



## Technical Memorandum

**To:** Pine Grove Solar, LLC  
**From:** Tetra Tech, Inc.  
**Date:** August 2, 2022  
**Subject:** Pine Grove Solar Project Visual Assessment

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Tetra Tech, Inc. (Tetra Tech) was contracted by Pine Grove Solar, LLC to perform a visual assessment for the Pine Grove Solar Project (Project), which is proposed to have a nameplate capacity of up to 50 megawatts. The Project is located on approximately 220 fenced acres of private land in Madison County, Kentucky (Project Area). The main Project components evaluated in the visual assessment include solar panels, perimeter fencing, a Project owned substation and a utility owned switching station.

### Desktop Review and Field Investigation

The Project Area is located between the unincorporated communities of Bybee and Winston in Madison County, approximately 10 miles east of the town of Richmond and approximately 10 miles west of the town of Irvine. It is roughly bounded by Kentucky Highway 52 and Bybee Loop Road on the north and east, Dodd Road on the south and east, and Brassfield Road on the west. Pine Grove Road traverses the middle of the Project Area in an east-west direction. The topography in the area consists of a series of gently to moderately rolling hills and swales. Land use is primarily pasture and agricultural; few fragmented large, forested areas are present. Tree lines typically occur at parcel boundaries, in riparian zones, and along roadways. Scattered rural residential development, commercial and retail businesses, communication facilities, transmission towers, and a vehicular transportation network are all present within and surrounding the Project Area.

A review of potential visual resources within 2 miles of the Project Area (Study Area) included, but was not limited to, recreation areas, local community resources (e.g., schools, libraries, places of worship), and other visually sensitive resources. After review of these potential sensitive resources, Tetra Tech identified 12 representative viewpoints (VP) for investigation in the field. These points represent locations around the Project where viewers could notice a change in the existing landscape setting because the Project facilities may be visible. These viewpoints include local schools, key travel-ways in the county, areas with clusters of residential properties, representative commercial areas, and recreation areas.

In addition to visiting each of these locations in the field,<sup>1</sup> three locations were chosen for creation of visual simulations (VP-02, VP-04, and VP-12a/12b; Attachment A) and three were chosen for line-of-sight graphics (VP-05, VP-09, and VP-11; Attachment B). Figure 1 depicts the Project site boundary, and Figure 2 depicts the Study Area and location of the 12 viewpoints visited in the field.

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<sup>1</sup> Tetra Tech conducted field visits on December 10, 2021, and again on July 6, 2022, to capture digital photographs of each of the 12 identified viewpoints. The field visit and technical photographs (Attachment C) were used for the subsequent visual assessment.

Each viewpoint was evaluated to determine whether the Study Area would be potentially visible and in what context that view would be. Visual simulations, line-of-sight graphics, and photographs were developed and referenced to assist in the analysis (Appendices A, B, and C, respectively). Visual simulations combine photographs with rendered three-dimensional digital models of Project facilities to predict what would be seen if the proposed Project were built in the photographed setting. A line-of-sight is the direct line between the viewer and an object, including objects in the distance. Both the visual simulations and line-of-sight assist in determining whether views may be obstructed by intervening terrain, vegetation, or structures that exist between a viewer and the Project.

Viewer groups were identified to understand the types of users in this area. Viewer groups are specific users associated with various land uses who may notice and be impacted by landscape change and who therefore could be affected by the construction and operation of the Project. Viewing locations are typically selected based on land uses and viewer groups associated with key travel routes, recreation areas, and residential areas. Key observation points (KOPs) represent critical or typical viewpoints within a land use, and associated viewer groups are used to assess the visual effect of a proposed project. The visual impact to viewers at each KOP is based on the type of use and expected concern for aesthetics. Identifying groups of individuals who would likely be perceptive to visual changes is an important part of the visual assessment process and helps to define specific locations from which to assess changes to the visual character of the landscape. The inventory considered (1) the most critical viewpoints (i.e., views from communities, residential areas, and travel ways), and (2) views that best represent the general area or landscape setting.

### ***Residents***

The residential viewer group consists of people who live within the Study Area (see Figure 2). Many local residents are present on a year-round basis. Generally, they view the landscape from their yards and homes and from places of employment while engaged in daily activities. Residents of primary interest for this analysis are located near the Project Area within the Study Area that may have views of the Project components. Regardless of their proximity to the Project, residents may have similar reactions to views of the Project facilities. Residents' threshold for visual quality can be variable and may be tempered by the visual character and setting of their neighborhoods. It is assumed that residents are generally familiar with the local landscape and may not be tolerant of changes to particular views that are important to them.

### ***Commuters/Travelers***

Travelers include daily commuters and people engaged in various types of business or personal travel within the Study Area and view the landscape from motor vehicles on their way to work or other business destinations. Commuters do not tend to stop along their travel routes, have a relatively narrow field of view because they are focused on road and traffic conditions, and are destination oriented. Commuters may be more likely to notice change because they view this environment regularly. Passengers in commuter vehicles would have greater opportunities for prolonged off-road views toward landscape features and, accordingly, may have greater perception of changes in the visual environment. Roads in and around the Project Area are primarily rural two-lane roads.

### ***Tourists and Recreational Users***

This viewer group includes local and potentially seasonal residents engaged in recreational activities and tourists and recreational users visiting from out of the local area. Viewers in this group can also be tied to traveler and residential, depending on the type of recreation. These users can be involved in outdoor



recreational activities at parks and other developed recreational facilities or in undeveloped natural settings such as forests or preserves. Tourists and recreational users come to the area for the purpose of experiencing its cultural, scenic, and/or recreational resources, including driving the scenic byways. For some of these viewers, scenery is a very important part of their recreational experience, and recreational users often have continuous views of landscape features over relatively long periods of time. Recreational users' perception of visual quality and landscape character would be variable depending on their reason for visiting the area. However, recreators are generally considered to be highly perceptive to changes in scenic quality and landscape character.

## Visual Assessment

Assessing the degree of visual contrast is a means to evaluate the level of modification to the existing landscape features that would result from an action. In the context of the Project, existing landscape scenery is defined by the visual characteristics (form, line, color, and texture) associated with the landform (including water), vegetation, and existing facilities within and adjacent to the Project.

Descriptions of each visual character element are listed below:

- Form—The shape and mass of landforms or structures;
- Line—The edge of shapes or masses, silhouettes, or bands;
- Color—The property of reflecting light of a particular intensity of wavelength that the eye can see; and
- Texture—The nature of the surface of landforms, vegetation, or structures.

The level of visual contrast introduced by an action can be measured by changes in form, line, color, and texture. The greater the difference between these character elements found within the landscape and the Project components, the level of visual contrast becomes more apparent, which typically increases perceived contrast.

The degree of contrast introduced to a particular viewpoint by Project facilities, in combination with the sensitivity of viewers at that viewpoint, will determine the level of visual effect. The following general criteria are typically used when rating the degree of contrast, and are utilized here to describe the visibility/noticeability of the Project components:<sup>2</sup>

- None—The element contrast is not visible or perceived.
- Weak—The element contrast can be seen but does not attract attention.
- Moderate—The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- Strong—The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Each viewpoint was evaluated to determine whether the Project Area would be potentially visible and in what context that view would be. Photographs were used to assist in the analysis.

### **VP-01: Pine Grove Road (East)**

- **View Represented:** Residential

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<sup>2</sup> Bureau of Land Management Visual Resource Inventory Process. Available online at: <https://blmwyomingvisual.anl.gov/vr-inventory/blm/>

- **Location:** VP-01 is located on the eastmost portion of Pine Grove Road in the middle of the Project Area situated between private agricultural and pasturelands on either side of the road. The photograph was taken approximately 1.4 miles east of Brassfield Road, looking east towards the Project Area.
- **Viewing Direction to Project:** East
- **Distance to Project:** Approximately 200 feet (approximately 0.04 mile)
- **Corresponding Figure:** See Photolog (Attachment C)

The existing landscape setting is characterized by moderately rolling terrain. The area is largely rural with agricultural and pastoral fields. Vegetation includes blocks of green grasses as well as clumps of dense patches of trees and tan grasses. Mostly deciduous and a few evergreen trees line the grass fields along the ridges in the foreground and into the middleground and background. Human-made features consist of a gravel road, post-and-rail fencing, combination timber and steel fencing along both sides of the road, barns, and scattered residential and agricultural buildings in the foreground. A cell phone tower can be seen in the middleground. Given its proximity to the Project Area, Project facilities would be visible from this viewpoint, but the view would be short term for residential travelers along the road. From this viewpoint, located approximately 200 feet away from the Project, views of the Project would be mostly unobstructed. The Project would introduce gray color, geometric shapes, and horizontal lines into the landscape setting. Fencing around the solar panels would introduce vertical lines. Because the panels would be adjacent to the road, moderate to strong contrast would be introduced at this location. These impacts would be short term for residents for a limited time as they are approaching and are parallel to the Project Area, but their focus would be on the road ahead. Nearby residents would have longer views, but tree cover surrounds most residences.

### ***VP-02: Pine Grove Road—Near Structure***

- **View Represented:** Residential
- **Location:** VP-02 is located on Pine Grove Road. The photograph was taken from Pine Grove Road, looking southeast towards the Project Area.
- **Viewing Direction to Project:** Southeast
- **Distance to Project:** Approximately 200 feet (approximately 0.04 mile)
- **Corresponding Figure:** See Visual Simulation (Attachment A)

The existing landscape setting is characterized by gently rolling terrain in the foreground. The area is largely rural with agricultural and pastoral fields. Vegetation includes blocks of green and yellow grasses and clumps of dense patches of trees and tan grasses. Mostly deciduous and several evergreen trees line the grass fields along the ridges in the foreground and into the middleground and background. Human-made features consist of a gravel road, transmission lines and utility poles crisscrossing the area, steel agricultural structures for the storing of hay bales, post-and-rail fencing, combination timber and steel fencing, a barn, and scattered buildings in the foreground visible through gaps in vegetation. Given its proximity to the Project Area, the Project facilities would be visible from this viewpoint, but the view would be short term for residential travelers along the road. From this viewpoint, located approximately 200 feet away from the Project, views of the Project would be mostly unobstructed. The Project would introduce gray color, geometric shapes, and horizontal lines into the landscape setting. Fencing around the solar panels would introduce vertical lines. New overhead power lines would be introduced in the existing environment; however, the new poles would be seen in the context of the existing power poles and transmission line. A Project owned substation and a utility owned switching station would be placed

approximately 500 feet from the road, and they would create additional gray color and geometric shapes in the existing environment. Because the panels, substation and switching station, and power line would be near the road, strong contrast would be introduced at this location (see Visual Simulation VP-02). These impacts would be short term for residents for a limited time as they are approaching and are parallel to the Project Area, but their focus would be on the road ahead. Residents would have longer views, but tree cover surrounds most residences.

### ***VP-03: Pine Grove Road***

- **View Represented:** Residential
- **Location:** VP-03 is located along Pine Grove Road. The photograph was taken from Pine Grove Road, looking southwest towards the Project Area.
- **Viewing Direction to Project:** Southwest
- **Distance to Project:** Approximately 200 feet (approximately 0.04 mile)
- **Corresponding Figure:** See Photolog (Attachment C)

The existing landscape setting is characterized by relatively flat to gently rolling terrain in the foreground. The area is largely rural with agricultural and pastural fields. Vegetation includes patches of green grasses and clumps of dense patches of trees lining the perimeter of the area. Mostly deciduous and several evergreen trees line the grass fields along the ridges in the foreground. Human-made features consist of a gravel road, a power line, steel agricultural structures for the storing of hay bales, silos, post-and-rail fencing, combination timber and steel fencing with barbed wire, and scattered buildings in the foreground. Given its proximity to the Project Area, the Project facilities would be visible from this viewpoint, but the view would be short term for residential travelers along the road. From this viewpoint, located approximately 200 feet away from the Project, views of the Project would be mostly unobstructed. The Project would introduce gray color, geometric shapes, and horizontal lines into the landscape setting. Fencing around the solar panels would introduce vertical lines. Because the panels would be adjacent to the road, moderate to strong contrast would be introduced at this location. These impacts would be short term for residents for a limited time as they are approaching and are parallel to the Project Area, but their focus would be on the road ahead. Nearby residents would have longer views, but tree cover surrounds most residences.

### ***VP-04: Pine Grove (West)***

- **View Represented:** Residential
- **Location:** VP-04 is located along Pine Grove Road. The photograph was taken from Pine Grove Road, looking southeast towards the Project Area.
- **Viewing Direction to Project:** Southeast
- **Distance to Project:** Approximately 880 feet (approximately 0.2 mile)
- **Corresponding Figure:** See Visual Simulation (Attachment A)

The existing landscape setting is characterized by relatively flat to gently rolling terrain in the foreground. The area is largely rural with agricultural and pastural fields in the distance and scattered residential homes. Vegetation includes blocks of green and yellow grasses and dense patches of trees lining the perimeter of the area. Mostly deciduous trees line the grass fields and are tucked behind the houses. Human-made features consist of residential buildings and associated structures including sheds and mailboxes, paved roads, gravel driveways, barns, utility lines paralleling the road, and various fencing material. The Project facilities would be visible from this viewpoint, but the view would be short term for

people traveling along the road. The Project would introduce gray color, geometric shapes, and horizontal lines into the landscape setting. Fencing around the solar panels would introduce vertical lines. Because the panels would be approximately 880 feet away, strong contrast would be introduced at this location. Landscaping is proposed around the perimeter of the Project Area where adjacent viewers would have unobstructed to partially unobstructed views towards the Project. Landscaping would consist of a variety of evergreen trees that would help screen portions of the Project and break up the uniformity of the blocks of photovoltaic (PV) panels, especially as the trees become more mature. The initial vegetation planted will be approximately 5 feet in size and will grow up to approximately 25 feet in height as the evergreen trees reach maturity. Landscape screening would help to reduce contrast significantly in some areas and in overall visibility for adjacent viewers. Therefore, contrast is anticipated to be strong during initial planting, moderate once the trees are closer to panel height at 10 feet, and weak following plant maturity (see Visual Simulation VP-04). These impacts would be short term for residents as they approach and are parallel to the Project Area, but their focus would be on the road ahead. Nearby residents would have longer views, but tree cover surrounds most residences.

### ***VP-05: Pine Grove Church***

- **View Represented:** Residential, traveler
- **Location:** VP-05 is located near the intersection of Brassfield Road and Pine Grove Road near the Pine Grove Church. The photograph was taken from Brassfield Road, looking east towards the Project Area.
- **Viewing Direction to Project:** East
- **Distance to Project:** Approximately 2,829 feet (approximately 0.6 mile)
- **Corresponding Figure:** See Line-of-Sight Graphic (Attachment B)

The existing landscape setting is characterized by relatively flat to gently rolling terrain. The area is largely rural with agricultural and pastoral fields, and rural residential properties are dispersed throughout. Vegetation includes some lighter and darker green grasses and thick patches of trees and shrubs and some dispersed areas of trees and shrubs. Human-made features consist of several small barns and a church that vary in color from browns to tans and white, wood and metal fence lines, and power lines paralleling the road where the photo was taken as well as in the foreground. Views of the Project are likely to be screened by vegetation and agricultural and residential buildings between the viewer and the Project's perimeter fence line. The fence and a few higher elevated panels along the hilltops may be visible where tree cover is not present. Some portions of the solar array may be visible where vegetation is not present; however, if any portion of the Project is visible, it would not attract attention and would be a subordinate feature in the landscape setting, thereby creating weak contrast. Landscaping is proposed around portions of the western perimeter of the Project Area and would consist of a variety of evergreen trees that would help screen potential views of the Project as indicated in VP-05. Landscape screening would help reduce contrast significantly and overall visibility for adjacent viewers. Based on existing and proposed vegetation at VP-05, existing vegetation would significantly screen the solar panels because the vegetation has a higher elevation than the proposed array. Therefore, contrast is anticipated to be negligible with screening.

### ***VP-06: Dodd Road (South)***

- **View Represented:** Residential, traveler
- **Location:** VP-06 is located along Dodd Road south of the Project Area. The photograph for this viewpoint was taken on Dodd Road, looking north towards the Project Area.

- **Viewing Direction to Project:** North
- **Distance to Project:** Approximately 2,181 feet (approximately 0.4 mile)
- **Corresponding Figure:** See Photolog (Attachment C)

The existing landscape setting is characterized by relatively flat terrain. The area is largely rural with agricultural fields; scattered rural residential areas are present. Vegetation includes green grasses along the road and yellow grasses in the fields. A line of dense dark green trees and shrubs appear to be following property lines. Human-made features consist of a paved road, fence lines, and local power lines that parallel the road in the foreground. Views of the Project facilities would be completely screened by vegetation between the viewer and the Project's perimeter fence line. Therefore, contrast is anticipated to be negligible.

#### ***VP-07: Dodd Road/Long Lane Intersection***

- **View Represented:** Residential, traveler
- **Location:** VP-07 is located near Blanton Cemetery at the intersection of Dodd and Cruse roads and Long Lane. The photograph was taken from the Dodd Road, looking northwest towards the Project Area.
- **Viewing Direction:** Northwest
- **Distance to Project:** Approximately 2,879 feet (approximately 0.6 mile)
- **Corresponding Figure:** See Photolog (Attachment C)

The existing landscape is characterized as flat to gently sloping terrain in the foreground. The area is largely rural with agricultural fields in the foreground as well as scattered rural residential areas. Vegetation includes green grasses that line the edge of the road and trees that line the perimeters of the yellow to brown agricultural fields. Human-made features consist of residential homes and associated structures such as sheds and fences, agricultural fences, paved roads, utility poles, antennas, and mailboxes. The Project would not be visible from this viewpoint. Therefore, no visual contrast would occur.

#### ***VP-08: Dodd Road (North)***

- **View Represented:** Residential, traveler
- **Location:** VP-08 is located along Dodd Road southeast of the Project Area. The photograph was taken on Dodd Road looking northwest towards to the Project.
- **Viewing Direction:** Northwest
- **Distance to Project:** Approximately 1,971 feet (approximately 0.4 mile)
- **Corresponding Figure:** See Photolog (Attachment C)

The existing landscape setting is characterized by gently rolling terrain. The area is largely rural with scattered residential homes. Vegetation includes large patches of grass fields, the perimeters of which are lined by trees. Human-made features consist of residential homes and associated structures such as garages, sheds, fences, barns, agricultural fences, paved roads, transmission lines, and mailboxes. Views of the Project are not visible from this viewpoint because the elevations and large greenery obstruct the Project perimeter. Therefore, contrast is expected to be negligible at this location.

#### ***VP-09: Brassfield Road***

- **View Represented:** Residential, traveler

- **Location:** VP-09 is located along Brassfield-Bybee Road northwest of the Project. The photograph was taken on Brassfield Road looking southeast towards the Project Area.
- **Viewing Direction:** Southeast
- **Distance to the Project:** Approximately 4,103 feet (approximately 0.8 mile)
- **Corresponding Figure:** See Line-of-Sight Graphic (Attachment B)

The existing landscape setting is characterized by relatively flat to gently rolling terrain. The area is largely rural with agricultural fields and is intermixed with residential development. The agricultural fields line the road. Vegetation includes green grasses in the residential areas and yellow grasses in the fields. Dense patches of trees and shrubs that typically occur at parcel lines and along roadways are present. Human-made features include paved roads, residential homes, agricultural fencing, a transmission line, and local power lines. Views of the Project are not visible from this viewpoint because of existing vegetation in the foreground. Based on renderings of VP-09, existing vegetation sits at approximately 40 feet higher than the proposed array and will significantly buffer the view of the panels. Therefore, contrast is expected to be negligible at this location.

### ***VP-10: Highway 52***

- **View Represented:** Residential, traveler
- **Location:** VP-10 is located along Highway 53 northwest of the Project Area. The photograph was taken on Highway 52 looking southeast towards the Project.
- **Viewing Direction:** Southeast
- **Distance to the Project:** Approximately 4,200 feet (approximately 0.8 mile)
- **Corresponding Figure:** See Photolog (Attachment C)

The existing landscape setting is characterized by moderately rolling terrain in the foreground. The area is largely residential with houses scattered along each side of the highway. Vegetation includes green grasses that line the edge of the highway near residential areas and a dense wall of vegetation behind the houses in the foreground that parallels the road. Human-made features consist of scattered residential homes and associated buildings including sheds, yellow-lined paved roads, mailboxes, and transmission lines and poles. According to Photograph 10 (VP-10), views of the Project are not visible from this viewpoint because of the vegetation in the foreground. Therefore, contrast is expected to be negligible at this location.

### ***VP-11: Bybee Loop Residences***

- **View Represented:** Residential, traveler
- **Location:** VP-11 is located along Bybee Loop north of the Project Area. The photograph was taken on Bybee Loop looking south towards the Project.
- **Viewing Direction:** South
- **Distance to the Project:** Approximately 2,700 feet (approximately 0.5 mile)
- **Corresponding Figure:** See Line-of-Sight Graphic (Attachment B)

The existing landscape setting is characterized by moderately rolling terrain in the foreground. The area is largely residential with houses scattered along each side of Bybee Road. Vegetation includes green grasses and a dense wall of vegetation on the north side of Bybee Road as well as in the distance; cropland can also be seen in the distance. Human-made features consist of scattered residential homes and associated buildings, paved roads, mailboxes, fencing, and transmission lines and poles. A line-of-



sight diagram was completed for VP-11 which indicates that some portions of the proposed array may be visible due to the higher elevation of the site at approximately 900 feet as opposed to the line-of-sight point at approximately 860 feet; however, existing trees screen the area. As the surrounding vegetation is dense in nature, contrast is expected to be weak to negligible at this location.

### ***VP-12a: Pine Grove Road Near Houses***

- **View Represented:** Residential
- **Location:** VP-12a is located along Pine Grove Road adjacent to the west side of the Project Area. The photograph was taken on Pine Grove Road looking northeast towards the Project.
- **Viewing Direction:** Northeast
- **Distance to the Project:** Approximately 413 feet
- **Corresponding Figure:** See Visual Simulation (Attachment A)

The existing landscape setting is characterized by fairly flat to moderately rolling terrain in the foreground and hills in the background. The area is largely rural residential with houses scattered along each side of Pine Grove Road (beyond the frame of the VP image). Vegetation includes green lawn and pasture in the foreground and scattered trees in the background. Human-made features consist of scattered buildings, the paved road, mailboxes, fencing, and transmission lines and poles. The Project facilities would be visible from this viewpoint. The Project would introduce gray color, low-profile geometric shapes, and horizontal lines into the landscape setting. Because the panels would be approximately 413 feet away, strong contrast would be introduced at this location. Closely spaced evergreen landscaping is proposed around the perimeter of the Project Area where adjacent viewers would have unobstructed to partially unobstructed views towards the Project. Proposed evergreen trees would help screen from view portions of the Project and break up the uniformity of the PV panel arrays, especially as the trees become more mature. The vegetation planted will initially be approximately 5 feet high and will grow up to approximately 25 feet high as the trees reach maturity. Landscape screening would help to reduce contrast, significantly in some areas, and overall visibility for adjacent viewers. Therefore, contrast is anticipated to be strong following initial planting, moderate once the trees are closer to panel height at 10 feet, and weak following plant maturity (see Visual Simulation VP-12a). These impacts would be short term for residents as they approach and are parallel to the Project Area. Nearby residents would have longer views, but tree cover surrounds most residences, and tree planting will help provide additional screening.

### ***VP-12b: Pine Grove Road Near Houses***

- **View Represented:** Residential
- **Location:** VP-12b is located along Pine Grove Road adjacent to the west side of the Project Area. The photograph was taken on Pine Grove Road looking southeast towards the Project.
- **Viewing Direction:** Southeast
- **Distance to the Project:** Approximately 229 feet
- **Corresponding Figure:** See Visual Simulation (Attachment A)

The existing landscape setting is characterized by fairly flat to moderately rolling terrain in the foreground and hills in the background. The area is largely rural residential with houses scattered along each side of Pine Grove Road (beyond the frame of the VP image). Vegetation includes green pasture in the foreground and scattered trees in the background. Human-made features consist of scattered residential homes and associated buildings, the paved road, mailboxes, wire fencing, and transmission lines and poles. The Project facilities would be visible from this viewpoint. As with VP-12a, the Project would

introduce gray color, geometric shapes, and horizontal lines into the landscape setting. Because the panels would be approximately 229 feet away, strong contrast would be introduced at this location. Landscaping is proposed around the perimeter of the Project Area where adjacent viewers would have unobstructed to partially unobstructed views towards the Project. Landscaping would consist of a variety of evergreen trees that would help to screen portions of the Project and break up the uniformity of the blocks of PV panels, especially as the trees become more mature. The initial vegetation planted will be approximately 5 feet in size and will grow up to approximately 25 feet in height as the evergreen trees reach maturity. Landscape screening would help to reduce contrast significantly in some areas and overall visibility for adjacent viewers. Therefore, contrast is anticipated to be strong during initial planting, moderate once the trees are closer to panel height at 10 feet, and weak following plant maturity (see Visual Simulation VP-12b). These impacts would be short term for residents for a limited time as they are approaching and are parallel to the Project Area. Nearby residents would have longer views, but tree cover surrounds most residences, and tree planting will help provide additional screening.

## Discussion

The proposed Project would introduce low vertical, geometric infrastructure elements that are dark gray in color into a relatively rolling terrain landscape dominated by agricultural and pasturelands lined with patches of dense stands of trees and shrubs. Visual impacts would vary depending on several factors, such as the distance of the viewer from the Project and whether views toward the Project are unobstructed or screened by vegetation, terrain, or development. The views can be vastly different from one location to another, even in proximity because of the rolling terrain and vegetation, and because the visual effect is greatly decreased with distance between the viewer and the Project.

VP-01 through VP-04 and VP-12a/12b are anticipated to have moderate to strong contrast given their proximity to the Project and its effects on foreground views. Contrast would be reduced once trees reach a height of approximately 10 feet at VP-04 and VP-12a/12b with proposed vegetative screening. VP-05 is anticipated to have weak contrast given its distance from the Project as well as other structures that would block most views of the Project. VP-06 through VP-11 are expected to have no contrast because views are obscured by vegetation and/or terrain.

Viewers in close proximity to the Project may have unobstructed or partially screened views and include residents and travelers who would be adjacent to the local roads and highway. Existing vegetation between the solar arrays and the roads and residences would be left in place to the extent practicable to help screen the Project and reduce visual impacts from the adjacent homes. Landscape screening is proposed around the perimeter of the Project Area in strategic locations where adjacent viewers would have unobstructed or partially unobstructed views towards the Project Area. Landscaping would consist of a variety of evergreen trees that would help to screen portions of the Project and break up the uniformity of the blocks of PV panels, especially once the trees become more mature. Efforts will be made to select site appropriate, fast growing trees and shrubs. Landscape screening would help to reduce contrast, significantly in some areas, and overall visibility for adjacent viewers. It is anticipated that views of the Project from surrounding communities (e.g., Bybee, Winston, Richmond, Irvine) and Highway 52 would generally be screened by topography, vegetation, and existing structures associated with development. Roadways and rural residential development located outside of built communities would generally have limited views towards the Project given the quantity of vegetation in the area. Views would vary from completely screened to partially screened to unobstructed. Portions of the Project that would be visible would be seen in the context of existing development and would appear as a co-dominant feature

in the landscape setting. Visual impacts would largely be localized and would be most apparent to those living, working, or traveling in areas within close proximity to the Project Area. The degree of visual impact would also vary based upon attitudes of the viewer towards solar energy development. Some viewers find solar panels to be a positive indication of a trend toward renewable energy, whereas others have more adverse reactions.

**ATTACHMENT A**  
**Visual Simulations**

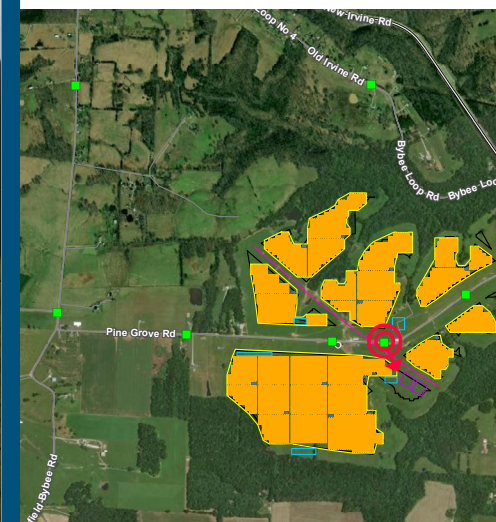


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VP-02**  
Pine Grove Rd-near  
Substation



## Photograph Information

Time of photograph:	10:27am
Date of photograph:	12/10/21
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.710548°
Longitude:	-84.113403°

Disclaimer:  
Preliminary visualizations are  
for reference only;  
Not for construction



**TETRA TECH**



**EXISTING CONDITIONS**

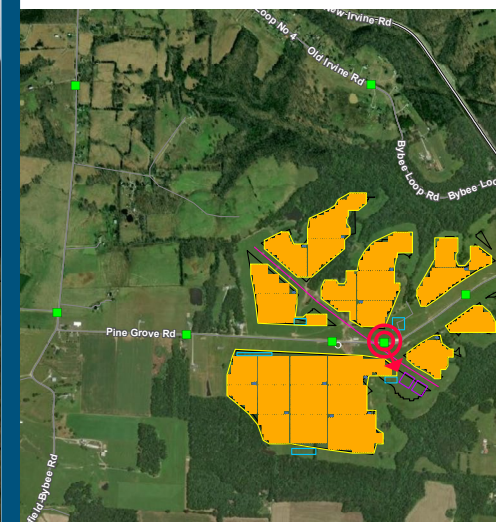


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VP-02**  
Pine Grove Rd-near  
Substation



### Photograph Information

Time of photograph:	10:27am
Date of photograph:	12/10/21
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.710548°
Longitude:	-84.113403°

Disclaimer:  
Preliminary visualizations are  
for reference only;  
Not for construction



**TETRA TECH**

**SIMULATED CONDITIONS**

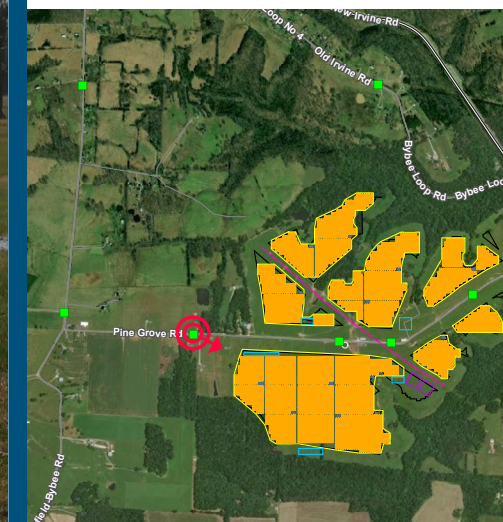


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VP-04**  
Pine Grove Rd-West



### Photograph Information

Time of photograph:	11:09am
Date of photograph:	12/10/21
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.711120°
Longitude:	-84.125243°

Disclaimer:  
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**EXISTING CONDITIONS**



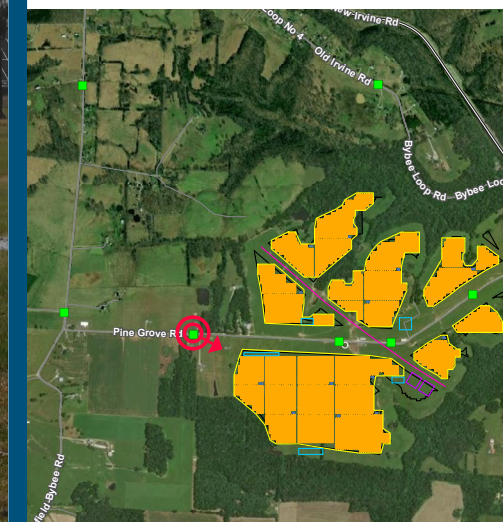


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VP-04**  
Pine Grove Rd-West



### Photograph Information

Time of photograph:	11:09am
Date of photograph:	12/10/21
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.711120°
Longitude:	-84.125243°

Disclaimer:  
Preliminary visualizations are  
for reference only;  
Not for construction

**SIMULATED CONDITIONS**  
Landscaping depicted at 5' height

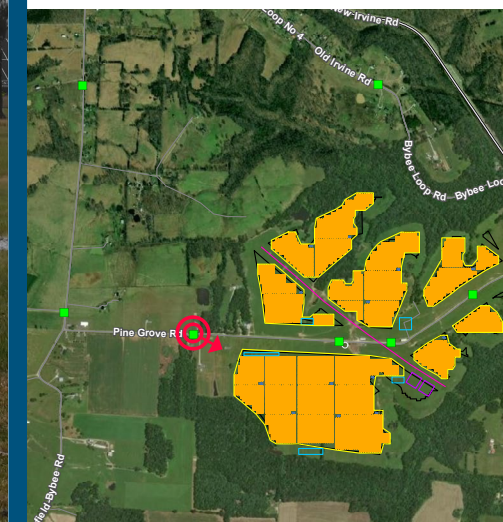


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VP-04**  
Pine Grove Rd-West



### Photograph Information

Time of photograph:	11:09am
Date of photograph:	12/10/21
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.711120°
Longitude:	-84.125243°

Disclaimer:  
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Not for construction

**SIMULATED CONDITIONS**  
Landscaping depicted at 10' height

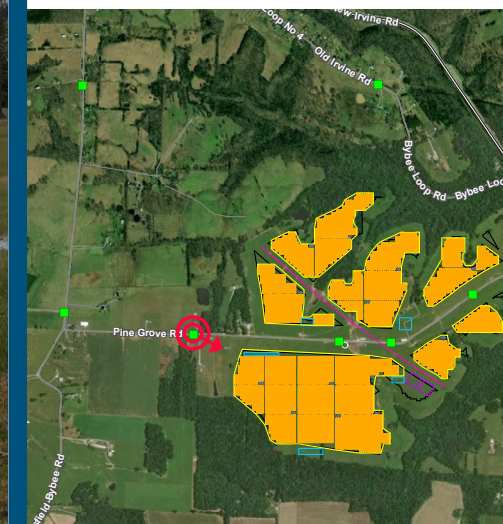


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VP-04**  
Pine Grove Rd-West



### Photograph Information

Time of photograph:	11:09am
Date of photograph:	12/10/21
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.711120°
Longitude:	-84.125243°

Disclaimer:  
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Not for construction

**SIMULATED CONDITIONS**  
Landscaping depicted at 25' height

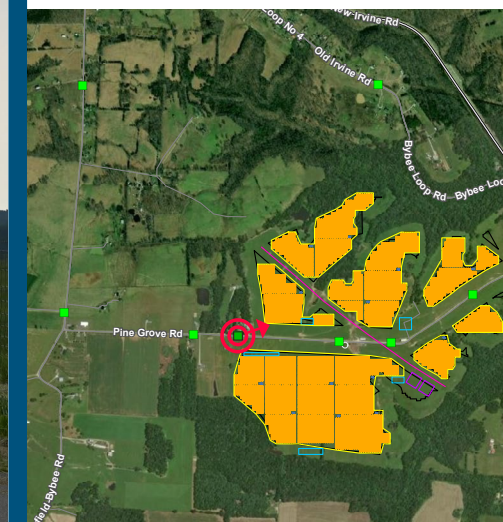


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12a**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Northeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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for reference only;  
Not for construction



**EXISTING CONDITIONS**

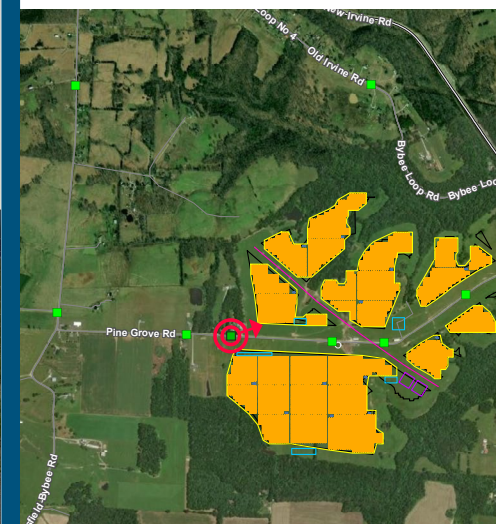


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12a**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Northeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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**TETRA TECH**

**SIMULATED CONDITIONS**  
Landscaping depicted at 5' height

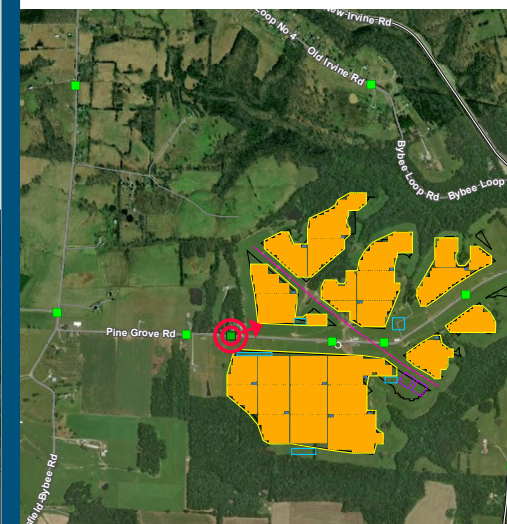


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12a**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Northeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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**TETRA TECH**

**SIMULATED CONDITIONS**  
Landscaping depicted at 10' height

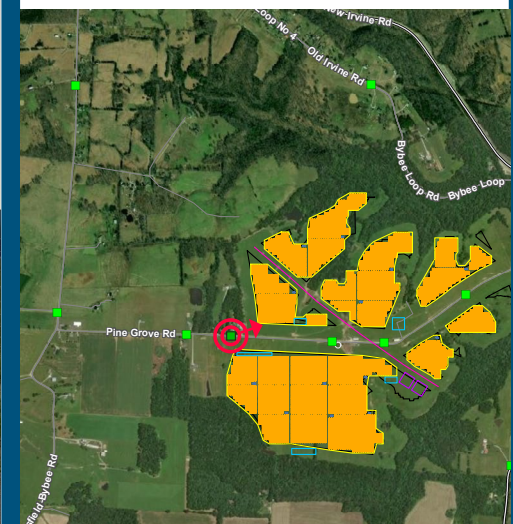


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12a**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Northeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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**TETRA TECH**

**SIMULATED CONDITIONS**  
Landscaping depicted at 25' height

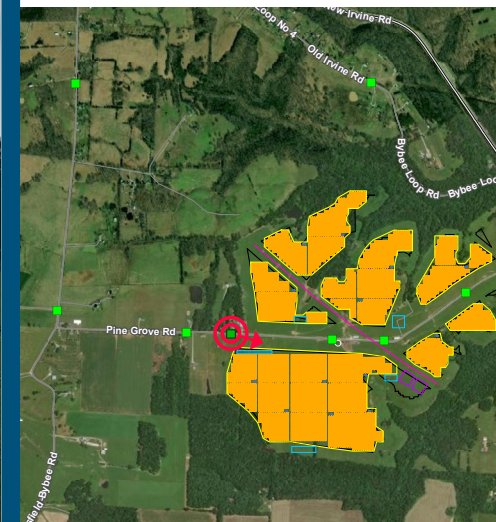


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12b**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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for reference only;  
Not for construction



**EXISTING CONDITIONS**

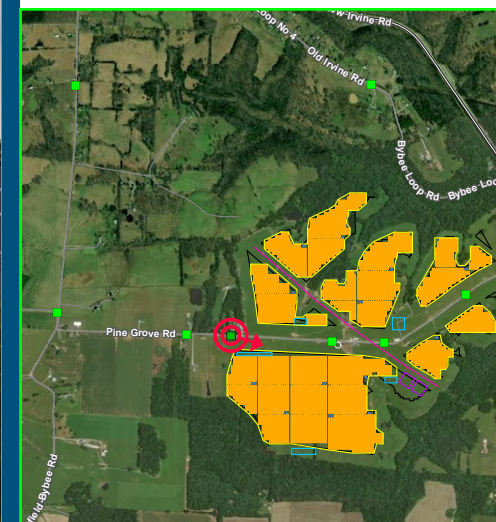


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12b**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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**TETRA TECH**



**SIMULATED CONDITIONS**  
Landscaping depicted at 5' height

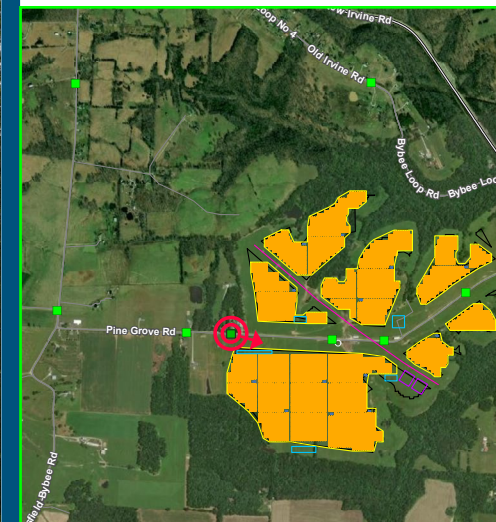


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12b**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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**TETRA TECH**



**SIMULATED CONDITIONS**  
Landscaping depicted at 10' height

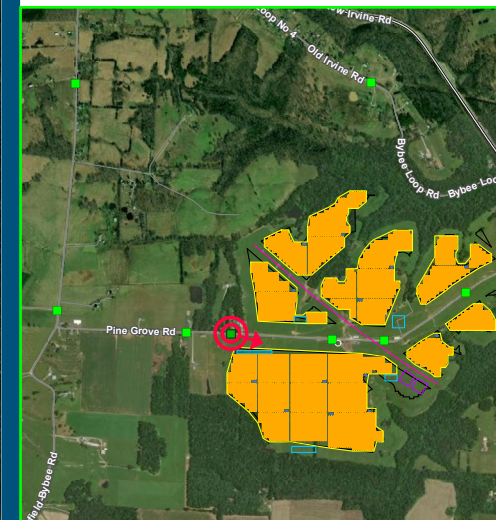


# PINE GROVE SOLAR PROJECT

Madison County, KY

PHOTO  
SIMULATIONS

**VIEWPOINT-12b**  
Pine Grove Rd



### Photograph Information

Time of photograph:	9:59am
Date of photograph:	07/06/2022
Weather condition:	Cloudy
Viewing direction:	Southeast
Latitude:	37.710994°
Longitude:	-84.122163°

Disclaimer:  
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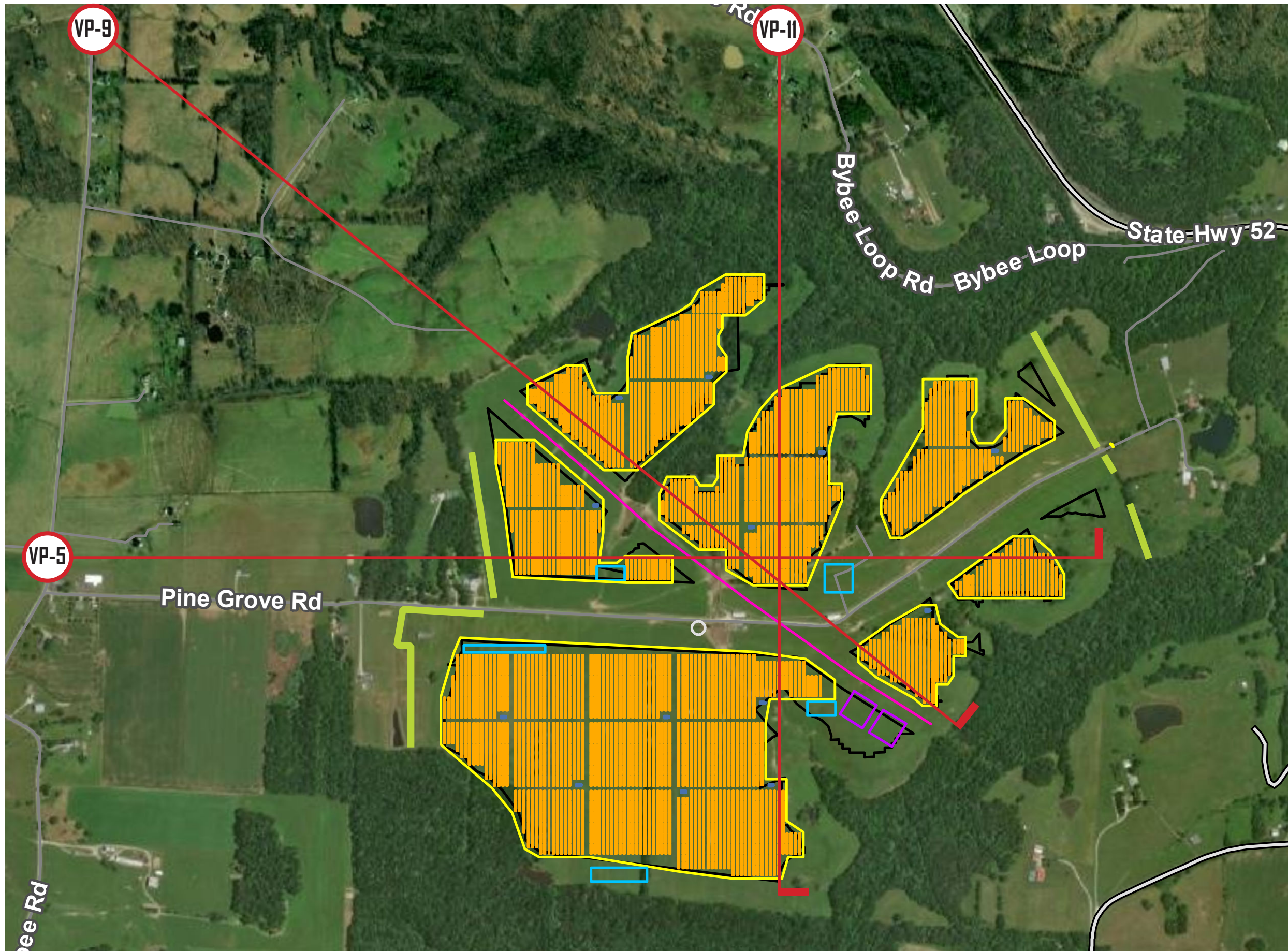
**TETRA TECH**



**SIMULATED CONDITIONS**  
Landscaping depicted at 25' height



**ATTACHMENT B**  
**Line-of-Sight Graphics**

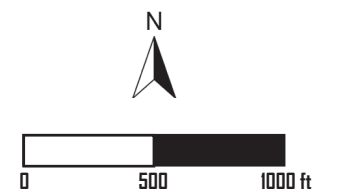


# PINE GROVE SOLAR PROJECT

Madison County, KY

Line-of Sight  
Diagrams

Key Locator Map



Disclaimer:  
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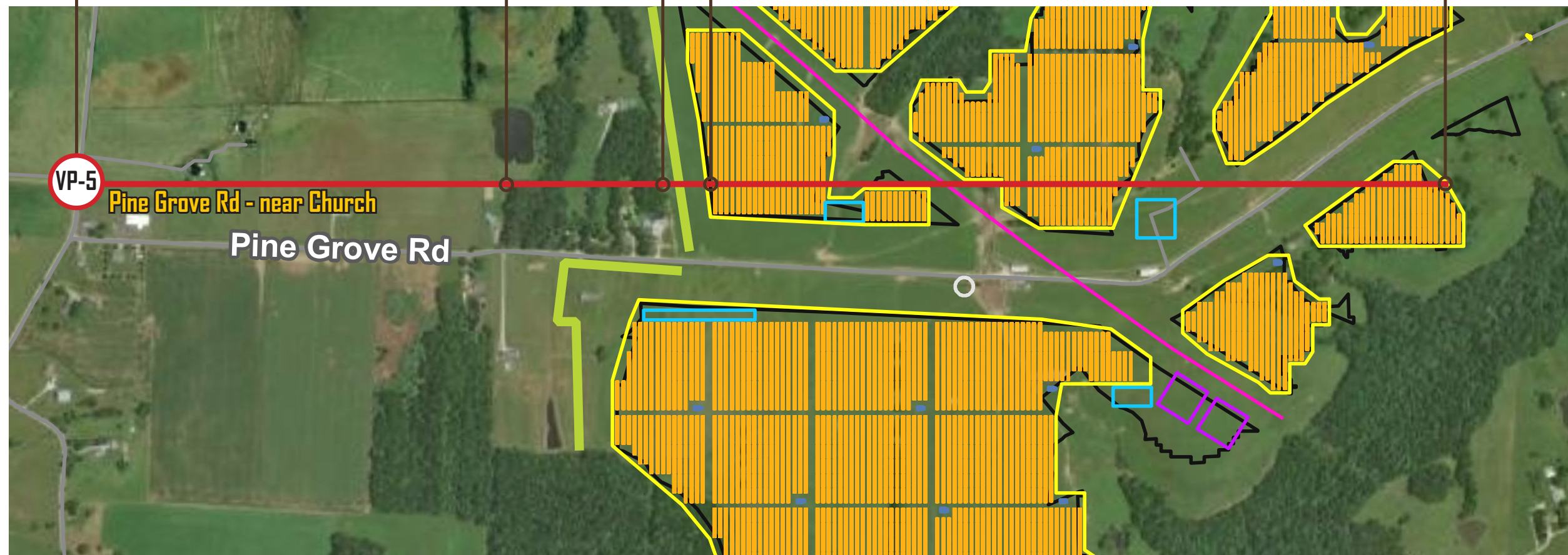
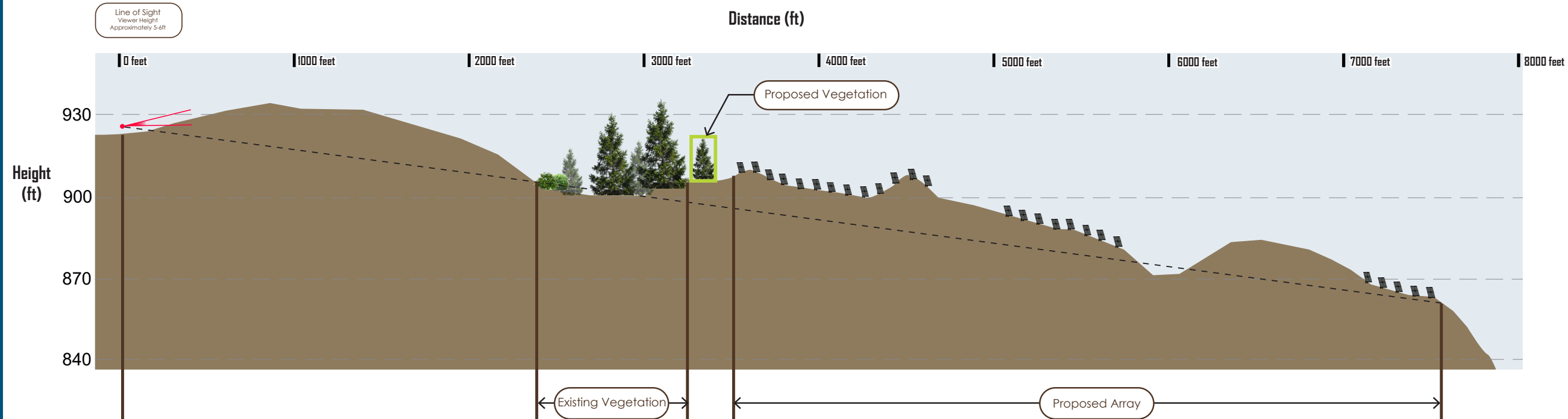


# PINE GROVE SOLAR PROJECT

Madison County, KY

## Line-of Sight Diagrams

### VP-05 Pine Grove Rd - near Church



Disclaimer:  
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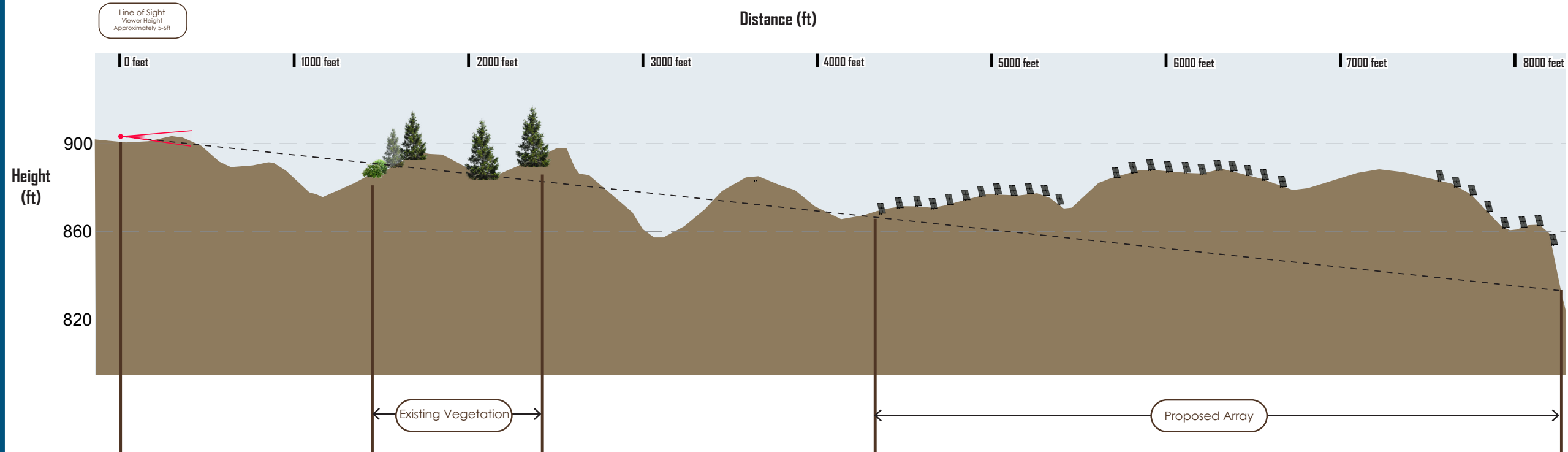


# PINE GROVE SOLAR PROJECT

Madison County, KY

## Line-of Sight Diagrams

### VP-09 Bassfield Rd



Disclaimer:  
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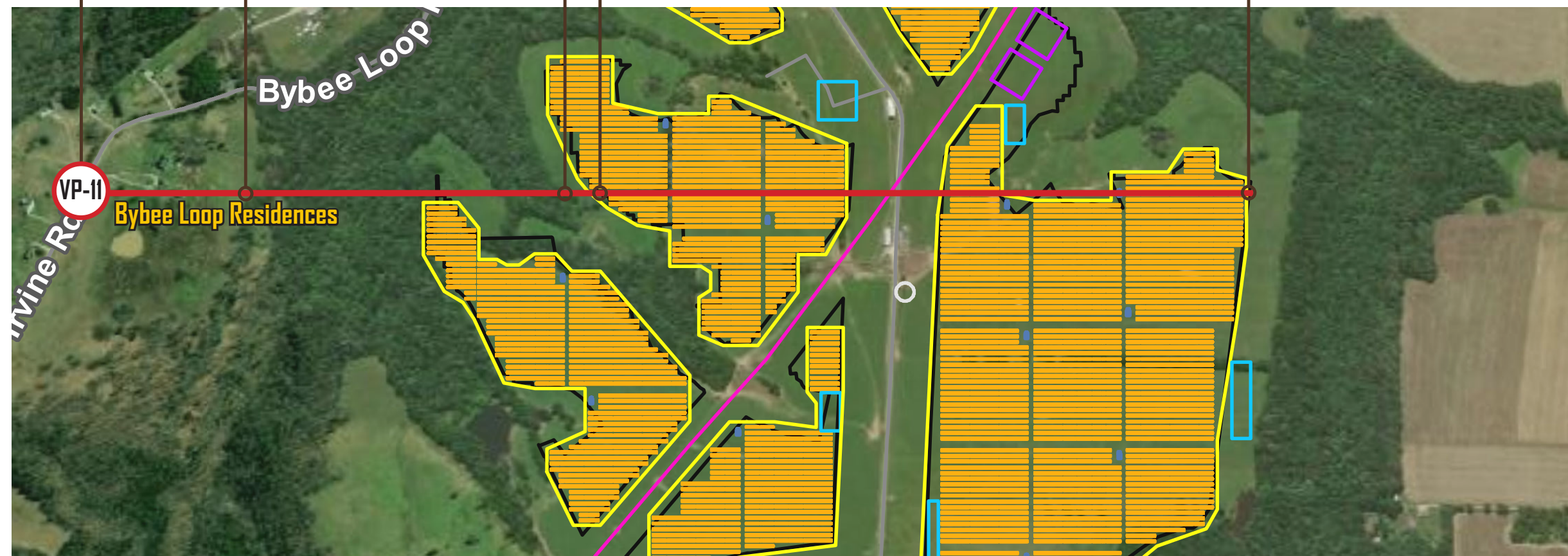
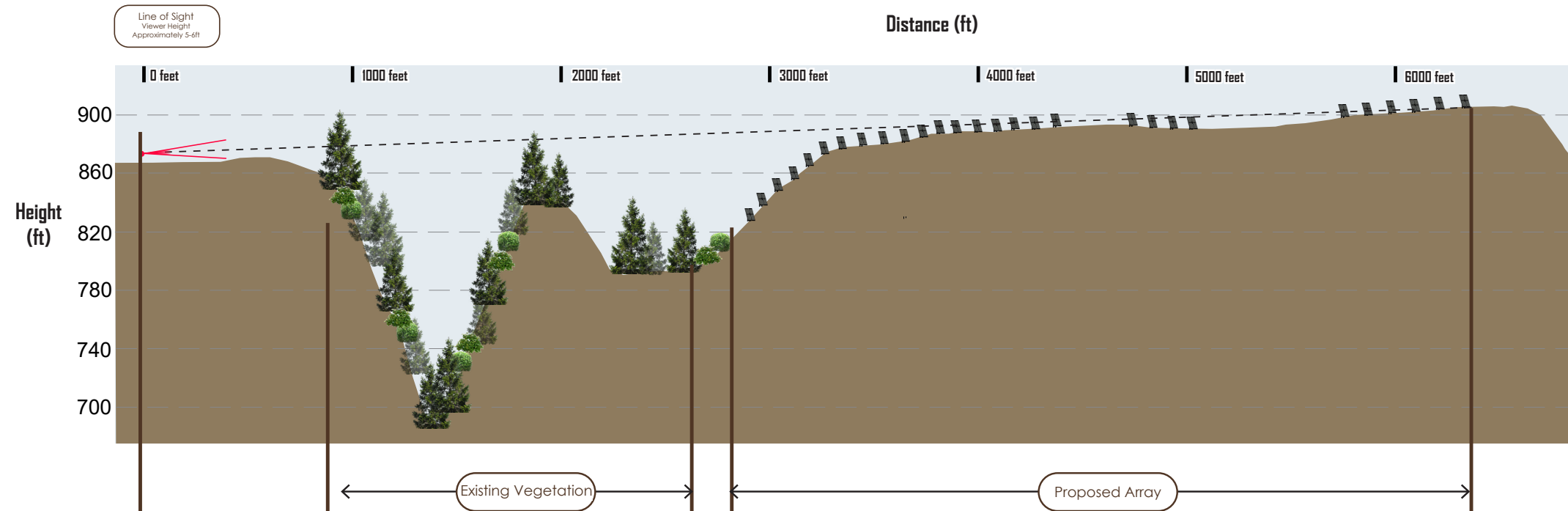


# PINE GROVE SOLAR PROJECT

Madison County, KY

Line-of Sight  
Diagrams

**VP-11**  
Bybee Loop  
Residences



Disclaimer:  
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**ATTACHMENT C**  
**Photolog**





**Viewpoint:** 01 | Pine Grove Road (East)

**Photo Location:** Adjacent to Project at Pine Grove Road

**Date/Time:** 12/10/21 | 9:57am

**Viewing Direction:** Facing East



**Viewpoint:** 02 | Pine Grove Road – Near Structure  
**Photo Location:** Adjacent to Project at Pine Grove Road  
**Date/Time:** 12/10/21 | 10:27am  
**Viewing Direction:** Facing Southeast





**Viewpoint:** 03 | Pine Grove Road – Near Cemetery

**Photo Location:** Adjacent to Project at Pine Grove Road

**Date/Time:** 12/10/21 | 10:51am

**Viewing Direction:** Facing Southwest





**Viewpoint:** 04 | Pine Grove Road (West)

**Photo Location:** Facing the Project at Pine Grove Road

**Date/Time:** 12/10/21 | 11:09am

**Viewing Direction:** Facing Southeast





**Viewpoint:** 05 | Pine Grove Church

**Photo Location:** Approximately 0.6 mile to Project at Brassfield Road near the Pine Grove Church

**Date/Time:** 12/10/21 | 11:31am

**Viewing Direction:** Facing East





**Viewpoint:** 06 | Dodd Road (South)

**Photo Location:** Approximately 0.4 mile to Project at Dodd Road

**Date/Time:** 12/10/21 | 11:56

**Viewing Direction:** Facing North





**Viewpoint:** 07 | Dodd Road/Long Lane Intersection

**Photo Location:** Approximately 0.6 mile to Project at Dodd Road/Long Lane Intersection

**Date/Time:** 12/10/21 | 12:09pm

**Viewing Direction:** Facing Northwest





**Viewpoint:** 08 | Dodd Road (North)

**Photo Location:** Approximately 0.4 mile from the Project at Dodd Road

**Date/Time:** 12/10/21 | 12:27pm

**Viewing Direction:** Facing Northwest





**Viewpoint:** 09 | Brassfield Road

**Photo Location:** Approximately 0.8 mile to Project at Brassfield Road

**Date/Time:** 12/10/21 | 1:12pm

**Viewing Direction:** Facing Southeast





**Viewpoint:** 10 | Highway 52

**Photo Location:** Approximately 0.8 mile to Project at Highway 52

**Date/Time:** 12/10/21 | 1:27pm

**Viewing Direction:** Facing Southeast





**Viewpoint:** 11 | Bybee Loop

**Photo Location:** Approximately 1880 feet to Project

**Date/Time:** June 2013 | GoogleEarth image; date/time unknown

**Viewing Direction:** Facing Southwest





**Viewpoint:** 12a | Pine Grove Road

**Photo Location:** Approximately 413 feet to Project

**Date/Time:** 07/06/2022 | 9:59am

**Viewing Direction:** Facing Northeast





**Viewpoint:** 12b | Pine Grove Rd

**Photo Location:** Approximately 229 feet to Project

**Date/Time:** 07/06/2022 | 9:59am

**Viewing Direction:** Facing Southeast