

## 4.10. NOISE AND VIBRATION

### 4.10.1 INTRODUCTION

The Noise and Vibration chapter of the EIR describes the existing noise environment in the project vicinity, and identifies potential impacts and mitigation measures related to noise and vibration associated with construction and operation of the proposed project. The method by which the potential impacts are analyzed is discussed, followed by the identification of potential impacts and the recommended mitigation measures designed to reduce significant noise and vibration impacts to less-than-significant levels, if required. The Noise and Vibration chapter is primarily based on the Noise and Vibration Analysis prepared for the proposed project by Bollard Acoustical Consultants (BAC) (see Appendix L),<sup>1</sup> the Technical Blasting Report prepared for the proposed project by Precision Blasting Services (see Appendix M),<sup>2</sup> the Nevada County General Plan,<sup>3</sup> the Nevada County General Plan EIR,<sup>4</sup> and the Whispering Pines Specific Plan.<sup>5</sup>

The technical noise and vibration reports listed above reflect the versions of the reports that were updated, as necessary, to address the comments included in the third-party independent peer review performed by Saxelby Acoustics under contract with Raney.<sup>6</sup>

### 4.10.2 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 sources and noise levels in the project vicinity, and groundborne vibration.

#### Fundamentals of Noise

Decibels (dB) are logarithmic units that compare the wide range of sound intensities to which the human ear is sensitive. The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the typical range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by filtering the frequency response of a sound level meter by means of the standardized A-weighting network. A-weighting of sound levels best reflects the human ear's reduced sensitivity to low frequencies, and the use of A-weighted sound level, expressed as dBA, has become the standard tool of environmental noise assessment. Noise levels associated with common noise sources are provided in Figure 4.10-1.

<sup>1</sup> Bollard Acoustical Consultants, Inc. *Noise and Vibration Analysis, Idaho Maryland Mine, Nevada County, California BAC Job #2018-203*. March 8, 2021.

<sup>2</sup> Precision Blasting Services. *Environmental Factors of Blasting Report for the Proposed Idaho-Maryland Project Nevada County, CA*. September 27, 2019.

<sup>3</sup> Nevada County. *Nevada County General Plan*. Updated 2014.

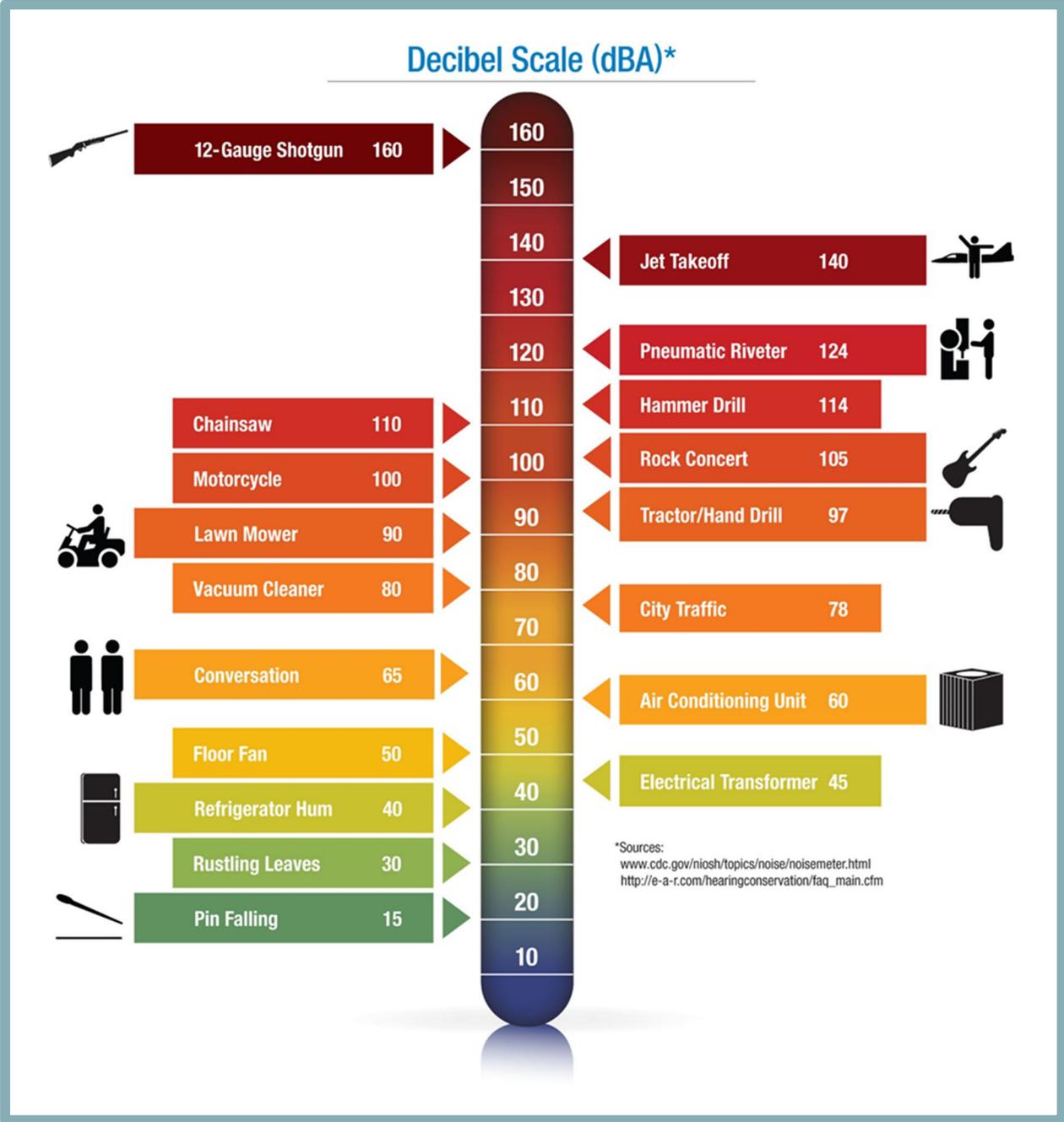
<sup>4</sup> Nevada County. *Nevada County General Plan, Final Environmental Impact Report*. March 1995.

<sup>5</sup> City of Grass Valley. *Whispering Pines Corporate Community Specific Plan/Master Environmental Impact Report*. February 1984.

<sup>6</sup> Saxelby Acoustics. *Noise study peer review for the Idaho-Maryland Mine EIR – Nevada County, California*. July 2, 2020.



**Figure 4.10-1  
 Noise Levels Associated with Common Noise Sources**



Source: *Bollard Acoustical Consultants, Inc. (2021).*



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 environment. A common statistical tool used to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ). The  $L_{eq}$  is the foundation of the day-night average noise descriptor, or  $L_{dn}$ , and represents a correlation with community response to noise.

The  $L_{dn}$  is based on the average noise level over a 24-hour day, with an additional 10 dB weighting applied to noise that occurs during nighttime (10:00 PM to 7:00 AM) hours. The 10 dB nighttime penalty is applied to account for the assumption that people are more sensitive to nighttime noise exposures as compared to daytime noise exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment.  $L_{dn}$  based noise standards are commonly used to assess noise impacts associated with traffic, railroad and aircraft noise sources.

The Nevada County noise standards, which are discussed in detail later in this chapter, are expressed in terms of the hourly average and single-event maximum noise level performance standards. In addition to applying the County's noise standards to the proposed project, CEQA requires that noise impacts be assessed relative to ambient noise levels that are present without the project. As a result, ambient noise surveys were conducted, and comparisons of Project to No-Project noise levels were used to assess noise impacts (in addition to comparison to Nevada County noise standards). Specifically, individual maximum ( $L_{max}$ ) noise levels and hourly average ( $L_{eq}$ ) noise levels, both with and without the project, were compared so that the assessment of noise impacts was not based solely on an assessment of project-generated noise in terms of 24-hour averages ( $L_{dn}$ ), but also on short-term fluctuations in the ambient noise environment.

### **Fundamentals of Vibration**

Vibration is similar to noise in that both involve a source, a transmission path, and a receiver. However, while noise is generally considered to be pressure waves transmitted through air, vibration is usually associated with transmission through the ground or structures. As with noise, vibration consists of an amplitude and frequency.

Seismic waves are waves that travel through the earth. Common sources of man-made seismic waves include explosions, blasting, pile driving, and mechanical excavation of rock. When these man-made seismic waves are perceptible, they are called vibration. Blasting creates seismic waves that radiate along the surface of the earth and downward into the earth. If close enough to the blasting location, these surface waves can be felt as ground vibration. A person's perception to the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Ground vibration is monitored using a seismograph, which is specially built to measure the high frequencies of blasting ground vibration. A seismograph records ground vibration in three different directions, giving three distinct wave traces: vertical, longitudinal, and transverse. A common practice is to monitor vibration measures in terms of peak particle velocities (PPV, inches/second [in/s]), or Velocity Decibels in terms of root-mean-square levels (VdB RMS). Standards pertaining to perception as well as potential damage to structures have been developed for vibration in terms of PPV as well as RMS.



## **Existing 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. Noise-sensitive land uses typically include residences, schools, child care centers, hospitals, long-term health care facilities, convalescent centers, retirement homes, and recreation areas.

Sensitive receptors in the project vicinity primarily consist of single-family residences. Residences near the Centennial Industrial Site are limited, and are located to the north and northeast of the site. Several residences are located around the Brunswick Industrial Site and along the proposed haul route.

While it is recognized that there are several residences surrounding the Brunswick Industrial Site, it is not necessary to assess potential project impacts at each and every individual residence. Rather, standard industry practice is to assess impacts at receptors which are representative of the nearest potentially affected residences to the project site (including residences located adjacent to project haul routes).

For the purposes of this analysis, 30 receptors were selected as representative of the nearest potentially affected receptors to the project sites (see Figure 4.10-2). The receptors consist of the following locations:

- 17 residences surrounding the Brunswick Industrial Site.
- 3 residences near the Centennial Industrial Site.
- 1 residence along Whispering Pines Lane between Brunswick Road and Centennial Drive.
- 5 residences along Brunswick Road, north of East Bennett Road.
- 4 residences along East Bennett Road.

Receptors 1 and 2 are located north of the Centennial Industrial Site and were selected because they represent the nearest residences to the Centennial Industrial Site. It is noted that noise generated at the Brunswick Industrial Site is expected to be inaudible over background noise at these locations. This occurs at other receptor locations as well, in that not all project noise sources would affect each of the representative receptors selected for analysis. Receptors 9 through 12 were selected to represent exposure of existing residences to noise generated during construction of the potable water pipeline along a portion of East Bennett Road. Receptors 3 through 7 were selected to represent residences exposed to project truck traffic noise, with Receptor 4 representing future residences in the Loma Rica development. Receptors 13 through 30 were selected for analysis of on-site noise generation at the Brunswick Industrial Site, with Receptors 17 through 23 also used to assess potential truck traffic noise impacts.

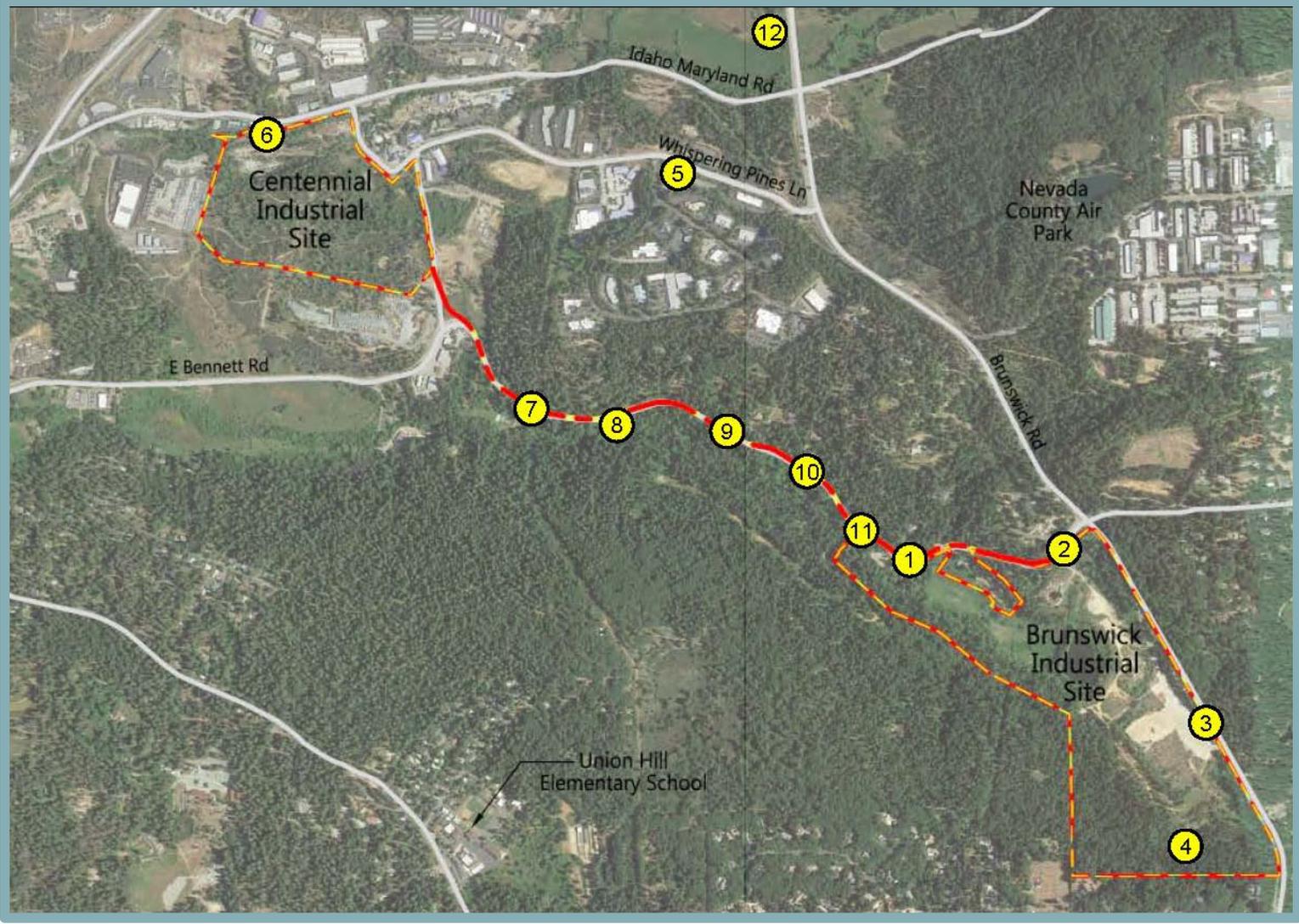
## **Ambient Noise Levels**

To quantify the existing ambient noise environment in the project vicinity, BAC conducted continuous noise level measurements at 11 locations in the project vicinity. The noise measurement locations were selected to be representative of ambient noise conditions at receptors nearest to both the Brunswick and Centennial Industrial Sites, at locations along East Bennett Road where the potable water system would be installed, and at receptors along the proposed haul routes. The ambient noise measurement locations are identified in Figure 4.10-3.





**Figure 4.10-3  
Noise and Vibration Measurement Locations**



Source: Bollard Acoustical Consultants, Inc. (2021).



Continuous noise monitoring was not necessary at all of the 30 sensitive receptors evaluated in this study because several of the monitoring locations represent ambient conditions at multiple receptor locations. For instance, the data collected at Monitoring Site 3 (see Figure 4.10-3) adequately represents the ambient noise conditions at Receptors 19 through 25 (see Figure 4.10-2). Similarly, monitoring site 12 can be used to extrapolate ambient conditions at receptors adjacent to Brunswick Road north of East Bennett Road (Receptors 4 through 7, 17 and 18). Results of ambient long-term noise monitoring are presented in Table 4.10-1.

**Table 4.10-1  
Summary of Long-term Noise Monitoring Results**

Site <sup>1</sup>	Date	Ldn (dBA)	Average Measured Hourly Noise Levels (dBA)					
			Daytime <sup>2</sup>		Evening <sup>3</sup>		Nighttime <sup>4</sup>	
			Leq	Lmax	Leq	Lmax	Leq	Lmax
1	Tuesday, June 13, 2017	61	60	82	57	82	51	71
	Wednesday, June 14, 2017	61	61	83	59	85	52	75
	Thursday, June 15, 2017	61	59	80	57	79	52	76
	Friday, June 16, 2017	60	59	80	56	77	51	74
	Saturday, June 17, 2017	58	57	78	55	78	49	69
	Sunday, June 18, 2017	58	57	83	56	81	49	71
	<b>Average</b>	<b>60</b>	<b>59</b>	<b>81</b>	<b>57</b>	<b>80</b>	<b>51</b>	<b>73</b>
2	Tuesday, June 13, 2017	60	59	82	56	81	51	71
	Wednesday, June 14, 2017	60	59	82	56	83	51	73
	Thursday, June 15, 2017	60	59	81	56	79	51	73
	Friday, June 16, 2017	60	59	80	55	77	51	73
	Saturday, June 17, 2017	58	56	78	55	81	48	70
	Sunday, June 18, 2017	58	57	82	56	82	47	69
	<b>Average</b>	<b>59</b>	<b>58</b>	<b>81</b>	<b>56</b>	<b>81</b>	<b>50</b>	<b>72</b>
3	Tuesday, June 13, 2017	69	67	80	64	79	60	78
	Wednesday, June 14, 2017	68	67	81	64	84	59	77
	Thursday, June 15, 2017	68	67	82	64	81	59	79
	Friday, June 16, 2017	68	67	82	64	79	59	76
	Saturday, June 17, 2017	67	65	80	63	81	58	76
	Sunday, June 18, 2017	66	64	81	64	81	57	77
	<b>Average</b>	<b>68</b>	<b>66</b>	<b>81</b>	<b>64</b>	<b>81</b>	<b>59</b>	<b>77</b>
4	Tuesday, June 13, 2017	53	52	64	49	64	45	55
	Wednesday, June 14, 2017	52	51	64	49	61	44	56
	Thursday, June 15, 2017	53	51	62	50	65	45	57
	Friday, June 16, 2017	53	52	65	49	61	45	56
	Saturday, June 17, 2017	51	50	64	48	63	43	54
	Sunday, June 18, 2017	50	49	62	48	63	42	56
	<b>Average</b>	<b>52</b>	<b>51</b>	<b>64</b>	<b>49</b>	<b>63</b>	<b>44</b>	<b>56</b>
5	Tuesday, Oct. 01, 2019	60	60	81	53	69	51	67
	Wednesday, Oct. 02, 2019	60	61	82	52	73	51	70
	<b>Average</b>	<b>60</b>	<b>61</b>	<b>82</b>	<b>53</b>	<b>71</b>	<b>51</b>	<b>69</b>
6	Tuesday, Oct. 01, 2019	66	65	80	60	76	59	73
	Wednesday, Oct. 02, 2019	67	65	81	60	74	59	74
	Thursday, Oct. 03, 2019	67	65	80	60	76	59	73

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**Table 4.10-1  
Summary of Long-term Noise Monitoring Results**

Site <sup>1</sup>	Date	Ldn (dBA)	Average Measured Hourly Noise Levels (dBA)					
			Daytime <sup>2</sup>		Evening <sup>3</sup>		Nighttime <sup>4</sup>	
			Leq	Lmax	Leq	Lmax	Leq	Lmax
	<b>Average</b>	<b>63</b>	<b>63</b>	<b>81</b>	<b>56</b>	<b>73</b>	<b>55</b>	<b>71</b>
7	Friday, Dec. 07, 2018	59	59	79	55	75	50	73
	Saturday, Dec. 08, 2018	57	57	76	54	77	47	69
	Sunday, Dec. 09, 2018	55	56	76	52	74	46	68
	Monday, Dec. 10, 2018	57	58	77	53	74	48	69
	<b>Average</b>	<b>60</b>	<b>60</b>	<b>78</b>	<b>55</b>	<b>75</b>	<b>51</b>	<b>70</b>
8	Friday, Dec. 07, 2018	57	57	76	54	73	47	70
	Saturday, Dec. 08, 2018	55	55	74	54	77	45	67
	Sunday, Dec. 09, 2018	54	54	74	51	72	44	65
	Monday, Dec. 10, 2018	56	56	75	52	74	45	66
	<b>Average</b>	<b>56</b>	<b>57</b>	<b>76</b>	<b>53</b>	<b>74</b>	<b>47</b>	<b>68</b>
9	Friday, Dec. 07, 2018	60	60	79	57	76	51	74
	Saturday, Dec. 08, 2018	59	59	79	56	79	49	71
	Sunday, Dec. 09, 2018	57	58	79	55	78	47	70
	Monday, Dec. 10, 2018	60	60	80	56	79	49	71
	<b>Average</b>	<b>58</b>	<b>58</b>	<b>78</b>	<b>55</b>	<b>77</b>	<b>48</b>	<b>70</b>
10	Friday, Dec. 07, 2018	59	59	79	56	77	50	74
	Saturday, Dec. 08, 2018	58	57	79	55	78	47	72
	Sunday, Dec. 09, 2018	57	57	79	53	76	47	70
	Monday, Dec. 10, 2018	58	59	79	55	77	48	71
	<b>Average</b>	<b>58</b>	<b>58</b>	<b>79</b>	<b>55</b>	<b>77</b>	<b>48</b>	<b>71</b>
11	Friday, Dec. 07, 2018	59	59	77	56	75	50	73
	Saturday, Dec. 08, 2018	57	57	76	56	78	48	70
	Sunday, Dec. 09, 2018	56	57	78	53	75	47	70
	Monday, Dec. 10, 2018	58	58	77	55	76	49	71
	<b>Average</b>	<b>58</b>	<b>58</b>	<b>78</b>	<b>55</b>	<b>76</b>	<b>48</b>	<b>71</b>
12	Thursday, July 26, 2018	63	55	72	53	65	56	70
	<b>Average</b>	<b>63</b>	<b>55</b>	<b>72</b>	<b>53</b>	<b>65</b>	<b>56</b>	<b>70</b>

Notes:

1. Ambient noise monitoring locations are shown on Figure 4.10-3.
2. Daytime = 7:00 AM– 7:00 PM
3. Evening = 7:00 PM– 10:00 PM
4. Nighttime = 10:00 PM – 7:00 AM

**Source: Bollard Acoustical Consultants, Inc. (2021).**

As shown in Table 4.10-1, ambient noise conditions vary depending primarily on the distance between the monitoring site and nearby roadways. Existing L<sub>dn</sub> levels range from a high of 68 dBA (near Brunswick Road (Site 3)) to a low of 52 dBA (e.g., locations removed from roadway noise sources (Site 4)).

The Nevada County Airport is located approximately 4,000 feet northeast of the Brunswick Industrial Site and approximately 7,500 feet east of the Centennial Industrial Site. According to the Nevada County Airport Land Use Compatibility Plan (NCALUCP), both the Brunswick



Industrial Site and Centennial Industrial Site are located outside of the airport's 55 dB Community Noise Equivalent Level (CNEL) contour (see Figure 4.10-4).<sup>7,8</sup>

### **Existing Traffic Noise Levels**

The existing ambient noise environment in the project vicinity is defined primarily by traffic. The existing traffic noise environment was quantified using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) with the Calveno vehicle noise emission curves. Traffic volumes for existing conditions were obtained from the traffic study prepared for the proposed project by KD Anderson & Associates. Table 4.10-2 shows the calculated existing traffic noise levels in L<sub>dn</sub> at the nearest representative residential receptors to each roadway segment.

#	Roadway	Segment	Distance (feet)	L <sub>dn</sub>	60 dB L <sub>dn</sub> Contour Distance (ft)
1	East Bennett Road	West of Brunswick Road	135	52.5	43
2	Brunswick Road	Brunswick Industrial Site Entrance to East Bennett Road	200	60.9	230
3	Brunswick Road	North of Whispering Pines Lane	100	66.6	275
4	Brunswick Road	South of Brunswick Industrial Site Entrance	150	62.8	230
5	Brunswick Road	Whispering Pines Lane to East Bennett Road	120	66.4	319
6	Empire Street	West of SR 174	50	59.8	49
7	Empire Street	East of South Auburn Street	50	61.1	59
8	Idaho Maryland Road	East of SR 49	90	61.5	113
9	State Route 174	West of Brunswick	50	67.8	166
10	Whispering Pines Lane	Crown Point Circle to Brunswick	70	57.8	50
11	Whispering Pines Lane	Centennial to Crown Point Circle	70	59.1	61

*Source: FHWA-RD-77-108 with inputs provided by KD Anderson, BAC and Caltrans.*

### **Ambient Vibration Levels**

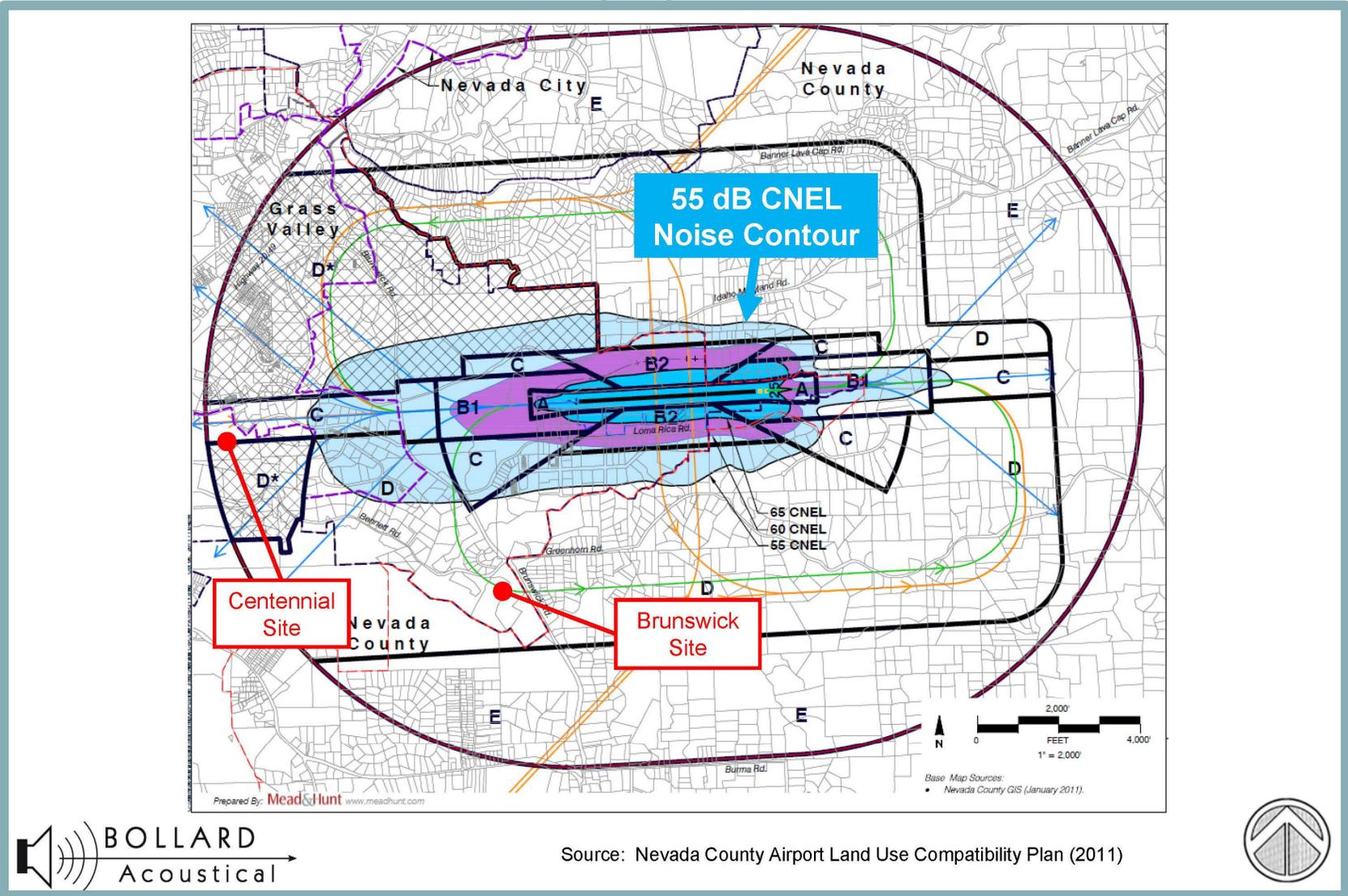
As with the local noise environment, the ambient vibration environment is defined primarily by traffic on the local roadway network. BAC conducted short-term vibration measurements at the same locations as the ambient noise monitoring locations (see Figure 4.10-3). A summary of the ambient vibration survey results is provided in Table 4.10-3.

<sup>7</sup> County of Nevada. *Nevada County Airport Land Use Compatibility Plan (NCALUCP)*. September 21, 2011.

<sup>8</sup> CNEL is defined as the 24-hour average noise level with noise occurring during the evening hours (7:00 PM – 10:00 PM) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.



**Figure 4.10-4  
Nevada County Airport Noise Contours**



Source: Nevada County Airport Land Use Compatibility Plan (2011)



**Table 4.10-3  
Summary of Short-term Vibration Results**

Measurement Site	Measured Vibration Levels, VdB rms		
	Minimum	Average	Maximum
V1	31	41	64
V2	31	42	60
V3	31	47	60
V4	31	35	50
V5	31	34	48
V6	31	37	48
V7	31	38	54
V8	32	41	62
V9	31	39	54
V10	32	57	76
V11	31	46	66

Note: Vibration measurement locations are shown on Figure 4.10-3.

Source: *Bollard Acoustical Consultants, Inc. (2021).*

### 4.10.3 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.

#### 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 (CCR), 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.

#### **Nevada County General Plan**

The relevant goals and policies from the Noise Element of the Nevada County General Plan are presented below.



Goal 9.1 Provide for the health, safety, and welfare of the people of Nevada County through a set of policies designed to encourage an environment free of unnecessary and annoying noise.

Policy 9.1.1 Determine the existing noise environment and continue to reassess this environment so that a realistic set of noise standards can be developed reflecting the varying nature of different land uses.

Policy 9.1.2 The following noise standards contained in Table 9.1 below [included as Table 4.10-4], as performance standards and land use compatibility standards, shall apply to all discretionary and ministerial projects, excluding permitted residential (including tentative maps) land uses.

Policy 9.1.3 The Nevada County Planning Department shall be the lead agency responsible for coordination of all local noise control activities and intergovernmental group activities and subsequent enforcement efforts.

<b>Table 4.10-4 General Plan Noise Element Exterior Noise Limits</b>				
<b>Land Use Category</b>	<b>Zoning Districts</b>	<b>Time Period</b>	<b>Noise Level, dBA</b>	
			<b>L<sub>eq</sub></b>	<b>L<sub>max</sub></b>
Rural	"A1" "TPZ" "AE" "OS" "FR" "IDR"	7:00 A.M. - 7:00 P.M.	55	75
		7:00 P.M. - 10:00 P.M.	50	65
		10:00 P.M. - 7:00 A.M.	40	55
Residential and Public	"RA" "R2" "R1" "R3" "P"	7:00 A.M. - 7:00 P.M.	55	75
		7:00 P.M. - 10:00 P.M.	50	65
		10:00 P.M. - 7:00 A.M.	45	60
Commercial and Recreation	"C1" "CH" "CS" "C2" "C3" "OP" "REC"	7:00 A.M. - 7:00 P.M.	70	90
		7:00 P.M. - 7:00 A.M.	65	75
Business Park	"BP"	7:00 A.M. - 7:00 P.M.	65	85
		7:00 P.M. - 7:00 A.M.	60	70
Industrial	"M1" "M2"	any time	80	90

Notes:

A. Compliance with the above standards shall be determined by measuring the noise level based on the mean average of not less than three (3) 20-minute measurements for any given time period. Additional noise measurements may be necessary to ensure that the ambient noise level is adequately determined.

B. Where two different zoning districts abut, the standard applicable to the lower, or more restrictive, district plus 5 dBA shall apply.

C. The above standards shall be measured only on property containing a noise sensitive land use as defined in Policy 9.8 and may be measured anywhere on the property containing said land use. However, this measurement standard may be amended to provide for measurement at the boundary of a recorded noise easement or as determined in a recorded letter of agreement between all affected property owners and approved by the County.

D. If the measured ambient level exceeds that permitted, then the allowable noise exposure standard shall be set at 5 dBA above the ambient.

E. Because of the unique nature of sound, the County reserves the right to provide for a more restrictive standard than shown in the Exterior Noise Limits table contained in this policy. The maximum adjustment shall be limited to be not less than the current ambient noise levels and shall

*(Continued on next page)*



not exceed the standards of this policy or as they may be further adjusted by Policy 9.1.2.b. Imposition of a noise level adjustment shall only be considered if one or more of the following conditions are found to exist:

- 1.) Unique characteristics of the noise source:
    - (a) The noise contains a very high or low frequency, is of a pure tone (a steady, audible tone such as a whine, screech, or hum), or contains a wide divergence in frequency spectra between the noise source and ambient level.
    - (b) The noise is impulsive in nature (such as hammering, riveting, or explosions), or contains music or speech.
    - (c) The noise source is of a long duration.
  - 2.) Unique characteristics of the noise receptor when the ambient noise level is determined to be 5 dBA or more below the Policy 9.1.2 standard for those projects requiring a General Plan amendment, rezoning, and/or conditional use permit. In such instances, the new standard shall not exceed 10 dBA above the ambient or the Policy 9.1.2 standard, whichever is more restrictive.
- F. The above standards shall not apply to those activities associated with the actual construction of a project or to those projects associated with the provision of emergency services or functions.
- G. The standards of this policy shall be enforced through compliance inspections and/or complaints.
- H. Recognizing that this chapter must work toward the solution to existing noise problems, those land uses that are inconsistent with the above standards and are therefore nonconforming in nature, shall comply with said standards as these land uses are upgraded or intensified or after abandonment through the use permit or site plan process. Said standards shall apply only to that portion of the land use requiring approval. In any event, the use or portion subject to a land use permit must meet the standards in the Exterior Noise Limits table in this policy and cumulatively the noise generated from the entire site must be equal to or less than the pre-land use permit ambient noise level. All such projects will require a comprehensive noise analysis pursuant to Policy 9.1.13 and the Nevada County Noise Element Manual.

**Source: General Plan Noise Element, Table 9.1.**

- Policy 9.1.6 Encourage public awareness of noise and its hazards and means to minimize its existing and future impacts.
- Policy 9.1.7 Encourage heavy truck traffic to those routes outside residential areas.
- Policy 9.1.8 Encourage cities within Nevada County to adopt noise control programs compatible with County efforts.
- Policy 9.1.9 Develop a realistic policy framework designed to function as a guide to planning for appropriate land uses in relation to hazardous and annoying noise.
- Policy 9.1.10 Strongly discourage those General Plan amendments and zone changes that would likely create land use conflicts relative to noise.
- Policy 9.1.11 Strongly encourage future noise sensitive land uses, including residences, schools, hospitals, nursing homes, churches, and libraries, to those location [sic] of the County where the impact of noise generators is limited so that compliance with standards found



in Policy 9.1.2 will be maintained. This policy shall apply to the approval of all tentative maps for residentially zoned parcels.

- Policy 9.1.12 Limit future noise generating land use to those location [sic] of the County where their impacts on noise sensitive land uses will be minimized, consistent with the standards found in Program 9.1.
- Policy 9.1.13 Require the preparation of a comprehensive noise study for all land use projects determined to have a potential to create noise levels inconsistent with those standards found in Program 9.1, and in accordance with the methodology identified in the Noise Element Manual contained in General Plan Volume 2, Section 3 - Noise Analysis Appendix A.
- Policy 9.1.14 Provide for adequate design controls to assist in mitigating on-site the significant adverse impacts of future noise generating land uses through increased setbacks, landscaping, earthen berms, and solid fencing.
- Policy 9.1.15 Strictly enforce the noise insulation standards for new construction as required by Title 24 of the California Administrative Code.
- Policy 9.1.16 Minimize the noise impact from automobiles, trucks, motorcycles, and off-road vehicles by continuing to request enforcement of those sections of the California Vehicle Code relative to vehicle exhaust system maintenance by the County Sheriff and State Highway Patrol.
- Policy 9.1.18 The routing and design of new or expanded transportation facilities by the County shall incorporate feasible measures necessary to mitigate increases in noise levels.
- Policy 9.1.19 Encourage the minimization of noise emission from all County-controlled activities consistent with Policy 9.1.1 standards.
- Policy 9.1.20 Protect the safety and general welfare of people in the vicinity of the Nevada County Airport and the Truckee Tahoe Airport port [sic] by implementing the appropriate noise compatibility policies to avoid the establishment of noise sensitive land uses in the portion of the airport environs that are exposed to significant levels of aircraft noise.
- Policy 9.1.21 Ensure the development of compatible land uses adjacent to the Nevada County Airport by enforcing the noise criteria as found in the Nevada County Airport Land Use Compatibility Plan as adopted by the Nevada County Airport Land Use Commission on September 21, 2011, as those standards are in effect and may be hereafter amended. (See Figure 9.1 of the General Plan Noise Element – Incorporated by reference).



Policy 9.1.23 The County shall continue to enforce noise criteria standards consistent with the airport noise policies adopted by the Nevada County Airport Land Use Commission and the Truckee Tahoe Airport Land Use Commission based on the considerations of the following factors:

- a. Established federal and state regulations and guidelines.
- b. The ambient noise levels in the community. Ambient noise levels influence the potential intrusiveness of aircraft noise upon a particular land use and vary greatly between Community Regions and Rural Regions.
- c. The extent to which noise would intrude upon and interrupt the activity associated with a particular use.
- d. The extent to which the activity itself generates noise.
- e. The extent which the activity itself generates itself [sic] generates noise.
- f. The extent of outdoor activity associated with a particular land use.
- g. The extent to which indoor uses associated with a particular land use may be made compatible with application of sound attenuation in accordance with the policies set forth for maximum acceptable interior noise levels.

### **Whispering Pines Corporate Community Specific Plan**

The Whispering Pines Corporate Community Specific Plan and Master Environmental Impact Report,<sup>9</sup> adopted in February of 1984, includes the following policies related to noise:

#### E.2 Noise

- a. Noise environments within the Specific Plan boundaries shall be maintained at the following levels: 70 dB CNEL for industrial areas (outdoor) 65 dB CNEL for residential areas (outdoor) and 45 dB CNEL for residential areas (indoor).
- b. Activities which may emit continuous noise levels in excess of standards outlined in a. shall be required to mitigate noise levels to acceptable standards.
- c. Activities located adjacent to existing residences shall demonstrate that noise levels will not adversely affect the adjacent neighborhood.

The policies listed above are consistent with the Nevada County General Plan Noise Element Policies. As a result, compliance with the County noise policies would ensure compliance with the Whispering Pines Corporate Community Specific Plan noise policies.

### **Nevada County Land Use and Development Code**

Section L-II 4.1.7 of the Nevada County Land Use and Development Code (LUDC) pertains to noise. The noise standards presented in Table L-II 4.1.7, Exterior Noise Limits, of the Nevada County LUDC are nearly identical to those contained in the General Plan Noise Element (see

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<sup>9</sup> Certain existing businesses located in the vicinity of the proposed project are within the Whispering Pines Corporate Community Specific Plan. This noise and vibration analysis considers impacts to such businesses and, thus, the Whispering Pines Corporate Community Specific Plan and Master Environmental Impact Report noise standards have been included.



Table 4.10-4). However, Section L-II 4.1.7.D.8 of the Nevada County LUDC states the following with respect to construction noise:

L-II 4.1.7.D.8 The above standards shall not apply to those activities associated with the actual construction of a project or to those projects associated with the provision of emergency services or functions.

The provision above exempts construction noise from the Table 4.10-4 noise standards. Nonetheless, an evaluation of construction noise is provided in this analysis for purposes of CEQA analysis.

### **City of Grass Valley**

The project sites are located within unincorporated Nevada County, but because the Centennial Industrial Site borders the City of Grass Valley, the City's noise standards are discussed here. The City of Grass Valley noise level standards are identical to the Nevada County noise level standards during daytime hours. Because operations at the Centennial Industrial Site would only occur during daytime hours (i.e., no later than 10:00 PM, as Table 6-5 of Grass Valley General Plan defines nighttime as 10:00 PM – 7:00 AM), the City and County noise standards are identical for the purposes of the proposed project.

## **4.10.4 IMPACTS AND MITIGATION MEASURES**

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

### **Standards of Significance**

Consistent with Appendix G of the CEQA Guidelines, the effects of a project are evaluated to determine if they would result in a significant adverse impact on the environment. For the purposes of this EIR, an impact is considered significant if the proposed project would result in any of the following:

- 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;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- 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.

### **Summary of Adjustments to Nevada County Noise Standards for On-Site Noise Sources**

As described in Footnote B of Table 4.10-4, a +5 dB adjustment to the noise standards would be applicable at all residential receptors due to the differing zoning districts. However, the +5 dB adjustment would be negated by a -5 dB adjustment due to the project noise sources occurring for long durations. As a result, the only adjustment applied to the Table 4.10-4 standards were based on ambient conditions. Pursuant to Table 4.10-4, Footnote D:



- where baseline ambient conditions currently exceed the Table 4.10-4 standards, the standard has been set at 5 dB above the ambient.
- where baseline ambient levels are more than 5 dB below the Table 4.10-4 standards, the standard has been set at the baseline ambient level plus 5 dB.
- Where ambient conditions are less than 5 dB below the Table 4.10-4 standards, no adjustment for ambient conditions was applied.

Table 4.10-6 shows the baseline ambient conditions at each representative receptor, extrapolated from the ambient noise survey results, and the corresponding maximum and average, daytime, evening, and nighttime noise level standards applicable to each representative receptor location after the appropriate adjustments to the Table 4.10-4 standards have been applied to account for the ambient conditions. Overall, the right-hand portion of Table 4.10-6 presents the applicable noise level standard for each representative receptor.

### Traffic Noise Increase Criteria

The Nevada County General Plan Noise Element and Noise Ordinance do not have a specific policy or standard for assessing noise impacts associated with **increases** in off-site ambient noise levels resulting from project-generated traffic on public roadways. The County’s General Plan and Ordinances do contain specific numeric standards for acceptable increases over ambient (5 dB according to footnote D of Table 4.10-5 – discussed later in this section), but they do not contain numeric standards for **increases** in off-site traffic noise levels resulting from a project.

Because CEQA requires that the significance of noise impacts be evaluated relative to the **increase** in noise resulting from a project, where the local jurisdiction does not have such adopted thresholds, reasonable thresholds from other agencies must be considered. As a result, the following section describes Federal thresholds for assessing the significance of project-related increases in off-site heavy truck traffic using federal research conducted by the Federal Interagency Commission on Noise (FICON).

Table 4.10-5 was developed by the 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.

<b>Table 4.10-5 Significance of Changes in Cumulative Noise Exposure</b>	
<b>Ambient Noise Level Without Project, dB</b>	<b>Increase Required for Significant Impact</b>
<60	+5.0 dB or more
60-65	+3.0 dB or more
>65	+1.5 dB or more
<i>Source: Federal Interagency Committee on Noise (FICON).</i>	

The FICON standards have been used extensively in recent years by the authors of this section in the preparation of the noise sections of EIRs that have been certified in many California cities and counties and are considered appropriate for this analysis.



**Table 4.10-6  
Baseline Ambient Conditions and Adjusted Nevada County Noise Standards by Receptor**

Receptor <sup>2</sup>	Baseline Ambient Conditions <sup>1</sup>						Applicable Standards After Adjustment					
	Daytime <sup>3</sup>		Evening <sup>3</sup>		Nighttime <sup>3</sup>		Daytime		Evening		Nighttime	
	Leq	Lmax	Leq	Lmax	Lmax	Leq	Leq	Lmax	Leq	Lmax	Leq	Lmax
1	58	76	51	68	50	66	63	81	56	73	55	71
2	63	81	56	73	55	71	68	86	61	78	60	76
3	61	82	53	71	51	69	66	87	58	76	56	74
4	55	72	53	65	56	70	60	75	58	70	61	75
5	49	66	47	59	50	64	54	71	50	64	55	69
6	50	67	48	60	51	65	55	72	50	65	56	70
7	49	66	47	59	50	64	54	71	50	64	55	69
8	54	72	49	69	45	65	55	75	50	74	45	70
9	48	66	43	63	39	59	53	71	48	65	44	60
10	47	66	43	64	37	58	52	71	48	65	42	60
11	47	67	43	65	37	59	52	72	48	70	42	60
12	49	69	45	67	39	62	54	74	50	72	44	67
13	51	70	48	69	41	64	55	75	50	74	45	69
14	50	72	48	72	42	64	55	75	50	77	45	69
15	51	73	49	72	43	65	55	75	50	77	45	70
16	48	71	46	71	40	62	53	75	50	76	45	67
17	56	73	54	66	57	71	61	75	59	71	62	76
18	52	69	50	62	53	67	55	74	50	65	58	72
19	54	69	51	68	46	65	55	74	56	73	51	70
20	57	72	55	72	50	68	62	75	60	77	55	73
21	55	70	53	70	48	66	60	75	58	75	53	71
22	56	71	53	70	48	67	61	75	58	75	53	72
23	58	73	56	73	51	69	63	75	61	78	56	74
24	60	75	58	75	53	71	65	80	63	80	58	76
25	60	75	57	74	52	71	65	75	62	79	57	76
26	51	64	49	63	44	56	55	69	50	65	45	60
27	51	64	49	63	44	56	55	69	50	65	45	60
28	51	64	49	63	44	56	55	69	50	65	45	60
29	51	64	49	63	44	56	55	69	50	65	45	60

(Continued on next page)



**Table 4.10-6  
 Baseline Ambient Conditions and Adjusted Nevada County Noise Standards by Receptor**

Receptor <sup>2</sup>	Baseline Ambient Conditions <sup>1</sup>						Applicable Standards After Adjustment					
	Daytime <sup>3</sup>		Evening <sup>3</sup>		Nighttime <sup>3</sup>		Daytime		Evening		Nighttime	
	L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>
30	51	64	49	63	44	56	55	69	50	65	45	60

Notes:

1. Baseline ambient conditions at each representative receptor were established through extrapolating the Table 4.10-1 data closest to each receptor using a 4.5 dB per doubling of distance decay rate.
2. Receptor locations are indicated on Figure 4.10-2.
3. Daytime = 7:00 AM – 7:00 PM; Evening = 7:00 PM – 10:00 PM; Nighttime = 10:00 PM – 7:00 AM

**Source: Bollard Acoustical Consultants, Inc. (2021).**



The use of the FICON standards are considered conservative relative to thresholds used by some other agencies in the State of California. For example, the California Department of Transportation (Caltrans) requires a project-related traffic noise level increase of 12 dB for a finding of significance, and the California Energy Commission (CEC) considers project-related noise level increases between 5 to 10 dB significant, depending on local factors. Therefore, the use of the FICON standards, which set the threshold for finding of significant noise impacts as low as 1.5 dB, provides a very conservative approach to impact assessment for this project.

Based on the FICON research, as shown in Table 4.10-5, a 5 dB increase in noise levels due to a project is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB. Where pre-project ambient conditions are between 60 and 65 dB, a 3 dB increase is applied as the standard of significance. Finally, in areas already exposed to higher noise levels, specifically pre-project noise levels in excess of 65 dB, a 1.5 dB increase is considered by FICON as the threshold of significance.

As noted previously, audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered significant according to CEQA. Because every physical process creates noise, whether by the addition of a single vehicle on a roadway, or a tractor in an agricultural field, the use of audibility alone as significance criteria would not provide a meaningful measure of impact significance. CEQA requires a substantial increase in ambient noise levels before noise impacts are identified, not simply an audible change.

### **Summary of Applicable Vibration Standards**

Nevada 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.

The Federal Transit Administration (FTA) Noise and Vibration Manual provides vibration levels at which damage to structures could occur. As shown in Table 4.10-7, a vibration level of 90 VdB is the minimum at which the onset of damage to extremely susceptible buildings could occur. As a result, 90 Vdb is used in this analysis for the consideration of damage to structures.

<b>Table 4.10-7 FTA Criteria for Assessing Damage to Structures</b>	
<b>Building Category</b>	<b>Level, VdB<sup>1</sup></b>
I. Reinforced-concrete, steel or timber (no plaster)	102
II. Engineered concrete and masonry (no plaster)	98
III. Non-engineered timber and masonry buildings	94
IV. Buildings extremely susceptible to vibration damage	90
Note: 1. RMS velocity in decibels (VdB) are 1 micro-inch/second.	
<b>Source: FTA Transit Noise and Vibration Impact Assessment [Table 12-3]. May 2006.</b>	

The FTA guidelines also provide criteria for assessing the potential for annoyance related to vibration. Table 4.10-8 provides vibration criteria for general assessment of impacts.

Because project operations would essentially occur continuously during the proposed business hours, the FTA criteria applicable to “Frequent Events” is applied in this analysis. According to



Table 4.10-8, the general assessment impact level for frequent events applicable at residential uses is 72 VdB. If vibration levels exceed the 72 VdB threshold, a detailed vibration assessment is recommended.

<b>Table 4.10-8</b>			
<b>Groundborne Vibration Impact Criteria for General Assessment</b>			
<b>Land Use Category</b>	<b>Impact Levels (VdB)</b>		
	<b>Frequent Events<sup>a</sup></b>	<b>Occasional Events<sup>b</sup></b>	<b>Infrequent Events<sup>c</sup></b>
Category 1: Buildings where vibration would interfere with interior operations	65 <sup>d</sup>	65 <sup>d</sup>	65 <sup>d</sup>
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83
a. "Frequent Events" is defined as more than 70 vibration events of the same source per day. b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. c. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day. d. This criterion limit is based on levels that are acceptable for most moderately-sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research equipment may require detailed evaluation to define the acceptable vibration levels.			
<b>Source: FTA Transit Noise and Vibration Impact Assessment [Table 8-1]. May 2006.</b>			

### Blasting Vibration Standards

The U.S. Bureau of Mines (USBM) and Office of Surface Mining, Reclamation, and Enforcement (OSMRE) have both developed recommendations for ground vibration levels to prevent damage to residential structures. Dr. Konya of Precision Blasting Services recommended a threshold level of 0.4 in/s PPV for the IMM project. The threshold level is based on previous studies for which it was determined that less than approximately eight percent of people would complain about blasting activities if the peak particle velocity was below 0.4 in/s. The project-specific blasting report recommends this threshold be applied at the location of receptors on surface to minimize annoyance and complaints.

The USBM also developed the Z-Curve method to identify blast level ranges which utilized PPV, displacement, and frequency. The Z-Curve is the main regulatory curve used in the United States, and is the regulatory curve used in all court cases dealing with vibration damage to residential structures. It should be noted that the Z-Curve and other ground vibration standards are conservative, and exceeding the curve does not mean that damage will occur but, rather, the possibility exists that damage could occur. In recent years, OSMRE has developed a modified Z-curve that is now used as the federal regulation for blasting vibration near residential structures.

Concerns about ground vibration and the effects it can have on sensitive electrical equipment such as microscopes, computers, and other systems has existed since electrical equipment first came out. When considering sensitive electrical equipment, three classifications exist: military, industrial, and commercial. The military equipment is the most robust and must be combat tested. The standards for military equipment are typically about two g-force (g) of acceleration at 20 to 40 Hertz (Hz) of frequency. Recent work has shown that computers for industrial and commercial settings could withstand ground vibration between two g and three g of acceleration. Telephone equipment has also been shown to withstand over 0.6 in/s of ground vibration on the unit, which



correlated to approximately 2.0 in/s on the ground. This was without any vibration dampening equipment installed. If vibration dampening equipment is utilized on electrical equipment then the equipment is affected less by the ground vibration.

A summary of the thresholds of significance for impacts from blasting vibrations can be summarized as follows:

<b>Table 4.10-9 Thresholds of Significance for Mine Blasting Vibrations</b>	
<b>Response</b>	<b>PPV (in/sec)</b>
Damage to residential structures unlikely	< OSMRE Z-Curve
No significant concerns about public annoyance	< 0.40 in/s
Blasting vibrations not typically detectable on blasting seismograph	< 0.05 in/s
<b>Source: Precision Blasting Services (2019).</b>	

### **Method of Analysis**

Below are descriptions of the methodologies utilized to measure background and ambient noise and estimate future traffic noise, construction noise, and vibration associated with the project. Further modeling details and calculations are provided in Appendix L and Appendix M 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.

For the ambient noise level measurement survey, BAC used Larson Davis Laboratories Model 820, LxT and 831 precision integrating sound level meters. The meters were calibrated before use with a Larson Davis Laboratories Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters. The noise monitoring survey was conducted in June 2017, July and December 2018, and October 2019. Weather conditions present during the monitoring program were typical for the seasons during which they were conducted. Adverse or anomalous weather conditions which could have caused measured ambient noise levels to be atypical did not exist.

The existing traffic noise environment was quantified using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) with the Calveno vehicle noise emission curves. Traffic volumes for existing conditions were obtained from the traffic study prepared for the proposed project by KD Anderson & Associates. Truck usage percentages were obtained from BAC observations and published Caltrans traffic counts. Vehicle speeds were based on posted speed limits and BAC observations, and the day/night distribution of traffic was obtained from the 24-hour ambient noise monitoring results.

For the project noise analysis, BAC used the SoundPlan Version 8.2 noise prediction model to estimate project-generated noise at the nearest residences. International Standards Organization (ISO) 9613-2 was employed as the sound propagation methodology within SoundPlan. ISO 9613-2 applies appropriate octave-band offsets for atmospheric absorption for various combinations of temperature and relative humidity for each noise source associated with the project.

The ambient vibration level measurements were conducted by BAC using a Larson Davis Laboratories Model LxT sound level meter fitted with a BRC SEN\_VEL Vibration Transducer (500



mV/ips). The test system is a Type I instrument designed for use in assessing vibration as perceived by humans, and meets the full requirements of ISO 8041:1990(E).

Because the project does not propose nighttime heavy truck trips, which is the only off-site noise source associated with the project (with the exception of water supply pipeline construction), and because the project's on-site noise sources must comply with the County's nighttime noise level standards, an evaluation of sleep disturbance is not warranted for this project.

### **Effects of Distance on Sound Propagation**

As a general rule, sound from a localized source spreads out as it travels away from the source, and the sound pressure levels drop off with distance according to fundamental relationships. Sound from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (i.e., decreases) at a rate of six dB for each doubling of distance from a point source. For the proposed project, on-site activities and processing equipment are treated as a point source in the noise propagation calculations. Off-site truck traffic is treated as a moving point source in the propagation calculations, with a sound level decay rate of 4.5 dB per doubling of distance from the noise source.

### **Atmospheric (Molecular) Absorption and Anomalous Excess Attenuation**

Air absorbs sound energy. The amount of absorption is dependent on the temperature and humidity of the air, as well as the frequency of the sound. Families of curves have been developed which relate these variables to molecular absorption coefficients, frequently expressed in terms of dB per thousand feet. For standard day atmospheric conditions, defined as 59 degrees Fahrenheit and 70 percent relative humidity, the molecular absorption coefficient at 1,000 Hz is 1.5 dB per thousand feet. Molecular absorption is greater at higher frequencies, and reduced at lower frequencies. In addition, for drier conditions, the molecular absorption coefficients generally increase. Similarly, as temperature increases, molecular absorption coefficients typically increase as well.

Anomalous excess attenuation caused by variations in wind speed, wind direction, and thermal gradients in the air can typically be estimated using an attenuation rate of 1.5 dB per thousand feet for a noise source generating a 1,000 Hz signal. As with molecular absorption, anomalous excess attenuation typically decreases with lower frequencies and increases with higher frequencies.

### **Effects of Topographic Shielding**

A noise barrier is any impediment which intercepts the path of sound as it travels from source to receiver. Such impediments can be natural, such as a hill or other naturally occurring topographic feature which blocks the receiver's view of the source. Impediments can also be vegetative, such as heavy tree cover, which similarly blocks the source from view of the receiver. Finally, impediments can be man-made, such as a solid wall, earthen berm, or structure constructed between the noise source and receiver. Regardless of the type of impediment, the physical properties of sound are such that, at the point where the line-of-sight between the source and receiver is interrupted by a barrier, a five dB reduction in sound occurs.

The effectiveness of a barrier is a function of the difference in distance sound travels on a straight-line path from source to receiver versus the distance it must travel from source to barrier, then barrier to receiver. This difference is referred to as the "path length difference", and is used to



calculate the Fresnel Number. A barrier's effectiveness is a function of the Fresnel Number and frequency content of the source. In general, the more acute the angle of the sound path created by the introduction of a barrier, the greater the noise reduction provided by the barrier.

For the proposed project, more distant receptors will typically be shielded from view of most on-site activities, but closer receptors may not be shielded. Where such shielding would occur, the level of noise reaching the receiver would be lower than at unshielded receivers located the same distances from the source. To account for shielding of project noise sources by intervening topography, elevation data for the entire study area was input to the SoundPlan model to create a three-dimensional base map. Noise source and receptor heights were input within the base map and the noise prediction model automatically computed the degree of acoustic shielding between each source and receptor.

### **Effects of Ground Cover**

Ground cover also affects sound propagation. For example, soft ground is more acoustically absorptive than paved surfaces and vegetated ground is more absorptive still. For this analysis, it was assumed that the project site would essentially consist of acoustically hard surfaces with little sound absorption. Conversely, the area surrounding the project site is heavily vegetated, primarily with pine trees. Using aerial imagery and project site plans, the SoundPlan model inputs for both hard surfaces, soft surfaces, and vegetated areas were applied. The degree of sound absorption applied to each noise source at each receptor varies depending on the type of ground cover and distance between the noise sources and receptors. The greater the distance between the project site and the sensitive receptors, the greater the amount of intervening vegetation and the higher the degree of sound absorption. Where the ground between the noise source and receptor consists primarily of hardscape, the model applied positive offsets to account for reflections of sound from those surfaces.

### **Attenuation by Proposed Buildings and Enclosures**

When equipment or processes are located within a building or enclosure, the noise generation of that equipment and processes is attenuated by the building walls and ceiling. The specific degree of attenuation provided by a building will depend on the building materials and construction, as well as the number and size of openings in the building, such as may be required for ventilation. With the exception of on-site mobile equipment, the significant stationary noise sources associated with the project are proposed to be located within insulated buildings. The noise attenuation provided by the proposed buildings varies by frequency, but will depend upon ultimate building design and construction. Additional technical detail is included in Appendix L to this EIR.

### **Blasting Vibration**

The prediction of ground vibration for an underground mine that will conduct blasting can be accomplished utilizing modelling of proposed blasting practices with industry accepted models. These models are developed to be extremely conservative and overestimate the ground vibration. There are various formulas that have been developed over time to estimate ground vibration. The formula most applicable to underground mining is the Cubed-Root Scale Distance (CRSD) formula.

To assess groundborne vibration impacts, Precision Blasting Services (PBS) used the CRSD prediction equation. The CRSD is based on the direct path distance between a blast and a structure, and the weight of explosives used. The CRSD is then applied to predict ground vibration.



To understand what types of ground vibration would be expected it is important to identify and define the type of blast design that will be used for underground development. The type of blast design utilized is based on the purpose of the blast area. The following section identifies the two main blast design methods to be used at the Idaho-Maryland Mine; Drift Development and Long-hole Stopping. Based on the blast designs identified, typical blast guidelines are established and analyzed to identify ground vibration levels.

Regarding drilling, it is noted that the mining industry utilizes two methods of drilling to develop boreholes or drill holes, these methods are percussion and rotary drilling. Percussion drilling is completed by striking a drill bit into the rock and applying small amounts of rotation to the drill bit with every strike. The total movement of the drill head is very small per hit and the borehole that is developed is slightly larger than the drill diameter. Rotary drilling is the process of cutting a borehole with a drill bit in which the rock is cut or crushed by a high-speed rotation drill system.

The drilling of bore holes will have only local effects within a few feet of the location of the drill. There is no vibration or effect of drilling except for the local zone around the drill hole. This vibration or effects of drilling cannot be detected feet away from the drill site and no impact to the community would exist from these drilling activities.

### Drift Development - Lateral Tunneling

A tunnel created by drilling and blasting underground is termed a "drift" in the mining industry. Drift development blasting is used to develop new or modify existing mine workings. An extensive network of existing drifts already exists in the Idaho-Maryland Mine, developed by historic operators. Existing drifts may be enlarged to accommodate modern mining equipment. In addition, new drifts would be developed to access new working areas in undeveloped ore zones or create passageways for moving broken rock, ventilation, or other services.

A drift is created by advancing the working face in short segments which are called "rounds". At the Idaho-Maryland Mine, a drift round is anticipated to be approximately 12 feet long. The actual advance per round is always less than the depth of the drilled holes and it is assumed that a 12-foot drift round would result in an advance of the drift of 10 feet per blast. The round commences by drilling a number of parallel holes in the face of the drift. To create enough void for the rock to be fragmented by explosives, one or several of the holes in the center of the drill hole pattern are enlarged and used as void, or relief, holes (open holes not loaded with explosives) and a number of closely spaced holes around the relief holes are loaded with explosives. This is called the "cut" of the drift round. The explosives in the cut are initiated first, which fragments and ejects the rock in the cut to create a larger void in the face of the drift. The remaining holes are then initiated in a series of delays to progressively enlarge the blast until the final dimensions and profile of the drift is created. The blasting of a drift round progresses as follows:

- 1) The cut holes surrounding the relief holes are initiated first with each hole on a different delay timing to progressively fragment the rock and create the cut.
- 2) The holes surrounding the cut are initiated after the cut holes have detonated and progressively fragment the rock to enlarge the blasted area of the round. As the void area increases, several of the holes can be initiated on the same delay timing.
- 3) The lifter holes at the floor of the drift are fired last in order to create the finished floor profile and "lift" the fragmented rock to allow easier loading of the broken rock. Typically, a number of the lifter holes are initiated on the same delay timing.



### Raise Development - Vertical Tunneling

A raise is a vertical tunnel which is used to connect drifts. Raises are constructed as ventilation airways, ore passes, ladder or hoist passageways, or slots (voids) for long-hole stope blasts. Raises are typically constructed using hand held pneumatic powered drills rather than the large machine mounted hydraulic drills used in drifting. Therefore, the drill hole diameters are smaller and the hole lengths shorter than drift rounds. A raise round is drilled and blasted similar to a drift round as previously described. Assuming a typical hole diameter of 1.25-inch, a loaded hole length of 8 feet, and the blasting of four holes in one delay the charge weight per delay using emulsion can be calculated as 21.3 pounds (lbs) per delay.

### Long-hole Stope Blasting

Generally, mining of a block of ore commences by driving horizontal tunnels, using drifting techniques as described above, along the length of an ore vein. Horizontal tunnels are driven through orebody on vertical spacing of approximately 50 feet. Once the tunnels are completed, a pattern of drill holes are drilled between the two levels. These long holes are then loaded with explosives and detonated to fragment the ore so that it can be transported to the shaft and then to surface. The mining of these blocks of ore is termed "stopping" in the mining industry and the mined areas between the drifts are termed "stopes".

Long-hole blasting utilizes longer boreholes which extend from the previously developed drift into the rock mass. The holes are typically larger in diameter and two to five times longer than the holes used in drift development. The stope blasting is similar to holes being blasted in a quarry, with long holes that are drilling into the rock which break to a free face or a slot. The preliminary long-hole stopping design would use 2.5-inch diameter drill holes. The long holes would be loaded with either ammonium nitrate fuel oil (ANFO) or emulsion.

### **Independent Peer Review**

Saxelby Acoustics, under contract with Raney, was hired to conduct a third-party independent peer review of the Noise and Vibration Analysis prepared for the proposed project by BAC, as well as the Technical Blasting Report prepared by PBS. The peer review requested additional detail and/or clarification. The most substantive comment was for BAC to use a noise model such as CadnaA or SoundPLAN for calculating project noise impacts rather than manual calculation of individual noise sources. In response to the technical peer review, BAC provided an updated Noise and Vibration Analysis, which included noise modelling using SoundPLAN, thus satisfactorily addressing the peer review comments.<sup>10</sup> Saxelby Acoustics found the Technical Blasting Report to be adequate.<sup>11</sup>

### **Project-Specific Impacts and Mitigation Measures**

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

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<sup>10</sup> Personal [email] communication between Nick Pappani, Vice President, Raney Planning & Management, Inc. and Luke Saxelby, Principal Consultant, Saxelby Acoustics LLC. November 17, 2020.

<sup>11</sup> Saxelby Acoustics. *Blasting Study Peer Review for the Idaho-Maryland Mine EIR – Nevada County, California*. June 29, 2020.



**4.10-1 Generation of a substantial temporary 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, due to initial construction activities. Based on the analysis below, even with the implementation of mitigation, the impact would be considered *significant and unavoidable*.**

Site preparation activities at both the Brunswick and Centennial Industrial Sites will include site clearing, grading, paving, and building construction. In addition, construction of the potable water pipeline along East Bennett Road will include trenching, pipeline installation, and compaction activities.

Construction activities associated with development of the aboveground facility at the Brunswick Industrial Site is anticipated to occur over approximately 18 months. Construction activities at the Centennial Industrial Site would be limited (e.g., driveway entrance and left-turn lane improvements) and are anticipated to take 1-2 months to complete. Construction of the potable water pipeline is anticipated to take approximately four months to complete. The aforementioned activities would lead to a temporary increase in ambient noise levels in the project vicinity, and are discussed in further detail below. Potential noise and vibration effects associated with the proposed engineered fill placement at the Brunswick and Centennial Industrial Sites is addressed separately at Impact 4.10-2.

Construction

Construction activities associated with the proposed project would require the use of numerous pieces of noise-generating equipment, such as excavating machinery (e.g., backhoes, bulldozers, excavators, front loaders) and other construction equipment (e.g., compactors, scrapers, graders). 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.

Table 4.10-10 presents the typical maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet.

As shown in the table, construction equipment typically generates 77 to 90 dBA of noise at 50 feet away. Not all of these construction activities would be required for the project.

The FHWA Roadway Construction Noise Model (RCNM) was used to quantify worst-case construction noise levels for the project as the model is considered representative of the types of construction activities that would be associated with the project. For this assessment, it was assumed that a bulldozer, grader, excavator, front-end loader and compactor would be used for the various stages of site preparation at both the Brunswick and Centennial Industrial Sites. It was also assumed that mobile equipment would not utilize traditional backup warning devices (beepers) during construction activities when operating in reverse, given that the broadband “squawker” type devices are proposed. For the pipeline installation, less equipment would be required.



**Table 4.10-10  
 Typical Construction Equipment Noise**

<b>Equipment Description</b>	<b>Maximum Noise Level at 50 Feet, dBA</b>
Auger drill rig	85
Backhoe	80
Compactor (ground)	80
Compressor (air)	80
Concrete batch plant	83
Concrete mixer truck	85
Concrete pump truck	82
Concrete saw	90
Crane (mobile or stationary)	85
Dozer	85
Dump truck	84
Excavator	85
Front end loader	80
Generator (more than 25 kVA)	82
Grader	85
Jackhammer	85
Mounted impact hammer	90
Paver	85
Pumps	77
Rock drill	85
Scraper	85
Soil mix rig	80

**Source: Federal Highway Administration (FHWA).**

Assuming a bulldozer, grader, excavator, front-end loader and compactor were operating concurrently at the Brunswick and Centennial Industrial Sites during site preparation, the combined noise exposure from the effective noise center of those operations would be 85 dBA  $L_{eq}$  and 85 dB  $L_{max}$  at a distance of 50 feet from the operations. However, the earthmoving equipment would be at various locations on the project sites rather than grouped in a small portion of the sites. To provide a conservative but reasonable assessment of project construction noise generation at the Brunswick and Centennial Industrial Sites, it was assumed that all of this equipment could be operating concurrently, but that the equipment would be spread out over the sites during the site clearing/construction operations. As a result, average noise levels were predicted for the Brunswick and Centennial Industrial Sites preparation activities assuming the noise sources were distributed throughout the sites, whereas maximum noise levels were predicted based on the closest proximity of the equipment to the sensitive receptor locations.

It should be noted that an average noise level of 80 dBA  $L_{eq}$  at 50 feet was used to assess construction noise generation of the proposed pipeline installation along East Bennett Road. This level is 5 dB lower than the 85 dBA  $L_{eq}$  level used for the assessment of construction noise generation at the Brunswick and Centennial Industrial Sites because less heavy earthmoving equipment would be required for the water pipeline installation component of the project than the site preparation and construction operations at the Brunswick and Centennial Industrial Sites.



BAC applied the aforementioned construction noise levels to the representative receptor locations shown on Figure 4.10-3 using the SoundPlan model. The results of the construction noise projections are presented in Table 4.10-11.

Receptor	Predicted Noise Level		Daytime Noise Criteria <sup>1</sup>		Daytime Noise Criteria Exceeded? <sup>2</sup>	
	Leq	Lmax	Leq	Lmax	Leq	Lmax
1	54	61	63	81	NO	NO
2	50	60	68	86	NO	NO
3	39	39	66	87	NO	NO
4	37	36	60	75	NO	NO
5	37	28	54	71	NO	NO
6	36	28	55	72	NO	NO
7	36	29	54	71	NO	NO
8	44	42	55	75	NO	NO
9	58	54	53	71	YES	NO
10	65	65	52	71	YES	NO
11	61	62	52	72	YES	NO
12	60	59	54	74	YES	NO
13	67	67	55	75	YES	NO
14	64	62	55	75	YES	NO
15	63	62	55	75	YES	NO
16	56	61	53	75	YES	NO
17	51	54	61	75	NO	NO
18	55	65	55	74	NO	NO
19	49	52	55	74	NO	NO
20	53	58	62	75	NO	NO
21	51	55	60	75	NO	NO
22	54	62	61	75	NO	NO
23	56	67	63	75	NO	NO
24	50	61	65	80	NO	NO
25	50	62	65	75	NO	NO
26	52	63	55	69	NO	NO
27	48	52	55	69	NO	NO
28	49	52	55	69	NO	NO
29	47	45	55	69	NO	NO
30	44	39	55	69	NO	NO

1. Project construction activities would be limited to daytime hours. As a result, only the daytime criteria were utilized for the assessment of potential noise impacts.

2. Because the Nevada County Zoning Ordinance exempts construction activities from the noise standards, these criteria are not applicable to this component of the project. Results of this analysis are provided to give an indication as to whether or not construction noise increases would be substantial relative to existing ambient conditions at these nearest receptors.

**Source: Bollard Acoustical Consultants, Inc. (2021).**

As demonstrated in Table 4.10-11, the construction activities could result in substantial temporary increases in daytime noise exposure at eight receptors in the project vicinity



(Receptors 9 through 16), when compared to the baseline ambient noise levels at these locations, shown in Table 4.10-6. The substantial increase in noise levels at such locations would be due to installation of the potable water pipeline along East Bennett Road. As noted above, construction noise is exempt from the Nevada County LUDC noise standards (Section L-II 4.1.7.D.8), thus the project's construction noise would not be in violation of the County noise standards. Nevertheless, the predicted construction noise level increases at Receptors 9 through 16 would still be considered substantial pursuant to CEQA.

In conclusion, construction noise impacts associated with construction activities at the Centennial Industrial Site and Brunswick Industrial Site would be *less than significant*. However, installation of the potable water pipeline in East Bennett Road is considered a **significant** impact during duration of daytime construction.

#### Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the temporary construction-related noise impact associated with installation of the potable water pipeline. However, because the noise reductions that would be achieved by the measures cannot be definitively determined to confirm that noise levels would be reduced to below a level of significance, the impact is considered *significant and unavoidable* for the purposes of this CEQA evaluation.

4.10-1 *The following noise reduction measures shall be implemented during construction of the potable water line along East Bennett Road and shall be included on Improvement Plans for installation of the potable water line to the satisfaction of the Nevada County Planning Department.*

- *Provide advanced notification of pipeline construction dates and durations to each of the residences located along the construction corridor.*
- *Ensure that all equipment utilizing internal combustion engines are fitted with working mufflers in good repair.*
- *Utilize the quietest equipment capable of performing the required construction.*
- *Locate construction staging areas as far as feasibly possible from existing residences.*
- *If portable generators or air compressors are to be used, locate that equipment as far as feasibly possible from existing residences and, if possible, shield them from view of those residences using intervening topography or vehicles.*
- *All mobile equipment shall be fitted with broad-band "growler" type back-up warning devices rather than the conventional "beeper" devices.*



**4.10-2 Generation of a substantial temporary 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, due to fill placement, compaction, off-site traffic, and related activities. Based on the analysis below, with the implementation of mitigation, the impact is *less-than-significant*.**

Placement and compaction of engineered fill at the Centennial Industrial Site would occur over approximately five years, and placement and compaction of engineered fill at the Brunswick Industrial Site would occur over approximately six years. Movement of fill from the Brunswick Industrial Site to the Centennial Industrial Site would involve an increase of heavy truck traffic along off-site roadways, which could increase local noise levels. The aforementioned activities would lead to a temporary increase in ambient noise levels in the project vicinity, and are discussed in further detail below.

Engineered Fill Placement and Compaction

While the placement of engineered fill is anticipated to occur over an extended period of time, these operations would not occur over the life of the project. For example, it is estimated that engineered fill placement may occur for approximately five years at the Centennial Industrial Site and six years at the Brunswick Industrial Site. This is in contrast to the operational life of the mine, which could occur up to 80 years, pursuant to the Conditional Use Permit. As a result, placement and compaction activities at both the Brunswick Industrial and Centennial Industrial Sites are evaluated in this construction noise impact discussion.

For this assessment, it was assumed that a bulldozer, grader, excavator, front-end loader and compactor would be used concurrently and that traditional backup warning devices would not be a component of the construction noise generation (the broadband warning devices are proposed). Based on these assumptions, the RCNM predicts maximum and average noise levels of 85 dBA  $L_{max}$  and 85 dBA  $L_{eq}$  at a reference distance of 50 feet from the operations. These levels were projected to the nearest receptors using industry standard sound propagation algorithms at the Centennial Industrial Site and the SoundPlan model at the Brunswick Industrial Site.

*Centennial Industrial Site*

The nearest sensitive receptors to the Centennial Industrial Site are Receptors 1, 2, and 8 (see Figure 4.10-3), which are located approximately 500 to 1,000 feet from the nearest locations on the Centennial Industrial Site where the engineered fill would be placed. BAC calculated the maximum noise levels at the nearest receptors using the SoundPlan Model. For modelling purposes, maximum noise levels were predicted based on the closest proximity of the heavy equipment to each receptor whereas average noise levels were predicted based on the assumption that the earthmoving equipment would be spread out on the project site. The results of the modeling are presented in Table 4.10-12.



Receptor	Minimum Distance	Predicted Noise Level		Daytime Noise Criteria		Criteria Exceeded?	
		Leq	Lmax	Leq	Lmax	Leq	Lmax
1	500	54	61	63	81	NO	NO
2	600	50	60	68	86	NO	NO
8	1000	44	42	55	75	NO	NO

Note: Engineered fill placement, grading and compaction activities would be limited to daytime hours. As a result, only the daytime criteria are utilized for the assessment of potential noise impacts for this activity.

**Source: Bollard Acoustical Consultants, Inc. (2021).**

As shown above, engineered fill placement and compaction activities at the Centennial Industrial Site would generate noise levels below the applicable daytime noise criteria at each of the nearest receptors, and impacts related to temporary noise increase from the placement and compaction of engineered fill at the Centennial Industrial Site would be less than significant.

Although engineered fill placement and compaction activities would only occur during daytime hours at the Centennial Industrial Site, transport of engineered fill material from the Brunswick Industrial Site to the Centennial Industrial Site would occur between the hours of 6:00 AM and 10:00 PM. As a result, the nighttime criteria would be applicable to the transport of materials to the Centennial Industrial Site, but only the daytime standards would be applicable to the placement and compaction operations. To quantify the noise generation of trucks arriving at the Centennial Industrial Site, depositing the fill material and departing the site, BAC utilized the SoundPlan model assuming 16 heavy truck operations at the Centennial Industrial Site per hour (eight arrivals loaded and eight departures empty). The results of the analysis are presented in Table 4.10-13.

Receptor	Minimum Distance	Predicted Noise Level		Nighttime Noise Criteria		Criteria Exceeded?	
		Leq	Lmax	Leq	Lmax	Leq	Lmax
1	500	47	61	55	71	NO	NO
2	600	43	59	60	76	NO	NO
8	1000	24	38	45	70	NO	NO

**Source: Bollard Acoustical Consultants, Inc. (2021).**

The Table 4.10-13 modeling results indicate that noise generated by deliveries of fill material to the Centennial Industrial Site during nighttime hours would be well below the nighttime noise criteria at the nearest sensitive receptors. As a result, this impact is considered less than significant.



**Brunswick Industrial Site**

Multiple noise-sensitive receptors are located around the perimeter of the Brunswick Industrial Site (see Figure 4.10-3). The distances between the proposed engineered fill placement areas and the nearby sensitive receptors range from 300 to 2,000 feet. Based on maximum and average construction noise levels of 85 dBA L<sub>max</sub> and 85 dBA L<sub>eq</sub> at a reference distance of 50 feet, average and maximum noise levels were computed at the nearest receptors to the Brunswick Industrial Site using the SoundPlan Model. The results of the modeling are presented in Table 4.10-14.

Receptor	Minimum Distance	Predicted Noise Level		Daytime Noise Criteria		Criteria Exceeded?	
		L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>
15	1400	45	45	55	75	NO	NO
16	1600	46	46	53	75	NO	NO
17	2000	40	40	61	75	NO	NO
18	1600	47	47	55	74	NO	NO
19	1300	40	40	55	74	NO	NO
20	1000	46	46	62	75	NO	NO
21	700	47	47	60	75	NO	NO
22	500	52	52	61	75	NO	NO
23	400	55	55	63	75	NO	NO
24	350	50	50	65	80	NO	NO
25	650	50	50	65	75	NO	NO
26	300	51	51	55	69	NO	NO
27	600	46	46	55	69	NO	NO
28	500	47	47	55	69	NO	NO
29	1200	40	40	55	69	NO	NO
30	1800	32	32	55	69	NO	NO

Note: Engineered fill placement, grading and compaction activities would be limited to daytime hours. As a result, only the daytime criteria are utilized for the assessment of potential noise impacts for this activity.

**Source: Bollard Acoustical Consultants, Inc. (2021).**

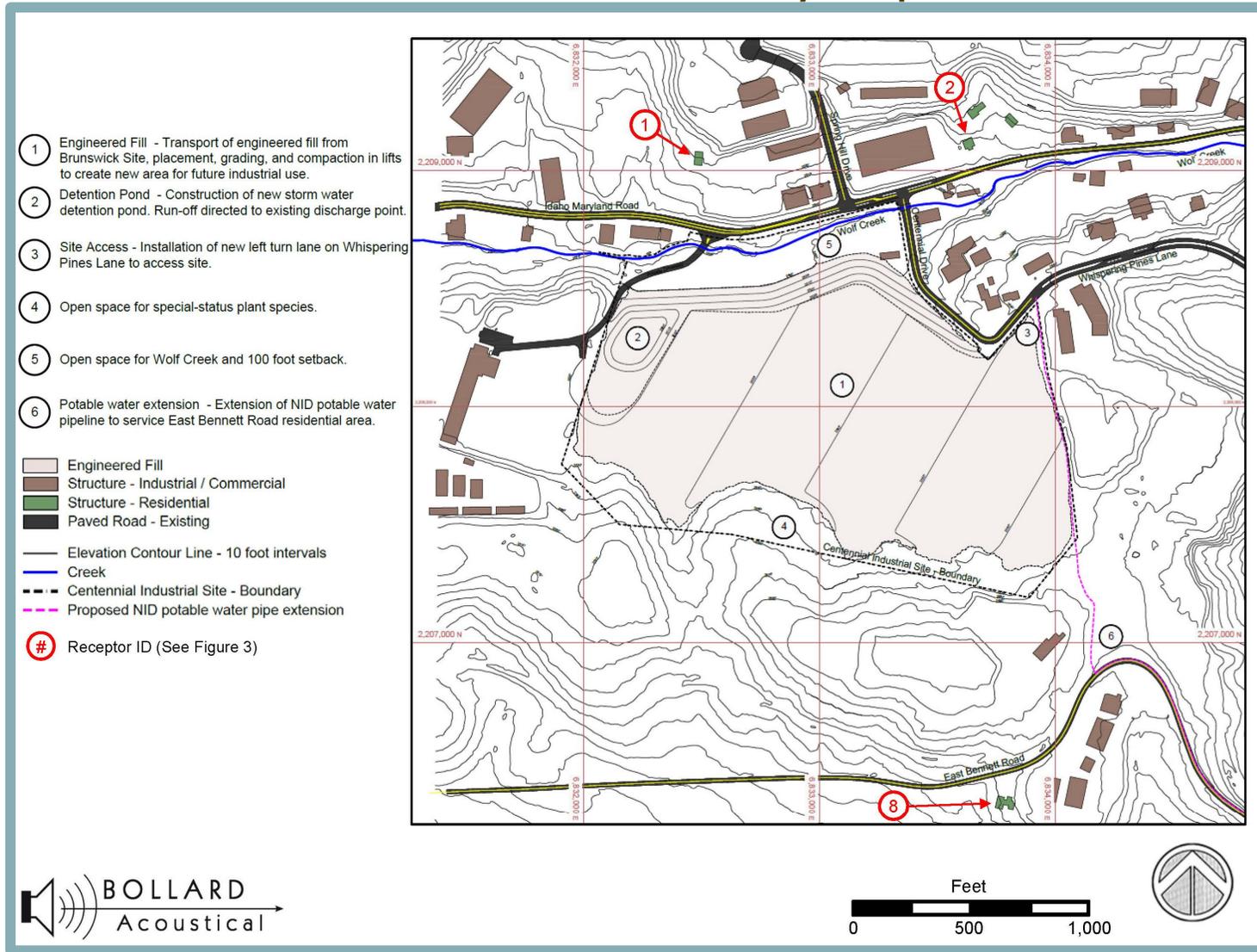
As shown above, engineered fill placement and compaction activities at the Brunswick Industrial Site would generate noise levels below the applicable daytime noise criteria at each of the nearest receptors, and impacts related to temporary noise increase from the placement and compaction of engineered fill at the Brunswick Industrial Site would be less than significant.

**Off-Site Traffic (including hauling to Centennial Industrial Site)**

During the first five years of the proposed project, fill would be transported from the Brunswick Industrial Site to the Centennial Industrial Site. The additional heavy truck traffic from hauling fill would contribute to the ambient noise environment, specifically to Receptors 1, 2, and 8 (see Figure 4.10-5).



**Figure 4.10-5  
 Centennial Industrial Site Plan and Nearby Receptor Locations**



Following the completion of fill placement at the Centennial Industrial Site and the Brunswick Industrial Site (an estimated combined period of approximately 11 years), project-generated fill material would be delivered by truck to various off-site locations via State Route (SR) 20/49. Due to the long-term delivery to market, that operation is evaluated in Impact 4.10-3.

Maximum off-site heavy truck traffic noise levels were assessed for the delivery of engineered fill material to the Centennial Industrial Site. Specifically, the analysis assumed 200 heavy truck trips per day (100 round trips). In addition, employees at the proposed project would generate vehicle trips and associated traffic noise during daily commutes. The proposed project would require approximately 312 direct employees during full mining operations. At full operations, approximately 44 employees would work regular eight-hour days, five days per week, and approximately 268 employees would work 12-hour shifts, seven days on and seven days off. The Brunswick Industrial Site would generate a maximum of 174 employee round trips per day while the Centennial Industrial Site would generate a maximum of four employee round trips per day. In total, the analysis assumed 356 daily one-way employee trips.

Table 4.10-15 presents the existing ambient noise levels and the anticipated existing plus-project traffic noise levels at the nearest residences to each roadway segment, as well as the project-related increase in traffic noise levels and the impact assessment threshold for each roadway segment (based on the substantial increase criteria presented in Table 4.10-5). As shown in the table, the traffic noise level increases from the transport of fill from the Brunswick Industrial Site to the Centennial Industrial Site and employee trips would not exceed the applicable thresholds of significance at any of the receptors.

However, it should be noted that the results presented above do not account for the use of jake brakes. In the event that jake brakes are used by project haul trucks operating between the Brunswick and Centennial Industrial Sites, the potential exists that a substantial increase in ambient noise levels could result from the project at the sensitive receptors located along that haul route.

### Conclusion

Implementation of the proposed project would include an estimated five years of temporary hauling of engineered fill from the Brunswick Industrial Site to the Centennial Industrial Site, and engineered fill placement and compaction at the Centennial Industrial Site, which would result in temporary increases in ambient noise levels in the vicinity of the project site. Based on the above analysis, all noise generated from engineered fill placement and compaction, and noise associated with haul truck operation (excepting potential jake brake use) and worker trips during this period, would remain below the applicable noise standards.

However, noise generated from hauling fill from the Brunswick Industrial Site to the Centennial Industrial Site could exceed local standards if jake brakes are used. Therefore, the project could result in the generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, and a **significant** impact could occur.



**Table 4.10-15  
Traffic Noise Levels ( $L_{dn}$ , dB) at Nearest Residences along Haul Routes  
used for Fill Placement Activities at Centennial**

<b>Roadway</b>	<b>Description</b>	<b>Baseline</b>	<b>Baseline Plus Project</b>	<b>Increase</b>	<b>Significance Threshold</b>	<b>Substantial Increase?</b>
Bennett Road	Site Entrance to Brunswick	52.5	54.9	2.4	5.0	<b>NO</b>
Brunswick Road	South of Project Site Entrance	62.8	62.8	0.0	3.0	<b>NO</b>
Brunswick Road	Site Entrance to Bennett	60.9	61.2	0.3	3.0	<b>NO</b>
Brunswick Road	Bennett to Whispering Pines	66.4	66.7	0.3	1.5	<b>NO</b>
Brunswick Road	Whispering Pines to Idaho-Maryland Road	66.6	66.7	0.1	1.5	<b>NO</b>
Brunswick Road	Idaho Maryland Road to 49	65.7	65.7	0.0	1.5	<b>NO</b>
Empire Street	West of SR 174	59.8	60.0	0.1	5.0	<b>NO</b>
Empire Street	East of Auburn	61.1	61.2	0.1	3.0	<b>NO</b>
Idaho Maryland Road	East of SR 49	61.5	61.5	0.0	3.0	<b>NO</b>
State Route 174	West of Brunswick	67.8	67.8	0.0	1.5	<b>NO</b>
Whispering Pines Lane	Crown Point to Brunswick	57.8	60.4	2.6	5.0	<b>NO</b>
Whispering Pines Lane	Centennial to Crown Point	59.1	61.1	2.1	5.0	<b>NO</b>

*Source: Bollard Acoustical Consultants, Inc. (2021).*



### Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the potential for jake brake use during hauling material between the Brunswick Industrial Site and the Centennial Industrial Site and would reduce the potential impact to a *less-than-significant* level.

4.10-2 *Haul truck operators shall be required to operate their trucks in such a manner so as to not require the use of jake brakes along the project haul routes. The project applicant shall post signage at the exits of both the Centennial Industrial Site and Brunswick Industrial Site informing drivers that the use of jake brakes is not permitted. Additionally, drivers directly employed by the project applicant, as well as any contract drivers, shall be required to abstain from use of jake brakes as a company policy. Proof of sign postage (e.g., photographic documentation) and a copy of the company policy language shall be provided to the Nevada County Planning Department prior to commencement of hauling. In the event that jake brake usage associated with project-related heavy truck traffic is observed, the project applicant shall implement additional measures to educate drivers regarding the safe operation of their vehicles without the use of jake brakes or take disciplinary action, if required, to the satisfaction of the Nevada County Planning Department. In addition, haul trucks shall be fitted with broad-band “growler” type back-up warning devices rather than the conventional “beeper” devices.*

### **4.10-3 Generation of a substantial 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. Based on the analysis below, and with implementation of mitigation, the impact is less than significant.**

Operations of the proposed mine would involve several components that would result in the long-term/permanent generation of noise, specifically the following:

- Long-Term Off-Site Traffic
- Mineral Processing
- Shaft Ventilation
- Exterior Pumps
- Water Treatment Plant
- Backup Generators
- Mine Compressor
- Brunswick Shaft Skipping
- Parking Lot
- Blasting

Each of the aforementioned components are analyzed for potential noise-related impacts, and discussed separately in further detail below. In addition, a discussion and analysis of the potential for several components to combine and result in additive noise-related impacts is included below.

### Long-Term Off-Site Traffic

Fill would be transported to market by heavy trucks for the lifetime of the project. As part of the Noise and Vibration Analysis prepared by BAC, maximum heavy truck traffic



noise levels were assessed for the delivery of engineered fill material to off-site vendors via SR 20/49. The analysis assumed 200 heavy truck trips per day (100 round trips) and employee trips, as previously discussed.

Table 4.10-16 presents the existing ambient noise levels and anticipated existing plus-project traffic noise levels at the nearest residences to each roadway segment, as well as the project-related increase in traffic noise levels and the impact assessment threshold for each roadway segment based on the criteria presented in Table 4.10-5.

As shown in Table 4.10-16, the traffic noise level increase from the transport of fill from the Brunswick Industrial Site to the highway and from employee commutes would not exceed the applicable thresholds of significance at any of the receptors. Therefore, noise-related impacts from off-site heavy truck and employee traffic would be less than significant.

### Mineral Processing

The project processing equipment located within the processing building would consist of the SAG mill (primary grinding), ball mill (secondary grinding), concentrator, cyclones and screens, and filter presses. The noise transmission loss of the proposed metal building ranges from 31 dB at 125 Hz to 75 dB at 4,000 Hz. In addition, the metal building would have double doors (i.e., airlock) to prevent sound escaping when one set of exterior doors are open.

Using information provided by the project applicant for similar facilities, the noise generation from such processing equipment is expected to be 105 dBA  $L_{eq}$  with maximum noise levels of approximately 110 dBA  $L_{max}$ .

The reference noise level data for both the noise source and building enclosure were used as inputs to the SoundPlan model to calculate processing plant operations at the nearest receptors (see Figure 4.10-6). The results of those calculations are provided in Table 4.10-17. Because such processes are anticipated to occur at all hours, the most restrictive, nighttime noise criteria were applied.

Based on the data presented in Table 4.10-17, the mineral processing operations would generate noise levels below the applicable nighttime standards of significance at each of the nearest sensitive receptor locations. As such, noise-related impacts from mineral processing would be less than significant.

### Shaft Ventilation Fan

Ventilation would be provided with a fan located on the surface and ducting into the Brunswick shaft until the service shaft is complete and the permanent underground ventilation fan can be installed. Required aboveground facilities to support pumping of fresh air underground would include a primary ventilation fan and duct work. The primary ventilation fan would include housing on each side, as well as a silencer to reduce noise levels. The front of the ventilation fan would connect to a vent duct that would carry air underground, into the mine shaft. In addition, secondary fans would be installed underground to promote air circulation.



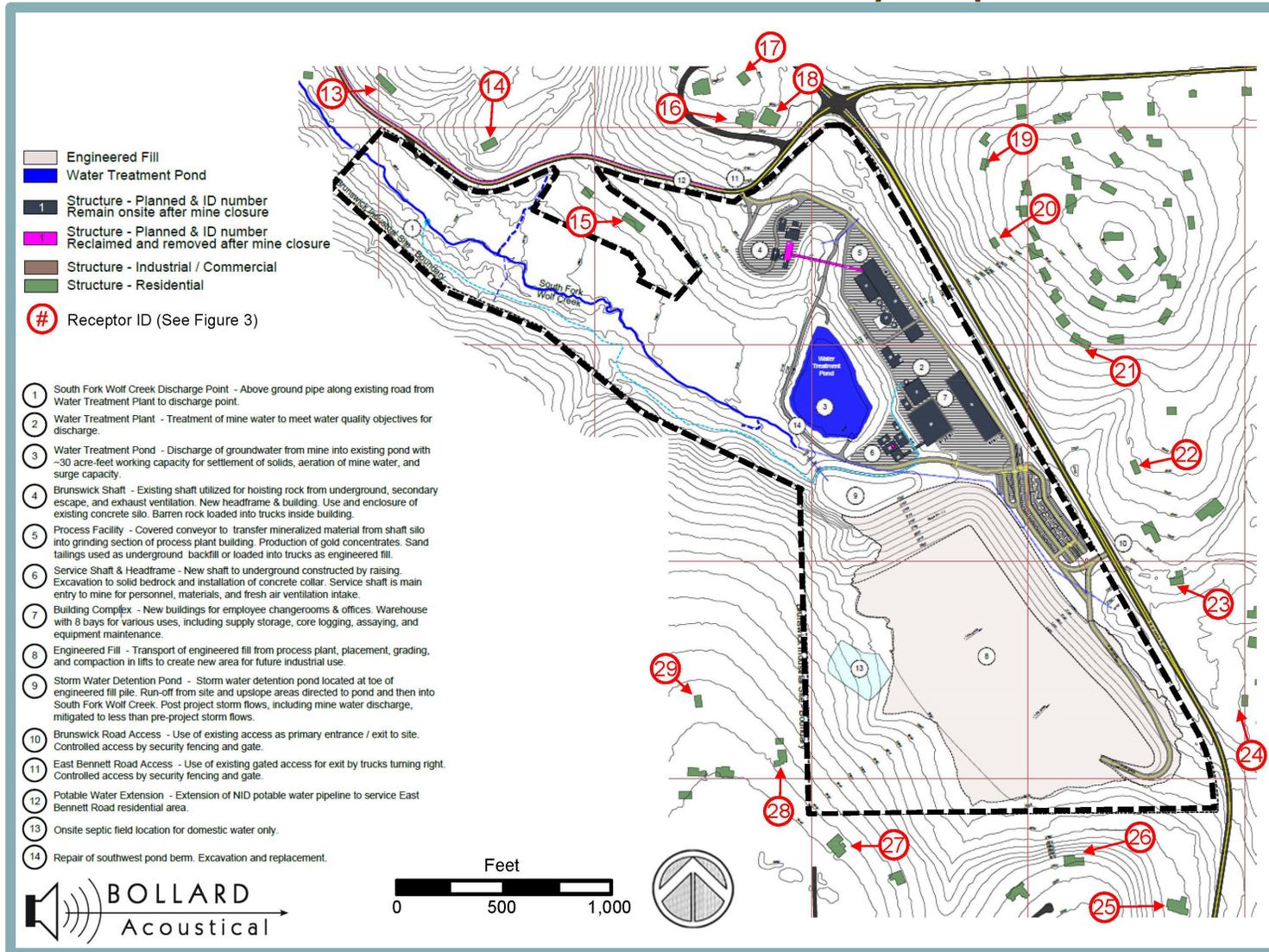
**Table 4.10-16**  
**Traffic Noise Levels ( $L_{dn}$ , dB) at Nearest Residences along Haul Routes**  
**used for Offsite Hauling of Fill Via SR 20/49**

Roadway	Description	Baseline	Baseline Plus Project	Increase	Significance Threshold	Substantial Increase?
Bennett Road	Site Entrance to Brunswick	52.5	54.9	2.4	5.0	NO
Brunswick Road	South of Project Site Entrance	62.8	62.8	0.0	3.0	NO
Brunswick Road	Site Entrance to Bennett	60.9	61.2	0.3	3.0	NO
Brunswick Road	Bennett to Whispering Pines	66.4	66.7	0.4	1.5	NO
Brunswick Road	Whispering Pines to Idaho Maryland Road	66.6	67.0	0.4	1.5	NO
Brunswick Road	Idaho Maryland Road to SR 49	65.7	66.2	0.5	1.5	NO
Empire Street	West of SR 174	59.8	60.0	0.1	5.0	NO
Empire Street	East of Auburn	61.1	61.2	0.1	3.0	NO
Idaho Maryland Road	East of SR 49	61.5	61.6	0.1	3.0	NO
State Route 174	West of Brunswick	67.8	67.8	0.0	1.5	NO
Whispering Pines Lane	Crown Point to Brunswick	57.8	57.8	0.0	5.0	NO
Whispering Pines Lane	Centennial to Crown Point	59.1	59.1	0.0	5.0	NO

Source: *Bollard Acoustical Consultants, Inc. (2021).*



**Figure 4.10-6  
 Brunswick Industrial Site Plan and Nearby Receptors**



**Table 4.10-17  
Mineral Processing Noise Levels at Nearest Receptors**

Receptor	Minimum Distance	Predicted Noise Level		Nighttime Noise Criteria		Criteria Exceeded?	
		L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>max</sub>
15	1000	25	30	45	70	NO	NO
16	800	32	37	45	67	NO	NO
17	1000	25	30	61	75	NO	NO
18	800	33	38	58	72	NO	NO
19	650	32	37	51	70	NO	NO
20	500	36	41	55	73	NO	NO
21	700	30	35	53	71	NO	NO
22	1100	25	30	53	72	NO	NO
23	1600	21	26	56	74	NO	NO
24	2200	22	27	58	76	NO	NO
25	2850	24	29	57	76	NO	NO
26	2500	25	30	45	60	NO	NO
27	2300	24	29	45	60	NO	NO
28	2000	24	29	45	60	NO	NO
29	2350	24	29	45	60	NO	NO
30	2700	21	26	45	60	NO	NO

Note: Mineral processing operations would occur 24-hours per day. As a result, the most restrictive nighttime criteria were utilized for the assessment of potential noise impacts for this activity.

**Source: Bollard Acoustical Consultants, Inc. (2021).**

The sound level generated by the ventilation fans depends primarily on the fan input power and type. The shaft ventilation fan proposed for use at the Brunswick Industrial Site would be centrifugal-type rated at 275 horsepower (hp) (205 kilowatts). Based on the fan power rating and the above formula, the sound pressure level for the proposed ventilation fan computes to 113 dBA at a distance of 5 feet. This reference noise level was projected to the nearest representative receptors to the Brunswick Industrial Site, including the effects of a silencer providing comparable sound attenuation as the other industrial buildings proposed at the site. Because the fan would operate at all hours, the most restrictive, nighttime noise criteria were applied. Due to the steady-state nature of the fan operations, maximum noise levels (L<sub>max</sub>) would be equivalent to average sound levels (L<sub>eq</sub>). It should be noted that a custom silencer, which would be fabricated for the temporary surface ventilation fan, would be engineered to provide the required degree of sound attenuation, as well as oriented with the fan inlet facing away from the nearest receptors. The results of those calculations are provided in Table 4.10-18.

As shown in Table 4.10-18, the shaft ventilation fan is predicted to generate noise levels below the applicable nighttime standards of significance at each of the nearest sensitive receptor locations. As such, noise-related impacts from shaft ventilation would be less than significant.



**Table 4.10-18  
 Ventilation Fan Noise Levels at Nearest Receptors**

Receptor	Distance	Predicted Noise Level		Nighttime Noise Criteria		Criteria Exceeded?	
		Leq	Lmax	Leq	Lmax	Leq	Lmax
15	650	24	24	45	70	NO	NO
16	600	29	29	45	67	NO	NO
17	800	23	23	62	76	NO	NO
18	600	31	31	58	72	NO	NO
19	950	23	23	51	70	NO	NO
20	950	25	25	55	73	NO	NO
21	1400	20	20	53	71	NO	NO
22	1850	15	15	53	72	NO	NO
23	2350	15	15	56	74	NO	NO
24	2950	12	12	58	76	NO	NO
25	3450	14	14	57	76	NO	NO
26	3100	15	15	45	60	NO	NO
27	2700	13	13	45	60	NO	NO
28	2300	14	14	45	60	NO	NO
29	2300	15	15	45	60	NO	NO
30	2600	13	13	45	60	NO	NO

Note: Processing operations would occur 24-hours per day. As a result, the most restrictive nighttime criteria were utilized for the assessment of potential noise impacts for this activity.

**Source: Bollard Acoustical Consultants, Inc. (2021).**

### Exterior Pumps

Several tanks would be located outdoors, adjacent to the proposed process plant. The water tanks would include electric pumps at the bottom of the tanks, and the thickener tank and paste filter feed tanks would include peristaltic hose pumps mounted on the bottom of the tanks. The cement silo would transfer cement into the plant with a mechanical auger, the thickener tank would have a rotating rake, and the paste filter feed tank would have a rotating impeller. The horsepower of the exterior pumps would range from 15 to 30 hp. Such equipment would generate very low noise emissions.

Based on the pump horsepower, combined pump noise levels are expected to be 65 dBA at a reference distance of 50 feet. The nearest receptor to the exterior pump area is Receptor 20, located 550 feet to the east. At a distance of 550 feet, pump noise would be reduced to 44 dBA. After accounting for ground attenuation and vegetation, as well as shielding provided by the 25-foot high process building, pump noise levels at the nearest receptor are predicted to be approximately 26 dBA. Because the predicted pump noise levels would be below the most restrictive nighttime noise criteria, noise-related impacts from exterior pumps would be less than significant.

### Water Treatment Plant

The primary noise source associated with the water treatment plant would be the pumps and the turbine aerator. The turbine aerator would be located inside the building. Several pumps would be located outdoors, adjacent to the building and at the pump platform on the water treatment pond. The distance from the water treatment



plant to the nearest residence, Receptor 20, (see Figure 4.10-3) would be approximately 900 feet.

Noise level measurements conducted by BAC at the Auburn California Wastewater Treatment Plant determined that average noise levels of approximately 50 dBA were recorded at a distance of 500 feet from the plant. This noise was generated primarily by pumps and an aeration system.

Using the SoundPlan model with an assumed interior noise level of 75 dBA within the treatment plant building, and including the noise attenuation provided by the building, water treatment plant noise was estimated to be approximately 28 dBA or less at the nearest receptors. The estimated noise level from operations of the water treatment plant would be well below the applicable daytime, evening, and nighttime thresholds of 62, 60, and 55 dB  $L_{eq}$ , respectively. As such, the noise-related impacts from the water treatment plant would be less than significant.

### Backup Generators

The proposed project would include four diesel generators located inside of a building adjacent to the water treatment plant. The generators would be used for emergency power during interruptions to grid power from PG&E, which would occur very infrequently. Noise level data for similar generators indicate that the generators would produce a combined sound level of approximately 105 dBA within the generator building. Due to the substantial noise attenuation provided by the proposed industrial building, the noise levels calculated using the SoundPlan model at the nearest residences are predicted to be below 25 dBA  $L_{eq}$ . Because the predicted generator noise levels are well below all applicable noise standards, the noise-related impacts from the backup generators would be less than significant.

### Mine Compressor

The proposed mine air compressor would be located inside a building adjacent to the Brunswick Shaft, and would have a rated capacity of 4,000 cubic feet per minute at 800 hp. The noise generation of an unenclosed compressor would be approximately 110 dBA at a reference distance of three feet. Assuming an overall interior noise level of 105 dB within the compressor building, the SoundPlan model predicts average noise levels of less than 35 dBA at the nearest sensitive receptor (Receptor 18). Because the predicted compressor sound levels would satisfy the applicable nighttime noise level criteria at the nearest receptors, noise-related impacts from the mine compressor would be less than significant.

### Brunswick Shaft Skipping

During project operations, rock would be hoisted up the Brunswick Shaft in skips and dropped into the concrete silo. Rock hoisted into the headframe building would drop approximately two feet onto a steel chute, which would direct the rock into a pile. The falling rock is predicted to generate a maximum noise level of approximately 120 dBA within the headframe building. Acoustical shielding provided by the concrete sleeve of the silo and the headframe building is predicted to substantially reduce maximum noise levels. At the nearest residence (Receptor 16), located 595 feet to the north, the SoundPlan model predicts a maximum noise level of less than 50 dBA  $L_{max}$ . The nighttime noise level criteria applicable at this receptor is 67 dBA  $L_{max}$ . Because the



maximum noise generation of the shaft skipping operations would be below the applicable noise standard, noise-related impacts from the Brunswick Shaft skipping would be less than significant.

### Parking Lot

Noise generation related to parking lot activities would include vehicles arriving and departing, engines starting and stopping, car doors opening and closing, and persons conversing. During the busiest shift change, approximately 107 employee vehicles would arrive at the project site and 67 employee vehicles would depart the project site, for a total of 174 parking lot movements. Parking lot movements generate mean sound exposure levels of 70 dB at a reference distance of 50 feet.

The nearest receptor to the parking area is located approximately 300 feet to the east (between Receptors 22 and 23). At 300 feet, noise generated from the parking lot would be 41 dBA  $L_{eq}$  and 49 dBA  $L_{max}$ . The nighttime noise level criteria applicable at this receptor is 53 dB  $L_{eq}$  and 72 dBA  $L_{max}$ . Because the average and maximum noise generation of the employee parking lot activities would be below those average and maximum noise criteria, noise-related impacts from the parking lot would be less than significant.

### Blasting

In order to assess the potential for noise impacts associated with blasting activities, BAC referred to the long-term blasting noise level data collected from a similar mine.

In 2013, BAC conducted a long-term blasting noise level survey over the course of 30 days at the Sutter Gold Mine, an underground mine located in Amador County, California. During the survey, noise monitoring was conducted at five separate locations, with the nearest located approximately 220 feet from the main mine portal. Over the course of the 30-day survey, 62 blasting events were captured at the nearest location. The average noise level calculated from the 62 blast events was 75 dBA  $L_{max}$  at the location 200 feet from the mine portal.

As part of the proposed project, two entrances would be provided to the vertical mine shafts at the Brunswick Industrial Site. The main shaft would be located at the northern portion of the site, approximately 550 feet away from the nearest receptor (Receptor 16). The new service shaft would be located approximately 1,000 feet from the nearest receptor (Receptor 21).

The Idaho-Maryland Mine would be a vertical shaft mine, whereas the portal to the Sutter Gold Mine, where the long-term blasting noise monitoring was performed, was accessed through a horizontal portal. In addition, the portals used for the proposed project would be smaller in size than those used for the Sutter Gold Mine. As such, blasting noise levels from the proposed project are expected to be considerably lower than those measured at the Sutter Gold site. According to BAC's Noise and Vibration Analysis, the difference in maximum noise levels at the two sites is estimated to be at least 20 dB.

Using the 75 dBA  $L_{max}$  average blasting noise level from the Sutter Gold Mine, and applying a 20 dB reduction to assess blasting noise impacts at the Brunswick



Industrial Site, the worst-case maximum noise levels at the nearest noise-sensitive receptors would range from 52 to 57 dBA  $L_{max}$ . The range of predicted worst-case blasting noise levels of 52 to 57 dBA  $L_{max}$  is below the daytime, evening, and nighttime dBA  $L_{max}$  criteria at the nearest receptors (refer to Table 4.10-6 for daytime, evening, and nighttime noise criteria for each receptor).

### Combined Stationary Noise Sources

Due to the considerable distance and topographic shielding between the Centennial and Brunswick Industrial Sites, noise sources present at one site would not result in any additive change in the noise environment at the other site. However, several separate noise sources would exist at the Brunswick Industrial Site and, when combined, would result in higher noise levels at the nearest receptors than the individual sources alone.

To predict combined project noise exposure, BAC developed noise contours for both daytime and nighttime periods using the SoundPlan model. Each of the aforementioned individual noise sources were included in the combined SoundPlan model runs. The noise contours for daytime and nighttime periods are provided in Figure 4.10-7 and Figure 4.10-8, respectively. Table 4.10-19 and Table 4.10-20 provide the computed daytime and nighttime combined noise exposure from all sources which would be in operation during those hours and a comparison of that exposure to the applicable noise criteria at each receptor.

As shown in Figure 4.10-7 and Figure 4.10-8, as well as Table 4.10-19 and Table 4.10-20, the combined project noise exposure is expected to fall below both the daytime and nighttime noise criteria at the nearest receptors.

### Conclusion

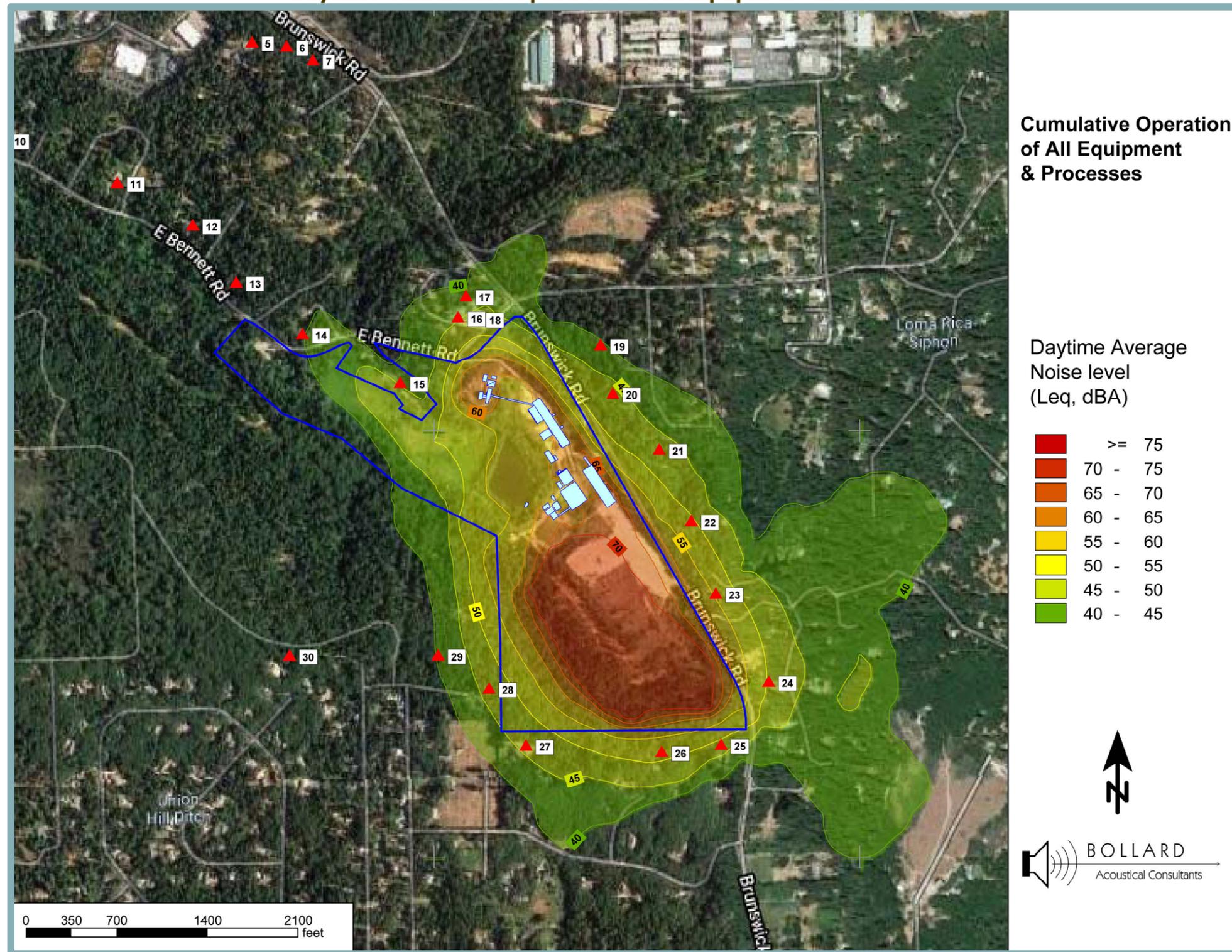
Based on the above, none of the individual activities associated with long-term operations of the proposed project would generate noise in excess of the applicable noise standards. Furthermore, combined project noise impacts are not anticipated for the proposed project. Nonetheless, because the project would include multiple processes which generate noise, and because compliance with the Nevada County Noise Standards is required, Mitigation Measure 4.10-2 is included out of an abundance of caution to ensure satisfaction with such standards and to reduce the potential for annoyance resulting from the proposed project to the maximum extent feasible. It is conservatively concluded that the proposed project could result in a substantial 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, and the project's noise impacts could be **significant**.

### Mitigation Measure(s)

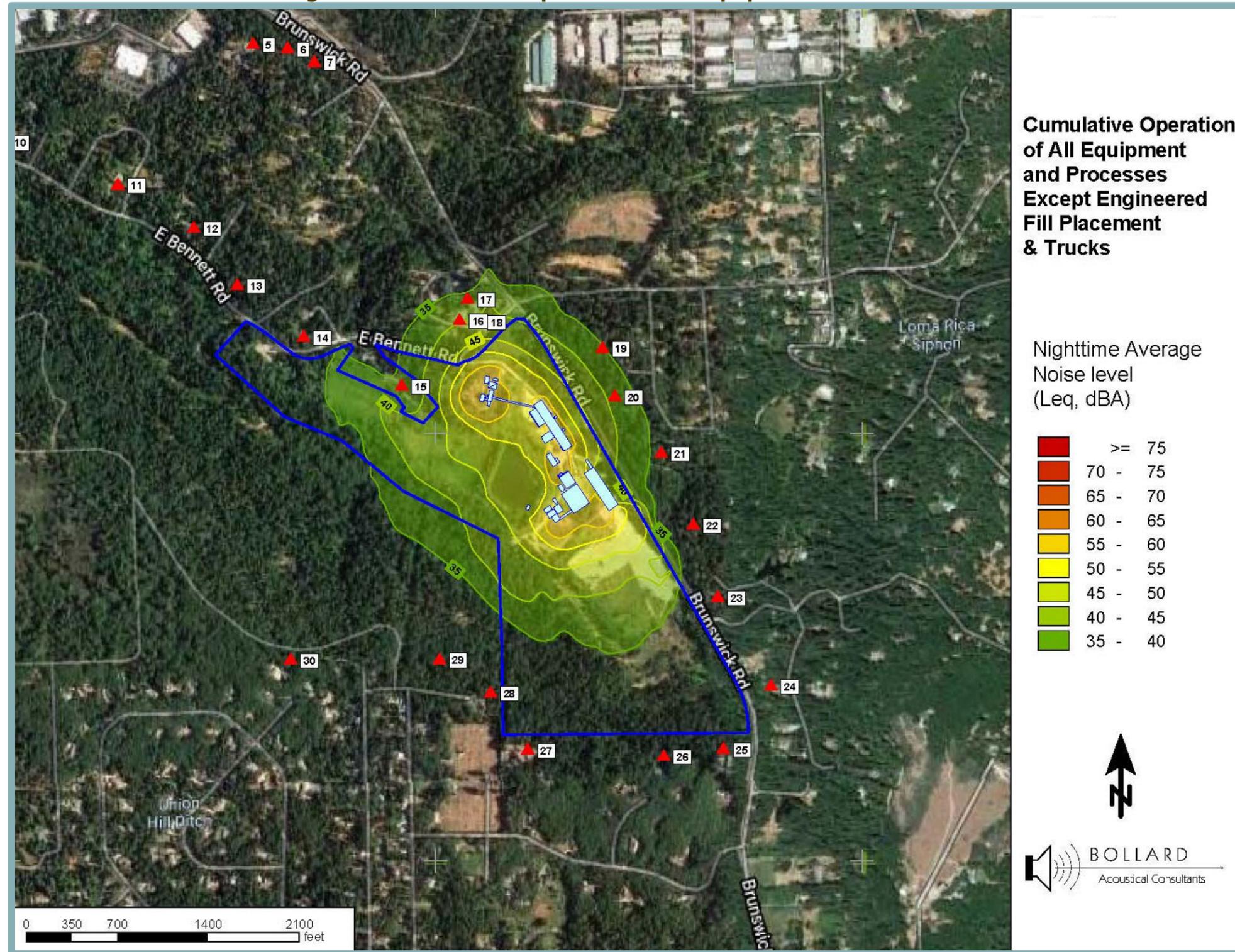
Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.



**Figure 4.10-7**  
**Daytime Cumulative Operation of All Equipment and Processes**



**Figure 4.10-8**  
**Nighttime Cumulative Operation of All Equipment and Processes**



**Table 4.10-19  
 Predicted Combined Noise Levels from All Daytime  
 Sources at Nearest Receptors**

Receptor	Project Daytime Noise Generation		Daytime Noise Criteria		Criteria Exceeded?	
	Leq	Lmax	Leq	Lmax	Leq	Lmax
1	56	68	63	81	NO	NO
2	54	67	68	86	NO	NO
3	39	46	66	87	NO	NO
4	37	43	60	75	NO	NO
5	29	34	54	71	NO	NO
6	29	34	55	72	NO	NO
7	29	33	54	71	NO	NO
8	38	48	55	75	NO	NO
9	35	41	53	71	NO	NO
10	34	40	52	71	NO	NO
11	34	42	52	72	NO	NO
12	33	41	54	74	NO	NO
13	34	43	55	75	NO	NO
14	41	48	55	75	NO	NO
15	44	55	55	75	NO	NO
16	45	51	53	75	NO	NO
17	43	49	61	75	NO	NO
18	47	53	55	74	NO	NO
19	41	50	55	74	NO	NO
20	47	55	62	75	NO	NO
21	47	58	60	75	NO	NO
22	51	62	61	75	NO	NO
23	55	67	63	75	NO	NO
24	50	66	65	80	NO	NO
25	49	67	65	75	NO	NO
26	51	68	55	69	NO	NO
27	46	57	55	69	NO	NO
28	46	57	55	69	NO	NO
29	40	50	55	69	NO	NO
30	34	39	55	69	NO	NO

Source: *Bollard Acoustical Consultants, Inc. (2021).*



**Table 4.10-20  
 Predicted Combined Noise Levels from All Nighttime  
 Sources at Nearest Receptors**

Receptor	Project Nighttime Noise Generation		Nighttime Noise Criteria		Criteria Exceeded?	
	Leq	Lmax	Leq	Lmax	Leq	Lmax
1	14	15	55	71	NO	NO
2	14	16	60	76	NO	NO
3	17	21	56	74	NO	NO
4	17	20	61	75	NO	NO
5	13	17	55	69	NO	NO
6	14	18	56	70	NO	NO
7	17	19	55	69	NO	NO
8	14	16	45	70	NO	NO
9	20	25	44	60	NO	NO
10	19	25	42	60	NO	NO
11	20	26	42	60	NO	NO
12	18	20	44	67	NO	NO
13	22	28	45	69	NO	NO
14	31	39	45	69	NO	NO
15	36	45	45	70	NO	NO
16	40	48	45	67	NO	NO
17	36	45	62	76	NO	NO
18	41	49	58	72	NO	NO
19	36	42	51	70	NO	NO
20	39	43	55	73	NO	NO
21	33	37	53	71	NO	NO
22	28	30	53	72	NO	NO
23	24	27	56	74	NO	NO
24	23	27	58	76	NO	NO
25	25	28	57	76	NO	NO
26	26	31	45	60	NO	NO
27	25	29	45	60	NO	NO
28	26	29	45	60	NO	NO
29	26	30	45	60	NO	NO
30	24	28	45	60	NO	NO

*Source: Bollard Acoustical Consultants, Inc. (2021).*



4.10-3 *The following conditions shall be met, subject to review and approval by the Nevada County Planning Department:*

1. *All on-site mobile equipment shall be fitted with broad-band “growler” type back-up warning devices rather than the conventional “beeper” devices.*
2. *A comprehensive noise monitoring program shall be conducted of each facet of the operation to both verify the modelling assumptions of the project noise analysis (Bollard Acoustical Consultants, Inc. Noise and Vibration Analysis, Idaho Maryland Mine, Nevada County, California BAC Job #2018-203. March 8, 2021) and to ensure that compliance with the applicable Nevada County noise standards is being achieved at nearby sensitive receptors. The noise monitoring program shall evaluate noise levels at a minimum of five receptor locations surrounding the Brunswick Industrial Site. The noise monitoring system shall consist of the installation of permanent noise monitors at three to five locations on the Brunswick Industrial Site, and one site at the Centennial Industrial Site, to be determined by a third-party noise consultant under contract with the County, in coordination with the applicant. The permanent monitors shall be provided with a continual power source, and shall include internet connectivity technology, to enable electronic retrieval of noise monitoring data at any time by the County’s third-party noise consultant.*
  - a. *Within 30 days of installation and operation of mine-related equipment at the Brunswick Industrial Site, the County’s third-party noise consultant shall retrieve and evaluate noise monitoring data to evaluate whether mine-related operational noise levels are in compliance with County noise standards at the pre-determined Receptor locations, using noise level data and noise attenuation calculations accounting for distance to the receptor locations. The results shall be submitted to the Nevada County Planning Department within one week from evaluation of the noise data. If the results indicate that the County noise standards are being exceeded either by individual equipment or processes, or cumulative noise generation of the entire facility, operations shall cease until additional engineering controls can be implemented as needed. Such measures could take the form of noise barriers, installation of sound absorbing materials, use of additional silencers, etc. After implementation of any recommended measures, follow-up noise level data evaluation shall be conducted to demonstrate that the resultant operational noise levels comply with the County noise level standards at nearby sensitive receptors.*
  - b. *After the initial noise monitoring evaluation described under “a”, the County’s third-party noise consultant shall evaluate permanent noise monitoring data at the pre-determined receptor locations as follows: i) on a quarterly basis during the*



first five years of project operation; ii) once per year thereafter for the life of the project; and iii) in response to public noise complaints. If the results indicate that the County noise standards are being exceeded, then the actions described in “a” shall be implemented to the satisfaction of the County.

**4.10-4 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Based on the analysis below, and with the implementation of mitigation, the impact is less than significant.**

Implementation of the proposed project could result in the generation of groundborne vibration from construction activities, heavy truck traffic, and underground blasting.

Construction

Construction activities associated with the proposed project would have the potential to result in varying degrees of temporary ground vibration depending on the specific construction equipment used and operations involved. Table 4.10-21 shows the typical vibration levels produced by various types of construction equipment.

**Table 4.10-21  
 Vibration Levels of Heavy Earthmoving Equipment at 25 Feet**

Source	PPV (in/s)	RMS Velocity in Decibels (VdB)
Water Trucks	0.001	57
Scraper	0.002	58
Bulldozer - Small	0.003	58
Backhoe	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86
Bulldozer - Large	0.089	87

*Source: Bollard Acoustical Consultants, Inc. (2021).*

The nearest receptor to where the most significant vibration would be generated is approximately 350 feet away. By applying a standard vibration attenuation calculation, the vibration level at the nearest sensitive receptor would be 0.002 in/s PPV, or approximately 58 VdB, which falls below the selected criteria for vibration impacts on structures (90 VdB) and annoyance to residential land uses (72 VdB). Therefore, construction associated with the proposed project would result in a less-than-significant impact related to groundborne vibration.

Heavy Truck Traffic

Vibration would be generated by heavy truck traffic transporting engineered fill material from the Brunswick Industrial Site to the Centennial Industrial Site and/or off-site. As shown in Table 4.10-3, measured ambient vibration levels along the local roadway network ranged from 34 to 57 VdB. The local roadway network already includes truck



traffic and, therefore, the ambient vibration survey included vibration generated from the passbys of heavy trucks. Heavy truck passbys associated with the proposed project would not generate higher vibration levels than the levels generated during existing truck passbys. The truck traffic vibration levels would be below the thresholds for both annoyance and damage to structures, and heavy truck traffic associated with the proposed project would result in a less-than-significant impact related to groundborne vibration.

### Underground Blasting

As part of the project, an extensive network of tunnels would be constructed throughout the lifetime of the proposed mine. New underground tunnels would be created as necessary to access potential ore veins or to provide the necessary infrastructure, ventilation, and escape routes. The largest types of blasting that would occur for tunnel expansion would be drift development and long-hole stope blasting.

The Idaho-Maryland Mine has already been extensively mined to 1,600 feet below surface, but the possibility exists that gold ore is located in the upper levels of the mine as well. Therefore, the analysis conducted by PBS assumed that mining by drift rounds and long-hole blasts could take place as shallow as 500 feet below the ground surface.

### *Blasting Effects at Nearby Residences*

The receptors located directly above the area that would be blasted have the least horizontal distance of separation from the blast area and, therefore, the least amount of rock through which ground vibration could be attenuated. As a result, such receptors have the greatest potential to notice adverse effects from a blast.

The maximum ground vibration from underground blasting was analyzed using the CRSD prediction equation. In addition, this analysis assumed that the receptor is located directly above the blast location (i.e., no horizontal separation). Table 4.10-22 and Table 4.10-23 present the anticipated PPV from various blasting levels using the drift development and long hole blasting techniques described above.

<b>Table 4.10-22 PPV for Drift Development Blasting based on Vertical Distance from Receptor</b>				
<b>Mine Level</b>	<b>Weight of Explosive (lbs)</b>	<b>Receptor Distance from Blast (ft)</b>	<b>Cubed-Root Scaled Distance</b>	<b>PPV (in/s)</b>
500	52.1	500	144.2	0.14
600	52.1	600	173.0	0.11
700	52.1	700	201.9	0.08
800	52.1	800	230.7	0.07
900	52.1	900	259.5	0.06
1000	52.1	1000	288.4	0.05
1100	52.1	1100	317.2	NT
1200	52.1	1200	346.0	NT
1300	52.1	1300	374.9	NT
1400	52.1	1400	403.7	NT

*(Continued on next page)*



**Table 4.10-22  
PPV for Drift Development Blasting based on Vertical  
Distance from Receptor**

Mine Level	Weight of Explosive (lbs)	Receptor Distance from Blast (ft)	Cubed-Root Scaled Distance	PPV (in/s)
1500	52.1	1500	432.6	NT
1600	52.1	1600	461.4	NT
1700	52.1	1700	490.2	NT
1800	52.1	1800	519.1	NT
1900	52.1	1900	547.9	NT
2000	52.1	2000	576.7	NT
2100	52.1	2100	605.6	NT
2200	52.1	2200	634.4	NT
2300	52.1	2300	663.3	NT
2400	52.1	2400	692.1	NT
2500	52.1	2500	720.9	NT
2600	52.1	2600	749.8	NT
2700	52.1	2700	778.6	NT
2800	52.1	2800	807.4	NT
2900	52.1	2900	836.3	NT

Note: Any field indicated with the symbol "NT" has an anticipated ground vibration below that which is detectable on a typical blasting seismograph (PPV < 0.05 in/s).

Source: Precision Blasting Services (2019).

**Table 4.10-23  
PPV for Long-Hole Stop Blasting based on Vertical  
Distance from Receptor**

Mine Level	Weight of Explosive (lbs)	Receptor Distance from Blast (ft)	Cubed-Root Scaled Distance	PPV (in/s)
500	133	500	98.0	0.23
600	133	600	117.5	0.18
700	133	700	137.1	0.14
800	133	800	156.7	0.11
900	133	900	176.3	0.09
1000	133	1000	195.9	0.08
1100	133	1100	215.5	0.07
1200	133	1200	235.1	0.06
1300	133	1300	254.7	0.05
1400	133	1400	274.3	0.05
1500	133	1500	293.9	NT
1600	133	1600	313.5	NT
1700	133	1700	333.0	NT
1800	133	1800	352.6	NT
1900	133	1900	372.2	NT
2000	133	2000	391.8	NT
2100	133	2100	411.4	NT
2200	133	2200	431.0	NT

(Continued on next page)



**Table 4.10-23  
PPV for Long-Hole Stope Blasting based on Vertical  
Distance from Receptor**

Mine Level	Weight of Explosive (lbs)	Receptor Distance from Blast (ft)	Cubed-Root Scaled Distance	PPV (in/s)
2300	133	2300	450.6	NT
2400	133	2400	470.2	NT
2500	133	2500	489.8	NT
2600	133	2600	509.4	NT
2700	133	2700	528.9	NT
2800	133	2800	548.5	NT
2900	133	2900	568.1	NT

Note: Any field indicated with the symbol "NT" has an anticipated ground vibration below that which is detectable on a typical blasting seismograph (PPV < 0.05 in/s).

**Source: Precision Blasting Services (2019).**

Emulsion explosive product has been assumed as it produces the largest weight of explosives (charge weight) per hole. This has been segmented based on the anticipated mining levels, beginning at 500 feet and every 100 feet below that. The datum to ground has been set as the elevation of Brunswick Shaft; however, many of the surrounding structures which the mine may be mining below are located at a higher elevation relative to the Brunswick Shaft, and thus, have lower ground vibration levels than shown in the tables. Any field indicated with the symbol "NT" has an anticipated ground vibration below that which is typically detectable on a typical blasting seismograph (PPV < 0.05 in/s) and as such, is viewed as having no ground vibration effects.

As shown in Table 4.10-22 and Table 4.10-23, all groundborne vibrations calculated for blasting of both drift round and long-hole stopes, respectively, fall below the USBM recommendations and the levels at which structural damage to buildings is possible (see Table 4.10-9). Drift development blasts at the shallowest depth considered of 500 feet would be barely perceivable to the general population and undetectable by instrumentation below 900 feet in depth. Larger longhole stoping blasts at the shallowest depth considered of 500 feet would be 0.23 in/s, which is also well below the threshold level of vibration (0.4 in/s) about which less than eight percent of the population complains. The calculated ground vibration is considered insignificant. At depths below 800 feet, the ground vibration becomes unnoticeable to the general population. Untraceable vibration would occur at a depth of approximately 1,500 feet. At depths below 1500 feet, it would be expected that ground vibration would be unnoticeable.

As such, underground blasting associated with the proposed project would result in a less-than-significant vibration-related impact to sensitive receptors in the project vicinity.

#### *Blasting Effects at Analog Devices*

Analog Devices, Inc., located along Crown Point Circle, is a business that works with sensitive electronic equipment and microscopes placed on vibration dampeners.



According to PBS, based upon research, it is reasonable to assume such equipment can withstand vibration levels up to 0.5 in/s without affecting the function of these devices.<sup>12</sup>

In the vicinity of the Analog Devices building, the shallowest depth that underground mining and blasting is likely to occur is 1,000 feet. Such blasting may occur directly below Analog Devices and, therefore, horizontal offset has not been included. Results of the analysis for groundborne vibration impacts at Analog Devices is presented in Table 4.10-24.

<b>Mine Level</b>	<b>Weight of Explosive (lbs)</b>	<b>Vertical Distance From Blast (ft)</b>	<b>Horizontal Distance From Blast (ft)</b>	<b>True Distance from Blast (ft)</b>	<b>Cubed-Root Scaled Distance</b>	<b>PPV (in/s)</b>
1000	133	1026.5	0	1026.5	201.1	0.07
1100	133	1126.5	0	1126.5	220.7	0.06
1200	133	1226.5	0	1226.5	240.3	0.06
1300	133	1326.5	0	1326.5	259.9	0.05
1400	133	1426.5	0	1426.5	279.5	NT
1500	133	1526.5	0	1526.5	299.1	NT
1600	133	1626.5	0	1626.5	318.6	NT
1700	133	1726.5	0	1726.5	338.2	NT
1800	133	1826.5	0	1826.5	357.8	NT
1900	133	1926.5	0	1926.5	377.4	NT
2000	133	2026.5	0	2026.5	397.0	NT

Note: Any field indicated with the symbol "NT" has an anticipated ground vibration below that which is detectable on a typical blasting seismograph (PPV < 0.05 in/s).

**Source: Precision Blasting Services (2019).**

As shown in Table 4.10-24, the calculated ground vibration predictions would remain below 0.1 in/s (i.e., vibration level that is perceivable). Underground blasting on the 1,400-foot level and below would not be traceable. Therefore, underground blasting associated with the proposed project would result in a less-than-significant vibration-related impact to Analog Devices.

***Blasting Effects at Sierra Nevada Memorial Hospital***

The Sierra Nevada Memorial Hospital has been identified as a vibration-sensitive receptor in the project vicinity. The Sierra Nevada Memorial Hospital contains sensitive equipment which may be susceptible to adverse impacts from groundborne vibration. PBS has worked on many projects that involved blasting next to working hospitals, including blasting foundations for hospital expansions next to existing hospitals. The ground vibration was never an issue and was typically set to the USBM Z-Curve limits for residential structures.

<sup>12</sup> PBS. *Environmental Factors of Blasting Report for the Proposed Idaho-Maryland Gold Project, Nevada County, CA* [pg. 23]. September 27, 2019.



Results of the analysis for groundborne vibration effects at the Sierra Nevada Memorial Hospital are presented in Table 4.10-25.

<b>Mine Level</b>	<b>Weight of Explosive (lbs)</b>	<b>Vertical Distance From Blast (ft)</b>	<b>Horizontal Distance From Blast (ft)</b>	<b>True Distance from Blast (ft)</b>	<b>Cubed-Root Scaled Distance</b>	<b>PPV (in/s)</b>
500	133	398.5	3300	3324.0	651.2	NT
600	133	498.5	3300	3337.4	653.8	NT
700	133	598.5	3300	3353.8	657.0	NT
800	133	698.5	3300	3373.1	660.8	NT
900	133	798.5	3300	3395.2	665.2	NT
1000	133	898.5	3300	3420.1	670.0	NT
1100	133	998.5	3300	3447.8	675.4	NT
1200	133	1098.5	3300	3478.0	681.4	NT
1300	133	1198.5	3300	3510.9	687.8	NT
1400	133	1298.5	3300	3546.3	694.7	NT
1500	133	1398.5	3300	3584.1	702.2	NT
1600	133	1498.5	3300	3624.3	708.3	NT
1700	133	1598.5	3300	3666.8	714.8	NT
1800	133	1698.5	3300	3711.5	721.7	NT
1900	133	1798.5	3300	3758.3	729.0	NT
2000	133	1898.5	3300	3807.1	736.7	NT

Note: Any field indicated with the symbol "NT" has an anticipated ground vibration below that which is detectable on a typical blasting seismograph (PPV < 0.05 in/s).

**Source: Precision Blasting Services (2019).**

As shown in Table 4.10-25, vibration from underground blasting would not be traceable at the hospital site. Therefore, underground blasting associated with the proposed project would result in a less-than-significant vibration-related impact to Sierra Nevada Memorial Hospital.

***Blasting Effects at Downtown Grass Valley***

Downtown Grass Valley was analyzed for vibration impacts due to the presence of older buildings and a larger population in the area. Results of the analysis for groundborne vibration impacts in Downtown Grass Valley are presented in Table 4.10-26.

As shown in Table 4.10-26, vibration from underground blasting would not be traceable in Downtown Grass Valley. Therefore, underground blasting associated with the proposed project would result in a less-than-significant vibration-related impact to Downtown Grass Valley.



**Table 4.10-26  
 Ground Vibration Predictions at Downtown Grass Valley**

Mine Level	Weight of Explosive (lbs)	Vertical Distance From Blast (ft)	Horizontal Distance From Blast (ft)	True Distance from Blast (ft)	Cubed-Root Scaled Distance	PPV (in/s)
500	133	169.5	6000	6002.4	1175.91	NT
600	133	269.5	6000	6006.0	1176.63	NT
700	133	369.5	6000	6011.4	1177.67	NT
800	133	469.5	6000	6018.3	1179.03	NT
900	133	569.5	6000	6027.0	1180.72	NT
1000	133	669.5	6000	6037.2	1182.74	NT
1100	133	769.5	6000	6049.1	1185.07	NT
1200	133	869.5	6000	6062.7	1187.72	NT
1300	133	969.5	6000	6077.8	1190.69	NT
1400	133	1069.5	6000	6094.6	1193.97	NT
1500	133	1169.5	6000	6112.9	1197.56	NT
1600	133	1269.5	6000	6132.8	1198.47	NT
1700	133	1369.5	6000	6154.3	1199.69	NT
1800	133	1469.5	6000	6177.3	1201.22	NT
1900	133	1569.5	6000	6201.9	1203.05	NT
2000	133	1669.5	6000	6227.9	1205.18	NT

Note: Any field indicated with the symbol "NT" has an anticipated ground vibration below that which is detectable on a typical blasting seismograph (PPV < 0.05 in/s).

**Source: Precision Blasting Services (2019).**

***Blasting Effects from Construction of Shaft Raise***

As part of the proposed project, an additional raise would be constructed from underground to develop a new shaft at the site. Construction blasting of the shaft raise would commence from an underground drift and move upward towards the surface using similar blasting methods as described for raise development (see page 4.10-28). The shaft raise would result in temporary blasting activities closer to the surface than the drift and stope development analyzed above.

The proposed shaft would have a breakthrough of approximately 50 feet below the ground surface. The shaft is expected to be approximately 18 feet by 12 feet in area. The shaft would likely be developed using drill holes up to 1.25-inch diameter with a total of eight feet of explosive product loaded in the hole in each blast. For this analysis, it is assumed that up to five holes would fire on a single delay, for a total of 26.6 lbs of explosive being detonated per delay.

The closest residence to the service shaft location on surface is greater than 900 feet horizontally. Based on the assumed charge weight per delay, the blasting vibrations would be undetectable at the nearest residence during the majority of construction of the raise from underground.

The highest levels of ground vibration would be those produced from the breakthrough round, as this round would have the least amount of vertical distance between the blast and the surface. While this round would occur 50 feet below surface, the round



would be blasted to the surface. The ground vibration from this single shot would not cause damage to residences in the area or to industrial structures adjacent to the raise breakthrough round. The maximum ground vibration at the nearest receptor is expected to be 0.13 in/s, which is well below the 0.4 in/s recommendation for annoyance within the community (see Table 4.10-9).

Therefore, underground blasting associated with the construction of the proposed shaft raise would result in a less-than-significant vibration-related impact.

### Conclusion

Based on the above, operation of the proposed mine is not anticipated to cause damage to structures in the project area. Regular drift round blasting would be undetectable below 900 feet depth or distance, and would be barely perceivable at 500 feet depth. The largest longhole blasts, occurring once every three to four days on average, would be undetectable below 1,400 feet depth or distance from a receiver. The maximum ground vibration that the mine would produce to nearby receptors is 0.23 in/s PPV, which considers a rare scenario where a longhole blast occurs directly underneath a receptor at 500 feet depth. The maximum ground vibration of 0.23 in/s PPV is comparable to the vibration level from running a garbage disposal in a house, with the exception that the blasting ground vibration would last only seconds. Blasting on mine levels below 1,400 feet would produce no traceable ground vibration on the surface. In addition, identified structures/businesses in the surrounding area have been analyzed to determine potential risk. Analog Devices may experience ground vibrations up to a maximum of 0.07 in/s PPV, which is below the limit that humans can feel. The Sierra Nevada Memorial Hospital and Downtown Grass Valley would not experience any ground vibration associated with the proposed project.

Overall, the proposed project is not anticipated to result in the exposure of persons to or generation of excessive groundborne vibration levels. Nonetheless, in order to ensure that actual mining operations would generate vibration levels as expected, a Ground Vibration Monitoring Program is required. Without quantitative evidence and regular monitoring from the Ground Vibration Monitoring Program, a **significant** impact related to the generation of groundborne vibration could occur.

### Mitigation Measure(s)

The mitigation below requires a Ground Vibration Monitoring Program to determine the actual levels of ground vibration that occur, assess ground vibration, and modify blasting, if needed. Implementation of the following mitigation measure would ensure the above potential impact is *less than significant*.

4.10-4 *The project applicant shall conduct a project-specific Ground Vibration Monitoring Program. As part of the Ground Vibration Monitoring Program, the mine shall employ between eight and ten seismographs during the blasting of levels above the 1,000-foot level. The seismographs shall be placed at the following locations:*

- *One at the Brunswick Shaft;*
- *One at each of the four corners of the Mine Property;*
- *One in the Whispering Pines Industrial Park;*



- Two at nearby residences; and
- Two travelling seismographs which can change location depending on the weekly/monthly mining plan.

*After the mine has stopped blasting at the proposed shaft and above the 1,000-foot level, only five seismographs would be required for the Ground Vibration Monitoring Program. One seismograph shall be located at the Brunswick Shaft and one in each of the four corners of the mine property. The five seismographs would collect relevant data throughout the entire operation to understand how the ground is transmitting vibration in these areas.*

*Once mining operations commence, the project applicant shall hire a blast consultant to assist with the development of a 95 percent confidence level equation for the site-specific ground vibration. The blast consultant shall assess the data acquired by the seismographs using a linear regression and log-log confidence model to develop an equation that the mine can use to modify blasting, as needed, to ensure vibration levels remain below 0.4 in/s at sensitive receptors.*

*Results of the Ground Vibration Monitoring Program and the equation for site-specific ground vibration shall be submitted to the Nevada County Planning Department for review.*

**4.10-5 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? Based on the analysis below, the impact is *less-than-significant*.**

The Nevada County Airport is located approximately 0.75-mile (4,000 feet) northeast of the Brunswick Industrial Site and approximately 1.42-mile (7,500 feet) east of the Centennial Industrial Site. The proposed project would not include the development of any noise-sensitive land uses. In addition, both the Brunswick and Centennial Industrial Sites are located outside of the future 55 dB CNEL noise contour for the Nevada County Airport, which falls below the County's normally acceptable 75 dB CNEL level established for industrial land uses. The proposed project is within Compatibility Zones C, D, D-Urban Overlay, and E of the Nevada County Airport Land Use Compatibility Plan. According to the Nevada County Airport Land Use Commission (NCALUC), the proposed project does not contain characteristics likely to result in inconsistencies with the compatibility criteria set forth in the Nevada County Airport Land Use Compatibility Plan and the NCALUC gives approval of the project.<sup>13</sup>

As a result, the project would not expose people residing or working in the project area to excessive aircraft noise levels, and the impact would be ***less than significant***.

<sup>13</sup> Daniel Landon, Executive Director, Nevada County Transportation Commission. Email correspondence to Matt Kelley, Senior Planner, Nevada County, January 27, 2020.



Mitigation Measure(s)

*None required.*

**Cumulative Impacts and Mitigation Measures**

For detail related to the cumulative setting of the proposed project, refer to Chapter 5, Statutorily Required Sections of this EIR.

**4.10-6 Generation of a substantial permanent increase in ambient noise and/or vibration levels associated with the cumulative noise and vibration from all sources of the proposed project. Based on the analysis below, the impact is *less than cumulatively considerable*.**

The extent by which noise and vibration sources combine to result in higher noise and vibration levels depends on the relative locations of the sources and the sources' individual magnitude. As noted in Chapter 5, Statutorily Required Sections, of this EIR, a list of 20 planned development projects was compiled to develop a reasonable estimate of the cumulative impacts that could occur within neighboring portions of both the County of Nevada and the City of Grass Valley. Considering noise and vibration attenuate with distance, the substantial distance and topography that separates each potential future development project from the Centennial and Brunswick Industrial Sites would ensure that noise and vibration levels from different projects would not combine. Furthermore, the planned projects that are nearest to any portion of the project site would not involve the development of land uses associated with the generation of substantial noise and/or vibration. For example, the Initial Study prepared for the nearest planned project, 12836 Greenhorn Road, concluded that operations of the proposed project would result in less-than-significant impacts related to noise with implementation of mitigation, and a less-than-significant impact related to vibration with no mitigation required. As a result, the operation of the cumulative development projects in the area would not produce noise or vibration levels that would combine with the noise or vibration levels generated from the proposed project.

Vehicle traffic generated from the proposed project and other planned development projects could potentially combine to result in a cumulative impact related to transportation noise. As noted in the Noise and Vibration Analysis, future traffic volumes on the project area roadways would increase over time relative to existing levels due to general growth of the region. However, the project-generated truck traffic would remain constant, and would not increase over time. As a result, the incremental contribution to overall traffic noise levels resulting from the project would decrease over time. For example, East Bennett Road, west of Brunswick Road, currently carries approximately 1,486 vehicles, and the associated noise level is 52.5 dBA. With the project contribution of 111 trucks, the noise level is expected to increase to 54.8 dBA, for a project-related change of 2.3 dB. However, if future traffic levels from cumulative development throughout the region were to increase by ten percent to 1,635 vehicles per day, and the project-related traffic remains at 111 trucks, the total transportation noise level would be 55.0 dBA, but the project-related change diminishes to 2.1 dBA. Because the future project-related traffic noise level increases would diminish over time and remain below the applicable thresholds of significance, the impact is considered to be less-than-significant relative to future cumulative traffic conditions.



Based on the above, each individual project would mitigate noise and vibration impacts to the maximum extent feasible, noise and vibration impacts would not combine due to substantial distance between projects, and cumulative transportation-related noise impacts would not occur. As a result, significant cumulative project noise and/or vibration impacts are not anticipated for the proposed project. The proposed project would not result in a substantial permanent increase in ambient noise or vibration 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, and the project's noise and vibration impacts would be ***less than cumulatively considerable***.

Mitigation Measure(s)

*None required.*

