

Hummingbird Energy LLC
Second Set of Supplemental Responses to Siting Board Staff's First Request for Information
Case No. 2022-00272

Request No. 10:

Refer to SAR, Exhibit A (Project Site Maps). State whether the proposed access roads referred to in the legend as thick orange lines are marked by thick black lines on the site maps. If not, identify on a map the locations of the proposed access roads.

Response No. 10:

The proposed access roads are depicted as thick black lines.

Supplemental Response:

After conducting the site visit and reviewing the relevant maps with Siting Board Staff and representatives of Harvey Economics, Hummingbird revised its Project Site Maps to clarify the locations of certain Project features, including proposed entrances and entrance roads. In addition, Hummingbird has revised its map depicting public resources within two miles of the Project to include two previously excluded cemeteries located approximately two miles from the Project's southeastern boundary, near Bowman Springs Road and John Lane. A complete list of changes made on each map is provided here:

List of Changes to C100

- Legend changed to show access roads as black.
- Existing access road extended to touch Poplar Grove Road.
- Easement corridor added near Kilbreth Valley Road.
- MV feeder line near POI reconfigured so as to not travel parallel with overhead T-Line.
- Karst areas near BESS and on parcel 069-0200 revised.
- Existing entrance road extended to touch Carpenter Road.
- Entrance road added that extends from Wilson Run Road to near the laydown road.

List of Changes to C200-1

- Existing entrance road extended west so it merges with Breeze Road, label relocated.

List of Changes to C200-2

- Labels added for two proposed site entrances.
- Label proposed site entrance for the access road extended to touch Poplar Grove Road.

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- MV feeder line near POI reconfigured so as to not travel parallel with overhead T-Line.
- Arrows updated to point to access roads, not thoroughfares.
- Label for proposed site entrance added near Murphy Lane.

List of Changes to C200-3

- Labels for 3 proposed site entrances added, with entrance roads added which stretch to Carpenter Road.
- MV feeder line near POI reconfigured so as to not travel parallel with overhead T-Line.

List of Changes to C200-4

- Label added for proposed entrance road.
- Karst feature relabeled as cemetery with label added.

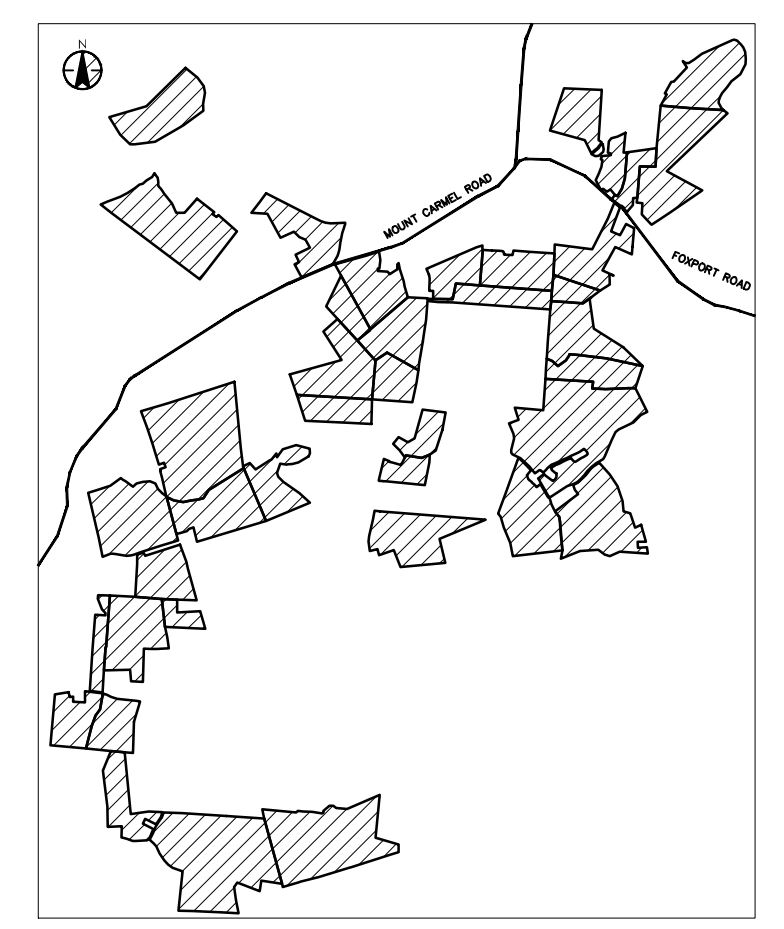
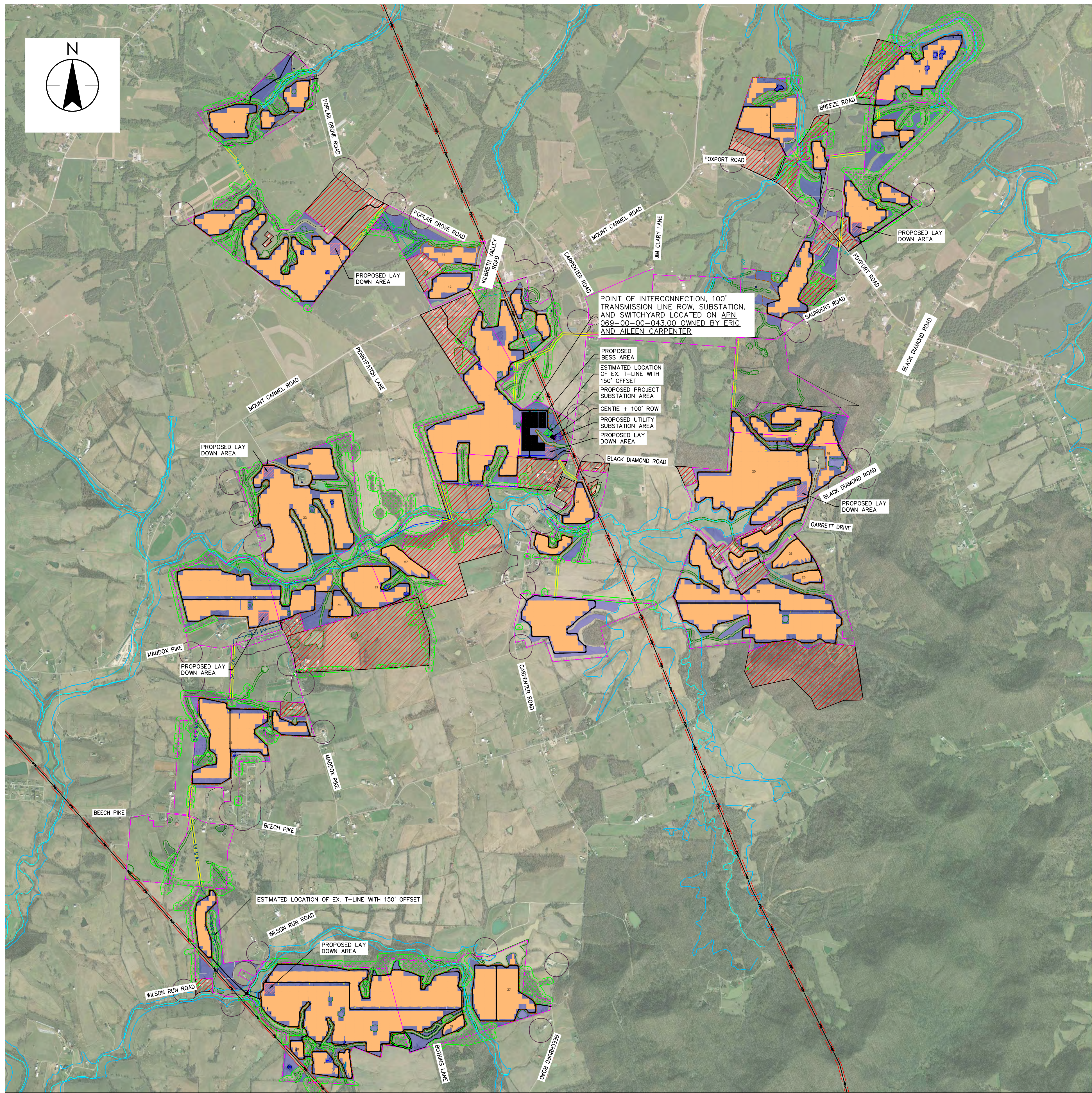
List of Changes to C200-5

- Karst feature relabeled as cemetery with label added (same as on C200-4).
- Entrance road added that extends from Wilson Run Road to near the laydown road.

List of Changes to C203

- Two cemeteries added near Bowman Springs Road and John Lane.

Responding Witness: Adam Peterson, Chad Martin



LEGEND

	PROPOSED SOLAR ARRAY
	INVERTER STATION
	BATTERY ENERGY STORAGE SYSTEM
	PROPOSED FENCELINE
	PROPERTY BOUNDARY
	PROPOSED SCREENING
	E-34.5kV-OH-25MW-1x
	E-34.5kV-OH-25MW-2x
	E-34.5kV-OH-50MW-1x
	E-34.5kV-OH-50MW-2x
	PROPOSED ACCESS ROADS
	WETLAND AND WATERWAY SETBACKS
	FEMA FLOOD ZONE - 100 YEAR FLOOD PLAN AREA
	FEMA FLOOD ZONE - 100 YEAR - WATER LINE
	EX. OVERHEAD POWER OFFSET
	EX. OVERHEAD POWER
	NONPARTICIPATING RESIDENT
	PARTICIPATING RESIDENT
	KARST AREAS
	KARST AREAS OFFSETS
	MV AND HV EASEMENT
	BUILDABLE AREA
	EXCLUSION AREA
	PROPOSED PROJECT SUBSTATION LOCATION
	PROPOSED UTILITY SUBSTATION LOCATION
	PROPOSED BESS LOCATION
	PROPOSED LAY DOWN AREA
	EXISTING VEGETATIVE BUFFER

PROJECT DATA	
PARCEL AREA	4,141 ACRES
PARCEL AREA WITHOUT EXCLUSION AREAS	3,507 ACRES
BUILDABLE AREA	2,032 ACRES

NOTES:

1. PROJECT AREAS ARE SUBJECT TO CHANGE PENDING FUTURE DESIGN CONSTRAINTS

OFFSETS:

1. WETLANDS - 25'
2. STREAMS - 25'
3. NON-PARTICIPATING ADJACENT OR BUSINESS - 300'
4. PARTICIPATING LANDOWNERS - 200'
5. EXISTING TRANSMISSION LINE - 25'
6. TREE SHADING - SOUTH 20'
7. TREE SHADING - NORTH, EAST AND WEST 80'
8. OPEN WATER - 25'
9. FEMA FLOOD PLAN 25'
10. ROADS - 100' FROM EDGE

Revision	By	Appd	YYYY.MM.DD
E	REVISOR FOR SSB SUBMISSION	DK	2023.09.05
D	ISSUED FOR SSB SUBMISSION	DK	2023.05.26
C	ISSUED FOR REVIEW	JB	2023.02.08
B	ISSUED FOR REVIEW	ZG	2022.07.11
A	ISSUED FOR REVIEW	ZG	2022.05.19

CONCEPTUAL LAYOUT	ZG	DK	2022.05.19
	By	Appd	YYYY.MM.DD
File Name: 193708901_C100	ZG	DK	2022.03.25
	Dwn.	Dsgn.	Chkd.
			YYYY.MM.DD

Permit/Seal

Client/Project Logo



Client/Project
HUMMINGBIRD ENERGY LLC

HUMMINGBIRD SOLAR PROJECT

Mt. Carmel, Kentucky (Fleming County)

Title
CONCEPTUAL LAYOUT
OVERALL SITE

Project No.
193708901

Scale
NTS

Revision Sheet
E 1 of 1

Drawing No.
C100

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	PROPOSED BESS LOCATION
	PROPOSED LAY DOWN AREA
	EXISTING VEGETATIVE BUFFER

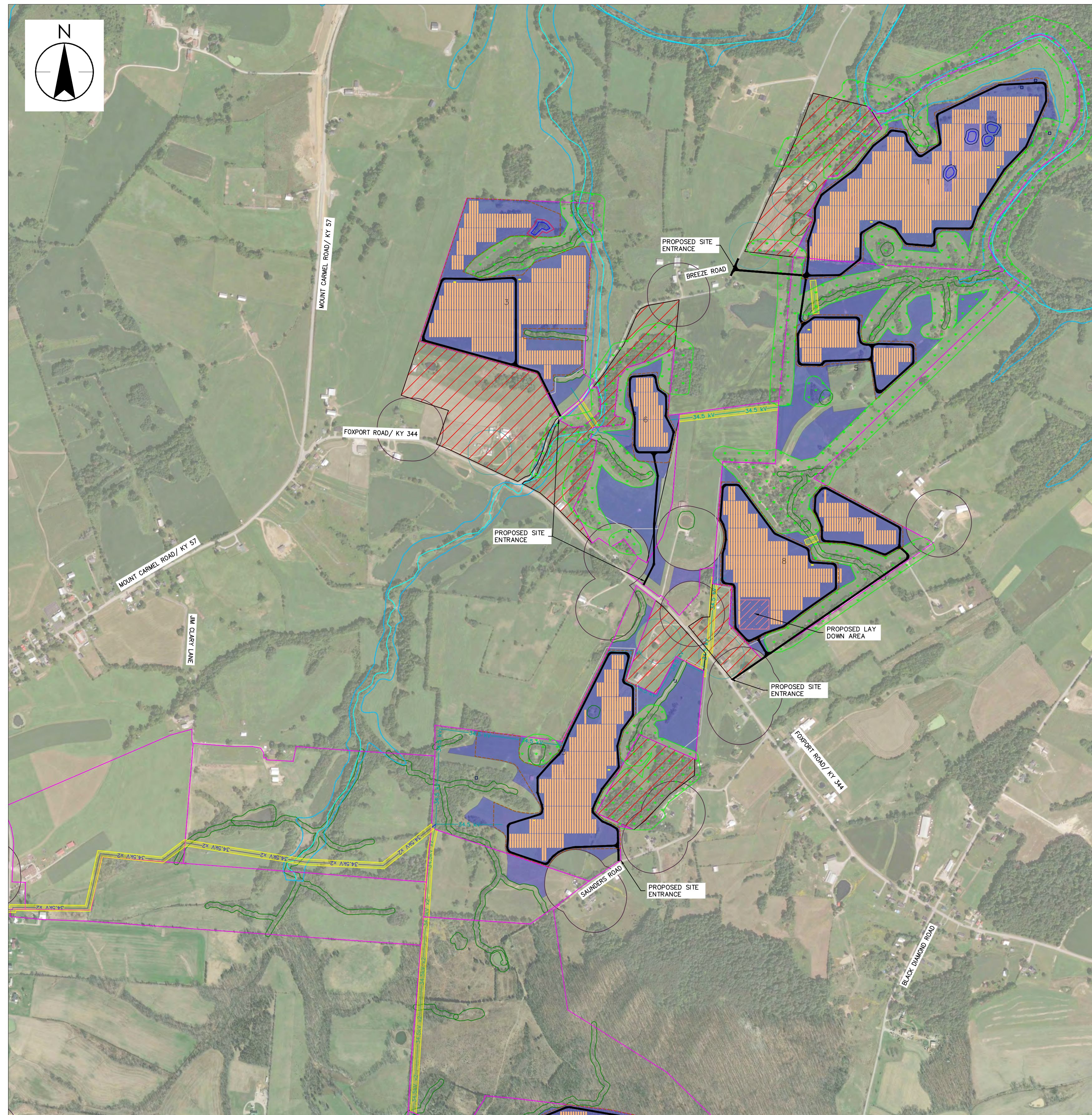
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PARCEL AREA WITHOUT EXCLUSION AREAS	3,507 ACRES
BUILDABLE AREA	2,032 ACRES

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File Name: 193708901_C200	ZG	ZG	DK	2022.03.25
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

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Client/Project
HUMMINGBIRD ENERGY LLC

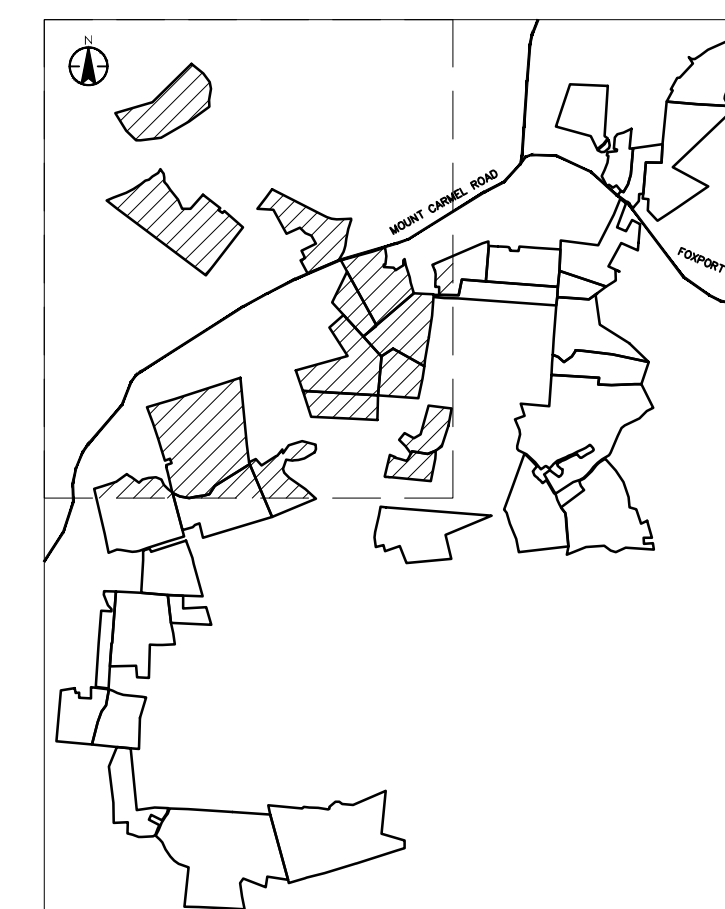
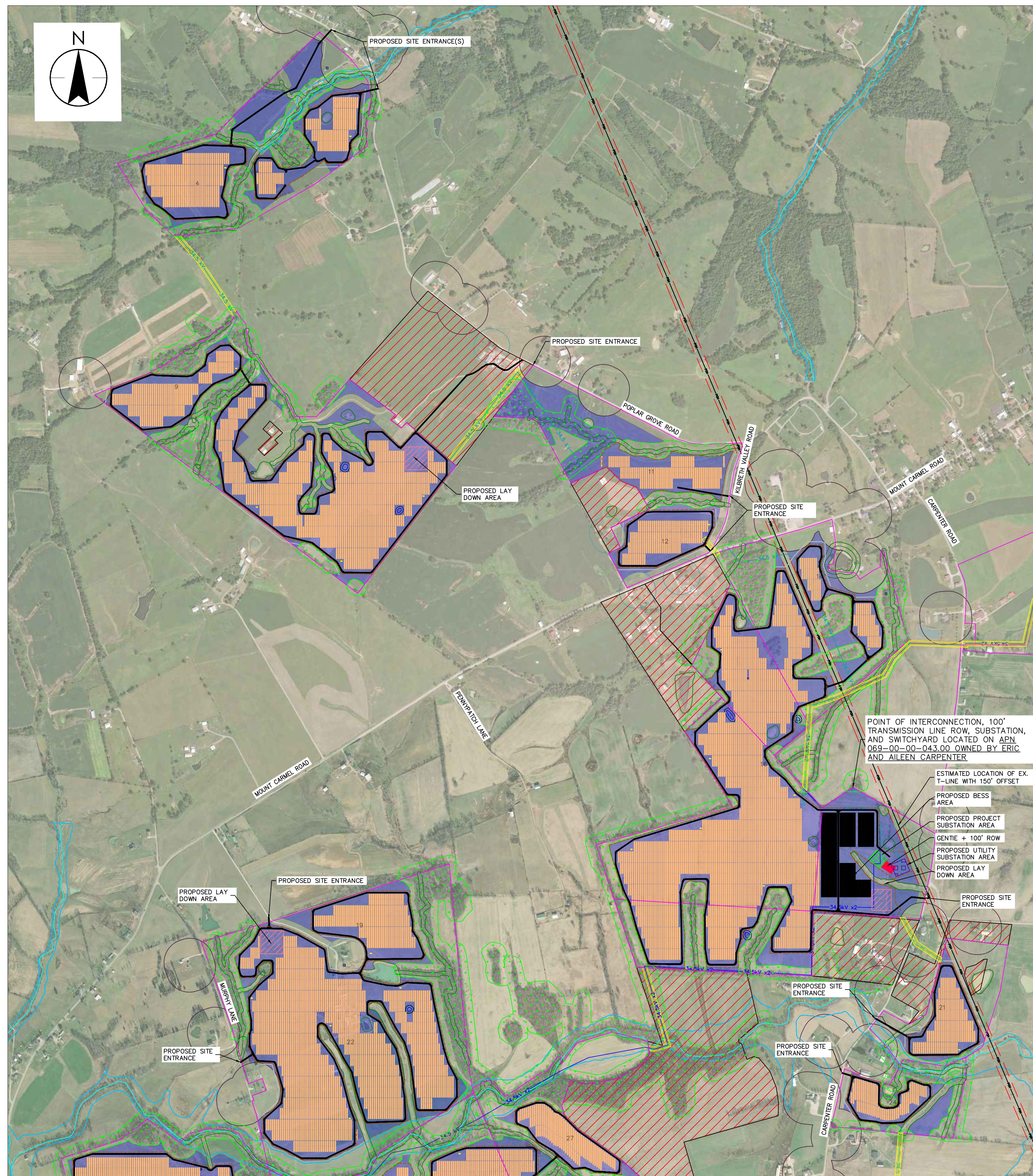
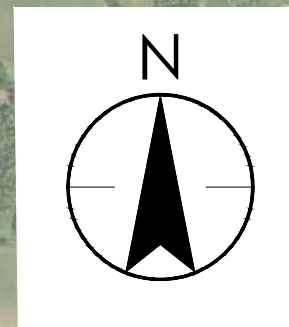
HUMMINGBIRD SOLAR PROJECT

Mt. Carmel, Kentucky (Fleming County)

Title
CONCEPTUAL LAYOUT
SECTIONAL VIEW

Project No. 193708901	Scale NTS
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Revision Sheet E	1 of 5	Drawing No. C200
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LEGEND

- PROPOSED SOLAR ARRAY
- INVERTER STATION
- BATTERY ENERGY STORAGE SYSTEM
- PROPOSED FENCELINE
- PROPERTY BOUNDARY
- PROPOSED SCREENING
- E-34.5kV-OH-25MW-1x
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- EX. OVERHEAD POWER OFFSET
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- NONPARTICIPATING RESIDENT
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- BUILDABLE AREA
- EXCLUSION AREA
- PROPOSED PROJECT SUBSTATION LOCATION
- PROPOSED UTILITY SUBSTATION LOCATION
- PROPOSED BESS LOCATION
- PROPOSED LAY DOWN AREA
- EXISTING VEGETATIVE BUFFER

POINT OF INTERCONNECTION, 100' TRANSMISSION LINE ROW, SUBSTATION, AND SWITCHYARD LOCATED ON APN 069-00-00-043.00 OWNED BY ERIC AND AILEEN CARPENTER

- ESTIMATED LOCATION OF EX. T-LINE WITH 150' OFFSET
- PROPOSED BESS AREA
- PROPOSED PROJECT SUBSTATION AREA
- GENTLE ± 100' ROW
- PROPOSED UTILITY SUBSTATION AREA
- PROPOSED LAY DOWN AREA

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Stantec
209 Commerce Parkway, P.O. Box 128
Cottage Grove, Wisconsin 53527-8955
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www.stantec.com

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File Name: 193708901_C200	ZG	ZG	DK	2022.03.25
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Permit/Seal

Client/Project Logo
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Client/Project
HUMMINGBIRD ENERGY LLC

HUMMINGBIRD SOLAR PROJECT

Mt. Carmel, Kentucky (Fleming County)

Title
CONCEPTUAL LAYOUT
SECTIONAL VIEW

Project No. 193708901	Scale NTS
Revision Sheet E	Drawing No. C200
2 of 5	

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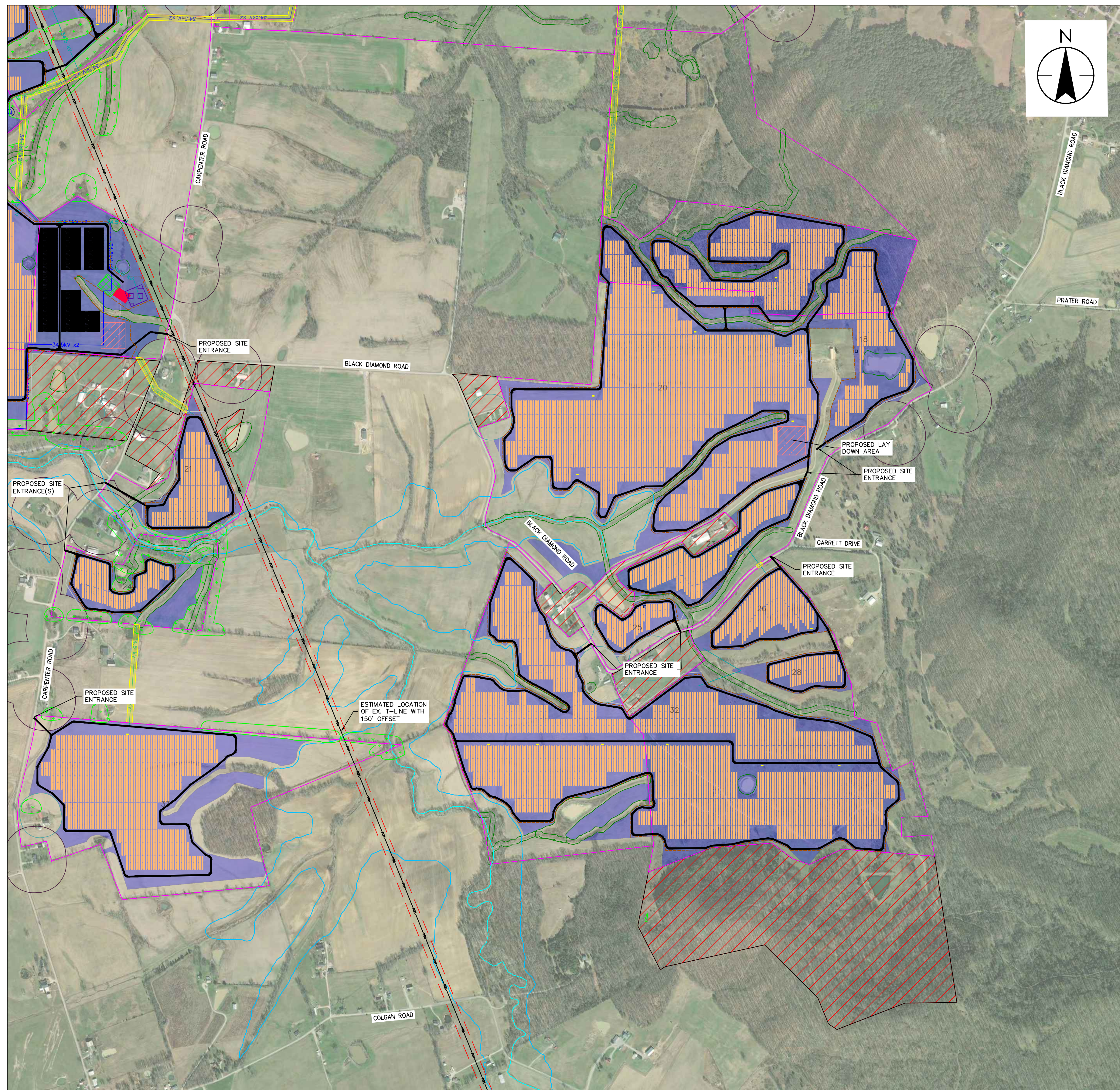
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Permit/Seal

Client/Project Logo



Client/Project
HUMMINGBIRD ENERGY LLC

HUMMINGBIRD SOLAR PROJECT

Mt. Carmel, Kentucky (Fleming County)

Title
CONCEPTUAL LAYOUT
SECTIONAL VIEW

Project No.
193708901


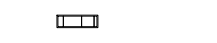
























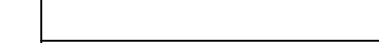
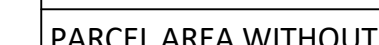
Scale
NTS

Revision Sheet
E 3 of 5

Drawing No.
C200



LEGEND

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	PROPOSED LAY DOWN AREA
	EXISTING VEGETATIVE BUFFER

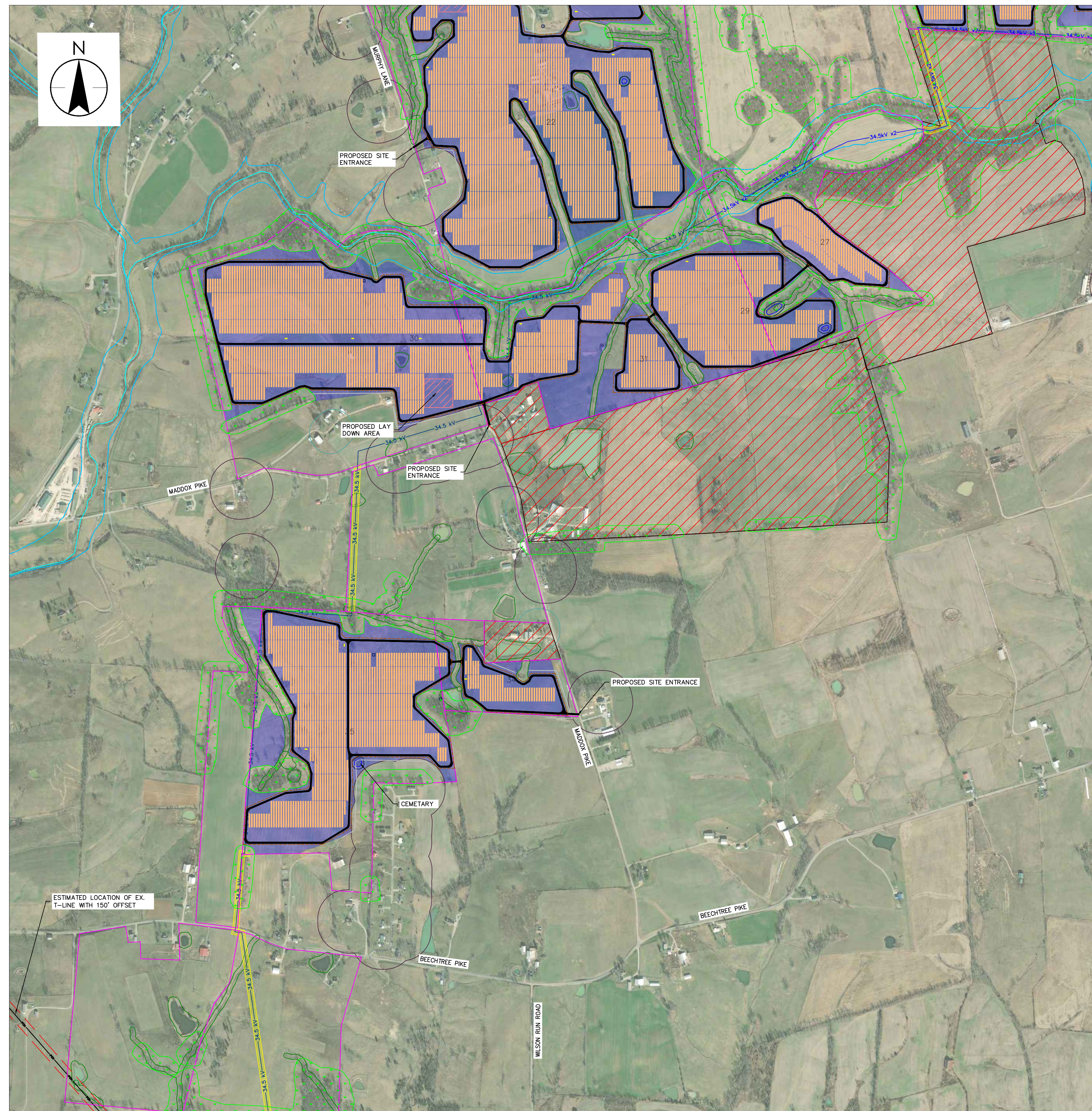
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HUMMINGBIRD SOLAR PROJECT

Mt. Carmel, Kentucky (Fleming County)

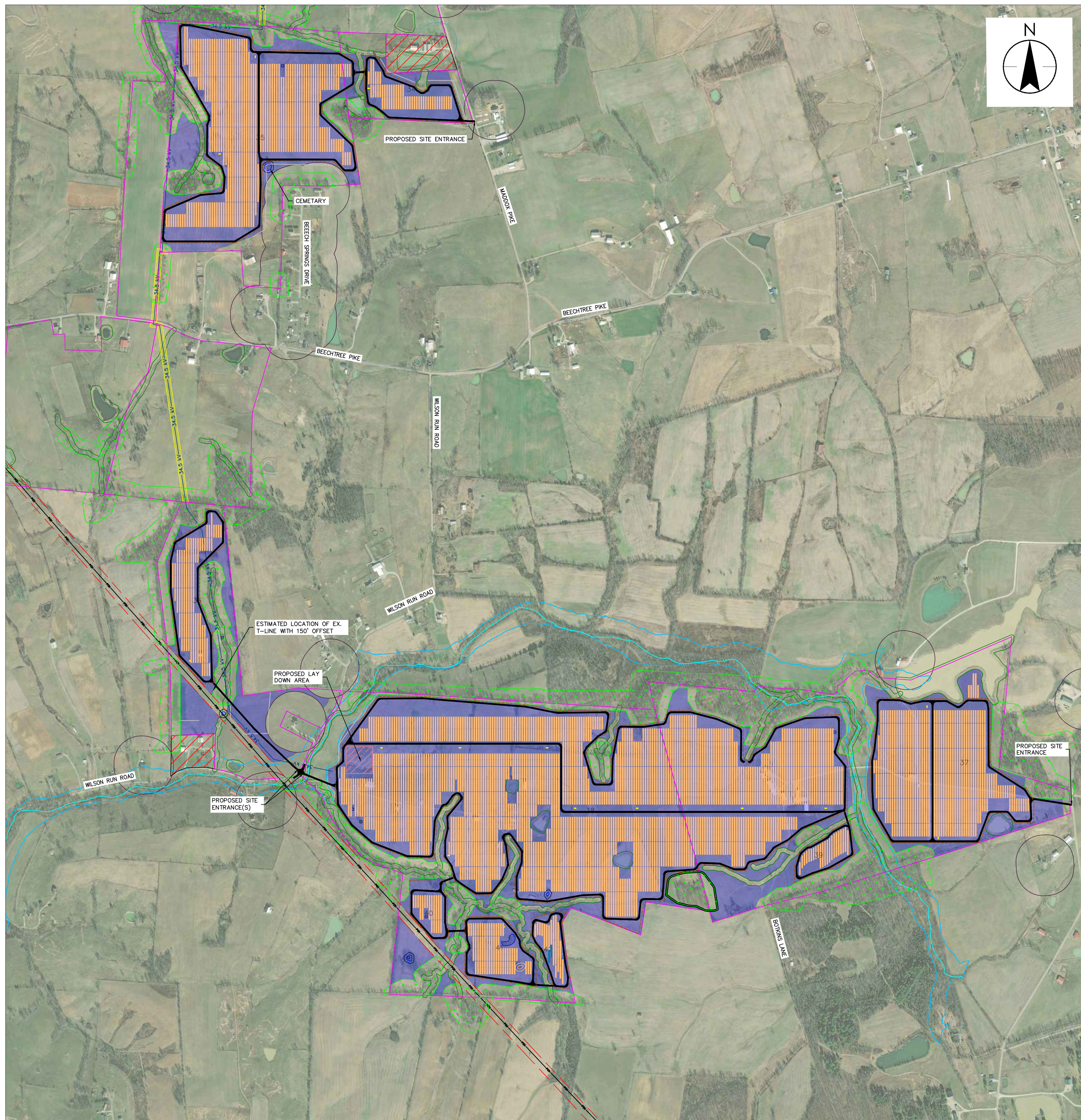
Title
CONCEPTUAL LAYOUT
SECTIONAL VIEW

Project No.
193708901

Scale
NTS

Revision Sheet
E 4 of 5

Drawing No.
C200



LEGEND

	PROPOSED SOLAR ARRAY
	INVERTER STATION
	BATTERY ENERGY STORAGE SYSTEM
	PROPOSED FENCELINE
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PROJECT DATA	
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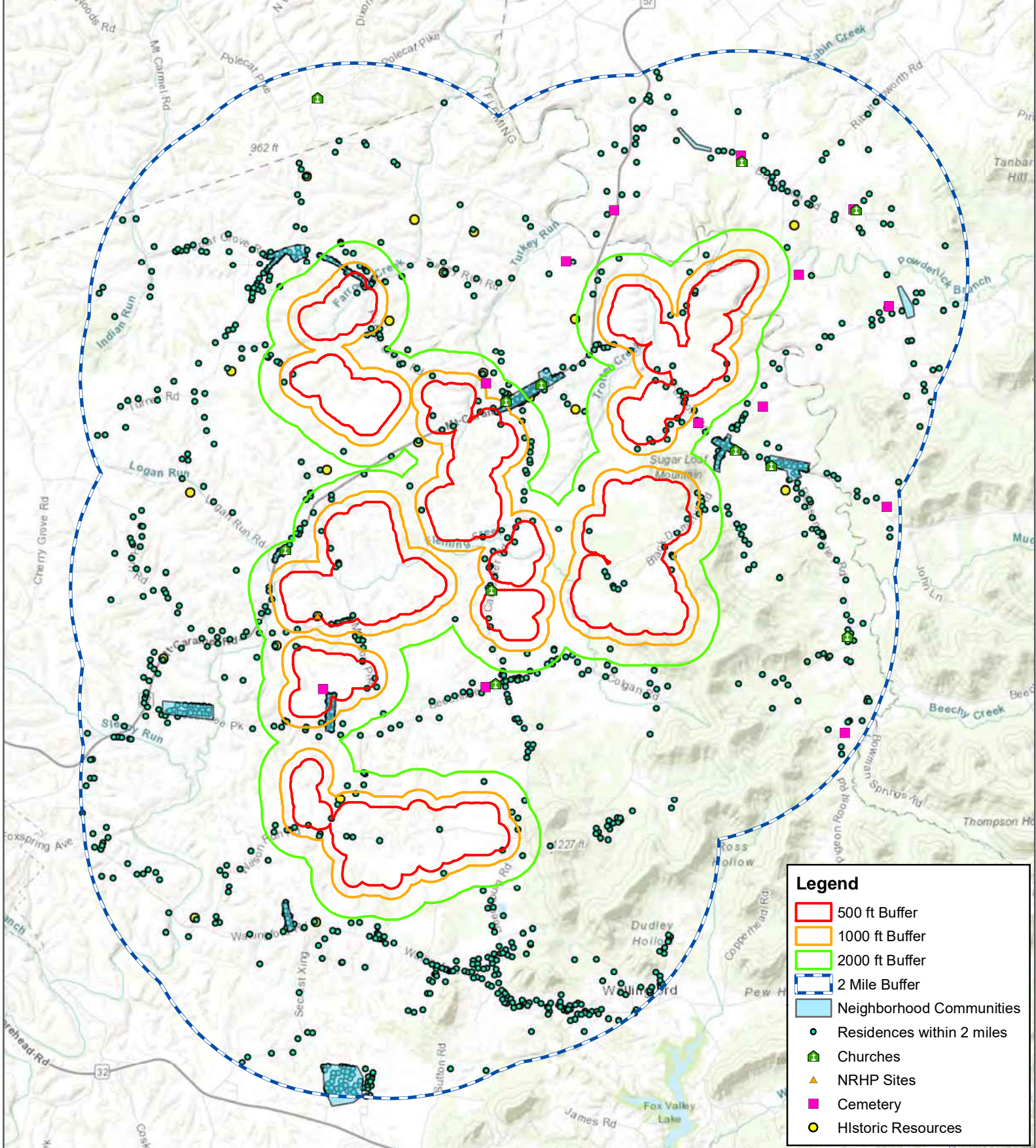
Client/Project
 HUMMINGBIRD ENERGY LLC

HUMMINGBIRD SOLAR PROJECT

Mt. Carmel, Kentucky (Fleming County)

Title
 CONCEPTUAL LAYOUT
 SECTIONAL VIEW

Project No. 193708901	Scale NTS
Revision Sheet E	Drawing No. C200



Legend

- 500 ft Buffer
- 1000 ft Buffer
- 2000 ft Buffer
- 2 Mile Buffer
- Neighborhood Communities
- Residences within 2 miles
- 🏠 Churches
- ▲ NRHP Sites
- Cemetery
- Historic Resources



*No Schools or Parks were identified within 2-miles of the facility.

7.5' Quadrangles:
 Flemingsburg, KY (2019)
 Orangeburg, KY (2019)
 Burtonville, KY (2019)

PLSS: unsectioned

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C203: Public Resources within 2 Miles of the Study Area

Visual Resource Assessment for the Hummingbird Solar Project

Hummingbird Solar, LLC

Fleming County, Kentucky

Cardno **Stantec**

76 San Marcos Street
 Austin, TX 78702 USA
 Phone (+1) 512.745.8129
 www.cardno.com

Hummingbird Energy LLC
Second Set of Supplemental Responses to Siting Board Staff's First Request for Information
Case No. 2022-00272

Request No. 47:

Provide any geotechnical reports indicating the location of karst formations within the project boundaries.

Original Response:

Hummingbird has commissioned several geotechnical investigations related to the potential for karst formations. The initial study was a desktop investigation, which is attached. Additional reporting is in progress from completed field studies and will be provided by August 25, 2023.

Supplemental Response:

The report is progressing but incomplete at this time. Hummingbird anticipates that reporting will be completed in the near future and will provide the report upon completion.

Second Supplemental Response:

Please see the attached field reconnaissance report memorandum.

Responding Witness: Chad Martin

To:	Chad Martin Austin, Texas	From:	Kurt Schaefer Louisville, Ky (Shelbyville Road)
File:	237800383	Date:	August 22, 2023

Stantec was requested to evaluate the results of a desktop karst survey by physically performing a field reconnaissance of the features identified in the desktop survey. A Karst Survey Desktop Review was performed by Terracon dated December 23, 2021 for this project site. Terracon identified 42 suspected karst features within the parcels. Based upon that review, Stantec performed a field reconnaissance of 27 of the suspected karst sites which were located within buildable areas on April 21, 2022, and provided evaluations on April 28, 2022. The evaluations were provided on and KMZ file for incorporation into the design of the facility. The attached figure shows the locations of the field evaluations. The attached table includes the identification of the feature relative to the parcel on which it was identified by Terracon, the approximate latitude and longitude of the feature based upon current Google Earth imagery, and Stantec's reconnaissance notes and opinion of the feature relative to construction of the facility. Several of the features noted were erosion features or locations where livestock had been fed or given mineral blocks. The actual karst features encountered were a combination of sinks and springs which appeared shallow in depth and narrow in plan dimensions. No large voids or open features were encountered, therefore Stantec recommended building offsets varying from 15 to 20 feet around the noted features to avoid contacting the visible karst.

Stantec Consulting Services Inc.

Kurt J Schaefer, PE
Principal

Phone: 502-565-8787

Attachment: karstfieldreconApril22

c. C.C.

TABLE OF KARST FIELD EVALUATIONS

No.	Parcel ID (per Terracon Report)	Coordinates (Google Earth)	Field Description
1	058-00-00-041.02	38-27-43N, 83-40-21W	Cemetery outside of the project fenceline.
2	058-1500	38-27-55N, 83-39-47W	This is a pond – Suggest a 15 feet buffer around the feature
3	058-2400	38-27-35N, 83-40-16W	Small spring coming out of the hillside and draining northeast. Suggest a 15 feet buffer around it.
4	059-1000	38-25-35N, 83-40-05W	No karst feature noted. Sycamore tree growing in hillside.
5	059-1000	38-25-34N, 83-40-03W	No karst feature noted. Sycamore tree growing in hillside.
6	059-1000	38-25-23N, 83-39-55W	This feature is erosion from a small spring. No effect on panel layout
7	059-1000	38-25-26N, 83-39-38W	Evidence of a spring coming out of hillside. Suggest a 15 feet buffer around it.
8	059-1000	38-25-20N, 83-39-43W	This is a spring which feeds a pond below it. Maintain a 15 feet buffer
9	059-1000	38-25-18N, 83-39-42W	This is a spring flowing to northeast. Maintain 15 feet buffer.
10	059-1000	38-25-19N, 83-39-57W (two features)	This feature is a large spring with moderate flow exiting the ground. The entire swale from the spring to the creek(southeast) is wet and soft. Suggest a 20 feet buffer around it.
11	069-0200	38-29-45N, 83-37-08W	This feature is an active spring. Suggest a minimum of a 20 foot buffer from the spring as well as the shallow depression immediately upslope of the spring during construction.
12	069-2200	38-28-32N, 83-58-31W	This feature is a low area/swale with multiple minor (less than 6 inches in diameter) throats. Suggest a maintaining a 15 feet clearance.
13	069-2300	38-28-35N, 83-38-48W	This feature is a swale at the head of a drainage feature. Suggest maintaining a 15 foot buffer from panels.
14	069-4300	38-28-04N, 83-48-36W	This feature is a spring. Suggest maintaining at minimum a 20 foot buffer to panels.

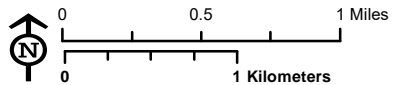
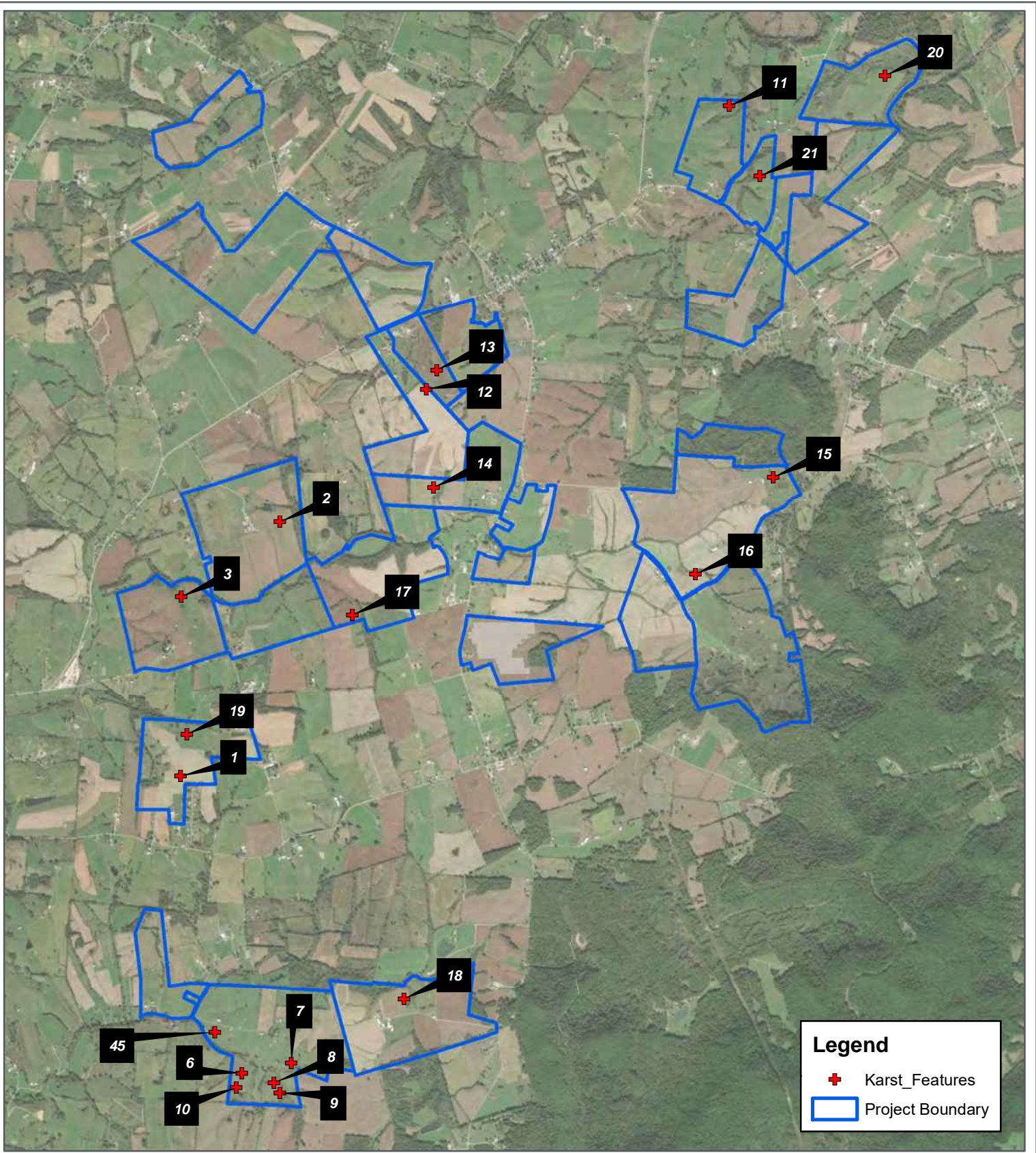
August 22, 2023

Chad Martin

Page 3 of 4

Reference: Reference

	Parcel ID (per Terracon Report)	Coordinates (Google Earth)	Field Description
15	07-0100	38-28-06N, 83-36-47W	No sinkhole noted.
16	07-0100	38-27-40N, 83-37-15W	No sinkhole observed at this location. Surface drainage runs northeast to pond.
17	07-0600	38-27-29N, 83-39-15W	This feature appears to be a spring. Several old tree stumps and heavy brush present. It drains to a drainage swale northeast. Suggest maintaining a 15 foot buffer from infrastructure.
18	071-0400	38-25-43N, 83-38-58W	No karst features noted. This is surface erosion.
19	08-0300	38-30-00N, 83-36-08W (two sites)	There are two features to the northeast corner of the parcel which are erosional; No karst features observed.
20	08-0300	38-29-57N, 83-36-06W (four closed basins)	There are four closed basins with no visible throats. Suggest buffering this area to avoid piling installation issues.
21	08-0500	38-29-30N, 83-56-32W	This feature is a shallow sinkhole less than 3 feet deep. Suggest a 15 feet buffer from infrastructure.




7.5' Quadrangles:
 Flemingsburg, KY (2022)
 Burtonville, KY (2022)
 Tollesboro, KY (2022)
 Orangeburg, KY (2022)

PLSS: unsectioned

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KYSB Request #47

**Structures Proposed for Demolition
 Hummingbird Solar, LLC
 Fleming County, Kentucky**



76 San Marcos Street
 Austin, TX 78702 USA
 Phone (+1) 512.745.8129
 www.stantec.com

Hummingbird Energy LLC
Second Set of Supplemental Responses to Siting Board Staff's First Request for Information
Case No. 2022-00272

Request No. 59:

Refer to SAR, Exhibit D, Noise Assessment, Table 5. For each nonresidential receptor, provide a table with operational sound pressure levels similar to Table 5.

Original Response:

Hummingbird has contacted Stantec to produce the requested table and will submit the table to the Siting Board by August 25, 2023.

Supplemental Response:

The answers to questions 59, 61 and 62 essentially require a new noise assessment to be developed. Hummingbird's contractor, Stantec, is in the process of developing a noise report that will address these questions, but at this point we do not have a clear date by which the new report will be available. The report will be filed as soon as complete, hopefully within the next three weeks.

Second Supplemental Response:

Please see the attached revised noise assessment.

Responding Witness: Chad Martin



Hummingbird Solar Noise Assessment

Hummingbird Solar Facility

September 1, 2023

Prepared for:

Hummingbird Energy LLC

Prepared by:

Stantec Consulting Services, Inc
Louisville, Kentucky



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HUMMINGBIRD SOLAR NOISE ASSESSMENT

Introduction

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Hummingbird Solar Project (Project) is a proposed 200-megawatt (MW) photovoltaic (PV) solar power energy generating facility located in Fleming County, Kentucky. The project site is located on approximately 3,900 acres 2.5 miles northeast of Flemingsburg (Figure 1). The solar project consists of solar panels, a panel tracking system, inverters and electrical equipment associated with a solar facility and substation. The power generated by the proposed solar facility will be connected to the existing power grid using the existing transmission line connecting to the proposed Substation located on Carpenter Road. The generating facility will sell power on the wholesale market as a merchant power plant or independent power producer. The solar facility will be enclosed by a six (6)-foot chain link fence with three strand barbed wire. At the end of the project's life the equipment and electrical infrastructure will be decommissioned, and land may return to farming or other development.

A desktop noise assessment was completed to evaluate potential noise impacts to noise sensitive receptors within 1,500 feet from the project boundary (Noise Assessment Area). Background noise as well as noise generated during construction and operation of the Project were considered in the analysis.

1.2 EXISTING LAND USE AND SITE CONDITIONS

The Project is located in a rural area with gently sloping topography. Existing land use within the project site is cultivated cropland with small areas of deciduous forest. (MLRC 2016 and USDA-FSA 2018). Land use adjacent to the Project is comprised of scattered homes and cultivated cropland. The community of Mt. Carmel is located in the north central portion of the Project while Flemingsburg is located to the southeast. KY-57 transects the project site northeast to southwest while forested land is present to the southeast (Figure 2). There are two 138-kV transmission lines that intersects the Project.



2.0 NOISE STUDY

2.1 EXISTING NOISE CONDITIONS

2.1.1 Noise Sensitive Receptors

A noise sensitive receptor is generally defined as locations where people reside or where the presence of unwanted sound may adversely affect the use of the land. Receptors may include but are not limited to schools, homes, churches, hospitals, and certain types of recreation or outdoor land uses such as outdoor restaurant seating.

Potential noise sensitive receptors were evaluated within a 1,500 foot buffer from the project boundary. High resolution aerial photography, topographic quadrangles and proposed site layouts were analyzed using ESRI ArcMap 10.8 and Google Earth Pro to determine the presence of potential noise sensitive receptors. These receptors include residential dwellings and are shown on Figure 2. Two churches are present within the study area: Mt. Carmel Christian Church and Mt. Carmel Bible Fellowship. Mt. Carmel Christian Church is located within the Mt. Carmel community near the north portion of the site while Mt. Carmel Bible Fellowship is located along Carpenter Road near the center of the site. The Fleming County Cemetery is located in the Mt. Carmel community and will not be analyzed further for this study. Three additional churches are located between 1,500 and 2,500ft from the project and are included in this study. Those churches include the Mt. Carmel United Methodist Church, Beechburg Christian Holiness Church, and Dalesburg Bible Holiness Church. No schools, childcare centers, outdoor recreation, medical centers, or other types of noise sensitive receptors were observed within the noise assessment area.

207 residences consisting of single family homes are located within the Noise Assessment Area. These dwellings are referred to as noise sensitive receptors within this report (R1 through R207). Fifty-five (55) of these dwellings are located within areas that meet the definition of “residential neighborhood” according to KRS 278.700. These 55 dwellings are in one of five neighborhoods, which include populated areas of five or more acres containing at least one residential structure per acre. The five residential neighborhoods include an area along Beech Springs Drive, Maddox Road, Poplar Grove Road, and the communities of Dalesburg and Mt. Carmel. The nearest residence is approximately 260 feet from the nearest solar panel (Table 1). Proposed inverters are located even further away with the nearest being approximately 578 feet from a residence. Three adjacent residences along Botkins Lane are currently under a purchase option and will be removed prior to construction (R4, R5 and R6); therefore, they have not been considered as noise sensitive receptors in this study. These are labeled as Participating Structures on Figure 2.



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

Table 1. Nearest Sensitive Receptor to the Site

Type	Nearest to	Direction from Project Site	Distance from Fence	Distance from Nearest Solar Panel	Distance from Nearest Inverter or Transformer*
Residences – Beech Springs Drive Neighborhood (R18-R32; R147-R149)		West	Within 305 ft	Within 351 ft	Within 1,252 ft
Residences – Maddox Road Neighborhood (R40-R44)		West	Within 309 ft	Within 381 ft	Within 1,053 ft
Residence (R46)	Fence	West	Within 180 ft	Within 316 ft	Within 755 ft
Residences – Poplar Grove Road Neighborhood (R63-R73; R166-RR167)		Northwest	Within 317 ft	Within 372 ft	Within 1,010 ft
Residences – Mount Carmel Neighborhood (R80-R84; R175-R185)		North Central	Within 320 ft	Within 394 ft	Within 1,529 ft
Residence (R91)	Substation	Central	Within 324 ft	Within 575 ft	Within 792 ft*
Residence (R105)	Solar Panel / Tracking Motors	East	Within 208 ft	Within 260 ft	Within 788 ft
Residence (R109)	Inverter	East	Within 286 ft	Within 406 ft	Within 578 ft
Residences – Dalesburg Neighborhood (R157-R159)		Northwest	Within 1,275 ft	Within 1,428 ft	Within 2,548 ft

*All values reflect distance to inverters except for R91 which is the distance to the substation/transformer area.

2.1.2 Noise Ordinances

The unincorporated portions of Fleming and Lewis Counties do not appear to have a specific noise ordinance. However, Chapter 98 of the City of Flemingsburg Code of Ordinances limits excessive loud and/or harsh noises but there are no specific noise decibel (dB) levels referenced within the ordinance. Since the city limits of Flemingsburg are more than 2.5 miles away from the Project, the noise ordinance does not apply (Flemingsburg, Kentucky Code of Ordinances 2008).



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

2.1.3 Existing Noise from Surrounding Areas

Noise is typically measured in decibels (dB_A - A-weighted sound levels) to describe the relative loudness of specific sounds. Unless otherwise noted, sound is presented as equivalent continuous sound level [L_{eq} (dB_A)]. This is defined as the steady sound pressure level which, over a given period of time, has the same total energy as the actual fluctuating noise. This can be generally thought of as average sound levels. L_{min} (dB_A) and L_{max} (dB_A) are the minimum and maximum sound levels at a given period in time. See Table 2 for example sound levels from the Centers for Disease Control and Prevention (CDC 2020) and the Federal Railroad Administration (FRA 2010).

Table 2. Common Sources of Noise and Decibel Levels

Noise Source	Average Noise Level (dB _A)*	Average Noise Level (dB _A)**
	At 50 feet	At 250 feet
Loud Entertainment Venues (Nightclubs, Bars and Rock Concerts)	105 – 110	91 -96
Car horn at 16 ft / Sporting Events	100	86
Motorcycle	95	81
Locomotives and Rail Cars at 100 feet**	80-90	76 - 76
Gas powered lawnmowers and leaf blowers	80-85	66 - 71
Heavy Traffic	80-85	66 - 71
Washing Machine / Dishwasher	70	56
Normal Conversation / Air Conditioner	60	46
Soft Whisper	30	16

**CDC 2020 *FRA 2010 **Estimated*

The primary source of noise from the surrounding area is similar to the Project site with sparse automotive traffic on rural roads and adjacent farms producing agricultural sounds related to tractors, farm machinery, trucks, and ATVs. Additionally, wildlife also contributes to the local noise including insects, birds, and frogs.

2.1.4 Existing On-Site Noise

Existing noise on the Project site consists of noises typically produced by agricultural activities. These noises include tractors, trucks, and all-terrain vehicles. Rural wildlife noises contribute to the existing noise conditions including birds, frogs, and insects.



2.2 PROPOSED CONSTRUCTION NOISE CONDITIONS

2.2.1 Equipment and Machinery

The Project’s construction will require earthmoving and tree removal activities as well as typical solar panel and electrical equipment installation. Typical construction equipment is expected to be used for site preparation and infrastructure installation and may include dump trucks, pile drivers, backhoes, dozers, and excavators. The Federal Transit Administration outlines typical construction equipment noise levels and is presented in Table 3 (FTA 2018). The Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) was used to evaluate noise during construction (FHWA 2006). Pile drivers are expected to be the loudest machinery and will only be used during installation of the solar panel supports. Since pile drivers will only be used during pole installation, nearest receptor model results have been presented both with and without pile drivers in use.

Table 3. Construction Equipment Noise Emission Levels

Equipment	Typical Noise Levels at 50 ft from Source (dBA)*	Typical Noise Levels at 250 ft from Source (dBA)**
Air Compressor	80	66
Backhoe	80	66
Ballast Equalizer	82	68
Ballast Tamper	83	69
Compactor	82	68
Concrete Mixer	85	71
Concrete Pump	82	68
Concrete Vibrator	76	62
Crane, Derrick	88	74
Crane, Mobile	83	69
Dozer	85	71
Generator	82	68
Grader	85	71
Impact Wrench	85	71
Jack Hammer	88	74
Loader	80	66
Paver	85	71
Pile Driver (Impact)	101	87
Pile Driver (Sonic)	95	81
Pneumatic Tool	85	71
Pump	77	63
Rail Saw	90	76
Rock Drill	95	81
Roller	85	71
Saw	76	62
Scarifier	83	69
Scraper	85	71
Shovel	82	68
Spike Driver	77	63
Tie Cutter	84	70



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

Equipment	Typical Noise Levels at 50 ft from Source (dBA)*	Typical Noise Levels at 250 ft from Source (dBA)**
Tie Handler	80	66
Tie Inserter	85	71
Truck	84	70

**Taken from FTA 2018 **Estimated*

2.2.2 Roadway Noise During Construction

Traffic noise is expected to increase temporarily during construction due to the mobilization of labor and materials, equipment and staff moving between sections of the project and construction and equipment vehicles entering and leaving the site. Construction related activity is expected to occur mainly between 7 a.m. and 7 p.m. (sunrise and sunset) and will be of limited duration at any given location within the project.

2.2.3 Assembly of Solar Array and Construction of Facilities

The solar facility consists of solar panels, a panel tracking system, inverters and electrical equipment associated with the solar facility and substation. All solar module equipment is expected to be assembled using handheld equipment and power tools. Assembly will occur within the Project site several hundred to thousands of feet from the nearest receptors. Assembly will take place during daytime hours and will be of limited duration at any given location within the project.

2.3 PROPOSED OPERATIONAL NOISE CONDITIONS

2.3.1 Solar Array and Tracking System

The solar array associated with this project includes single-axis tracking panels distributed evenly across the site (Figure 2). Tracking systems involve the panels being driven by small, 24-volt brushless DC motors to track the arc of the sun to maximize each panel's potential for solar absorption. Panels would turn no more than five (5) degrees every 15 minutes and would operate no more than one (1) minute out of every 15-minute period during daylight hours. Tracking motors will not be installed closer than 100 feet from the project boundary. The sound typically produced by panel tracking motors (NexTracker or equivalent) is approximately 20 dBA at 100 feet. At the nearest receptor (R105) the tracking system will be approximately 11.7 dBA as a worst-case maximum noise [L_{max} (dBA)] which is barely audible. Model results are presented in Table 5.

2.3.2 Inverters

Approximately 52 inverters are expected to be installed across the Project site. Inverters installed onsite are expected to be SMA Energy PCS or General Electric (GE) LV5 PCS or similar. Manufacturer's specifications for the equipment include a range of noise emission for SMA Energy PCS from 49 dBA at 50 meters (164 feet) distance to 67 dBA at 10 meters (32.8 feet) from the source which roughly translates to 31.1 dBA at the nearest receptor (R109), comparable to a computer. The GE LV5 PCS ranges from 73.6 dBA at lowest cooling level to 91.3 dBA at highest cooling levels at 10 meters (32.8 feet) from the



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

source which is approximately 48.6 dBA at the nearest receptor (R109), comparable to a refrigerator. Since the GE approximate sound levels are higher, those were used for this assessment and results are shown in Table 5.

The noise produced by the inverters can be characterized as a hum and during average operation is similar in noise level to a household air conditioner at the unit. Proposed inverter locations are shown on Figure 2.

2.3.3 Transformers

The proposed substation and battery storage area covers approximately 14.0 acres and is located on the central portion of the Project. Transformers associated with the project will include an SBG-SMIT 3 phase 127 kVA transformer or similar. According to manufacturer specifications the loudest the transformer is expected to be is just over 60 dBA, measured 1 meter (3.2 feet) from the source, or the level of a normal conversation. The nearest sensitive receptor (R91) is approximately 792 feet away which equates to a sound level of 12.2 dBA and is barely audible, comparable to normal breathing. Remaining model results can be found in Table 5.

2.3.4 Site Operation and Maintenance

2.3.4.1 Vehicular Traffic

During operation, the solar facility is expected to have a maximum of one technician visiting the site daily for inspection and two to three technicians up to 70 days per year. Operation and maintenance work may be expected at night for up to 30 days per year. Weekend work is not anticipated but may be required upon any component outages that may impact energy production from the site. Other than the scenarios mentioned, vehicular traffic onsite will be limited to typical weekday business hours. Technicians will drive mid- or full-sized trucks and will not contribute noticeably to the existing traffic noise levels.

2.3.4.2 Maintenance Activities

Typical maintenance activities may include inspection, minor repair and maintenance on the solar panels, the tracking system, wiring, and/or inverters. Grounds maintenance will include periodic inspection of the boundary fencing and vegetation control through mowing and herbicide applications.

2.4 NOISE SUMMARY AND CONCLUSIONS

Noise is expected to increase temporarily and intermittently during the construction phase of the project due to increases in vehicular traffic, construction equipment and assembly of the solar facility components. This increase in noise is expected to be within accepted ranges and of short duration at any given location within the project with the majority of the noise producing activities to occur many hundreds to thousands of feet from the nearest noise sensitive receptors. With the exception of the pile driving



HUMMINGBIRD SOLAR NOISE ASSESSMENT

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activities, the typical noise levels of construction equipment are not unlike the existing noise levels related to cultivation within and surrounding the Project.

The noisiest portion of the construction will be the use of pile drivers to install the solar panel supports. These will only be used very briefly for each pile. The pile driver's worst-case intermittent maximum noise [L_{max} (dBA)] level (86.5 dBA) is expected to occur at the nearest receptor (R105) and is similar to a motorcycle. The equivalent continuous sound level [L_{eq} (dBA)] from construction including the pile driver is 79.6 dBA which is similar to the sound level of a leaf blower. The noise model was also evaluated without the inputs of the pile driver since that is more typical of ongoing construction sound levels. The sound levels for typical construction (without pile driving) onsite are approximately 64.2 dBA which around the sound level of a dishwasher (Table 4). Construction activities at the Project site would move around the site and are not anticipated to be performed near a sensitive receptor for more than a few weeks.

Table 4. Calculated Noise Levels at Nearest Receptor Due to Construction (Sunrise to Sunset)

	Panel Distance (ft)	Calculated L_{max} (dBA)	Calculated L_{eq} (dBA)
R105 (including pile driver)	260	86.5	79.6
R105 (minus pile driver)	260	66.2	64.2
R52 (including pile driver)	405	82.7	75.8
R52 (minus pile driver)	405	62.4	60.2
R91 (including pile driver)	575	79.6	72.8
R91 (minus pile driver)	575	59.3	58.4

During site operation, intermittent noise related to the panel tracking system and the constant noise of the inverters is expected. The increase in noise is negligible due to the distance between the panels / inverters and the nearest noise sensitive receptors. The nearest receptor (R105) is approximately 260 feet from the closest solar panels and approximately 788 feet from an inverter. Maximum sound levels from the tracking system can be expected to be the levels of a refrigerator hum at the nearest receptor (R105, 45.9 dBA), while the sounds will be much quieter at most receptors.

It should be noted that the trackers and the inverters for the panels themselves will not operate at night when residential receptors are most sensitive. During average daytime operation, the inverters will be similar in noise level (~48.6 dBA_{max}) to a quiet library at the nearest receptor (R109). According to manufacturer specifications the loudest the substation transformer is expected to be is just over 60 dBA at 1m from the source, or the level of a normal conversation. Since the nearest receptor (R91) is approximately 792 ft from the substation, transformers are not expected to add additional noise above background noise as the noise levels are barely audible (12.2 dBA). Site visits and maintenance activities including single vehicular traffic and mowing will be negligible as they are similar to the background agricultural noise characteristics. All site visits, outside of emergency maintenance, will occur during daylight hours.



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At the nearest receptors, besides intermittent and infrequent pile driver activity, no elevated and prolonged noise levels above background levels are expected either during construction or operation of the Project site. Construction (pile driving) is not expected to remain in any area beyond a week.

Table 5. Approximate Noise Levels During Operation Within 1000ft of the Project Area (Sunrise to Sunset)

Receptor*	Nearest Panel / Panel Tracking System		Nearest Inverter		Nearest Transformer/Substation	
	Distance (ft)	dB _A	Distance (ft)	dB _A	Distance (ft)	dB _A
R1	542	<10	1430	40.8	16205	<10
R2	913	<10	1990	37.9	15231	<10
R3	477	<10	989	44.0	13972	<10
R7	1027	<10	1534	40.2	14700	<10
R8	903	<10	1472	40.5	14960	<10
R9	668	<10	1526	40.2	15850	<10
R10	386	<10	1328	41.4	16538	<10
R11	823	<10	1742	39.1	17479	<10
R12	441	<10	1022	43.7	17351	<10
R13	733	<10	1254	41.9	17802	<10
R14	1061	<10	1522	40.2	18083	<10
R15	1003	<10	1118	42.9	14049	<10
R16	988	<10	1187	42.4	13587	<10
R17	880	<10	1414	40.9	12999	<10
R18	1079	<10	1706	39.2	12807	<10
R19	951	<10	1605	39.8	12701	<10
R20	849	<10	1550	40.1	12600	<10
R21	722	<10	1460	40.6	12524	<10
R22	571	<10	1410	40.9	12356	<10
R23	376	<10	1349	41.3	12073	<10
R24	352	<10	1333	41.4	11967	<10
R25	369	<10	1412	40.9	11734	<10
R26	395	<10	1252	41.9	11525	<10
R27	544	<10	1475	40.5	11747	<10
R28	558	<10	1538	40.1	11910	<10
R29	586	<10	1552	40.1	12006	<10
R30	756	<10	1627	39.6	12267	<10
R31	853	<10	1668	39.4	12390	<10
R32	953	<10	1725	39.1	12481	<10
R33	718	<10	1657	39.5	10010	<10
R34	457	<10	1402	40.9	9621	<10
R35	506	<10	883	45.0	9441	<10



HUMMINGBIRD SOLAR NOISE ASSESSMENT

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Receptor*	Nearest Panel / Panel Tracking System		Nearest Inverter		Nearest Transformer/Substation	
	Distance (ft)	dB _A	Distance (ft)	dB _A	Distance (ft)	dB _A
R36	1132	<10	1400	40.9	8914	<10
R37	532	<10	1291	41.7	11251	<10
R38	1077	<10	1842	38.6	8626	<10
R39	350	<10	1037	43.6	8220	<10
R40	398	<10	1080	43.2	8581	<10
R41	439	<10	1065	43.3	8702	<10
R42	440	<10	1054	43.4	8800	<10
R43	381	<10	1086	43.2	9072	<10
R44	462	<10	1188	42.4	9344	<10
R45	474	<10	893	44.9	9752	<10
R46	317	<10	755	46.3	9712	<10
R47	902	<10	1515	40.3	10854	<10
R48	1182	<10	1901	38.3	11408	<10
R49	960	<10	1653	39.5	11248	<10
R50	1047	<10	1895	38.3	11288	<10
R51	1042	<10	1939	38.1	11233	<10
R52	405	<10	1320	41.5	7917	<10
R53	361	<10	1157	42.6	7699	<10
R54	488	<10	655	47.5	8026	<10
R55	682	<10	901	44.8	8195	<10
R56	275	11.2	821	45.6	6181	<10
R57	348	<10	757	46.3	3530	<10
R58	351	<10	1246	42.0	3725	<10
R59	284	10.9	1306	41.6	4532	<10
R60	1035	<10	1054	43.4	8084	<10
R61	829	<10	2466	36.0	11207	<10
R62	405	<10	1966	38.0	11006	<10
R63	914	<10	2172	37.1	12787	<10
R64	613	<10	1864	38.5	12484	<10
R65	615	<10	1883	38.4	12481	<10
R66	445	<10	1697	39.3	12257	<10
R67	385	<10	1609	39.7	12148	<10
R68	373	<10	1545	40.1	12054	<10
R69	408	<10	1447	40.7	11903	<10
R70	485	<10	1361	41.2	11762	<10
R71	381	<10	1133	42.8	11603	<10
R72	526	<10	1011	43.8	11317	<10



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

Receptor*	Nearest Panel / Panel Tracking System		Nearest Inverter		Nearest Transformer/Substation	
	Distance (ft)	dB _A	Distance (ft)	dB _A	Distance (ft)	dB _A
R73	672	<10	1153	42.6	11380	<10
R74	920	<10	2068	37.6	12463	<10
R75	807	<10	1834	38.6	12159	<10
R76	787	<10	1749	39.0	12046	<10
R77	1063	<10	1526	40.2	11483	<10
R78	995	<10	1272	41.8	9538	<10
R79	740	<10	2193	37.0	6130	<10
R80	534	<10	1529	40.2	3941	<10
R81	394	<10	1740	39.1	3719	<10
R82	675	<10	2006	37.8	3857	<10
R83	955	<10	2309	36.6	3932	<10
R84	1046	<10	2375	36.4	4011	<10
R85	463	<10	2030	37.7	3162	<10
R86	1113	<10	3056	34.2	3393	<10
R87	859	<10	2916	34.6	2690	<10
R88	1708	<10	1960	38.0	926	10.9
R89	1554	<10	2018	37.8	895	11.3
R90	598	<10	1571	39.9	1399	<10
R91	575	<10	1624	39.7	792	12.2
R92	428	<10	1386	41.0	906	11.2
R93	371	<10	844	45.3	1514	<10
R94	727	<10	1259	41.9	1220	<10
R95	631	<10	1710	39.2	866	11.6
R96	369	<10	2225	36.9	1251	<10
R97	590	<10	1679	39.4	1882	<10
R98	412	<10	1118	42.9	1974	<10
R99	371	<10	1904	38.3	3043	<10
R100	750	<10	1938	38.1	3549	<10
R101	406	<10	1580	39.9	3819	<10
R102	469	<10	862	45.2	5483	<10
R103	268	11.4	3100	34.0	4147	<10
R104	314	<10	1584	39.9	5635	<10
R105	260	11.7	788	45.9	6267	<10
R106	286	10.8	650	47.6	6406	<10
R107	328	<10	916	44.6	6652	<10
R108	941	<10	975	44.1	8346	<10
R109	469	<10	578	48.6	7851	<10



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

Receptor*	Nearest Panel / Panel Tracking System		Nearest Inverter		Nearest Transformer/Substation	
	Distance (ft)	dB _A	Distance (ft)	dB _A	Distance (ft)	dB _A
R110	374	<10	1469	40.5	8326	<10
R111	564	<10	2207	37.0	8969	<10
R112	371	<10	2393	36.3	8792	<10
R113	906	<10	2885	34.7	9291	<10
R114	983	<10	3203	33.8	9253	<10
R115	1053	<10	3527	32.9	9359	<10
R116	1094	<10	3664	32.6	9399	<10
R117	370	<10	745	46.4	7302	<10
R118	542	<10	967	44.2	7418	<10
R119	733	<10	1357	41.2	8090	<10
R120	443	<10	837	45.4	8189	<10
R121	648	<10	770	46.1	8462	<10
R122	867	<10	1325	41.4	9076	<10
R123	956	<10	1801	38.8	9802	<10
R124	774	<10	1351	41.3	11791	<10
R125	420	<10	1328	41.4	12165	<10
R126	452	<10	1435	40.7	9498	<10
R127	533	<10	1427	40.8	9675	<10
R128	454	<10	1352	41.3	9665	<10
R129	306	10.2	1287	41.7	9606	<10
R130	475	<10	1313	41.5	9555	<10
R131	395	<10	1392	41.0	9125	<10
R132	504	<10	1639	39.6	8888	<10
R133	385	<10	1258	41.9	9978	<10
R134	890	<10	1797	38.8	9062	<10
R135	921	<10	1589	39.8	8743	<10
R136	915	<10	1685	39.3	11542	<10
R137	586	<10	1300	41.6	12410	<10
R138	293	10.5	894	44.8	13064	<10
R139	317	<10	907	44.7	13152	<10
R140	1212	<10	2040	37.7	14719	<10
R141	1112	<10	1800	38.8	14365	<10
R142	1458	<10	1973	38.0	12957	<10
R143	1368	<10	2417	36.2	16429	<10
R144	1460	<10	1773	38.9	18225	<10
R145	1301	<10	2007	37.8	14821	<10
R146	1465	<10	2261	36.8	12405	<10



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

Receptor*	Nearest Panel / Panel Tracking System		Nearest Inverter		Nearest Transformer/Substation	
	Distance (ft)	dB _A	Distance (ft)	dB _A	Distance (ft)	dB _A
R147	1190	<10	1861	38.5	12715	<10
R148	1401	<10	2009	37.8	12912	<10
R149	1190	<10	1807	38.7	12943	<10
R150	1445	<10	1823	38.7	13555	<10
R151	1188	<10	1378	41.1	13755	<10
R152	1342	<10	1467	40.6	14387	<10
R153	1566	<10	1668	39.4	14601	<10
R154	1422	<10	2279	36.7	12154	<10
R155	1363	<10	1981	37.9	11713	<10
R156	1440	<10	2085	37.5	11769	<10
R157	1428	<10	2459	36.1	10635	<10
R157	1225	<10	1715	39.2	8827	<10
R158	1536	<10	2569	35.7	10532	<10
R159	1466	<10	2491	36.0	10197	<10
R160	1521	<10	1790	38.8	8959	<10
R161	1294	<10	1721	39.2	8503	<10
R162	1397	<10	2137	37.3	7642	<10
R163	1284	<10	2186	37.1	4173	<10
R164	1335	<10	2700	35.3	11942	<10
R165	1186	<10	2594	35.6	11795	<10
R166	1254	<10	2490	36.0	13119	<10
R167	1427	<10	2655	35.4	13288	<10
R168	1515	<10	2754	35.1	13218	<10
R169	1087	<10	1236	42.0	9380	<10
R170	1252	<10	1437	40.7	9183	<10
R171	1446	<10	1646	39.6	8984	<10
R172	1519	<10	2149	37.2	7356	<10
R172	1484	<10	2393	36.3	6912	<10
R173	1404	<10	2395	36.3	6834	<10
R174	1312	<10	2145	37.3	5602	<10
R175	1589	<10	2260	36.8	4944	<10
R176	1415	<10	2224	36.9	4739	<10
R177	1376	<10	2314	36.6	4632	<10
R178	1253	<10	2334	36.5	4431	<10
R179	1201	<10	2376	36.4	4302	<10
R180	1444	<10	2678	35.3	4361	<10
R181	1444	<10	2752	35.1	4235	<10



HUMMINGBIRD SOLAR NOISE ASSESSMENT

Noise Study

Receptor*	Nearest Panel / Panel Tracking System		Nearest Inverter		Nearest Transformer/Substation	
	Distance (ft)	dB _A	Distance (ft)	dB _A	Distance (ft)	dB _A
R182	1339	<10	2639	35.5	4196	<10
R183	1263	<10	2572	35.7	4145	<10
R184	1194	<10	2509	35.9	4101	<10
R185	1114	<10	2435	36.1	4054	<10
R186	1188	<10	3104	34.0	2661	<10
R187	1124	<10	2866	34.7	2383	<10
R188	1179	<10	2712	35.2	2172	<10
R189	1455	<10	2444	36.1	1752	<10
R190	1652	<10	2133	37.3	1317	<10
R191	1478	<10	1843	38.6	2954	<10
R192	1203	<10	1859	38.5	8419	<10
R193	1317	<10	1912	38.2	8336	<10
R194	1446	<10	2020	37.8	8242	<10
R195	1606	<10	2196	37.0	8059	<10
R196	1283	<10	1814	38.7	13540	<10
R197	1366	<10	2161	37.2	14811	<10
R198	1250	<10	1902	38.3	9683	<10
R199	1110	<10	3436	33.2	9411	<10
R200	1172	<10	3231	33.7	9424	<10
R201	1266	<10	3268	33.6	9583	<10
R202	1428	<10	2211	37.0	8222	<10
R203	1534	<10	2354	36.4	6965	<10
R204	1834	<10	2763	35.1	7403	<10
R205	1118	<10	1794	38.8	6829	<10
R206	379	<10	609	48.2	7739	<10
R207	1316	<10	1555	40.0	6589	<10
Mt Carmel Bible Fellowship	493	<10	1967	38.0	2604	<10
Mt. Carmel Christian Church	1083	<10	2208	37.0	4284	<10
Mt. Carmel United Methodist	2924	<10	3999	31.8	5355	<10
Dalesburg Bible Holiness Church	1636	<10	2572	35.7	9981	<10
Beechburg Christian Holiness Church	2691	<10	5959	28.4	8195	<10
Note Noise Levels are Lmax	Operates 1 minute every 15 minutes during daylight hours		Continuous low hum during daylight hours		Substation area	



HUMMINGBIRD SOLAR NOISE ASSESSMENT

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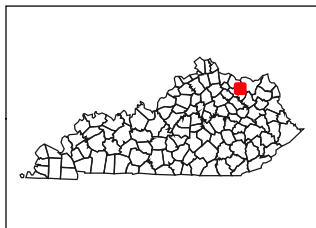
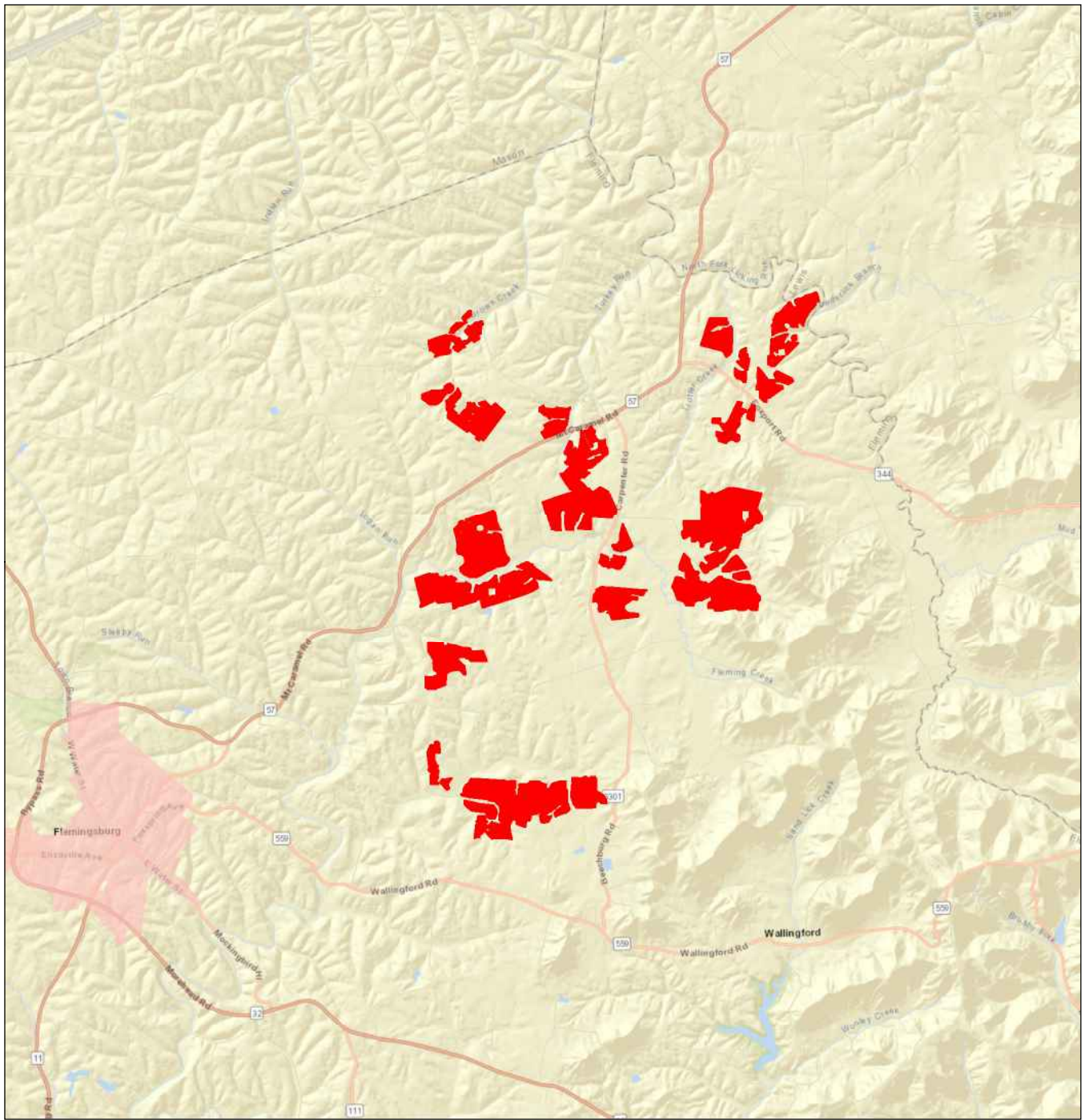


HUMMINGBIRD SOLAR NOISE ASSESSMENT

Appendix A Figures

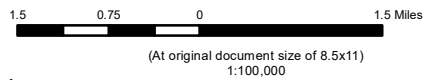
Appendix A FIGURES





Legend

- Kentucky Corporate Boundary Polygons
- Project Study Area



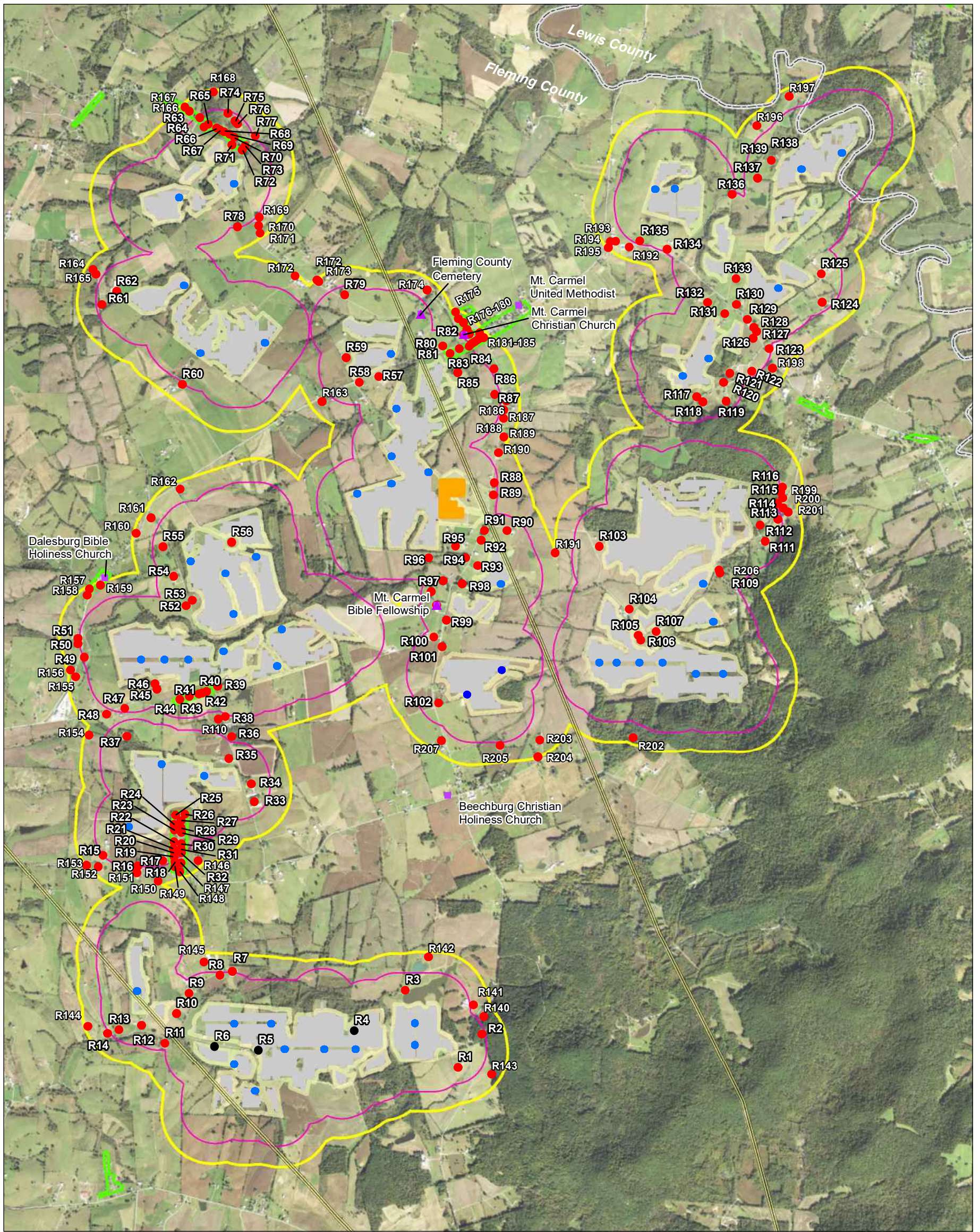
Project Location Prepared by GRG on 2022-09-19
 Fleming County, KY TR by ALC on 2022-03-31
Client/Project IR Review by on 2022-03-31

**Hummingbird Solar Facility
 Noise Assessment**

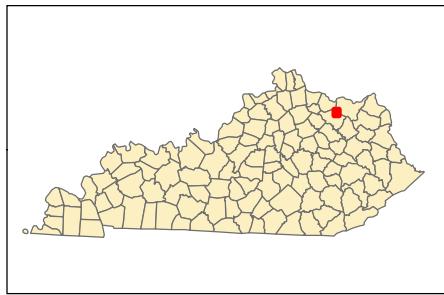
Figure No.
1

Title
Vicinity Map

Notes
 1. Coordinate System: NAD 1983 2011 StatePlane
 Kentucky South FIPS 1602 Ft US
 2. Data Sources: Stantec
 3. Background: Sources: Esri, HERE, Garmin,
 USGS, Intermap, INCREMENT P, NRCan, Esri
 Japan, METI, Esri China (Hong Kong), Esri Korea,
 Esri (Thailand), NGCC, (c) OpenStreetMap
 contributors, and the GIS User Community

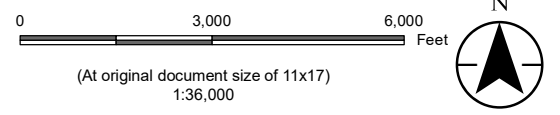


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- Legend**
- 1500 foot Noise Assessment Area
 - Potential Fence Line
 - Non-Participating Residential Receptors
 - Participating Receptors
 - Non-residential Receptors (Churches, Cemetery)
 - Potential Inverter Locations
 - Potential PV Layout
 - Potential Substation Location
 - 55dBA Temporary Construction Noise Limit
 - Residential Neighborhoods as per KRS 278.700
 - Counties
 - 138kv Transmission Line

Notes
 1. Coordinate System: NAD 1983 StatePlane Kentucky North FIPS 1601 Feet
 2. Data Sources: ESRI; Stantec
 3. Background: BING Aerials Kentucky Transportation Cabinet (KYTC)



Project Location
 Fleming County, KY

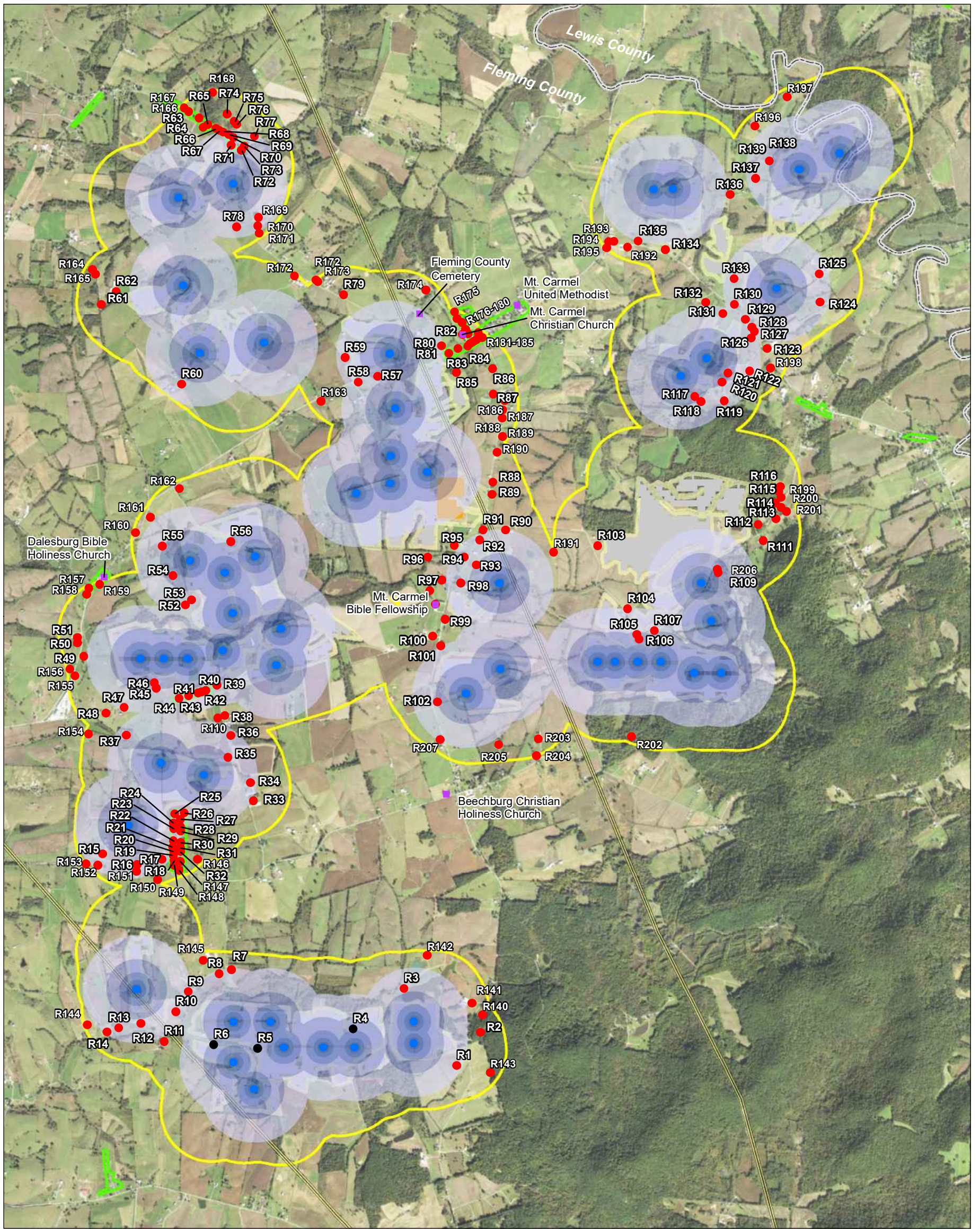
Prepared by ALC on 2023-08-25
 TR by CM on 2023-08-25

Client/Project
 Hummingbird Solar Facility
 Noise Assessment Report

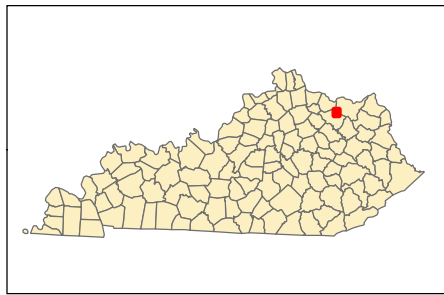
Figure No.
 2

Title
 Noise Sensitive Receptors

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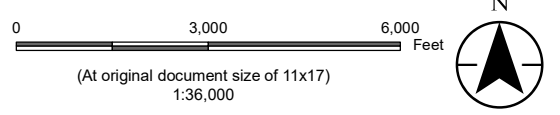
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Notes
 1. Coordinate System: NAD 1983 StatePlane Kentucky North FIPS 1601 Feet
 2. Data Sources: ESRI; Stantec
 3. Background: BING Aerials Kentucky Transportation Cabinet (KYTC)

Legend

- 1500 foot Noise Assessment Area
- Approximate Sound Levels for Potential Inverter Locations**
- 40 dB
- 45 dB
- 50 dB
- 55 dB
- 60 dB
- Potential Fence Line
- Non-Participating Residential Receptors
- Participating Receptors
- Non-residential Receptors (Churches, Cemetery)
- Potential Inverter Locations
- Potential PV Layout
- Potential Substation Location
- Residential Neighborhoods as per KRS 278.700
- Counties
- 138kv Transmission Line



Project Location
 Fleming County, KY

Prepared by ALC on 2023-08-25
 TR by CM on 2023-08-25

Client/Project
 Hummingbird Solar Facility
 Noise Assessment Report

Figure No.
 3

Title
 Approximate Inverter Sound Contours

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Hummingbird Energy LLC
Second Set of Supplemental Responses to Siting Board Staff's First Request for Information
Case No. 2022-00272

Request No. 61:

Refer to SAR, Exhibit D, Noise Assessment, Table 3. Provide the same table with typical noise levels at 250 feet from the source.

Original Response:

A revised table that will extrapolate noise levels to 250 feet will be submitted to the Siting Board by August 25, 2023.

Supplemental Response:

See response to Request No. 59.

Second Supplemental Response:

Please see the attachment to Second Supplemental Response to Request No. 59.

Responding Witness: Chad Martin

Hummingbird Energy LLC
Second Set of Supplemental Responses to Siting Board Staff's First Request for Information
Case No. 2022-00272

Request No. 62:

Refer to SAR, Exhibit D, Noise Assessment, Table 4. Provide additional calculated noise levels reflecting the cumulative levels of construction related and ambient noise for the following noise receptors:

- a. R105.
- b. R52.
- c. R91.

Original Response:

The Project's Noise Assessment will be revised to reflect the cumulative levels of construction related and ambient noises for noise receptors R105, R53, and R91 and will be provided to the Siting Board by August 25, 2023.

Supplemental Response:

See response to Request No. 59.

Second Supplemental Response:

Please see the attachment to Second Supplemental Response to Request No. 59.

Responding Witness: Chad Martin