BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of **Union Ridge Solar, LLC** for a Certificate of Environmental Compatibility and Public Need for a Solar Facility Located in Licking County, Ohio.	))))	Case No. 20-1757-EL-BGN

DIRECT TESTIMONY OF

GORDON PERKINS

on behalf of

Union Ridge Solar, LLC

September 2, 2021

Q-1. Please state your name, title, and business address.

A-1. My name is Gordon Perkins. My title is Visualization Services Leader at Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. ("EDR"). My business address is 217 Montgomery Street, Suite 1100, Syracuse, NY 13202.

Q-2. What are your duties as Visualization Services Leader?

A-2. As Visualization Services Leader at EDR, I am responsible for the general oversight of all analyses associated with visual resource assessments. This includes identification of visually sensitive resources, field evaluation and documentation, visibility analyses, development of detailed and accurate visual simulations, description of existing scenic quality as well as visibility and potential visual impacts to public resources resulting from the Project, conceptual mitigation design, and report production.

Q-3. What is your education and professional background?

A-3. I received a Bachelor of Science Degree in Landscape Architecture from the State University of New York College of Environmental Science and Forestry in 2001 and I am a Certified Geographic Information Systems Professional. I have 21 years of professional experience, focusing primarily on visualization and visual impact assessment. In particular, I have extensive expertise in two-dimensional ("2-D") and three-dimensional ("3-D") visualization tools, photography, calibrated simulation methodology, and documentation of the visual environment. I have worked for several design and consulting firms and currently serve as Visualization Services Leader at EDR. A copy of my resume is attached to my testimony as Attachment GP-1.

Q-4. Have you testified previously before the Ohio Power Siting Board?

A-4. No.

Q-5. On whose behalf are you offering testimony?

A-5. I am testifying on behalf of the Union Ridge Solar, LLC (the Applicant or Union Ridge), which is seeking to develop the proposed Union Ridge Solar facility (the Project) in Harrison Township, Licking County, Ohio.

Q-6. What is the purpose of your testimony?

A-6. The purpose of my testimony is to provide additional context, and support regarding the information set forth in the Visual Resource Assessment (VR), filed as Exhibit S (Visual Resource Assessment and Mitigation Plan) to the Application for a Certificate of Environmental Compatibility and Public Need, filed by Union Ridge Case No. 20-1757-EL-BGN ("the Application") on March 26, 2021. My testimony, together with the other witnesses for Union Ridge testifying in this case, supports the Ohio Power Siting Board's (OPSB's) review of Union Ridge's Application for a Certificate of Environmental Compatibility and Public Need (Certificate) to construct the Project. In addition, the VRA provides conceptual mitigation measures to reduce and minimize the potential visual effects of the Project. Since the filing of the Application, the Applicant has continued to develop more robust conceptual vegetative mitigation and the use of an earthen berm to further reduce and minimize the potential visual impacts to specific properties and stakeholders.

Q-7. What was your role in the Visual Resource Assessment conducted for the Application?

A-7. I provided oversight and had direct involvement in the technical studies, authoring, and production of the Union Ridge Solar VRA as well as final review and approval of the completed Exhibit.

Q-8. What is a Visual Resource Assessment?

A-8. A VRA is a comprehensive analysis of the visual and aesthetic characteristics of the landscape in the vicinity of a Project site and the effect of the visible components of the Project on resources/receptors within the visual study area. The purpose of the VRA is to evaluate the visual impact of the Project and ensure that the Board has the required information necessary to make an informed decision regarding the potential visual alterations to the scenic quality of the landscape resulting from the Project.

Q-9. What is specifically addressed in the VRA?

A-9. The VRA:

- Describe the visible components of the proposed Project.
- Define the visual character of the visual study area (VSA).
- Inventory and evaluate the existing visually sensitive resources (VSRs) within the VSA.
- Evaluate the potential visibility of the Project within the VSA.
- Create photographic simulations of the proposed Project from select locations.
- Assess the visual impacts associated with the proposal.
- Describe proposed mitigation measures considered to reduce/minimize potential visual impacts.

Q-10. Please describe the VRA Methodology?

A-10. The VRA was prepared by a team of experienced visual resource assessment experts in accordance with the policies, procedures, and guidelines contained in established visual resource assessment methodologies. Landscape Types (LTs) within the 5-mile radius VSA were categorized based on the similarity of various features, in accordance with established resource assessment methodologies (Smardon et al., 1988; USDA Forest Service, 1995; USDOT Federal Highway Administration, 1981; USDI Bureau of Land Management, 1980).

VSRs within the VSA were identified per the requirements of OAC Chapter 4906-4-08(D). The categories of VSRs considered in the VRA included the following:

- Properties of Historic Significance: National Historic Landmarks, National or State Historic Sites, Sites listed on National or State Registers of Historic Places (NRHP, SRHP); Sites Eligible for Listing on the NRHP or SRHP; National or State Historic Sites, Ohio Historic Structures, Historic Bridges, Ohio Genealogical Society (OGS) Cemeteries, and Ohio Historic State Markers.
- Designated Scenic Resources: Rivers Designated as National or State Wild, Scenic, or Recreational; Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic; Other Designated Scenic Resources.
- Public Lands and Recreational Resources: National Parks, Recreation Areas, Seashores, and/or Forests; National Natural Landmarks; National Wildlife Refuges; Heritage Areas; State Parks; State Nature Preserves or Wildlife Areas; State Forests; State Fishing/Waterway Access Sites; Other State Lands, Designated Trails; Local Parks and Recreation Areas; Publicly Accessible

Conservation Lands/Easements; Rivers and Streams with Public Fishing Rights Easements; Named Lakes, Ponds, and Reservoirs.

- High Use Public Areas: State, US, and Interstate Highways, Schools, Cities, and Villages.
- To identify areas where views of the proposed PV panel arrays, substation and overhead gen-tie line could potentially be available viewshed analyses were performed based on the height of the tallest proposed above ground components. A digital surface model (DSM) viewshed analysis for the proposed photovoltaic (PV) panel arrays was conducted to incorporate the screening effects of topography, structures, and vegetation. To provide the most accurate possible assessment of potential PV panel array visibility, the DSM viewshed analysis was prepared using: 1) a DSM derived from the Ohio Statewide Imagery Program's (OSIP) 2006 lidar data for Licking and Fairfield counties, Ohio; 2) sample points representing solar panel locations placed 200 feet apart in a grid pattern throughout all proposed PV panel areas; 3) an assumed maximum solar panel height of 15 feet; 4) an assumed viewer height of 6 feet; and 5) Esri ArcGIS® software with the Spatial Analyst extension.

A DSM viewshed analysis was also conducted for above-ground electrical components, consisting of the proposed collection substation and overhead gen-tie line. At the time of the study, two collection substation locations were under consideration, each with its own associated overhead gen-tie line route.[1] This viewshed analysis was run based on the unrealistic but conservative assumption that both substations and overhead lines would be

[1] Subsequently, on May 6, 2021, the Applicant filed correspondence with the OPSB selecting the west gen-tie route.

built. Each collection substation footprint was represented by five sample points (e.g., the four corners and an approximate center point of the substation footprint), and the associated overhead gen-tie lines were represented by sample points spaced 100 feet apart (collection line poles are more likely to be spaced approximately 450 feet apart, however, their locations are unknown at this time). All sample points were assigned a height of 75 feet, as that is the maximum potential height of both the lightning masts (the tallest proposed structures within the collection substation) and the gen-tie line structures. This approach provides a worst-case scenario that overestimates the size and potential for visibility for the substation. All other data sources and assumptions used in the above-ground electrical component viewshed analysis are as described above for the PV panel viewshed analysis.

Field verification was conducted on November 19, 2020 and January 21, 2021, to verify potential visibility of the Project and to document the visual character of the various LTs within the VSA, identify the type and extent of existing visual screening, and obtain photographs for subsequent use in the development of visual simulations. During the site visit, EDR staff members drove public roads and visited public vantage points within the VSA and obtained photographs from nine different viewpoints utilizing a digital SLR camera with a lens setting between 24 and 35 mm (equivalent to between 37 and 55 mm on a standard 35 mm full frame camera). Viewpoint locations were recorded using global positioning system (GPS) units. At each viewpoint, all field notes, GPS points, focal length parameters, times, and dates were documented electronically.

Visual simulations of the proposed Project were developed from seven representative locations within the VSA by constructing a 3D computer model of the proposed PV arrays and full Project layout based on specifications, dimensions, and locations provided by the

Applicant. Next, the camera specifications used to take the selected photograph in the field were replicated in the 3D model. This was accomplished by positioning the 3D camera in the same real-world coordinate system as the Project model using GPS coordinates collected at each photo location. The camera was then aligned, and the camera's target position (view direction) adjusted, until the modeled 3D elements aligned exactly with the elements in the photograph. Once this step was complete, the Project was incorporated into the photograph at the correct location, perspective, and scale. At this point, the appropriate sun angle was simulated based on the specific date, time, and location (latitude and longitude) at which the photograph was taken. This information allows the program to realistically illustrate highlights, shading, and shadows for all Project components shown in the view.

At viewpoints where mitigation plantings are proposed, vegetative screening was included in the simulations and represented at a height that would be achieved approximately 5-7 years after installation.

The visual simulations were used to characterize the type and extent of the visual impact resulting from the Project.

Q-11. What were the results of the Visual Resource Assessment you performed?

A-11. Results of the VRA were as follows:

(1) The Project PV panels will be screened from view by intervening topography, vegetation, and structures in approximately 96.7% of the 5-mile radius of the VSA. The majority of PV panel visibility, based on percentage of total area, is concentrated within the near-foreground distance zone, with 52.2% of the area out to 0.5 mile from the Project indicated as having potential views of some portion of

the proposed solar panel arrays. Views from areas beyond the near-foreground and into the foreground distance zone (0.5-1.5 miles) are well screened, with only 8.4% of the foreground distance zone indicated as having the potential for views of the PV panels. The DSM viewshed analysis indicates that potential Project visibility is further reduced at distances beyond the foreground. Approximately 99.8% of the VSA is screened from view of the PV panels in the middle ground (at distances between 1.5 and 4 miles), and at distances between 4 and 5 miles (the background distance zone) viewshed analysis suggests that there will be no visibility of the PV panels.

(2) Viewshed analysis of the collection substation and gen-tie line indicates that the tallest structures associated with these Project components will be screened from approximately 96.3% of the VSA by intervening landforms, vegetation, and structures. Potential visibility is primarily located in the near-foreground, as represented by the percentage of area with visibility (52.3%). As the distance from these components increases, potential visibility decreases. Roughly 10% of the foreground is calculated to have potential views which, decreases to 0.7% for the middle ground area, and less than 0.1% in the background. It is important to keep in mind that the above-ground electrical component viewshed analysis presents theoretical visibility and, in this instance, evaluates two separate facilities (only one of which will be built), therefore, it overestimates the degree to which these components of the Project will be visible in reality. It also ignores the narrow profile and neutral color of the lightning masts and overhead collection line structures, which will likely make these structures difficult to discern at distances beyond the

foreground. Consequently, viewshed analysis results overstate the extent of actual above-ground electrical component visibility.

(3) The DSM viewshed analysis suggests that 13 of the 238 VSRs identified within the VSA (5%) may have some level of PV panel visibility, while nine additional VSRs (4%) may have views of some portion of the above-ground electrical components. Of the 13 resources with potential PV panel visibility, 12 (92%) are located beyond 0.5 mile from the Project, and therefore are not anticipated to experience significant visual impact (based on the results of field review and simulations). Viewshed results also suggest that areas of potential visibility from VSRs in the middle ground and background will generally be small and/or include only a limited number of PV panel arrays.

(4) Field verification generally confirmed the results of the DSM viewshed analysis. Open views toward the Project are largely restricted to areas adjacent to the Project Area where public roads are bordered by open agricultural fields. These roads include U.S. Route 30 and State Routes 34, 39, and 42. State Route 42 runs through the center portion of the Project Area from North to South for approximately 0.55 mile and will offer the greatest opportunity for near foreground views of the Project. Field review confirmed that views of the Project from more distant portions of the VSA (beyond 1 mile) to the north and northeast will be largely screened by a vegetated railroad corridor, scattered structures, woodlots, and mature woodland areas. Increased opportunities for views of portions of the Project are available from the southeast (i.e., toward the intersection of Route 30 and Route 39) and from the west (i.e., in the direction of Route 310) due to the lack of topographical change

and limited intervening forest vegetation. However, during the growing season, visibility of the Project from these areas may be limited by crop (corn) growth in the foreground agricultural fields. The combination of relatively low panel height, along with existing streamside vegetation, hedgerows, gently rolling topographic relief, and the atmospheric effects of distance, will limit visibility of the Project from the vast majority of the VSA.

(5) As illustrated in the visual simulations, the Project will result in varying levels of visual impact when viewed from adjacent roads and residences. When directly adjacent to the viewer and unscreened, the panel arrays will alter the scenic quality and/or existing agricultural character of the landscape. However, this visibility and potential visual impact diminishes rapidly when the Project is viewed from greater distances or through existing vegetation. Consequently, it is anticipated that visual impact will be largely limited to certain areas directly adjacent to the Project. As discussed below, these foreground views of the Project will be substantially mitigated through the use of vegetative buffering.

Q-12. Please describe any design techniques/standards utilized to minimize visual impacts of the proposed Project.

A-12. The Applicant proposes a robust visual mitigation program, consisting of a variety of perimeter plantings intended to screen or soften views of the solar arrays. The conceptual mitigation plan developed for this Project reflects the reality that 100% opaque screening would not appear natural and is not practicable. Introduction of native vegetation will create visual buffers that fit into the context of the existing landscape, mimicking the hedgerows and woodlots currently present on and around the Project Area. As illustrated in the visual simulations, the proposed plantings will provide effective screening and/or soften the horizontal line created by the installation of the PV panels and blend the Project into the surrounding landscape. It is important to note that the mitigation plantings illustrated in the visual simulations will be refined to reflect on-the-ground conditions, and may also require adjustment, due to availability of specific sizes or species of plant material. These refinements will help ensure that the final mitigation plans will be consistent with the concepts described and illustrated in this study, and effective in screening/integrating the Project into the landscape.

Four main planting modules were developed to provide variable levels of Project screening and visual softening. Module 1, which was applied to approximately 1,100 feet (0.2 mile) of perimeter fencing includes a grass seed mix. This module is intended to soften the edges of agricultural fields or low visibility areas. The grass seed mix will provide seasonal color and texture interest as well as ecological benefits that did not previously exist on the Project Area. Additionally, a variety of potential seed mixes will be specified based on the expected soil composition in different areas of the Project Area to increase survivability and successful regeneration.

Module 2 was applied to approximately 7,200 feet (1.4 miles) of perimeter fencing and is used in areas with frequent viewers but without prolonged viewer duration. Consisting of shrub and trees of varying scale and form, Module 2 can visually break up the horizontal line resulting from the solar array, to provide partial screening and greater integration with the surrounding landscape. The low profile of the selected species allows for partial Project screening while maintaining long views and open sky over the top of the solar facility.

Module 3 was applied to approximately 12,300 feet (2.3 miles) of perimeter fence and is designed to be used when a high level of screening is desired, most notably where stationary adjacent uses could be impacted by the installation of facility components. Type 3A relies on the use of large shade trees, shrubs and the incorporation of evergreen material to provide significant screening during winter (leaf-off) and summer (leaf-on) conditions. Type 3C matches the layout, massing, and screening intent with substitution of lower-height trees where overhead utilities or other space constraints were identified.

In addition, due to the proximity of the Project to the York Gate Estates neighborhood (Covington Lane), more robust mitigation plantings are proposed along the perimeter fence abutting the homes on Covington Lane. The plantings consist of a mix evergreen trees and shrubs of varying sizes, and in response to community feedback, additional vegetation (in the form of low-growing deciduous and evergreen shrubs) was added to provide variation and color to the vegetative buffer. As illustrated in the simulation (Viewpoint 14), the proposed plantings appear compatible in this suburban residential setting, will effectively minimize the visibility and visual effect of the Project during all seasons of the year. The effectiveness of the plantings will increase as the trees mature.

Additionally, the Application considers the use of a PV panel configuration that would result in two panel units in portrait orientation (2P layout) resulting in a maximum height of 14 feet above ground level. This condition would only be present only during morning and afternoon hours. However, after extensive discussion with stakeholders, it was determined that a lower-profile PV panel configuration consisting of one panel in portrait (1P) with a total height of ten feet above ground level, would address some stakeholder concerns. This reduction in height would in essence increase the overall effectiveness of the proposed mitigation by providing more complete screening of the Project during the early stages of plant growth due to the lower profile of the panels compared to the typical install size of the plant material. It is also possible that this 1P layout could reduce the overall affected viewshed within the visual study area. More importantly, the 1P layout would likely decrease the perceived scale of the Project from near-foreground vantage points.

Q-13. Was local zoning considered in the development of mitigation modules?

A-13. The Harrison Township Zoning Resolution (Adopted Date 5/3/2021, Effective Date 6-2-2021) was consulted during the development of the mitigation plan. General provisions of the Zoning Resolution include a section on "Buffering and Screening" (Section 10.17) and which includes standards for installation, maintenance, and performance of planting buffers and mitigation. Additionally, solar facilities are addressed in "10.20 Solar Collection-Accessory System." While the provisions set forth appear to be mainly geared toward residential solar installations, the Project generally complies with the height standards for PV array installations which are not to exceed 10 feet above ground level. Additionally, where potential visual impacts were identified, the mitigation plan includes a vegetative buffer that will achieve the landscaping requirements in locations where views may be available from neighboring residential properties

Q-14. Does this conclude your testimony?

A-14. Yes. However, I reserve the right to update this testimony to respond to any further testimony, reports, and/or evidence submitted in this case.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Testimony was served upon the parties of record listed below this 2nd day of September 2021 *via* electronic mail.

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