Appendix 12.0

Noise Impact Analysis

Gun Shooting Range/Tactical Training Facility

NOISE IMPACT ANALYSIS

CITY OF WILDOMAR

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Gun Shooting Range/Tactical Training Facility
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Gun Shooting Range/Tactical Training Facility development ("Project"). The Project site is located on the southeast corner of Mission Trail and Bundy Canyon Road, in the City of Wildomar. It is our understanding that the Project is to consist of two land use alternatives, a gun shooting range and tactical training facility, or a mix of retail uses should the gun range not be developed. This study has been prepared to satisfy applicable City of Wildomar standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the Project will influence the traffic noise levels in surrounding off-site areas. Consistent with the *Gun Shooting Range/Tactical Training Facility Traffic Impact Analysis* prepared by Urban Crossroads, Inc., this analysis is based upon the more conservative Land Use Alternative 2 which includes the potential development of a 12-vehicle fueling position gas station and up to 15,000 sf of commercial retail use. (2)

To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on nine study-area roadway segments were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Gun Shooting Range/Tactical Training Facility Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing (2019), Opening Year 2020, and Horizon Year 2040 conditions. The analysis shows that the unmitigated Project-related traffic noise level increases under all with Project traffic scenarios are considered *less than significant* impacts at land uses adjacent to the study area roadway segments.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from both Land Use Alternative 1 and 2 for the Project site, this analysis conservatively estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The operational activities associated with the proposed Gun Shooting Range/Tactical Training Facility are anticipated to include indoor shooting range activities, gas station activity, parking lot vehicle movements, a trash enclosure, and roof-top air conditioning units, and operate between the Municipal Code's daytime hours of 7:00 a.m. to 10:00 p.m. The operational noise analysis shows that the unmitigated Project-related stationary-source noise levels at all receiver locations will not exceed the City of Wildomar base exterior noise level standards.

The operational noise analysis includes the barrier attenuation provided by the planned, minimum 6-foot high trash enclosure barriers and existing noise-barriers in the Project study area, where applicable.

Moreover, the results of the analysis indicate that the unmitigated Project operational noise levels will not contribute a long-term operational noise level impact to the existing ambient noise environment. Therefore, the operational noise level impacts associated with the proposed Project activities, under a conservative condition which analyzes the simultaneous operation of noise sources under both Land Use Alternatives 1 and 2, are considered *less than significant*.

OPERATIONAL NOISE ABATEMENT RECOMMENDATIONS

While not required, the following noise abatement measures are recommended to reduce potential noise levels at adjacent sensitive receiver locations:

- All exterior openings to the Project shooting range building(s) (e.g., doors, windows) should remain closed during normal business hours.
- Consistent with comment no.8 of the PAR No. 18-0202 Comment Letter for the Project, all roof-mounted equipment should be screened from public view. (3) Parapet walls or other screening materials should block the line-of-sight to adjacent receiver locations.

CONSTRUCTION NOISE ANALYSIS

Using sample reference noise levels to represent the planned construction activities of the Gun Shooting Range/Tactical Training Facility site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. Since the City of Wildomar General Plan and Municipal Code do not identify specific construction noise level thresholds, a threshold is identified based on the National Institute for Occupational Safety and Health (NIOSH) limits for construction noise. The Project-related short-term construction noise levels are expected to range from 38.6 to 73.5 dBA L_{eq} and will not exceed the 85 dBA L_{eq} threshold identified by the National Institute for Occupational Safety and Health (NIOSH) at all receiver locations. Therefore, based on the results of this analysis, all nearby sensitive receiver locations will experience *less than significant* impacts due to Project construction noise levels.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. At distances ranging from 50 to 951 feet from primary construction activities, construction vibration velocity levels are expected to approach 78.0 VdB. Based on the Federal Transit Administration vibration standard of 80 VdB, construction vibration impacts are considered *less than significant*.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter.

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Gun Shooting Range/Tactical Training Facility Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Gun Shooting Range/Tactical Training Facility ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The proposed Gun Shooting Range/Tactical Training Facility site is located on the southeast corner of Mission Trail and Bundy Canyon Road, in the City of Wildomar, as shown on Exhibit 1-A. Existing land uses in the Project study area include commercial and industrial uses to the north, vacant lots to the west and south, and existing residential homes north and east of the Project site.

1.2 PROJECT DESCRIPTION

1.2.1 LAND USE ALTERNATIVE 1

The Project is proposed to include the development of a gun shooting range building of approximately 34,702 square feet, which includes 42 lanes and would operate between 9:00 a.m. and 10:00 p.m., seven days per week. The site is proposed to also include a 4,000 square-foot space for tactical/situational training for law enforcement, which includes four dedicated classroom spaces to accommodate 25 to 50 people.

1.2.2 LAND USE ALTERNATIVE 2

Pursuant to discussions with City staff, a conservative mix of retail uses is also proposed to be evaluated in the event a gun range is not developed on the site. For the purposes of the *Traffic Impact Analysis*, the site could potentially be developed with a 12-vehicle fueling position gas station and up to 15,000 square feet of commercial retail use.

1.2.3 ANALYSIS APPROACH

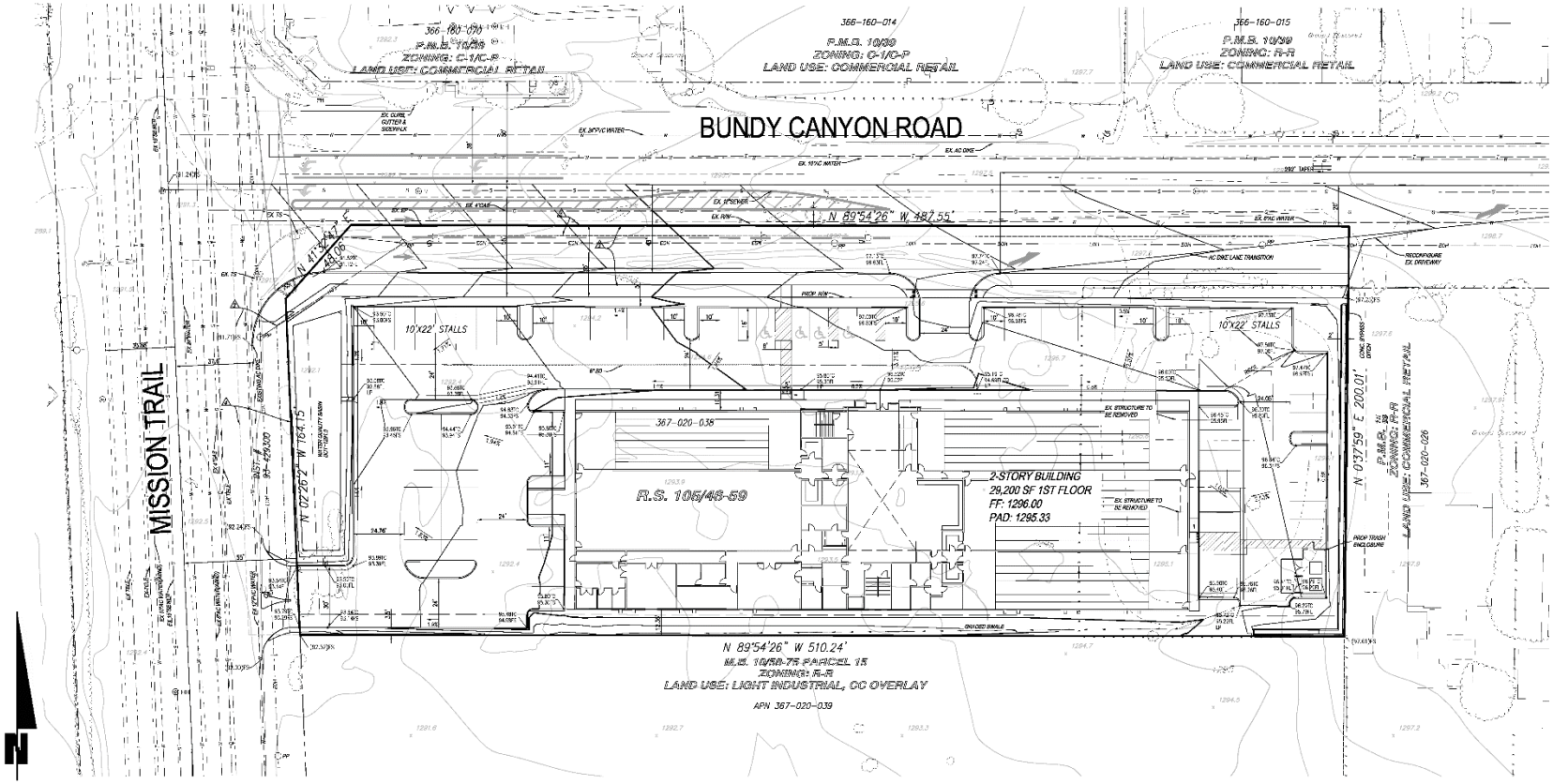
In an effort to conduct a conservative analysis, Land Use Alternative 2 has been evaluated for the purposes of the *Traffic Impact Analysis*, and as such, the off-site traffic noise analysis of this report has been prepared consistent with the approach of the *Traffic Impact Analysis*. For the purposes of this analysis, it is assumed that the Project will be constructed within a single phase of development and is anticipated to be fully built and occupied by Year 2020.

The operational (stationary) noise sources within the Project site area analyzed in this report based on a conservative condition which combines noise sources of both Land Use Alternatives 1 and 2. The on-site Project-related noise sources are expected to include: indoor shooting range

activities, gas station activity, parking lot vehicle movements, a trash enclosure, and roof-top air conditioning units.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (4) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (5) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Wildomar relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (4)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (6)

2.3.3 ATMOSPHERIC EFFECTS

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (4)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (6)

2.4 SHOOTING RANGE NOISE PREDICTION

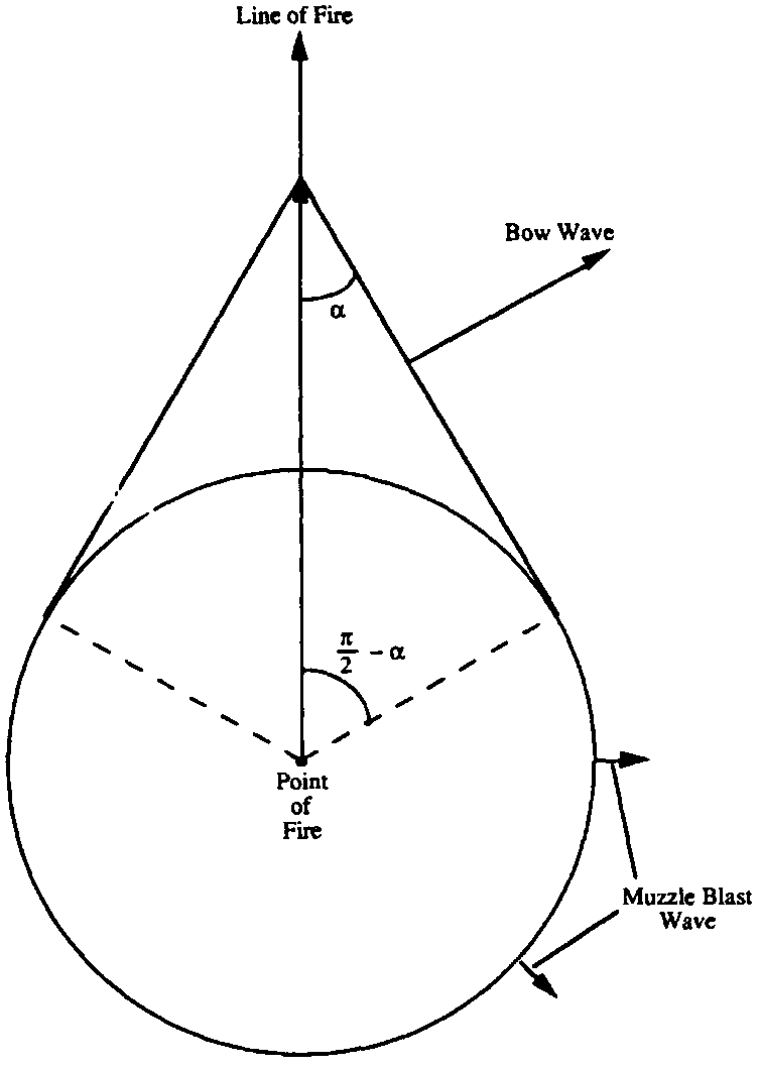
The noise generated by arms fire can produce sound levels greater than 140 dBA and is a combination of two noise sources: the muzzle blast and the sonic boom, or bow wave, noise generated by the flight of the bullet. The muzzle blast is caused by the explosion of the powder charge in the gun chamber and can be modeled as a point source located at the point of fire. Therefore, the noise from a muzzle blast propagates in a spherical pattern and decreases at a rate of 6 dB per doubling of distance. (7)

The bow wave is created by the bullet traveling faster than the speed of sound, and the amplitude of the bow wave depends on the geometry and caliber of the bullet. (7) The bow wave only propagates forward of the line-of-fire and within the angle defined by the bullet's speed. Since the bullet speed decreases as it travels further from the point of fire, the noise propagates in a conical pattern; with the largest portion of the noise located at the point of fire where the bullet leaves the muzzle and the vertex is the bullet moving forward along the line-of-fire. The bow wave noise levels decrease at a rate of 4.5 dB per doubling of distance in the near field, and

decays in a nonlinear fashion. At greater distances, such as the distance to nearby sensitive receptors, the bow wave decreases at a rate of 3 dB per doubling of distance and can be modeled linearly. (7) The muzzle blast and bow wave propagation patterns are graphically shown on Exhibit 2-B.

In addition to the two noise sources from each gunshot, the frequency of shots, type of weapons and ammunition, shooting range attributes (e.g., indoor or outdoor), and barrier locations must be taken into account to accurately describe the potential noise impacts from a shooting range. By assessing the specific noise parameters of a shooting range, including the loudest weapon type, the noise levels at nearby receiver locations can be evaluated under conservative conditions.

EXHIBIT 2-B: MUZZLE BLAST AND BOW WAVE PROPAGATION PATTERNS



Source: U.S. Army Corps of Engineers Construction Engineering Research Laboratories, Acoustic Analysis of Small Arms Fire, January 1994.

2.5 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to these three elements.

2.6 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (6)

2.7 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (8)

2.8 COMMUNITY RESPONSE TO NOISE

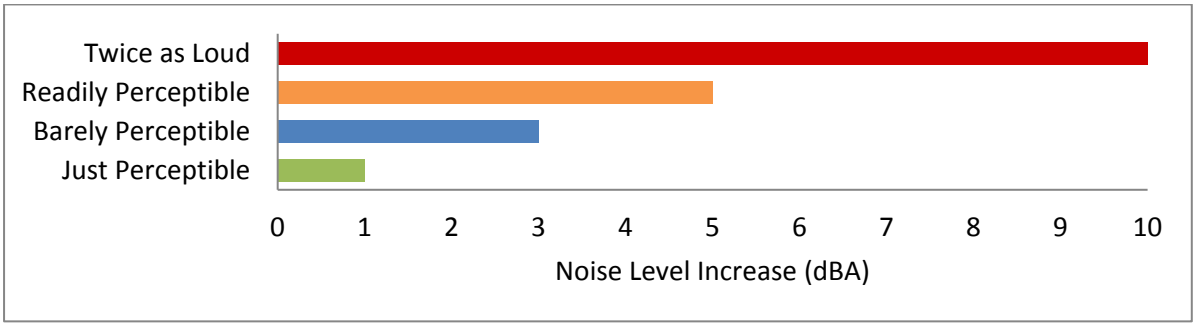
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (9) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When

traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (9) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-C. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (6)

EXHIBIT 2-C: NOISE LEVEL INCREASE PERCEPTION



2.9 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (10)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (11)

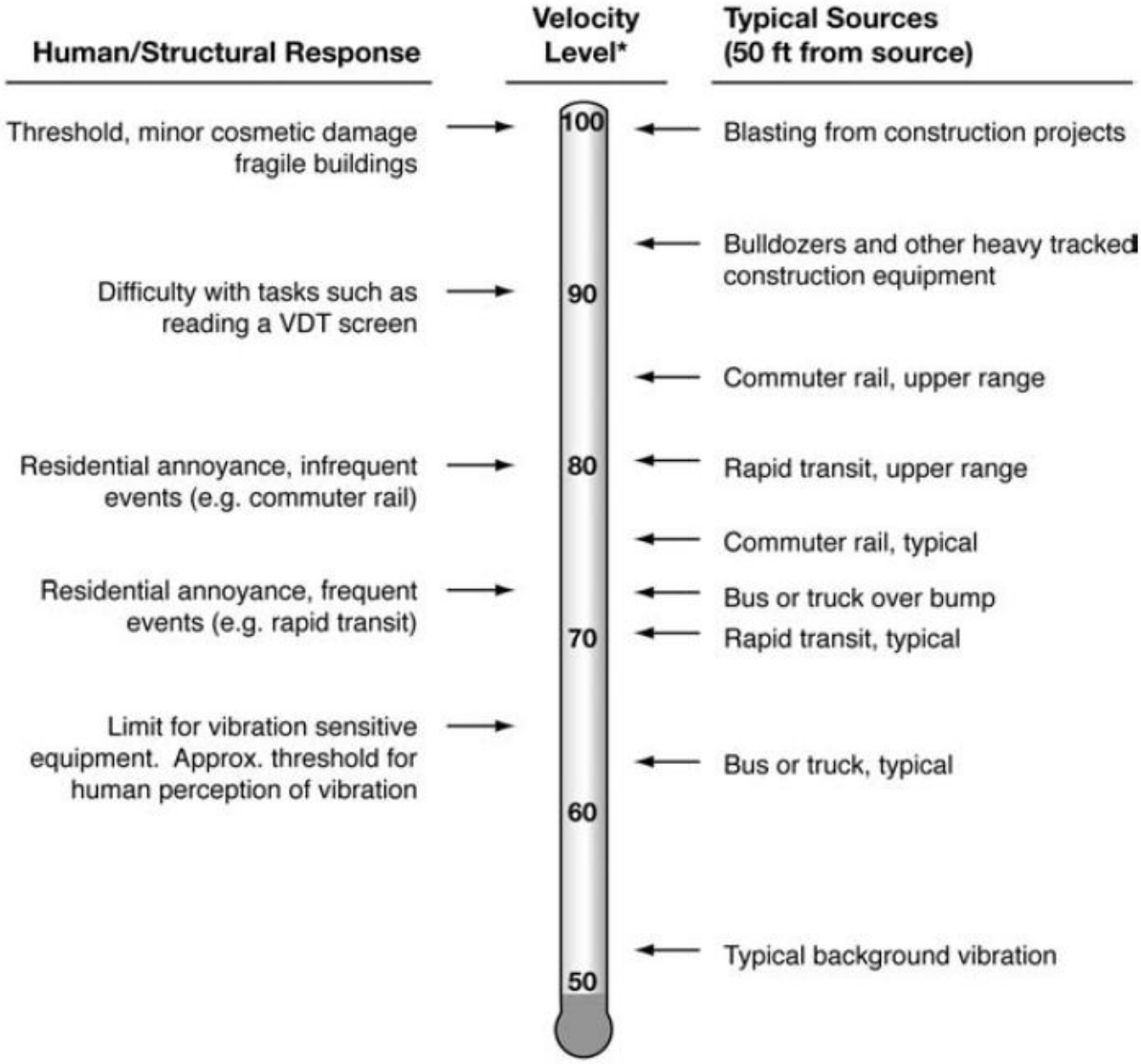
2.10 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (12), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings, but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal, and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-D illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-D: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (13) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 CITY OF WILDOMAR GENERAL PLAN NOISE ELEMENT

The City of Wildomar was incorporated as a City in October of 2008. Through the incorporation process, the City adopted the Riverside County General Plan Noise Element to control and abate environmental noise, and to protect the citizens of the City of Wildomar from excessive exposure to noise. (14) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. In addition, the Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community, and establishes noise level requirements for all land uses. To protect City of Wildomar residents from excessive noise, the Noise Element contains the following seven policies:

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.

N 1.3 Consider residential use as noise-sensitive and discourage this use in areas in excess of 65 CNEL.

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 1.7 Require proposed land uses, affected by unacceptable high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

N 12.1 Minimize the impacts of construction noise on adjacent uses within acceptable standards.

N 12.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse impacts on surrounding areas.

N 12.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N1.3) by requiring the developer to submit a construction-related noise mitigation plan to the City for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

i. Temporary noise attenuation fences;
ii. Preferential location and equipment; and
iii. Use of current noise suppression technology and equipment.

3.3 OPERATIONAL NOISE STANDARDS

The City of Wildomar Noise Ordinance included in the Municipal Code (Chapter 9.48) establishes the maximum permissible noise level that may intrude into a neighbor's property. The Noise Ordinance (Section 9.48.040) establishes the exterior noise level criteria for residential properties affected by stationary noise sources. For residential properties, the exterior noise level shall not exceed 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and shall not exceed 45 dBA during the nighttime hours (10:00 p.m. to 7:00 a.m.). (15)

However, it is important to recognize that the City of Wildomar Municipal Code noise level standards incorrectly identify maximum noise level (L_{max}) standards that should instead reflect the average (L_{eq}) noise levels. This inaccuracy was originally adopted in the Municipal Code by the County of Riverside and subsequently adopted by the City of Wildomar at the time of incorporation. Based on several discussions with the County of Riverside Office of Industrial Hygiene, the Municipal Code stationary source noise level standards should reflect the average L_{eq} noise levels. (16) Therefore, exterior noise levels for residential land uses located in the City of Wildomar near the Project site, may not exceed 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.), and may not exceed 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). For this analysis, since Project activities are anticipated to be limited to the daytime hours, the 55 dBA L_{eq} standard is used to evaluate potential impacts at nearby sensitive receiver locations. The City of Wildomar Municipal Code is included in Appendix 3.1.

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the City of Wildomar has established limits to the hours of operation. However, neither the City of Wildomar General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*.

To evaluate whether the Project will generate potentially significant construction noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the *Criteria for Recommended Standard: Occupational Noise Exposure* prepared by the National Institute for Occupational Safety and Health (NIOSH). (17) A division of the U.S. Department of

Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (17) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time, they are expressed as L_{eq} noise levels. Therefore, the noise level threshold of 85 dBA L_{eq} over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

The Occupational Safety and Health Administration (OSHA) requires hearing protection be provided by employers in workplaces where the noise levels may, over long periods of exposure to high noise levels, endanger the hearing of their employees. Standard 29 CFR, Part 1910 indicates the noise levels under which a hearing conservation program is required to be provided to workers exposed to high noise levels. (10) This analysis does not evaluate the noise exposure of workers within the Project site based on CEQA requirements, and instead, evaluates the Project-related construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (11)

3.5 VIBRATION STANDARDS

The City of Wildomar has not identified or adopted vibration standards. However, the United States Department of Transportation Federal Transit Administration (FTA) provides guidelines for maximum-acceptable vibration criteria for different types of land uses. (12) These guidelines allow 80 VdB for residential uses and buildings where people normally sleep.

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Occasionally large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. While not enforceable regulations within the City of Wildomar, the FTA guidelines of 80 VdB for sensitive land uses provide the basis for determining the relative significance of potential Project related vibration impacts.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of 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. Generation of excessive ground-borne vibration or ground-borne noise levels?

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, would the project expose people residing or working in the project area to excessive noise levels?

While the City of Wildomar General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is located approximately 2,500 feet southeast of the private airfield, Skylark Field Airport, and is not located within two miles of a public airport, and as such, would not be exposed to excessive aircraft noise levels. Therefore, impacts are considered *less than significant* and no further noise analysis is conducted in relation to Guideline C.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (18)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (19) developed guidance to be used for the assessment of project-generated increases

in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (18) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Federal Interagency Committee on Noise (FICON), 1992.

4.2 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).

OPERATIONAL NOISE

- If Project-related operational (stationary-source) noise levels exceed the exterior 55 dBA L_{eq} daytime noise level standard at nearby sensitive residential receiver locations (City of Wildomar Municipal Code, Section 9.48.040).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{eq} and the Project creates a community noise level impact of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE

- If Project-related construction activities create noise levels which exceed the 85 dBA L_{eq} acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure).

CONSTRUCTION VIBRATION

- If short-term Project-generated construction vibration levels exceed the 80 VdB vibration standard at sensitive receiver locations (Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria
Off-Site Traffic Noise	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase
Operational Noise	Noise-Sensitive	Exterior Noise Level Standard[2]	55 dBA L_{eq}
		if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase
		if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase
		if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase
Construction	Noise-Sensitive	Noise Level Threshold[3]	85 dBA L_{eq}
		Vibration Level Threshold[4]	80 VdB

[1] Source: FICON, 1992.
[2] Source: City of Wildomar Municipal Code (Appendix 3.1).
[3] Acceptable threshold for construction noise based on the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health.
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at six locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, May 1st, 2019. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (20)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (4) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (12)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (12) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels on Bundy Canyon Road, on the northern boundary line of the Project site, near a 76 Gas Station. The energy (logarithmic) average daytime noise level was calculated at 71.2 dBA L_{eq} with an average nighttime noise level of 65.8 dBA L_{eq}.
- Location L2 represents the noise levels on Bundy Canyon Road, northeast of the Project site, near P K Mechanical Systems and residential homes. The energy (logarithmic) average daytime noise level was calculated at 67.3 dBA L_{eq} with an average nighttime noise level of 63.6 dBA L_{eq}.
- Location L3 represents the noise levels on Clovis Way, southeast of the Project site, near an existing single-family residential neighborhood. The energy (logarithmic) average daytime noise level was calculated at 52.3 dBA L_{eq} with an average nighttime noise level of 44.8 dBA L_{eq}.
- Location L4 represents the noise levels on Canyon Drive, south of the Project site, near an existing single-family residential neighborhood and vacant land use area. The energy (logarithmic) average daytime noise level was calculated at 59.8 dBA L_{eq} with an average nighttime noise level of 53.3 dBA L_{eq}.
- Location L5 represents the noise levels on Mission Trail, southwest of the Project site, near a vacant land use area and Wildomar Library. The energy (logarithmic) average daytime noise level was calculated at 70.8 dBA L_{eq} with an average nighttime noise level of 65.6 dBA L_{eq}.
- Location L6 represents the noise levels on Beecher Street Trail, southwest of the Project site, near existing rural-residential homes. The energy (logarithmic) average daytime noise level was calculated at 53.9 dBA L_{eq} with an average nighttime noise level of 53.5 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with study area roadways in addition to background stationary noise sources such as existing commercial and industrial activities. The 24-hour existing noise level measurement results are shown on Table 5-1.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located on Bundy Canyon Road, on the northern boundary line of the Project site, near a 76 Gas Station.	71.2	65.8	73.8
L2	Located on Bundy Canyon Road, northeast of the Project site, near P K Mechanical Systems and residential homes.	67.3	63.6	71.1
L3	Located on Clovis Way, southeast of the Project site, near an existing single-family residential neighborhood.	52.3	44.8	53.8
L4	Located on Canyon Drive, south of the Project site, near an existing single-family residential neighborhood and vacant land use area.	59.8	53.3	61.6
L5	Located on Mission Trail, southwest of the Project site, near a vacant land use area and Wildomar Library.	70.8	65.6	73.7
L6	Located on Beecher Street Trail, southwest of the Project site, near existing rural-residential homes.	53.9	53.5	60.1

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (21) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (22) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (23)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the nine study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Wildomar General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study are presented on Table 6-2 and were obtained from the *Gun Shooting Range/Tactical Training Facility Traffic Impact Analysis*, for the following traffic scenarios: Existing (2019), Opening Year 2020, and Horizon Year 2040 conditions. (2)

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Planned (Existing) Land Use[1]	Distance From Centerline To Nearest Adjacent Land Use (Feet)[2]	Vehicle Speed (mph)[3]
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	64'	50
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	64'	50
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	30'	25
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	30'	25
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	76'	45
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	76'	45
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	76'	45
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	76'	45
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	76'	45

[1] Source: City of Wildomar General Plan Land Use Map.
[2] Distance to adjacent land use is based on the right-of-way for each functional roadway classification provided in the General Plan Circulation Element.
[3] Source: Gun Shooting Range / Tactical Training Facility Traffic Impact Analysis, Urban Crossroads, Inc.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]					
			Existing 2019		Opening Year 2020		Horizon Year 2040	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Mission Tr.	n/o Bundy Canyon Rd.	14.1	14.5	15.4	15.7	23.4	23.7
2	Mission Tr.	s/o Dwy. 1	9.3	9.6	9.6	9.9	16.5	16.8
3	Orchard St.	s/o Bundy Canyon Rd.	0.9	1.0	1.1	1.2	1.2	1.3
4	Almond St.	n/o Bundy Canyon Rd.	1.5	1.6	1.7	1.8	1.9	2.0
5	Bundy Canyon Rd.	e/o Dwy. 2	10.3	10.9	11.6	12.3	34.3	34.9
6	Bundy Canyon Rd.	w/o Orchard St.	11.1	11.7	12.4	13.1	34.3	34.9
7	Bundy Canyon Rd.	e/o Orchard St.	11.8	12.4	13.4	13.9	25.2	25.8
8	Bundy Canyon Rd.	w/o Almond St.	11.8	12.3	13.4	13.9	25.2	25.8
9	Bundy Canyon Rd.	e/o Almond St.	12.5	13.0	14.2	14.7	25.3	25.7

[1] Source: Gun Shooting Range / Tactical Training Facility Traffic Impact Analysis, Urban Crossroads, Inc.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits, and Table 6-4 shows the traffic flow by vehicle type (vehicle mix).

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] Source: Typical Southern California vehicle mix.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: DAILY VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways[1]	97.42%	1.84%	0.74%	100.00%

[1] Source: Typical Southern California vehicle mix & the County of Riverside Office of Industrial Hygiene.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: (12) $L_{VdB}(D) = L_{VdB}(25\text{ ft}) - 30\log(D/25)$

TABLE 6-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Decibels (VdB) at 25 feet
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Gun Shooting Range/Tactical Training Facility Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing (2019) Without / With Project:
  - This scenario refers to the Existing present-day noise conditions, without and with the proposed Project.
- Opening Year 2020 Without / With Project:
  - This scenario below refers to the background noise conditions at future Year 2020 without and with the proposed Project plus ambient growth.
- Horizon Year 2040 Without / With Project:
  - This scenario below refers to the background noise conditions at future Year 2040 without and with the proposed Project plus ambient growth, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the study area roadway segments analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing (2019), Opening Year 2020, and Horizon Year 2040. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	69.8	RW	192	606
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	68.0	RW	126	399
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	53.4	RW	RW	RW
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	55.6	RW	RW	RW
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	66.3	RW	102	324
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	66.6	RW	110	349
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	66.9	RW	117	371
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	66.9	RW	117	371
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	67.1	RW	124	393

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	69.9	RW	197	623
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	68.1	RW	130	412
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	53.8	RW	RW	RW
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	55.9	RW	RW	RW
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	66.5	RW	108	343
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	66.9	RW	116	368
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	67.1	RW	123	390
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	67.1	RW	122	387
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	67.3	RW	129	409

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: OPENING YEAR WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	70.1	66	209	662
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	68.1	RW	130	412
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	54.2	RW	RW	RW
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	56.1	RW	RW	RW
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	66.8	RW	115	365
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	67.1	RW	123	390
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	67.4	RW	133	422
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	67.4	RW	133	422
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	67.7	RW	141	447

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: OPENING YEAR WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	70.2	67	213	674
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	68.2	RW	134	425
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	54.6	RW	RW	RW
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	56.4	RW	RW	RW
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	67.1	RW	122	387
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	67.3	RW	130	412
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	67.6	RW	138	437
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	67.6	RW	138	437
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	67.8	RW	146	463

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: HORIZON YEAR WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	72.0	101	318	1005
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	70.4	71	224	709
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	54.6	RW	RW	RW
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	56.6	RW	RW	RW
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	71.5	108	341	1079
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	71.5	108	341	1079
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	70.2	79	251	793
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	70.2	79	251	793
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	70.2	80	252	796

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: HORIZON YEAR WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	72.0	102	322	1018
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	70.5	72	228	722
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	54.9	RW	RW	RW
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	56.8	RW	RW	RW
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	71.6	110	347	1098
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	71.6	110	347	1098
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	70.3	81	257	812
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	70.3	81	257	812
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	70.3	81	256	809

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITIONS PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report. However, the analysis of existing traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until Year 2020 cumulative conditions.

Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 53.4 to 69.8 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 53.8 to 69.9 dBA CNEL. Table 7-7 shows that the Project off-site traffic noise level increases will range from 0.1 to 0.5 dBA CNEL.

TABLE 7-7: UNMITIGATED EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Adjacent Planned (Existing) Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Noise-Sensitive Land Use?
				No Project	With Project	Project Addition	
1	Mission Tr.	n/o Bundy Canyon Rd.	Industrial/Commercial	69.8	69.9	0.1	No
2	Mission Tr.	s/o Dwy. 1	Industrial (Residential)	68.0	68.1	0.1	Yes
3	Orchard St.	s/o Bundy Canyon Rd.	Residential/Public	53.4	53.8	0.5	Yes
4	Almond St.	n/o Bundy Canyon Rd.	Commercial/Residential	55.6	55.9	0.3	Yes
5	Bundy Canyon Rd.	e/o Dwy. 2	Industrial/Comm. (Residential)	66.3	66.5	0.2	Yes
6	Bundy Canyon Rd.	w/o Orchard St.	Commercial (Residential)	66.6	66.9	0.2	Yes
7	Bundy Canyon Rd.	e/o Orchard St.	Business Park/Residential/Comm.	66.9	67.1	0.2	Yes
8	Bundy Canyon Rd.	w/o Almond St.	Residential/Commercial/Public	66.9	67.1	0.2	Yes
9	Bundy Canyon Rd.	e/o Almond St.	Public /Residential	67.1	67.3	0.2	Yes

[1] Source: City of Wildomar General Plan Land Use Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

7.3 OPENING YEAR 2020 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 presents the Opening Year without Project conditions CNEL noise levels. The Opening Year without Project exterior noise levels are expected to range from 54.2 to 70.1 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Year with Project conditions will range from 54.6 to 70.2 dBA CNEL. Table 7-8 shows that the Project off-site traffic noise level increases will range from 0.1 to 0.4 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-8: UNMITIGATED OPENING YEAR WITH PROJECT TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Mission Tr.	n/o Bundy Canyon Rd.	70.1	70.2	0.1	No	No
2	Mission Tr.	s/o Dwy. 1	68.1	68.2	0.1	Yes	No
3	Orchard St.	s/o Bundy Canyon Rd.	54.2	54.6	0.4	Yes	No
4	Almond St.	n/o Bundy Canyon Rd.	56.1	56.4	0.2	No	No
5	Bundy Canyon Rd.	e/o Dwy. 2	66.8	67.1	0.3	No	No
6	Bundy Canyon Rd.	w/o Orchard St.	67.1	67.3	0.2	No	No
7	Bundy Canyon Rd.	e/o Orchard St.	67.4	67.6	0.2	Yes	No
8	Bundy Canyon Rd.	w/o Almond St.	67.4	67.6	0.2	Yes	No
9	Bundy Canyon Rd.	e/o Almond St.	67.7	67.8	0.2	Yes	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Significance Criteria (Section 4).

7.4 HORIZON YEAR 2040 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-5 presents the Horizon Year without Project conditions CNEL noise levels. The Horizon Year without Project exterior noise levels are expected to range from 54.6 to 72.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the Horizon Year with Project conditions will range from 54.9 to 72.0 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases will range from 0.1 to 0.3 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-9: UNMITIGATED HORIZON YEAR WITH PROJECT TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Mission Tr.	n/o Bundy Canyon Rd.	72.0	72.0	0.1	No	No
2	Mission Tr.	s/o Dwy. 1	70.4	70.5	0.1	Yes	No
3	Orchard St.	s/o Bundy Canyon Rd.	54.6	54.9	0.3	Yes	No
4	Almond St.	n/o Bundy Canyon Rd.	56.6	56.8	0.2	No	No
5	Bundy Canyon Rd.	e/o Dwy. 2	71.5	71.6	0.1	No	No
6	Bundy Canyon Rd.	w/o Orchard St.	71.5	71.6	0.1	No	No
7	Bundy Canyon Rd.	e/o Orchard St.	70.2	70.3	0.1	Yes	No
8	Bundy Canyon Rd.	w/o Almond St.	70.2	70.3	0.1	Yes	No
9	Bundy Canyon Rd.	e/o Almond St.	70.2	70.3	0.1	Yes	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Significance Criteria (Section 4).

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following receiver locations as shown on Exhibit 8-A were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Sensitive receivers near the Project site are described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Located approximately 63 feet north of the Project site, R1 represents existing residential homes north of Bundy Canyon Road. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R2: Location R2 represents the existing residential home located east of the Project site at roughly 29 feet. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing residential homes southeast of the Project site at approximately 167 feet. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R4: Location R4 represents the existing residential home located roughly 767 feet south of the Project site on the east side of Mission Trail. A 24-hour noise measurement near this location, L5, is used to describe the existing ambient noise environment.

R5: Located approximately 931 feet southwest of the Project site, R5 represents the existing Wildomar Library. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the existing residential homes located southwest of the Project site at roughly 797 feet. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS

9 OPERATIONAL NOISE IMPACTS

This section analyzes uses reference noise levels to represent the expected noise sources from both Land Use Alternative 1 and 2 occurring simultaneously within the Project site, and thereby conservatively estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the indoor shooting range activities, gas station activity, parking lot vehicle movements, a trash enclosure, and roof-top air conditioning units all operating simultaneously. These noise level impacts will likely vary throughout the day.

9.1.1 INDOOR SHOOTING RANGE ACTIVITIES

To evaluate future off-site stationary source noise impacts associated with indoor shooting range activities, a reference stationary source noise level measurement was taken at the Orange County Indoor Shooting Range in the City of Brea. This level was utilized as a reference stationary source noise level for the proposed Project which is anticipated to be a similar facility with similar building construction. The reference measurement was taken at a distance of 10 feet from the building façade at the end of the shooting lanes by Urban Crossroads, Inc on November 17, 2009. The reference noise level, at a uniform distance of 50 feet for comparison purposes, is 37.7 dBA L_{eq}.

9.1.2 GAS STATION ACTIVITY

To describe the potential noise level impacts created by the gas station of the proposed Project uses, a reference noise level measurement was collected on Tuesday, April 26th, 2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine. The reference noise level measurement includes six cars fueling at once, car doors closing, engines starting, fuel pump TV sounds, and background car pass-by events within a 3-minute period. At a uniform reference noise level distance of 50 feet, the reference noise level is 48.2 dBA L_{eq}.

9.1.3 PARKING LOT VEHICLE MOVEMENTS

To determine the noise levels associated with commercial parking lot vehicle movements, Urban Crossroads collected reference noise level measurements at the Laguna Niguel Walmart located at 27470 Alicia Parkway on May 30, 2012. The 15-minute noise level measurement indicates that the parking lot vehicle movements generates noise levels of 40.1 dBA L_{eq} at a normalized distance

of 50 feet. The parking lot noise levels are mainly due to cars pulling in and out of spaces, car alarms sounding, and customers moving shopping carts.

9.1.4 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure, Urban Crossroads collected a reference noise level measurement on May 3rd, 2018 at an existing commercial and office park trash enclosure within a parking lot on the northeast corner of Baker Street and Red Hill Avenue. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA L_{eq} for the trash enclosure activity. The trash enclosure activity noise levels include two metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, trash dropping into the metal dumpster, and background parking lot vehicle movements.

9.1.5 ROOF-TOP AIR CONDITIONING UNITS

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken over a four-day total duration at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe mechanical roof-top air conditioning units on the roof of an existing Walmart store, in addition to background noise levels from additional roof-top units. The reference noise level represents Lennox SCA120 series 10-ton model packaged air conditioning units. At 5 feet from the closest roof-top air conditioning unit, the highest exterior noise level from all four days of the measurement period was measured at 77.2 dBA L_{eq}. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect an observed 39 minutes during the peak hour of summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F.

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins.)[6]	Reference Noise Level (dBA L_{eq})	
					@ Ref. Dist.	@ 50 Feet
Indoor Shooting Range[1]	00:03:00	10'	5'	60	51.7	37.7
Gas Station Activity[2]	00:03:00	5'	5'	60	68.2	48.2
Parking Lot Vehicle Movements[3]	00:15:00	5'	5'	60	60.1	40.1
Trash Enclosure Activity[4]	00:00:32	5'	5'	60	77.3	57.3
Roof-Top Air Conditioning Units[5]	01:00:00	5'	5'	39	77.2	57.2

[1] As measured by Urban Crossroads, Inc. on 11/17/2009 at the Orange County Indoor Shooting Range in the City of Brea.
[2] As measured by Urban Crossroads, Inc. on 4/26/2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine.
[3] As measured by Urban Crossroads, Inc. on 5/30/2012 at the Laguna Niguel Walmart located at 27470 Alicia Parkway.
[4] As measured by Urban Crossroads, Inc. on 5/3/2018 at a commercial and office parking lot in the City of Costa Mesa.
[5] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[6] Anticipated minutes of activity within a given hour based on the reference noise source activity.

9.2 PROJECT OPERATIONAL NOISE LEVELS

Based upon the reference noise levels, it is possible to estimate the Project operational stationary-source noise levels at each receiver location. The operational noise level calculations shown on Table 9-2 account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source. The basic noise attenuation equation shown below is used to calculate the distance attenuation based on a reference noise level (SPL_1):

$$SPL_2 = SPL_1 - 20\log(D_2/D_1)$$

Where SPL_2 is the resulting noise level after attenuation, SPL_1 is the source noise level, D_2 is the distance to the reference sound pressure level (SPL_1), and D_1 is the distance to the receiver location. Table 9-2 indicates that the unmitigated operational noise levels associated with the indoor shooting range activities, gas station activity, parking lot vehicle movements, a trash enclosure, and roof-top air conditioning units are expected to range from 31.3 to 52.8 dBA L_{eq} at nearby receiver locations. The unmitigated operational noise level calculation worksheets are included in Appendix 9.1 and include the barrier attenuation provided by the planned 6-foot high trash enclosure barrier and existing noise barriers in the Project study area, shown on Exhibit 9-A, where applicable.

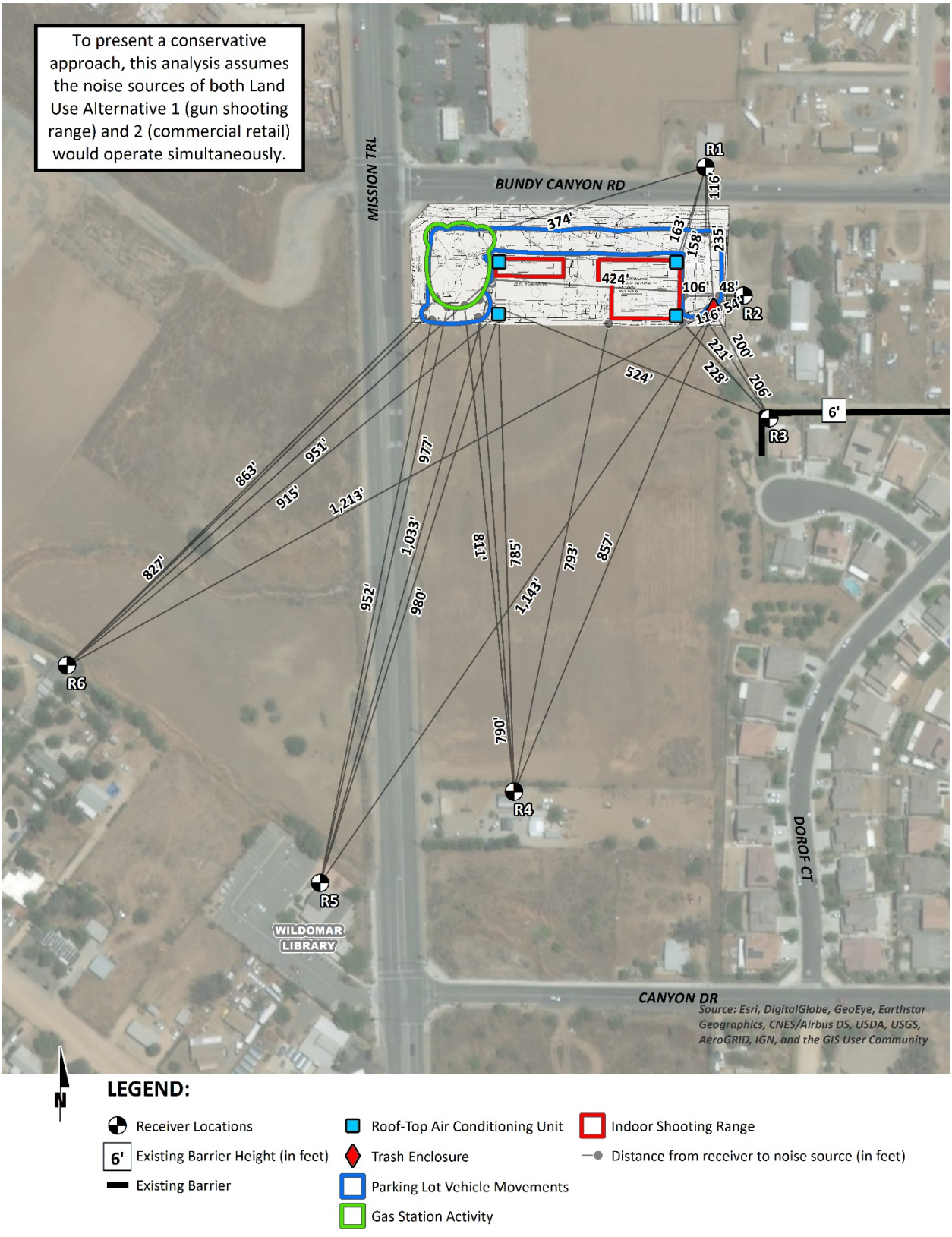
As indicated on Table 9-2, the daytime Project-only operational noise levels will range from 31.3 to 52.8 dBA L_{eq} at the receiver locations, which will not exceed the City of Wildomar 55 dBA L_{eq} exterior noise level standards at nearby sensitive receiver locations based on the daytime operational conditions of the Project.

TABLE 9-2: UNMITIGATED PROJECT-ONLY OPERATIONAL NOISE LEVELS

Receiver Location[1]	Noise Sources[2]					Combined Operational Noise Levels (dBA L_{eq})[3]	Daytime Noise Level Standard (dBA L_{eq})[4]	Threshold Exceeded?[5]
	Indoor Shooting Range	Gas Station Activity	Parking Lot Vehicle Movements	Trash Enclosure Activity	Roof-Top Air Conditioning Unit			
R1	27.7	30.7	32.8	37.9	45.0	46.2	55	No
R2	31.2	29.6	40.5	50.5	48.0	52.8	55	No
R3	24.8	27.8	26.9	39.3	43.0	44.8	55	No
R4	13.7	24.0	16.1	26.6	31.4	33.3	55	No
R5	11.4	22.4	14.5	24.1	29.5	31.3	55	No
R6	12.1	23.5	15.7	23.6	30.1	31.8	55	No

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Calculations for each noise source are provided in Appendix 9.1.
[4] Daytime residential exterior noise level standard.
[5] Do the estimated Project operational noise source activities exceed the noise level threshold?

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



9.3 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (4) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime ambient conditions are presented on Table 9-3.

As indicated on Table 9-3, the Project will generate unmitigated daytime operational noise level increase of up to 0.7 dBA L_{eq}, which will satisfy the significance criteria previously presented in Table 4-2. Since the Project-related operational noise level contributions will satisfy the operational noise level increase significance criteria presented in Table 4-2 under long-range typical operational conditions, the increases at the receiver locations will be *less than significant*.

TABLE 9-3: UNMITIGATED PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Meas. Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Threshold[7]	Threshold Exceeded?[7]
R1	46.2	L2	67.3	67.3	0.0	1.5	No
R2	52.8	L2	67.3	67.5	0.2	1.5	No
R3	44.8	L3	52.3	53.0	0.7	5.0	No
R4	33.3	L5	70.8	70.8	0.0	1.5	No
R5	31.3	L5	70.8	70.8	0.0	1.5	No
R6	31.8	L6	53.9	53.9	0.0	5.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearby sensitive receiver locations previously described in Section 8.

10.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following stages, based on similar projects in the City of Wildomar:

- Demolition
- Site Preparation
- Grading
- Building Construction
- Architectural Coating
- Paving

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages are based on the *Gun Shooting Range/Tactical Training Facility Air Quality Impact Analysis*. (24)

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Duration (h:mm:ss)	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[5]
1	Truck Pass-Bys & Background Dozer Activity[1]	0:01:15	30'	63.6	59.2
2	Dozer Activity[1]	0:01:00	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	0:01:00	30'	71.9	67.5
4	Foundation Trenching[2]	0:01:01	30'	72.6	68.2
5	Rough Grading Activities[2]	0:05:00	30'	77.9	73.5
6	Framing[3]	0:02:00	30'	66.7	62.3
7	Concrete Mixer Truck Movements[4]	0:01:00	50'	71.2	71.2
8	Concrete Paver Activities[4]	0:01:00	30'	70.0	65.6
9	Concrete Mixer Pour & Paving Activities[4]	0:01:00	30'	70.3	65.9
10	Concrete Mixer Backup Alarms & Air Brakes[4]	0:00:20	50'	71.6	71.6
11	Concrete Mixer Pour Activities[4]	1:00:00	50'	67.7	67.7
12	Forklift, Jackhammer, & Metal Truck Bed Loading[5]	0:02:06	50'	67.9	67.9

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[5] As measured by Urban Crossroads, Inc. on 9/9/16 during the demolition of an existing paved parking lot at 41 Corporate Park in Irvine.
[6] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Tables 10-2 to 10-7 present the short-term construction noise levels for each stage of construction. Table 10-8 provides a summary of the construction noise levels by stage at the nearby noise-sensitive receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To present a conservative approach, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity to each receiver location.

TABLE 10-2: DEMOLITION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Background Dozer Activity	59.2
Forklift, Jackhammer, & Metal Truck Bed Activities	67.9
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.9

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	83'	-4.4	0.0	63.5
R2	50'	0.0	0.0	67.9
R3	195'	-11.8	-5.0	51.1
R4	787'	-23.9	0.0	44.0
R5	951'	-25.6	0.0	42.3
R6	823'	-24.3	0.0	43.6

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-3: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Background Dozer Activity	59.2
Dozer Activity	64.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	64.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	83'	-4.4	0.0	59.8
R2	50'	0.0	0.0	64.2
R3	195'	-11.8	-5.0	47.3
R4	787'	-23.9	0.0	40.2
R5	951'	-25.6	0.0	38.6
R6	823'	-24.3	0.0	39.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-4: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Background Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	73.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	83'	-4.4	0.0	69.1
R2	50'	0.0	0.0	73.5
R3	195'	-11.8	-5.0	56.6
R4	787'	-23.9	0.0	49.5
R5	951'	-25.6	0.0	47.9
R6	823'	-24.3	0.0	49.1

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-5: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	83'	-4.4	0.0	63.8
R2	50'	0.0	0.0	68.2
R3	195'	-11.8	-5.0	51.3
R4	787'	-23.9	0.0	44.2
R5	951'	-25.6	0.0	42.6
R6	823'	-24.3	0.0	43.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	83'	-4.4	0.0	63.1
R2	50'	0.0	0.0	67.5
R3	195'	-11.8	-5.0	50.6
R4	787'	-23.9	0.0	43.5
R5	951'	-25.6	0.0	41.9
R6	823'	-24.3	0.0	43.1

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-7: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	83'	-4.4	0.0	67.2
R2	50'	0.0	0.0	71.6
R3	195'	-11.8	-5.0	54.8
R4	787'	-23.9	0.0	47.7
R5	951'	-25.6	0.0	46.0
R6	823'	-24.3	0.0	47.3

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/berms in the Project study area.

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the closest point from primary Project construction activity to each of the nearby receiver locations. As shown on Table 10-7, the unmitigated construction noise levels are expected to range from 38.6 to 73.5 dBA L_{eq} at the nearby receiver locations.

TABLE 10-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY (DBA L_{EQ})

Receiver Location[1]	Construction Noise Level (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Architectural Coating	Paving	Highest Activity Noise Levels[2]
R1	63.5	59.8	69.1	63.8	63.1	67.2	69.1
R2	67.9	64.2	73.5	68.2	67.5	71.6	73.5
R3	51.1	47.3	56.6	51.3	50.6	54.8	56.6
R4	44.0	40.2	49.5	44.2	43.5	47.7	49.5
R5	42.3	38.6	47.9	42.6	41.9	46.0	47.9
R6	43.6	39.8	49.1	43.8	43.1	47.3	49.1

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Estimated construction noise levels during peak reference conditions.

To evaluate whether the Project will generate potentially significant short-term noise levels at off-site sensitive receiver locations a construction-related the NIOSH noise level threshold of 85 dBA L_{eq} is used as acceptable thresholds for construction noise at the nearby sensitive receiver locations. Table 10-9 shows the highest construction noise levels at the potentially impacted receiver locations are expected to approach 73.5 dBA L_{eq} and will satisfy the NIOSH 85 dBA L_{eq} significance threshold during temporary Project construction activities. The noise impact due to unmitigated Project construction noise levels is, therefore, considered a *less than significant* impact at the nearby receiver locations.

TABLE 10-9: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE (DBA L_{EQ})

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	69.1	85	No
R2	73.5	85	No
R3	56.6	85	No
R4	49.5	85	No
R5	47.9	85	No
R6	49.1	85	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Estimated construction noise levels during peak operating conditions, as shown on Table 10-8.
[3] Construction noise thresholds as shown on Table 4-2.
[4] Do the estimated Project construction noise levels satisfy the construction noise level threshold?

10.5 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-5 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-10 presents the expected Project related vibration levels at the nearby receiver locations.

At distances ranging from 50 to 951 feet from primary construction activities, construction vibration velocity levels are expected to approach 78.0 VdB. Based on the Federal Transit Administration vibration standard of 80 VdB, construction vibration impacts are considered *less than significant*.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter.

TABLE 10-10: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Construction Activity (Feet)	Receiver Vibration Levels (VdB)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	
R1	83'	42.4	63.4	70.4	71.4	71.4	No
R2	50'	49.0	70.0	77.0	78.0	78.0	No
R3	195'	31.2	52.2	59.2	60.2	60.2	No
R4	787'	13.1	34.1	41.1	42.1	42.1	No
R5	951'	10.6	31.6	38.6	39.6	39.6	No
R6	823'	12.5	33.5	40.5	41.5	41.5	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-5.
[3] Does the highest vibration level exceed the FTA maximum acceptable vibration standard of 80 VdB?

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G & Amendments and Additions to the State CEQA Guidelines.* 2019.
2. **Urban Crossroads, Inc.** *Desert Wave Traffic Impact Analysis.* February 2019.
3. **City of Wildomar.** *Wildomar Shooting Academy Preliminary Application Review (PAR) No. 18-0202.* December 11, 2018.
4. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
5. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
6. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.
7. **U.S. Army Corps of Engineers Construction Engineering Research Laboratories.** *Acoustic Analysis of Small Arms Fire.* January 1994.
8. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
9. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
10. **Occupational Safety and Health Administration.** *Standard 29 CRF, Part 1910.*
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12. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2018.
13. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2018.
14. **City of Wildomar.** *General Plan Noise Element.* October 2003.
15. —. *Municipal Code, Chapter 9.48.*
16. **County of Riverside Department of Environmental Health, Office of Industrial Hygiene.** *Mr. Steve Hinde, REHS, CIH, Senior Industrial Hygienist (951) 955-8982.*
17. **National Institute for Occupational Safety and Health.** *Criteria for Recommended Standard: Occupational Noise Exposure.* June 1998.
18. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
19. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
20. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*

21. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.

22. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.

23. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

24. **Urban Crossroads, Inc.** *Gun Shooting Range/Tactical Training Facility Air Quality Impact Analysis.* May 2019.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Gun Shooting Range/Tactical Training Facility Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF WILDOMAR MUNICIPAL CODE

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Chapter 9.48 NOISE REGULATION

9.48.010 Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of the City of Wildomar residents and degrade their quality of life. Pursuant to its police power, the City Council declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish City-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are established. (Ord. 18 § 2, 2008, RCC § 9.52.010)

9.48.020 Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

A. Facilities owned or operated by or for a governmental agency;

B. Capital improvement projects of a governmental agency;

C. The maintenance or repair of public properties;

D. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;

E. Public or private schools and school-sponsored activities;

F. Agricultural operations on land designated "agriculture" in the City General Plan, or land zoned A-l (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), A-D (agriculture-dairy) or C/V (citrus/vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;

G. Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of Title 17;

H. Private construction projects located one-quarter of a mile or more from an inhabited dwelling;

I. Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, and

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May;

J. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7:00 a.m. and 8:00 p.m.;

K. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;

L. Heating and air conditioning equipment;

M. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare;

N. The discharge of firearms consistent with all state laws. (Ord. 18 § 2, 2008, RCC § 9.52.020)

9.48.030 Definitions.

As used in this chapter, the following terms shall have the following meanings:

"Audio equipment" means a television, stereo, radio, tape player, compact disc player, mp3 player, iPod or other similar device.

"Decibel (dB)" means a unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately 130 decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

1. "A-weighting (dBA)" means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

2. "Maximum sound level (L_{max})" means the maximum sound level measured on a sound level meter.

"Governmental agency" means the United States, the State of California, Riverside County, any city within Riverside County, any special district within Riverside County, the City of Wildomar or any combination of these agencies.

"Land use permit" means a discretionary permit issued by the City pursuant to Title 17.

"Motor vehicle" means a vehicle that is self-propelled.

"Motor vehicle sound system" means a stereo, radio, tape player, compact disc player, mp3 player, iPod or other similar device.

"Noise" means any loud, discordant or disagreeable sound.

"Occupied property" means property upon which is located a residence, business or industrial or manufacturing use.

"Off-highway vehicle" means a motor vehicle designed to travel over any terrain.

"Public or private school" means an institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

"Public property" means property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

"Sensitive receptor" means a land use that is identified as sensitive to noise in the noise element of the City General Plan, including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries or public libraries.

"Sound-amplifying equipment" means a loudspeaker, microphone, megaphone or other similar device.

"Sound level meter" means an instrument meeting the standards of the American National Standards Institute for Type 1 or Type 2 sound level meters or an instrument that provides equivalent data. (Ord. 18 § 2, 2008, RCC § 9.52.030)

9.48.040 General sound level standards.

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1.

TABLE 1

Sound Level Standards (Db L_{max})

GENERAL PLAN FOUNDATION COMPONENT	GENERAL PLAN LAND USE DESIGNATION	GENERAL PLAN LAND USE DESIGNATION NAME	DENSITY	MAXIMUM DECIBEL LEVEL	
				7 am—10 pm	10 pm—7 am
Community Development	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
	MDR	Medium Density Residential	2—5	55	45
	MHDR	Medium High Density Residential	5—8	55	45
	HDR	High Density Residential	8—14	55	45
	VHDR	Very High Density Residential	14—20	55	45
	H'TDR	Highest Density Residential	20+	55	45
	CR	Retail Commercial		65	55
	CO	Office Commercial		65	55
	CT	Tourist Commercial		65	55
	CC	Community Center		65	55
	LI	Light Industrial		75	55
	HI	Heavy Industrial		75	75
	BP	Business Park		65	45
	PF	Public Facility		65	45
	SP	Specific Plan-Residential		55	45
		Specific Plan-Commercial		65	55
		Specific Plan-Light Industrial		75	55
		Specific Plan-Heavy Industrial		75	75
Rural Community	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
Rural	RR	Rural Residential	5 AC	45	45
	RM	Rural Mountainous	10 AC	45	45
	RD	Rural Desert	10 AC	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation Habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral Resources		75	45

(Ord. 18 § 2, 2008, RCC § 9.52.040)

9.48.050 Sound level measurement methodology.

Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the enforcement officials identified in Section 9.48.080 of this chapter. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American

National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually. (Ord. 18 § 2, 2008, RCC § 9.52.050)

9.48.060 Special sound sources standards.

The general sound level standards set forth in Section 9.48.040 of this chapter apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitutes separate violations of this chapter:

A. Motor Vehicles.

1. Off-Highway Vehicles.

a. No person shall operate an off-highway vehicle unless it is equipped with a USDA-qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.

b. No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than 96 dBA if the vehicle was manufactured on or after January 1, 1986 or is not more than 101 dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of 20 inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.

2. Sound Systems. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of 10:00 p.m. and 8:00 a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than 100 feet from the vehicle.

B. Power Tools and Equipment. No person shall operate any power tools or equipment between the hours of 10:00 p.m. and 8:00 a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than 100 feet from the power tools or equipment.

C. Audio Equipment. No person shall operate any audio equipment, whether portable or not, between the hours of 10:00 p.m. and 8:00 a.m. such that the equipment is audible to the human ear inside an inhabited dwelling other than a dwelling in which the equipment may be located. No person shall operate any audio equipment, whether portable or not, at any other time such that the equipment is audible to the human ear at a distance greater than 100 feet from the equipment.

D. Sound-Amplifying Equipment and Live Music. No person shall install, use or operate sound-amplifying equipment, or perform, or allow to be performed, live music unless such activities comply with the following requirements. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control:

1. Sound-amplifying equipment or live music is prohibited between the hours of 10:00 p.m. and 8:00 a.m.

2. Sound emanating from sound-amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than 200 feet from the equipment or music. (Ord. 18 § 2, 2008, RCC § 9.52.060)

9.48.070 Exceptions.

Exceptions may be requested from the standards set forth in Section 9.48.040 or 9.48.060 of this chapter and may be characterized as construction-related, single-event or continuous-events exceptions.

A. Application and Processing.

1. Construction-Related Exceptions. An application for a construction-related exception shall be made to and considered by the Director of Building and Safety on forms provided by the Building and Safety Department and shall be accompanied by the appropriate filing fee. No public hearing is required.

2. Single-Event Exceptions. An application for a single-event exception shall be made to and considered by the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. No public hearing is required.

3. Continuous-Events Exceptions. An application for a continuous-events exception shall be made to the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. Upon receipt of an application for a continuous-events exception, the Planning Director shall set the matter for public hearing before the Planning Commission, notice of which shall be given as provided in Title 17. Notwithstanding the above, an application for a continuous-events exception that is associated with an application for a land use permit shall be processed concurrently with the land use permit in the same manner that the land use permit is required to be processed.

B. Requirements for Approval. The appropriate decision-making body or officer shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decision-making body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

C. Appeals. The Director of Building and Safety's decision on an application for a construction-related exception is considered final. The Planning Director's decision on an application for a single-event exception is considered final. After making a decision on an application for a continuous-events exception, the appropriate decision-making body or officer shall mail notice of the decision to the applicant. Within 10 calendar days after the mailing of such notice, the applicant or an interested person may appeal the decision to the City Council. Upon receipt of an appeal and payment of the appropriate appeal fee, the City Clerk shall set the matter for hearing not less than five days nor more than 30 days thereafter and shall give written notice of the hearing in the same manner as notice of the hearing was given by the appropriate hearing officer or body. The City Council shall render its decision within 30 days after the appeal hearing is closed.

D. Effect of a Pending Continuous-Events Exception Application. For a period of 180 days from the effective date of the ordinance codified in this chapter, no person creating any sound prohibited by this chapter shall be considered in violation of this chapter if the sound is related to a use that is operating pursuant to an approved land use permit, if an application for a continuous-events exception has been filed to sanction the sound and if a decision on the application is pending. (Ord. 18 § 2, 2008, RCC § 9.52.070)

9.48.080 Enforcement.

The Chief of Police and Code Enforcement Department shall have the primary responsibility for enforcing this chapter; provided, however, the Chief of Police and Code Enforcement Department may be assisted by the Public Health Department. Violations shall be prosecuted as described in Section 9.48.100 of this chapter, but nothing in this chapter shall prevent the Chief of Police, Code Enforcement or the Department of

Public Health from engaging in efforts to obtain voluntary compliance by means of warnings, notices, or educational programs. (Ord. 18 § 2, 2008, RCC § 9.52.080)

9.48.090 Duty to cooperate.

No person shall refuse to cooperate with, or obstruct, the enforcement officials identified in Section 9.48.080 of this chapter when they are engaged in the process of enforcing the provisions of this chapter. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this chapter. (Ord. 18 § 2, 2008, RCC § 9.52.090)

9.48.100 Violations and penalties.

Any person who violates any provision of this chapter once or twice within a 180-day period shall be guilty of an infraction. Any person who violates any provision of this chapter more than twice within a 180-day period shall be guilty of a misdemeanor. Each day a violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. Penalties shall not exceed the following amounts:

A. For the first violation within a 180-day period, the minimum mandatory fine shall be $500.00.

B. For the second violation within a 180-day period, the minimum mandatory fine shall be $750.00.

C. For any further violations within a 180-day period, the minimum mandatory fine shall be $1,000.00 or imprisonment for a period not exceeding six months, or both. (Ord. 18 § 2, 2008, RCC § 9.52.100)

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:11776 Study Area Photos

L1 East
33, 37' 36.720000", 117, 17' 21.560000"

L1 North
33, 37' 36.740000", 117, 17' 21.560000"

L1 South
33, 37' 36.700000", 117, 17' 21.560000"

L1 West
33, 37' 36.700000", 117, 17' 21.560000"

L2 East
33, 37' 36.610000", 117, 17' 16.200000"

L2 North
33, 37' 36.470000", 117, 17' 16.260000"

JN:11776 Study Area Photos

L2 South
33, 37' 36.470000", 117, 17' 16.260000"

L2 West
33, 37' 36.470000", 117, 17' 16.260000"

L3 East
33, 37' 32.030000", 117, 17' 17.580000"

L3 North
33, 37' 32.060000", 117, 17' 17.580000"

L3 South
33, 37' 32.060000", 117, 17' 17.580000"

L3 West
33, 37' 32.050000", 117, 17' 17.600000"

JN:11776 Study Area Photos

L4 East
33, 37' 23.810000", 117, 17' 19.910000"

L4 North
33, 37' 23.810000", 117, 17' 19.990000"

L4 South
33, 37' 23.810000", 117, 17' 19.970000"

L4 West
33, 37' 23.810000", 117, 17' 19.990000"

L5 East
33, 37' 30.150000", 117, 17' 25.210000"

L5 North
33, 37' 30.150000", 117, 17' 25.210000"

L5 South
33, 37' 30.150000", 117, 17' 25.180000"

L5 West
33, 37' 30.140000", 117, 17' 25.240000"

L6 Northeast
33, 37' 29.380000", 117, 17' 34.190000"

L6 Northwest
33, 37' 29.350000", 117, 17' 34.220000"

L6 Southeast
33, 37' 29.350000", 117, 17' 34.190000"

L6 Southwest
33, 37' 29.350000", 117, 17' 34.190000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

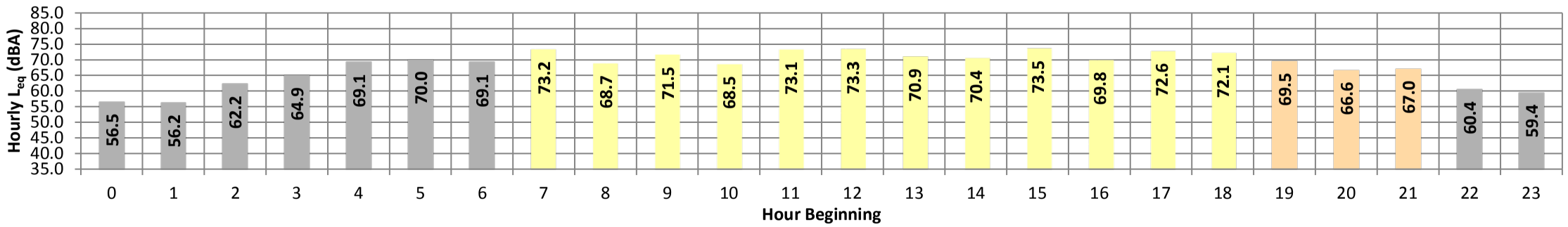
Date: Wednesday, May 01, 2019
Project: Gun Shooting Range/ Tactical Training Facility

Location: L1 - Located on Bundy Canyon Road, on the northern boundary line of the Project site, near a 76 Gas Station.

Meter: Piccolo I

JN: 11776
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	56.5	80.7	39.1	68.0	66.0	62.0	58.0	46.0	43.0	41.0	40.0	39.0	56.5	10.0	66.5
	1	56.2	78.7	36.5	68.0	66.0	62.0	58.0	48.0	44.0	39.0	36.0	36.0	56.2	10.0	66.2
	2	62.2	92.0	41.1	73.0	70.0	65.0	62.0	52.0	48.0	43.0	42.0	41.0	62.2	10.0	72.2
	3	64.9	88.1	39.5	77.0	74.0	70.0	68.0	58.0	50.0	44.0	43.0	41.0	64.9	10.0	74.9
	4	69.1	93.2	44.1	80.0	77.0	74.0	72.0	66.0	59.0	50.0	49.0	46.0	69.1	10.0	79.1
	5	70.0	92.5	42.5	82.0	79.0	75.0	73.0	67.0	60.0	50.0	48.0	44.0	70.0	10.0	80.0
	6	69.1	89.4	46.6	79.0	77.0	75.0	73.0	68.0	62.0	52.0	51.0	49.0	69.1	10.0	79.1
Day	7	73.2	100.7	48.3	82.0	79.0	76.0	74.0	69.0	64.0	54.0	52.0	50.0	73.2	0.0	73.2
	8	68.7	87.5	45.6	80.0	78.0	74.0	73.0	67.0	61.0	51.0	49.0	47.0	68.7	0.0	68.7
	9	71.5	98.4	44.8	80.0	77.0	74.0	72.0	67.0	60.0	51.0	49.0	47.0	71.5	0.0	71.5
	10	68.5	89.6	45.2	79.0	77.0	74.0	72.0	66.0	60.0	50.0	48.0	46.0	68.5	0.0	68.5
	11	73.1	99.8	44.9	82.0	79.0	75.0	73.0	67.0	61.0	50.0	49.0	46.0	73.1	0.0	73.1
	12	73.3	103.0	45.4	83.0	80.0	75.0	73.0	67.0	62.0	50.0	49.0	46.0	73.3	0.0	73.3
	13	70.9	97.7	47.7	81.0	78.0	75.0	73.0	68.0	62.0	52.0	51.0	48.0	70.9	0.0	70.9
	14	70.4	92.8	47.5	81.0	79.0	75.0	73.0	68.0	63.0	53.0	52.0	50.0	70.4	0.0	70.4
	15	73.5	99.4	47.5	84.0	81.0	77.0	75.0	69.0	63.0	53.0	52.0	50.0	73.5	0.0	73.5
	16	69.8	93.8	46.5	80.0	78.0	74.0	73.0	68.0	63.0	53.0	52.0	49.0	69.8	0.0	69.8
	17	72.6	102.0	49.1	82.0	79.0	75.0	73.0	68.0	63.0	55.0	53.0	51.0	72.6	0.0	72.6
	18	72.1	99.5	50.1	82.0	79.0	74.0	73.0	67.0	63.0	54.0	52.0	51.0	72.1	0.0	72.1
Evening	19	69.5	96.2	49.2	80.0	77.0	73.0	71.0	66.0	61.0	52.0	51.0	50.0	69.5	5.0	74.5
	20	66.6	93.2	47.8	76.0	74.0	71.0	69.0	64.0	58.0	51.0	50.0	49.0	66.6	5.0	71.6
	21	67.0	92.7	43.5	76.0	72.0	69.0	67.0	62.0	54.0	49.0	48.0	46.0	67.0	5.0	72.0
Night	22	60.4	81.2	44.2	72.0	69.0	66.0	64.0	55.0	50.0	46.0	45.0	45.0	60.4	10.0	70.4
	23	59.4	84.7	40.7	70.0	68.0	64.0	62.0	51.0	46.0	43.0	42.0	41.0	59.4	10.0	69.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.5	87.5	44.8	79.0	77.0	74.0	72.0	66.0	60.0	50.0	48.0	46.0
	Max	73.5	103.0	50.1	84.0	81.0	77.0	75.0	69.0	64.0	55.0	53.0	51.0
Energy Average		71.8	Average:		81.3	78.7	74.8	73.1	67.6	62.1	52.2	50.7	48.4
Evening	Min	66.6	92.7	43.5	76.0	72.0	69.0	67.0	62.0	54.0	49.0	48.0	46.0
	Max	69.5	96.2	49.2	80.0	77.0	73.0	71.0	66.0	61.0	52.0	51.0	50.0
Energy Average		67.9	Average:		77.3	74.3	71.0	69.0	64.0	57.7	50.7	49.7	48.3
Night	Min	56.2	78.7	36.5	68.0	66.0	62.0	58.0	46.0	43.0	39.0	36.0	36.0
	Max	70.0	93.2	46.6	82.0	79.0	75.0	73.0	68.0	62.0	52.0	51.0	49.0
Energy Average		65.8	Average:		74.3	71.8	68.1	65.6	56.8	51.3	45.3	44.0	42.4

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
69.9	71.2	65.8

24-Hour CNEL (dBA)
73.8

24-Hour Noise Level Measurement Summary

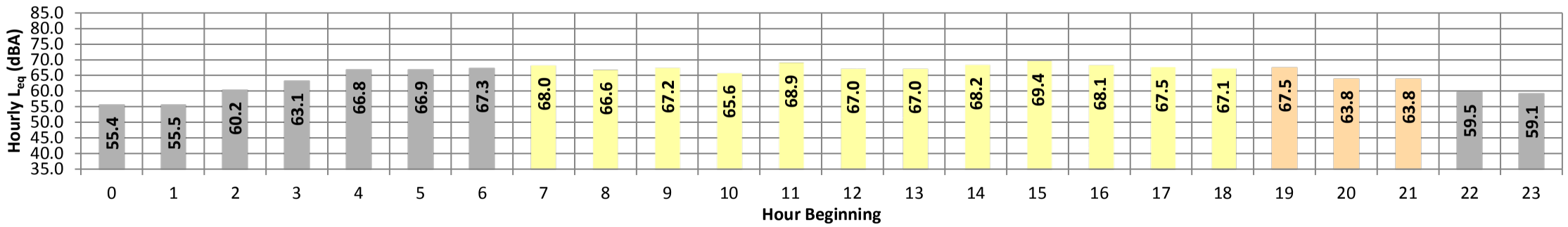
Date: Wednesday, May 01, 2019
Project: Gun Shooting Range/ Tactical Training Facility

Location: L2 - Located on Bundy Canyon Road, northeast of the Project site, near P K Mechanical Systems.

Meter: Piccolo I

JN: 11776
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	55.4	77.0	37.4	68.0	66.0	62.0	55.0	41.0	39.0	37.0	37.0	37.0	55.4	10.0	65.4
	1	55.5	76.6	37.2	68.0	67.0	62.0	57.0	42.0	39.0	37.0	37.0	37.0	55.5	10.0	65.5
	2	60.2	85.3	37.4	72.0	70.0	65.0	61.0	45.0	42.0	39.0	38.0	37.0	60.2	10.0	70.2
	3	63.1	85.4	37.4	74.0	72.0	70.0	68.0	55.0	44.0	40.0	39.0	38.0	63.1	10.0	73.1
	4	66.8	89.5	39.1	77.0	75.0	72.0	71.0	65.0	54.0	44.0	43.0	41.0	66.8	10.0	76.8
	5	66.9	82.9	40.1	77.0	75.0	73.0	72.0	66.0	56.0	43.0	42.0	41.0	66.9	10.0	76.9
	6	67.3	83.8	41.3	77.0	75.0	73.0	72.0	67.0	60.0	44.0	43.0	42.0	67.3	10.0	77.3
Day	7	68.0	83.7	41.4	77.0	75.0	73.0	72.0	68.0	63.0	47.0	45.0	43.0	68.0	0.0	68.0
	8	66.6	82.3	39.2	77.0	75.0	72.0	71.0	66.0	58.0	43.0	42.0	41.0	66.6	0.0	66.6
	9	67.2	93.6	41.2	76.0	73.0	72.0	70.0	66.0	58.0	45.0	43.0	41.0	67.2	0.0	67.2
	10	65.6	84.0	39.9	75.0	74.0	71.0	70.0	66.0	58.0	44.0	42.0	41.0	65.6	0.0	65.6
	11	68.9	95.9	39.1	77.0	75.0	72.0	71.0	66.0	59.0	44.0	43.0	41.0	68.9	0.0	68.9
	12	67.0	87.2	40.3	77.0	75.0	72.0	71.0	66.0	60.0	45.0	43.0	42.0	67.0	0.0	67.0
	13	67.0	88.7	40.4	76.0	74.0	72.0	71.0	67.0	62.0	46.0	44.0	41.0	67.0	0.0	67.0
	14	68.2	92.2	42.1	77.0	74.0	72.0	71.0	68.0	63.0	48.0	45.0	43.0	68.2	0.0	68.2
	15	69.4	92.3	40.4	78.0	76.0	74.0	72.0	68.0	64.0	48.0	45.0	42.0	69.4	0.0	69.4
	16	68.1	88.6	41.0	77.0	75.0	73.0	72.0	68.0	63.0	47.0	44.0	42.0	68.1	0.0	68.1
	17	67.5	87.7	41.3	77.0	75.0	72.0	71.0	68.0	62.0	46.0	45.0	43.0	67.5	0.0	67.5
	18	67.1	89.2	42.1	77.0	74.0	72.0	71.0	66.0	60.0	47.0	45.0	44.0	67.1	0.0	67.1
Evening	19	67.5	92.7	42.8	77.0	74.0	72.0	70.0	66.0	58.0	45.0	44.0	43.0	67.5	5.0	72.5
	20	63.8	84.6	41.8	73.0	72.0	70.0	68.0	63.0	52.0	44.0	44.0	43.0	63.8	5.0	68.8
	21	63.8	89.9	39.3	72.0	71.0	68.0	67.0	60.0	49.0	43.0	42.0	41.0	63.8	5.0	68.8
Night	22	59.5	80.8	38.8	71.0	69.0	66.0	64.0	50.0	43.0	40.0	40.0	39.0	59.5	10.0	69.5
	23	59.1	84.6	37.4	70.0	68.0	65.0	62.0	45.0	40.0	38.0	37.0	37.0	59.1	10.0	69.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.6	82.3	39.1	75.0	73.0	71.0	70.0	66.0	58.0	43.0	42.0	41.0
	Max	69.4	95.9	42.1	78.0	76.0	74.0	72.0	68.0	64.0	48.0	45.0	44.0
Energy Average		67.7	Average:		76.8	74.6	72.3	71.1	66.9	60.8	45.8	43.8	42.0
Evening	Min	63.8	84.6	39.3	72.0	71.0	68.0	67.0	60.0	49.0	43.0	42.0	41.0
	Max	67.5	92.7	42.8	77.0	74.0	72.0	70.0	66.0	58.0	45.0	44.0	43.0
Energy Average		65.4	Average:		74.0	72.3	70.0	68.3	63.0	53.0	44.0	43.3	42.3
Night	Min	55.4	76.6	37.2	68.0	66.0	62.0	55.0	41.0	39.0	37.0	37.0	37.0
	Max	67.3	89.5	41.3	77.0	75.0	73.0	72.0	67.0	60.0	44.0	43.0	42.0
Energy Average		63.6	Average:		72.7	70.8	67.6	64.7	52.9	46.3	40.2	39.6	38.8

L_{eq} (dBA)		
24-Hour	*Daytime*	*Nighttime*
66.2	**67.3**	**63.6**

24-Hour CNEL (dBA)

71.1

24-Hour Noise Level Measurement Summary

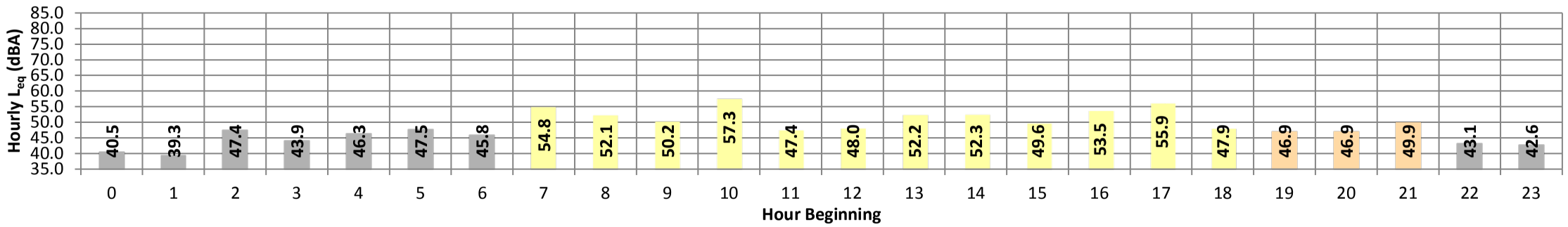
Date: Wednesday, May 01, 2019
Project: Gun Shooting Range/ Tactical Training Facility

Location: L3 - Located on Clovis Way, southeast of the Project site, near an existing single-family residential neighborhood.

Meter: Piccolo I

JN: 11776
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	40.5	53.9	36.4	45.0	44.0	43.0	42.0	41.0	39.0	39.0	37.0	36.0	40.5	10.0	50.5
	1	39.3	47.9	36.4	44.0	43.0	42.0	41.0	39.0	39.0	36.0	36.0	36.0	39.3	10.0	49.3
	2	47.4	62.5	38.1	53.0	53.0	53.0	53.0	43.0	41.0	39.0	39.0	39.0	47.4	10.0	57.4
	3	43.9	57.8	38.2	51.0	50.0	47.0	46.0	44.0	42.0	39.0	39.0	39.0	43.9	10.0	53.9
	4	46.3	62.6	40.5	52.0	51.0	49.0	48.0	46.0	45.0	42.0	42.0	41.0	46.3	10.0	56.3
	5	47.5	65.1	39.8	55.0	53.0	51.0	50.0	47.0	46.0	43.0	42.0	41.0	47.5	10.0	57.5
	6	45.8	59.7	41.1	53.0	51.0	49.0	48.0	45.0	44.0	42.0	42.0	41.0	45.8	10.0	55.8
Day	7	54.8	79.9	42.0	69.0	60.0	53.0	51.0	48.0	45.0	43.0	43.0	42.0	54.8	0.0	54.8
	8	52.1	80.1	39.3	60.0	56.0	50.0	48.0	45.0	43.0	41.0	41.0	39.0	52.1	0.0	52.1
	9	50.2	75.0	39.4	58.0	54.0	52.0	50.0	46.0	44.0	41.0	41.0	40.0	50.2	0.0	50.2
	10	57.3	87.4	40.8	63.0	58.0	54.0	52.0	48.0	45.0	42.0	42.0	41.0	57.3	0.0	57.3
	11	47.4	63.9	39.4	55.0	53.0	51.0	50.0	47.0	45.0	42.0	42.0	41.0	47.4	0.0	47.4
	12	48.0	67.6	40.7	55.0	53.0	51.0	50.0	47.0	45.0	43.0	42.0	41.0	48.0	0.0	48.0
	13	52.2	66.4	41.1	62.0	61.0	60.0	58.0	48.0	46.0	42.0	42.0	41.0	52.2	0.0	52.2
	14	52.3	67.1	42.2	61.0	60.0	57.0	56.0	52.0	49.0	45.0	44.0	43.0	52.3	0.0	52.3
	15	49.6	67.6	42.4	56.0	55.0	53.0	52.0	49.0	48.0	45.0	44.0	43.0	49.6	0.0	49.6
	16	53.5	82.6	42.4	60.0	58.0	54.0	52.0	50.0	48.0	45.0	44.0	43.0	53.5	0.0	53.5
	17	55.9	81.7	42.1	68.0	64.0	59.0	57.0	51.0	48.0	45.0	44.0	43.0	55.9	0.0	55.9
	18	47.9	63.2	43.1	55.0	53.0	50.0	49.0	47.0	46.0	44.0	44.0	43.0	47.9	0.0	47.9
Evening	19	46.9	59.2	42.4	52.0	51.0	49.0	48.0	47.0	46.0	44.0	44.0	43.0	46.9	5.0	51.9
	20	46.9	59.4	41.2	54.0	52.0	50.0	49.0	47.0	45.0	43.0	43.0	42.0	46.9	5.0	51.9
	21	49.9	71.9	41.1	55.0	54.0	53.0	53.0	48.0	45.0	43.0	43.0	41.0	49.9	5.0	54.9
Night	22	43.1	52.0	39.4	48.0	47.0	45.0	45.0	43.0	42.0	41.0	40.0	39.0	43.1	10.0	53.1
	23	42.6	59.1	38.7	49.0	48.0	46.0	45.0	42.0	41.0	39.0	39.0	39.0	42.6	10.0	52.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	47.4	63.2	39.3	55.0	53.0	50.0	48.0	45.0	43.0	41.0	41.0	39.0
	Max	57.3	87.4	43.1	69.0	64.0	60.0	58.0	52.0	49.0	45.0	44.0	43.0
Energy Average		52.9	Average:		60.2	57.1	53.7	52.1	48.2	46.0	43.2	42.8	41.7
Evening	Min	46.9	59.2	41.1	52.0	51.0	49.0	48.0	47.0	45.0	43.0	43.0	41.0
	Max	49.9	71.9	42.4	55.0	54.0	53.0	53.0	48.0	46.0	44.0	44.0	43.0
Energy Average		48.1	Average:		53.7	52.3	50.7	50.0	47.3	45.3	43.3	43.3	42.0
Night	Min	39.3	47.9	36.4	44.0	43.0	42.0	41.0	39.0	39.0	36.0	36.0	36.0
	Max	47.5	65.1	41.1	55.0	53.0	53.0	53.0	47.0	46.0	43.0	42.0	41.0
Energy Average		44.8	Average:		50.0	48.9	47.2	46.4	43.3	42.1	40.0	39.6	39.0

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
50.7	52.3	44.8

24-Hour CNEL (dBA)
53.8

24-Hour Noise Level Measurement Summary

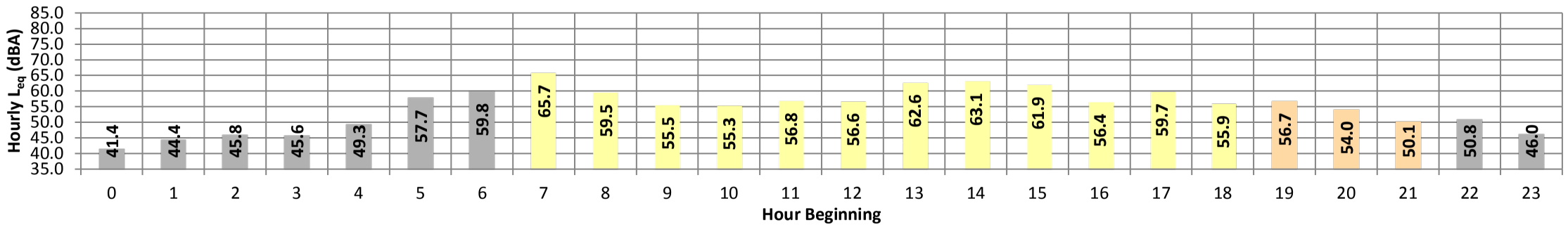
Date: Wednesday, May 01, 2019
Project: Gun Shooting Range/ Tactical Training Facility

Location: L4 - Located on Canyon Drive, south of the Project site, near an existing single-family residential neighborhood and vacant land use area.

Meter: Piccolo I

JN: 11776
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	41.4	55.8	36.1	46.0	45.0	44.0	43.0	42.0	40.0	39.0	38.0	36.0	41.4	10.0	51.4
	1	44.4	73.3	36.1	48.0	46.0	44.0	44.0	42.0	40.0	36.0	36.0	36.0	44.4	10.0	54.4
	2	45.8	69.8	36.1	52.0	49.0	47.0	46.0	44.0	42.0	39.0	39.0	39.0	45.8	10.0	55.8
	3	45.6	65.8	36.1	53.0	51.0	49.0	48.0	45.0	43.0	39.0	39.0	36.0	45.6	10.0	55.6
	4	49.3	72.2	36.1	59.0	56.0	52.0	50.0	47.0	44.0	41.0	40.0	37.0	49.3	10.0	59.3
	5	57.7	81.9	39.1	69.0	67.0	63.0	60.0	53.0	49.0	43.0	42.0	40.0	57.7	10.0	67.7
	6	59.8	79.8	39.1	71.0	69.0	66.0	64.0	54.0	49.0	43.0	42.0	40.0	59.8	10.0	69.8
Day	7	65.7	87.5	41.9	75.0	73.0	71.0	70.0	65.0	57.0	46.0	45.0	42.0	65.7	0.0	65.7
	8	59.5	88.8	38.9	70.0	68.0	63.0	60.0	49.0	45.0	40.0	40.0	39.0	59.5	0.0	59.5
	9	55.5	78.0	38.8	68.0	65.0	60.0	57.0	48.0	45.0	41.0	40.0	39.0	55.5	0.0	55.5
	10	55.3	76.2	39.1	67.0	65.0	61.0	58.0	50.0	46.0	42.0	41.0	40.0	55.3	0.0	55.3
	11	56.8	83.9	39.0	68.0	66.0	61.0	57.0	49.0	46.0	42.0	41.0	40.0	56.8	0.0	56.8
	12	56.6	77.6	39.1	69.0	67.0	62.0	59.0	50.0	46.0	42.0	41.0	40.0	56.6	0.0	56.6
	13	62.6	85.1	39.6	74.0	71.0	68.0	66.0	59.0	50.0	43.0	42.0	40.0	62.6	0.0	62.6
	14	63.1	87.3	40.1	72.0	70.0	68.0	66.0	61.0	54.0	45.0	44.0	42.0	63.1	0.0	63.1
	15	61.9	90.4	39.1	70.0	68.0	64.0	62.0	53.0	47.0	43.0	42.0	40.0	61.9	0.0	61.9
	16	56.4	79.2	39.3	68.0	66.0	62.0	59.0	51.0	47.0	43.0	42.0	40.0	56.4	0.0	56.4
	17	59.7	90.6	40.1	69.0	66.0	62.0	58.0	49.0	46.0	42.0	42.0	40.0	59.7	0.0	59.7
	18	55.9	79.9	40.6	68.0	66.0	61.0	58.0	49.0	46.0	43.0	43.0	41.0	55.9	0.0	55.9
Evening	19	56.7	81.4	42.0	68.0	66.0	61.0	57.0	51.0	49.0	45.0	44.0	42.0	56.7	5.0	61.7
	20	54.0	78.9	40.2	66.0	63.0	56.0	53.0	49.0	47.0	43.0	42.0	40.0	54.0	5.0	59.0
	21	50.1	71.4	39.5	63.0	57.0	51.0	49.0	47.0	45.0	42.0	41.0	40.0	50.1	5.0	55.1
Night	22	50.8	77.3	38.6	64.0	59.0	50.0	47.0	44.0	42.0	39.0	39.0	39.0	50.8	10.0	60.8
	23	46.0	70.9	36.1	56.0	51.0	46.0	45.0	42.0	40.0	36.0	36.0	36.0	46.0	10.0	56.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	55.3	76.2	38.8	67.0	65.0	60.0	57.0	48.0	45.0	40.0	40.0	39.0
	Max	65.7	90.6	41.9	75.0	73.0	71.0	70.0	65.0	57.0	46.0	45.0	42.0
Energy Average		60.5	Average:		69.8	67.6	63.6	60.8	52.8	47.9	42.7	41.9	40.3
Evening	Min	50.1	71.4	39.5	63.0	57.0	51.0	49.0	47.0	45.0	42.0	41.0	40.0
	Max	56.7	81.4	42.0	68.0	66.0	61.0	57.0	51.0	49.0	45.0	44.0	42.0
Energy Average		54.4	Average:		65.7	62.0	56.0	53.0	49.0	47.0	43.3	42.3	40.7
Night	Min	41.4	55.8	36.1	46.0	45.0	44.0	43.0	42.0	40.0	36.0	36.0	36.0
	Max	59.8	81.9	39.1	71.0	69.0	66.0	64.0	54.0	49.0	43.0	42.0	40.0
Energy Average		53.3	Average:		57.6	54.8	51.2	49.7	45.9	43.2	39.4	39.0	37.7

L_{eq} (dBA)		
24-Hour	*Daytime*	*Nighttime*
58.3	**59.8**	**53.3**

24-Hour CNEL (dBA)

61.6

24-Hour Noise Level Measurement Summary

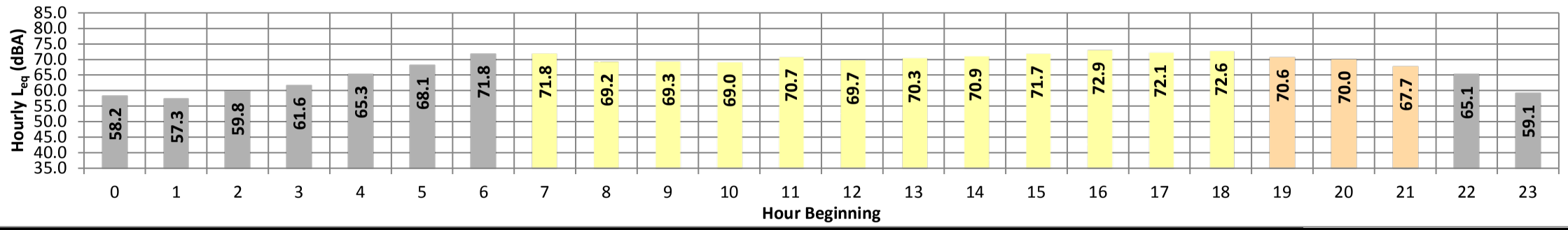
Date: Wednesday, May 01, 2019
Project: Gun Shooting Range/ Tactical Training Facility

Location: L5 - Located on Mission Trail, southwest of the Project site, near a vacant land use area and Wildomar Library.

Meter: Piccolo I

JN: 11776
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	58.2	84.0	37.6	71.0	68.0	61.0	56.0	44.0	42.0	40.0	39.0	38.0	58.2	10.0	68.2
	1	57.3	81.2	35.9	71.0	66.0	58.0	54.0	44.0	42.0	38.0	36.0	35.0	57.3	10.0	67.3
	2	59.8	83.7	40.6	73.0	70.0	64.0	60.0	50.0	47.0	43.0	42.0	41.0	59.8	10.0	69.8
	3	61.6	84.5	38.9	74.0	71.0	67.0	64.0	53.0	49.0	43.0	42.0	40.0	61.6	10.0	71.6
	4	65.3	90.0	41.4	77.0	74.0	71.0	69.0	60.0	54.0	47.0	46.0	43.0	65.3	10.0	75.3
	5	68.1	92.0	40.7	79.0	77.0	74.0	72.0	65.0	57.0	46.0	44.0	42.0	68.1	10.0	78.1
	6	71.8	91.1	44.6	81.0	80.0	78.0	76.0	71.0	66.0	53.0	50.0	47.0	71.8	10.0	81.8
Day	7	71.8	90.7	46.1	81.0	80.0	78.0	76.0	71.0	67.0	55.0	52.0	49.0	71.8	0.0	71.8
	8	69.2	89.0	41.7	80.0	78.0	75.0	74.0	67.0	61.0	48.0	45.0	43.0	69.2	0.0	69.2
	9	69.3	90.1	41.8	80.0	78.0	75.0	74.0	67.0	60.0	47.0	45.0	43.0	69.3	0.0	69.3
	10	69.0	87.4	41.9	79.0	78.0	75.0	74.0	67.0	60.0	48.0	46.0	43.0	69.0	0.0	69.0
	11	70.7	93.8	41.9	81.0	79.0	77.0	75.0	68.0	61.0	48.0	46.0	43.0	70.7	0.0	70.7
	12	69.7	88.1	41.7	80.0	79.0	76.0	74.0	68.0	61.0	46.0	45.0	43.0	69.7	0.0	69.7
	13	70.3	88.7	41.8	81.0	79.0	76.0	75.0	69.0	63.0	48.0	46.0	43.0	70.3	0.0	70.3
	14	70.9	90.2	43.3	80.0	79.0	77.0	75.0	70.0	64.0	52.0	50.0	47.0	70.9	0.0	70.9
	15	71.7	94.5	42.7	81.0	80.0	77.0	76.0	70.0	64.0	51.0	48.0	45.0	71.7	0.0	71.7
	16	72.9	92.8	42.6	83.0	81.0	79.0	77.0	71.0	65.0	53.0	50.0	46.0	72.9	0.0	72.9
	17	72.1	93.4	44.6	81.0	80.0	78.0	77.0	71.0	65.0	51.0	49.0	46.0	72.1	0.0	72.1
	18	72.6	95.0	45.5	82.0	81.0	78.0	77.0	71.0	65.0	52.0	50.0	47.0	72.6	0.0	72.6
Evening	19	70.6	89.3	47.0	81.0	79.0	77.0	75.0	69.0	64.0	53.0	51.0	49.0	70.6	5.0	75.6
	20	70.0	92.6	43.7	80.0	79.0	76.0	74.0	67.0	60.0	49.0	48.0	46.0	70.0	5.0	75.0
	21	67.7	94.8	43.9	78.0	77.0	74.0	71.0	63.0	54.0	46.0	45.0	44.0	67.7	5.0	72.7
Night	22	65.1	89.2	41.2	77.0	75.0	71.0	68.0	58.0	49.0	44.0	43.0	42.0	65.1	10.0	75.1
	23	59.1	81.9	38.9	73.0	69.0	63.0	60.0	48.0	45.0	41.0	41.0	40.0	59.1	10.0	69.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	69.0	87.4	41.7	79.0	78.0	75.0	74.0	67.0	60.0	46.0	45.0	43.0
	Max	72.9	95.0	46.1	83.0	81.0	79.0	77.0	71.0	67.0	55.0	52.0	49.0
Energy Average		71.0	Average:		80.8	79.3	76.8	75.3	69.2	63.0	49.9	47.7	44.8
Evening	Min	67.7	89.3	43.7	78.0	77.0	74.0	71.0	63.0	54.0	46.0	45.0	44.0
	Max	70.6	94.8	47.0	81.0	79.0	77.0	75.0	69.0	64.0	53.0	51.0	49.0
Energy Average		69.6	Average:		79.7	78.3	75.7	73.3	66.3	59.3	49.3	48.0	46.3
Night	Min	57.3	81.2	35.9	71.0	66.0	58.0	54.0	44.0	42.0	38.0	36.0	35.0
	Max	71.8	92.0	44.6	81.0	80.0	78.0	76.0	71.0	66.0	53.0	50.0	47.0
Energy Average		65.6	Average:		75.1	72.2	67.4	64.3	54.8	50.1	43.9	42.6	40.9

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
69.5	70.8	65.6

24-Hour CNEL (dBA)
73.7

24-Hour Noise Level Measurement Summary

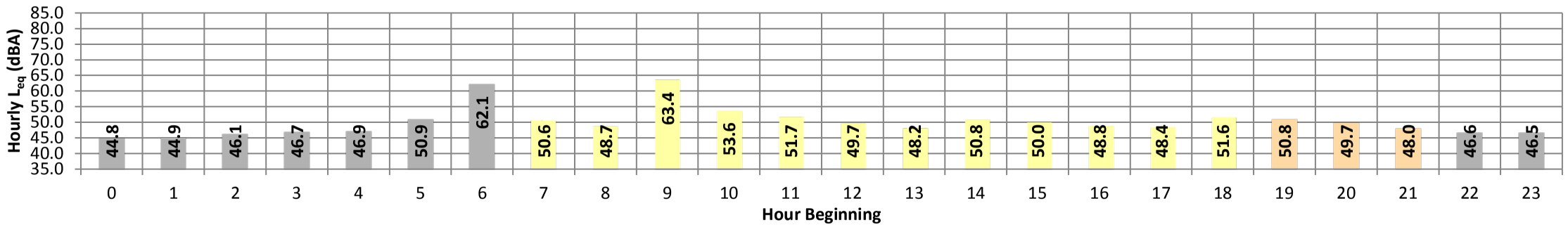
Date: Wednesday, May 01, 2019
Project: Gun Shooting Range/ Tactical Training Facility

Location: L6 - Located on Beecher Street Trail, southwest of the Project site, near existing rural-residential homes.

Meter: Piccolo I

JN: 11776
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	44.8	50.8	44.0	46.0	46.0	45.0	45.0	44.0	44.0	44.0	44.0	44.0	44.8	10.0	54.8
	1	44.9	52.0	43.3	48.0	47.0	46.0	45.0	45.0	44.0	44.0	44.0	44.0	44.9	10.0	54.9
	2	46.1	51.5	44.4	48.0	48.0	47.0	47.0	46.0	45.0	44.0	44.0	44.0	46.1	10.0	56.1
	3	46.7	54.9	43.9	51.0	50.0	49.0	48.0	47.0	46.0	44.0	44.0	44.0	46.7	10.0	56.7
	4	46.9	53.4	44.0	50.0	49.0	48.0	48.0	47.0	46.0	45.0	44.0	44.0	46.9	10.0	56.9
	5	50.9	76.0	44.7	63.0	59.0	51.0	49.0	47.0	47.0	45.0	45.0	45.0	50.9	10.0	60.9
	6	62.1	90.4	45.1	71.0	66.0	57.0	52.0	49.0	48.0	46.0	46.0	45.0	62.1	10.0	72.1
Day	7	50.6	71.0	46.2	56.0	55.0	53.0	52.0	50.0	49.0	47.0	47.0	46.0	50.6	0.0	50.6
	8	48.7	61.1	44.9	54.0	52.0	51.0	50.0	49.0	48.0	46.0	46.0	45.0	48.7	0.0	48.7
	9	63.4	87.0	45.6	77.0	71.0	56.0	54.0	50.0	49.0	47.0	47.0	46.0	63.4	0.0	63.4
	10	53.6	76.3	44.8	64.0	59.0	55.0	54.0	51.0	49.0	47.0	47.0	45.0	53.6	0.0	53.6
	11	51.7	68.2	43.8	62.0	61.0	56.0	54.0	50.0	48.0	46.0	45.0	45.0	51.7	0.0	51.7
	12	49.7	69.6	43.9	60.0	58.0	54.0	51.0	48.0	47.0	45.0	44.0	44.0	49.7	0.0	49.7
	13	48.2	65.7	43.5	56.0	53.0	51.0	50.0	48.0	46.0	45.0	44.0	44.0	48.2	0.0	48.2
	14	50.8	66.0	44.8	60.0	59.0	56.0	54.0	49.0	47.0	46.0	45.0	45.0	50.8	0.0	50.8
	15	50.0	66.3	43.7	59.0	57.0	54.0	53.0	49.0	47.0	45.0	45.0	44.0	50.0	0.0	50.0
	16	48.8	63.6	43.1	57.0	56.0	53.0	51.0	48.0	46.0	44.0	44.0	43.0	48.8	0.0	48.8
	17	48.4	64.7	43.0	55.0	53.0	51.0	50.0	48.0	47.0	45.0	44.0	44.0	48.4	0.0	48.4
	18	51.6	76.1	44.7	59.0	57.0	53.0	51.0	49.0	48.0	46.0	46.0	45.0	51.6	0.0	51.6
Evening	19	50.8	74.2	46.2	61.0	56.0	52.0	51.0	49.0	48.0	47.0	47.0	46.0	50.8	5.0	55.8
	20	49.7	67.7	45.9	57.0	55.0	52.0	51.0	49.0	48.0	47.0	46.0	46.0	49.7	5.0	54.7
	21	48.0	58.9	45.3	53.0	52.0	50.0	49.0	48.0	47.0	46.0	46.0	45.0	48.0	5.0	53.0
Night	22	46.6	54.6	45.1	49.0	48.0	48.0	47.0	46.0	46.0	45.0	45.0	45.0	46.6	10.0	56.6
	23	46.5	52.8	44.7	49.0	48.0	48.0	47.0	46.0	46.0	45.0	45.0	45.0	46.5	10.0	56.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	48.2	61.1	43.0	54.0	52.0	51.0	50.0	48.0	46.0	44.0	44.0	43.0
	Max	63.4	87.0	46.2	77.0	71.0	56.0	54.0	51.0	49.0	47.0	47.0	46.0
Energy Average		54.6	Average:		59.9	57.6	53.6	52.0	49.1	47.6	45.8	45.3	44.7
Evening	Min	48.0	58.9	45.3	53.0	52.0	50.0	49.0	48.0	47.0	46.0	46.0	45.0
	Max	50.8	74.2	46.2	61.0	56.0	52.0	51.0	49.0	48.0	47.0	47.0	46.0
Energy Average		49.6	Average:		57.0	54.3	51.3	50.3	48.7	47.7	46.7	46.3	45.7
Night	Min	44.8	50.8	43.3	46.0	46.0	45.0	45.0	44.0	44.0	44.0	44.0	44.0
	Max	62.1	90.4	45.1	71.0	66.0	57.0	52.0	49.0	48.0	46.0	46.0	45.0
Energy Average		53.5	Average:		52.8	51.2	48.8	47.6	46.3	45.8	44.7	44.6	44.4

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
53.8	53.9	53.5

24-Hour CNEL (dBA)
60.1

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Mission Tr.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,410 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.92	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-18.15	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-22.11	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	65.0	58.9	67.5	68.1
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	70.3	68.6	65.5	60.7	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	54	172	544	1,720
CNEL:	61	192	606	1,915

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Mission Tr.
Road Segment: s/o Dwy. 1

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	930 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-2.72	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-19.96	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-23.92	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	60.4	58.9	52.5	51.0	59.4	59.7
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	68.5	66.8	63.7	58.9	67.5	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	113	359	1,134
CNEL:	40	126	399	1,263

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Orchard St.
Road Segment: s/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	90 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-9.86	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-27.09	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-31.05	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.1	49.2	47.4	41.3	50.0	50.6
Medium Trucks:	45.9	44.4	38.1	36.5	45.0	45.2
Heavy Trucks:	49.1	47.7	38.7	39.9	48.3	48.4
Vehicle Noise:	54.0	52.3	48.4	44.5	53.0	53.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	2	6	19
CNEL:	1	2	6	21

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Almond St.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	150 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-7.64	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-24.88	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-28.83	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.3	51.4	49.6	43.6	52.2	52.8
Medium Trucks:	48.1	46.6	40.3	38.7	47.2	47.4
Heavy Trucks:	51.4	49.9	40.9	42.1	50.5	50.6
Vehicle Noise:	56.2	54.5	50.6	46.7	55.2	55.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	10	31
CNEL:	1	3	11	34

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Bundy Canyon Rd.
Road Segment: e/o Dwy. 2

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,030 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.82	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-19.06	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-23.02	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.0	63.1	61.4	55.3	63.9	64.5
Medium Trucks:	58.8	57.3	50.9	49.4	57.8	58.1
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	66.9	65.1	62.0	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	92	292	922
CNEL:	32	102	324	1,025

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Bundy Canyon Rd.
Road Segment: w/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,110 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.50	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.74	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.69	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.4	63.5	61.7	55.6	64.3	64.9
Medium Trucks:	59.1	57.6	51.2	49.7	58.2	58.4
Heavy Trucks:	60.0	58.5	49.5	50.8	59.1	59.2
Vehicle Noise:	67.2	65.5	62.3	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	99	314	994
CNEL:	35	110	349	1,105

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Bundy Canyon Rd.
Road Segment: e/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,180 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.23	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.47	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.43	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	67.5	65.7	62.6	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	106	334	1,057
CNEL:	37	117	371	1,174

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Bundy Canyon Rd.
Road Segment: w/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,180 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.23	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.47	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.43	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	67.5	65.7	62.6	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	106	334	1,057
CNEL:	37	117	371	1,174

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Bundy Canyon Rd.
Road Segment: e/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,250 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.98	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.22	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.18	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.2	64.8	65.4
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	60.5	59.1	50.0	51.3	59.6	59.8
Vehicle Noise:	67.7	66.0	62.8	58.1	66.7	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	112	354	1,120
CNEL:	39	124	393	1,244

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Mission Tr.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,450 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.79	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-18.03	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-21.99	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.1	59.0	67.7	68.3
Medium Trucks:	62.3	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	70.4	68.7	65.7	60.9	69.4	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	177	559	1,769
CNEL:	62	197	623	1,970

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Mission Tr.
Road Segment: s/o Dwy. 1

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	960 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-2.59	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-19.82	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-23.78	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.0	65.1	63.3	57.2	65.9	66.5
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	61.0	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.7	66.9	63.9	59.1	67.6	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	117	370	1,171
CNEL:	41	130	412	1,304

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Orchard St.
Road Segment: s/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-9.40	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-26.64	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-30.59	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.5	49.6	47.8	41.8	50.4	51.0
Medium Trucks:	46.4	44.9	38.5	37.0	45.4	45.7
Heavy Trucks:	49.6	48.2	39.1	40.4	48.7	48.9
Vehicle Noise:	54.4	52.7	48.8	44.9	53.4	53.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	2	7	21
CNEL:	1	2	7	23

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Almond St.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	160 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-7.36	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-24.60	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-28.55	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.6	51.7	49.9	43.8	52.5	53.1
Medium Trucks:	48.4	46.9	40.6	39.0	47.5	47.7
Heavy Trucks:	51.6	50.2	41.2	42.4	50.8	50.9
Vehicle Noise:	56.5	54.8	50.9	47.0	55.5	55.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	11	33
CNEL:	1	4	12	36

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Dwy. 2

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,090 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.58	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.82	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.77	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.0	57.5	51.2	49.6	58.1	58.3
Heavy Trucks:	59.9	58.5	49.4	50.7	59.0	59.2
Vehicle Noise:	67.1	65.4	62.2	57.5	66.1	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	98	309	976
CNEL:	34	108	343	1,085

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Bundy Canyon Rd.
Road Segment: w/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,170 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.27	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.51	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.46	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	59.3	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	60.2	58.8	49.7	51.0	59.3	59.5
Vehicle Noise:	67.4	65.7	62.5	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	105	331	1,048
CNEL:	37	116	368	1,164

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,240 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.02	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.26	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.21	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.2	56.1	64.7	65.3
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	60.4	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.7	65.9	62.8	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	111	351	1,111
CNEL:	39	123	390	1,234

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Bundy Canyon Rd.
Road Segment: w/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,230 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.05	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.29	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.25	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.1	56.1	64.7	65.3
Medium Trucks:	59.6	58.1	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.6	65.9	62.7	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	110	348	1,102
CNEL:	39	122	387	1,224

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,300 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.81	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.05	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.01	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.0	64.1	62.4	56.3	64.9	65.6
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.9	66.1	63.0	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	116	368	1,164
CNEL:	41	129	409	1,294

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Mission Tr.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,540 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.53	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-17.77	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-21.73	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.0	67.1	65.3	59.3	67.9	68.5
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.3
Vehicle Noise:	70.7	69.0	65.9	61.1	69.7	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	59	188	594	1,879
CNEL:	66	209	662	2,092

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Mission Tr.
Road Segment: s/o Dwy. 1

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	960 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-2.59	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-19.82	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-23.78	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.0	65.1	63.3	57.2	65.9	66.5
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	61.0	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.7	66.9	63.9	59.1	67.6	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	117	370	1,171
CNEL:	41	130	412	1,304

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Orchard St.
Road Segment: s/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	110 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.98	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-26.22	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-30.18	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.9	50.0	48.3	42.2	50.8	51.4
Medium Trucks:	46.8	45.3	38.9	37.4	45.8	46.1
Heavy Trucks:	50.0	48.6	39.6	40.8	49.2	49.3
Vehicle Noise:	54.8	53.2	49.2	45.3	53.8	54.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	2	7	23
CNEL:	1	3	8	25

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Almond St.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	170 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-7.09	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-24.33	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-28.29	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.8	51.9	50.2	44.1	52.7	53.3
Medium Trucks:	48.7	47.2	40.8	39.3	47.7	48.0
Heavy Trucks:	51.9	50.5	41.4	42.7	51.0	51.2
Vehicle Noise:	56.7	55.0	51.1	47.2	55.7	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	4	11	35
CNEL:	1	4	12	39

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Bundy Canyon Rd.
Road Segment: e/o Dwy. 2

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,160 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.31	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.54	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.50	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.5	63.7	61.9	55.8	64.5	65.1
Medium Trucks:	59.3	57.8	51.4	49.9	58.4	58.6
Heavy Trucks:	60.2	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	67.4	65.6	62.5	57.8	66.4	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	104	329	1,039
CNEL:	37	115	365	1,154

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Bundy Canyon Rd.
Road Segment: w/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,240 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.02	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.26	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.21	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.2	56.1	64.7	65.3
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	60.4	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.7	65.9	62.8	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	111	351	1,111
CNEL:	39	123	390	1,234

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Bundy Canyon Rd.
Road Segment: e/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,340 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.68	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-17.92	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.87	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	59.9	58.4	52.1	50.5	59.0	59.2
Heavy Trucks:	60.8	59.4	50.3	51.6	59.9	60.1
Vehicle Noise:	68.0	66.3	63.1	58.4	67.0	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	120	380	1,200
CNEL:	42	133	422	1,333

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Bundy Canyon Rd.
Road Segment: w/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,340 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.68	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-17.92	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.87	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	59.9	58.4	52.1	50.5	59.0	59.2
Heavy Trucks:	60.8	59.4	50.3	51.6	59.9	60.1
Vehicle Noise:	68.0	66.3	63.1	58.4	67.0	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	120	380	1,200
CNEL:	42	133	422	1,333

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY
Road Name: Bundy Canyon Rd.
Road Segment: e/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,420 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.43	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-17.67	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.62	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	64.5	62.8	56.7	65.3	65.9
Medium Trucks:	60.2	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	68.3	66.5	63.4	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	127	402	1,272
CNEL:	45	141	447	1,413

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Mission Tr.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,570	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	58	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	64.0	feet
Centerline Dist. to Observer:	64.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.45	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-17.69	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-21.64	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.4	59.4	68.0	68.6
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	61.9
Heavy Trucks:	63.1	61.7	52.6	53.9	62.2	62.4
Vehicle Noise:	70.8	69.0	66.0	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	61	192	606	1,915
CNEL:	67	213	674	2,133

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Mission Tr.
Road Segment: s/o Dwy. 1

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	990 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-2.45	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-19.69	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-23.65	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.1	65.2	63.4	57.4	66.0	66.6
Medium Trucks:	60.7	59.2	52.8	51.2	59.7	59.9
Heavy Trucks:	61.1	59.7	50.6	51.9	60.2	60.4
Vehicle Noise:	68.8	67.0	64.0	59.2	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	121	382	1,208
CNEL:	43	134	425	1,345

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Orchard St.
Road Segment: s/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	120 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.61	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-25.84	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-29.80	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.3	50.4	48.6	42.6	51.2	51.8
Medium Trucks:	47.2	45.7	39.3	37.8	46.2	46.4
Heavy Trucks:	50.4	49.0	39.9	41.2	49.5	49.7
Vehicle Noise:	55.2	53.5	49.6	45.7	54.2	54.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	8	25
CNEL:	1	3	9	27

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Almond St.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	180 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-6.85	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-24.08	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-28.04	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.1	52.2	50.4	44.3	53.0	53.6
Medium Trucks:	48.9	47.4	41.1	39.5	48.0	48.2
Heavy Trucks:	52.1	50.7	41.7	42.9	51.3	51.4
Vehicle Noise:	57.0	55.3	51.4	47.5	56.0	56.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	4	12	38
CNEL:	1	4	13	41

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Dwy. 2

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,230 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.05	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.29	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.25	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.1	56.1	64.7	65.3
Medium Trucks:	59.6	58.1	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.6	65.9	62.7	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	110	348	1,102
CNEL:	39	122	387	1,224

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Bundy Canyon Rd.
Road Segment: w/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.78	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-18.02	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.97	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.8	58.3	52.0	50.4	58.9	59.1
Heavy Trucks:	60.7	59.3	50.2	51.5	59.8	60.0
Vehicle Noise:	67.9	66.2	63.0	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	117	371	1,173
CNEL:	41	130	412	1,304

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,390	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.52	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-17.76	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.72	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	124	394	1,245
CNEL:	44	138	437	1,383

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Bundy Canyon Rd.
Road Segment: w/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,390	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.52	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-17.76	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.72	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	124	394	1,245
CNEL:	44	138	437	1,383

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,470	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.28	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-17.52	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.47	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	60.3	58.8	52.5	50.9	59.4	59.6
Heavy Trucks:	61.2	59.8	50.7	52.0	60.3	60.5
Vehicle Noise:	68.4	66.7	63.5	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	132	416	1,317
CNEL:	46	146	463	1,463

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Mission Tr.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,340 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.28	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-15.95	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-19.91	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.8	68.9	67.2	61.1	69.7	70.3
Medium Trucks:	64.4	62.9	56.5	55.0	63.4	63.7
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	72.5	70.8	67.7	62.9	71.5	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	90	285	903	2,854
CNEL:	101	318	1,005	3,179

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Mission Tr.
Road Segment: s/o Dwy. 1

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,650 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.23	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-17.47	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-21.43	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.3	67.4	65.6	59.6	68.2	68.8
Medium Trucks:	62.9	61.4	55.0	53.5	61.9	62.2
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	71.0	69.3	66.2	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	64	201	636	2,013
CNEL:	71	224	709	2,241

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Orchard St.
Road Segment: s/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	120 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.61	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-25.84	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-29.80	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.3	50.4	48.6	42.6	51.2	51.8
Medium Trucks:	47.2	45.7	39.3	37.8	46.2	46.4
Heavy Trucks:	50.4	49.0	39.9	41.2	49.5	49.7
Vehicle Noise:	55.2	53.5	49.6	45.7	54.2	54.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	8	25
CNEL:	1	3	9	27

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Almond St.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	190 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-6.61	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-23.85	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-27.80	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.3	52.4	50.6	44.6	53.2	53.8
Medium Trucks:	49.2	47.7	41.3	39.8	48.2	48.4
Heavy Trucks:	52.4	51.0	41.9	43.2	51.5	51.7
Vehicle Noise:	57.2	55.5	51.6	47.7	56.2	56.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	4	13	40
CNEL:	1	4	14	43

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Bundy Canyon Rd.
Road Segment: e/o Dwy. 2

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,430 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.40	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.84	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.79	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.3	68.4	66.6	60.5	69.2	69.8
Medium Trucks:	64.0	62.5	56.1	54.6	63.1	63.3
Heavy Trucks:	64.9	63.4	54.4	55.7	64.0	64.1
Vehicle Noise:	72.1	70.4	67.2	62.5	71.1	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	97	307	971	3,072
CNEL:	108	341	1,079	3,413

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Bundy Canyon Rd.
Road Segment: w/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,430 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.40	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.84	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.79	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.3	68.4	66.6	60.5	69.2	69.8
Medium Trucks:	64.0	62.5	56.1	54.6	63.1	63.3
Heavy Trucks:	64.9	63.4	54.4	55.7	64.0	64.1
Vehicle Noise:	72.1	70.4	67.2	62.5	71.1	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	97	307	971	3,072
CNEL:	108	341	1,079	3,413

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Bundy Canyon Rd.
Road Segment: e/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,520 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.06	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.18	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.13	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.9	67.0	65.3	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	70.8	69.0	65.9	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	71	226	714	2,257
CNEL:	79	251	793	2,508

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Bundy Canyon Rd.
Road Segment: w/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,520	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.06	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.18	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.13	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.9	67.0	65.3	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	70.8	69.0	65.9	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	71	226	714	2,257
CNEL:	79	251	793	2,508

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Bundy Canyon Rd.
Road Segment: e/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,530	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	54	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.08	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.16	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.11	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.9	67.0	65.3	59.2	67.8	68.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	70.8	69.0	65.9	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	72	227	717	2,266
CNEL:	80	252	796	2,517

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Mission Tr.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,370 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.34	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-15.90	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-19.86	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	64.5	62.9	56.6	55.0	63.5	63.7
Heavy Trucks:	64.9	63.5	54.4	55.7	64.0	64.1
Vehicle Noise:	72.6	70.8	67.8	63.0	71.5	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	91	289	914	2,891
CNEL:	102	322	1,018	3,219

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Mission Tr.
Road Segment: s/o Dwy. 1

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,680 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.271
Medium Trucks:	57.117
Heavy Trucks:	57.132

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.16	-0.66	0.00	*-4.70*	0.000	0.000
Medium Trucks:	81.00	-17.39	-0.65	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-21.35	-0.65	0.00	*-5.31*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.0	61.5	55.1	53.5	62.0	62.2
Heavy Trucks:	63.4	62.0	52.9	54.2	62.5	62.7
Vehicle Noise:	71.1	69.3	66.3	61.5	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	65	205	648	2,049
CNEL:	72	228	722	2,282

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Orchard St.
Road Segment: s/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	130 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.26	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-25.50	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-29.45	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.7	50.8	49.0	42.9	51.6	52.2
Medium Trucks:	47.5	46.0	39.6	38.1	46.6	46.8
Heavy Trucks:	50.7	49.3	40.3	41.5	49.9	50.0
Vehicle Noise:	55.6	53.9	50.0	46.1	54.6	54.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	9	27
CNEL:	1	3	9	30

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Almond St.
Road Segment: n/o Bundy Canyon Rd.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	200 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-6.39	2.18	0.00	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-23.63	2.22	0.00	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-27.58	2.22	0.00	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.5	52.6	50.9	44.8	53.4	54.0
Medium Trucks:	49.4	47.9	41.5	40.0	48.4	48.7
Heavy Trucks:	52.6	51.2	42.1	43.4	51.8	51.9
Vehicle Noise:	57.4	55.7	51.8	47.9	56.4	56.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	4	13	42
CNEL:	1	5	14	46

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Dwy. 2

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,490 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.48	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.76	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.72	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.3	68.4	66.7	60.6	69.2	69.8
Medium Trucks:	64.1	62.6	56.2	54.7	63.1	63.4
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.2	70.4	67.3	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	99	313	988	3,126
CNEL:	110	347	1,098	3,473

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Bundy Canyon Rd.
Road Segment: w/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,490 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.48	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.76	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.72	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.3	68.4	66.7	60.6	69.2	69.8
Medium Trucks:	64.1	62.6	56.2	54.7	63.1	63.4
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.2	70.4	67.3	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	99	313	988	3,126
CNEL:	110	347	1,098	3,473

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Orchard St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,580 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.17	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.07	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.03	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.0	67.1	65.4	59.3	67.9	68.5
Medium Trucks:	62.8	61.3	54.9	53.4	61.8	62.1
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.9	69.1	66.0	61.3	69.8	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	73	231	731	2,311
CNEL:	81	257	812	2,567

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Bundy Canyon Rd.
Road Segment: w/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,580 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.17	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.07	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.03	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.0	67.1	65.4	59.3	67.9	68.5
Medium Trucks:	62.8	61.3	54.9	53.4	61.8	62.1
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.9	69.1	66.0	61.3	69.8	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	73	231	731	2,311
CNEL:	81	257	812	2,567

Tuesday, May 21, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P
Road Name: Bundy Canyon Rd.
Road Segment: e/o Almond St.

Project Name: Gun Range
Job Number: 11776

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,570 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	54 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.218
Medium Trucks:	71.094
Heavy Trucks:	71.106

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.15	-1.61	0.00	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.09	-1.60	0.00	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.05	-1.60	0.00	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.0	67.1	65.3	59.3	67.9	68.5
Medium Trucks:	62.8	61.3	54.9	53.3	61.8	62.0
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.8	69.1	65.9	61.3	69.8	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	73	230	728	2,302
CNEL:	81	256	809	2,557

Tuesday, May 21, 2019

APPENDIX 9.1:

OPERATIONAL NOISE LEVEL CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R1**
Source: Indoor Shooting Range
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	158.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	158.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	51.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	158.0	-24.0	-24.0	-24.0	-24.0	-24.0	-24.0
Shielding (Barrier Attenuation)	158.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		27.7	-24.0	-24.0	-24.0	-24.0	-24.0
60 Minute Hourly Adjustment		**27.7**	**-24.0**	**-24.0**	**-24.0**	**-24.0**	**-24.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R1**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	116.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	116.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	116.0	-27.3	-27.3	-27.3	-27.3	-27.3	-27.3
Shielding (Barrier Attenuation)	116.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		32.8	-27.3	-27.3	-27.3	-27.3	-27.3
60 Minute Hourly Adjustment		**32.8**	**-27.3**	**-27.3**	**-27.3**	**-27.3**	**-27.3**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R1**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	235.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	5.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	230.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	235.0	-33.4	-33.4	-33.4	-33.4	-33.4	-33.4
Shielding (Barrier Attenuation)	5.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Raw (Distance + Barrier)		37.9	-39.4	-39.4	-39.4	-39.4	-39.4
60 Minute Hourly Adjustment		**37.9**	**-39.4**	**-39.4**	**-39.4**	**-39.4**	**-39.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R1**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	163.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	163.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	20.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	163.0	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Shielding (Barrier Attenuation)	163.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		46.9	-30.3	-30.3	-30.3	-30.3	-30.3
39 Minute Hourly Adjustment		**45.0**	**-32.2**	**-32.2**	**-32.2**	**-32.2**	**-32.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R2**
Source: Indoor Shooting Range
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	106.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	106.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	51.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	106.0	-20.5	-20.5	-20.5	-20.5	-20.5	-20.5
Shielding (Barrier Attenuation)	106.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.2	-20.5	-20.5	-20.5	-20.5	-20.5
60 Minute Hourly Adjustment		**31.2**	**-20.5**	**-20.5**	**-20.5**	**-20.5**	**-20.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R2**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	48.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	48.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	48.0	-19.6	-19.6	-19.6	-19.6	-19.6	-19.6
Shielding (Barrier Attenuation)	48.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		40.5	-19.6	-19.6	-19.6	-19.6	-19.6
60 Minute Hourly Adjustment		**40.5**	**-19.6**	**-19.6**	**-19.6**	**-19.6**	**-19.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R2**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	54.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	5.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	49.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	54.0	-20.7	-20.7	-20.7	-20.7	-20.7	-20.7
Shielding (Barrier Attenuation)	5.0	-6.1	-6.1	-6.1	-6.1	-6.1	-6.1
Raw (Distance + Barrier)		50.5	-26.8	-26.8	-26.8	-26.8	-26.8
60 Minute Hourly Adjustment		**50.5**	**-26.8**	**-26.8**	**-26.8**	**-26.8**	**-26.8**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R2**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	116.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	116.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	116.0	-27.3	-27.3	-27.3	-27.3	-27.3	-27.3
Shielding (Barrier Attenuation)	116.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		49.9	-27.3	-27.3	-27.3	-27.3	-27.3
39 Minute Hourly Adjustment		**48.0**	**-29.2**	**-29.2**	**-29.2**	**-29.2**	**-29.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R3**
Source: Indoor Shooting Range
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	221.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	221.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	51.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	221.0	-26.9	-26.9	-26.9	-26.9	-26.9	-26.9
Shielding (Barrier Attenuation)	221.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		24.8	-26.9	-26.9	-26.9	-26.9	-26.9
60 Minute Hourly Adjustment		**24.8**	**-26.9**	**-26.9**	**-26.9**	**-26.9**	**-26.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R3**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	228.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	228.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	228.0	-33.2	-33.2	-33.2	-33.2	-33.2	-33.2
Shielding (Barrier Attenuation)	228.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		26.9	-33.2	-33.2	-33.2	-33.2	-33.2
60 Minute Hourly Adjustment		**26.9**	**-33.2**	**-33.2**	**-33.2**	**-33.2**	**-33.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R3**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	200.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	5.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	195.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	200.0	-32.0	-32.0	-32.0	-32.0	-32.0	-32.0
Shielding (Barrier Attenuation)	5.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Raw (Distance + Barrier)		39.3	-38.0	-38.0	-38.0	-38.0	-38.0
60 Minute Hourly Adjustment		**39.3**	**-38.0**	**-38.0**	**-38.0**	**-38.0**	**-38.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R3**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	206.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	206.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	206.0	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3
Shielding (Barrier Attenuation)	206.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		44.9	-32.3	-32.3	-32.3	-32.3	-32.3
39 Minute Hourly Adjustment		**43.0**	**-34.2**	**-34.2**	**-34.2**	**-34.2**	**-34.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R4**
Source: Indoor Shooting Range
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	793.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	793.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	51.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	793.0	-38.0	-38.0	-38.0	-38.0	-38.0	-38.0
Shielding (Barrier Attenuation)	793.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		13.7	-38.0	-38.0	-38.0	-38.0	-38.0
60 Minute Hourly Adjustment		**13.7**	**-38.0**	**-38.0**	**-38.0**	**-38.0**	**-38.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	790.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	790.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	790.0	-44.0	-44.0	-44.0	-44.0	-44.0	-44.0
Shielding (Barrier Attenuation)	790.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		16.1	-44.0	-44.0	-44.0	-44.0	-44.0
60 Minute Hourly Adjustment		**16.1**	**-44.0**	**-44.0**	**-44.0**	**-44.0**	**-44.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R4** *Project Name:* Gun Range
Source: Trash Enclosure Activity *Job Number:* 11776
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	857.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	5.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	852.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	857.0	-44.7	-44.7	-44.7	-44.7	-44.7	-44.7
Shielding (Barrier Attenuation)	5.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Raw (Distance + Barrier)		26.6	-50.7	-50.7	-50.7	-50.7	-50.7
60 Minute Hourly Adjustment		**26.6**	**-50.7**	**-50.7**	**-50.7**	**-50.7**	**-50.7**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R4** *Project Name:* Gun Range
Source: Roof-Top Air Conditioning Units *Job Number:* 11776
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	785.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	785.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	785.0	-43.9	-43.9	-43.9	-43.9	-43.9	-43.9
Shielding (Barrier Attenuation)	785.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		33.3	-43.9	-43.9	-43.9	-43.9	-43.9
39 Minute Hourly Adjustment		**31.4**	**-45.8**	**-45.8**	**-45.8**	**-45.8**	**-45.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R5**
Source: Indoor Shooting Range
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,033.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,033.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	51.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,033.0	-40.3	-40.3	-40.3	-40.3	-40.3	-40.3
Shielding (Barrier Attenuation)	1,033.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		11.4	-40.3	-40.3	-40.3	-40.3	-40.3
60 Minute Hourly Adjustment		**11.4**	**-40.3**	**-40.3**	**-40.3**	**-40.3**	**-40.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R5**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	952.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	952.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	952.0	-45.6	-45.6	-45.6	-45.6	-45.6	-45.6
Shielding (Barrier Attenuation)	952.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		14.5	-45.6	-45.6	-45.6	-45.6	-45.6
60 Minute Hourly Adjustment		**14.5**	**-45.6**	**-45.6**	**-45.6**	**-45.6**	**-45.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R5**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,143.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	5.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	1,138.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,143.0	-47.2	-47.2	-47.2	-47.2	-47.2	-47.2
Shielding (Barrier Attenuation)	5.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Raw (Distance + Barrier)		24.1	-53.2	-53.2	-53.2	-53.2	-53.2
60 Minute Hourly Adjustment		**24.1**	**-53.2**	**-53.2**	**-53.2**	**-53.2**	**-53.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R5**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	980.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	980.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	20.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	980.0	-45.8	-45.8	-45.8	-45.8	-45.8	-45.8
Shielding (Barrier Attenuation)	980.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.4	-45.8	-45.8	-45.8	-45.8	-45.8
39 Minute Hourly Adjustment		**29.5**	**-47.7**	**-47.7**	**-47.7**	**-47.7**	**-47.7**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R6**
Source: Indoor Shooting Range
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	951.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	951.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	51.7	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	951.0	-39.6	-39.6	-39.6	-39.6	-39.6	-39.6
Shielding (Barrier Attenuation)	951.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		12.1	-39.6	-39.6	-39.6	-39.6	-39.6
60 Minute Hourly Adjustment		**12.1**	**-39.6**	**-39.6**	**-39.6**	**-39.6**	**-39.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R6**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	827.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	827.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	827.0	-44.4	-44.4	-44.4	-44.4	-44.4	-44.4
Shielding (Barrier Attenuation)	827.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		15.7	-44.4	-44.4	-44.4	-44.4	-44.4
60 Minute Hourly Adjustment		**15.7**	**-44.4**	**-44.4**	**-44.4**	**-44.4**	**-44.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R6**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,213.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	5.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	1,208.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,213.0	-47.7	-47.7	-47.7	-47.7	-47.7	-47.7
Shielding (Barrier Attenuation)	5.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Raw (Distance + Barrier)		23.6	-53.7	-53.7	-53.7	-53.7	-53.7
60 Minute Hourly Adjustment		**23.6**	**-53.7**	**-53.7**	**-53.7**	**-53.7**	**-53.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

5/21/2019

Observer Location: **R6**
Source: Roof-Top Air Conditioning Units
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	915.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	915.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	20.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	915.0	-45.2	-45.2	-45.2	-45.2	-45.2	-45.2
Shielding (Barrier Attenuation)	915.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		32.0	-45.2	-45.2	-45.2	-45.2	-45.2
39 Minute Hourly Adjustment		**30.1**	**-47.1**	**-47.1**	**-47.1**	**-47.1**	**-47.1**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R1**
Source: Gas Station Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	374.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	374.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	374.0	-37.5	-37.5	-37.5	-37.5	-37.5	-37.5
Shielding (Barrier Attenuation)	374.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.7	-37.5	-37.5	-37.5	-37.5	-37.5
60 Minute Hourly Adjustment		**30.7**	**-37.5**	**-37.5**	**-37.5**	**-37.5**	**-37.5**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R2**
Source: Gas Station Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	424.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	424.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	424.0	-38.6	-38.6	-38.6	-38.6	-38.6	-38.6
Shielding (Barrier Attenuation)	424.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		29.6	-38.6	-38.6	-38.6	-38.6	-38.6
60 Minute Hourly Adjustment		**29.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R3**
Source: Gas Station Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	524.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	524.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	524.0	-40.4	-40.4	-40.4	-40.4	-40.4	-40.4
Shielding (Barrier Attenuation)	524.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		27.8	-40.4	-40.4	-40.4	-40.4	-40.4
60 Minute Hourly Adjustment		**27.8**	**-40.4**	**-40.4**	**-40.4**	**-40.4**	**-40.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R4**
Source: Gas Station Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	811.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	811.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	811.0	-44.2	-44.2	-44.2	-44.2	-44.2	-44.2
Shielding (Barrier Attenuation)	811.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		24.0	-44.2	-44.2	-44.2	-44.2	-44.2
60 Minute Hourly Adjustment		**24.0**	**-44.2**	**-44.2**	**-44.2**	**-44.2**	**-44.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R5**
Source: Gas Station Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	977.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	977.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	977.0	-45.8	-45.8	-45.8	-45.8	-45.8	-45.8
Shielding (Barrier Attenuation)	977.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		22.4	-45.8	-45.8	-45.8	-45.8	-45.8
60 Minute Hourly Adjustment		**22.4**	**-45.8**	**-45.8**	**-45.8**	**-45.8**	**-45.8**

STATIONARY SOURCE NOISE PREDICTION MODEL 5/21/2019

Observer Location: **R6**
Source: Gas Station Activity
Condition: Operational

Project Name: Gun Range
Job Number: 11776
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	863.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	863.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	863.0	-44.7	-44.7	-44.7	-44.7	-44.7	-44.7
Shielding (Barrier Attenuation)	863.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		23.5	-44.7	-44.7	-44.7	-44.7	-44.7
60 Minute Hourly Adjustment		**23.5**	**-44.7**	**-44.7**	**-44.7**	**-44.7**	**-44.7**

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