Project Heartland

Environmental Noise Study

CLIENT	CLIENT CONTACT	DATE
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We have reviewed the proposed equipment layout and associated sound data for the Aligned Data Centers campus in Coal City, Illinois, located at the southeast corner of S Carbon Hill Road and E Reed Road in Grundy County. The campus consists of five data center buildings with supporting mechanical yards and electrical infrastructure. This report summarizes the applicable noise regulations, the results of our ambient noise survey, our acoustic model analyses of the proposed equipment, and the noise mitigation measures incorporated into the design. With the mitigation measures described in this report, the projected noise levels comply with the applicable Illinois Pollution Control Board limits at all evaluated receptors.

1.0 Applicable Noise Ordinances

1.1 Illinois Pollution Control Board Standards

The statewide noise standard enforced by the Illinois Pollution Control Board (IL PCB) applies to the site (35 Ill. Adm. Code Parts 900/901). The Illinois code classifies land into three classes based on use (35 Ill. Adm. Code 901.101): Class A includes residential and other noise-sensitive uses; Class B generally includes commercial uses; and Class C includes industrial, utility, and agricultural uses. Several of the receptors surrounding the site are commercial (Class B) or agricultural (Class C) properties. For sound emitted to receiving Class B land, the code establishes the following limits (35 Ill. Adm. Code 901.103), which apply at all hours.

We understand the site to be classified as Class B land, with the nearest noise-sensitive receivers being residential (Class A) properties. Under the Illinois code, noise emitted from a Class B property-line noise source to receiving Class A land must not exceed the following octave-band sound pressure levels, measured at any point within the receiving Class A land (and no less than 25 ft. from the noise source property line):

Table 1: IL PCB Maximum Permissible Sound Levels (Class B to Class A)

Period	SPL (dB) at Octave Band Center Frequency (Hz)								dBA*
	63	125	250	500	1k	2k	4k	8k	
Daytime (7am to 10pm)**	71	65	57	51	45	39	34	32	55
Nighttime (10pm to 7am)**	61	55	47	40	35	30	25	25	44

* Overall dBA levels are not specifically listed in the IL code; the equivalent dBA levels shown are calculated from the octave band data.

** Technically the standard defines daytime as "any continuous 16 hour period between 6:00 a.m. and 11:00 p.m. local time" with the other 8 hours considered nighttime, but in practice the 7am to 10pm daytime window is usually used.

Note that there are also Class B and C receivers in the immediate vicinity. Class B receivers are subject to the following limits:

Table 2: IL PCB Maximum Permissible Sound Levels (Class B to Class B)

Period	SPL (dB) at Octave Band Center Frequency (Hz)								dBA*
	63	125	250	500	1k	2k	4k	8k	
All hours	78	72	64	58	52	46	41	39	62

* Overall dBA levels are not specifically listed in the IL code; the equivalent dBA level shown is calculated from the octave band data.

The code does not establish numeric limits for sound emitted to receiving Class C land; as described in Section 1.5, we have conservatively evaluated both the commercial and agricultural receptors against a 55 dBA limit at all hours, which is more stringent than the Class B receiving-land limits below.

These levels apply at the receiving property, with the additional proviso that noise levels are to be measured no less than 25 ft. from the property line containing the noise source. It is possible to comply with the overall dBA rating while failing to comply with the levels in individual octave bands; compliance is therefore evaluated on an octave-band basis.

1.2 Village of Coal City Performance Standards

We understand that the project is being processed as a Planned Unit Development through the Village of Coal City, and that the Village has requested that the project demonstrate how it satisfies the Illinois Pollution Control Board standards. The Village of Coal City Zoning Code additionally contains a noise performance standard (§ 156-207, amended by Ord. No. 99-13): no operation or activity may create noise above a sound pressure level of 75 decibels (unweighted, slow response) measured at the boundaries of the nearest residentially zoned lot, as adjusted by Table 18 of the Zoning Code:

Table 3: Village of Coal City Adjustments to Permitted Sound Levels (Zoning Code Table 18)

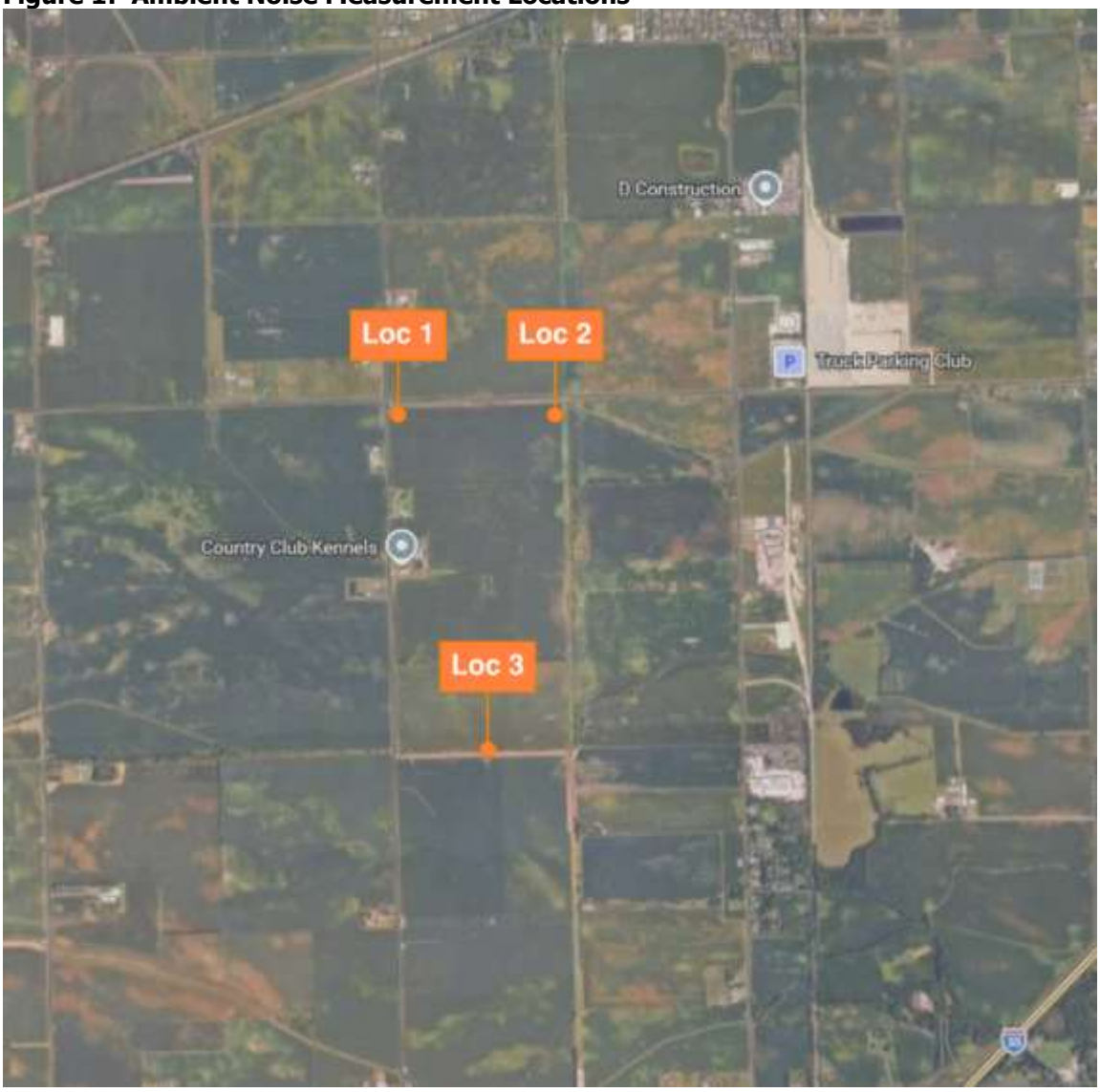
Condition	Adjustment
Duration of noise under 12 minutes in any one-hour period (one duration adjustment only)	Add 5 dB
Duration of noise under 3 minutes in any one-hour period	Add 10 dB
Duration of noise under 1/2 minute in any one-hour period	Add 15 dB
At boundaries of nearest office or commercial zoned lot	Add 5 dB
Noise is impulsive in character (for example, hammering)	Subtract 5 dB
Noise is periodic in character (for example, hum, screech)	Subtract 5 dB
Noise may be heard between the hours of 7:00 p.m. and 7:00 a.m.	Subtract 5 dB

For continuously operating data center equipment audible during nighttime hours, the operative Village limit would be 70 dB (unweighted); if the noise were judged "periodic in character," the limit would be 65 dB (unweighted). For continuous broadband equipment noise, the IL PCB octave-band limits summarized in Table 1 are substantially more stringent than the Village performance standard. Compliance with the IL PCB limits is therefore the governing design condition, and demonstrating compliance with the IL PCB standards also demonstrates compliance with the Village of Coal City noise performance standard.

1.3 Ambient Noise Survey

We measured ambient noise levels at three locations around the project site over an approximately 24-hour period from 6 to 7 July 2026; locations are shown in Figure 1.

Figure 1: Ambient Noise Measurement Locations



The noise levels measured on site were recorded in 1-second increments and analyzed over 1-hour periods. In each 1-hour period we determined the L90 noise level – the level exceeded 90% of the time, or the statistical minimum level – which represents the underlying background level of noise when the louder, more intermittent sounds are ignored.

For comparison to a noise ordinance, the L90 is typically used to determine whether the existing ambient noise should supersede the level published in the ordinance. The measured hourly L90 levels are summarized below; nighttime hours per the IL PCB definition are the 10:00 p.m. through 6:00 a.m. hours.

Table 4: Measured Ambient Noise Levels (hourly L90, dBA)

Hour	Location 1	Location 2	Location 3
09:00 AM	36	41	-
10:00 AM	38	42	41
11:00 AM	38	42	37
12:00 PM	36	40	36
01:00 PM	39	39	35
02:00 PM	42	40	33
03:00 PM	40	41	35
04:00 PM	41	42	35
05:00 PM	37	42	37
06:00 PM	37	41	38
07:00 PM	33	40	33
08:00 PM	34	38	31
09:00 PM	29	45	30
10:00 PM	29	37	30
11:00 PM	31	36	31
12:00 AM	28	36	29
01:00 AM	30	37	30
02:00 AM	30	41	30
03:00 AM	31	37	31
04:00 AM	34	53	33
05:00 AM	40	52	36
06:00 AM	43	49	38
07:00 AM	41	43	38
08:00 AM	39	42	37
Daytime lowest	29	37	29
Nighttime lowest	28	36	28

Ambient levels at Locations 1 and 3 are well below the IL PCB limits during both daytime and nighttime periods. At Location 2, levels during the 5:00 a.m. and 6:00 a.m. hours were elevated (approximately 51 dBA), which raises the nighttime average at that location above the 44 dBA nighttime code equivalent; we attribute these elevated levels to existing transportation-related activity rather than to a continuous ambient condition.

The primary conclusion of the survey is that existing ambient levels do not supersede the code limits: the IL PCB levels remain the operative standard, and equipment noise from the data

center will be quieter than, or comparable to, the quietest existing conditions only if substantial noise control is incorporated in the design.

1.4 Summary of Applicable Criteria

Upon review of the above we observe the following:

- Normal data center operations occur 24 hours per day, and so should be evaluated against more stringent nighttime standards.
- Generator testing can be scheduled at the operator's convenience and therefore should be evaluated against the less-stringent daytime standards.
- The Village of Coal City performance standard (75 dB unweighted, with adjustments) is less stringent than the IL PCB limits for continuous equipment noise and is satisfied where the IL PCB limits are met.
- Ambient noise levels do not exceed IL PCB limits, so the levels listed in the code should be the operative standard for evaluating relative to IL PCB.

As a result, we conclude that that following noise limits should be applied to the evaluation of the proposed data center:

- Typical day-to-day data center operations should be evaluated relative to the IL PCB nighttime limits (44 dBA with octave band levels per Table 1) at residential (Class A) receivers.
- Generator testing is expected to occur during daytime hours, and may be evaluated against the IL PCB daytime limits (55 dBA with octave band levels per Table 1).
- Non-residential receivers (commercial and agricultural properties) should be evaluated relative to the 55 dBA limit established for Class B and C land.

2.0 Acoustic Model Analysis

To analyze the potential acoustic impact of the campus on surrounding properties, we developed a computer model in the CadnaA noise prediction software. The model projects the combined effect of all noise sources on site, taking into account site topography, building screening, and barrier walls. Once preliminary site noise impact is determined, noise mitigation measures can be tested within the model.

2.1 Model Parameters & Assumptions

The following section outlines the geometric and acoustic parameters defined in our model.

.1 Geometric Inputs

The overall site configuration is based on the PUD Combined Plan provided by Aligned Data Center (June 2026), the APEX Footprint Options prepared by Aligned (11 May 2026), and the Preliminary Elevations and Renderings package prepared by Woolpert (5 June 2026).

- The campus includes five data center buildings, identified by their respective data hall segments as Buildings 01/02, 03/04, 05, 06/07, and 08/09. The buildings range in capacity from 96 MW to 192 MW, and each includes an attached administration block and mechanical equipment yards located along the data halls. Building footprints and heights are summarized below:

Table 5: Building Geometric Inputs

Building	MW	L × W × H (ft.)
Building 01/02	144	1,071 × 994 × 30
Building 03/04	144	1,071 × 994 × 30
Building 05	96	1,387 × 504 × 30
Building 06/07	144	1,071 × 994 × 30
Building 08/09	192	1,387 × 994 × 30

Overall footprint dimensions, including mechanical yards, per the APEX Footprint Options (11 May 2026). Heights are to the top of the data hall parapet per the single-story concept elevations (5 June 2026); admin block parapets are approximately 36 ft. above grade.

- Screen walls at mechanical yards are per the architectural design.
- Finished floor elevations (572.5 ft. to 574.5 ft.) and site grading are per the PUD grading plan, and local topography is included in the model.

.2 Sound Source Data

The following sound data was used for the analysis. Manufacturer octave-band sound power data for the chillers was taken from the Munters chiller submittal; the manufacturer's A-weighted octave-band sound power levels were converted to unweighted octave-band levels for use in the model. Chiller noise was modeled as separate sub-sources (inlet, discharge, and casing/fan) to allow attenuation to be targeted where it is most effective; the discharge is the dominant source path and is shown in the table below. Generator sound data reflects the Caterpillar 3516E generator with the specified acoustic enclosure and exhaust silencer; the silenced exhaust sound pressure data from the silencer manufacturer was converted to

sound power for use in the model. Transformer sound data is based on the level reported by Aligned from field experience.

Current equipment selections are as follows:

- Chillers: Munters TMA (Geoclima) 2.0MW HA air-cooled chillers
- Emergency Generators: Caterpillar 3516E, 3,000 ekW standby, in walk-in acoustic enclosures with critical-grade exhaust silencers
- Transformers: pad-mounted power transformers per Aligned specification (12 units campus-wide)

Table 6: Modeled Sound Source Sound Power Levels (Lw, dB re 10^{-12} W)

Source	PWL (dB) at Octave Band Center Frequency (Hz)								dBA	Lin
	63	125	250	500	1k	2k	4k	8k		
Chiller Discharge (per chiller)*	97	104	99	100	101	97	93	88	105	109
Emergency Generator, silenced (per unit)**	106	105	95	95	94	91	93	92	101	111
Transformer (per unit)***	-	79	-	-	-	-	-	-	63	79

* Unattenuated (base chiller) values converted from manufacturer A-weighted octave-band sound power data; see Section 3.0 for silencer insertion losses applied in the mitigated scenarios. Chiller inlet and casing/fan sub-sources are modeled separately and are not shown.

** Derived from silenced exhaust sound pressure levels published by the silencer manufacturer, converted to sound power. Values reflect the generator within its acoustic enclosure with exhaust silencer.

*** Per Aligned, the transformer specification is 75 dB with levels up to approximately 79 dB observed in the field; the 79 dB value was conservatively modeled with all energy assigned to the 125 Hz octave band, consistent with transformer hum.

Overall dBA and Lin values reflect the full modeled spectrum, which includes energy below the 63 Hz band where applicable.

.3 Operational Scenarios

Chillers are designed for N+2 redundancy and operate at approximately 86% capacity under typical conditions (12 of 14 chillers operating per 24MW block). Transformers operate continuously. The proposed campus is expected to include approximately 420 emergency generators, which do not operate during normal conditions; routine generator exercise/testing is expected to be scheduled during daytime hours.

The following scenarios were evaluated:

- Normal Operations – all continuously operating cooling equipment at typical design capacity, plus transformers. Evaluated against nighttime limits.
- Generator Testing Operations – Normal Operations plus generator testing during daytime hours. For the testing scenario, the generator closest to the nearest receptor at each building was modeled as operating, with multiple buildings testing simultaneously; this represents a worst-case, yet realistic, testing condition.

.4 Area of Study

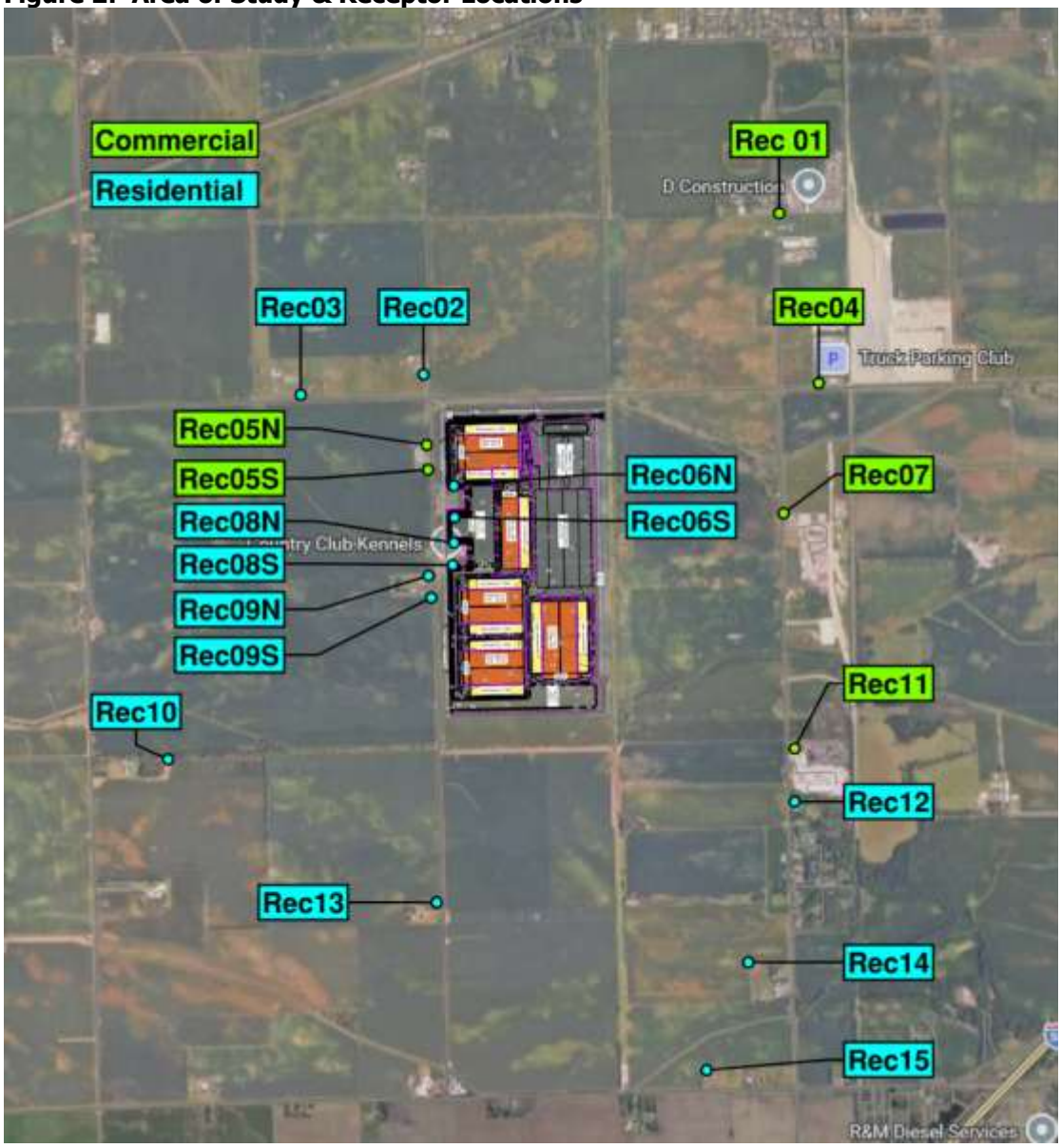
The computer model maps noise levels over a region extending beyond the site and allows detailed analyses at specific discrete receptors. Receptors were placed at the nearest residences and occupied commercial and agricultural properties surrounding the site; where a residence has building faces oriented toward different portions of the campus, north (N) and south (S) receptors were evaluated. Receptor locations are listed below and shown in Figure 2.

Table 7: Receptor Locations

Rec	Description	Land Use
01	CY Landscaping	Commercial
02	1965 S Carbon Hill Rd	Residential
03	5680 E Reed Rd	Residential
04	Cardinal Transport	Commercial
05N	2165 S Carbon Hill Rd	Agricultural*
05S	2165 S Carbon Hill Rd	Agricultural*
06N	2280 S Carbon Hill Rd	Residential
06S	2280 S Carbon Hill Rd	Residential
07	IL Recovery Group	Commercial
08N	2500 S Carbon Hill Rd	Residential
08S	2500 S Carbon Hill Rd	Residential
09N	2535 S Carbon Hill Rd	Residential
09S	2535 S Carbon Hill Rd	Residential
10	3028 S Jugtown Rd	Residential
11	Broadway Auto	Commercial
12	3180 S Broadway Rd	Residential
13	3465 S Carbon Hill Rd	Residential
14	3695 S Broadway Rd	Residential
15	6800 E Braceville Rd	Residential

* Agricultural land is Class C under the IL PCB land-use classification (35 Ill. Adm. Code 901.101), for which the code does not establish numeric limits at the receiving land. We have conservatively evaluated agricultural and commercial receptors against a 55 dBA limit at all hours, corresponding to the IL PCB daytime level for Class A land. Should a dwelling on an agricultural parcel be occupied as a residence, the Class A limits would apply at that dwelling.

Figure 2: Area of Study & Receptor Locations



3.0 Noise Mitigation

3.1 Noise Mitigation Measures

The following measures are incorporated into the design and reflected in the mitigated model results:

- Chiller discharge silencers – 60 in. or 48 in. discharge silencers on all chillers, by location per Table 9. The following insertion losses are assumed for the two silencer options:

Table 8a: Silencer Insertion Loss (dB)

Mitigation Equipment	Insertion Loss (dB) at Octave Band Center Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
60 in. discharge silencer	10	12	19	31	39	39	25	15
48 in. discharge silencer	5	9	14	17	25	29	11	9

Insertion loss values are per manufacturer published data for the selected silencer and louver products. Final selections, pressure drop, structural impacts, maintenance access, and compatibility with the chiller design are to be confirmed with the mechanical engineer and the equipment manufacturers.

- Chiller fan and inlet acoustic louvers – 12 in. or 6 in. acoustic louvers on all chillers, by location per Table 9.

Table 8b: Louver Insertion Loss (dB)

Mitigation Equipment	Insertion Loss (dB) at Octave Band Center Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
12 in. inlet louver	9	10	12	15	20	20	20	19
6 in. inlet louver	6	8	10	11	14	15	15	13

Insertion loss values are per manufacturer published data for the selected silencer and louver products. Final selections, pressure drop, structural impacts, maintenance access, and compatibility with the chiller design are to be confirmed with the mechanical engineer and the equipment manufacturers.

- Barrier walls – acoustic barrier wall panels at the mechanical yards indicated in Figure 3, integrated with the yard screen wall design.
- Generator acoustic packages – walk-in acoustic enclosures with critical-grade exhaust silencers on all emergency generators (reflected in the generator source levels in Table 6).

The silencer and louver sizes vary by yard based on the proximity and orientation of each yard to the nearest receptors:

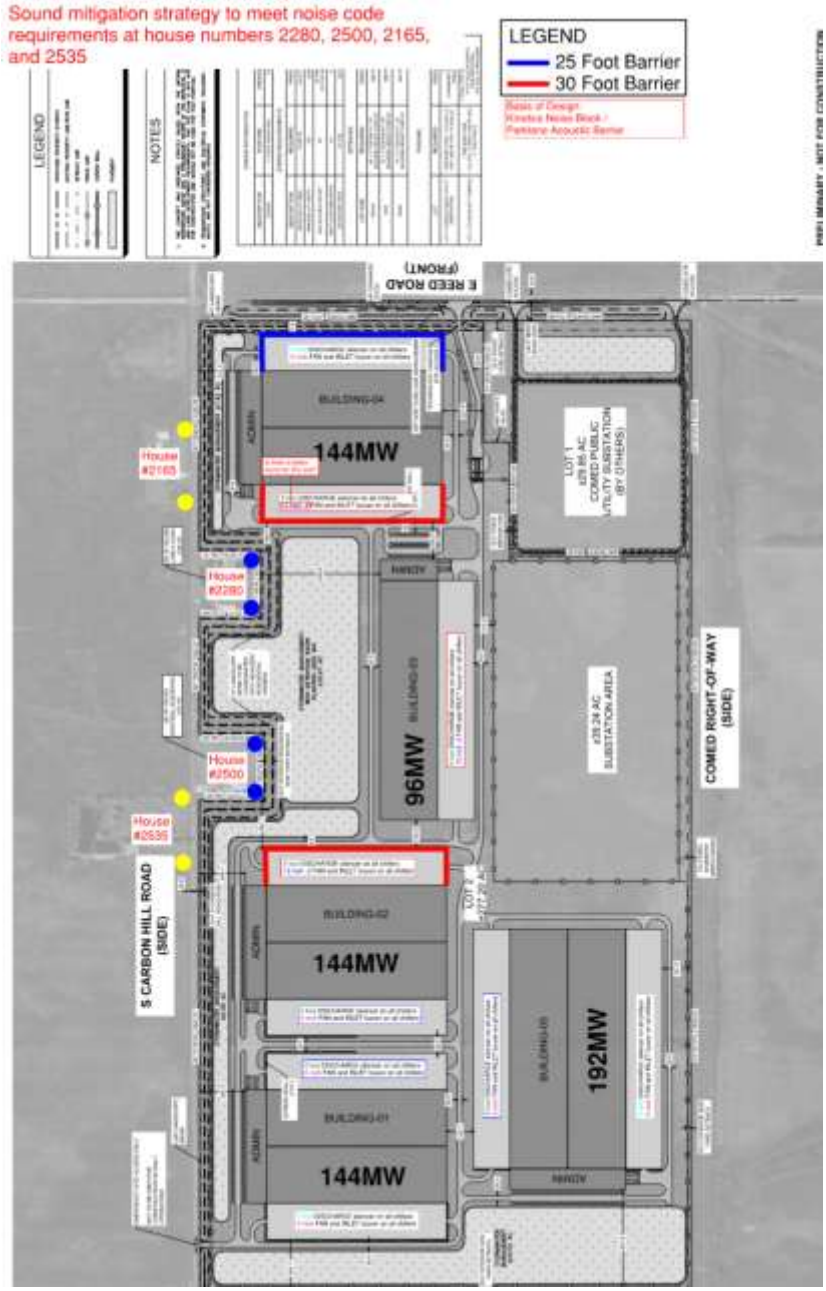
Table 9: Noise Mitigation by Building and Yard

Building	Mechanical Yard	Discharge Silencer	Inlet Louver	Barrier Wall
Building 01 (144MW)	Interior yard	60 in.	6 in.	–
Building 01 (144MW)	South yard	48 in.	6 in.	–
Building 02 (144MW)	North yard	60 in.	12 in.	Yes
Building 02 (144MW)	Interior yard	60 in.	6 in.	–
Building 03 (96MW)	West yard	60 in.	12 in.	Yes

Building 04 (144MW)	North yard	48 in.	6 in.	Yes
Building 04 (144MW)	South yard	60 in.	12 in.	Yes
Building 05 (192MW)	West yard	60 in.	6 in.	–
Building 05 (192MW)	East yard	48 in.	6 in.	–

Barrier walls are acoustic barrier wall panels at the yards indicated; extents per Figure 3. Wall heights to be coordinated with the architectural screen wall design.

Figure 3: Noise Mitigation Layout



3.2 Model Results with Mitigation – Normal Operations

We modeled the campus with the mitigation measures described in Section 3.1. Noise levels for Normal Operations are evaluated relative to the IL PCB nighttime standards.

Table 10: Model Results – Normal Operations with Mitigation

Rec	SPL (dB) at Octave Band Center Frequency (Hz)								dBA	Meets IL PCB?
	63	125	250	500	1k	2k	4k	8k		
01	41	38	28	28	24	9	-	-	29	Yes
02	49	48	38	37	34	24	18	-	39	Yes
03	45	44	34	34	31	20	3	-	36	Yes
04	44	41	31	31	28	14	-	-	33	Yes
05N	50	48	37	36	32	22	10	-	38	Yes
05S	50	49	39	38	34	25	11	-	40	Yes
06N	51	51	40	38	35	26	15	9	41	Yes
06S	51	50	39	38	35	25	10	-	40	Yes
07	47	44	34	35	32	21	-	-	37	Yes
08N	51	50	40	39	35	25	10	-	41	Yes
08S	52	51	40	38	33	24	12	3	40	Yes
09N	51	50	39	38	34	25	10	-	40	Yes
09S	51	50	40	39	34	25	13	-	40	Yes
10	44	40	30	32	29	15	-	-	33	Yes
11	48	44	34	36	33	22	-	-	37	Yes
12	47	43	33	35	32	20	-	-	36	Yes
13	47	44	34	36	34	23	3	-	37	Yes
14	44	40	30	32	28	14	-	-	33	Yes
15	37	34	24	24	20	4	-	-	25	Yes

With the mitigation measures in place, projected levels comply with the applicable IL PCB limits at all evaluated receptors, with a maximum of 41 dBA at the nearest residences relative to the 44 dBA nighttime limit.

3.3 Model Results with Mitigation – Generator Testing Operations

For Generator Testing Operations, we have evaluated noise levels relative to the IL PCB daytime standards, assuming generator testing is performed only during daytime hours.

Table 11: Model Results – Generator Testing Operations with Mitigation

Rec	SPL (dB) at Octave Band Center Frequency (Hz)								dBA	Meets IL PCB?
	63	125	250	500	1k	2k	4k	8k		
01	44	39	29	29	25	11	-	-	30	Yes
02	52	49	39	38	34	26	19	-	40	Yes
03	48	45	35	34	31	21	4	-	36	Yes
04	47	42	32	32	29	15	-	-	34	Yes
05N	52	49	38	37	33	23	14	-	39	Yes
05S	53	50	40	38	35	26	18	5	41	Yes
06N	55	53	41	39	36	28	22	14	42	Yes
06S	53	51	40	39	36	27	16	-	41	Yes
07	49	44	35	36	33	22	-	-	37	Yes
08N	53	51	40	39	36	27	16	-	42	Yes
08S	55	52	41	39	35	27	19	8	42	Yes
09N	53	51	40	39	35	26	15	-	41	Yes
09S	55	52	41	40	37	30	22	3	42	Yes
10	46	41	31	32	29	16	-	-	34	Yes
11	50	44	35	36	34	23	1	-	38	Yes
12	49	43	34	35	33	21	-	-	37	Yes
13	49	44	35	36	34	24	4	-	38	Yes
14	46	40	31	32	29	15	-	-	33	Yes
15	40	35	25	25	22	6	-	-	27	Yes

With the mitigation measures in place, projected levels during generator testing comply with the applicable IL PCB daytime limits at all evaluated receptors, with a maximum of 42 dBA relative to the 55 dBA daytime limit.

4.0 Summary

Based on the equipment selections, layout, and noise mitigation measures described in this report, projected sound levels at all surrounding receptors comply with the Illinois Pollution Control Board maximum permissible sound levels under typical 24-hour operation and during routine generator testing. Predicted A-weighted levels at the nearest Class A (residential) receivers remain at or below the 44 dBA nighttime limit during typical operation and at or below the 55 dBA daytime limit during generator testing, with the corresponding octave-band levels also within the allowable values.

This concludes our review at this time. Please advise regarding any comments or questions that arise while reviewing this report.