

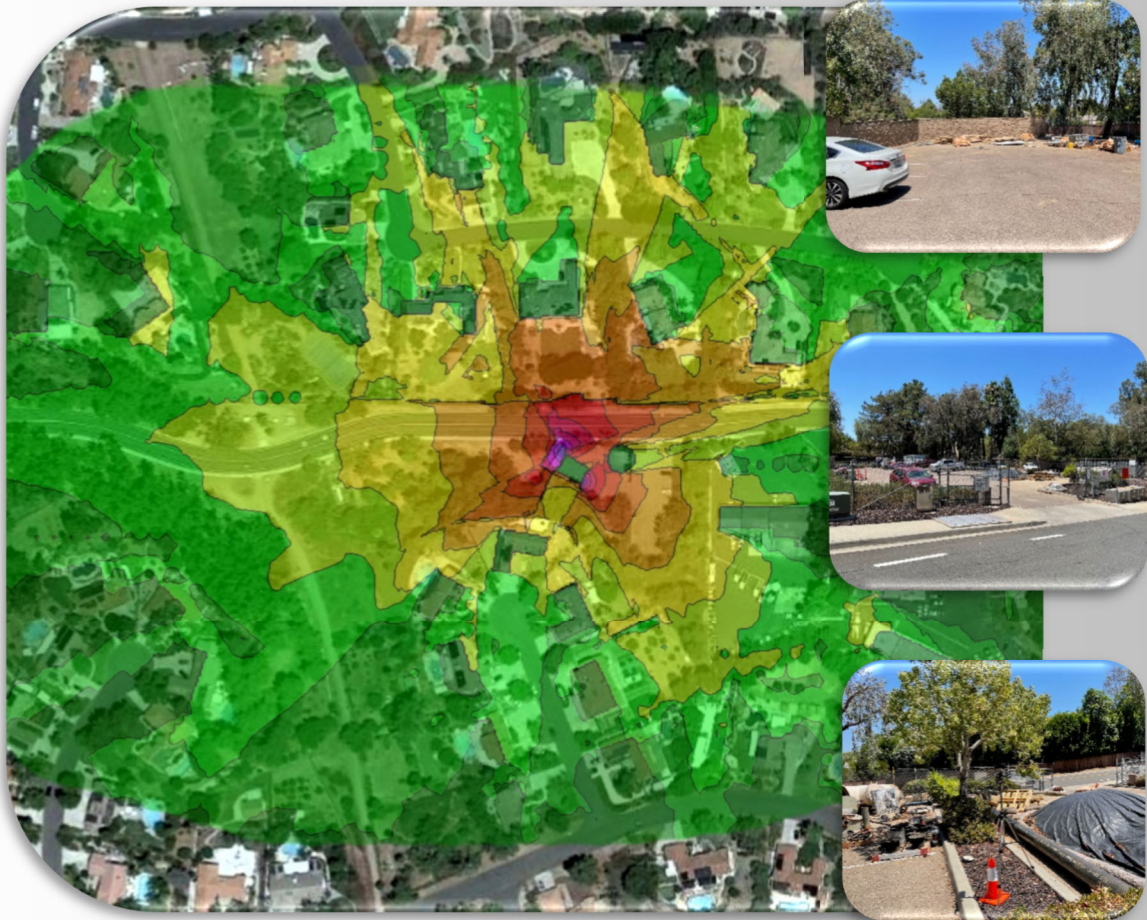
Appendix F

Noise Impact Report



NOISE IMPACT REPORT

**Poway Treated Water Facilities and Redundant Pipeline Project
(Forebay Tank and Pump Station)
Poway, California**



Prepared for:
Black & Veatch Corporation
300 Rancheros Dr, Suite 250
San Marcos, CA 92069



Prepared by:
DHK Engineers, Inc.
1851 Skyhill Place
Escondido, CA 92026



August 2023

TABLE OF CONTENTS

1.0	INTRODUCTION	2
1.1	OBJECTIVE AND METHODOLOGY	2
1.2	SITE AND PROJECT DESCRIPTION	2
1.3	PHOTOGRAPHS	3
2.0	NOISE CRITERIA AND AMBIENT NOISE ASSESSMENT	5
2.1	NOISE CRITERIA.....	5
2.1.1	<i>Industrial Noise</i>	5
2.1.2	<i>Emergency Work</i>	6
2.1.3	<i>Construction Noise</i>	6
2.2	AMBIENT NOISE ASSESSMENT.....	7
2.2.1	<i>Ambient Noise Assessment Methodology</i>	7
3.0	NOISE MODELING METHODOLOGY	7
3.1	NOISE SIMULATION MODEL	7
3.1.1	<i>Industrial Propagation</i>	8
3.1.2	<i>Geo-Database Modules</i>	8
3.1.3	<i>Point and Area Noise Sources</i>	8
3.1.4	<i>Calculation/Graphics</i>	8
3.2	PARAMETERS AND PHYSICAL ASSUMPTIONS	9
3.2.1	<i>Project Model Parameters</i>	9
3.2.2	<i>Noise Profiles of the Mechanical System</i>	9
3.2.3	<i>Grid Map Selection</i>	9
4.0	NOISE SIMULATION RESULTS.....	10
5.0	CONCLUSIONS AND RECOMMENDATIONS	14
6.0	REFERENCES	14

LIST OF TABLES

Table 2-1: Typical Noise Source Levels in dB(A)	5
Table 2-2: Maximum Exterior Sound Levels in dB(A) at Property Line	6
Table 2-3: Maximum Exterior Construction Noise Levels in dB(A) at or within Project Property Line.....	6
Table 2-4: Ambient Noise Measurements, June 30 and July 1, 2022.....	7
Table 3-1: Industrial Noise Sources and Construction Materials used in Noise Simulations.....	9
Table 4-1: Modeled Sound Results at Selected Receptors in dB(A)	10

LIST OF FIGURES

Figure 1: Site Map	4
Figure 2: Scenario 1 Noise Isopleth Map, Operational Configuration	12
Figure 3: Scenario 2 Noise Isopleth Map, Emergency Configuration	13

APPENDIX A – ACOUSTICAL TERMINOLOGY

APPENDIX B – CONSTRUCTION NOISE

1.0 INTRODUCTION

This noise impact analysis was prepared for the Poway Treated Water Facilities and Redundant Pipeline Project, Forebay Tank and Pump Station (PS) located in Poway, California (City). Potential noise impacts were evaluated at surrounding sensitive receptors within 2,000 feet from the PS (Figure 1). The project noise sources were modeled as both point sources and area sources using information provided by Black & Veatch project team, DHK's extensive acoustical library, and general assumptions. Acoustical terminology used throughout this report is provided as Appendix A.

The *City of Poway Municipal Code, Chapter 8.08, Noise Abatement and Control* was used as the analysis criteria for the maximum permissible noise levels for permanent noise sources during the day and night, for construction operations and for emergency work, which pertains to operation of the emergency generator.

1.1 OBJECTIVE AND METHODOLOGY

The objectives of the analysis were to:

1. Evaluate potential noise impacts at residential-zoned receptors from permanent, stationary industrial noise sources associated with the proposed PS operation; and
2. Determine if mitigative measures proposed in the design package such as acoustical walls, improved materials of construction and acoustical features, and/or design enhancements will be effective or if additional abatement is warranted (to be conducted during later design stage if required).

The methodology used in the analysis was as follows:

1. Identify regulatory noise impact goals at sensitive receptors in the area surrounding the proposed project site.
2. Determine the noise impacts associated with the indoor pumps, indoor HVAC fan coils and outdoor condenser unit, and roof fans using acoustical simulation computer modeling in accordance with industrial stationary source standards.
3. Compare the incremental increase to the ambient noise survey conducted as part of this study, regulatory noise ordinance, and industry-standard decibel requirements.

1.2 SITE AND PROJECT DESCRIPTION

The proposed project site is located on Poway Lake Road immediately west of the City of Poway Public Works Fleet facilities. Single-family residential homes are located in all directions around the site except to the east on Fox Crossing Ct, Blue Sage Dr, Cumberland Dr, Grey Stone Rd and Trailwind Rd (see Figure 1 and photographs). The proposed site occupies an area of approximately 22,800 square feet with 700-foot perimeter and is surrounded by a block wall on the south and west sides.

The operational mechanical design configuration of interest is based on 90% design drawings (Black and Veatch 2023) and consists of 4 x 125-hp vertical turbine pumps (3 operating), 2 x 2-hp outdoor roof-mounted exhaust fans, an exterior 13-ton condenser and a 450-kW emergency generator with critical exhaust silencer.

1.3 PHOTOGRAPHS



Photograph 1: The Quest noise level meter used for this project looking south.



Photograph 2: Looking southeast across site.



Photograph 3: Location of Pump Station building.



Photograph 4: Looking South-southwest at entry gate and full site.

Figure 1: Site Map



2.0 NOISE CRITERIA AND AMBIENT NOISE ASSESSMENT

An acoustics primer is provided in this section followed by a description of nuisance noise criteria. Ambient noise monitoring results from on-site monitoring conducted on June 30 and July 1, 2022 are also provided in this section.

2.1 NOISE CRITERIA

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The decibel (dB) scale is used to quantify sound intensity. Because sound pressure levels can vary by over one million times within the range of human hearing, a logarithmic loudness scale (similar to the Richter Scale used for earthquake intensity) is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity (middle A and its higher harmonics) in a process called "A-weighting," written as dB(A). Table 2-1 illustrates the typical A-weighted sound level of representative noise sources. Acoustical terminology definitions are provided in Appendix A.

Table 2-1: Typical Noise Source Levels in dB(A)

Noise Source	dB(A)
Noise at ear level from rustling leaves	20
Room in a quiet dwelling at midnight	32
Soft whisper at five feet	34
Large Department Store	50 to 65
Room with window air conditioner	55
Conversational Speech	60 to 75
Passenger Car at 50 ft.	69
Vacuum cleaner in private home at 10 feet	69
Bulldozer at 50 ft	87
Heavy city traffic	90
Home lawn mower	98
Jet aircraft at 500 feet overhead	115
Human pain threshold	120

Reference: Noise Control Reference Handbook, Industrial Acoustics Company

Noise level impacts were evaluated near the PS area and at the receptors indicated on figures 1, 2, and 3. Noise level impacts were evaluated against the ambient noise levels recorded in June-July 2022 and the City's construction and permanent industrial noise source limitations.

2.1.1 Industrial Noise

The PS is located within City of Poway zoning district PF and is surrounded by zoning district PRD-1, residential with density of less than 11 dwellings per acre. Permanent industrial noise sources are limited by zoning to the levels in the table below.

Table 2-2: Maximum Exterior Sound Levels in dB(A) at Property Line

1-Hour Average Sound Levels in dB(A)			
ZONE	DAYTIME (7 am to 7 pm)	EVENING (7 pm to 10 pm)	NIGHT (10 pm to 7 am)
PF	55 L _{eq}	50 L _{eq}	45 L _{eq}
PRD-1	50 L _{eq}	40 L _{eq}	

Reference: City of Poway Noise Ordinance Section 8.08.040 Sound Level Limits.

The sound level limit at locations on the boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. This sound level threshold for nighttime is 42.5 dB(A) Leq.

2.1.2 Emergency Work

Section 8.08.020 Definitions states that “emergency work” means work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from imminent exposure to danger or damage or work by public or private utilities when resorting utility service.

Section 8.08.170 Exemptions states that the provisions of the noise ordinance shall not apply to emergency work provided that the Noise Control Officer has been notified in advance, if possible, or as soon as practical after said emergency and that 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.

Operation of the acoustically mitigated 450 kW emergency generator would be required to operate the PS in the event of power failure. While the ordinance does not specifically state that routine testing of the emergency generator is exempted, since the routine testing is anticipated to be limited to daytime only with anticipated duration of up to 1 hour per month plus an annual testing with a load bank up to 4 hours, meeting daytime noise thresholds is not anticipated to be an issue with the routine testing. The City’s Noise Control Officer should be notified in advance if routine testing is to be performed outside of daytime hours. It should be noted that the City's Noise Control Officer will provide a Memorandum of Understanding that testing of emergency generator will be completed during daytime hours and operation of the emergency generator during any and all times for the protection and safety of the public is approved.

2.1.3 Construction Noise

The ordinance states that no such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than 8 hours during any 24-hour period 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. These sound levels shall be corrected for time duration in accordance with the table below. Additionally, construction noise mitigation and best management practices are provided in Appendix B.

Table 2-3: Maximum Exterior Construction Noise Levels in dB(A) at or within Project Property Line

Duration in 24-Hour Period	Decibel Level Allowance	Total Decibel Level
Up to 15 minutes	+15	90
Up to 30 minutes	+12	87
Up to 1 hour	+9	84
Up to 2 hours	+6	81
Up to 4 hours	+3	78
Up to 8 hours	0	75

Reference: City of Poway Noise Ordinance.

2.2 AMBIENT NOISE ASSESSMENT

To determine the existing noise levels at the project site prior to development, noise monitoring was conducted at the project site during day and night periods. The neighborhood noise heavily influenced by local traffic, Lake Poway general public activities, children playing, landscaping and construction and dogs barking.

The noise measurements were conducted using a calibrated SoundPro DL- 2—1/3 (BJM12001). The sound level meter met the current American National Standards Institute (ANSI) standard for a Type 2 and was calibrated prior to use. Appendix A provides further noise terminology and definitions.

2.2.1 Ambient Noise Assessment Methodology

Noise monitoring was conducted at the PS to determine the near-range ambient noise characteristics during various times of the day. Day measurements were recorded during the morning, afternoon an evening hour on June 30, 2022 and the nigh-time and night-time/early morning of July 1, 2022. The sound measurements were conducted at a height of 1.5 meters (5 feet) above the ground. The table below summarizes the ambient noise readings.

Table 2-4: Ambient Noise Measurements, June 30 and July 1, 2022

Noise Parameter ⁽¹⁾	Noise Level in dB(A) during Event				
	AFTERNOON 11:45 am- 12:45 pm	AFTERNOON 5:15 pm-5:30 pm	EVENING 5:30 pm- 10:30 pm	NIGHTTIME 10:30 pm- 4:00 am	MORNING 6:40 am – 7:00 am
L _{eq}	51.2	48.2	51.5	45.7	56.1
L ₁	61.5	59.5	58.8	55.4	66.8
L ₁₀	54.4	51.9	50.5	48.8	59.1
L ₅₀	46.6	42.1	44.9	41.5	51.2
L ₉₀	43.6	38.7	37.6	38.4	46.2
L _{DN}	51.2	48.2	51.5	55.7	66.1
CNEL	51.2	48.2	53.6	55.7	66.1
L _{Max}	71.4	66.2	78.5	66.0	75.9

Notes:

- (1) See Appendix A for definitions
- (2) Local traffic, Fleet maintenance during daytime hours, construction staging activities, frogs, dog barking, idling flatbed for Fleet pick-up (morning elevated noise) neighborhood noise (landscaping, construction), main contributors to background noise.
- (3) Ambient measurement information provided in Appendix B.

3.0 NOISE MODELING METHODOLOGY

Prediction of future noise impacts within a region requires a series of very complex calculations to determine the areas and extent of potential acoustical problems. Computer-aided simulation programs have been developed to assist in the calculation process and properly assess complex systems of multiple noise sources, receptors, and environmental factors. Due to several noise generating sources, potential low background ambient noise levels, and project specific environmental features (e.g., elevated terrain), a computer simulation program was selected to assist with this project. The results will assist in the determination of potential noise impacts to nearby receptors from the proposed noise sources.

3.1 NOISE SIMULATION MODEL

SoundPLAN Wins, developed by Braunstein +Berndt GmbH, was selected as the most appropriate modeling program for the noise impact assessment. The selection was based on recent experience on similar projects and the program's ability to calculate multiple sources with various degrees of abatement, multiple receptors, and elevated terrain features.

SoundPLAN's main objective is to calculate noise emitted from industrial sources and assess the influence upon receivers. The model data are generated in compliance with standards selected by the user and the results are presented in tabular and/or graphic form. SoundPLAN was developed as a composite noise simulation program for traffic, industrial, rail and airport simulations. The program includes the following modules: Geo-Database, Industrial Noise Propagation, Cartography, Calculation, and Graphics.

3.1.1 Industrial Propagation

SoundPLAN provides six industrial propagation calculation choices. Each calculation method is internationally recognized and offers unique computer simulation techniques. ISO 9613 was used for the simulations. ISO 9613 is a general-purpose standard for outdoor noise propagation and calculates the sound pressure for a frequency using the following formula:

$$L_s = [L_w + D_1 + K_0] - [D_s + \Sigma D]$$

Where: L_s	sound pressure for a single frequency
L_w	sound power
D_1	directivity of the source
K_0	spherical model
D_s	spreading
ΣD	different contributing factors
	a. air absorption
	b. ground absorption
	c. volume type absorption
	d. screening

3.1.2 Geo-Database Modules

The Geo-Database module allows for site specific development of the source, receptor and environmental features of the project. The Geo-Data files allow for layering of various files including source and receptor location (x, y, z) coordinates, buildings, acoustical characteristics (absorptive or reflective), and special features (terrain, ground cover, landscape abatement). Each file can be combined to form various combinations of "Scenarios."

3.1.3 Point and Area Noise Sources

The locations of noise sources and receptors, dimensions and building shape, equipment location and landscape elevation contours are critical to the model results. Satellite imaging, site photographs and design drawings were used to prepare the overall basemap. Electrical and mechanical design drawings and manufacturer-provided data are typically used to determine the location, type, and sound power levels of the stationary noise sources. Noise transmission loss and absorption loss values were obtained or calculated from architectural design drawings and DHK's acoustical library. The building footprint and site improvements that may mitigate or increase propagated noise such as landscaping, walls and graded barriers (mitigation) and concrete/asphalt were obtained from 90% progress design documents and direction from the design engineer (Black & Veatch, 2023).

3.1.4 Calculation/Graphics

The computer simulation program operates in types of "Scenarios." Prior to the execution of the program, each scenario is set-up with the appropriate selection of geo-data files, calculation standard and calculation parameters. The calculation parameters are selected to determine the overall area, distances between points, acoustical scale (A-weighted), specific receptor, and graphical parameters. Each Scenario is evaluated at each single point sound (SPS) location and using a grid map with noise isopleth contours. The predicted noise levels presented are based on these calculations.

3.2 PARAMETERS AND PHYSICAL ASSUMPTIONS

The analysis requires establishing values for physical parameters such as the noise profiles for the pump, roof-top fan, evaporative cooler and air conditioning unit. Key physical assumptions are described below.

3.2.1 Project Model Parameters

The project and adjacent areas were analyzed for zones with the greatest potential for noise conflict. Noise impacts are greatly determined by proximity of sources to receptors, the project site and adjacent land. The location of sensitive receptors, analysis of elevated terrain and preliminary layout assisted in the determination of the project study area. Geo-Data files were developed and completed to include terrain associated ground cover, acoustical enclosures, walls, equipment and specific receptors. Noise absorption and reflective properties are provided for each geo-data file.

3.2.2 Noise Profiles of the Mechanical System

Three scenarios were modeled based on preliminary RFP information:

Scenario 1, Operational Configuration: This scenario consisted of the operational “worst case” configuration and included three 125-hp indoor vertical turbine pumps, two 2-hp roof-mounted exhaust fans for the pump room, and indoor and outdoor HVAC units (13-ton chiller) all running 24/7.

Scenario 2, Emergency Configuration: This scenario included all operational noise sources in Scenario 1 with the addition of the 450-kW emergency generator with critical-grade stack noise silencer operating within a partially walled compound along the east boundary of the site.

The noise sources and pump station building construction materials are summarized in the table below.

Table 3-1: Industrial Noise Sources and Construction Materials used in Noise Simulations

Noise Source/Construction Material Description (Preliminary Information)	Scenario
Four (4) 125-hp vertical turbine pumps in Pump Room, 3 in operation	1 & 2
Two (2) Exhaust Fans, 2 hp, 14,000 cfm, roof-mounted	1 & 2
Indoor fan coils (4) and exterior air conditioning unit condenser, 13-ton	1 & 2
Walls: 12-inch CMU, filled	1 & 2
Roof: metal decking, insulated	1 & 2
Doors: steel, acoustical	1 & 2
Garage entry: STC 46-rated oversized double doors	1 & 2
Pump Room acoustical supply air louvers & indoor baffle wall with sound panels, 18" from louvers	1 & 2
Steel gate, north entrance	1 & 2
Emergency Generator: 450 kW, acoustical enclosure from manufacturer	2
Emergency Generator exhaust stack with critical-grade silencer	2

Notes: PS = Pump Station, cfm = cubic feet per minute (airflow), CMU = concrete masonry unit (block), STC= sound transmission class

3.2.3 Grid Map Selection

A noise calculation area 2,000 feet by 1,500 feet was selected for the project area. This area was determined by line of site or direct line of potential impact to nearby residential housing (sensitive receptors). Additional residences were modeled beyond the first based on experience with similar noise projects. A height of 5 feet above ground was used for the grid map noise calculations. The calculation grid provides detailed 3-dimensional identification of the areas of impact within grid area.

4.0 NOISE SIMULATION RESULTS

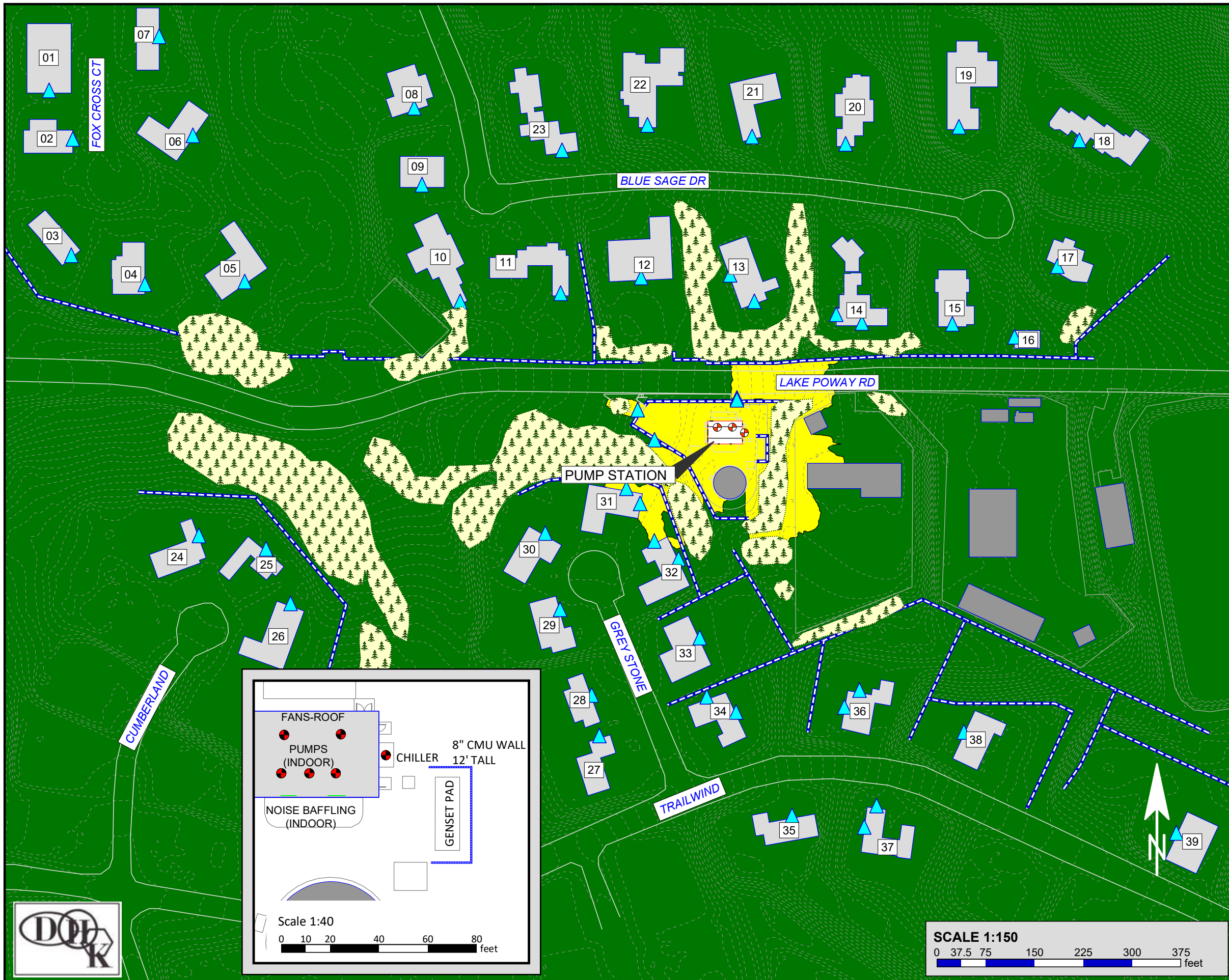
Results of the noise modeling are presented in this section. A graphical representation of predicted noise isopleths by the SoundPLAN model are illustrated on Figure 2 for Scenario 1 and Figure 3 for Scenario 2. The following table provides the results at discrete points along the façades at selected residential receptors as well as points around the interior of the site and on the outside near the property line.

Table 4-1: Modeled Sound Results at Selected Receptors in dB(A)

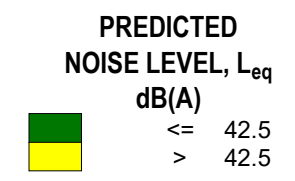
Receptor Map ID (Street & House # for Residences)	Modeled Scenario Sound Level Results in dB(A), L_{eq}	
	Scenario 1: Operational	Scenario 2: Operational + GENSET
01 – FOX CROSS CT	19.0	23.9
02 – FOX CROSS CT	21.3	27.5
03 – FOX CROSS CT	15.9	22.5
04 – FOX CROSS CT	22.5	28.9
05 – FOX CROSS CT	24.6	30.8
06 – FOX CROSS CT	18.1	24.3
07 – FOX CROSS CT	16.5	23.2
08 – BLUE SAGE DR	22.1	29.8
09 – BLUE SAGE DR	22.3	28.2
10 – BLUE SAGE DR	30.4	35.1
11 – BLUE SAGE DR	29.1	35.2
12 – BLUE SAGE DR	33.9	41.3
13 – BLUE SAGE DR	37.5	43.1
14 – BLUE SAGE DR	40.1	44.1
15 – BLUE SAGE DR	34.2	35.6
16 – BLUE SAGE DR	31.1	31.6
17 – BLUE SAGE DR	28.3	29.0
18 – BLUE SAGE DR	26.6	30.1
19 – BLUE SAGE DR	28.2	31.2
20 – BLUE SAGE DR	29.5	33.7
21 – BLUE SAGE DR	24.3	32.2
22 – BLUE SAGE DR	26.4	34.5
23 – BLUE SAGE DR	23.1	30.9
24 – CUMBERLAND	20.2	28.1
25 – CUMBERLAND	23.2	29.5
26 – CUMBERLAND	21.6	28.3
27 – GREY STONE	24.8	27.7
28 – GREY STONE	27.5	29.8
29 – GREY STONE	33.1	35.7

Receptor Map ID (Street & House # for Residences)	Modeled Scenario Sound Level Results in dB(A), L_{eq}	
	Scenario 1: Operational	Scenario 2: Operational + GENSET
30 – GREY STONE	30.4	32.9
31 – GREY STONE	43.5	47.7
32 – GREY STONE	41.7	42.2
33 – GREY STONE	31.2	38.5
34 – GREY STONE	24.7	36.3
35 – TRAILWIND	26.6	30.0
36 – TRAILWIND	32.1	36.2
37 – TRAILWIND	24.7	28.3
38 – TRAILWIND	26.0	30.3
39 – TRAILWIND	19.4	23.7
NORTH GATE, INSIDE	53.9	60.8
NORTH GATE, OUTSIDE	38.9	43.8

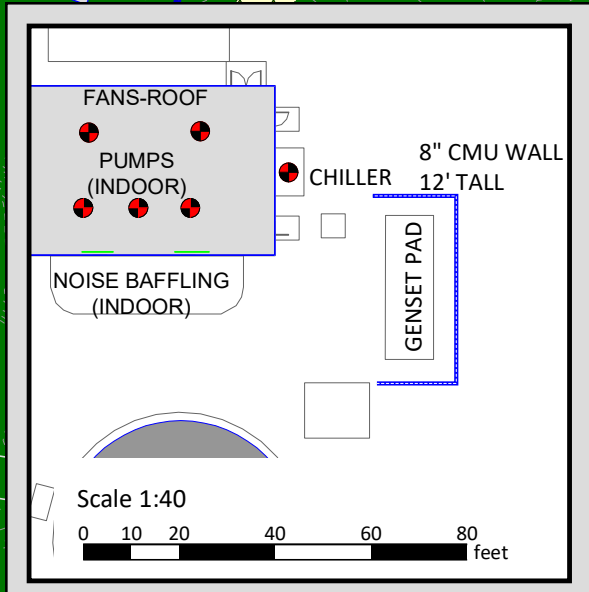
NOTES: See Appendix A for terminology.



- LEGEND**
- RESIDENTIAL RECEPTOR (WITH REPORT ID)
 - RESIDENTIAL (NOT EVALUATED)
 - WALL
 - ELEVATION CONTOUR
 - SPS RECEIVER
 - BUILDING NOISE SOURCE (BOOSTER STATION)
 - MITIGATION AREA - TREES/SHRUBS
 - GROUND ABSORPTION (ROCK, CONCRETE, WATER)



- NOTES:**
- NOISE SOURCES:**
1. 3x 125-hp pumps @ 1770 RPM
 2. 13-ton outdoor chiller
 3. 2x2-hp roof-top exhaust fans
- PUMP HOUSE CONSTRUCTION:**
- 12" CMU, filled and painted
 - Acoustical doors
 - STC 18 acoustical louvers on south facade
 - STC 46 acoustical rollup door
 - Internal baffling by louvers
 - 8" CMU wall, 12' tall around north, east & south sides of GENSET

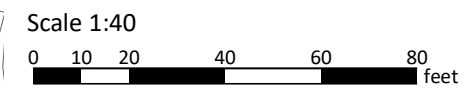
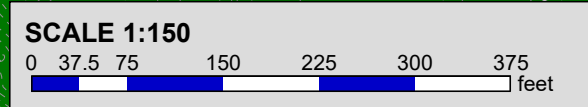


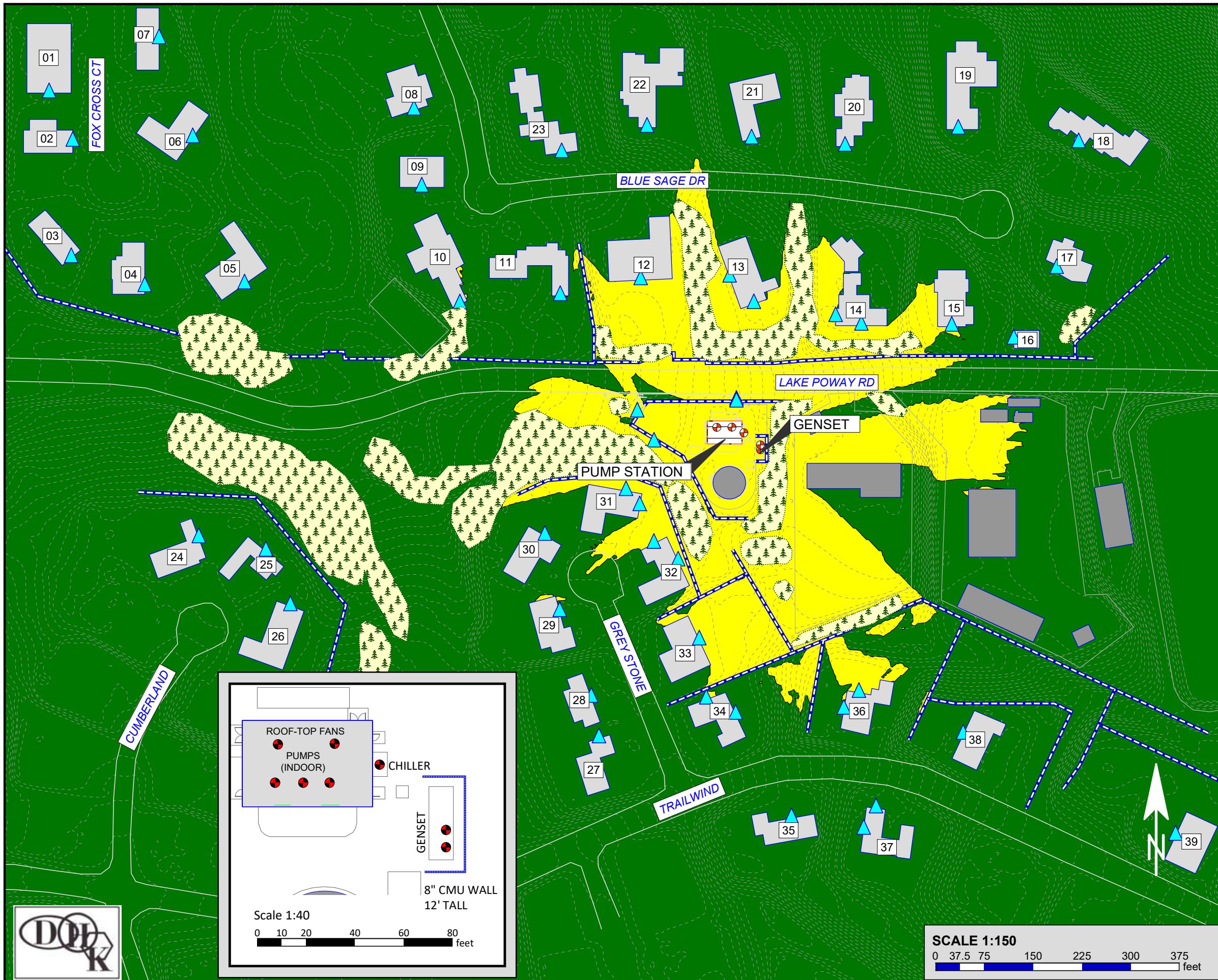
CITY OF POWAY

FOREBAY TANK & PUMP STATION

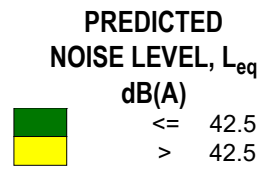
**FIGURE 2
SCENARIO 1 NOISE ISOPLETH MAP
OPERATIONAL CONFIGURATION**

AUGUST 2023

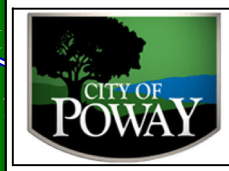
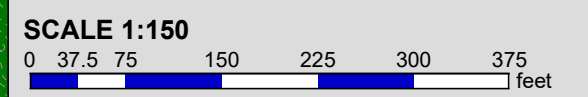
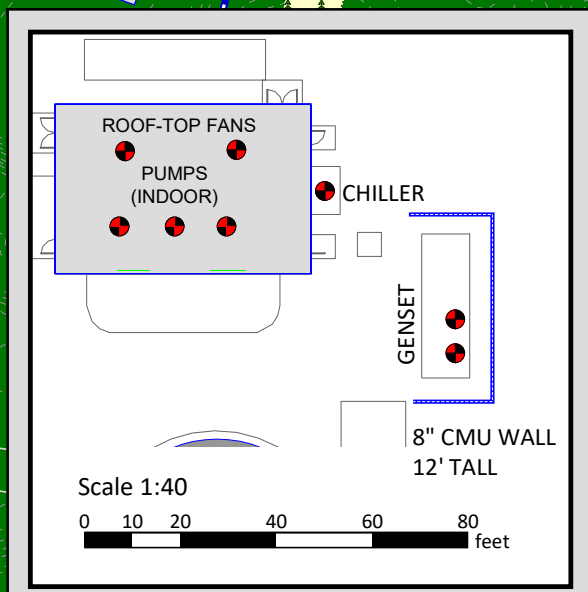




- LEGEND**
- RESIDENTIAL RECEPTOR (WITH REPORT ID)
 - RESIDENTIAL (NOT EVALUATED)
 - WALL
 - ELEVATION CONTOUR
 - SPS RECEIVER
 - BUILDING NOISE SOURCE (BOOSTER STATION)
 - MITIGATION AREA - TREES/SHRUBS
 - GROUND ABSORPTION (ROCK, CONCRETE, WATER)
 - INDUSTRIAL NOISE POINT SOURCE



- NOTES:**
- NOISE SOURCES:**
1. 3x 125-hp pumps @ 1770 RPM
 2. 13-ton outdoor chiller
 3. 2x 2-hp roof-top exhaust fans
 4. 450kW GENSET
- PUMP HOUSE CONSTRUCTION:**
- 12" CMU, filled and painted
 - Acoustical doors
 - STC 18 louvers on south facade
 - STC 46 acoustical rollup door
 - Critical silencer and Level 2 acoustical enclosure on GENSET
 - 8" CMU wall, 12-ft tall on north, east and south sides of GENSET



CITY OF POWAY

FOREBAY TANK & PUMP STATION

**FIGURE 3
SCENARIO 2 NOISE ISOPLETH MAP
EMERGENCY CONFIGURATION**

AUGUST 2023



5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are derived from evaluation and comparison of the noise modeling results with the noise criteria established for this project based on preliminary information and to aid in the design development.

1. The measured ambient nighttime noise levels are greater than 45.0 dB(A), which are above the City of Poway noise regulation threshold of 42.5 dB(A) for residential property adjacent to a public facility.
2. Modeled results indicate that the operational configuration (Scenario 1) noise levels are below the daytime noise ordinance threshold of 50.0 dB(A) but exceed the averaged 42.5 dB(A) threshold for nighttime at a single residential home by 1 dB(A).
3. Use of the emergency generator during daytime and night-time hours will require a City of Poway Noise Control Officer Memo for public safety purposes, because the noise ordinance does specifically allow this type of operation without permission of the Noise Control Officer
4. Emergency generator testing will be conducted during daytime hours for no more than 1 hour.
5. A public workshop/outreach program should be completed prior to construction to ensure the local neighborhood is aware of the new facility and the potential for emergency generator operations.
6. Construction noise best management practices and monitoring recommendations are provided in Appendix B.
7. Prior to the project construction, a memorandum shall be provided by the City's Noise Control Officer to grant an ordinance exemption to allow for operation of the emergency generator at any time during emergency conditions and specify any limitations or prohibitions for testing of the generator at routine times.

6.0 REFERENCES

- Black and Veatch, 2023. *Progress Design Documents, 90%*.
- Black and Veatch, 2023. *Direction from Design Engineer*.
- City of Poway. 2022. *City of Poway Municipal Code, Chapter 8.08 Noise Abatement and Control, Sections 8.08.020 Definitions, 8.08.040 Sound Level Limits, 8.08.100 Construction Equipment, and 8.08.170 Exemptions*.
- Crocker, Ed., 1998. *Handbook of Acoustics*.
- Industrial Acoustics Company, 1989. *Noise Control Reference Handbook*.

APPENDIX A

ACOUSTICAL TERMINOLOGY

Acoustical Terminology:

Ambient Noise: The sound pressure levels associated with a given environment. Ambient noise is a composite of sounds from near and far sources none of which are particularly dominant.

Background Noise: The sound pressure levels in a given environment from all sources excluding a specific sound source being investigated or measured.

Decibel “A” Scale: Sound level weighting which approximately represents the frequency response of the human ear, which is less sensitive to low frequency than to high frequency sound.

Far Field Noise: Noise acting in accordance to the inverse law. Double the distance - reduce the dB(A) by “6”.

Noise measurement metrics:

- Equivalent sound level (L_{eq}), the average sound level calculated from instantaneous measurements recorded over a specific period of time.
- Maximum sound level (L_{max}) reached during a sampling period. The L_{max} value is the peak noise level that occurred during the measurement period.
- Minimum sound level (L_{min}) reached during a sampling period. The L_{min} value obtained for a particular monitoring location typically reflects ambient conditions.
- Percentile sound levels (L_{90} , L_{50} , and L_{10}) are sound levels that exceed the percentile value during the measurement period.
- Community Noise Equivalent (CNEL): the average of the daytime measurement, evening measurement +5 dB(A), and the night measurement +10 dB(A).
- Single Event Level (SEL): Used for blasting events that are less than a minute in duration, when energy average noise values do not provide accurate depiction of the maximum noise levels produced by the single event.
- Peak Noise Level (P_{K15}): Un-weighted peak sound levels or maximum sound levels that assess maximum noise levels during single-noise events. This is necessary when the DNL (average) noise measurements might understate the severity of a single-noise event. Sometimes annoying noise peaks can be “averaged out.” Un-weighted peak measurements, with no time averaging, are a good predictor of complaints.
- Day Night Level (L_{dn}): The day-night sound level (DNL) evaluator is recommended by the Environmental Protection Agency and used by most federal agencies as a land-use planning tool. It describes the average daily acoustic energy over the period of one year—meaning that moments of quiet are averaged together with moments where loud noises can be heard. The Department of Defense (DoD) uses DNL because it incorporates a “penalty” for nighttime noise (normally 10:00 p.m. to 7:00 a.m.) when loud sounds are typically more annoying.

Noise Control: Usually involves three elements including 1) A noise source, 2) a receiver of noise and 3) various paths noise can travel between the source and receiver.

Sound Absorption Coefficient: The dimensionless ratio of the sound energy absorbed by a given surface to that incident upon the surface.

Sound Receiver: One or more observations points at which sound is evaluated or measured. The effect of sound on an individual receiver is usually evaluated near the ear or close to the body.

Speed of Sound in Air: 1,129 feet per second.

APPENDIX B

CONSTRUCTION NOISE

Construction Noise

This appendix provides three noise mitigation measures with best management practices and construction monitoring recommendations in the table below. The construction noise blanket cut sheet used for modeling follows.

MITIGATION MEASURE	MONITORING PROCESS	MONITORING TIMING	RESPONSIBLE PARTY
<p>Noise Mitigation Measure 1: The following mitigation measures are recommended to minimize the noise impacts near the Project site:</p> <p>For project construction activities, the contractor shall provide a minimum 8-foot-tall temporary noise barrier around the Project site between the adjacent receivers to the north, west, and south with a performance standard of achieving a minimum 10 dBA noise level reduction at the residential receptors to the north, south, and west. A temporary construction noise blanket with NRC 0.95 rating is recommended. Use of the existing block wall should be evaluated for noise level reduction if proposed for use in lieu of blanket on south and west sides.</p>	<p>Include mitigation measure in construction contracting specifications</p> <ul style="list-style-type: none"> Conduct periodic monitoring to ensure noise generated from construction of the PS is attenuated to at least a 10 dBA reduction from noise barrier Retain construction monitoring report in project file 	<ul style="list-style-type: none"> During preparation of contractor specifications (mitigation measure in specifications) During construction (monitoring) After construction (retain documentation) 	<ul style="list-style-type: none"> City of Poway Engineer and Construction Contractor City of Poway Construction Manager City of Poway Engineer
<p>Noise Mitigation Measure 2: In coordination with the City of Poway, construction contractors shall implement the following:</p> <ul style="list-style-type: none"> Signs shall be posted at the construction site that include permitted construction days and hours, a day and evening contact number for the job site, and a City of Poway contact number (Noise in the event of problems). An on-site complaint and enforcement manager shall respond to, and track, complaints and questions related to noise. 	<ul style="list-style-type: none"> Include mitigation measure in construction contracting specifications Conduct periodic monitoring to ensure signs are posted at construction sites with required noise-related information Conduct periodic monitoring of on-site enforcement manager Retain construction monitoring report in project file 	<ul style="list-style-type: none"> During preparation of construction contractor specifications (mitigation measure in specifications) During construction (monitoring) During construction (enforcement manager) During/after construction (retain documentation) 	<ul style="list-style-type: none"> City of Poway Engineer and Construction Contractor City of Poway Construction Manager City of Poway Construction Manager City of Poway Engineer
<p>Noise Mitigation Measure 3: To reduce noise impacts due to construction, the City of Poway shall require construction contractors to implement the following BMP measures:</p> <ul style="list-style-type: none"> During construction, the contractor shall outfit all equipment, fixed or mobile, with properly operating and maintained exhaust and intake mufflers, consistent with manufacturers' standards. Impact tools (e.g., jack hammers, pavement breakers) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. External jackets on the tools themselves shall be used where feasible. 	<ul style="list-style-type: none"> Include mitigation measure in design specifications Conduct periodic monitoring of BMPs Retain a copy of design specifications in project file 	<ul style="list-style-type: none"> During preparation of construction contractor specifications (mitigation measure in specifications) During construction (monitoring) During/after construction (retain documentation) 	<ul style="list-style-type: none"> City of Poway Engineer and Construction Contractor City of Poway Construction Manager City of Poway Engineer