

# Clean Eagle Interconnect RNG Facility Preliminary Noise Impact Report

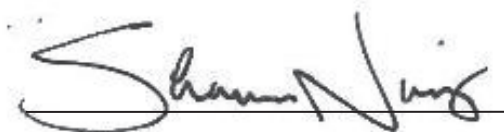
October 30, 2024

Prepared for:

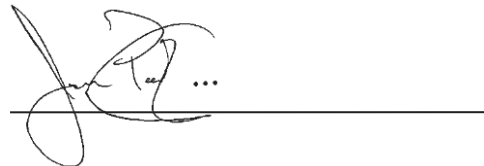
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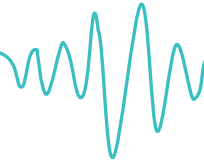
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## 1. Introduction

Archaea Energy (“Archaea”) contracted Behrens and Associates, Inc. (“BAENC”) to provide a preliminary noise assessment of the proposed renewable natural gas facility (“RNG”) operations at the Clean Eagle Interconnect RNG Facility (“facility”) site located in Hall County, Georgia.

The noise assessment includes a modeling analysis of the facility equipment at the site. This report provides the predicted operational noise level impact at nearby noise sensitive receptors adjacent to the site. The location (34.212980°, -83.779587°) of the proposed Clean Eagle Interconnect RNG Facility and surrounding area is shown in Figure 1-1.

The following is provided in this report:

- A brief introduction of the fundamentals of noise.
- Documentation of the measured ambient noise levels at the project site.
- A discussion of noise modeling methodology.
- An assessment of the predicted operational noise levels in relation to the measured ambient sound levels.

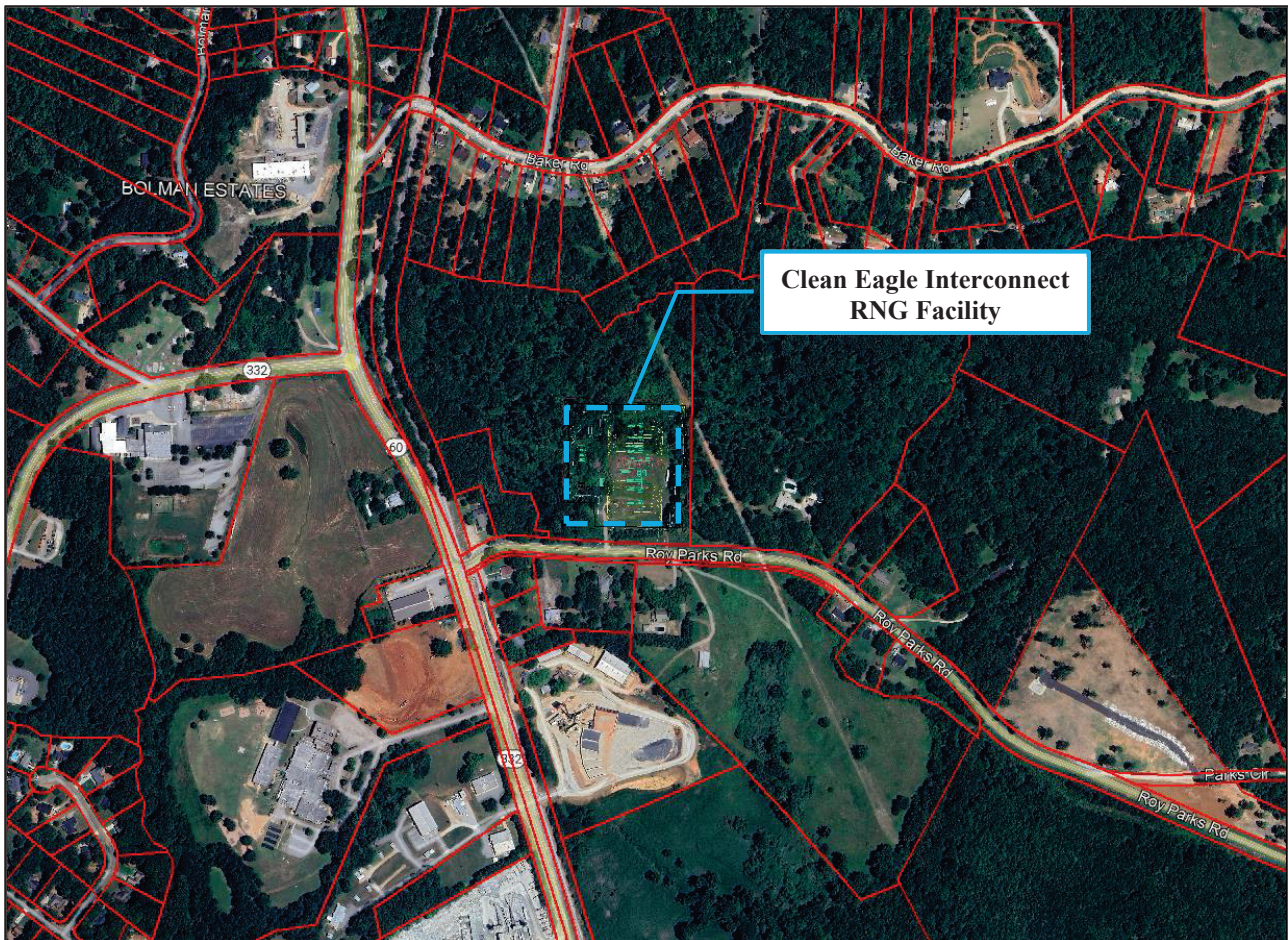


Figure 1-1 Clean Eagle Interconnect RNG Facility Location and Surrounding Area



## 2. Noise Fundamentals

Sound is most commonly experienced by people as pressure waves passing through air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear range from approximately 20 Hz to 20,000 Hz. Toward the lower end of this range are low-pitched sounds, including those that might be described as a “rumble” or “boom”. At the higher end of the range are high-pitched sounds that might be described as a “screech” or “hiss”.

### 2.1 Environmental Noise

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include common experiences such as distant traffic, wind in trees, and distant industrial or farming activities. These distant sources create a low-level "background noise" in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle.

Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include the passing of single-vehicles, aircraft flyovers, screeching of brakes, and other short-term events. The presence of these short-term events causes the noise level to fluctuate. Typical indoor and outdoor A-weighted sound levels are shown in Figure 2-1.

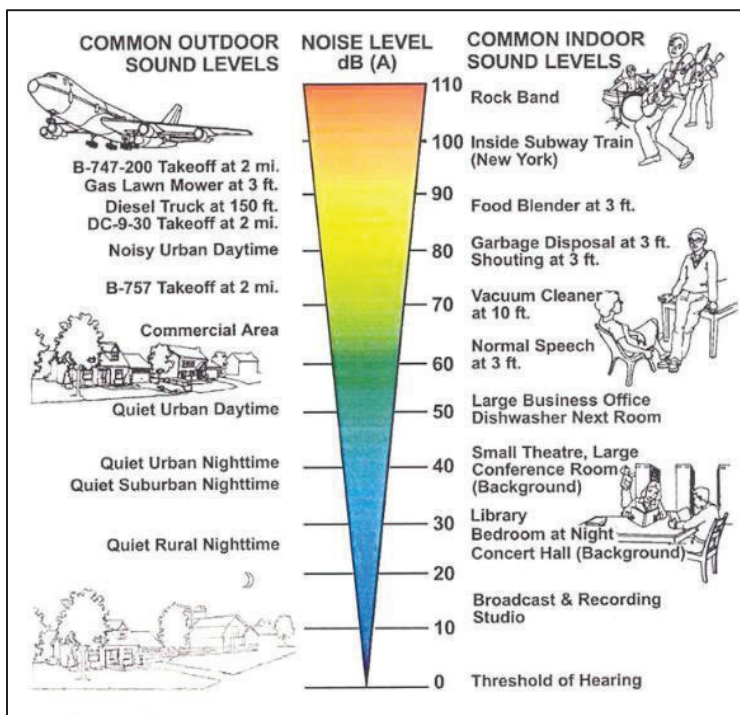
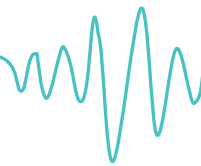


Figure 2-1 Typical Indoor and Outdoor A-Weighted Sound Levels



## 2.2 Relative Loudness of Environmental Noise

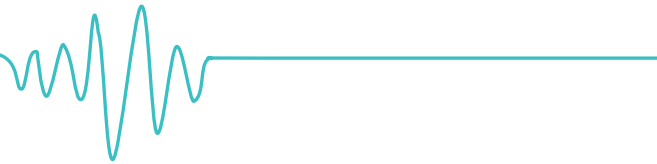
Published data exists describing how humans generally respond to changes in relative loudness. Table 2-1, adapted from the Highway Traffic Noise: Analysis and Abatement Guidance (revised December 2011) published by the Federal Highway Administration, shows typical responses to changes in relative loudness.

**Table 2-1 Decibel Changes, Loudness, and Relative Loudness<sup>1</sup>**

Sound Level Change	Relative Loudness
0 dB(A)	Reference
-3 dB(A)	Barely Perceptible Change
-5 dB(A)	Readily Perceptible Change
-10 dB(A)	Half as Loud
-20 dB(A)	1/4 as Loud
-30 dB(A)	1/8 as Loud

The table describes reductions in noise levels, but the opposite holds true for increases in noise level.

<sup>1</sup> Table adapted from FHWA Highway Traffic Noise: Analysis and Abatement Guidance, revised December 2011



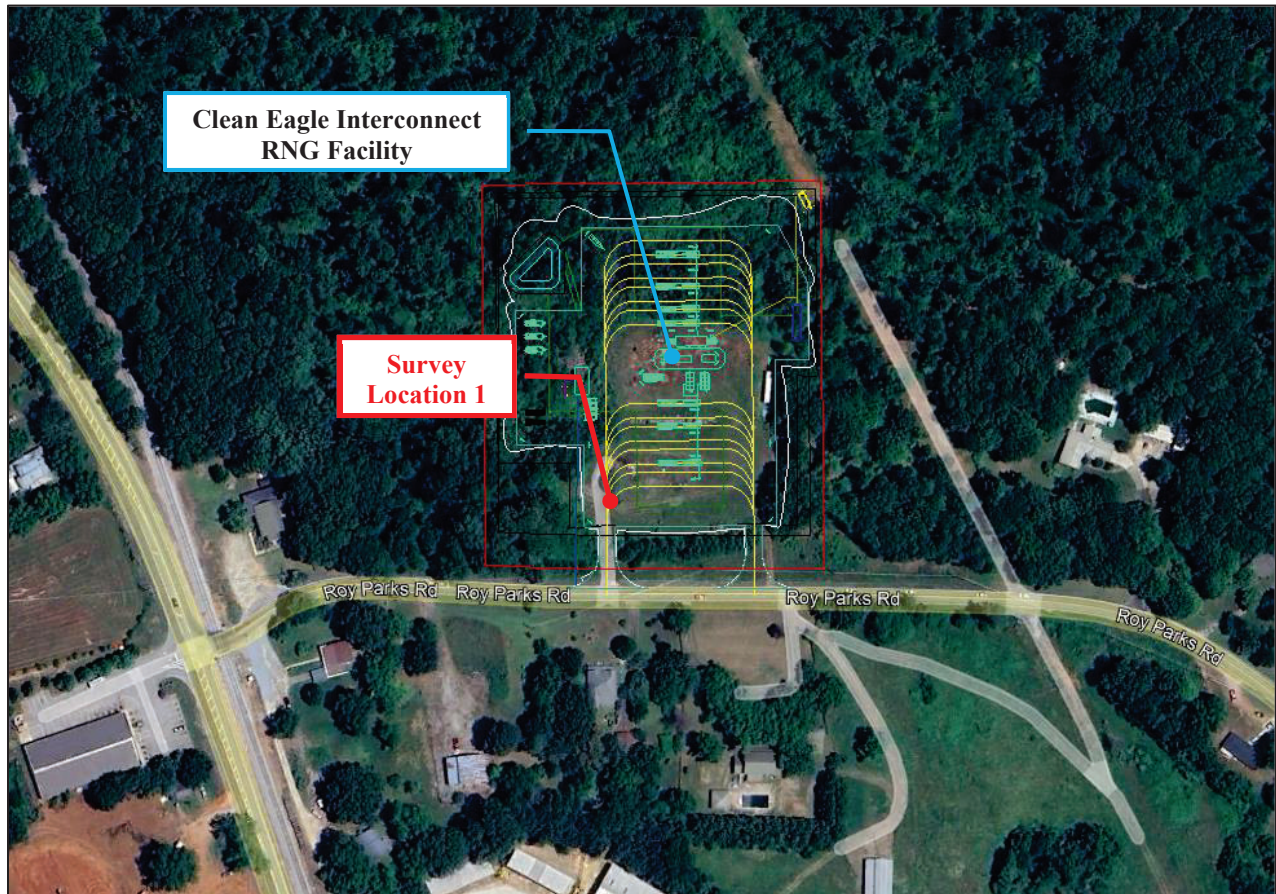
## 3. Ambient Sound Level Survey

### 3.1 Ambient Sound Level Survey Procedure

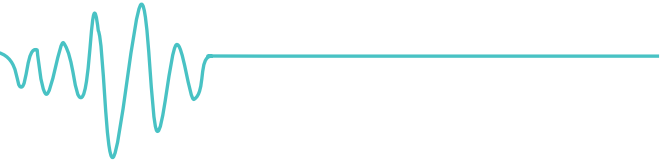
A Type 1 SVANTEK SVAN 971 sound level meter was utilized to conduct an ambient sound level survey adjacent to the proposed Clean Eagle Interconnect RNG Facility. The sound level meter conforms to Class 1 as per ANSI/ASA S1.4/IEC 61672 (2024). The instrumentation details are presented in Table 3-1. The sound level meter was placed approximately 5 feet above ground level, 10 feet away from any reflective surfaces, and was calibrated prior to deployment and upon retrieval. The sound level monitoring period began on Sunday, October 13, 2024 with the meter programmed to continuously monitor and record A-weighted sound levels. Audio recordings were created by the sound level meters at the measurement location to, if the need arose, help in the identification of the source of noise level spikes. The monitoring period ended on Monday, October 14, 2024. The locations of the sound level meter used to conduct the ambient sound level survey can be seen in Figure 3-1 below.

**Table 3-1 Instrumentation Details**

Location	Instrument	GPS Coordinates	Manufacturer/Model	Serial Number
Location 1	Sound Level Meter	34.212451°, -83.779905°	SVANTEK SVAN 971	87101



**Figure 3-1 Clean Eagle Interconnect RNG Facility Ambient Sound Level Survey Location**



## 3.2 Clean Eagle RNG Facility Ambient Sound Level Results

The measured A-weighted average Leq and L90 sound levels for the monitoring period are shown in Table 3-2. The Location 1 measured 15-minute average Leq and L90 A-weighted sound levels for the duration of survey can be seen graphically in Figure 3-2.

The A-weighted filter is applied to instrument-measured sound levels in effort to account for the relative loudness perceived by the human ear. As the human ear is less sensitive to low frequencies, the A-weighted filter correspondingly discounts low frequency sound observed during measurements and is widely utilized for environmental noise measurements.

The measure sound level data was processed and used to calculate an average over the 24-hour monitoring period. The attached charts show the unfiltered measurement data. Weather data from the survey period was sourced from a nearby weather station ([www.wunderground.com](http://www.wunderground.com)) named Summer Creek – KGAGAIN148 in Gainesville, Georgia. Peak wind gust speed data was used and correlated with the ambient sound level measurement data when filtering wind speeds above 11 miles per hour for broadband measurement data. Wind gust speed and ambient sound level data were filtered on a 15-minute basis.

**Table 3-2 24-Hour Average Sound Levels (Leq dBA)**

Location	Overall Average (24-hours)
Location 1	53.5

L90 is a statistical measurement (Ln) representing the sound level that was exceeded 90% of the time over a given time interval (15 minutes). L90 sound levels are commonly used to represent the background sound level of a noise environment by excluding the effects of shorter duration noise level spikes that might occur (planes, trains, traffic, etc.). Table 3-3 shows the arithmetic average of the 15-minute L90 sound levels over the 24-hour monitoring period.

**Table 3-3 24-Hour Average Sound Levels (L90 dBA)**

Location	Overall Average (24-hours)
Location 1	48.3

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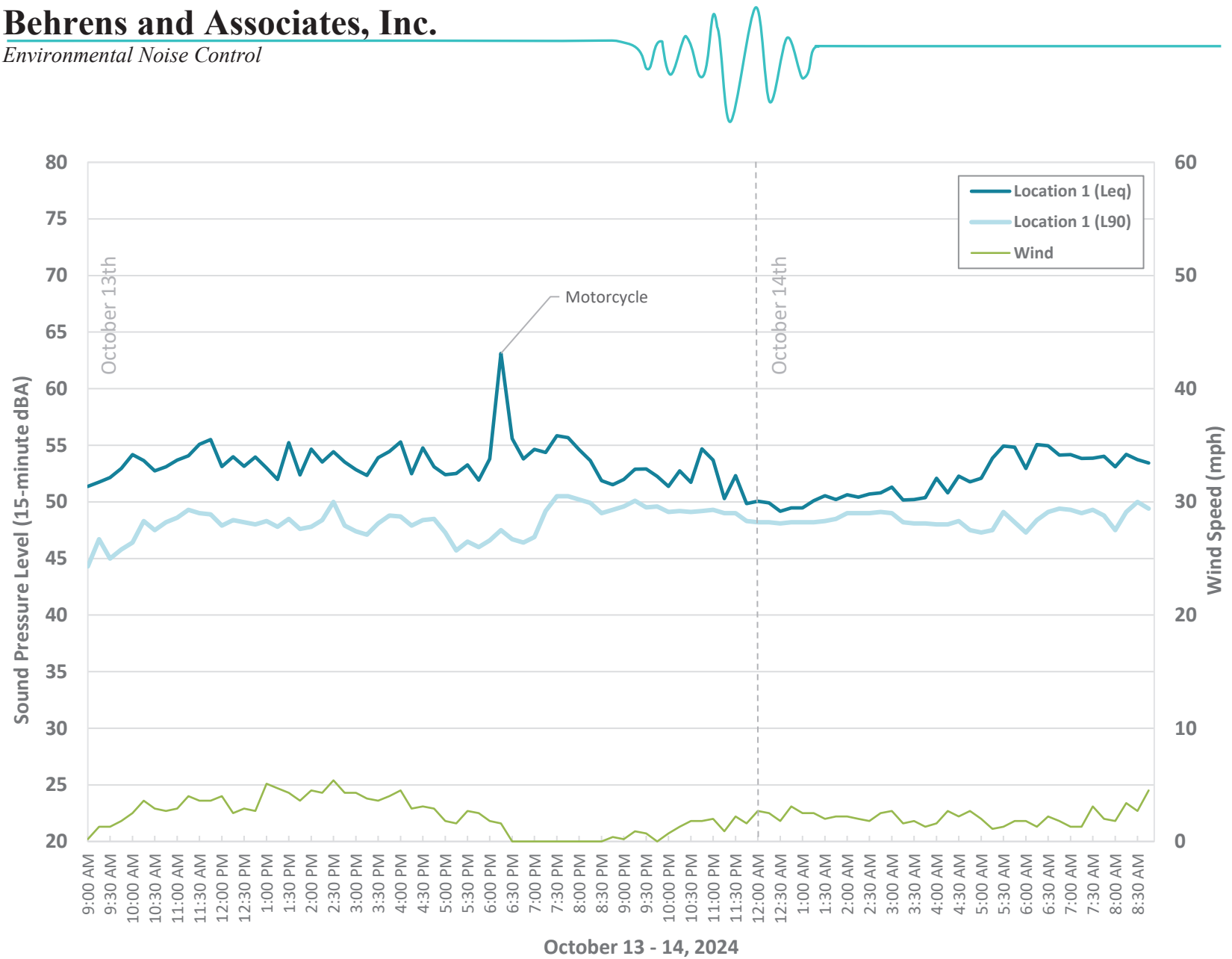


Figure 3-2 Location 1 - Measured Ambient Sound Level Data (15-minute dBA)



## 4. Clean Eagle RNG Facility Noise Modeling

### 4.1 Noise Modeling Methodology

The noise modeling was completed with the use of three-dimensional computer noise modeling software. All models in this report were developed with SoundPLAN 9.0 software using the ISO 9613-2 standard. Noise levels are predicted based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers. To ensure a conservative assessment and compliance with ISO 9613-2 standards, light to moderate winds were assumed to be blowing from the source to receptor. The predicted noise levels represent only the contribution of the Clean Eagle Interconnect RNG Facility operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors. The modeled environmental conditions can be seen in Table 4-1.

**Table 4-1 Modeled Environmental Conditions**

Weather Parameter	Modeled Input
Temperature	10° C
Relative Humidity	70%
Air Pressure	1013.3 mbar
Wind Velocity	Per ISO 9613-2
Wind Direction	Source to receptor
Foliage	Not included
Ground Absorption	0.7 for general ground cover 0.5 for working pad 0.0 for bodies of water

The equipment sound level data used for the proposed Interconnect RNG facility was based on manufacturer data and was provided by Certarus. The predicted modeling results for the modeled facility and filling station are dependent on the modeled equipment layout provided by Archaea Energy (Figure 4-1). The electric compressor engines will be enclosed in an acoustical building with 3-inch-deep walls, insulation, and a perforated liner. Changes, removals or additions of equipment (e.g., compressors, coolers, etc.) may result in measured operational noise levels that are inconsistent with the modeling results. The modeled facility equipment sound power levels are presented in Table 4-2.

**Table 4-2 Clean Eagle Energy Modeled Noise Emitting Equipment**

Equipment	Site	Data Source	Quantity	Sound Power Level (dBA)
Decant Compressor	Interconnect RNG Facility	Manufacture Data	1	107.5 L <sub>w</sub> /Unit
Loading Compressor	Interconnect RNG Facility	Manufacture Data	2	111.3 L <sub>w</sub> /Unit
Loading Compressor Cooler	Interconnect RNG Facility	Manufacture Data	2	100.6 L <sub>w</sub> /Unit

### 4.2 Clean Eagle Interconnect RNG Facility Noise Sensitive Receptors

The locations of the noise sensitive receptors and surrounding environment are shown in Figure 4-2. The noise levels will be assessed at the receiving property line of nearby residences properties.





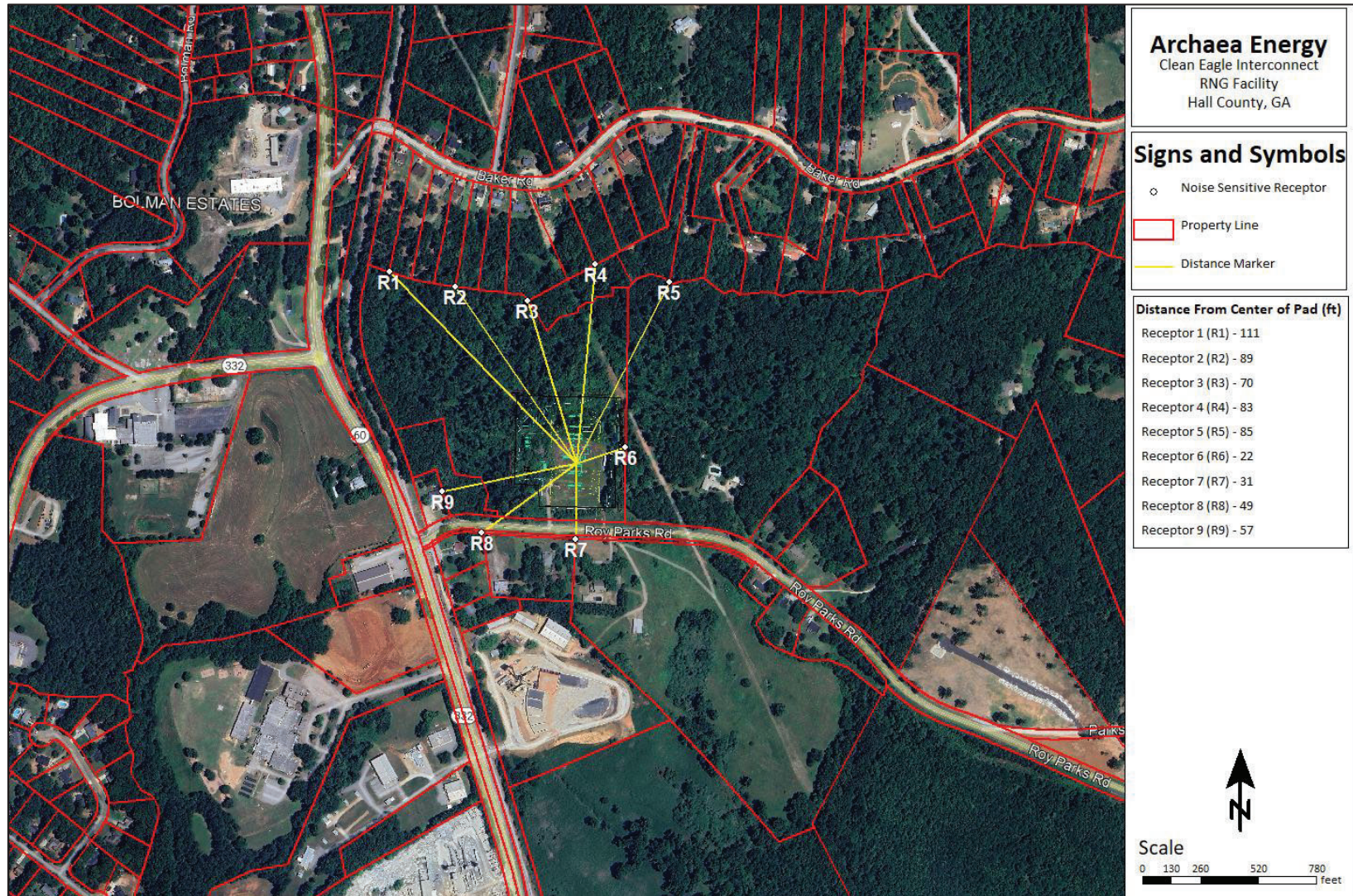
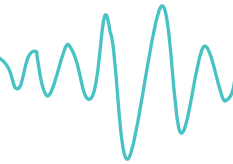
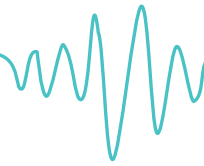


Figure 4-2 Modeled Clean Eagle Interconnect RNG Facility Noise Sensitive Receptors



### 4.3 Unmitigated – Clean Eagle Interconnect RNG Facility Noise Modeling Results

The unmitigated modeling is based off current Clean Eagle Interconnect RNG Facility plans and does not include sound walls or other third-party acoustical mitigation measures. The results of the facility noise modeling are presented in Table 4-3. The locations in the tables correspond to the locations identified in Figure 4-2. The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Figure 4-3 shows the Unmitigated Clean Eagle Interconnect RNG Facility Noise Contour Map in dBA. The noise contours are provided in 2 dB increments with the color scale indicating the sound level of each contour.

**Table 4-3 Unmitigated Clean Eagle Interconnect RNG Facility Noise Modeling Results (dBA)**

Receptor	Description	Predicted dB(A)	Representative Ambient Sound Level dB(A)
1	3693 BAKER ROAD	40	48.3 L90
2	3679 BAKER ROAD	43	48.3 L90
3	3667 BAKER ROAD	41	48.3 L90
4	3653 BAKER ROAD	39	48.3 L90
5	3619 BAKER ROAD	27	48.3 L90
6	4176 ROY PARKS ROAD	56	48.3 L90
7	4211 ROY PARKS	49	48.3 L90
8	4237 ROY PARKS ROAD	42	48.3 L90
9	4236 ROY PARKS ROAD	45	48.3 L90

**Table 4-4 Predicted Changes in Overall Noise Level**

Receptor	Predicted dB(A)	Representative Ambient Sound Level dB(A)	Combined (Ambient + Predicted)	Difference (combined - ambient)	Perceptibility
1	40	48.3 L90	48.9	0.6	Likely Not Perceptible
2	43	48.3 L90	49.4	1.1	Likely Not Perceptible
3	41	48.3 L90	49.0	0.7	Likely Not Perceptible
4	39	48.3 L90	48.8	0.5	Likely Not Perceptible
5	27	48.3 L90	48.3	0.0	Likely Not Perceptible
6	56	48.3 L90	56.7	8.4	Readily Perceptible
7	49	48.3 L90	51.7	3.4	Barely Perceptible
8	42	48.3 L90	49.2	0.9	Likely Not Perceptible
9	45	48.3 L90	50.0	1.7	Likely Not Perceptible

The results of the unmitigated noise modeling indicate that the change in overall noise levels due to the facility’s operations are predicted to be perceptible at Receptors 6 and 7. Therefore, mitigation will be recommended for the Clean Eagle Interconnect RNG Facility operations.

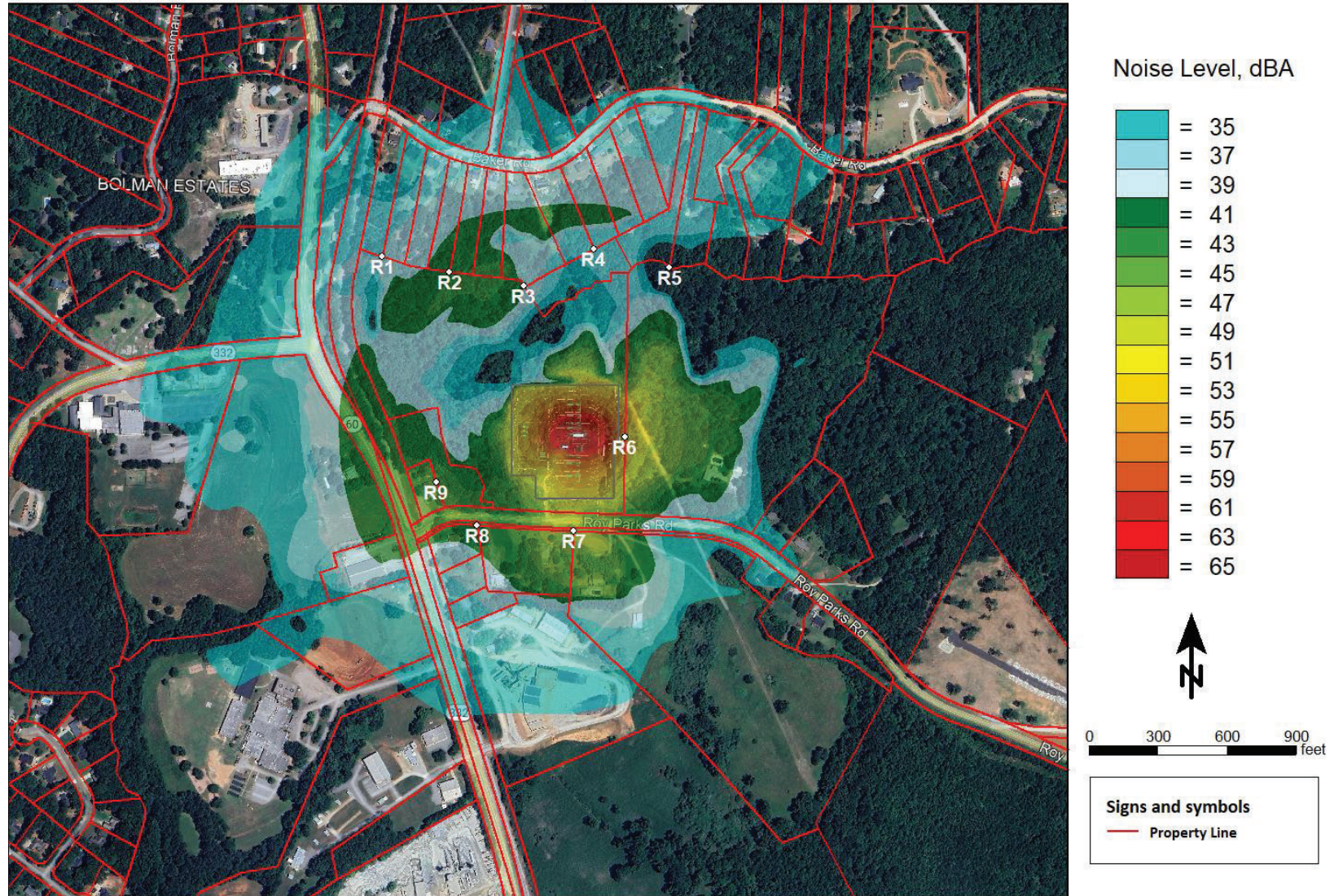
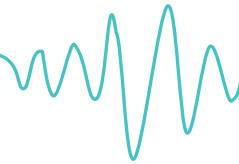
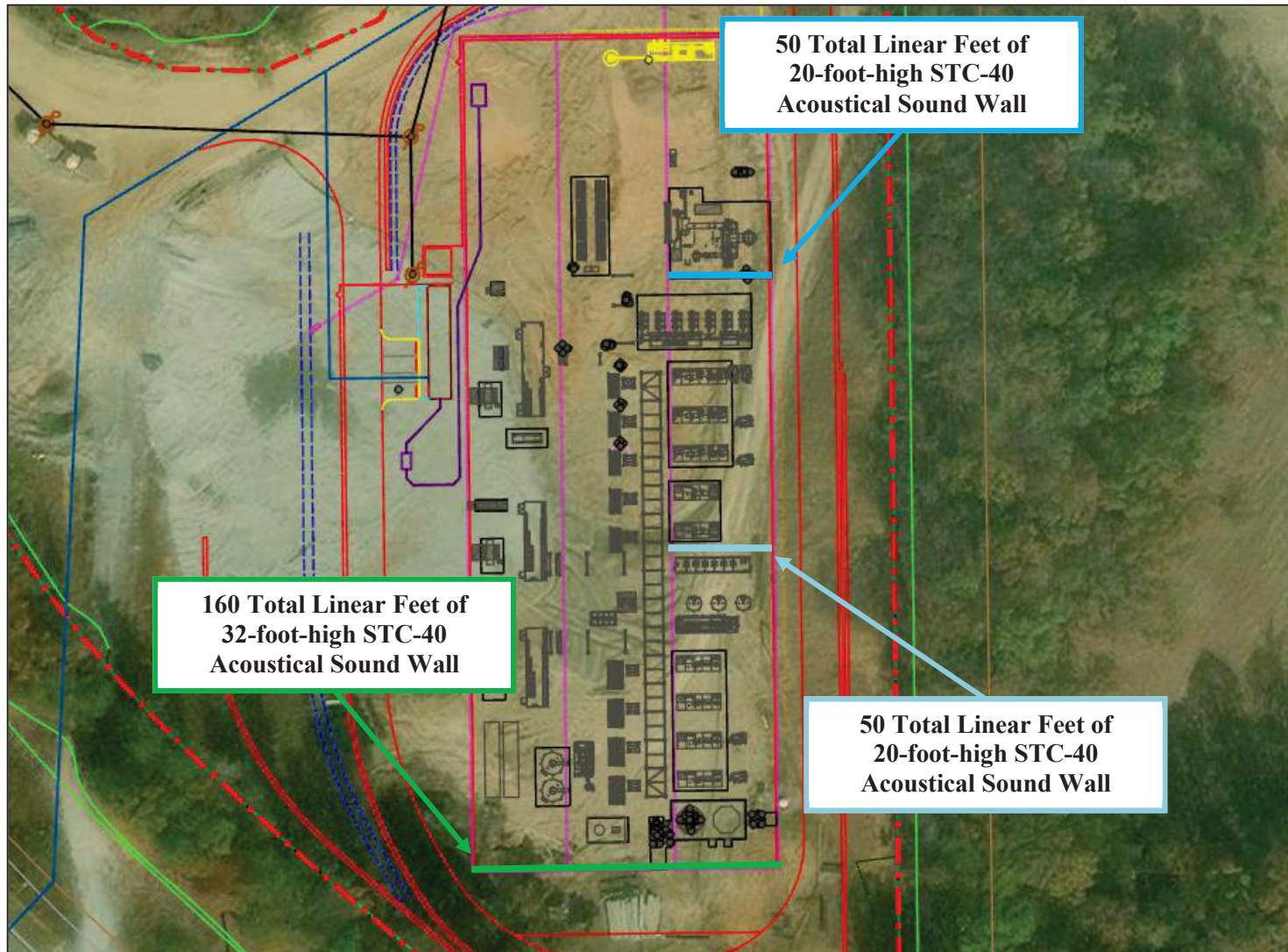
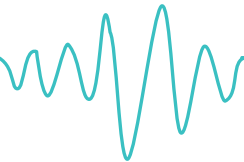


Figure 4-3 Unmitigated Clean Eagle Interconnect RNG Facility Noise Contour Map (dBA)

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**160 Total Linear Feet of  
32-foot-high STC-40  
Acoustical Sound Wall**

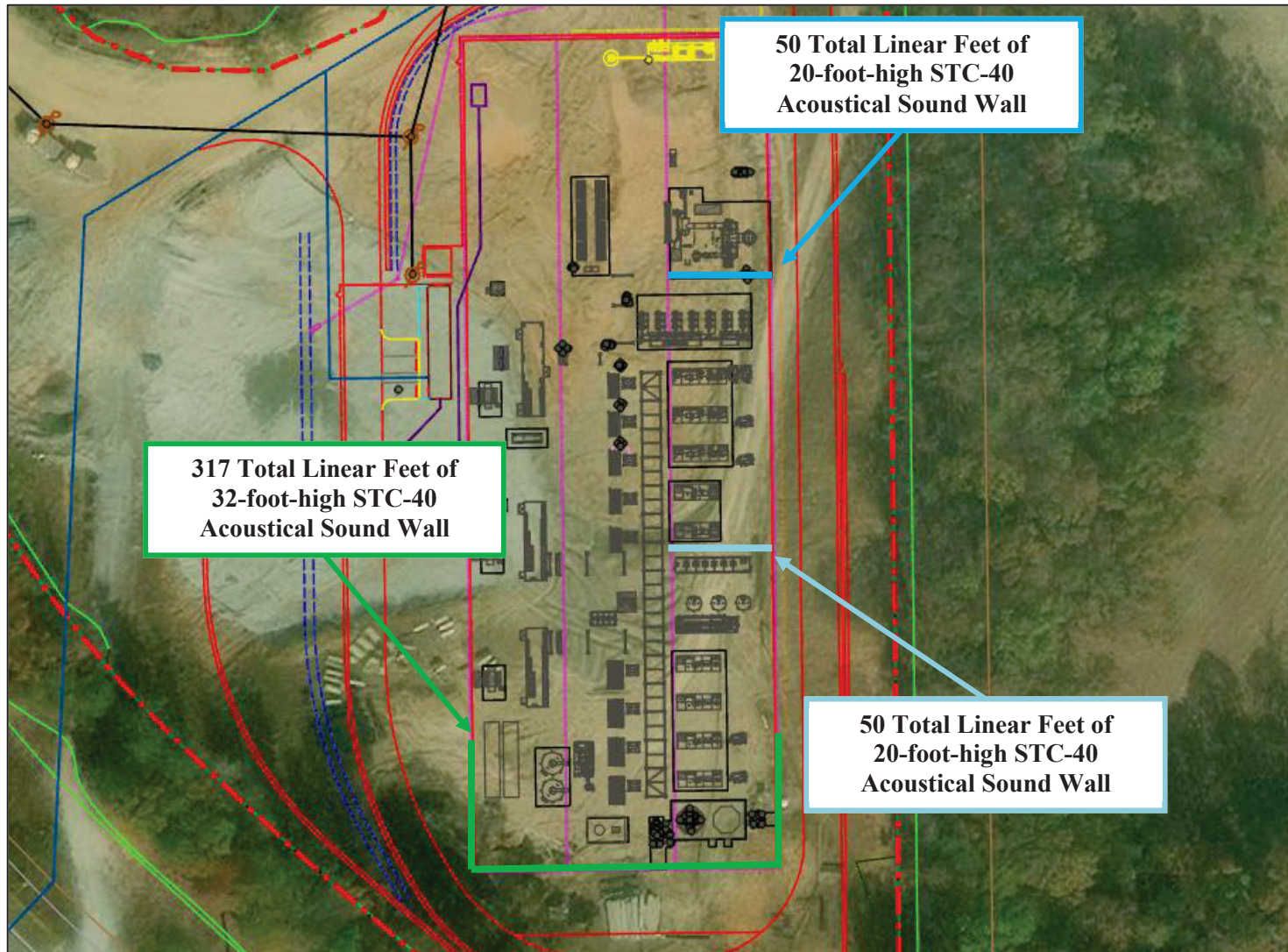
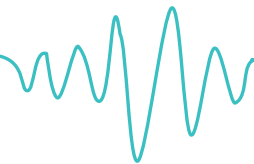
**50 Total Linear Feet of  
20-foot-high STC-40  
Acoustical Sound Wall**

**50 Total Linear Feet of  
20-foot-high STC-40  
Acoustical Sound Wall**

Figure 1 Scenario 1 - Mitigation Layout

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**317 Total Linear Feet of  
32-foot-high STC-40  
Acoustical Sound Wall**

**50 Total Linear Feet of  
20-foot-high STC-40  
Acoustical Sound Wall**

**50 Total Linear Feet of  
20-foot-high STC-40  
Acoustical Sound Wall**

Figure 2 Scenario 2 - Mitigation Layout

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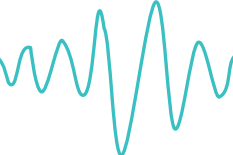
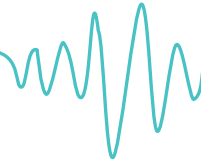


Figure 3 Site and Noise Sensitive Receptor Location

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The results of the mitigated noise modeling are presented in Table 1. The locations in the tables correspond to the locations identified in Figure 3. The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Figure 4 shows the Scenario 1 - Mitigated Clean Eagle RNG Facility Noise Contour Map in dBA. Figure 5 shows the Scenario 2 - Mitigated Clean Eagle RNG Facility Noise Contour Map in dBA. The noise contours are provided in 2 dB increments with the color scale indicating the sound level of each contour.

**Table 1 Mitigated Noise Modeling Results (dBA)**

Receptor	Unmitigated Clean Eagle RNG	Mitigated Scenario 1	Mitigated Scenario 2
Receptor 1	56	56	56
Receptor 2	54	53	52
Receptor 3	62	56	54
Receptor 4	62	47	47
Receptor 5	60	49	49
Receptor 6	55	50	48
<b>Forsyth County Noise Limit</b>	<b>60</b>	<b>60</b>	<b>60</b>

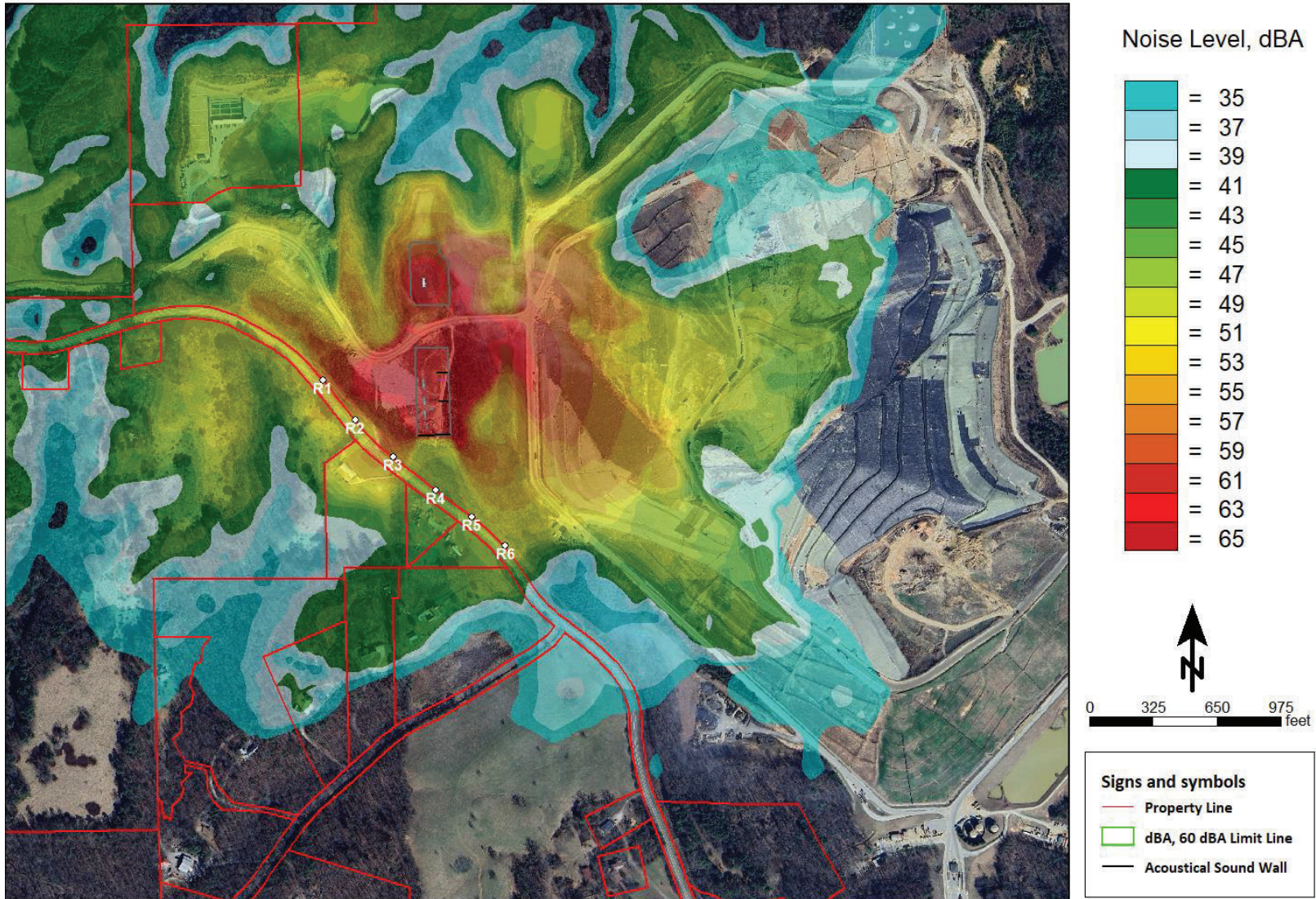
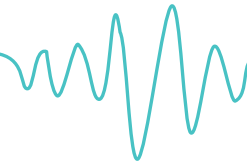
**Table 2 Scenario 1 - Mitigated Noise Modeling Results Reduction (dBA)**

Receptor	Unmitigated Clean Eagle RNG	Mitigated Clean Eagle RNG	Reduction
Receptor 1	56	56	0
Receptor 2	54	53	-1
Receptor 3	62	56	-6
Receptor 4	62	47	-15
Receptor 5	60	49	-11
Receptor 6	55	50	-5

**Table 3 Scenario 2 - Mitigated Noise Modeling Results Reduction (dBA)**

Receptor	Unmitigated Clean Eagle RNG	Mitigated Clean Eagle RNG	Reduction
Receptor 1	56	56	0
Receptor 2	54	52	-2
Receptor 3	62	54	-8
Receptor 4	62	47	-15
Receptor 5	60	49	-11
Receptor 6	55	48	-7





**Figure 4 Scenario 1 - Mitigated Clean Eagle RNG Facility Noise Contour Map**

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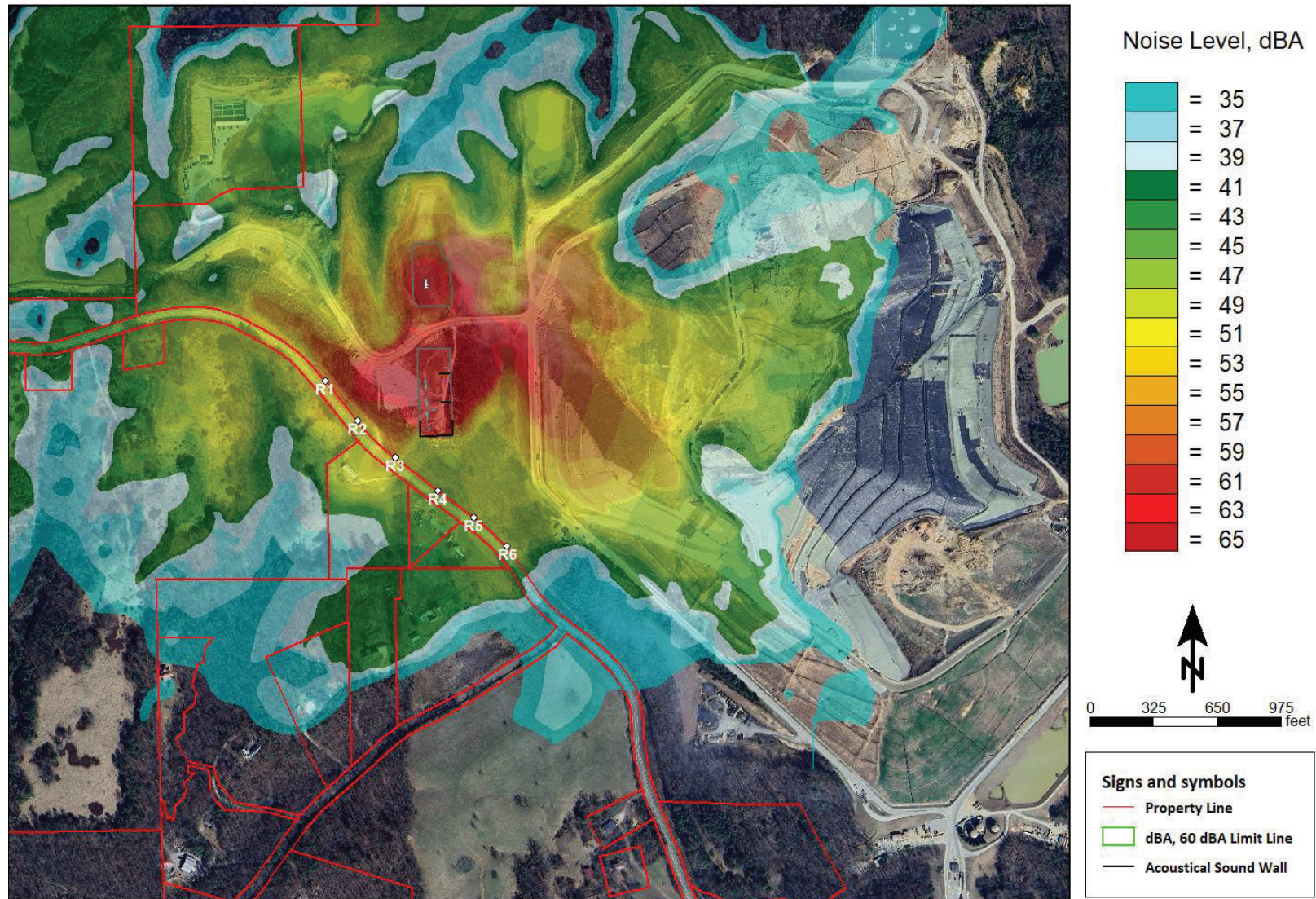
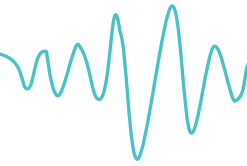


Figure 5 Scenario 2 - Mitigated Clean Eagle RNG Facility Noise Contour Map

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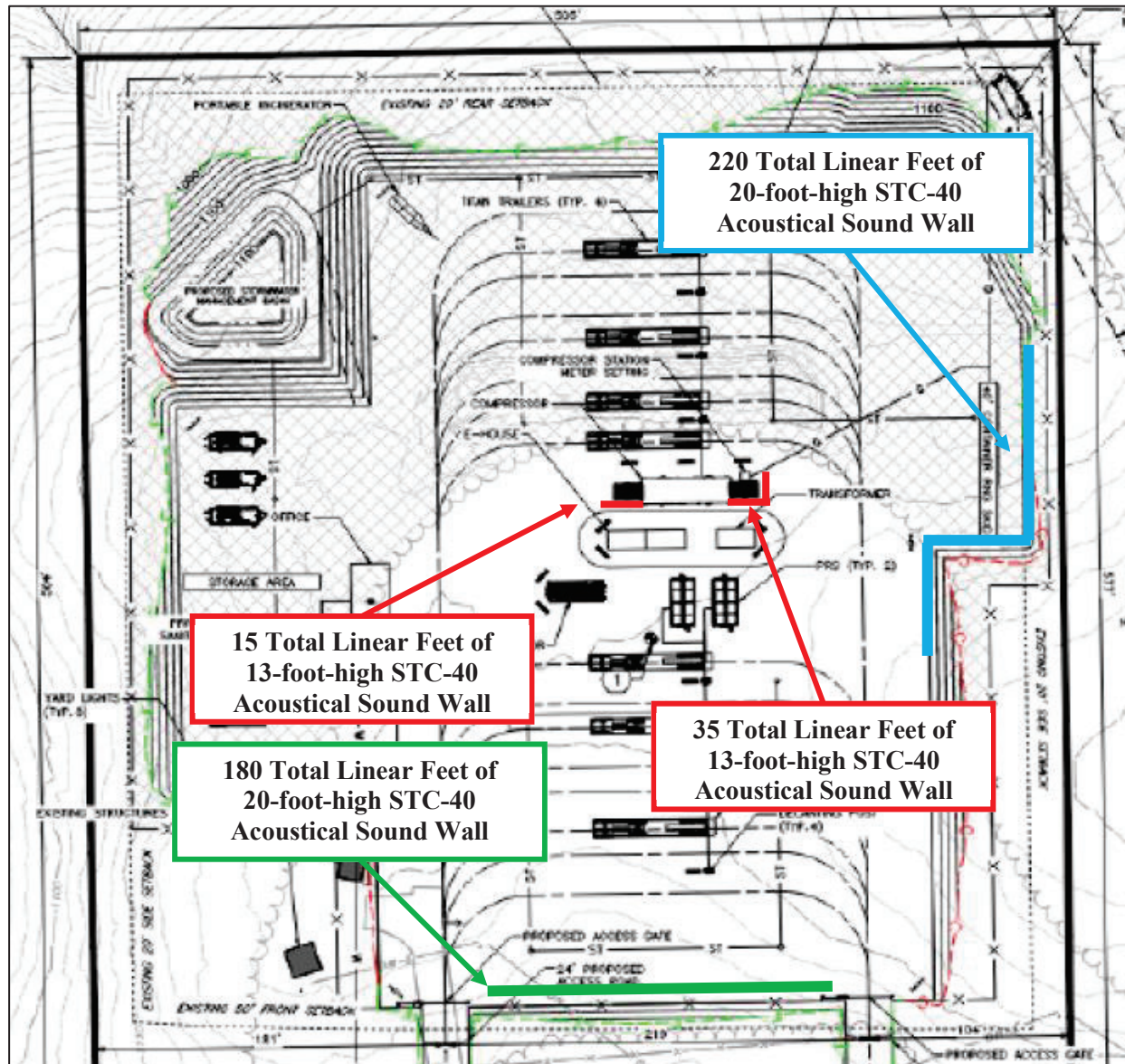
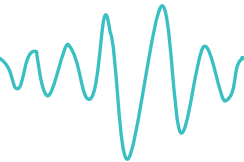


Figure 1 Clean Eagle Interconnect Mitigation Layout

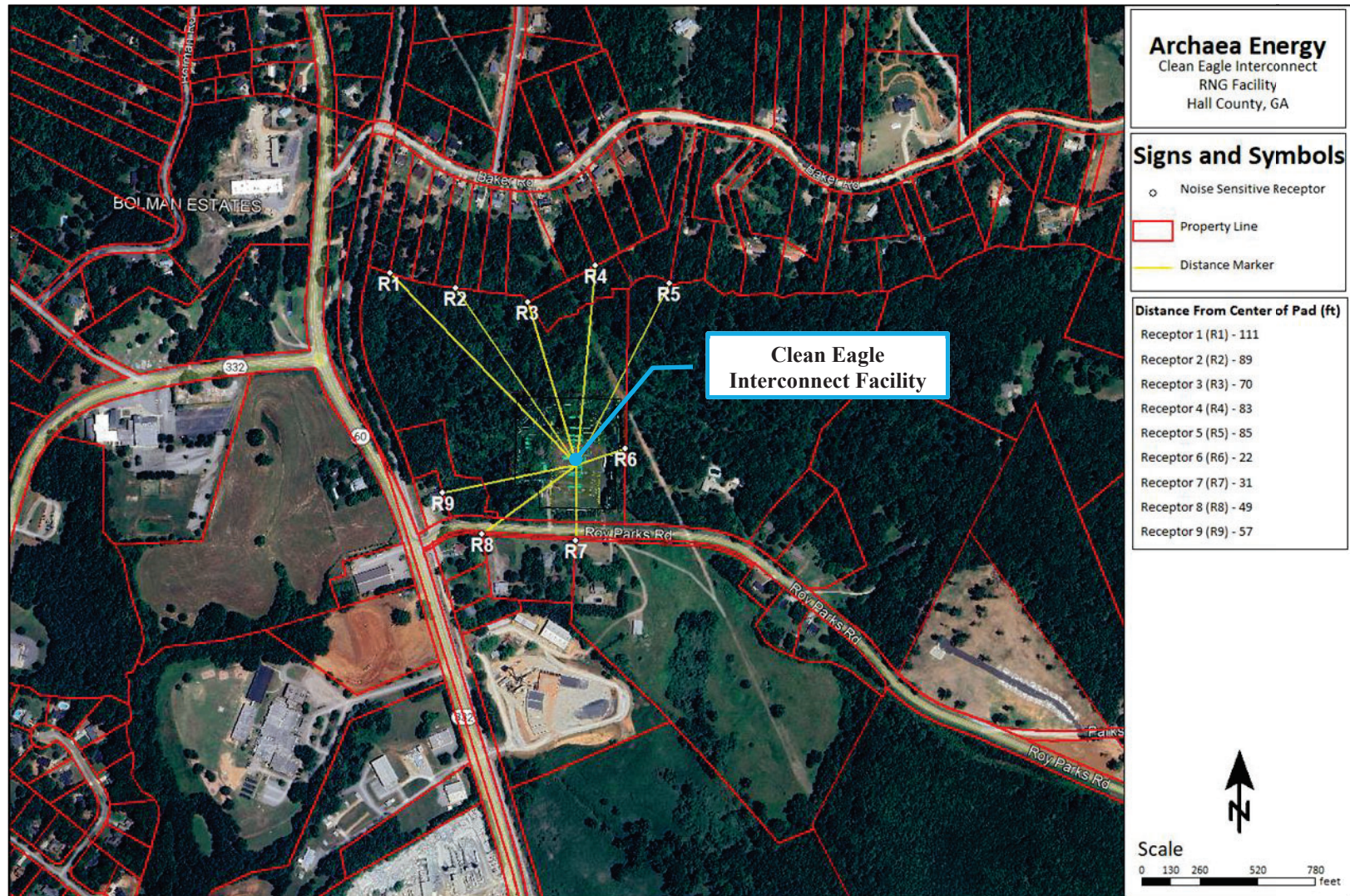
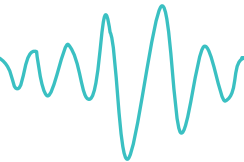
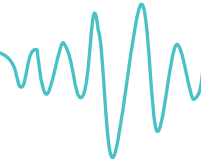


Figure 2 Site and Noise Sensitive Receptor Location

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The results of the mitigated noise modeling are presented in Table 1. The locations in the tables correspond to the locations identified in Figure 2. The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Figure 3 shows the Scenario 1 - Mitigated Clean Eagle Interconnect Facility Noise Contour Map in dBA. The noise contours are provided in 2 dB increments with the color scale indicating the sound level of each contour.

**Table 1 Mitigated Noise Modeling Results (dBA)**

<b>Receptor</b>	<b>Unmitigated Interconnect</b>	<b>Mitigated Interconnect</b>	<b>Reduction</b>
Receptor 1	41	41	0
Receptor 2	43	43	0
Receptor 3	42	42	0
Receptor 4	40	40	0
Receptor 5	27	27	0
Receptor 6	57	42	-15
Receptor 7	51	44	-7
Receptor 8	44	42	-2
Receptor 9	46	46	0

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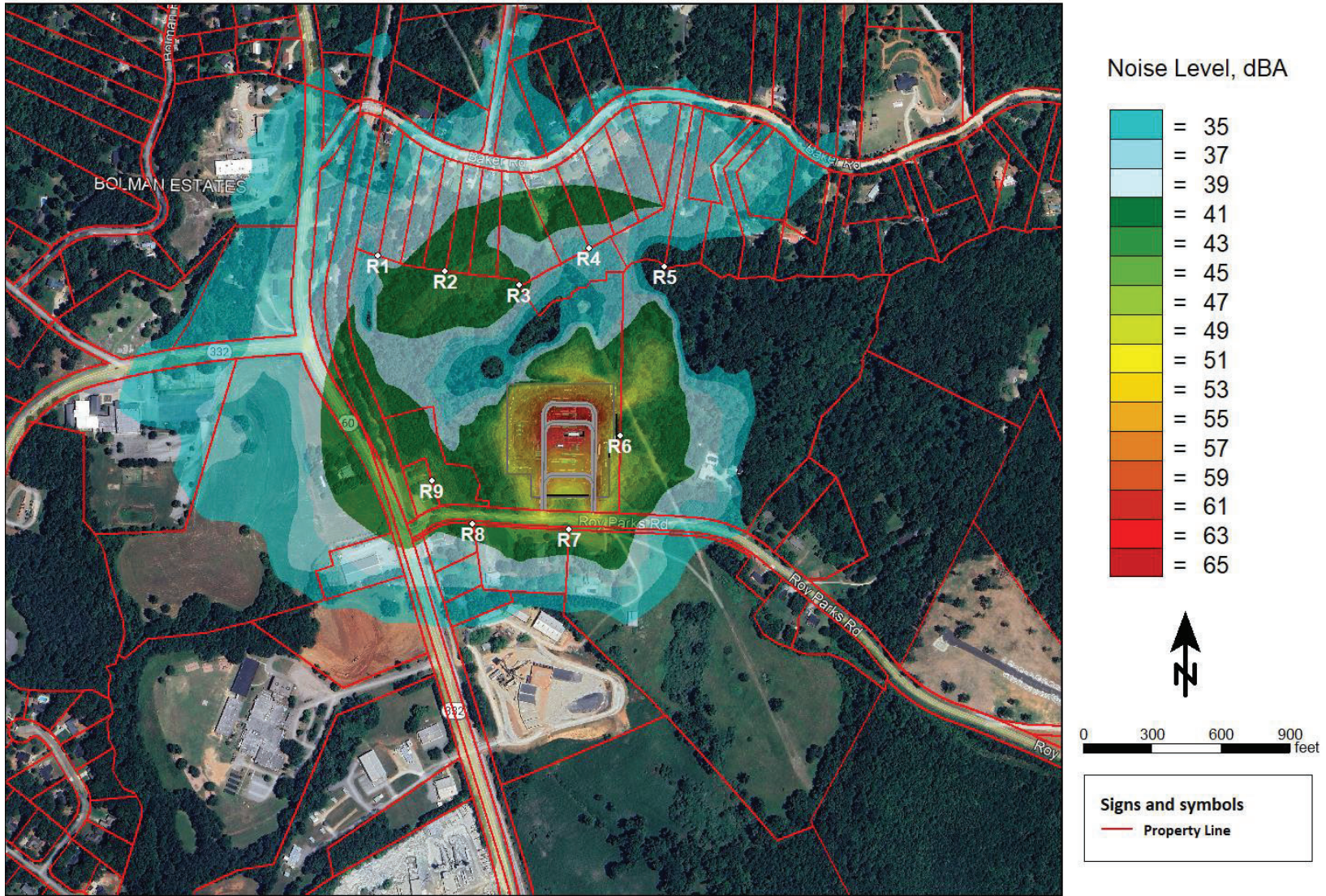
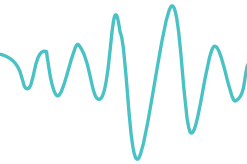


Figure 4 Mitigated Clean Eagle Interconnect Facility Noise Contour Map (dBA)

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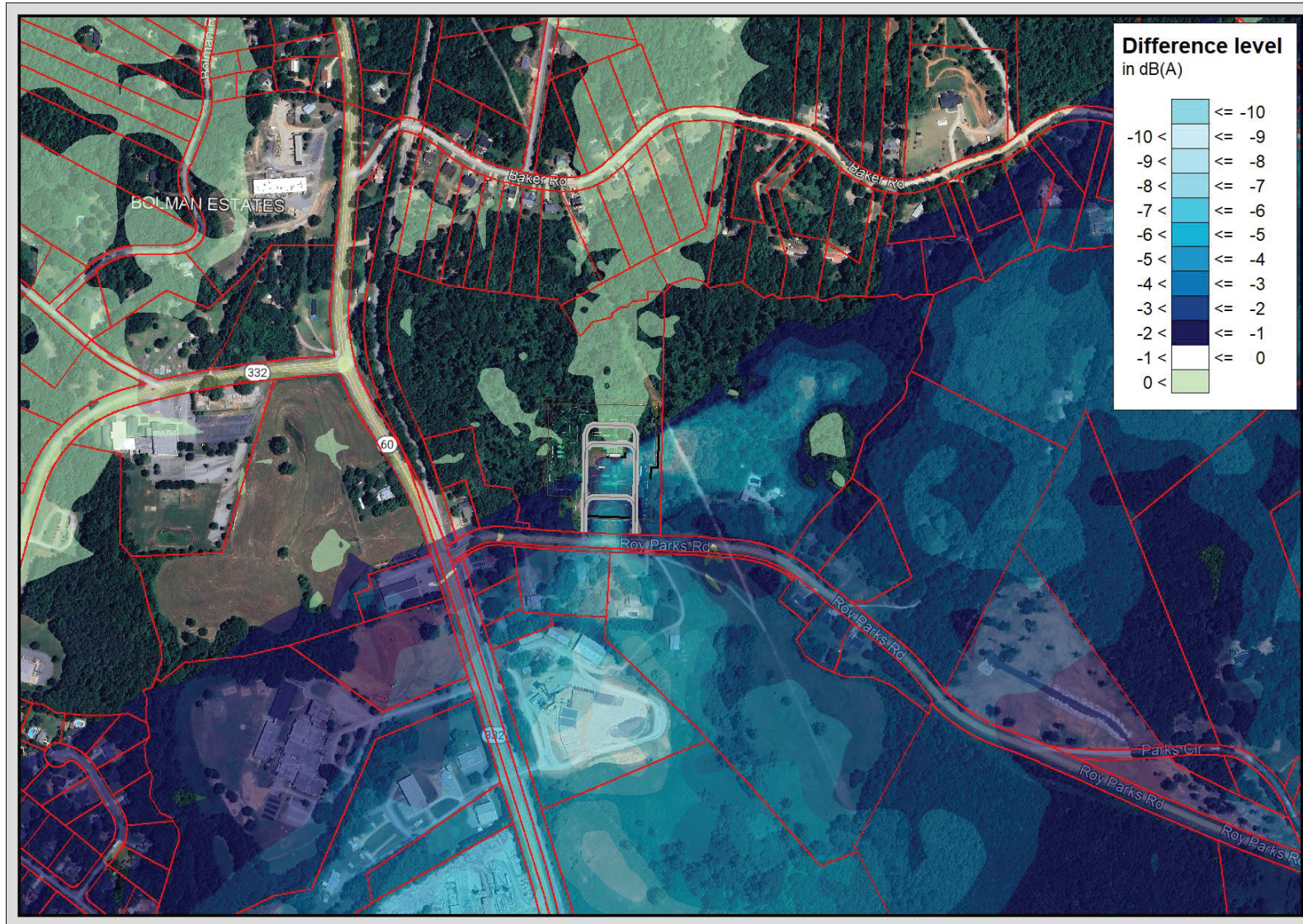
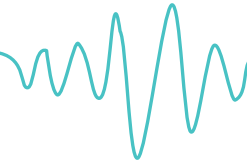


Figure 5 Mitigated Clean Eagle Interconnect Facility Difference Noise Contour Map (dBA)