in Section 8.0 of this report.

Note: vapor migration in the subsurface is described in Guide E2600 published by ASTM. ECS has not conducted a Vapor Encroachment Screening in accordance with the E2600 guide.

The conclusions and/or recommendations presented within this report are based upon a level of investigation consistent with the standard of care and skill exercised by members of the same profession currently practicing in the same locality under similar conditions. The intent of this assessment is to identify the potential for recognized environmental conditions in connection with the subject property; however, no environmental site assessment can completely eliminate uncertainty regarding the potential for recognized environmental conditions in connection with the subject property. The findings of this ESA are not intended to serve as an audit for health and safety compliance issues pertaining to improvements or activities at the subject property. ECS is not liable for the discovery or elimination of hazards that may potentially cause damage, accidents or injury.

Observations, conclusions and/or recommendations pertaining to environmental conditions at the subject property are necessarily limited to conditions observed, and/or materials reviewed at the time this study was undertaken. It was not the purpose of this study to determine the actual presence, degree or extent of contamination, if any, at this subject property. This could require additional exploratory work, including sampling and laboratory analysis. No warranty, expressed or implied, is made with regard to the conclusions and/or recommendations presented within this report.

This report is provided for the exclusive use of Barrego Solar Systems, Inc.. This report is not intended to be used or relied upon in connection with other projects or by other unidentified third parties. The use of this report by any undesignated third party or parties will be at such party's sole risk and ECS disclaims liability for any such third party use or reliance. The use of this report is subject to the same terms, conditions and scope of work reflected in this report and the associated proposal.

2.5 Data Gaps

Data failures (historical data gaps) were identified during the historical research of the subject property. Use of the subject property was generally documented back to 1919. Historical information was missing for various periods; however, due to the apparent historical agricultural use, the present use, and the other information that was obtained about the subject property, the historical data gaps are not expected to impact our ability to render a professional opinion regarding the subject property.

2.6 Limiting Conditions/Deviations

ASTM E1527-13 requires that the Environmental Professional identify limiting conditions, deletions, and deviations from the ASTM E1527-13 standard, if any, including client-imposed constraints. Limiting conditions and/or deviations from the standard practice that would be expected to impact our ability to provide a professional opinion concerning the subject property were not encountered during the performance of this Phase I ESA.

3.0 SUBJECT PROPERTY DESCRIPTION

3.1 Subject Property Location and Legal Description

Site Name	Blue Star Highway Solar Site
Property Address	20201 Blue Star Highway
Property City, State	Jarratt, Virginia
Property County	Sussex County
Number of Parcel(s)	One
Property ID Number(s)	138-A-1
Property Size	65 Acres
Property Owner of Record	Molly Prince Johnson
Property Legal Description	As provided by the Sussex County Property Report: ON RT 301 CHARLEY CROWDER

3.2 Physical Setting and Hydrogeology

USGS Topographic Map	
Quad Designation	Jarratt, Virginia
Date	2013
Subject Property Settings	
Average Subject Property Elevation (In feet or meters)	120 - 140 feet above mean sea level.
General Sloping Direction	Northwest
Bodies of Water	None
General Directions of Surface Flow	Northwest
Presumed Direction of Groundwater Flow	Northwest
Geologic Province	Coastal Plain
Up-gradient Property Direction	Southeast

Nearby Properties' Setting

General Sloping Direction	Northwest
Bodies of Water	Unnamed tributary to Creath Pond is located approximately 1,216 feet southeast and Flat Swamp is located approximately 2,864 feet northwest.
General Directions of Surface Flow	Northwest
Presumed Direction of Groundwater Flow	Northwest

Regional influences such as changes in soil and geologic conditions, and local topography, may have an impact on groundwater flow. The actual groundwater flow direction cannot be determined without site-specific information obtained through the gauging of groundwater monitoring wells.

3.3 Current Use and Description of the Site

The subject property consists of an approximately 65-acre portion of a larger parcel that is currently wooded and agricultural land. The subject property is unimproved. The subject property is located in an area that can generally be described as rural.

4.0 USER PROVIDED INFORMATION

The ASTM standard includes disclosure and obligations of the User to help the Environmental Professional identify the potential for Recognized Environmental Conditions associated with the subject property. The ASTM E1527-13 User Questionnaire was submitted to and completed by Melissa Samaroo, representing Borrego Solar Systems, Inc. (User of the report). Section 4.0 is based on the completed User Questionnaire. A copy of the completed User Questionnaire is included in Appendix II.

4.1 Title Information

ECS was not provided with title information by the User. If this information is provided following issuance of this report and information contained therein materially changes the outcome of this report, ECS will issue an addendum to this report.

4.2 Environmental Liens or Activity and Use Limitations

ECS was neither contracted to obtain information on environmental liens or activity and use limitations, nor have we been provided with information on environmental liens or activity and use limitations for our review. It should be noted by the User of this report that if the User does not obtain activity and use limitation information, the User that is seeking to qualify for an innocent landowner, a contiguous property owner, or a bona fide prospective purchaser liability defense may lose these rights to qualify under CERCLA. If the activity and use information is provided following issuance of this report and information contained therein materially changes the outcome of this report, ECS will issue an addendum to this report. The User, however, stated she was not aware of any AULs associated with the subject property.

4.3 Specialized Knowledge

The User indicated that she did not possess specialized knowledge of the subject property.

4.4 Commonly Known or Reasonably Ascertainable Information

The User indicated that she was not aware of commonly known environmental concerns related to the subject property.

4.5 Valuation Reduction for Environmental Issues

No information pertaining to the valuation reduction for environmental issues was provided to ECS.

4.6 Owner, Property Manager, and Occupant Information

The User indicated that the site is owned by Molly Prince Johnson and the property is managed by James Johnson Jr.

4.7 Degree of Obviousness

The User stated that she was not aware of obvious indicators that point to the presence or likely presence of contamination at the subject property.



5.0 RECORDS REVIEW

A regulatory records search of ASTM standard and supplemental databases was conducted for the subject property and is included in Appendix III. The regulatory search report in the appendix includes additional details about the regulatory databases that were reviewed. The regulatory records search involves searching a series of databases for facilities that are located within a specified distance from the subject property. The ASTM standard specifies an approximate minimum search distance from the subject property for each database. Pursuant to ASTM, the approximate minimum search distance may be reduced for each standard environmental record except for Federal NPL site list, and Federal RCRA TSD list. According to ASTM, government information obtained from nongovernmental sources may be considered current if the source updates the information at least every 90 days or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public. The following table indicates the standard environmental record sources and the approximate minimum search distances for each record.

Standard Environmental Record Sources	Approximate Minimum Search Distance Per ASTM (miles)	Subject Property	Off-Site Properties
Federal NPL	1.0	No	0
Federal Delisted NPL	0.5	No	0
Federal CERCLIS	0.5	No	0
Federal CERCLIS INFRAP	0.5	No	0
Federal RCRA CORRACTS	1.0	No	0
Federal RCRA non-CORRACTS TSD	0.5	No	0
Federal RCRA Generators	Subject Site and Adjoining Properties	No	0
Federal IC/EC	Subject Site Only	No	N/A
Federal ERNS	Subject Site Only	No	N/A
State and Tribal Hazardous Waste Sites (NPL Equivalent)	1.0	No	0
State and Tribal Hazardous Waste Sites (CERCLIS Equivalent)	0.5	No	0
State and Tribal Landfill and/or solid waste disposal sites	0.5	No	0



Standard Environmental Record Sources	Approximate Minimum Search Distance Per ASTM (miles)	Subject Property	Off-Site Properties
State and Tribal Leaking Tanks	0.5	No	0
State and Tribal Registered UST and AST	Subject Site and Adjoining Properties	No	0
State and Tribal IC/EC	Subject Site Only	No	N/A
State and Tribal Voluntary Cleanup (VCP)	0.5	No	0
State and Tribal Brownfield Sites	0.5	No	0

Based on our knowledge of the subject property and the surrounding area, ECS attempts to verify and interpret this data. While this attempt at verification is made with due diligence, ECS cannot guarantee the accuracy of the record(s) search beyond that of information provided by the regulatory report(s). ECS makes no warranty regarding the accuracy of the database report information included within the regulatory report(s).

The regulatory database search was performed by EDR and is dated July 24, 2020. ECS did not reduce the minimum ASTM search distances stipulated in the standard. The regulatory databases reviewed by ECS included supplemental databases researched by EDR.

5.1 Federal ASTM Databases

Neither the subject property nor properties within the designated search radii are identified on the federal databases researched for this assessment.

5.2 State ASTM Databases

Neither the subject property nor properties within the designated search radii are identified on the state databases researched for this assessment.

5.3 Additional Environmental Record Sources

5.3.1 Additional Non-ASTM Federal Databases

Neither the subject property nor properties within the designated search radii are identified on the additional non-ASTM federal databases researched for this assessment.

5.3.2 Additional Non-ASTM State Databases

Neither the subject property nor properties within the designated search radii are identified on the additional non-ASTM state databases researched for this assessment.



5.3.3 Other Proprietary Databases

Neither the subject property nor properties within the designated search radii are identified on the other proprietary databases researched for this assessment.

5.3.4 Unmapped (Orphan) Facilities and Sites

No properties are identified on the Orphan Summary List.

5.4 Regulatory Review Summary

A regulatory database search report was provided by EDR. The database search involves researching a series of Federal, State, Local, and other databases for facilities and properties that are located within specified minimum search distances from the subject property. The report did not identify the subject property or off-site properties on the databases researched.

6.0 HISTORICAL USE INFORMATION

6.1 Aerial Photograph Review

ECS reviewed aerial photographs of the subject property and immediately surrounding properties for evidence of former usage which may indicate potential environmental issues. The aerial photographs were obtained from EDR. The aerial photographs reviewed are dated 1937, 1949, 1950, 1953, 1961, 1973, 1976, 1982, 1990, 1994, 2000, 2009, 2012 and 2016. Aerial photographs dated prior to 1937 were not available for review from EDR. The ECS review is dependent on the quality and scale of the photographs. The following is a description of relevant information from the aerial photographs:

Year(s)	Subject Property	Adjoining Properties	REC? (yes or no)
1937 - 2016	The site appears to be mostly wooded and agricultural land. A small homestead with several structures appear to be located on the south-central portion of the site between 1937 and 1994. By 1994 it appears only one structure remains visible that is no longer present.	North - Mixture of wooded and agricultural land. East - Mixture of wooded and agricultural land. South - A road, expanded over the years, with a mixture of wooded and agricultural land beyond. West - Mixture of wooded and agricultural land.	No

6.2 Sanborn Fire Insurance Map Review

In an effort to identify past uses, ECS utilized EDR to search for historical Sanborn Fire Insurance Maps (Sanborn) for the subject property and surrounding area. Sanborn maps were not available for this area. The absence of such maps generally indicates that the subject property is located in an area where Sanborn maps were not produced because the area was rural or it was not economically feasible. ECS does not expect the lack of Sanborn maps to impact our ability to render a professional opinion concerning the subject property given the amount of historical information obtained from our research, the USGS topographic map, aerial photographs, city directories, and other historical records obtained. A copy of the Unmapped Property report is included within Appendix IV.

6.3 Property Tax Files

Property tax files may include records of past ownership, appraisals, maps, sketches, photos or other information kept by the local jurisdiction for property tax assessment purposes. According to the Sussex County tax assessor on-line information, the subject property is owned by Molly Prince Johnson. The subject property is listed as a 65-acre parcel with an identification number of 138-A-1.

6.4 Recorded Land Title Records

Recorded land title records may include leases, land contracts, and AUs recorded by the local jurisdiction. Land title records may provide only a list of the names of previous owners and may be of limited use; however, they may provide useful information about uses or occupancy of the property when employed in combination with other sources. ECS was not provided with land title records.

6.5 Historical USGS Topographic Maps

Topographic maps are produced by the United States Geological Survey (USGS) for various time periods. ECS reviewed topographic maps of the subject property and immediately surrounding properties for evidence of former usage which may indicate potential environmental issues. The topographic maps were obtained from EDR and are dated 1919, 1951, 1966, 1977, 1986, and 2013. Topographic maps dated prior to 2013 were not available for review from EDR. The following is a description of relevant information from the topographic maps:

Year(s)	Subject Property	Adjoining Properties	REC? (yes or no)
1919	The site is depicted as developed with an unpaved road to a single structure located on the south-central portion of the site. A sink hole is depicted along the northern portion of the site.	North - Undeveloped. East - An unpaved road followed by undeveloped land. South - A road with undeveloped land beyond. West - Undeveloped land. A railroad is depicted to the northwest.	No
1951 - 1986	The site is depicted as developed with an unpaved road leading to structures on the south-central portion of the site. The northern portion is shaded green, which indicates wooded land.	North - Wooded and cleared land. East - An unpaved road followed by wooded and cleared land. South - A primary road followed by wooded and cleared land. West - Wooded and cleared land. A railroad is depicted to the northwest.	No
2013	In general, this topographic map does not depict structures. The northern portion of the site is depicted as wooded land.	In general, this topographic map does not depict structures. The surrounding properties are depicted as a mixture of wooded and cleared land. A dual highway is located to the south and a railroad is depicted to the northwest.	No

6.6 City Directory Review

One of the ASTM standard historical sources to be reviewed for previous subject property uses is local street directories, commonly known as City Directories. The purpose of the directory review is to identify past occupants of the subject property, adjoining properties, or nearby properties. In some rural areas, street directories information is limited.

ECS reviewed City Directories obtained from EDR. The directories reviewed are dated 1992, 1995, 2000, 2005, 2010, 2014 and 2017. The directories reviewed prior to 1995 did not provide listings for the subject property or surrounding area. Directories dated prior to 1992 were not available for review. The subject property address utilized for the research was 20201 Blue Star Highway. A copy of the City Directory report is included in Appendix IV. To summarize, the subject site was not listed in the directories reviewed and the surrounding addresses were reported as residential tenants.

6.7 Building Department Records

The term building department records means those records of the local government indicating permissions of the local government to construct, alter or demolish improvements on the property.

ECS contacted the Sussex County Building Department to determine if they had historical information regarding construction dates, inspections, or other information regarding the subject property. A Freedom of Information Act request was submitted to the Building Department on July 31, 2020. No information has been received at the time of the report completion. If information is received that changes the conclusions or recommendations of this report, ECS will forward the information to the Client.

6.8 Zoning/Land Use Records

The term zoning/land use records refers to records of the local government indicating the uses permitted by the government in particular zones within its jurisdictions. ECS reviewed zoning/land use records obtained from Sussex County, Virginia. The subject property is currently zoned A-1: general agriculture.

6.9 Other Historical Sources

Other credible historical sources may be reviewed to identify past uses of the subject property. These sources may include websites, county or state road maps, historical society documents, or local library information.

The Sussex County Fire and Health Departments were contacted to determine if they had historical information regarding environmental issues or responses at the subject property, including records of well or septic systems. Freedom of Information Act requests were submitted to the Fire and Health Departments on July 31, 2020. No information has been received at the time of the report completion. If information is received that changes the conclusions or recommendations of this report, ECS will forward the information to the Client.

6.10 Previous Reports

We have not been provided with environmental or engineering assessment reports for the subject property completed by others, nor has ECS completed similar studies or prior assessments of the subject property.

6.11 Historical Use Summary

According to historical research, the subject property has been mostly wooded and agricultural land with a small homestead and several structures located on the south-central portion of the site from at least 1919 until around 1994. The surrounding area has generally remained undeveloped wooded and agricultural land with a scattering of residential type structures. In conclusion, no obvious indications of RECs were identified in the historical data review.

7.0 SITE AND AREA RECONNAISSANCE

7.1 Methodology

ECS conducted the field reconnaissance on August 10, 2020. The weather at the time of the reconnaissance was 90 degrees Fahrenheit and sunny. Observations were made from a walking reconnaissance around the perimeter and along several transects across the subject property. Access or visibility limitations, if any, are discussed in Section 2.6. Subject property photographs are included in Appendix V.

7.2 On-Site Features

The subject property consists of a mixed landscape of cleared farmland (currently in use as crop fields) throughout the central and southern portions of the site, as well as undeveloped forested land throughout the northern portions of the site. An unpaved access road runs through the central portion of the site, which is directly connected to Interstate I-95 to the south and includes a large billboard sign slightly off-path. Areas of no till erosion buffers lie between the bean and corn strips. A fiber optic cable line was observed to run directly adjacent and parallel to I-95 to the south, along the utility line easement. Overhead electrical lines with pole-mounted transformers are located along the southern boundary.

The table below lists pertinent features of interest that were assessed for the subject property. Relevant information regarding pertinent features is discussed further in this section.

Feature	Yes	No
Underground or aboveground storage tanks		✓
Strong, pungent or noxious odors		✓
Surface waters	✓	
Standing pools of liquid likely containing petroleum or hazardous substances		✓
Drums or containers of petroleum or hazardous substances greater than five-gallons		✓
Drums or containers of petroleum or hazardous substances less than or equal to five-gallons		✓
Unidentified opened or damaged containers of hazardous substances or petroleum products		✓
Known or suspect PCB-containing equipment (excluding light ballasts)	✓	
Stains or corrosion to floors, walls or ceilings		✓
Floor drains and sump pumps		✓
Pits, ponds or lagoons		✓

Feature	Yes	No
Stained soil or pavement		✓
Stressed vegetation		✓
Solid waste mounds or non-natural fill materials		✓
Wastewater discharges into drains, ditches or streams		✓
Groundwater wells including potable, monitoring, dry, irrigation, injections and/or abandoned		✓
Septic systems or cesspools		✓
Elevators		✓
Dry cleaning		✓
On-site emergency electrical generators		✓
Specialized industrial equipment (paint booths, bag houses, etc.) on-site		✓
Hydraulic lifts		✓
Oil-water separators		✓
Compressors on-site		✓
Grease traps		✓

Surface waters

Several wetland complex features were observed throughout the undeveloped forested areas of the subject site. ECS did not observe petroleum sheen on the surface water at the time of our assessment.

Known or suspect PCB-containing equipment (excluding light ballasts)

A utility line easement with pole-mounted transformers, which were observed to be owned and maintained by Verizon according to their labels, was observed to run through a portion of the southern section of the site. Non-PCB stickers were not observed on the casings. Staining, which could be indicative of fluid leakage, was not observed on the transformers or ground surfaces below.

7.3 Adjoining and Nearby Properties

Contiguous and nearby properties were observed during a walking and vehicular reconnaissance of the subject property boundary and public places. The subject property is located in a rural area of Jarratt, Sussex County, Virginia. The following is a brief description of neighboring property:

Direction	Description	Relative Gradient	REC
North	Undeveloped forested land	Cross-gradient	No
East	A rural residential structure with a dirt access road	Cross-gradient	No
South	Interstate I-95, followed by undeveloped forested land	Up-gradient	No
West	Agricultural fields and undeveloped forested land followed by railway line	Cross-gradient	No

7.4 Site and Area Reconnaissance Summary

The subject property consists of a mixed landscape of cleared farmland and undeveloped forested land. The subject property is located in a rural area of Jarratt, Sussex County, Virginia. We did not identify RECs associated with the subject property or neighboring properties during the reconnaissance.

8.0 ADDITIONAL SERVICES

ASTM guidelines identify non-scope issues, which are beyond the scope of this practice. Non-scope issues have the potential to be business environmental risks. Some of these non-scope issues include: asbestos-containing building materials, radon, lead-based paint, lead in drinking water, wetlands and mold.

ECS was authorized to conduct reviews of state and federal databases for the potential presence of threatened and endangered species for the subject property, complete a wetland and stream delineation, and prepare a site specific checklist for the subject site. These reports and documents will be provided under separate cover.

9.0 INTERVIEWS

Mr. James Johnson Junior, owner of the subject property, was contacted by phone. The subject property has been in his wife's family for many decades and has always been farmland. The farm is leased to a farmer who grows peanuts and soybeans. He noted that no storage tanks are or have been used onsite and no agricultural chemicals are stored or mixed on the subject property. Mr. Johnson further indicated that he is not aware of 1) previous reports; 2) environmental concerns associated with the subject property; 3) pending, past, or threatened administrative litigation or administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the subject property; or 4) government notices regarding possible violation of environmental laws or possible liability related to hazardous substances or petroleum products.

10.0 FINDINGS AND CONCLUSIONS

The subject property is identified by Sussex County as parcel number 13B-A-1 and owned by Molly Prince Johnson. The subject property is an approximately 65-acre portion of a larger 142.14 acre parent parcel. The subject site is undeveloped wooded and agricultural land.

The subject property is located in a rural area of Jarratt, Virginia. The subject property is bound on the north by undeveloped forested land, on the east by a rural residential structure with a dirt access road, on the south by Interstate-95 followed by undeveloped forested land, and on the west by agricultural fields and undeveloped forested land followed by a railway line. ECS did not identify environmental issues at adjoining or nearby properties that are believed to present a recognized environmental condition (REC) at the subject property.

According to historical research, the subject property has been mostly wooded and agricultural land with a small homestead and several structures located on the south-central portion of the site from at least 1919 until around 1994. The surrounding area has generally remained undeveloped wooded and agricultural land with a scattering of residential type structures. No obvious indications of RECs were identified in the historical data review. Historical records prior to 1919 were not reasonably ascertainable for the subject property.

A regulatory database search report was provided by Environmental Data Resources, Inc. (EDR). The database search involves researching a series of Federal, State, Local, and other databases for facilities and properties that are located within specified minimum search distances from the subject property. The report did not identify the subject property or off-site properties within the minimum ASTM search distances.

ASTM E1527-13 defines a "data gap" as: "a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information." Data gaps which would be expected to impact our ability to render a professional opinion concerning the subject property were not identified.

We have performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM E1527-13 of the Blue Star Highway Solar Site located at 20201 Blue Star Highway in Jarratt, Sussex County, Virginia. Exceptions to, or deletions from, this practice are described in Section 2.6 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property.

Opinion

It is the opinion of ECS Mid-Atlantic, LLC that additional assessment of this site is not warranted at this time.

11.0 REFERENCES

ASTM E1527-13. *Standard Practice for Environmental Site Assessment, Phase I Environmental Site Assessment Process.*

Environmental Data Resources, Inc., *The EDR Aerial Photo Decade Package (years 1937, 1949, 1950, 1959, 1961, 1973, 1976, 1982, 1990, 1994, 2000, 2009, 2012, and 2016),* dated July 27, 2020.

Environmental Data Resources, Inc., *The EDR Radius Map Report,* dated July 24, 2020.

Environmental Data Resources, Inc., *Certified Sanborn Map Report (no coverage),* dated July 24, 2020.

Sussex County County GIS website, accessed on July 27, 2020.

Environmental Data Resources, Inc., *EDR City Directory Image Report (years 1992, 1995, 2000, 2005, 2010, 2014, 2017),* dated August 4, 2020.

Environmental Data Resources, Inc., *Historical Topo Map Report (years 1919, 1951, 1966, 1977, 1986, and 2013),* dated July 24, 2020.

Appendix I: Figures

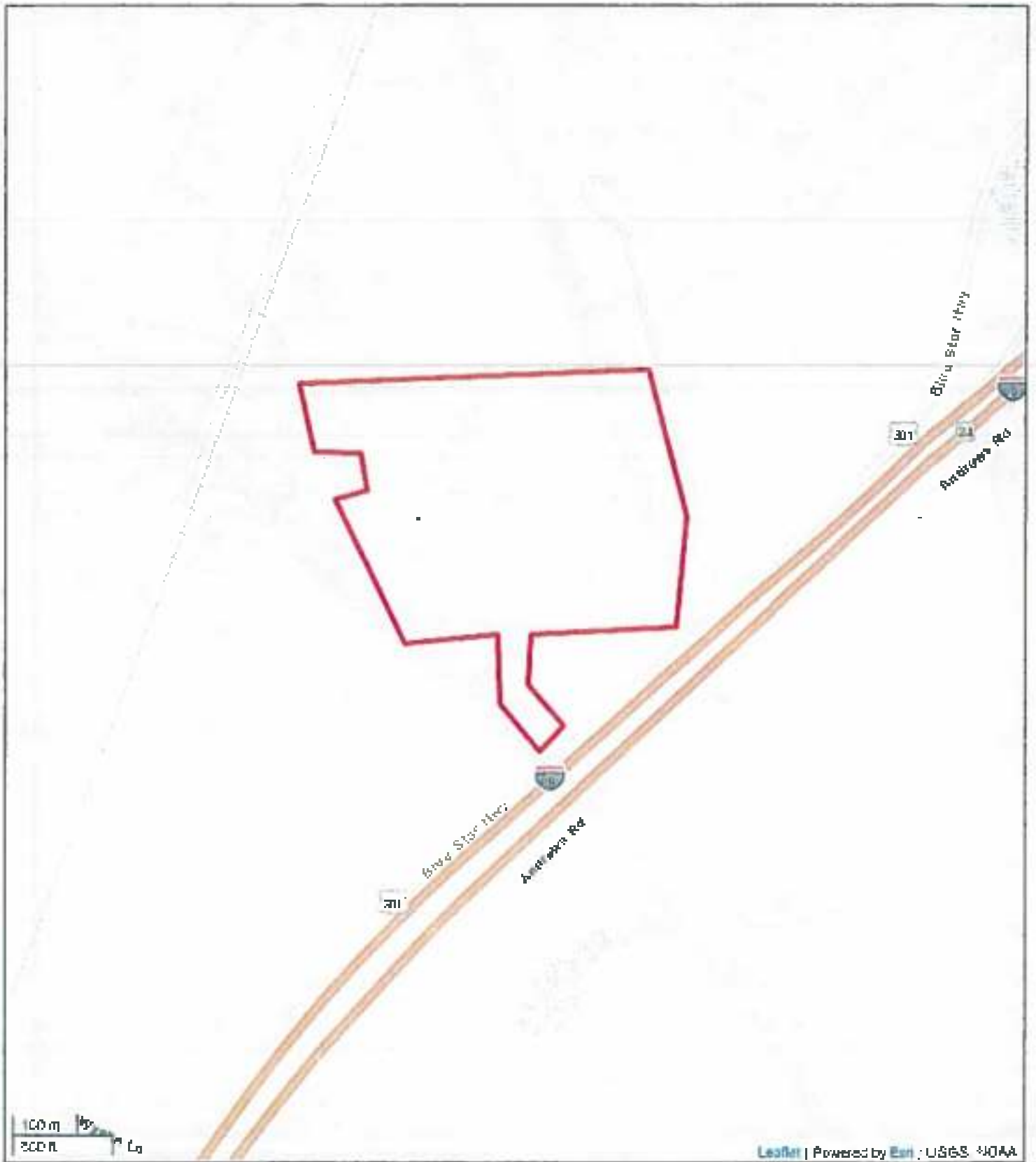


Figure 1
Site Location Map
Blue Star Highway Solar Site
20201 Blue Star Highway
Jarratt, Virginia 23882



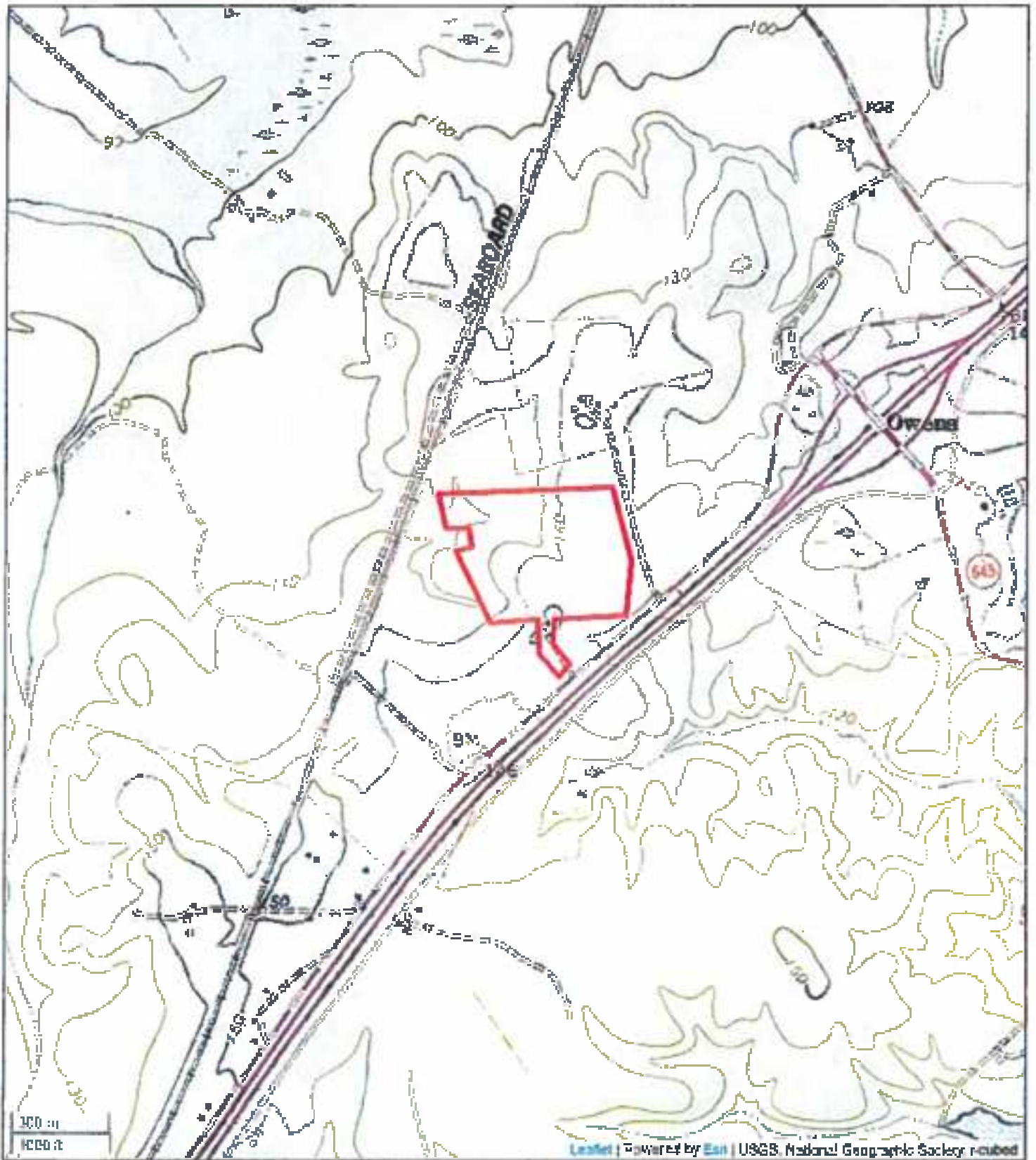


Figure 2

USGS Topographic Map
Blue Star Highway Solar Site
20201 Blue Star Highway
Jarrett, Virginia 23862





Figure 3
Aerial Photograph
Blue Star Highway Solar Site
20201 Blue Star Highway
Jarratt, Virginia 23062







September 9, 2020

Ms. Melissa Samaroo
Borrego Solar Systems, Inc.
1 N. State Street
Suite 1500
Chicago, Illinois 60602

ECS Project No. 47-10699-A

Reference: Threatened & Endangered Species Database Review Summary Letter, Blue Star Solar Site, 20201 Blue Star Highway, Jamett, Sussex County, Virginia.

Dear Ms. Samaroo:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide Borrego Solar Systems, Inc. with the results of the Threatened & Endangered (T&E) Species database reviews for the above-referenced project site. Our services were provided in general accordance with ECS Proposal No. 47-15555-EP, dated July 21, 2020.

PROPERTY DESCRIPTION

The subject site is located on the west side of Blue Star Highway proximal to Interstate 95 in Jamett, Sussex County, Virginia. The site is approximately 48-acres in size and is identified by Sussex County as Tax Map Number 138-A-1. The site is comprised of forested land on the northern half and an active farm field on southern half.

DATABASE REVIEW FINDINGS

Virginia Department of Wildlife Resources (VDWR):

ECS conducted a search of the VDWR Fish and Wildlife Information Service (FWIS) threatened and endangered species database to evaluate documented occurrences of federally and/or state listed species within a two-mile radius of the project site (see Appendix I). According to FWIS, six species are listed as having potential habitat within this radius:

- Federally and State-Endangered Dwarf Wedgemussel (*Alasmidonta heterodon*) – confirmed records within 2 miles. Typical habitat for this mussel includes running waters of all sizes, from small brooks to large rivers. Bottom substrates include silt, sand, and gravel, which may be distributed in relatively small patches behind larger cobbles and boulders. The river velocity is usually slow to moderate. Dwarf wedgemussels appear to select or are at least tolerant of relatively low levels of calcium in the water. The subject site is forested on the north half and is an active farm field on the southern half. Such suitable habitat features are not believed to be present within the subject property and no adverse impacts are expected. All applicable erosion and sediment control regulations should be adhered to in order to prevent adverse impacts to off-site aquatic resources.
- Federally and State-Endangered Roanoke Logperch (*Percina rex*) – confirmed records within 2 miles. Roanoke logperch typically inhabit medium-to-large sized warm, clear streams and small

rivers of moderate to low gradient. Adults usually occupy riffles, runs, and pools containing sand, gravel, or boulders that are free of silt. Young tend to congregate in mixed-species schools in shallow habitat underlain by sand and gravel along stream margins. The proposed site is forested on the northern half and is an active farm field on the southern half. Stream features are not believed to be present within the subject property and suitable habitat should therefore not be adversely impacted by the proposed project.

- State-endangered Rafinesque's eastern big-eared bat (*Corynorhinus rafinesquii macrotis*) – confirmed records within 2 miles. This species roosts singly, in small clusters, or groups to 100 or more in hollow trees, under loose bark, houses, unoccupied buildings and culverts. It hibernates in the northern part of its range. Potential habitat was observed throughout the northern forested area of the site as this species prefer to roost and winter in hollow trees or caves. Should impacts to wetland features be proposed, VDWR review may be required as part of the permit review process.
- State-threatened Bachman's Sparrow (*Faucaes Aestivatis*) – potential records within 2 miles; no confirmed sightings within 2 miles. Bachman's Sparrows are residents of open pine woodlands with wiregrass and saw palmetto in the understory. They also occur in grassy areas, oak-palmetto scrub, powerline cuts, and clearcuts with little to no shrubs in the understory. Bachman's Sparrows tend to abandon clearcuts older than 7 years and forest patches that haven't burned in 4 or more years. They tend to nest on the ground typically at the base of small shrubs, pine seedling, or bunch grass. Such features are not believed to be present within the subject property and adverse impacts to this species are not expected from the proposed project.
- State-threatened and federally proposed Atlantic pigtoe (*Fusconaia masoni*) – confirmed records within 2 miles. The Atlantic pigtoe inhabits mostly medium to large streams. It prefers clean, swift waters with stable gravel, or sand and gravel substrate. It often is found at the downstream edge of riffle areas. Historically, the best populations existed in small creeks to larger rivers with excellent water quality where flows were sufficient to maintain clean, silt-free substrates. The proposed site is forested on the northern half and is an active farm field on the southern half. Stream features or suitable habitat for this species are not believed to be present within the subject property and adverse impacts are therefore not expected.
- State-threatened Mabee's salamander (*Ambystoma mabeei*) – potential records within 2 miles; no confirmed sightings of this species within 2 miles. According to VDWR and the Virginia Natural History Society (2013), the Mabee's Salamander inhabits forested areas close to suitable breeding sites. These sites include fish-free ephemeral ponds in coastal rivers and pine savannas, and in bogs, ponds, low wet woods, and swamps. It has been reported in Jamaica and in Isle of Wight. The proposed site is forested on the northern half and is an active farm field on the southern half. Wetland features are believed to be present in the forested northern portion of the subject site, although habitat suitable for this species (ponds, inundated swamps, etc.) do not appear to be prevalent in this portion of the site. As such, adverse impacts to this species are not expected as the subject site appears to only provide marginal habitat.

Based on the proposed site plans, tree clearing is proposed in the northern portion of the site. ECS identified potential wetland areas within the forested portions of the site and, as a result, a wetland permit may be required from state and federal agencies. The VDWR would conduct a project review associated with the wetland permit application and may require specific erosion and sediment controls to limit the potential for adverse impacts to the aquatic environment. Tree clearing restrictions may also be imposed to periods outside of the breeding season, although VDWR guidance would be needed to verify this assumption.

U.S. Fish and Wildlife Service (USFWS):

ECS conducted a review of the USFWS Information for Planning and Consultation (IPaC) database to evaluate the documented occurrences or potential habitat for federally-listed species within the project boundaries (see Appendix II). According to the IPaC database, three species are listed as having potential to occur at the project site:

- Federally-threatened Northern long-eared bat (NLEB, *Myotis septentrionalis*) - According to the USFWS' Species Fact Sheet, the male bat prefers large caves and abandoned mines during the winter and summer. Female bats prefer caves and mines during the winter and maternity colonies are located in riparian forests along streams. It is also known that this bat species generally roosts in trees greater than 9 inches dbh that are found on south-facing slopes and have exfoliating bark or snags during the summer months.

The USFWS issued a Final 4(d) rule under the Endangered Species Act (ESA) effective February 16, 2016. The rule specified that for areas of the country impacted by white-nose syndrome (WNS), incidental take is prohibited under the following circumstances:

1. If it occurs within a hibernaculum,
2. If it results from tree removal activities and,
 - The activity occurs within 1/2-mile of a known, occupied hibernaculum; or,
 - The activity cuts or destroys a known, occupied maternity roost tree or other trees within a 150 foot radius from the maternity roost tree during the pup season from June 1 through July 31.

Since there are no documented occurrences within close proximity to the subject site (see attached habitat map), ECS believes time of year restrictions or habitat surveys will not be required by USFWS for *M. septentrionalis*.

- Federally-endangered Red-cockaded woodpecker (RCW, *Picoides borealis*) - According to the USFWS' Species Fact Sheet, RCWs inhabit mature pine forests, specifically those with longleaf pines averaging 80 to 120 years old and loblolly pines averaging 70 to 100 years old. The site is comprised of a mixed deciduous and pine forest of relatively new growth pine, primarily loblolly, that borders an active farm field to the south. Based on the lack of critical habitat within close proximity to the site, adverse effects to this species or its habitat is not anticipated.
- Federally-threatened Yellow lance (*Elliptio lanceolatus*) - According to the USFWS' Species Fact Sheet, the Yellow lance is a sand-loving species often found buried deep in clean, coarse to medium sand and sometimes migrating with shifting sands, although it has also been found in gravel substrates. Yellow lances are often found in sand at the downstream end of stable sand/gravel bars, and sometimes near the water's edge within inches of exposed substrate. The species is dependent on clean (i.e., not polluted), moderate flowing water with high dissolved oxygen content in riverine or larger creek environments. The proposed site activities are located greater than one mile from the Nottoway River and suitable habitat for this species was not identified on the subject site. According to the IPaC database, the site is outside of the critical habitat for this species. Based on the distance from the project site and the planned adherence to local erosion and sediment controls, adverse effects to this species or its habitat are not anticipated.

Blue Star Site
ECS Project No. 47: 10899-A
September 9, 2020
Page 4

Virginia Department of Conservation and Recreation (DCR):

ECS conducted a review of the DCR Natural Heritage Data Explorer database to evaluate the potential for documented natural heritage resources within or near the project site limits (see Appendix III). According to DCR, no natural heritage resources are mapped within the site limits.

It should be noted that these recommendations are based on our review of available online information and have not been confirmed by a site evaluation of onsite conditions. If you have any questions or comments concerning the contents of the enclosed documents or other related topics, please feel free to contact the undersigned. We appreciate the opportunity to be of service on this project.

Respectfully submitted,

ECS MID-ATLANTIC, LLC



Dana M. Spontak
Staff Project Manager
dspontak@ecslimited.com



Adam M. Meurer, CHMM, PWS
Principal
ameurer@ecslimited.com

APPENDIX I

VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES



Virginia Department of Game and Inland Fisheries

Fish and Wildlife Information Service

Home » By Map » VaFWS Geographic Select Options

- Options
- Species Information
 - By Name
 - By Land Management
 - References
- Geographic Search
 - By Map
 - By Coordinates
 - By Place Name
- Number of Results
- Help
- Logout

Show this page as
Printer Friendly

VaFWS Search Report Completed 09/09/20, 3:13:58 PM

Known or likely to occur within a 2 mile radius around point 36.18, 37.6 - 47.25, 89.0
in 9th Greenville County, 193 Sussex County, VA

[View Map of Site Location](#)

491 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 50) (31 species with Status of Tier I or Tier II)

BOWA Code	Status	Tier	Common Name	Scientific Name	Confirmed	Details(s)
040158	FESE	1a	Blackgoby and rockfish	<i>Pseudis leucolus</i>		BOWA
060000	FESE	1a	Black-throated blue	<i>Abamas doola heliodon</i>	Yes	BOWA, TE Waters, Habitat, HUB
010714	FESE	1b	Blue-winged Teal	<i>Hydrochelidon</i>	Yes	BOWA, TE Waters, Habitat, HUB
060022	FTST	1a	Blue-winged teal	<i>Nyroca septentrionalis</i>		BOWA
090029	FTST	1a	Blue-winged teal	<i>Elanus leucurus</i>		BOWA, HUB
010347	EE	1a	Blue-winged teal	<i>Ereunocryptus cheedon</i>		BOWA
080110	FPSE	1a	Blue-winged teal	<i>Labeana jamaicensis jamaicensis</i>		BOWA
050020	BE	1a	Blue-winged teal	<i>Mytilus tethyus</i>		BOWA
060004	SE	1a	Blue-winged teal	<i>Corynorhinus milviformis microis</i>	Yes	BOWA, Sp, C, HUB
050027	BE	1a	Blue-winged teal	<i>Parimysia subilluata</i>		BOWA
010283	ET	1a	Blue-winged teal	<i>Lanius ludovicianus</i>		BOWA
040385	BT	1a	Blue-winged teal	<i>Poocana ovalis</i>	Status	BOWA, BBA, HUB
010379	ET	1a	Blue-winged teal	<i>Geryonx hendsoni</i>		BOWA
060175	FRST	1a	Blue-winged teal	<i>Pipocania masoni</i>	Yes	BOWA, TE Waters, Habitat
020044	BT	1a	Blue-winged teal	<i>Ambystoma macrodactylus</i>	Status	BOWA, Habitat
020092	ST	1a	Blue-winged teal	<i>Hyla gratiosa</i>		BOWA
040282	ST		Blue-winged teal	<i>Lanius ludovicianus excubitorides</i>		BOWA
030053	DC	1a	Blue-winged teal	<i>Clemmys guttata</i>		BOWA, HUB
030021	CC	1a	Blue-winged teal	<i>Lampyris nocturna</i>		BOWA
010174		1a	Blue-winged teal	<i>Amblyopis cinctus</i>	Status	BOWA, Habitat, HUB
010377		1a	Blue-winged teal	<i>Melospiza cinerea</i>		BOWA
020163		1a	Blue-winged teal	<i>Anas platyrhynchos</i>	Status	BOWA, Habitat, HUB
040152		1a	Blue-winged teal	<i>Anas rubripes</i>		BOWA, HUB
090329		1a	Blue-winged teal	<i>Egretta caerulea caerulea</i>		BOWA
040118		1a	Blue-winged teal	<i>Nyelanassa violacea violacea</i>		BOWA
040220		1a	Blue-winged teal	<i>Semotilus atromaculatus</i>		BOWA, HUB
040140		1a	Blue-winged teal	<i>Sceloporus minor</i>		BOWA, HUB
060071		1a	Blue-winged teal	<i>Lampyris carolinensis</i>		HUB
040305		1a	Blue-winged teal	<i>Rana sylvatica</i>		BOWA
060175		1a	Blue-winged teal	<i>Elanus leucurus</i>	Status	Habitat, HUB
040004		1a	Blue-winged teal	<i>Lanius ludovicianus excubitorides</i>		HUB

26 items All (4) items [View All](#)

FE=Federal Endangered FT=Federal Threatened S=State Endangered N=Native Protected H=Historical Protected P=Federal Candidate C=Columbia Corbin

H=Wilderness of Man - No 100% Federal Conservation Fee, 10-75% BLM Action Plan - Tier 1 - Very High Conservation Need, B=Wilderness Action Plan - Tier 2 - High Conservation Need

W=Wilderness Plan - Tier 1 - Maximum Conservation Fee

W=Wilderness Plan Conservation Category: R=Recreational

S=On the ground management (2000-2010) and (2011-2015) (2016-2020) (2021-2025) (2026-2030) (2031-2035) (2036-2040) (2041-2045) (2046-2050) (2051-2055) (2056-2060) (2061-2065) (2066-2070) (2071-2075) (2076-2080) (2081-2085) (2086-2090) (2091-2095) (2096-2100)

C=No on the ground efforts or research results have been identified as currently or potentially in compliance with the criteria

U=No on the ground efforts or research results have been identified or identified as currently or potentially in compliance with the criteria



Get Column or Headers: Not Known

Anadromous Fish Use Streams (1 reaches)

[View Map](#)

[Anadromous Fish Use Streams](#)

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE	Highest Tier	
035	Nobles Run	Confirmed	5		IV	Yes

Impediments to Fish Passage (1 reaches)

[View Map](#)

[Impediments to Fish Passage](#)

ID	Name	River	View Map
070	CROFTON TR-SPRING CREEK		Yes

General Water Quality Survey

NA

Threatened and Endangered Wetlands (18 reaches)

[View Map](#)

[Threatened and Endangered Wetlands](#)

Stream Name	Highest TE	TSS Profile Species					View Map
		BQMA Code	Blades	Tier	Common	Selected Name	
Nobles Run (0350000)	FESE	010214	FESE	IV	Lutescent Bladder	Percina nec	Yes
		030003	FESE	IV	Winged Bladder	Ammocetes heterodon	
		050173	FPBT	IV	Spine Bladder	Fusconia macul	
Nobles Run (0350700)	FESE	010214	FESE	IV	Lutescent Bladder	Percina nec	Yes
		030003	FESE	IV	Winged Bladder	Ammocetes heterodon	
		050173	FPBT	IV	Spine Bladder	Fusconia macul	
Nobles Run (0351000)	FESE	010214	FESE	IV	Lutescent Bladder	Percina nec	Yes
		030003	FESE	IV	Winged Bladder	Ammocetes heterodon	
		050173	FPBT	IV	Spine Bladder	Fusconia macul	
Nobles Run (0351300)	FESE	010214	FESE	IV	Lutescent Bladder	Percina nec	Yes
		030003	FESE	IV	Winged Bladder	Ammocetes heterodon	
		050173	FPBT	IV	Spine Bladder	Fusconia macul	
Nobles Run (0351600)	FESE	010214	FESE	IV	Lutescent Bladder	Percina nec	Yes
		030003	FESE	IV	Winged Bladder	Ammocetes heterodon	
		050173	FPBT	IV	Spine Bladder	Fusconia macul	
Nobles Run (0351900)	FESE	010214	FESE	IV	Lutescent Bladder	Percina nec	Yes
		030003	FESE	IV	Winged Bladder	Ammocetes heterodon	
		050173	FPBT	IV	Spine Bladder	Fusconia macul	

Managed Trout Streams

NA

Bald Eagle Concentration Areas and Roosts

NA

Bald Eagle Maps

N/A

Species Observations (4 records) [Downloadable Database of Observations](#) [View Map of All Geographical Species Observations](#)

obsID	Class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE	Highest Tier**	
011174	SpObs	May 27 2000	John Keogler	1	SE	I	Yes
011114	SpObs	Jan 1 1900		2			Yes
011130	SpObs	Jan 1 1900		1			Yes
011111	SpObs	Jan 1 1900		1			Yes

Displayed 4 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species (3 Species) [View Map of Geographical Habitat Predicted for WAP Tier I & II Aquatic Species](#)

Basin Name	Tier Species					View Map	
	Highest TE	BQWA Code	Status	Tier**	Common & Scientific Name		
Choptank Swamp (03010201)	#BSE	010174		Ia	Belted Kingfisher	<i>Alcedo alutacea</i>	Yes
		010244	FESE	Ia	Least Tern	<i>Ferrousus</i>	
		020005	FESE	Ia	American Osprey	<i>Alcedo alutacea</i>	
Choptank Swamp (03010201)	FESE	010214	FESE	Ia	Least Tern	<i>Ferrousus</i>	Yes
		020005	FESE	Ia	American Osprey	<i>Alcedo alutacea</i>	
Nottoway River (03010204)	FESE	010174		Ia	Belted Kingfisher	<i>Alcedo alutacea</i>	Yes
		010214	FESE	Ia	Least Tern	<i>Ferrousus</i>	
		020005	FESE	Ia	American Osprey	<i>Alcedo alutacea</i>	
		020173	FPST	Ia	Eastern Kingbird	<i>Ferrousus</i>	
Nottoway River (03010204)	FESE	010174		Ia	Belted Kingfisher	<i>Alcedo alutacea</i>	Yes
		010214	FESE	Ia	Least Tern	<i>Ferrousus</i>	
		050103	FESE	Ia	American Osprey	<i>Alcedo alutacea</i>	
		050173	FPST	Ia	Eastern Kingbird	<i>Ferrousus</i>	
Nottoway River (03010204)	FESE	010174		Ia	Belted Kingfisher	<i>Alcedo alutacea</i>	Yes
		010214	FESE	Ia	Least Tern	<i>Ferrousus</i>	
		050103	FESE	Ia	American Osprey	<i>Alcedo alutacea</i>	
		050173	FPST	Ia	Eastern Kingbird	<i>Ferrousus</i>	

Habitat Predicted for Terrestrial WAP Tier I & II Species (2 Species) [View Map of Geographical Habitat Predicted for WAP Tier I & II Terrestrial Species](#)

BQWA Code	Status	Tier**	Common Name	Scientific Name	View Map
020044	S1	Ia	American Woodcock	<i>Amblyramphus</i>	Yes
020003		Ia	Blue Jay	<i>Asyndes</i>	Yes

Virginia Breeding Bird Atlas Blocks (3 records) [View Map of All Geographical Virginia Breeding Bird Atlas Blocks](#)

BQA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE	Highest Tier**	
51004	Atlantic CE	47	S1	I	Yes
51002	Atlantic PL	30		II	Yes
51047	Roanoke CR	70		II	Yes

Public Initiatives

N/A

Summary of BQWA Species Associated with DDEs and Counties of the Commonwealth of Virginia

DDE Code	City and County Name	Different Species	Highest TE	Highest Tier
001	Arlington	370	#BSE	I
103	Arlington	301	FESE	I

Site Location

36.50,57.6 -77.26,09.0
is the Search Point

Show Position Rings

Yes No

I will add 1/4 mile to the Search Point

Show Search Area

Yes No

2 Search distance miles

Search Point is at map center

Base Map Choices

Color Aerial Photography

Map Overlay Choices

Current List Position, Search, BECAR, DATA, Maps, TFW, Water, Trail, Habitat, Field, Anonymous

Map Overlay Legend

Taxation

- Partial
- State

Wildlife Habitat MAP Per 1, 2, 3

- Aquatic
- Terrestrial

Trout Habitat

- Class I - IV
- Class V - VI

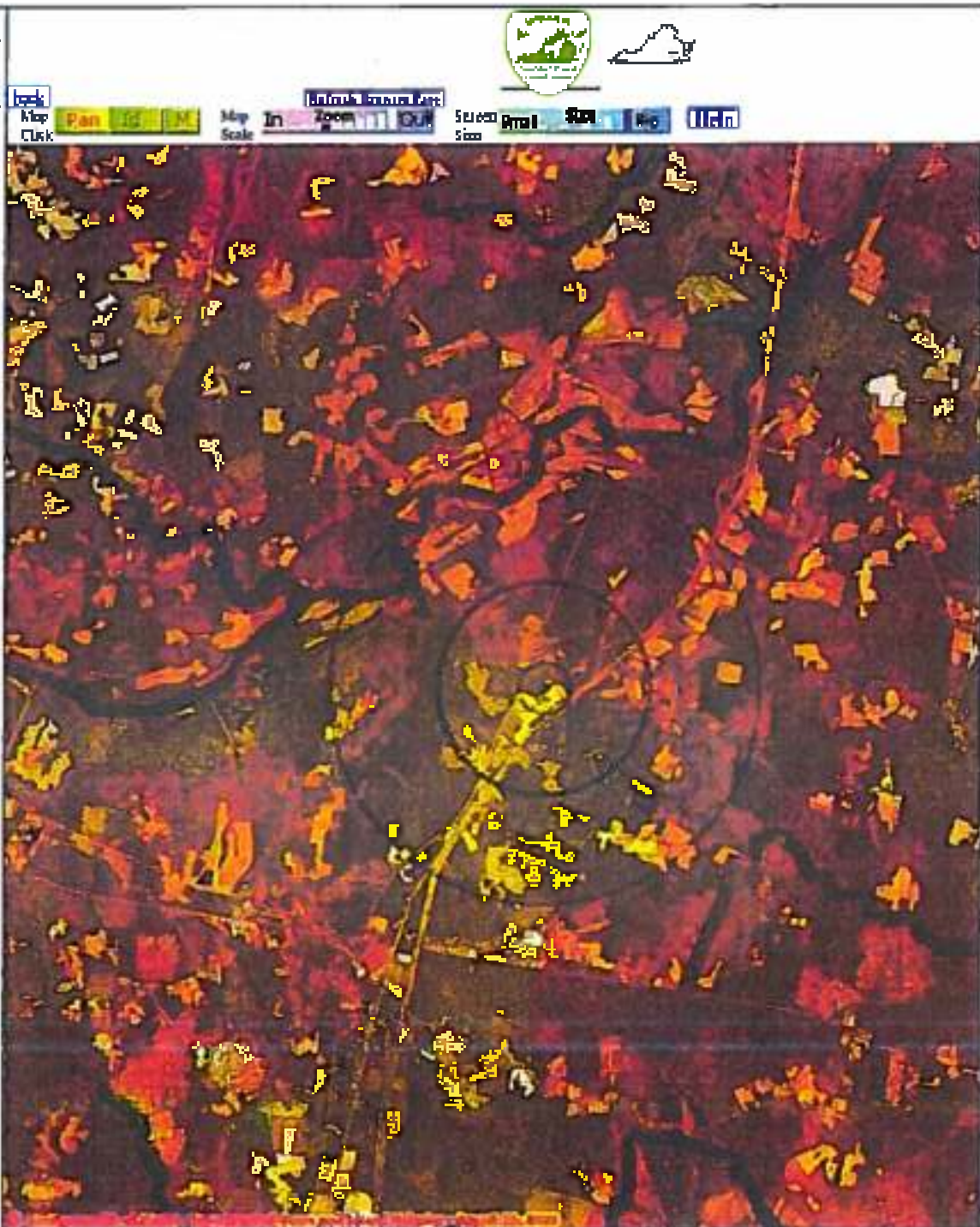
Anonymous Fish Species

- Confirmed
- Potential
- Impediment

Position from 1/4 mile and 1/4 mile at the Search Point

1/4 mile radius Search Area

Wild Eagle Concentration Areas and Roosts



Point of Search: 36.50,57.6 -77.26,09.0
Map Location: 36.50,57.6 -77.26,09.0

- Select Coordinate System:
- Virginia Geographic Information System - Longitude
 - Decimal Degree Latitude - Longitude
 - NAD83 UTM (NAD83 East North Zone)
 - NAD83 UTM (NAD83 East North Zone)

Base Map source: Color Aerial Photography 2002 - Virginia Base Mapping Program, Virginia Geographic Information Network

Map projection is UTM Zone 18 NAD 1983 with east 274826 and top 4011928. Pixel size is 18 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 1000 meters by 1000 meters for a total of 1000000 pixels. The map display represents a 15000 meters east to west by 16000 meters north to south for a total of 276 0 square kilometers. The map display represents 32302 East to West by 32531 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 acquired 2002 is from Virginia State Mapping Program, Virginia Geographic Information Network.

Shaded topographic maps are from USPO 42006 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 was added 2020-06-10 14:15:33 (gmt) Mon 21 Jun 2016 12:20 - id=1049111 & dist=02111000 ()
 dist=36.1400133 -37.1398333

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APPENDIX II

U.S. FISH AND WILDLIFE SERVICE



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Virginia Ecological Services Field Office
6669 Saint Lane

Gloucester, VA 23061-4410

Phone: (804) 693-6694 Fax: (804) 693-9032

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

In Reply Refer To:

July 29, 2020

Consultation Code: 05E2VA00-2020-SLI-5251

Event Code: 05E2VA00-2020-E-14566

Project Name: Blue Star

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/contow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6069 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2020-SLI-5251

Event Code: 05E2VA00-2020-E-14566

Project Name: Blue Star

Project Type: POWER GENERATION

Project Description: The development of a ground mounted solar array farms.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/36.649249344753034N77.43534287114531W>



Counties: Sussex, VA

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [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.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red-cockaded Woodpecker <i>Picoides borealis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered

Clams

NAME	STATUS
Yellow Lance <i>Elliptio lanceolara</i> There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4511	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

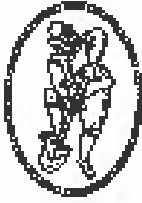
Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

APPENDIX III

VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION

The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations. The second part outlines the specific procedures and protocols that must be followed to ensure that all data is properly collected, stored, and analyzed. This includes details on how to handle sensitive information and how to ensure the integrity of the data throughout the entire process. The third part of the document provides a comprehensive overview of the various tools and technologies that are currently being used to support these efforts. It highlights the strengths and weaknesses of each tool and provides recommendations for how they should be used most effectively. Finally, the document concludes with a series of key takeaways and a call to action, urging all staff members to take ownership of their role in maintaining the organization's data and to work together to ensure that all information is accurate, up-to-date, and secure.



The JAMES RIVER
INSTITUTE for
ARCHAEOLOGY, Inc.

James River Institute for Archaeology, Inc.

Registered Professional Archaeologists

www.jriarchaeology.com

P: 757-229-9425

F: 757-229-8277

223 McLaws Circle, Suite 1
Williamsburg, VA 23185

1221 Parcell Street
Fredericksburg, VA 22401

Nicholas M. Lucchetti, M.A.
President, Principal Investigator
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Garrett H. Fesler, Ph.D.
Senior Archaeologist
gfesler@jriarchaeology.com

Matthew R. Laird, Ph.D.
Senior Researcher
mlaird@jriarchaeology.com

28 July 2020

Melissa Samarno, Civil Engineer II
Borrego Solar Systems, Inc.
1 N. State Street #1500
Chicago, Illinois 60602

RE: Preliminary cultural resources assessment for a proposed solar project at 20201
Blue Star Highway, Sussex County, Virginia.

Dear Ms. Samarno:

The proposed solar project area at 20201 Blue Star Highway (U.S. Route 301) in Sussex County, Virginia, is located on the west side of Blue Star Highway and currently consists of a combination of woodland and open fields.

A review of the Virginia Department of Historic Resources' (DHR) Virginia Cultural Resource Information System (V-CRIS) indicates that this property has not been subject to a previous Phase I archaeological survey, and there are no recorded archaeological sites within the study area or the immediate vicinity (Figure 1).

The study area does not coincide with any previously recorded architectural resources, and none is located within a half-mile radius.

Thank you very much for the opportunity to provide this preliminary cultural resources assessment, and please do not hesitate to contact me should you have any questions.

Sincerely,

Matthew R. Laird, Ph.D., RPA
Partner & Senior Researcher



Figure 1. Location of previously recorded historic resources in the study area vicinity (DHR V-CRIS).

Decommissioning Estimate/Plan



Date: 11/25/2020

20201 EAU Star Highway - Site 2
Janett, VA 23867

This Decommissioning Estimate has been prepared by Borrego Solar in an attempt to predict the cost associated with the removal of the proposed solar facility. The primary cost of decommissioning is the labor to dismantle and load as well as the cost of trucking and equipment. All material will be removed from the site, including the concrete equipment pads, which will be broken up at the site and hauled to the nearest transfer station.

This decommissioning estimate includes removing the entirety of the access road and re-grading the area unless the landowner requests that all or part of the road remains.

No salvage values have been assumed in this calculation.

The following values were used in this Decommissioning Estimate:

System Specifications		Equipment & Material Removal Rates	
Number of Modules	6,640	Module Removal Rate (min/module)	0.5
Linear Feet of Racking (R)	28,388	Rack Wiring Rem. Rate (min/mod)	0.25
Number of Inverters	2	Racking Dismantling Rate (min/LF)	0.2
Number of Transformers	2	Inverter Removal Rate (hr/unit)	0.5
Number of Tracker Motors	57	Transformer Removal Rate (hr/unit)	1
Electrical Wiring Length (ft)	3,103	Motor Removal Rate (hr/unit)	1
Number of Foundation Piles	1,720	Rack Loading Rate (min/LF)	0.1
Length of Perimeter Fence (ft)	5,787	Elect. Wiring Removal Rate (min/LF)	0.5
Number of Power Poles	8	Pile Rem. Rate (piles/csy)	800
Access Rd Material Volume (YD)	82	Fence Removal Rate (min/LF)	1
Total Disturbed Area (SF)	2,920	Days req. to break up concrete pads	1
Total Fence Weight (lbs)	4,108	Days req. with Rough Grader	1
Total Racking Weight (lbs)	203,040	Days req. with Fine Grader	1
Total Foundation Pile Weight (lbs)	232,200	Total Truckloads Required	17
Labor and Equipment Costs		Round-Trip Dist. to Trans. Sta. (miles)	53
Labor Rate (\$/hr)	\$ 20.81	Round-Trip Time to Trans. Sta. (hr)	1.25
Operator Rate (\$/hr)	\$ 21.22		
Bobcat Cost (\$/hr)	\$ 104.10		
Front End Loader Cost (\$/Day)	\$ 864.03		
Excavator Cost (\$/Day)	\$ 1,394.94		
Trucking Cost (\$/hr)	\$ 130.13		
Backhoe Cost (\$/hr)	\$ 104.10		
Power Pole Removal Cost (\$/pole)	\$ 1,503.00		
Grader Cost (\$/day)	\$ 1,353.30		
Gravel Export Cost (\$/YD)	\$ 8.03		
Loam Import Cost (\$/YD)	\$ 20.00		
Seeding Cost (\$/SF)	\$ 0.10		
Fuel Cost (\$/mile)	\$ 0.50		



Labor, Material, and Equipment Costs

1. Remove Modules

The solar modules are fastened to racking with clamps. They slide in a track. A laborer needs only unclamp the module and reach over and slide the module out of the track.

$$\text{Module Removal Rate} \times \text{Total Number of Solar Modules} \times \text{Labor Rate} = \\ \text{Module Removal Cost}$$

$$\text{Total} = \$ \quad 1,498.32$$

2. Remove Rack Wiring

The modules are plugged together in the same manner as an electrical cord from a light is plugged into a wall socket. The string wires are in a tray. A laborer needs only unplug the module, reach into the tray and remove the strands of wire.

$$\text{Wire Removal Rate} \times \text{Total Number of Solar Modules} \times \text{Labor Rate} = \\ \text{Rack Wiring Removal Cost}$$

$$\text{Total} = \$ \quad 748.16$$

3. Dismantle Racks

Tracker module racking primarily consists of torque tubes and a driveline. These are supported on driven piles. The torque tubes and driveline unbolt from the foundation piles.

$$\text{Linear feet of Racking} \times \text{Rack Dismantling Rate} \times \text{Labor Rate} = \\ \text{Rack Dismantling Cost}$$

$$\text{Total} = \$ \quad 1,567.79$$

4. Remove and Load Electrical Equipment

Electrical equipment includes transformers, inverters, and tracker motors.

$$(\text{Number of Inverters} \times \text{Inverter Removal Rate} + \text{Number of Transformers} \times \text{Transformer Removal} \\ \text{Rate} + \text{Number of Motors} \times \text{Motor Removal Rate}) \times (\text{Operator Rate} + \text{Bobcat Cost}) = \\ \text{Electrical Equipment Removal Cost}$$

$$\text{Total} = \$ \quad 7,518.20$$

5. Break Up Concrete Pads

Concrete pads are broken up using an excavator and jackhammer.

$$\text{Number of Demolition Days} \times (\text{Excavator Cost} + \text{Operator Cost}) = \\ \text{Total Concrete Pad Removal}$$

$$\text{Total} = \$ \quad 1,033.79$$



6. Load Racks

Once the racking has been dismantled, it will be loaded onto trucks for removal from the site. The trucking cost associated with this line item represents the additional time a truck will be needed during loading. Please see item # 13 for the cost of trucking off-site.

$$\text{Linear feet of Racking} \times \text{Rack Loading Rate} \times (\text{Operator Cost} + \text{Front End Loader Cost} + \text{Trucking Cost}) = \text{Total Rack Removal Cost}$$

Total = \$ 12,077.44

7. Remove Electrical Wiring

Electrical wiring will be removed from all underground conduits.

$$\text{Cable Length} \times \text{Cable Removal Rate} \times (\text{Operator Cost} + \text{Backhoe Cost}) = \text{Total Cable Removal Cost}$$

Total = \$ 3,240.57

8. Remove Foundation Piles

Foundation piles will be pulled out of the ground and loaded onto a truck to be removed from site.

$$(\text{Total Number of Piles} / \text{Daily Pile Removal Rate}) \times (\text{Operator Rate} + \text{Excavator Cost}) = \text{Total Pile Removal Cost}$$

Total = \$ 13,458.42

9. Remove Fencing

Fencing posts, mesh, and foundations will be loaded onto a truck and removed from site. Trucking costs included in this line item are for the removal process. Trucking to a recycling facility are included in item #13.

$$(\text{Total Length of Fence} \times \text{Fence Removal Rate}) \times (\text{Operator Rate} + \text{Bobcat Cost} + \text{Trucking Cost}) =$$

Total = \$ 24,837.67

10. Remove Power Poles

Power poles will be removed and shipped off site.

$$\text{Number of Power Poles} \times \text{Pole Removal cost} = \text{Total Power Pole Removal Cost}$$

Total = \$ 13,800.00



11. Gravel Road Reclamation

Reclamation of the gravel access road will entail removing the gravel material and exporting it off site. The area will then be backfilled with loam and graded.

$$(Days\ with\ Rough\ Grader + Days\ with\ Fine\ Grader) \cdot (Grader\ Cost\ per\ Day + Operator\ Cost\ per\ Day) + (Gravel\ Material\ Volume \cdot (Gravel\ Export\ Cost + Loam\ Import\ Cost)) =$$

Gravel Road Reclamation Cost

Total = \$ 5,342.47

12. Seed Disturbed Areas

Seeding cost includes labor and materials for reseeding all disturbed areas including the reclaimed gravel road area, former electrical areas, and areas disturbed by racking foundation removal.

$$Seeding\ Cost \cdot Disturbed\ Area =$$

Total Seeding Cost

Total = \$ 291.97

13. Truck to Transfer Station

All material will be trucked to the nearest Transfer station that accepts construction material. The nearest transfer station is Waste Management - Atlantic Waste Disposal

$$(Total\ Truckloads \cdot Roundtrip\ Distance \cdot Fuel\ Cost) + (Total\ Truckloads \cdot Round\ Trip\ Time \cdot Trucking\ Cost) =$$

Total Trucking Cost to Transfer Station

Total = \$ 3,215.66



Salvage Values

Salvage Value Not Included



Summary of Decommissioning Costs and Salvage Values

Line Item	Task	Cost
1	Module Removal	\$ 1,498.92
2	Rack Wiring Removal	\$ 749.18
3	Rack Dismantling	\$ 1,967.79
4	Electrical Equipment Loading and Removal	\$ 7,519.20
5	Break Up Concrete Pads	\$ 1,033.79
6	Load Racks	\$ 12,077.44
7	Electrical Wiring Removal	\$ 3,240.57
8	Foundation Pile Removal	\$ 13,458.42
9	Fences Removal	\$ 24,837.87
10	Power Pole Removal	\$ 13,500.00
11	Gravel Road Reclamation	\$ 5,342.47
12	Seed Disturbed Areas	\$ 291.87
13	Trucking to Transfer Station	\$ 3,215.68
		Subtotal = \$ 88,530.45

Present Value Total = \$ 88,530.45

CONCEPT PLANT SOURCE



2020-2021
 2022-2023
 2024-2025
 2026-2027



2028-2029
 2030-2031
 2032-2033
 2034-2035



2036-2037
 2038-2039
 2040-2041
 2042-2043
 2044-2045



2046-2047
 2048-2049
 2050-2051
 2052-2053
 2054-2055

INDIGENOUS TREES



EMERGING TREES







ORNAMENTAL TREES



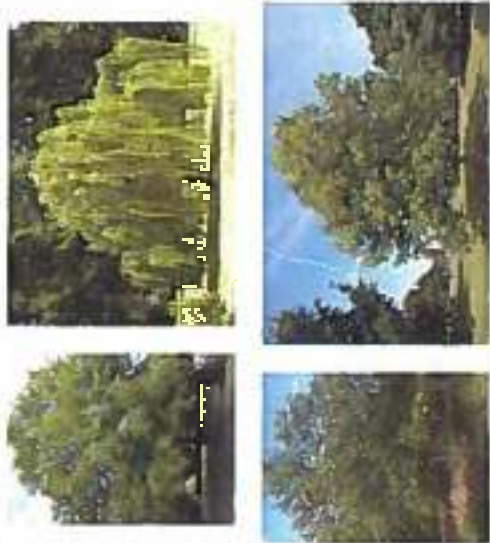
LARGE SHADE TREES



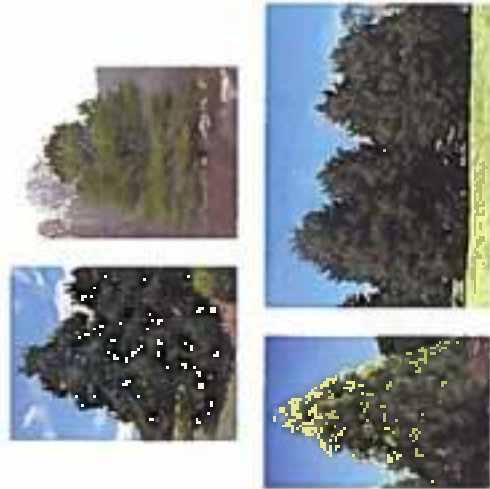
CONCEPT PLANT SCHEDULE

-  **PLANTING PHASE 1**
 1. ALL PLANTING PHASE 1 PLANTS TO BE PLANTED BY THE END OF THE PROJECT CONSTRUCTION PERIOD.
-  **PLANTING PHASE 2**
 2. ALL PLANTING PHASE 2 PLANTS TO BE PLANTED BY THE END OF THE PROJECT CONSTRUCTION PERIOD.
-  **PLANTING PHASE 3**
 3. ALL PLANTING PHASE 3 PLANTS TO BE PLANTED BY THE END OF THE PROJECT CONSTRUCTION PERIOD.
-  **PLANTING PHASE 4**
 4. ALL PLANTING PHASE 4 PLANTS TO BE PLANTED BY THE END OF THE PROJECT CONSTRUCTION PERIOD.

DECIDUOUS TREES



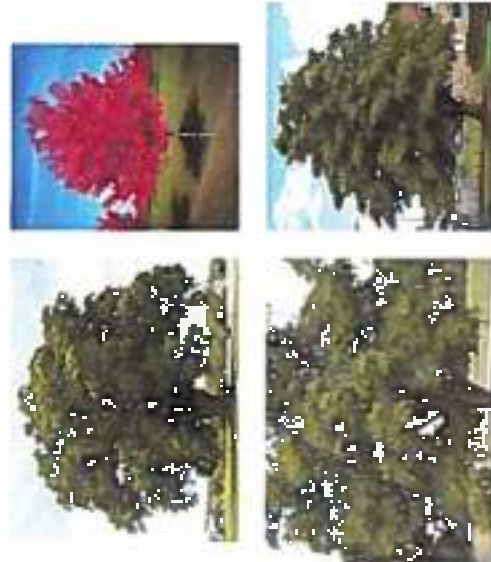
EVERGREEN TREES



ORNAMENTAL TREES



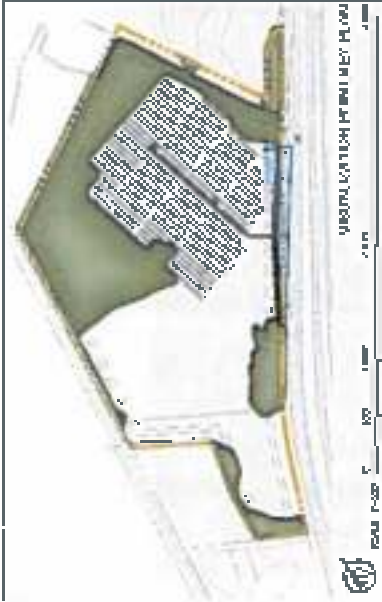
JAPANESE SPICE TREES



**CONCEPT PLANT PALETTE IMAGES
 BLUE STAR HIGHWAY SOLAR SITE CIP**

SULLY COUNTY, VIRGINIA
 400 WEST MAIN STREET, SUITE 100, SULLY, VIRGINIA 22190





SITE VISIT PHOTOGRAPH



3D VISUALIZATION - BEFORE BUFFER PLANTING



3D VISUALIZATION - AFTER BUFFER PLANTING (PLANT INSTALLATION)



3D VISUALIZATION - MATURE HEIGHT BUFFER PLANTING



PROPOSED BUFFER 3D VISUALIZATION POINT 'A'
 BLUE STAR HIGHWAY SOLAR SITE CUP

5099X COUNTY, VIRGINIA
 000 PROJECT NUMBER - VISUALIZATION-0000-0000-0000





SITE VISIT PHOTOGRAPH



3D VISUALIZATION - BEFORE BUFFER PLANTING



3D VISUALIZATION - AFTER BUFFER PLANTING (PLANT INSTALLATION)



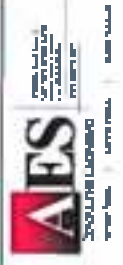
3D VISUALIZATION - MATURE HEIGHT BUFFER PLANTING



UNIMPROVED BUFFER 3D VISUALIZATION POINT B
 BLUE STAR HIGHWAY SOLAR SITE CLIP

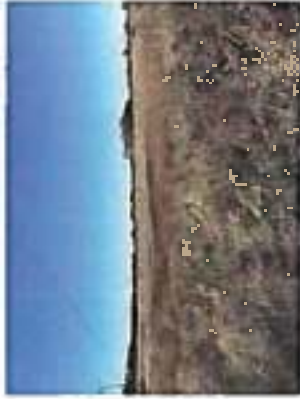
SUSSEX COUNTY, VIRGINIA

10000 BLUE STAR HIGHWAY, SUDBURY, VIRGINIA 22454





SITE VISIT PHOTOGRAPH



3D VISUALIZATION - BEFORE BUFFER PLANTING



3D VISUALIZATION - AFTER BUFFER PLANTING (PLANT INSTALLATION)



3D VISUALIZATION - NATURAL HEIGHT BUFFER PLANTING



PROPOSED BUFFER 3D VISUALIZATION POINT A
BLUE STAR HIGHWAY SOLAR SITE CUP

RUSSELL COUNTY, VIRGINIA

101 Blue Star Highway - Charlottesville, Virginia 22904





SITE VISIT PHOTOGRAPH



3D VISUALIZATION - BEFORE BUFFER PLANTING



3D VISUALIZATION - AFTER BUFFER PLANTING (PLANT INSTALLATION)



3D VISUALIZATION - MATURE HEIGHT BUFFER PLANTING

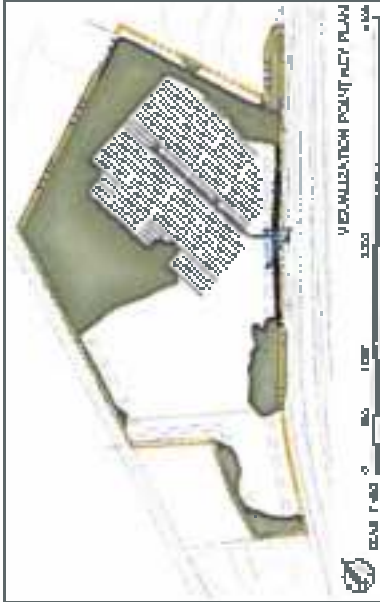


PROPOSED BUFFER 3D VISUALIZATION POINT B
 BLUE STAR HIGHWAY SOLAR SITE CUP

SUSSEX COUNTY, VIRGINIA

1015 MARKET STREET • ARLINGTON, VIRGINIA 22204-3001





SITE VISIT PHOTOGRAPH



3D VISUALIZATION - BEFORE BUFFER PLANTING



3D VISUALIZATION - AFTER BUFFER PLANTING (PLANT INSTALLATION)



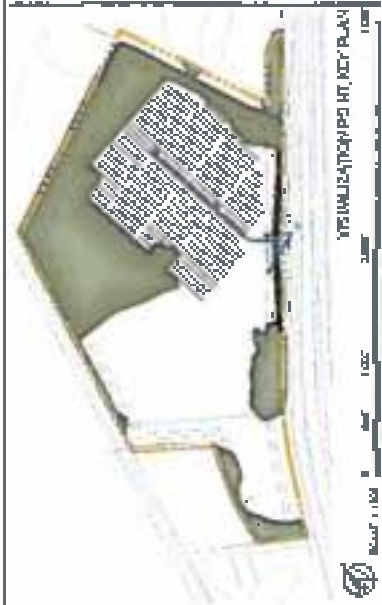
3D VISUALIZATION - MATURE HEIGHT BUFFER PLANTING



PROPOSED BUFFER 3D VISUALIZATION POINT 'C'
BLUE STAR HIGHWAY SOLAR SITE CUP

BLUES STAR HIGHWAY, VIRGINIA
 (480) 424-4444 | www.aes.com





SITE VISIT PHOTOGRAPH



3D VISUALIZATION - BEFORE BUFFER PLANTING



3D VISUALIZATION - AFTER BUFFER PLANTING (PLANT INSTALLATION)



3D VISUALIZATION - MATURE HEIGHT BUFFER PLANTING



PROPOSED BUFFER 3D VISUALIZATION POINT 4C
 BLUE STAR HIGHWAY SOLAR SITE CUP

BLUE STAR HIGHWAY SOLAR SITE CUP
 BLUE STAR HIGHWAY SOLAR SITE CUP
 BLUE STAR HIGHWAY SOLAR SITE CUP

Blue Star Solar, Site 2

Public Facility Application Review for 2021-03

Code of Virginia Section 15.2-2232

(Refer to Site 1 duplicate application documents)

**Staff Report
Blue Star Solar 2
Public Facility Application Review for 2021-03
Code of Virginia § 15.2-2232
Sussex County, Virginia**

**Report Date: March 23, 2021
Planning Commission Meeting Date: April 5, 2021**

APPLICATION SUMMARY

Project:	Blue Star Highway Solar 2, 3MW _{AC}
Location:	Located along Blue Star Highway (Route 301), immediately west of Interstate 95, 2 miles north of Jarratt, Sussex County.
Parcel Record Numbers:	138-A-1
Proposal:	Applicant's request for review of the Blue Star Hwy Solar 2 pursuant to Virginia Code Section 15.2-2232
Application Submitted:	February 17, 2021
Applicant(s):	Blue Star Hwy Solar 2, LLC, c/o Borrego Solar Systems, Inc. 55 Technology Drive, Suite 102 Lowell, MA 01853
Representative:	Alexander E. Deuson, PE, Civil Engineer Borrego Solar Systems, Inc.
Parcel Owner(s):	Molly P. Johnson

PLANNING COMMISSION ACTION

The Applicant has requested that the Planning Commission review its proposed solar energy facility, as a "public utility facility" under Virginia Code Section 15.2-2232(A), to determine whether the general or approximate location, character, and extent of the proposed facility is substantially in accord with the County's Comprehensive Plan. As required by the Zoning Ordinance, the Applicant submitted a 2232 Review Application (County reference number: 2021-03) that was deemed complete on February 25, 2021 (Attachment A).

Staff has recommended that the Planning Commission review the request for determination under Virginia Code Section 15.2-2232 prior to any review of a conditional use permit (CUP) application. Subject to the Planning Commission's 2232 decision, the Planning Commission will separately review and consider the merits of any associated CUP Application.

PURPOSE OF THE REVIEW UNDER VIRGINIA CODE SECTION 15.2-2232

Virginia Code Section 15.2-2232 requires that the Planning Commission review all proposed developments that include a "public utility facility" prior to the construction or authorization of such facility. The purpose of the Planning Commission's review is to determine whether the general or approximate location, character, and extent of the proposed public utility facility is substantially in accord with the Sussex County Comprehensive Plan or part thereof. The Planning Commission has set aside time at its April 5, 2021, meeting to afford citizens an opportunity to offer their comments to the Planning Commission. The Planning Commission must advise the Board of Supervisors of its determination. If appealed by the Applicant, the Board of Supervisors may overrule the action of the Planning Commission.

RELEVANT CONSIDERATIONS

Solar facilities less than or equal to 5 MW are:

- Subject to 2232 review (Virginia Code § 15.2-2232).
- Subject to a CUP review.
- Required to send DEQ a notification of intent and certification from a locality showing compliance with land use ordinances (9VAC15-60).
- Eligible to agree to a reasonable cash payment (Virginia Code §15.2-2288.8).

Solar facilities less than or equal to 5 MW are NOT:

- Subject to DEQ's Permit by Rule process (9VAC15-60).
- Taxed on M&T (Virginia Code § 58.1-3660).
- Eligible for revenue under a revenue share ordinance (Virginia Code § 58.1-2636).
- Eligible for a siting agreement (Virginia Code § 15.2-2316.6).

PROPOSED DEVELOPMENT

The Applicant is proposing two adjacent 3 megawatt (alternating current) photovoltaic solar energy generation facilities on 50 acres of a 142 acre parcel. This 2232 application (2232 2021-03) is for the front/southern 3 MW facility (site #2). A second 2232 application (2232 2021-02) is for the rear/northern 3 MW facility (site #1). The Applicant is proposing the two separate facilities to meet the Dominion Energy request for proposals for 3 MW facilities. Dominion allows the 3 MW facilities to be sited adjacent to each other as in these two proposals (they use the term "stacking"). If approved by the county, the Applicant will submit both projects to Dominion who may choose to purchase one, both, or none. If both facilities are constructed, they will effectively look and operate as a 6 MW facility.

The project infrastructure will consist primarily of solar photovoltaic modules (PV panels) mounted on steel racking structures, inverters, a transformer, and control cabinet, switch gear, meter, interconnection, and security fencing. Portions of the equipment will be mounted on concrete pads. No new buildings will be constructed, and no existing buildings utilized or expanded. Energy storage battery facilities are not proposed. Each project will include PV panels on approximately 17% of the 142 acre parcel.

The project is generally bound to the south by Route 301, to the west by a CSX Railroad line, to the east by a residential drive/right-of-way, and to the southwest by an unimproved agricultural road with residences off Wyche Ln beyond. There is an existing access road on the property.

According to the Applicant, energy generated will be connected to the grid at an existing 3-phase distribution line on Route 301.

The project is setback at least 150 feet from all property lines, with proposed vegetative buffers. The nearest residence would be 950 feet from the nearest solar panels.

The Applicant forecasts construction to begin in 2022 and last six to eight months, dependent on weather. The proposed plans for vegetative buffers include many non-native, potentially invasive plants such as Japanese cedar (*Cryptomeria japonica*), Japanese cherry (*Prunus x yedoensis*), Chinese holly (*Ilex x "Nellie R. Stevens"*), Chinese elm (*Ulmus parvifolia*), Asian sycamore hybrids (*Platanus x acerifolia* "bloodgood"), and Indian crepe myrtle (*Lagerstroemia indica*).

EXISTING CONDITIONS AND ZONING

The project is contained within the Jarratt/I-95/US 301 planning area. The project area is located in the A-1 Agricultural zoned section of the parcels. The A-1 Agricultural zoned section of the parcels has primarily been used for agricultural production. The future land use designation of the project area is a combination of residential and agricultural/forested/open space.

The project area is setback an adequate distance from Route 301 and the nearby residences. The parcel is bordered on the opposite side by a CSX railroad, and there is forested buffer between the site and residences to the northeast.

The Applicant contracted ECS Mid-Atlantic, LLC to make a determination on whether there are any recognized wetlands according to federal guidelines. They identified three (3) areas which would meet the criteria set by the Army Corps of Engineers as protected wetland habitat in an area totaling less than 1 acre. ECS expects this will likely require a wetlands permit from the Corps at the time of final construction permitting.

The Applicant contracted ECS Mid-Atlantic LLC to determine whether there are any recognized environmental conditions (RECs) on the site. They found no concerns.

The Applicant contracted the James River Institute for Archaeology, Inc. to determine whether there are any cultural resources on or near the project site. None were found concurrently or historically. Site 2 will require minimal tree removal (Site 1 will require tree removal on the majority of the 25 acre project area). The existing trees and wetland vegetation surrounding the project area will provide natural screening.

The project area is relatively flat and will require minimal grading and minimal new stormwater infrastructure. The Applicant is proposing 3 new bioretention ponds for stormwater management.

ADJACENT AND SURROUNDING USES

The project is roughly 2 miles from the town boundary of Jarratt. The project area is adjacent to five (5) parcels (Attachment A) with 4 others nearby that are all agriculturally zoned and include residences, agricultural and forestry uses, and a railroad. The future land use map designates these parcels as agricultural/forested/open space and residential.

The Applicant contracted ECS Mid-Atlantic, LLC for a review of potential natural heritage resources in and around the project area. Using DCR's database, they found no natural heritage sites on the property. There are a number of state and federally threatened species which have potential habitat within a 2-mile radius, but most are aquatic and should not see significant or any impact if proper sediment and erosion control measures are taken. One species, the state-threatened Mabee's salamander (*Ambystoma mabeei*), may have only marginal habitat on the project parcel's identified wetlands, but there have been no confirmed sightings within 2 miles. Of bigger concern is the state-endangered Rafinesque's eastern big-eared bat (*Corynorhinus rafinesquii macrotis*), which has confirmed sightings within 2 miles and has potential habitat on the project site. Coordination with the Virginia Department of Wildlife Resources may be required to ensure potential habitat is not destroyed.

COMPREHENSIVE PLAN CITATIONS

The Comprehensive Plan 2004-2005 update was adopted on October 20, 2005. The plan was amended April 2, 2019, to specifically address solar generating facilities. The plan describes the general trends and future preferences for development with emphasis on maintaining the rural character of the county.

Chapter II: Concerns and Aspirations, section B. Issues and Existing and Emerging Conditions (p.II-12), item 23. Utility-scale Solar Facilities states:

As used in this Comprehensive Plan, a utility-scale solar facility is a facility that generates electricity from sunlight which will be used to provide electricity to a utility provider or a large private user with a generating capacity in excess of one megawatt (1 MW). Sussex's abundant agricultural and forest land combined with its electrical infrastructure and transportation system appear to be attractive to the solar industry. These facilities are an industrial scale land use that occupy significant acreage. Many utility-scale solar facilities are located on agricultural or forested land that may have had other future land use potential or land use designations.

The County will consider solar facilities in districts zoned agricultural or industrial with preference for brownfields and County-owned capped landfills. The following site features should be addressed to mitigate the potential negative impacts of utility-scale solar facilities on County land use patterns as part of the evaluation of a Conditional Use Permit (CUP) application:

- The total size shall be larger than two (2) acres but less than 1,500 contiguous acres with no more than 65% PV panel coverage;
- Located outside planning areas or community hubs;
- Located outside forested areas to preserve forest resources;
- Further than three (3) miles from any village or town boundary;
- Further than two (2) miles from other existing or permitted solar facilities; and
- Proximity to residences, historic, cultural, recreational, or environmentally sensitive

areas; and scenic viewsheds.

Chapter II: Concerns and Aspirations, section C. County Vision, item 2. Vision Statement on p.II-13 states:

Sussex County seeks to maintain its rural character and natural beauty. The County is intent upon protecting its forest resources, agricultural lands, and natural environmental systems. It will accomplish its objectives by: concentrating commercial and industrial development along US 460 and the I-95/US 301 corridor and in other areas where adequate infrastructure exist to support such development; balancing residential and commercial land uses; protecting and preserving viewsheds; protecting and preserving the natural environment and surface and ground waters; promoting smart growth practices and prudent land use decisions; and discouraging over development and strip development along State maintained roads.

Chapter IX: Land Use and Development, section B. Land Use Conflicts (p.IX-2) lists several issues to consider in addressing land use conflicts:

Land use conflicts that occur in Sussex County are typical of similar Virginia counties that must balance the needs of, and activities associated with, agriculture, forestry, and conservation uses with residential, commercial, industrial, and public uses. With respect to land uses and development, the County must remain cognizant and carefully consider a variety of issues when making land use decisions. Issues relevant to solar facilities include:

- Encroachment of residential and other urban-level land uses into traditional agricultural and forestry areas.
- The balance between needed commercial and industrial development and the conversion of vacant land.

Chapter X: Plan for the Future, section A. Introduction provides guidance for each land use type. **Item 1. Agricultural and Forested Lands (p.X-1)** states:

Agricultural land is one of the most valuable of all-natural resources. Of major importance, and an objective of land use planning in Sussex County is to identify prime agricultural land and to preserve it from being developed for residential or other land uses. Once developed, it cannot easily be restored to its original condition (nature).

Item 3. Industrial Development (p.X-2) states:

Industry, which will provide much of the basic employment needed for anticipated growth, has more critical location requirements than other major land uses. Prime industrial sites should be located where they can be served by major transportation facilities, including major highways, railroads, and airports. Industries dependent upon the transportation of heavy materials and products require locations served by railroad facilities. Other types of industry may prefer locations near major highways to facilitate truck service and access by employees, and still others may seek location near the airport. In addition to transportation facilities, industries should be in locations where adequate public utilities and services can be provided. Other requirements include suitability of sites with respect to slope, drainage, and soil bearing capacity, and suitable buffering from residential or other incompatible uses.

Potential industrial sites are located on the fringe of the existing towns, along the corridors of U.S.301, I-95, and the CSX Railroad, in the western portion of the County, and along the U.S. 460 and Norfolk Southern Railroad in the eastern portion of the County. Also, areas on the north side of Cabin Point Road (State Route 602) may be suitable for industrial development. Sussex County is one of the few localities in Virginia that have been identified as having the potential and available acreage necessary to develop a mega industrial site.

This chapter also includes section C. County-wide Goals and Objectives clearly delineating 22 issues, each with one or two goals and several objectives (tactics). There are seven (7) issues and ten (10) goals relevant to the subject of solar facility siting.

Issue 1 Commercial and Industrial Development (p.X-10)

Goal 1: Promote economic development that will assure employment stability and provide ready access to needed goods and services in the County. Encourage local expansion and new industry location in the County to broaden the tax base and increase employment opportunities.

Goal 2: Sustainable commercial and industrial development in areas where such activities already occur or can be reasonably accommodated by public facilities and the County's natural systems and to encourage local support and patronage of County business.

Issue 2 Community Appearance (p.X-12)

Goal 1: Guide and support sound and attractive land use development with the County that will result in the least possible adverse fiscal and environmental impact.

Goal 2: Remain aesthetically pleasing while maintaining rural atmosphere, open spaces, and natural areas.

Issue 6 Growth Management (p.X-14)

Goal 2: Promote environmentally friendly development that is sustainable, aesthetically pleasing, and consistent with the County's rural image and character.

Issue 8 Infrastructure Carrying Capacity and Provision for Facilities and Services (p.X-16)

Goal 2: Ensure that public systems and services are sized, located, and managed to protect or restore the quality of areas of environmental concern or other fragile areas while providing adequate levels of service to meet the needs of citizens.

Issue 10 Land Development and Land Use Compatibility (p.X-18)

Goal 2: Ensure that development and use of resources or preservation of land minimizes direct and secondary environmental impacts, avoids risks to public health, safety and welfare and is consistent with the capability of the land based on considerations of interactions of natural and man-made features.

Issue 11 Natural Systems (p.X-20)

Goal 1: Preserve and develop forestry, agriculture, and related industry as important economic components of the County. Provide for the wise use of the County's nonrenewable earth and mineral resources, while protecting the beauty of the landscape.

Goal 2: Conserve protective functions of wetlands, flood plains, and other shoreline features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

Issue 21 Water Quality (p.X-26)

Goal: Maintain, protect, and where possible, enhance water quality of public waters.

In this chapter, Section D. **Planning Areas' Goals and Objectives** provides specific goals and objectives under the 22 issues for each planning area. The **Jarratt/I-95/U.S. 301 Planning Area goals and objectives** relevant to the subject of solar facility siting are below.

Issue 1 Commercial and Industrial Development (p.X-31)

Objective 5/Objective 14: Provide and maintain natural buffers such as open spaces, trees, and shrubbery between industrial and residential areas.

Issue 2 Community Appearance (p.X-32)

Objective 1: Utilize the County's Zoning Ordinance to prevent the location of incompatible land uses or other potential nuisances in the planning area.

Issue 11 Natural Systems (p.X-20)

Goal: To preserve and protect the predominately agricultural, forestall, and rural character of the Jarratt/I-95/U.S. 301 Planning Area.

Objective 1: Protect the agricultural and forestall areas by discouraging premature conversion of prime farmland and woodlands for residential, commercial, or industrial development.

Objective 3: Prevent incompatible land uses from locating in the vicinity of prime agricultural areas.

Objective 7: Identify the environmentally sensitive areas that pose constraints to development such as floodplains, wetlands, areas with steep slopes, and areas with undesirable soil conditions.

Objective 11: Continue to provide for soil erosion and sediment control as land is developed.

Objective 12: Maintain the rural character of the planning area.

Chapter XI: Tools for Managing Development, section A. Guide for Land Use Decision-Making (p.XI-2) offers general criteria to consider when evaluating a proposed development or ordinance amendment.

The Commission, however, should also look beyond the plan and consider whether proposed developments, even if consistent with the plan, advance the best interests of public health, safety, and general welfare. This very general criterion calls for consideration of a wide range of issues, including, but not limited to the potential impact of a development on:

- **The natural environment** – i.e., how a proposed development might affect air quality, water quality, flooding, erosion, important natural areas, etc.;
- **Important natural resources** – i.e., how a proposed development might threaten or enhance the continued availability and efficient use of finite natural resources for agriculture or forestry;
- **The transportation system** – i.e., whether any additional traffic generated by a proposed development can be safely and efficiently accommodated by the County's transportation facilities;
- **The provision of utilities and services** – i.e., whether an additional demand for water supply, electricity, refuse collection, fire and police protection, education, health care, recreation, etc. generated by a proposed development can be safely and efficiently accommodated by public, community, or private utility and service systems;
- **The County economy** – i.e., how a proposed development might affect employment opportunities and the general health of the Sussex County economy;
- **Important historical, architectural, archeological, and cultural resources** – i.e., how a proposed development might threaten or enhance the continued existence and integrity of resources of architectural, archeological, or cultural significance;
- **Neighboring development** – i.e., how a proposed development or development allowed by an amendment might affect living or working conditions in neighboring areas (including whether development might deter or enhance the appropriate development or conservation of neighboring property);
- **Community function, character, and attractiveness** – i.e., how a proposed development or development allowed by an amendment might enhance the attractiveness and functional mix of land uses needed to meet the needs of future populations and avoid adverse impacts; and,
- **Provision of affordable and convenient housing**– i.e., how a proposed development might affect people's ability to find affordable housing reasonably accessible to their place of employment.

STAFF COMMENTS AND ANALYSIS

A. Applicant's Position

In the application materials (Attachment A), the Applicant set forth its reasons why the proposed project is substantially in accord with the Comprehensive Plan.

The Applicant identifies the following items in support of its project:

- The proposed project is:
 - Located in an agricultural district
 - Less than 1,500 contiguous acres
 - Less than 65% solar panel coverage
 - Adjacent to a few residential properties with existing forest buffers
 - Not proximate to eligible historic, cultural, or recreational areas or scenic viewsheds
 - Adjacent to surface waters and wetlands, but mitigation measures are proposed to protect these areas

- A Dominion transmission line is near the property for interconnection to the grid.
- The project will generate minimal offsite noise, little glare, and no emissions or safety hazards.
- After the construction is complete, there will be limited ongoing maintenance, and the ingress/egress traffic will remain similar to current use patterns.
- The project will generate tax revenue and create temporary construction jobs.
- Solar facilities are a low intensity use that do not require county infrastructure or resources.

B. Staff Analysis

Staff has analyzed the proposed project considering the recently approved amendments and other relevant sections of the County's Comprehensive Plan, primarily:

- Chapter II, section B, item 23. Utility-scale Solar Facilities
- Chapter II, section C, item 2. Vision Statement
- Chapter IX, section B. Land Use Conflicts
- Chapter X, section D. Jaratt/I-95/Route 301 Planning Area goals and objectives

In addition to the items identified by the Applicant above, staff analysis considerations include:

- The project is 2 miles from the town boundary for Jaratt. The guidelines recommend greater than three (3) miles from the closest town boundary to allow for future growth and urbanization.
- The project is within the Jaratt/I-95/Route 301 Planning area.
- The project is located in an area designated for residential and agricultural/open space use in the Jaratt/I-95/Route 301 Future Land Use map.
- This project is proposed at the same time as an identical project on the same parcel (2232 2021-02). The two facilities would be closer than two (2) miles from each other and would essentially appear as one six (6) MW facility.
- There are wetlands directly abutting the project site which will require careful consideration.
- Some trees will need to be cleared to prevent overshadowing.
- Non-native plants were proposed. Native plants that preserve the rural character of Sussex and enhance natural resources and habitats should be considered.
- The project site is located within 0.5 miles of the Interstate 95 and Route 301 interchange and will utilize land near a key transportation network that would be more suitable for higher intensity development, such as commercial or industrial uses that could generate revenue and jobs.

The location, character, and extent of the proposed utility-scale solar project are in accord with these guidelines set forth in the Comprehensive Plan, Chapter II, section B, item 23. Utility-scale Solar Facilities.

- The project section of the parcels is zoned agricultural.

- The total size is less than 1,500 contiguous acres.
- There is no more than 65% solar panel coverage.

The location, character, and extent of the proposed utility-scale solar project are not in accord with these guidelines set forth in the Comprehensive Plan, Chapter II, section B, item 23. Utility-scale Solar Facilities.

- The project is less than three (3) miles from the town boundary for Jarratt.
- The project is within the Jarratt/I-95/Route 301 Planning area.
- The project is located in an area designated for residential and agricultural/open space use in the Jarratt/I-95/Route 301 Future Land Use map.
- Non-native plants in the project proposal are not in keeping with the rural character of Sussex.

Staff has analyzed the Comprehensive Plan elements, and the proposed project does not appear to meet the Comprehensive Plan's land use goals, objectives, and strategies. Based on the information reviewed for this report, staff finds that the proposed utility-scale solar facility is not in accord with the Sussex County Comprehensive Plan, or parts thereof. The proposed project does not meet the use criteria set for the given planning area.

As recommended in the Comprehensive Plan, the Commission, however, should look beyond the plan and consider whether proposed developments, even if consistent with the plan, advance the best interests of public health, safety, and general welfare. This very general criterion calls for consideration of a wide range of issues, including, but not limited to the potential impact of a development on:

- The natural environment
- Important natural resources
- The County's economy
- Important historical, architectural, archeological, and cultural resources
- Neighboring development
- Community function, character, and attractiveness

The question before the Planning Commission with this 2232 application is:

Whether the general location or approximate location, character, and extent of the proposed solar energy facility is substantially in accord with the Comprehensive Plan or parts thereof.

- The Planning Commission should consider all relevant portions of the Comprehensive Plan in its analysis.
- The Planning Commission should carefully and thoroughly document its reasons for whatever conclusion it reaches.
- The Planning Commission has three options:

- a. Determine that the application is not substantially in accord with the Comprehensive Plan with written reasons for its decision.
- b. Determine that the application is substantially in accord with the Comprehensive Plan with written reasons for its decision.
- c. Defer making a decision on the comprehensive plan compliance review for further discussion and consideration (within the 60-day window).

Attachment:

A – CUP Application 2021-03, submitted February 17, 2021.

DRAFT PLANNING COMMISSION ACTIONS

Staff Recommendation; Option 1 – Applicant’s proposal is not substantially in accord with the Comprehensive Plan

I move that Blue Star Hwy Solar 2, LLC’s proposed 3 megawatt photovoltaic solar energy facility as described in application 2021-03, is not substantially in accord with the Sussex County Comprehensive Plan for the following reasons:

1. The project is adjacent to a residential land use and is not further than three (3) miles from the nearest town boundary.
2. The project area is in the Jarratt/I-95/U.S. 301 planning area.
3. This project is proposed at the same time as an identical project on the same parcel (2232 2021-02). The two facilities would be closer than two (2) miles from each other and would essentially appear as one six (6) MW facility.
4. The project site is located within .5 miles of the Interstate 95 and Route 301 interchange and will utilize land near a key transportation network that would be more suitable for higher intensity development, such as commercial or industrial uses that could generate revenue and jobs.

The Secretary of the Planning Commission is directed to communicate the Planning Commission’s findings to the Board of Supervisors.

Option 2 – Applicant’s proposal is substantially in accord with the Comprehensive Plan

I move that Blue Star Hwy Solar 2, LLC’s proposed 3 megawatt photovoltaic solar energy facility as described in application 2021-03, is substantially in accord with the Sussex County Comprehensive Plan or parts thereof for the following reasons:

1. The project parcels are zoned agricultural or industrial.
2. The total size is less than 1,500 contiguous acres.
3. There is no more than 65% solar panel coverage.
4. The proposed project involves only a small part of the total agricultural land in the County and will have setbacks and buffers which, if adequate in scope and required in the Conditional Use Permit, could afford protection for adjacent properties.

The Secretary of the Planning Commission is directed to communicate the Planning Commission’s findings to the Board of Supervisors.

Option 3 – Deferral of the application

I move that the Planning Commission defer a decision on Blue Star Hwy Solar 2 LLC’s request under Va. Code § 15.2-2232 regarding its proposed 3 megawatt photovoltaic solar energy facility as described in application 2021-03, until the Planning Commission meeting scheduled to begin at ____ p.m. on _____, in the Board of Supervisors meeting room.



Borrego Solar Systems, Inc.
55 Technology Drive, Suite 102
Lowell, MA 01851
804-904-7068

January 29, 2021

Sussex County Planning Department
21035 Princeton Road
Sussex, VA 23884
Attention: Ms. Beverly Walkup
Phone: 434-246-1043

Re: Conditional Use Permit Application Submittal
20201 Blue Star Highway (Site 2) - Proposed 3MW AC Solar Facility
Parcel Number: 138-A-1

Dear Ms. Walkup:

On behalf of Blue Star Hwy Solar 2, LLC (Project Company), Borrego Solar Systems, Inc. (Borrego) respectfully submits the enclosed Conditional Use Permit (CUP) Application to construct and operate a proposed small-scale solar facility located at 20201 Blue Star Highway in Sussex County, Virginia. Molly P. Johnson owns the subject property (Parcel Number 138-A-1) and authorizes Borrego to seek land use entitlements supporting the proposed project, refer to Attachment 7.

The following Attachments support Borrego's CUP application in compliance with County Ordinances and discussions with County representatives:

Attachments

1. CUP Application
2. Permit Fee Check
3. Conceptual Landscaping Plan
4. Project Narrative
5. CUP Permit Plans
6. Decommissioning Estimate
7. Owner Authorization & Signature

Also enclosed for your reference are the following Exhibits documenting due diligence efforts undertaken by Borrego to date:

Exhibits

- A. Waters of the US Delineation Report
- B. Phase I Environmental Site Assessment
- C. Threatened and Endangered Species Review
- D. Preliminary Cultural Assessment

The proposed project site has been conceptually designed as a "stacked" solar facility, defined as two (2) separate and independent projects each of 3MW AC nameplate capacity. Stacked solar facilities are proposed throughout the Commonwealth, including at the proposed project site, to meet the capacity requirements of the Virginia Clean Economy Act. Pairing identically sized solar facilities in one project location enables cost-sharing of interconnection expenses and other synergies, and is a widely accepted mechanism of Distributed Generation electrical capacity construction.

At the proposed project site, Blue Star Highway Solar 1 and Blue Star Highway Solar 2 are proposed. The proposed project site and facilities may also be eligible for participation in a Community Solar or other program format given refinement in the understanding of renewable energy requirements in the Commonwealth. Refer to Attachment 4 for additional information.

Borrego endeavors to meet the requirements of Sussex County's CUP process and has met with County Staff at various times in late 2020 to review the proposed projects. For transparency and in respect of the community, Borrego has notified neighbors of the proposed project's application for entitlements. Borrego is working to schedule and hold a meeting with the community to discuss the project in an appropriate and safe format given the uncertainty of current global events.

Borrego proffers compliance with the County's governing Ordinance Section 16-404 of Article XXIII Solar Facilities as follows:

- (a) *Pre-application meeting.* Held with County Staff on December 18, 2020.
- (b) *Comprehensive Plan Review.* Refer to Attachment 4. Through the use of appropriate landscaping and vegetative screening, the projects' location is compliant with the character and extent of the adopted Comprehensive Plan, and substantially in accordance with regional goals outlined in the approved document conforming with Sec. 15.2-2232 of the Virginia Code.
- (c) *CUP Application.* Refer to Attachment 1 and Attachment 2.
- (d) *Concept plan.* Refer to Attachment 5. The guidance set forth in Section 16-404 has been demonstrated in Borrego's conceptual plans.
- (e) *Concept plan compliance.* The proposed projects are individually beneath the threshold to qualify for DEQ's Permit By Rule (PBR); this section is not applicable.
- (f) *Decommissioning plan.* Refer to Attachment 6. The guidance set forth in Section 16-404 has been adhered to in Borrego's analysis.
- (g) *Decommissioning escrow/surety.* To be determined upon consideration by the County.
- (h) *Traffic study.* Refer to Attachment 4. Minimal traffic is anticipated during the operational life of the project.
- (i) *Estimated construction schedule.* Refer to Attachment 4. Borrego expects the project to be operational by 12/31/2022, with construction occurring during the summer of 2022.
- (j) *Wetlands and waterways delineation.* Refer to Exhibit A.
- (k) *Environmental Inventory.* Refer to Exhibit D.
- (l) *Visual impact analysis.* Refer to Attachment 3.

Section 16-409 of Article XXIII of the Sussex County Ordinances, as adopted, outlines conditions the Board of Supervisors may find appropriate in granting land use entitlements for solar facilities. As discussed with County planning Staff on December 18, 2020, the proposed projects' nameplate capacities are below the threshold of eligibility for a Siting Agreement under VA Code 15.2-2316.7.

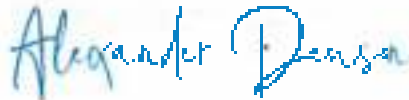
Borrego. Powering your Growth.

Borrego looks forward to discussions with Sussex County regarding the potential appropriateness of utilizing Title 15.2, Article 7 of the VA Code in accommodating the proposed project.

Outside of direct economic benefit at the governmental level, solar facilities at the scale of the proposed projects provide diverse advantages to Sussex County. Increased property value with associated assessments, local spending during construction, and lease payments to property owners throughout the facility lifecycle work to create diversity in the local economy without straining existing infrastructure. The proposed project requires no utility services, does not utilize existing water resources, and generates no air emissions.

Should you have any questions or require additional information, please contact me at adeuson@borregosolar.com or 804-904-7068. Thank you for your consideration of the proposed permit application.

Very Truly Yours,



BORREGO SOLAR SYSTEMS, INC.
Alexander E. Deuson, PE
Civil Engineer

Cc: BOX file, John Bennett, PE (AES)

Procedure for Conditional Use Permit Applications

- STEP ONE.** Applicant completes the appropriate application furnishing information as requested on application and pays the appropriate fees.
- STEP TWO.** Director of Planning reviews the application and accompanying materials. The request is scheduled for public hearing with the Planning Commission.
- STEP THREE.** The first public hearing is advertised as required by local and state ordinances.
- STEP FOUR.** Official notice of the public hearing date will be provided to the applicant and adjacent property owners by the county.
- STEP FIVE.** The planning commission holds a public hearing. A determination is made and a recommendation is forwarded to the Board of Supervisors.
- STEP SIX.** The second public hearing is advertised as required by local and state ordinances and an official notice given to the applicant and adjacent property owners by the County.
- STEP SEVEN.** The Board of Supervisors holds public hearing. A final determination is made by the Board.

Site 2 (southern Site)

CUP Number: _____

Date Application Filed: _____

\$500 Processing Fee Received By: _____



Sussex County Planning Department
Post Office Box 1397
21035 Princeton Road
Sussex, Virginia 23884
Phone: 434-246-1043
Fax: 434-246-2175

CONDITIONAL USE PERMIT APPLICATION

Owner Information:

Name: Molly P Johnson

Address: 4503 Coventry Road
Richmond, VA 23221

Phone Number: (804)613-3170

Applicant Information:

Name: Blue Star New Solar 2, LLC

Address: c/o Borrego Solar Systems, Inc.
55 Technology Drive, Suite 102 Lowell, MA, 01853

Phone Number: (804)804-7088

Legal Description of Property:

Tax Map Number: 138-A-1

Zoning District: A-1

Block Number: N/A

Lot Size (Acreage): 142.14

Election District: 5-Henry

Subdivision: N/A

Lot Number: N/A

Square Footage: 6,181,618

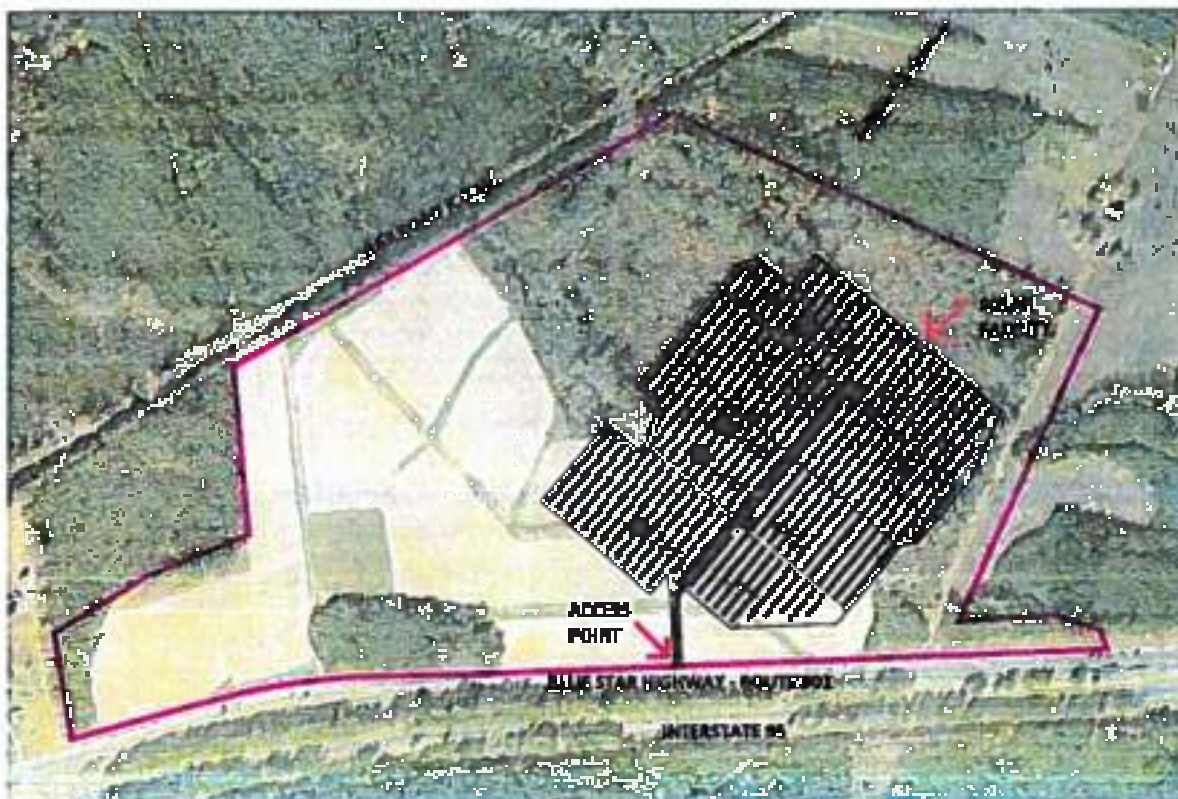
Please answer the following:

- When was property acquired by applicant? N/A (Lease agreement with owner)
- Are there any deed restrictions on the property in question? Yes No
(If yes, attach a copy of restrictions).
- What is the proposed use of property or type of improvement? Please be detailed and specific in your description. (For example: new construction, addition or demolition, agricultural, residential or commercial use)
Utility Scale Solar
- What is the Fair market value of improvements \$4,500,000
(Value must include all buildings, electrical, plumbing, and mechanical work to be performed).
- Describe briefly the type of use and improvements proposed. State whether new buildings are to be constructed, existing buildings are to be used, or additions made to existing buildings.
Proposed solar farms development, refer to attached drawings and reports.
- Describe how the proposed use and improvements are to be designed and arranged to fit into the development of adjacent property of the neighborhood.
Refer to attached Project Narrative.
- Furnish plot plan, preliminary site plan, and/or preliminary subdivision plat showing boundaries and dimensions of property, width of boundary sheets, location and size of buildings on site, roadways, walks, off street parking and loading space, landscaping and the like. Architect's/Engineer's sketches showing elevations of proposed buildings and complete plans are also desirable and if available should be filed with application.
Refer to attached drawings and renderings.
- I hereby certify that I have the authority to make the foregoing application and that the application, is complete and correct and that the conditional use permit is in accordance with section 18-403 & 404 of the Zoning Ordinance.

Owner Signature: _____ Date: 1/4/20

Applicant Signature: Alexander Denson Date: 1/4/20

Project Narrative
for
Conditional Use Permit Application
Proposed Solar Site
20201 Blue Star Highway
Sussex, VA



Borrego Solar Systems, Inc.
55 Technology Drive, Suite 102
Lowell, MA 0185

Prepared by AES Consulting Engineers
4120 Cox Rd, Suite D
Glen Allen, VA 23060

December 16, 2020



PROJECT NARRATIVE

The project is located along Blue Star Highway (Route 301), west of Interstate 95. The total site area is approximately 142 acres, per the Sussex County Geographical Information System (GIS) website. The agriculturally zoned parcel is identified as tax map number 138-A-1. The site will consist of two separate projects. Both projects are nearly identical in nature and have been entered into the interconnection queue with the local utility (Dominion). Blue Star Highway Solar 1 LLC and Blue Star Highway Solar 2 LLC, c/o Borrego Solar Systems Incorporated (BSSI) seeks to separately permit these projects at the County level to insulate against the possibility of one project being eliminated from consideration during the selection process with Dominion, which will not be determined until 2021 or later. Figure 2 below depicts site 1 which sits directly north of site 2. Figure 3 depicts site 2 which is set approximately 150 feet from the property line along Blue Star Highway.

The proposed leased area currently consists of existing forested conditions and active agricultural uses. The site is generally situated atop a ridge, with slopes approximately ranging between 1-5%. The parcel is bounded by Route 301 to the southeast. The parcel located to the northeast of the site is zoned A-1 and is of residential use. The parcel directly west of the site is occupied by CSX railroad. The parcel southwest of the site is also zoned A-1 and is currently completely forested. Lastly, the parcel south of the project is zoned A-1 and is of residential use. Refer to Figure 1 for the surrounding zonings.

Both proposed projects are 3 mega-watt utility-scale solar electricity generating. The proposed facility footprints are each expected to cover approximately 25 acres of land area (for each project). Each project will contain approximately 9,000 solar modules (panels), and generate approximately three (3) megawatts AC of electricity. The facilities will interconnect with the electrical grid via the existing three-phase lines at Route 301. Both sites will be encompassed by one continuous chain link fence and have a single access road. The solar facilities combined will encompass approximately 50 acres.

- A-1. General Agriculture
- R-R. Rural Residential
- R-1. General Residential
- R-2. Manufactured/Mobile Home Park
- B-1. Limited Business
- B-2. General Business
- B-3. Shopping Center
- I-1. Limited Industrial
- I-2. General Industrial
- PUD - Planned Unit Development



Figure 1

Once the sites are operational there will be virtually no personnel on-site. Maintenance for landscaping would be required approximately three times a year. The site is generally self-sufficient and unless the plant or any of the panels are malfunctioning, personnel will not be on-site.

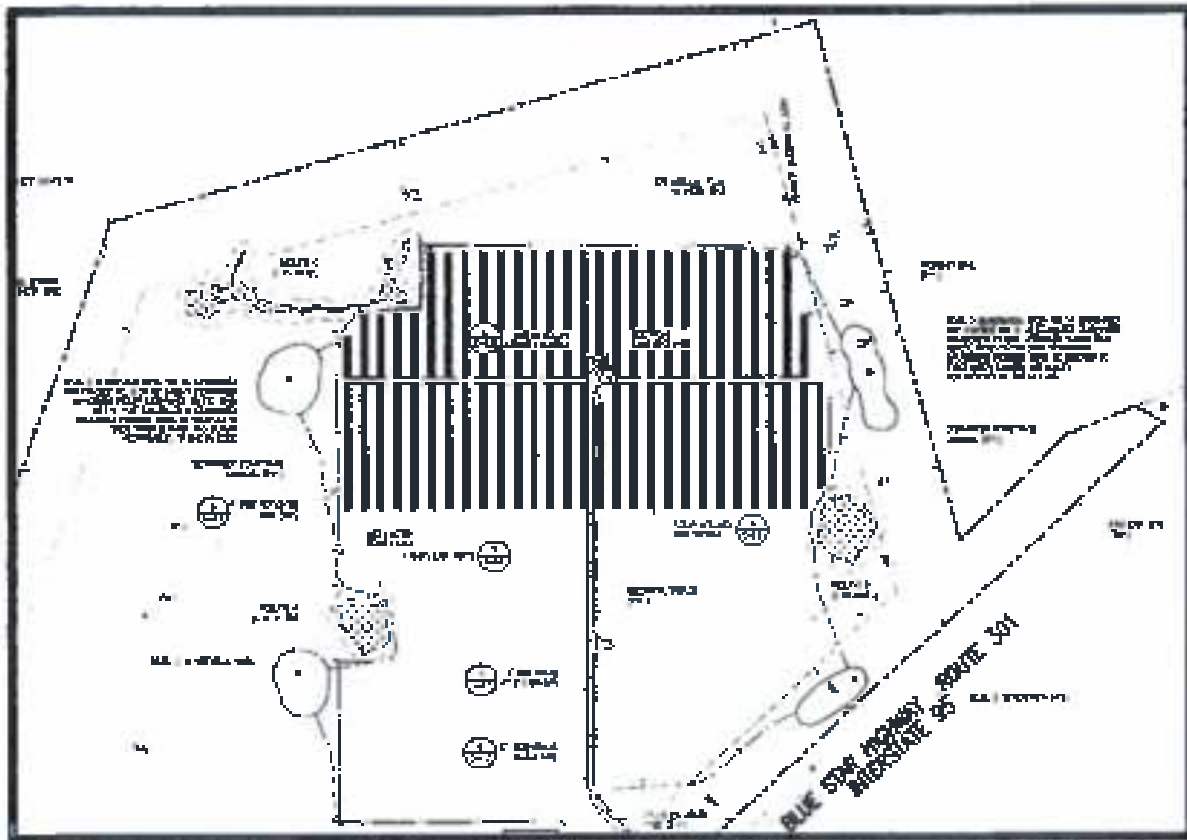


Figure 2

SITE 1

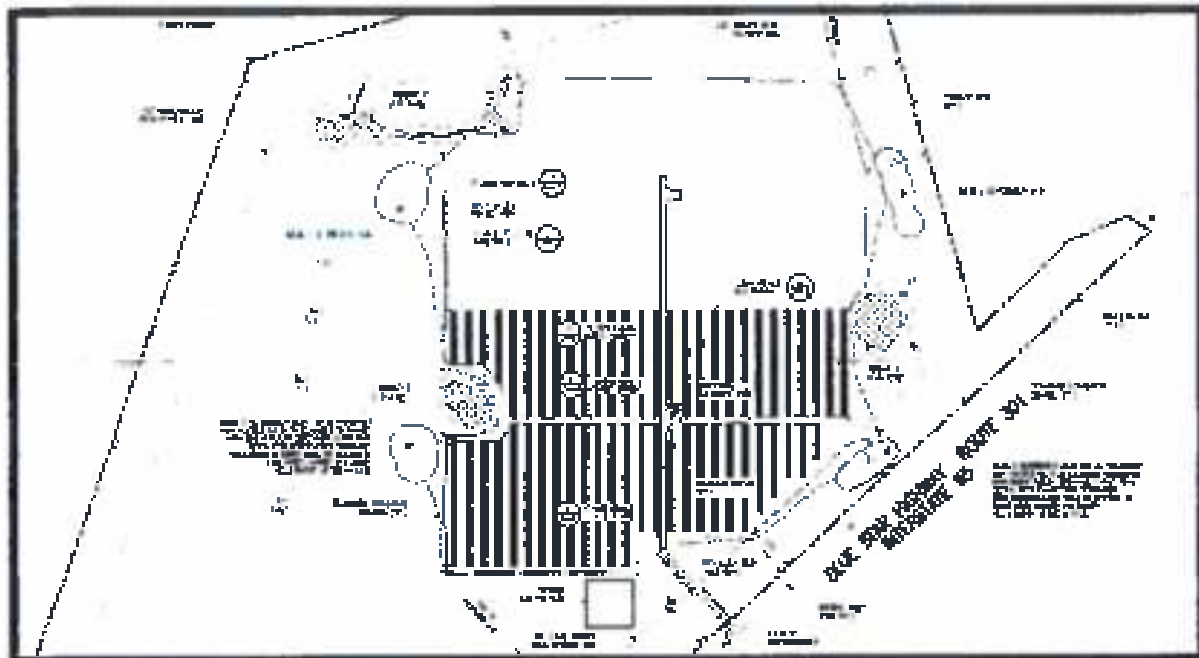


Figure 3

SITE 2

The project sponsor and applicants are Blue Star Highway Solar 1 LLC and Blue Star Highway Solar 2 LLC,

c/o Borrego Solar Systems Incorporated (BSSI). Consistent with industry standard, separate operating companies for each project are required for contractual terms with electrical utilities. BSSI proposes to lease land owned by Molly Prince Johnson, Trustee of the Alesa H. Prince Exemption Trust for the temporary installation of the facilities, targeting a lifespan of approximately 30 years. At the conclusion of the projects' lifecycle the facilities will be decommissioned, removed, and the land use, cover types, lines and grades, and character of the leased area restored to pre-project condition.

Environmental Inventory

A "Waters of the U.S. Study" (WQUS) was performed by ECS Mid-Atlantic, LLC dated September 30, 2020. The study has been submitted for your review. The wetlands are delineated on the Conditional Use Permit Site Plan, which was also submitted with the application package. The wetlands will not be impacted by the proposed development.

Additionally, a "Phase I Environmental Site Assessment" was performed by ECS Mid-Atlantic, LLC dated September 14, 2020. The assessment concluded that there is no evidence of recognized conditions for the subject parcel.

ECS Mid-Atlantic, LLC also performed a Threatened and Endangered (T&E) Species database review for the site dated September 9, 2020. The review included conducting a search of the Virginia Department of Wildlife Resources (VDWR), Fish and Wildlife Information Services (FIVIS) threatened and endangered species within a two-mile radius of the site. There were several species listed in the review. However, the habitat for most of the species does not appear to be present on the site or the development doesn't appear to pose adverse effects on the species. State endangered big-eared bat may be present; therefore, if any impacts to wetlands are proposed a VDWR review may be required. The review also included a U.S. Fish and Wildlife Services (USFWS) review and three species were listed as potentially inhabiting the site, but adverse effects to the species are not anticipated. ECS Mid-Atlantic, LLC also conducted a review of the DCR Heritage Data Explorer database and concluded that natural heritage resources are not present on the site. The studies mentioned have been submitted for your reference.

Per the Federal Management Agency (FEMA) mapping, there are no floodplains on the site. The development will not directly or indirectly impact national forests, state forests, national parks, or state parks.

Traffic Information

The site is located along Blue Star Highway (Route 301). It primarily runs north-south, is a two-lane, undivided, asphalt surfaced roadway with approximately 12 foot-wide travel lanes without shoulders. Ditches are located along both sides of Blue Star highway and the posted speed limit is 55 miles per hour. The closest intersecting road is Wyche Lane, approximately 200 feet from the southernmost corner of the property. There are a few residential drives that also connect to Blue Star Highway within 1,000 feet of the site.

The Average Daily Traffic Volume for this section of Blue Star Highway is 900 vehicles per day as determined by the Virginia Department of Transportation (VDOT) and published in their 2019 Annual Average Traffic Volume Estimates by Section of Route for Sussex County. Based on recent IRC design

service volume recommendations, the capacity of this section of Blue Star Highway is approximately 21,400 vehicles per day.

Based upon an analysis of the Virginia Department of Transportation (VDOT) Annual Average Traffic Volume Estimates by Section of Route for the Sussex County from 2005 to 2019, a fifteen (15) year period, the daily traffic volume has decreased from 1,000 to 900 vpd range. Since the traffic volumes have changed very little in the past 15 years, and there are no substantial changes anticipated in proposed land uses in this area based on the current Comprehensive Plan, it is reasonable to project no significant change in the future traffic volumes in this area for the analysis period extending out 10 years.

The solar facility is unmanned and there are few regular daily vehicle trips to the site anticipated, the traffic impacts of the proposed solar facility once it is up and running is nearly zero. There would only be less than ten trips generated per month anticipated for maintenance of the site. The frequency and number of additional vehicle trips daily and at the peak hour are so low the impact will be nearly imperceptible given the existing and anticipated traffic along this section of Blue Star Highway.

The traffic impacts during construction must be accommodated during the construction period as recommended above. However, the additional traffic anticipated during construction, estimated to be 6 to 8 months, will have a temporary impact on the daily traffic as well as the peak hour volumes. As such, the following items are recommended immediately preceding and following the construction period: 1) 1200' feet in either direction from the access point, along Blue Star Highway, on the site must be clearly marked as a Construction Zone using all appropriate signage in accordance with VDOT's construction zone guidelines; and 2) The roadway speed limit 1200' feet in either direction from the access point on the site must be temporarily reduced to 40 mph (from the current 55 mph) for at least one month before the construction work begins, in order to help drivers acclimate to the reduced speed limit before the construction traffic begins to arrive at the site, until one month after the construction ends.



Figure 4 – Blue Star Highway adjacent to subject parcel

Compliance with Comprehensive Plan

20201 Blue Star Highway Site 1 and 2 are designed to be in substantial accordance with the comprehensive plan. As previously mentioned, the site is approximately 142 acres and the projects will take up about 50 acres of the site. Hence, the total combined PV panel coverage will be approximately 35%. The site is located approximately two miles from the town boundary of Jarratt and within the Jarratt/ I-95/ U.S. 301 Planning Area. The parcel's projected use per the projected future land use based on the planning area is residential, agricultural, forested, and/or open space.

James River Institute for Archaeology, Inc performed a preliminary cultural resources assessment of the site and concluded that there are no recorded archaeological sites on or within a half-mile radius the site.

Natural Environment

The projects seek to have little to no negative effects on the environment, including air quality, water quality, flooding and erosion. A typical concern that may arise with solar developments is water quality and erosion. There is no mass grading proposed for these projects, and they will adhere to VA DEQ regulations for stormwater and erosion control. Complete stabilization of the land will be ensured to minimize the risks of erosion. There are no known floodplains on the property.

Additionally, several BMP's will be included in the final design as needed to treat any run-off prior to leaving the site and to achieve compliance with the VA stormwater regulations. The Virginia Department of Environmental Quality (DEQ), has determined that solar arrays are not considered an impervious surface unless the solar array is so close to the ground that storm water cannot flow freely beneath. The single axis tracking panels will be placed so that water will flow freely beneath the installed panels. Planted ground cover will be established and maintained under the panel arrays. The only impervious area associated with the solar arrays will be items physically attached to the ground (pillings, posts, equipment, etc.) and any supporting structures or access roads. Stormwater is proposed to be treated on site utilizing stormwater Best Management Practices. The proposed facility is anticipated to generate less than 2 acres of impervious area, including the initial construction laydown area, and will be treated for both water quality and quantity as required. As such, at the time of Site Plan submittal, calculations will be provided to confirm that the stormwater treatment is sufficient to meet design requirements established within the Virginia Stormwater Management Program regulations.

As previously mentioned, the projects will require minimal grading. Minimal grading will allow the possibility to return the land to its original state at the end of the project's life.

Neighboring Development

The property to the north and south of the site both contain residences. The development will produce little to no sound, hence, posing no noise impacts on the surrounding residents. The project is proposing a setback of 150 feet or more from all property lines. The closest resident to the project lies to the north and would be approximately 950 feet from the closest panel on the project.

Community Function, Character and Attractiveness, Visual Impact

One major goal of this development is to minimize the visual impacts the solar panels may pose on the community. In order to minimize the visual impact, plantings along Blue Star Highway are being proposed. A landscape plan and color perspective rendering are provided with the application to represent the existing and proposed views from Route 301 adjacent to the site.

Fiscal Impact Analysis

The proposed solar facility will be constructed using private funds and there are no public infrastructure required to support the facility. As such, there will be no capital, operations, maintenance, or replacement costs for public facilities needed to service the project.

Decommissioning Plan

Refer to the attached "Decommissioning Estimate/ Plan" for an analysis on the total cost of decommissioning the site.

Estimated Construction Schedule

If the Conditional Use Permit is granted by the County and approved for interconnection by Dominion, BSSI proposes to submit ministerial permit applications by mid-2021, aiming to have permits in hand by early 2022. The facility would be constructed and commissioned by late 2022 and fully operational by 12/31/2022.

