12 NOISE

12.1 Introduction

The Noise chapter of the EIR describes the existing noise environment in the vicinity of the projects and identifies potential impacts and mitigation measures, if necessary, related to noise associated with the construction and operation of the proposed projects. The method by which the potential impacts are analyzed is discussed, followed by the identification of potential impacts and recommended mitigation measures to reduce impacts as necessary. The Noise chapter is based on the Technical Noise Analyses[1] prepared for the Whitehawk I (WHI) and Whitehawk II (WHII) projects by RCH Group and an associated technical memorandum prepared to analyze traffic noise impacts associated with the proposed projects (see Appendix L).[2] Additional information was sourced from the Placer County General Plan,[3] the Placer County General Plan EIR,[4] the Granite Bay Community Plan (GBCP),[5] and the Placer County Noise Ordinance.[6]

12.2 Existing Environmental Setting

The Existing Environmental Setting section provides background information on noise and vibration, a discussion of acoustical terminology and the effects of noise on people, existing sensitive receptors in the project vicinity, existing noise sources and noise levels in the project vicinity, and vibration.

Fundamentals of Noise and Vibration

Noise, or sound, is typically described in terms of the decibel (dB) scale. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are compared to the reference pressure and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. A strong correlation exists between the way humans perceive sound and A-weighted sound levels. As such, the A-weighted sound level has become the standard tool of environmental noise assessment for community exposures. All sound levels expressed as dB in this chapter are A-weighted sound levels, unless noted

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1 RCH Group. *Technical Noise Analysis, Whitehawk I, Granite Bay, California.* October 2018.
RCH Group. *Technical Noise Analysis, Whitehawk II, Granite Bay, California.* October 2018.
2 RCH Group. *Technical Memorandum, Whitehawk I and II Noise Analysis Updates.* October 2, 2018.
3 Placer County. *Countywide General Plan Policy Document.* August 1994 (updated May 2013).
4 Placer County. *Countywide General Plan EIR.* July 1994.
5 Placer County. *Granite Bay Community Plan.* Adopted February 28, 2012.
6 Placer County. *Placer County Noise Ordinance*. 2004.

otherwise. Table 12-1 below identifies decibel levels for common sounds heard in outdoor and indoor environments.

Table 12-1
Typical Noise Levels

Noise Level (dB)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at three feet, jet flyover at 1,000 feet	Rock band
80–90	Diesel truck at 50 feet	Loud television at three feet
70–80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at three feet, vacuum cleaner at 10 feet
60–70	Commercial area	Normal speech at three feet
40–60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20–40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10–20	--	Broadcast/recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

Source: RCH Group, 2018.

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), over a given time period. The L_{eq} is the foundation of the composite noise descriptors, day-night average level (L_{dn}) and the community noise equivalent level (CNEL), and exhibits strong correlation with community response to noise for the average person. The median noise level descriptor, denoted L_{50}, represents the noise level which is exceeded 50 percent of the hour.

The L_{dn} is based upon the average noise level over a 24-hour day, with a +10 dB weighting applied to noise occurring during the nighttime hours of 10:00 PM to 7:00 AM. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, the metric tends to disguise short-term variations in the noise environment.

Stationary point sources of noise, including construction equipment, attenuate (lessen) at a rate of 6 to 7.5 dB per doubling of distance from the source, depending on ground absorption. Soft sites with an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees attenuate at 7.5 dB per doubling of distance. Hard sites with reflective surfaces (e.g., parking lots or smooth bodies of water) attenuate at approximately 6.0 dB per doubling of distance. A street or roadway with moving vehicles (known as a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dB per doubling of distance, dependent on ground absorption. In addition, physical barriers located between a noise source and the noise receptor, such as berms or sound walls, will increase the attenuation that occurs by distance alone.

Existing Noise Sensitive Receptors

Certain land uses are more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure time and shielding from noise sources) and the type of activities typically involved. Accordingly, such land uses are referred to as sensitive receptors. Noise sensitive land uses typically include residences, schools, child care centers, hospitals, long-term health care facilities, convalescent centers, retirement homes, and recreation areas. Currently, the nearest sensitive receptor to the WHI site is a single-family residence located approximately 30 feet east of the WHI site boundary. Existing residences to the south of the site are located over 300 feet from the site boundary, while residences north of the site across Douglas Boulevard are located approximately 140 feet from the site boundary. With regard to the WHII site, the nearest sensitive receptor is a single-family residence located 18 feet south of the site boundary. Additional residences are located 140 to 340 feet to the east of the WHII site boundary, and more than 500 feet to the west of the site boundary. Similar to the WHI site, the nearest sensitive receptors to the north of the site across Douglas Boulevard are located approximately 130 feet from the WHII site boundary.

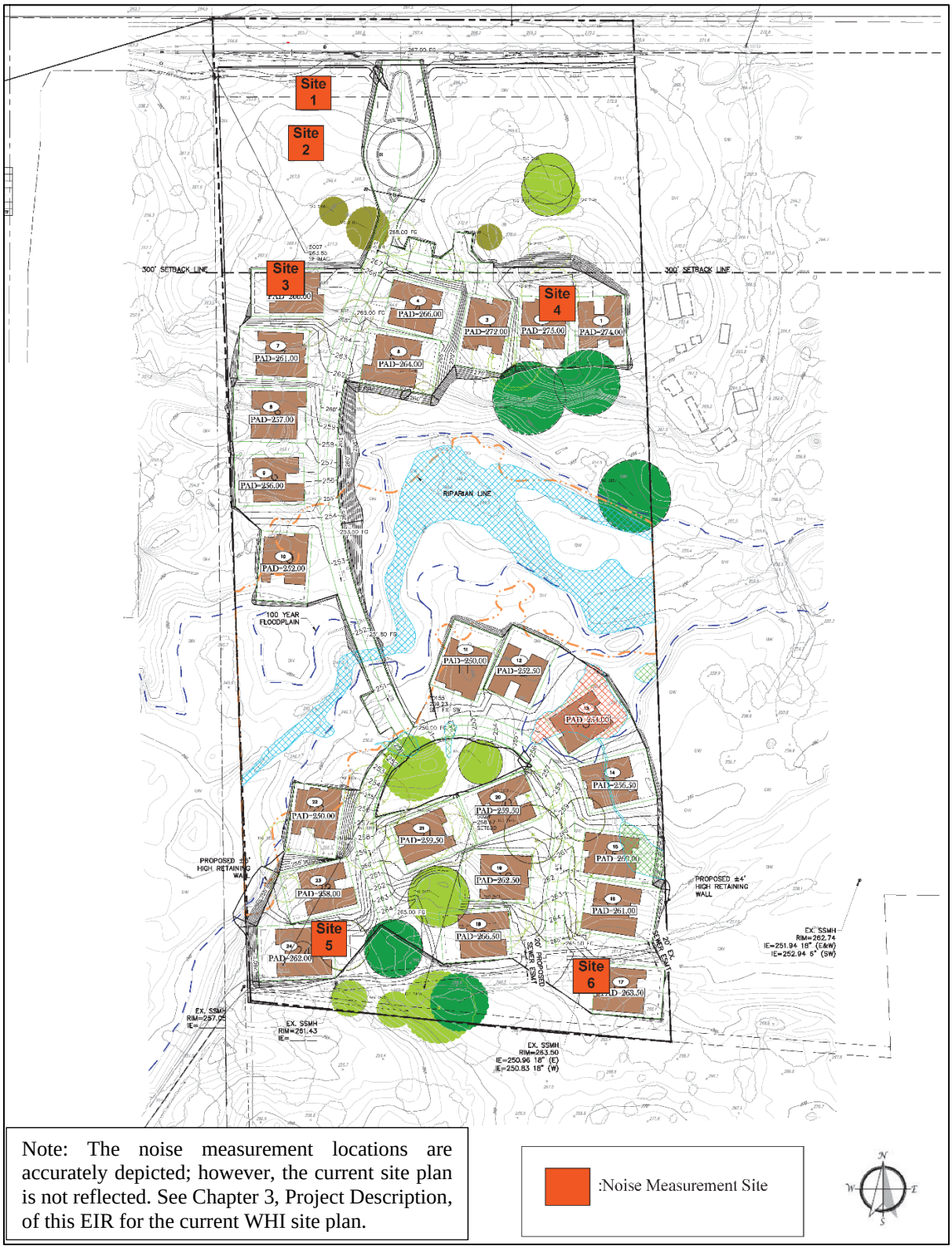
Existing Ambient Noise Levels

To quantify existing ambient noise levels in the immediate vicinity of the projects, RCH conducted several short-term (10-minute) measurements and two long-term (72-hour) measurements at both the WHI and WHII sites (see Figure 12-1 and Figure 12-2, respectively). The noise measurement locations at the WHI and WHII sites were selected to capture existing noise levels that would affect the proposed residences, primarily traffic noise from Douglas Boulevard. The short-term noise measurements at the sites were conducted on Monday June 22, and Tuesday June 23, 2015. The long-term sound level measurements were conducted from Tuesday June 23 through Thursday June 25, 2015. The noise measurements were made using Metrosonics db308 Sound Level Meters calibrated before and after the measurements.

<u>WHI</u>

The long-term noise measurements at the WHI site were conducted at the locations of the two proposed building pads located closest to Douglas Boulevard. Two short-term measurements were conducted 60 and 120 feet from Douglas Boulevard during the peak morning traffic hour, and two short-term measurements were conducted within the southern portion of the WHI site. The noise measurements are summarized in Table 12-2 below. Detailed 24-hour noise plots and sound level data is included in the appendix to the WHI Technical Noise Analysis (see Appendix L).

Figure 12-1
Noise Measurement Locations: WHI



Note: The noise measurement locations are accurately depicted; however, the current site plan is not reflected. See Chapter 3, Project Description, of this EIR for the current WHI site plan.

Source: RCH Group, 2018.

Figure 12-2
Noise Measurement Locations: WHII

Note: The noise measurement locations are accurately depicted; however, the current site plan is not reflected. See Chapter 3, Project Description, of this EIR for the current WHII site plan.

: Noise Measurement Site

Source: RCH Group, 2018.

Table 12-2
Summary of Existing Noise Measurement Data: WHI

Location	Time Period	Noise Level (dB)	Noise Sources
Site 1	June 23, 2015 7:41 to 7:51 AM	5-minute L_{eq}: 64, 65 5-minute L_{max}: 71, 71	Traffic on Douglas Boulevard is the main source of noise. Traffic in westbound ranges from 55 to 56 dB and traffic in eastbound lanes is 66 to 70 dB. Passing pickup truck is 71 dB and pickup pulling trailer is 67 dB.
Site 2	June 23, 2015 7:55 to 8:05 AM	5-minute L_{eq}: 60 ,61 5-minute L_{max}: 66, 66	Traffic from Douglas Boulevard is the main source of noise. Van pulling trailer is 65 dB, medium truck is 64 dB, and large van is 66 dB, all in eastbound lanes. Birds chirping do not register on noise meter.
Site 3	June 23, 2015, 12:00 AM through June 25, 11:59 PM 72-hour measurement	24-hour L_{dn}: 54, 53, 54 Hourly L_{eq}: 43 to 52	Unattended noise measurements do not specifically identify noise sources.
Site 4	June 23, 2015, 12:00 AM through June 25, 11:59 PM 72-hour measurement	24-hour L_{dn}: 52, 51, 53 Hourly L_{eq}: 43 to 51	Unattended noise measurements do not specifically identify noise sources.
Site 5	June 22, 2015 8:35 to 8:45 AM	5-minute L_{eq}: 43 ,43 5-Minute L_{max}: 48, 45	Noise sources include wild birds and roosters as well as distant traffic noise. Loud bird is 44 dB. Traffic from nearby roads is 45 dB. Motor in the distance is 46 dB.
Site 6	June 22, 2015 8:10 to 8:20 AM	5-minute L_{eq}: 45 ,44 5-Minute L_{max}: 48, 47	Noise sources include birds, roosters and distant traffic noise. Rooster is 43-45 dB. Birds chirping is 44-45 dB. Distant traffic noise does not register on noise meter.

Source: RCH Group, 2018.

As shown in Table 12-2, the dominant source of noise captured during the measurements was traffic noise associated with Douglas Boulevard to the north of the site. At the southern boundary of the WHI site, noise consisted primarily of neighborhood and nature noise. The average noise level for the five-minute periods measured near Douglas Boulevard during peak-hour morning traffic was 64 to 65 dB L_{eq} at a distance of 60 feet from the road (Site 1) and 60-61 dB L_{eq} at a distance 120 feet from the edge of Douglas Boulevard (Site 2). The average five-minute noise levels measured near the southern end of the project site (Sites 5 and 6) ranged from 43 to 45 dB L_{eq}. The 24-hour noise level was 53 to 54 dB L_{dn} at Site 3 and 51 to 53 dB L_{dn} at Site 4.

<u>WHII</u>

Similar to the WHI site, the long-term noise measurements at the WHII site were conducted at the locations of two planned building pads closest to Douglas Boulevard. Two short-term measurements were conducted 50 and 100 feet from Douglas Boulevard during the peak

morning traffic hour, and one short term measurement was conducted near the southern portion of the WHII site. The noise measurements are summarized in Table 12-3 below. Detailed 24-hour noise plots and sound level data is included in the appendix to the WHII Technical Noise Analysis (see Appendix L).

As shown in Table 12-3, the dominant source of noise captured during the measurements was traffic noise associated with Douglas Boulevard to the north of the site. At the southern boundary of the WHII site, noise consisted primarily of neighborhood and nature noise. The average noise level for the five-minute periods measured near Douglas Boulevard during peak-hour morning traffic was 61 to 62 dB L_{eq} at a distance of 50 feet from the road (Site 1) and 56 dB L_{eq} at a distance of 100 feet from the edge of Douglas Boulevard (Site 2). The average five-minute L_{eq} measured near the southern end of the project site (Site 5) was 44 dB L_{eq}. The 24-hour noise level was 52 to 53 dB L_{dn} at Site 3 and 55 to 56 dB L_{dn} at site 4.

Table 12-3
Summary of Existing Noise Measurement Data: WHII

Location	Time Period	Noise Level (dB)	Noise Sources
Site 1	June 23, 2015 8:19 to 8:29 AM	5-minute L_{eq}: 61, 62 5-minute L_{max}: 70, 75	Traffic on Douglas Boulevard is the main source of noise. The noise level is 64 dB when steady traffic exists in both directions. Motorcycle accelerating from stoplight in westbound lane is 75 dB. Motorcycle in eastbound land is 73 dB.
Site 2	June 23, 2015 8:30 to 8:40 AM	5-minute L_{eq}: 56, 56 5-minute L_{max}: 62, 62	Traffic on Douglas Boulevard is the main source of noise. Medium truck idling at stoplight is 64 dB. Traffic in westbound land is 54 dB. Traffic passing in both directions is 60 dB. Motor scooter is 57 dB.
Site 3	June 23, 2015, 12:00 AM through June 25, 11:59 PM 72-hour measurement	24-hour L_{dn}: 52, 52, 53 Hourly L_{eq}: 43 to 51	Unattended noise measurements do not specifically identify noise sources.
Site 4	June 23, 2015, 12:00 AM through June 25, 11:59 PM 72-hour measurement	24-hour L_{dn}: 55, 55, 56 Hourly L_{eq}: 42 to 55	Unattended noise measurements do not specifically identify noise sources.
Site 5	June 22, 2015 2:54 to 3:02 PM	5-minute L_{eq}: 44, 44 5-Minute L_{max}: 47, 48	Noise sources include kids playing is a yard to the south, dogs barking, birds, and wind in the trees. Ambient noise level is 44 dB. Distant traffic noise is audible but does not register on noise meter.

Source: RCH Group, 2018.

Existing Roadway Noise Levels

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used with existing traffic data obtained from the Transportation Impact Study prepared for the proposed project by Fehr & Peers to model existing traffic noise levels on the local roadway network. Detailed model inputs are included in Appendix L to this EIR.

Noise levels were modeled at the property lines of the nearest existing sensitive receptors along local roadways. The results of the modeling are presented in Table 12-4 below. For the roadway segments located adjacent to the WHI and WHII site frontages, the noise levels for segments 3 and 4 were calculated at the closest existing sensitive receptors to the segments, while the noise levels for segments 3w and 4w were calculated at the property lines of the nearest proposed residences on the WHI and WHII sites, respectively. Specifically, noise levels for 3w and 4w were calculated at distances of 322 feet and 344 feet, respectively, from Douglas Boulevard.

Table 12-4
Traffic Noise Levels – Existing Conditions

ID #	Roadway	Segment	Distance to Receiver (feet)	Noise Level (dB, L_{dn})
1	Douglas Blvd.	Sierra College Blvd. to Cavitt Stallman Rd.	722	63.8
2	Douglas Blvd.	Cavitt Stallman Rd. to Woodgrove Way	121	73.6
3	Douglas Blvd.	Woodgrove Way to Seeno Ave. (near WHI and WHII)	59	74.8
3w	Douglas Blvd.		322	57.3
4	Douglas Blvd.	Seeno Ave. to Barton Rd. (near WHII)	95	72.7
4w	Douglas Blvd.		344	56.8
5	Douglas Blvd.	Barton Rd. to Auburn Folsom Rd.	92	73.4
6	Sierra College Blvd.	North of Douglas Blvd.	128	68.8
7	Sierra College Blvd.	Douglas Blvd. to Renaissance Creek/Granite Bay Business Park	157	69.0
8	Sierra College Blvd.	Renaissance Creek/Granite Bay Business Park to Eureka Rd.	108	70.3
9	Auburn-Folsom Rd.	Douglas Blvd. to Eureka Rd.	82	72.4

Note: 3w = at nearest proposed WHI residences; 4w = at nearest proposed WHII residences.

Source: RCH Group, 2018.

It should be noted that the values presented in the table reflect an offset of -6 dB used to calibrate the modeled traffic noise levels to the measured 72-hour ambient noise levels at sites 3w and 4w.

Vibration

While vibration is similar to noise, both involving a source, a transmission path, and a receiver, vibration differs from noise because noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce

any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

Operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can also be a source of such vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage. In addition, ground vibration can be a source of annoyance to individuals who live or work close to vibration-generating activities. Traffic rarely generates vibration amplitudes high enough to cause structural or cosmetic damage.

12.3 Regulatory Context

In order to limit exposure to physically and/or psychologically damaging noise levels, the State of California, various county governments, and most municipalities in the State have established standards and ordinances to control noise. The following provides a general overview of the existing State and local regulations that are relevant to the proposed project. Federal plans, policies, regulations, or laws related to noise are not directly applicable to the proposed projects.

State Regulations

The following are the State environmental laws and policies relevant to noise.

California State Building Codes

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations, establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses, and dwellings other than single-family dwellings.

Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB L_{dn} or CNEL in any habitable room. Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

Local Regulations

The following are the local environmental goals and policies relevant to noise.

Placer County General Plan

The relevant goals and policies from the Placer County General Plan related to noise are presented below.

Goal 9.A To protect County residents from the harmful and annoying effects of exposure to excessive noise.

Policy 9.A.1 The County shall not allow development of new noise-sensitive uses where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 9-1 (see Table 12-5) as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in Table 9-1 (see Table 12-5).

Table 12-5
Allowable L_{dn} Noise Levels within Specified Zone Districts
Applicable to New Projects Affected by or Including Non-Transportation Noise Sources[1]

Zone District of Receptor	Property Line of Receiving Use (L_{dn}, dB)	Interior Spaces[2]
Residential Adjacent to Industrial[3]	60	45
Other Residential[4]	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood Commercial	70	45
General Commercial	70	45
Heavy Commercial	75	45
Limited Industrial	75	45
Highway Service	75	45
Shopping Center	70	45
Industrial	---	45
Industrial Park	75	45
Industrial Reserve	---	---
Airport	---	45
Unclassified	---	---
Farm	---[6]	---
Agriculture Exclusive	---[6]	---
Forestry	---	---
Timberland Preserve	---	---
Recreation & Forestry	70	---
Open Space	---	---
Mineral Reserve	---	---

Notes:

- Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.
- Where existing transportation noise levels exceed the standards of this table, the allowable L_{dn} shall be raised to the same level as that of the ambient level.
- If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, of if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.
- Where a use permit has established noise level standards for an existing use, those standards shall supersede the levels specified in Table 9-1 and Table 9-3 (see Table 12-5 and Table 12-6). Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in Tables 9-1 and 9-3 (see Table 12-5 and Table 12-6), said excess noise shall be considered the allowable level. If a new development is proposed which will be affected by noise from such an existing use, it will ordinarily

(Continued on next page)

be assumed that the noise levels already existing or those levels allowed by the existing use permit, whichever are greater, are those levels actually produced by the existing use.

- Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art[5] at the time of expansion. In no case will expansion of an existing industrial operation because to decrease allowable noise emission limits. Increased emissions above those normally allowable should be limited to a one-time 5 dB increase at the discretion of the decision-making body.
- The noise level standards applicable to land uses containing incidental residential uses, such as caretaker dwellings at industrial facilities and homes on agriculturally zoned land, shall be the standards applicable to the zone district, not those applicable to residential uses.
- Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.

[1] Overriding policy on interpretation of allowable noise levels: Industrial-zoned properties are confined to unique areas of the County, and are irreplaceable. Industries which provide primary wage-earner jobs in the County, if forced to relocate, will likely be forced to leave the County. For this reason, industries operating upon industrial zoned properties must be afforded reasonable opportunity to exercise the rights/privileges conferred upon them be their zoning. Whenever the allowable noise levels herein fall subject to interpretation relative to industrial activities, the benefit of the doubt shall be afforded to the industrial use.

Where an industrial use is subject to infrequent and unplanned upset or breakdown of operations resulting in increased noise emissions, where such upsets and breakdowns are reasonable considering the type of industry, and where the industrial use exercises due diligence in preventing as well as correcting such upsets and breakdowns, noise generated during such upsets and breakdowns shall not be included in calculations to determine conformance with allowable noise levels.

[2] Interior spaces are defined as any locations where some degree of noise-sensitivity exists. Examples include all habitable rooms of residences, and areas where communication and speech intelligibility are essential, such as classrooms and offices.

[3] Noise from industrial operations may be difficult to mitigate in a cost-effective manner. In recognition of this fact, the exterior noise standards for residential zone districts immediately adjacent to industrial, limited industrial, industrial park, and industrial reserve zone districts have been increased by 10 dB as compared to residential districts adjacent to other land uses.

For purposes of the Noise Element, residential zone districts are defined to include the following zoning classifications: AR, R-1, R-2, R-3, FR, RP, TR-1, TR-2, TR-3, and TR-4.

[4] Where a residential zone district is located within an -SP combining district, the exterior noise level standards are applied at the outer boundary of the -SP district. If an existing industrial operation within an -SP district is expanded or modified, the noise level standards at the outer boundary of the -SP district may be increased as described above in these standards.

Where a new residential use is proposed in an -SP zone, an Administrative Review Permit is required, which may require mitigation measures at the residence for noise levels existing and/or allowed by use permit as described under "NOTES," above, in these standards.

[5] State of the art should include the use of modern equipment with lower noise emissions, site design, and plant orientation to mitigate offsite noise impacts, and similar methodology.

[6] Normally, agricultural uses are noise insensitive and will be treated in this way. However, conflicts with agricultural noise emissions can occur where single-family residences exist within agricultural zone districts. Therefore, where effects of agricultural noise upon residences located in these agricultural zones is a concern, an L_{dn} of 70 dBA will be considered acceptable outdoor exposure at a residence.

Source: Placer County General Plan, 2013.

Policy 9.A.2 Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 9-1 (see Table 12-5) as measured immediately within the property line of lands designated for noise-sensitive uses: provided, however, the noise created by occasional events occurring within a stadium on land zoned for university purposes may temporarily exceed these standards as provided in an approved Specific Plan.

Policy 9.A.4 Impulsive noise produced by blasting should not be subject to the criteria listed in Table 9-1 (see Table 12-5). Single event impulsive noise levels produced by gunshots or blasting shall not exceed a peak linear overpressure of 122 db, or a C-weighted Sound Exposure Level (SEL) of 98 dBC. The cumulative noise level from impulsive sounds such as gunshots and blasting shall not exceed 60 dB LCdn or CNELC on any given day. These standards shall be applied at the property line of a receiving land use.

Policy 9.A.6 The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Table 9-3 (see Table 12-6).

Table 12-6
Maximum Allowable Noise Exposure Transportation Noise Sources

Noise Sensitive Land Uses	Outdoor Activity Area[1]	Interior Spaces	
	L_{dn}, dB	L_{dn}/CNEL, dB	L_{eq}, dB[2]
Residential	60[3]	45	--
Transient Lodging[4]	60[3]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60[3]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

Notes:
1 Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
2 As determined for a typical worst-case hour during periods of use.
3 Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Source: Placer County General Plan, 2013.

Policy 9.A.8 New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources, including airports, which exceed the levels specified in Table 9-3 (see Table 12-6), unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to the levels specified in Table 9-3 (see Table 12-6).

Policy 9.A.9 Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 9-3 (see Table 12-6) or the performance standards in Table 9-3 (see Table 12-6) at outdoor activity areas or interior spaces of existing noise sensitive land uses.

Policy 9.A.11 The County shall require one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses, or where the cumulative increase in noise levels resulting from new development significantly impacts noise-sensitive land uses:

a. Rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses;
b. Lowering speed limits, if feasible and practical;
c. Programs to pay for noise mitigation such as low cost loans to owners of noise-impacted property or establishment of developer fees;
d. Acoustical treatment of buildings; or,
e. Construction of noise barriers.

Policy 9.A.12 Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3 (see Table 12-5 and Table 12-6), the emphasis of such measure shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

Policy 9.B.1 The County shall require that new noise-sensitive land uses established next to existing industrial areas be responsible for self-mitigating noise impacts from industrial activities.

Granite Bay Community Plan

The goals and policies from the GBCP related to noise are presented below.

Goal 8.1.1.1 Provide for the health, safety and welfare of the Granite Bay area residents by providing a livable environment free from excessive noise.

Policy 8.1.1.1 Encourage the use of greenbelts or natural areas along roadways as a design feature of any development in order to mitigate noise impacts.

Policy 8.1.1.2 Ensure compliance with noise standards adopted in the General Plan Noise Element.

Policy 8.1.1.3 Avoid the interface of noise-producing and noise-sensitive land uses.

Policy 8.1.1.4 Noise emanating from construction activity that requires a grading or building permit is prohibited on Sundays and federal holidays, and shall only occur:

- Monday through Friday, 6 AM to 8 PM (during daylight savings)
- Monday through Friday, 7 AM to 8 PM (during standard time)
- Saturdays, 8 AM to 6 PM

Policy 8.1.1.5 Where proposed non-residential land uses are likely to produce noise levels exceeding County performance standards of Table 8.1.2 (see Table 12-5) at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design. The requirements for the content of an acoustical analysis are contained in the General Plan.

Policy 8.1.1.7 Where noise mitigation measures are required to achieve the standards of Tables 8.1.2 and 8.1.3 (see Table 12-5 and Table 12-6), the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

Policy 8.1.1.8 The County shall employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the project review process and, as may be determined necessary, through the building permit process.

Policy 8.1.1.9 Noise created by new proposed non-transportation noise sources shall be mitigated as not to exceed the noise level standards of Table 8.1.3 (see Table 12-6) as measured immediately within the property line of lands designated for noise-sensitive uses such as residential.

Placer County Noise Ordinance

Section 9.36.060 of the Placer County Code establishes non-transportation noise level standards for noise-sensitive receptors. The purpose of the Noise Ordinance is to implement the noise level standards identified in the Placer County General Plan. The specific language of Section 9.36.060 is provided below:

A. It is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person that:

1. Causes the exterior sound levels when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by five (5) dBA; or

2. Exceeds the sound level standards as set forth in Table 1 (see Table 12-7), whichever is the greater.

Table 12-7
Noise Level Standards for Non-Transportation Noise Sources

Sound Level Descriptor	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)
Hourly L_{eq}, dB	55	45
L_{max}, dB	70	65

Source: *Placer County Noise Ordinance.*

B. Each of the sound level standards specified in Table 1 (see Table 12-7) shall be reduced by five (5) dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus five (5) dB.

C. If the intruding sound source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient sound level can be measured, the sound level measured while the source is in operation shall be compared directly to the sound level standards of Table 1 (see Table 12-7).

Per Section 9.36.030 of the Placer County Code (Exemptions), sound or noise emanating from construction activities between the hours of 6:00 AM and 8:00 PM Monday through Friday, and between the hours of 8:00 AM and 8:00 PM Saturday and Sunday, is exempt from Section 9.36.060 of the Placer County Code Noise Ordinance, provided that all construction equipment is fitted with factory installed muffling devices and that all construction equipment is maintained in

good working order. However, Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08 indicate the following:

> Construction noise emanating from any construction activities for which a Grading or Building Permit is required is prohibited on Sundays and Federal Holidays, and shall only occur: a) Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings) b) Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time) c) Saturdays, 8:00 a.m. to 6:00 p.m.
>
> In addition, temporary signs shall be located throughout the project, as determined by the Development Review Committee, at key intersections depicting the above construction hour limitations.

12.4 Impacts and Mitigation Measures

The following section describes the standards of significance and methodology used to analyze and determine the proposed projects' potential impacts related to noise. In addition, a discussion of the projects' impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

According to CEQA Guidelines and the County's Initial Study Checklist, a significant impact would occur related to noise and vibration if the proposed projects would result in any of the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan, Community Plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within 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; or
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

<u>Summary of Placer County Noise Standards</u>

Applicable Placer County noise level standards from the Placer County General Plan and the Placer County Noise Ordinance are summarized below.

Transportation Noise

The Placer County General Plan Noise Element applies 60 dB L_{dn}/CNEL exterior and 45 dB L_{dn}/CNEL interior noise level standards at the property lines of residential uses affected by transportation noise sources. The County may conditionally allow exterior noise levels between 60 and 65 dB L_{dn} for residential uses, provided that practical noise reduction measures have been implemented and interior noise levels remain in compliance with the 45 dB L_{dn} interior standard.

Substantial Increase Criteria

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to measurably severe noise levels. In practice, a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in transportation noise associated with the proposed projects is a factor in determining significance.

Placer County, like many jurisdictions, does not have an adopted policy regarding significant increases in ambient noise. A common practice in many jurisdictions is to use a 3 to 5 dB increase as a threshold of significance. However, a limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project noise conditions.

The following table was developed by the Federal Interagency Committee on Noise (FICON) as a means of developing thresholds for identifying project-related noise level increases. The rationale for the graduated scales is that test subject's reactions to increases in noise levels varied depending on the starting level of noise. Specifically, with lower ambient noise environments, such as those below 60 dB L_{dn}, a larger increase in noise levels was required to achieve a negative reaction than was necessary in environments where noise levels were already elevated. Therefore, because the County does not have defined thresholds for what would be considered a substantial increase in traffic noise levels, the County has determined information from Table 12-8 should be used.

Table 12-8
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project, L_{dn} dB	Increase Required for Significant Impact
<60	+5.0 dB or more
60-65	+3.0 dB or more
>65	+1.5 dB or more

Source: RCH Group, 2018.

The approach to assessing the significance of increases in off-site traffic noise is also consistent with other recent Placer County EIRs and the industry-standard approach in general.

Blasting Noise

Per Policy 9.A.4 of the Placer County General Plan, single event impulsive noise levels produced by gunshots or blasting must not exceed a peak linear overpressure of 122 dB, or a C-weighted SEL of 98 dBC. In addition, the cumulative noise level from multiple impulsive sounds such as gunshots and blasting must not exceed 60 dB LCdn or CNELC on any given day. Such standards are applied to the property lines of receiving land uses.

Vibration

Placer County does not have specific policies or standards pertaining to vibration levels. However, vibration levels associated with construction activities and project operations are addressed as potential vibration impacts associated with project implementation.

Vibration is measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocities (PPV) in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of PPVs. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 12-9, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures.

Table 12-9
Effects of Vibration on People and Buildings

PPV		Human Reaction	Effect on Buildings
in/sec	mm/sec		
0.15 to 0.30	0.006 to 0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
10 to 15	0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage

Source: Caltrans. Transportation and Construction Vibration Guidance Manual [TAV-04-01-R0201, pg. 11]. September 2013.

As shown in the table, the threshold for architectural damage to structures is 0.20 in/sec PPV and continuous vibrations of 0.10 in/sec PPV, or greater, would likely cause annoyance to sensitive receptors.

Issues Not Discussed Further

Issues related to the following issue areas are discussed in Chapter 16, Effects Not Found to be Significant, of this EIR, including whether the proposed project would:

- For a project located within 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; and
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Method of Analysis

Below are descriptions of the methodologies used to measure ambient noise and estimate future traffic noise, construction noise, and vibration. Further modeling details and calculations are provided in Appendix L to this EIR. The results of the noise and vibration impact analyses were compared to the standards of significance discussed above in order to determine the associated level of impact.

Metrosonics db308 Sound Level Meters were used for the ambient noise level measurement surveys. The meters were calibrated before and after use. To assess traffic noise impacts on structures adjacent to nearby roadway segments, RCH Group used the FHWA RD-77-108 Model. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. Direct inputs to the model included traffic volumes provided by Fehr & Peers. Noise level values were calculated for nine roadway segments under eight different scenarios. Such scenarios are discussed in Chapter 14, Transportation and Circulation, of this EIR.

Based on fairly large difference between measured noise levels and initial model runs, an offset of -6 dB was used to calibrate the modeled traffic volumes to the actual 72-hour measured levels at sites 3w and 4w. The future values were based on a conservative estimate of 10 percent of all daily trips in the peak hour. The peak hour was then used as an estimate of the 24-hour future L_{dn}. Per industry standard methodologies, L_{dn} is typically within +/- 2 dBA of the peak hour L_{eq} under normal conditions.[7] For the measurements conducted at the WHI and WHII sites, the most frequent offset was L_{dn} +2 dBA from the peak hour L_{eq}.

Construction noise and vibration was analyzed using data compiled for various pieces of construction equipment at a representative distance of 50 feet.

[7] California Department of Transportation. *Technical Noise Supplement*. October 1998.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on implementation of the proposed project in comparison with the standards of significance identified above.

12-1 Exposure of persons to or generation of traffic noise levels in excess of standards established in the local General Plan, Community Plan or noise ordinance, or applicable standards of other agencies, or result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Based on the analysis below, the impact is *less than significant*.

The primary source of noise associated with the proposed residential developments would be traffic noise associated with traffic on local roadways. As discussed above, CEQA does not require an analysis of the environment's impact on the project; however, impacts to future residents at the WHI and WHII projects due to traffic noise along local roadways is evaluated for the purposes of considering the projects' consistency with policies in the County's General Plan and the GBCP. Traffic noise levels associated with the Existing Plus WHI, Existing Plus WHII, and Existing Plus WHI and WHII are described in the following sections.

<u>WHI</u>

Table 12-10 below provides a summary of the predicted noise levels on area roadway segments under Existing Plus WHI conditions. Noise levels were modeled at the nearest existing structures along each roadway, with the exception of the noise levels for segments 3w and 4w, which were modeled at the future property line of the nearest proposed WHI and WHII residences, respectively. As shown in the table, the WHI project's contribution to traffic noise increases would be 0.1 dB or less for all roadway segments, which is below the applicable substantial increase thresholds shown in Table 12-8. In addition, the WHI project would not cause new exceedances of the County's 60 dB L_{dn} exterior noise level threshold at any of the study roadway segments. Therefore, traffic generated by the WHI project would not result in a significant increase in traffic noise levels under Existing Plus WHI conditions. Thus, a less-than-significant impact would occur.

For information purposes, it is noted that average traffic noise at the proposed residences closest to Douglas Boulevard (along segment 3w) would be approximately 57.4 dB L_{dn}, which is below the County's 60 dB L_{dn} threshold.

Table 12-10
Traffic Noise Levels – Existing Plus WHI Conditions

ID #	Roadway	Segment	Distance to Receiver (feet)	Noise Level (dB, L_{dn})		
				Existing	Existing Plus WHI	Change
1	Douglas Blvd.	Sierra College Blvd. to Cavitt Stallman Rd.	722	63.8	63.8	0.0
2	Douglas Blvd.	Cavitt Stallman Rd. to Woodgrove Way	121	73.6	73.6	0.0
3	Douglas Blvd.	Woodgrove Way to Seeno Ave. (near WHI and WHII)	59	74.8	74.8	0.0
3w	Douglas Blvd.		322	57.3	57.4	+0.1
4	Douglas Blvd.	Seeno Ave. to Barton Rd. (near WHII)	95	72.7	72.7	0.0
4w	Douglas Blvd.		344	56.8	56.9	+0.1
5	Douglas Blvd.	Barton Rd. to Auburn Folsom Rd.	92	73.4	73.4	0.0
6	Sierra College Blvd.	North of Douglas Blvd.	128	68.8	68.8	0.0
7	Sierra College Blvd.	Douglas Blvd. to Renaissance Creek/Granite Bay Business Park	157	69.0	69.0	0.0
8	Sierra College Blvd.	Renaissance Creek/Granite Bay Business Park to Eureka Rd.	108	70.3	70.3	0.0
9	Auburn-Folsom Rd.	Douglas Blvd. to Eureka Rd.	82	72.4	72.4	0.0

Source: RCH Group, 2018.

WHII

Table 12-11 below provides a summary of the predicted noise levels on area roadway segments under Existing Plus WHII conditions. Noise levels were modeled at the nearest existing structures along each roadway, with the exception of the noise levels for segments 3w and 4w, which were modeled at the future property line of the nearest proposed WHI and WHII residences, respectively. As shown in the table, the WHII project's contribution to traffic noise increases would be 0.1 dB or less for all roadway segments, which is below the applicable substantial increase thresholds shown in Table 12-8. In addition, the WHII project would not cause new exceedances of the County's 60 dB L_{dn} exterior noise level threshold at any of the study roadway segments. Therefore, traffic generated by the WHII project would not result in a significant increase in traffic noise levels under Existing Plus WHII conditions. Thus, a less-than-significant impact would occur.

For information purposes, it is noted that average traffic noise at the proposed WHII residences closest to Douglas Boulevard (along segment 4w) would be approximately 56.9 dB L_{dn}, which is below the County's 60 dB L_{dn} threshold.

Table 12-11
Traffic Noise Levels – Existing Plus WHII Conditions

ID #	Roadway	Segment	Distance to Receiver (feet)	Noise Level (dB, L_{dn})		
				Existing	Existing Plus WHII	Change
1	Douglas Blvd.	Sierra College Blvd. to Cavitt Stallman Rd.	722	63.8	63.8	0.0
2	Douglas Blvd.	Cavitt Stallman Rd. to Woodgrove Way	121	73.6	73.6	0.0
3	Douglas Blvd.	Woodgrove Way to Seeno Ave. (near WHI and WHII)	59	74.8	74.8	0.0
3w	Douglas Blvd.		322	57.3	57.4	+0.1
4	Douglas Blvd.	Seeno Ave. to Barton Rd. (near WH II)	95	72.7	72.7	0.0
4w	Douglas Blvd.		344	56.8	56.9	+0.1
5	Douglas Blvd.	Barton Rd. to Auburn Folsom Rd.	92	73.4	73.4	0.0
6	Sierra College Blvd.	North of Douglas Blvd.	128	68.8	68.8	0.0
7	Sierra College Blvd.	Douglas Blvd. to Renaissance Creek/Granite Bay Business Park	157	69.0	69.0	0.0
8	Sierra College Blvd.	Renaissance Creek/Granite Bay Business Park to Eureka Rd.	108	70.3	70.3	0.0
9	Auburn-Folsom Rd.	Douglas Blvd. to Eureka Rd.	82	72.4	72.4	0.0

Source: RCH Group, 2018.

WHI and WHII

Table 12-12 below provides a summary of the predicted noise levels on area roadway segments under Existing Plus WHI and WHII conditions. Noise levels were modeled at the nearest existing structures along each roadway, with the exception of the noise levels for segments 3w and 4w, which were modeled at the future property line of the nearest proposed WHI and WHII residences, respectively. As shown in the table, the proposed projects' contributions to traffic noise increases would be 0.1 dB or less for all roadway segments, which is below the applicable substantial increase thresholds shown in Table 12-8. In addition, the combined projects would not cause new exceedances of the County's 60 dB L_{dn} exterior noise level threshold at any of the study roadway segments. Therefore, combined traffic generated by the proposed projects would not result in a significant increase in traffic noise levels under Existing Plus WHI and WHII conditions. Thus, a less-than-significant impact would occur.

For information purposes, it is noted that average traffic noise at the proposed WHI and WHII residences closest to Douglas Boulevard would be approximately 57.4 dB L_{dn} and 56.9 dB L_{dn}, respectively, under this scenario, which is below the County's 60 dB L_{dn} threshold.

Table 12-12
Traffic Noise Levels – Existing Plus WHI and WHII Conditions

ID #	Roadway	Segment	Distance to Receiver (feet)	Noise Level (dB, L_{dn})		
				Existing	Existing Plus WHI and WHII	Change
1	Douglas Blvd.	Sierra College Blvd. to Cavitt Stallman Rd.	722	63.8	63.8	0.0
2	Douglas Blvd.	Cavitt Stallman Rd. to Woodgrove Way	121	73.6	73.7	+0.1
3	Douglas Blvd.	Woodgrove Way to Seeno Ave. (near WHI and WHII)	59	74.8	74.8	0.0
3w	Douglas Blvd.		322	57.3	57.4	+0.1
4	Douglas Blvd.	Seeno Ave. to Barton Rd. (near WH II)	95	72.7	72.7	0.0
4w	Douglas Blvd.		344	56.8	56.9	+0.1
5	Douglas Blvd.	Barton Rd. to Auburn Folsom Rd.	92	73.4	73.4	0.0
6	Sierra College Blvd.	North of Douglas Blvd.	128	68.8	68.8	0.0
7	Sierra College Blvd.	Douglas Blvd. to Renaissance Creek/Granite Bay Business Park	157	69.0	69.0	0.0
8	Sierra College Blvd.	Renaissance Creek/Granite Bay Business Park to Eureka Rd.	108	70.3	70.3	0.0
9	Auburn-Folsom Rd.	Douglas Blvd. to Eureka Rd.	82	72.4	72.4	0.0

Source: RCH Group, 2018.

Conclusion

The WHI and WHII projects would not result in any individual or combined substantial increases in traffic noise on area roadways and would not cause new exceedances of the County's 60 dB L_{dn} exterior noise level threshold for existing residential uses. Per the Technical Noise Analyses, typical residential construction consistent with the Uniform Building Code (UBC) provides an exterior-to interior noise level reduction of approximately 25 dB provided that exterior windows and doors are closed. Thus, residences exposed to exterior noise levels of 70 dB L_{dn} or less will comply with the County's interior noise level standard of 45 dB L_{dn}. Given that none of the proposed residences would be exposed to noise levels in excess of 70 dB L_{dn}, interior noise levels at the WHI and WHII projects would comply with County standards.

Based on the above, the proposed projects would not result in the exposure of persons to or generation of traffic noise levels in excess of standards established in the County's General Plan, the GBCP, the County's Noise Ordinance, or applicable standards of other agencies. In addition, because traffic noise level increases occurring under the Existing Plus WHI, Existing Plus WHII, and Existing Plus WHI and WHII conditions would be below the applicable substantial increase thresholds, the WHI and WHII projects would

not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the projects. Therefore, a ***less-than-significant*** impact would occur.

Mitigation Measure(s)
None required.

12-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

Construction activities have the potential to result in varying degrees of temporary ground vibration depending on the specific construction equipment used and operations involved. Table 12-13 shows the typical vibration levels produced by construction equipment at various distances.

Table 12-13
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (in/sec)	PPV at 50 feet (in/sec)
Large Bulldozer	0.089	0.029
Loaded Trucks	0.076	0.025
Small Bulldozer	0.003	0.000
Auger/Drill Rigs	0.089	0.029
Jackhammer	0.035	0.011
Vibratory Hammer	0.070	0.023
Vibratory Compactor/Roller	0.210	0.070

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006.

WHI

The primary vibration-generating activities associated with the WHI project would occur during grading, placement of utilities, paving of roadways, and construction of building foundations. The most substantial source of groundborne vibration associated with project construction equipment would be the use of vibratory compactors during construction of the proposed on-site roadways. As noted previously, the nearest existing sensitive receptor to the WHI site is the single-family residence located on the Mac Bride parcel to the east of the site. The residence is located approximately 43 feet from the nearest proposed residential lot on the site.

As shown in Table 12-13, at a distance of 50 feet, vibration levels for the types of equipment anticipated for use on the WHI site would be below the applicable 0.2 in/sec PPV threshold shown in Table 12-9 at which vibration is readily detectable. Because vibration levels generated by the type of construction equipment that would typically be required for the proposed project dissipate very rapidly with distance, and because the proposed construction activities would occur at a distance of approximately 43 feet from

the nearest residential structure to the east of the WHI site, vibration levels at the nearest residences would be below 0.2 in/sec PPV during project construction. Therefore, groundborne vibration associated with the types of equipment anticipated for use during construction activities would not cause damage to existing buildings.

However, in addition to vibration from construction equipment, development of the WHI site could potentially involve controlled blasting in hard rock areas that could generate vibration or groundborne noise levels at nearby sensitive receptors. If blasting is necessary, blasting activities would be conducted at specific locations within the project site to break up the rock for hauling and processing, and would typically occur once per day. Typically, blasting is controlled using micro delays between holes and by limiting charge size in order to minimize dispersal of the rock fragments, ensure worker safety, and prevent vibration damage to nearby structures. Nonetheless, given the proximity of the WHI site to the nearest existing receptors, a significant impact could occur related to blasting vibration.

WHII

Similar to the WHII site, primary vibration-generating activities associated with the WHII project would occur during grading, placement of utilities, paving of roadways, and construction of building foundations. The most substantial source of groundborne vibrations associated with project construction equipment would be the use of vibratory compactors during construction of the proposed on-site roadways. The nearest existing sensitive receptor to the WHII site is the single-family residence to the south of the site. The residence is located approximately 52 feet from the nearest proposed residential lot and approximately 25 feet from the nearest proposed roadway.

As shown in Table 12-13, at a distance of 25 feet, vibration levels associated with vibratory compactors could exceed the 0.2 in/sec PPV threshold shown in Table 12-9, at which vibration is readily detectable and architectural damage could occur depending upon the age of the structure. Vibratory compactors would only be used over a relatively short period of time at the particular roadway segment nearest to the existing off-site sensitive receptor. Nonetheless, because vibration intensities could exceed 0.2 in/sec PPV, roadway construction activities as the southern boundary of the WHII site could cause damage to existing buildings.

In addition to vibration from construction equipment, development of the WHII site could potentially involve controlled blasting in hard rock areas that could generate substantial vibration or groundborne noise levels at nearby sensitive receptors. Similar to WHI, blasting would be conducted at specific locations within the project site to break up the rock for hauling and processing, and would typically occur once per day. Typically, blasting is controlled using micro delays between holes and by limiting charge size in order to minimize dispersal of the rock fragments, ensure worker safety, and prevent vibration damage to nearby structures. Nonetheless, given the proximity of the WHII site to the nearest existing receptors, a significant impact could occur related to blasting vibration.

WHI and WHII

Based on the above, combined development of the WHI and WHII projects could result in a significant impact related to generation of substantial groundborne vibration or groundborne noise during blasting activities. The use of vibratory compactors to construct the southernmost roadway on WHII could also exceed the vibration threshold at the nearest off-site residential structure. It should be noted that construction phases associated with the two projects, particularly blasting activities, would not be expected to overlap such that combined effects related to groundborne vibration would occur.

Conclusion

With the exception of compaction of the proposed hammerhead turnaround at the southern portion of the WHII site, typical construction activities associated with development of the WHI and WHII projects would not generate substantial groundborne vibration at existing residences in the project area. In the event that blasting is required during construction, the proposed projects could expose persons to or generate excessive groundborne vibration or groundborne noise levels, and a ***significant*** impact could occur.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

WHII

12-2(a) *During construction activities associated with the WHII project, any compaction required within 25 feet of existing structures adjacent to the project site shall be accomplished by using static drum rollers rather than vibratory compactors. The above requirement shall be included via notation on any Improvement Plans approved for the project to the satisfaction of the Planning Services Division.*

WHI and WHII

12-2(b) *A Blasting Plan for construction shall be prepared and submitted to the County Planning Services Division prior to initiation of construction activities. The plan shall include the following:*

1. *The Blasting Plan shall be consistent with the County General Plan Noise Element's Policy 9.A.4.*
2. *Primary components of the Blasting Plan shall include:*
    a. *Identification of blast officer;*
    b. *Scaled drawings of blast locations, and neighboring buildings, streets, or other locations which could be inhabited;*

c. *Blasting notification procedures, lead times, and lists of those notified. Public notification to potentially affected vibration receptors describing the expected extent and duration of the blasting;*
d. *Description of means for transportation and on-site storage and security of explosives in accordance with local, State and federal regulations;*
e. *Minimum acceptable weather conditions for blasting and safety provisions for potential stray current (if electric detonation);*
f. *Traffic control standards and traffic safety measures (if applicable);*
g. *Require personal protective equipment;*
h. *Minimum standoff distances and description of blast impact zones and procedures for clearing and controlling access to blast danger;*
i. *Procedures for handling, setting, wiring, and firing explosives, as well as procedures for handling misfires per federal code;*
j. *Type and quantity of explosives and description of detonation device. Sequence and schedule of blasting rounds, including general method of excavation, lift heights, etc.;*
k. *Methods of matting or covering of blast area to prevent flyrock and excessive air blast pressure;*
l. *Description of blast vibration and air blast monitoring programs;*
m. *Dust control measures in compliance with applicable air pollution control regulations (to interface with general construction dust control plan);*
n. *Emergency Action Plan to provide emergency telephone numbers and directions to medical facilities. Procedures for action in the event of injury;*
o. *Material Safety Data Sheets for each explosive or other hazardous materials to be used;*
p. *Evidence of licensing, experience, and qualifications of blasters; and*
q. *Description of insurance for the blasting work.*

3. *A Blast Survey Workplan shall be prepared by the blaster. The Plan shall establish vibration limits in order to protect structures from blasting activities and identify specific monitoring points. At a minimum, a pre-blast survey shall be conducted of any potentially affected structures and underground utilities within 500 feet of a blast area, as well as the nearest residential structure, prior to blasting. The survey shall include visual inspection of the structures, documentation of structures by means of photographs,*

video, and a level survey of the ground floor of structures or the crown of major and critical utility lines, and these shall be submitted to the County. This documentation shall be reviewed with the individual owners prior to any blasting operations. The County and impacted property owners shall be notified at least 48 hours prior to the visual inspections.

4. *Vibration and settlement threshold criteria (for example peak particle velocity of 0.5 inches per second) shall be submitted by the blaster to the County for review and approval during the design process. If the settlement or vibration criteria are exceeded at any time or if damage is observed at any of the structures or utilities, then blasting shall immediately cease and the County immediately notified. The stability of segmental retaining walls, existing slopes, creek canals, etc. shall be monitored and any evidence of instability due to blasting operations shall result in immediate termination of blasting. The blaster shall modify the blasting procedures or use alternative means of excavating in order to reduce the vibrations to below the threshold values, prevent further settlement, slope instability, and prevent further damage.*
5. *Air blast overpressure limits shall be set and monitoring shall be conducted at the property line closest to the blast and at other above ground structures identified in the Plan for vibration monitoring. Air blast overpressure limits shall be in accordance with applicable law and shall be established to prevent damage to adjacent properties, new construction, and to prevent injuries to persons on-site and off-site.*
6. *Prior to full-scale production blasting, the blaster shall conduct a series of test blasts at the sites where blasting is to occur. The tests shall start with reduced charge weights and shall increase incrementally to that of a full-scale production round. Monitoring shall be conducted as described in the Plan.*
7. *Post-construction monitoring of structures to identify (and repair if necessary) all damage, if any, from blasting vibrations. Any damage shall be documented by photograph, video, etc. This documentation shall be reviewed with the individual property owners.*
8. *Reports of the results of the blast monitoring shall be provided to the County, the local fire department, and owners of any buried utilities on or adjacent to the site within 24 hours following blasting. Reports documenting damage, excessive vibrations, etc. shall be provided to the County and impacted property owners.*

12-3 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

During development of the WHI and WHII projects, construction activities would require the use of numerous pieces of noise-generating equipment, such as excavating machinery (e.g., backhoes, bulldozers, excavators, front loaders, etc.) and other construction equipment (e.g., compactors, scrapers, graders, etc.). Construction worker traffic and construction-related material haul trips would raise ambient noise levels along local haul routes, depending on the number of haul trips made and types of vehicles used. Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point, as well as the prevailing wind direction. Standard construction equipment, such as backhoes, loaders, and trucks, would be used on the project sites.

Table 12-14 below provides a summary of the range of maximum noise levels for various types of construction equipment at a distance of 50 feet. The noise values represent maximum noise generation, or full power operation, of the equipment. As one increases the distance between equipment, or increases separation of areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of combining separate noise sources.

Table 12-14
Construction Equipment Noise Levels

Type of Equipment	Typical Noise Level at 50 feet (L_{max}, dB)
Dump Truck	76
Air Compressor	78
Concrete Mixer (Truck)	79
Jackhammers	89
Scraper	84
Dozer	82
Paver	77
Generator	81
Auger Drill Rig	84
Front End Loader	79
Grader	85
Backhoe	78

Source: RCH Group, 2018.

As shown in Table 12-14, maximum noise levels generated by various types of construction equipment can range from 76 to 89 dB L_{max} at 50 feet. Table 12-15 summarizes typical construction noise levels at 50 feet for various phases. As shown in the table, the highest noise levels associated with construction activities typically occur during ground excavation and finishing.

Table 12-15 Typical Construction Phase Noise Levels	
Phase	**Typical Noise Level at 50 feet (L_{eq}, dB)**
Ground Clearing	83
Excavation	88
Foundations	81
Erection	81
Finishing	88
Source: RCH Group, 2018.	

WHI

Based on the above, construction equipment noise associated with the WHI project could generate short-term noise level increases at nearby sensitive receptors during development of the site. In addition, as discussed under Impact 12-3 above, controlled blasting may be required during site preparation to excavate hard rock on the WHI site.

The audible sound associated with blasting is reported to be the result of escaping gases and falling (slumping) rock. Subjectively, audible blasting sound has been described as similar to the closing of a car trunk, or to rolling thunder. While these terms are subjective rather than quantitative, the described sounds are relatively benign.

Audible noise due to blasting is not commonly considered to be a significant source of annoyance if blasting is controlled to meet safety standards on the project site. Nonetheless, construction blasting noise is expected to be audible, and its sudden occurrence could startle people nearby under certain circumstances.

Per Section 9.36.030 of the Placer County Code, sound or noise emanating from construction activities occurring during the following time periods is exempt from the noise level standards included in the County's Noise Ordinance, provided that all construction equipment is fitted with factory-installed muffling devices and that all construction equipment is maintained in good working order: a) Monday through Friday, 6:00 AM to 8:00 PM (during daylight savings); b) Monday through Friday, 7:00 AM to 8:00 PM (during standard time); and c) Saturdays, 8:00 AM to 6:00 PM. However, if such requirements are not met, construction of the WHI project could conflict with the Placer County Code. In addition, standard procedures would be required to limit blasting noise at existing sensitive receptors. In the absence of standard practices to limit construction equipment and blasting noise exposure at nearby sensitive receptors, a significant temporary impact could occur.

WHII

Similar to the WHI project, construction equipment noise associated with the WHI project could generate short-term noise level increases at nearby sensitive receptors during development of the site. In addition, the WHII project could potentially require controlled blasting activities within the proximity of the existing single-family residences to the south and/or east of the WHII site. Therefore, similar to the WHI project, in the

absence of standard practices to limit construction equipment and blasting noise exposure at nearby sensitive receptors, a significant temporary impact could occur.

WHI and WHII

Both the WHI and WHII projects could potentially require use of heavy-duty construction equipment and on-site blasting activity during construction. Therefore, combined development of the two projects could result in a significant impact related to short-term noise level increases. It should be noted that construction phases associated with the two projects, particularly blasting activities, would not be expected to overlap such that combined effects related to blasting noise would occur.

Conclusion

Based on the above, construction noise associated with the WHI and WHII projects would be exempt from the noise level standards included in the County's Noise Ordinance, provided that all construction equipment is fitted with factory-installed muffling devices and is maintained in good working order per 9.36.030 of the Placer County Code. Noise-generating construction activities would be limited to the time periods specified above. However, if such requirements are not met, construction of the proposed projects could conflict with the Placer County Code. In addition, standard procedures would be required to limit blasting noise at existing sensitive receptors. In the absence of standard practices to limit construction equipment and blasting noise exposure at nearby sensitive receptors, the WHI and WHII projects could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the projects. Thus, a ***significant*** impact could occur.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

WHI and WHII

12-3(a) *The following criteria shall be included in the Improvement Plans. Exceptions to allow expanded construction activities shall be reviewed on a case-by-case basis as determined by the Community Development Resource Agency Director.*

- *Noise-generating construction activities (e.g. construction, alteration or repair activities), including truck traffic coming to and from the project site for any purpose, shall be limited to the hours outlined in Placer County Board of Supervisors Minute Order 90-08; specifically, a) Monday through Friday, 6:00 AM to 8:00 PM (during daylight savings); b) Monday through Friday, 7:00 AM to 8:00 PM (during standard time); and c) Saturdays, 8:00 AM to 6:00 PM.*

- *Project construction activities should be limited to daytime hours unless conditions warrant that certain construction activities occur during evening or early morning hours (i.e., extreme heat).*
- *All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc welders, air compressors) shall be equipped with shrouds and noise-control features that are readily available for that type of equipment.*
- *All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, State, or local agency shall comply with such regulations while in the course of project activity.*
- *Electrically powered equipment shall be used instead of pneumatic or internal combustion-powered equipment, where feasible.*
- *Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.*
- *Construction site and access road speed limits shall be established and enforced during the construction period.*
- *The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.*
- *Project-related public address or music systems shall not be audible at any adjacent receptor.*
- *As a means of avoiding the potential for annoyance, haul trucks shall be restricted along the local roadways to the same hours as construction activities are allowed unless a request is made for the County to allow greater flexibility in order to minimize potential AM peak hour traffic conflicts..*

12-3(b) *Implement Mitigation Measure 12-2(b).*