**DG Connecticut Solar III, LLC**

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June 21, 2024

**Via Electronic Mail**

Melanie Bachman
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

**Re: PETITION NO. 1426 – DG Connecticut Solar, III, 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 4.9-megawatt AC solar photovoltaic electric generating facility located west of the Ellington town boundary at 341 East Road, East Windsor, Connecticut and associated electrical interconnection.**

Dear Ms. Bachman:

As you know, DG Connecticut Solar III, LLC ("DGCS III" or the "Company") is aware of local noise concerns related to the East Windsor Solar Project, a 4.9-megawatt AC solar photovoltaic electric generating facility located at 341 East Road, East Windsor (the "Project"). Although a prior third-party acoustical engineering and design study ("Sound Assessment 1") demonstrated the Project is in compliance with applicable sound level requirements, in consideration of the neighbors' continued concerns, the Company voluntarily agreed to take additional steps to help mitigate sound at the Project. This correspondence serves to update the Connecticut Siting Council (the "Council") on these measures.

By letter dated November 3, 2023, the Council approved the Company's request to revise its Development & Management ("D&M") Plan in order to install a sound barrier consisting of vinyl composite material affixed to a 12-foot-tall chain-link fence near the Project inverters ("Sound Barrier"). Construction of the Sound Barrier was completed the week of February 26, 2024.

As previously advised, the Company also conducted a follow up acoustical engineering and design study ("Sound Assessment 2") to assess any changes in sound level after installation of the Sound Barrier. The Sound Assessment 2 report is attached to this correspondence. The Sound Assessment 2 demonstrates that the Sound Barrier reduced the sound at three neighboring residential property lines between 11.2 and 14.5 dBA. Again, while the Project sound levels were already in compliance with applicable state sound level requirements, the Sound Barrier was effective in further reducing sound levels at the property lines.

Sincerely,

Tracy Backer

Attachment (1)

Copy to: Service List, Spencer Woodward

April 26, 2024

Spencer Woodward
Business Manager
NextEra Energy
341 East Road
East Windsor, CT 06016

**Subject:** **Community Noise and Attenuation Design Assessment**
***DG Connecticut Solar III, LLC - East Windsor, CT***
*US0027174.6477-US-DGIII*

Dear Mr. Woodward,

WSP USA Environment & Infrastructure, Inc ("WSP") is pleased to submit the following community noise and attenuation design assessment report to NextEra Energy Resources, LLC ("NextEra") for the DG Connecticut Solar III, LLC ("DGIII") solar photovoltaic energy generating facility, formerly known as the East Windsor Solar One facility, located at 341 East Road, East Windsor, CT (herein the "Facility" and/or "Site").

The purpose of this report is to summarize the results of the noise monitoring and modeling investigation performed by WSP to determine if operational sound levels from the Facility comply with the State of Connecticut noise standards, and to verify the effectiveness of the installed sound attenuation measures (i.e., noise barrier) in reducing the community noise impacts caused by the DC-to-AC power inverters installed at the Site.

The report concludes that the proposed Facility, as constructed, complies with the requirements of the Regulations of Connecticut State Agencies ("RCSA") Department of Energy & Environmental Protection ("CT DEEP") Noise Control Regulations (i.e., RCSA §22a-69). Our assessment also estimates that the sound barrier wall that was installed at the Site is effective at reducing the sound levels caused by the power inverters at nearby residential property lines by between 11.2 and 14.5 A-weighted decibels ("dBA").

## BACKGROUND

The DGIII facility is a 4.9 megawatt ("MW") solar photovoltaic electric generating facility constructed in 2021 by Verogy Solar Services at the corner of East Road and Middle Road in East Windsor, CT. Soon after construction, the ownership of the Facility was transferred to NextEra, and it became known as the DGIII facility. Shortly after construction the Facility received noise complaints from several neighboring homeowners (specifically residents at 67 and 69 Middle Road) indicating that the installed DC-to-AC power inverters were causing a "high pitched ringing sound," which was constantly audible during daytime operations. Throughout 2022 and 2023, Verogy and NextEra worked with Brooks Acoustics Corporation ("BAC") to conduct a followup sound study and acoustical attenuation design. At the end of 2023, NextEra constructed a 12-foot tall and approximately 278 feet long sound attenuation barrier located approximately 5 feet to the north of the forty (40) DC-AC inverters based on BAC's recommendations.

WSP was contracted by NextEra for professional consulting services related to follow-up acoustical assessment of the photovoltaic solar energy system (i.e., solar array). The goals of this assessment were to better understand the sound environment (i.e., background community sound levels) in the area, quantify the sound levels associated with the Facility, evaluate the sound levels at the property lines along the northern side of the Site caused by the daytime operation of the solar array, and independently assess the effectiveness of the sound attenuation measures.

On Tuesday, April 9, 2024, WSP performed an environmental noise monitoring assessment at the Facility to measure community sound levels and assess and verify the effectiveness of the noise attenuation design (i.e., 12' x 278' sound barrier wall).

Throughout this report there are numerous references to methods and terminology used to quantify and describe community sound levels. All of these use a logarithmic-scaled unit of measure known as the 'decibel' (i.e., dB). The 'decibel' is an essential scale for understanding perception of sound levels. Attachment A of this report provides a broad technical summary of the various sound terminology and acoustical engineering methods used throughout this report.

## APPLICABLE NOISE REGULATION

The CT DEEP prohibits the emission of continuous excessive noise beyond the boundaries of one's property such that the noise exceeds the following:

**Table 1 – CT DEEP Noise Control Regulation – Excessive Noise Values**

| Source Property Land Use Class | Receptor Property Land Use Class Excessive Noise Values (dBA) | | | |
|---|---|---|---|---|
| | Class A (daytime) [1] | Class A (nighttime) [2] | Class B (all-day) | Class C (all-day) |
| Class A | 55 | 45 | 55 | 62 |
| Class B | 55 | 45 | 62 | 62 |
| Class C [3] | **61 [4]** | 51 | 66 | 70 |

[1] CT DEEP daytime hours are between 7:00 AM and 10:00 PM
[2] CT DEEP nighttime hours are between 10:00 PM and 7:00 AM
[3] Photovoltaic installations are not explicitly classified in the definition of Class C Land Use Category (see RCSA §22.a-69-2.5). However, agricultural, and other resource production and extraction (not elsewhere classified) land uses are deemed to be Class C. Therefore, it is assumed that the solar power generating facility (i.e., source) must adhere to Class C requirements in terms of noise control.
[4] All residential property lines are to be considered Class A land use, and photovoltaic system is expected to operate only during the daytime. Therefore, the Site shall not generate a sound level in excess of 61 dBA at abutters' property lines.

Additionally, the CT DEEP specifies that noise sources which demonstrate one (1) or more discrete tones are subject to noise limits five (5) A-weighted decibels ("dBA") below the levels specified in the table above.

It should be noted that the *Land Use Classes* listed in the table above do not necessarily correspond to Town zoning districts. Noise zone classifications in the CT DEEP Noise Regulation are defined by actual land use. For example, the Facility is to be located on a property that is currently zoned as rural residential (i.e., zoning code RR) with much of the property used as farmland. The proposed usage of the land will be for a photovoltaic solar energy production, which is most appropriately defined as: "Other Resource Production and Extraction (not elsewhere classified, N.E.C.)," which is expected to be considered a Class C source property.

The properties immediately surrounding the Site are assumed to fit the category of Class A (i.e., residential) receptor properties with the closest sensitive receptor located approximately 115 feet (35 m) to the north of the center of the proposed Facility (i.e., the single-family residence located at 67 Middle Road). Therefore, the Site must not generate a sound level in excess of 61 dBA [i.e., the Source Class C to Receptor Class A (daytime) noise limit], or 56 dBA if a prominent discrete tone exists.

# SOUND ENVIRONMENT

The parcel of land occupied by the Facility is approximately 27-acre of farmland bounded by single-family residential properties to the north across Middle Road, agricultural properties to the northwest, west, south and northeast, and wooded areas surrounding Pecks Brook to the southeast and east.

The Site is located near the intersection of Middle Road and East Road, which are single-lane asphalt paved town roads, and is located to the south of the Jessie Lane residential subdivision.

The Site is approximately 5 miles (8 km) away from the nearest interstate highway I-84, which is located to the southeast. Another potential source of community sound in the area is the Bradley International airport ("KBDL") eastern approach corridor, as KBDL runways are located approximately 8.5 miles (13.7 km) to the northwest of the Site.

A locus map for the Site is shown in Figure 1 (see Attachment B).

## FACILITY OPERATIONS

The primary significant continuous source of Facility noise is emitted by the forty (40) DC-to-AC power inverters. At the DGIII site there are thirty-nine (39) Yaskawa Solectria Solar XGI 1500-125/125-UL ("Solectria") inverters and one (1) Chint Power CPS SCH100KTL-DO/US-600 ("CPS") inverters installed in three (3) banks along the north frontage of the Site. These units convert the 12-volt direct current ("DC") power produced by the photovoltaic panels to the high-voltage alternating current ("AC") power used by the electrical transmission grid. When operating, the DC-AC inverters emit an electrical humming sound with a high-pitched (i.e., 6.3 kHz) discrete tone and have built in cooling fans which also emits some noise. The locations of the inverters are shown in Figure 2 (see Attachment B).

Other intermittent and relatively minor sources of facility sound include the three (3) electrical transformers, which are used to step-up the power output from the inverters to a voltage required by the distribution network and low-speed motors used to adjust solar panel angle are not considered to be capable of generating enough sound to produce a nuisance noise condition at the property line.

At the end of 2023, NextEra constructed a 12-foot tall and approximately 278 feet long sound attenuation barrier located approximately 5 feet to the north of the forty (40) DC-AC inverters. The noise barrier wall is construced using a flexible composite barrer-absorber material affixed to a chain-link fence. The seams between the barrier panels ovelap and are joined with heavy duty hook and loop mating strips.

The sound attenuation barrier and placement relative to the DC-AC inverters is shown in the photo below:


## SOUND LEVEL MONITORING

On Tuesday, April 9, 2024, WSP personnel performed daytime sound level monitoring along the northern property line of the Site and in multiple locations onsite at the Facility. The daytime measurements were collected between 10:00 AM and 3:30 PM during what is considered a typical weekday operational period – this is, midday conditions during which the solar array would be expected to operate at near full capacity. A

NextEra technician was onsite during the monitoring session to cycle the DC-to-AC inverter units ON and OFF to allow for collection of various background and near-field (i.e., equipment specific) measurements.

Although it is not required by the CT DEEP unless the Site is in an area with high background sound levels, other jurisdictions commonly prohibit facility noise which exceeds the *ambient noise* level by a specified amount (i.e., typically ten (10) dBA) when measured at the abutting property line(s). The standard practice in environmental sound level measurement is to record background community sound pressure levels at multiple locations to establish ambient (i.e., pre-construction) sound levels for the Site. The ambient sound level measurements are collected consecutively during a 20- to 30-minute sample period (i.e., observation time interval) which is conducted during a time period that is reasonably representative of “typical” community noise conditions (i.e., minimal wind, no precipitation, no snow-cover, no unusual events), and during the time of day at which a nuisance is most likely to occur at nearby sensitive receptors (i.e., daytime or nighttime). In the case of solar photovoltaic energy systems, because the systems do not operate at night, these measurements are designed to establish the daytime ambient sound level.

The sections below summarize the methodologies employed by WSP personnel during the sound level measurement session, describe the measurement locations, and present the results of the community sound level monitoring.

## MONITORING LOCATIONS

The daytime operational sound level measurements were collected at three (3) locations along the property line, and daytime background (i.e., Facility OFF) sound level measurements were collected at two (2) locations inside the Facility fence line as indicated in Figure 2 (see Attachment B).

- PL-1: This residential property line location is directly across the street from the single-family residential property at 67 Middle Road on the northern side of the Site. This location is approximately 117 ft (35.6 m) (on average) to the north of the location of the Facility’s forty (40) DC-AC power inverters.
- PL-2: This residential property line location is directly across the street from the single-family residential property at 69 Middle Road on the northern side of the Site. This location is approximately 189 ft (57.7 m) (on average) to the northeast of the location of the Facility’s forty (40) DC-AC power inverters.
- PL-3: This residential property line location is directly across the street from the single-family residential property at 309 East Road on the northwestern side of the Site. This location is approximately 214 ft (65.3 m) (on average) to the northwest of the location of the Facility’s forty (40) DC-AC power inverters.
- BG-1: This onsite location is near the northwestern corner of the Site. The background sound level was measured at this location during the period of time when only one (1) of the most distant DC-AC power inverters (i.e., the CPS inverter 3-8 located approximately 324 ft. (99 m) away and on the opposite side of the noise barrier wall from the location) was powered ON.
- BG-2: This onsite location is near the northern side of Site. The background sound level was measured at this location during the period of time when only one (1) of the most distant DC-AC power inverters (i.e., the Solectria inverter 3-7 located approximately 131 ft. (40 m) away and on the opposite side of the noise barrier wall from the location) was powered ON.

WSP confirmed via noise modeling that the operation of this single units would have negligible impact on the background sound levels at the locations BG-1 and BG-2. The monitoring locations were selected to capture various sound level micro-environments that occur along the border of the Facility property.

## MONITORING METHODOLOGY

The community operational and background sound level measurements were collected at the locations indicated Figure 2 (see Attachment B) during the measurement session on Tuesday, April 9, 2024 (10:00 AM – 3:30 PM). At the time of the monitoring surveys the weather conditions were as follows:

- The temperature was between 57°F to 60°F and the relative humidity varied between approximately 40% and 45%. There was relatively little ground level wind (0 – 3 miles per hour throughout the monitoring period). No precipitation was reported, and the sky was mostly clear during all measurements.

At each of the three (3) operational monitoring locations a series of six (6) short-term (i.e., 5-minute) sound level measurements periods were recorded during the monitoring session (i.e., total measurement time at each location was 30-minutes). Field notes and observations for each monitoring location are attached to this report (see Attachment C). These observations included traffic counts for vehicles driving on Middle Road during the monitoring session. The two (2) background monitors were left unattended, while WSP personnel performed near-field measurements on the single operating inverter.

All sound level measurements were conducted in general accordance with American National Standards Institute ("ANSI") S12.8-1994, Outdoor Measurement of Sound Pressure Level. Each measurement was at least 30 minutes in duration, and the $L_{eq}$, $L_{90}$, $L_{50}$, and $L_{10}$ for each period was calculated from the measurement data.

All sound level measurements were collected with a calibrated Casella CEL-633C real-time octave band analyzer, which was equipped with precision condenser microphone having an operating range of 19 dB to 140 dB, and an overall frequency range of 12.5 Hz to 20 kHz. The sound level meter used meets or exceeds all requirements set forth by the ANSI for Type 1 quality and accuracy. Prior to and following all measurement sessions, the sound analyzer was calibrated with an ANSI Type 1 calibrator, which had accuracy traceable to the National Institute of Standards and Technology ("NIST"). All instrumentation was laboratory calibrated per ANSI recommendations within the last twelve (12) months. Copy of the equipment certificate of calibrations are attached (see Attachment D).

For all measurement sessions the microphone was fitted with an environmental windscreen to minimize the effects of air movement, and tripod mounted at a height of 4.5 feet (1.4 m) above grade. All measurements were made away from the influence of vertical reflecting surfaces in compliance with ANSI S12.9-1992, Qualities and Procedures for Description and Measurement of Environmental Sound. All data were downloaded to a computer following the measurement session for post-processing and analysis.

## MONITORING RESULTS

The following table provides the broadband sound level monitoring results for all locations. These results are useful in comparing difference sound micro-environments that occur along the property line.

**Table 2 – Daytime Existing Sound Monitoring Results**

| Location ID | Inverter Status | Date | Start | End | Cumulative Sound Pressure Level (dBA) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| PL-1 | ON | 4/9/24 | 9:55 AM | 10:25 AM | 54.7 | 49.4 | 41.3 | 38.9 |
| PL-2 | ON | 4/9/24 | 10:00 AM | 10:30 AM | 55.7 | 49.7 | 43.0 | 39.9 |
| PL-3 | ON | 4/9/24 | 10:30 AM | 11:00 AM | 55.0 | 49.8 | 37.1 | 34.9 |
| BG-1 | OFF | 4/9/24 | 1:53 PM | 2:28 PM | 46.4 | 46.0 | 33.9 | 29.3 |
| BG-2 | OFF | 4/9/24 | 2:30 PM | 3:30 PM | 50.2 | 47.1 | 33.7 | 30.7 |

The $L_{90}$ monitoring results are summarized in Figure 2 (see Attachment B), and the detailed monitoring results data summaries are provided in Attachment C. The time-series plots shown in in Figure 3 (see Attachment B) and Attachment C provide an overall summary of how the recorded sound levels varied throughout the monitoring periods on 5-minute and 1-second timescales.

## TEMPORAL ANALYSIS

The time-series plots in Figure 3 (see Attachment B) provide an overall summary of when during the day each sound level data point was collected (as well as the associated $L_{90}$ sound level). Each data point on the line plot represents a 1-second sound level sample, and each distribution bar plot represents a 5-minute sampling period (i.e., six (6) 5-minute consecutive periods were recorded for each 30-minute monitoring run).

The $L_{eq}$ and $L_{10}$ sound pressure level values are clearly for each measurement period are highly skewed upward by short, high-energy (i.e., loud) events (e.g., vehicles passing by on the nearby Middle Rd). These metrics are not considered suitable for describing the consistent sound levels generated by the DC-AC inverters. It is standard practice to describe consistent environmental sound levels using the $L_{90}$ metric. Attachment A of this report provides a technical definition for the $L_{90}$ value.

Since the operative metric of the existing community sound levels to which the noise from the photovoltaic solar array operations must be compared is the $L_{90}$, the remainder of this analysis focuses on the $L_{90}$ metric recorded during the monitoring session. The $L_{90}$ metric is utilized because $L_{90}$ sound levels are normally minimally affected by seasonal changes and variations in local conditions (e.g., roadway and airplane traffic, etc.). In other words, it is reasonable to assume that if the daytime sound levels were re-recorded the $L_{90}$ sound level measurements would likely be indistinguishable from each other. This assumes that any follow-up study, if conducted, measured similarly 'typical' periods (i.e., relatively normal weather conditions and not during an extremely windy, extremely hot, or snowy weather conditions).

### TONAL ANALYSIS

A discrete tone is a sound that consists primarily of a single pitch such that it is clearly audible against the normal broadband background sounds, even when the tone is at a lower level. Tones are generally more annoying than broadband noise. If an equipment source generates a prominent discrete tone as defined in the CT DEEP standards, the allowable overall level of noise is reduced by five (5) dBA.

WSP performed a spectrum analysis of the of the $L_{90}$ monitoring results in Figure 4 (see Attachment B). Two (2) discrete tones were observed in the spectral analyses for PL-1 and PL-3 at 800 Hz and 6.30 kHz, and one (1) discrete tone was identified in the spectral analysis for PL-2 at 6.30 kHz. These discrete tones were not present in the background measurement data (i.e., BG-1 and BG-2), and therefore it is reasonable to conclude that tones are generated by the DC-AC inverters at the Facility. Furthermore, source specific measurement data for the inverters showed obvious prominent discrete tones present in the unit sound signatures.

A tonal analysis using the addition of the CT DEEP 'penalty' as described above is easily conducted by subtracting the five (5) dBA tonal penalty noise limit levels shown in Table 3.

**Table 3 – Facility Discrete Tonal Impact Results**

| CT DEEP Class C to Class A Noise Limit Value (without discrete tone) (dBA) | CT DEEP Class C to Class A Noise Limit Value (with discrete tone) (dBA) | Location ID | DGIII $L_{90}$ Sound Pressure Level Measured (with discrete tone) (dBA) | Measured Sound Level Complies with CT DEEP Noise Regulation? |
|---|---|---|---|---|
| 61 | 56 | PL-1 | 38.9 | Yes |
| | | PL-2 | 39.9 | Yes |
| | | PL-3 | 34.9 | Yes |

A review of the data in the above table reveals that the sound generated by the Facility, as currently configured (despite producing a prominent discrete tone), is **well below** the CT DEEP daytime noise standard at all residential property line locations.

## MODELING ANALYSIS

In order to assess the effectiveness of the installed sound attenuation measures (i.e., noise barrier) in reducing the community noise impacts caused by the DC-to-AC power inverters WSP utilized a computer noise model to simulate the sound impacts at the property line locations if the wall were to be removed. This section describes the modeling methodology and results associated with WSP's review of the noise barrier.

### INVERTER SOUND POWER

After conducting the community sound level monitoring described in the previous section, WSP collected a series of near-field, source specific sound level measurements in close proximity to the DC-AC inverters with only a select number of inverters operational (i.e., other inverters turned OFF).

For the Solectria inverters WSP requested that NextEra operate a partial bank of six (6) inverters (i.e., 3-1 – 3-3, and 3-5 – 3-7. A diagram of the measurement arrangement is provided in Figure 5 (see Attachment B). This approach was determined to be an appropriate method for measuring the sound energy produced by these inverters as the symmetry of the arrangement allowed for simultaneous measurement capturing the noise emitted from both the front- and back-sides of the units. Using industry accepted measurement averaging techniques, WSP was able to accurately compute the sound power level for one (1) Solectria inverter. The following table summarizes the Solectria ("SOL") inverter sound level data, and the computation of sound power level ("Lw") for input into the sound propagation models.

**Table 4 – Solectria Inverter - Sound Measurement Conversion to Sound Power Level**

| | [1] | [2] | | [3] |
|---|---|---|---|---|
| 1/3 Octave Band Frequency (Hz) | Measured Sound Level (Lp) at 3.8 m (avg.) for six (6) SOL units (dB) | Calculated Sound Power (Lw) for one (1) SOL unit (dB) | 1/1 Octave Band Frequency (Hz) | Calculated Sound Level (Lp) at 1 m for one (1) SOL unit (dB) |
| 25 | 42.0 | 53.8 | 32 | 47.6 |
| 32 | 41.8 | 53.6 | | |
| 40 | 42.4 | 54.2 | | |
| 50 | 41.2 | 53.0 | 63 | 47.1 |
| 63 | 42.6 | 54.4 | | |
| 80 | 40.4 | 52.2 | | |
| 100 | 44.0 | 55.8 | 125 | 49.7 |
| 125 | 45.2 | 57.0 | | |
| 160 | 43.0 | 54.8 | | |
| 200 | 44.2 | 56.0 | 250 | 50.3 |
| 250 | 45.0 | 56.8 | | |
| 315 | 45.0 | 56.8 | | |
| 400 | 48.6 | 60.4 | 500 | 54.0 |
| 500 | 46.2 | 58.0 | | |
| 630 | 49.8 | 61.6 | | |
| 800 | 57.6 | 69.4 | 1,000 | 59.1 |
| 1,000 | 46.4 | 58.2 | | |
| 1,250 | 47.4 | 59.2 | | |
| 1,500 | 48.6 | 60.4 | 2,000 | 53.4 |
| 2,000 | 47.8 | 59.6 | | |
| 2,500 | 46.8 | 58.6 | | |
| 3,200 | 46.6 | 58.4 | 4,000 | 56.7 |
| 4,000 | 47.6 | 59.4 | | |
| 5,000 | 54.6 | 66.4 | | |
| 6,300 | 65.2 | 77.0 | 8,000 | 66.1 |
| 8,000 | 45.2 | 57.0 | | |
| 10,000 | 40.4 | 52.2 | | |
| 12,500 | 46.6 | 58.4 | 16,000 | 47.6 |
| 16,000 | 32.2 | 44.0 | | |
| 20,000 | 29.4 | 41.2 | | |
| **Broadband (dBA)** | **66.8** | **78.5** | **Broadband (dBA)** | **67.0** |

[1] The Solectria inverter near-field sound test was conducted by A. Roland (WSP) on April 9, 2024 at 3:45 PM. The 1/3 octave band sound pressure level values we measured at an average distance of 3.8 meters from six (6) Solectria inverters that were operating simultaneously.

[2] The Solectria inverter sound power level (for use in sound modeling) was computed by WSP using standard procedures specified in ISO 3740, Acoustics – Determination of Sound Power Levels of Noise Sources. Prominent discrete tones identified at 800 Hz and 6.30 kHz.

[3] The Solectria inverter sound pressure level at 1 m was calculated by WSP using the sound power value (calculated above) and using the procedures specified in ISO 9613-2, Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation. The calculated sound pressure level at 1 meter (i.e., 67.0 dBA) is different than what is specified by Yaskawa in the manufacturer's data sheet, which lists the units as having a noise rating of 73 dBA at 1 m and 67 dBA at 3 m (see Attachment E).

WSP performed a similar set of measurements for the one (1) CPS inverter onsite (i.e., 3-8).

**Table 5 – CPS Inverter - Sound Measurement Conversion to Sound Power Level**

| | [1] | [2] | | [3] |
|---|---|---|---|---|
| 1/3 Octave Band Frequency (Hz) | Measured Sound Level (Lp) at 2.5 m (avg.) for one (1) CPS unit (dB) | Calculated Sound Power (Lw) for one (1) CPS unit (dB) | 1/1 Octave Band Frequency (Hz) | Calculated Sound Level (Lp) at 1 m for one (1) SOL unit (dB) |
| 25 | 38.6 | 54.5 | 32 | 47.6 |
| 32 | 37.4 | 53.3 | | |
| 40 | 37.4 | 53.3 | | |
| 50 | 40.0 | 55.9 | 63 | 47.4 |
| 63 | 36.4 | 52.3 | | |
| 80 | 35.0 | 50.9 | | |
| 100 | 37.4 | 53.3 | 125 | 45.4 |
| 125 | 36.4 | 52.3 | | |
| 160 | 31.0 | 46.9 | | |
| 200 | 37.6 | 53.5 | 250 | 49.9 |
| 250 | 40.8 | 56.7 | | |
| 315 | 41.4 | 57.3 | | |
| 400 | 46.0 | 61.9 | 500 | 55.7 |
| 500 | 43.8 | 59.7 | | |
| 630 | 47.4 | 63.3 | | |
| 800 | 57.6 | 73.5 | 1,000 | 62.9 |
| 1,000 | 45.4 | 61.3 | | |
| 1,250 | 42.8 | 58.7 | | |
| 1,500 | 45.2 | 61.1 | 2,000 | 54.2 |
| 2,000 | 44.8 | 60.7 | | |
| 2,500 | 43.0 | 58.9 | | |
| 3,200 | 42.8 | 58.7 | 4,000 | 52.3 |
| 4,000 | 43.0 | 58.9 | | |
| 5,000 | 41.8 | 57.7 | | |
| 6,300 | 37.0 | 52.9 | 8,000 | 43.9 |
| 8,000 | 32.8 | 48.7 | | |
| 10,000 | 29.8 | 45.7 | | |
| 12,500 | 25.4 | 41.3 | 16,000 | 31.8 |
| 16,000 | 20.2 | 36.1 | | |
| 20,000 | 15.6 | 31.5 | | |
| **Broadband (dBA)** | **59.1** | **74.9** | **Broadband (dBA)** | **64.4** |

[1] The CPS inverter near-field sound test was conducted by A. Roland (WSP) on April 9, 2024 at 1:50 PM. The 1/3 octave band sound pressure level values we measured at an average distance of 2.5 meters from one (1) CPS inverter that was operating.

[2] The CPS inverter sound power level (for use in sound modeling) was computed by WSP using standard procedures specified in ISO 3740, Acoustics – Determination of Sound Power Levels of Noise Sources. Prominent discrete tone identified at 800 Hz.

[3] The CPS inverter sound pressure level at 1 m was calculated by WSP using the sound power value (calculated above) and using the procedures specified in ISO 9613-2, Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation. The calculated sound pressure level at 1 meter (i.e., 64.4 dBA) is consistent with sound pressure level specified by CPS in the manufacturer's data sheet (i.e., <65 dBA @ 1 m) (see Attachment E).

## SOUND MODELING ANALYSIS

The DGIII facility's sound impacts at the property line locations were modeled using the SoundPLAN (i.e., "SPLAN") computer software modeling program. Sound modeling calculations use sound propagation algorithms and attenuation methodologies that are based on ANSI S12.62 and ISO 9613-2, Acoustics - Attenuation of Sound During Propagation Outdoors - Part 2: General Method of Calculation, and other industry accepted standards.

All sound propagation losses, such as geometric spreading, air absorption, ground absorption, and barrier shielding are calculated automatically in accordance with these recognized standards. Reflection from adjacent structures and terrain effects was accounted for in the modeling.

Discrete modeling receptors were chosen at the residential property line locations corresponding to where the community noise monitoring was conducted in order that direct comparison to existing (i.e., attenuated) noise levels could be assessed. First, the attenuated sound levels were calculated at the three (3) property line locations based on simultaneous operation of all forty (40) DC-AC inverters and the modeled results were compared to ensure good agreement with the measured sound level values. Then, the sound barrier wall was removed from the model and the unattenuated sound levels were re-calculated at the three (3) property line locations. The difference between the two (2) modeling scenarios attenuated and unattenuated provides the effectiveness of the sound barrier wall at reducing property line sound levels.

The analysis shows that the noise barrier is responsible for between 11.2 and 14.5 dBA reductions in sound levels along the property lines. The following table presents the results of this sound modeling analysis.

**Table 6 – Noise Barrier Wall Effectiveness Results**

| Location ID | Ambient Background Sound Level ($L_{90}$) (dBA) | Attenuated Sound Level from Facility (dBA) | | Unattenuated Sound Level from Facility (dBA) | Sound Level Decrease from Noise Barrier Wall (dBA) |
|---|---|---|---|---|---|
| | | WSP | SPLAN | SPLAN | |
| PL-1 | 30.0 | 38.9 | 38.8 | 53.3 | 14.5 |
| PL-2 | 30.0 | 39.9 | 39.9 | 51.1 | 11.2 |
| PL-3 | 30.0 | 34.9 | 35.5 | 47.8 | 12.3 |

The attenuated and unattenuated sound spectrum analysis is provided in Figure 5 (see Attachment B).

The Figure 6 (see Attachment B) provides a sound level contour plot showing the attenuating effect that the noise barrier wall has on the Facility sound levels.

A review of the data in the above table reveals that the sound generated by the Facility (despite producing a prominent discrete tone), is **well below** the CT DEEP daytime noise standard at all residential property line locations. Increases in environmental and community sound levels of less than 10 dB occur over the minimum daytime $L_{90}$ levels, but the total property line sound level, even when added to ambient noise, will remain at or below the specified State noise standard. The magnitude of the increases in community sound level caused by the Facility are deemed to be **noticeable, but not overly disruptive** (i.e., less than 10 dBA increase).

## CONCLUSION

An environmental and community noise measurement and modeling analysis of the DGIII solar site was conducted in order to determine if operational sound levels from the Facility comply with the State of

Connecticut noise standards, and to verify the effectiveness of the installed sound attenuation measures (i.e., noise barrier) in reducing the community noise impacts caused by the DC-to-AC power inverters installed at the Site.

The study utilized WSP obtained data and field measurements for the major noise generating equipment sources (i.e., DC-AC inverters), which were incorporated into the SoundPLAN computer propagation model. The analysis results reveal that the sound level from the Facility is in compliance with the State of Connecticut noise standards at all residential property lines, and that the sound barrier wall that was installed at the Site is effective at reducing the sound levels caused by the power inverters at nearby residential property lines by approximately 11.2 – 14.5 dBA. The magnitude of the increases in community sound level caused by the Facility are deemed to be noticeable, but not overly disruptive.

The sound levels from the Facility are expected remain in full compliance with State of Connecticut Noise Control Regulations (i.e., RCSA §22a-69) as long as the noise barrier wall is maintained in proper condition.

The conclusions and calculations provided are based on the background sound level measurements collected on April 9, 2024 by WSP. The observations in this report were valid on the date and time of the investigation. Reported noise levels contained herein are a factor of operational conditions and environmental conditions present at the time of the assessment and may represent "normal" facility noise levels. Measurements and calculations in this report should be considered accurate to within one (1) decibel.

This report is intended to be used in its entirety for the purposes of NextEra Energy Resources, LLC ("NextEra") for the DG Connecticut Solar III, LLC ("DGIII") solar photovoltaic energy generating facility. Any use of this report, or portions thereof, out of context or any application of this report for purposes other than those explicitly expressed above is considered inappropriate and is done at the sole risk of the user.

If you have any questions, or require additional information, please contact me (860-966-4391, andy.roland@wsp.com), or Paul Richard, P.E. (781-552-9899, paul.richard2@wsp.com), at your earliest convenience

Sincerely,

**WSP USA Inc.**

Andrew R. Roland
Senior Project Engineer

Paul G. Richard, P.E.
Vice President, Senior Project Manager

cc: Marcos Quintana (NextEra)

Attachments:
A. Environmental Acoustics Technical Background
B. Environmental & Community Noise Assessment Figures
C. Sound Level Monitoring Field Notes and Results
D. Monitoring Equipment Certificates of Calibration
E. Manufacturers' Technical Data Sheet

## Attachment A

Environmental Acoustics Technical Background

## Decibel Scale

All sounds originate from a source. The sound energy produced by a source creates variations in air pressure which travel in all directions, much like how a wave ripples across water. The "loudness" or intensity of a sound depends on the sound pressure level, defined as the ratio of two pressures: the measured sound pressure from the source divided by a reference pressure (i.e., the minimum threshold pressure of human hearing). This measured ratio is expressed using the decibel ("dB") scale, which is a logarithmic scale designed to accommodate the wide range of sound intensities the human ear can respond to – that is, approximately 20 micropascals ("µPa") up to 100 kilopascals ("kPa"). On the decibel scale, the threshold of human hearing is equal to 0 dB, while levels above 140 dB can cause immediate hearing damage.

The following formula is used to convert a sound pressure value measured in pascals into a decibel value:

$$Lp\ [dB] = 20 \cdot \log_{10}(P_{rms} / P_0)$$

where: $Lp$ = sound pressure level in decibels (dB)

$P_{rms}$ = root mean square of measured sound pressure waveform in pascals (Pa)

$P_0$ = 0.00002 Pa, reference sound pressure in pascals (Pa)

The table below provides some examples of common sources of sound and their sound pressure levels. All sound levels in this assessment are provided in A-weighted decibels, abbreviated "dBA." The A-weighted sound level reflects how the human ear responds to sound, by deemphasizing sounds that occur in frequencies (i.e., pitch) at which the human ear is least sensitive to sound and emphasizing sounds that occur in frequencies at which the human ear is most sensitive. In the context of environmental and community sound, noise is defined as "unwanted sound."

**Comparison of Sound Levels and Sensation of Loudness**

| Sound Pressure Level (dBA) | Example Sound Source | Perceived Loudness |
|---|---|---|
| 140 | Gun Shot at 3 ft. | Physical Pain |
| 130 | Jet Aircraft at 200 ft. | |
| 120 | Rock Band (near stage) | Deafening |
| 110 | Motorcycle at 3 ft. | |
| 100 | Lawn Mower at 3 ft. | Very Loud |
| 90 | Noisy Factory Floor | |
| 80 | Heavy Truck at 50 ft. | Loud |
| 70 | Busy Restaurant | |
| 60 | Normal Conversation | Normal |
| 50 | Quiet Office | Quiet |
| 40 | Living Room | |
| 30 | Quiet Library | Faint |
| 20 | Empty Auditorium | |
| 10 | Soundproof Room | Barely Audible |
| 0 | - | Threshold of Hearing |

One property of the logarithmic nature of the decibel scale is that the combined sound levels of multiple sound sources is not simply the sum of the contributing sound decibel levels. For example, if the sound of one source measured to have a sound level of 70 dBA is added to another source of 70 dBA, the total is only 73 dBA, not a doubling to 140 dBA. Another mathematical property of the decibel scale is that is one source of sound is at least 10 dB higher than another source, then the total sound is simply the sound level of the louder source. For example, if a sound source at 80 dBA is added to a source at 65 dBA, then the total sound level is 80 dBA.

The following formula is used to combine decibel sound level values:

$L\ [dB] = 10 \cdot log_{10}(10^{L_1/10} + 10^{L_2/10})$

where: $L$ = combined sound level of source 1 and source 2 in decibels (dB)

$L_1$ = sound level of sound source 1 in decibels (dB)

$L_2$ = sound level of sound source 2 in decibels (dB)

In terms of human perception of sound, a ±3 dB difference is considered a barely perceptible change for broadband sounds (i.e., sounds that include all frequencies). Similarly, a difference of ±10 dB is perceived as a halving or doubling of apparent sound loudness and the response that goes with it.

The tables below provide a summary comparison of sound pressure levels and loudness sensations.

**Subjective Perception of Changes in Sound level**

| Change in Sound Level | Perceived Change in Loudness (Absolute Difference in Sound Energy) |
|---|---|
| ± 3 dB | Barely Noticeable Change (2x [or 1/2] energy) |
| ± 5 dB | Easily Noticeable Change (4x [or 1/4] energy) |
| ± 10 dB | Double (or Half) as Loud (10x [or 1/10] energy) |
| ± 20 dB | Very "Dramatic" Change (100x [or 1/100] energy) |

## Frequency / A-Weighting

Sound is transmitted by pressure variations in air – that is, the compression / release of gas pressure in air. Frequency of pressure waves is expressed in Hertz ("Hz"), which is defined as the number of complete wave cycles per second. Low frequency sound has fewer waves per second (longer wavelength) than high frequency sound (shorter wavelength) and is often described in musical terms as 'pitch' or 'tone'. The frequency range of audible sound that the human ear responds to is 20 to 20,000 Hz. This range is difficult to use to express individual sounds since most sounds created within the environment are composed of multiple frequencies being emitted simultaneously (i.e., broadband). Broadband sound is therefore divided into frequency "bands" called octaves which are identified by their center frequency to make using frequency measurements easier. Octave bands are necessary to evaluate environmental noise because the human ear responds differently to each octave band.

Environmental sound is commonly expressed in terms of an A-weighted sound decibel level ("dBA"). The A-weighting is a standard frequency filter used to make measured sound levels more nearly approximate the frequency response of the human ear, which is centered at a frequency of 1,000 Hz. The table below shows the approximate adjustments made within each octave band frequency to contour un-weighted octave band sound pressure levels in decibels ("dB" or "dBZ") to A-weighted sound pressure levels ("dBA").

**A-Weighed Octave Band Adjustments**

| Octave (Hz) | 32 | 64 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | 16K |
|---|---|---|---|---|---|---|---|---|---|---|
| A-Adj. Value (dB) | -39.4 | -26.2 | -16.1 | -8.6 | -3.6 | 0.0 | +1.2 | +1.0 | -1.1 | -6.6 |

As shown above, the A-weighting sound levels emphasize the middle frequency sounds (i.e., 1 kHz – 4 kHz), and de-emphasize low- and high-frequency sounds. A 'broadband' sound includes sound pressures at all octave bands expressed as a single representative value.

The A-weighted broadband value is calculated by taking the logarithmic summation of all octave band sound pressure level according to the following formula:

$Lp\ [dBA] = 10 \cdot log_{10}(\sum 10^{(L_x+Adj_x)/10})$

where: *Lp* = broadband sound pressure level in A-weighted decibels (dBA)

$L_x$ = sound pressure level at octave band (x) in un-weighted decibels (dB)

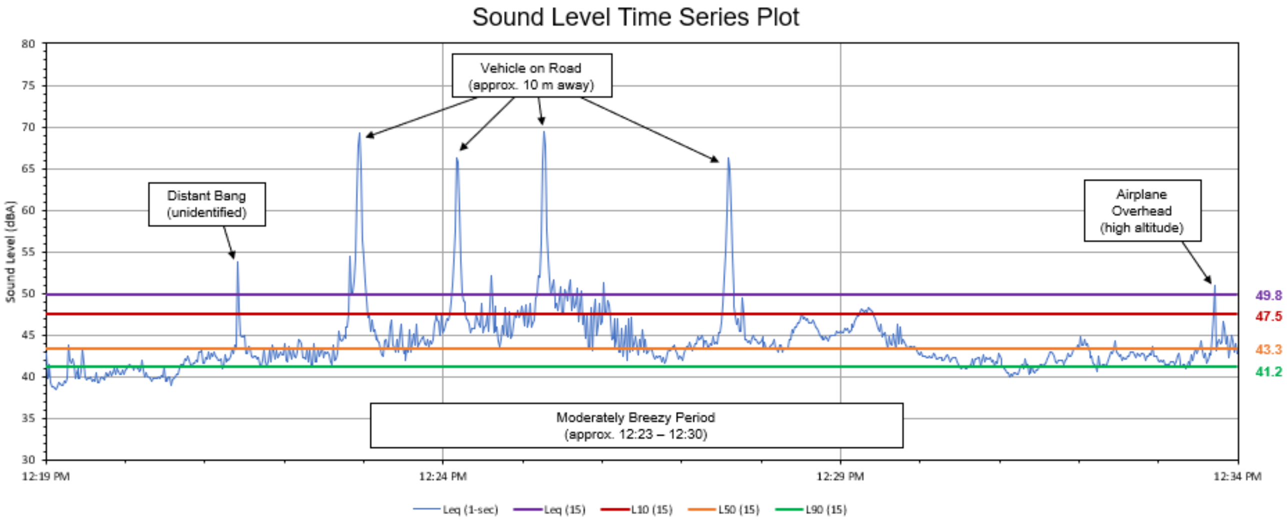
$Adj_x$ = octave band (x) adjustment to A-weighting (±dB) (see table above)

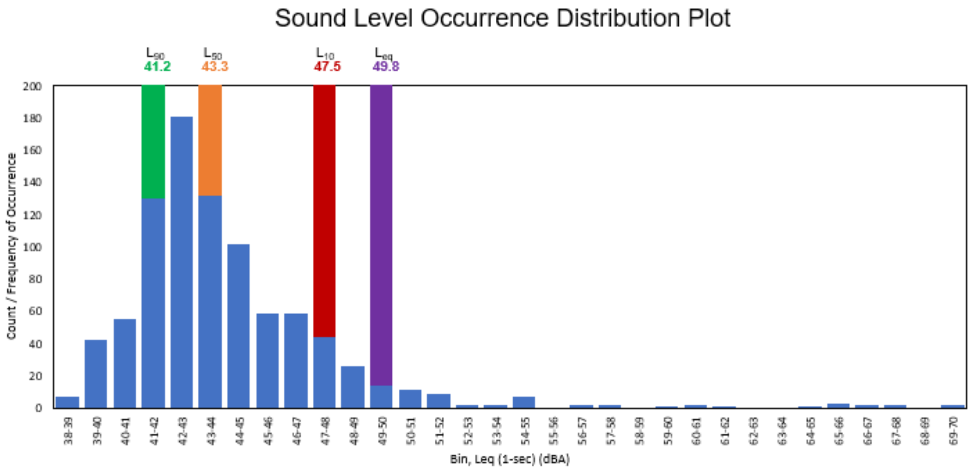
## Temporal Sound Metrics

Environmental sound levels vary from moment to moment – that is, some sounds are sharp and impulsive lasting a very short time, while others rise and fall over much longer periods of time. These are termed "temporal" sound level variations, and there are various measures (i.e., metrics) which are designed to account for various levels of temporal variation in sound. The most common in this analysis are the 90% exceedance level (i.e., $L_{90}$), and the equivalent sound level (i.e., $L_{eq}$).

- $L_{90}$ sound metric is a statistical value that calculates the steady-state sound pressure level that is exceeded during 90% of the measurement period. In other words, the $L_{90}$ represents the "quietest" 10% of a sound measurement period and is normally considered the background sound level. The $L_{90}$ calculation effectively eliminates nearly all temporal variation in recorded noise and is used to set baseline and continuous background sound levels. The $L_{90}$ can be considered the "residual" sound level, which is the ambient sound leftover when nearly all obvious intermittent noise sources are eliminated from the measurement. This is known as an exceedance value, or the percent of time (n) during a measurement period a sound level value is exceeded ($L_n$). Conversely, the $L_{10}$ sound level metric is the statistical value that calculates the "loudest" 10% of the measurement period (i.e., the sound pressure level that is exceeded for only 10% of the measurement period).
- $L_{50}$ is the median sound level – that is, the sound level value that is exceeded by 50% (i.e., half) of the data sample. The $L_{50}$ is not skewed by a small proportion of extremely high or low sound level values, and therefore provides a good representation of the most typical sound level recorded during the sample period.
- $L_{eq}$, or equivalent sound level, is the steady-state sound level over a period that has the same acoustic energy as the fluctuating sound that occurred during the same period. As an example, if two (2) sounds were measured, and one (1) sound had twice (2X) the sound energy but lasted for half as long, the two (2) sounds would be characterized as having the same equivalent sound level (since the energy released is equivalent). The $L_{eq}$ is directly related to the effects of sound on peoples' perceived intrusiveness or level of annoyance since it expresses the equivalent magnitude of the sound as a function of occurrence frequency and time. The $L_{eq}$ is commonly referred to as the average sound pressure level, although this is not necessarily an accurate description. In certain situations, the $L_{eq}$ sound level should be considered overly conservative as the value is more significantly affected by short-duration loud noises. This is caused by the logarithmic nature of the decibel scale and that it is a time-integrated energy average (as opposed to a simple arithmetic average). For example, a 76 dB sound level equates to 'quadruple' (i.e., four times) the sound energy produced by a 70 dB source, therefore the $L_{eq}$ value is mostly determined by loud sounds if there are fluctuations during a measurement period.

The $L_{eq}$ and $L_{90}$ ($L_{50}$ and $L_{10}$) values are both automatically calculated with a sound level meter in accordance with the methods define in American National Standards Institute ("ANSI") S1.4-1983. The figure below provides a visual description of how these sound level metrics are used to summarize fluctuating sound data during an example 15-minute measurement period. The figure also demonstrates how the 'skewness' of the data frequency distribution will generate a $L_{eq}$ value which exceeds the $L_{10}$ metric due to several loud, short-duration events.




## Sound Power versus Sound Pressure

Sound power ("Lw") and sound pressure ("Lp") are two distinct and commonly confused descriptors of sound because both values are typically expressed in the decibel scale. Sound power is the acoustical energy emitted by the sound source and is an absolute value. It is not affected by the environment and is independent of distance to the source. On the other hand, sound pressure levels vary substantially with distance from the source and are diminished by other environmental factors (e.g., obstacles, barriers, air absorption, wind, etc.). Sound pressure is what human ears experience (or hear), and what sound level meters measure.

The total acoustical power emitted by a sound source is given in terms of the sound power level (Lw). The sound power level of a source is an intrinsic property of the unit for a give set of operating conditions irrespective of the orientation of the source. Sound power is a theoretical value that is not directly measured. It is a characteristic of the sound source and is an estimate of the total sound power emitting in all directions by the source. The value of sound power level is determined by the following equation:

$$Lw\ (dB) = 10 \cdot \log_{10}(W / W_0)$$

where: $Lw$ = sound power of source in decibels (dB)

$W$ = acoustic power radiated by the source in watts (W)

$W_0 = 10^{-12}$ W, reference power in watts (W)

The sound pressure level (Lp) is a measure of the magnitude of the acoustical pressure wave at a specific receptor location. The magnitude of the sound pressure level is a result of how the sound power is distributed and influenced by the environment between the sound source and the receiver location. Environmental influences may include distance between the source and the receiver, atmospheric attenuation of the path of propagation, reflections from surfaces, as well as sound transmission and refraction through and around fluid/solid structures. In many instances these effects are frequency dependent necessitating an analysis that can account for the change in spectral distribution of the sound power during the propagation from the source to the receiver.

## Sound Level Reduction Over Distance

The calculation to estimate environmental sound pressure value at a given location from a source value at a given sound power level is detailed in ISO 9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors. This is the commonly accepted procedure for 'modeling' predicted sound level impact at a receptor location due to the introduction of a sound source. As mentioned above, this calculation is influenced by numerous factors – for example, geometric divergence (i.e., wave-spreading due to distance between source and receiver), atmospheric absorption, ground and surface reflection and absorption, and screening and refraction due to obstacles between source and receiver. The following section provides an explanation of the most basic of these 'factors' – that is, geometric divergence or sound level reduction over distance.

When traveling from a source to a receptor in an outdoor environment, sound energy levels decrease with increasing distance from source to receptor. This is due to geometric divergence (or wave-spreading), and the decrease in sound level from any source normally follows the "inverse-square law". The inverse-square law generally applies to energy as it is radiated outward in three-dimensions (i.e., spherically). As the emitted energy gets farther from the source it is spread out over an area that increases in proportion to the square of the distance from the source (i.e., $r^2$). The attenuation value due to spherical spreading in the free field is equal to:

$$A_{div}\ (dB) = 10 \cdot \log_{10}(4 \cdot \pi \cdot r^2) = 20 \cdot \log_{10}(r) + 11$$

where: $A_{div}$ = attenuation due to geometric divergence in decibels (dB)

$r$ = distance from the source to the receiver in meters (m)

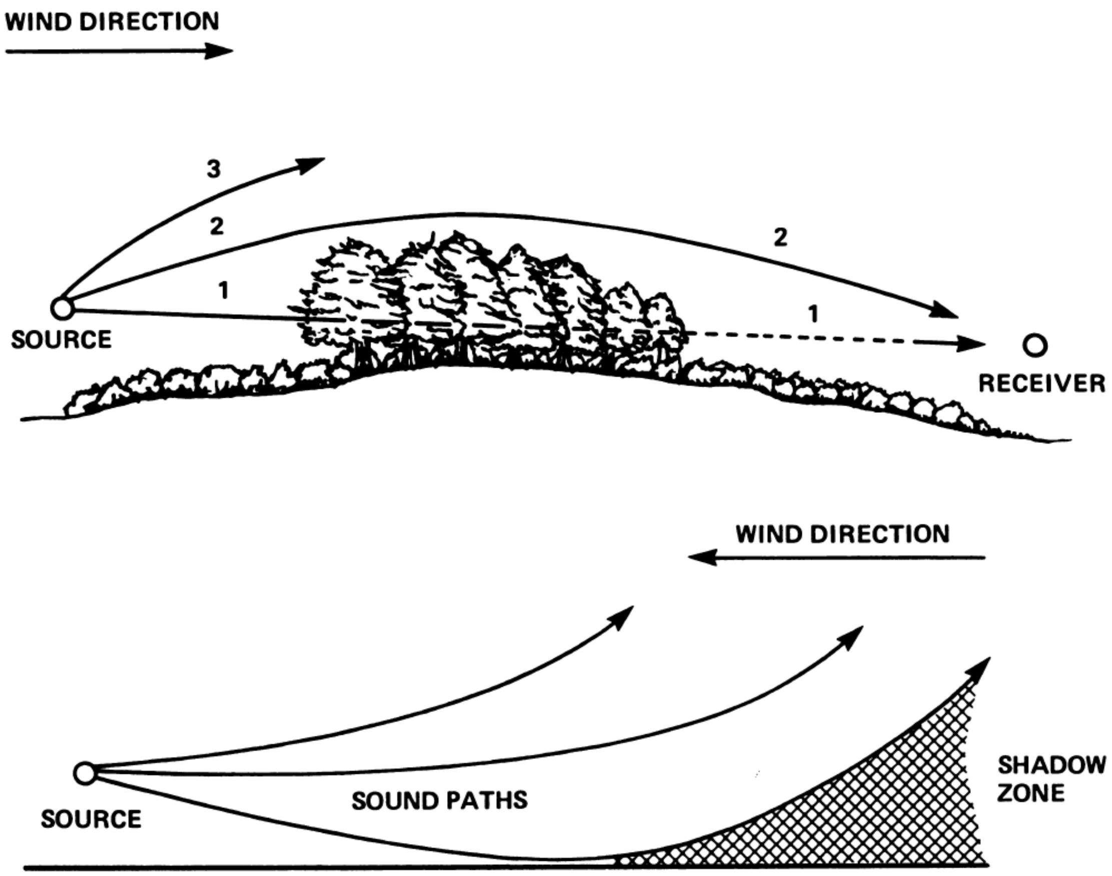
In general, at distances greater than 50 feet from a point source, every doubling of the distance between the source and the receiver produces a 6 dB reduction in sound level at the receptor. However, for heavy roadway traffic, which can be approximated as a line source, sound levels typically decrease by approximately 3 dB every time the distance between the road and the receptor is doubled due to the cylindrical spreading of the waves. In either case the actual reduction in sound levels over the distance is dependent on the characteristics of the source itself (e.g., frequency, directionality, etc.) and the conditions over which the sound travels (e.g., barriers, topography, groundcover, etc.).

## Atmospheric Effects

Wind and temperature variations can cause bending of sound waves and can influence changes in sound levels at large distances and help explain the variation that occurs in outdoor sound propagation and measurements.

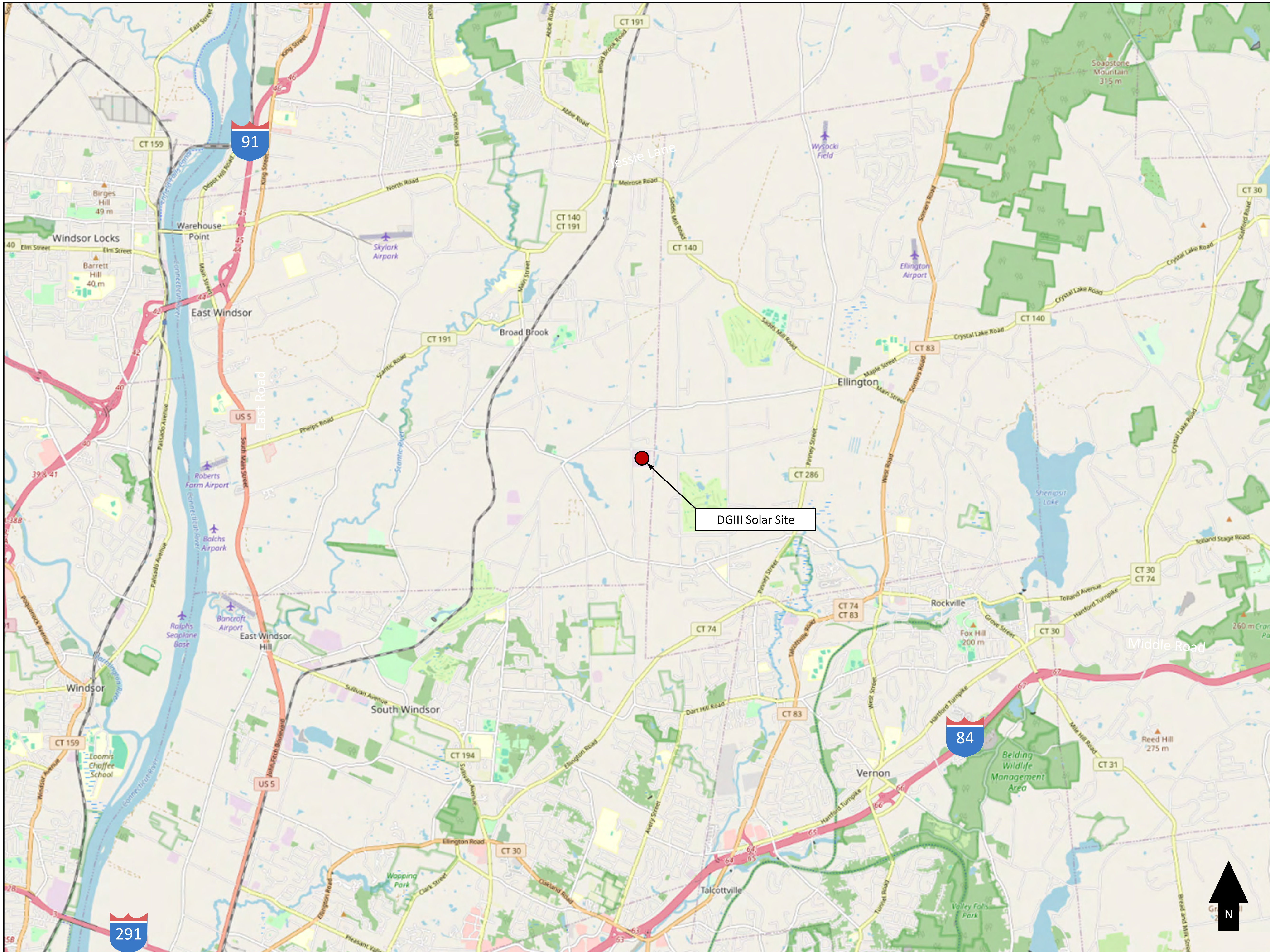
A steady, smooth flow of wind, equal at all altitudes, would have no noticeable effect on sound transmission. In practice, however, wind speeds are generally higher above the ground than at the ground level, and the resulting wind speed gradients tend to "bend" sound waves over large distances. Sound traveling with the wind is bent down to earth, while sound traveling against the wind is bent upwards toward the sky.

The figure below shows illustrates the influence wind can have on sound propagation:


WIND DIRECTION
3
2
2
1
1
SOURCE
RECEIVER
WIND DIRECTION
SOURCE
SOUND PATHS
SHADOW
ZONE

## Attachment B

Environmental & Community Noise Assessment Figures

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CLIENT:

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JUNO BEACH, FL 33408

PROJECT:

**DG CONNECTICUT SOLAR III, LLC**
341 EAST ROAD
EAST WINDSOR, CT 06016

| | |
|---|---|
| PROJECT NO: | US0027174.6477 |
| REVISION: | 00 |
| DRAWN BY: | ARR |
| CHECKED BY: | PGR |
| DATE: | 04/09/2024 |

SCALE:

0 1.5 3.0

KILOMETERS

NOTES:

The Facility occupies an approximately 27-acre parcel of farmland bounded by single-family residential properties to the north across Middle Road, agricultural properties to the northwest, west, south and northeast, and wooded areas surrounding Pecks Brook to the southeast and east.

The Site is located near the intersection of Middle Road and East Road, which are single-lane asphalt paved town roads. This Site is located to the south of the Jessie Lane residential subdivision.

The Site is approximately 5 miles (8 km) away from the nearest interstate highway I-84, which is located to the southeast.

FIGURE TITLE:

SITE LOCUS MAP

FIGURE NUMBER:

1



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SCALE:

0 20 40

METERS

NOTES:

$L_{90}$ = Residual (i.e., 90% Exceedance) Sound Pressure Level
dBA = A-Weighted Decibels

Existing operational and background daytime sound level monitoring was conducted by Andy Roland (WSP):
- Tues., April 9, 2024 (10:00 AM – 3:30 PM)

Sound levels were measured at each location using a Casella model CEL-633C, Type1 octave band analyzer.

Property line (PL) measurements were collected while all forty (40) DC-AC inverters were powered ON.

Background (BG) measurements collected while only one (1) inverter in bank #3 was still operational.

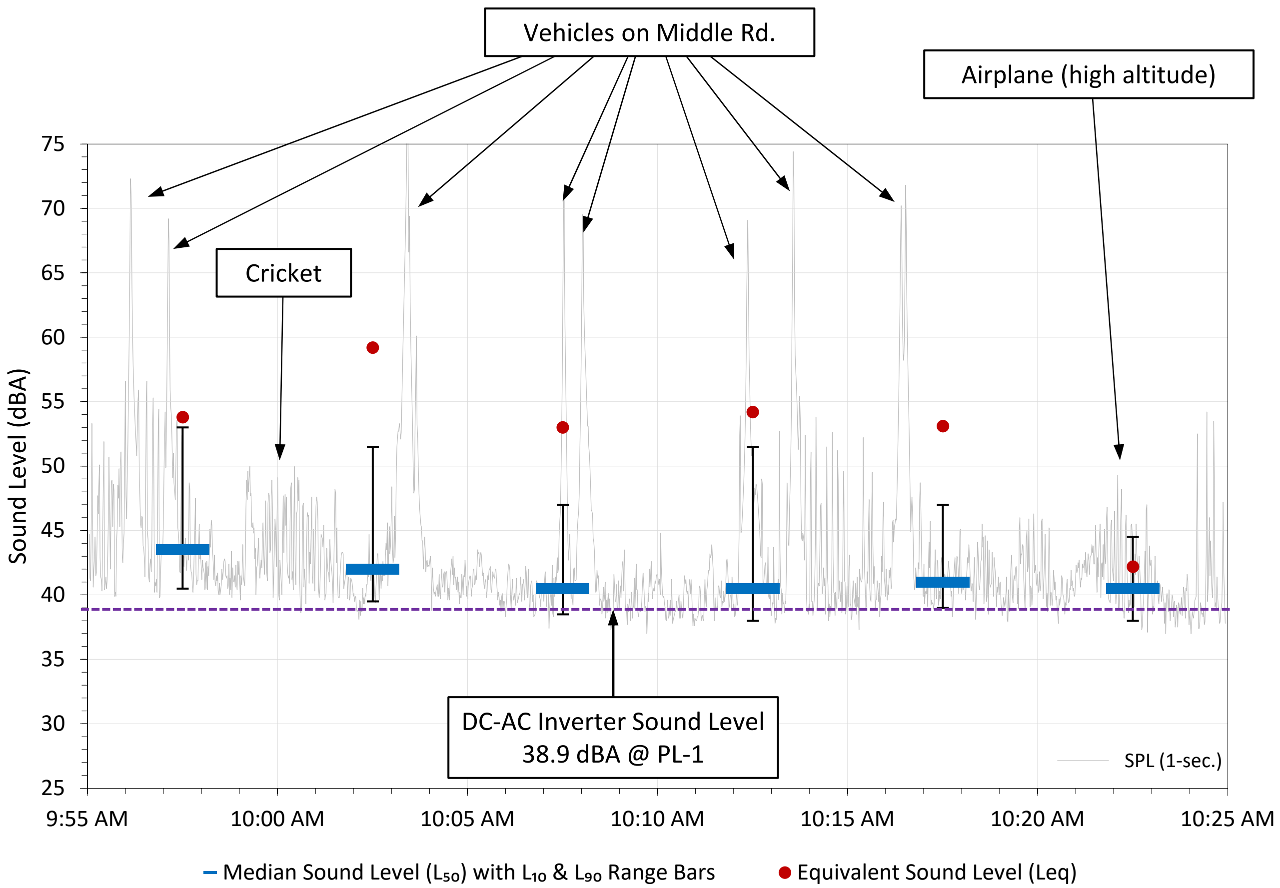
FIGURE TITLE:

MONITORING LOCATIONS & DAYTIME RESULTS SUMMARY

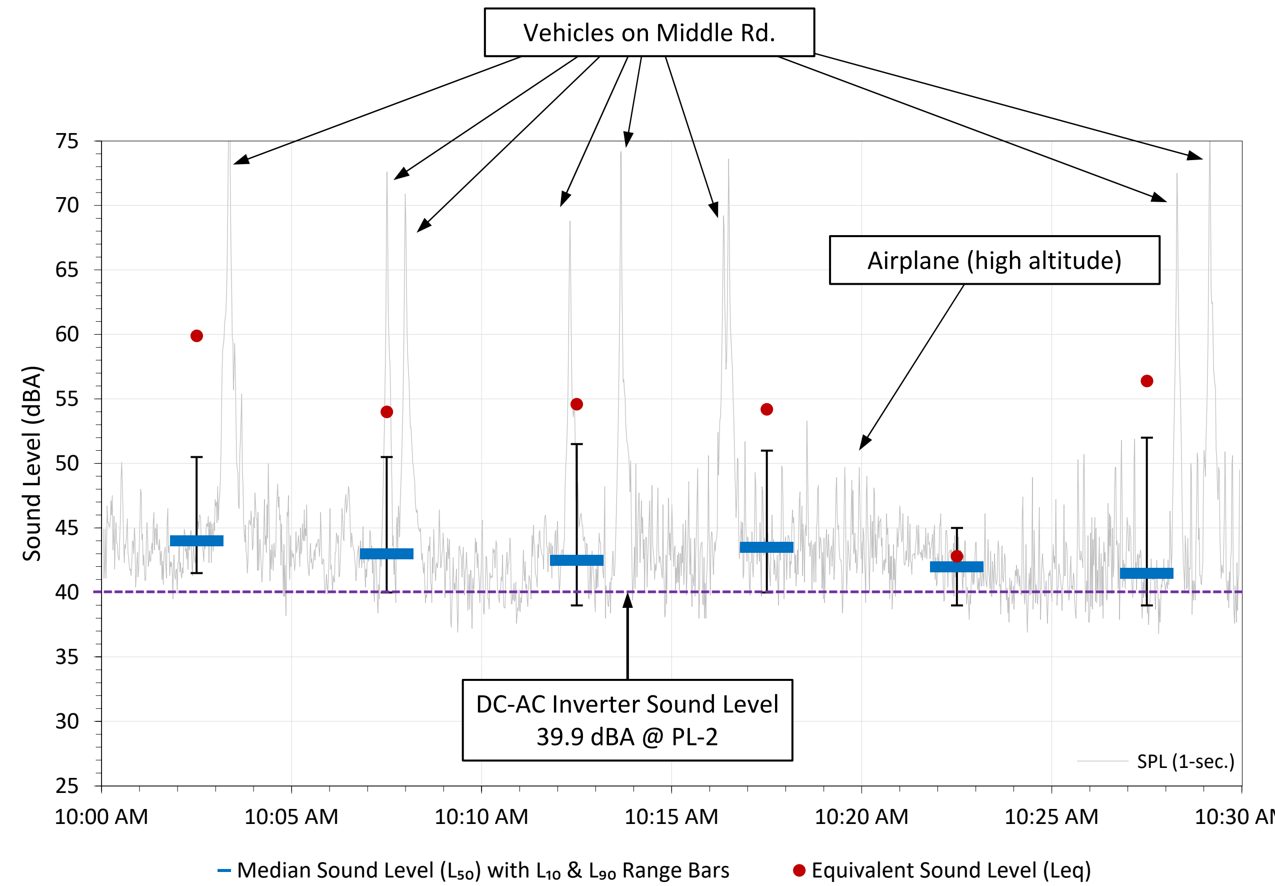
FIGURE NUMBER:

2

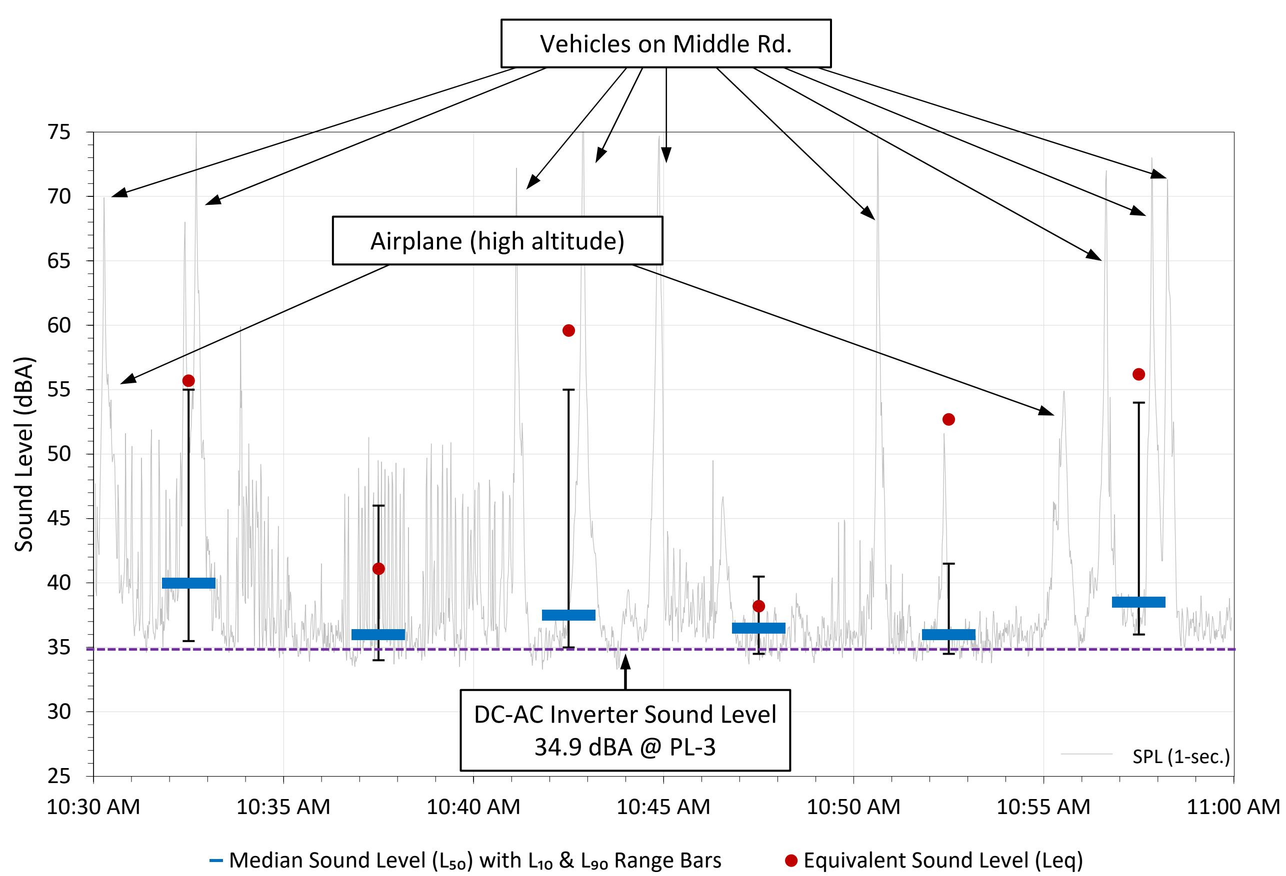
PL-1 – Time-Series Analysis




PL-2 – Time-Series Analysis




PL-3 – Time-Series Analysis





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NOTES:

The Leq and $L_{10}$ sound pressure level values are clearly for each measurement period are highly skewed upward by short, high-energy (i.e., loud) events (e.g., vehicles passing by on the nearby Middle Rd). These metrics are not considered suitable for describing the consistent sound levels generated by the DC-AC inverters. It is standard practice to describe consistent environmental sound levels using the $L_{90}$ metric.

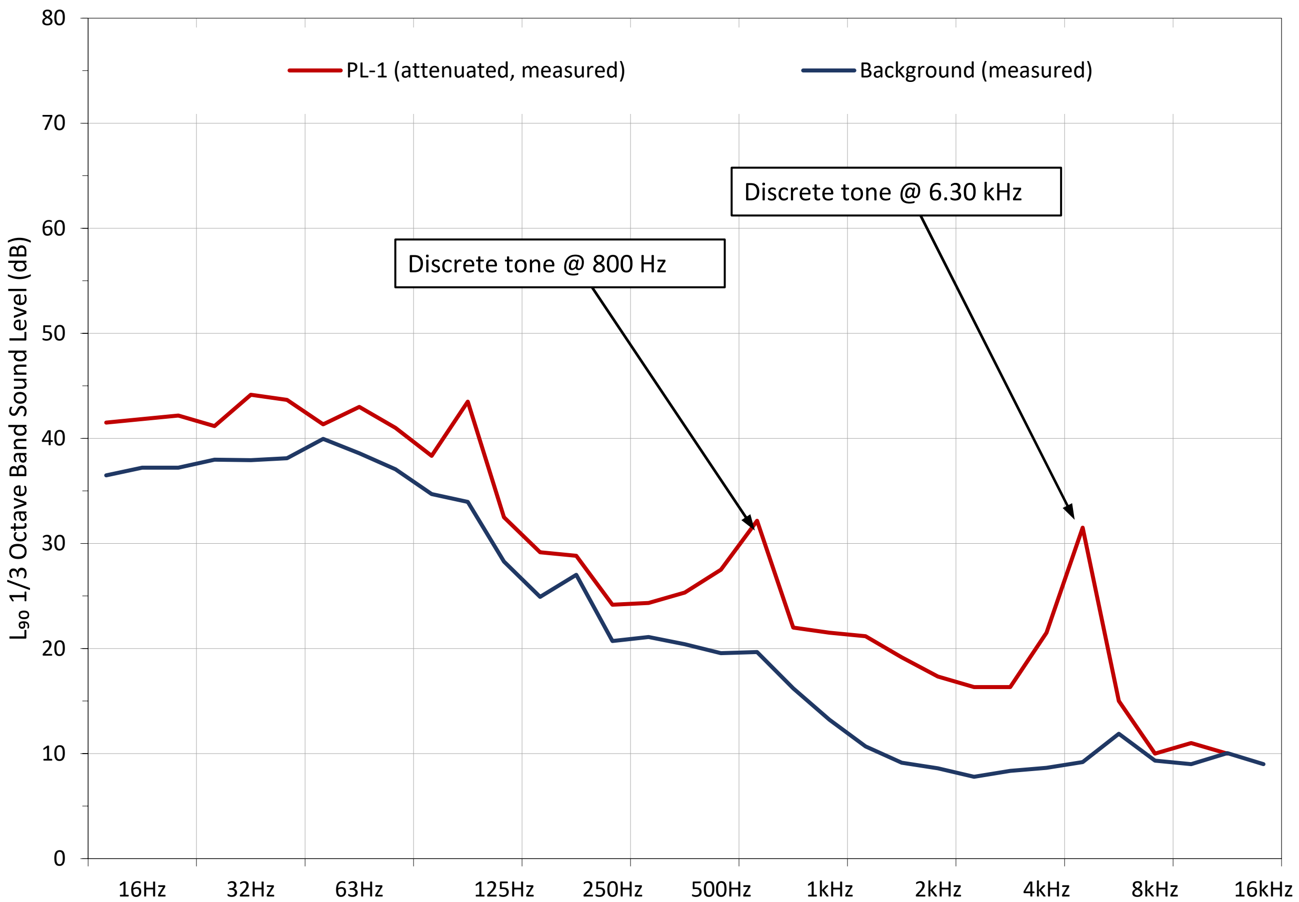
FIGURE TITLE:

MONITORING RESULTS
TEMPORAL ANALYSIS

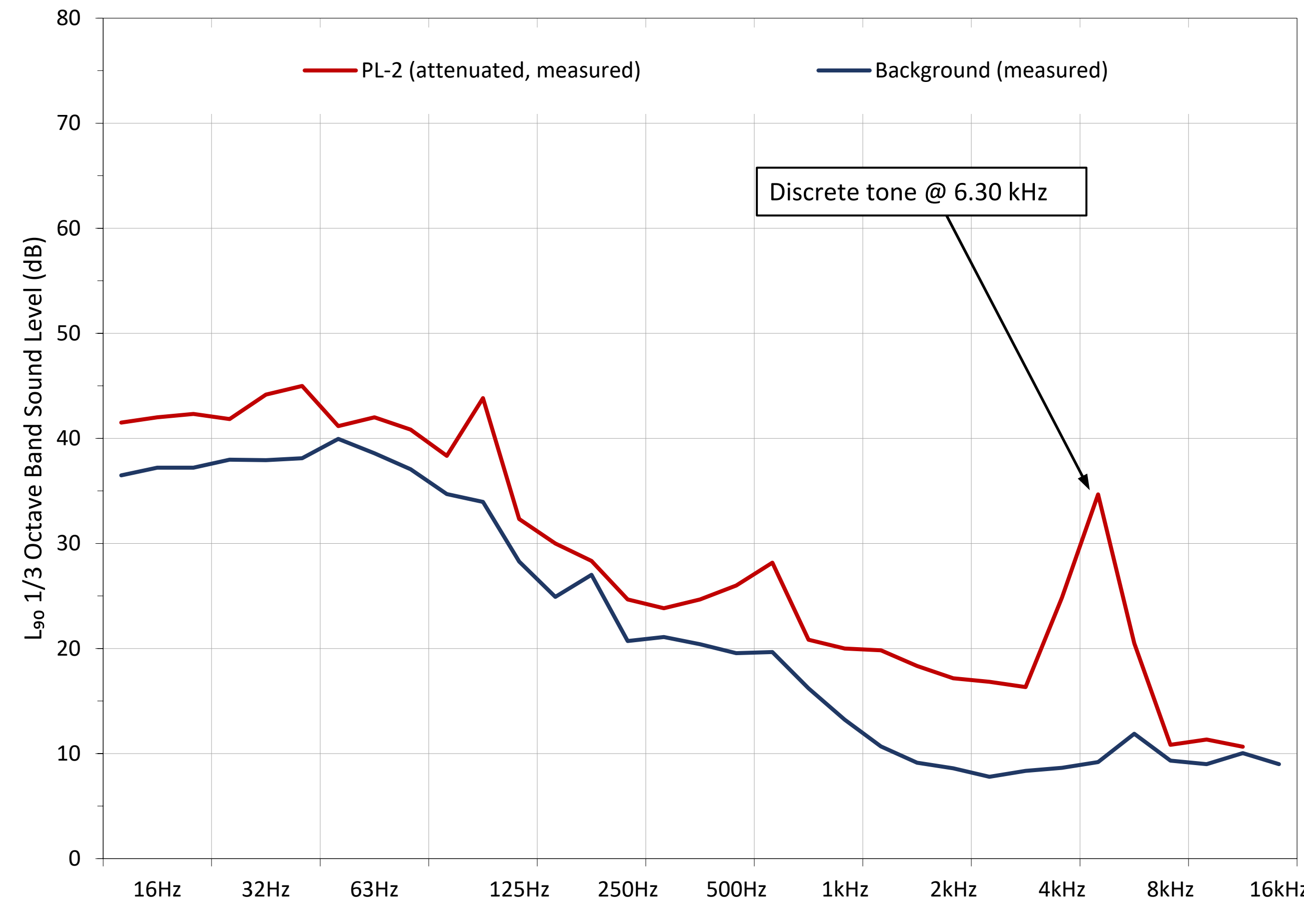
FIGURE NUMBER:

3

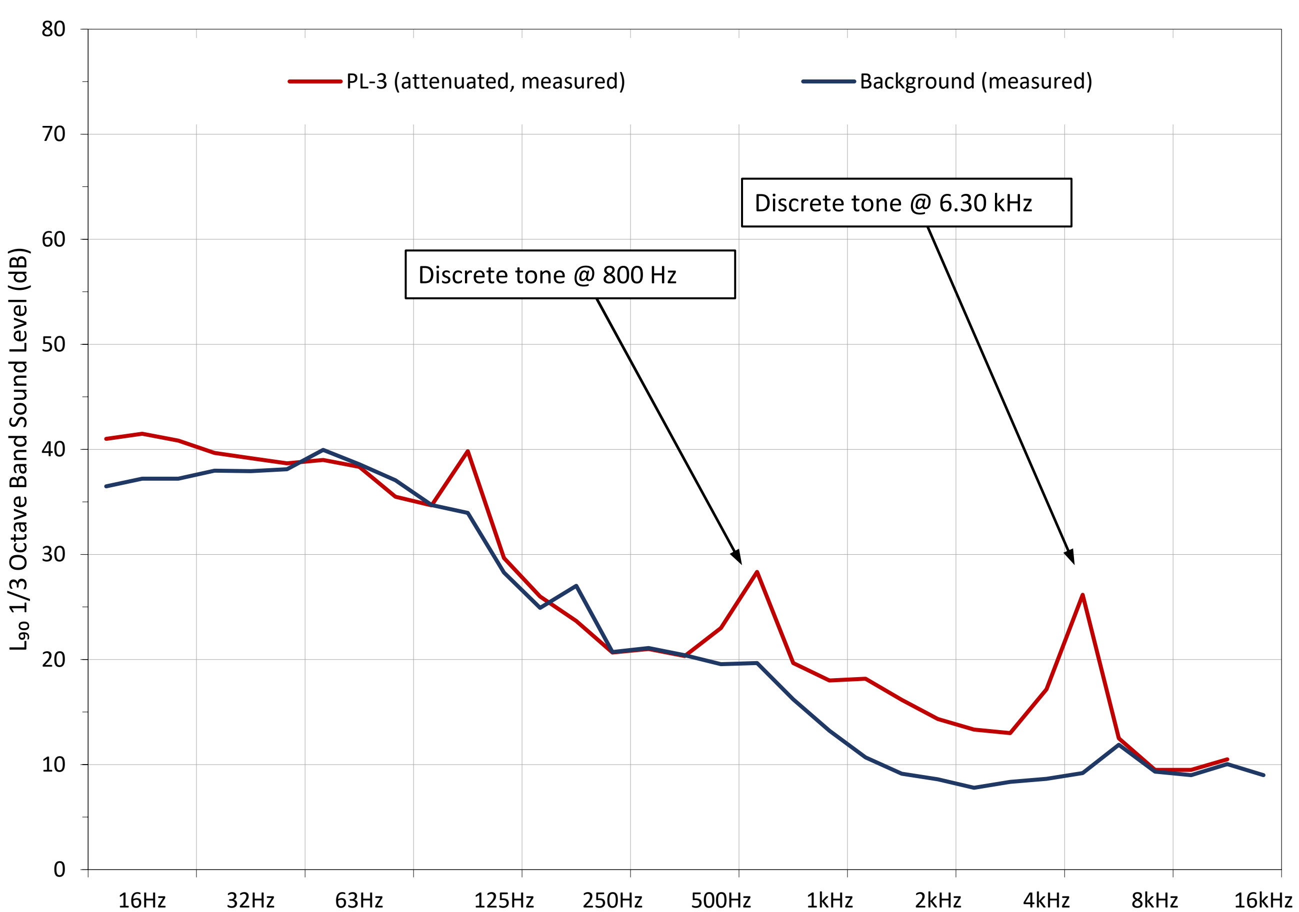
PL-1 – $L_{90}$ Spectrum Analysis




PL-2 – $L_{90}$ Spectrum Analysis




PL-3 – $L_{90}$ Spectrum Analysis




| | Frequency | dB Offset |
|---|---|---|
| 1/3 Octave Band Sound Pressure Level (dB) | 50 Hz | |
| | 63 Hz | |
| | 80 Hz | |
| | 100 Hz | 16.0 |
| | 125 Hz | 14.0 |
| | 160 Hz | 12.0 |
| | 200 Hz | 11.0 |
| | 250 Hz | 9.0 |
| | 315 Hz | 8.0 |
| | 500 Hz | 7.0 |
| | 500 Hz | 6.0 |
| | 630 Hz | 6.0 |
| | 800 Hz | 5.0 |
| | 1.00 kHz | 4.0 |
| | 1.25 kHz | 4.0 |
| | 1.50 kHz | 4.0 |
| | 2.00 kHz | 3.0 |
| | 2.50 kHz | 3.0 |
| | 3.20 kHz | 3.0 |
| | 4.00 kHz | 3.0 |
| | 5.00 kHz | 4.0 |
| | 6.30 kHz | 4.0 |
| | 8.00 kHz | 5.0 |
| | 10.0 kHz | 6.0 |
| | 12.5 kHz | |
| | 16.0 kHz | |
| | 20.0 kHz | |

CT DEEP, Noise Control Regulation R.S.C.A. §22a-69-1.2.(r)

A prominent discrete tone means the presence of acoustic energy concentrated in a narrow frequency range, including, but not limited to, an audible tone, which produces a one-third octave sound pressure level greater than that of either adjacent one-third octave and which exceeds the arithmetic average of the two adjacent one-third octave band levels by an amount greater than shown in the table opposite the center of frequency for the one-third octave band containing the concentration of acoustical energy.

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|---|---|
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| CHECKED BY: | PGR |
| DATE: | 04/09/2024 |

NOTES:

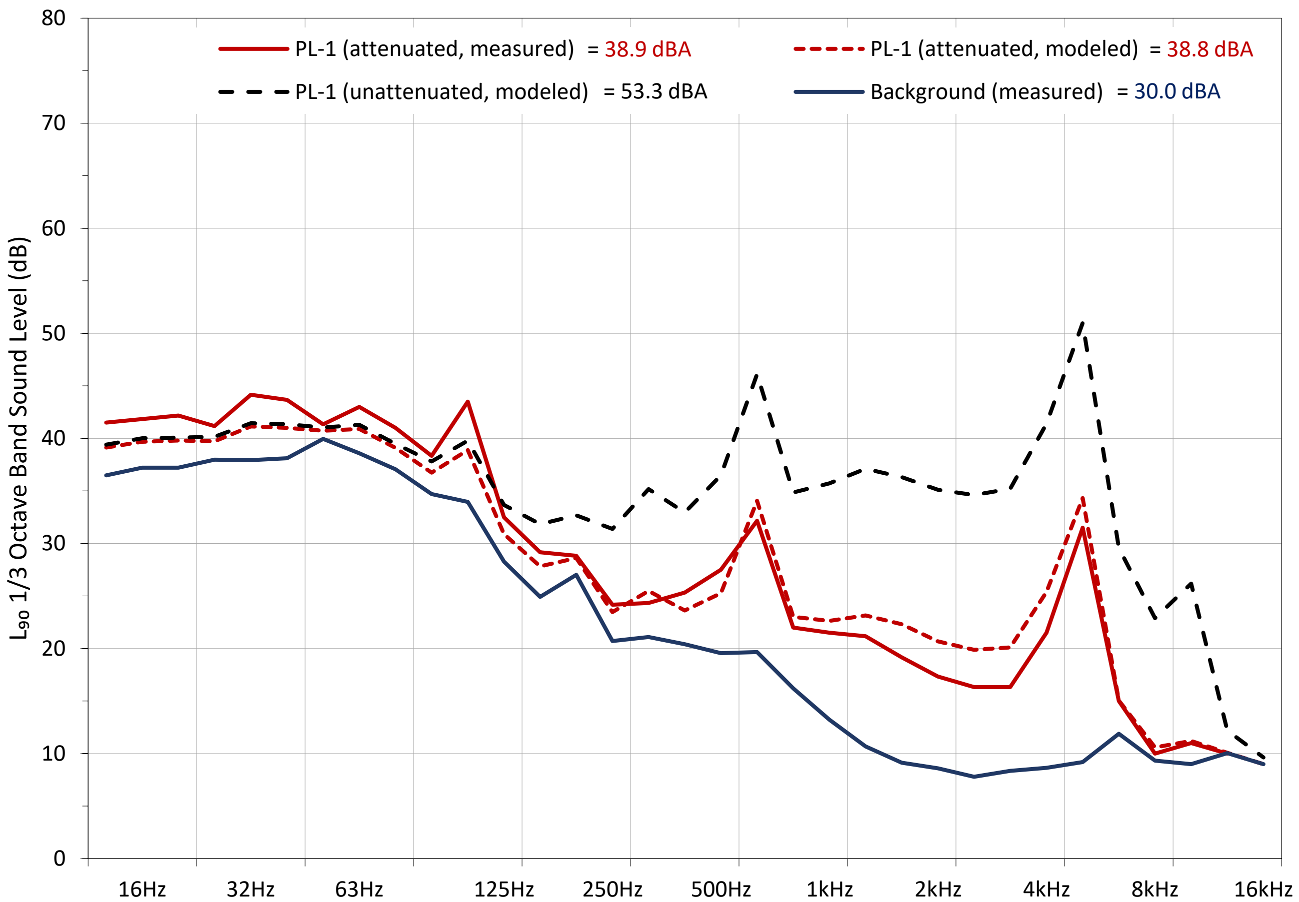
FIGURE TITLE:

MONITORING RESULTS
TONAL ANALYSIS

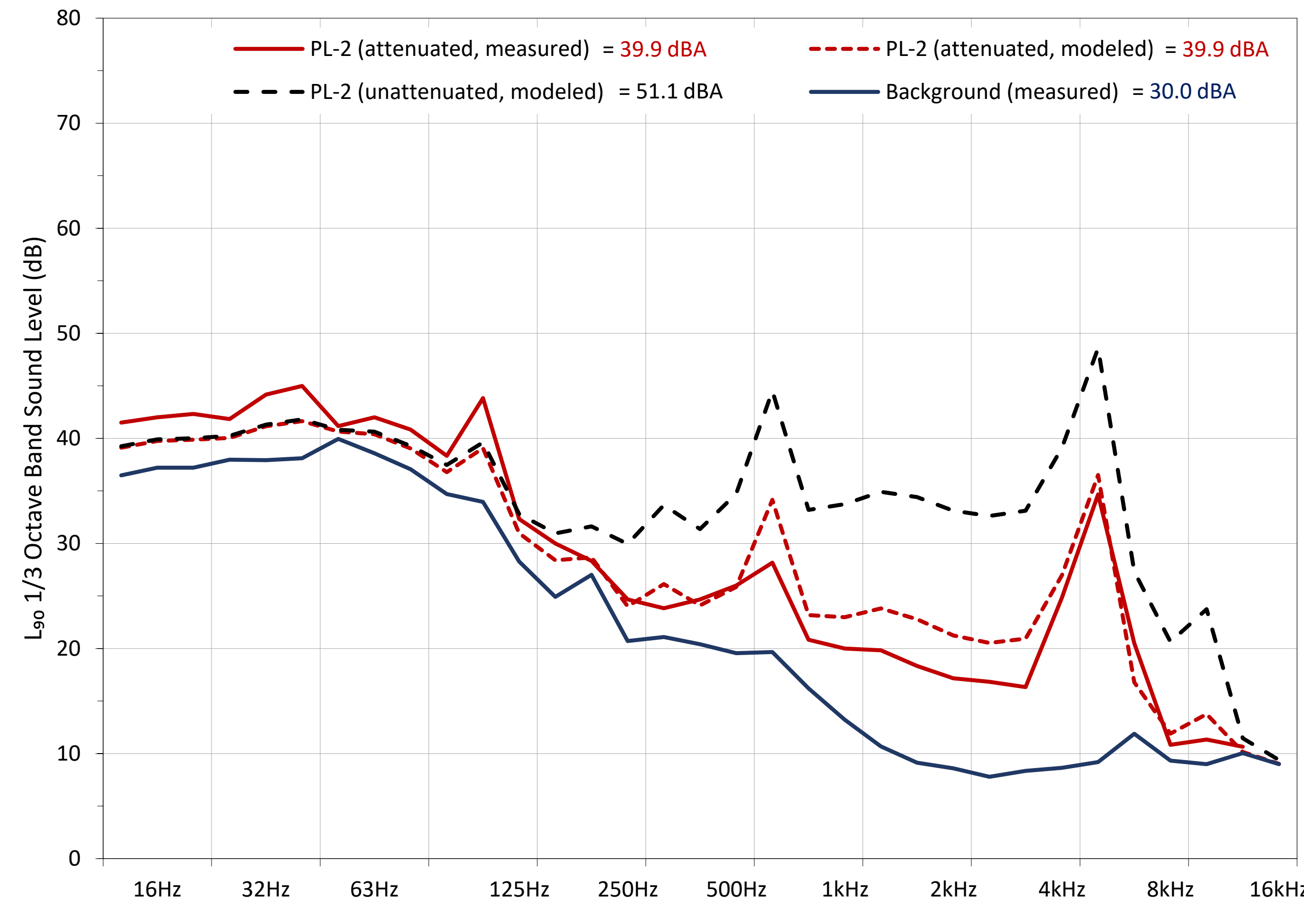
FIGURE NUMBER:

4

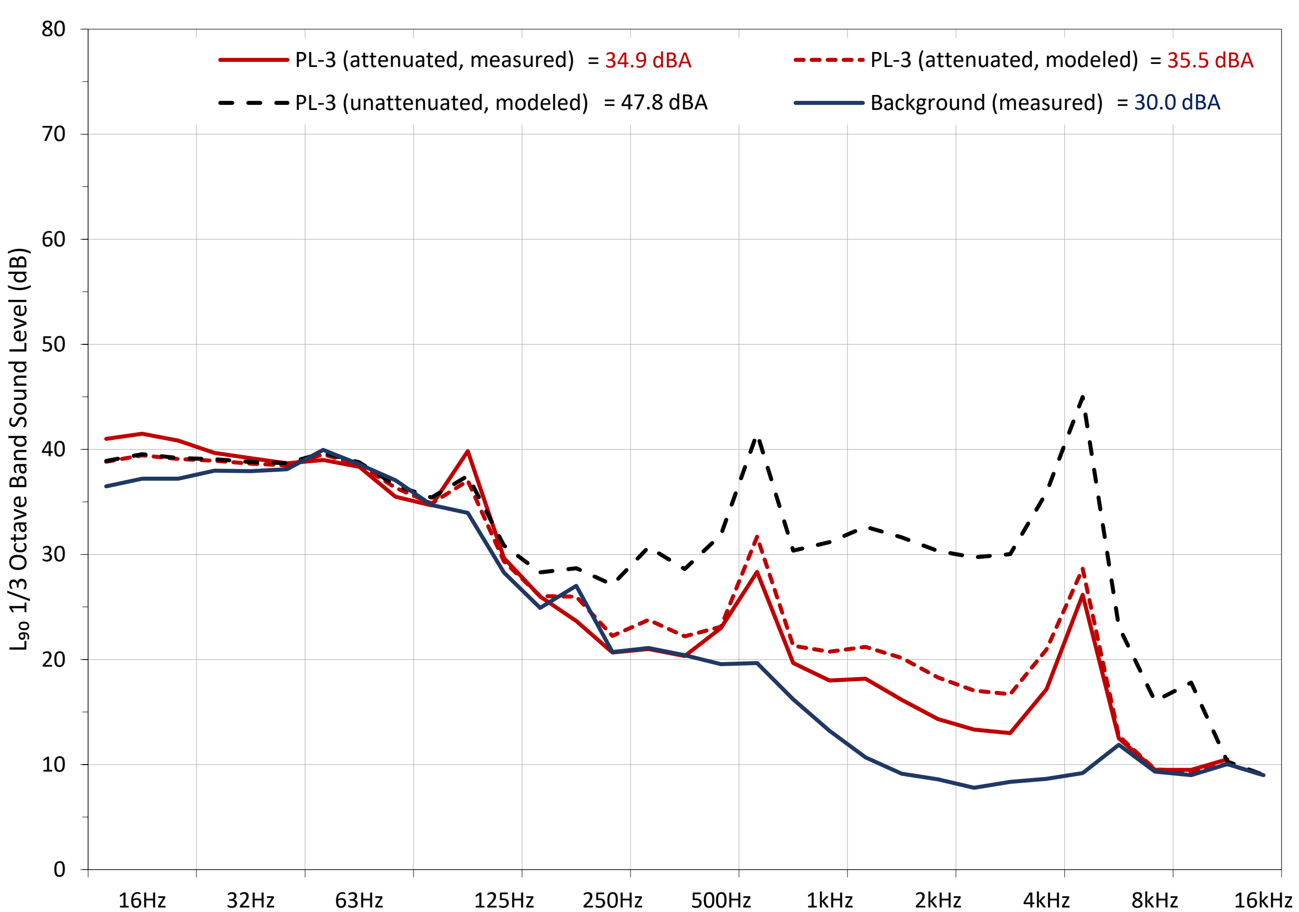
## PL-1 – $L_{90}$ Spectrum Analysis (with and without noise attenuation)



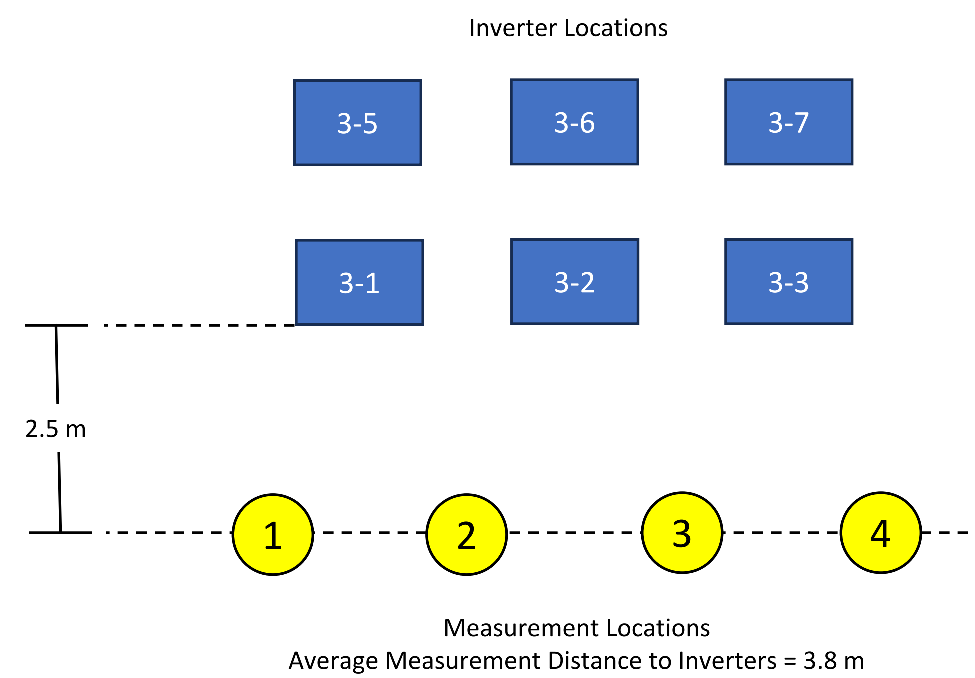

## PL-2 – $L_{90}$ Spectrum Analysis (with and without noise attenuation)




## PL-3 – $L_{90}$ Spectrum Analysis (with and without noise attenuation)




## SOLECTRIA DC–AC INVERTER MEASUREMENT ARRANGEMENT





**WSP USA INC.**
100 APOLLO DRIVE, SUITE 302
CHELMSFORD, MA 01824


CLIENT:

**NEXTERA ENERGY RESOURCES, LLC**
700 UNIVERSE BLVD.
JUNO BEACH, FL 33408

PROJECT:

**DG CONNECTICUT SOLAR III, LLC**
341 EAST ROAD
EAST WINDSOR, CT 06016

| | |
|---|---|
| PROJECT NO: | US0027174.6477 |
| REVISION: | 00 |
| DRAWN BY: | ARR |
| CHECKED BY: | PGR |
| DATE: | 04/09/2024 |

NOTES:

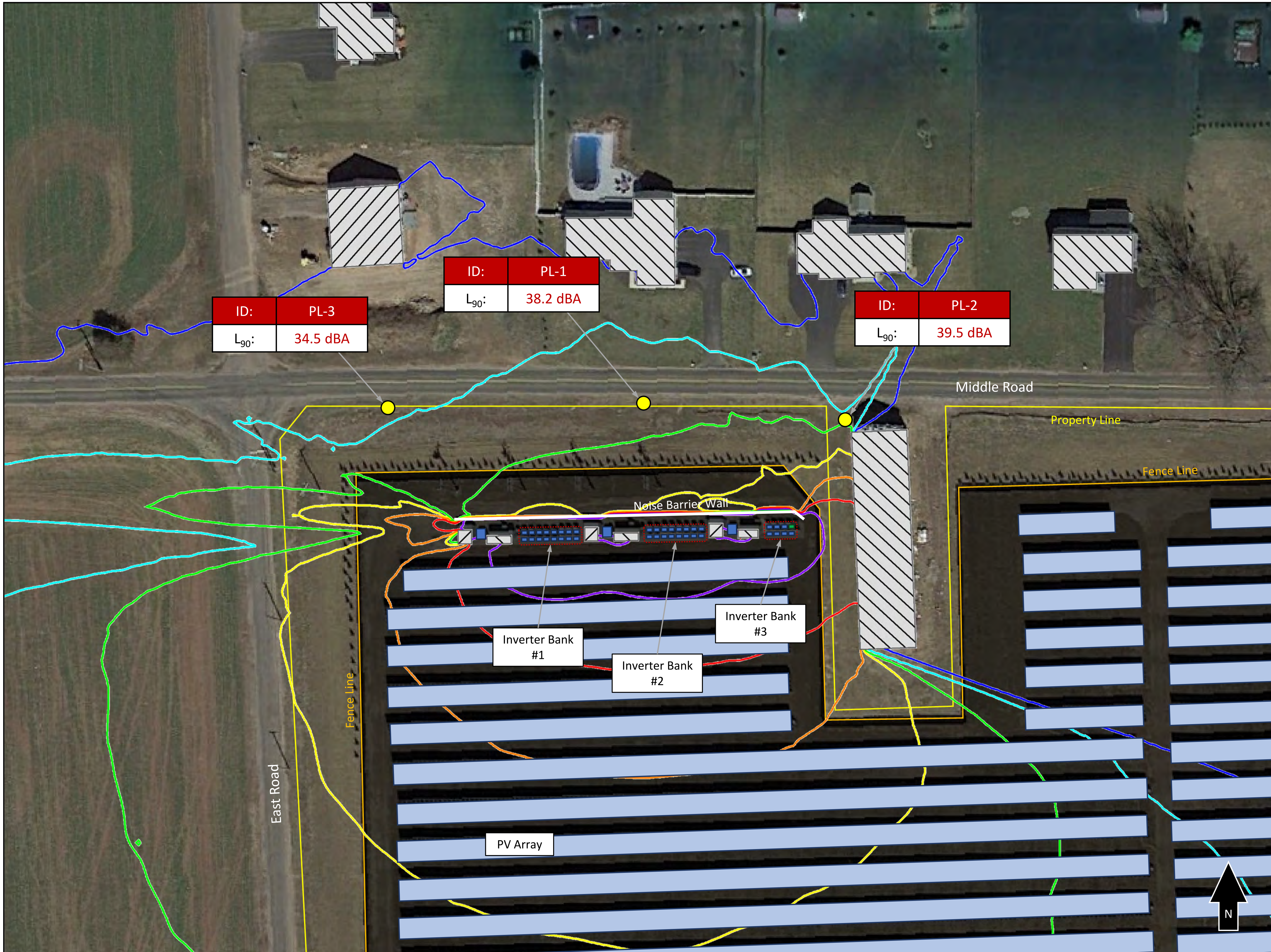
Discrete modeling receptors were chosen at the residential property line locations corresponding to where the community noise monitoring was conducted in order that direct comparison to existing (i.e., attenuated) noise levels could be assessed. First, the attenuated sound levels were calculated at the three (3) property line locations based on simultaneous operation of all forty (40) DC-AC inverters and the modeled results were compared to ensure good agreement with the measured sound level values. Then, the sound barrier wall was removed from the model and the unattenuated sound levels were re-calculated at the three (3) property line locations. The difference between the two (2) modeling scenarios attenuated and unattenuated provides the effectiveness of the sound barrier wall at reducing property line sound levels.

FIGURE TITLE:

MODELING RESULTS
SPECTRUM ANALYSIS

FIGURE NUMBER:

5





**WSP USA INC.**
100 APOLLO DRIVE, SUITE 302
CHELMSFORD, MA 01824


CLIENT:

**NEXTERA ENERGY RESOURCES, LLC**
700 UNIVERSE BLVD.
JUNO BEACH, FL 33408

PROJECT:

**DG CONNECTICUT SOLAR III, LLC**
341 EAST ROAD
EAST WINDSOR, CT 06016

| | |
|---|---|
| PROJECT NO: | US0027174.6477 |
| REVISION: | 00 |
| DRAWN BY: | ARR |
| CHECKED BY: | PGR |
| DATE: | 04/09/2024 |

SCALE:

0 20 40
METERS

CONTOUR LEVELS (dBA):

| | | |
|---|---|---|
| Blue | 30 | |
| Cyan | 35 | |
| Green | 40 | |
| Yellow | 45 | |
| Orange | 50 | |
| Red | 55 | ◄ 55 dBA = Tone Limit |
| Purple | 60 | ◄ 61 dBA = Class C Limit |

NOTES:

SPL = Sound Pressure Level
dBA = A-Weighted Decibels

CT DEEP Noise Control Regulation (RCSA §22a-69) prohibits excessive daytime at property line that exceeds the following:

- Class C -to- Class A = 61 dBA
- Class C -to- Class A = 56 dBA (when a discrete pure tone is present)

FIGURE TITLE:

SOUNDPLAN MODELING RESULTS SUMMARY

FIGURE NUMBER:

6

## Attachment C

Sound Level Monitoring Field Notes and Results

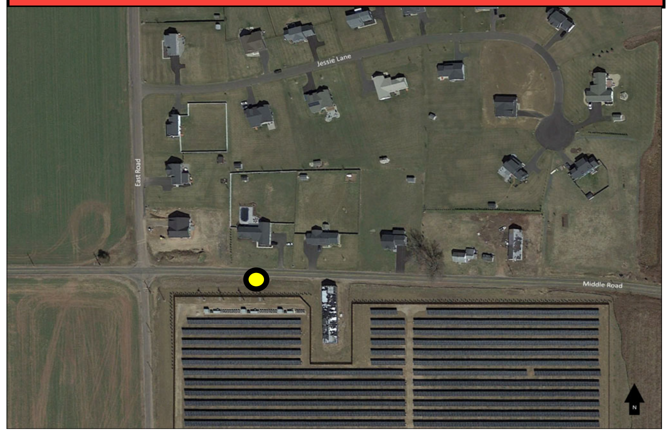
**WSP USA Inc.**
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

| LOCATION INFORMATION | |
|---|---|
| Location ID: | PL-1 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 9:55:06 AM |
| End Time: | 10:25:06 AM |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 57 °F |
| Wind Speed: | 0 - 3 mph |
| Direction: | n/a |
| Humidity: | 45% |
| Sky Type: | Clear |
| Precipitation: | n/a |

LOCATION SKETCH



| GENERAL SOUND SOURCES (order by most prominent) | |
|---|---|
| 1) | DC-AC inverters (high-pitch, constant) |
| 2) | Natural sounds (e.g., birds) |
| 3) | Distant vehicle engine (NE)* |
| 4) | Vehicles passing on Middle Rd. |
| 5) | |

MONITORING NOTES / EVENTS

| Event Description: | Number of Instances, Start Time, End Time: |
|---|---|
| Heavy Truck on Middle Rd. | 10:03 |
| Heavy Truck on East Rd. | 10:12 |
| Airplane (high altitude) | 10:21-10:22 |
| | |
| | |
| | |
| | |

TRAFFIC COUNT (nearest roadway)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Middle Rd. | 9:55 AM | 9:56 AM | 9:57 AM | 9:58 AM | 9:59 AM | 10:00 AM | 10:01 AM | 10:02 AM | 10:03 AM | 10:04 AM |
| | | 1 | 1 | | | | | | 1 | |
| | 10:05 AM | 10:06 AM | 10:07 AM | 10:08 AM | 10:09 AM | 10:10 AM | 10:11 AM | 10:12 AM | 10:13 AM | 10:14 AM |
| | | | 1 | 1 | | | | 1 | 1 | |
| | 10:15 AM | 10:16 AM | 10:17 AM | 10:18 AM | 10:19 AM | 10:20 AM | 10:21 AM | 10:22 AM | 10:23 AM | 10:24 AM |
| | | 2 | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

OTHER COMMENTS

Distant engine (maybe a dirty bike) was barely noticable at PL-1, more so at PL-2.

**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | PL-1 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 9:55:06 AM |
| End Time: | 10:25:06 AM |

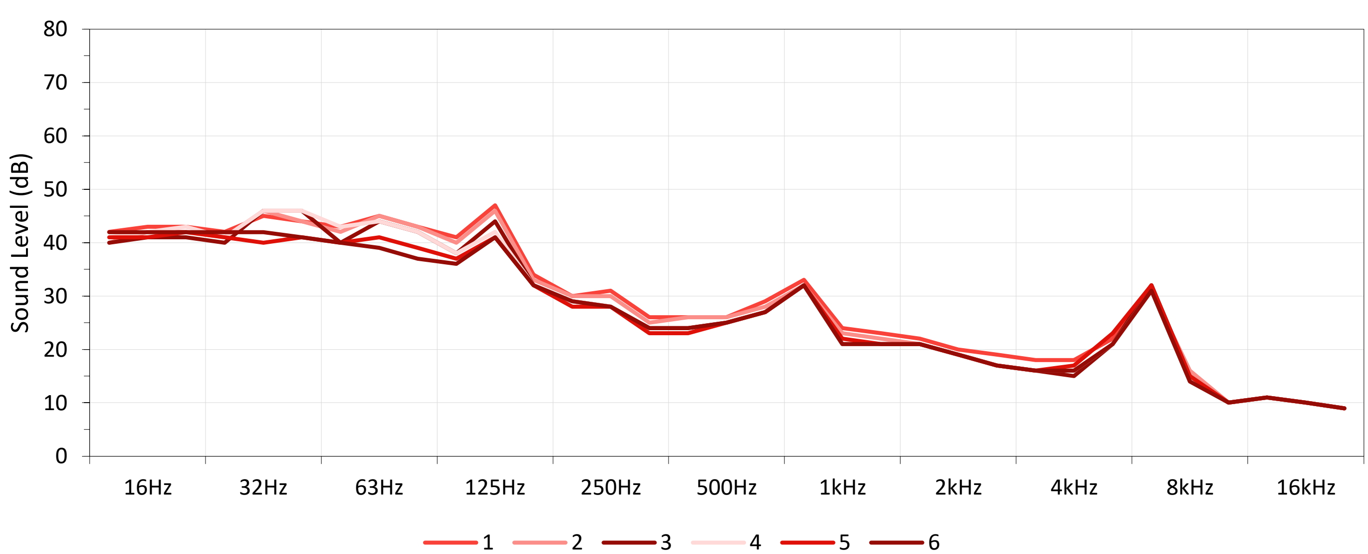
MONITOR PHOTO

| SUMMARY INFORMATION | |
|---|---|
| Duration: | 00:30:00 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 9:51:59 AM |
| Cal. (After): | 10:25:43 AM |
| Cal. Drift: | -0.1 |

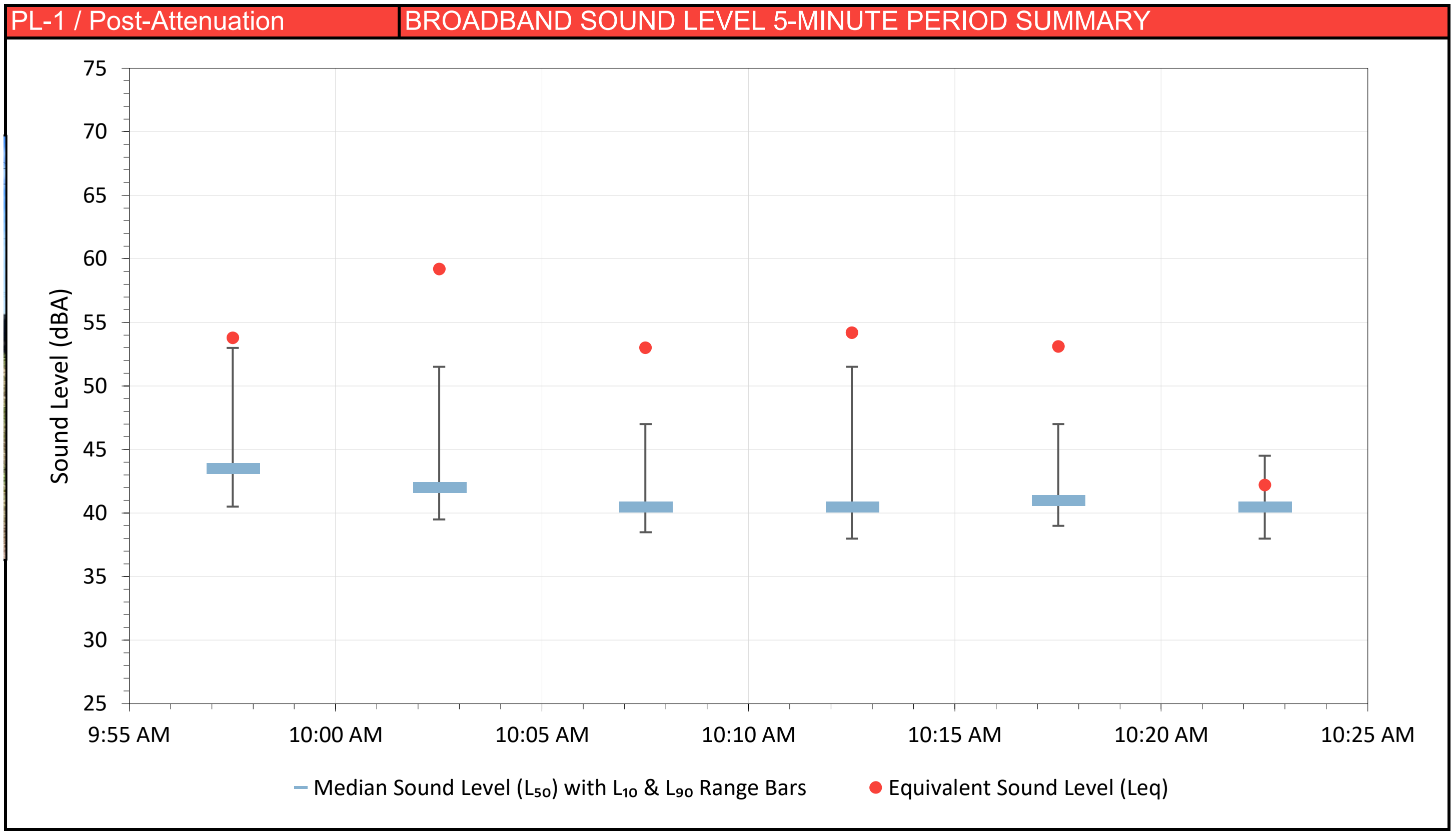
RESULTS SUMMARY

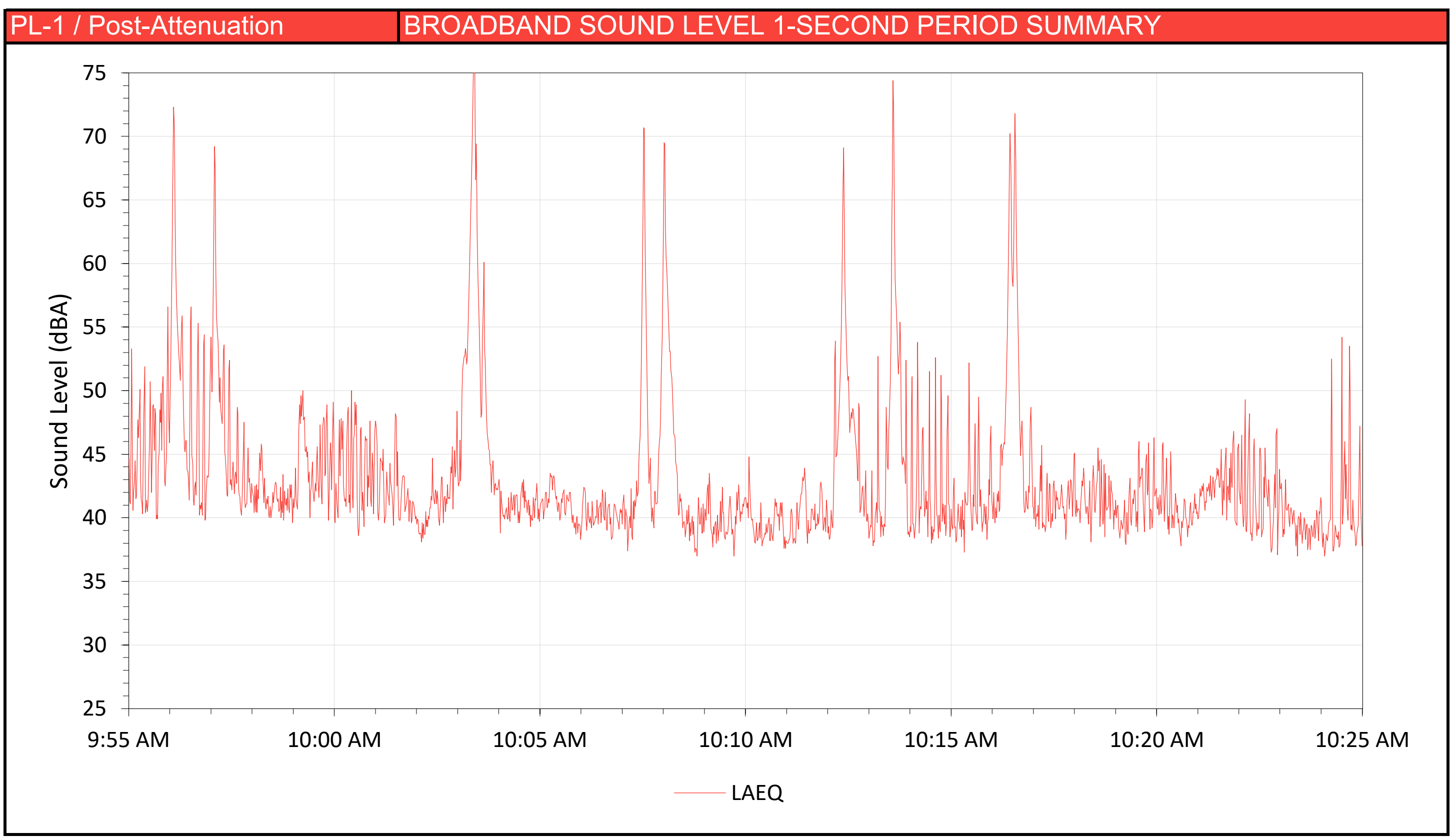
| | | Cumulative Results | | | |
|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 54.0 | 55.9 | 51.6 | 48.1 |
| | 63 Hz: | 54.3 | 54.4 | 49.7 | 46.7 |
| | 125 Hz: | 52.4 | 50.7 | 47.2 | 44.9 |
| | 250 Hz: | 49.0 | 42.7 | 35.1 | 32.7 |
| | 500 Hz: | 49.7 | 40.7 | 32.5 | 30.7 |
| | 1 kHz: | 51.3 | 43.2 | 34.5 | 32.9 |
| | 2 kHz: | 47.2 | 38.3 | 26.3 | 24.3 |
| | 4 kHz: | 42.9 | 40.3 | 28.9 | 23.6 |
| | 8 kHz: | 38.3 | 39.1 | 35.6 | 31.6 |
| **Broadband (dBA):** | | **54.7** | **49.4** | **41.3** | **38.9** |

PL-1 / Post-Attenuation — LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY

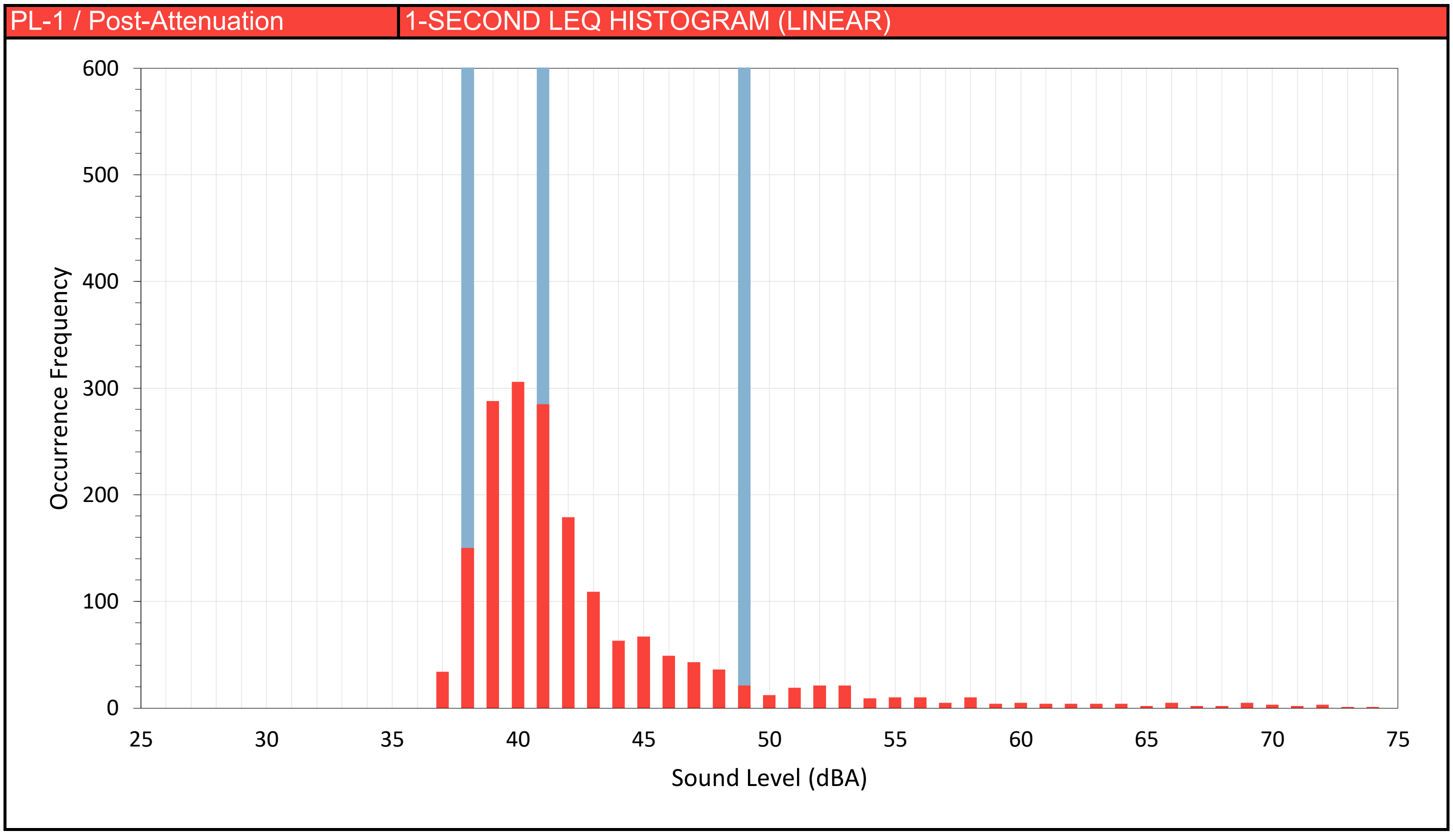


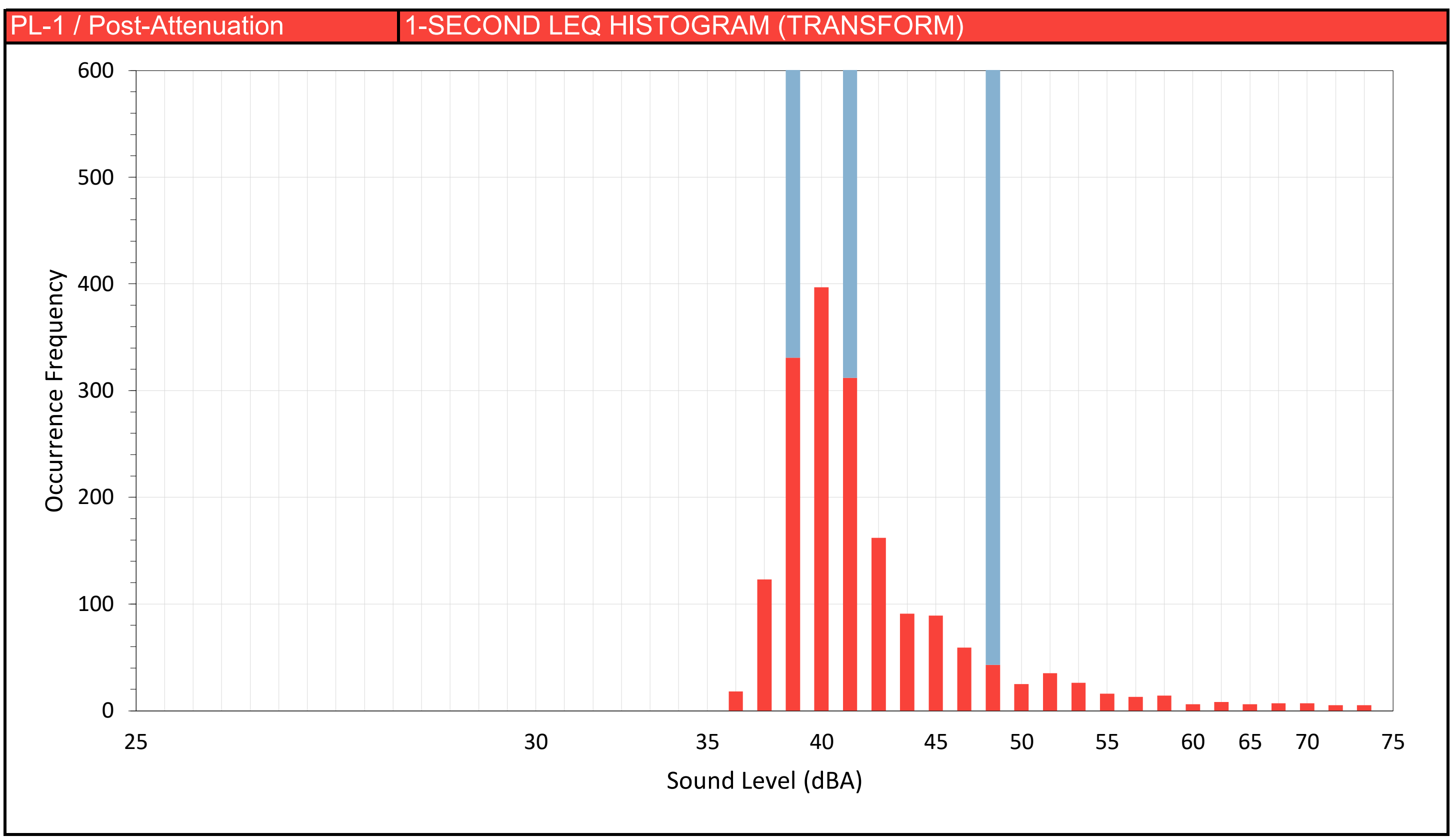
## Environmental Noise Monitoring Summary Charts



**Environmental Noise Monitoring Distribution Charts**



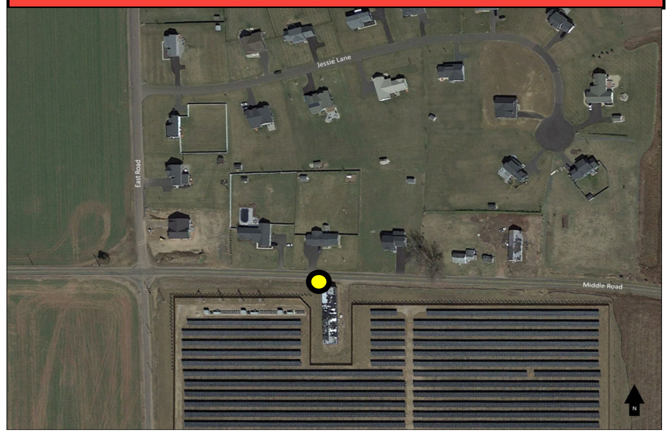
**WSP USA Inc.**
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

| LOCATION INFORMATION | |
|---|---|
| Location ID: | PL-2 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 10:00:03 AM |
| End Time: | 10:30:03 AM |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 57 °F |
| Wind Speed: | 0 - 3 mph |
| Direction: | n/a |
| Humidity: | 45% |
| Sky Type: | Clear |
| Precipitation: | n/a |

LOCATION SKETCH




| GENERAL SOUND SOURCES (order by most prominent) | |
|---|---|
| 1) | DC-AC inverters (high-pitch, constant) |
| 2) | Natural sounds (e.g., birds) |
| 3) | Distant vehicle engine (NE) - see monitoring notes for periods when engine was inaudible |
| 4) | Vehicles passing on Middle Rd. |
| 5) | |

| MONITORING NOTES / EVENTS | |
|---|---|
| Event Description: | Number of Instances, Start Time, End Time: |
| Heavy Truck on Middle Rd. | 10:03 |
| Engine (NE), audible | 10:00-10:08, 10:13-10:21 |
| Heavy Truck on East Rd. | 10:12 |
| Airplane (high altitude) | 10:21-10:22 |
| Person shouting on Jesse Ln. | 10:26-10:27 |
| | |
| | |

TRAFFIC COUNT (nearest roadway)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Middle Rd. | 10:00 AM | 10:01 AM | 10:02 AM | 10:03 AM | 10:04 AM | 10:05 AM | 10:06 AM | 10:07 AM | 10:08 AM | 10:09 AM |
| | | | | 1 | | | | 1 | 1 | |
| | 10:10 AM | 10:11 AM | 10:12 AM | 10:13 AM | 10:14 AM | 10:15 AM | 10:16 AM | 10:17 AM | 10:18 AM | 10:19 AM |
| | | | 1 | 1 | | | 2 | | | |
| | 10:20 AM | 10:21 AM | 10:22 AM | 10:23 AM | 10:24 AM | 10:25 AM | 10:26 AM | 10:27 AM | 10:28 AM | 10:29 AM |
| | | 2 | | | | | | | 1 | 1 |
| | | | | | | | | | | |
| | | | | | | | | | | |

OTHER COMMENTS

Distant engine (maybe a dirty bike) was somewhat noticable at PL-2, but not constant.

**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | PL-2 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 10:00:03 AM |
| End Time: | 10:30:03 AM |

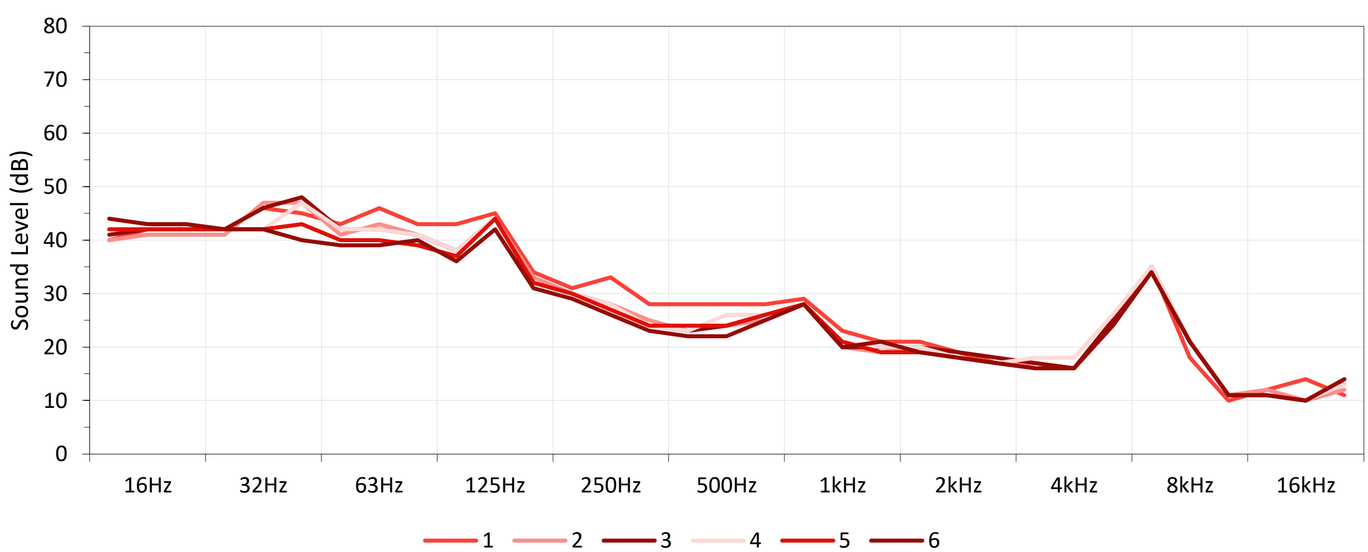
MONITOR PHOTO

| SUMMARY INFORMATION | |
|---|---|
| Duration: | 00:30:00 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 9:58:29 AM |
| Cal. (After): | 10:32:38 AM |
| Cal. Drift: | -0.1 |

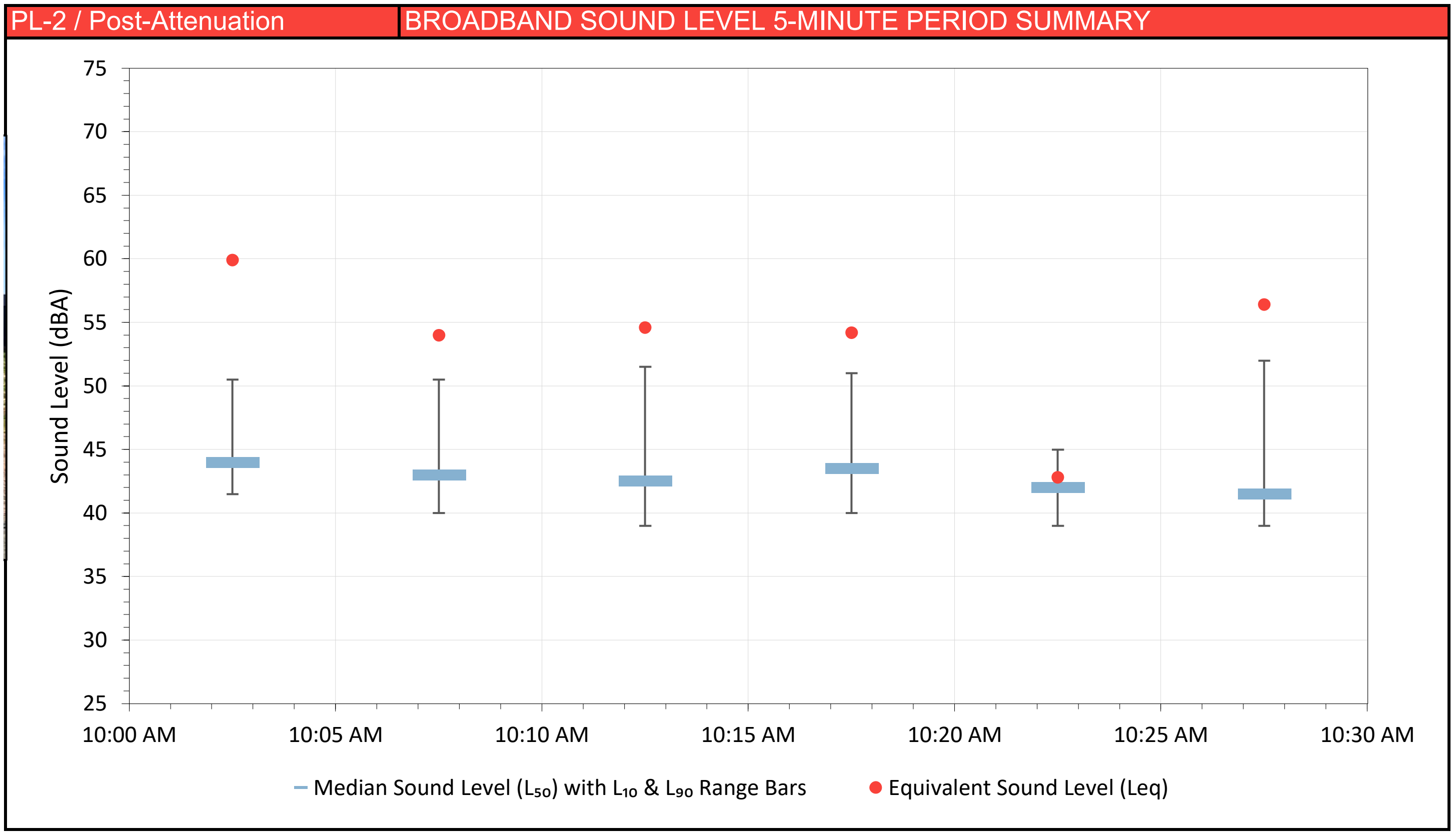
RESULTS SUMMARY

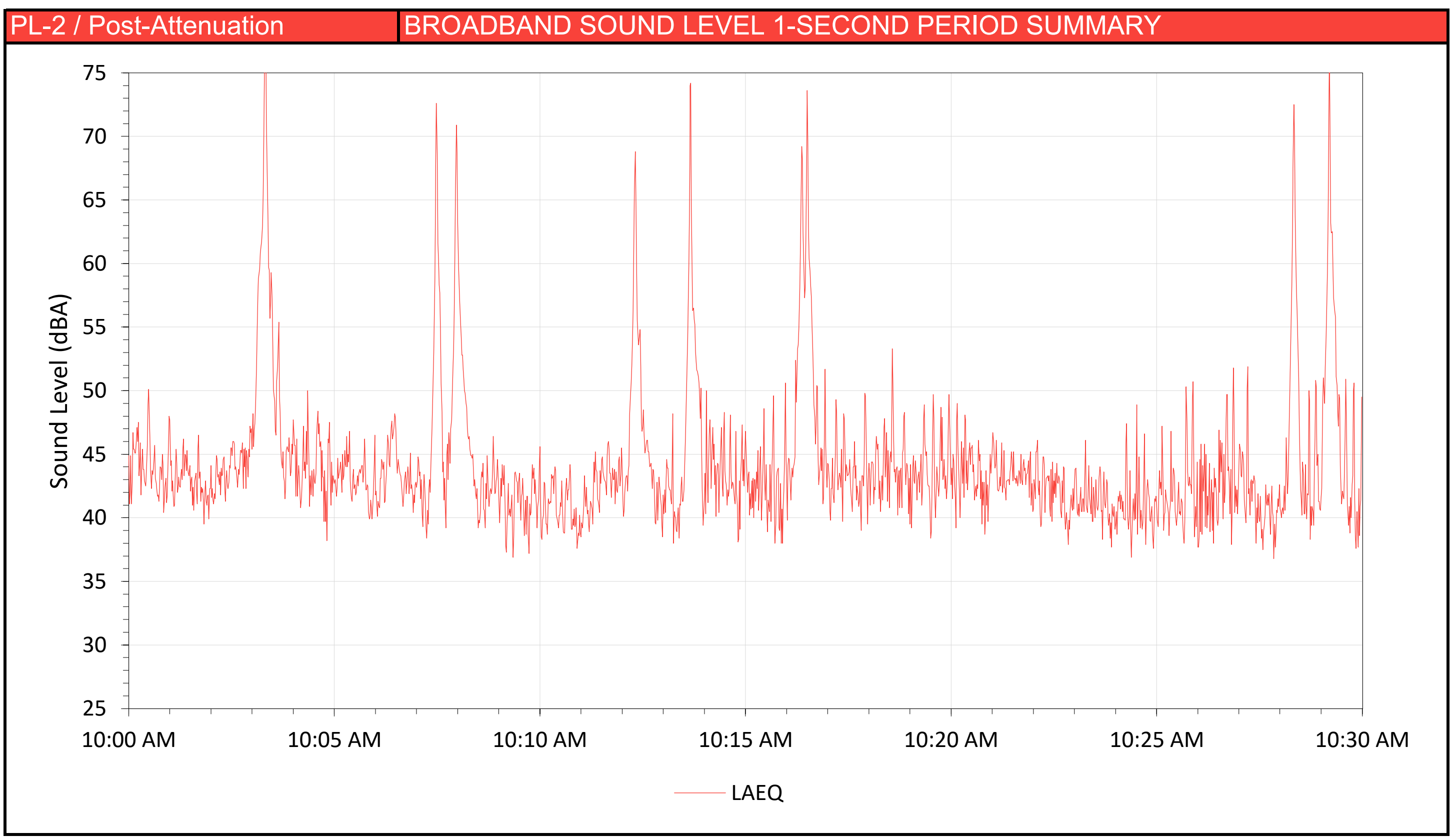
| | | Cumulative Results | | | |
|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 56.2 | 58.5 | 52.8 | 48.9 |
| | 63 Hz: | 55.2 | 55.4 | 49.6 | 46.2 |
| | 125 Hz: | 53.6 | 51.2 | 47.3 | 45.2 |
| | 250 Hz: | 49.8 | 43.7 | 35.7 | 33.0 |
| | 500 Hz: | 50.4 | 41.3 | 32.4 | 29.7 |
| | 1 kHz: | 52.6 | 43.1 | 31.9 | 29.4 |
| | 2 kHz: | 48.0 | 39.4 | 26.1 | 23.4 |
| | 4 kHz: | 42.6 | 40.9 | 31.0 | 26.0 |
| | 8 kHz: | 40.8 | 43.1 | 39.3 | 34.9 |
| **Broadband (dBA):** | | **55.7** | **49.7** | **43.0** | **39.9** |

PL-2 / Post-Attenuation — LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY



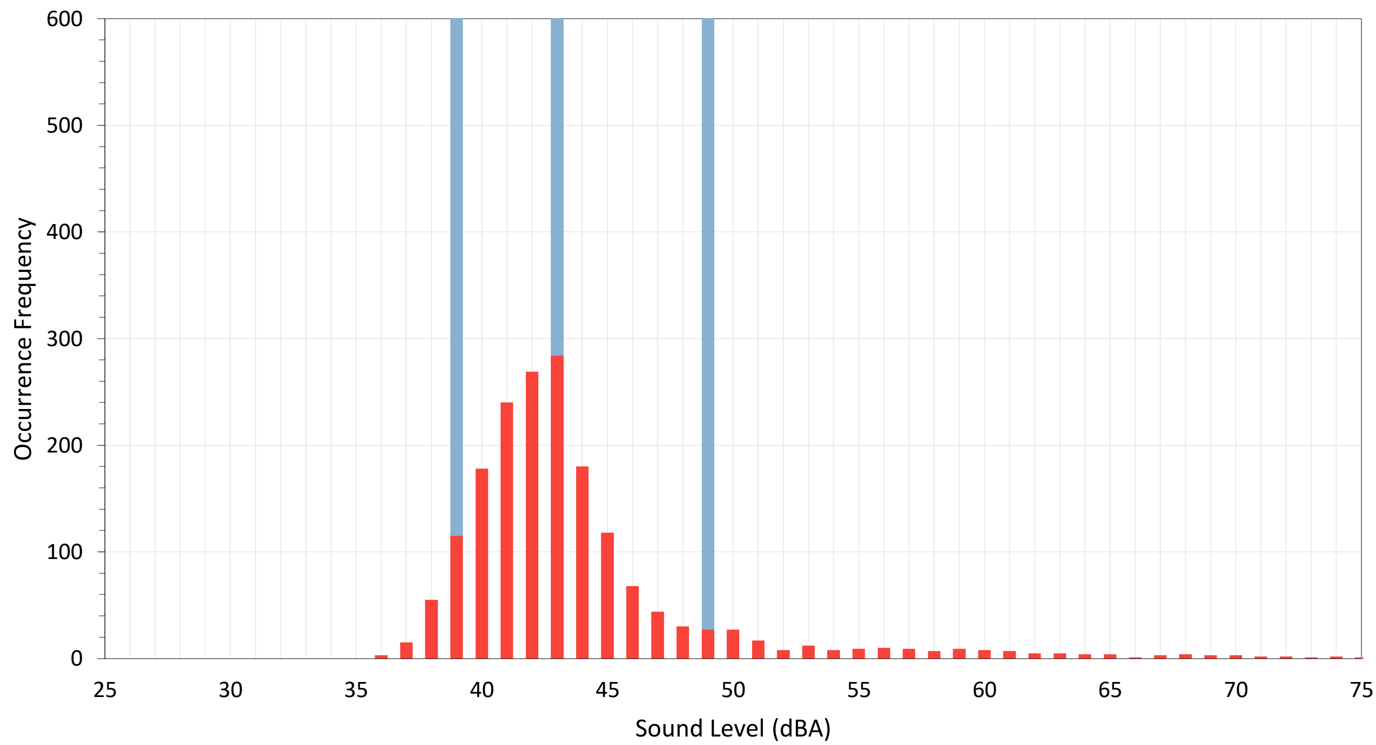
**Environmental Noise Monitoring Summary Charts**



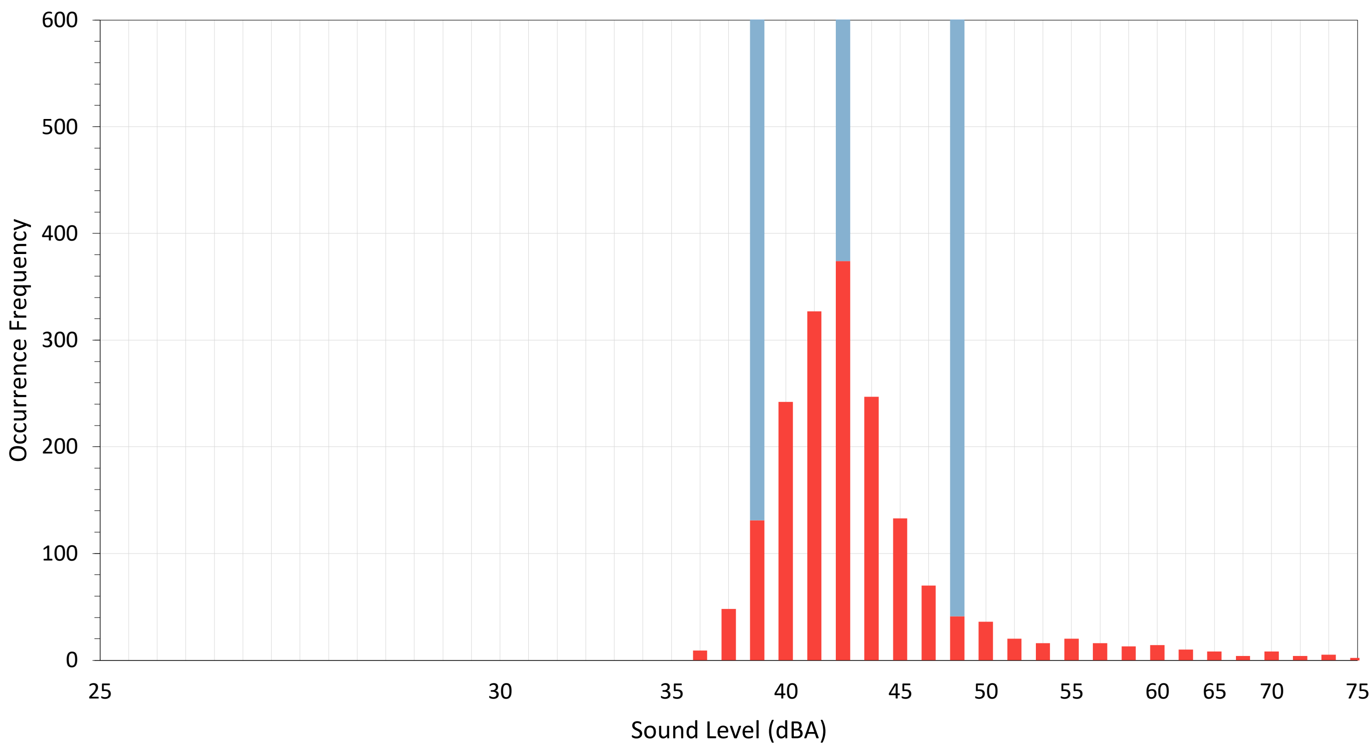



## Environmental Noise Monitoring Distribution Charts

| PL-2 / Post-Attenuation | 1-SECOND LEQ HISTOGRAM (LINEAR) |
| --- | --- |




| PL-2 / Post-Attenuation | 1-SECOND LEQ HISTOGRAM (TRANSFORM) |
| --- | --- |



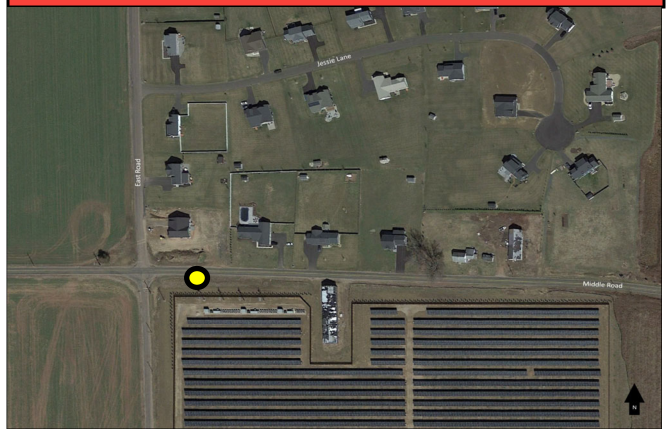
**WSP USA Inc.**
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

| LOCATION INFORMATION | |
|---|---|
| Location ID: | PL-3 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 10:30:06 AM |
| End Time: | 11:00:06 AM |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 59 °F |
| Wind Speed: | 0 - 3 mph |
| Direction: | n/a |
| Humidity: | 42% |
| Sky Type: | Clear |
| Precipitation: | n/a |

LOCATION SKETCH



| GENERAL SOUND SOURCES (order by most prominent) | |
|---|---|
| 1) | DC-AC inverters (high-pitch, constant) |
| 2) | Natural sounds (e.g., birds) |
| 3) | Vehicles passing on Middle Rd. |
| 4) | |
| 5) | |

MONITORING NOTES / EVENTS

| Event Description: | Number of Instances, Start Time, End Time: |
|---|---|
| Airplane (high altitude) | 10:30, 10:44, 10:56, 10:59 |
| Vehicle turning on East Rd. | 10:42, 10:52, 10:55, 10:58 |
| Heavy Truck on Middle Rd. | 10:42 |
| Train Horn (very distant) | 10:47 |
| | |
| | |
| | |

TRAFFIC COUNT (nearest roadway)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Middle Rd. | 10:30 AM | 10:31 AM | 10:32 AM | 10:33 AM | 10:34 AM | 10:35 AM | 10:36 AM | 10:37 AM | 10:38 AM | 10:39 AM |
| | 1 | | 2 | | | | | | | |
| | 10:40 AM | 10:41 AM | 10:42 AM | 10:43 AM | 10:44 AM | 10:45 AM | 10:46 AM | 10:47 AM | 10:48 AM | 10:49 AM |
| | | 1 | 1 | | 1 | | | | | |
| | 10:50 AM | 10:51 AM | 10:52 AM | 10:53 AM | 10:54 AM | 10:55 AM | 10:56 AM | 10:57 AM | 10:58 AM | 10:59 AM |
| | 1 | | | | | | 1 | 1 | 1 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

OTHER COMMENTS

Unobserved sound occurred 10:37-10:40, during period when A. Roland was setting up monitor at FL-1.
Negligible effect on L90. Suspected to be a cricket / cicada located nearby the monitor based on 4 kHz frequency.

**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | PL-3 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 10:30:06 AM |
| End Time: | 11:00:06 AM |

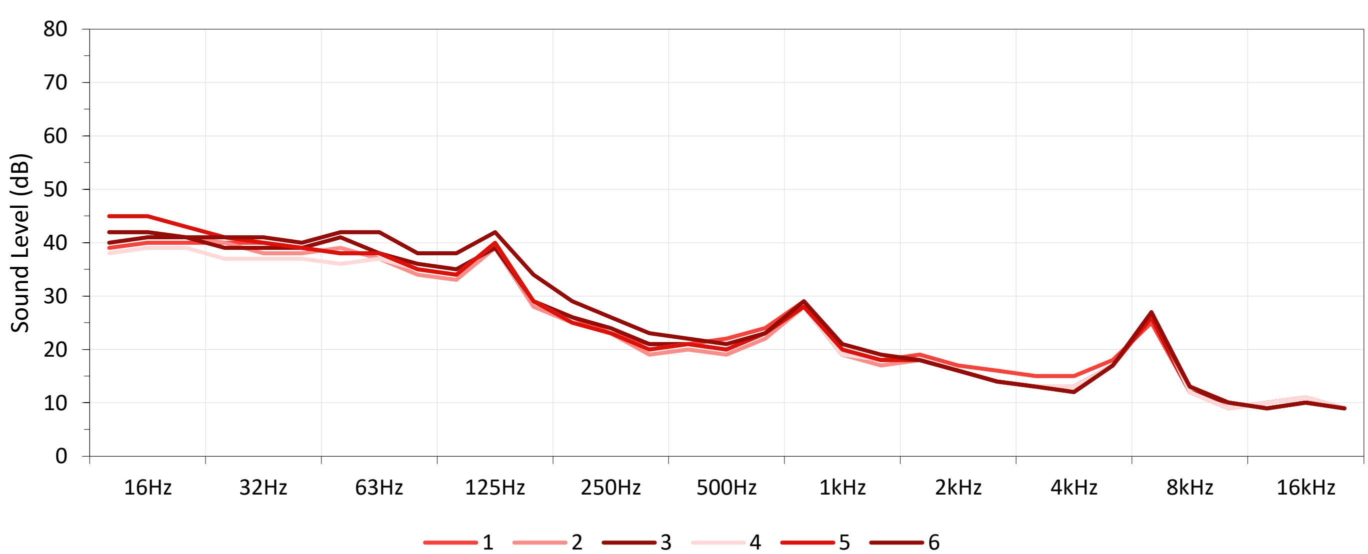
MONITOR PHOTO

| SUMMARY INFORMATION | |
|---|---|
| Duration: | 00:30:00 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 10:29:43 AM |
| Cal. (After): | 11:00:25 AM |
| Cal. Drift: | 0.1 |

RESULTS SUMMARY

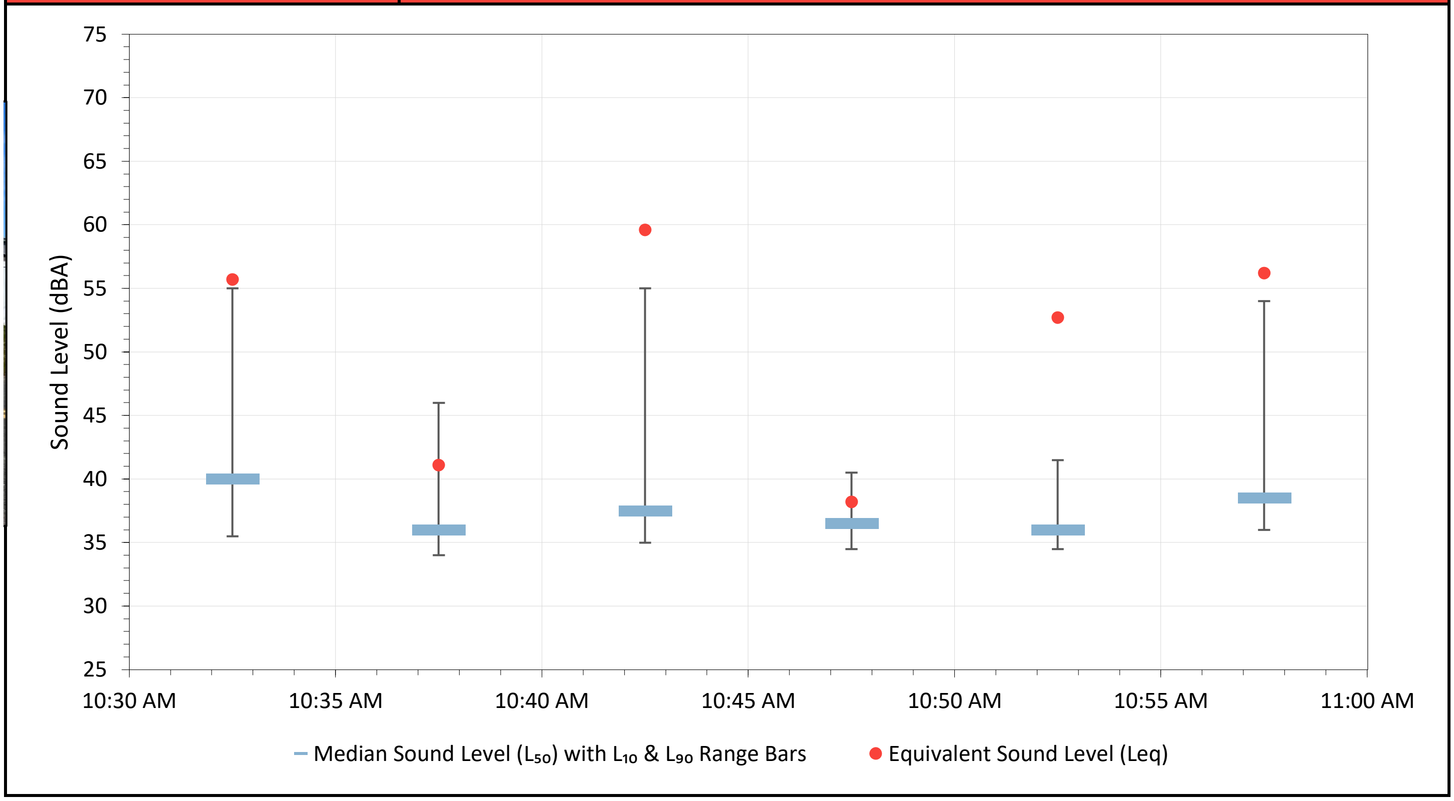
| | | Cumulative Results | | | |
|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 54.9 | 55.7 | 49.1 | 44.0 |
| | 63 Hz: | 59.7 | 53.6 | 46.9 | 42.7 |
| | 125 Hz: | 54.6 | 49.9 | 43.8 | 41.3 |
| | 250 Hz: | 51.2 | 42.6 | 32.6 | 28.7 |
| | 500 Hz: | 49.3 | 39.2 | 28.7 | 26.4 |
| | 1 kHz: | 52.0 | 42.2 | 30.7 | 29.2 |
| | 2 kHz: | 47.5 | 38.9 | 24.0 | 21.3 |
| | 4 kHz: | 41.1 | 38.2 | 24.0 | 19.7 |
| | 8 kHz: | 34.7 | 34.3 | 30.6 | 26.4 |
| **Broadband (dBA):** | | **55.0** | **49.8** | **37.1** | **34.9** |

PL-3 / Post-Attenuation — LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY

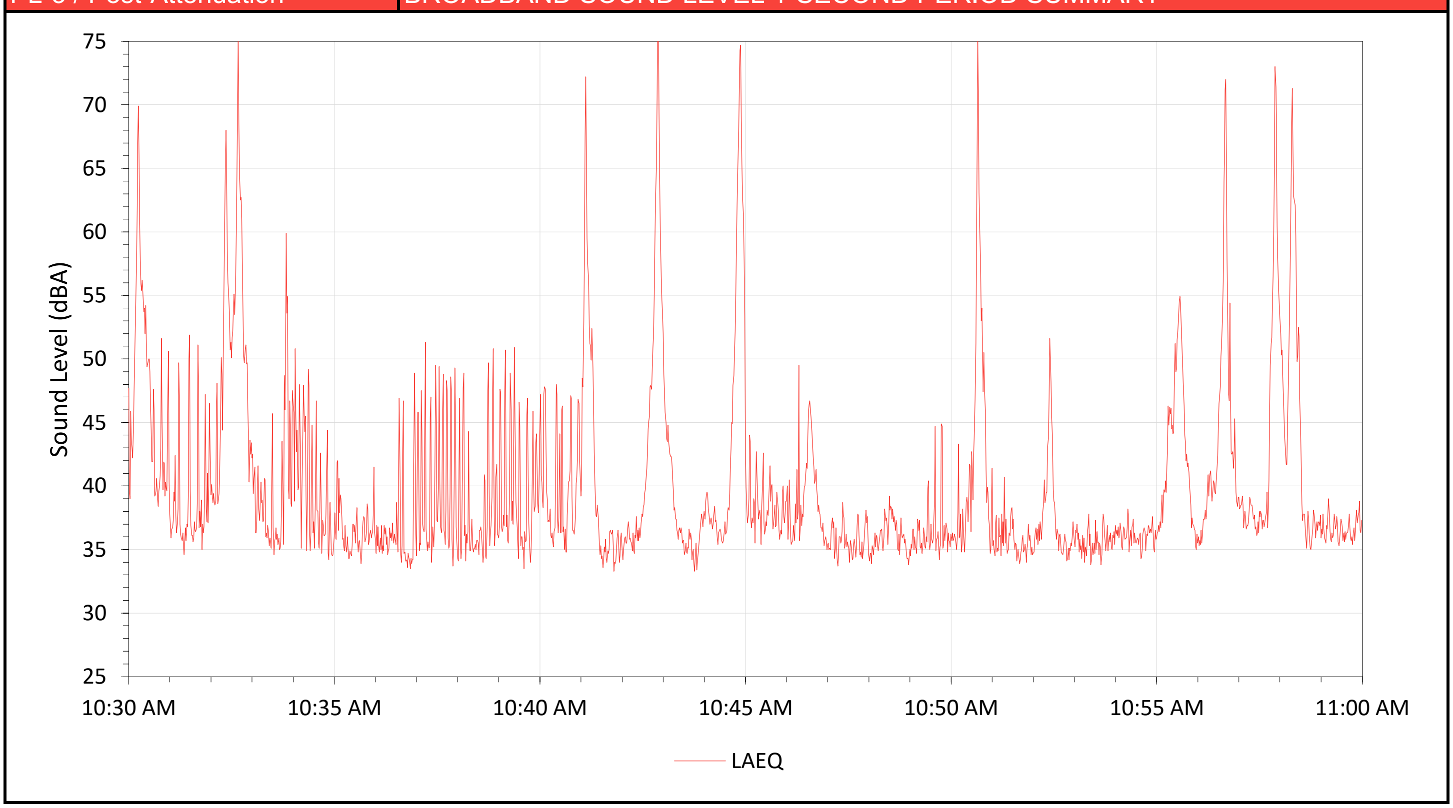


## Environmental Noise Monitoring Summary Charts

| PL-3 / Post-Attenuation | BROADBAND SOUND LEVEL 5-MINUTE PERIOD SUMMARY |
|---|---|

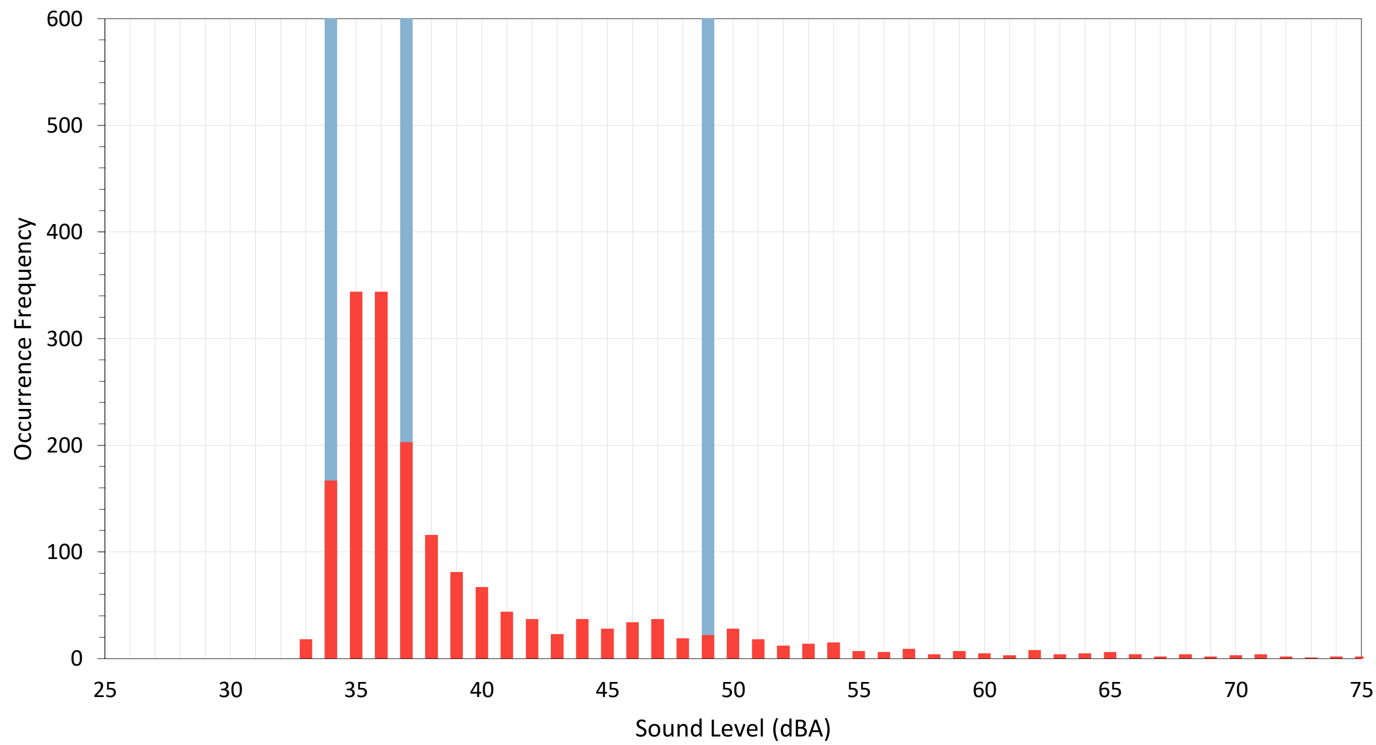



| PL-3 / Post-Attenuation | BROADBAND SOUND LEVEL 1-SECOND PERIOD SUMMARY |
|---|---|

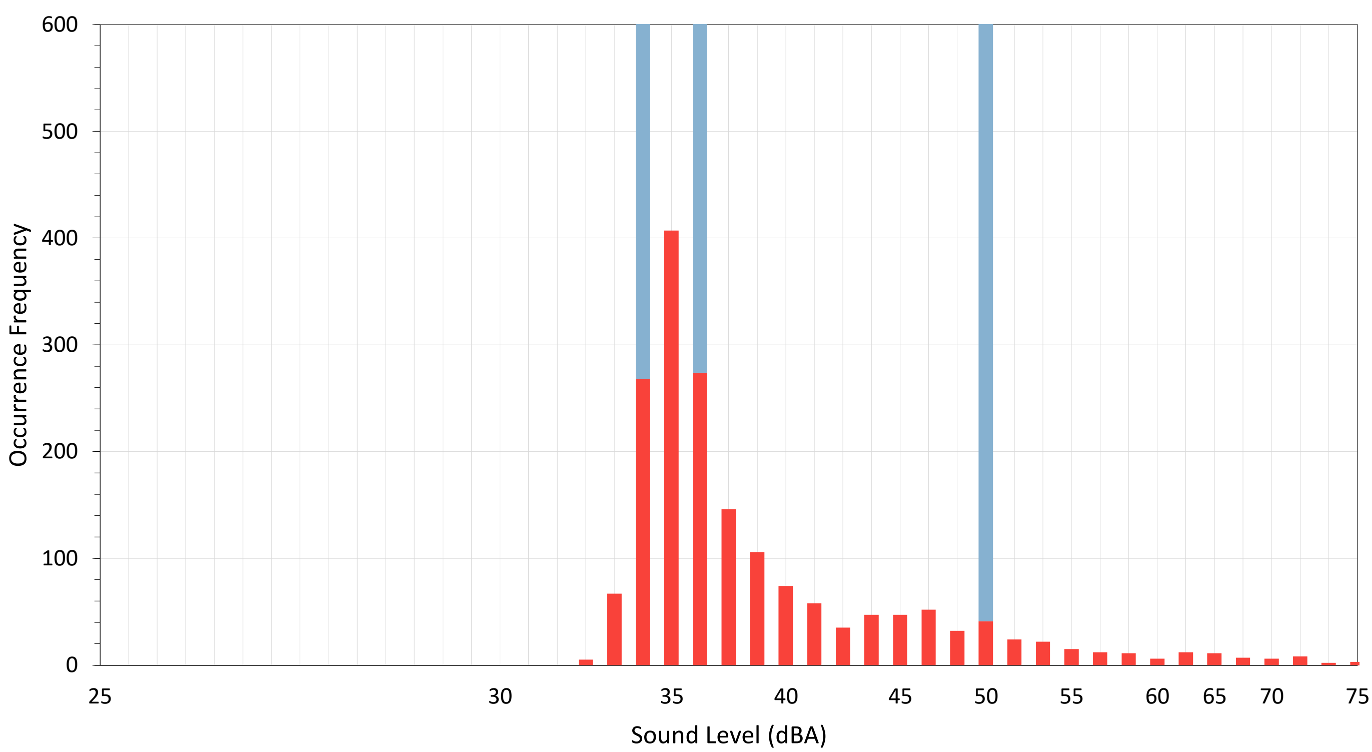


**Environmental Noise Monitoring Distribution Charts**

PL-3 / Post-Attenuation | 1-SECOND LEQ HISTOGRAM (LINEAR)




PL-3 / Post-Attenuation | 1-SECOND LEQ HISTOGRAM (TRANSFORM)



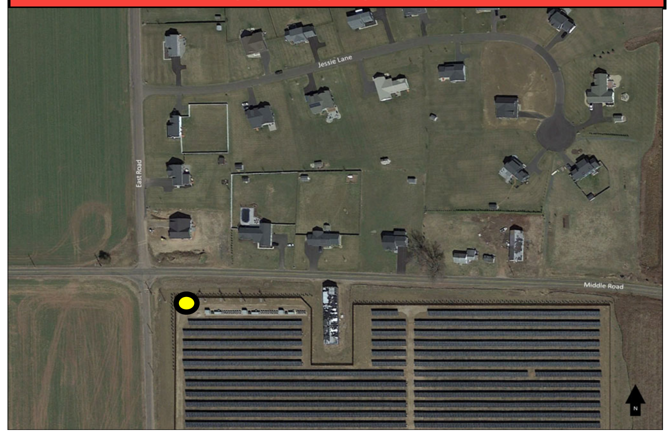
**WSP USA Inc.**
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

| LOCATION INFORMATION | |
|---|---|
| Location ID: | BG-1 |
| Description: | Background-1 |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 1:53:04 PM |
| End Time: | 2:28:13 PM |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 59 °F |
| Wind Speed: | 0 - 3 mph |
| Direction: | n/a |
| Humidity: | 42% |
| Sky Type: | Clear |
| Precipitation: | n/a |

**LOCATION SKETCH**




| GENERAL SOUND SOURCES (order by most prominent) | |
|---|---|
| 1) | Natural sounds (e.g., birds) |
| 2) | Vehicles passing on Middle Rd. |
| 3) | |
| 4) | |
| 5) | |

| MONITORING NOTES / EVENTS | |
|---|---|
| Event Description: | Number of Instances, Start Time, End Time: |
| N/A | Unattended background monitoring |
| | |
| | |
| | |
| | |
| | |
| | |

**TRAFFIC COUNT (nearest roadway)**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**OTHER COMMENTS**

**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

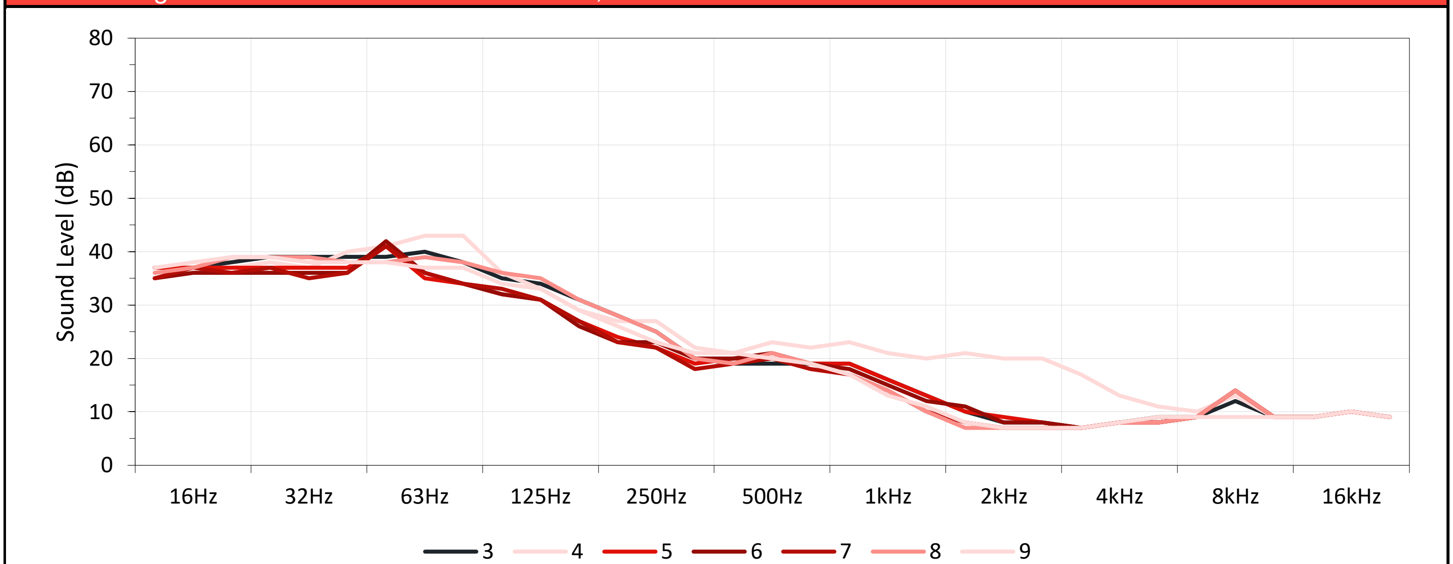
| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | BG-1 |
| Description: | Background-1 |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 1:53:04 PM |
| End Time: | 2:28:13 PM |

MONITOR PHOTO


| SUMMARY INFORMATION | |
|---|---|
| Duration: | 00:35:09 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 1:42:09 PM |
| Cal. (After): | 2:29:37 PM |
| Cal. Drift: | -0.1 |

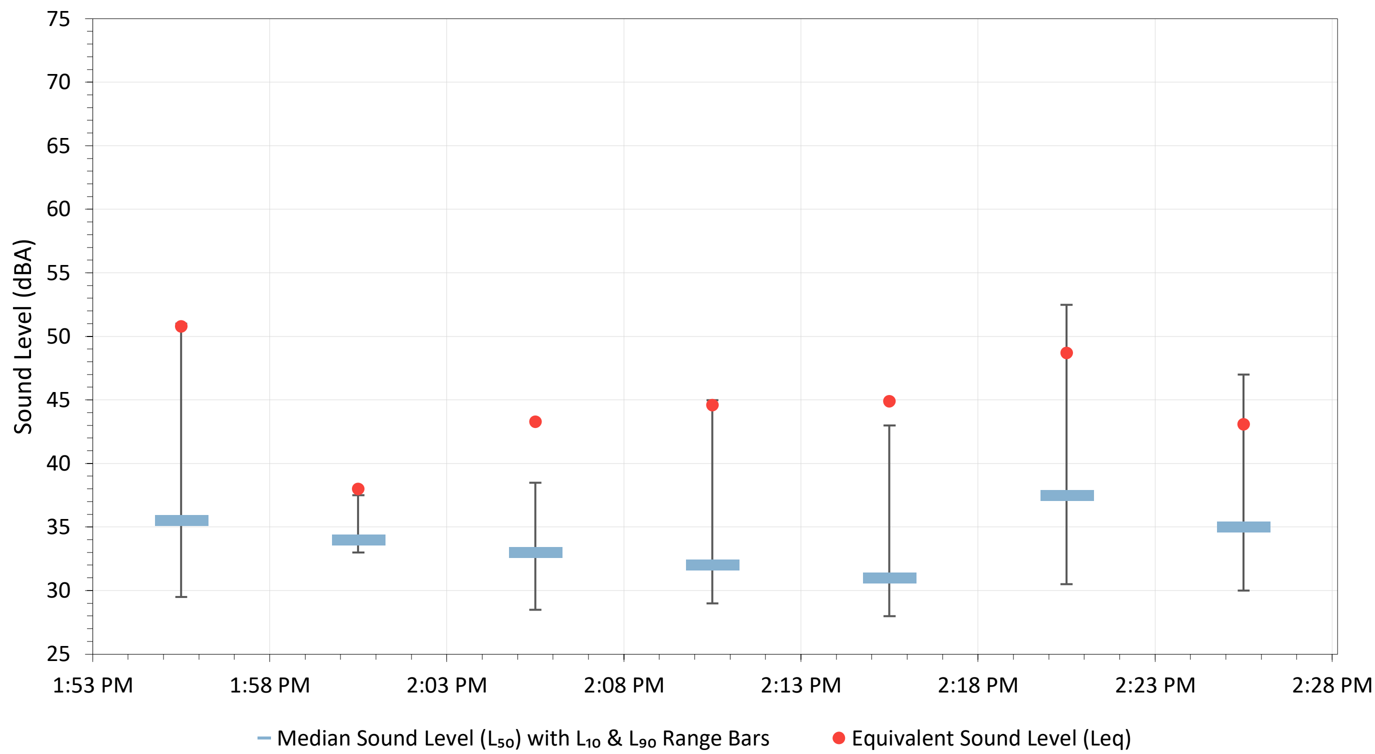
| RESULTS SUMMARY | | | | | |
|---|---|---|---|---|---|
| | | Cumulative Results | | | |
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 49.8 | 51.8 | 46.6 | 42.4 |
| | 63 Hz: | 51.7 | 52.8 | 47.5 | 43.6 |
| | 125 Hz: | 52.4 | 50.8 | 41.4 | 37.0 |
| | 250 Hz: | 44.6 | 42.9 | 33.4 | 28.5 |
| | 500 Hz: | 38.7 | 37.8 | 28.6 | 24.7 |
| | 1 kHz: | 42.5 | 39.9 | 25.2 | 21.1 |
| | 2 kHz: | 39.2 | 35.9 | 19.6 | 14.7 |
| | 4 kHz: | 31.8 | 28.6 | 16.3 | 13.5 |
| | 8 kHz: | 26.0 | 19.1 | 16.3 | 15.6 |
| **Broadband (dBA):** | | **46.4** | **46.0** | **33.9** | **29.3** |

BG-1 / Background-1 — LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY

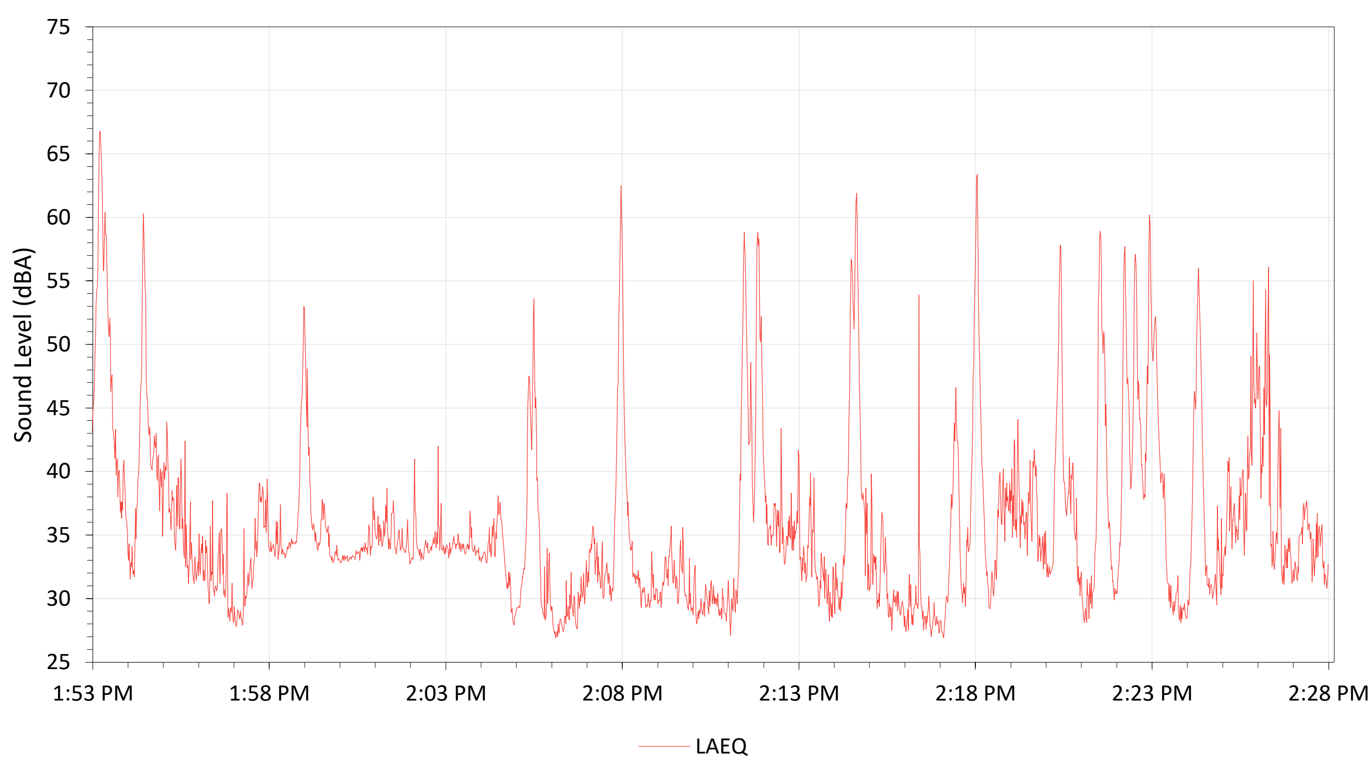


**Environmental Noise Monitoring Summary Charts**

| BG-1 / Background-1 | BROADBAND SOUND LEVEL 5-MINUTE PERIOD SUMMARY |
|---|---|

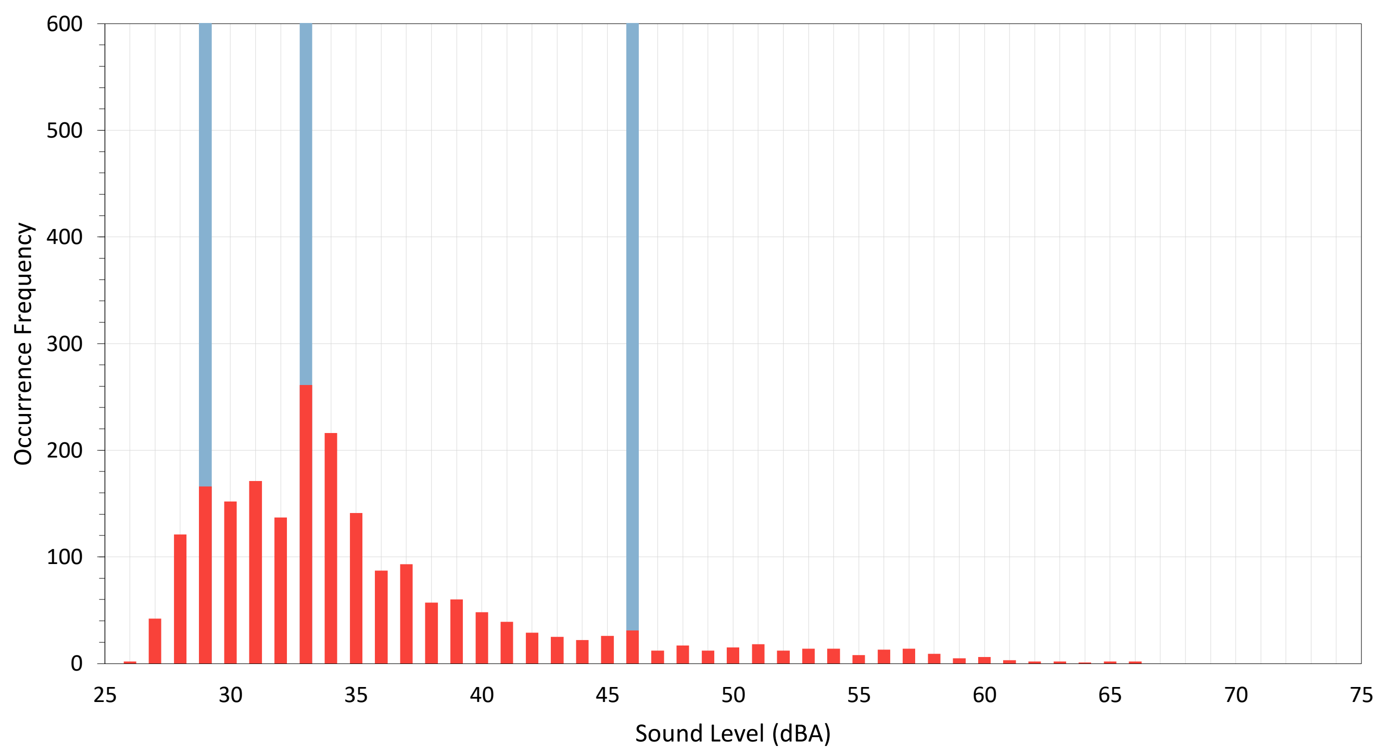



| BG-1 / Background-1 | BROADBAND SOUND LEVEL 1-SECOND PERIOD SUMMARY |
|---|---|

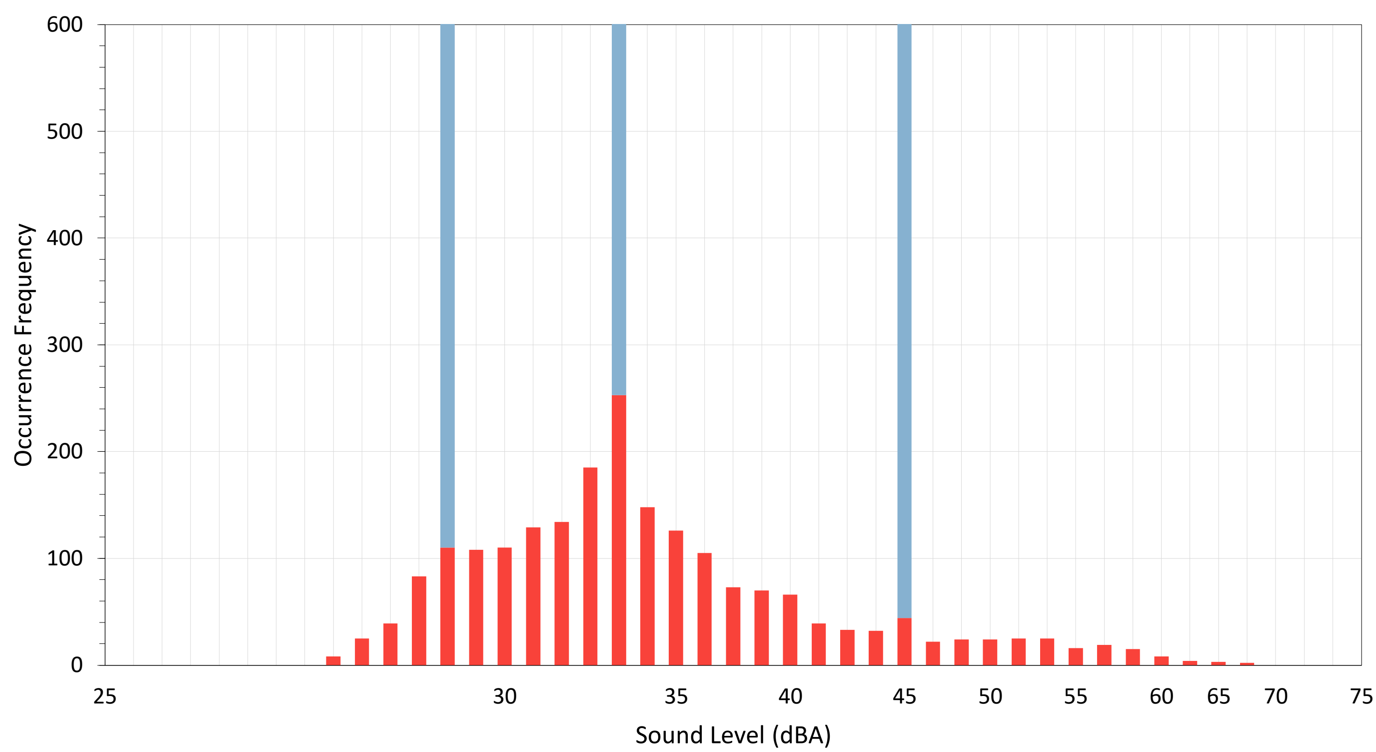


## Environmental Noise Monitoring Distribution Charts

| BG-1 / Background-1 | 1-SECOND LEQ HISTOGRAM (LINEAR) |
|---|---|




| BG-1 / Background-1 | 1-SECOND LEQ HISTOGRAM (TRANSFORM) |
|---|---|



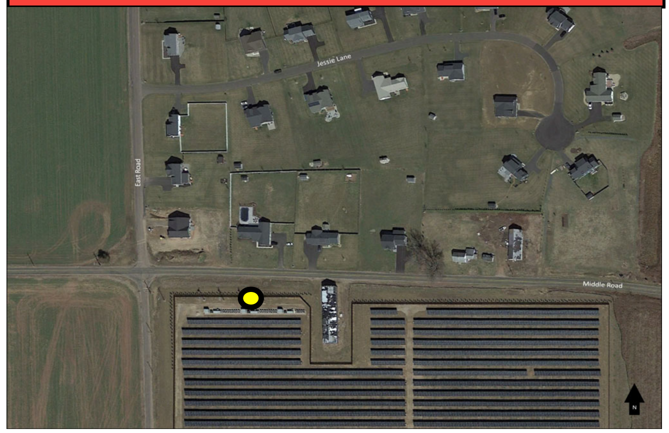
**WSP USA Inc.**
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

| LOCATION INFORMATION | |
|---|---|
| Location ID: | BG-2 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 2:30:05 PM |
| End Time: | 3:30:24 PM |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 57 °F |
| Wind Speed: | 0 - 3 mph |
| Direction: | n/a |
| Humidity: | 45% |
| Sky Type: | Clear |
| Precipitation: | n/a |

LOCATION SKETCH



| GENERAL SOUND SOURCES (order by most prominent) | |
|---|---|
| 1) | Natural sounds (e.g., birds) |
| 2) | Vehicles passing on Middle Rd. |
| 3) | |
| 4) | |
| 5) | |

MONITORING NOTES / EVENTS

| Event Description: | Number of Instances, Start Time, End Time: |
|---|---|
| N/A | Unattended background monitoring |
| | |
| | |
| | |
| | |
| | |
| | |

TRAFFIC COUNT (nearest roadway)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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| | | | | | | | | | | |

OTHER COMMENTS

**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | BG-2 |
| Description: | Post-Attenuation |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 2:30:05 PM |
| End Time: | 3:30:24 PM |

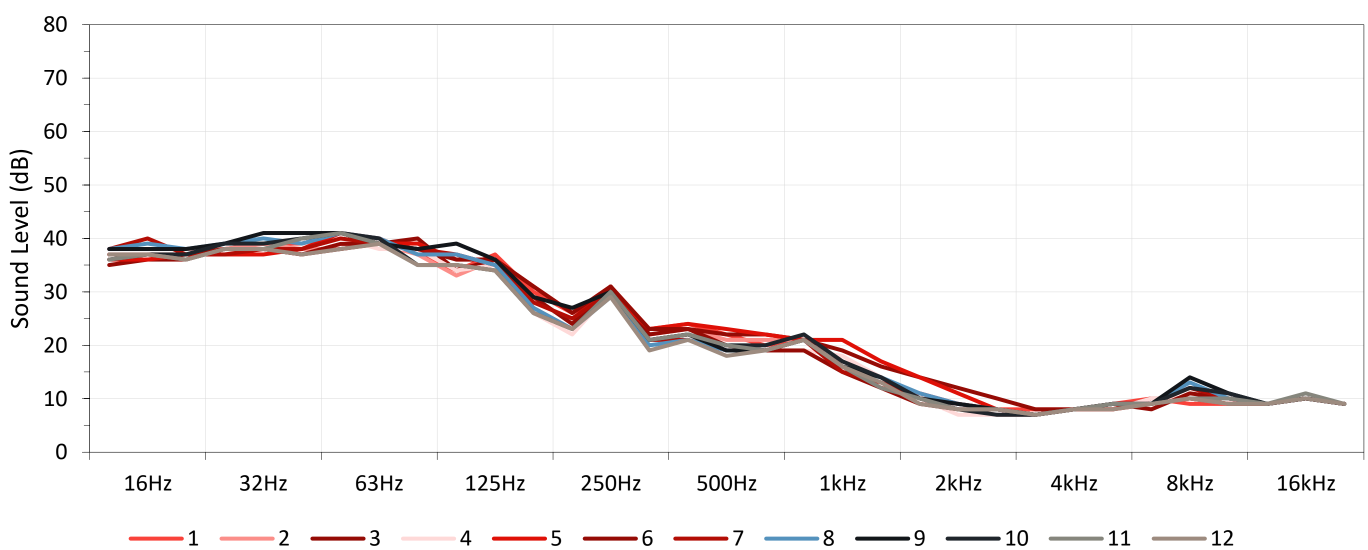
| SUMMARY INFORMATION | |
|---|---|
| Duration: | 01:00:19 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 2:29:37 PM |
| Cal. (After): | 3:30:47 PM |
| Cal. Drift: | -0.1 |

MONITOR PHOTO


RESULTS SUMMARY

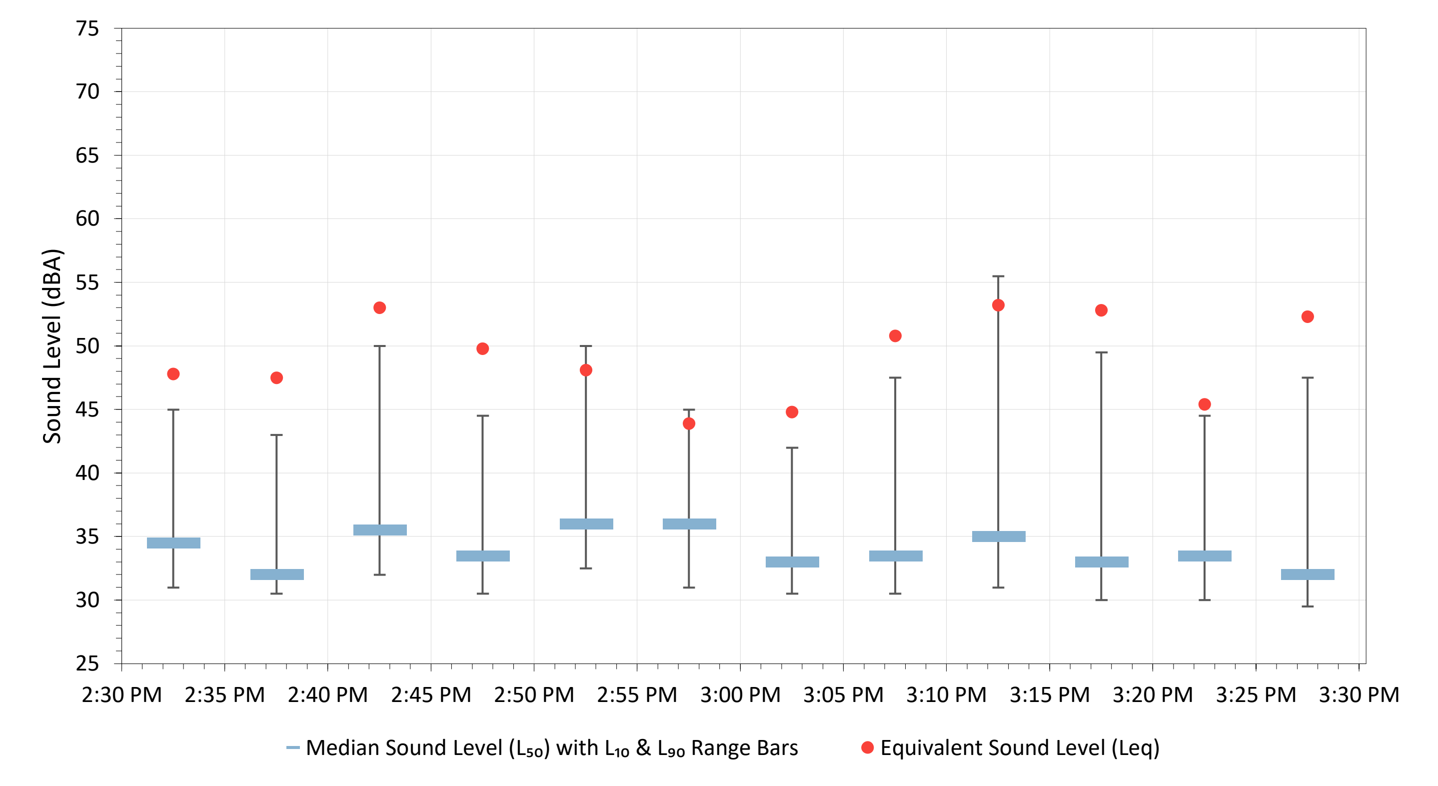
| | | Cumulative Results | | | |
|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 54.5 | 53.6 | 47.6 | 43.2 |
| | 63 Hz: | 58.3 | 56.3 | 48.0 | 43.8 |
| | 125 Hz: | 58.2 | 55.3 | 43.1 | 38.9 |
| | 250 Hz: | 51.2 | 47.3 | 34.6 | 31.6 |
| | 500 Hz: | 45.2 | 39.4 | 28.5 | 25.7 |
| | 1 kHz: | 45.3 | 39.9 | 25.8 | 22.9 |
| | 2 kHz: | 41.4 | 35.4 | 17.2 | 14.1 |
| | 4 kHz: | 34.5 | 28.9 | 14.4 | 12.7 |
| | 8 kHz: | 26.2 | 17.5 | 15.5 | 14.8 |
| **Broadband (dBA):** | | **50.2** | **47.1** | **33.7** | **30.7** |

BG-2 / Post-Attenuation — LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY

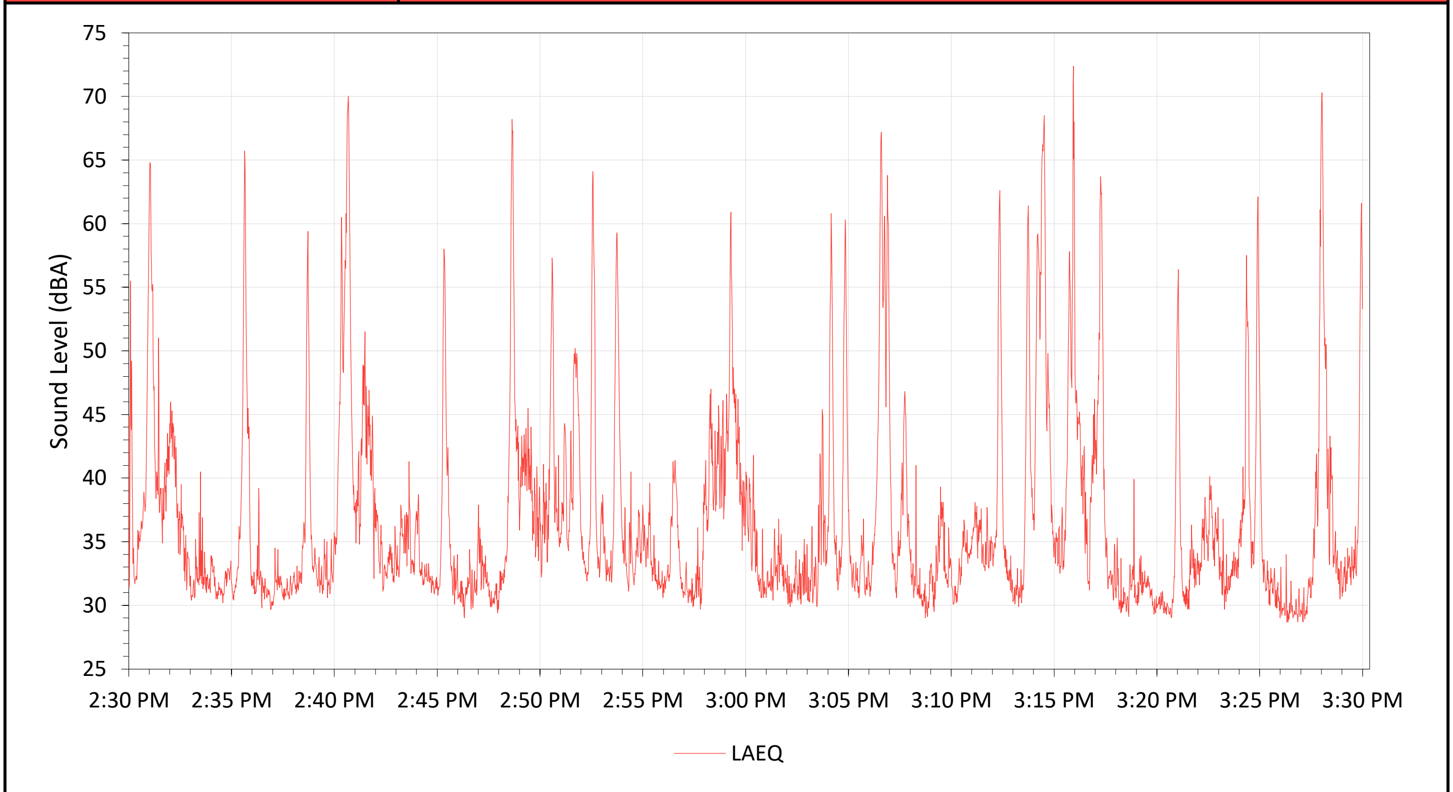


## Environmental Noise Monitoring Summary Charts

| BG-2 / Post-Attenuation | BROADBAND SOUND LEVEL 5-MINUTE PERIOD SUMMARY |
|---|---|

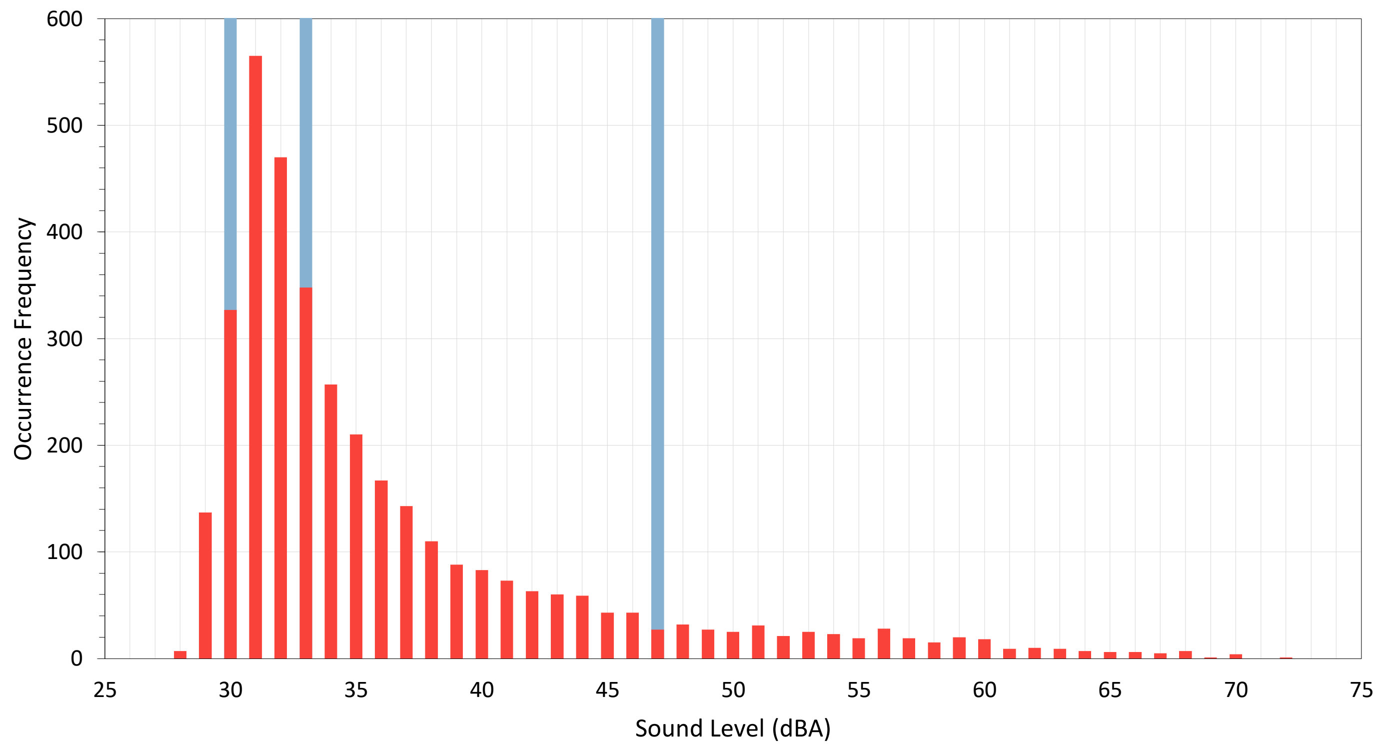



| BG-2 / Post-Attenuation | BROADBAND SOUND LEVEL 1-SECOND PERIOD SUMMARY |
|---|---|

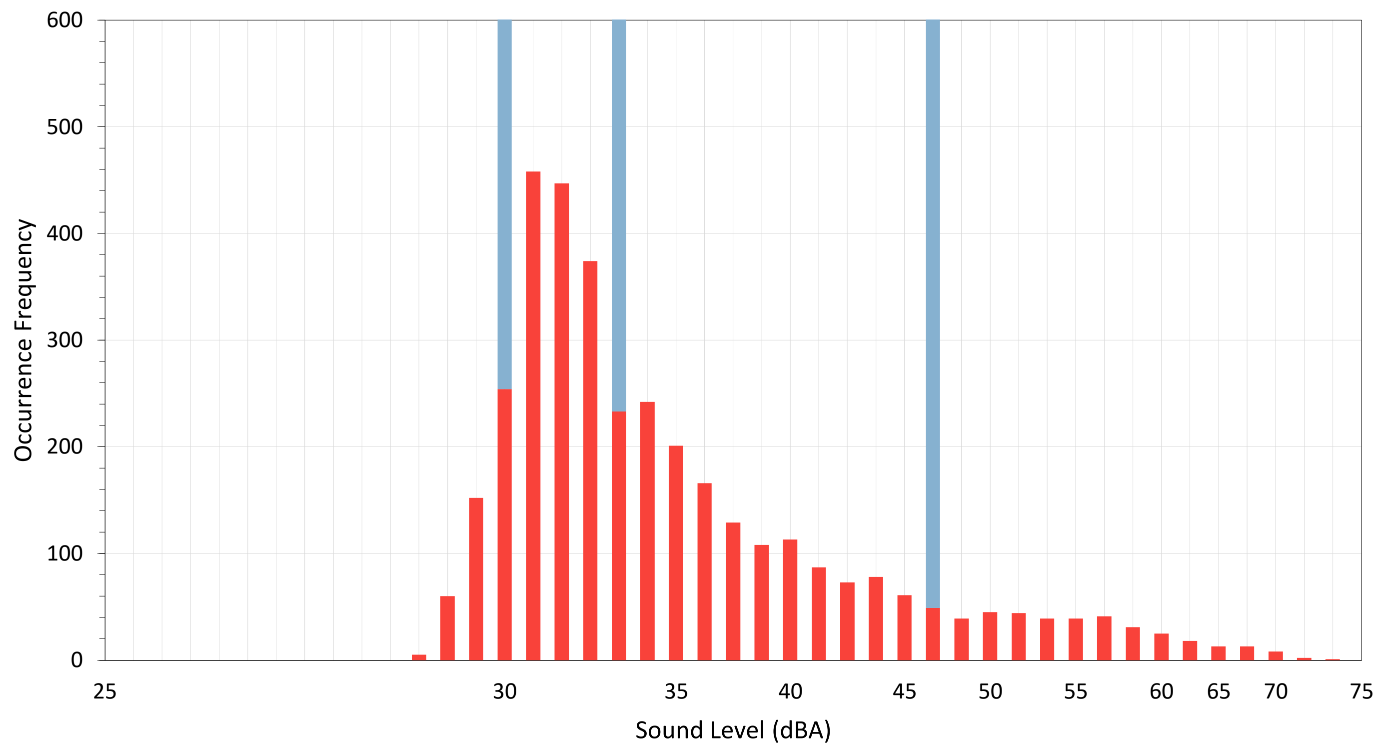


## Environmental Noise Monitoring Distribution Charts

| BG-2 / Post-Attenuation | 1-SECOND LEQ HISTOGRAM (LINEAR) |
|---|---|




| BG-2 / Post-Attenuation | 1-SECOND LEQ HISTOGRAM (TRANSFORM) |
|---|---|



**WSP USA Inc.**
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

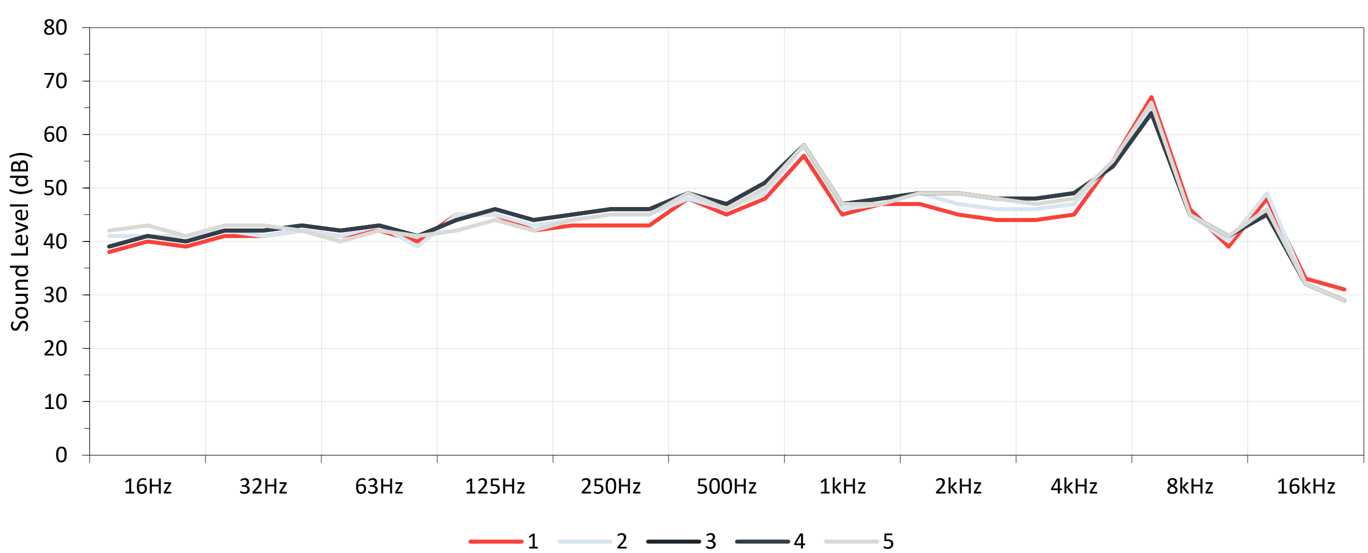
| LOCATION INFORMATION | |
|---|---|
| Location ID: | SOL (6) Units |
| Description: | Bank Measurements |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 3:45:23 PM |
| End Time: | 3:54:09 PM |

| SUMMARY INFORMATION | |
|---|---|
| Duration: | 00:08:46 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 3:44:40 PM |
| Cal. (After): | 4:07:50 PM |
| Cal. Drift: | 0.0 |

EQUIPMENT PHOTO


| RESULTS SUMMARY | | | | | |
|---|---|---|---|---|---|
| | | Cumulative Results | | | |
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 54.4 | 57.1 | 51.3 | 46.9 |
| | 63 Hz: | 51.8 | 54.5 | 49.8 | 46.3 |
| | 125 Hz: | 52.4 | 54.5 | 51.3 | 49.0 |
| | 250 Hz: | 51.7 | 53.1 | 50.9 | 49.5 |
| | 500 Hz: | 55.0 | 56.4 | 54.8 | 53.2 |
| | 1 kHz: | 59.9 | 61.1 | 60.0 | 58.3 |
| | 2 kHz: | 53.8 | 54.4 | 53.6 | 52.6 |
| | 4 kHz: | 58.8 | 60.8 | 58.6 | 56.0 |
| | 8 kHz: | 69.5 | 71.8 | 69.0 | 65.3 |
| **Broadband (dBA):** | | **70.4** | **72.6** | **70.0** | **66.8** |

SOL (6) Units / Bank Measurements LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY



**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | SOL (6) Units |
| Description: | Bank Measurements |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 3:45:23 PM |
| End Time: | 3:54:09 PM |

| MEASUREMENT INFORMATION | |
|---|---|
| Horizontal Offset: | 3.80 m |
| Vertical Offset: | 0.00 m |
| Distance: | 3.80 m |
| Boudary Condition: | 2.0 |
| Arrangement: | Point source, half sphere |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 67 °F |
| Wind Speed: | 0 - 5 mph |
| Direction: | n/a |
| Humidity: | 28% |
| Sky Type: | Clear |
| Precipitation: | n/a |

| CALCULATED SOUND POWER LEVEL | |
|---|---|
| Power Level: | 78.5 dBA |

| CALCULATED SOUND PRESSURE LEVEL | |
|---|---|
| Horizontal Offset: | 1.00 m |
| Pressure Level: | 67.0 dBA |

| Measurement Results | | $L_p$ (6) | $L_w$ (1) | 1/1 Octave Band | $L_p$ (1m) |
|---|---|---|---|---|---|
| 1/3 Octave Band SPL (dB) | 12 Hz | 39.8 | 51.6 | | |
| | 16 Hz | 41.2 | 53.0 | 16 Hz | 46.0 |
| | 20 Hz | 40.2 | 52.0 | | |
| | 25 Hz | 42.0 | 53.8 | | |
| | 32 Hz | 41.8 | 53.6 | 32 Hz | 47.6 |
| | 40 Hz | 42.4 | 54.2 | | |
| | 50 Hz | 41.2 | 53.0 | | |
| | 63 Hz | 42.6 | 54.4 | 63 Hz | 47.1 |
| | 80 Hz | 40.4 | 52.2 | | |
| | 100 Hz | 44.0 | 55.8 | | |
| | 125 Hz | 45.2 | 57.0 | 125 Hz | 49.7 |
| | 160 Hz | 43.0 | 54.8 | | |
| | 200 Hz | 44.2 | 56.0 | | |
| | 250 Hz | 45.0 | 56.8 | 250 Hz | 50.3 |
| | 315 Hz | 45.0 | 56.8 | | |
| | 400 Hz | 48.6 | 60.4 | | |
| | 500 Hz | 46.2 | 58.0 | 500 Hz | 54.0 |
| | 630 Hz | 49.8 | 61.6 | | |
| | 800 Hz | 57.6 | 69.4 | | |
| | 1.00 kHz | 46.4 | 58.2 | 1.00 kHz | 59.1 |
| | 1.25 kHz | 47.4 | 59.2 | | |
| | 1.50 kHz | 48.6 | 60.4 | | |
| | 2.00 kHz | 47.8 | 59.6 | 2.00 kHz | 53.4 |
| | 2.50 kHz | 46.8 | 58.6 | | |
| | 3.20 kHz | 46.6 | 58.4 | | |
| | 4.00 kHz | 47.6 | 59.4 | 4.00 kHz | 56.7 |
| | 5.00 kHz | 54.6 | 66.4 | | |
| | 6.30 kHz | 65.2 | 77.0 | | |
| | 8.00 kHz | 45.2 | 57.0 | 8.00 kHz | 66.1 |
| | 10.0 kHz | 40.4 | 52.2 | | |
| | 12.5 kHz | 46.6 | 58.4 | | |
| | 16.0 kHz | 32.2 | 44.0 | 16.0 kHz | 47.6 |
| | 20.0 kHz | 29.4 | 41.2 | | |

WSP USA Inc.
**Environmental Noise Monitoring Field Notes**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Performed By: | A. Roland |

| LOCATION INFORMATION | |
|---|---|
| Location ID: | CPS |
| Description: | 1.5 m Measurements |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 1:57:03 PM |
| End Time: | 2:12:43 PM |

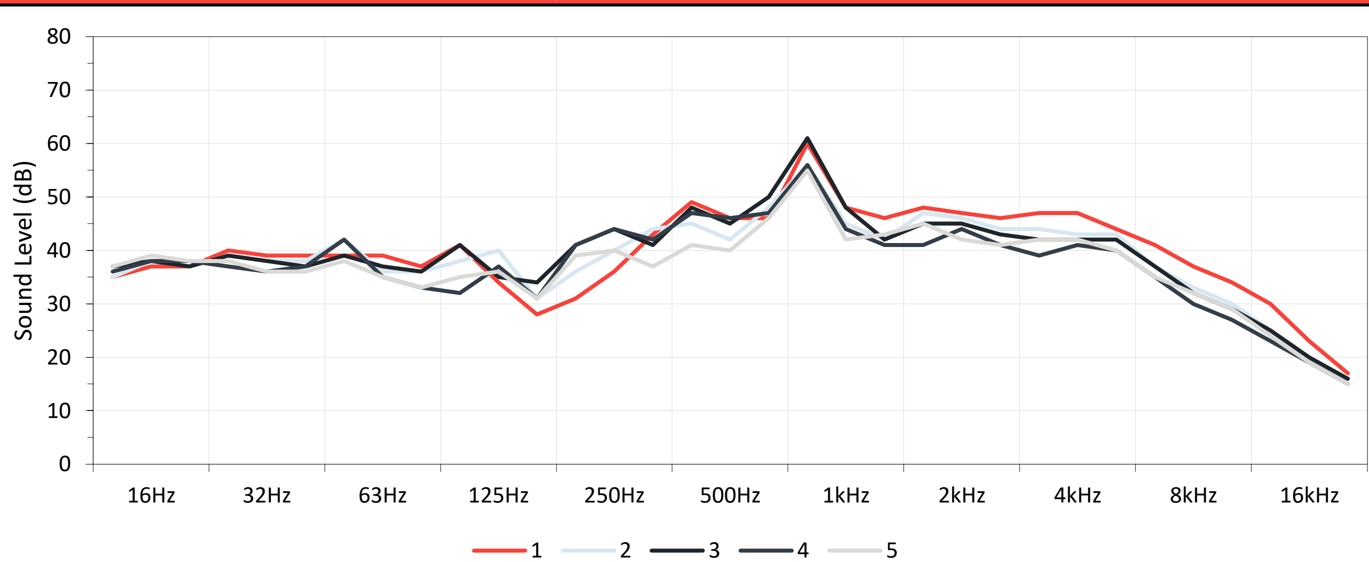
| SUMMARY INFORMATION | |
|---|---|
| Duration: | 00:15:40 |
| Response: | Random |
| Overload: | FALSE |
| Cal. (Before): | 1:49:09 PM |
| Cal. (After): | 2:24:36 PM |
| Cal. Drift: | 0.0 |

EQUIPMENT PHOTO


RESULTS SUMMARY

| | | Cumulative Results | | | |
|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| Octave Band SPL (dB) | 32 Hz: | 49.9 | 52.2 | 46.7 | 42.6 |
| | 63 Hz: | 48.0 | 50.6 | 46.0 | 42.6 |
| | 125 Hz: | 45.2 | 46.5 | 43.5 | 41.0 |
| | 250 Hz: | 47.4 | 48.5 | 47.1 | 45.6 |
| | 500 Hz: | 52.9 | 53.8 | 52.3 | 51.0 |
| | 1 kHz: | 60.4 | 61.2 | 59.6 | 58.0 |
| | 2 kHz: | 50.5 | 51.2 | 50.2 | 49.3 |
| | 4 kHz: | 48.5 | 48.5 | 47.9 | 47.4 |
| | 8 kHz: | 40.0 | 39.7 | 39.5 | 39.0 |
| **Broadband (dBA):** | | **60.6** | **61.9** | **60.4** | **59.1** |

CPS / 1.5 m Measurements — LZ90,1/3 OCTAVE BAND SOUND LEVEL SUMMARY



**Environmental Noise Monitoring Data Sheet**

| | |
|---|---|
| Project Name: | NextEra - DG Connecticut Solar III |
| Project No: | US0027174.6477 |

| MEASUREMENT INFORMATION | |
|---|---|
| Location ID: | CPS |
| Description: | 1.5 m Measurements |
| Date: | Tue. Apr 9, 2024 |
| Start Time: | 1:57:03 PM |
| End Time: | 2:12:43 PM |

| MEASUREMENT INFORMATION | |
|---|---|
| Horizontal Offset: | 2.50 m |
| Vertical Offset: | 0.00 m |
| Distance: | 2.50 m |
| Boudary Condition: | 2.0 |
| Arrangement: | Point source, half sphere |

| WEATHER CONDITIONS | |
|---|---|
| Temperature: | 67 °F |
| Wind Speed: | 0 - 5 mph |
| Direction: | n/a |
| Humidity: | 28% |
| Sky Type: | Clear |
| Precipitation: | n/a |

| CALCULATED SOUND POWER LEVEL | |
|---|---|
| Power Level: | 74.9 dBA |

| CALCULATED SOUND PRESSURE LEVEL | |
|---|---|
| Horizontal Offset: | 1.00 m |
| Pressure Level: | 64.4 dBA |

| Measurement Results | | $L_p$ | $L_w$ | 1/1 Octave Band | $L_p$ (1m) |
|---|---|---|---|---|---|
| 1/3 Octave Band SPL (dB) | 12 Hz | 36.0 | 51.9 | 16 Hz | 46.9 |
| | 16 Hz | 38.0 | 53.9 | | |
| | 20 Hz | 37.4 | 53.3 | | |
| | 25 Hz | 38.6 | 54.5 | 32 Hz | 47.6 |
| | 32 Hz | 37.4 | 53.3 | | |
| | 40 Hz | 37.4 | 53.3 | | |
| | 50 Hz | 40.0 | 55.9 | 63 Hz | 47.4 |
| | 63 Hz | 36.4 | 52.3 | | |
| | 80 Hz | 35.0 | 50.9 | | |
| | 100 Hz | 37.4 | 53.3 | 125 Hz | 45.4 |
| | 125 Hz | 36.4 | 52.3 | | |
| | 160 Hz | 31.0 | 46.9 | | |
| | 200 Hz | 37.6 | 53.5 | 250 Hz | 49.9 |
| | 250 Hz | 40.8 | 56.7 | | |
| | 315 Hz | 41.4 | 57.3 | | |
| | 400 Hz | 46.0 | 61.9 | 500 Hz | 55.7 |
| | 500 Hz | 43.8 | 59.7 | | |
| | 630 Hz | 47.4 | 63.3 | | |
| | 800 Hz | 57.6 | 73.5 | 1.00 kHz | 62.9 |
| | 1.00 kHz | 45.4 | 61.3 | | |
| | 1.25 kHz | 42.8 | 58.7 | | |
| | 1.50 kHz | 45.2 | 61.1 | 2.00 kHz | 54.2 |
| | 2.00 kHz | 44.8 | 60.7 | | |
| | 2.50 kHz | 43.0 | 58.9 | | |
| | 3.20 kHz | 42.8 | 58.7 | 4.00 kHz | 52.3 |
| | 4.00 kHz | 43.0 | 58.9 | | |
| | 5.00 kHz | 41.8 | 57.7 | | |
| | 6.30 kHz | 37.0 | 52.9 | 8.00 kHz | 43.9 |
| | 8.00 kHz | 32.8 | 48.7 | | |
| | 10.0 kHz | 29.8 | 45.7 | | |
| | 12.5 kHz | 25.4 | 41.3 | 16.0 kHz | 31.8 |
| | 16.0 kHz | 20.2 | 36.1 | | |
| | 20.0 kHz | 15.6 | 31.5 | | |

## Attachment D

Monitoring Equipment Certificates of Calibration

# Certificate of Conformity and Calibration FA03873

| | | | |
|---|---|---|---|
| **Instrument Model:-** | CEL-633C | | |
| Serial Number | 2383045 | | |
| Firmware revision | V006-05 | | |
| **Microphone Type:-** | CEL-251 | **Preamplifier Type:-** | CEL-495 |
| Serial Number | 4335 | Serial Number | 005488 |
| **Instrument Class/Type:-** | 1 | | |

## Applicable standards:-

IEC 61672: 2013 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

| | | | |
|---|---|---|---|
| **Test Conditions:-** | 23 °C<br>32 %RH<br>985 mBar | **Test Engineer:-**<br>**Date of Issue:-** | Chao Vang<br>March 29, 2024 |

## Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

## *Test Summary:-*

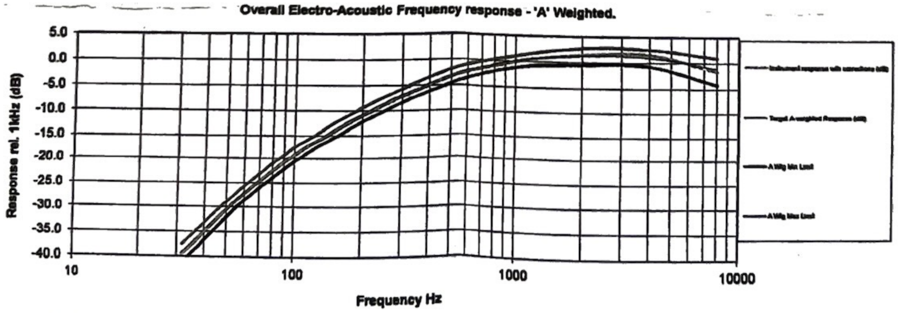
| | |
|---|---|
| Self Generated Noise Test | **All Tests Pass** |
| Electrical Signal Test Of Frequency Weightings | **All Tests Pass** |
| Frequency & Time Weightings At 1 kHz | **All Tests Pass** |
| Level Linearity On The Reference Level Range | **All Tests Pass** |
| Toneburst Response Test | **All Tests Pass** |
| C-peak Sound Levels | **All Tests Pass** |
| Overload Indication | **All Tests Pass** |
| Acoustic Tests | **All Tests Pass** |

## Combined Electro-Acoustic Frequency Response - *A Weighted*

**Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)**

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.

**Overall Electro-Acoustic Frequency response - 'A' Weighted.**

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E-mail:rajeshjoshi@casellasolutions.com

Tested to CEL-63X test sheet TP444 revision 06-00

CASELLA
A DIVISION OF TSI

# Certificate of Conformity and Calibration

FA03873

| | |
|---|---|
| Customer: | 5145086 |
| Instrument: | CEL-120/1 |
| Serial Number: | 2383722 |
| Job Number: | 300581913 |
| Date of Issue: | 29-Mar-2024 |
| Engineer: | Chao Vang |

| | | |
|---|---|---|
| Traceable Equipment: | Reference Calibrator | E011384 |
| | DVM type Fluke 45 | E011386 |

Test Conditions:

| | | |
|---|---|---|
| Ambient Temperature | 23.0 | °C |
| Ambient Humidity | 33.0 | %RH |
| Ambient Pressure | 985 | mBar |

Results:

| | Level 1 | Level 2 | Frequency |
|---|---|---|---|
| *Initial Reading* | 113.90 dB | 93.80 dB | 1.0000 kHz |
| Final Reading | 114.00 dB | 93.98 dB | 1.0000 kHz |

Uncertainty:

| | | | |
|---|---|---|---|
| Level | ± | 0.15 | dB |
| Frequency | ± | 0.5 | Hz |

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.
Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.


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**Casella India**

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Proc. 447 Rev.2

# FA05190

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CASELLA
A DIVISION OF TSI

# Certificate of Conformity and Calibration

**Instrument Model:-** CEL-633C
Serial Number 4210504
Firmware revision V006-05

**Microphone Type:-** CEL-261
Serial Number 5084

**Preamplifier Type:-** CEL-495
Serial Number 005056

**Instrument Class/Type:-** 1

**Applicable standards:-**

IEC 61672: 2013 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

**Test Conditions:-** 23.1 °C, 44 %RH, 986.8 mBar

**Test Engineer:-** Chue Moua
**Date of Issue:-** September 22, 2023

**Declaration of conformity:-**

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

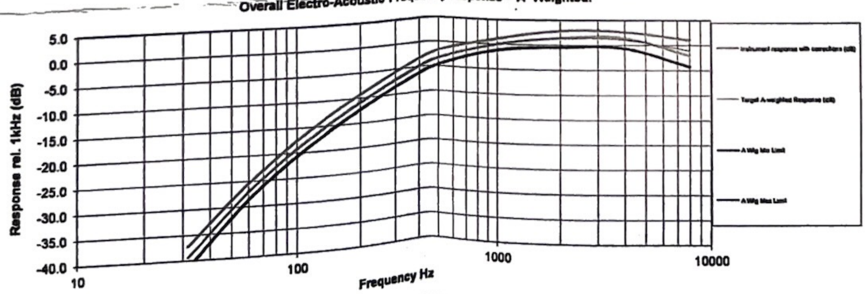
**Test Summary:-**

| | |
|---|---|
| Self Generated Noise Test | All Tests Pass |
| Electrical Signal Test Of Frequency Weightings | All Tests Pass |
| Frequency & Time Weightings At 1 kHz | All Tests Pass |
| Level Linearity On The Reference Level Range | All Tests Pass |
| Toneburst Response Test | All Tests Pass |
| C-peak Sound Levels | All Tests Pass |
| Overload Indication | All Tests Pass |
| Acoustic Tests | All Tests Pass |

**Combined Electro-Acoustic Frequency Response - *A Weighted***

**Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)**
The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.

Overall Electro-Acoustic Frequency response - 'A' Weighted.





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Tested to CEL-63X test sheet TP444 revision 08-00

FA05190 CASELLA

# Certificate of Conformity and Calibration

Customer: 5145086

Instrument: CEL-120/1

Serial Number: 4914399

Job Number: 300539965

Date of Issue: 22-Sep-2023

Engineer: Chue Moua

Traceable Equipment: Reference Calibrator E011384
DVM type Fluke 45 E011386

Test Conditions:

| | | |
|---|---|---|
| Ambient Temperature | 23.4 | °C |
| Ambient Humidity | 45.5 | %RH |
| Ambient Pressure | 987 | mBar |

Results:

| | Level 1 | Level 2 | Frequency |
|---|---|---|---|
| Initial Reading | 114.09 dB | 94.04 dB | 1.0001 kHz |
| Final Reading | 114.01 dB | 93.98 dB | 1.0001 kHz |

Uncertainty:

| | | | |
|---|---|---|---|
| Level | ± | 0.15 | dB |
| Frequency | ± | 0.5 | Hz |

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.
Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.


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## Attachment E

Manufacturers’ Technical Data Sheet

# SOLECTRIA® XGI 1500-166 SERIES

## PREMIUM 3-PHASE TRANSFORMERLESS UTILITY-SCALE INVERTERS

### FEATURES

- Made in the USA with global components
- Buy American Act (BAA) compliant
- Four models:
  - 125kW/125kVA,
  - 125kW/150kVA,
  - 150kW/166kVA,
  - 166kW/166kVA
- Additional models available certified to UL1699b, Photovoltaic DC Arc-Fault Circuit Protection
- 99.0% peak efficiency
- Flexible solution for distributed and centralized system architecture
- Advanced grid-support functionality Rule 21/UL1741SB
- Robust, dependable, & built to last
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- SunSpec Modbus Certified
- Tested compatible with the TESLA PowerPack Microgrid System app for system visibility

### OPTIONS

- String combiners for distributed and centralized systems
- Web-based monitoring
- Extended warranty


## Yaskawa Solectria Solar's XGI 1500 utility-scale string inverters are designed for high reliability and built of the highest quality components that were selected, tested and proven to last beyond their warranty.

XGI 1500 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL1741SB standards for safety. They are the most powerful 1500 VDC string inverters in the PV market and have been engineered for both distributed and centralized system architecture.

Designed and engineered in Lawrence, MA, XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. They are Made in the USA with global components and are compliant with the Buy American Act.

YASKAWA
SOLECTRIA SOLAR

**Yaskawa Solectria Solar** 1-978-683-9700 | Email: sales@solectria.com | solectria.com
Document No. FL.XGI1500.01 | 04/26/2023 | 

# SOLECTRIA® XGI 1500-166 SERIES TECHNICAL DATA

## SPECIFICATIONS

| SOLECTRIA XGI 1500 Model | | XGI 1500-125/125-UL<br>XGI 1500-125/125-UL-A | XGI 1500-125/150-UL<br>XGI 1500-125/150-UL-A | XGI 1500-150/166-UL<br>XGI 1500-150/166-UL-A | XGI 1500-166/166-UL<br>XGI 1500-166/166-UL-A |
|---|---|---|---|---|---|
| DC Input | Absolute Max Input Voltage | 1500 VDC | 1500 VDC | 1500 VDC | 1500 VDC |
| | Max Power Input Voltage Range (MPPT) | 860-1250 VDC | 860-1250 VDC | 860-1250 VDC | 860-1250 VDC |
| | Operating Voltage Range (MPPT) | 860-1450 VDC | 860-1450 VDC | 860-1450 VDC | 860-1450 VDC |
| | Number of MPP Trackers | 1 MPPT | 1 MPPT | 1 MPPT | 1 MPPT |
| | Max Operating Input Current | 148.3 A | 148.3 A | 178.0 A | 197.7 A |
| | Max Operating PV Power | 128 kW | 128 kW | 153 kW | 170 kW |
| | Max DC/AC Ratio \| Max Rated PV Power | 2.6 \| 332 kW | 2.6 \| 332 kW | 2.2 \| 332 kW | 2.0 \| 332 kW |
| | Max Rated PV Short-Circuit Current (∑Isc x 1.25) | 500 A | 500 A | 500 A | 500 A |
| AC Output | Nominal Output Voltage | 600 VAC, 3-Ph | 600 VAC, 3-Ph | 600 VAC, 3-Ph | 600 VAC, 3-Ph |
| | AC Voltage Range | -12% to +10% | -12% to +10% | -12% to +10% | -12% to +10% |
| | Continuous Real Output Power | 125 kW | 125 kW | 150 kW | 166 kW |
| | Continuous Apparent Output Power | 125 kVA | 150 kVA | 166 kVA | 166 kVA |
| | Max Output Current | 120 A | 144 A | 160 A | 160 A |
| | Nominal Output Frequency | 60 Hz | 60 Hz | 60 Hz | 60 Hz |
| | Power Factor (Unity default) | +/- 0.80 Adjustable | +/- 0.80 Adjustable | +/- 0.80 Adjustable | +/- 0.80 Adjustable |
| | Total Harmonic Distortion (THD) @ Rated Load | <3% | <3% | <3% | <3% |
| | Grid Connection Type | 3-Ph + N/GND | 3-Ph + N/GND | 3-Ph + N/GND | 3-Ph + N/GND |
| | Fault Current Contribution (1 cycle RMS) | 144 A | 173 A | 192 A | 192 A |
| Efficiency | Peak Efficiency | 98.9% | 98.9% | 99.0% | 99.0% |
| | CEC Average Efficiency | 98.5% | 98.5% | 98.5% | 98.5% |
| | Tare Loss | 2.75 W | 2.75 W | 2.75 W | 2.75 W |
| Temperature | Ambient Temp Range | -40°F to 140°F (-40C to 60C) | | -40°F to 140°F (-40C to 60C) | |
| | De-Rating Temperature | 122°F (50C) | | 113°F (45C) | |
| | Storage Temperature Range | -40°F to 167°F (-40C to 75C) | | -40°F to 167°F (-40C to 75C) | |
| | Relative Humidity (non-condensing) | 0 - 95% | | 0 - 95% | |
| | Operating Altitude | Full Power up to 9,840 ft (3.0 km); De-Rate to 70% of Full Power at 13,123 ft (4.0 km) | | | |
| Communications | Advanced Graphical User Interface | WiFi | | | |
| | Communication Interface | Ethernet | | | |
| | Third-Party Monitoring Protocol | SunSpec Modbus TCP/IP | | | |
| | Web-Based Monitoring | Optional | | | |
| | Firmware Updates | Remote and Local | | | |
| Testing & Certifications | Safety Listings & Certifications | UL1741SB, IEEE 1547, UL 1998 (All models)<br>UL 1699b Photovoltaic Arc-Fault Circuit Protection Certified (-A models) | | | |
| | Advanced Grid Support Functionality | Rule 21, UL 1741SB | | | |
| | Testing Agency | ETL | | | |
| | FCC Compliance | FCC Part 15 (Subpart B, Class A) | | | |
| Warranty | Standard and Options | 5 Years Standard; Option for 10 Years | | | |
| Enclosure | Acoustic Noise Rating | 73 dBA @ 1 m ; 67dBA @ 3 m | | | |
| | DC Disconnect | Integrated 2-Pole 250 A DC Disconnect | | | |
| | Mounting Angle | Vertical only | | | |
| | Dimensions | Height: 29.5 in. (750 mm) \| Width: 39.4 in. (1000 mm) \| Depth: 15.1 in. (380 mm) | | | |
| | Weight | 270 lbs (122 kg) | | | |
| | Enclosure Rating and Finish | Type 4X, Polyester Powder-Coated Aluminum | | | |

IT'S PERSONAL

YASKAWA SOLECTRIA SOLAR

# 100/125 kW, 1500 Vdc String Inverters for North America


**CPS SCH100/125KTL-DO/US-600**

The 100 and 125 kW high power CPS three-phase string inverters are designed for ground mount applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 99.1% peak and 98.5% CEC, wide operating voltages, broad temperature ranges and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 100/125 kW products ship with the Standard or Centralized Wire-box, each fully integrated and separable with AC and DC disconnect switches. The Standard Wire-box includes touch-safe fusing for up to 20 strings. The CPS FlexOM Gateway enables communication, controls and remote product upgrades.

## Key Features

- NFPA 70 and NEC compliant
- Touch-safe DC Fuse holders add convenience and safety
- CPS FlexOM Gateway enables remote firmware upgrades
- Integrated AC and DC disconnect switches
- 1 MPPT with 20 fused inputs for maximum flexibility
- Copper- and Aluminum-compatible AC connections
- NEMA Type 4X outdoor rated enclosure
- Advanced Smart-Grid features (CA Rule 21 certified)
- kVA headroom yields 100 kW @ 0.9 PF and 125 kW @ 0.95 PF
- Generous 1.87 (100 kW) and 1.5 (125 kW) DC/AC inverter load ratios
- Separable wire-box design for fast service
- Standard 5-year warranty with extensions to 20 years

100/125KTL Standard Wire-box

100/125KTL Centralized Wire-box

This device complies with part 15 of the FCC Rules



Chint Power Systems America
1380 Presidential Drive, Suite 100, Richardson, TX 75081
Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com

| Model Name | CPS SCH100KTL-DO/US-600 | CPS SCH125KTL-DO/US-600 |
|---|---|---|
| **DC Input** | | |
| Max. PV power | 187.5 kW | |
| Max. DC input voltage | 1500 V | |
| Operating DC input voltage range | 860-1450 Vdc | |
| Start-up DC input voltage / power | 900 V / 250 W | |
| Number of MPP trackers | 1 | |
| MPPT voltage range[1] | 870-1300 Vdc | |
| Max. PV input current (Isc x 1.25) | 275 A | |
| Number of DC inputs | Standard Wire-box: 20 PV source circuits, pos. and neg. fused<br>Centralized Wire-box: 1 input circuit, 1-2 terminations per pole, non-fused | |
| DC disconnection type | Load-rated DC switch | |
| DC surge protection | Type II MOV (with indicator/remote signaling) | |
| **AC Output** | | |
| Rated AC output power | 100 kW | 125 kW |
| Max. AC output power[2] | 100 kVA (111 kVA @ PF>0.9) | 125 kVA (132 kVA @ PF>0.95) |
| Rated output voltage | 600 Vac | |
| Output voltage range[3] | 528-660 Vac | |
| Grid connection type[4] | 3Φ / PE / N (neutral optional) | |
| Max. AC output current @ 600 Vac | 96.2 / 106.8 A | 120.3 / 127.0 A |
| Rated output frequency | 60 Hz | |
| Output frequency range[3] | 57-63 Hz | |
| Power factor | >0.99 (±0.8 adjustable) | >0.99 (±0.8 adjustable) |
| Current THD | <3% | |
| Max. fault current contribution (1-cycle RMS) | 41.47 A | |
| Max. OCPD rating | 200 A | |
| AC disconnection type | Load-rated AC switch | |
| AC surge protection | Type II MOV (with indicator/remote signaling) | |
| **System** | | |
| Topology | Transformerless | |
| Max. efficiency | 99.1% | |
| CEC efficiency | 98.5% | |
| Stand-by / night consumption | <4 W | |
| **Environment** | | |
| Enclosure protection degree | NEMA Type 4X | |
| Cooling method | Variable speed cooling fans | |
| Operating temperature range | -22°F to +140°F / -30°C to +60°C (derating from +108°F / +42°C) | |
| Non-operating temperature range[5] | -40°F to +158°F / -40°C to +70°C maximum | |
| Operating humidity | 0-100% | |
| Operating altitude | 8202 ft / 2500 m (no derating) | |
| Audible noise | <65 dBA @ 1 m and 25°C | |
| **Display and Communication** | | |
| User interface and display | LED indicators, WiFi + APP | |
| Inverter monitoring | Modbus RS485 | |
| Site-level monitoring | CPS FlexOM Gateway (1 per 32 inverters) | |
| Modbus data mapping | SunSpec / CPS | |
| Remote diagnostics / firmware upgrade functions | Standard / (with FlexOM Gateway) | |
| **Mechanical** | | |
| Dimensions (W x H x D) | Standard Wire-box: 45.28 x 24.25 x 9.84 in (1150 x 616 x 250 mm)<br>Centralized Wire-box: 39.37 x 24.25 x 9.84 in (1000 x 616 x 250 mm) | |
| Weight | Inverter: 121 lbs (55 kg)<br>Standard Wire-box: 55 lbs (25 kg)<br>Centralized Wire-box: 33 lbs (15 kg) | |
| Mounting / installation angle | 15 - 90 degrees from horizontal (vertical or angled) | |
| AC termination | M10 stud type terminal [3Φ] (wire range: 1/0 AWG - 500 kcmil CU/AL; lugs not supplied)<br>Screw clamp terminal block [N] (#12 - 1/0 AWG CU/AL) | |
| DC termination | Standard Wire-box: Screw clamp fuse holder (wire range: #12 - #6 AWG CU)<br>Centralized Wire-box: Busbar, M10 bolts (wire range: #1AWG - 500kcmil CU/AL [1 termination per pole],<br>#1 AWG - 300 kcmil CU/AL [2 terminations per pole]; lugs not supplied) | |
| Fused string inputs | 25 A fuses provided (fuse values up to 30 A acceptable) | |
| **Safety** | | |
| Certifications and standards | UL 1741-SA/SB Ed. 3, CSA-C22.2 NO.107.1-01, IEEE 1547-2018, FCC PART15 | |
| Selectable grid standard | IEEE 1547a-2014, IEEE 1547-2018[6], CA Rule 21, ISO-NE | |
| Smart-grid features | Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAR, Freq-Watt, Volt-Watt | |
| **Warranty** | | |
| Standard[7] | 5 years | |
| Extended terms | 10, 15 and 20 years | |

1) See user manual for further information regarding MPPT voltage range when operating at non-unity PF.
2) "Max AC apparent power" rating valid within MPPT voltage range and temperature range of -30°C to +40°C (-22°F to +104°F) for 100 kW PF≥0.9, and 125 kW PF≥0.95.
3) The "output voltage range" and "output frequency range" may differ according to the specific grid standard.
4) Wye neutral-grounded; delta may not be corner-grounded.
5) See user manual for further requirements regarding non-operating conditions.
6) Firmware version 12.0 or later required.
7) 5-year warranty effective for units purchased after October 1, 2019.