

NOISE ASSESSMENT

GOAL LINE ENERGY BATTERY ENERGY STORAGE SYSTEM PROJECT CITY OF ESCONDIDO, CA

Prepared By:

Ldn Consulting, Inc.

**42428 Chisolm Trail
Murrieta, California 92562
760-473-1253**

Prepared For:

**Chambers Group, Inc.
9909 Huennekens Street, Suite 206
San Diego, CA 92121**

March 30, 2023

TABLE OF CONTENTS

TABLE OF CONTENTS	II
LIST OF FIGURES	III
LIST OF TABLES	III
COMMON TERMS	IV
EXECUTIVE SUMMARY	V
1.0 INTRODUCTION	1
1.1 PURPOSE OF THIS STUDY.....	1
1.2 PROJECT LOCATION	1
1.3 PROJECT DESCRIPTION	1
1.4 ENVIRONMENTAL SETTINGS & EXISTING CONDITIONS.....	3
1.5 METHODOLOGY AND EQUIPMENT	5
2.0 OPERATIONAL ACTIVITIES	9
2.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE.....	11
2.2 POTENTIAL OPERATIONAL NOISE IMPACTS	11
2.2.1 OPERATIONAL EQUIPMENT NOISE LEVELS ON-SITE	14
2.2.2 FINDINGS.....	15
2.2.3 MAINTENANCE NOISE LEVELS ON-SITE	19
2.3 CONCLUSIONS	19
3.0 CONSTRUCTION ACTIVITIES	20
3.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE.....	20
3.2 CONSTRUCTION NOISE LEVELS	20
3.3 POTENTIAL PROPERTY LINE NOISE IMPACTS.....	20
3.4 CONCLUSIONS	22
4.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSIONS	23
5.0 CERTIFICATIONS	24

LIST OF FIGURES

FIGURE 1-A: PROJECT VICINITY MAP	2
FIGURE 1-B: SITE DEVELOPMENT PLAN	4
FIGURE 1-C: NOISE MEASUREMENT LOCATIONS	7
FIGURE 2-A: PROPOSED EQUIPMENT LOCATION AND PROPERTY LINE ORIENTATION	13
FIGURE 2-B: COGEN NOISE DOSIMETRY LOCATIONS	15

LIST OF TABLES

TABLE 1-1: LONG-TERM NOISE LEVEL SUMMARY	6
TABLE 2-1: SOUND LEVEL LIMITS	9
TABLE 2-2: PROJECT RELATED OPERATIONAL NOISE SOURCES	14
TABLE 2-3: OPERATIONAL NOISE LEVELS (RESIDENTIAL PROPERTY LINE)	17
TABLE 2-4: OPERATIONAL NOISE LEVELS (COMMERCIAL PROPERTY LINE)	17
TABLE 2-5: OPERATIONAL NOISE LEVELS (LIGHT INDUSTRIAL PROPERTY LINE)	18
TABLE 2-6: OPERATIONAL NOISE LEVELS (GEN INDUSTRIAL PROPERTY LINE)	18
TABLE 3-1: CONSTRUCTION NOISE LEVELS	21

COMMON TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 μ Pa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by $20 \log (L/L_{ref})$.

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. L_{eq} is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (Ldn): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB “Penalty” for nighttime noise. Typically, Ldn’s are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts associated with the development of the proposed approximate 50-Megawatt (MW) battery energy storage project. The Project site is located at 555 Tulip Street in Escondido, CA. The proposed project would consist of battery energy storage system (BESS) facilities on a single parcel.

Operational Noise

Based on the empirical data, the manufacturers specifications and the distances to the property lines, it was determined that the cumulative noise levels from the proposed battery storage containers and transformers and the existing CoGen plant would comply with the most restrictive nighttime property line standards at the surrounding land uses. Therefore, no mitigation is required.

Major facility maintenance is anticipated to occur at most 10 times per year and would generally require less than a day to complete. Maintenance activities would be limited during the daytime hours of 7am - 7pm. No direct or cumulative noise impacts are anticipated with these noise reduction measures.

Construction Noise

At a distance as close as 120 feet, the point source noise attenuation from the grading activities and the nearest property line is -7.6 dBA. This would result in an anticipated worst-case 8-hour average combined noise level of 75 dBA at the property line during grading. No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with the City of Escondido's Noise Ordinance.

1.0 INTRODUCTION

1.1 Purpose of this Study

This noise study was completed to determine the noise impacts associated with the construction or operation of the proposed Battery Energy Storage System (BESS) Project. The project site is located within the City of Escondido, in northern San Diego County. Should impacts be determined, the intent of this study would be to recommend mitigation measures, which would reduce those impacts.

1.2 Project Location

The Project site is located at 555 Tulip Street on a 6.5-acre parcel (232-131-25-00). A general project vicinity map is shown in Figure 1-A.

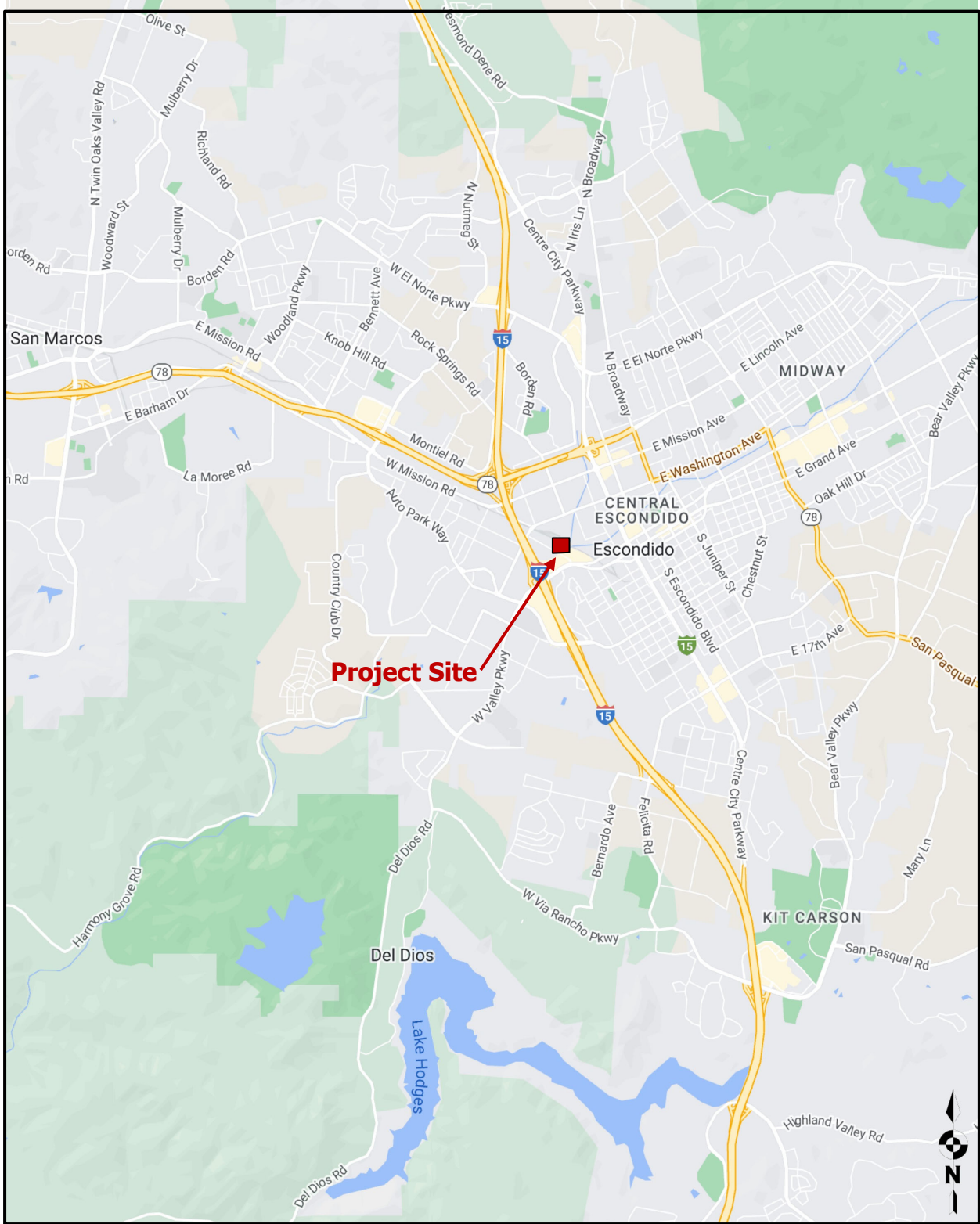
1.3 Project Description

The Project proposes to construct 50 MW of battery energy storage on a parcel that has a General Plan Land Use Designation of General Industrial (GI) and zoned Planned Development Industrial (PD-I); however, the proposal includes a zone change to General Industrial (M-2). The Project would utilize advanced technology batteries and control systems contained within an approximate 6.5-acre lot.

The Project consists of lithium-based battery modules installed in racks and housed within purpose-built outdoor Battery Energy Storage System (BESS) enclosures. A typical BESS enclosure will house hundreds of battery modules where each enclosure is typically capable of storing between 0.4 to 5 megawatt-hours (MWh) of energy. Each BESS enclosure would be approximately 30-feet long, 6-feet wide, and 10-feet tall, in groups consisting of 4 to 6 enclosures. The battery storage containers would be set back at least 10 feet from the fence line and would be separated by a minimum of 5 feet from each other.

The Project would provide electrical service for the local electric utility, SDG&E, and the California Independent System Operator ("CAISO"). Each grouping of BESS enclosures would have a power conversion system (PCS) containing an inverter and transformer. In addition, the system would be equipped with integrated operational management systems, fire and safety systems (HVAC systems, ventilation, gas, heat, and smoke detection and alarms, and fire suppression systems) all designed, constructed, and operated pursuant to the version of the California Fire Code in effect at the time of building permit issuance.

Figure 1-A: Project Vicinity Map



Source: (Google, 2023)

The Project would be constructed by Onward Energy of Denver, CO. The proposed construction schedule includes approximately 6 months for demolition and 15 months for construction. Construction would occur Monday through Saturday.

The Project will operate 24 hours per day/seven days per week. It will be operated remotely, with no new buildings or parking areas. It is estimated that maintenance will include two to four staff performing maintenance visits weekly and as needed. Figure 1-B shows the Conceptual Plan of the Project.

1.4 Environmental Settings & Existing Conditions

a) Settings & Locations

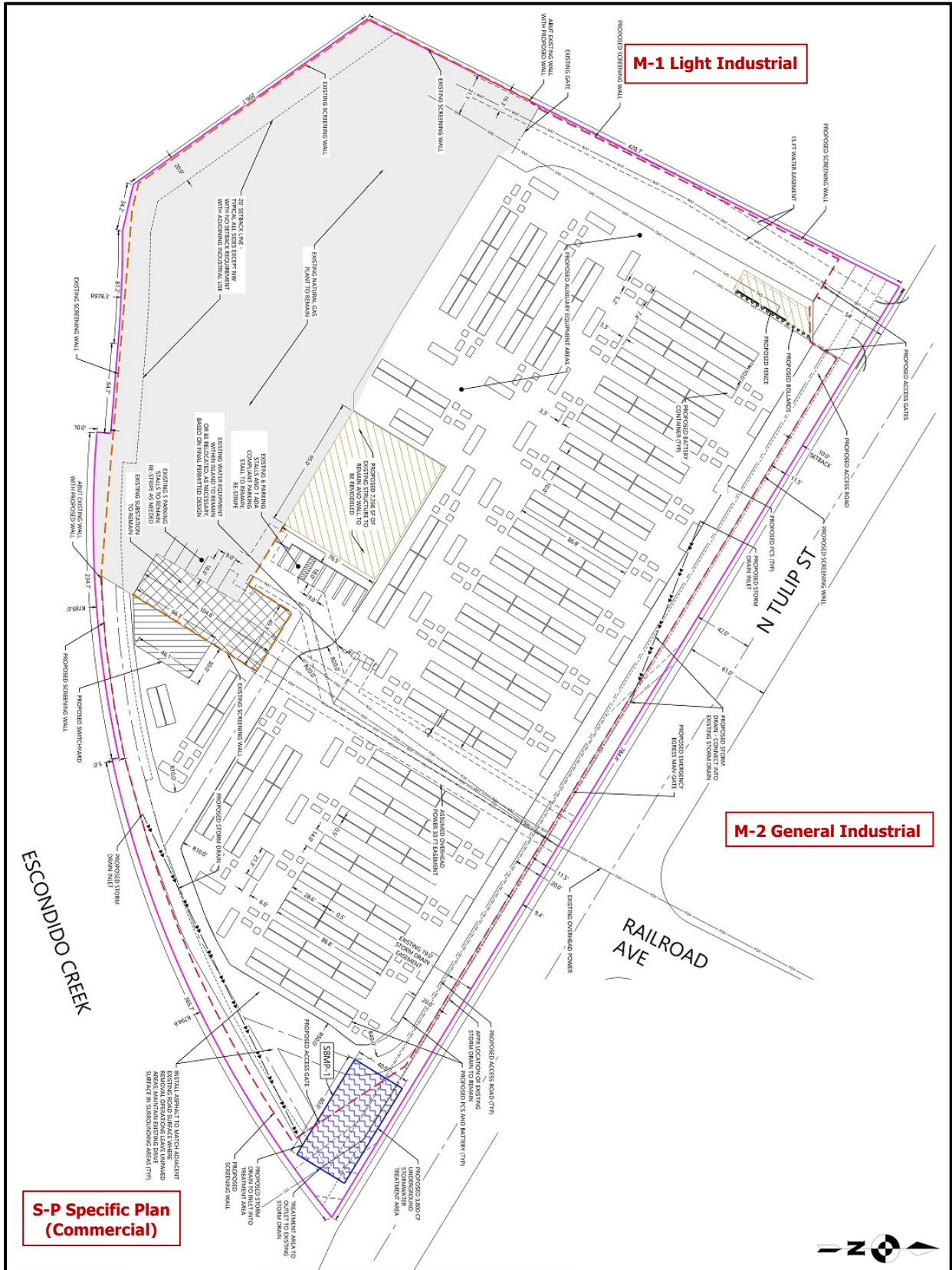
The site topography is flat, with an elevation of approximately 640 feet above sea level. The project site currently contains a non-operational ice-rink and a 50 MW natural gas power plant (CoGen plant). Project facilities will be constructed within the existing ice-rink and parking facilities and adjacent to the natural gas power plant facilities, which will remain. This includes an area of approximately 4.5 acres.

The Project Site is located within the City of Escondido's (City) Planned Development: Industrial zone (PD-I) land use, has a General Plan Land Use Designation of Planned Development Industrial (PD-I); however, the proposal includes a zone change to General Industrial (M-2). This designation allows "utilities," including the Project. Under Section 33-564 of the Municipal Code, utilities are considered a permitted use within the M-2 zone.

b) Existing Noise Conditions

The site is located at 555 Tulip Street, east of Interstate 15 (I-15) between Washington Avenue and Valley Parkway. Access to the site is from Interstate 15 to the west via Valley Parkway to the south. Existing noise occurs mainly from vehicular traffic traveling on I-15 and nearby roadways.

Figure 1-B: Site Development Plan



Source: (Westwood Professional Services, Inc., 2023)

1.5 Methodology and Equipment

a) Noise Measuring Methodology and Procedures

To determine the existing noise environment and to assess potential noise impacts, 24-hour measurements were taken at two locations with the greatest impact potential from the proposed project having a relatively flat terrain and no obstruction from trees or structures. The noise measurements were recorded on Monday October 10th to Tuesday October 11th, 2022 by Ldn Consulting between approximately 10:00 a.m. and 10:00 a.m. the following day. Noise measurements were taken using Larson-Davis Spark Model 706 Type 2 precision sound level meters, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meters and microphones were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

Table 1-1 provides the hourly noise levels along with the average values. The noise measurement locations were determined based on site access and noise impact potential to the proposed sensitive uses. Monitoring location 1 (M1) was located across the Escondido Creek to the southeast at the existing commercial and retail uses. Monitoring location 2 (M2) was located south of West Valley Parkway at the nearest residential uses along Upas Street. The noise monitoring locations are provided graphically in Figure 1-C on the following page.

Table 1-1: Long-Term Noise Level Summary

	M1 (dBA L_{eq})	M2 (dBA L_{eq})
11:00 AM	68.1	62.8
12:00 PM	61.2	62.9
1:00 PM	60.9	63.4
2:00 PM	62.7	63.6
3:00 PM	62.3	64.2
4:00 PM	63.1	64.2
5:00 PM	63.0	64.7
6:00 PM	62.1	64.6
7:00 PM	61.9	63.9
8:00 PM	62.5	63.2
9:00 PM	63.0	62.7
10:00 PM	58.9	60.9
11:00 PM	57.7	59.7
12:00 AM	49.8	58.5
1:00 AM	53.4	56.9
2:00 AM	56.5	51.5
3:00 AM	43.8	52.2
4:00 AM	59.1	52.8
5:00 AM	60.6	56.0
6:00 AM	60.2	59.1
7:00 AM	60.7	60.4
8:00 AM	61.2	62.6
9:00 AM	63.1	60.8
10:00 AM	61.0	61.9
Overall	61.6	61.8

Figure 1-C: Noise Measurement Locations



b) Noise Calculations and Factors

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs.

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as L_{eq} represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24 hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

A vehicles noise level is from a combination of the noise produced by the engine, exhaust and tires. The cumulative traffic noise levels along a roadway segment are based on three primary factors: the amount of traffic, the travel speed of the traffic, and the vehicle mix ratio or number of medium and heavy trucks. The intensity of traffic noise is increased by higher traffic volumes, greater speeds and increased number of trucks. Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore, the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiate in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas and vegetation.

On the other hand, fixed/point sources radiate outward uniformly as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance. The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods may be required to reduce noise levels to an acceptable level.

2.0 OPERATIONAL ACTIVITIES

The City of Escondido has published noise regulations and guidelines in the Noise Element of the General Plan and the Municipal Code. The City of Escondido Noise Element has identified several policies on noise and acceptable noise levels with respect to noise receptors; however, none apply to the type of use associated with the proposed Project. With respect to noise generators, the Noise Element states that Projects that increase noise levels by five (5) dBA or greater would result in a significant impact.

The majority of City noise regulations and guidelines that apply to the Project are found in Section 17 of Article 12 (Noise Abatement and Control) of the City Municipal Code.

Sections 17-234 and 17-240 regulate construction noise. Any piece of construction equipment or any combination of construction equipment cannot be operated so as to cause an average noise level excess of 75 dBA L_{eq} during the allowable hours of operation. Per City regulations, construction equipment can only be operated from 7:00 AM to 6:00 PM, Monday through Friday, and on Saturday from 9:00 AM to 5:00 PM. Construction equipment cannot be operated on Sundays or holidays. Operation of any construction equipment during non-allowable hours is permitted only by a variance from the City Manager.

Operational noise limits at the common property lines of adjacent land uses are regulated by Section 17-229 of Article 12 of the Municipal Code. These limits are shown in Table 2-1.

Table 2-1: Sound Level Limits

Zone	Time	Applicable Limit One-Hour Average Sound Level (dBA)
Residential zones	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
Multi-residential zones	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial zones	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
Light industrial/Industrial park zones	Anytime	70*
General industrial zones	Anytime	75*

*Subject to provisions of Section 17-229 (c)(5).

Section 17-229(c) of Article 12 of the Municipal Code allows for corrections to the sound level limits identified in Table 2-1. The corrections applicable to proposed Project are described below:

If the noise is continuous, the Leq for any hour will be represented by any lesser time period within that hour. Noise measurements of a few minutes only will thus suffice to define the noise level.

If the noise is intermittent, the Leq for any hour may be represented by a time period typical of the operating cycle. Measurement should be made of a representative number of noisy/quiet periods. A measurement period of not less than 15 minutes is, however, strongly recommended when dealing with intermittent noise.

The sound level limit at a location on a boundary between two land use classifications is the limit applicable to the receiving land use. If the measured ambient level exceeds that permissible, the allowable noise exposure standard shall be the ambient noise level. The ambient level shall be measured when the alleged noise violations source is not operating.

Section 17-242 of Article 12 of the Municipal Code describes exemptions to the noise level limits are as follows:

(a) Emergency Work. The provisions of this article shall not apply to any emergency work as defined in Section 17-227(1), provided that (1) a variance has been obtained from the City Manager, and (2) any vehicle device, apparatus, or equipment used, related to or connected with emergency work is designed, modified, or equipped to reduce sounds produced to the lowest possible level consistent with effective operation of such vehicle, device, apparatus, or equipment.

(b) Sporting, Entertainment, Public Events. The provisions of this article shall not apply to:

1. Those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events.
2. Sporting, entertainment and public events which are conducted pursuant to a license or permit issued by the Building Director for noise exceeding criteria, standards or levels as set forth in this article.
3. Those reasonable sounds emanating from a sporting, entertainment, or public event; provided, however, it shall be unlawful to exceed those levels set forth in Section 17-229 when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes unless a variance has been granted allowing sounds in excess of said levels.

2.1 Guidelines for the Determination of Significance

Operational noise limits at the property lines are regulated by Section 17-229 of Article 12 of the Municipal Code as stated above in Section 3 of this report. If the measured ambient level exceeds that permissible, the allowable noise exposure standard shall be the ambient noise level. Section 17-242 of Article 12 of the Municipal Code describes exemptions to the noise level limits as they pertain to this Project are as follows:

The provisions of Section 17-242 of Article 12 shall not apply to sporting, entertainment and public events which are conducted pursuant to a license or permit issued by the Building Director for noise exceeding criteria, standards or levels as set forth in this article. Those reasonable sounds emanating from a sporting, entertainment, or public event; provided, however, it shall be unlawful to exceed those levels set forth in Section 17-229 when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes unless a variance has been granted allowing sounds in excess of said levels.

For the purposes of this analysis, the adjacent property to the northwest is zoned light industrial and has a noise standard of 70 dBA Leq anytime. The properties to the northeast across Tulip Street are zoned industrial and have a noise standard of 75 dBA Leq anytime. The property to the south and southeast across the Escondido Creek is zoned SPA 9, Downtown Specific Plan. The Downtown Specific Plan does not indicate a land use goal for this area other than residential uses are not permitted, however, the existing land use is commercial, therefore, the evening noise standard of 55 dBA Leq was utilized. The nearest residential land use is located south of W Valley Parkway along Upas Street over 900-feet southwest of the project site and has an evening noise standard of 45 dBA Leq.

It was determined during the ambient measurements that the current noise levels at the nearest residential land uses along Upas Street exceed the allowable standards. The lowest hourly ambient noise level of 51.5 dBA during the nighttime hours as shown above in Table 1-1. Therefore, the allowable one-hour average sound level at the nearest residences shall be 51.5 dBA for the purposes of this analysis.

2.2 Potential Operational Noise Impacts

Each battery storage container has four (4) internal heating, ventilation, and air conditioning (HVAC) systems. Each grouping of BESS enclosures would have a power conversion system (PCS) containing an inverter and transformer. In addition, the system would be equipped with integrated operational management systems, fire and safety systems (HVAC systems, ventilation, gas, heat, and smoke detection and alarms, and fire suppression systems) all designed,

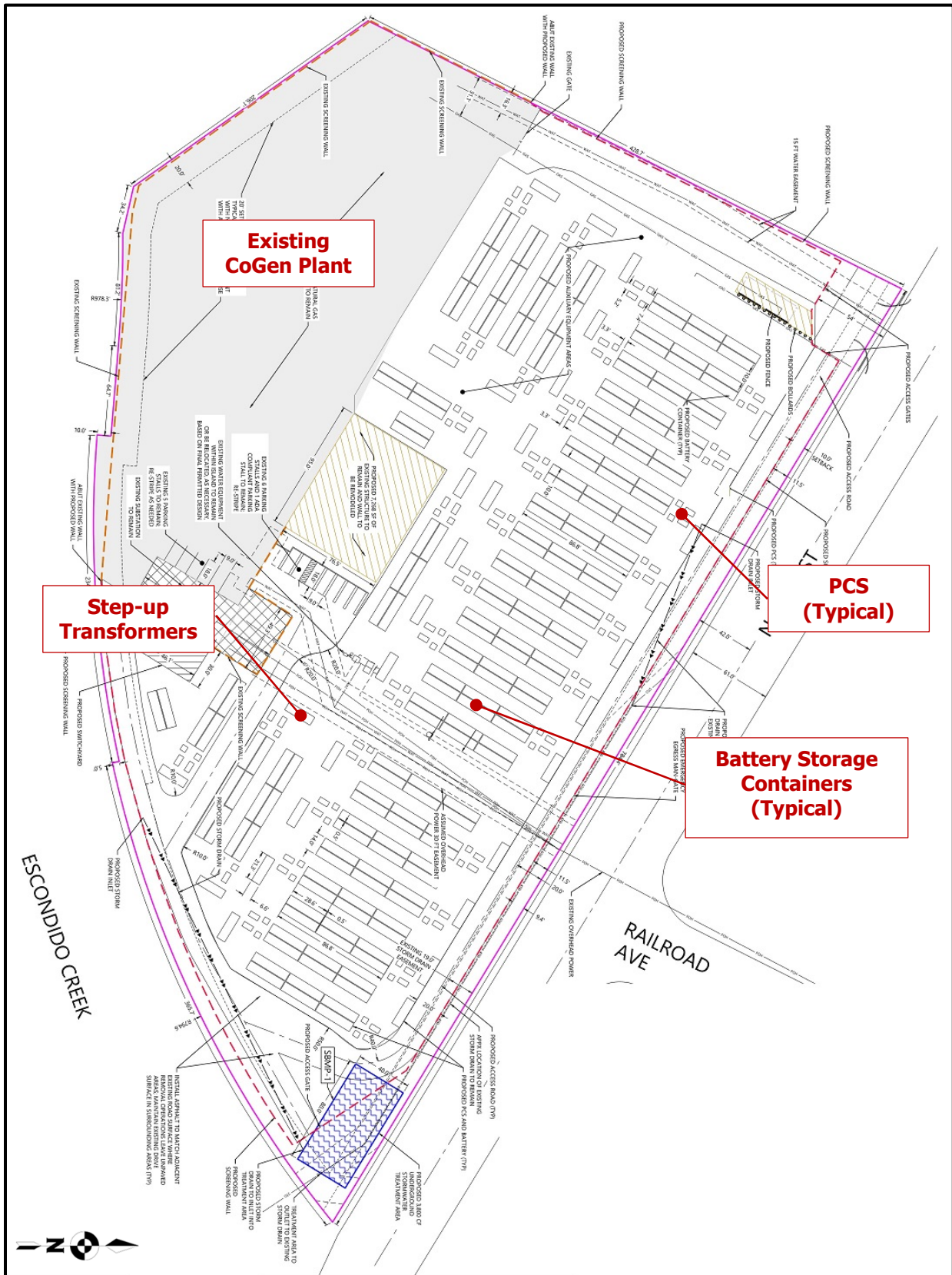
constructed, and operated pursuant to the version of the California Fire Code in effect at the time of building permit issuance. The proposed project would also include a step-up transformer.

This section examines the potential stationary noise source impacts associated with the operation of the proposed project. Specifically, noise levels from the proposed battery storage containers, transformers, inverters, and project maintenance.

The proposed battery storage containers, power conversion systems (PCS), and step-up transformer locations for the site can be seen in Figure 2-A on the following page. The project is not proposing any back-up generators. On-site operation is anticipated to be remote with occasional major maintenance trips at most 10 times a year and minor maintenance/landscaping visits twice monthly.

The existing CoGen plant is a 50 MW natural gas power plant that utilizes gas turbines to generate electricity to provide to San Diego Gas & Electric. The existing plant operations would continue to generate noise to the surrounding community. An existing 15 to 20-foot wall surrounds the CoGen plant to the west, south, and east. The existing building on the Project site provides shielding to the north which will be demolished.

Figure 2-A: Proposed Equipment Location and Property Line Orientation



2.2.1 Operational Equipment Noise Levels On-site

Fixed or point sources radiate outward uniformly as sound travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance. Using a point-source noise prediction model, calculations of the expected operational noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and vertical separations, and any transmission loss from topography or barriers.

Proposed Battery Storage System

In order to examine the potential stationary noise source impacts associated with the operation of the proposed BESS, reference noise levels were used for the step-up transformers (*Source: Cooper Power Series Three Phase Transformers CA202003EN*). The project is proposing to use two transformers up to 10,000 kVA with unshielded noise levels anticipated to be 68 dBA at 3 feet.

The project proposes to use Freemaq PCSM / Multi PCSM power conversion systems (PCS), or equivalent, with a reference noise level of less than 79 dBA at 3 feet from the rear part (*Source: Power Electronics Hardware and Installation Manual, Freemaq PCSM / Multi PCSM*).

The project is proposing to use an LG Energy Solution ESS B-Link System for the battery storage containers, or equivalent. Each of the proposed BESS enclosures would be equipped with four (4) Envicool HVAC units Model MC50HDNC1U with a reference noise level of 65 dBA at 3 feet. The reference noise levels of the HVAC, transformers, and inverters are shown in Table 2-2 below.

Table 2-2: Project Related Operational Noise Sources

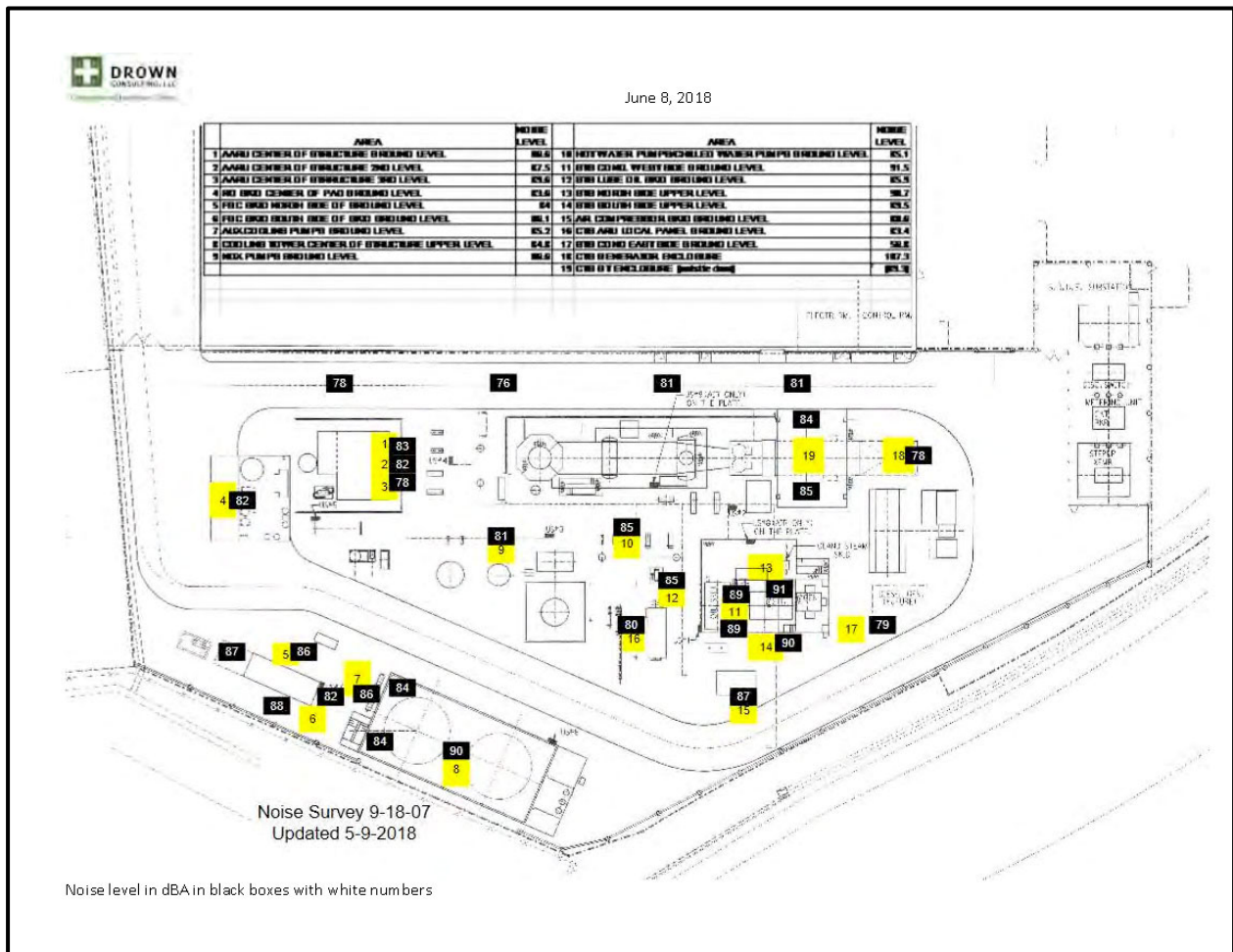
Quantity	Equipment Description	Related Sound Level Distance (ft)	Noise Level (dBA)
768	HVAC	3	65
33	Power Conversion System	3	79
2	Step-Up Transformer	3	68

Existing CoGen Plant

In order to examine the existing stationary noise source impacts associated with the operation of the existing CoGen plant, noise dosimetry was conducted by Drown Consulting, LLC and the results were summarized in a session report for each location dated June 8, 2018. As seen in Figure 2-B, the predominant sources of noise at the plant are at dosimetry locations 13 and 14 with an average

noise level of 91 and 90 dBA Leq, respectively. Although most of the noise sources at the CoGen plant would be at the ground level and shielded by the existing 15 to 20-foot noise wall surrounding the site, the combined noise level at the property line is a conservative representation of the potential noise impacts from the CoGen plant. The cumulative noise level of the CoGen plant operations was determined to be 68.5 dBA Leq at a distance of 54-feet. Overall, the noise levels from the CoGen plant would be lower when measured at the nearest property line.

Figure 2-B: CoGen Noise Dosimetry Locations



2.2.2 Findings

It was determined based on the site configuration and equipment locations that the worst-case noise exposure would occur at the commercial uses to the southwest and the residential uses located south of West Valley Parkway along Upas Street. Additionally, although the noise standards are higher, the industrial uses to the northwest and northeast were analyzed due to their close proximity

to the project site. The location and relationship to the surrounding land uses can be seen in Figure 2-A above. The noise levels for each source along with the calculated cumulative noise levels are based upon a conservative approach that all the noise producing equipment is operating at the same time.

The noise level projections were calculated based on the site plan provided by Westwood Professional Services, Inc. dated January 2023, showing the location of the proposed equipment and the property lines. The noise sources were grouped into separate areas to improve the accuracy of the calculations. The results of the propagated noise levels at the property lines are shown in Tables 2-3 through 2-6. The project is proposing a minimum 8-foot wall surrounding the Project which would reduce noise levels at the adjacent property lines by a minimum of 5 dBA. The existing 15 to 20-foot wall that currently surrounds the CoGen plant to the west, south, and east would also reduce noise levels a minimum of 5 dBA from the operational noises of the plant. Additionally, the proposed BESS enclosures would provide additional shielding to the surrounding property lines.

The existing residential homes along Upas Street are elevated 80-feet or more and could potentially have direct line-of-sight to the noise sources. Therefore, to be conservative, no reductions from existing or proposed structures were taken into account. In reality, the proposed 8-foot perimeter wall, the proposed BESS enclosures, and the existing commercial building to the south of the Project could provide partial shielding to the residences, further reducing noise levels at the residences.

The unmitigated noise levels from the proposed battery storage containers and existing CoGen plant were found to be below the City's evening thresholds at all property lines. As mentioned previously, the allowable one-hour average sound level at the nearest residences is the lowest ambient noise level of 51.5 dBA. The project would be in compliance with the ambient noise level as well as the more restrictive nighttime threshold of 45 dBA. Therefore, no mitigation is required.

It should be noted that the existing CoGen plant is operational an average of 50 times per year when additional power is required for the electrical grid during peak summer months. Additionally, the plant does not generally operate during the nighttime and late evening hours. Therefore, potential noise impacts during the nighttime and late evening hours would be further reduced.

Table 2-3: Operational Noise Levels (Residential Property Line)

Source	Reference Noise Level (dBA)	Quantity	Distance to Property Line (Feet)	Noise Reduction (dBA)	Resultant Noise Level at Property Line (dBA Leq)
Area 1					
HVAC	65	360	1,464	--	37
HVAC	65	144	1,536	--	32
PCS	79	14	1,464	--	37
PCS	79	4	1,536	--	31
Step-Up Transformer	68	1	1,180	--	16
Area 2					
HVAC	65	192	1,178	--	36
HVAC	65	72	1,282	--	31
PCS	79	10	1,178	--	37
PCS	79	5	1,282	--	33
Step-Up Transformer	68	1	1,180	--	16
CoGen Plant	68.5	1	1,450	--	40
CUMULATIVE NOISE LEVEL @ PROPERTY LINE (dBA)					45

Table 2-4: Operational Noise Levels (Commercial Property Line)

Source	Reference Noise Level (dBA)	Quantity	Distance to Property Line (Feet)	Noise Reduction (dBA)	Resultant Noise Level at Property Line (dBA Leq)
Area 1					
HVAC (West)	65	360	545	-5.0	40
HVAC (West)	65	144	530	-5.0	37
PCS (West)	79	14	545	-5.0	40
PCS (West)	79	4	530	-5.0	35
Step-Up Transformer	68	1	280	-5.0	24
Area 2					
HVAC (East)	65	192	430	-5.0	40
HVAC (East)	65	72	330	-5.0	38
PCS (East)	79	10	430	-5.0	41
PCS (East)	79	5	330	-5.0	40
Step-Up Transformer	68	1	255	-5.0	24
CoGen Plant	68.5	1	320	-5.0	48
CUMULATIVE NOISE LEVEL @ PROPERTY LINE (dBA)					51

Table 2-5: Operational Noise Levels (Light Industrial Property Line)

Source	Reference Noise Level (dBA)	Quantity	Distance to Property Line (Feet)	Noise Reduction (dBA)	Resultant Noise Level at Property Line (dBA Leq)
Area 1					
HVAC (West)	65	360	216	-5.0	48
HVAC (West)	65	144	156	-5.0	47
PCS (West)	79	14	216	-5.0	48
PCS (West)	79	4	156	-5.0	46
Step-Up Transformer	68	1	496	-5.0	19
Area 2					
HVAC (East)	65	192	516	-5.0	36
HVAC (East)	65	72	394	-5.0	39
PCS (East)	79	10	516	-5.0	39
PCS (East)	79	5	394	-5.0	18
Step-Up Transformer	68	1	504	-5.0	53
CoGen Plant	68.5	1	190	-5.0	36
CUMULATIVE NOISE LEVEL @ PROPERTY LINE (dBA)					56

Table 2-6: Operational Noise Levels (Gen Industrial Property Line)

Source	Reference Noise Level (dBA)	Quantity	Distance to Property Line (Feet)	Noise Reduction (dBA)	Resultant Noise Level at Property Line (dBA Leq)
Area 1					
HVAC (West)	65	360	220	-5.0	48
HVAC (West)	65	144	376	-5.0	40
PCS (West)	79	14	220	-5.0	48
PCS (West)	79	4	376	-5.0	38
Step-Up Transformer	68	1	370	-5.0	21
Area 2					
HVAC (East)	65	192	255	-5.0	44
HVAC (East)	65	72	328	-5.0	38
PCS (East)	79	10	255	-5.0	45
PCS (East)	79	5	328	-5.0	40
Step-Up Transformer	68	1	392	-5.0	21
CoGen Plant	68.5	1	506	--	49
CUMULATIVE NOISE LEVEL @ PROPERTY LINE (dBA)					55

The unmitigated noise levels from the proposed battery storage containers and existing CoGen plant were found to be below the City's evening thresholds at all property lines. As mentioned previously, the allowable one-hour average sound level at the nearest residences is the lowest ambient noise level of 51.5 dBA. Additionally, the analysis of the commercial property line to the south is located at the rear of the existing retail use building where no outdoor uses exist. The nearest outdoor use area within the commercial property is located an additional 500-feet or more away. Therefore, noise levels would be further reduced. The project would be in compliance with the ambient noise level as well as the more restrictive nighttime threshold of 45 dBA. Therefore, no mitigation is required.

2.2.3 Maintenance Noise Levels On-site

Periodic site maintenance of the BESS facility would be required. Section 10.80.040 of the Noise Ordinance sets a most restrictive operational exterior noise limit for the noise sensitive land uses of 60 dBA L_{eq} for daytime hours of 7 a.m. to 7 p.m. Therefore, the most restrictive 60 dBA L_{eq} standard was applied at the property lines. On-site activities are not anticipated to result in noise levels in excess of existing landscape maintenance on the existing and surrounding properties. Therefore, on-site maintenance is not anticipated to result in a substantial increase in noise levels. Similarly, on-site maintenance is not anticipated to exceed City noise standards. Additionally, since the on-site operations will be limited to the daytime hours of 7 a.m. to 7 p.m., no impacts are anticipated.

2.3 Conclusions

Based on the empirical data, the manufacturers specifications and the distances to the property lines, it was determined that the cumulative noise levels from the proposed battery storage containers and transformers and the existing CoGen plant would comply with the most restrictive nighttime property line standards at the surrounding land uses. Therefore, no mitigation is required.

Major facility maintenance is anticipated to occur at most 10 times per year and would generally require less than a day to complete. Maintenance activities would be limited during the daytime hours of 7am - 7pm. No direct or cumulative noise impacts are anticipated with these noise reduction measures.

3.0 CONSTRUCTION ACTIVITIES

3.1 Guidelines for the Determination of Significance

Sections 17-234 and 17-240 of the City of Escondido Municipal Code regulate construction noise. Any piece of construction equipment or any combination of construction equipment cannot be operated so as to cause an average noise level excess of 75 dBA Leq during the allowable hours of operation. Per City regulations, construction equipment can only be operated from 7:00 AM to 6:00 PM, Monday through Friday, and on Saturday from 9:00 AM to 5:00 PM. Construction equipment cannot be operated on Sundays or holidays. Operation of any construction equipment during non-allowable hours is permitted only by a variance from the City Manager.

Except for emergency work, the provisions of this article shall not apply to any emergency work as defined in Section 17-227, provided that (1) a variance has been obtained from the City Manager, and (2) any vehicle device, apparatus, or equipment used, related to or connected with emergency work is designed, modified, or equipped to reduce sounds produced to the lowest possible level consistent with effective operation of such vehicle, device, apparatus, or equipment.

3.2 Construction Noise Levels

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and pile drivers can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

The U.S. Environmental Protection Agency (U.S. EPA) and the U.S. Department of Transportation (U.S. DOT) have compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from 60 dBA to in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor, and reduced to 63 dBA at 200 feet from the source.

3.3 Potential Property Line Noise Impacts

Project construction includes demolition of the existing facility, site preparation and grading, installation of drainage and retention basins, foundations/supports, setting battery enclosures, wiring and electrical system installation, and assembly of the accessory components including

inverter transformers and generation step-up transformers. Earth cut and fill are proposed to be balanced within the Project site such that no import of fill material or export of material is proposed. Due to unknown site conditions beneath the existing infrastructure, this may need to be modified after demolition operations. Up to 30,000 cubic yards of material may need to be imported if site conditions require mitigation. Further, it is anticipated that approximately 5,000 cubic yards of surfacing (asphalt and/or open graded crushed rock aggregate) and trench fill material will be required. The proposed construction schedule includes approximately 6 months for demolition and 15 months for construction. Construction would occur Monday through Friday, between the hours of 7 AM and 6 PM and Saturday between the hours of 9 AM and 5 PM.

Grading operations are typically the loudest construction activity. The grading operations may utilize a total of up to a dozer, grader, excavator, water truck, dump truck, and drum roller. This list is considered conservative and provides a worst-case assessment from a noise perspective. The noise levels utilized in this analysis of on-site construction are based upon the conservative list of equipment as shown in Table 3-1 below. Most of the construction activities will consist of demolition of existing structures for the preparation of the BESS containers and inverters. Based on the project site plan, the acoustical center for the grading operation would be approximately 120 feet from the nearest property line with an occupied structure.

As can be seen in Table 3-1, if all the equipment was operating in the same location, which is not physically possible, at a distance as close as 120 feet from the nearest property line the point source noise attenuation from construction activities is -7.6 dBA. This would result in an anticipated worst-case eight-hour average combined noise level of 75 dBA at the northern property line. Given this and the spatial separation of the equipment, the noise levels will comply with the City of Escondido's 75 dBA standard at all project property lines.

Table 3-1: Construction Noise Levels

Construction Equipment	Quantity	Duty Cycle Hours/Day	Source Level @ 50-Feet (dBA)	Combined Noise Level @ 50-Feet (dBA Leq-8h)
Dozer	1	8	74	74.0
Grader	1	8	73	73.0
Excavator	1	8	78	78.0
Water Truck	1	8	70	70.0
Dump Truck	1	8	75	75.0
Roller/Compactor	1	8	74	74.0
Total Noise Level @ 50 Feet (dBA)				82.4
Distance				120
Noise Reduction Due to Distance				-7.6
NEAREST PROPERTY LINE NOISE LEVEL				74.8

3.4 Conclusions

At a distance as close as 120 feet, the point source noise attenuation from the grading activities and the nearest property line is -7.6 dBA. This would result in an anticipated worst-case 8-hour average combined noise level of 75 dBA at the property line during grading. No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with the City of Escondido's Noise Ordinance.

4.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSIONS

- Operational Noise Analysis

Based on the empirical data, the manufacturers specifications and the distances to the property lines, it was determined that the cumulative noise levels from the proposed battery storage containers and transformers and the existing CoGen plant would comply with the most restrictive nighttime property line standards at the surrounding land uses. Therefore, no mitigation is required.

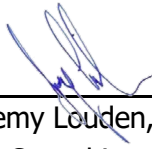
Major facility maintenance is anticipated to occur at most 10 times per year and would generally require less than a day to complete. Maintenance activities would be limited during the daytime hours of 7am - 7pm. No direct or cumulative noise impacts are anticipated with these noise reduction measures.

- Construction Noise Analysis

At a distance as close as 120 feet, the point source noise attenuation from the grading activities and the nearest property line is -7.6 dBA. This would result in an anticipated worst-case 8-hour average combined noise level of 75 dBA at the property line during grading. No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with the City of Escondido's Noise Ordinance.

5.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the existing and future acoustical environment and impacts within the proposed Project. This report was prepared utilizing the latest project information and methodologies.



Jeremy Loudon, Principal
Ldn Consulting, Inc.
760-473-1253
jloudon@ldnconsulting.net

Date March 30, 2023