BEFORE THE
PUBLIC SERVICE COMMISSION
OF MARYLAND

In the Matter of the Application	**)**	
Of Cherrywood Solar 1, LLC for a	**)**	
Certificate Of Public Convenience and	**)**	**Case No. 9477**
Necessity To Construct a 202 MW Solar	**)**	
Photovoltaic Generating Facility in	**)**	
Caroline County, Maryland	**)**	

DIRECT TESTIMONY OF DR. PETER D. HALL

ON BEHALF OF THE

MARYLAND DEPARTMENT OF NATURAL RESOURCES

POWER PLANT RESEARCH PROGRAM

December 13, 2018

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND CURRENT POSITION.

A. My name is Peter D. Hall. I am President of Metametrics, Inc., a consulting firm based in Sperryville, Virginia, and a consulting economist who specializes in regional economics and socioeconomic impact assessments. A statement of my educational background, occupational history, and professional qualifications is appended to this testimony as Appendix A.

Q. PLEASE DESCRIBE YOUR EXPERIENCE.

A. I have conducted numerous socioeconomic impact studies for federal, state and private sector organizations for more than thirty-five years. I have conducted socioeconomic assessments and provided expert testimony for the Power Plant Research Program in multiple CPCN cases before the PSC over that time.

Q. PLEASE EXPLAIN YOUR ROLE IN THE REVIEW OF THE CPCN APPLICATION IN THIS CASE.

A. I am responsible for evaluating socioeconomic impacts associated with the Cherrywood Solar 1, LLC (Cherrywood Solar) CPCN application to construct a solar photovoltaic (PV) facility in Caroline County, Maryland. It is referred to throughout my testimony as the Cherrywood Solar Project (Project). My responsibilities included undertaking a regional overview of current and anticipated socioeconomic conditions in the Project area, and conducting comprehensive assessments of the potential employment, income, population, housing and fiscal impacts, in addition to impacts upon land use, transportation, visual quality and historical and cultural resources, associated with the construction and operation of the Project. My evaluation is summarized in PPRP's Draft *Project Assessment Report for Cherrywood Solar* being filed in this case (PPRP Exhibit__(HS-3)).

Economic, Demographic, and Fiscal Issues

Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE ECONOMIC, DEMOGRAPHIC AND FISCAL IMPACTS OF THE PROPOSED PROJECT?

A. Construction will occur over an approximately 10-month period beginning in November 2019. During the peak construction period, the Project will create approximately 250-350 direct design, management and construction jobs on site or at remote locations. Most construction activities are not expected to require highly specialized skills. As a result, the Project is likely to source many construction jobs from the local labor pool if area subcontractors competitively bid 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, particularly PV panels, are manufactured elsewhere and 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 provision. With public service levels largely unaffected, the net benefit of Project construction will be positive for Caroline County and Maryland.

The Project will have no on-site operations or maintenance (O&M) facilities, nor will it have a permanent O&M workforce. Fiscal benefits will be in the form of corporate income tax revenues to the State, and utility (property) tax revenues to Caroline County.

Land Use

Q. WHAT ARE YOUR CONCLUSIONS REGARDING LAND USE IMPACTS DUE TO THE PROPOSED PROJECT?

A. The Project is located in an unincorporated part of Caroline County, outside the municipal boundaries of Greensboro and Goldsboro although some parcels are within town- or county-designated growth areas. The Project will occupy 18 parcels and use 4 other parcels for easements. Approximately 1,088 acres will be within the Project's limit of disturbance, most currently in agriculture and forest. Two non-easement parcels are within a Priority Funding Area. Most Project parcels are located within the county's Priority Preservation Area (PPA) and most acreage with the Project's limit of disturbance is prime farmland or farmland of statewide importance.[1] The Maryland Department of Agriculture has opined Cherrywood Solar will not be required to mitigate the loss of prime farmland within the PPA. No agricultural or other land preservation easement protects the Project property or any adjoining parcels.

All non-easement Project parcels are zoned R – Rural District. Caroline County permits a commercial solar energy system subject to special use exception in the R-district and other restrictions. The Board of Zoning Appeals granted Cherrywood Solar a special use exception on July 17, 2018. PPRP has concluded that Planning Commission review following the granting of a special use exception by the Caroline County Board of Appeals is necessary to ensure that the final site plan complies with all existing local laws, regulations and ordinances, and provides a basis for the issuance of building and grading permits. The reviewing State agencies recommend a license condition requiring the Applicant to design the facility in substantial conformity to Caroline County

1 Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses.

site plan requirements, and has received site plan approval and all required local permits prior to the commencement of construction (Initial Recommended License Condition No. 21).

Post construction, the land uses of other properties in the area will not change if the Applicant adopts all the State agencies' recommended license conditions.

Transportation

Q. WHAT ARE YOUR CONCLUSIONS REGARDING TRANSPORTATION IMPACTS FROM THE PROPOSED PROJECT?

A. Transportation impacts on nearby roads will occur during the construction period. Construction vehicles will access the site from multiple entry points off MD 313, Bridgetown Road and MD 287. Entrances for commercial or industrial site access from State highways will require access permits from Maryland State Highway Administration (SHA) Access Management. All new entrance or improved entrances onto a county road require an access permit per the Caroline County Code of Public Laws.

Cherrywood Solar estimates approximately 315 vehicles will arrive at the Project site daily and leave at the end of the workday during the peak construction period, which is anticipated to last 4-5 months. Staffing before and after the peak construction period will be less than half the peak workforce. PPRP does not expect 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.

Trucks will deliver all materials for Project construction. Between 60 and 70 trucks will deliver excavation and other site preparation equipment to the Project site at the beginning of the construction period. Deliveries of panels, racking

and piles, inverters, cabling and other Project components plus aggregates and materials for internal roads and other improvements will occur throughout construction. Overall, the Project will generate nearly 1,500 truck deliveries over the construction period. The Applicant's preliminary construction plan estimates deliveries will occur between 9:00am and 2:00pm to minimize disruption to commuter traffic, and trucks will be onsite for about two hours. No more than four trucks will be onsite at any given time. PPRP has concluded that truck traffic will not affect existing motor vehicle traffic near the Project site. Post construction, the Project will not be a significant traffic generator. Most traffic to the site during operations will be light vehicles.

During construction, some loads transporting site preparation equipment to or from the Project site could be oversize or overweight. The SHA requires hauling permits for transporting oversize or overweight loads on Maryland highways. Caroline County does not have a permit process for oversize or overweight loads. The Applicant has stated there will be no oversize or overweight vehicles necessary for material delivery to the Project. The reviewing State agencies recommend a license condition requiring the Applicant to comply with all permit requirements for use, crossing and occupancy of State and Caroline County roads (Initial Recommended License Condition No. 22).

The SHA reviewed the Project for potential conflicts with highway projects in Caroline County and noted it is currently designing a replacement of the existing drainage structure and pipe that run parallel to MD 313 along the southbound side at the intersection of Bridgetown Road. The SHA indicated concern that culvert replacement may conflict with proposed utilities for the solar project at the MD 313/Bridgetown Road intersection. The reviewing State agencies recommend a license condition requiring the Applicant to consult with the SHA concerning this potential conflict (Initial Recommended License Condition No.

23).

Q. ARE THERE ANY OTHER MATTERS WITH REGARD TO POTENTIAL TRANSPORTATION IMPACTS FROM THE PROPOSED PROJECT?

A. Yes. Federal Regulation Title 14 Part 77 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. Off-airport solar Projects in the vicinity of 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.

Four airports are within 5 miles of Project arrays. Spiering Airport is approximately one mile from the Project. Ridgely Airpark is the closest public use airport, approximately 3 miles southwest of the Project. Dover Air Force Base, in Delaware, is more than 16 miles from the Project.

PPRP undertook a glare study on the flight paths into nearby airports. In no case was glare from the Project predicted. PPRP has concluded the Project will not have an adverse effect upon air navigation.

<u>Visual Quality</u>

Q. WHAT ARE PPRP'S CONCLUSIONS REGARDING THE PROPOSED PROJECT'S VISUAL IMPACTS?

A. The terrain within the Project site, much of which is open farmland, exhibits little vertical relief. Views of the site from roads and highways adjacent to the Project are mostly unencumbered by vegetation. Except where the Project abuts residences, the Applicant's site plan shows solar panels and associated

equipment enclosed within a 20-foot grass covered access road, 6-foot chain link fence, and one of three 20-foot landscape buffer options. Where the Project is adjacent to visually impacted residential properties, the Applicant has proposed a fourth option comprising a 50-foot landscape buffer within a 200-foot setback.

Sitting between 2 and 8 feet above ground, the solar arrays will have a low visual profile. In general, where landscaping is not proposed, existing forest and woodland edges block views of solar panels from most perspectives. Visual trespass outside the Project's limit of disturbance is mostly attributable to the absence of a landscape buffer or deployment of a "full pollinator habitat", the latter composed of grasses and wildflowers. Many unobstructed views, however, are from agricultural parcels that do not contain residences. Where landscape buffers are the primary source of visual mitigation, natural growth and maturing of trees and shrubs will reduce the visual footprint of the Project over time.

Although the landscape screen and existing natural vegetation will mitigate much of the Project's visual impact, it does not mean that existing views toward the Project site will be unchanged. Agricultural fields that dominate foreground views from State and county roads that bypass the Project, and from properties overlooking the Project area, will no longer be visible, for example. Landscaping may even create a visual contrast to viewers due to their linearity and uniformity of design. Still, PPRP has concluded the landscape plan in the Project's site plan satisfies design standards in §175-85 of Caroline County's zoning bylaw, and that landscaping that meets the county's design standards for solar arrays will mitigate the Project's appearance and reduce incompatibilities with other land uses in the Project area. The reviewing State agencies recommend a license condition requiring the Applicant to develop a process to document and address complaints related to visual impacts associated with structures within the

Project's perimeter fence (Initial Recommended License Condition No. 24).

As part of the local approval process, the Applicant will be required to enter into a landscaping maintenance agreement with the county. PPRP reviewed the proposed landscaping agreement and concluded the agreement will ensure the buffer is protected, monitored and maintained to the County's specifications over the life of the Project. The reviewing State agencies recommend a license condition requiring the Applicant submit to the PSC and to PPRP a copy of an executed landscaping maintenance agreement with Caroline County (Initial Recommended License Condition No. 25).

The Project has no lighting requirements, although outdoor lighting may be necessary for security, or to satisfy OSHA statutory requirements for worker safety. Exterior lighting standards are codified in the Caroline County Code. PPRP has concluded that the Project will not create a new source of substantial light if its lighting plan satisfies the County's exterior lighting standards.

PPRP undertook a glare analysis of the Project estimating the intensity, time-of-day and duration of glare upon nearby residences and public roads. In no case is glare cast upon any observation point. PPRP has concluded that it is extremely unlikely that reflected sunlight from solar arrays will affect nearby properties or traffic on roads bypassing the Project; nevertheless, the reviewing State agencies recommend a condition requiring Cherrywood Solar to address complaints related to unanticipated solar reflections (Initial Recommended License Condition No. 26).

<u>Cultural and Aesthetic Resources</u>

Q. WHAT ARE YOUR CONCLUSIONS REGARDING IMPACTS ON HISTORICAL AND CULTURAL RESOURCES FROM THE PROPOSED PROJECT?

A. No property on the National Register of Historic Places is within one-half mile of the Project site. Several properties on the Maryland Inventory of Historic Properties are within one-half mile, including four that are within the Project's limit of disturbance. The Maryland Historical Trust (MHT) lists the Greensboro and Goldsboro historic districts in the MIHP. No MHT preservation easement is within one-half mile.

MHT noted some parcels within the Project's limit of disturbance are in areas that are archeologically sensitive. Furthermore, six prehistoric archeological sites are known to be within the Project area. MHT recommended Phase I archeological investigations be conducted within 8 parcels within the Project's limit of disturbance. After reviewing the survey results, the MHT determined no further archeology work is warranted. MHT also requested National Register Determination of Eligibility (DOE) submissions for several parcels, plus any other resources over 50 years of age. After reviewing the Applicant's submissions, MHT determined two properties were eligible for listing in the National Register of Historic Places, although it concluded the proposed buffer plan will mitigate any potential adverse effect on one of the properties. For the other property, MHT concluded avoidance of any potential adverse effect would require removing the solar arrays from the parcel and leaving the structure standing. Otherwise, the undertaking will be required to mitigate the adverse effect on the property. The reviewing State agencies recommend a license condition requiring the resolution of these issues (Initial Recommended License Condition No. 27).

In the event that construction reveals relics of unforeseen archeological sites , the reviewing State agencies recommend a license condition requiring the Applicant, 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 (Initial Recommended License Condition No. 28).

Most of the Project lies within the programmatic boundaries of the Stories of the Chesapeake Certified Heritage Area. PPRP has consulted with Eastern Shore Heritage, Inc., the heritage area's management unit, in fulfillment of its consultation requirement.

The Harriet Tubman Underground Railroad (HTUR) Byway, a National Scenic Byway, bypasses much of the Project. The HTUR Corridor Management Plan makes particular note of farms along MD 313 and MD 287 north of Greensboro, and specifically identifies key views north of Greensboro along MD 313 and east of Goldsboro on MD 287. These landscapes will no longer be visible after the Project is constructed. Furthermore, until the buffer provides the required level of opaqueness through maturation, scenic quality along the HTUR in the Project area will be degraded.

PPRP consulted with SHA's Regional and Intermodal Planning Division to review the Project for consistency to the Scenic Byways program. Since the Project will cover several farms within the byway's viewshed with solar panels, SHA expressed a preference for full screening or intensive screening where the HTUR bypasses these parcels. PPRP has confirmed from the Project's site plan that full screening landscape buffers are planned where solar arrays are adjacent to the HTUR byway. The reviewing State agencies recommend a condition requiring the Applicant to seek approval from the SHA should it modify its landscaping plan for the Project that, in any way, changes the type or composition of landscape buffers along the Harriet Tubman Underground Railroad National Scenic Byway (Initial Recommended License Condition No. 29).

State highways leading to the Project site are designated bicycle trails. The low

volume of truck traffic servicing the facility, and a construction schedule that will commence in late 2019, when cycling activity seasonally declines, are expected to mitigate impacts to cyclists during construction. Still, PPRP is concerned that the additional truck traffic delivering supplies and services could compromise the safety of cyclists on truck routes used for the Project. The reviewing State agencies recommend a license condition requiring Cherrywood Solar to instruct its suppliers and contractors to be aware of on-road bicycle route designations near the Project and Maryland traffic laws regarding bicycles on the road (Initial Recommended License Condition No. 30).

Public Services and Safety

Q. WHAT ARE YOUR CONCLUSIONS REGARDING IMPACTS ON PUBLIC SERVICES AND SAFETY FROM THE PROPOSED PROJECT?

A. During construction and operation, no additional public services will be required to support the Project under normal conditions. In the event of a fire or accident, the Emergency Management Service Division within the Caroline County Department of Emergency Services dispatches emergency responders. Volunteer fire departments respond to regional needs. Caroline County provides emergency medical services. The Caroline County Sheriff's Office is the primary law enforcement agency in the county.

Post construction, the risk of fire from ground-mounted photovoltaic systems is low if site preparation and maintenance has removed potential fuels from under and around the arrays. Fire prevention guidance for ground-mounted PV installations is contained within the National Fire Protection Association's NFPA 1 Fire Code Handbook and NFPA 70 National Electrical Code. The reviewing State agencies recommend a license condition requiring the Applicant to design, install and maintain the Project to meet the minimum standards set forth in

NFPA 1 and NFPA 70 (Initial Recommended License Condition No. 31).

Although the likelihood of fire is low, there are unique challenges facing firefighters at PV facilities. Caroline County's fire and rescue is a mostly volunteer system where standard operating procedures or guidelines may not currently address operations at PV facilities. The reviewing State agencies recommend a license condition requiring the Applicant to contact the Goldsboro VFC, Greensboro VFC and the Caroline County Department of Emergency Services to develop appropriate protocols for addressing on-site emergencies (Initial Recommended License Condition No. 31).

Property Values

Q. WHAT ARE YOUR CONCLUSIONS REGARDING IMPACTS ON PROPERTY VALUES FROM THE PROPOSED PROJECT?

A. With a minimal vertical profile and both existing and proposed buffering along parts of the perimeter of the site, the Project will be largely out of sight from nearby properties. The Project's operation will not create significant traffic, noise, air emissions, or water pollution, nor will it generate any hazardous waste that could potentially affect public health. In other words, the local environment will be minimally affected by the Project. That the proposed facility will have a moderately benign local presence once the facility is operational suggests that property values will be unaffected by the Project.

Q. DOES THAT CONCLUDE YOUR TESTIMONY AT THIS TIME?

A. Yes, it does.

APPENDIX A:

STATEMENT OF QUALIFICATIONS

for Peter D. Hall

Dr. Peter D. Hall is a consulting economist and president of Metametrics, Inc., a consulting firm based in Sperryville, Virginia. He has over thirty years of experience in regional economic analysis and socioeconomic impact assessment. Over that period, he has directed numerous consulting engagements assessing the economic, social and other impacts from economic development and infrastructure investment Projects. Dr. Hall has undertaken consulting assignments for a large number of clients including major telephone utilities, banks, the U.S. Army Corps of Engineers, the Department of Energy, the U.S. Department of Commerce and the Environmental Protection Agency.

For the Maryland Department of Natural Resources, Dr. Hall serves as an expert socioeconomic consultant and has performed a number of socioeconomic assessments for CPCN applications over the years. Dr. Hall directed the Power Plant Research Program's socioeconomic assessment in the Western Maryland Power Plant Siting Study. He also conducted the socioeconomic assessments for Baltimore Gas and Electric's (BG&E's) proposed Perryman facility and Delmarva Power and Light's proposed Dorchester facility. Dr. Hall directed PPRP's environmental reviews for PEPCO's Station H power plant, PEPCO's Chalk Point CT Project, Panda Energy Corporation's Panda-Brandywine cogeneration facility, and Projects in Laytonsville and College Park, Maryland. He has also been involved in the estimation and forecasting of residential, commercial, industrial and peak-load electricity demand in the Allegheny Power System service territories. Dr. Hall directed socioeconomic assessments on behalf of PPRP for the ODEC/Reliant Project in Cecil County, for the Kelson Ridge Project in Charles County, the Mirant combined cycle facility in Montgomery County, the Clipper, U.S. Windforce and Synergics wind energy Projects in western Maryland and Projects resulting from Maryland's Healthy Air Act (HAA). Other assessments have included the proposed Catoctin power plant in Frederick County, the CPV St. Charles power plant in Charles County, the Wildcat Point combined cycle facility in Cecil County, the Keys and Mattawoman power plants in Prince George's County, and many transmission line cases throughout the State. Dr. Hall has conducted more than two dozen socioeconomic assessments of renewable energy projects proposed for Maryland.

Dr. Hall was previously employed as a Managing Associate of Urban Systems Research and Engineering, Inc. and as a Senior Technical Engineer at the Sorites Group, Inc. He has also served as an adjunct instructor in the Department of Civil Engineering of Tufts University.

Dr. Hall received his B.A. in 1974 and M.A. in 1975 from McMaster University in Economic Geography. He received his Ph.D. in Civil Engineering (Transportation) from the Massachusetts Institute of Technology in 1980.