



RIVERSIDE SOLAR, LLC

Matter No. 21-00752

900-2.23 Exhibit 22

Electric and Magnetic Fields

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Appendix 22-1. Electric Magnetic Field (EMF) Study

Acronym List

AES	The AES Corporation, Inc.
EMF	electric and magnetic field
kV	kilovolt
IFP	Issued for Permitting
NYPSC	New York Public Service Commission
ORES	Office of Renewable Energy Siting
ROW	right-of-way
STE sum	summer short term emergency
STE win	winter short term emergency
USCs	Uniform Standards and Conditions

Glossary Terms

Applicant

Riverside Solar, LLC, a subsidiary of The AES Corporation, Inc. (AES), the entity seeking a siting permit for the Facility from the Office of Renewable Energy Siting (ORES) under Section 94-c of the New York State Executive Law.

Facility

The proposed components to be constructed for the collection and distribution of energy for the Riverside Solar Project, which includes solar arrays, inverters, electric collection lines, and the collection substation.

Exhibit 22: Electric and Magnetic Fields

This Exhibit provides information required in accordance with the requirements of §900-2.23 of the 94-c Regulations.

22(a) Right-of-Way (ROW) Segments with Unique Characteristics

The Applicant has identified the new proposed 115 kilovolt (kV) interconnection line as the only right-of-way (ROW) segment with unique electric and magnetic field (EMF) characteristics. The 115 kV line connects the Facility's collection substation with the existing National Grid Lyme Tap Line off the Thousand Islands – Coffeen St. 115 kV transmission line #4. An EMF Study (Appendix 22-1), with calculations tables and field strength graphs, was performed on the interconnection between the Facility's collection substation and the tap to the existing line. The interconnection line will be approximately 330 feet in length and composed of a flexible connection. The proposed ROW for the interconnection line is 150 feet wide, or 75 feet from the centerline to the edge of the ROW on both sides. Additional information on the EMF evaluation for these components is included in the EMF Study in Appendix 22-1.

The EMF study did not evaluate the effects from the 34.5 kV collection lines since the proposed line rating is less than the require 69 kV rating requirement. The collection lines will also be installed underground, therefore EMF impacts would be negligible.

22(b) Cross Sections

The EMF Study (Appendix 22-1) details the "base case" and the "proposed" cross-sections for the overhead electric interconnection and distribution facilities. The base case represents the existing conditions prior to Facility construction. The Study, as well as the Issued for Permitting (IFP) Design Drawings (Appendix 5-1), provide structural details and dimensions, cross sections, phasing and phase spacing, and other characteristics that may affect EMF.

The EMF Study includes an analysis of the potential EMF impacts related to the Facility along the interconnection between the Facility's proposed collection substation and the tap to the Existing National Grid Lyme Tap Line off the Thousand Islands – Coffeen St. 115 kV transmission line #4. No EMF calculations were performed on the 34.5 kV collection system. Cross-sections provided in Appendix 22-1 and the IFP Design Drawings (Appendix 5-1) include the following, as applicable:

- 1) All overhead electric transmission, sub-transmission and distribution facilities including the proposed Facility showing structural details and dimensions and identifying phase spacing, phasing, and any other characteristics affecting EMF emissions;
- 2) All underground electric transmission, sub-transmission, and distribution facilities;
- 3) All underground gas transmission facilities;
- 4) All ROW boundaries; and
- 5) Structural details and dimensions for all structures (dimensions, phase spacing, phasing, and similar categories) and include a station number identifying the location.

Information regarding the underground collection system for the Facility are shown in the IFP Design Drawings provided as Appendix 5-1.

22(c) Aerial Photographs/Drawings

The proposed interconnection line is depicted on aerial photography in the IFP Design Drawings provided in Appendix 5-1 (Sheet HV-C.09.01), as well as on Figure 1 in the EMF Study (Appendix 22-1). The drawings and figure detail ROW segment, cross-sections, and the location of the Facility components in relation to the nearest residence or occupied non-residential building (1,338 feet away to the southeast). The EMF Study provides an evaluation of the distance from the interconnection to the nearest residence.

22(d) Electric and Magnetic Field (EMF) Calculation Report

The EMF Study (Appendix 22-1) evaluates the EMFs for each identified segment cross-section for the proposed Facility. The EMF Study includes the following:

- 1) Signed, and stamped by a licensed professional engineer registered and in good standing with the State of New York.
- 2) EMF modeling and calculations performed using the Bonneville Power Corona & Field Effects Ver. 3.1 Software.
- 3) The EMF Study modeled the electric field circuits at rated voltage and provides calculation tables and field strength graphs calculated at one meter (3.28 feet) above ground level with five-foot measurement intervals, depicting the width of the entire ROW out to 500 feet

from the edge of the ROW on both sides. The Study includes digital copies of all input assumptions and outputs for the calculations.

- 4) The EMF Study modeled the magnetic field of the circuit phase currents equal to the summer normal, summer short term emergency (STE sum), winter normal, and winter short term emergency (STE win) loading conditions. The Study also provided the magnetic field calculation tables and field strength graphs calculated at one meter (3.28 feet) above ground level with five-foot measurement intervals, depicting the width of the entire ROW out to 500 feet from the edge of the ROW on both sides. The Study includes digital copies of all input assumptions and outputs for the calculations.
- 5) In addition, the EMF Study provides modeling of the magnetic field circuit phase currents equal to the maximum average annual load estimated to occur on the power lines within 10 years of Facility operation. Magnetic field calculation tables and field strength graphs calculated at one meter (3.28 feet) above ground level with five-foot measurement intervals, depicting the width of the entire ROW out to 500 feet from the edge of the ROW on both sides have been provided in the EMF Study, along with digital copies of all input assumptions and outputs for the calculations.
- 6) A “Base Case” analysis for magnetic field is provided in the EMF Study with the circuit phase currents equal to the maximum average annual load estimated to occur on the power lines within 10 years of Facility operation. Magnetic field calculation tables and field strength graphs calculated at one meter (3.28 feet) above ground level with five-foot measurement intervals, depicting the width of the entire ROW out to 500 feet from the edge of the ROW on both sides have been provided in the EMF Study, along with digital copies of all input assumptions and outputs for the calculations.
- 7) The EMF Study demonstrates that the proposed Facility and associated components, including the interconnection lines, conform to the Public Service Commission’s Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities at the proposed ROW edges. Table 22-1 below, details the maximum EMF levels calculated in the analysis.

Table 22-1. New York Public Service Commission (NYPSC) EMF Level Interim Guidelines

Field Type	Guidelines Limit	Maximum Value at Proposed Right-of-Way Edge
Electric Field	1.6 kV/m	0.88 kV/m (transmission line)
Magnetic Field	200 mG	15.16 mG (transmission line)

The levels of EMF were determined to be less than the 1.6 kV/m maximum and 200 mG field level permitted at the edge of the proposed ROW. The Study demonstrates that the EMF levels are well within the guidelines. Refer to Appendix 22-1 for additional information.

Conclusions

An EMF Study was performed on the interconnection between the Facility's collection substation and the tap to the existing line. It details the "base case" and the "proposed" cross-sections for the overhead electric interconnection and distribution facilities, and provides structural details and dimensions, cross sections, phasing and phase spacing, and other characteristics that may affect EMF. The levels of EMF were determined to be less than the 1.6 kV/m maximum and 200 mG field level permitted at the edge of the proposed ROW, which is well within the guidelines. The Facility has been designed to comply with 19 NYCRR § 900-2.23 and the Uniform Standards and Conditions (USCs) and impacts related to EMFs have been avoided and minimized to the maximum extent practicable.