Appendix F

Santiago Basins Saddle Improvement Project

Noise and Vibration Technical Memorandum

VISTA ENVIRONMENTAL

December 10, 2018

Greg Woodside
Orange County Water District
18700 Ward Street
Fountain Valley, CA 92708

Subject: Orange County Water (OCWD) – Santiago Basins Saddle Improvement Project Noise and Vibration Technical Memorandum.

Dear Mr. Woodside:

Vista Environmental has conducted an analysis to evaluate whether the proposed Santiago Basins Saddle Improvement Project (proposed project) would cause significant noise or vibration impacts. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.).

Project Location and Description

The proposed saddle repair and improvement activities would occur in the area between the Blue Diamond Basin and Bond Basin at the Santiago Recharge Basins, which are located in the City of Orange. The Santiago Basins are bounded by Prospect Avenue to the west, Hewes Street to the east, Bond Avenue to the south, and Villa Park Road to the north. The project site is surrounded by open space and residential land uses. The nearest sensitive receptors are residents at the single-family homes located as near as 210 feet southeast of the project site. The nearest school to the project site is Eldorado Emerson Private School, located approximately 0.6 miles south of the project site.

The proposed project would consist improvements to the stabilization of the saddle side slopes, the reconstruction of the saddle apron, reconstruction of an equalization culvert for the protection of the saddle apron, and restoration of any vegetation removed for the project. To improve the stability of the saddle side slopes, the slopes of the saddle would need to be cut back to a maximum steepness of 1.8 to 1. The proposed grading activity would remove slope failure related debris and areas prone to failing.

In conjunction with the slope grading, the saddle would be widened by approximately 60 feet and the existing grade would be lowered by approximately 30 feet. A 12-foot square by 400-foot concrete box culvert would be excavated and installed between the basins in the saddle area. The underground pipeline would convey flows between Blue Diamond Basin and Bond basin, allowing the basin levels to equalize without overtopping and destroying the apron. After the culvert is constructed, the trench would be backfilled with native material and the saddle would be reconstructed. The saddle would also function as an apron allowing water within Blue Diamond Basin to spill over into Bond Basin if the basins cannot equalize due to high basin inflows.

Proposed Construction Activities

Construction of the proposed project would require the use of multiple pieces of equipment over four phases of construction. The overall construction of the project would take approximately four months to complete.

1021 DIDRIKSON WAY
LAGUNA BEACH CALIFORNIA 92651
PHONE 949 510 5355
EMAIL GREG@VISTALB.COM

Phase 1 – Clearing and Remedial Excavation

Phase 1 is anticipated to start in August 2019 and would take approximately three weeks to complete. Phase 1 would consist of clearing the work area of existing vegetation, excavation to create 1.8 to 1 slope on either side of the saddle and remedial rough grading to remove loose soil deposits. The loose soil deposits on the existing slopes on the east and west side of the saddle that were left by the erosion damage during storm events would be excavated during Phase 1 to make sure the excavation for Phase 2 is safe. The field activities and approximate equipment usage for the clearing and remedial excavation phase is shown below in Table A.

Table A – Phase 1 Clearing and Remedial Excavation Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation per Day	Total Days	Total Hours of Operation	Horsepower Ratings
Phase 1A - Clearing and Grubbing					
Bulldozer	1	8	5	40	250
Tracked Excavator	1	8	5	40	200
Off-Road Haul Truck	1	8	5	40	350
Dump Truck	5	8	1	40	350
Water Truck	1	8	5	40	350
Work Truck	1	8	5	40	300
Phase 1B - Grading					
Scraper	2	8	10	160	490
Bulldozer	1	8	10	80	250
Compactor	1	8	10	80	200
Water Truck	1	8	10	80	350
Work Truck	2	8	10	80	300

Source: OCWD.

Phase 2 – Culvert Installation and Backfill

Phase 2 is anticipated to start in September 2019 and would take four weeks to complete. Phase 2 would consist of excavation, placement, and backfill of the concrete box culvert. This culvert will allow the basin elevations to rise and fall together and prevent an elevation differential that leads to damaging erosion over the saddle apron. The field activities and approximate equipment usage for the culvert installation and backfill phase is shown below in Table B.

Table B – Phase 2 Culvert Installation and Backfill Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation per Day	Total Days	Total Hours of Operation	Horsepower Ratings
Crane	1	8	10	80	300
Tracked Excavator	2	8	20	320	200
Wheel Loader	1	8	20	160	250
Compactor	1	8	20	160	200
Water Truck	1	8	20	160	350
Work Truck	1	8	20	160	300

Source: OCWD.

VISTA ENVIRONMENTAL
1021 DIDRIKSON WAY
LAGUNA BEACH CALIFORNIA 92651
PHONE 949 510 5355
EMAIL GREG@VISTALB.COM

Phase 3 – Saddle Apron Embankment and Finish Grading

Phase 3 is anticipated to start in October 2019 and would take four weeks to complete. Phase 2 would consist of placing fill for the saddle apron and finish grading all surfaces within the work area. The saddle apron will create a divider that will prevent erosive water flows between the two basins and create a buttress that will stabilize the slopes on the east and west sides of the saddle. The field activities and approximate equipment usage for the sediment depositing and spreading equipment mix phase as shown bellowing in Table C.

Table C – Phase 3 Saddle Apron Embankment and Finish Grading Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation per Day	Total Days	Total Hours of Operation	Horsepower Ratings
Scraper	4	8	15	480	490
Bulldozer	1	8	15	120	250
Compactor	1	8	15	120	200
Water Truck	1	8	15	120	350
Work Truck	1	8	15	120	300

Source: OCWD.

Phase 4 – Vegetation Restoration

Phase 4 is anticipated to start in November 2019 and would take approximately four weeks to complete. Phase 4 would consist of activities required to restore the vegetation removed by construction activities. This work will be completed mostly by hand and the only equipment anticipated for work consists of support for the planting crew. The field activities and approximate equipment usage for the vegetation restoration as shown bellowing in Table D.

Table D – Phase 4 Vegetation Restoration Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation per Day	Total Days	Total Hours of Operation	Horsepower Ratings
Water Truck	1	4	10	40	350

Source: OCWD.

Proposed Long-Term Maintenance Activities

Annually, OCWD would dewater the basin to inspect the condition of the saddle and to remove any debris or trash that might accumulate along the saddle apron. All maintenance activities would be conducted in accordance with Orange County Water District Regional Maintenance Plan for Groundwater Recharge Facilities Streambed Alteration Agreement 1600-201-0013-R5. Since maintenance activities would involve minimal equipment and would be done by hand, there is no maintenance equipment list. Additionally, the maintenance activities associated with the proposed saddle improvements would not significantly alter current maintenance activities at the existing saddle.

Existing Noise Setting

Currently, the primary sources of noise within the study area consists of vehicle traffic on Hewes Street. In order to determine the existing nose levels, two short-term (15-minute) ambient noise measurements were taken in the vicinity of the proposed project between 9:39 a.m. and 10:10 a.m. on Tuesday, December 4, 2018. The results of the noise level measurements are presented in Table E and the noise

VISTA ENVIRONMENTAL
1021 DIDRIKSON WAY
LAGUNA BEACH CALIFORNIA 92651
PHONE 949 510 5355
EMAIL GREG@VISTALB.COM

measurement printouts are attached to this letter along with a photo index showing the locations of the noise measurements.

Table E – Existing (Ambient) Noise Level Measurements

Site No.	Description	Primary Noise Source	Start Time of Measurement	Noise Level (dBA L_{eq}/L_{max})
1	Located east of the grading limits and approximately 145 feet west of Hewes Street centerline.	Vehicles on Hewes Street	9:39 a.m.	51.7/60.8
2	Located approximately 40 feet east of the Hewes Street centerline and next to backyard of home at 982 N Big Sky Lane.	Vehicles on Hewes Street	9:55 a.m.	67.3/78.1

Source: Noise measurements taken with a Larson Davis Model 831 Type 1 precision sound level meter on Tuesday, December 4, 2018.

City of Orange Noise and Vibration Standards

The proposed project is located within the City of Orange and would have to conform to the following applicable noise standards provided in the City of Orange Municipal Code. It should be noted that neither the City of Orange General Plan nor the Municipal Code provide any policies or standards for vibration. However, Section 5.10.3 of the *City of Orange General Plan Program EIR* (General Plan EIR), March 2010, determined that a significant vibration impact would occur if vibration levels would exceed 0.2 inch per second PPV at any nearby building

Section 8.24.020 Definitions.

The following words, phrases and terms as used in this chapter shall have the meaning as indicated below:

A. "Ambient noise level" means the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

B. "Adjusted ambient noise level" means the measured ambient noise level plus 3 dB (A). Three (3) dB (A) is the industry-accepted threshold of human perceptibility for a change in noise environment.

Section 8.24.040 Exterior Noise Standards.

A. The following noise standards [Table F] for fixed noise sources, unless otherwise specifically indicated, shall apply to all residential property:

Table F – City of Orange Municipal Code Exterior Noise Standards

Standard	Noise Level	Time Period
Hourly Average (L_{eq})	55 dB (A)	7:00 a.m. – 10:00 p.m.
	50 dB (A)	10:00 p.m. – 7:00 a.m.
Maximum Level	70 dB (A)	7:00 a.m. – 10:00 p.m.
	65 dB (A)	10:00 p.m. – 7:00 a.m.

Source: City of Orange Municipal Code Section 8.24.040.

B. It is unlawful for any person at any location within the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other residential property to exceed the noise standards identified in Table 8.24.040. For multi-family residential or mixed use developments located within the City's

VISTA ENVIRONMENTAL
1021 DIDRIKSON WAY
LAGUNA BEACH CALIFORNIA 92651
PHONE 949 510 5355
EMAIL GREG@VISTALB.COM

Urban Mixed Use, Neighborhood Mixed Use, Old Towne Mixed Use or Medium Density Residential General Plan land use districts, exterior noise standards shall apply to common recreation areas only and shall not apply to private exterior space (such as a private yard, patio, or balcony)

C. In the event the ambient noise level exceeds the noise standards identified in Table 8.24.040 of this section, the "adjusted ambient noise level" shall be applied as the noise standard. In cases where the noise standard is adjusted due to a high ambient noise level, the noise standard shall not exceed the "adjusted ambient noise level", or 70 dB (A), whichever is less. In cases where the ambient noise level is already greater than 70 dB (A), the ambient noise level shall be applied as the noise standard.

D. Each of the noise limits specified in Table 8.240.040 shall be reduced by five dB(A) for impact or simple tone noises, recurring impulsive noises, or for noises consisting of speech or music. (Ord. No. 1-4 § I, 8-12-14)

8.24.050 Exemptions from Chapter Provisions.

The following activities shall be exempted from the provisions of this chapter:

E. Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except for Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday. Noise generated outside of the hours specified are subject to the noise standards identified in Table 8.24.040;

Project Impacts

Construction-Related Noise Impacts

The proposed project would require the use of multiple pieces of equipment over four phases of construction. The overall construction of the proposed project would take approximately four months. All construction activities would occur between 7:00 a.m. and 8:00 p.m. Monday through Saturday and between 9:00 a.m. and 8:00 p.m. on Sundays and holidays, when construction activities are exempt from the City's noise standards as detailed in Section 8.24.050(E) of the Municipal Code. However, the City construction noise standards do not provide any limits to the noise levels that may be created from construction activities and even with adherence to the City standards, the resultant construction noise levels may result in a significant substantial temporary noise increase to the nearby residents that are located as near as 210 feet southeast of the proposed grading activities.

The *Transit Noise and Vibration Impact Assessment,* prepared by Federal Transit Administration (FTA), 2006, which is the only agency that has defined what constitutes a significant construction noise impact has been utilized to determine if the proposed construction activities would create a significant substantial temporary noise increase. The FTA determined that an 80 dBA Leq daytime construction noise level at nearby homes would constitute a significant construction noise impact.

The Federal Highway Administration (FHWA) has compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston that is provided in the *FHWA Roadway Construction Noise Model User's Guide*, January 2006. The FHWA's measured noise levels for each piece of equipment that is anticipated to be utilized during each phase of construction of the proposed project are shown in Table G. Table G also shows the anticipated worst-case noise level at the nearest homes, which was calculated based on a noise propagation drop-off rate of 6 decibels per doubling of distance. The calculated noise

levels at the nearby homes also accounted for the 40 to 80 foot elevation difference and a cliff between the proposed project area and nearest homes that results in the line-of-sight between the project site and nearest homes being blocked by the cliff. According to the *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (TeNS), prepared by Caltrans, September 2013, a noise barrier high enough to block the line-of-sight provides between a minimum of 5 dB attenuation and a noise barrier in the shape of a berm provides an additional 3 dB of attenuation, as such 8 dB of additional attenuation was added to the noise calculations at 210 feet that are shown in Table G.

Table G – Construction Equipment Noise Levels

Phase	Equipment Type	Equipment Quantity	Acoustical Use Factor[1] (percent)	Noise Level (dBA Lmax)	
				At 50 feet[2]	At 210 Feet
Phase 1A	Bulldozer	1	40	82	62
	Excavator	1	40	81	61
	Haul Truck	1	40	74	54
	Dump Truck	5	40	76	56
	Water Truck	1	40	76	56
	Work Truck	1	40	75	55
			Maximum Equipment Noise During Phase 1A		**62**
Phase 1B	Scraper	2	40	84	64
	Bulldozer	1	40	82	62
	Compactor	1	20	83	63
	Water Truck	1	40	76	56
	Work Truck	2	40	75	55
			Maximum Equipment Noise During Phase 1B		**64**
Phase 2	Crane	1	16	81	61
	Excavator	2	40	81	61
	Wheel Loader	1	40	79	59
	Compactor	1	20	83	63
	Water Truck	1	40	76	56
	Work Truck	1	40	75	55
			Maximum Equipment Noise During Phase 2		**63**
Phase 3	Scraper	4	40	84	64
	Bulldozer	1	40	82	62
	Compactor	1	20	83	63
	Water Truck	1	40	76	56
	Work Truck	1	40	75	55
			Maximum Equipment Noise During Phase 3		**64**
Phase 4	Water Truck	1	40	76	56
			Maximum Equipment Noise During Phase 4		**56**

Notes:
[1] Acoustical Use Factor from *FHWA Roadway Construction Noise Model User's Guide*, January 2006.
[2] Equipment noise level at 50 feet from *FHWA Roadway Construction Noise Model User's Guide*, January 2006.
[3] Equipment noise level at 210 feet calculated based on noise propagation rate of 6 dB reduction per doubling of distance plus an additional 8 dB of attenuation for the berm blocking the line of sight between the equipment and the nearest homes.
Source: FHWA, 2006; Caltrans, 2013.

VISTA ENVIRONMENTAL
1021 DIDRIKSON WAY
LAGUNA BEACH CALIFORNIA 92651
PHONE 949 510 5355
EMAIL GREG@VISTALB.COM

Table G shows that worst-case construction noise levels would occur during Phase 1B and Phase 3 with a noise level as high as 64 dBA Lmax at the nearest home (210 feet away). Table G shows that none of the construction phases would exceed the FTA daytime construction noise standard of 80 dBA Leq. It should also be noted that none of the construction phases would exceed the measured ambient noise level adjacent to the rear yards of the nearest homes that are located on the east side of Hewes Street of 67.3 dBA Leq. Therefore, the construction-related noise impacts created from the proposed project would result in a less than significant impact.

Construction-Related Vibration Impacts

The proposed project would require the use of multiple pieces of equipment over four phases of construction. The nearest sensitive receptors are residents at the single-family homes located as near as 210 feet southeast of the project site.

Section 5.10.3 of the *City of Orange General Plan Program EIR* (General Plan EIR), March 2010, determined that a significant vibration impact would occur if vibration levels would exceed 0.2 inch per second PPV at any nearby building. The FTA has compiled vibration level data regarding vibrating generating characteristics of several types of construction equipment that are shown in Table H.

Table H – Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 feet (inches/second)	Approximate Vibration Level (L_V)at 25 feet
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Federal Transit Administration, May 2006.

As shown in Table H, a vibratory roller would be the type of equipment that is anticipated to be utilized during construction activities associated with the proposed project that would create the highest vibration level of 0.210 inch-per-second peak particle velocity (PPV) at 25 feet. Based on typical vibration propagation rates, the vibration level at the nearest offsite receptor (210 feet away) would be 0.02 inch-per-second PPV, which is within the 0.2 inch-per-second PPV threshold detailed above. Impacts would be less than significant.

Operational Noise and Vibration Impacts

The proposed saddle repair activities would consist of four phases of construction that would be completed over an approximately four month period. Annually, OCWD would dewater the basin to inspect the condition of the saddle and to remove any debris or trash that might accumulate along the saddle apron. No changes are proposed to the annual maintenance activities that currently occur within the Santiago Basins and all maintenance activities would be conducted in accordance with Orange County Water District Regional Maintenance Plan for Groundwater Recharge Facilities Streambed Alteration Agreement 1600-201-0013-R5. In addition, maintenance activities would primarily be done by hand and

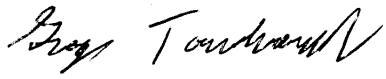
would require only minimal use of off-road equipment. As such, no operational noise or vibration impacts are anticipated to be created from the proposed project.

Analysis Findings for the Proposed Project

This analysis found that through implementation the applicable City of Orange construction noise regulations, all noise and vibration impacts created from the proposed project would be reduced to less than significant levels. As such, no noise or vibration-related mitigation measures are required for the proposed project.

Please let me know if you have any questions or need additional information with regard to the above analysis. I can be reached at (949) 510-5355, or email me at greg@vistalb.com.

Sincerely,



Greg Tonkovich, INCE
Senior Analyst
Vista Environmental

Encl.: Photo Index of Noise Measurements
Noise Measurement Printouts

VISTA ENVIRONMENTAL
1021 DIDRIKSON WAY
LAGUNA BEACH CALIFORNIA 92651
PHONE 949 510 5355
EMAIL GREG@VISTALB.COM

Noise Measurement Site 1 - looking north

Noise Measurement Site 1 - looking northeast

Noise Measurement Site 1 - looking east

Noise Measurement Site 1 - looking southeast

Noise Measurement Site 1 - looking south

Noise Measurement Site 1 - looking southwest

Noise Measurement Site 1 - looking west

Noise Measurement Site 1 - looking northwest

Noise Measurement Site 2 - looking north

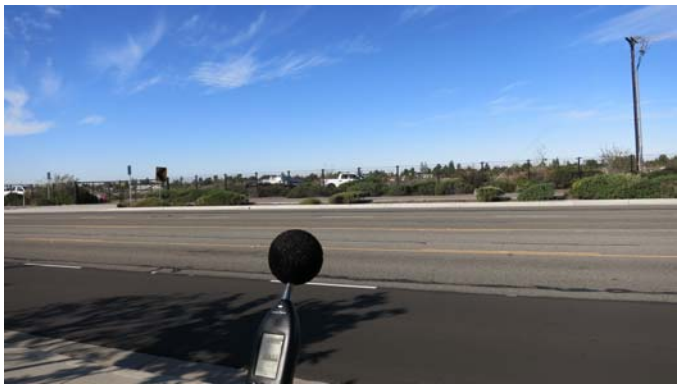
Noise Measurement Site 2 - looking northeast

Noise Measurement Site 2 - looking east

Noise Measurement Site 2 - looking southeast

Noise Measurement Site 2 - looking south

Noise Measurement Site 2 - looking southwest



Noise Measurement Site 2 - looking west

Noise Measurement Site 2 - looking northwest

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.002
User	GT
Job Description	OCWD Santiago Basins Saddle Improvement Project
Location	East side of Area to be Graded
Measurement Description	
Start Time	Tuesday, 2018 December 04 09:39:17
Stop Time	Tuesday, 2018 December 04 09:54:17
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2018 December 04 09:35:01
Post Calibration	None
Calibration Deviation	---

Note

Approx 145 feet west of Hewes St CL
63 F, 29.67 in Hg, 37% Hu, no wind, clear sky

Overall Data

LAeq		51.7	dB
LASmax	2018 Dec 04 09:41:23	60.8	dB
LApeak (max)	2018 Dec 04 09:49:26	91.5	dB
LASmin	2018 Dec 04 09:44:09	40.1	dB
LCeq		61.8	dB
LAeq		51.7	dB
LCeq - LAeq		10.1	dB
LAIeq		53.4	dB
LAeq		51.7	dB
LAIeq - LAeq		1.7	dB
Ldn		51.7	dB
LDay 07:00-22:00		51.7	dB
LNight 22:00-07:00		---	dB
Lden		51.7	dB
LDay 07:00-19:00		51.7	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		81.3	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00		56.8	dBA
LAS10.00		55.3	dBA
LAS33.30		51.6	dBA
LAS50.00		49.6	dBA
LAS66.60		47.3	dBA
LAS90.00		43.7	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.0	dB
Under Range Peak	75.5	dB
Noise Floor	16.9	dB
Overload	143.0	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	51.1	53.1	54.7	57.7	57.5	51.7	47.5	48.5	40.6	31.7	29.0	25.3
LZSmax	76.8	67.9	68.3	66.9	75.5	63.0	58.7	58.6	50.8	52.4	50.9	47.5
LZSmin	41.2	45.3	43.7	48.3	45.7	40.5	35.8	36.6	23.2	11.2	11.3	12.6

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	49.5	48.3	45.0	46.3	48.0	50.2	48.7	49.4	51.2	52.8	53.3	52.5
LZSmax	72.6	70.5	65.3	68.7	66.5	65.1	61.4	62.8	68.5	63.6	66.3	64.1
LZSmin	32.3	32.3	35.3	37.1	36.7	39.7	38.6	38.8	39.8	36.7	42.3	37.0

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	52.1	54.7	50.5	48.5	46.9	44.4	42.6	42.6	43.0	44.6	44.3	42.1
LZSmax	67.0	75.0	66.7	62.6	57.2	55.6	52.6	56.3	53.2	54.6	54.7	52.6
LZSmin	40.9	39.9	38.1	36.8	34.7	31.3	30.1	30.0	31.6	33.5	32.1	27.0

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	38.7	34.0	31.2	28.4	26.7	24.1	24.5	25.4	23.6	22.9	20.0	15.7
LZSmax	48.3	45.1	46.5	48.0	48.9	44.2	48.1	47.9	45.9	45.5	41.8	37.5
LZSmin	22.2	14.5	8.2	6.2	6.0	6.0	6.3	6.5	6.5	6.8	8.0	8.3

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9
PRM831	26 Sep 2018 15:49:25	-26.2
PRM831	21 Sep 2018 08:51:56	-25.6
PRM831	05 Sep 2018 11:51:21	-25.9
PRM831	13 Jun 2018 13:02:21	-25.7
PRM831	30 Mar 2018 23:00:57	-25.2
PRM831	30 Mar 2018 12:23:25	-25.8
PRM831	07 Mar 2018 13:40:34	-25.8

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.003
User	GT
Job Description	OCWD Santiago Basins Saddle Improvement Project
Location	On East Side of Hewes St
Measurement Description	
Start Time	Tuesday, 2018 December 04 09:55:53
Stop Time	Tuesday, 2018 December 04 10:10:53
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2018 December 04 09:35:01
Post Calibration	None
Calibration Deviation	---

Note

Approx 40 feet east of Hewes St CL and next to backyard of home at 982 N Big Sky Ln
63 F, 29.67 in Hg, 37% Hu, no wind, clear sky

Overall Data

LAeq		67.3	dB
LASmax	2018 Dec 04 10:09:39	78.1	dB
LApeak (max)	2018 Dec 04 10:10:01	96.5	dB
LASmin	2018 Dec 04 10:00:15	36.2	dB
LCeq		70.1	dB
LAeq		67.3	dB
LCeq - LAeq		2.8	dB
LAIeq		72.5	dB
LAeq		67.3	dB
LAIeq - LAeq		5.2	dB
Ldn		67.3	dB
LDay 07:00-22:00		67.3	dB
LNight 22:00-07:00		---	dB
Lden		67.3	dB
LDay 07:00-19:00		67.3	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		96.9	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	74.0	dBA
LAS10.00	72.4	dBA
LAS33.30	66.2	dBA
LAS50.00	58.5	dBA
LAS66.60	49.0	dBA
LAS90.00	41.0	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	41 / 363.0	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.0	dB
Under Range Peak	75.5	dB
Noise Floor	16.9	dB
Overload	143.0	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	57.1	57.2	60.7	62.4	59.9	60.1	63.4	65.1	58.1	46.9	36.7	24.9
LZSmax	80.1	76.6	77.5	78.0	75.4	74.5	77.0	75.9	70.4	62.6	53.0	39.8
LZSmin	41.9	45.0	46.8	47.3	43.1	37.6	32.3	30.4	18.1	10.8	11.3	12.5

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	54.3	52.4	50.4	50.3	51.3	54.7	55.0	55.8	56.9	58.9	58.2	55.0
LZSmax	76.0	76.5	69.5	66.6	71.1	75.2	74.8	73.9	74.7	78.0	75.8	70.8
LZSmin	33.1	36.2	35.5	37.3	38.7	41.1	41.4	40.1	41.4	42.7	41.8	37.4

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	53.5	55.2	56.3	56.2	55.1	54.9	55.6	57.0	61.2	60.9	61.1	58.5
LZSmax	71.0	72.4	74.9	72.5	69.5	69.2	71.9	71.2	75.8	73.4	72.5	71.8
LZSmin	37.5	37.9	36.5	34.0	32.2	29.5	27.4	26.8	26.5	27.2	25.6	22.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	56.3	51.9	48.1	44.6	41.4	37.6	34.4	31.7	26.5	22.4	19.6	15.4
LZSmax	68.7	64.8	61.4	58.2	59.2	56.6	50.2	48.5	42.7	36.5	36.9	33.9
LZSmin	16.6	10.0	7.2	5.8	5.7	6.1	6.3	6.4	6.7	6.9	7.8	8.3

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9
PRM831	26 Sep 2018 15:49:25	-26.2
PRM831	21 Sep 2018 08:51:56	-25.6
PRM831	05 Sep 2018 11:51:21	-25.9
PRM831	13 Jun 2018 13:02:21	-25.7
PRM831	30 Mar 2018 23:00:57	-25.2
PRM831	30 Mar 2018 12:23:25	-25.8
PRM831	07 Mar 2018 13:40:34	-25.8