Appendix P

KARST DESKTOP REVIEW

Mantle Rock Solar LLC

Livingston County, Kentucky

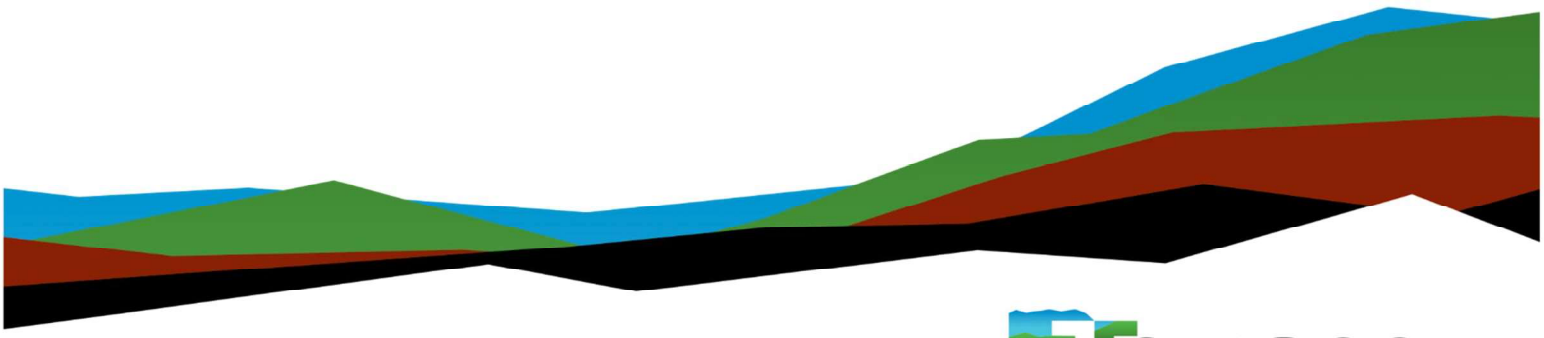
Mantle Rock Solar

Karst Desktop Report

August 21, 2025 | Terracon Project No. 57257162

Prepared for:

Mantle Rock Solar LLC
1553 W. Todd Drive, Suite 204
Tempe, Arizona 85283



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August 21, 2025

Mantle Rock Solar LLC
1553 W. Todd Drive, Suite 204
Tempe, Arizona 85283

Attn: Mr. Frederick Rendell
E: frederick.redell@atlantica.com

Re: Karst Desktop Report
Mantle Rock Solar
Livingston County, Kentucky
Terracon Project No. 57257162

Dear Mr. Rendell:

We have completed the scope of Karst Desktop services for the above referenced project in general accordance with the proposal P57257162 and associated Agreement for Services dated August 6, 2025. This report presents the findings of the preliminary desktop study at the proposed Mantle Rock Solar site in Livingston County, Kentucky.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Sean Vanderhoff
Senior Staff Geologist

Doug Trusty
Senior Geologist

Introduction

The proposed Mantle Rock Solar site located in Livingston County, Kentucky and was assessed for potential karst geohazards underlying the property. The objective of the desktop review was to identify suspect karst features which could impact the proposed solar development, roadways, and supporting infrastructure. Portions of the site are mapped as underlain by unconsolidated calcareous or carbonate rocks forming a regional karst terrain (i.e., a landscape characterized by the presence of sinkholes, small caves, and conduits).

Geology and Terrain

Physiography

The proposed Mantle Rock Solar site is situated within the western portion of the Interior Low Plateaus Physiographic Province of Ohio, Kentucky and Tennessee[1], which extends from the Greater Cincinnati metropolitan region in the Ohio River Valley southward to the Nashville Region of Tennessee. In general, the Interior Low Plateaus range from approximately 380 to 1,200 feet in elevation and predominantly comprise of rolling plains and eroded plateaus. This region is almost completely composed of horizontal beds of sandstone, shale, and limestone from the Paleozoic Era (541 to 252 million years ago). The Interior Low Plateaus exist at the southeastern area of the Central Lowlands, the boundary occurring where the maximum extent of the Pleistocene glaciers reached.

Specifically, the subsection of the Low Plateaus Physiographic Province in Kentucky[2] is referred to locally as the Mississippian Plateaus or the "Pennyrile" (named for the Pennyroyal plant, *Hedeoma puligiodes*). The Mississippian Plateaus wrap around the Western Kentucky Coalfield Province, in a crescent that opens towards the north. The Mantle Rock Solar site lies within the Pennyroyal Plateau of Livingston County, KY in far western Kentucky, just north of the Jackson Purchase Physiographic Province. Livingston County is also part of the Big Rivers area of western Kentucky, which includes the Cumberland, Tennessee, and Ohio Rivers.

[1] Fenneman, Nevin M. (January 1917). "Physiographic Subdivision of the United States"

[2] McDowell, Robert C. 1986, Newell, Wayne L. The Geology of Kentucky: Physiography US Geological Survey Professional Paper 1151-H.

Topography

Referencing the USGS 7.5-minute topographic quadrangle map index, the site is located entirely within the Golconda, Kentucky-Illinois quadrangle of Livingston County, Kentucky. The site lies on the locally named Goodhope Bluff and elevation ranges from EL 550 feet along Peck Branch and its tributaries which traverse the site east to west and north to south, to 636 feet on the higher portions of the site. There are a few ponds on the site.

Geology

Referencing the Geologic Map of the State of Kentucky, the following units are mapped as underlying the site.

Quaternary Alluvium (Qal) – Clay, silt, sand, and gravel. Clay and silt is medium to dark gray and medium brown. Sand is light brown, medium to coarse angular quartz. Alluvium along the smaller streams contains more sand and gravel that is mainly derived from nearby rocks.

Hardinsburg Sandstone (Mh) – This unit represents a majority of the site and is defined a sandstone, siltstone, and shale. The sandstone is white and light gray, with the upper few feet commonly weathering reddish brown, fine grained and medium to thin bedded with ripple marks. The siltstone is light gray, thin bedded, and even bedded, rarely carbonaceous. The shale is gray to dark gray, commonly silty, locally carbonaceous, which is more common in lower part of unit.

The sandstone can also be white to light gray, fine to medium grained, medium to thick bedded, commonly crossbedded with some ripple marks. The lower few feet are locally calcareous. This unit forms prominent bluff with an unconformity at the base.

Golconda Formation (Mgo) – Limestone and shale. Limestone, gray to dark gray, dense to medium crystalline, thick to thin bedded. Thinner beds are tend to be more shaly. Some beds are fossiliferous, a few beds are oolitic.

Shale is light to dark gray, in part calcareous and fossiliferous. Locally contains lenses of finely crystalline limestone, as much as 10 feet at top of unit is silty calcareous shale.

Along with limestone and shale, this unit can also contain siltstone and shale beddings and a purer limestone, brownish gray that can weather buff brown with fossil fragments common.

Structural Geology

Faults are common geologic structures across Kentucky, and have been mapped in many of the Commonwealth's counties. Faults were mapped within the site boundaries and are mapped as normal faults. The site is located northwest of the Mineral Ridge fluorspar district associated with Livingston and neighboring Crittenden County. Seismic risk associated with the vicinity of the site include the New Madrid Seismic Zone. Faults may be associated with increased fracturing of bedrock in the immediately adjacent area. This fracturing may influence karst development, slope stability, and groundwater flow in these limited areas.

Karst Geology

Referencing the USGS Karst Map of the United States[3] the majority of the site is not mapped as karst, while a portion of the site is classified as "carbonate rocks at or near the surface in a humid climate." Referencing the Kentucky Geological Survey (KGS) karst sinkhole areas and inventories map[4], sinkholes were not mapped within site boundaries. Additionally, according to the KGS karst potential map, The majority of the site is mapped as non-karst prone bedrock, except for the far south and eastern portions of the site, which is mapped as a low potential for karst development. Therefore, it is highly unlikely that any surface karst features are located at the site.[5]

Desktop Data Review

A review of the LiDAR derived shaded relief map and 2-foot contour layer across the site did not identify suspect karst features (SKFs) at the site (Exhibit 1, 2, and 3). The site is predominately overlain by the Hardinsburg Sandstone, which acts as a caprock, a layer of resistant rock that overlies the more soluble Golconda Formation below. This caprock layer acts by protecting the underlying soluble rocks from erosion and influencing the development of caves, sinkholes, and other karst formations.

[3] Weary, D.J., and Doctor, D.H., 2014, Karst in the United States: A digital map compilation and database: U.S. Geological Survey Open-File Report 2014–1156, 10 p.

[4] https://opengisdata.ky.gov/datasets/kygeonet::ky-water-resources-polygons-sinkholes/about

Recommendations

The results of the karst desktop data review serve as a conservative estimate and indication for suspect karst feature locations and karst potential concentrations. The desktop delineates potential karst features using all remote resources available; therefore, the product is comprised of polygons to design around. A field reconnaissance (ground truthing) survey to locate and delineate possible and visible surface karst features within the site boundary is the next recommended phase of the project. In the case that no field survey is conducted then according to the Natural Resource Conservation Service (NRCS) Code 527[6], the minimum setback around karst features should be 25-feet, yet since the features have not been field verified, we recommend utilizing a 50-feet setback to further reduce the likelihood of future issues. This setback area shall remain in an undisturbed natural state[7] through all periods of construction and subsequent facility operations.

This report outlines the findings and opinions of our initial step in the proposed preliminary karst survey. Information presented herein is based on the review of publicly available information. No site or project-specific information has been reviewed for the preparation of this report. Field reconnaissance may be required as the next step to locate and characterize suspect karst features from our desktop review as well as identify other features at the site in the field based on observations from the ground surface. This report is representative only of surficial indications from remote sensing data observable at the time the data was collected. It should be noted that karst is a dynamic landform and significant changes can occur over time. Absence of a mapped resource does not mean that it is not present.

Our opinions of the site surface and subsurface geologic conditions are very preliminary in nature. Confirmation of opinions stated in this document is essential. These opinions must be validated with site-specific field reconnaissance, exploration, and testing. In order to characterize the subsurface conditions, we recommend geotechnical explorations of the site. Geotechnical explorations will provide the necessary sampling

[6] 2015, Conservation Practice Standard Karst Sinkhole Treatment, Code 527. Natural Resources Conservation Service, United States Department of Agriculture.

[7] An "Undisturbed Natural State" is defined for the purpose of karst conservation as not causing any disturbance to the natural vegetation and soils within the 25-foot buffer of a karst feature. This would include (but not be limited to) activities such as cutting, trimming, stripping and grubbing, grading, use of herbicides and/or insecticides, application of fertilizers or soil amendments, and depositing vegetation cuttings or trash of any kind.

and testing to provide design parameter recommendations. In conjunction with borings, a geophysical survey could also correlate depth of rock and offer some reduction to the potential number of necessary explorations, thus reducing our impact on any given site. Additionally, the results of the geophysical survey can be used to characterize the subsurface conditions and potential karst features more accurately and in greater detail than visual observations alone.

General Comments

Our services and any correspondence or collaboration are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical and geological engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

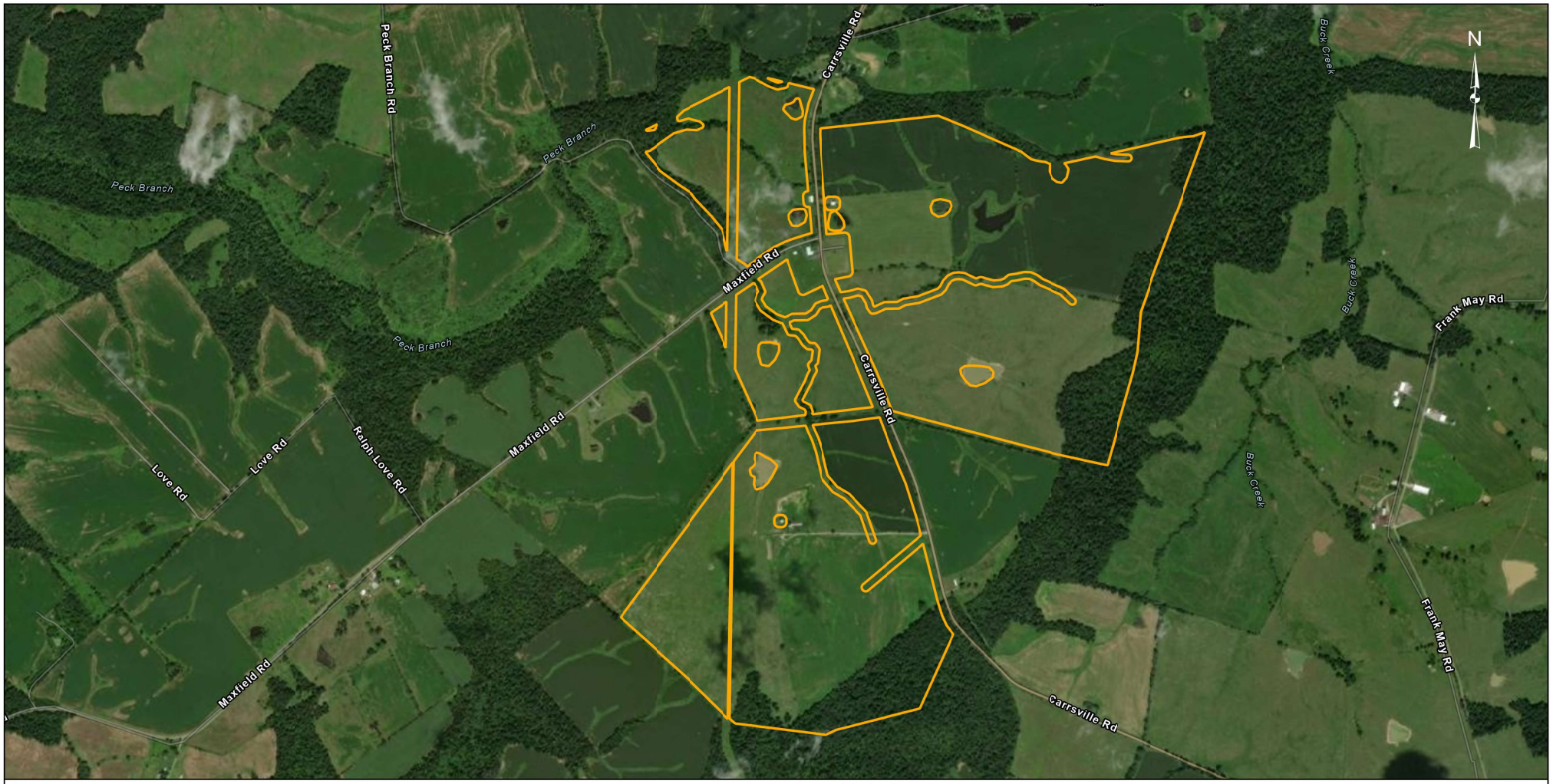
All parties are advised that any decisions or actions taken by any party based on the information contained herein, including decisions with financial implications are done solely at the risk of that party. By providing this information in this preliminary form, Terracon expressly disclaims any duties or obligations associated with the usage of this information for decision-making or design purposes.

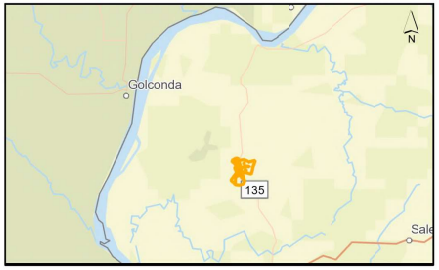
In the event that changes to the nature, design, or location of the project, as outlined in this report, are planned, the preliminary conclusions and recommendations contained in this report shall not be used unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing. As the project moves into the design phase, Terracon should be retained to develop and complete a scope of work that includes site-specific explorations.

Appendix A – Site Location Plans

Contents:

Site Map
Topography Map
Geology Map





Legend

Site Boundary

DATA SOURCES:
Firefly Imagery Hybrid, OpenStreetMap
Parcel data referenced RatedPower-Mantle Rock-14-LAYOUT (1).kmz

0 5 10 20 Miles

Project No.:	57257162
Date:	Aug 2025
Drawn By:	SMV
Reviewed By:	WDFT

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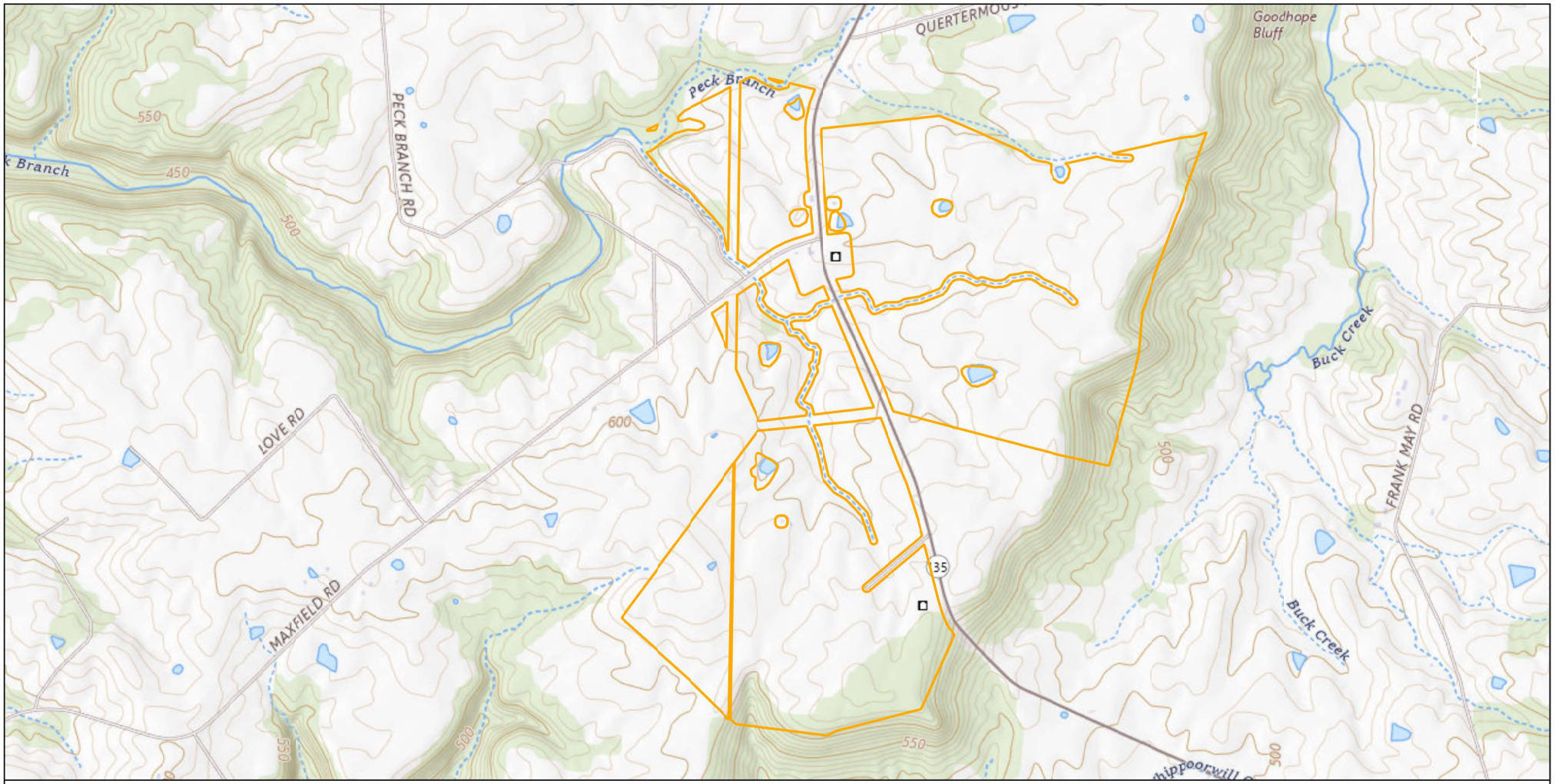
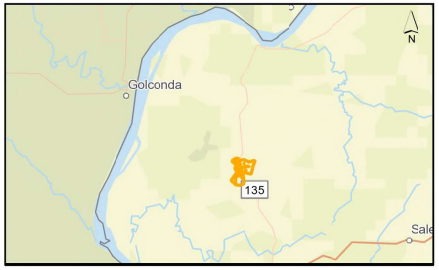
Site Map

Mantle Rock Solar
Desktop Karst Survey
Livingston, Kentucky

Exhibit

1





Legend

Site Boundary

DATA SOURCES:
USGS Topographic Basemap, OpenStreetMap
Parcel data referenced RatedPower-Mantle Rock-14-LAYOUT (1).kmz

0 5 10 20 Miles

Project No.:	57257162
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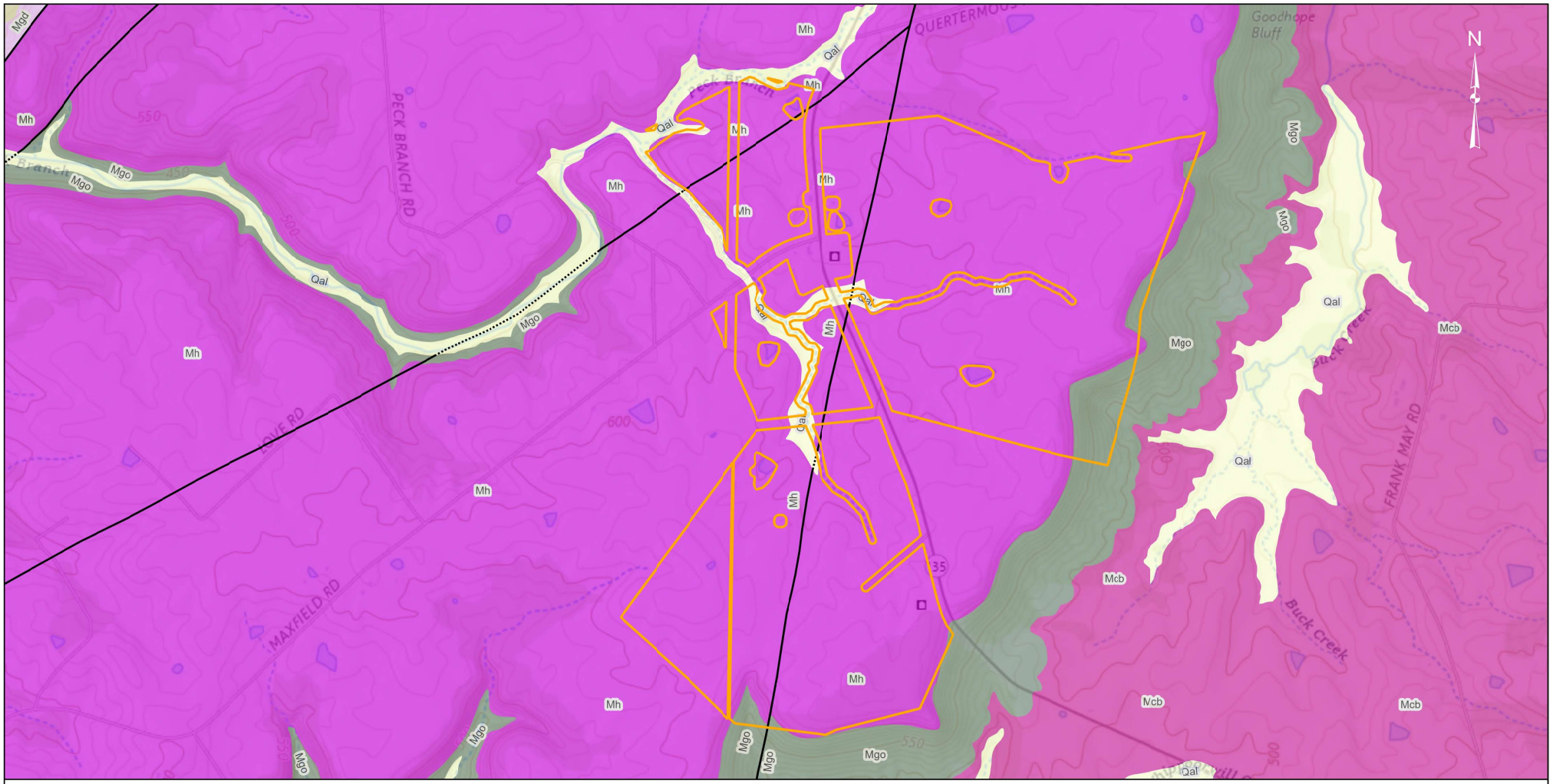
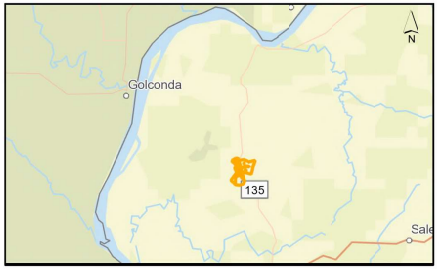
Topography Map

Mantle Rock Solar
Desktop Karst Survey
Livingston, Kentucky

Exhibit

2





Legend

- Site Boundary
- Alluvium (Qal)
- Hardinsburg Sandstone (Mh)
- Golconda Formation Mgo)
- Cypress Sandstone, Paint Creek Shale, and Bethel Sandstone (Mcb)
- Faults

DATA SOURCES:
USGS Topographic Basemap, OpenStreetMap
Kentucky Geological Survey 1:24,000 Geology Maps
Parcel data referenced RatedPower-Mantle Rock-14-LAYOUT (1).kmz

0 5 10 20 Miles

Project No.:	57257162
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Geology Map

Mantle Rock Solar
Desktop Karst Survey
Livingston, Kentucky

Exhibit

3