

PPRP

DRAFT

Assessment of the
Phoenix Solar Project

September 13, 2017

**MARYLAND POWER PLANT
RESEARCH PROGRAM**

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Sol Phoenix Solar, LLC (Sol Phoenix Solar) submitted an application to the Maryland Public Service Commission (PSC) on April 11, 2017 for approval to construct a 2.5 megawatt (MW) alternating current (AC) solar photovoltaic (PV) facility in Prince George's County, Maryland. Direct testimony regarding the Project was filed by the Applicant with the PSC on May 31, 2017.

Before the facility can be constructed, Sol Phoenix Solar must obtain a Certificate of Public Convenience and Necessity (CPCN) from the PSC. As part of the licensing process, the Power Plant Research Program (PPRP) of the Maryland Department of Natural Resources (DNR) has evaluated the facility's potential impacts to environmental and cultural resources in Maryland, pursuant to Section 3-304 of the Natural Resources Article of the Annotated Code of Maryland. This environmental and socioeconomic review was performed in coordination with other State agencies.

This report summarizes PPRP's evaluation of the Project in the following sections:

- Section 2 provides a description of the proposed site and facility components;
- Section 3 describes the Project's effect on biological resources;
- Section 4 presents socioeconomic resources and associated impacts;
- Section 5 presents the noise impacts from the Project;
- Section 6 discusses electromagnetic field impacts; and
- Section 7 summarizes the findings of PPRP's evaluations.

2.0 *PROJECT DESCRIPTION*

2.1 *Site Description*

The Phoenix Solar Project (Project) will be located on 12-acres of land located at 513 Rollins Avenue in Prince George's County, Maryland (see Figure 1). The Project will be located on three privately owned parcels and one plat identified as: Tax Map 73 Parcel 35, Tax Map 73 Parcel 54, Tax Map 73 Parcel 55, Tax Map 73 Subdivision 3760, Plat A-0036 (lots 9, 10, 11, 12, and part of 13) within the boundary limits of Xenia Avenue, Venture Avenue, and Rollins Avenue. The Applicant has contracted with the current property owner, SF Rollins Avenue, LLC, via a long-term lease agreement for the necessary acreage to accommodate the Project.

Although the Project site is zoned Residential Townhouse ("RT"), the site was previously used as an undocumented, Class III rubble landfill. The site would not likely be used for residential development, as it would require soil compaction due to presence of rubble debris in shallow soil. As such, the Project site is undeveloped and contains no buildings or existing structures. The Project is required to submit to Maryland-National Capital Park and Planning Commission (MNCPPC) for review under the Mandatory Referral Program. Thereafter, the Applicant will need local site plan approval from the Prince George's County Department of Permitting, Inspections, and Enforcement (DPIE).

The Project site is located in an urban setting surrounded by primarily forested areas and residences. The site lies within the boundary of Xenia Avenue, Venture Avenue, and Rollins Avenue within Prince George's County, Maryland. The Project site is bordered by forested areas along the western and southern portions of the site. In addition, some residences are located to the north, west, and east of the Project site. Since the site was previously a landfill, the fields have remained where indigenous trees and shrubs have grown into the open spaces.

The Project site has steep slopes along the margins of the property where natural drainage discharges to the banks of Watts Branch. Stone and concrete check-dams were installed at the property to reduce surface water drainage velocities. Such structures will remain at the Project site; however, due to the presence of steep slopes at the site, additional improvements such as construction of retaining walls will be implemented for stormwater management and sediment and erosion control.

The preliminary site layout indicates that approximately half of the Project site will need to be cleared of immature and poor quality tree stands to meet the generation requirements. The Applicant has indicated that Forest Conservation Act (FCA) requirements will be satisfied by developing a Forest Conservation Plan, Forest Conservation Easement, paying an in-lieu-of fee, and investigating availability of nearby FCA mitigation banks.

The Project site is located outside of the Critical Area, not within designated flood plain areas, and will have no impacts to wetlands. As summarized in the Response to PPRP Data Request 1-15, wetlands were delineated by ECS Mid-Atlantic, and a site walk was performed by the Maryland Department of the Environment (MDE). MDE issued a letter stating they reviewed the Project limits of disturbance and nontidal wetlands, and agree that the location of the solar panels have no impacts to jurisdictional areas of the State, including regulated 25-foot buffer areas. However, if Watts Branch is crossed underground by any component associated with the Project, then the Applicant will need to file a Joint Permit Application to MDE and the U.S. Army Corps of Engineers (USACE).

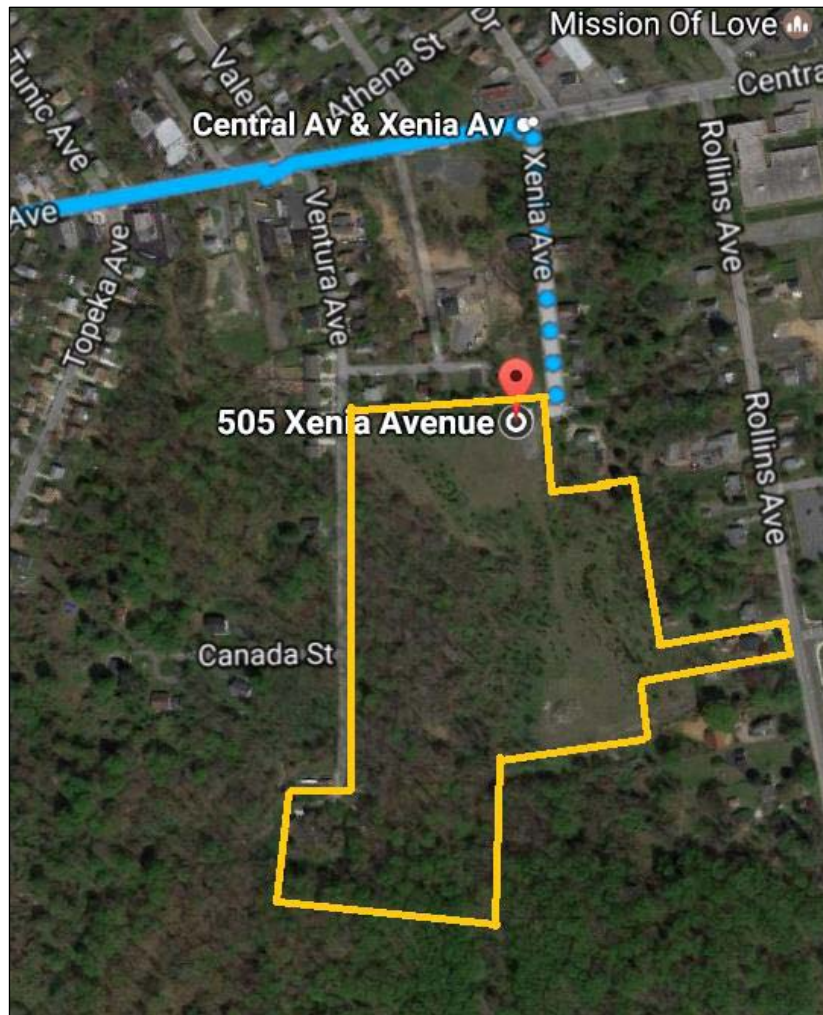
The Applicant consulted with the MHT regarding archeological and historic resources in the Project area, which determined no historic properties are in the area of potential effect.

2.2 *Project Components*

The Project will involve the design, construction, and operation of a 2.5 MW AC solar generating facility. The Project will connect to Potomac Electric Power Company (Pepco) grid servicing Maryland and Washington, D.C. through a 12 kV underground line connected to the existing Ritch 69 kV substation via an overhead pole at the corner of Central Avenue and Ventura Avenue.

The Project will consist of approximately 6,642 fixed-tilt solar panels, the facility components will include a ballasted racking system, direct current (DC) to AC power inverters, medium-voltage transformers, control and distribution cabinets, a medium voltage collection system, project switchgear, and other equipment needed to interconnect the Project to the distribution system. The current conceptual design includes two separate

Figure 1 **Project Site Location Map**



Source: Sol Phoenix Solar CPCN Application, 2017

inverter skids: one 1,667 kW DC to AC inverter and a second 833 kW DC to AC inverter. Each skid will have a transformer that will step up the power output to 12 kV for connection to the existing distribution feeder.

The PV panel array will be installed utilizing a ballasted racking system comprised of a galvanized steel or aluminum module with pour-in-place concrete foundations. The PV panels, once installed, will have a maximum height of seven to seven and a half feet and will be arranged in rows with at least 13 feet of spacing between each row. The number of racking structures will be dependent on the vendor selection and final design; however, the racking system is expected to include approximately 922 concrete footers for the foundation. The solar PV panels will generally follow the site topography and will be constructed on existing

Figure 2 *Sol Phoenix Solar Site Layout*



Source: Sol Phoenix Solar Response to PPRP Data Request 1-4, July 12, 2017

grades, which range from zero (0) percent to fifteen (15) percent, with grades at the edge of limits of disturbance that could exceed twenty-five (25) percent. Since the Project site was formerly a landfill, some grading and several retaining walls will be constructed to support slopes located on the Project site.

The panel arrays will be enclosed and protected using a 6-foot chain-link fence, with a service entrance accessible from Ventura Avenue, Xenia Avenue, and Rollins Avenue. The Project site will contain approximately 32,471 square feet (0.745 acres) of impervious surface, which is less than one percent of the site. Impervious areas created by the Project include improvements associated with the existing stone entrance to the site, two inverter pads, ballast footing, posts for fencing, retaining walls and associated improvements. Collectively, the impervious areas will exceed one acre and will require an NPDES General Permit (NOI) to be submitted.

Water and sewer utilities are not required for the Project since there will be no operations and/or maintenance facilities as part of this Project and no full-time personnel located at this site. Normal rain events will keep manual cleanings to a minimum. In addition, quarterly to semiannual cleansing of the panels would occur. In addition, water tanks would also be used to manage dust during construction, if required.

The Project will connect to Pepco's distribution grid servicing Maryland and Washington, D.C through an underground 12 kV line that connects to existing Ritch 69 kV substation via an overhead pole, which is at the corner of Central Avenue and Ventura Avenue. In its response to Data Request No. 2-2, the Applicant indicated that the final point of interconnection and layout has not been finalized. This will occur after the PJM Facilities Study report is issued in late October. Sol Phoenix will then prepare a supplemental filing to include all necessary layouts. In addition, the Applicant will coordinate with the Prince George's County DPIE to obtain the necessary local permitting for burying the 12 kV line.

2.3 *Construction Details*

A National Pollutant Discharge Elimination System (NPDES) General Permit is required for planned construction activities with a planned total disturbance of one acre or greater. Projects greater than one acre or greater, including this Project, require a 90-day notice prior to construction. Coverage under the General Permit is obtained by filing a completed Notice of Intent (NOI) form with the MDE Water Management Administration. The completed NOI form is considered a formal application for coverage and intent to comply with the terms of the General Permit. An NOI will be submitted to MDE during the construction drawing plan review phase.

The State of Maryland COMAR 26.17.02.01-1B(1) requires stormwater quality and quantity controls to be implemented. The Project will include impervious surfaces such as the existing stone entrance to the Project site, two inverter pads, ballast footing, posts for fencing, retaining walls and associated improvements. Land disturbance will include construction of retaining walls where grades and slopes exceed twenty percent, and twenty-five percent in some areas such as along the fringes of the Project site. The Project will be designed in accordance with Maryland Stormwater Management and Erosion & Sediment Control Guidelines. Stormwater management during installation of the panels will be subject to an Erosion Sediment Control Plan.

The Project site primarily consists of soils that are of the Christiana-Downer-Urban land complex (CdD), Elkton Silt Loam (EkA), Collington-

Wist complex (CnE), Marr-Dodon complex MnE), and Collington-Wist complex (CnC). These soil types are suitable for various State Environmentally Sensitive Design (ESD) Best Management Practices (BMPs) for stormwater management. The specific ESD BMPs are included in the 2000 Maryland Stormwater Design Manual, Volumes I and II, with Supplement No. 1 and will consist primarily of a system of check-dams, where most are already in place. Also included would be the use of non-rooftop disconnect sheet flow which would go into the natural drainage swales, bio-retention areas, and tree planting and landscaping along drainage areas.

The Applicant will apply for a grading permit after the site plan approval. As required by Prince George's County, the grading permit application package will provide the detailed engineering and specifications required to implement the approved site plan.

The Applicant will apply for a building permit after the construction drawing approval. The Applicant will work in close coordination with Prince George's County to file the appropriate and necessary building permits as required by Prince George's County.

Because it is a non-combustion process relying on the direct conversion of solar energy into electrical energy, the operation of a solar PV facility does not produce air emissions. This differs significantly from conventional fossil-fired electric power plants. Electricity generated by solar PV facilities represents a way of meeting the region's growing demand for electric power without emitting combustion-related air pollutants.

The only sources of emissions from the Project will be those associated with construction activities, including site clearing, grading, and the use of construction equipment, which will be for a temporary period. The Project will be required to comply with the following State regulations during construction activities, including:

- COMAR 26.11.06.03D — Particulate Matter from Materials Handling and Construction – A person may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne.
- COMAR 26.11.06.08 — Nuisance – An installation or premises may not be operated or maintained in such a manner that a nuisance or air pollution is created. Nothing in this regulation relating to the control of emissions may in any manner be construed as

authorizing or permitting the creation of, or maintenance of, a nuisance or air pollution.

- COMAR 26.11.06.09 — Odors – A person may not cause or permit the discharge into the atmosphere of gases, vapors, or odors beyond the property line in such a manner that a nuisance or air pollution is created.

2.4 *Decommissioning*

Sol Phoenix Solar will provide PPRP and the PSC with a facility Decommissioning Plan for review, outlining the responsible party(ies), timeframes, and estimated costs for decommissioning, dismantling, and legal disposal of all components, including cables, wiring, and foundations below ground surface. The plan shall address site conditions after decommissioning, including stabilization, grading and seeding all disturbed areas. The plan shall maximize the extent of component recycling and reuse, where practicable, and ensure all materials are handled in accordance with applicable federal, State, county, and local requirements. The Applicant shall not begin construction until the Applicant has addressed all comments from the PSC and PPRP, the PSC has approved the plan, and all specified financial guaranties are in place.

Funding mechanisms to cover the cost of implementing the Decommissioning Plan will be secured by Sol Phoenix Solar to ensure that decommissioning costs are not borne by the County and/or State at the end of the useful life of the Project or in the event of abandonment of the Project. The Project will be considered to be abandoned if the Project is non-operational for a period of one (1) year. The financial instrument may be in the form of a surety bond, a corporate guaranty, a letter of credit issued by a financial institution, or other alternative arrangement and must be in place prior to the commencement of construction of the Project.

Sol Phoenix Solar shall develop an estimate of decommissioning costs by a third party consultant to determine the amount of the decommissioning performance bond or letter of credit. The cost estimate shall address provisions for the safe removal and proper disposal of all components of the Project, including any components containing hazardous or toxic materials, minus salvage value. Every five years, over the life of the Project, the Applicant will prepare an updated estimate of decommissioning costs to adjust for inflation, changes in salvage market conditions, and any other necessary changes. Based on this estimate, the financial guarantee mechanism shall be adjusted to cover the revised estimate of decommissioning.

3.0

BIOLOGICAL RESOURCES

The following sections provide a review of the potential environmental effects of the proposed Phoenix Solar Project on biological resources, including vegetation; wildlife; rare, threatened and endangered (RTE) species; and wetlands and streams. Information on these resources was derived from the Project proponent's environmental review document and subsequent data request responses; from publicly available environmental information; from Maryland DNR documents, web pages, and agency communications; and from a site visit by PPRP staff and consultants on May 3, 2017.

3.1

Vegetation

The majority of the approximately 12-acre project site was previously used as a Class III rubble landfill, but has sat vacant and underutilized for twenty years. Since the site was abandoned, the fields have remained fallow and only small trees and shrubs indigenous to the area remain. The majority of the forest remaining on the site is of poor quality, with the exception of some of the trees on the steep slopes leading to Watts Branch and the five acres of forest land on the western portion of the site. PPRP is currently awaiting the completed forested stand delineation of that portion of the site (PPRP Data Request 1-10, response dated July 12, 2017) before assessing the value of the forest on that portion of the site.

The Maryland Forest Conservation Act (FCA) establishes standards for land development that make the identification and protection of forests and other sensitive areas an integral part of the site planning process. The primary objective of the FCA is to conserve forest cover on development sites by minimizing the loss of existing forests and/or replenishing forest that has been lost to development activities in the past. FCA provides a set of minimum standards that developers must follow when designing a new project. County and municipal governments are responsible for making sure these standards are met, but may choose to implement even more stringent criteria. For the Phoenix Solar project, Prince George's County has implementation authority through its Forest Resource Ordinance Program.

Under the requirements of the FCA, a site proposed for development encompassing 40,000 square feet (approximately 1 acre) or greater is subject to FCA and will require a Forest Conservation Plan prepared by a licensed forester, licensed landscape architect, or other qualified professional. The developer must submit to the reviewing authority a

Forest Stand Delineation and a Forest Conservation Plan. Having little or no forest on site does not exempt a development from the mitigation requirements of FCA. Once land has been taken out of its previous use and structures have been installed, the regeneration potential of forests may be temporarily or permanently lost, which triggers the need for forest mitigation, even if no trees are being removed. Mitigation alternatives may include, but are not limited to, onsite retention or planting, off-site retention or planting, natural regeneration, or payment in lieu.

Since the Phoenix Solar project both removes existing forest and develops cleared land, PPRP is recommending a license condition that requires both reforestation and afforestation. The Applicant's ERD states that it will voluntarily comply with the Prince George's County FRO. In Prince George's County, the fee in lieu for mitigation is assessed at a rate of ninety cents (\$0.90) per square foot of the conservation requirement within the designated Priority Funding Area and at a rate of one dollar and eight cents (\$1.08) per square foot of conservation requirement outside the designated Priority Funding Area. These funds are then placed in the Woodland Conservation Fund. In addition to the fee option, the Applicant may also mitigate by planting trees at a two to one (2:1) ratio, or placing appropriate acreage of wooded area into a Forest Conservation Easement (FCE).

It is assumed, based on the Applicants preliminary site layout that approximately half of the site will need to be cleared of trees in order to produce the generation requirements outlined by PJM. The Applicant's intent is to consider all options for mitigation and to incorporate one or all of the following: mitigation banks, establishing a FCE on the property, and using in-lieu-of fees to meet the total mitigation requirement. Given the opportunity for additional watershed protection along a tributary of the Anacostia Scenic River, in the Applicant will prefer pursuing an on-site FCE as the most synergistic means of achieving compliance.

The Applicant's ERD states that they expect "minimal" tree cutting for construction of this project, yet trees will be removed from approximately five of the 12 acres of the site. The Applicant states in its response to PPRP Data Request No. 1-10a that "Under the FCA, and considering the underlying purpose which is to protect and improve Watts Branch and the associated watershed, cutting 5 acres of trees compared to the total number of trees in the watershed is considered minimal...cutting of trees and mitigating for that tree cutting contributes to the viability of the project which will result in overall improvements within the watershed." PPRP questions whether the mitigation required for this tree cutting will improve the Anacostia watershed and notes that the FCA is not based on water quality objectives and is only intended to maintain or improve

Maryland's forest cover (as part of the State's "no net loss of trees" policy objectives). In addition, there is no guarantee of improvement to Watts Branch itself, since mitigation areas have not yet been determined. The five acres of trees to be removed include a portion of interior forest in the western portion of the site that, while not yet delineated, is of significantly higher quality than the "immature trees and scrub pines" that will be removed according to the Applicant's ERD (as observed on the May 3, 2017 site visit). At this time, PPRP disagrees with the Applicant that clearing nearly half the project site of its trees and replacing them with solar panels will contribute to the improvement of water quality in Watts Branch, regardless of mitigation opportunities.

Impervious areas will be associated with improvements to the existing stone entrance of the property, the two inverter pads, ballast footing for the solar panel brackets, posts for fencing, retaining walls associated with the steep slopes, and associated improvements. Internal service drives will be unpaved grass roads. The total amount of impervious surface estimated to be added to the project site is approximately 0.745 acres, less than one percent of the total project site.

The developer's plans include planting and maintaining the entire site in a low-height cover grass in accordance with plans as approved by local agencies. During construction, as part of its Sediment and Erosion Control and Stormwater Management Plans, the Applicant will develop a stormwater pollution prevention plan, implement BMPs, and reseed disturbed areas. A low maintenance native seed mix that provides low growth will be used for the vegetation beneath and around the arrays when possible, with the objective of controlling erosion and promoting stormwater infiltration under and between the panels. In addition, special attention will have to be paid to stormwater management and erosion control on the steep slopes (greater than 20-25 percent slope in some areas) on the site that lead to Watts Branch. Once the terracing plans are complete for these sloped areas and a stormwater management report will be submitted to PPRP in a supplemental filing (Response to PPRP Data Request 1-13, dated July 12, 2017). PPRP cannot assess the efficacy of the stormwater management on the proposed project site at this time.

The Applicant's ERD also notes that at a preliminary meeting with the MNCPPC they were provided with a copy of the Prince George's County Landscape manual, which will be used during the design of the planting buffer, which will be located just outside the perimeter fence. Additionally, the Applicant has contacted the Anacostia Watershed Association and based on recommendations provided, is evaluating planting woody shrubs on the upper portions of the steep slopes to create

new wildlife habitat and will also evaluate performing invasive vine removal and management to protect the native tree species.

In addition, the MNCPPC submitted a mandatory referral notice with staff recommendations concerning the proposed project. MNCPPC will require that the Applicant complete a Natural Resources Inventory (NRI), as well as a grading permit from the Prince George's County DPIE. The 100-year floodplain on the site is subject to local approval and approval must be obtained prior to the acceptance of the NRI. MNCPPC also recommends that the Applicant submit a Type 2 Tree Conservation Plan (TCP2) for the site before any permits are issued for the project. The MNCPPC staff general does not support the clearing of woodland for solar arrays; however, since this project is located on a previously disturbed site and the Applicant has agreed to submit a TCP2 and comply with the requirements of the Woodland Conservation Ordinance, limited clearing is acceptable. PPRP Recommended License Condition 11 supports the recommendations put forth by the MNCPPC.

No mention of operational vegetation management was made in the Applicant's ERD, but the PPRP expects that regular vegetation management will be required to control undesirable plant species, keep the panels from being shaded, and maintain reliable access for operations, maintenance, and emergency response purposes.

To have the most beneficial ecological result, PPRP recommends that mowing be restricted during the nesting season of ground nesting birds (May through August) and that the vegetation not be mowed at any time to a height less than 10 inches. To the extent possible, the applicant should try to use a native seed mix and an integrated vegetation management (IVM) approach that will create and maintain a self-sustaining, low-growing community that requires little if any mowing and provides wildlife and pollinator habitat. At a minimum, the IVM approach should be applied to the maintenance of the buffers for any wetland, stream, and 100-year floodplain areas that occur on the site.

3.2 *Wildlife*

The Project site currently offers little wildlife habitat. The former landfill has been subject to major disturbances over time that has severely limited the natural fauna at this site. According to the Applicant, the Project is not anticipated to have significant effects on any wildlife or wildlife habitat. In fact, the Applicant states that the proposed project would have a stabilizing effect on the area once construction is completed. For example, the Applicant intends to consider the creation of pollinator habitat as part

of their final site design, which will contribute to the revitalization of the wildlife in the area.

PPRP agrees that the Project could be developed and maintained in a manner that provides benefits to wildlife, with little cost to the project. Following the installation of the solar panel arrays, PPRP recommends that the areas below and between the solar panels be planted with native, warm season grasses and low-growing pollinator-friendly plant species, to encourage ground-nesting birds and pollinators. Suitable pollinator habitats consist of native herbaceous plants that are known to attract a variety of pollinator species (e.g., Bee Balm, Butterfly Milkweed, Black-eyed Susan, Joe-Pye Weed). Although warm season grasses may take longer to establish, they offer a number of ecological benefits including strong root systems that hold soil in place and act as a filter of stormwater runoff by removing sediment. They remain standing throughout the winter, thereby providing cover for wildlife.

PPRP specifically recommends a license condition requiring a minimum vegetation height of 10 inches on all parts of the site (including under the solar panels, which do not come closer to the ground than 24 inches at the lower edge), and no mowing during the nesting season of ground-nesting birds, from the beginning of May through August of each year. In addition, PPRP encourages Phoenix Solar to adopt the pollinator friendly criteria established in Senate Bill 1158, passed in Maryland's 2017 legislative session, and pursue future designation by DNR as a "pollinator friendly" solar facility.

Due to the removal of five acres of trees (especially the higher quality forest on the western portion of the site), PPRP does find that there will be wildlife impacts that must be addressed. The tree removals will result in a permanent decrease in the available mature forest habitat and will reduce the populations of species that use that habitat. In an urban setting, even small portions of contiguous forest are crucial to the survival of wildlife species, especially potential forest interior dwelling species.

As noted in the section above, mitigation will be required for forest habitat removal. To avoid impacts to aquatic resources resulting from construction-related siltation and sedimentation, an approved sediment and erosion control plan and SWPPP will be required. The Applicant indicates that the Project will be designed in accordance with Maryland Stormwater Management and Erosion & Sediment Control Guidelines and that storm water quality and quantity controls will be implemented to prevent water quality impacts. In addition, PPRP is recommending that the stream, wetland, and floodplain areas be protected from unintended releases of contaminants from the transformers. This specifically includes

a license condition requiring that a Spill Prevention, Containment and Counter Measures (SPCC) Plan be developed and implemented to minimize the potential for unintended releases of hazardous chemicals during Project construction and operation.

3.3 *Rare, Threatened, and Endangered (RTE) Species*

The Applicant used the U.S. Fish and Wildlife Service's Environmental Conservation Online System to determine that there were four RTE species in Prince George's County (Hay's Spring amphipod, sensitive joint-vetch, rusty patched bumblebee, and the northern long-eared bat). Based on the Phase I/Phase II site reports, there is no documented presence of those species at the proposed site location.

Additionally, the Applicant contacted Maryland DNR Wildlife and Heritage Service and received a response dated March 28, 2017 (Appendix 8 of the Applicant's ERD) that stated that there are no official State or Federal records for RTE species within the proposed project area and that WHS has "no specific concerns regarding potential impacts or recommendations for protection measures at this time."

In general, cleared fields do not provide habitat for RTE plant species, but small streams and drainage ditches may still provide such habitat. As noted in the WHS letter, if appropriate habitat is present, the absence of a record of RTE species may only indicate that adequate surveys have not been conducted.

PPRP concludes that it is unlikely that any RTE species are present on the site. However, if any RTE species is identified prior to or during construction, the Applicant should coordinate with WHS to institute appropriate avoidance and/or minimization measures (e.g., fencing or flagging, the presence of an environmental monitor, or appropriate time of year restrictions).

3.4 *Wetlands and Streams*

The Phoenix Solar site is located adjacent to the Watts Branch watershed that flows into the Anacostia River. The Anacostia River is a tributary to the Middle Potomac River (sub-basin code 02-14-03) and flows through the Washington DC metropolitan areas. The receiving streams in this watershed are classified as Use I-P (Water Contact Recreation, and Protection of Aquatic Life). This is an extremely small watershed with a history of urban pollution from stormwater runoff and leaky sewer systems.

The surface topography of the Site is moderately sloping with average grades ranging from zero percent (0%) to fifteen percent (15%) and steeper grades to the edges of the LOD that may exceed twenty-five percent (25%). These slopes lead directly to the banks of Watts Branch, which has been determined to be a jurisdictional water of the United States. The Applicant's ERD states that there will be no disturbance to Watts Branch, any 100-year floodplains, any associated wetlands or their buffers. At this time, the Applicant does not plan to submit a Joint Wetlands and Waterways Permit Application to MDE and the U.S. Army Corps of Engineers. PPRP notes that if Watts Branch is crossed underground, then the Applicant will need to file a Joint Permit Application to MDE and the USACE.

As a tributary to a Maryland-designated Scenic River, Watts Branch is also subject to the Maryland Scenic River Act. The General Assembly of the State of Maryland created the Scenic and Wild Rivers System in 1968. In passing the Act, the Assembly recognized that portions of many rivers in Maryland, and their associated land areas, possess outstanding scenic, geologic, ecologic, historic, recreational, agricultural, fish, wildlife, cultural and other similar resources values. The policy of the State under the Act is therefore to preserve and protect the natural values of these rivers, enhance their water quality, and achieve essential conservation goals by wise use of resources within their surrounding environment. These objectives inherently require actions throughout the watershed of a designated river. Specifically, protecting and enhancing the water quality of the Anacostia Scenic River requires protecting and enhancing the water quality of its tributaries, including Watts Branch.

In response to PPRP Data Request 1-6a, dated July 12, 2017, the Applicant had not yet contacted DNR Land Acquisition and Planning concerning the potential impacts to the Anacostia Scenic River. The response states that the Applicant will contact DNR within 30 days from the response date of the data request and inform PPRP of the results of the discussion. In PPRP Data Request 1-6b, PPRP asked what actions the Applicant would take to adhere to the Maryland Scenic River Act, which mandates "the preservation and protection of natural values associated with rivers designated as Scenic..." In PPRP Data Request 1-8, PPRP asked if the Applicant had considered the specific goals for the Anacostia River published in the Watershed Restoration Plan and Report (February 2010).

In their response to Question 1-6, the Applicant states that

"The historical property use as a clean fill site will be replaced by a green energy solar generation facility. In its current state with poor cover, visible erosion, and no management, the property is

impacting downstream water quality. By installing a solar generation facility at this location, it will be like converting a Brownfields site to a managed, stabilized site that will conform with “state-of the-art” sediment and erosion control and stormwater management.

The principal benefit to the Anacostia River of the Project will be complete site stabilization, stormwater management, the addition of trees and pollinators to the perimeter of the site, installation of retaining walls, and agreements with the State and Prince George’s County to continuously manage the property in keeping with the CPCN requirements and local site plan/permitting requirements. Currently the previous landfill site is completely unmanaged and there are signs of landfill material becoming exposed and slopes eroding.”

The Applicant’s response to Question 1-8 also states that they will be improving the site from one “resembling” a Brownfields site and will therefore be improving water quality. PPRP would like to note that a Brownfields site is defined by the EPA as a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. By definition, a Class III landfill is one that is not authorized to accept hazardous materials, so defining the proposed project site as “like a Brownfields site” is misleading, since there will be no disturbance to hazardous materials upon redevelopment of the site. PPRP does acknowledge that the development of solar facility on this site, in accordance with current environmental regulations, does provide an opportunity to improve site conditions, which could potentially translate to improved water quality, including pollutant loads, in Watts Branch.

According to their ERD, the Applicant has already met with the Anacostia Watershed Society and has taken some recommendations regarding the improvement of stormwater runoff and the fostering of local habitat. Based on their response to PPRP Data Request 1-7, the Applicant does not plan on meeting with any other watershed organizations related to the Anacostia Scenic River and feels that local outreach and public meetings should suffice. Additionally, based on their response to PPRP Data Request 1-9, PPRP has not contacted the USF&WS or the DC Government concerning their restoration project on Watts Branch downstream of the proposed project site.

Based on discussions with DNR’s Department of Land Acquisition and Planning, PPRP recommends that in order to conform with the Scenic River Plan that no forest clearing in the riparian area of the stream reach

occur and that 2:1 replacement of forest clearing in the watershed be required for mitigation of tree clearing.

To prevent adverse effects from construction-related stormwater runoff to streams, the Applicant is required to obtain an NPDES general permit for construction activities over one acre and implement an Erosion and Sediment Control Plan that contains appropriate stormwater quality and quantity control measures. The Phoenix Solar Project ERD indicates that the Applicant anticipates that the use of standard Best Management Practices (BMPs), like silt fence and super silt fence, will accommodate a majority of the control requirements during construction. In accord with NPDES permit requirements, site controls will be maintained during construction and a record of daily inspections to the controls will be kept for the MDE inspector to review upon site visits.

The Project ERD states that the overall Environmental Site Design (ESD) will comply with the Maryland Stormwater Design Manual, Volumes I and II (2000) with Supplement No. 1. The specific ESD techniques to be employed will consist of a combination of check-dams, non-rooftop disconnection, and possible bio-retention areas, in addition to tree planting and landscaping along drainage areas that will be implemented to enhance water quality control measures.

Additionally, low cover grass vegetation to grow beneath the elevated solar panels post-development, so that the entire Project Site will "mimic a forested site in good condition", with essentially entire field remaining in pervious vegetative cover. PPRP notes that for any given Hydrologic Soil Group, the target ESD condition of "woods in good condition" corresponds to a TR-55 Runoff Curve Number that is lower than the Curve Number of the proposed condition, which will likely fall between "meadow" and "open space in good condition".

Thus, even if the entire site were to be allowed to revegetate into meadowland (ignoring any construction effects, tree removals, and new impervious surface), the site would not actually achieve the stormwater characteristics of "woods in good condition".

Nonetheless, PPRP does agree that the water quality leaving the site is likely to be improved compared to that resulting from the current landfill conditions. Given the disturbed nature of the site, the new meadow-like vegetation will likely provide slower runoff and less surface evaporation than with an agricultural field, but not the deeper, longer water storage associated with tree root systems.

Counteracting some of the improvement in surface runoff will be the removal of almost 5 acres of forest from the site, including some trees on steep (> 25%) slopes. Because a constructed solar facility will not control run-off as well as a forest, these areas of the site will have worse runoff conditions than previously, including the portion of the site across from Watts Branch that is currently better quality forest. Also, despite the lack of mass grading and heavy construction equipment, the installation of solar panels with light trucks and pile drivers will, nevertheless, cause some degree of soil compaction on the areas to be used for “Non-Rooftop Disconnected Impervious Area” crediting. Recent work (Schwartz and Smith, 2016; SHA 2016; Haynes, et al. 2013) shows that soil decompaction and amendment can be highly effective at improving stormwater infiltration and providing deeper, longer water storage after such compaction. PPRP recommends that ripping and compost amendment (to a depth of 6”) be performed in the lanes between the solar panel arrays to ensure the proper post-construction runoff characteristics. In lieu of decompaction and amendment, PPRP recommends that additional small-scale stormwater management practices like bioretention be implemented on site to improve post-construction runoff and water quality.

The Applicant’s ERD states that there are no mapped 100-year floodplains on the project site and that it is outside of Maryland’s Critical Area (as confirmed in Appendices 5 and 6, respectively). One remaining direct impact to Watts Branch is crossing to connect the two arrays currently proposed for the site. The Applicant’s response to PPRP Data Request 1-5 states that the Applicant is leaning towards the use of underground directional drilling for this connection and that the decision will be made after consulting with their construction partner. Upon that decision, PPRP will be informed of the potential construction plans. If directional drilling is used, the Applicant does not expect any impacts to Watts Branch and its associated wetlands; nor do they expect any trees to be cut. PPRP cannot adequately evaluate the potential impacts of this stream crossing at this time.

Economic and Fiscal Impacts

The Project will install approximately 6,600 PV modules on a property formerly used as an undocumented landfill. Construction will occur from 2017Q4 through 2018Q2. During the peak construction period, the Project will create about 20 to 35 direct design, management and construction jobs. Most construction activities associated with PV energy development do not require highly specialized skills. As a result, the Project will likely draw from the Capital region labor pool if area subcontractors competitively bid for the work. This will have a positive effect on the local economy from construction worker payrolls and subsequent consumption expenditures, local purchases of common construction materials and associated multiplier effects. Not all benefits will accrue to Maryland since specialized components, such as PV panels, will be imported into the State.

With most of the construction workforce within daily commuting distance, the Project will have no effect upon population and housing, or on population-related public service provisions. Prince George's County, the State and, to a lesser extent, surrounding jurisdictions will experience fiscal benefits from taxes on construction worker wages, consumption expenditures and supplier sales receipts. With public service levels largely unaffected, the net fiscal benefit of Project construction will be positive for Prince George's County and Maryland.

The Project will have no operations and maintenance facilities on-site nor will it have a permanent O&M workforce. Long-term fiscal benefits will be in the form of corporate income tax revenues to the State, income tax revenues from lease payments to the landowner, and property tax revenues. Maryland imposes a corporate income tax rate of 8.25% on taxable income. The State taxes real property at a rate of \$.112 per \$100 valuation, while the County's real property rate for 2016-2017 is \$1.00 per \$100 valuation. Municipalities in Prince George's County piggyback additional real property taxes onto County taxes.¹

For tax purposes, Maryland classifies the facility as a non-utility generator. Prince George's County applies a tax of 2.5 percent to ordinary business personal property and utilities. PPRP has estimated that

¹ http://dat.maryland.gov/Documents/statistics/Taxrate_July12016.pdf

personal property taxes from the Project could be in the neighborhood of \$26-32 thousand in the first full year of operations, declining to about \$10-12 thousand in Year 30 (2017 \$), depending on the final design, equipment specification and other factors.

4.2

Land Use

The Project will be located in an unincorporated part of Prince George's County near the Town of Capitol Heights. It will consume about 12 acres, replacing a rubble fill that formerly operated in the 20.15-acre site, which has been assembled from several land parcels. Residential neighborhoods surround the site to the north, east and west.

The Project is not located in the County's Priority Preservation Area (PPA) and is within its Priority Funding Area (PFA). The Project is not dependent on State infrastructure funding. The Project parcel is not under any land preservation easement, nor is it in the Chesapeake Bay Critical Area.

The subject parcels are zoned Residential-Townhouse (R-T). The purpose of the R-T zone is to provide for attractive communities with a variety of dwelling types designed to utilize available land area, public utilities, and public facilities efficiently. Prince George's County does not explicitly address utility-scale solar energy generating systems in its zoning bylaws although Plan 2035 does recommend updating the zoning ordinance to encourage solar and other renewable energy facilities (Prince George's County 2014). However, by §27-441 other public utility uses or structures are permitted in the R-T zone by special exception. §27A-106(74) defines a public utility as a privately owned facility which provides the public with electricity, natural gas, water or sewer services (as part of a community system), or wire-transmitted telecommunications service; or any privately-owned railroad facility. The George's County Planning Department has concluded the project will be acceptable in this location, provided that all staff recommendations are implemented by the applicant.

The topography of the Project site is moderately sloping. The Applicant will construct several retaining walls where slopes change significantly. Most of the area within the Project's limit of disturbance will be excavated or graded to construct retaining walls and access roads, and to prepare the surface for concrete ballasts for supporting the arrays. PPRP has concluded the Project will not significantly affect the use of other properties in the area if the Applicant adopts all PPRP's recommended license conditions. These include one that requires Sol Phoenix Solar to certify to the PSC and to PPRP that it has received Mandatory Referral

approval for the Project from the Prince George's County Planning Department and has obtained all required local permits for the Project's construction and operation.

4.3 *Transportation*

The Project site is accessible from three roads, Ventura Avenue, Xenia Street and Rollins Avenue. These roads are accessed from Old Central Avenue (MD 332), which connects to Central Avenue (MD 214) about one block to the east. All transportation impacts associated with the Project will occur during the construction period when trucks are delivering materials and equipment to the Project site. Non-local traffic will likely access the Project from the Capital Beltway (I-95) via Central Avenue. Between the District of Columbia line and East Capitol Street, the State Highway Administration (SHA) classifies Central Avenue as a minor arterial, with two marked 12-foot lanes, a paved shoulder beside the westbound lane and a sidewalk along the southbound lane. The average annual daily traffic was 12,123 vehicles in 2015. Truck volumes are not available for the segment of Old Central Avenue near the Project site, but are probably in the range of 4-8 percent of total vehicular traffic.

To minimize neighborhood disturbance, the Applicant has stated that during construction it intends to route truck deliveries to a site entrance off Rollins Avenue, approximately one-quarter mile from Old Central Avenue. Prince George's County classifies Rollins Avenue as a collector. It intersects Old Central Avenue at an unsignalized T-intersection, with Rollins Avenue the minor approach. Near the Project entrance, Rollins Avenue is a two-lane road within a 60-foot ROW. According to the Countywide Master Plan of Transportation (Prince George's County 2009), the County plans to add on-road dedicated one-way bike lanes or a side path to Rollins Avenue in the future. Trucks on this route will bypass an elementary school located at the corner of Old Central Avenue and Rollins Avenue.

Construction worker traffic will increase background traffic volumes at the beginning and end of each workday, primarily on weekdays. With 25-30 design, management and construction workers involved in the Project, no more than 25 or so automobiles and light trucks will be added to local roads, assuming typical vehicle occupancy rates for construction projects. The estimated increase in passenger vehicles is insignificant relative to existing traffic volumes in the area. In other words, PPRP does not expect the additional construction worker traffic will reduce the level of service (LOS) on roads near the Project, even if coincident with morning and evening peak hour traffic.

The Project will generate a number of truck deliveries over the construction period, primarily solar panels and ancillary components. Trucks will also transport excavation and other site preparation equipment, plus aggregates and materials for internal roads and other improvements, to and from the site. The Applicant did not estimate the number of trucks needed to construct the facility. However, based on ratios from another solar project in Maryland,² panel delivery for a project of this size will probably require about 20 deliveries using 53-foot combination vehicle trailers, and between 40 and 70 total deliveries for all project components. Some peaking of component delivery is likely to occur in the mid to later stages of construction, and trucks will deliver base materials and grading equipment near the beginning. PPRP has concluded that the Project's truck volume will not have an adverse effect upon existing motor vehicle traffic near the Project site.

During early stages of construction, trucks will transport excavation equipment to the Project site, some of which could be oversize or overweight. To the extent that any loads of materials or equipment for the Project are oversize or overweight, the SHA requires hauling permits if transported on Maryland highways. Title 24, Subtitle 1 of the Transportation Article of the Annotated Code of Maryland defines an oversize or overweight vehicle. In addition, some bridges crossing State highways are height-restricted.

Prince George's County also requires permits for transporting extremely large and/or heavy items on public roadways. The Prince George's County Department of Permitting, Inspection and Enforcement require sufficient advance notice to conduct an inspection of the proposed hauling route and for analysis of the equipment. No bridges or certain culverts may be crossed if the combined load is in excess of Maryland legal load or posted limits. Permits for overweight/oversize vehicles issued by the SHA are valid for county roads provided weight restrictions for structures are observed.

Interconnection to the grid will occur through an underground line tap to a circuit located on Old Central Avenue. Occupancy of State highway ROWs is subject to SHA's utility policy (SHA 1998). In addition, an access permit would be required for all construction within the SHA right-of-way (ROW). Prince George's County policy on utility accommodation is detailed in its Policy and Specification for Utility Installation and Maintenance (DPW&T 2007).

² OneEnergy Baker Point Solar, LLC. PSC Case #9399. Environmental Review Document, p. 26.

PPRP has included a recommended license condition requiring the Applicant to comply with all permit requirements for use, crossing and occupancy of State and Prince George's County roads.

Post construction, the facility will not be a significant traffic generator. Most traffic to the Project site during operations will be light vehicles. The Prince George's County Planning Department has concluded the project does not conflict with the 2009 Approved Countywide Master Plan of Transportation recommendations.

Federal Regulation Title 14 Part 77 establishes standards and notification requirements for objects affecting navigable airspace, including determining the potential hazardous effect of the proposed construction on air navigation. Part 77 also provides the Federal Aviation Administration (FAA) with the authority to conduct aeronautical studies of proposed activities that could affect airspace. These studies review physical incursions of proposed structures into airspace, interference with radar communications and any other conditions such as glare that might negatively affect air traffic. Regardless of height or location, all solar Projects at airports must submit to the FAA a Notice of Proposed Construction Form (Form 7460-1) to ensure the Project does not penetrate the imaginary surfaces³ around the airport or cause radar interference or glare. For off-airport Projects, local governments, solar developers and other stakeholders near an airport have the responsibility to inform the FAA about proposed Projects so that the agency can determine if the Project presents any safety or navigational problems (FAA 2010).

In 2013, the FAA issued interim policy for the review of solar energy Projects on federally-obligated airports (FAA 2013). The policy adopted the Solar Glare Hazard Analysis Plot as the standard for measuring the ocular impact of any proposed solar energy system. Furthermore, to obtain FAA approval for a solar installation and/or a "no objection" to a Notice of Proposed Construction Form, an airport sponsor is required to demonstrate that the proposed solar energy system meets the following standards.

³ Airport imaginary surfaces delimit volumes of airspace around airports that exist to prevent existing or proposed manmade objects, objects of natural growth or terrain from extending upward into navigable airspace. They either slope out and up from all sides and ends of runways or are a horizontal plane or a sloping plane above public use airports. Federal Air Regulation Part 77 defines imaginary surfaces for civil airports (§77.19), Department of Defense airports (§77.21) and heliports (§77.23).

- No potential for glint or glare in the existing or planned airport traffic control tower.
- No potential for glare or “low potential for after-image” along the final approach⁴ path for any existing landing threshold or future landing thresholds as shown on the current FAA-approved Airport Layout Plan.

Ocular impact must be analyzed over the entire calendar year in one minute intervals from sunrise to sunset. FAA interim policy requires the use of the Solar Glare Hazard Analysis Tool (SGHAT), a web-based application developed and maintained by Sandia National Laboratories, U.S. Department of Energy to determine whether a proposed solar energy Project will result in a potential ocular impact. Solar energy systems located on an airport that is not federally-obligated or located outside the property of a federally-obligated airport are not subject to FAA interim policy. However, the FAA strongly urges proponents of solar energy systems located on off-airport property or on non-federally-obligated airports to consider the policy’s requirements when siting such systems (FAA 2013).

The closest airport to the Project is Joint Base Andrews (JBA), formerly Andrews Air Force Base, which is under the jurisdiction of the United States Air Force 11th Wing. The Project is approximately 4.5 miles north of the nearest runway threshold. PPRP’s glare analysis predicts no glare upon flight paths into JBA. Prince George’s County Heliport is about 3.5 miles to the north. PPRP has concluded the Project will not have an adverse effect upon air navigation.

4.4 Visual Impacts

The terrain of the Project property is moderately sloping. Views of the property from north, west and south are fully or partially obscured by a woodland buffer. Without additional landscaping, the Project may be visible from neighboring homes on Xenia Avenue, Belgium Street and Ventura Avenue, and from some homes on Rollins Avenue.

The Applicant has stated panel arrays will be enclosed within a six-foot chain link fence, beyond which a landscaped buffer will be planted. The buffer will be consistent with the Prince George’s County Landscape manual and presented for review and approval to the P.G. County

⁴ The final approach path is defined as two miles from fifty feet above the landing threshold using a standard three-degree glide path.

Department of Permits, Inspections and Enforcement and the local Soil Conservation Service District Office. PPRP has concluded that landscape buffering that is in substantial conformance with Prince George's County's site plan review requirements will mitigate most views of the facility structures from adjoining public roads and properties.

Sol Phoenix Solar has stated that there are few lighting requirements for the Project. Lighting could be required during construction or during operations to provide illumination to achieve safety and security objectives. For utility-scale photovoltaic facilities, these objectives are achievable using downward-facing shielded luminaires and sensor-triggered lights. Uniform standards for Mandatory Referral review adopted by the Prince George's County Planning Department include a lighting plan requirement that provides details and specifications of all lighting fixtures, including pole heights, designs and locations (Prince George's County 2012). PPRP has concluded that the Project will not create a new source of substantial light if its lighting plan satisfies Prince George's County exterior lighting requirements as negotiated during Mandatory Referral review.

The applicant undertook an assessment of glare from the Project, estimating the intensity, time-of-day and duration of reflective glare upon selected observation points representing views from surrounding residences. Using Project data and terrain elevations within the limit of disturbance, the Applicant's model suggested that in the absence of landscape buffers, nearby residential properties could experience glare over short intervals either shortly after sunrise or in the early evening. Glare would occur only in the early spring and late autumn months of the year, with receptors to the east experiencing greater glare intensity than those to the west. PPRP undertook an independent assessment of glare applying the same model⁵ and Project data published in the Applicant's ERD. PPRP's glare estimates essentially confirmed the Applicants findings, but also estimated a greater intensity of glare upon receptors to the west of the Project area than predicted by the Applicant. Specifically, PPRP model results showed glare with a potential to induce a temporary after-image within the receptor's vision both east and west of the Project. Although differences can be expected due to geographic discrepancies in array layouts, input parameters and other factors, PPRP's glare estimates are more significant in terms of intensity than those of the Applicant, even though neither considers the mitigating effects of landscape buffers or existing vegetation. A more rigorous glare analysis was subsequently proffered by the Applicant which concluded that glare with a potential to

⁵ Solar Glare Hazard Analysis Tool (SGHAT).

induce a temporary after-image could trespass onto properties both east and west of the Project, although in most cases, reflected light would be blocked by existing vegetation. Additional vegetative screening would limit glare on other properties. PPRP notes the Applicant is working with a licensed landscape architect to prepare a landscape buffer plan to, among other things, reduce glare. A site plan/landscape buffer plan is one of the submission requirements for Mandatory Referral review, and will be evaluated in the context of the County's landscape manual (Prince George's County 2010), which addresses glare. In addition, the Prince George's County Planning Department has recommended the Applicant continue to conduct glare analysis after the project becomes operational and if glare impacts to residences are identified, to mitigate them by providing landscaping adjacent to the affected properties. PPRP has concluded that landscape buffering in substantial conformance with Prince George's County's site plan review requirements and Mandatory Referral recommendations will mitigate glare trespass upon nearby public roads and properties.

While the likelihood of glare trespass is minimal, PPRP has recommended a license condition requiring Sol Phoenix Solar to develop a process to document and address complaints related to potential solar reflections. If it is determined that complaints are valid, the Applicant will be required to prepare a screening plan to mitigate impacts from reflective glare upon affected properties.

4.5 *Cultural and Aesthetic Resources*

Part of one property on the National Register of Historic Places (NRHP) is within one mile of the Project site. The Fairmont Heights Historic District is notable as one of the first planned African-American communities in the Washington, DC area. There are several properties listed on the Maryland Inventory of Historic Places (MIHP) within one mile, including the Capitol Heights Survey Area and several residential structures. No resources are adjacent to the Project area. No easements held by the Maryland Historical Trust (MHT) are within one mile of the Project. The Applicant submitted a Project Review Form to the MHT, which responded that no historic properties are in the area of potential effect.

In the event that construction reveals unforeseen archeological relics or sites, PPRP has recommended a license condition requiring Sol Phoenix Solar, in consultation with and as approved by the MHT, to develop and implement a plan for avoidance and protection, data recovery, or destruction without recovery of such relics or sites.

The Maryland Heritage Areas Program preserves the State's historical, cultural, archeological, and natural resources for sustainable economic development through heritage tourism. The Program designates Heritage Areas, defined by a distinct focus or theme that makes a place or region different from other areas of Maryland. The Maryland Heritage Areas Authority (MHAA) certifies and governs Heritage Areas. A management plan sets forth the strategies, Projects, programs, actions, and partnerships that will be involved in achieving each Heritage Area's goals. Once certified, a Heritage Area management entity becomes eligible for State-matching grants for operating assistance and marketing activities. Local jurisdictions and non-profit organizations in a Heritage Area may also qualify for State matching grants for planning, design, interpretation, and programming. Central to the promotion of heritage tourism is the Targeted Investment Zone (TIZ). TIZs are defined as areas identified through the management planning process as locations of high heritage tourism development potential and worthy of additional focus and capital investment for rapid results. There are no heritage areas near the Project.

No State scenic byways are nearby. As noted earlier, Rollins Avenue is a planned bicycle trail containing one-way bike lanes or a side path, but the road is not currently constructed as such. Between Central Avenue (MD 214) and the District of Columbia line, Old Central Avenue (MD 332) is a State-designated bicycle route. The SHA rates the trail to be of least difficulty due to the highway's light traffic volume, shoulder width and speed limit on that particular segment. A paved shoulder exists on the westbound lane only, with the eastbound lane bordered by a sidewalk. PPRP does not expect the additional traffic generated by the Project during construction will adversely affect cyclists. A nearby hard-surface walking trail links Suffolk Avenue to and meanders within Capitol Heights Neighborhood Park, but will not be affected by the Project.

4.6 *Public Services and Safety*

During construction and operation, no additional public services will be required to support the Project under normal conditions. Prince George's County's fire, rescue, and emergency medical service (EMS) is available through the 911-dispatch center, administered from the Public Safety Communications Center, one of the agencies within the Prince George's County Office of Homeland Security. The Prince George's County Fire/EMS Department is a combination career/volunteer agency. The County maintains standard response plans for all major incidents. The Project is within the first response area of Prince George's County Fire/EMS Department Company 805 - Capitol Heights Volunteer Fire Department Volunteer Fire Department (VFD) and Company 808 - Seat

Pleasant VFD. Company 808 is staffed by both career and volunteer personnel, while Company 805 is all-volunteer.

Solar panels and associated electrical equipment are largely free of flammable materials. Post-construction, the risk of fire from ground-mounted photovoltaic systems will be low if site preparation and maintenance has removed potential fuels from under and around solar arrays (Planning Solutions 2014). Fire prevention guidance for ground-mounted PV installations is contained within the National Fire Protection Association's NFPA 1 Fire Code Handbook (NFPA 2015) and NFPA 70 National Electrical Code (NFPA 2014). PPRP has recommended a license condition requiring Chesapeake Solar to design, install and maintain the facility to meet the minimum standards set forth in NFPA 1 and NFPA 70.

Although the likelihood of fire at PV facilities is low, a challenge facing firefighters is the risk of electrical shock (FPRF 2013). This is because PV panels generate electricity when exposed to sunlight. Even at night, apparatus-mounted scene lighting may produce enough light to generate an electrical hazard. Under a continuous electrical load, any conduit or components between PV modules and disconnect switches will remain energized. Inverters may also provide voltage during daylight hours for several minutes on both sides of a disconnect even when opened (FPRF 2013). The Fire Protection Research Foundation also recommends the use of respiratory protection during fireground operations involving PV systems.

PPRP has recommended a license condition requiring the Applicant to contact nearby fire companies and the Prince George's County Fire/EMS Department to develop appropriate SOPs or SOGs for addressing on-site emergencies.

4.7 *Property Values*

Little in the way of research has been published on the impact of utility scale solar photovoltaic systems on nearby property values. This may be partly because utility scale photovoltaic land requirements favor rural locations where adjacency issues are not as prevalent, or because repeat sales data, which might capture such effects, are simply not available. Still public perceptions that solar farms adversely affect property values remain.

Limited evidence from real estate appraisal methods has not revealed any influence on property values from solar farm development. Expert opinion from a past siting case in Massachusetts, for example, concluded that utility scale photovoltaic energy systems that are not visible from

surrounding properties will have no impact on their market values (Franklin County 2014). A paired comparison of market values of residential and agricultural properties near solar farms in North Carolina came to a similar conclusion (Kirkland Appraisals 2014).

The property was previously used as an undocumented landfill. With a minimal vertical profile and existing and proposed vegetative buffering along the perimeter of the site, the Project will be largely out of sight from nearby properties. The Project's operation will not emit significant traffic, noise, air, or water pollutants, or generate any hazardous waste that could potentially affect public health. At the end of the facility's useful life, a decommissioning plan will return the Project site to its original state. In other words, the Project will minimally change the local environment. That the proposed facility will have a moderately benign local presence once the facility is operational suggests that property values will be unaffected.

5.0 NOISE IMPACTS

This licensing review incorporates an evaluation of noise impacts to ensure compliance with State noise regulations. The analysis of potential noise impacts focuses on the potential for sound pressure from generating equipment to exceed numerical limitations at the nearby noise sensitive areas.

5.1 *Definition of Noise*

Noise generally consists of many frequency constituents of varying loudness. Three decibels (dB) is approximately the smallest change in sound intensity that can be detected by the human ear. A tenfold increase in the intensity of sound is expressed by an additional 10 units on the dB scale, a 100-fold increase by an additional 20 dB. Because the sensitivity of the human ear varies according to the frequency of sound, a weighted noise scale is used to determine impacts of noise on humans. This A-weighted decibel (dBA) scale weights the various components of noise based on the response of the human ear. For example, the ear perceives middle frequencies better than low or very high frequencies; therefore, noise composed predominantly of the middle frequencies is assigned a higher loudness value on the dBA scale. Subjectively, a tenfold increase in sound intensity (10 dB increase) is perceived as an approximate doubling of sound. Typical A-weighted sound levels for various noise sources are shown in Table 1.

Table 1 *Typical Sound Levels for Common Sources (dBA)*

Noise Source	Typical Sound Pressure Level
Lowest sound audible to human ear	10
Soft whisper in a quiet library	30-40
Light traffic, refrigerator motor, gentle breeze	50
Air conditioner at 6 meters, conversation	60
Busy traffic, noisy restaurant, freight train moving 30 mph at 30 meters	70
Subway, heavy city traffic, factory noise	80
Truck traffic, boiler room, lawnmower	90
Chain saw, pneumatic drill	100
Rock concert in front of speakers, sand blasting, thunder clap	120
Gunshot, jet plane	140

Sound energy dissipates with increasing distance from the noise source. For every doubling of the distance, the sound pressure level produced by a given noise source decreases by approximately 6 dBA. However, this calculation method is only valid for far field propagation and does not accurately represent the behavior of sound waves in the near field, within approximately 50 feet of the noise source (Hansen 2001).

5.2 *Summary of Regulatory Requirements*

Maryland noise regulations specify maximum allowable noise levels, shown in Table 2 (COMAR 26.02.03). The maximum allowable noise levels specified in the regulations vary with zoning designation and time of day. The noise limit for residential areas is 55 dBA during nighttime hours and 65 dBA during daytime hours. A noise source should not create noise that exceeds the allowable levels, as measured at the receiving property.

Table 2 **Maximum Allowable Noise Levels (dBA) for Receiving Land Use Categories**

	Zoning Designation		
	Industrial	Commercial	Residential
Day	75	67	65
Night	75	62	55

Source: COMAR 26.02.03

Note: Day refers to the hours between 7 AM and 10 PM; night refers to the hours between 10 PM and 7 AM.

The State regulations exempt certain noise sources and noise generating activities. For example, motor vehicles on public roads are exempt from Maryland noise regulations; however, while on industrial property, trucks are considered part of the industrial source and are regulated as such. The regulations also allow for construction activity to generate noise levels up to 90 dBA during daytime hours, but the nighttime standard may not be exceeded during construction.

While the State has established target levels for noise, enforcement authority for noise regulations rests with local government (in this case, Prince George’s County).

5.3 **Noise Impact Evaluation**

Operational noise from PV facilities is typically low. The PV panels and support equipment do generate some noise, primarily associated with the power inverters and electrical transformers. While there is some audible noise associated with the motors in the solar panel tracking mechanism, a 2013 report from Argonne National Laboratory concluded that such mechanical noise was not a significant source of noise for off-site receptors (ANL 2013).

Regarding noise generated by the power inverters and electrical transformers, a recent study conducted for the Massachusetts Clean Energy Center (2012) found that operational noise is inaudible at moderate distances. The measured noise levels from the PV arrays included in the study declined to ambient background noise levels at distances between 50 and 150 feet.

The nearest residences to the Phoenix Solar installed panels appear to be those near the northwest corner of the site on Ventura Avenue. According to Sol Phoenix Solar response to PPRP’s Data Request No. 2-1 dated

August 21, 2017, the Applicant will be using three-phase string inverters rather than the two central inverters as stated in its original Environmental Review Document. The site layout figure provided by the Applicant did not indicate the proposed locations of the string inverters; however, based on the available site mapping and the proposed setbacks shown in the site layout (see Figure 2), the inverters will be a minimum of 150 feet from any residence. Therefore, we expect that the noise created by the inverters will not be noticeable above background levels at nearby residences.

PPRP's recommended license conditions would require that the construction and operation of the proposed solar facility comply with the State's regulatory standards of 65 dBA (day) and 55 dBA (night), and the 90 dBA level during daytime construction. It is anticipated that noise from the Project, as proposed, will meet these construction and operational noise limits.

Electric and magnetic fields, referred to collectively as electromagnetic fields (EMF), occur as a result of the generation, transmission, and use of electric power. These fields are present around such things as appliances, electronics, electric wiring, and power lines. EMF also occurs naturally on Earth and is observed at background levels.

For electric fields, the strength of a field is dependent on the voltage level and the amount of current flow. For example, the amount of current flowing through a power line varies as the demand for electric power changes. Electric fields, measured in units of volts per meter (V/m), are produced by voltage and increase in strength as the voltage increases. Magnetic fields, measured in units of gauss (G) or tesla (T), result from the flow of current through wires or electrical devices and increase in strength as the current increases. Electric fields and magnetic fields are characterized by wavelength, frequency, and amplitude. The frequency of the field, measured in hertz (Hz), describes the number of cycles that occur in one second. Electricity in North American alternates through 60 cycles per second, or 60 Hz.

Electric fields are shielded or weakened by materials that conduct electricity (i.e., trees, buildings, and human skin), while magnetic fields pass through most materials and are more difficult to shield. Both electric and magnetic fields decrease rapidly as the distance from the source increases. However, since magnetic fields are not easily shielded, most research in recent years has focused on the potential health effects from magnetic field exposure. Estimated average background levels of 60-Hz magnetic fields in most homes, away from appliances and electrical panels, range from 0.5 to 5.0 milligauss (NIEHS 2002). Table 3 shows typical magnetic field levels for common household appliances.

Table 3 *Typical Magnetic Field Levels of Common Appliances*

Source	Field Strength at 12 inches (milligauss)	Field Strength at 3 feet (milligauss)
Coffee maker	0.09 to 7.3	0 to 0.61
Copy machine	0.05 to 18.38	0 to 2.39
Television	1.8 to 12.99	0.07 to 1.11
Vacuum cleaner	7.06 to 22.62	0.51 to 1.28
Microwave oven	0.59 to 54.33	0.11 to 4.66
Computer monitor	0.2 to 134.7	0.01 to 9.37

Source: California Department of Health Services

6.1 *EMF and Solar Facilities*

PV solar panel arrays convert solar energy into DC electricity. A solar inverter, a component of a PV system, converts the DC output of a solar panel into an AC that can be fed to the electrical grid. AC electricity produces “power frequency magnetic fields” and DC electricity produces “static magnetic fields.”

Humans are constantly exposed to EMF throughout daily life, but EMF can cause negative health effects if exposure exceeds certain health-based thresholds. The most rigorous exposure guidelines are those developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). For the general public, the ICNIRP has established a threshold for acute exposure of 830 milligauss for power frequency magnetic fields and 4 million milligauss for static magnetic fields.

Solar energy systems produce magnetic fields significantly below the minimum thresholds established by the ICNIRP. Solar energy systems will produce power frequency magnetic fields from the AC inverters and grid interconnection, while the DC electricity generated by the PV modules will produce static magnetic fields. A typical solar PV inverter may produce a power frequency magnetic field of about 3 milligauss at a distance of 10 feet; this level is comparable to the levels produced by common household appliances at a distance of only 3 feet. By design, solar energy systems will be located at least 50 feet from any residences, and EMF levels will be insignificant at these distances. Table 4 provides

an example of calculated EMF levels for a typical solar PV energy system, specifically the West Linn Highway project in Oregon.

Table 4 *EMF Levels at the Proposed 3 MW West Linn Highway Solar Project, Oregon*

Source	Field Type	Field Strength at 3 feet (milligauss)	Field Strength at 10 feet (milligauss)	Corresponding ICNIRP exposure limit for the general public (milligauss)
Parallel string of PV modules	Static	1,697	509	4,000,000
DC to AC power inverters	Power frequency	344	3	830
Grid interconnection	Power frequency	14	N/A	830

Source: Scaling Public Concerns of Electromagnetic Fields Produced by Solar Photovoltaic Arrays

This evaluation of the proposed West Linn Highway Solar project found that the calculated field strength of 509 milligauss at 10 feet from the PV modules is well below the ICNIRP static threshold of 4 million milligauss; the field strength of the DC to AC power inverters of 3 milligauss is also well below the 830 milligauss power frequency threshold. At the Sol Phoenix Solar Project site, the closest resident to the proposed PV modules or inverter pad is located approximately 150 feet away. EMF levels at this distance will be well below the reported thresholds and are not expected to pose potential health risks to nearby residents.

The United States Department of Energy ordered the National Renewable Energy Laboratory (NREL) to conduct a study on solar panels' emission of EMFs (DOE 2009). NREL found that the magnitude of EMF measured at the perimeter of PV (photovoltaic, i.e., solar panels) installations has been shown to be indistinguishable from background EMF, and is lower than that from many household appliances such as televisions and refrigerators.

Mitigation Strategies

As previously discussed, electric fields are shielded or weakened by materials that conduct electricity, while magnetic fields pass through most materials and are more difficult to shield. However, both electric and magnetic fields decrease rapidly as the distance from the source increases. Therefore, the most effective strategy for limiting exposure at solar energy systems is to provide adequate buffer space between the inverters and PV modules and nearby residential properties. As described above, magnetic field levels will fall below threshold human health standards at a distance of 3 feet. According to the proposed layout for the Phoenix Solar project, the nearest houses are located more than 100 feet from the edge of the solar panel layout. Therefore, EMF levels from the solar energy systems are not anticipated to pose a potential health risk to nearby residents.

PPRP concludes that there will be minor impacts to environmental or socioeconomics resources if the Sol Phoenix Solar Project adheres to the recommended license conditions put forth in PPRP_Exhibit (FSK-2), especially due to the cutting of five acres of forested land in an already urban landscape.

Because it is a non-combustion process relying on the direct conversion of solar energy into electrical energy, the operation of a solar PV facility does not produce air emissions. This differs significantly from conventional fossil-fired electric power plants. Electricity generated by solar PV facilities represents a way of meeting the region's growing demand for electric power without emitting combustion-related air pollutants. Therefore, there will be no significant impact to air quality.

Depending on the final equipment selection, the transformers that may be used for the Project could contain a total volume of oil-based coolant exceeding SPCC requirements. PPRP also recommends that a SPCC Plan be developed and implemented to minimize the potential for unintended releases of petroleum and other hazardous chemicals during Project construction and operation.

PPRP assessed the potential environmental effects of the proposed Phoenix Solar Project on biological resources, including vegetation; wildlife; rare, threatened and endangered (RTE) species; and wetlands and streams. With the exception of removal of 5 acres of trees, including some potential interior forest, biological impacts due to the construction and operation of the proposed Project will be minimal. PPRP disagrees that clearing almost half of the project site constitutes "minimal tree clearing" and is concerned about the loss of the higher quality forest on the western portion of the site.

The Project is located on an existing rubble landfill, and the Applicant will develop a stormwater pollution prevention plan, implement BMPs, and reseed areas disturbed during construction. The Applicant's ERD claims that redeveloping this site into a solar array will improve the condition of the site. After construction, the area below and between the arrays will be planted with low growth and low maintenance vegetation that will reduce runoff and stabilize groundwater flow.

Watts Branch, a tributary to the Anacostia Scenic River, runs through the parcel proposed for development, with steep (> 25% in some areas) slopes

leading to its banks. The Applicant's ERD states that these slopes will be terraced and necessary stormwater improvements will be made. Because the Applicant is avoiding construction near Watts Branch and its associated wetlands, it does not intend to apply for or obtain an MDE/Army Corps of Engineers Joint Wetlands and Waterways permit.

The Applicant has stated that it intends to comply with the Prince Georges County FRO and has not decided how to mitigate for the five acres of tree loss due to the construction of this project. The Applicant must comply with the Mandatory Referral submitted by MNCPPC and submit a Natural Resources Inventory and a Type 2 Tree Conservation Plan prior to any local permits being issued. PPRP is also recommending that wildlife and pollinator habitat be created beneath and between the solar panels through appropriate plantings and maintenance.

The Project will create temporary construction jobs and generate fiscal benefits to the State and Prince George's County. PPRP does not anticipate permanent population and housing impacts given the short duration of the construction schedule. Long-term fiscal benefits will be in the form of corporate income tax revenues to the State, income tax revenues from lease payments to the landowner and property tax revenues.

In terms of land use, the Project will consume about 12 acres from a 20.15-acre site assembled from several land parcels previously used as an undocumented landfill. The subject parcel is zoned Residential-Townhouse. Prince George's County does not explicitly address utility-scale solar energy generating systems in its zoning bylaws. The County permits public utility uses or structures in the R-T zone by special exception. The Project is undergoing Mandatory Referral review by the Prince George's County Planning Department. PPRP has concluded the Project will not significantly affect the use other properties in the area if the Applicant adopts all PPRP's recommended license conditions.

Construction worker traffic added to background traffic volumes at the beginning and end of each workday will not affect the level of service on roads near the Project, nor will truck deliveries of solar panels and ancillary components have an adverse effect on existing motor vehicle traffic flows. During early stages of construction, some trucks transporting excavation equipment to the Project site may be oversized or overweight. To minimize neighborhood disturbance, the Applicant has stated that during construction it intends to route truck deliveries to a site entrance off Rollins Avenue. Interconnection to the grid will occur through an underground line tap to a circuit located on Old Central Avenue. PPRP has recommended a license condition requiring Sol

Phoenix Solar to comply with all permit requirements and restrictions for use, crossing and occupancy of State and Prince George's County roads. PPRP has concluded the Project will not have an adverse effect upon air navigation.

With respect to visual impacts, a woodland buffer fully or partially obscures views of the property from north, west and south. Without additional landscaping, the Project may be visible from neighboring homes on Xenia Avenue, Belgium Street and Ventura Avenue, and from some homes on Rollins Ave. The Applicant has stated a six-foot chain link fence will enclose panel arrays, beyond which a landscaped buffer will be planted. The buffer will be presented for review and approval to the Prince George's County Department of Permits, Inspections, and Enforcement and the local Soil Conservation Service District Office. PPRP has concluded that landscape buffering that is in substantial conformance with Prince George's County's site plan review requirements will mitigate most views of the facility structures from adjoining public roads and properties.

The Project will not create a new source of substantial light if its lighting plan satisfies Prince George's County exterior lighting requirements as negotiated during Mandatory Referral review. Without additional buffering, the Project could cast glare onto some neighboring properties. However, the Applicant is working with a licensed landscape architect to prepare a landscape buffer plan to reduce glare, which will be evaluated in the County's Mandatory Referral review. PPRP has included an initial license condition requiring Sol Phoenix Solar to document and address complaints related to potential solar reflections.

The Applicant consulted with the MHT regarding archeological and historic resources in the Project area, which determined no historic properties are in the area of potential effect. The Project is not within a Maryland Heritage Area and no State scenic byways are nearby. PPRP does not expect the additional traffic generated by the Project during construction will adversely affect cyclists or pedestrians.

PPRP has included license conditions to ensure that the Project conforms to national fire and electrical codes and that emergency response protocols are in place in the unlikely event of a fire or other emergency at the site. Overall, the Project's operation will not emit significant traffic, noise, air, or water pollutants, or generate any hazardous waste that could potentially affect public health. At the end of the facility's useful life, a decommissioning plan will return the Project site to its original state. In other words, the Project will minimally affect the local environment.

Because of this, PPRP has concluded that property values will be unchanged by the Project.

PPRP has included a license condition requiring all of the noise sources associated with the Project to comply with the State noise regulations, as listed in COMAR 26.02.03. The available information provided by the Applicant indicates that the Project will comply with both the construction and operational noise limits.

EMF levels, in particular magnetic field levels, from the proposed Project are projected to fall below threshold human health standards at a distance of 3 feet. Given that the typical buffer from adjacent homes is more than 100 feet, EMF levels from the Project are not anticipated to pose a serious health risk to nearby residents.

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