
MEMORANDUM

To: Karl Schrader
BuildLACCD

From: Zack Dennis

Date: January 3, 2019

Subject: Monthly Noise Report for Construction Noise Monitors, December 2019

This memorandum presents the results of the construction noise monitoring along the border between West Los Angeles College and several communities to the northwest of the campus, including Raintree, Tara Hill, Lakeside Village, and Lakeside Villas. There are currently three monitors installed to monitor construction-related truck and equipment noise, with plans to install an additional two monitors as soon as appropriate sites can be secured. Each monitor is an independent station consisting of a microphone, sound level meter, and assorted ancillary equipment. The locations of the monitors are shown in Appendix A.

Monitor A: Monitor A has not yet been installed.

Monitor B: The microphone at Monitor B is no longer serviceable due to extreme old age. The monitor will be returned to service when a replacement has been obtained.

Monitor C: Monthly noise levels at Monitor C were similar to those observed during previous months at this location since the removal of the noise barrier along Freshman Drive. Peaks were observed on December 6, 20, and 27 that are consistent with a regularly scheduled Friday activity. Additional peaks were observed on December 3, 9, 12, and 23.

Monitor D: Monitor D was installed on June 5. The monitor has yet to maintain power cycling through the month.

Monitor E: Monthly noise levels at Monitor E were similar to those observed during previous months at this location. Peaks of greater than 65 dBA were observed on December 2, 11, 12, 13, 17, 18, and 30.

Table 1. Summary of Monthly Results, Monitor C				
Metric	Sound Level, dBA			
	Average	Maximum ²	Minimum ³	Standard Deviation
Day-Night Sound Level (Ldn)	56	66	52	4.0
Work Hours Leq ¹	56	70	48	5.2
Notes: 1. The Work Hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays. 2. The maximum Ldn or daytime hourly Leq value during the month. 3. The minimum Ldn or daytime hourly Leq value during the month.				

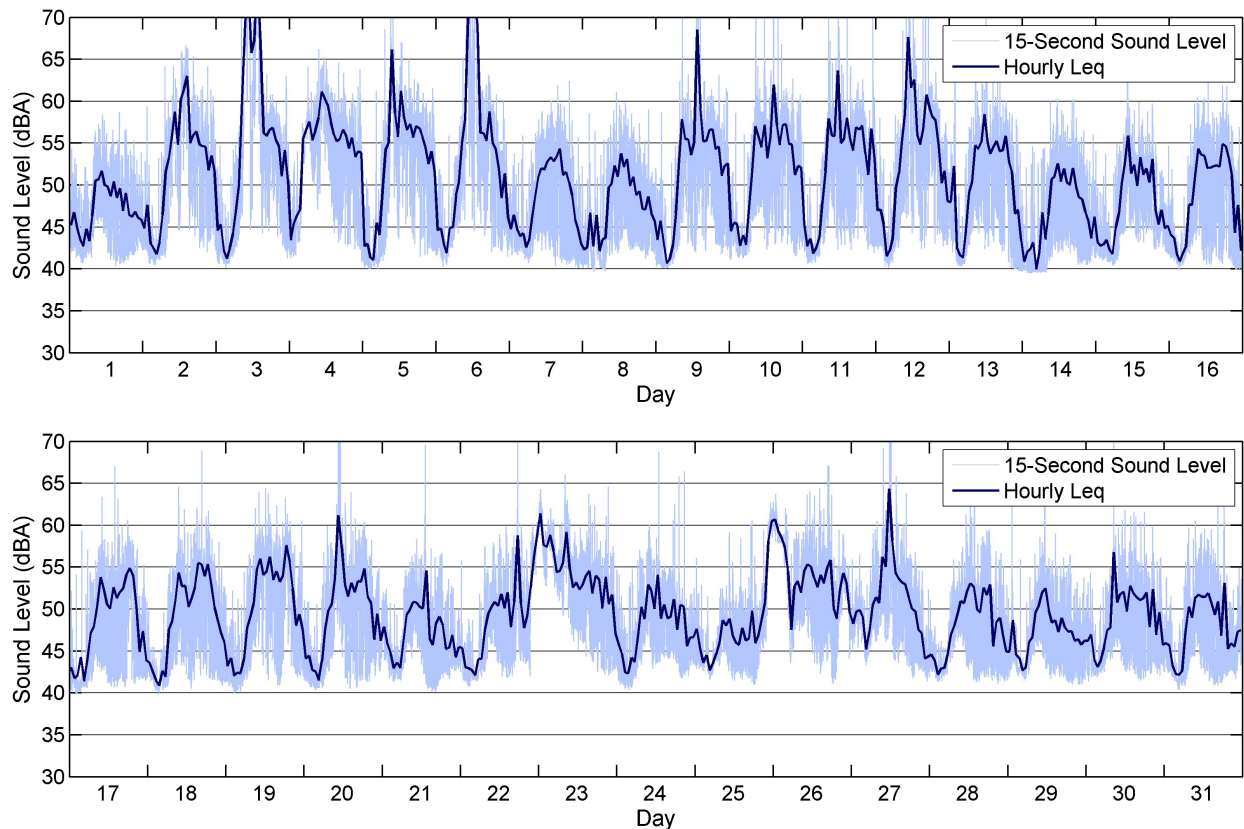


Figure 1: Monitor C Hourly Leq Results

Table 2. Summary of Monthly Results, Monitor E				
Metric	Sound Level, dBA			
	Average	Maximum²	Minimum³	Standard Deviation
Day-Night Sound Level (Ldn)	57	66	52	3.1
Work Hours Leq ¹	56	69	49	4.8
Notes: 1. The Work Hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays. 2. The maximum Ldn or daytime hourly Leq value during the month. 3. The minimum Ldn or daytime hourly Leq value during the month.				

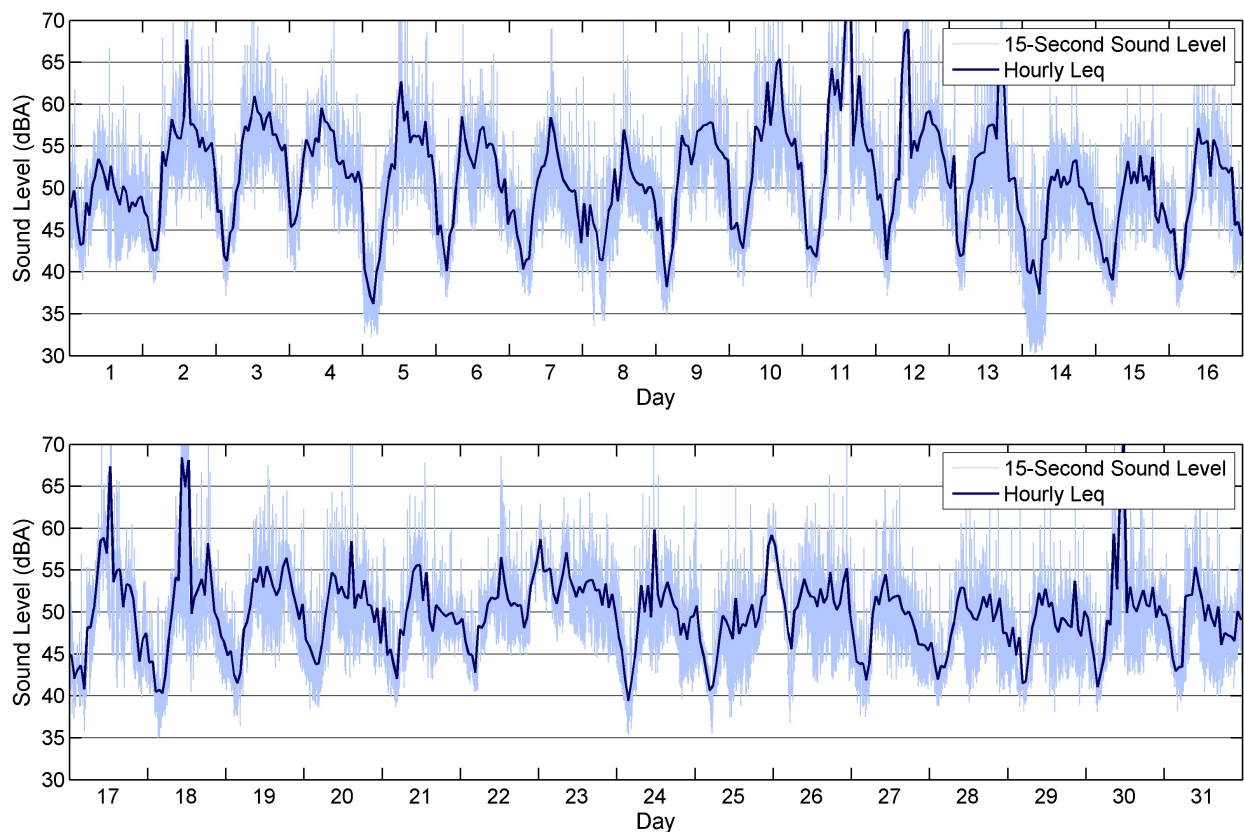


Figure 2: Monitor E Hourly Leq Results

APPENDIX A: RESULTS FOR INDIVIDUAL MONITOR SITES



Figure 3: Noise Monitor Locations

Monitor A (proposed location)



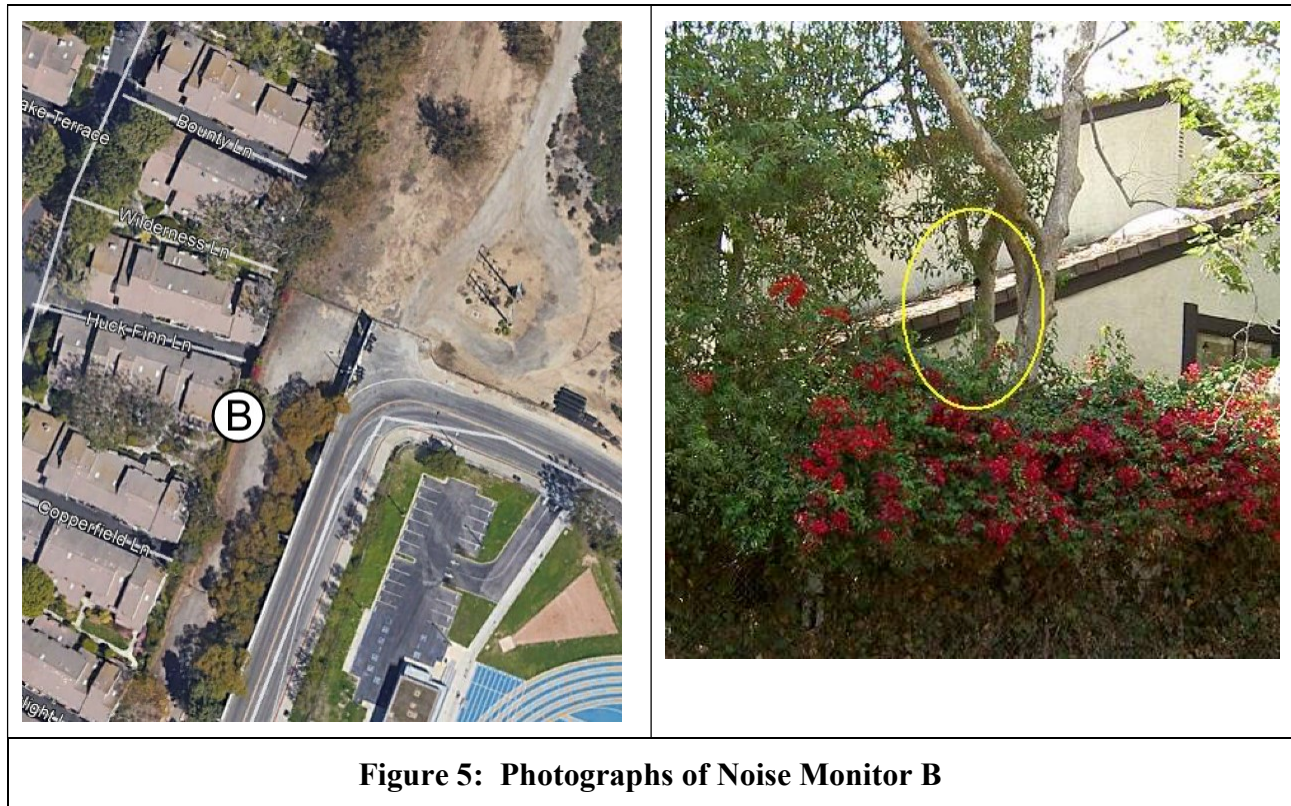
Figure 4: Photographs of Noise Monitor A

Monitor A is located near the northeast corner of the Raintree complex, south of the tennis courts and close to the property fence on the eastern edge of the Raintree complex. The microphone head is approximately level with the lower stories of the Raintree residences. Prior to construction activity, the primary noise sources in the area are local traffic, airplanes, residential activity, landscaping equipment and lawnmowers, and distant traffic noise from Interstate 405.

Table 3. Summary of Monthly Results, Monitor A					
Month	Year	Sound Level, dBA			
		Work Hours Leq ¹	Standard Deviation	Ldn	Standard Deviation
January	2019	-- ²	-- ²	-- ²	-- ²
February	2019	-- ²	-- ²	-- ²	-- ²
March	2019	-- ²	-- ²	-- ²	-- ²
April	2019	-- ²	-- ²	-- ²	-- ²
May	2019	-- ²	-- ²	-- ²	-- ²
June	2019	-- ²	-- ²	-- ²	-- ²
July	2019	-- ²	-- ²	-- ²	-- ²
August	2019	-- ²	-- ²	-- ²	-- ²
September	2019	-- ²	-- ²	-- ²	-- ²

Table 3. Summary of Monthly Results, Monitor A					
October	2019	-- ²	-- ²	-- ²	-- ²
November	2019	-- ²	-- ²	-- ²	-- ²
December	2019	-- ²	-- ²	-- ²	-- ²
Notes: 1. The work hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays. 2. Monitor had not been installed yet.					

Monitor B



Monitor B is located hanging from a tree at a height of approximately 15 feet above ground level near the residence at 5111 Wilderness Lane. The microphone head is approximately level with the second story of the nearby Raintree residences. The monitor is located about 65 feet away from Freshman Drive and about 140 feet away from where the road turns right and becomes Sophomore Drive. Prior to construction activity, the primary noise source in the area was local traffic on Freshman Drive and Sophomore Drive.

Table 4. Summary of Monthly Results, Monitor B					
Month	Year	Sound Level, dBA			
		Work Hours Leq¹	Standard Deviation	Ldn	Standard Deviation
January	2019	47	6.4	51	4.7
February	2019	-- ²	-- ²	-- ²	-- ²
March	2019	-- ²	-- ²	-- ²	-- ²
April	2019	-- ²	-- ²	-- ²	-- ²
May	2019	-- ²	-- ²	-- ²	-- ²
June	2019	-- ²	-- ²	-- ²	-- ²

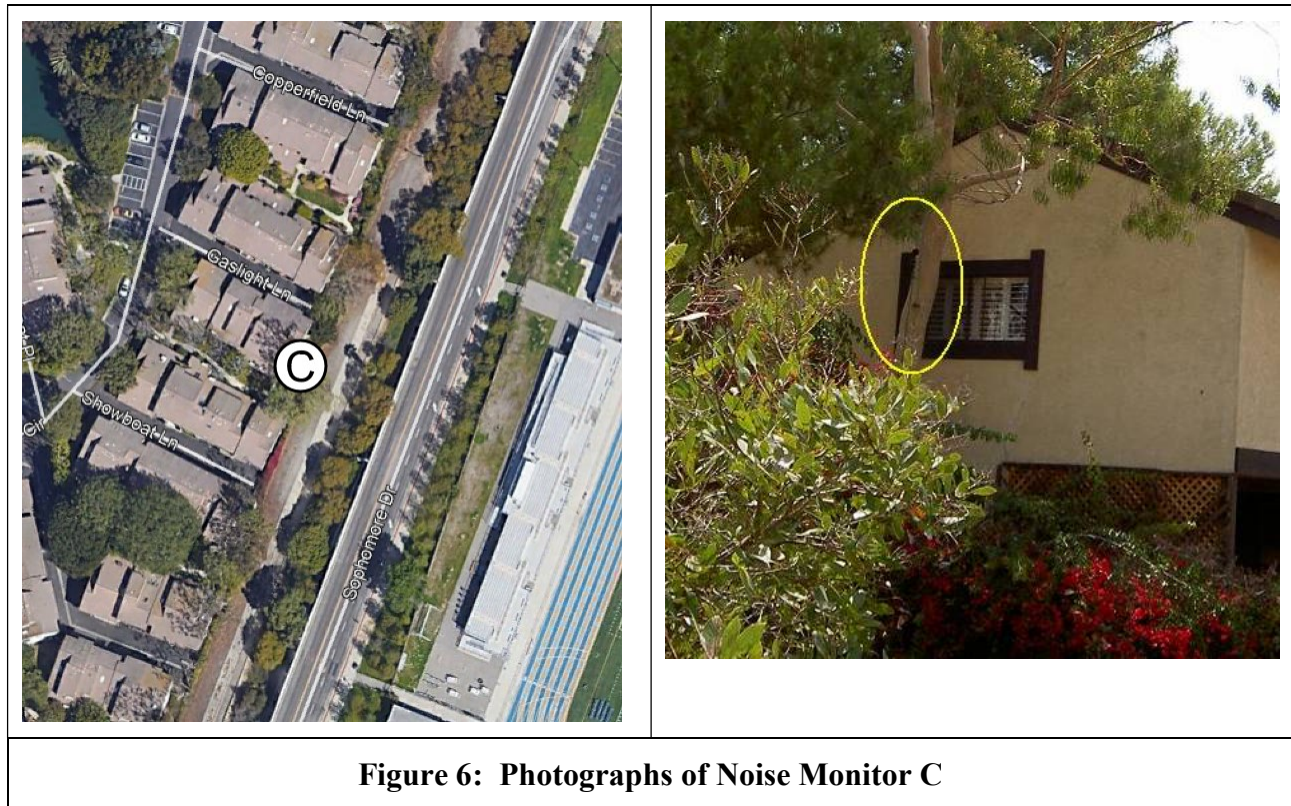
Table 4. Summary of Monthly Results, Monitor B

July	2019	-- ²	-- ²	-- ²	-- ²
August	2019	-- ²	-- ²	-- ²	-- ²
September	2019	-- ²	-- ²	-- ²	-- ²
October	2019	-- ²	-- ²	-- ²	-- ²
November	2019	-- ²	-- ²	-- ²	-- ²
December	2019	-- ²	-- ²	-- ²	-- ²

Notes:

1. The work hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays.
2. Data was not recorded due to power issues.

Monitor C



Monitor C is located hanging from a tree at a height of approximately 30 feet above ground level near the residence at 5111 Gaslight Lane. The microphone head is approximately level with the second story of the nearby Raintree residences. The monitor is located about 75 feet away from Freshman Drive. Prior to construction activity, the primary noise source in the area was local traffic on Freshman Drive.

**Table 5. Daily Results
Monitor C, December 2019**

Date	Sound Level, dBA			
	Work Hours Leq	Maximum ¹	Minimum ²	Ldn
12/1/19	--	59	40	52
12/2/19	59	67	41	58
12/3/19	70	80	40	66
12/4/19	58	66	41	61
12/5/19	60	72	40	59
12/6/19	67	81	40	64
12/7/19	52	62	40	53
12/8/19	--	61	40	52
12/9/19	61	81	40	59
12/10/19	57	77	41	57
12/11/19	58	80	41	58
12/12/19	61	77	40	59
12/13/19	55	73	40	56
12/14/19	51	60	40	52
12/15/19	--	63	40	52
12/16/19	53	63	40	53
12/17/19	52	67	40	53
12/18/19	53	69	40	53
12/19/19	54	64	40	55
12/20/19	55	73	40	55
12/21/19	50	70	40	52
12/22/19	--	73	41	58
12/23/19	54	66	42	63
12/24/19	51	69	40	53
12/25/19	48	63	41	59
12/26/19	54	67	41	63
12/27/19	57	76	41	57
12/28/19	51	66	41	53
12/29/19	--	65	41	53
12/30/19	52	71	41	54
12/31/19	51	64	40	53
Notes:				
1. The maximum sound level over a 15 second interval (15 second Leq) during the 24-hour period.				
2. The minimum sound level over a 15 second interval (15 second Leq) during the 24-hour period.				

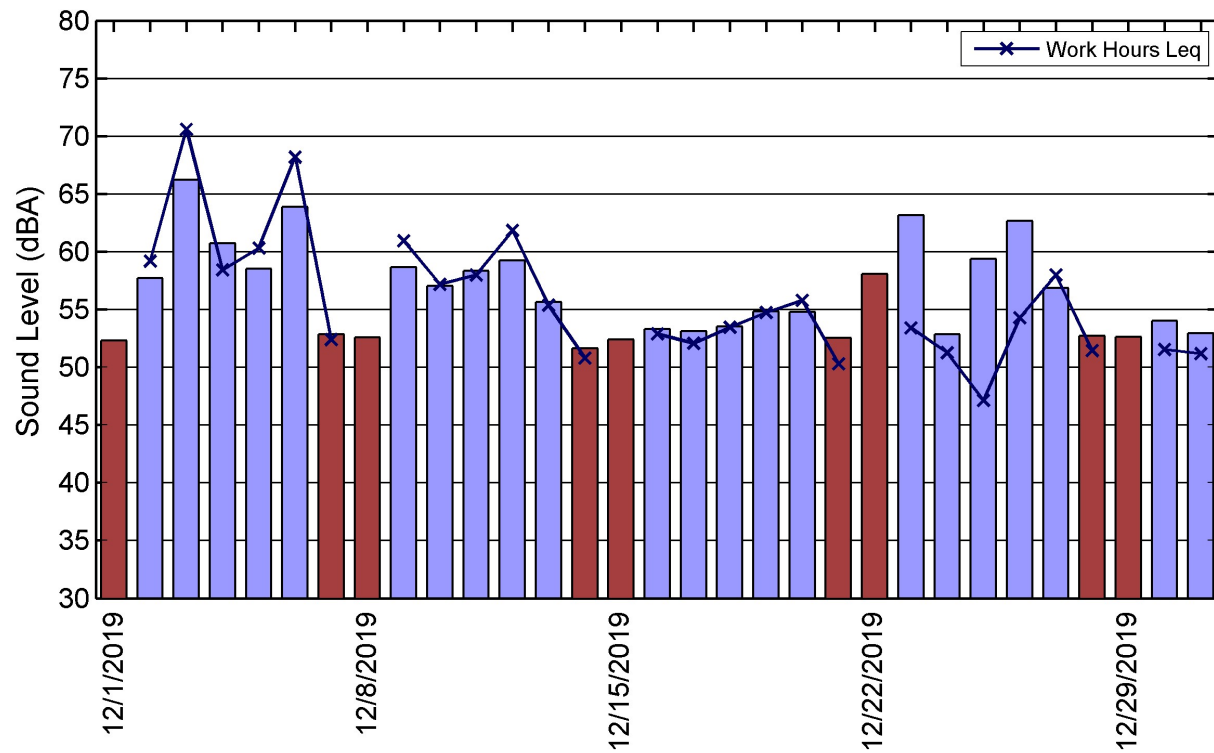


Figure 7: Monitor C Ldn and Daytime Leq Results

Table 6. Summary of Monthly Results, Monitor C					
Month	Year	Sound Level, dBA			
		Work Hours Leq ¹	Standard Deviation	Ldn	Standard Deviation
January	2019	50	4.0	53	2.8
February	2019	46	4.1	49	3.4
March	2019	48	5.6	49	3.5
April	2019	46	5.6	47	3.1
May	2019	48	2.7	51	3.7
June	2019	49	3.7	51	2.1
July	2019	49	3.7	52	2.7
August	2019	48	3.0	51	1.8
September	2019	50	3.7	52	2.1
October	2019	52	5.5	53	3.2
November	2019	56	3.5	55	2.6
December	2019	56	5.2	56	4.0

Notes:
1. The work hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on

Table 6. Summary of Monthly Results, Monitor C

Saturdays.

Monitor D



Figure 8: Photographs of Noise Monitor D

Monitor D is located at the southeast corner of the Tara Hill complex. The microphone head is approximately level with the upper stories of the Tara Hill residences. The monitor is located about 80 feet away from Freshman Drive. Prior to construction activity, the primary noise source in the area was local traffic on Freshman Drive.

Table 7. Summary of Monthly Results, Monitor D

Month	Year	Sound Level, dBA			
		Work Hours Leq ¹	Standard Deviation	Ldn	Standard Deviation
January	2019	-- ²	-- ²	-- ²	-- ²
February	2019	-- ²	-- ²	-- ²	-- ²
March	2019	-- ²	-- ²	-- ²	-- ²
April	2019	-- ²	-- ²	-- ²	-- ²
May	2019	-- ²	-- ²	-- ²	-- ²
June	2019	-- ³	-- ³	-- ³	-- ³
July	2019	-- ³	-- ³	-- ³	-- ³

Table 7. Summary of Monthly Results, Monitor D					
August	2019	-- ³	-- ³	-- ³	-- ³
September	2019	-- ³	-- ³	-- ³	-- ³
October	2019	-- ³	-- ³	-- ³	-- ³
November	2019	-- ³	-- ³	-- ³	-- ³
Notes: 1. The work hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays. 2. Monitor had not been installed yet. 3. Monitor did not charge properly and data was lost.					

Monitor E

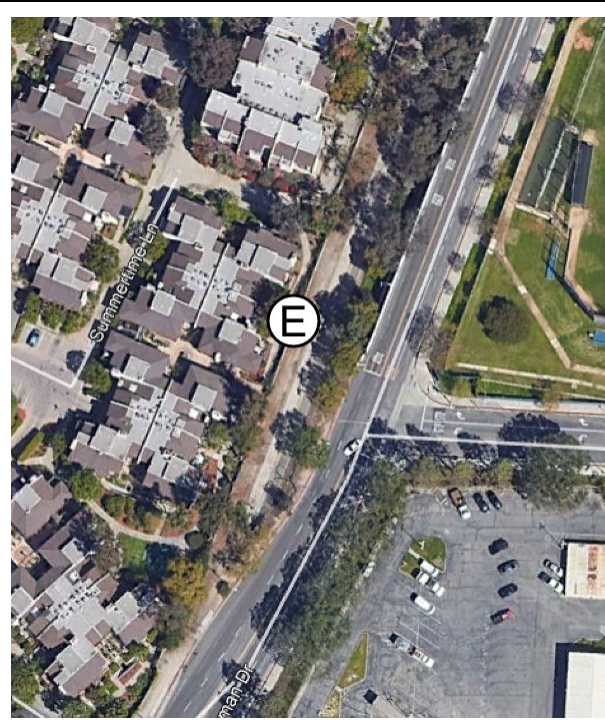


Figure 9: Photographs of Noise Monitor E

Monitor E is located near Building 15 in the south end of the Lakeside Villas complex, directly next to the property wall that separates the Building 15 pathway from the LADWP spillway. Prior to construction activity, the primary noise sources in this area were residential activity, landscaping equipment and lawnmowers, airplanes, athletic activity on the baseball field, and traffic noise from Freshman Drive and A Street.

**Table 8. Daily Results
Monitor E, December 2019**

Date	Sound Level, dBA			
	Work Hours Leq	Maximum ¹	Minimum ²	Ldn
12/1/19	--	67	39	54
12/2/19	61	81	39	60
12/3/19	58	77	37	58
12/4/19	57	72	39	59
12/5/19	58	76	32	57
12/6/19	56	70	37	56
12/7/19	54	69	37	54
12/8/19	--	71	34	54
12/9/19	56	69	35	57
12/10/19	61	81	38	60
12/11/19	69	83	37	66
12/12/19	63	78	37	61
12/13/19	62	79	38	60
12/14/19	51	64	30	52
12/15/19	--	66	36	52
12/16/19	55	68	36	54
12/17/19	59	78	36	57
12/18/19	63	78	35	60
12/19/19	54	68	37	55
12/20/19	54	74	39	55
12/21/19	53	68	39	55
12/22/19	--	69	41	57
12/23/19	53	64	44	61
12/24/19	54	75	35	54
12/25/19	49	65	36	58
12/26/19	53	70	37	60
12/27/19	52	65	38	53
12/28/19	51	66	39	53
12/29/19	--	68	38	54
12/30/19	63	85	38	60
12/31/19	51	65	38	55
Notes:				
1. The maximum sound level over a 15 second interval (15 second Leq) during the 24-hour period.				
2. The minimum sound level over a 15 second interval (15 second Leq) during the 24-hour period.				

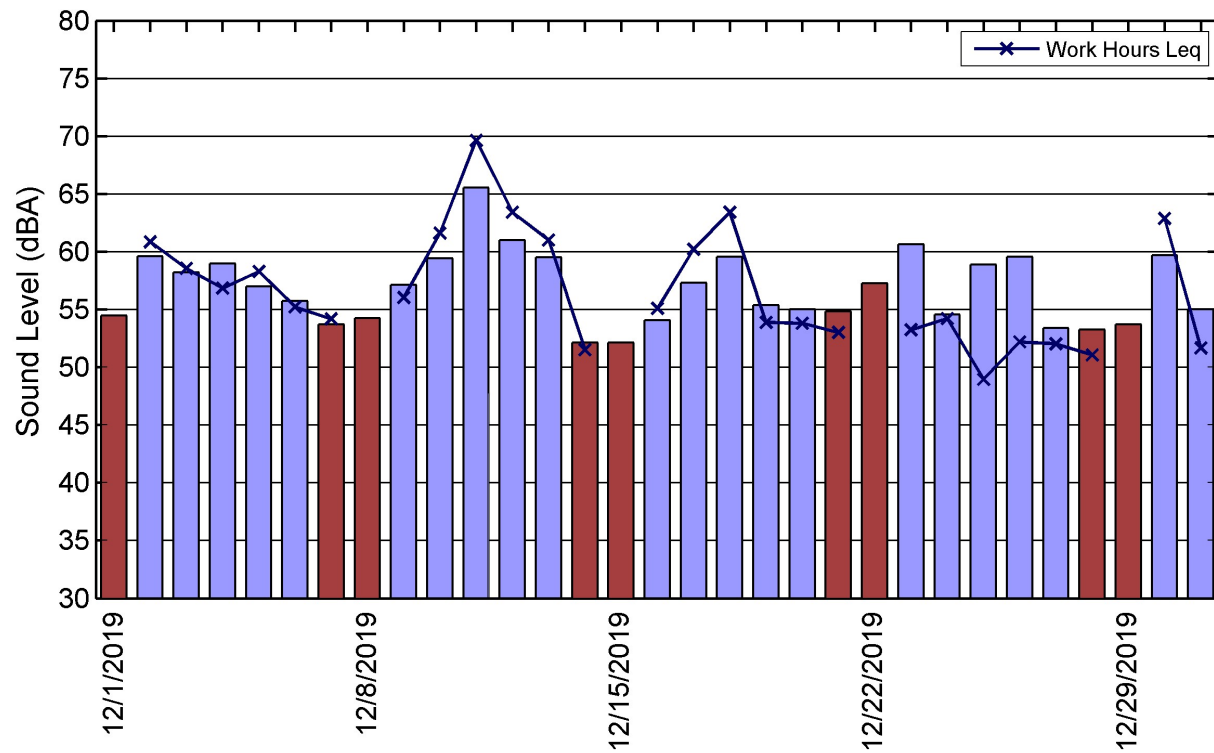


Figure 10: Monitor E Ldn and Daytime Leq Results

Table 9. Summary of Monthly Results, Monitor E					
Month	Year	Sound Level, dBA			
		Work Hours Leq ¹	Standard Deviation	Ldn	Standard Deviation
January	2019	53	2.9	54	2.2
February	2019	-- ²	-- ²	-- ²	-- ²
March	2019	54	2.4	56	2.9
April	2019	57	2.8	56	2.4
May	2019	57	3.3	56	2.4
June	2019	54	2.5	54	1.9
July	2019	53	2.3	54	2.0
August	2019	54	3.2	54	1.9
September	2019	55	2.9	55	1.7
October	2019	56	3.4	56	2.6
November	2019	56	3.1	56	2.2
December	2019	56	4.8	57	3.1

Notes:
1. The work hours Leq is the energy average between 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays.
2. Data lost due to user error.

APPENDIX B: BACKGROUND OF NOISE

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted or excessive sound. Sound can vary in intensity by over one million times within the range of human hearing. Therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity and compress the scale to a more manageable range.

Sound is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. To better approximate the sensitivity of human hearing, the A-weighted decibel scale has been developed. A-weighted decibels are abbreviated as “dBA.” On this scale, the human range of hearing extends from approximately 3 dBA to around 140 dBA. As a point of reference, Figure 11 includes examples of A-weighted sound levels from common indoor and outdoor sounds.

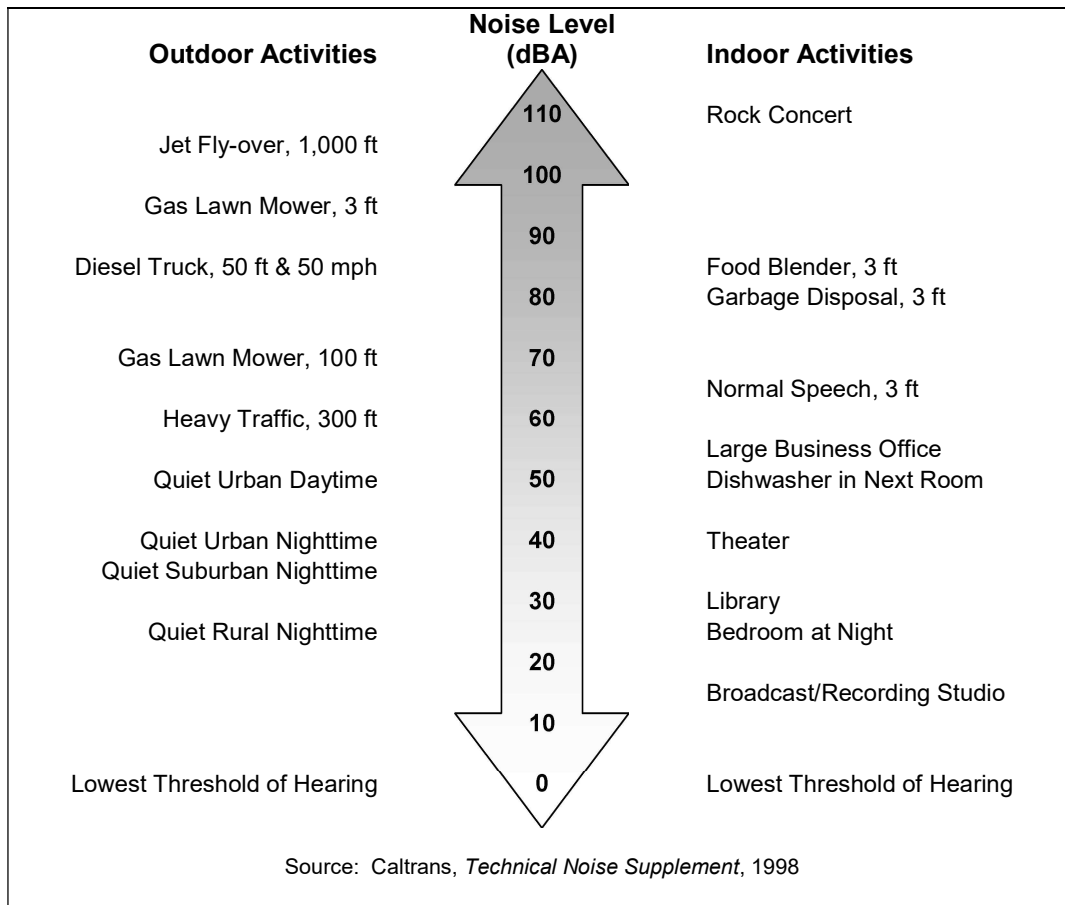


Figure 11. Typical Outdoor and Indoor Noise Sources

Using the decibel scale, sound levels from two or more sources cannot be directly added together to determine the overall sound level. Rather, the combination of two sounds at the same level yields an increase of 3 dBA. The smallest recognizable change in sound level is approximately 1 dBA. A 3-dBA increase is generally considered perceptible, whereas a 5-dBA increase is readily perceptible. A 10-dBA increase is judged by most people as an approximate doubling of the perceived loudness.

Two of the primary factors that reduce levels of environmental sounds are increasing the distance between the sound source and the receiver and having intervening obstacles, such as walls, buildings or

terrain features, that block the direct path between the sound source and the receiver. Factors that act to increase the loudness of environmental sounds include the proximity of the sound source to the receiver, sound enhancements caused by reflections, and focusing caused by various meteorological conditions.

Brief definitions of the measures of environmental noise used in this report are:

- **Equivalent Sound Level (Leq):** Environmental sound fluctuates constantly. The equivalent sound level (Leq), sometimes referred to as the energy-average sound level, is the most common means of characterizing community noise. Leq represents a constant sound that, over the specified period, has the same sound energy as the time-varying sound. The noise monitors currently measure sound in 15 second intervals and these are used to calculate the 1-hour Leqs.
- **Day-Night Sound Level (Ldn):** Ldn is basically a 24-hour Leq with an adjustment to reflect the greater sensitivity of most people to nighttime noise. The adjustment is a 10-dB penalty for all sound that occurs between 10 p.m. and 7 a.m. The effect of the penalty is that, when calculating Ldn, any event that occurs during the nighttime is equivalent to 10 of the same event during the daytime. Ldn is the most common measure of total community noise over a 24-hour period.
- **Work Hours Sound Level:** The work hours sound level is effectively a sound level based on the hours the haul road is expected to be used. For weekdays Monday through Friday, it consists of the Leq for the period between 8 a.m. and 6 p.m. For Saturdays, it consists of the Leq for the period between 9 a.m. and 5 p.m. The road is not expected to be used on Sunday.
- **Maximum Sound Level (Lmax):** The maximum sound level over a period of time or for a specific event can also be a useful parameter for characterizing specific noise sources. Standard sound level meters have two settings, FAST and SLOW, which represent different time constants. Lmax using the FAST setting will typically be 1 to 3 dB greater than Lmax using the SLOW setting.
- **Sound Exposure Level (SEL):** SEL is a measure of the total sound energy of an event. In essence, all sound from the event is compressed into a one-second period. This means that SEL increases as the event duration increases and as the event sound level increases. SEL is useful for estimating the Ldn that would be caused by individual events such as train passbys. Although the SEL values for the fifteen-second intervals are recorded (and reported along with the Leq values on the website), we are not using SEL's in any of our calculations.