# ConnectGen Chautauqua County LLC

South Ripley Solar Project
Matter No. 21-00750

## 900-2.23 Exhibit 22

## Supplement

## Electric and Magnetic Fields

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# EXHIBIT 22 ELECTRIC AND MAGNETIC FIELDS

### (a) Right-of-Way Segments Having Unique Electric and Magnetic Field Characteristics

The proposed medium voltage (MV) collection system, connecting solar array inverters/medium voltage transformers to the collection substation, is approximately 28 linear miles of underground trenched or horizontal directional drilling (HDD) lines and 14 linear miles of overhead lines, rated at 34.5 kilovolts (kV). The design assumes a maximum of 4 underground collection circuits for any single right-of-way (ROW) routed in parallel trenches with 10-foot buffers between each trench and between the outer collection lines and the edge of the ROW. The design assumes a maximum of 4 circuits in any overhead ROW with at least 30 feet from the edge of the overhead line and the edge of ROW. No collection lines will be used for interconnection, rated above 69 kV, or provide connection between the Facility and the existing transmission and distribution system. Therefore, per Section 900-2.23(a), an Electric and Magnetic Field (EMF) Study is not required for the Facility's collection line system.

The Facility design proposes an approximately 200-foot-long 230 kV transmission line segment to interconnect the new collection substation to the new point of interconnection (POI) 3-ring breaker switchyard (Transmission ROW 1) which will be owned and operated by National Grid. This configuration is referred to as Case 1 in the EMF Study. The Facility Design additionally proposes two adjacent approximately 215-foot-long 230 kV transmission line segments to interconnect the new POI switchyard to the existing National Grid-owned South Ripley to Dunkirk 230 kV transmission line (Transmission ROW 2). This configuration is referred to as Case 2 in the EMF Study. Modeling calculations were used to identify the potential unique EMF characteristics that could result from construction and operation of the connecting the two transmission line spans associated with the Facility. Mott MacDonald (Mott), on behalf of the Applicant, conducted an EMF Study along Transmission ROW 1 (Case 1) and Transmission ROW 2(Case 2, each described further in Section (d) below, and included in Appendix 22-A. For the purposes of these calculations, a 150-foot-wide corridor was assumed for the Transmission ROW 1, the span between the collection substation and the POI (75 feet from centerline), and a 250-foot-wide corridor was assumed for the Transmission ROW 2, the span connecting the POI to the existing National Grid-owned South Ripley to Dunkirk 230 kV transmission line (125 feet from centerline). The EMF Study provides analysis assumptions, design scenarios, and calculation tables and field strength graphs for Transmission ROW 1 and Transmission ROW 2. The results of the EMF Study conclude that all electric and magnetic field levels for the overhead interconnection cables at the edge of each transmission ROW are within the Interim Standard values of 1.6 kV/m for electric fields and 200 mG for magnetic fields set forth by the New York State Public Service Commission.

**(b) For Each Right-of-Way Segment, Base Case and Proposed Cross Sections**

For each transmission ROW segment identified in Section (a) above, the EMF Study (Appendix 22-A to this Application) and supporting drawings (e.g., Appendix B of the EMF Study) provide both base case (where existing facilities are present) and proposed cross-sections that show, to scale, the following features:

Known Overhead Electric Transmission

There are no known overhead electric transmission, sub-transmission, and distribution facilities located within Transmission ROW 1. With respect to Transmission ROW 2, the 230 kV spans connect the new POI switchyard to the existing overhead National Grid South Ripley to Dunkirk 230-kV transmission line, with a lateral ROW of 250 feet, running on a southwest to northeast alignment through the Facility Site directly adjacent to the proposed POI switchyard. There are no known overhead electric transmission lines within Transmission ROW 2.

Known Underground Electric Transmission

There are no known underground electric transmission, sub-transmission, and distribution facilities within Transmission ROW 1 or Transmission ROW 2 or directly adjacent to the collection substation and POI.

Known Underground Gas Transmission

There are no known underground gas transmission facilities within Transmission ROW 1 or Transmission ROW 2 or directly adjacent to the collection substation and POI.

ROW Boundaries

The edge of Transmission ROW 1, the span between the collection substation and the POI, is assumed to be 75 feet from centerline, and, for Transmission ROW 2, 125 feet from centerline between the spans connecting the POI to the existing 230 kV transmission system.

Structural Details

The structural details and dimensions for all structures (dimensions, phase spacing, phasing, and similar categories) and an overview map showing locations of structures are included in Exhibit 5.

**(c) Enhanced Aerial Photos/Drawings**

The EMF Study (Appendix 22-A) includes a set of aerial photos/drawings enhanced by showing the exact location of:

- The identified ROW segments;

- The ROW cross-sections; and
- The distance between the edge of Transmission ROW 1 and Transmission ROW 2 and the nearest residence/occupied building.

### (d) Electric and Magnetic Field Study

The EMF Study (Appendix 22-A) includes the following information:

#### (1) Licensed Professional Engineer

The EMF Study was prepared, signed, and stamped/sealed by Krystian Sokolowski, a licensed professional engineer registered and in good standing in the State of New York.

#### (2) Computer Software Program

The EMF Study used PLS-CADD software to model the facilities and make the calculations.

#### (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 the rated voltage of 230 kV. The measurement location was calculated at 3.28 feet (1 meter) above grade, and the measurement interval was 5 feet. The EMF Study includes electric field strength graphs depicting electric fields along the width of the entire ROW out to 500 feet from the edge of the ROW on both sides. Software model calculation output tables are included as Table 2-1 in the EMF Study.

#### (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 along the Transmission ROW. 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, and 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 Transmission ROWs and out to the property boundary of the Facility are included in Table 2-2 and Figure 2-2 of the EMF Study.

### (5) Magnetic Field Calculation Tables and Field Strength Graphs for Maximum Annual Load

As indicated in the EMF Study, there is no expected change in amperage in maximum average load initially versus 10 years after initiation of operation. Therefore, the modeling of magnetic fields using maximum average load, and the associated graphs and tables included in the EMF Study, is applicable to both initial operation and operation after 10 years.

### (6) Base Case Magnetic Field Calculations for Existing Power Lines Within ROW

There are no existing power lines within Transmission ROW 1 or Transmission ROW 2. Therefore, this section is not applicable to the proposed Facility.

### (7) Conformance with Public Service Commission Interim Policy Standard

The results of the EMF Study conclude that all electric and magnetic field levels at the edge of Transmission ROW 1 and Transmission ROW 2 are within the Interim Standard values of 1.6 kV/m for electric fields and 200 mG for magnetic fields set forth by the state of New York State Public Service Commission. All project facilities and interconnection transmission lines will conform with the New York State Public Service Commission's Statement of Interim Policy Standard on Magnetic Fields of Major Electric Transmission Facilities.