

June 10, 2020

*Via Electronic Mail*

Ms. Melanie Bachman, Esq.  
Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

Re: ***Petition 1397*** – Constitution Solar, LLC petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 20-megawatt AC solar photovoltaic electric generating facility on approximately 149 acres comprised of four separate parcels located off of Cornell Road in Plainfield, Connecticut and associated electrical interconnection – ***Acoustic Study***

Dear Ms. Bachman:

I am writing on behalf of the petitioner, Constitution Solar, LLC, in connection with the above-referenced Connecticut Siting Council (“Council”) Petition.

In its response to Council Interrogatory 35, the Petitioner indicated that an Acoustic Study was in progress and would be submitted to the Council once complete. Enclosed please find the completed Acoustic Study for the Council’s consideration in this proceeding.

Please feel free to contact David Bogan of this office (860-541-7711) or me should you have any questions regarding this submission.

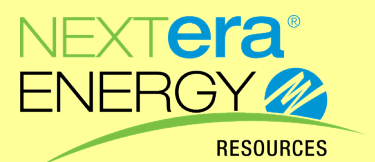
Very truly yours,



Kathryn E. Boucher

**EXHIBIT N:**  
Acoustic Analysis

**Constitution Solar Project**  
Plainfield, Connecticut



June 4, 2020

Ms. Briony Angus, AICP  
Senior Project Manager/ Associate  
Tighe & Bond, Inc.  
53 Southampton Road  
Westfield, MA 01085

**Re: Constitution Solar PV Farm, Plainfield, CT – Sound Study Report**

**Ref. 4211**

Dear Ms. Angus:

This letter report presents the results of an acoustic study for the 42 MW Constitution Solar PV Farm in Plainfield, CT. The ground-based solar panels will cover an area of approximately 141 acres, within which equipment pads will house 10 inverter skids<sup>1</sup> for converting Direct Current (DC) to Alternating Current (AC), and ten transformers<sup>2</sup> to step-up the voltage of power delivered to the utility grid. These sound sources will only operate in the daytime when electricity is produced by the solar panels.

### **The Decibel Scale for Sound and the Connecticut Sound Limit**

All sounds originate with a source – a human voice, vehicles on a roadway, or an airplane overhead. The sound energy moves from the source to a person's ears as sound waves, which are minute variations of air pressure. The loudness of a sound depends on the sound pressure level, which has units of decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. On this scale, the quietest sound we can hear is 0 dB, while the loudest is 120 dB. Every 10-dB increase is perceived as a doubling of loudness. Most sounds we hear in our daily lives have sound pressure levels in the range of 30 dB to 90 dB.

Community noise studies and regulations use an A-weighting scale (dBA) when measuring sound pressure levels as this approximates the response of the human ear to sounds we experience in everyday life. Typical sound levels associated with various activities and environments are presented in Figure 1. Here are examples of sound levels we all encounter. A quiet suburban area at night without any traffic typically has an average sound level of 40 to 45 dBA. The freight train you hear in the distance may be 50 dBA, and crickets and tree frogs in the summer sing a sound level of 55 dBA. Two people having a conversation in a normal tone of voice will hear each other speak at 65 dBA. Standing near a road, a car passing by can produce 75 dBA, and a truck passing by is louder at 80 dBA. The Connecticut Department of Energy and Environmental Protection (CTDEEP) daytime sound limit for residential areas of 55 dBA<sup>3</sup> is used in this study to assess the potential sound impacts from the project. There are no local ordinances with sound level limits applicable to the Project.

---

<sup>1</sup> TMEIC Ninja PVU-0840GR Inverter, Ninja-5 4200 MW Skid Configuration.

<sup>2</sup> ABB Solar-Ready Distribution Transformers

<sup>3</sup> Connecticut General Statutes Section 22a-67 *et seq.* and Regulations of Connecticut State Agencies ("R.C.S.A.") Sections 22a-69-1 to 22a-69-7.4..

### Predicted Project Sound Levels

Future sound levels from the Constitution Solar Project, when it is producing maximum electrical power of 19.59 MW, were calculated with the Cadna A acoustic model. Cadna A is a three-dimensional model for sound propagation and attenuation based on International Standard ISO 9613<sup>4</sup>. Atmospheric absorption, the process by which sound energy is absorbed by the air, was calculated using ANSI S1.26-1995.<sup>5</sup> Ground surfaces were assumed to be semi-reflective (a ground factor of 0.5), approximating worst-case, winter frozen ground conditions. Digital terrain data for the project areas were analyzed to obtain terrain heights. The model assumes the most-favorable sound propagation conditions, as occur under downwind conditions or during a ground-based temperature inversion on a clear night. At other times, atmospheric turbulence and wind shadow effects will reduce sound levels by 5 dBA to 20 dBA from those presented below.

Sound power levels for the equipment at Constitution Solar PV Farm were obtained from manufacturers' data. The manufacturer's data for five (5) 840-KW inverters per skid provided a maximum sound pressure level of 81 dBA at 1 meter, which is equivalent to a sound power level of 91 dBA<sup>6</sup>. This sound power level was used in Cadna/A for each inverter skid. The transformers were assumed to have National Electrical Manufacturers Association (NEMA) sound level ratings of 60 dBA based on the maximum output of 2700 KVA.<sup>7</sup> The sound power level of 75 dBA, used in Cadna/A, was calculated based on the NEMA sound level rating and dimension of the proposed transformers.

Sound levels were predicted at the nineteen (19) residential locations, listed in Table 1. Figure 2 shows the layout plan for the Project's solar panels, and the 10 sites where the inverters and transformers are co-located. Figure 3 shows the nearby residences, and a decibel-level contour map of maximum Project sound levels. Predicted maximum sound levels for each residence are listed in Table 1. Maximum sound levels at nearby residences will range from 14.6 to 36.3 dBA, and all predicted sound levels are far below the 55 dBA daytime sound limit set by CTDEEP. The highest predicted sound level of 36.3 dBA is predicted for the residence at 150 Cornell Road. All predicted sound levels are very low, and it is unlikely that sound from Constitution Solar PV Farm will be noticeable on nearby residential properties.

Please call if you have any questions regarding this report.

Sincerely,  
TECH ENVIRONMENTAL, INC.



Marc C. Wallace, QEP, INCE  
Vice President  
4211/Constitution Solar PV Farm Sound Study Report

<sup>4</sup> International Standard, ISO 9613-2, Acoustics – Attenuation of Sound During Propagation Outdoors, -- Part 2 General Method of Calculation.

<sup>5</sup> American National Standards Institute, ANSI S1.26-1995, "American National Standard Method for the Calculation of the Absorption of Sound by the Atmosphere," 1995.

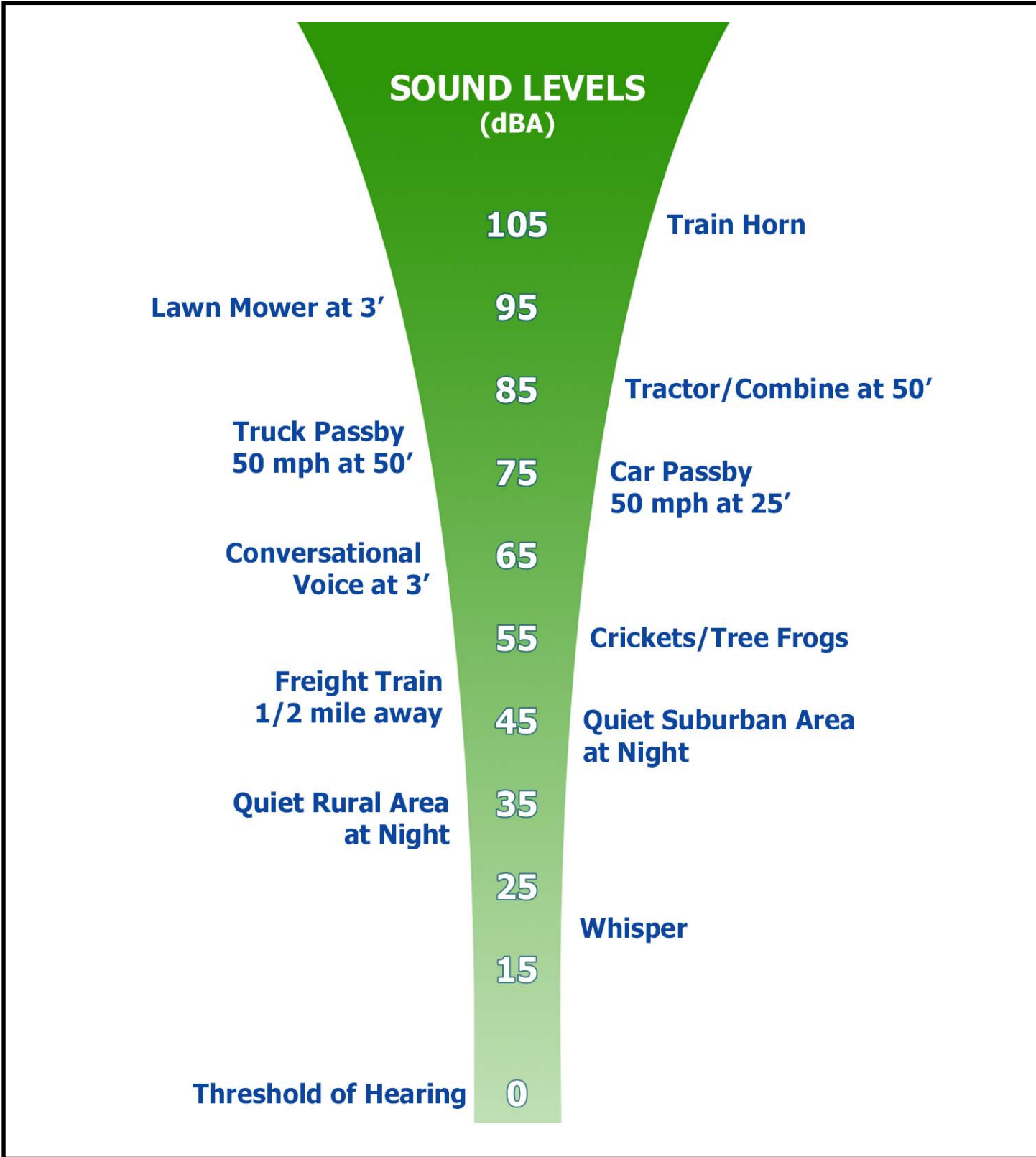
<sup>6</sup> TMEIC Ninja PVU-0840GR Inverter, Ninja-5 4200 MW Skid Configuration.

<sup>7</sup> Edison Electric Institute, Electric Power Plant Environmental Noise Guide, 1983, p. 4-17.

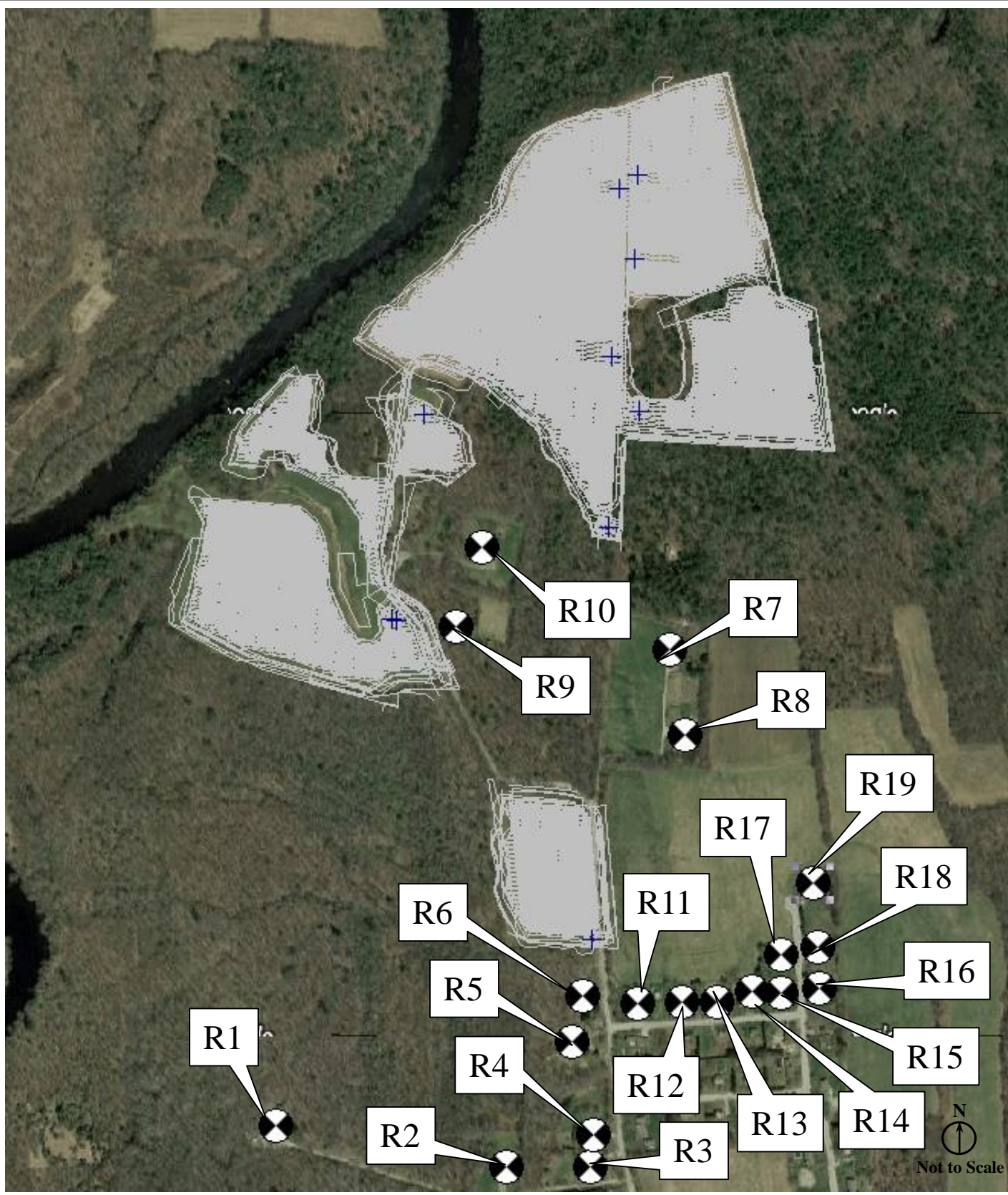
**TABLE 1**

**PREDICTED SOUND LEVELS AT NEARBY RESIDENCES  
FROM THE CONSTITUTION SOLAR PV FARM AT MAXIMUM POWER**

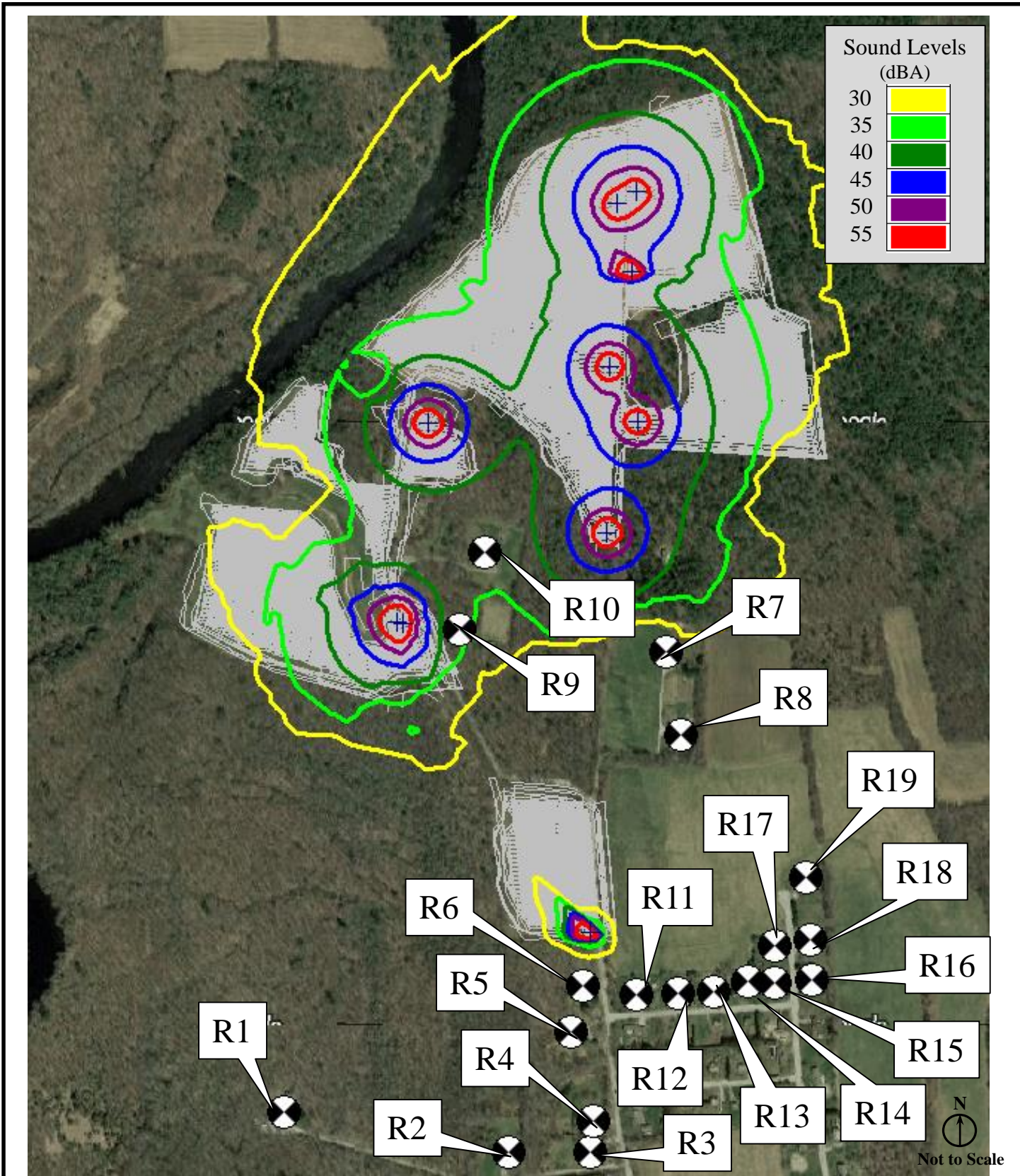
Receptor ID	Receptor Address	Maximum Sound Level (dBA)	Coordinates (UTM)		
			X	Y	Z
R1	25 Cornell Road	16.4	253752	4621641	80
R2	31 Cornell Road	16.0	254068	4621585	89
R3	37 Cornell Road	15.3	254182	4621585	94
R4	41 Cornell Road	14.6	254186	4621628	95
R5	57 Cornell Road	18.1	254156	4621755	94
R6	65 Cornell Road	23.6	254172	4621818	96
R7	98 Cornell Road	25.9	254311	4622172	95
R8	100 Cornell Road	27.0	254289	4622289	87
R9	146 Cornell Road	36.0	253998	4622320	80
R10	150 Cornell Road	36.3	254034	4622428	78
R11	4 George Street	21.4	254246	4621807	101
R12	12 George Street	18.9	254306	4621809	103
R13	18 George Street	18.1	254355	4621810	102
R14	24 George Street	17.5	254403	4621824	102
R15	86 Glebas Road	17.3	254441	4621823	103
R16	91 Glebas Road	16.5	254494	4621828	98
R17	94 Glebas Road	17.8	254441	4621875	100
R18	99 Glebas Road	16.4	254491	4621885	96
R19	109 Glebas Road	17.4	254484	4621971	91



**FIGURE 1.**  
**Common Outdoor Sound Levels**



**FIGURE 2.**  
 Layout Plan for Constitution Solar PV Farm  
 Plainfield, CT



**FIGURE 3.**  
**Sound Levels from Project at Maximum Power Output**  
**Plainfield, CT**