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Memo

To: Rosa Garcia
CC: --
From: Chris Dugan
Date: March 7, 2023
SUBJECT: Noise and Vibration Analysis for PROJ-2021-00099: Ken's Towing Services Impound Yard Project, Baker, CA

MIG, Inc. (MIG) has prepared this memorandum at the request of Ken's Towing Services. This memorandum estimates the potential noise and vibration levels for the proposed Ken's Towing Services Impound Yard Project (proposed Project) and evaluates those noise and vibration levels against applicable standards established by the County of San Bernardino. As explained in this memorandum, the proposed Project does not have the potential to result in noise or vibration levels that would exceed applicable standards or otherwise substantially alter the existing environment because the Project would not generate substantial temporary or permanent noise levels with the incorporation of noise control measures, including a six (6)-foot-tall concrete masonry unit (CMU) perimeter wall, into the Project design, would not generate excessive groundborne vibration levels, and would not be subjected to excessive airport-related noise levels.

PROJECT DESCRIPTION

The proposed Project involves the relocation of an existing vehicle impound yard on Silver Lane, in the unincorporated community of Baker, San Bernardino County, to a new location on Silver Lane approximately 0.7 miles away.

Ken's Towing Services operates an existing vehicle impound yard at 72373 Silver Lane (see Figure 1: Project Location). The existing impound yard property is a 2.5-acre, square-shaped parcel of land (Assessor's Parcel Number, or APN, 054429143). The property includes one single-family residence. Ken's Towing Services leases 0.5 acres in the southeast corner of the property for impound services. Ken's Towing Services operates 24-hours a day, averaging six (6) service calls per day. Tow trucks are not parked and kept at the existing impound yard. Instead, tow trucks are parked and stored at Ken's Towing Services' existing auto shop building, which is located at 72922 Baker Boulevard approximately 0.7 miles east of the existing impound yard.

The proposed impound yard would be located on an unaddressed property on Silver Lane that is approximately 0.7 miles east of the existing impound yard (see Figure 1). The property (APN 054447108) is approximately 5.0 acres in size, however, the impound yard would only occupy approximately 4.0 acres of the property (see Figure 2: Aerial View of Project Site). The Project site is classified by the County's development code as Rural Commercial (CR) and designated by the County's General Plan as Commercial (County of San Bernardino, 2007 and 2020a). The proposed site is undeveloped and bordered by a commercial storage yard to the north, Silver Lane to the south, a manufactured home park to the east (zoned RC), and undeveloped Bureau of Land Management (BLM) land to the west (see Figure 2). Other surrounding land uses include rural commercial and residential facilities to the north and commercial businesses to the south, across Silver Lane, including Ken's Towing Services auto shop (72922 Baker Boulevard), a travel center/convenience store, and a Chevron gas station, as well as a Caltrans facility. Baker Boulevard and Interstate 15 (I-15) are approximately 400 and 1,235 feet southeast of the Project site.

Figure 1: Project Location

Figure 2: Aerial View of Project Site

The new impound yard surface would consist of 4 inches of decomposed granite include 52 tractor trailer/RV spaces located in the center of the site and up to 340 standard vehicle spaces that would be located around the perimeter of the site (see Figure 3: Project Site Plan). Other site improvements would include a gated entrance to the facility from Silver Lane, a small on-site stormwater infiltration basin, security pole lighting, and a six-foot-tall CMU perimeter wall. The proposed Project also includes sidewalk improvements along its Silver Lane frontage.

The proposed Project would not substantially change Ken's Towing Services existing operations. Like the existing impound yard, the new impound yard would operate 24-hours a day, seven (7) days a week and support eight (8) employees. Tow trucks would continue to parked and stored at Ken's Towing Service auto shop located across the street from the new impound yard. The proposed Project would not expand Ken's Towing Service tow truck fleet.

Ken's Towing Service usually operates within an approximately 50-to-60-mile service territory surrounding Baker. In 2022, Ken's Towing Service averaged six service calls per day. Most service calls result in the disabled vehicles being towed to a home or the closest dealership. Ken's Towing Service estimates the maximum amount of daily service calls that could occur to be 10 service calls, consisting of up to eight (8) standard service calls and two (2) tractor trailer/RV service calls. Due to the logistics involved with driving out, hook up, and driving back, Ken's Towing Service that no more than one (1) serviced vehicle would be brought to the impound yard in any given hour.

The construction of the proposed Project would include minor grading (2 weeks) to level the site and put in the infiltration basin, delivery and compaction of approximately 1,700 cubic yards of decomposed granite (2 weeks), and construction of the other on-site and off-site improvements (6 weeks). Construction activities are anticipated to begin in the 1st or 2nd quarter of 2023 and last approximately 10 weeks in total. The operation of the new impound yard is anticipated to begin in the 2nd or 3rd quarter of 2023.

The following sections describe the typical noise level associated with a Ken's Towing Service impound pick-up/drop-off event and evaluate the proposed Project's potential noise and vibration impacts. Refer to Attachment 1 for background information on environmental noise and vibration, including commonly used terminology.

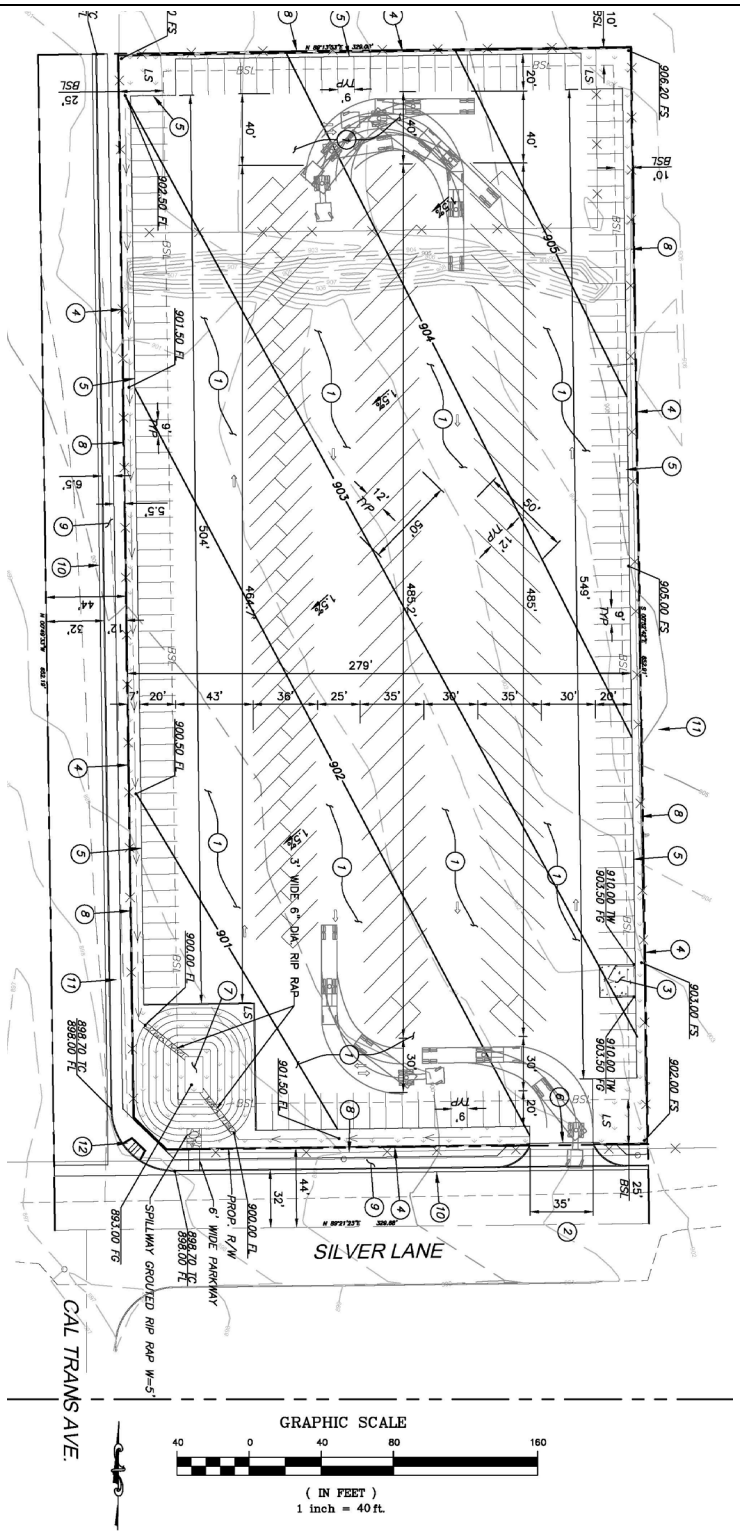
TOW TRUCK/IMPOUND ACTIVITY NOISE LEVEL

On January 29, 2023, MIG, Inc. conducted noise monitoring to evaluate noise levels at the proposed Project site with and without tow truck / impound yard services. Noise levels were measured with three Larson Davis Model LxT Type I integrating sound level meters. The meters' receiving microphones were set to a height of five feet above ground, approximately the same height as a human receptor's ears. Conditions during the monitoring were sunny with a temperature of approximately 60 degrees and calm winds.

Two different short-term noise readings were collected:

- Tow truck noise levels (ST-1, ST-2, and ST-3): Noise levels were collected over a 10-minute period during which time a flatbed tow truck arrived at the Ken's Towing Service auto shop, dropped off a vehicle, pick-up the same vehicle, and then drove away from the auto shop. Noise levels were measured directly behind and to the sides of the serviced vehicle (see Figure 4) at distances of 65 (ST-1), 50 (ST-2), and 55 (ST-3) feet from the center of the tow truck engine (see Figure 4: Short-Term Noise Monitoring Locations).
- Existing site noise levels (ST-4): Noise levels were collected near the southeastern corner of the proposed Project site over a 20-minute period when no tow truck activity occurred (see Figure 4).

Figure 3: Project Site Plan



Source: Sake Engineers, Inc. 2022

Figure 4: Short-Term Noise Monitoring Locations

The results of the noise monitoring are summarized in Table 1: Measured Noise Levels With and Without Tow Truck Operations (dBA). Refer to Attachment 2 for detailed noise monitoring data.

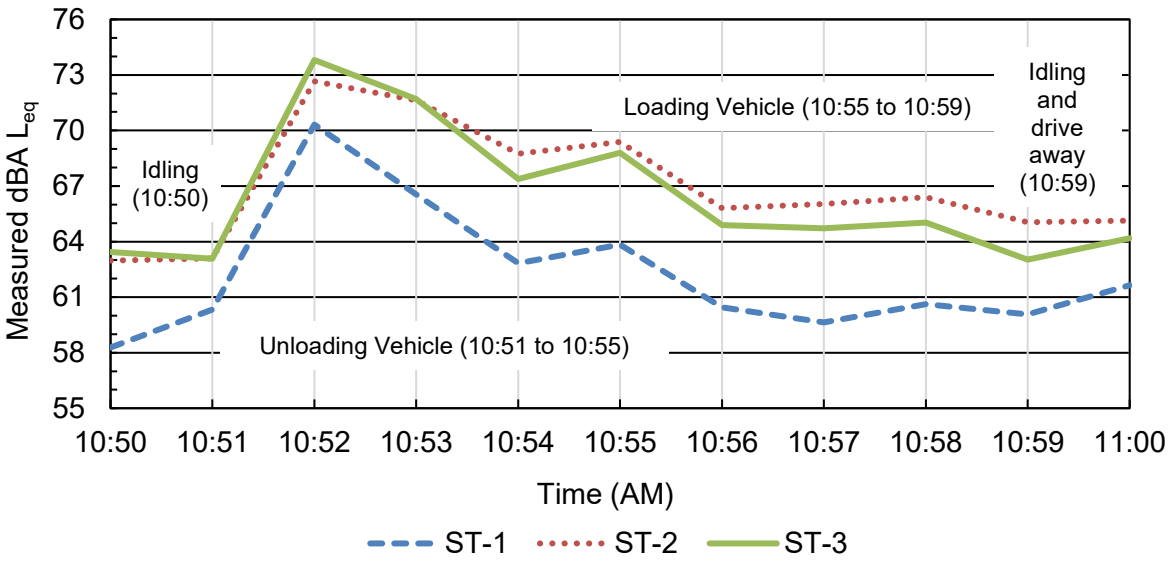
Table 1: Measured Noise Levels With and Without Tow Truck Operations (dBA)

Day/Site	Duration[(A)]	L_{min}	L_{max}	L_{eq}	L_{10}	L_{50}	L_{90}
With Tow Truck Activity							
ST-1	10:50 AM to 11:00 AM	55.1	84.0	63.9	66.8	59.3	57.8
ST-2	10:50 AM to 11:00 AM	58.6	87.6	68.1	70.0	65.0	63.6
ST-3	10:50 AM to 11:00 AM	59.1	89.9	68.0	69.8	63.7	62.3
Without Tow Truck Activity							
ST-4	11:15 AM to 11:35 AM	46.6	74.1	56.8	59.3	53.6	51.0
Source: MIG, 2023 (See Attachment 2)							

As shown in Table 1, daytime noise levels at the proposed Project site without tow truck activity (ST-4) were in the range of 55 dBA L_{eq} to 60 dBA L_{eq}. These noise levels are consistent with existing I-15 traffic noise modeling conducted for the Countywide Plan, which indicates daily noise exposure level at the Project site and adjacent mobile home park is a minimum of 60 CNEL (County of San Bernardino, 2020b). Noise levels during the tow truck operations were approximately 7 to 11 dBA L_{eq} higher than noise levels without tow truck operations. In addition,

unloading activities were slightly louder than loading activities (due to noise from lowering the bed on the ground), and noise levels during tow truck operations were several decibels higher to the side of the tow truck (ST-2 and ST-3) than noise levels directly behind the tow truck. This is probably because most operator activities (e.g., attaching and detaching chains) take place on one side of the truck or another. The time needed to unload a vehicle from the flatbed tow truck and then reload the vehicle was approximately ten (10) minutes. Based on observations during the monitoring, the highest noise levels from the tow truck were associated with the hydraulic flatbed lift system and operator actions such as the movement of chains during loading and unloading of the vehicle. The noise levels measured over the 10-minute monitoring period are shown in Figure 5: Tow Truck Loading and Unloading Noise Levels.

Figure 5: Tow Truck Loading and Unloading Noise Levels



As shown in Table 1 and Figure 5, the noise levels from impound yard tow truck activities vary depending on the activity, but average between approximately 64 dBA and 68 dBA at 50 feet to 65 feet behind and to the side of the truck, respectively. Once the pick-up or drop off activity is complete, the impound yard would not generate noise levels. Noise levels can be adjusted to account for changes in distance between the noise source and the receiver (see Equation XYZ in Attachment 1). In addition, short-term noises can be presented as an hourly L_{eq} by adjusting the fraction of time the noise level occurs out of the hour (see Equation XYZ in Attachment 1). Based on the tow truck monitoring, the hourly L_{eq} levels from towing activities at the impound yard are estimated to be approximately 61.3 to 63.4 dBA L_{eq} at a distance of 50 feet. Refer to Attachment 03 for detailed tow truck activity assumptions.

NOISE AND VIBRATION ANALYSIS

The proposed Project would generate noise from construction and operational activities The following analysis evaluates if the Project would:

a) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

b) Generate excessive ground-borne vibration or ground-borne noise levels; or

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

With regard to item a), the San Bernardino County Code and Countywide Plan establish the following standards applicable to construction noise, noise / land use compatibility, and operational noise.

- *Noise Standards for Adjacent Mobile Sources:* County Code Section 83.01.080 (d) establishes standards for noise from mobile sources at different receiving land use types. The interior and exterior standards for single-family, multi-family, duplex, and mobile homes are 45 CNEL and 60 CNEL, respectively. Pursuant to County Code Table 83-3, the exterior noise standard may be 65 CNEL provided exterior noise levels have been mitigated through a reasonable application of noise reduction technologies and interior noise levels do not exceed 45 CNEL. In addition, interior standards do not apply to bathrooms, kitchens, toilets, closets, and corridors.
- *Exempt Noise Sources:* County Code Section 83.01.080 (g) exempts temporary construction, maintenance, repair, and demolition activities between 7 AM and 7 PM, except Sundays and Federal holidays, from the County's noise standards.
- *External Commercial or Industrial Activity on Private Property*: County Code Section 83.01.110 establishes there shall be no unpermitted external or industrial activity on properties subject to the County's jurisdiction between the hours of 9 PM and 7 AM that shall at any time impair the quiet enjoyment of neighboring property owners or residents or in any manner disturb the public peace.
- *Countywide Plan*: The Countywide Plan encourages truck delivery areas to be located away from residential properties and requires noise impacts to be mitigated. The Countywide plan also establishes 60 CNEL and 75 CNEL as the normally acceptable noise limit for mobile home and commercial uses, respectively.

With regard to item b), County Code Section 83.01.090 (d) (Vibration) sets forth that no ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line (0.2 inches/second). The Code exempts motor vehicles not under the control of the subject use and temporary construction, maintenance, repair, or demolition activities between 7 AM and 7 PM, except Sundays and Federal holidays, from the County's vibration standards.

Project Construction Noise (Temporary Increases in Ambient Noise Levels Above Standards)

The proposed Project involves developing a new impound yard over an approximately 10-week period. Typical construction equipment noise levels are shown in Table 2, Project Construction Equipment Noise Levels.

Table 2: Project Construction Equipment Noise Levels								
Equipment	**Noise Level at 50 feet (L_{max})(A)**	**Percent Usage Factor(B)**	**Predicted Equipment Noise Levels (L_{eq})(C)**					
			50 Feet	**75 Feet**	**100 Feet**	**150 Feet**	**200 Feet**	**250 Feet**
Bulldozer	85	40%	81	77	75	71	69	67
Backhoe	80	40%	76	72	70	66	64	62
Scraper	85	40%	81	77	75	71	69	67
Delivery Truck	85	40%	81	77	75	71	69	67

Sources: Caltrans, 2013 and FHWA, 2010.

(A) L_{max} noise levels based on manufacturer's specifications.

(B) Usage factor refers to the amount (percent) of time the equipment produces noise over the time period.

(C) Estimate does not account for any atmospheric or ground attenuation factors. Calculated noise levels based on Caltrans, 2013: L_{eq} (hourly) = L_{max} at 50 feet – 20log (D/50) + 10log (UF), where: L_{max} = reference L_{max} from manufacturer or other source; D = distance of interest; UF = usage fraction or fraction of time period of interest equipment is in use.

As shown in Table 2, the worst case hourly L_{eq} and L_{max} construction equipment noise levels are predicted to be approximately 82 and 85 dBA, respectively, at 50 feet; however, the magnitude of the Project's temporary and periodic increase in ambient noise levels would depend on the nature of the construction activity (i.e., grading, aggregate delivery, etc. and the distance between the construction activity and sensitive receptors such as the mobile home park adjacent to the proposed Project site. Although construction activities associated with the proposed Project could increase noise levels in the Project vicinity, the proposed Project would not generate a substantial temporary increase in ambient noise levels because:

1. Construction equipment contains standard noise suppression devices such as mufflers, engine shields/covers, and engine/mechanical isolators/mounts that typically reduce engine, mechanical, and exhaust noise levels below standard reference noise levels, which are based on older equipment operations.
2. The worst-case noise levels, which are predicted to occur during grading and aggregate deliveries, would last approximately two-to-four weeks in total. In addition, construction equipment would move throughout the site during construction, and would not generate the same noise level, day after day, at sensitive receptor locations (i.e., when equipment operates in the center and western sides of the site it would be more than 50 feet from adjacent residences) .
3. The proposed Project would comply with County Code Section 83.01.080 (g), which limits construction activities to the hours of 7 AM to 7 PM, Monday through Saturday. This code requirement limits construction activities to daytime hours only, when people are generally considered to be least sensitive to environmental noise levels.

For the reasons outlined above, the proposed Project's construction activities would not generate a substantial, temporary increase in ambient noise levels at sensitive receptor locations. This impact would be less than significant.

Project Operations Noise (Long-term Increases in Ambient Noise Levels Above Standards)

Once constructed, the proposed Project would generate noise from tow truck activities at the impound yard, including loading and unloading of vehicles, tractors, and RVs. The Project's potential noise effects are primarily a function of tow truck noise levels and the distance between the tow truck and noise receivers. At their closest - the standard vehicle spaces along

the impound yard's eastern and northeastern perimeter - tow truck operations would occur approximately 30 feet from the property line shared with the adjacent mobile home park and at least 35 feet from the exterior façade of any home within the mobile home park; however, most tow truck activities would occur 90 feet or more from noise sensitive property lines and residential buildings. The distances between the proposed Project's potential impound yard activity, shared property lines, and nearby noise-sensitive receivers are summarized in Table 3: Distance to Noise Receivers Near Project Site.

Table 3: Distance to Noise Receivers Near Project Site

Noise Receiver	Closest Distance to Potential Impound Yard Activity
East and North Property Line	30 Feet
West Property Line	85 Feet
South Property Line	50 Feet
Multi-family Residential (Mobile Home Park)	35 Feet
Rural Residence (72999 Paradise Lane)	90 Feet
Rural Residence (57020 Lakeview Road)	170 Feet
Rural Residence (57000 Lakeview Road	230 Feet

The proposed Project includes a six (6)-foot-tall CMU perimeter wall that would block the direct transmission of noise from the Project site to adjacent properties and residences. Based on the proposed site elevation and the distances between Project noise sources, the CMU wall, and adjacent residences, the CMU wall is estimated to reduce Project noise levels by approximately 5.0 to 6.2 dBA, with the wall being more effective for receptors closer to the barrier (e.g., the adjacent mobile home park).

The County does not maintain hourly noise standards for mobile sources of noise like tow trucks; rather the County maintains a 24-hour noise exposure standard for mobile sources. Ken's Towing Services anticipates a maximum of 10 service calls per day for the impound yard, meaning the proposed Project would generate noise only at certain times. Due to the size of the service territory (50 to 60 miles), impound yard activity would average one (1) vehicle loading/unloading event approximately every two (2) to three (3) hours, or approximately six (6) service calls during daytime hours (7 AM to 7 PM), two (2) service calls during evening hours (7 PM to 10 PM), and two (2) service calls during nighttime hours (10 PM to 7 AM). The proposed Project's potential hourly noise levels at shared property lines are summarized in Table 4: Estimated Project Noise Levels. Refer to Attachment 3 for detailed Project noise level and noise barrier attenuation estimates.

Table 4: Estimated Project Noise Levels

Noise Receiver	Project Noise Level		
	Hourly dBA L_{eq}	Exterior CNEL(A)	Interior CNEL(B)
East and North Property Line	60.6	61.9	--
West Property Line	52.8	54.1	--
South Property Line	56.2	57.5	--
Multi-family Residential (Mobile Home Park)	59.3	60.6	43.6
Rural Residence (72999 Paradise Lane)	52.3	53.6	<40.0
Rural Residence (57020 Lakeview Road)	46.8	48.1	<40.0
Rural Residence (57000 Lakeview Road)	44.2	45.5	<40.0
County Standard	--	65.0(C)	45.0

Source: MIG (see Attachment 3)

(A) CNEL estimate assumes all impound yard activities occur at closest point to receiver (see Table 3). CNEL estimate assumes six (6) service calls during the daytime, one (1) service call during the evening, and three (3) service calls during the nighttime.

(B) The typical type of construction of a prefabricated or mobile home structures consists of a wood or metal frame attached to exterior aluminum, steel, or wood siding and interior plywood, vinyl or particleboard wall panels. This design, including a small single glaze window, provide a minimum exterior to interior noise reduction of 10 dB with windows open and 17 dB with windows closed (FHWA 2023 and HUD 2009a, 2009b).

(C) County Code Section 83.02.080(d), Table 83-3, Note 3 states, "An exterior noise level of up to 65 dBA [CNEL] shall be allowed provided exterior noise levels have been mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dBA [CNEL] with windows and doors closed.

As shown in Table 4, the proposed Project could, under certain unlikely circumstances, generate noise levels of up to 61.9 CNEL along the northern and eastern property lines, and up to 60.6 CNEL at the exterior façade of mobile homes that border the site to the east. Specifically, for these noise levels to occur, the proposed impound yard would have to load/unload all 10 anticipated service calls adjacent to the northern and/or eastern property line, including two (2) service calls during the evening (7 PM to 10 PM) and two (2) service calls during the nighttime (10 PM to 7 AM).

County Code Section 83.01.080(d) establishes interior and exterior noise standards for mobile noise sources operating adjacent to residential uses of 45 CNEL and 60 CNEL, respectively. The County Code permits the 60 CNEL exterior standard to be adjusted upwards to 65 CNEL if exterior noise levels have been substantially mitigated and interior noise exposure does not exceed 45 CNEL. The proposed Project satisfies both these conditions because it includes a six (6)-foot-tall CMU perimeter wall that would substantially reduce noise levels at noise receivers (up to 6.2 dBA) and, as shown in Table 4, would not result in interior noise exposure levels above 45 CNEL with windows closed and the use of mechanical ventilation. A visual survey of the residences near the Project site indicated air conditioning units were present in all mobile home residences directly adjacent to the Project site.

As demonstrated above, the proposed Project would comply with the County's daily mobile source noise exposure standards; however, as shown in Table 1, the Project could generate maximum exterior noise levels of up to 89.9 dBA L_{max} at a distance of approximately 50 feet, which would attenuate to interior noise levels between approximately 55 dBA L_{max} to 71 dBA L_{max} at mobile homes and rural residences on the eastern side of the site. These maximum noise levels would not be excessive during the daytime, when humans are less sensitive to short-term increases in noise, but are of sufficient magnitude to potentially annoy residents,

interfere with the quiet use of a home, and/or interfere with sleep if they were to occur at night. To avoid the potential for the impound yard to interfere or disturb nighttime residential activities, Ken's Towing Services would incorporate the following noise control measures into the Project design:

> **Ken's Towing Services Impound Yard Nighttime Noise Control Measures:** Ken's Towing Services shall limit operations at the impound yard as follows:
>
> 1) Standard vehicles shall be placed into the standard vehicle stalls on the western and southern perimeter of the yard first. The standard vehicle stalls on the northern and eastern perimeter of the yard shall only be used when there is no space to safely place/remove a standard vehicle from the spaces on the western and southern sides of the yard.
> 2) Trucks, trailers, and other oversized vehicles shall be placed into the oversized vehicle stalls in the center and west of the site. The oversized vehicle stalls on the eastern side of the site shall only be used when there is no space to safely place/remove an oversized vehicle from the spaces in the center and west of the site.
> 3) Standard vehicles shall not be placed into or removed from a standard vehicle space on the northern and eastern sides of the yard between the hours of 10 PM and 7 AM.
> 4) All tow truck operators shall be informed of the site's noise control measures, and signs shall be posted along the northern and eastern perimeter of that clearly identify when vehicle spaces on the northern and eastern perimeter may be used.

The noise control measures identified above would limit tow truck activity in close proximity to adjacent residences to daytime hours only. With these restrictions, tow truck activity during the night would occur at least 120 feet from any shared property line, and at least 125 feet from any residential building façade. These restrictions would lower the proposed Project's daily noise exposure to levels below 60 CNEL and reduce potential nighttime L_{max} noise levels inside adjacent residences to 61 dBA L_{max} or less with windows closed.

For the reasons described above, the proposed Project would not generate operational noise levels that exceed the County's exterior noise standards for mobile sources (per County Code Section 83.01.080 (d)) or otherwise result in a substantial permanent increase in noise levels This impact would be less than significant.

Off-site Noise Level Increases

The proposed Project involves the relocation of existing impound yard services and is anticipated to result in up to 10 service calls per day, plus employee trips, that would be distributed onto the local roadway system, namely Silver Lane. Caltrans considers a doubling of total traffic volume to result in a three dBA increase in traffic-related noise levels (Caltrans, 2013). The proposed Project would not result in significant increase in traffic volumes on Silver Lane and would not result in a substantial permanent increase in traffic-related noise levels. This impact would be less than significant.

Ground-borne Vibration and Noise

Construction of the proposed Project would involve the use of heavy-duty off-road pieces of equipment, which, in addition to generating airborne noise, would also generate ground-borne vibration. Certain Project construction activities could take place close to residences that border the Project site to the east for a short period of time (several days); however, most construction activities would take place more than 100 feet or more from the nearest structure. In addition, the proposed Project would comply with County Code Section 83.01.080 (g), which limits construction activities to the hours of 7 AM to 7 PM, Monday through Saturday. This code

requirement limits construction activities to daytime hours only when people are generally considered to be least sensitive to groundborne vibration levels. Although construction activities could generate slightly perceptible vibrations when work occurs near residences, these vibrations would not be excessive because they would be intermittent (lasting only a few hours each day), temporary (lasting a few days at worst), occur during the daytime (i.e., would not interfere with evening or nighttime use of residences), and would not result in physical damage to any building or structure.

Once operational, the proposed Project would not involve the operation of any large or vibration generating equipment that would generate excessive vibration levels. The operation of a tow truck and the loading/unloading of vehicles does not generate substantial groundborne vibrations because this activity involves the controlled loading and unloading of a vehicle for a short period of time.

For the reasons outlined above, the proposed Project would not generate excessive ground-borne vibration or noise levels. This impact would be less than significant.

Airport-Related Noise

The proposed Project site is located 1.3 miles east of Baker Airport. According to the Countywide Plan, the Project site is not located within any noise impact or safety review zone associated with Baker Airport (County of San Bernardino 2020c). The proposed Project would not expose people residing or working in the Project area to excessive aircraft- or airport-related noise levels.

CONCLUSION

As described in this memo, the proposed Project would not generate a substantial temporary or permanent increase in noise levels that would exceed the County's standards, would not generate excessive ground-borne vibration or ground-borne noise levels, and would not expose people residing or working in the Project area to excessive aircraft noise levels. The proposed Project, therefore, would not result in a substantial, adverse noise-related effect on the environment.

PREPARERS AND REFERENCES

This Report was prepared by MIG under contract to Ken's Towing Services. This study reflects the independent, objective, professional opinion of MIG. The following individuals were involved in the preparation and review of this study:

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The following references were used to prepare this memorandum:

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Attachment 1

Environmental Noise Background

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NOISE BACKGROUND

Noise may be defined as loud, unpleasant, or unwanted sound. The frequency (pitch), amplitude (intensity or loudness), and duration of noise all contribute to the effect on a listener, or receptor, and whether the receptor perceives the noise as objectionable, disturbing, or annoying.

The Decibel Scale (dB)

The decibel scale (dB) is a unit of measurement that indicates the relative amplitude of a sound. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a tenfold increase in acoustic energy, while 20 dBs is 100 times more intense, 30 dBs is 1,000 more intense, and so on. In general, there is a relationship between the subjective noisiness, or loudness of a sound, and its amplitude, or intensity, with each 10 dB increase in sound level perceived as approximately a doubling of loudness. Due to the logarithmic basis, decibels cannot be directly added or subtracted together using common arithmetic operations:

$$50\ decibels + 50\ decibels\ \neq 100\ decibels$$

Instead, the combined sound level from two or more sources must be combined logarithmically. For example, if one noise source produces a sound power level of 50 dBA, two of the same sources would combine to produce 53 dB as shown below.

$$10 * \ 10\ log\left(10^{\left(\frac{50}{10}\right)} + \ 10^{\left(\frac{50}{10}\right)}\right) = 53\ decibels$$

In general, when one source is 10 dB higher than another source, the quieter source does not add to the sound levels produced by the louder source because the louder source contains ten times more sound energy than the quieter source.

Sound Characterization

There are several methods of characterizing sound. The most common method is the "A-weighted sound level," or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is typically most sensitive. Thus, most environmental measurements are reported in dBA, meaning decibels on the A-scale.

Human hearing matches the logarithmic A-weighted scale, so that a sound of 60 dBA is perceived as twice as loud as a sound of 50 dBA. In a quiet environment, an increase of 3 dB is usually perceptible, however, in a complex noise environment such as along a busy street, a noise increase of less than 3 dB is usually not perceptible, and an increase of 5 dB is usually perceptible. Normal human speech is in the range from 50 to 65 dBA. Generally, as environmental noise exceeds 50 dBA, it becomes intrusive and above 65 dBA noise becomes excessive. Nighttime activities, including sleep, are more sensitive to noise and are considered affected over a range of 40 to 55 dBA.

Sound levels are typically not steady and can vary over a short time period. The equivalent noise level (L_{eq}) is used to represent the average character of the sound over a period of time. The L_{eq} represents the level of steady noise that would have the same acoustical energy as the sum of the time-varying noise measured over a given time period. L_{eq} is useful for evaluating shorter time periods over the course of a day. The most common L_{eq} averaging period is hourly, but L_{eq} can describe any series of noise events over a given time period.

Variable noise levels are values that are exceeded for a portion of the measured time period. Thus, L_{01} is the level exceeded one percent of the time and L90 is the level exceeded 90 percent of the time. The L_{90} value usually corresponds to the background sound level at the measurement location.

Noise exposure over the course of an entire day is described by the day/night average sound level, or DNL (also referred to as L_{dn}), and the community noise equivalent level, or CNEL. Both descriptors represent the 24-hour noise impact on a community. For DNL, the 24-hour day is divided into a 15-hour daytime period (7 AM to 10 PM) and a nine-hour nighttime period (10 PM to 7 AM) and a 10 dB "penalty" is added to measure nighttime noise levels when calculating the 24-hour average noise level. For example, a 45-dBA nighttime sound level would contribute as much to the overall day-night average as a 55-dBA daytime sound level. The CNEL descriptor is similar to DNL, except that it includes an additional 5 dBA penalty beyond the 10 dBA for sound events that occur during the evening time period (7 PM to 10 PM). The artificial penalties imposed during DNL and CNEL calculations are intended to account for a receptor's increased sensitivity to sound levels during quieter nighttime periods.

Sound Propagation

The energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out and travels away from the noise generating source. Theoretically, the sound level of a point source attenuates, or decreases, by 6 dB with each doubling of distance from a point source. Sound levels are also affected by certain environmental factors, such as ground cover (asphalt vs. grass or trees), atmospheric absorption, and attenuation by barriers. Outdoor noise is also attenuated by the building envelope so that sound levels inside a residence are from 10 to 20 dB less than outside, depending mainly on whether windows are open for ventilation or not.

For an ideal "point" source of sound, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a spherical pattern and travels away from the point source. Theoretically, the sound level attenuates, or decreases, by 6 dB with each doubling of distance from the point source. The change in noise levels between two distances can be calculated according to Equation 1 (California Department of Transportation (Caltrans), 2013a) as follows:

Equation 1

$$dBA2 = dBA1 + 20\log (D1/D2)$$

Where:

dBA1 = Known noise level, such as a reference noise level
D1 = Distance associated with dBA1
dBA2 = Noise level at distance 2
D2 = Distance associated with dBA2

For an ideal line source of sound, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a cylindrical pattern from the source. Theoretically, the sound level attenuates, or decreases, by 3 dB with each doubling of distance from the line source. The change in noise levels between two distances can be calculated according to Equation 2 as follows:

Equation 2

$$dBA2 = dBA1 + 10\log (D1/D2)$$

Where:

dBA1 = Known noise level, such as a reference noise level
D1 = Distance associated with dBA1
dBA2 = Noise level at distance 2
D2 = Distance associated with dBA2

For noise sources that do not operate continuously (e.g., vehicles and trucks that travel on-site, park, and then cease to generate noise),the average, hourly noise level associated with variable (i.e., non-steady) noise source can be calculated using Equation 3 as follows:

Equation 3

$$Hourly\ L_{eq} = 10 * Log\ (P_h) * 10^{(Lp/10)}$$

Where:

P_h = Percentage or fraction of hour the noise is generated

L_p = The noise level generated during the partial hour (P_h)

Finally, the total combined sound pressure level from multiple, identical sources of noise at a receiver location can be calculated using Equation 4 as follows:

Equation 4

$$SPL_{Total} = SPL_1 + 10 * Log\ (N)$$

Where:

SPL_1 = Sound pressure level of one source

N = Number of identical sources to be added

Noise Effects on Humans

Noise effects on human beings are generally categorized as:

- Subjective effects of annoyance, nuisance, and/or dissatisfaction
- Interference with activities such as speech, sleep, learning, or relaxing
- Physiological effects such as startling and hearing loss

Most environmental noise levels produce subjective or interference effects; physiological effects are usually limited to high noise environments such as industrial manufacturing facilities or airports.

Predicting the subjective and interference effects of noise is difficult due to the wide variation in individual thresholds of annoyance and past experiences with noise; however, an accepted method to determine a person's subjective reaction to a new noise source is to compare it the existing environment without the noise source, or the "ambient" noise environment. In general, the more a new noise source exceeds the ambient noise level, the more likely it is to be considered annoying and to disturb normal activities.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness that would almost certainly cause an adverse response from community noise receptors.

When exposed to high noise levels, humans may suffer hearing damage. Sustained exposure to high noise levels (e.g., 90 dBs for hours at a time) can cause gradual hearing loss, which is usually temporary, whereas sudden exposure to a very high noise level (e.g., 130 to 140 dBs) can cause sudden and permanent hearing loss. In addition to hearing loss, noise can cause stress in humans and may contribute to stress-related diseases, such as hypertension, anxiety, and heart disease (Caltrans, 2013).

Vibration

Vibration is the movement of particles within a medium or object such as the ground or a building. As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared, in inches per second (in/sec). PPV represents the maximum instantaneous positive or negative peak of a vibration signal and is most appropriate for evaluating the potential for building damage. Human response to groundborne vibration is subjective and varies from person to person.

Attachment 2

Ambient Noise Monitoring Data

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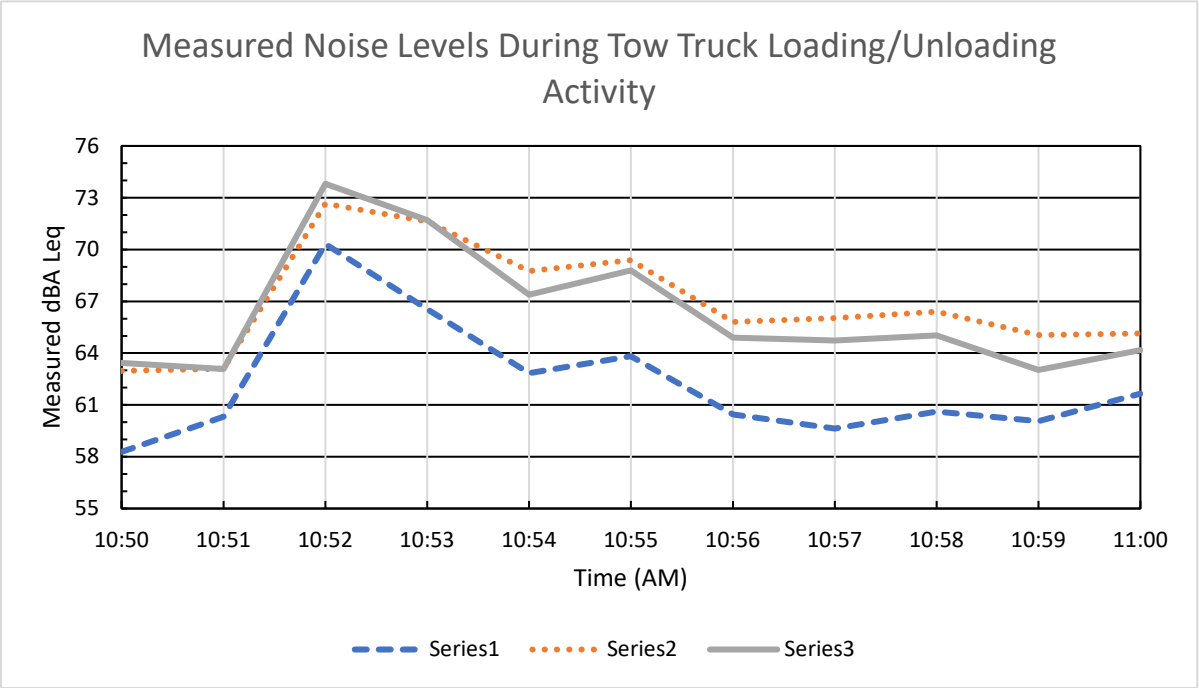
Ken's Towing Services - Impound Yard Project
Baker, CA
Attachment 2: Ambient Noise Monitoring Data
Prepared by MIG, Inc. February 2023

Table 1: Measured Ambient Noise Levels During Tow Truck Vehicle Loading/Unloading												
Time	**Noise Metric / Meter**											
	Leq			**Lmin**			**Lmax**			**L10**		
	ST-1	**ST-2**	**ST-3**	**ST-1**	**ST-2**	**ST-3**	**ST-1**	**ST-2**	**ST-3**	**ST-1**	**ST-2**	**ST-3**
10:50	58.3	63.0	63.4	56.7	62.2	61.6	63.7	68.1	70.0	58.9	63.3	64.6
10:51	60.3	63.1	63.1	56.9	58.6	60.1	65.0	66.1	70.4	62.3	64.2	64.1
10:52	70.3	72.7	73.8	58.4	61.2	59.1	83.2	86.5	89.9	74.5	76.5	77.3
10:53	66.5	71.6	71.7	58.4	61.7	61.2	84.0	87.6	87.0	67.6	69.9	69.5
10:54	62.8	68.8	67.4	55.8	63.5	61.3	78.9	83.6	82.8	64.4	70.3	68.8
10:55	63.8	69.4	68.8	55.5	62.9	61.3	79.5	84.9	85.4	65.6	70.9	69.7
10:56	60.4	65.8	64.9	55.1	63.0	61.5	72.4	76.1	75.7	63.6	67.7	67.3
10:57	59.6	66.0	64.7	55.9	63.3	61.8	63.4	69.2	67.6	62.2	67.9	66.5
10:58	60.6	66.4	65.0	56.0	63.2	61.4	74.5	81.4	80.0	61.7	67.0	65.9
10:59	60.1	65.1	63.0	56.5	62.5	60.9	72.7	76.3	73.8	61.9	66.5	64.3
11:00	61.6	65.1	64.2	56.7	61.0	59.8	70.9	75.7	73.5	64.6	67.0	66.8
Period	**63.9**	**68.1**	**68.0**	**55.1**	**58.6**	**59.1**	**84.0**	**87.6**	**89.9**	**66.8**	**70.0**	**69.8**
Time	**L50**			**L90**								
	ST-1	**ST-2**	**ST-3**	**ST-1**	**ST-2**	**ST-3**						
10:50	58.1	62.9	63.0	57.5	62.6	62.3						
10:51	60.0	63.0	62.8	57.6	62.4	62.2						
10:52	61.1	65.5	64.1	60.2	63.8	63.4						
10:53	61.6	67.2	66.0	60.3	64.7	63.8						
10:54	59.7	66.9	65.3	56.8	64.1	62.0						
10:55	57.8	64.5	62.7	56.3	63.8	61.9						
10:56	56.9	64.1	62.7	55.9	63.5	62.0						
10:57	59.1	65.4	64.5	56.6	63.8	62.3						
10:58	58.3	64.7	62.7	57.0	63.8	61.9						
10:59	57.8	64.0	62.0	57.1	63.4	61.5						
11:00	59.2	64.0	62.7	57.7	63.1	61.8						
Period	**59.3**	**65.0**	**63.7**	**57.8**	**63.6**	**62.3**						

Ken's Towing Services - Impound Yard Project
Baker, CA
Attachment 2: Ambient Noise Monitoring Data
Prepared by MIG, Inc. February 2023



Ken's Towing Services - Impound Yard Project
Baker, CA
Attachment 2: Ambient Noise Monitoring Data
Prepared by MIG, Inc. February 2023

Table 2: Measured Noise Levels Without Tow Truck							
Time	**Leq**	**Lmin**	**Lmax**	**L10**	**L50**	**L90**	
11:15	60.62	47.61	73.92	63.4	53.2	50.2	
11:16	55.92	49.17	64.66	60	53.6	50.5	
11:17	58.12	50.9	71.22	62.1	54.9	52.2	
11:18	56.46	51.41	72.63	57	54.9	53.2	
11:19	56.1	51.28	66.71	57.8	54.6	52.7	
11:20	55.29	47.29	68.57	58.5	52	49.1	
11:21	57.04	49.42	68.95	57.7	54.2	51.8	
11:22	51.12	46.63	54.3	52.4	51.2	48.6	
11:23	52.96	48.8	59.57	54.8	52.6	50	
11:24	60.1	50.1	74.06	63	54.1	51.3	
11:25	57.73	50.44	69.53	60.3	53.9	51.9	
11:26	57.48	47.6	68.88	60.4	53.6	50	
11:27	53.16	47.64	57.63	55.7	52.3	49.9	
11:28	57.02	48.91	65.67	59.7	55.1	52.1	
11:29	54.41	50.9	57.89	56.1	54.1	52.1	
11:30	53.3	47.9	57.76	55.3	53.1	50.2	
11:31	55.66	47.95	63.34	59.2	53.6	49.5	
11:32	58.26	49.37	72.35	58.7	53.3	51.4	
11:33	51.54	47.62	57.69	53.2	51	49.2	
11:34	58.4	48.76	69.4	61.7	54.5	50.8	
Period	**56.8**	**46.6**	**74.1**	**59.3**	**53.6**	**51.0**	

Summary

File Name on Meter	Kens1.001.s
File Name on PC	LxT_0005065-20230129 105000-
Serial Number	0005065
Model	SoundTrack LxT®
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	Ken's Towing, Baker, CA
Start	2023-01-29 10:50:00
Stop	2023-01-29 11:27:13
Duration	00:37:13.6
Run Time	00:37:13.6
Pause	00:00:00.0
Pre-Calibration	2023-01-11 16:35:41
Post-Calibration	2023-01-29 11:27:37
Calibration Deviation	0.00 dB

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Fast
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	122.5 dB

	A	**C**	**Z**
Under Range Peak	**79.0**	76.0	81.0 dB
Under Range Limit	**24.2**	25.3	31.4 dB
Noise Floor	15.1	16.1	22.2 dB

Results

LA_{Feq}	62.3		
LAFE	95.8		
EAF	424.224	µPa²h	
EAF8	5.470	mPa²h	
EAF40	27.350	mPa²h	
$LA_{Fpeak\ (max)}$	2023-01-29 11:27:06	109.9	dB
LAF_{max}	2023-01-29 11:27:06	89.4	dB
LAF_{min}	2023-01-29 11:13:08	45.9	dB
SEA	-99.9	dB	

LAF > 60.0 dB (Exceedance Counts / Duration)	93	598.4	s
LAF > 75.0 dB (Exceedance Counts / Duration)	39	31.2	s
L_{AFpeak} > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
L_{AFpeak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
L_{AFpeak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	62.3	62.3	-99.9	62.3	62.3	-99.9	-99.9	dB

L_{CFeq}	68.0	dB
L_{AFeq}	62.3	dB
L_{CFeq} - L_{AFeq}	5.7	dB
L_{AIeq}	68.3	dB
L_{Aeq}	62.3	dB
L_{AIeq} - L_{Aeq}	6.0	dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	62.3					
$L_{F(max)}$	89.4	2023/01/29 11:27:06				
$L_{F(min)}$	45.9	2023/01/29 11:13:08				
$L_{Peak(max)}$	109.9	2023/01/29 11:27:06				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	-99.94	0.00	%
Projected Dose	-99.94	0.06	%
TWA (Projected)	-99.9	36.7	dB
TWA (t)	-99.9	18.3	dB
Lep (t)	51.2	51.2	dB

Statistics

LAF1.70	72.7	dB
LAF8.30	63.5	dB
LAF10.00	62.6	dB
LAF16.70	60.7	dB
LAF50.00	55.8	dB
LAF90.00	50.3	dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	2020-01-28 06:05:01	-28.49
PRMLxT1L	2023-01-29 11:27:35	-28.73
PRMLxT1L	2023-01-11 16:35:41	-28.74
PRMLxT1L	2022-12-20 13:28:26	-28.71
PRMLxT1L	2022-12-19 09:35:16	-28.61
PRMLxT1L	2022-12-06 16:09:44	-28.74
PRMLxT1L	2022-12-06 13:26:24	-28.68
PRMLxT1L	2022-11-30 17:39:34	-28.82
PRMLxT1L	2022-11-30 17:33:52	-28.80
PRMLxT1L	2022-11-30 14:43:32	-28.57
PRMLxT1L	2022-11-30 14:08:09	-28.58
PRMLxT1L	2022-11-30 08:38:56	-28.60
Unknown	2023-01-29 10:41:50	-28.69
Unknown	2022-11-22 12:05:40	-28.57
Unknown	2022-11-21 11:46:47	-28.65
Unknown	2022-11-21 11:45:41	-28.63
Unknown	2022-11-21 11:44:13	-28.62
Unknown	2022-03-29 14:00:31	-28.57
Unknown	2022-03-29 09:47:56	-28.50
Unknown	2018-11-13 08:29:15	-28.30
Unknown	2018-11-05 14:21:01	-28.27
Unknown	2018-06-27 10:46:33	-28.02
Unknown	2018-06-27 10:46:16	-28.03

Note: Detailed calibration records available upon request.

Summary

File Name on Meter	Kens2.001.s
File Name on PC	LxT_0005064-20230129 105000-
Serial Number	0005064
Model	SoundTrack LxT®
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	Ken's Towing, Baker, CA
Start	2023-01-29 10:50:00
Stop	2023-01-29 11:37:06
Duration	00:47:06.0
Run Time	00:47:06.0
Pause	00:00:00.0
Pre-Calibration	2023-01-29 10:31:11
Post-Calibration	2023-01-29 11:37:57
Calibration Deviation	0.00 dB

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Fast
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	122.8 dB

	A	C	Z	
Under Range Peak	**79.4**	76.4	81.4	dB
Under Range Limit	**24.3**	25.5	31.7	dB
Noise Floor	15.2	16.3	22.5	dB

Results

LA_{Feq}	64.9		
LAFE	99.4		
EAF	968.596	µPa²h	
EAF8	9.871	mPa²h	
EAF40	49.355	mPa²h	
$LA_{Fpeak\ (max)}$	2023-01-29 10:54:51	101.1	dB
LA_{Fmax}	2023-01-29 10:53:10	87.6	dB
LA_{Fmin}	2023-01-29 11:37:00	45.2	dB
SEA	-99.9	dB	

LAF > 60.0 dB (Exceedance Counts / Duration)	56	1091.4 s
LAF > 75.0 dB (Exceedance Counts / Duration)	35	59.2 s
LAFpeak > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAFpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAFpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	64.9	64.9	-99.9	64.9	64.9	-99.9	-99.9	dB

LCFeq	69.6	dB
LAFeq	64.9	dB
LCFeq - LAFeq	4.7	dB
LAIeq	68.7	dB
LAeq	64.9	dB
LAIeq - LAeq	3.8	dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	64.9					
LF(max)	87.6	2023/01/29 10:53:10				
LF(min)	45.2	2023/01/29 11:37:00				
LPeak(max)	101.1	2023/01/29 10:54:51				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	-99.94	0.02	%
Projected Dose	-99.94	0.19	%
TWA (Projected)	-99.9	44.9	dB
TWA (t)	-99.9	28.2	dB
Lep (t)	54.8	54.8	dB

Statistics

LAF1.70	74.6	dB
LAF8.30	66.9	dB
LAF10.00	66.4	dB
LAF16.70	64.4	dB
LAF50.00	55.4	dB
LAF90.00	50.8	dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
Direct	2020-01-28 05:43:54	-28.63
PRMLxT1L	2023-01-29 11:37:55	-29.08
PRMLxT1L	2023-01-29 10:31:11	-29.13
PRMLxT1L	2022-12-20 13:48:24	-29.13
PRMLxT1L	2022-12-19 12:53:16	-29.01
PRMLxT1L	2022-12-19 12:24:24	-29.09
PRMLxT1L	2022-12-19 09:34:47	-29.04
PRMLxT1L	2022-12-07 13:58:43	-29.06
PRMLxT1L	2022-12-06 13:33:32	-28.94
PRMLxT1L	2022-11-30 17:48:57	-29.15
PRMLxT1L	2022-11-29 16:56:46	-29.12
PRMLxT1L	2022-11-16 14:43:13	-29.12

Note: Detailed calibration records available upon request.

Summary

File Name on Meter	Kens3.001.s
File Name on PC	LxTse_0003790-20230129 105000-
Serial Number	0003790
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	Ken's Towing, Baker, CA
Start	2023-01-29 10:50:00
Stop	2023-01-29 11:23:17
Duration	00:33:17.7
Run Time	00:33:17.7
Pause	00:00:00.0
Pre-Calibration	2023-01-29 10:33:47
Post-Calibration	2023-01-29 11:23:45
Calibration Deviation	0.00 dB

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Fast
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	122.9 dB

	A	**C**	**Z**	
Under Range Peak	**79.5**	76.5	81.5	dB
Under Range Limit	**24.4**	25.6	31.8	dB
Noise Floor	15.2	16.4	22.7	dB

Results

L_{AFeq}		67.1		
LAFE		100.1		
EAF		1.136	mPa^2h	
$L_{AFpeak\ (max)}$	2023-01-29	11:23:14	109.9	dB
L_{AFmax}	2023-01-29	11:23:15	92.7	dB
L_{AFmin}	2023-01-29	11:13:08	47.5	dB
SEA		-99.9	dB	

LAF > 60.0 dB (Exceedance Counts / Duration)	36	989.0	s
LAF > 75.0 dB (Exceedance Counts / Duration)	32	52.7	s
L_{AFpeak} > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
L_{AFpeak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
L_{AFpeak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	67.1	67.1	-99.9	67.1	67.1	-99.9	-99.9	dB

L_{CFeq}	70.7	dB
L_{AFeq}	67.1	dB
L_{CFeq} - L_{AFeq}	3.6	dB
L_{AIeq}	71.8	dB
L_{Aeq}	67.1	dB
L_{AIeq} - L_{Aeq}	4.7	dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	67.1					
$L_{F(max)}$	92.7	2023/01/29 11:23:15				
$L_{F(min)}$	47.5	2023/01/29 11:13:08				
$L_{Peak(max)}$	109.9	2023/01/29 11:23:14				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LAF1.70	77.0 dB
LAF8.30	66.3 dB
LAF10.00	65.9 dB
LAF16.70	64.1 dB
LAF50.00	58.4 dB
LAF90.00	51.3 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
Direct	2020-01-28 06:13:43	-26.38
Direct	2020-01-27 13:00:51	-29.00
PRMLxT1L	2023-01-29 11:23:42	-29.22
PRMLxT1L	2023-01-29 10:33:47	-29.40
PRMLxT1L	2022-12-19 13:48:25	-29.33
PRMLxT1L	2022-12-19 10:39:24	-29.18
PRMLxT1L	2022-11-30 17:39:44	-29.31
PRMLxT1L	2022-11-30 14:42:45	-29.18
PRMLxT1L	2022-11-30 14:38:59	-29.17
PRMLxT1L	2022-11-30 14:10:30	-29.17
PRMLxT1L	2022-11-30 08:34:32	-29.09
PRMLxT1L	2022-11-21 13:43:04	-29.08
PRMLxT1L	2022-11-21 11:58:39	-29.11
Unknown	2019-12-01 17:09:04	-28.99

Note: Detailed calibration records available upon request.

Attachment 3

Reference and Project Noise Level Data

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Ken's Towing Services - Impound Yard Project
Baker, CA
Attachment 3: Operational Noise Level Estimates
Prepared by MIG, Inc. February 2023

Sheet 1: dBA Reference Noise Level Information

Table 1: Tow Truck Noise Level - Adjusted for Distance (S1 Back of Truck)				
Activity	Measured Noise Level		Noise Level at 50 Feet	
	Distance	dBA Leq	Distance	dBA Leq
Approach/Departure and Idling	65	61.6	50	63.9
Unloading Vehicle Peak	65	70.3	50	72.6
Unloading Vehicle Typical	65	66.5	50	68.8
Loading Vehicle	65	63.8	50	66.1

Table 2: Tow Truck Noise Level - Adjusted for Distance (S2 Side of Truck)				
Activity	Measured Noise Level		Noise Level at 50 Feet	
	Distance	dBA Leq	Distance	dBA Leq
Approach/Departure and Idling	50	63.1	50	63.1
Unloading Vehicle Peak	50	72.7	50	72.7
Unloading Vehicle Typical	50	71.6	50	71.6
Loading Vehicle	50	69.4	50	69.4

Table 3: Tow Truck Noise Level - Adjusted for Distance (S3 Side of Truck)				
Activity	Measured Noise Level		Noise Level at 50 Feet	
	Distance	dBA Leq	Distance	dBA Leq
Approach/Departure and Idling	55	63.1	50	63.9
Unloading Vehicle Peak	55	72.7	50	73.5
Unloading Vehicle Typical	55	71.6	50	72.4
Loading Vehicle	55	68.8	50	69.6

Table 4: Reference Noise Level Information (at 30 Feet)

Noise Source	Reference dBA @ 50 Feet	Duration (Seconds)	Estimated Hourly dBA Leq @ 50 Feet
Impound Tow Truck Activity (Back of Truck)			
Approach/Departure and Idling	*63.9*	*300*	*53.1*
Unloading Vehicle Peak	*72.6*	*60*	*54.8*
Unloading Vehicle Typical	*68.8*	*240*	*57.0*
Total Combined Noise Level			*60.0*
Impound Tow Truck Activity (Side of Truck)			
Approach/Departure and Idling	*63.9*	*300*	*53.1*
Unloading Vehicle Peak	*73.5*	*60*	*55.7*
Unloading Vehicle Typical	*72.4*	*240*	*60.7*
Total Combined Noise Level			*62.4*

Ken's Towing Services - Impound Yard Project
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Sheet 2: Leq and CNEL Noise Level Estimates

Table 1: Estimated Project Noise Level (dBA Leq)						
Receiver	**Reference Noise Data**		**Project Noise Level (without Barrier)**		**Project Noise Level (with Barrier)**	
	Distance	**dBA Leq**	**Distance**	**dBA Leq**	**Distance**	**dBA Leq**
East Property Line	50	62.4	30	66.9	30	60.6
East Mobile Home Park	50	62.4	35	65.5	35	59.3
East Residence	50	62.4	90	57.3	90	52.3
Northeast Residence	50	62.4	170	51.8	170	46.8
North Property Line	50	62.4	30	66.9	30	60.6
North Residences	50	62.4	230	49.2	230	44.2
West Property Line	50	62.4	85	57.8	85	52.8
South Property Line	50	62.4	50	62.4	50	56.2

Ken's Towing Services - Impound Yard Project
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Attachment 3: Operational Noise Level Estimates
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Sheet 2: Leq and CNEL Noise Level Estimates

Table 2: Estimated Project Noise Level (CNEL, with Barrier, No Nightime Restriction)							
Time	**North and East Property Line**	**East Mobile Home Park**	**East Residence**	**Northeast Residence**	**North Residence**	**West Property Line**	**South Property Line**
7:00 AM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
8:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 AM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
10:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 AM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
12:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1:00 PM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
2:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 PM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
4:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 PM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
6:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7:00 PM	65.6	64.3	57.3	51.8	49.2	57.8	61.2
8:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 PM	65.6	64.3	57.3	51.8	49.2	57.8	61.2
10:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1:00 AM	70.6	69.3	62.3	56.8	54.2	62.8	66.2
2:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 AM	70.6	69.3	62.3	56.8	54.2	62.8	66.2
6:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Hour CNEL	**61.9**	**60.6**	**53.6**	**48.1**	**45.5**	**54.1**	**57.5**

Ken's Towing Services - Impound Yard Project
Baker, CA
Attachment 3: Operational Noise Level Estimates
Prepared by MIG, Inc. February 2023

Sheet 2: Leq and CNEL Noise Level Estimates

Table 3: Estimated Project Noise Level (CNEL, with Barrier, Nightime Activity Restricted)							
Time	**North and East Property Line**	**East Mobile Home Park**	**East Residence**	**Northeast Residence**	**North Residence**	**West Property Line**	**South Property Line**
7:00 AM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
8:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 AM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
10:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 AM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
12:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1:00 PM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
2:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 PM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
4:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 PM	60.6	59.3	52.3	46.8	44.2	52.8	56.2
6:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7:00 PM	65.6	64.3	57.3	51.8	49.2	57.8	61.2
8:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 PM	65.6	64.3	57.3	51.8	49.2	57.8	61.2
10:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1:00 AM	66.2	66.2	62.3	56.8	54.2	62.8	66.2
2:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 AM	66.2	66.2	62.3	56.8	54.2	62.8	66.2
5:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Hour CNEL	**59.8**	**59.0**	**53.6**	**48.1**	**45.5**	**54.1**	**57.5**

Ken's Towing Services - Impound Yard Project
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Attachment 3: Operational Noise Level Estimates
Prepared by MIG, Inc. February 2023

Sheet 3: Lmax Noise Level Estimates

Table 1: Estimated Project Noise Level Without Nighttime Restrictions(dBA Lmax)						
Receiver	**Reference Exterior Noise Data**		**Project Interior Noise Level (Windows Open)**		**Project Exterior Noise Level (Windows Closed)**	
	Distance	**dBA Lmax**	**Distance**	**dBA Lmax**	**Distance**	**dBA Lmax**
East Mobile Home Park	55	89.9	35	77.6	35	70.6
East Residence	55	89.9	90	70.6	90	63.6
Northeast Residence	55	89.9	170	65.1	170	58.1
North Residences	55	89.9	230	62.5	230	55.5
Table 2: Estimated Project Noise Level with Nighttime Restrictions (dBA Lmax)						
Receiver	**Reference Exterior Noise Data**		**Project Interior Noise Level (Windows Open)**		**Project Exterior Noise Level (Windows Closed)**	
	Distance	**dBA Lmax**	**Distance**	**dBA Lmax**	**Distance**	**dBA Lmax**
East Mobile Home Park	55	89.9	125	67.7	125	60.7
East Residence	55	89.9	200	63.7	200	56.7
Northeast Residence	55	89.9	230	62.5	230	55.5
North Residences	55	89.9	270	61.1	270	54.1

Ken's Towing Services - Impound Yard Project
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Attachment 3: Operational Noise Level Estimates
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Sheet 4: Noise Barrier Attenuation Estimates

Table 1: Source/ Property Line Receiver Information									
Noise Source:	Truck Dock Loading Area								
Source Noise Level:	PL=	63.4	63.4						
Receptor Noise Level:	PL=	60.0	60.0						
Noise Reduction Level:	PL=	3.4	3.4						
Source Frequency:	500	Hertz							
Source Grade:	903.5	Feet	Source Height:		909.5	Feet			
Receiver Grade:	PL=	903.5	Feet	PL=	903.5	Feet			
Receiver Elevation:	PL=	908.5	Feet	PL=	908.5	Feet			
Barrier Height:		6.0	Feet		6.0	Feet			

Note: "PL" = Property Line

Table 2: Barrier Insertion Loss Summary			
Receiver	**Preliminary Barrier Insertion Loss Estimate (dBA)**		
	Predicted Noise Level	**Barrier Attenuation**	**Noise Level with Barrier**
East Property Line	66.9	6.2	60.6
East Mobile Home Park	65.5	6.2	59.3
East Residence	57.3	5.0	52.3
Northeast Residence	51.8	5.0	46.8
North Property Line	66.9	6.2	60.6
North Residences	49.2	5.0	44.2
West Property Line	57.8	5.1	52.8
South Property Line	62.4	6.2	56.2

Table 3: Barrier Attenuation 6-Foot High Wall (East Property Line)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	5.10	35.01	35	30	5	1.0	1.0

Table 4: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (East Property Line)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.08	2.30	0.0737	6.2

Table 5: Barrier Attenuation 6-Foot High Wall (East Mobile Home Park)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	5.10	35.01	35	30	5	1.0	1.0

Table 6: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (East Mobile Home Park)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.08	2.30	0.0737	6.2

Table 7: Barrier Attenuation 6-Foot High Wall (East Residence)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	70.01	100.00	100	30	70	1.0	1.0

Table 8: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (East Residence)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.00	2.30	0.0019	5.0

Table 9: Barrier Attenuation 6-Foot High Wall (Northeast Residence)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	135.00	165.00	165	30	135	1.0	1.0

Table 10: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Northeast Residence)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.00	2.30	0.0006	5.0

Table 11: Barrier Attenuation 6-Foot High Wall (North Property Line)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	5.10	35.01	35	30	5	1.0	1.0

Table 12: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North Property Line)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.08	2.30	0.0737	6.2

Table 13: Barrier Attenuation 6-Foot High Wall (North Residences)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	135.00	165.00	165	30	135	1.0	1.0

Table 14: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North Residences)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.00	2.30	0.0006	5.0

Table 15: Barrier Attenuation 6-Foot High Wall (West Property Line)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	55.01	85.01	85	30	55	1.0	1.0

Table 16: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (West Property Line)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.00	2.30	0.0028	5.1

Table 17: Barrier Attenuation 6-Foot High Wall (South Property Line)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	30.00	5.10	35.01	35	30	5	1.0	1.0

Table 18: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (South Property Line)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.08	2.30	0.0737	6.2