Morris Ridge Solar Energy Center

Case No. 18-F-0440

1001.35 Exhibit 35

Electric and Magnetic Fields

EXHIBIT 35 ELECTRIC AND MAGNETIC FIELDS

The information presented in this Exhibit is derived from an Electric and Magnetic Field (EMF) Study prepared for the Morris Ridge Solar Energy Center by WSP USA Inc. The Study is included as Appendix 35-A.

(a) Every Right-of-way Segment Having Unique Electric and Magnetic Field Characteristics

None of the electrical collection lines from the photovoltaic (PV) arrays to the collection substation will exceed 34.5 kilovolts (kV); therefore, the Facility will not have transmission line rights-of-way (ROWs) for high voltage transmission power lines. However, 400-foot 230 kV transmission line segments between the point of interconnection (POI) switchyard and the existing New York State Electric and Gas (NYSEG) transmission line will be located on land controlled by the Applicant.

Seven ROW segments with unique EMF characteristics were identified in the EMF Study. Modeling calculations identified existing EMFs and future EMFs that would result from construction and operation of the Facility. Buried collection lines were assigned a right-of-way (ROW) value of 15 feet from the outermost circuit. The number of circuits along a single 34.5 kV cable route ranges from one to six circuits in parallel, affecting the ROW width. For the purposes of the EMF calculations, the ROW is assumed to be 30 feet for Case 1, 36.5 feet for Case 2, 43 feet for Case 3, 49.5 feet or Case 4, 56 feet for Case 5, and 62.5 feet for Case 6.[1] For the overhead 230-kV line, the ROW extends 50 feet from the centerline of the outermost circuit, yielding a minimum ROW of 100 feet, dependent on the number of circuits used at a given point. Table 35-1 below identifies the name and calculation number of each of these segments, as referred to in the EMF Study. A map of these segments is provided in the EMF Study.

Table 35-1. Unique ROW segments within the Facility

ROW Segment Name	ROW Calculation
Case 1: Single Circuit Trench	1
Case 2: Two Circuit Parallel Trench	2
Case 3: Three Circuit Parallel Trench	3
Case 4: Four Circuit Parallel Trench	4
Case 5: Five Circuit Parallel Trench	5
Case 6: Six Circuit Parallel Trench	6
Case 7: 230 kV Overhead Transmission Lines	7

[1] The right-of-way easements that Applicant has secured on parcels hosting collection or transmission lines range from 75 feet to 100 feet in width. The calculations presented in this report were based on these reduced ROW widths to provide a conservative assessment.

(b) For Each Right-of-way Segment, Base Case and Proposed Cross Sections Showing:

For each of the unique ROW segments identified in Section (a) above, the EMF Study and supporting drawings (e.g., the Electrical Detail Drawings (Appendix 5-B) provide both base case (where existing facilities are present) and proposed cross sections that show, to scale, the following features:

- Any known overhead electric transmission, sub-transmission, and distribution facilities showing structural details and dimensions and identifying phase spacing, phasing, and any other characteristics affecting EMF emissions;
- Any known underground electric transmission, sub-transmission (i.e., 34.5 kV collection system), and distribution facilities;
- ROW boundaries; and
- Structural details and dimensions for all structures (dimensions, phase spacing, phasing, and similar categories) and an overview map showing locations of structures.

(c) Enhanced Aerial Photos/Drawings Showing Exact Locations of Unique ROW Segments

The EMF Study included in this Application includes a set of aerial photos/drawings showing the exact location of each unique ROW segment and each cross section, and any residences or occupied buildings within the ROW segments. If no residence or occupied building is within the ROW segments, the measurement of the distance between the edge of the ROW segment and the nearest residence or occupied building is provided.

(d) Electric and Magnetic Field Study

(1) Licensed Professional Engineer

The EMF Study, attached as Appendix 35-A to this Application, was signed and stamped/sealed by James Kiehl, a licensed professional engineer registered and in good standing in the State of New York.

(2) Computer Software Program

The EMF Study used WSP's in house calculation sheet to model the facilities and make the calculations. WSP's calculation sheet uses established engineering techniques and has been validated against industry standard tools, including PLS-CADD and CDEGS software

(3) Electric Field Calculation Tables and Field Strength Graphs

The EMF Study modeled the strength and locations of electric fields to be generated by the Facility. Modeling was conducted at rated voltage. The measurement location was assumed to be 3.28 feet (1 meter) above grade, and the measurement interval was 5 feet. The Study includes electric field strength graphs depicting electric fields along the width of the entire ROW and out to 500 feet on either side. Digital copies of all input assumptions and outputs for the calculations are being provided under separate cover.

(4) Magnetic Field Calculation Tables and Field Strength Graphs

The EMF Study modeled the strength and locations of magnetic fields to be generated by the Facility. Modeling was conducted at rated voltage. The measurement location was assumed to be 3.28 feet (1 meter) above grade, and the measurement interval was 5 feet. There is no expected change in amperage under any of the following conditions: summer normal, summer short term emergency, winter normal, winter short term emergency. Therefore, the magnetic field modeling that was performed is applicable to any of these conditions. Magnetic field strength graphs depicting magnetic fields along the width of the entire ROW and out to the property boundary of the Facility are included in the EMF Study. Digital copies of all input assumptions and outputs for the calculations are being filed under separate cover.

(5) Magnetic Field Calculation Tables and Field Strength Graphs for Maximum Annual Load within 10 Years

There is no expected change in amperage in maximum average load initially versus for 10 years after initiation of operation. Therefore, the modeling of magnetic fields described in Section (d)(4) above (including both the graphs and tables included in the EMF Study) is applicable to both initial operation and operation after 10 years.

(6) Base Case Magnetic Field Calculation Tables and Field Strength Graphs

Besides the 230 kV transmission line proposed to connect the POI switchyard to the existing NYSEG transmission line, there are no high-voltage transmission lines proposed as part of this project. Therefore, this section is not applicable to the proposed Facility.