APPENDIX G

Acoustical Analysis Report Addendum
Acoustical Analysis Report

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MEMORANDUM

To:	Souphalak Sakdarak (County of San Diego)
From:	Mark Storm (Dudek)
Subject:	Campo Wind Project with Boulder Brush Facilities – DEIR Appendix G (Noise) Addendum
Date:	December 3, 2019
cc:	Matt Valerio (Dudek)
Attachment(s):	Attachment A – Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data Attachment B – High-Voltage Substation Transformer Noise Emission Attachment C – Predicted Corona Audible Noise from 150-foot-tall 230 kV Power Line

This noise technical memorandum was prepared to supplement Appendix G (the Acoustical Analysis Report [AAR]) of the Campo Wind Project with Boulder Brush Facilities Draft Environmental Impact Report (DEIR) as an "Addendum" for the County of San Diego (County) on the AAR. Specifically, baseline outdoor ambient sound measurement data collected in 2018 with American National Standards Institute (ANSI) Type 2 instruments at locations proximate to and within the Reservation Boundary are supplemented herein with baseline data collection at a set of comparable locations using ANSI Type 1 instruments in the summer of 2019. This Addendum also includes presentation of baseline outdoor ambient sound measurement data collected in 2018 and 2019 at locations proximate to the Boulder Brush Boundary. Additionally, more detailed noise analysis from anticipated operation of the Boulder Brush Facilities is provided.

Following the organization of this document, the Addendum primarily serves three functions:

I. Summarize updated baseline outdoor ambient sound pressure level (SPL) data collection performed in 2019 at locations within and near the Reservation Boundary using Dudek-deployed ANSI Type 1 unattended sound level meters (SLM);

II. Update the DEIR AAR predictive noise analyses and impact assessments due to this newly collected baseline outdoor SPL data; and,

III. Provide more detailed acoustical analysis of anticipated operational noise emission from the Boulder Brush Facilities, including comparison with baseline outdoor ambient SPL collected at positions along the Boulder Brush Boundary in 2018 and 2019.

I. UPDATED BASELINE SOUND LEVEL DATA COLLECTION

Executive Summary

The following are highlights of results and findings from the updated baseline outdoor ambient data collection effort, performed over the course of six (6) elapsed days between and including Thursday, August 29, 2019 and Wednesday, September 4, 2019.

- Data collection – SPL data was successfully collected over a consecutive 48-hour period at each of five SLM locations associated with the proximity of tagged long-term monitoring locations (LT) LT-2, LT-3, LT-6, LT-8, and LT-12 as currently presented in Figure 2 of the AAR and on Addendum Figure I-2 included herein. SPL data was collected at tagged locations LT-4, LT-5, LT-9, LT-10, and LT-11 for less than 48 hours due to encountered field conditions and instrument function. SPL data was also collected over an 11-hour period at a survey location near BBF-LT-8, which is on the Boulder Brush Boundary.
- Key observations – While the ANSI Type 1 instruments demonstrated a capability of measuring SPL at lower magnitudes than the levels measured with ANSI Type 2 instruments deployed during the 2018 baseline outdoor ambient SPL survey, all of the monitored locations during the 2019 field survey exhibited elevated evening and nighttime sound levels attributed to insect noise, as supported by brief audio recording samples triggered to occur during measured momentary high noise levels (e.g., a vehicle pass-by) detected by the unattended SLM deployments. The acoustical frequencies of the insect sounds and their duration correlates with a period between dusk and dawn, and is consistent with published research on cricket and katydid songs and their expected occurrence (Hershberger and Elliot n.d.). This finding underscores the acoustical contribution of natural sound sources to the measured outdoor sound environment, which also includes birdsong and weather effects (e.g., thunderstorms).
- Comparison of SPL – Calculated day-night sound level (L_{dn}) and community noise equivalent level (CNEL) values from this 2019 field survey of deployed ANSI Type 1 SLM at the tagged locations were compared with similarly calculated L_{dn} and CNEL values from the 2018 survey that were presented and used for noise impact assessment. Generally, L_{dn} and CNEL values from the 2019 field survey were comparable to those calculated from the 2018 field survey, which occurred at the same time of year (early September). Where SPL data was successfully collected in 2019 at the tagged survey locations, corresponding calculated values for L_{dn} and CNEL have replaced those calculated from 2018 baseline SPL data. At tagged survey locations from the 2018 survey where SPL data was not collected in 2019, previously calculated L_{dn} and CNEL values from 2018 baseline SPL data have been retained to quantify the outdoor sound environment at those locations. As a result

of these updated baseline outdoor L_{dn} and CNEL metrics at several representative locations, changes to the assessment of cumulative noise impacts On- and Off-Reservation are slight with respect to applicable criteria. Furthermore, the contribution of insect noise also affected the average A-weighted L_{90} values (i.e., the "background" sound) from which the Residual Background Sound Criterion (RBSC) would be calculated and used for Off-Reservation noise impact assessment per Renewable Energy Regulations Section 6952 (Large Wind Turbine) of the County of San Diego Zoning Ordinance.

Methodology

Dudek personnel visited the Project Vicinity four (4) times over the anticipated course of six (6) elapsed days between and including Thursday, August 29, 2019 and Wednesday, September 4, 2019 to deploy, re-locate, and retrieve up to five (5) automated, unattended SPL monitoring systems in three successive cycles so as to conduct SPL measurements at a total of up to thirteen (13) survey locations on and within the Reservation Boundary comparable to those of the original 2018 field survey effort using ANSI Type 2 SLMs.

The five SLM deployments included the following equipment and features:

- Three (3) ANSI Type 1 Larson-Davis Model 831 Sound Level Meters (serial numbers [SN]: 1219, 2559, 3627), each enclosed within locked weatherproof heavy plastic (e.g., Pelican brand) cases. The locked case containing the data analyzer was secured to a nearby natural (tree trunk) or man-made feature (fence) via an insulated cable lock. SLM microphones and pre-amplifiers were connected to the encased data analyzer via signal cable. An "environmental shroud" comprising cylindrical windscreen and external "bird spikes" protected the microphone mounted atop a portable tripod. Please refer to Figure I-1 for a sample installation. One of these SLM setups also included a separately mounted (i.e., on its own tripod) Vaisala-brand meteorological data station, for the concurrent measurement and collection of outdoor ambient temperature, wind speed and direction, and relative humidity.
- One (1) ANSI Type 1 Larson-Davis Model 831C Sound Advisor (SN: 10576), with the same additional hardware as the above-described LD 831 kits.
- One (1) ANSI Type 1 Larson-Davis Model 820 Sound Level Meter with the same additional hardware as the above-described LD 831 kits. Unlike the Model 831 and 831C, however, the model 820 is an older design that lacks capability of data storage to a plugged-in USB key drive that can be conveniently swapped with another in the field between deployment locations.

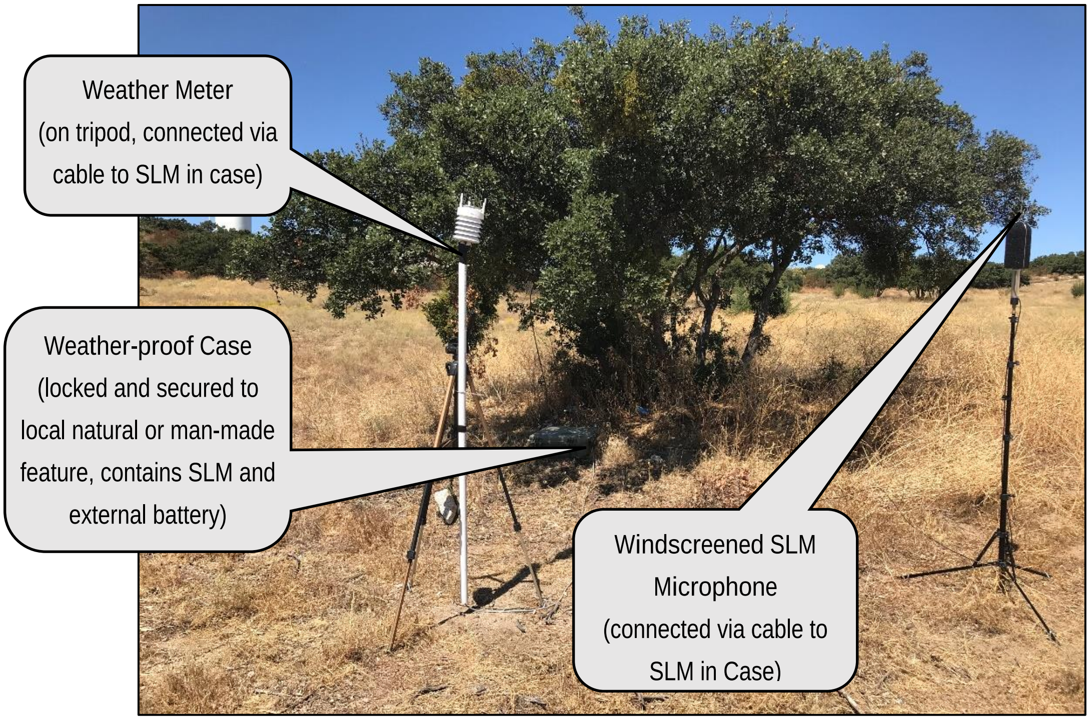

Figure I-1. Unattended SLM Deployment
(with callouts of main features, including Weather Meter)

The SLM kits were deployed at the following locations as shown in Table I-1 below. In some cases, field conditions required the 2019 location be slightly off-set from the previous 2018 field survey location. The 2019 SLM location was generally within 200 feet of the 2018 location and was surrounded by comparable acoustical and environmental conditions. The approximate 2019 locations appear on Figure I-2.

Table I-1
Campo Wind Project Baseline Sound Pressure Level Survey Locations (2018 vs. 2019)

Sound Level Meter (SLM) Location Tag	2018 GPS Coordinates of SLM Deployments	2019 GPS Coordinates of SLM Deployments	2019 Deployments On or Off Reservation?
LT-1	32°37'23.28"N, 116°21'4.71"W	32°37'27.27"N, 116°21'4.34"W	Off
LT-2	32°37'30.87"N, 116°21'48.58"W	32°37'29.22"N, 116°21'47.63"W	On
LT-3	32°38'25.00"N, 116°22'44.64"W	32°38'24.99"N, 116°22'45.85"W	On
LT-4	32°39'1.18"N, 116°22'5.32"W	32°39'2.50"N, 116°22'6.03"W	On
LT-5	32°39'9.90"N, 116°21'26.13"W	32°39'11.56"N, 116°21'25.04"W	On
LT-6	32°42'14.44"N, 116°23'37.85"W	32°42'12.61"N, 116°23'38.05"W	Off
LT-7	32°41'40.47"N, 116°20'43.37"W	32°41'40.51"N, 116°20'42.39"W	On

Table I-1
Campo Wind Project Baseline Sound Pressure Level Survey Locations (2018 vs. 2019)

Sound Level Meter (SLM) Location Tag	2018 GPS Coordinates of SLM Deployments	2019 GPS Coordinates of SLM Deployments	2019 Deployments On or Off Reservation?
LT-8	32°42'56.90"N, 116°21'33.77"W	32°42'55.92"N, 116°21'34.17"W	On
LT-9	32°43'32.06"N, 116°21'20.41"W	32°43'32.28"N, 116°21'20.77"W	On
LT-10	32°44'3.57"N, 116°19'42.57"W	32°44'7.49"N, 116°19'44.48"W	Off
LT-11	32°40'34.50"N, 116°21'21.68"W	32°40'40.88"N, 116°21'24.50"W	On
LT-12	32°42'38.15"N, 116°18'50.60"W	32°42'39.92"N, 116°19'2.95"W	On
LT-13	32°36'5.82"N, 116°23'10.79"W	32°36'5.25"N, 116°23'10.77"W	Off

One of the unattended ANSI Type 1 monitor deployments was located near BBF-LT-8 on September 2, 2019, and enabled SPL data collection to be compared with a sample of the baseline outdoor ambient sound data collected in 2018. The comparable Boulder Brush Boundary monitoring locations appear in Figure I-2 and Table I-2.

Table I-2
Boulder Brush Facilities Baseline Sound Pressure Level Survey Location (2018 vs. 2019)

Sound Level Meter (SLM) Location Tag	2018 GPS Coordinates of SLM Deployments	2019 GPS Coordinates of SLM Deployments	Deployments On or Off Reservation?
BBF-LT-8	32°45'30.49"N, 116°17'44.86"W	32°45'25.20"N, 116°17'40.03"W	Off

Consistent with County of San Diego Municipal Code Section 36.403, the SLMs were set with a "slow" response time. Calibration status of the SLMs were checked in the field before and after SPL measurement data was collected.

Measurement Data Highlights

Observed field conditions were seasonally consistent with late summer for the Project Vicinity: daytime temperatures ranging from the high 80s to low 100s (degrees Fahrenheit) and relative humidity ranging from 17% to 50%. Aside from generally sunny skies (or with overcast), precipitation did occur briefly during the measurement periods. Table I-3 presents a summary of the measurement data, along with previous metrics from the 2018 baseline outdoor field survey. Day-night sound level (L_{dn}) is an energy-averaged sound level over a 24-hour period, with sound during the 10:00 p.m. to 7:00 a.m. "nighttime" period adjusted upwards by 10 dB. Community noise equivalent level (CNEL) is a similar calculated descriptor, but also includes upward adjustment of 5 dB to the sound within the 7:00 p.m. to 10:00 p.m. "evening" period. Residual Background Sound Criterion (RBSC) is the sum of the A-weighted L90 value plus 5 dB, as defined by the County of San Diego Ordinance 10262. The "delta" value is the decibel difference between the 2019 and 2018 values.

Table I-3
Summarized Baseline SPL Survey Data (2018 vs. 2019)

Sound Level Meter (SLM) Location Tag	Day-night Sound Level (L_{dn})			Community Noise Equivalent Level (CNEL)			Residual Background Sound Criterion (RBSC = L_{90} + 5 dBA)		
	2018 (dBA)	*2019 (dBA)*	*Delta (dBA)*	*2018 (dBA)*	*2019 (dBA)*	*Delta (dBA)*	*2018 (dBA)*	*2019 (dBA)*	*Delta (dBA)*
LT-1	51.5	n/a	n/a	51.8	n/a	n/a	40.1	n/a	n/a
LT-2	48.5	48.5	0.0	48.9	50.4	1.5	40.4	36.2	-4.2
LT-3	52.9	58.9	6.0	53.8	59.2	5.4	42.0	41.2	-0.8
LT-4	56.1	51.1	-5.1	56.2	51.9	-4.3	40.1	42.6	2.5
LT-5	56.6	54.0	-2.6	57.0	54.4	-2.6	40.1	39.0	-1.1
LT-6	44.7	51.2	6.5	45.6	51.4	5.8	40.0	38.3	-1.7
LT-7	67.3	n/a	n/a	67.4	n/a	n/a	44.0	n/a	n/a
LT-8	50.3	51.9	1.6	50.7	52.2	1.5	43.0	39.5	-3.5
LT-9	43.5	56.1	12.6	44.0	56.8	12.8	37.6	44.4	6.8
LT-10	45.2	48.3	3.1	46.3	48.6	2.3	37.8	36.7	-1.1
LT-11	48.7	62.0	13.3	50.3	63.1	12.8	49.3	49.9	0.6
LT-12	55.8	52.4	-3.5	56.5	52.8	-3.7	53.4	37.8	-15.6
LT-13	50.4	n/a	n/a	50.7	n/a	n/a	41.3	n/a	n/a
BBF-LT-8	47.8	51.3	3.5	47.8	53.3	5.5	42.4	43.0	0.6

Notes:
1 2018 measurement data as appearing in Appendix A of the Acoustical Analysis Report (Appendix G) of the Campo Wind Project with Boulder Brush Facilities DEIR.
2 2019 measurement data is, as applicable, the arithmetic average of values for up to two (2) consecutive 24-hour periods.
3 The "Delta" is the arithmetic difference of the 2019 value minus the 2018 value.
4 RBSC is calculated from the average of measured A-weighted hourly L_{90} for the listed SLM location.
5 "n/a" = not available, due to data on SLM lost when it was removed from 2019 survey site LT-7. Data for LT-1 and LT-13 was on the same LT-7 SLM and thus also lost.
6 2018 measurement data for BBF-LT-8 was collected from June 26–28, 2018.

Table I-3 shows that at several locations, measured SPL during this reported 2019 field survey were—within a few dBA—comparable to the 2018 measurement data. Data for LT-1, LT-7, and LT-13 is unavailable for contrast with the 2018 measurement results. The SLM deployment at LT-7 was discovered to be removed by an unknown party. Unfortunately, as this instrument deployment at LT-7 contained the Model 820 SLM, data collected from LT-13 and LT-1 from previous deployments on its onboard memory was also lost along with any LT-7 data collection. At locations LT-9 and LT-11, where less than 24 hours of SPL data was collected during this 2019 field survey, the reported L_{dn} and CNEL values are calculated from the available hourly data. At

LT-9, it was discovered during instrument retrieval that the signal cable connecting the microphone to the encased SLM was damaged, apparently after the 5:00 a.m. – 6:00 a.m. hour according to the collected data. At LT-11, technical issues with a USB key drive limited data recovery to a 7-hour period on August 29, 2019. The resulting higher L_{dn} and CNEL values for these two locations includes the effect of the aforementioned evening and nighttime decibel adjustments for these acoustical descriptors during time periods when measured outdoor noise was successfully collected and elevated due to acoustical contributors such as insects and vehicle pass-bys. Despite these issues, and for purposes of the noise impact assessment, the SPL data successfully collected from the 2019 field survey at an assortment of On- and Off-Reservation representative locations sufficiently updates and quantifies the existing outdoor sound environment of the Project Vicinity.

Attachment A of this Addendum presents tabulated hourly details for the collected SPL data at the 2019 survey locations, along with histogram plots to help illustrate how measured sound levels varied with time over the unattended measurement durations.

Field Observations

Based on documented observations by Dudek field investigators present during the field survey, as well as audio file samples logged during SPL measurement data collection and storage to instrument memory, the following is a summarized list of witnessed, perceived, or recorded audible acoustical contributors to the measured sound environment:

- Common to all SLM locations – Between dusk and dawn, insect noise was the dominant contributor to measured background sound, causing hourly L_{90} levels to exceed many during the daytime. Sounds of aircraft (both propeller-driven and jet-powered) overflights, as well as nearby and/or distant road vehicle pass-bys (including trucks, passenger cars, motorcycles and or all-terrain vehicles [ATVs]) were also detected and contributed to the measured outdoor ambient sound levels. The sound of rustling leaves in nearby trees, shrubs, and grasses was also present when wind gusts and steady winds were sufficiently strong.
- Common for many SLM locations – Sounds of dog barks, birdsong, as well as nearby and/or distant road vehicle pass-bys were also detected and contributed to the measured outdoor ambient sound levels.
- Unique to some or singular SLM locations – Included as follows:
  - LT-3 – Music (low-frequency "bass") during a vehicle pass-by
  - LT-5 – Wind chimes from a nearby residence
  - LT-9 – Audible wind turbines (operating Kumeyaay Wind turbines)

Additionally, the collected data and sample short-duration audio files indicate that rainstorms (including thunder and sounds from precipitation impacting the nearby ground surfaces and vegetation) occurred in the early or mid-afternoons of September 2, 3, and 4.

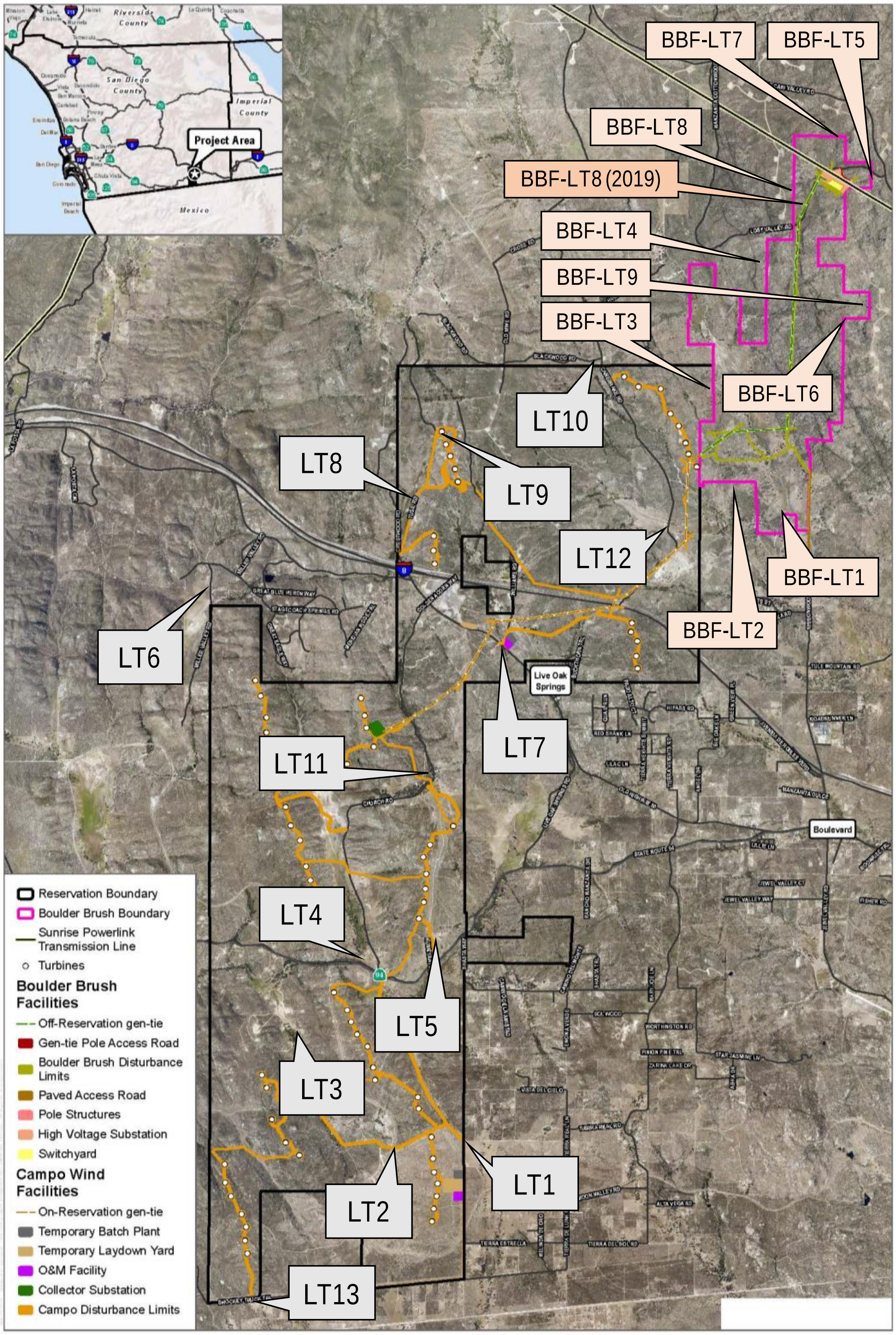

Figure I-2. Approximate Locations of Sound Level Meters (SLMs) during 2018 and 2019 Field Surveys (location tag callouts over background image of DEIR Figure 1-3)

II. UPDATED PREDICTIVE NOISE ANALYSIS

Existing Noise Levels

Based on the SPL data collected in 2019 using ANSI Type 1 instrumentation, as summarized in Section I of this Addendum, Table II-1 reflects updated L_{dn} values, with the right-most parenthetical columns showing—for reader convenience—the previously presented L_{dn} values and the change in dB. At 2018 survey locations LT1, LT7, and LT13 where SPL data was not successfully retrieved, the previously calculated L_{dn} values represent what the noise impact assessment will default to when they are relevant for analysis. Thus, at these three locations, the change presented in Table II-1 is zero.

Table II-1
Calculated A-Weighted Day/Night Sound Levels from 2018 and 2019 Field-Collected Survey Data

Receiver ID	Outdoor Ambient L_{dn} Noise Level (dBA) Measured in 2019	(Outdoor Ambient Ldn Noise Level [dBA] Measured in 2018)	(Change in Presented Ambient L_{dn} Noise Level [dBA])
LT1	n/a	51	0
LT2	48	48	0
LT3	59	53	+6
LT4	51	56	-5
LT5	54	57	-3
LT6	51	45	+6
LT7	n/a	67	0
LT8	52	50	+2
LT9	56	43	+13
LT10	48	45	+3
LT11	62	49	+13
LT12	52	56	-4
LT13	n/a	50	0

Notes: L_{dn} = day/night sound level; dBA = A-weighted decibels.

Aside from the +13 dBA change for LT-9 and LT-11, due to the calculation of L_{dn} from a smaller set of hourly values, the change in L_{dn} values for the set of locations varies from -5 dBA for LT-4 to +6 for LT-6.

Additionally, based on the 2019 data collected using the ANSI Type 1 instrumentation, the reported range in measured hourly L_{eq} values would range from 29 to 71 L_{eq1h}, which is similar to the previously reported 31 dBA to 70 dBA L_{eq1h} value range. The average hourly L_{90} values over a 24-hour period for these thirteen (13) representative baseline locations now range from 26 to 63 dBA, which is wider than the previously reported 32 to 49 dBA average hourly L_{90} values.

Although the measured L_{dn} between the 2018 and 2019 late-summer field surveys at several locations varied by several decibels, the range of values above is still considered representative of the Project Vicinity for the same reasons as listed in the DEIR AAR (repeated below for reference):

- Higher hourly sound levels, and corresponding calculated L_{dn}, tend to be closer to frequently travelled paved and unpaved roads;
- Lower outdoor sound levels would characterize areas that are remote from sources of regularly-occurring man-made sound emission; and,
- The acoustical energy from short-duration, intermittent, or even impulsive sounds in proximity to the SLM, such as occasional pass-bys from recreational vehicles or the burst of a truck horn, can skew L_{eq}, L_{dn}, and CNEL values higher than what other acoustical metrics might suggest about the surveyed location.

On-Reservation Operational Noise Impacts

Predicted aggregate operating wind turbine noise from Project turbines is assessed with respect to a fixed value: 55 dBA L_{dn}, consistent with the U.S. EPA recommended outdoor noise threshold for noise-sensitive receptors such as residences. Because the U.S. EPA-recommended outdoor noise threshold is a fixed value, the updated baseline outdoor ambient sound levels do not change the noise assessment and the predicted potentially significant impacts.

On-Reservation Cumulative Discussion

The predicted aggregate operating wind turbine noise from Project turbines was combined with a “cumulative + existing” outdoor ambient sound level to assess cumulative noise impact by Project turbines. Note that “cumulative + existing” is defined here as the logarithmic combination of the measured outdoor ambient sound level and the foreseeable predicted acoustic contribution from the proposed Torrey Wind project. Table II-2 presents appropriate representative locations updated calculated cumulative values reflecting the existing outdoor ambient components due to the newly collected baseline data presented in the preceding section. The bold-italicized values indicate changes resulting from using the updated baseline data collected.

Table II-2
Predicted Future Cumulative Noise Levels due to Project Operation (at 7 m/s)

Receiver ID	Cumulative + Existing[1] L_{dn} (dBA)	Predicted Project Operations[2] L_{dn} (dBA)	Cumulative + Existing Plus Predicted Project[3] L_{dn} (dBA)	Cumulative Impact caused by Project?[4]
LT-1	51	53	55	No
LT-2	49	50	53	No
LT-3	*59*	48	*59*	No
LT-4	*51*	49	*53*	No
LT-5	*54*	52	*56*	No
LT-6	*51*	38	*51*	No
LT-7	67	40	67	No
LT-8	*52*	50	54	No
LT-9	*56*	59	*61*	Yes
LT-10	*50*	52	*54*	No
LT-11	*62*	46	*62*	No
LT-12	*53*	42	53	No
LT-13	50	44	51	No

Notes:
1 Cumulative + Existing is the measured noise level, including operating Kumeyaay Wind and Tule Wind project turbines, and predicted foreseeable future Torrey Wind project turbines.
2 Predicted Project Operations is from Table 10 of the Acoustical Analysis Report (AAR), at an average wind speed of 7 meters per second (m/s).
3 This value is the logarithmic sum of Cumulative + Existing and Predicted Project, or what could be called a "future" outdoor ambient noise level.
4 A cumulative impact would be caused when the Cumulative + Existing Plus Predicted Project is more than 3 dB higher than the Cumulative + Existing level. This 3 dB relative criterion is similar to the County's "cumulatively considerable" criterion, but is suggested guidance for On-Reservation receptors on the basis of a 3 dB increase being considered perceptible.

As shown, the result of these updates to the "Cumulative + Existing" sound levels and the corresponding "Cumulative + Existing + Predicted Project" logarithmic summations does not change the cumulative impact conclusions.

Off-Reservation Noise Impact Assessment (General Plan)

The predicted aggregate operating wind turbine noise from Project turbines was compared with the County of San Diego's Guidelines for Determining Significance of 60 dBA CNEL (or 10 dBA greater than the existing outdoor ambient CNEL) for the nine representative study locations located Off-Reservation (LT-1, LT-5, LT-6, LT-7, LT-8, LT-10, LT-11, LT-12, and LT-13). The predicted wind turbine generator (WTG) sound levels remain accurate. The newly collected baseline SPL data shows that only LT-10 has an existing CNEL of 48 dBA—the CNEL values for the other eight studied locations are greater than 50 dBA; therefore, the threshold for LT-10 would be 58 dBA CNEL, and all other LTs would be 60 dBA CNEL. Since the predicted WTG noise levels for the 76-turbine locations at the nine studied locations are less than 60 dBA CNEL (or meet 58 dBA CNEL at LT-10), no significant impacts are expected.

Off-Reservation Noise Impact Assessment (Municipal Code, Noise Ordinance Hourly)

Existing outdoor ambient sound levels do not affect this aggregate WTG operation noise analysis.

Off-Reservation Noise Impact Assessment (County Zoning Ordinance Section 6952 – Large Wind Turbine)

The predicted aggregate operating wind turbine C-weighted noise from Project turbines was compared with the Residual Background Sound Criterion (RBSC), calculated from an A-weighted average L_{90} value plus 5 dB, at three representative study locations (LT-1, LT-10, and LT-13). The 2019 baseline outdoor sound level data has updated the RBSC for one of these locations. Bold-italicized values in Table II-3 below indicate where the difference between the predicted C-weighted WTG operation noise and the RBSC is greater than 20 dB.

Table II-3
Predicted C-Weighted Aggregate Project Wind Turbine Noise Levels

Receiver ID	Predicted Hourly L_{eq} (dBC) minus Residual Background Sound Criterion (RBSC) at Indicated Average Wind Speed (m/s)						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	14	14	17	20	*23*	*26*	*27*
LT-10	16	16	19	*22*	*25*	*28*	*29*
LT-13	6	6	9	12	15	18	19

Notes: L_{eq} = equivalent continuous sound level; dBC = C-weighted decibels; m/s = meter per second.

In summary, predicted noise levels at representative study locations LT-1 and LT-10 would exceed the allowable difference (i.e., predicted C-weighted minus RBSC) of 20 dB per the County's Zoning Ordinance Section 6952 relating to large wind turbines. The range of average hub-height wind speeds at which LT-1 would be impacted is unchanged, but the range for LT-10 has increased to include average hub-height wind speed as low as 7 meters per second. This means for LT-10, the frequency of occurrence for the County large wind turbine standard to be exceeded would be greater, as it would take a lower average hub-height wind speed to foster the right conditions for aggregate Project operating wind turbine noise to cause the exceedance (i.e., predicted C-weighted noise higher than the RBSC value by more than 20 dB). No additional studied locations are anticipated to be impacted.

Off-Reservation Noise Impact Assessment (Cumulative Discussion)

Table II-4 presents the assessment of predicted cumulatively considerable noise increases due to Project turbines at three representative locations (LT-1, LT-10, and LT-13). The 2019 baseline outdoor sound level data has resulted in updated "cumulative + existing" CNEL levels, to which the predicted Project WTG operation noise is logarithmically added to determine an impact—that is, where the result exceeds the County's criteria for a cumulative impact (60 dBA CNEL) and the Project has had a cumulatively considerable contribution. Table II-4 below presents the updated analysis. Bold-italicized values indicate changes resulting from using the updated baseline data collected.

Table II-4
Predicted Cumulative Noise Levels from Project Operation

Receiver ID	Cumulative + Existing* CNEL (dBA)	Cumulative + Existing Plus Project Modeled CNEL (dBA)	Over 60 dBA CNEL Threshold and Cumulative Considerable?
LT1	*52*	60	No
L10	*50*	59	No
L13	*51*	54	No

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels.
* Cumulative + Existing is the measured noise level, including noise exposure from operating Kumeyaay Wind and Tule Wind project turbines, and predicted contribution from foreseeable future Torrey Wind project turbines.

While Table II-4 shows that several values have changed, the finding of no significant cumulative impacts from among the five studied locations is the same as what was previously presented using the ANSI Type 2 data collection from 2018 for the following reasons:

- At LT1, the combined sound level does not exceed 60 dBA CNEL, consistent with the aforementioned County's Report Format and Content Requirements for Noise and summarized as follows (County of San Diego 2015): "an increase of 10 CNEL over pre-existing noise levels of less than 50 CNEL resulting in a combined exterior noise level of 60 CNEL or greater."
- At LT10 and LT13, the cumulative noise level does not exceed 60 dBA CNEL.

III. BOULDER BRUSH FACILITIES OPERATION NOISE ANALYSIS

This section of the Addendum provides additional detail and depth of predictive operations noise analysis for the major continuous noise-producing features of the Boulder Brush facilities as follows: High-Voltage Substation transformer noise, and audible corona discharge from Off-Reservation gen-tie transmission line.

Baseline Outdoor Ambient Sound Levels

As presented in Table III-1, existing outdoor ambient SPL was measured in 2018 for a minimum of 24 continuous hours at the nine listed representative locations along or near the Boulder Brush Boundary as previously depicted in Figure I-2. The presented metrics in Table III-1 are day-night sound level (L_{dn}), community equivalent sound level (CNEL), and L_{90} (the sound level exceeded 90% of the time during the measurement period).

Table III-1
Boulder Brush Boundary Baseline Sound Pressure Level Survey Locations (2018)

Sound Level Meter (SLM) Location Tag	2018 GPS Coordinates of SLM Deployments	Calculated L_{dn} (dBA)	Calculated CNEL (dBA)	Average L_{90} (dBA)	Deployments On or Off Reservation?
BBF-LT-1	32°42'50.77"N, 116°17'52.34"W	51.8	52.1	35.8	Off
BBF-LT-2	32°43'4.43"N, 116°18'20.24"W	47.8	48.1	33.0	Off
BBF-LT-3	32°43'54.18"N, 116°18'33.50"W	53.3	53.4	37.4	Off
BBF-LT-4	32°44'55.56"N, 116°18'0.82"W	48.4	48.6	38.1	Off
BBF-LT-5	32°45'43.14"N, 116°16'58.57"W	53.2	53.6	42.2	Off
BBF-LT-6	32°44'28.21"N, 116°17'15.44"W	56.9	57.0	43.3	Off
BBF-LT-7	32°45'59.90"N, 116°17'14.27"W	51.4	51.7	41.0	Off
BBF-LT-8	32°45'30.49"N, 116°17'44.86"W	47.8	48.1	37.4	Off
BBF-LT-9	32°44'33.16"N, 116°16'59.94"W	52.9	53.1	41.0	Off

As mentioned in Section I and shown in Tables I-2 and I-3, in 2019, an SPL measurement was performed near BBF-LT-8 that resulted in data that updates the metrics for BBF-LT-8 as follows: the 2019 L_{dn} value is 3.5 dB higher than that calculated from the 2018 data; the 2019 CNEL value is 5.5 dB higher than the 2018 CNEL value; and the 2019 RBSC (i.e., average L_{90} plus 5 dBA) is only 0.6 dB higher than the 2018 RBSC value.

High-Voltage Substation

The High-Voltage Substation would include a 230kV/500kV transformer that is anticipated to be the major continuous producer of noise during operation of the Boulder Brush Facilities. Other electrical equipment may be onsite, but consistent with similar noise studies of substations with adjoining switchyards, such other potential noise sources are intermittent and infrequent (Acentech Incorporated 2015). Therefore, this Addendum does not further evaluate noise from the switchyard.

Dudek prepared a Microsoft Excel-based "grid" spreadsheet sound propagation model that utilizes International Organization of Standardization (ISO) 9613-2 acoustical algorithms and reference data to estimate transformer noise level within, along, and beyond the Boulder Brush Boundary. The reference A-weighted sound pressure level (SPL) for the transformer at a distance of 492 feet (150 meters) was calculated from the following expression (Beranek and Ver 1992), assuming a 300 million volt-ampere (MVA) transformer capacity:

SPL = 26 + 8.5*LOG(MVA) + 7 = 26 + 8.5*LOG(300) + 7 = 54.1 dBA at 492 feet

This reference SPL translates into 97.5 at one meter (3.28 feet).

An alternative transformer noise level estimation technique, described in the Electric Power Plant Environmental Noise Guide (Edison Electric Institute 1984), involves the following expressions to arrive at a sound power level as follows:

10*LOG(S) = 14 + 2.5*LOG(MVA) = 14 + 2.5*LOG(300) = 20.2

where "S" is the area of the transformer sidewalls. The approximate National Electrical Manufacturers Association (NEMA) Sound Rating for a "Standard (unquieted)" transformer is defined by:

NEMA Rating = 55 + 12*LOG(MVA) = 55 + 12*LOG(300) = 85

Added together, the transformer sound power level (PWL) is calculated with:

PWL = NEMA Sound Rating + 10*LOG(S) = 85 + 20.2 = 105.2 dBA

Converted to an SPL at one meter distance in a hemispherical free field, the above value of 105.2 dBA becomes 97.2 dBA and is thus functionally equivalent to the 97.5 dBA (at one meter) SPL estimate per the Beranek and Ver (1992) method.

Sound attenuation effects applied to this reference transformer noise level include geometric divergence, acoustical air absorption, and ground surface acoustical absorption in a manner that emulates ISO 9613-2. However, for purposes of model conservatism, any sound-path occlusion due to terrain has been ignored in the prediction model because such path interference would reduce the transformer-attributed noise level at a receiving position.

Attachment B depicts two figures that illustrate the modeled potential sound emission with distance from Boulder Brush Facilities transformer noise: 1) a "spectral" display, in which the individual Excel cells in the array are 167-foot by 167-foot square units of a map and display the predicted transformer-attributed SPL values; and 2) the same predicted results, but displayed in a manner that limits visualized output to a region within which transformer-attributed SPL is 45 dBA or greater. These figures also show the Boulder Brush Boundary (purple). Because the

Boulder Brush Boundary is surrounded by Bureau of Land Management (BLM) administered lands, the nearest occupied private parcel under County jurisdiction would be APN 61102005, which is over 13,000 feet south of the HV substation and would be expected to see a predicted transformer noise exposure of no more than 10 dBA. As shown in the Attachment B imagery, predicted transformer noise is not expected to exceed 45 dBA at a distance beyond 1,000 feet from the substation transformer, well within the property line, and would thus comply with the County of San Diego's Noise Ordinance (Section 36.404[a]). Additionally, the predicted transformer noise values along the purple-colored Boulder Brush Boundary portion shown in Attachment B range from 25 dBA to 41 dBA, which is comparable to—or quieter than—the measured range of baseline background sound levels (33 dBA to 43 dBA) as presented in Table III-1.

Gen-Tie Transmission Lines

Audible "corona noise" is sound generated by the corona effect along transmission line conductors conveying electrical current. In summary, the corona effect results from dust or moisture on the conductor surfaces; hence, while sound may be generated from corona during dry, fair-weather conditions, it is louder and more likely to be audible depending on the outdoor background sound the proximity of the listener.

The overhead 230 kV transmission line would include a single circuit with three conductor wires (one per each of three phases) on steel pole structures up to a maximum of 150 feet in height. Assuming these alternating current (AC) conductors are aluminum conductor steel reinforced (ACSR) "Bluebird" type (i.e., 1.762" outer diameter) and have a maximum surface voltage gradient ("E") of 19 kilovolts root-mean-square per centimeter (kVrms/cm), it is possible for them to emit audible noise under rainy conditions.

The L_{50} (a.k.a., median sound level) for audible corona can be predicted with algorithms and reference information found in the U.S. Department of Interior, Bonneville Power Administration (BPA), Technical Report No. ERJ-77-168 (Chartier 1983; Chartier and Larson Lines 1977). The mathematical expression for estimating an A-weighted SPL under *rainy* weather conditions and based on surface voltage gradient (E), conductor equivalent diameter ("d" in millimeters [mm]), and distance from a receiver position ("r" in meters [m]) is as follows:

$$SPL = 120*LOG(E) + 55*LOG(d) – 11.4*LOG(r) – 170.5$$

Attachment C illustrates the propagation of corona noise under this rainy-weather condition, showing that at a distance of 100 feet from either side of the power line conductors, the expected SPL is less than 24 dBA at a listener standing at grade. This is also shown as a plan view with respect to the Boulder Brush Area in Figure 8 of the AAR, and below in Figure III-1. Even if the pole structure was shorter, or if the conductors were closer to grade due to sag, the anticipated corona SPL would not substantially change at this distance from the gen-tie line alignment.

Under "fair weather" conditions, and according to the same BPA report, the estimated median sound level would be 25 dB less than the values shown in Attachment C. This means that at this same 100-foot distance, the predicted sound level from corona noise under dry, fair-weather conditions would be below 0 dBA—the threshold of average human hearing. Therefore, although the overhead gen-tie line could produce audible noise, its audibility would depend on the weather conditions, the proximity of the listener, and the background sound level. For example, corona audible noise at a level of 24 dBA would likely be imperceptible from a background sound level that is already 25 dBA or greater.

Regardless of audibility, the predicted corona audible noise levels—even at their loudest under rainy weather conditions—would be well below the County's hourly noise thresholds per Section 36.404 of its noise ordinance and well below the measured baseline L_{90} values along the Boulder Brush Boundary as appearing in Table III-1.

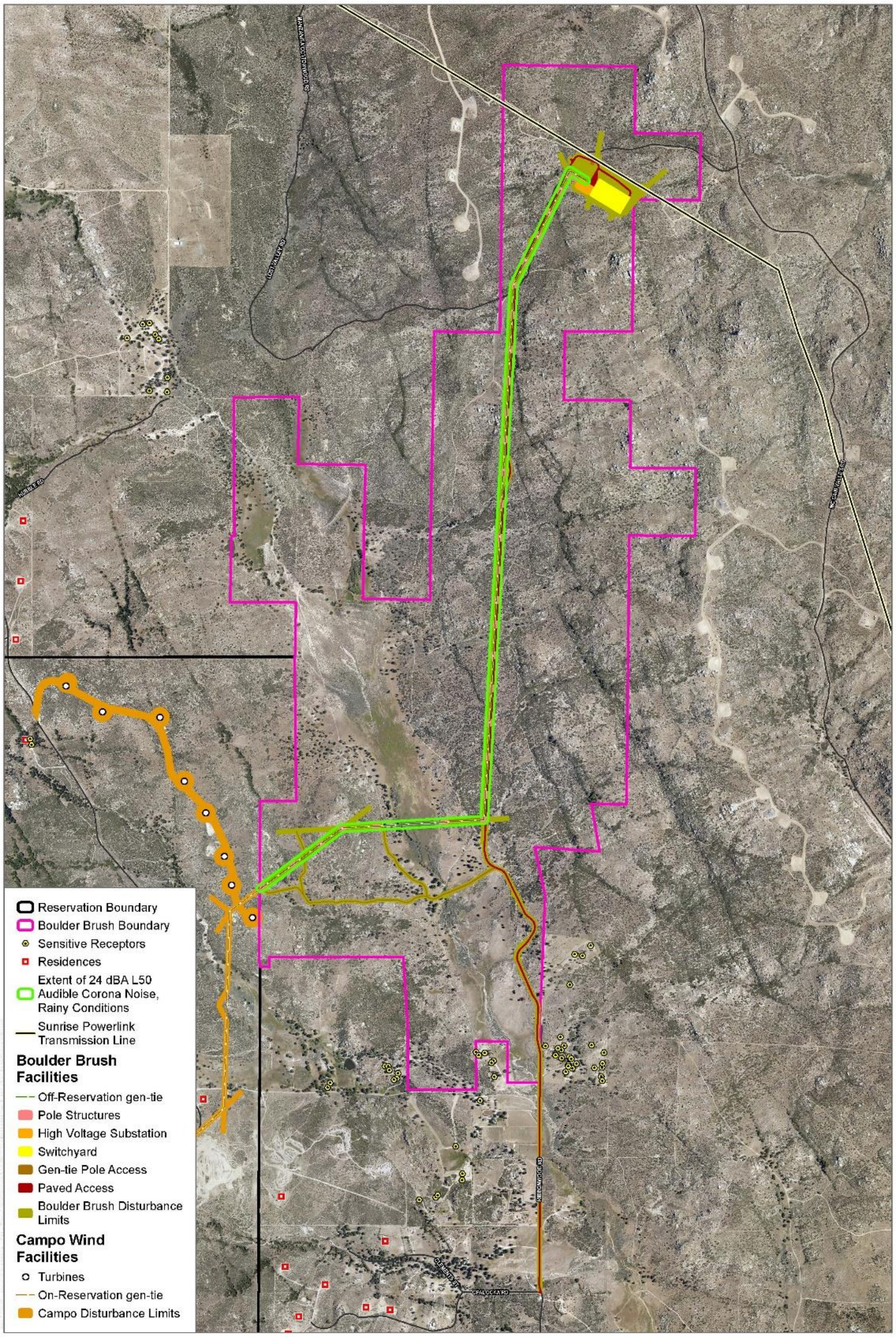

Figure III-1. Predicted 24 dBA Median Sound Level (L50) Off-Reservation due to Boulder Brush Facilities Gen-Tie Line Corona Noise under Rainy Conditions

REFERENCES

Acentech Incorporated. 2015. *Mesa 500 Kilovolt (kV) Substation Project Technical Noise Report*. http://www.cpuc.ca.gov/Environment/info/ene/mesa/attachment/DraftEIR/38AppendixJNoiseBackgroundReports.pdf.

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ATTACHMENT A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 29, 2019 to August 30, 2019

Site: LT2

Hour	Leq	Lmax	L50	L90
10:00	33.6	60.2	27.6	23.7
11:00	36.2	59.8	28.0	22.7
12:00	36.4	60.9	28.8	22.7
13:00	35.8	60.6	28.7	22.4
14:00	33.6	46.9	28.3	22.2
15:00	36.9	62.1	31.8	24.9
16:00	38.3	63.1	34.0	26.6
17:00	41.4	62.6	33.2	25.3
18:00	30.7	48.0	25.4	21.3
19:00	45.1	72.6	34.0	20.8
20:00	48.0	69.8	46.4	43.7
21:00	45.1	54.6	44.6	43.1
22:00	44.1	48.9	43.3	41.9
23:00	44.2	46.7	44.4	42.2
0:00	44.0	61.5	43.2	41.3
1:00	46.9	57.6	46.7	41.8
2:00	45.1	64.1	43.2	41.2
3:00	41.0	44.6	40.7	39.6
4:00	38.5	43.5	37.6	35.5
5:00	32.9	61.3	23.7	19.2
6:00	30.1	46.5	24.5	20.7
7:00	34.9	60.5	27.4	23.1
8:00	35.6	66.2	23.8	21.8
9:00	37.5	63.3	23.3	21.5

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	30.7	46.9	23.3	20.8
Nighttime (10 p.m. - 7 a.m.)	30.1	43.5	23.7	19.2

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	40.9	60.8	31.0	25.7
Nighttime (10 p.m. - 7 a.m.)	43.0	52.7	38.6	35.9

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	48.0	72.6	46.4	43.7
Nighttime (10 p.m. - 7 a.m.)	46.9	64.1	46.7	42.2

Energy Distribution

Daytime	50%
Nighttime	50%

Calculated CNEL, dBA

50.9

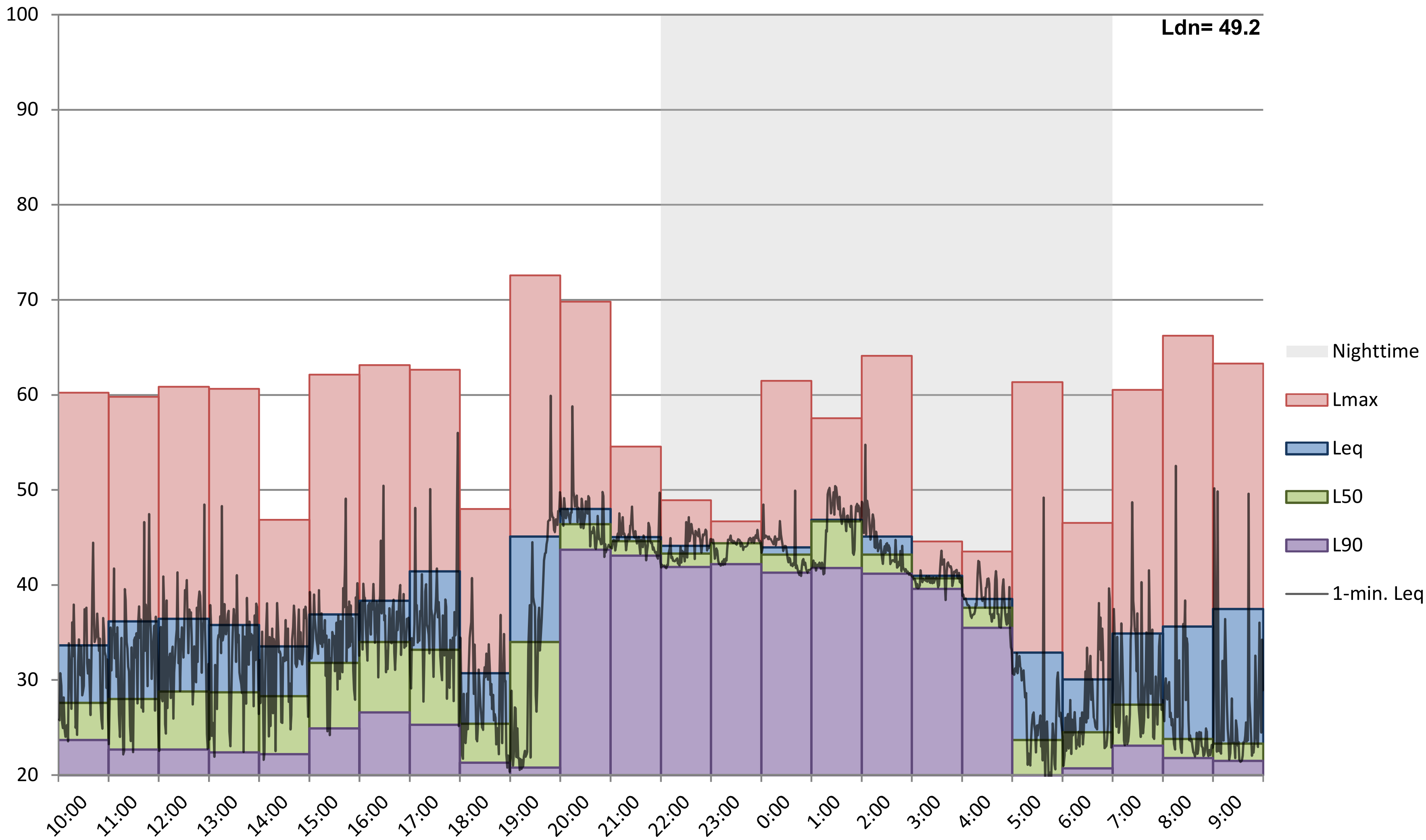
Calculated L_{dn}, dBA

49.2

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT2

August 29, 2019 to August 30, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 30, 2019 to August 31, 2019

Site: LT2

Hour	Leq	Lmax	L50	L90
10:00	31.5	47.0	26.1	22.6
11:00	39.3	64.1	33.6	26.4
12:00	37.6	51.1	33.7	26.8
13:00	41.4	62.0	37.4	28.9
14:00	40.1	61.0	36.9	30.0
15:00	43.7	69.9	39.0	33.1
16:00	42.7	70.5	37.7	31.7
17:00	37.0	53.1	34.0	27.7
18:00	35.7	58.3	29.7	24.6
19:00	41.8	53.9	31.8	23.4
20:00	47.2	62.8	46.6	44.4
21:00	45.7	64.5	45.3	43.1
22:00	44.6	49.9	44.3	42.2
23:00	44.4	62.2	43.1	41.8
0:00	43.2	47.0	43.0	41.3
1:00	41.8	44.7	41.7	40.6
2:00	41.4	50.4	41.3	40.3
3:00	40.3	61.3	39.9	36.9
4:00	34.5	46.6	34.4	32.1
5:00	30.5	42.3	27.2	19.1
6:00	30.9	48.8	23.3	19.6
7:00	31.8	54.5	24.5	21.2
8:00	32.3	58.7	21.8	20.5
9:00	29.2	46.7	22.1	20.7

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	29.2	46.7	21.8	20.5
Nighttime (10 p.m. - 7 a.m.)	30.5	42.3	23.3	19.1

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	41.2	58.5	33.3	28.3
Nighttime (10 p.m. - 7 a.m.)	41.3	50.4	37.6	34.9

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	47.2	70.5	46.6	44.4
Nighttime (10 p.m. - 7 a.m.)	44.6	62.2	44.3	42.2

Energy Distribution

Daytime	62%
Nighttime	38%

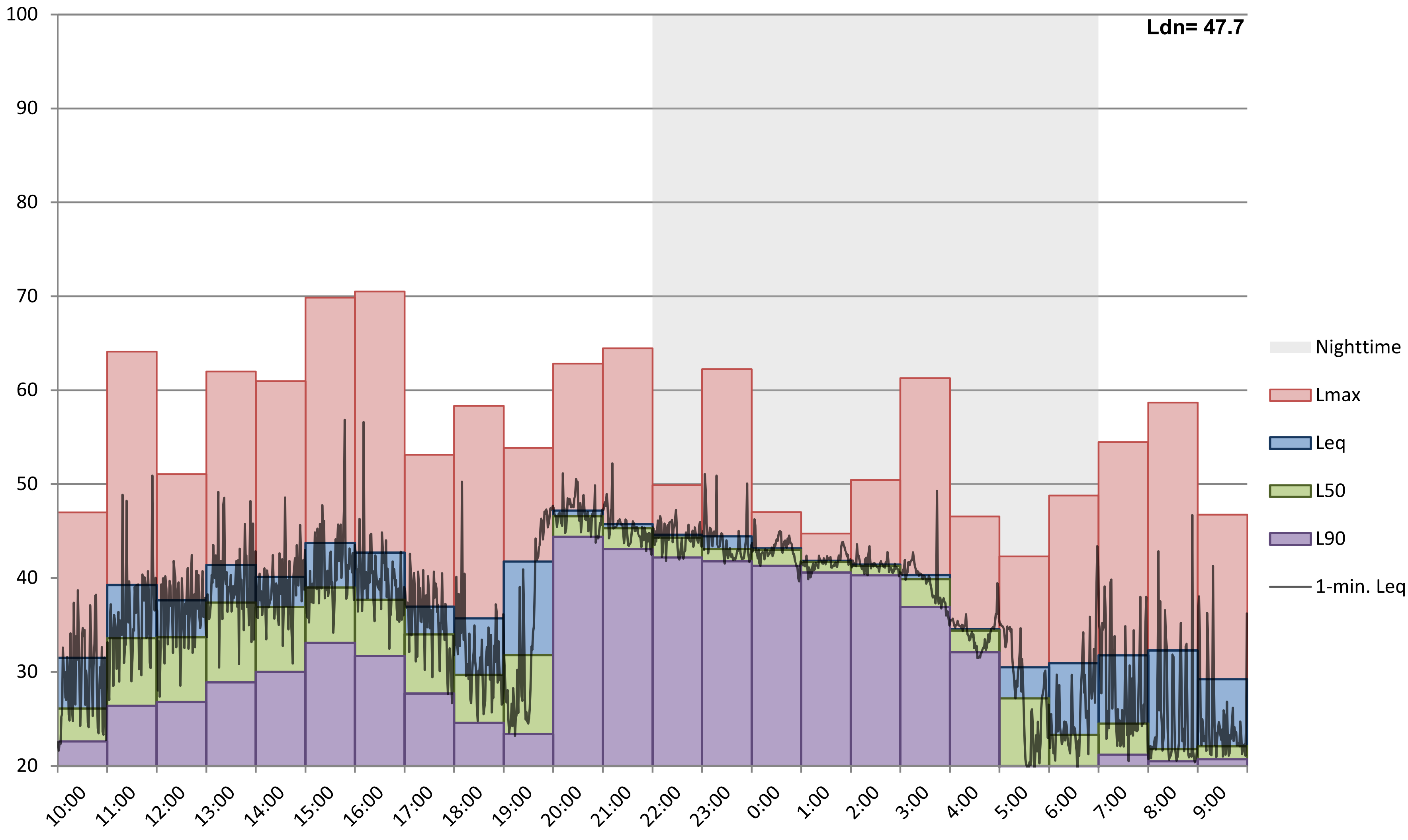
Calculated CNEL, dBA

49.8

Calculated L_{dn}, dBA

47.7

Attachment A
10212 - Campo Wind Project with Boulder Brush Facilities - LT2
August 30, 2019 to August 31, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 31, 2019 to September 01, 2019

Site: LT3

Hour	Leq	Lmax	L50	L90
11:00	40.6	65.2	33.0	28.1
12:00	45.2	69.4	33.9	27.7
13:00	49.2	71.5	39.9	32.0
14:00	44.7	65.1	39.6	31.9
15:00	40.9	61.7	34.9	28.2
16:00	41.9	55.4	38.1	32.4
17:00	38.2	50.6	35.2	29.4
18:00	47.6	70.4	31.2	27.3
19:00	51.1	67.6	41.6	27.4
20:00	54.8	66.2	53.7	51.8
21:00	54.2	72.4	53.8	52.0
22:00	53.3	74.9	52.1	50.5
23:00	53.7	83.2	49.8	48.9
0:00	50.4	65.6	49.4	48.3
1:00	48.7	62.5	48.2	46.8
2:00	48.2	70.4	46.9	45.6
3:00	51.1	77.9	45.3	44.1
4:00	47.0	53.1	45.1	40.8
5:00	42.5	53.7	33.6	20.1
6:00	54.2	86.9	28.1	25.3
7:00	37.7	65.3	27.8	25.0
8:00	38.1	63.2	27.7	25.2
9:00	35.5	61.7	27.0	24.2
10:00	35.9	62.4	29.9	24.8

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	35.5	50.6	27.0	24.2
Nighttime (10 p.m. - 7 a.m.)	42.5	53.1	28.1	20.1

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	48.1	64.5	36.5	31.2
Nighttime (10 p.m. - 7 a.m.)	51.1	69.8	44.3	41.2

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	54.8	72.4	53.8	52.0
Nighttime (10 p.m. - 7 a.m.)	54.2	86.9	52.1	50.5

Energy Distribution

Daytime	46%
Nighttime	54%

Calculated CNEL, dBA

57.7

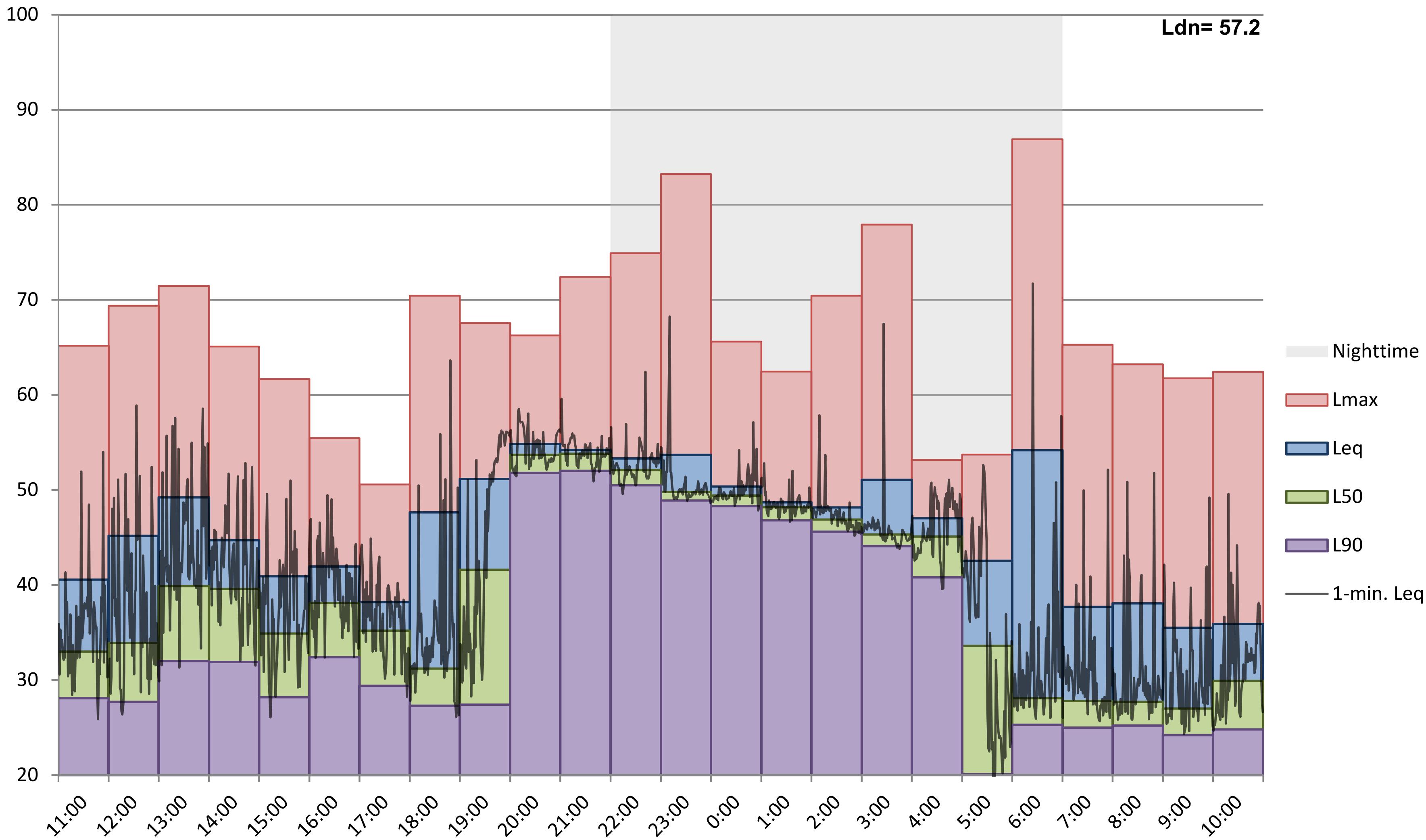
Calculated L_{dn}, dBA

57.2

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT3

August 31, 2019 to September 01, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: September 01, 2019 to September 02, 2019

Site: LT3

Hour	Leq	Lmax	L50	L90
11:00	54.3	85.0	29.0	24.6
12:00	38.7	61.8	31.0	25.4
13:00	49.9	80.0	34.1	27.4
14:00	40.4	67.2	29.2	24.9
15:00	44.7	74.1	35.7	29.9
16:00	43.7	72.9	30.5	25.5
17:00	71.6	101.7	28.7	25.1
18:00	44.5	73.9	28.2	25.0
19:00	51.6	68.3	47.5	26.3
20:00	53.9	67.2	53.6	52.2
21:00	52.4	75.4	51.3	49.3
22:00	51.3	73.6	50.6	49.7
23:00	51.1	53.8	50.9	49.5
0:00	51.1	65.6	50.7	48.8
1:00	50.1	57.5	49.2	48.3
2:00	54.2	57.2	54.4	50.6
3:00	54.7	59.4	54.6	52.7
4:00	48.1	62.4	46.8	42.9
5:00	36.6	46.9	28.9	20.9
6:00	32.2	47.7	27.1	25.0
7:00	37.7	61.5	28.6	25.3
8:00	41.0	65.5	30.9	27.0
9:00	41.5	71.8	29.4	25.5
10:00	41.5	71.1	27.8	23.7

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	37.7	61.5	27.8	23.7
Nighttime (10 p.m. - 7 a.m.)	32.2	46.9	27.1	20.9

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	60.1	73.2	34.4	29.1
Nighttime (10 p.m. - 7 a.m.)	51.0	58.2	45.9	43.2

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	71.6	101.7	53.6	52.2
Nighttime (10 p.m. - 7 a.m.)	54.7	73.6	54.6	52.7

Energy Distribution

Daytime	93%
Nighttime	7%

Calculated CNEL, dBA

60.7

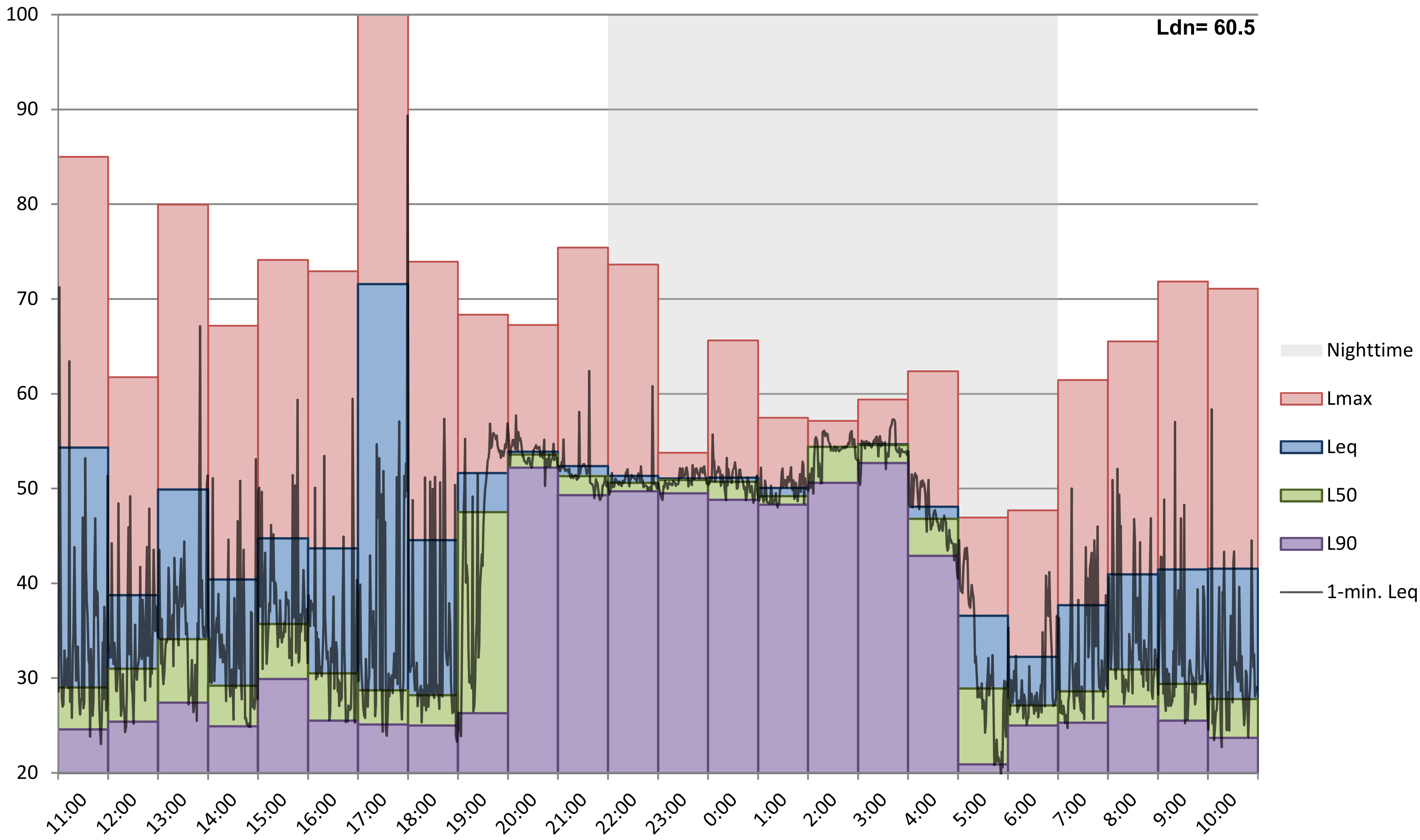
Calculated L_{dn}, dBA

60.5

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT3

September 01, 2019 to September 02, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 29, 2019 to August 30, 2019

Site: LT4

Hour	Leq	Lmax	L50	L90
11:00	42.0	60.2	38.7	31.4
12:00	41.3	58.4	38.5	29.1
13:00	44.0	56.1	41.4	33.8
14:00	45.4	56.0	43.6	34.7
15:00	46.0	58.2	44.3	37.5
16:00	46.5	57.1	44.9	38.6
17:00	44.3	54.9	42.3	35.5
18:00	42.9	59.7	38.7	30.3
19:00	47.6	55.2	46.6	27.5
20:00	49.0	56.7	48.5	46.8
21:00	48.1	64.7	47.1	45.4
22:00	47.9	53.3	46.8	45.2
23:00	47.0	58.4	46.6	44.4
0:00	44.9	55.2	44.0	39.9
1:00	44.7	55.5	44.3	37.8
2:00	39.3	53.3	37.3	35.6
3:00	36.0	53.8	34.8	32.1
4:00	45.8	71.2	31.4	25.7
5:00	42.1	60.8	33.0	23.4
6:00	45.3	63.5	38.8	27.7
7:00	45.1	58.8	40.4	32.6
8:00	40.1	54.0	37.6	32.5
9:00	41.7	61.5	37.9	33.1
10:00	42.6	66.3	37.8	32.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	40.1	54.0	37.6	27.5
Nighttime (10 p.m. - 7 a.m.)	36.0	53.3	31.4	23.4

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	45.2	58.5	41.9	34.8
Nighttime (10 p.m. - 7 a.m.)	44.8	58.3	39.7	34.6

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	49.0	66.3	48.5	46.8
Nighttime (10 p.m. - 7 a.m.)	47.9	71.2	46.8	45.2

Energy Distribution

Daytime	65%
Nighttime	35%

Calculated CNEL, dBA

51.8

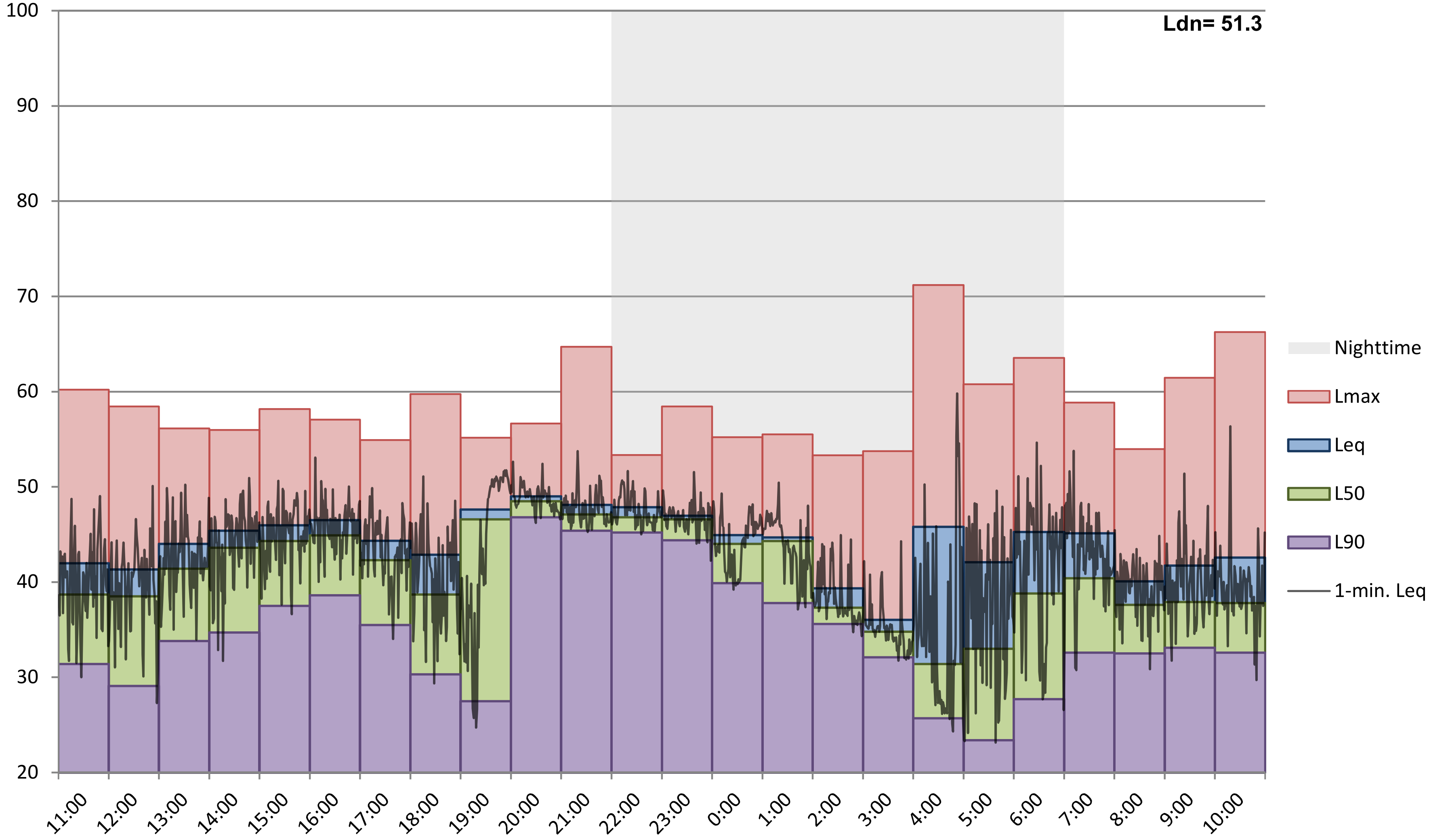
Calculated L_{dn}, dBA

51.3

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT4

August 29, 2019 to August 30, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 30, 2019

Site: LT4

Hour	Leq	Lmax	L50	L90
11:00	43.2	63.7	41.2	34.7
12:00	45.1	56.3	43.5	37.6
13:00	46.8	56.8	45.4	39.5
14:00	48.7	58.5	47.5	42.6
15:00	50.5	60.2	48.8	42.6
16:00	47.9	58.4	46.6	41.8
17:00	47.6	64.6	46.0	40.0
18:00	45.2	69.2	41.4	34.0
19:00	49.7	61.5	49.5	37.3
20:00	50.1	56.1	49.6	47.9
21:00	48.2	57.8	47.7	45.8
22:00	46.8	58.7	46.0	44.0
23:00	45.4	57.5	43.3	40.1
0:00	41.3	53.7	39.5	37.3

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	43.2	56.1	41.2	34.0
Nighttime (10 p.m. - 7 a.m.)	41.3	53.7	39.5	37.3

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	46.7	60.3	46.1	40.3
Nighttime (10 p.m. - 7 a.m.)	40.3	56.6	42.9	40.5

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	50.5	69.2	49.6	47.9
Nighttime (10 p.m. - 7 a.m.)	46.8	58.7	46.0	44.0

Energy Distribution

Daytime	88%
Nighttime	12%

Calculated CNEL, dBA

52.0

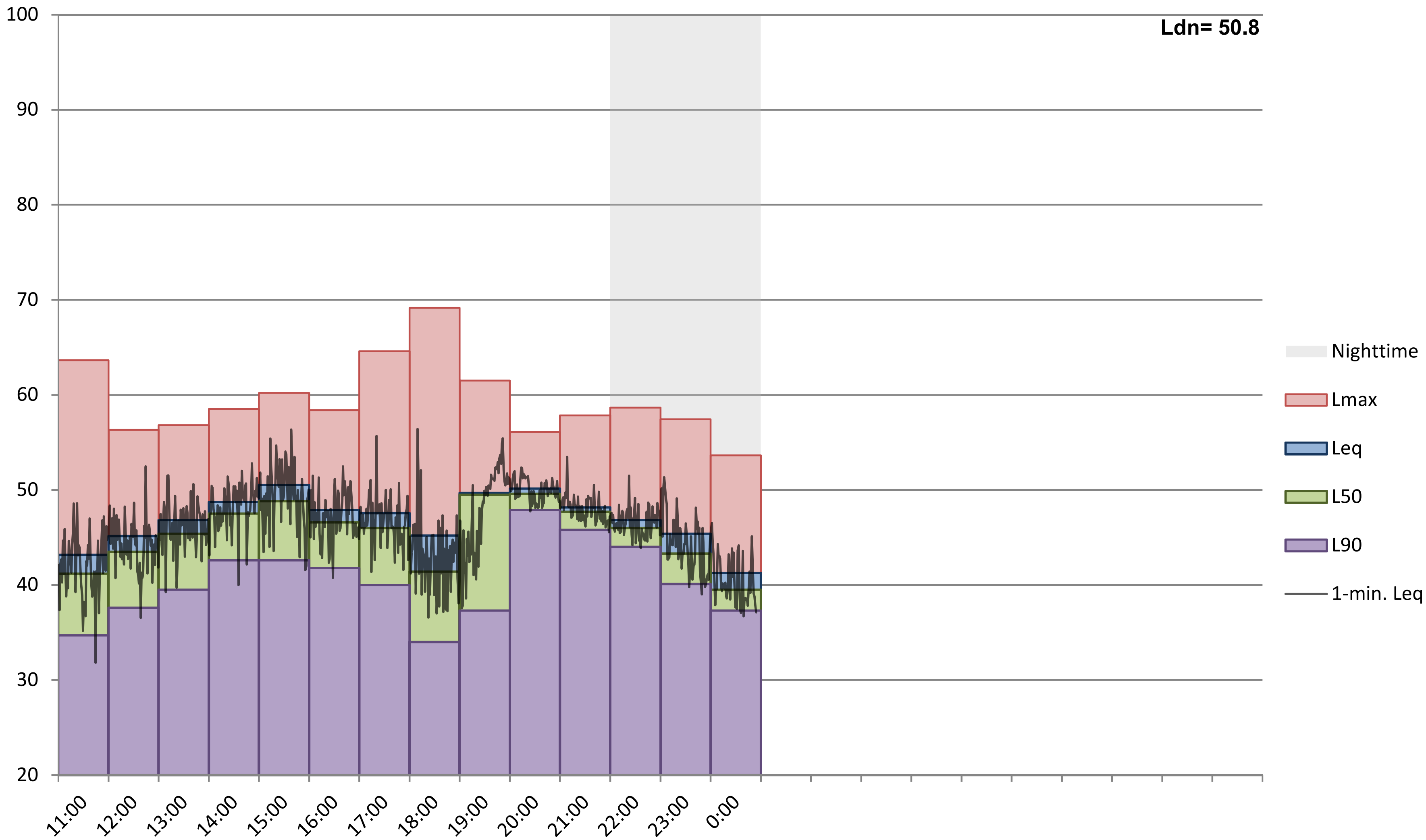
Calculated L_{dn}, dBA

50.8

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT4

August 30, 2019



Attachment A
Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 31, 2019 to September 01, 2019

Site: LT5

Hour	Leq	Lmax	L50	L90
12:00	36.7	59.6	32.1	27.9
13:00	38.9	67.8	29.7	26.6
14:00	39.8	67.0	32.2	28.2
15:00	38.0	57.7	33.8	28.6
16:00	43.6	65.7	33.1	28.3
17:00	36.4	55.6	32.2	28.9
18:00	40.5	59.9	31.9	27.8
19:00	45.9	65.5	35.3	27.8
20:00	43.8	61.6	42.8	40.3
21:00	48.6	64.5	45.3	39.8
22:00	49.5	66.9	46.1	39.6
23:00	48.4	76.2	42.1	40.0
0:00	54.9	79.4	43.7	40.7
1:00	43.1	49.8	43.2	40.4
2:00	43.9	64.0	40.3	38.9
3:00	38.9	50.4	37.9	35.8
4:00	45.3	70.6	36.6	32.9
5:00	55.9	83.4	37.6	27.2
6:00	36.3	55.1	28.9	26.4
7:00	35.7	57.3	29.6	27.1
8:00	37.5	60.3	32.6	28.4
9:00	36.5	52.0	31.5	28.4
10:00	39.4	60.1	33.1	27.8
11:00	47.4	76.4	34.0	29.1

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	35.7	52.0	29.6	26.6
Nighttime (10 p.m. - 7 a.m.)	36.3	49.8	28.9	26.4

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	42.7	62.1	33.9	29.7
Nighttime (10 p.m. - 7 a.m.)	50.2	66.2	39.6	35.8

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	48.6	76.4	45.3	40.3
Nighttime (10 p.m. - 7 a.m.)	55.9	83.4	46.1	40.7

Energy Distribution

Daytime	23%
Nighttime	77%

Calculated CNEL, dBA

56.2

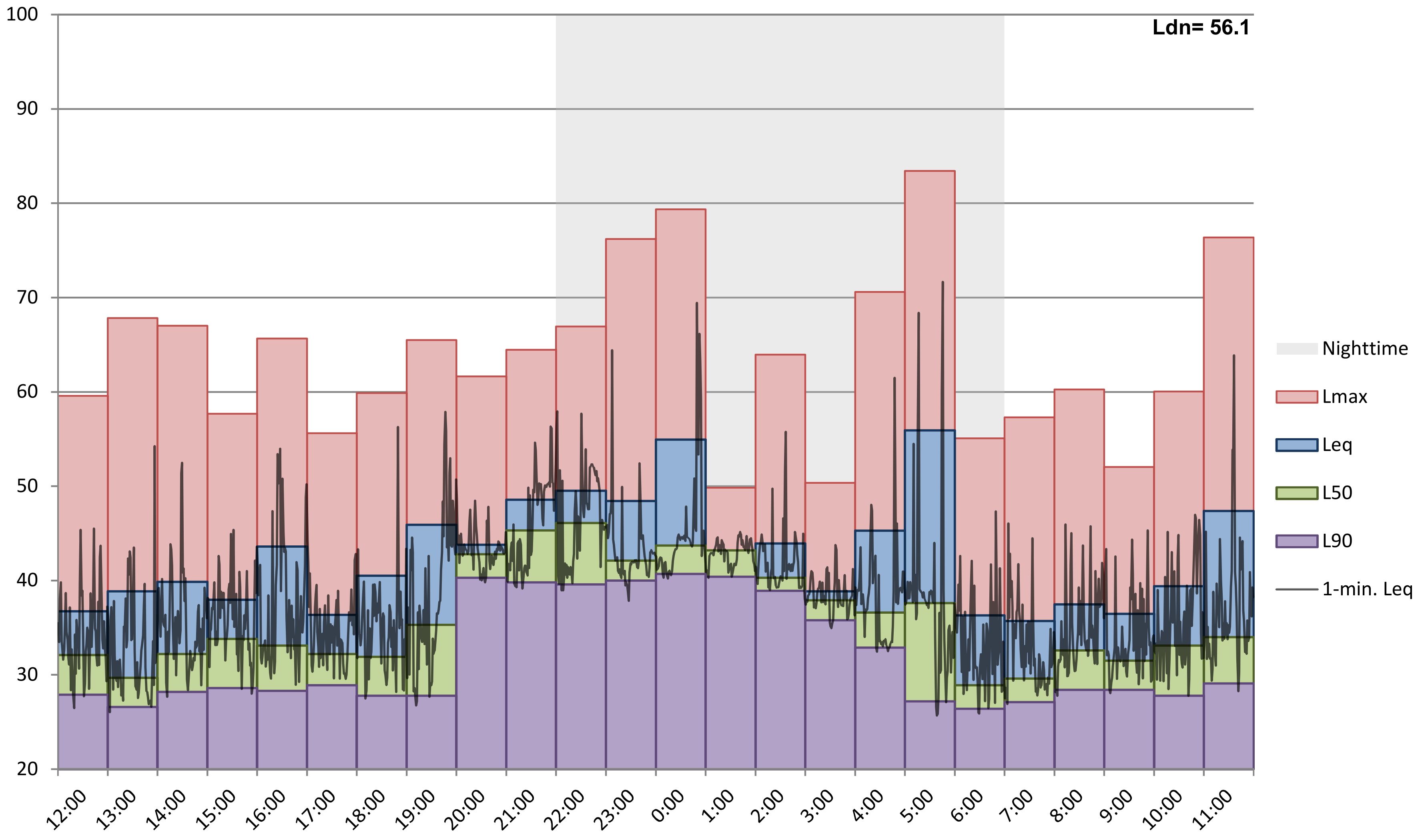
Calculated L_{dn}, dBA

56.1

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT5

August 31, 2019 to September 01, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: September 01, 2019

Site: LT5

Hour	Leq	Lmax	L50	L90
12:00	42.8	67.2	36.1	31.9
13:00	42.1	61.4	38.0	31.7
14:00	56.6	86.1	40.1	29.7
15:00	39.6	55.0	34.4	30.1
16:00	40.7	62.3	33.3	28.4
17:00	46.4	67.1	37.8	28.6
18:00	46.9	70.9	29.2	26.6
19:00	49.4	67.8	40.9	28.5
20:00	44.8	65.6	41.3	40.3
21:00	45.3	67.1	39.9	39.2
22:00	45.9	65.3	39.4	38.6
23:00	45.1	67.4	39.7	38.4
0:00	46.9	64.1	40.7	39.4

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	39.6	55.0	29.2	26.6
Nighttime (10 p.m. - 7 a.m.)	45.1	64.1	39.4	38.4

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	47.0	67.0	37.1	31.5
Nighttime (10 p.m. - 7 a.m.)	41.3	65.6	39.9	38.8

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	56.6	86.1	41.3	40.3
Nighttime (10 p.m. - 7 a.m.)	46.9	67.4	40.7	39.4

Energy Distribution

Daytime	86%
Nighttime	14%

Calculated CNEL, dBA

52.5

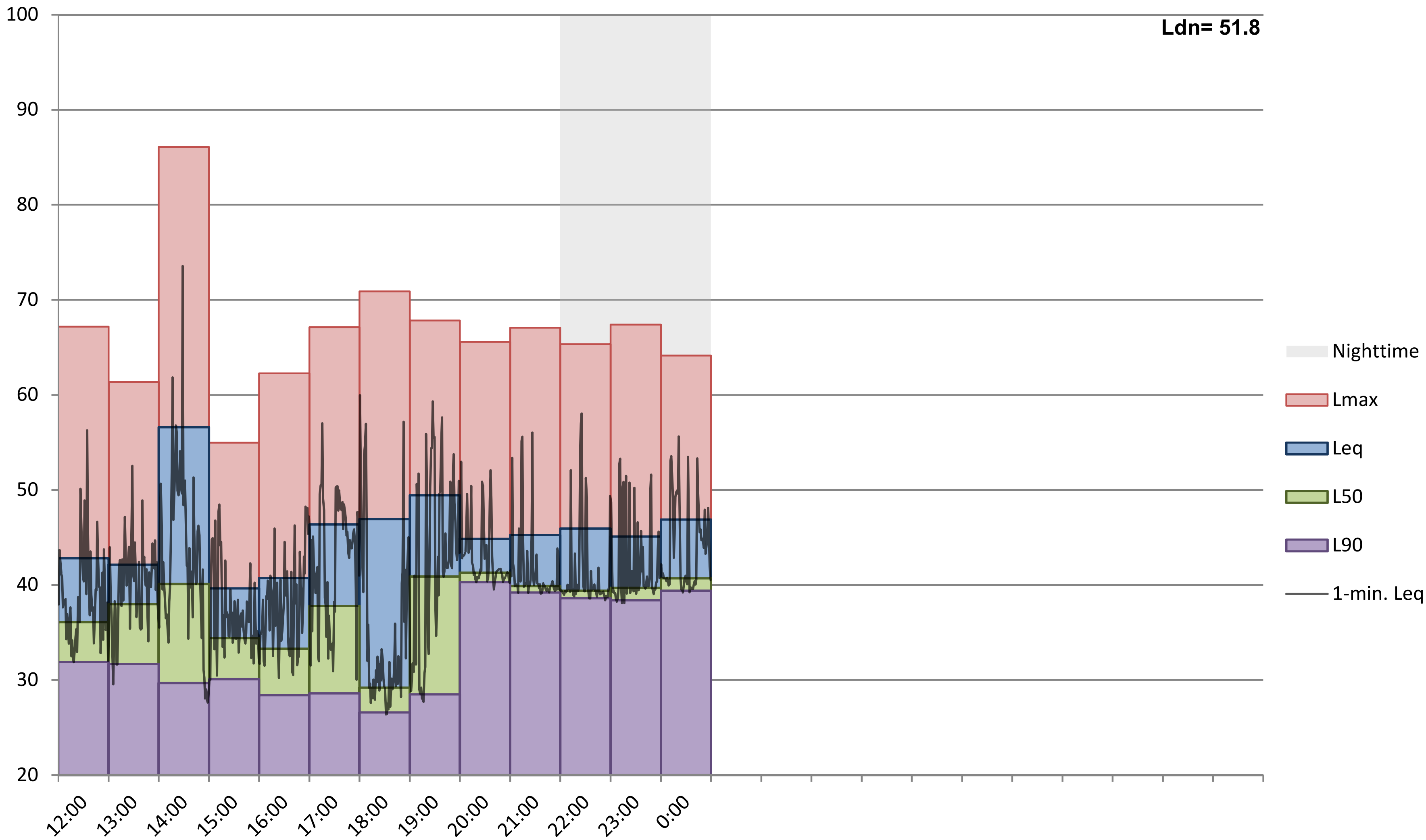
Calculated L_{dn}, dBA

51.8

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT5

September 01, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: September 02, 2019 to September 03, 2019

Site: LT6

Hour	Leq	Lmax	L50	L90
12:00	35.3	52.9	31.0	28.1
13:00	40.8	65.8	31.4	27.5
14:00	48.4	72.0	34.0	25.7
15:00	56.3	79.3	43.8	33.9
16:00	41.0	61.0	32.9	27.7
17:00	37.9	64.9	32.1	28.0
18:00	39.0	63.2	28.6	24.4
19:00	39.1	62.9	32.3	21.1
20:00	44.4	69.8	42.9	41.4
21:00	44.4	54.2	44.2	42.4
22:00	45.9	63.7	45.7	44.6
23:00	45.1	48.1	45.1	44.3
0:00	44.6	47.8	44.7	43.8
1:00	45.6	52.3	45.5	43.8
2:00	42.6	46.9	41.4	40.3
3:00	42.2	46.6	41.5	40.4
4:00	42.6	66.4	40.6	37.8
5:00	36.0	64.0	30.5	24.0
6:00	37.4	63.5	29.0	25.0
7:00	38.0	58.1	34.4	27.4
8:00	36.5	59.9	29.0	24.8
9:00	37.8	62.4	28.6	24.6
10:00	40.8	65.9	29.4	24.6
11:00	46.9	70.6	34.2	26.0

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	35.3	52.9	28.6	21.1
Nighttime (10 p.m. - 7 a.m.)	36.0	46.6	29.0	24.0

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	46.6	64.2	33.9	28.5
Nighttime (10 p.m. - 7 a.m.)	43.5	55.5	40.4	38.2

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	56.3	79.3	44.2	42.4
Nighttime (10 p.m. - 7 a.m.)	45.9	66.4	45.7	44.6

Energy Distribution

Daytime	77%
Nighttime	23%

Calculated CNEL, dBA

50.7

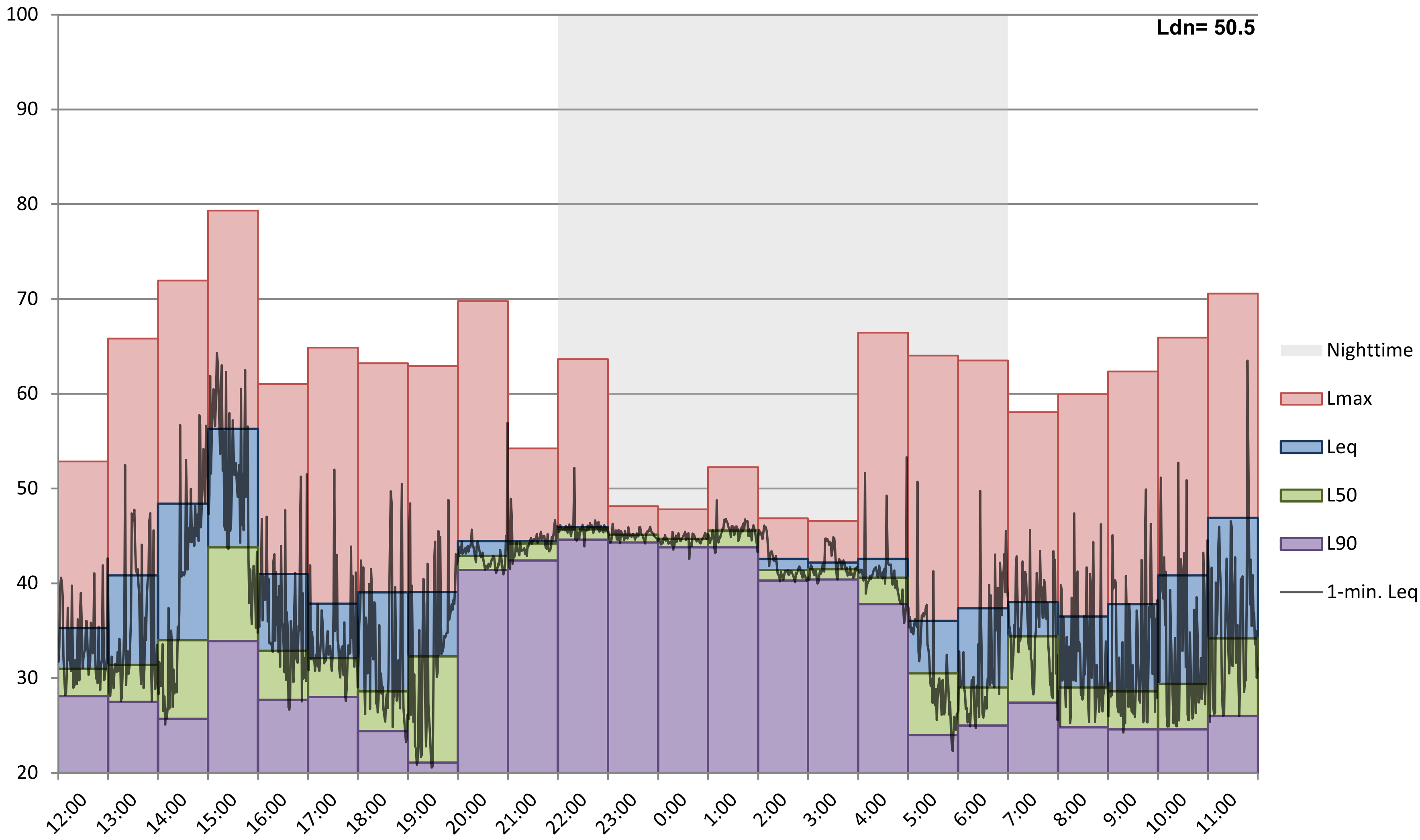
Calculated L_{dn}, dBA

50.5

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT6

September 02, 2019 to September 03, 2019



Attachment A
Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**
Date: September 03, 2019 to September 04, 2019
Site: LT6

Hour	Leq	Lmax	L50	L90
12:00	37.7	60.2	31.0	25.8
13:00	37.8	63.4	28.9	25.2
14:00	39.7	61.4	34.7	27.8
15:00	54.1	79.0	43.9	32.0
16:00	58.3	80.9	33.2	27.2
17:00	39.8	60.2	34.9	29.1
18:00	35.2	51.0	29.5	23.4
19:00	42.8	55.6	35.7	22.6
20:00	46.7	55.6	46.5	45.0
21:00	47.9	69.8	47.4	44.7
22:00	44.9	47.1	44.9	43.9
23:00	44.1	47.8	44.1	43.1
0:00	44.9	47.5	44.8	43.6
1:00	44.5	62.5	44.3	42.3
2:00	43.8	59.3	43.6	42.8
3:00	44.1	63.4	43.5	41.8
4:00	42.6	60.3	42.4	41.2
5:00	38.8	63.4	29.0	20.0
6:00	45.8	78.0	29.1	24.4
7:00	51.0	77.4	34.1	25.9
8:00	36.3	59.0	29.2	24.5
9:00	42.5	68.7	28.5	24.4
10:00	36.4	52.4	31.4	25.6
11:00	50.0	77.8	28.8	24.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	35.2	51.0	28.5	22.6
Nighttime (10 p.m. - 7 a.m.)	38.8	47.1	29.0	20.0

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	49.5	64.8	34.5	28.5
Nighttime (10 p.m. - 7 a.m.)	44.1	58.8	40.6	38.1

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	58.3	80.9	47.4	45.0
Nighttime (10 p.m. - 7 a.m.)	45.8	78.0	44.9	43.9

Energy Distribution

Daytime	85%
Nighttime	15%

Calculated CNEL, dBA

52.1

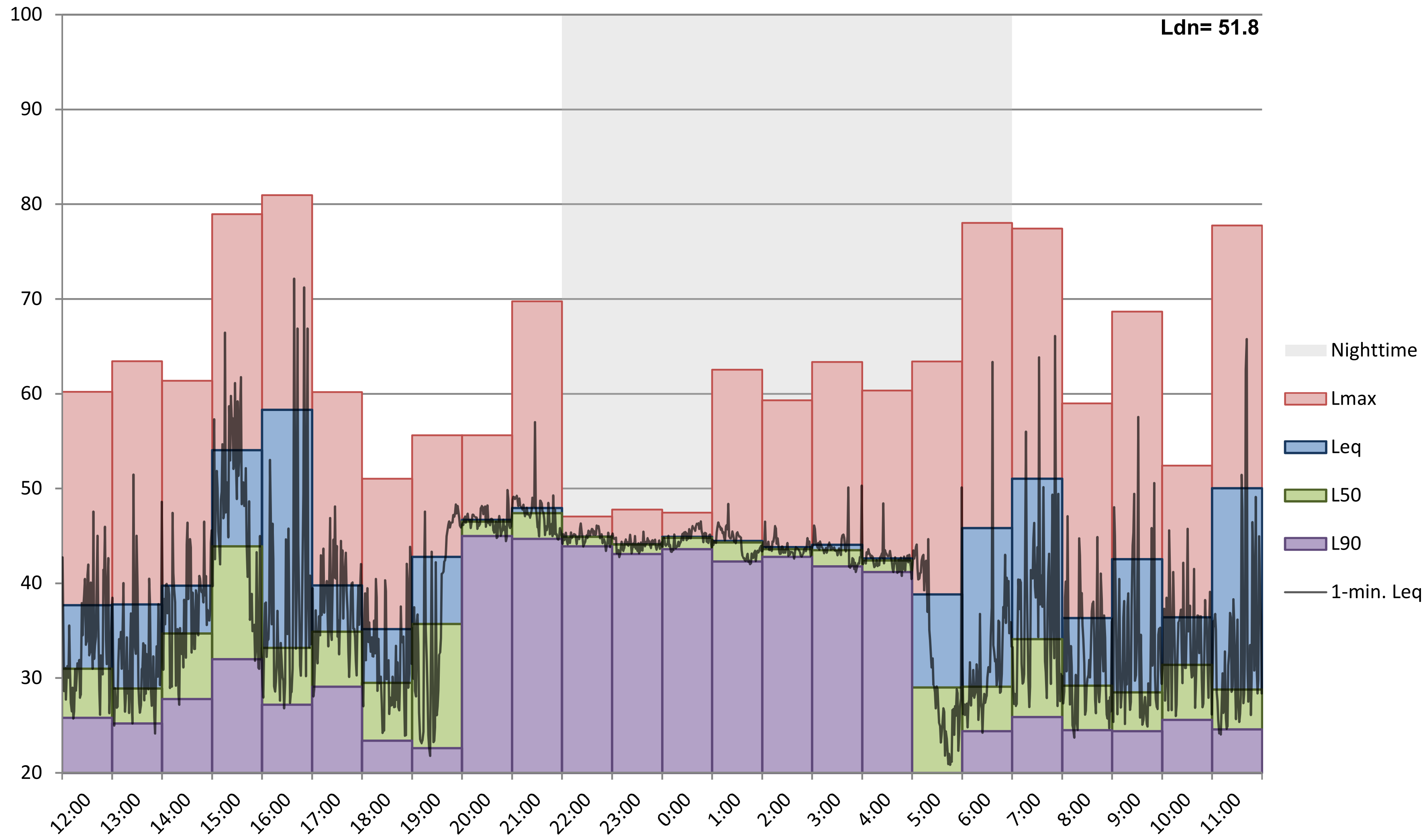
Calculated L_{dn}, dBA

51.8

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT6

September 03, 2019 to September 04, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 31, 2019 to September 01, 2019

Site: LT8

Hour	Leq	Lmax	L50	L90
13:00	35.3	53.5	30.6	27.2
14:00	49.9	75.5	31.9	27.2
15:00	45.2	75.6	30.5	26.3
16:00	47.1	71.7	28.9	26.3
17:00	33.5	51.5	27.9	24.8
18:00	37.3	65.8	24.8	22.2
19:00	47.7	76.2	38.6	33.5
20:00	48.0	73.4	43.4	42.3
21:00	43.4	57.9	42.1	40.8
22:00	44.7	72.6	42.0	41.0
23:00	44.2	70.0	42.4	41.6
0:00	44.7	70.4	42.3	41.5
1:00	43.0	60.8	41.7	40.8
2:00	46.3	76.5	42.0	40.7
3:00	49.3	77.3	40.6	39.7
4:00	40.2	57.8	39.6	37.8
5:00	33.6	43.9	31.4	28.7
6:00	35.5	51.6	32.9	30.3
7:00	32.8	44.4	31.0	27.9
8:00	46.3	73.2	29.2	26.6
9:00	33.8	49.5	29.2	26.1
10:00	42.8	56.5	33.8	28.1
11:00	41.0	71.0	31.1	28.0
12:00	36.3	55.6	31.7	28.1

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	32.8	44.4	24.8	22.2
Nighttime (10 p.m. - 7 a.m.)	33.6	43.9	31.4	28.7

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	44.5	63.4	32.3	29.0
Nighttime (10 p.m. - 7 a.m.)	44.4	64.5	39.4	38.0

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	49.9	76.2	43.4	42.3
Nighttime (10 p.m. - 7 a.m.)	49.3	77.3	42.4	41.6

Energy Distribution

Daytime	63%
Nighttime	37%

Calculated CNEL, dBA

51.3

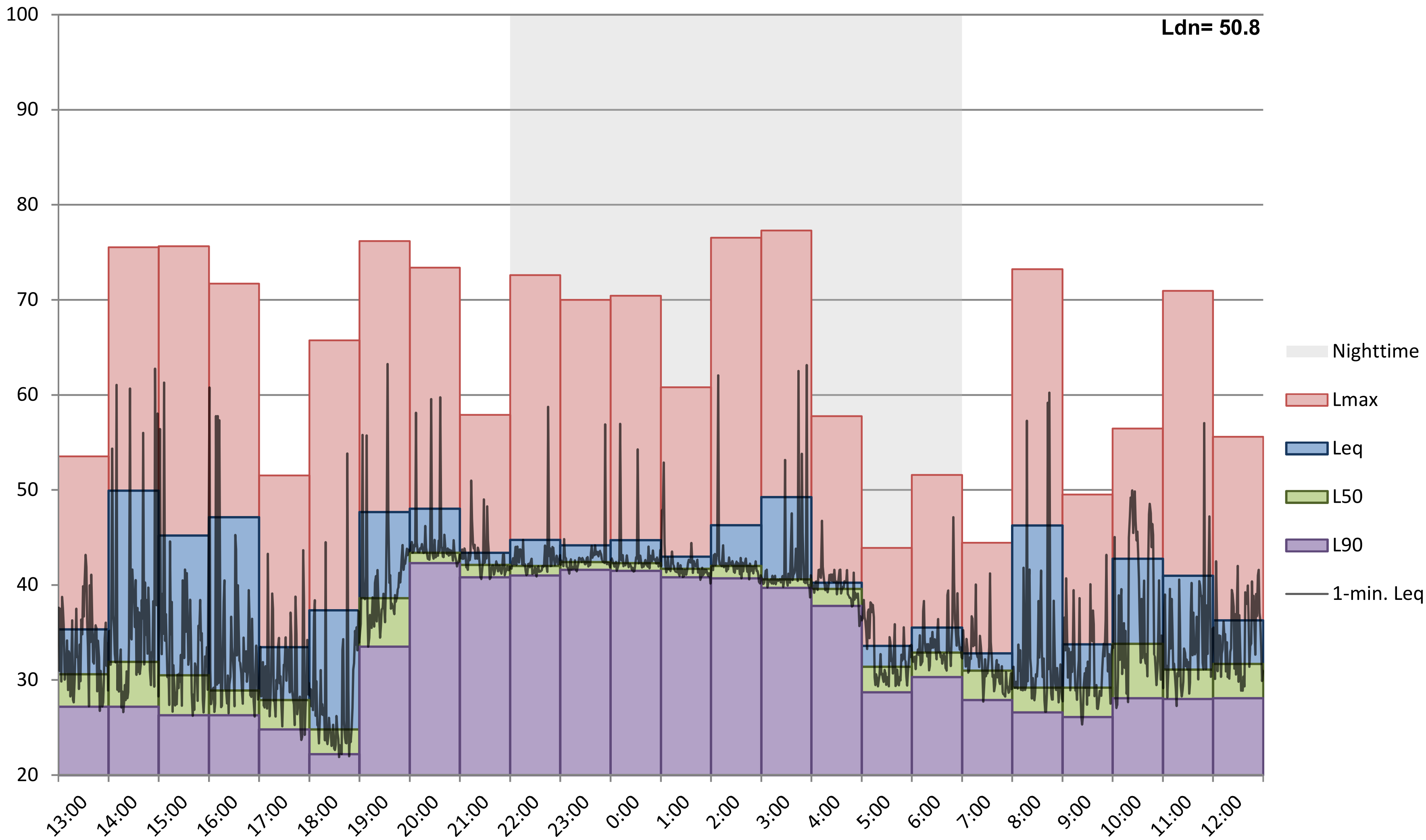
Calculated L_{dn}, dBA

50.8

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT8

August 31, 2019 to September 01, 2019



Attachment A
Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**
Date: September 01, 2019 to September 02, 2019
Site: LT8

Hour	Leq	Lmax	L50	L90
13:00	38.6	53.8	34.4	29.8
14:00	40.6	71.6	29.2	26.2
15:00	38.4	51.7	35.3	29.2
16:00	43.3	73.1	34.2	29.9
17:00	35.7	48.0	33.5	29.8
18:00	43.3	72.4	32.9	29.1
19:00	40.7	52.5	39.7	30.7
20:00	46.0	73.9	43.7	42.8
21:00	47.0	75.4	43.2	42.4
22:00	44.0	68.5	42.6	41.7
23:00	44.5	70.1	42.5	41.6
0:00	42.9	46.8	42.9	42.2
1:00	46.1	72.2	42.9	41.8
2:00	46.5	62.8	44.0	41.8
3:00	45.2	57.7	43.8	42.6
4:00	45.5	74.2	41.7	40.4
5:00	50.3	82.4	39.4	36.1
6:00	49.8	77.1	36.9	34.7
7:00	46.3	73.5	35.4	29.8
8:00	46.8	73.7	29.2	26.1
9:00	42.7	69.7	32.2	27.8
10:00	46.3	73.7	34.3	29.9
11:00	44.1	66.3	33.9	29.5
12:00	40.2	69.5	31.9	28.3

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	35.7	48.0	29.2	26.1
Nighttime (10 p.m. - 7 a.m.)	42.9	46.8	36.9	34.7

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	43.8	66.6	34.9	30.8
Nighttime (10 p.m. - 7 a.m.)	46.8	68.0	41.9	40.3

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	47.0	75.4	43.7	42.8
Nighttime (10 p.m. - 7 a.m.)	50.3	82.4	44.0	42.6

Energy Distribution

Daytime	46%
Nighttime	54%

Calculated CNEL, dBA

53.1

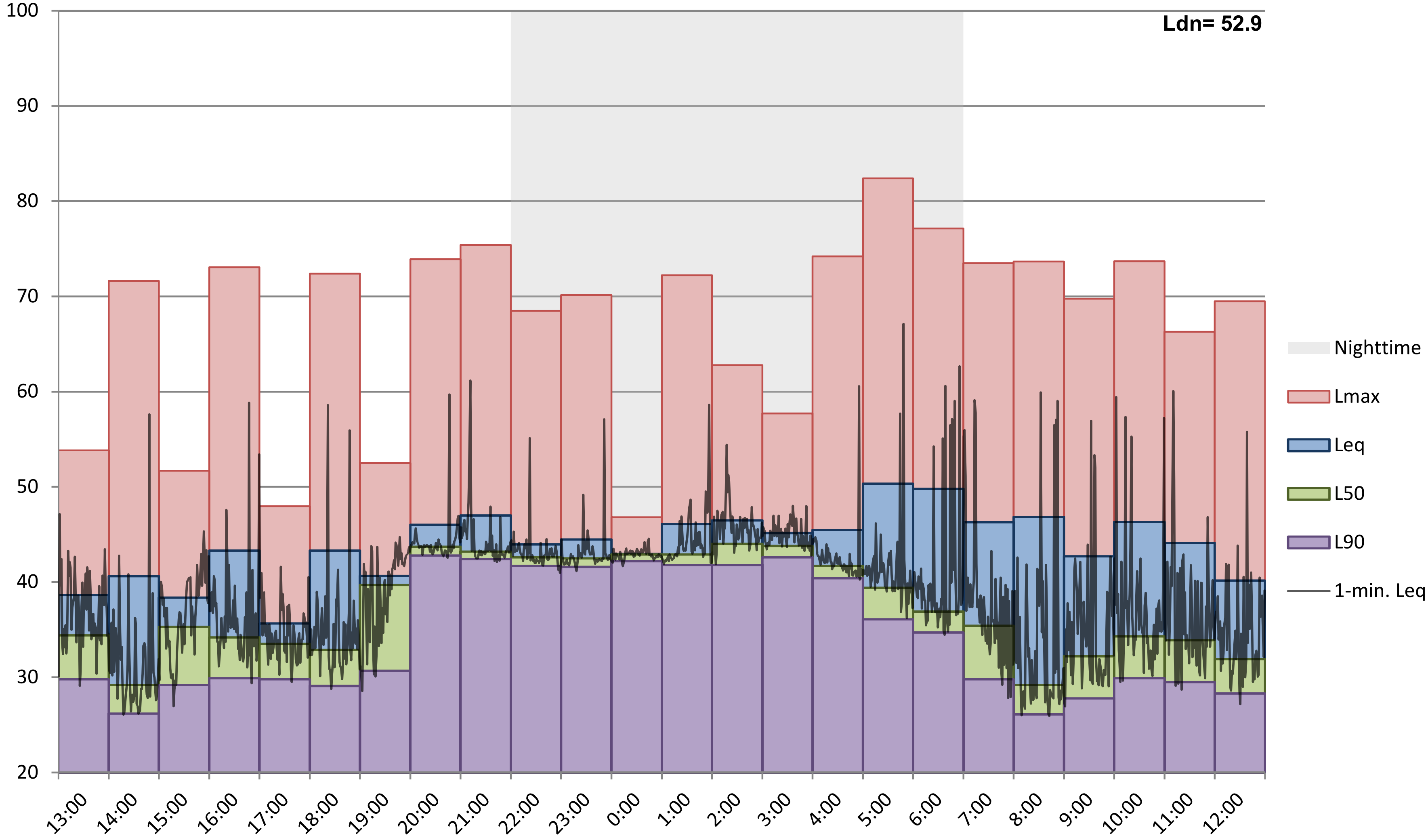
Calculated L_{dn}, dBA

52.9

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT8

September 01, 2019 to September 02, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 29, 2019

Site: LT9

Hour	Leq	Lmax	L50	L90
12:00	47.9	74.8	35.0	29.9
13:00	40.8	57.0	37.4	31.1
14:00	45.4	68.6	36.5	31.3
15:00	56.9	86.4	36.6	32.0
16:00	44.9	68.2	38.2	33.2
17:00	39.9	59.9	36.0	32.4
18:00	35.9	55.6	32.7	30.3
19:00	50.8	58.5	36.0	30.8
20:00	54.4	60.2	53.4	48.7
21:00	53.3	63.3	53.6	47.8
22:00	51.6	54.4	52.8	45.4
23:00	46.0	62.0	45.6	44.8
0:00	47.6	61.1	46.0	45.2
1:00	51.8	55.0	52.5	46.4
2:00	49.4	55.5	48.5	47.0
3:00	48.9	65.9	47.5	45.6
4:00	46.0	58.6	45.7	43.3
5:00	40.1	61.7	36.8	34.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	35.9	55.6	32.7	29.9
Nighttime (10 p.m. - 7 a.m.)	40.1	54.4	36.8	34.6

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	49.2	65.3	39.5	34.8
Nighttime (10 p.m. - 7 a.m.)	48.3	59.3	46.9	44.0

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	56.9	86.4	53.6	48.7
Nighttime (10 p.m. - 7 a.m.)	51.8	65.9	52.8	47.0

Energy Distribution

Daytime	67%
Nighttime	33%

Calculated CNEL, dBA

56.8

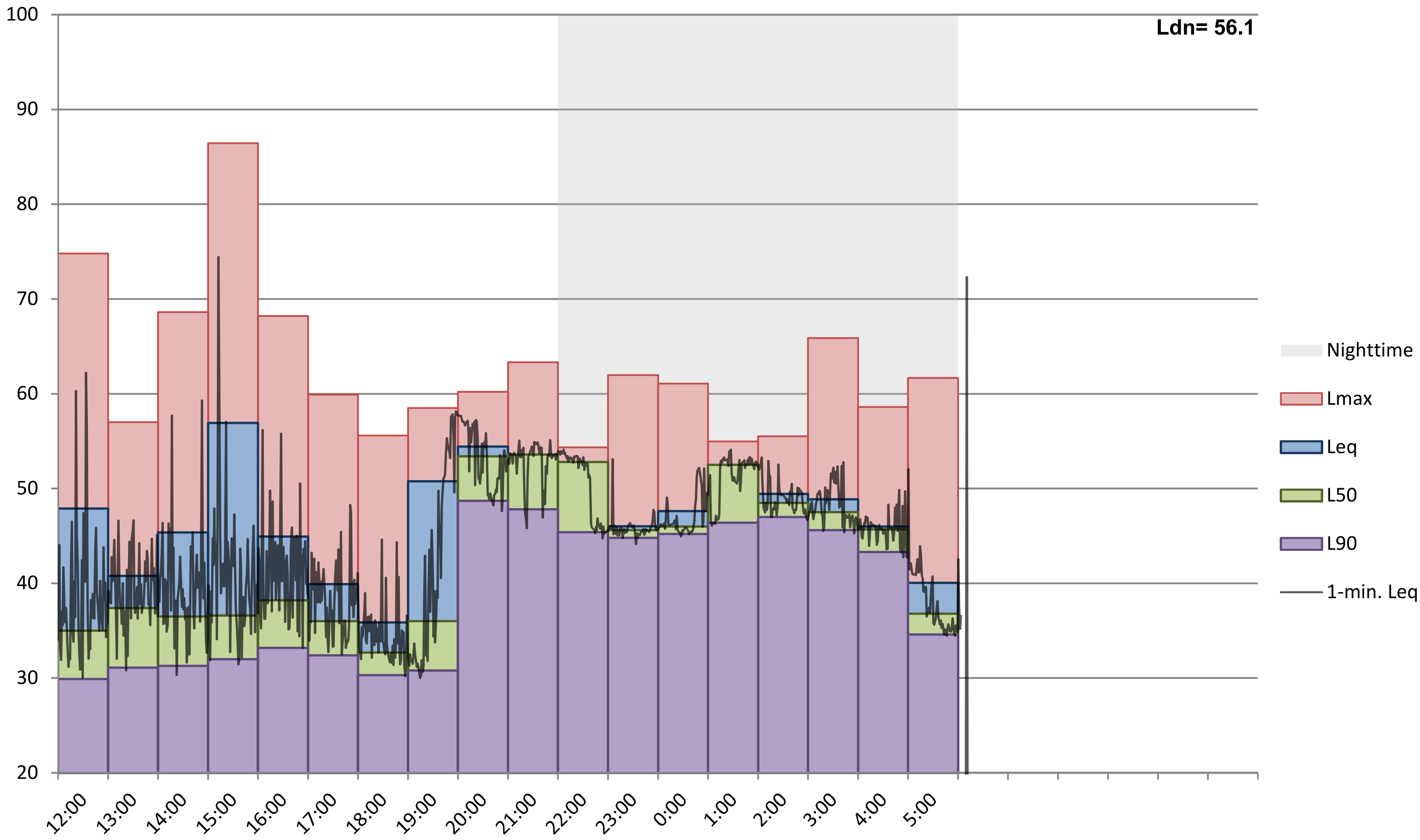
Calculated L_{dn}, dBA

56.1

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT9

August 29, 2019



Attachment A
Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**
Date: September 02, 2019 to September 03, 2019
Site: LT10

Hour	Leq	Lmax	L50	L90
14:00	41.9	64.8	34.3	27.4
15:00	51.0	70.3	41.7	37.3
16:00	40.1	55.8	38.4	31.8
17:00	41.7	64.1	30.7	26.4
18:00	48.0	78.1	29.8	26.3
19:00	40.3	59.4	35.8	28.9
20:00	43.1	57.5	41.5	40.3
21:00	44.5	60.8	40.9	39.3
22:00	40.4	49.6	39.5	38.0
23:00	41.5	58.9	39.4	37.9
0:00	41.7	54.9	40.9	37.9
1:00	41.3	50.9	40.7	38.4
2:00	43.6	48.9	43.7	41.9
3:00	43.0	51.6	42.8	39.3
4:00	41.8	55.3	41.3	36.8
5:00	37.2	61.4	25.1	18.8
6:00	38.9	58.1	29.0	22.4
7:00	37.7	57.5	25.9	21.6
8:00	36.2	53.6	26.3	22.4
9:00	38.5	56.1	28.4	24.4
10:00	39.6	57.5	30.6	24.9
11:00	45.8	65.8	32.8	26.4
12:00	39.9	59.0	30.0	26.7
13:00	42.7	72.1	30.2	25.7

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	36.2	53.6	25.9	21.6
Nighttime (10 p.m. - 7 a.m.)	37.2	48.9	25.1	18.8

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	44.1	62.2	33.2	28.7
Nighttime (10 p.m. - 7 a.m.)	41.4	54.4	38.0	34.6

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	51.0	78.1	41.7	40.3
Nighttime (10 p.m. - 7 a.m.)	43.6	61.4	43.7	41.9

Energy Distribution

Daytime	75%
Nighttime	25%

Calculated CNEL, dBA

48.6

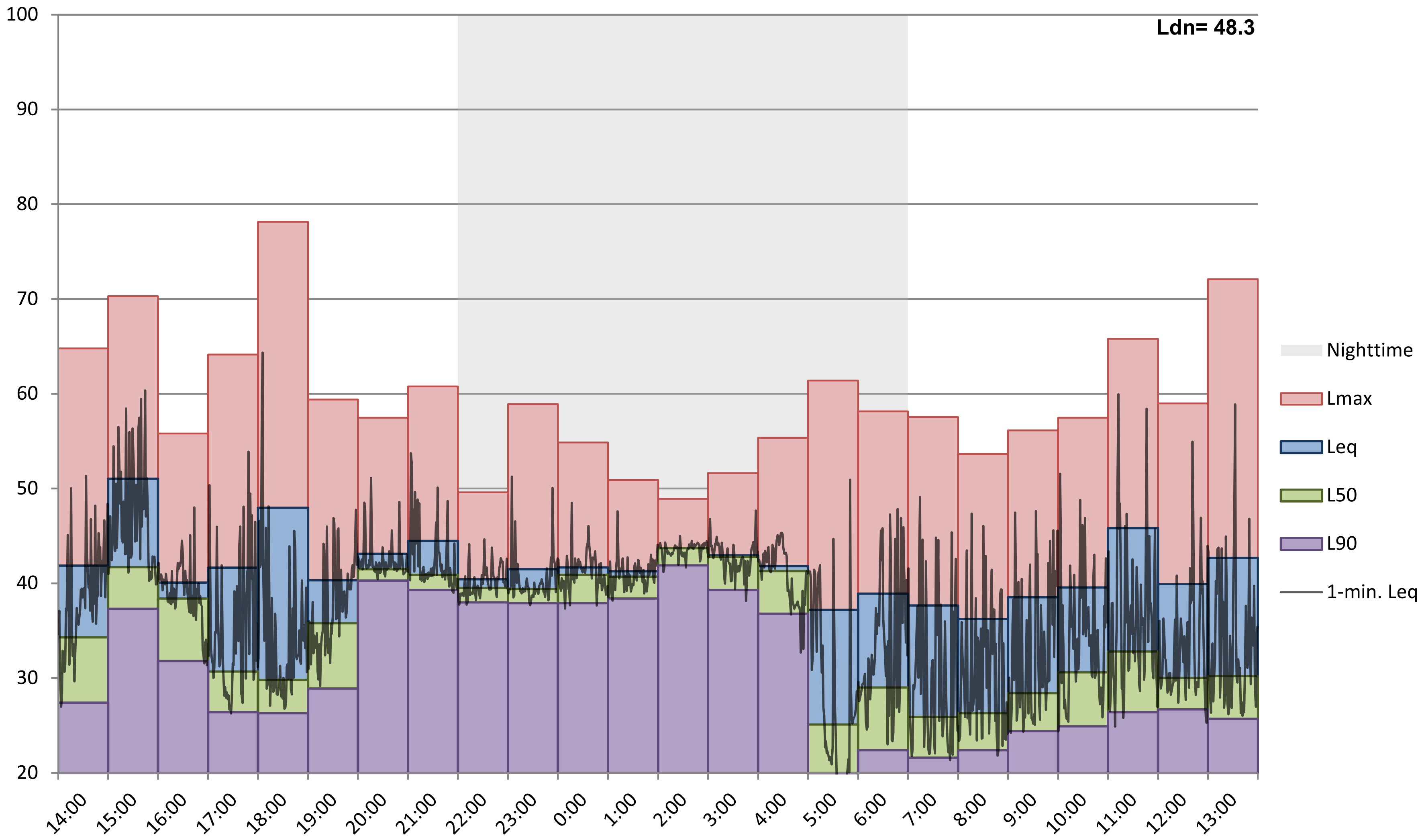
Calculated L_{dn}, dBA

48.3

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT10

September 02, 2019 to September 03, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 29, 2019

Site: LT11

Hour	Leq	Lmax	L50	L90
17:00	57.6	80.7	36.3	28.7
18:00	57.3	80.3	33.1	26.1
19:00	56.5	77.7	48.1	26.8
20:00	57.9	76.8	55.7	54.8
21:00	56.4	73.7	54.2	52.9
22:00	55.7	73.8	52.8	51.9
23:00	56.7	79.4	52.7	51.9

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	56.4	73.7	33.1	26.1
Nighttime (10 p.m. - 7 a.m.)	55.7	73.8	52.7	51.9

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	52.4	77.8	45.5	37.9
Nighttime (10 p.m. - 7 a.m.)	49.7	76.6	52.8	51.9

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	57.9	80.7	55.7	54.8
Nighttime (10 p.m. - 7 a.m.)	56.7	79.4	52.8	51.9

Energy Distribution

Daytime	76%
Nighttime	24%

Calculated CNEL, dBA

63.1

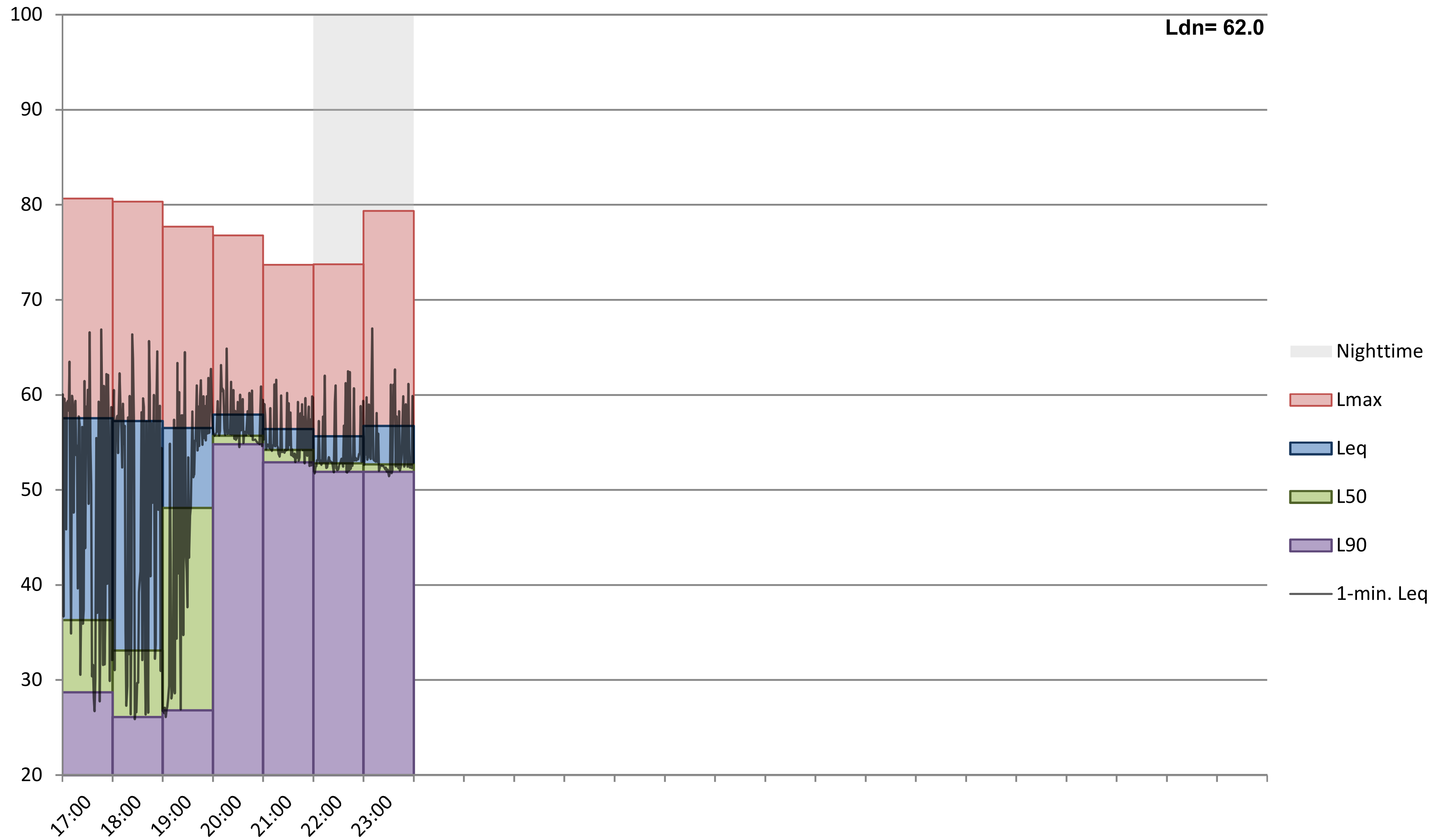
Calculated L_{dn}, dBA

62.0

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT11

August 29, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: August 31, 2019 to September 01, 2019

Site: LT12

Hour	Leq	Lmax	L50	L90
13:00	50.8	77.2	34.7	27.0
14:00	48.7	75.0	35.2	28.0
15:00	48.0	76.7	35.0	27.1
16:00	48.9	75.5	27.7	25.0
17:00	54.6	81.5	26.4	23.9
18:00	50.3	76.5	26.8	22.4
19:00	45.3	72.9	31.9	22.6
20:00	46.2	70.8	44.0	43.2
21:00	43.9	53.7	43.5	42.9
22:00	43.3	60.7	42.8	41.5
23:00	46.1	73.2	43.3	42.2
0:00	43.4	46.0	43.2	42.4
1:00	46.2	73.8	43.0	42.3
2:00	41.8	47.9	41.4	40.8
3:00	40.4	44.1	40.3	39.5
4:00	46.9	77.4	37.0	32.7
5:00	28.2	50.9	25.9	20.7
6:00	33.9	50.3	27.8	24.4
7:00	44.7	74.6	28.7	26.1
8:00	33.5	47.7	27.8	26.0
9:00	32.4	47.0	28.0	26.1
10:00	44.3	71.0	30.7	26.7
11:00	37.6	59.1	31.0	26.9
12:00	44.1	73.7	34.7	28.5

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	32.4	47.0	26.4	22.4
Nighttime (10 p.m. - 7 a.m.)	28.2	44.1	25.9	20.7

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	47.9	68.9	32.4	28.2
Nighttime (10 p.m. - 7 a.m.)	43.5	58.3	38.3	36.3

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	54.6	81.5	44.0	43.2
Nighttime (10 p.m. - 7 a.m.)	46.9	77.4	43.3	42.4

Energy Distribution

Daytime	82%
Nighttime	18%

Calculated CNEL, dBA

51.2

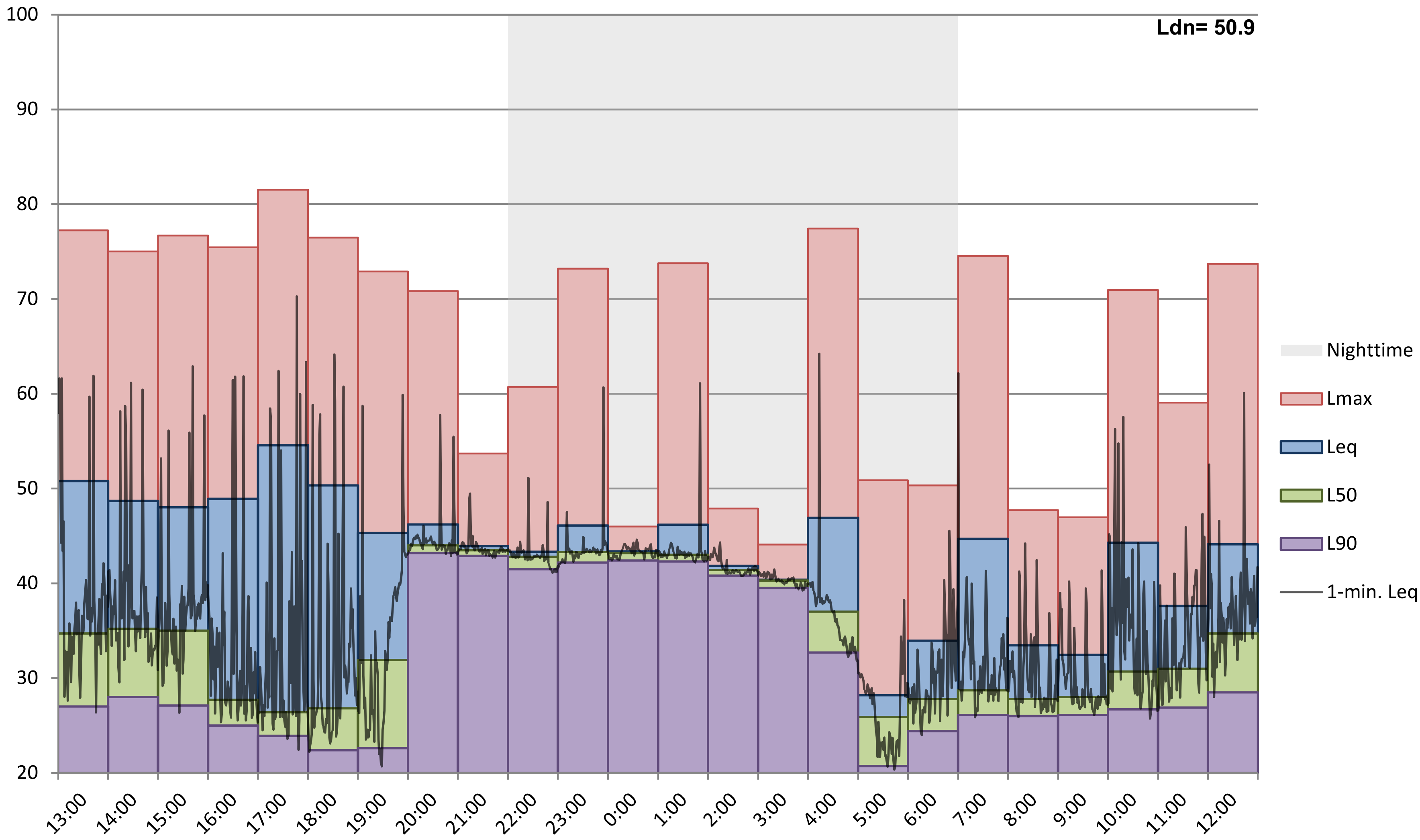
Calculated L_{dn}, dBA

50.9

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT12

August 31, 2019 to September 01, 2019



Attachment A

Tabular Hourly Data and Histograms of 2019 ANSI Type 1 Baseline Outdoor SPL Data

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**

Date: September 01, 2019 to September 02, 2019

Site: LT12

Hour	Leq	Lmax	L50	L90
13:00	47.8	76.7	36.4	29.4
14:00	35.8	60.8	28.9	25.2
15:00	63.9	91.6	31.5	25.5
16:00	50.4	77.5	33.4	27.2
17:00	46.5	76.2	28.9	26.3
18:00	32.6	52.3	28.0	25.6
19:00	53.0	82.0	38.0	24.4
20:00	50.6	74.5	45.0	44.0
21:00	45.2	56.3	44.7	43.9
22:00	49.3	75.2	43.5	42.7
23:00	43.7	48.6	43.7	42.8
0:00	43.3	52.5	43.1	42.5
1:00	44.1	52.1	44.0	43.2
2:00	47.1	73.9	42.5	41.6
3:00	45.2	73.5	41.4	40.0
4:00	38.1	48.7	38.0	34.9
5:00	33.0	49.1	29.4	26.2
6:00	37.0	61.4	27.2	24.8
7:00	36.9	49.8	32.4	26.2
8:00	35.8	50.8	29.5	26.7
9:00	49.7	80.0	31.6	27.5
10:00	45.9	76.2	35.2	29.6
11:00	47.1	74.2	33.7	28.0
12:00	46.6	75.2	31.7	27.5

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	32.6	49.8	28.0	24.4
Nighttime (10 p.m. - 7 a.m.)	33.0	48.6	27.2	24.8

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	53.4	70.3	33.9	29.1
Nighttime (10 p.m. - 7 a.m.)	44.5	59.4	39.2	37.6

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	63.9	91.6	45.0	44.0
Nighttime (10 p.m. - 7 a.m.)	49.3	75.2	44.0	43.2

Energy Distribution

Daytime	93%
Nighttime	7%

Calculated CNEL, dBA

54.3

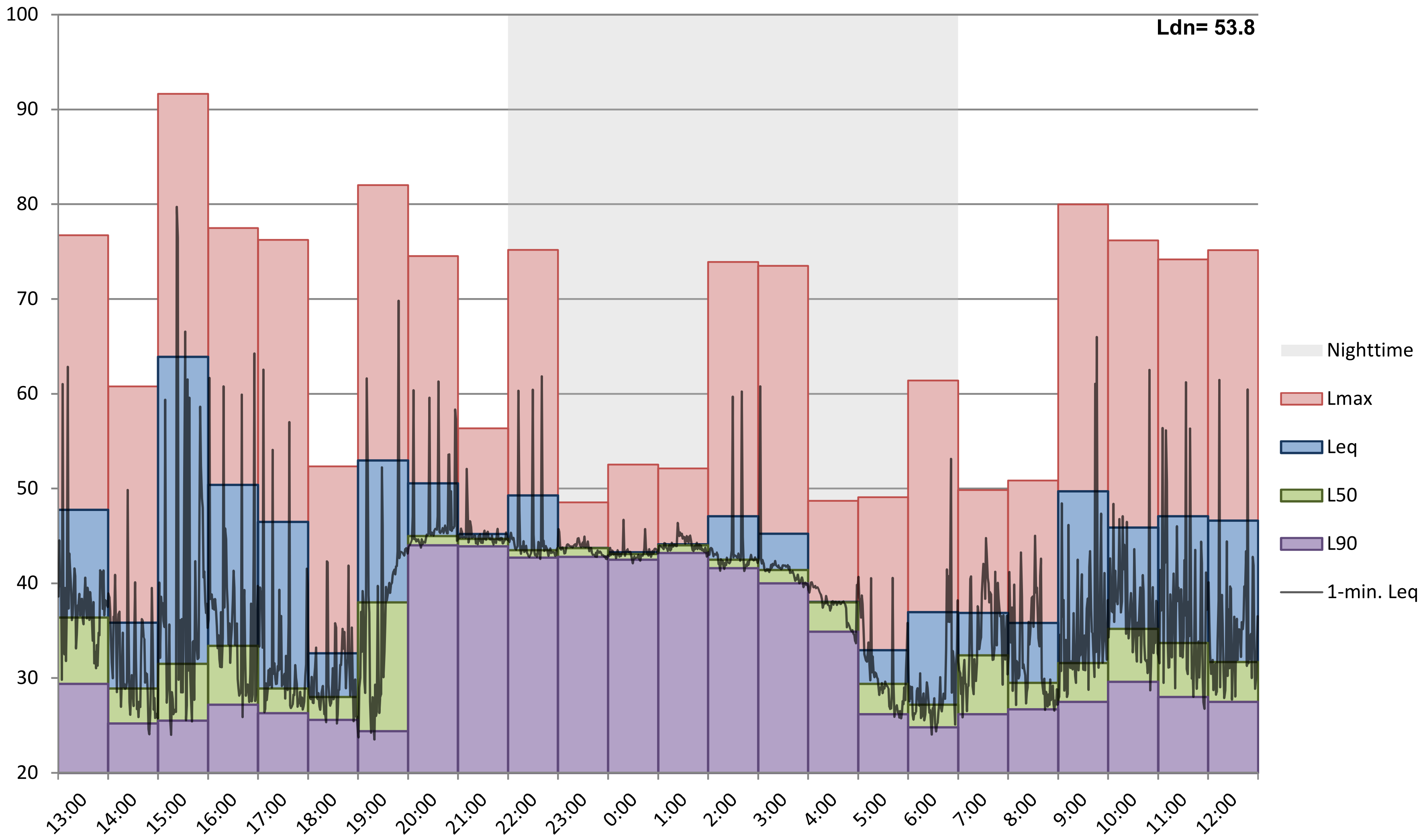
Calculated L_{dn}, dBA

53.8

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - LT12

September 01, 2019 to September 02, 2019



Attachment A
Long-Term 24 Hour Continuous Noise Monitoring

Project: **10212 - Campo Wind Project with Boulder Brush Facilities**
Date: September 02, 2019
Site: BBF-LT8 (2019)

Hour	Leq	Lmax	L50	L90
13:00	39.3	55.2	34.5	31.2
14:00	40.5	60.9	35.9	32.5
15:00	47.3	66.7	40.0	34.8
16:00	43.3	56.0	43.5	36.4
17:00	40.0	57.7	30.3	28.0
18:00	38.6	56.8	30.9	29.3
19:00	41.4	56.4	38.3	32.9
20:00	51.7	59.3	51.6	47.2
21:00	53.6	59.7	54.0	49.3
22:00	48.7	56.2	44.4	41.8
23:00	43.8	58.0	41.6	38.7

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	38.6	55.2	30.3	28.0
Nighttime (10 p.m. - 7 a.m.)	43.8	56.2	41.6	38.7

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	45.3	58.7	39.9	35.7
Nighttime (10 p.m. - 7 a.m.)	40.4	57.1	43.0	40.3

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	53.6	66.7	54.0	49.3
Nighttime (10 p.m. - 7 a.m.)	48.7	58.0	44.4	41.8

Energy Distribution

Daytime	84%
Nighttime	16%

Calculated CNEL, dBA

53.3

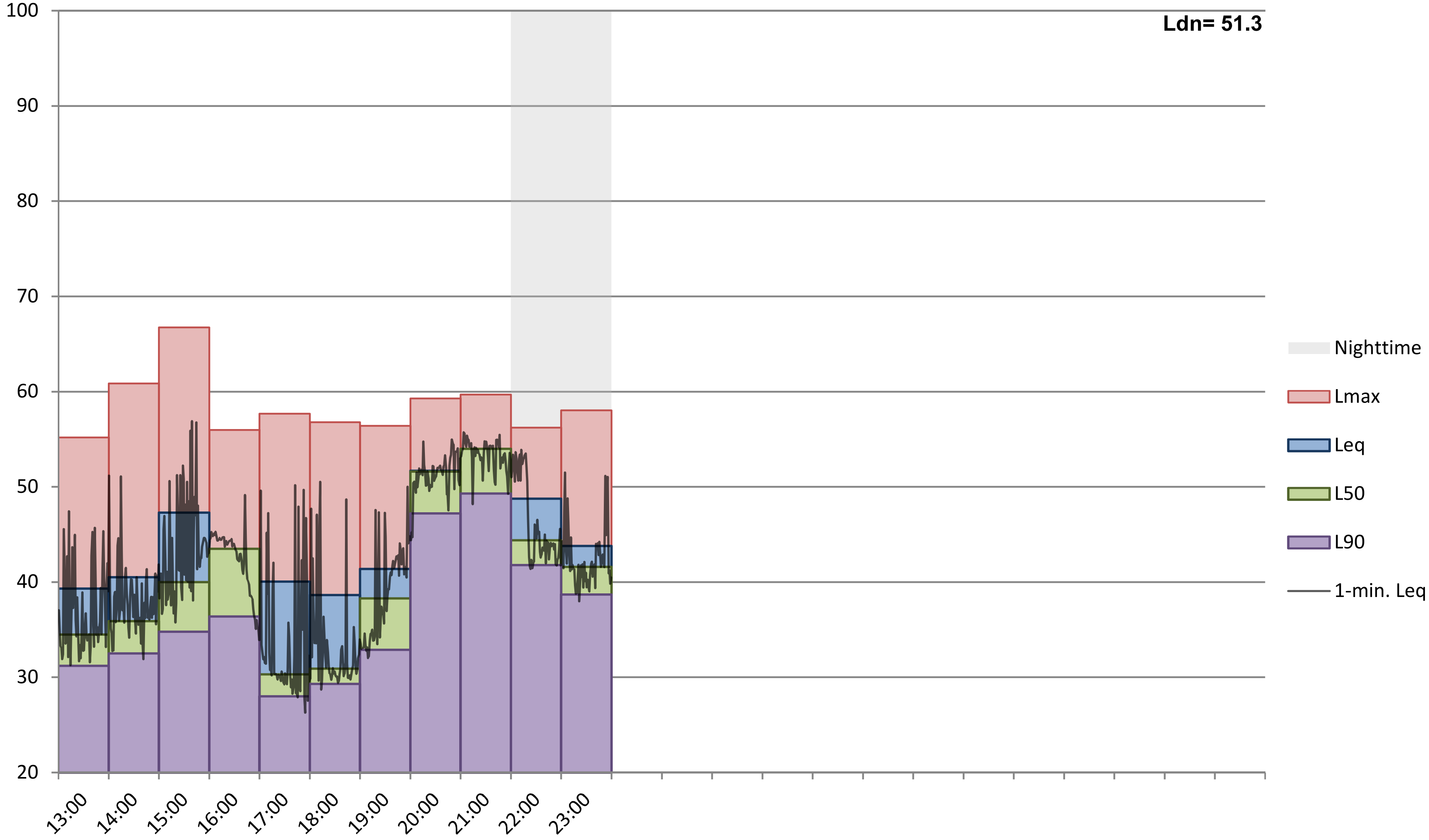
Calculated L_{dn}, dBA

51.3

Attachment A

10212 - Campo Wind Project with Boulder Brush Facilities - BBF-LT8 (2019)

September 02, 2019



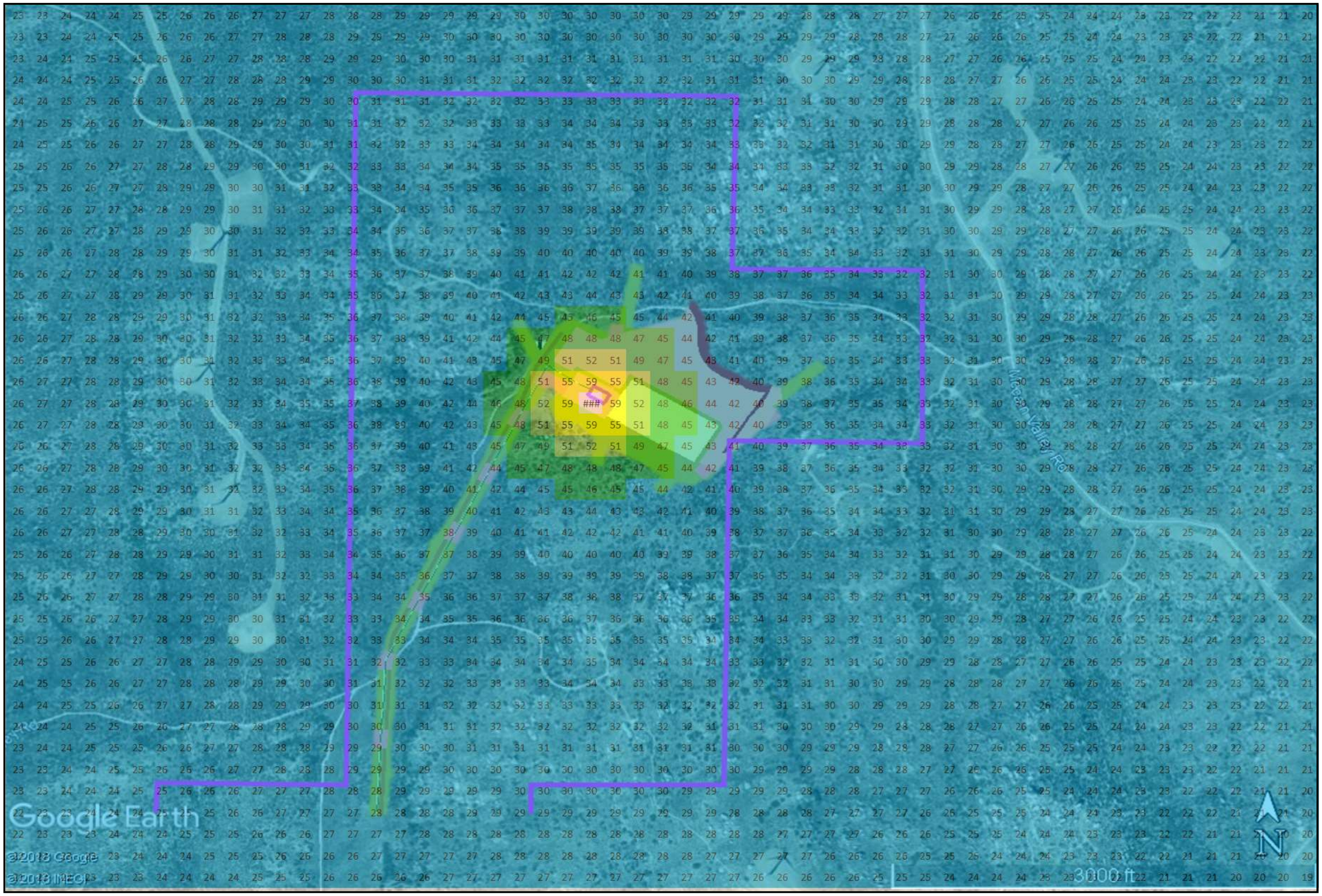
ATTACHMENT B

High-Voltage Substation Transformer Noise Emission

Attachment B:

High-Voltage Substation Transformer Noise Emission

(230 kV / 500 kV single-phase transformer on proposed site)



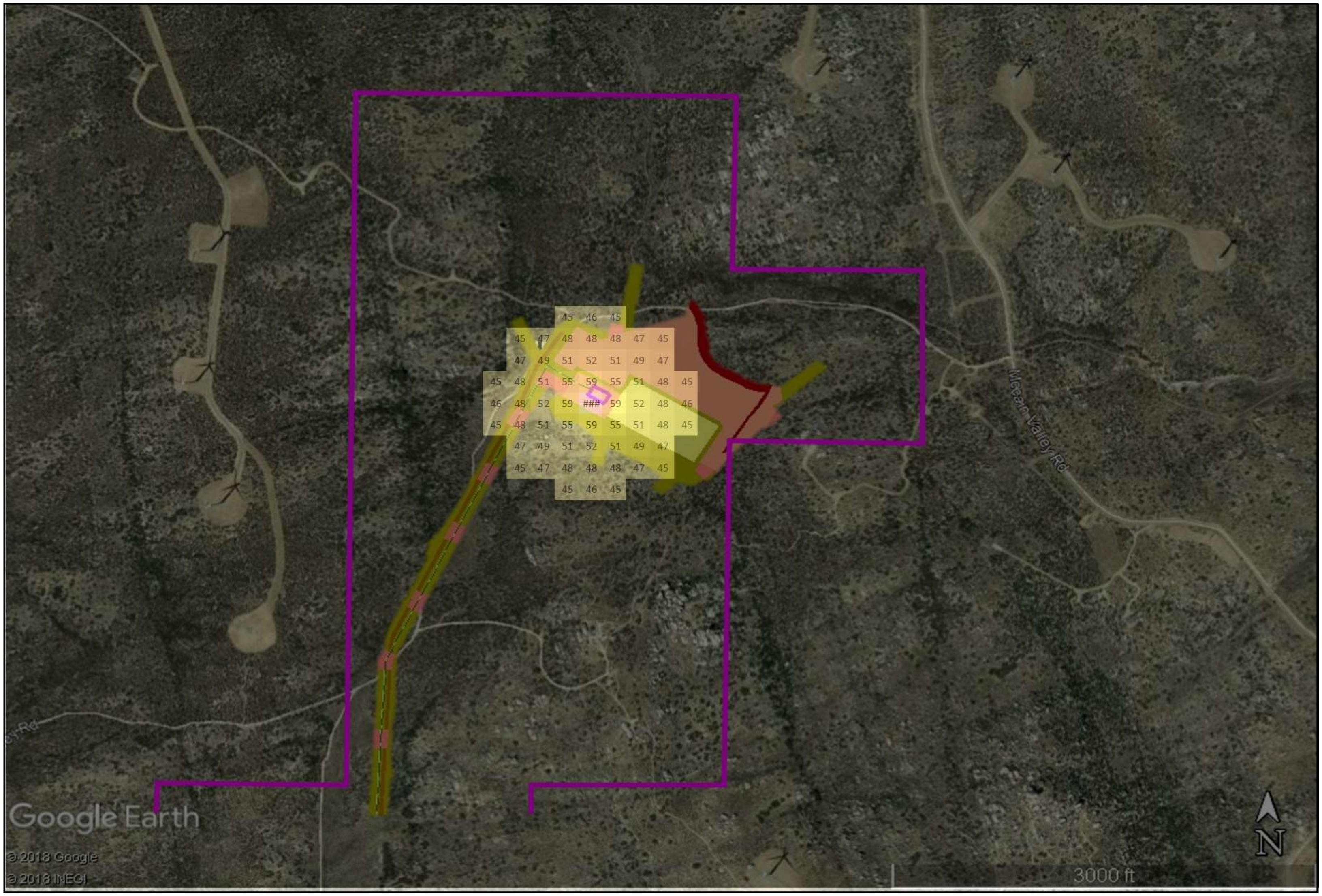
> 70 dBA	65-70 dBA	60-65 dBA	55-60 dBA	50-55 dBA	45-50 dBA	< 45 dBA

Scale: this box = **3,000 feet**

Attachment B:

High-Voltage Substation Transformer Noise Emission

(230 kV / 500 kV single-phase transformer on proposed site)



Scale: this box = **3,000 feet**

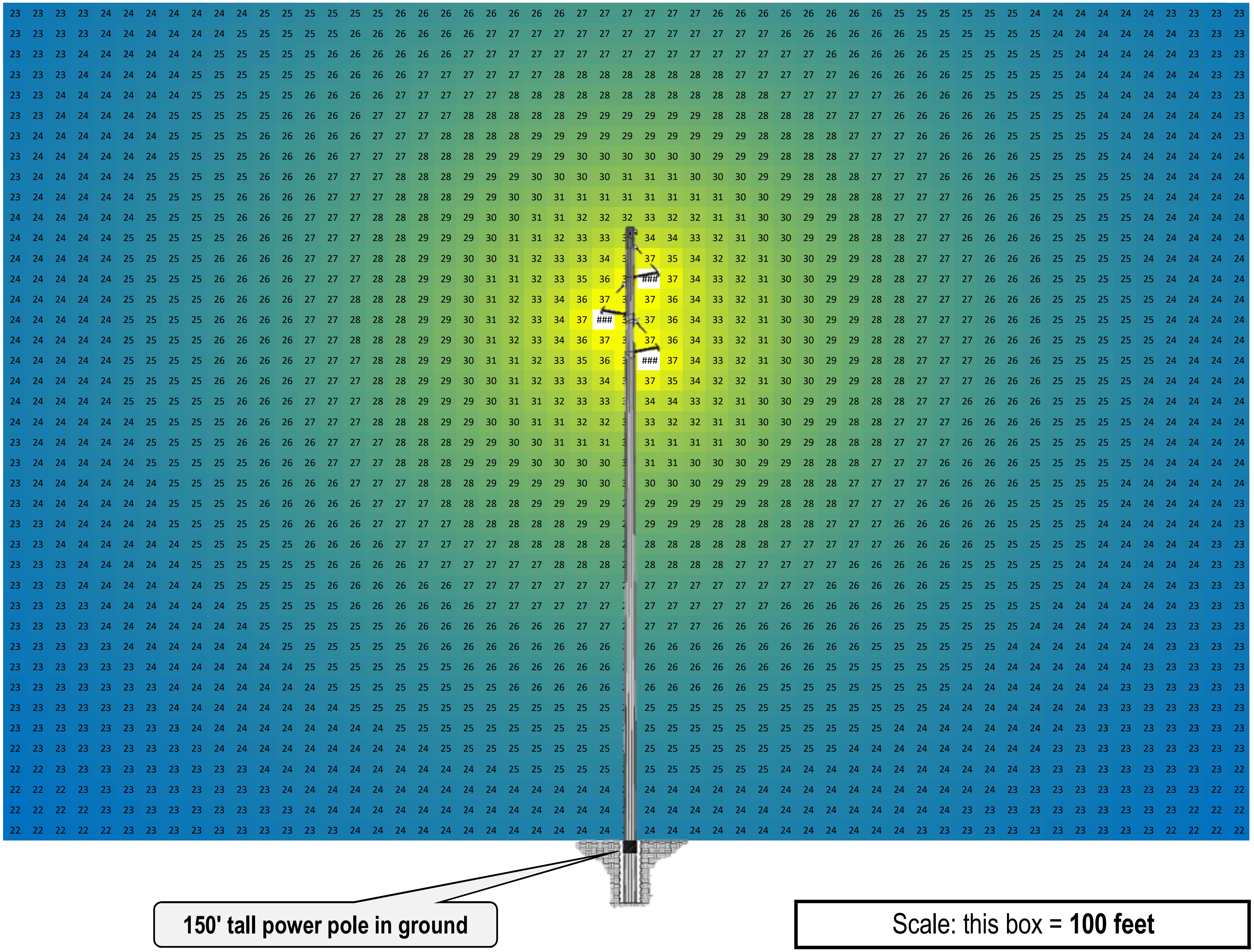
ATTACHMENT C

Predicted Corona Audible Noise from 150-foot-tall 230 kV Power Line

Attachment C:

Predicted Corona Audible Noise from 150'-tall 230 kV Power Line

(Section View through Three Conductors [one per phase])



DRAFT

Acoustical Analysis Report for the Campo Wind Project with Boulder Brush Facilities

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DECEMBER 2019

Printed on 30% post-consumer recycled material.

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SUMMARY

Dudek has prepared this noise study for the proposed Campo Wind Project with Boulder Brush Facilities (Project) to evaluate exterior noise and vibration impacts associated with construction and operation of the Project.

The primary existing noise source within the Project Area, which includes the Campo Band of Diegueño Mission Indians Reservation (Reservation) and private land parcels within County of San Diego (County) jurisdiction through which the Boulder Brush Facilities extend, is local vehicular traffic. Other existing noise sources include noise from landscaping maintenance activities. Sound from birds and other fauna (including insects), rustling leaves, distant conversations and other human activities, aircraft overflights, and operation of electro-mechanical systems (including HVAC [heating, ventilating, and air-conditioning], agricultural equipment, pumps, and wind turbine generators) in the Project Area contribute to the outdoor ambient noise environment. With regards to existing wind turbine operation, noise emission is from the gearbox at the nacelle and due to aerodynamic effects associated with blade rotation through the incoming wind. As is the case for many of these localized sound-producing sources, at sufficient proximity the corona noise from existing power transmission lines in the Project Area can also be an audible component of the existing sound setting at a listener position. An outdoor ambient noise level survey was conducted in the Project Area to establish existing (a.k.a., baseline) noise levels at representative receiver locations. Based on 24-hour sound level monitoring data collected during a field survey performed in September 2018, the existing day/night noise level (L_{dn}) measured at representative positions along the Project boundaries ranged from 44 dBA to 67 dBA. As detailed in the accompanying Campo Wind Project with Boulder Brush Facilities – DEIR Appendix G (Noise) Addendum - DRAFT ("Addendum"), an additional baseline outdoor sound level field survey was performed a year later and yielded a range of L_{dn} values from 48 to 62 dBA. For 10 of the 13 baseline sound level survey locations where outdoor ambient sound data was collected in 2018 to represent the On-Reservation environment, newly collected data from this subsequent 2019 field survey has updated the quantification of the existing conditions.

Baseline outdoor ambient sound levels were also collected in 2018 at nine representative positions along the Boulder Brush Boundary. In 2019, existing sound levels were re-measured near one of these locations and updated the quantified baseline conditions in a manner similar to what was done for the On-Reservation representative locations. Where sound pressure level was not re-measured, data from the 2018 field surveys have been retained; hence, for purposes of noise impact assessment discussed herein, the baseline represents a combination of measurement data from the 2018 and 2019 field surveys.

Project operation would create new stationary noise emission sources on the Campo Band of Diegueño Mission Indians Reservation (Reservation) in the form of operating wind turbines ("turbines"), the Project collector substation transformers, operations and maintenance (O&M) building activities and HVAC, aboveground transmission lines, and maintenance and inspection activities across the Project Site. For purposes of this analysis, the aggregate noise emission from 76 possible turbine locations was predicted and assessed for potential impacts to proximate noise-sensitive land uses (NSLUs). However, only 60 turbine locations would be used per the terms of the Campo Lease. Therefore, while this potentially overstates effects at some NSLUs, it provides the reader a conservative "worst-case" for consideration. By way of example, some proposed possible turbine locations cannot be realized on the basis of being located within 0.25 miles of a pre-existing On-Reservation residences (which qualifies as an NSLU and for which modeled locations (LTs) are intended to be representative of) and thus be considered incompatible with the terms and conditions of the Campo Lease.

Operational turbine and Project-attributed traffic noise levels were predicted for all 76 possible turbine locations at On-Reservation NSLU areas and Reservation boundary positions to assess where an EPA-based guideline exterior noise standard of 55 dBA L_{dn} would be exceeded. Predicted Project-related operating turbine noise levels vary from 44 dBA to 65 dBA L_{dn} at these identified NSLU areas. At one modeled location (LT-9), predicted operational noise levels exceed the 55 dBA L_{dn} guideline but includes the proximity of five turbines proposed to be located within 0.25 miles of apparent NSLU. Such an assessment location helps identify what potential turbine locations would be incompatible with the terms of the Campo Lease.

With the 0.25-mile minimum screening distance respected between any residence and a possible turbine site, the expected exterior sound level at a residence exposed to noise from one operating turbine (at maximum sound emission) is not expected to exceed 49 dBA equivalent continuous sound level (L_{eq}) during the daytime. Each additional operating turbine in 0.25-mile proximity to the same NSLU would cause a logarithmic addition of sound energy to the total noise level; for instance, two turbines at 0.25 miles would yield a predicted level of 52 dBA L_{eq}, and three would yield 54 dBA L_{eq}. As another example, a residence located 0.25 miles perpendicular distance from the midpoint of a "string" or line of five operating turbines would probably experience an outdoor level of 53 dBA L_{eq}—louder than two turbines each 0.25 miles distant from the receptor, but quieter than three equidistant to the receptor because the turbines at the far ends of the string are more distant from the residence.

For representative On-Reservation location LT-9, predicted Project turbine operations noise is expected to cause the combined future noise level (i.e., an acoustical combination of all sound sources in the vicinity, including neighboring wind turbine projects) to exceed the EPA guidance limit. At the other listed locations, the predicted Project noise level is either not greater than the "cumulative +

existing" portion of the future total noise level, or its acoustical contribution is not sufficient to result in a future combined adverse effect when compared to the EPA guidance standard.

With respect spillover noise that extends beyond the Reservation Boundary, the operation noise from the aggregate of Campo Wind Facilities wind turbines is expected to comply with County General Plan limits (60 dBA CNEL) at NSLUs located Off-Reservation. With respect to the County's daytime and nighttime hourly L_{eq} limits per noise ordinance 36.404, predicted turbine noise levels would exceed these limits on private lands within the County near representative Project property line locations LT-1 (as representative of noise levels at the Reservation boundary) and LT-10, when average wind speeds are greater than 7 meters per second (m/s) and 8 m/s, respectively. Under these conditions, impacts relative to the County's noise ordinance limits at representative property line locations would be **significant and unavoidable**. When wind speeds at hub height are less than these values, noise emission levels near these two locations should be compliant with the County's daytime and nighttime hourly standards.

For operating Project turbine spillover noise beyond the Reservation Boundary, consideration is afforded with respect to the County Zoning Ordinance Section 6952 – Large Wind Turbine. C-weighted aggregate hourly L_{eq} is expected to be greater than the Residual Background Sound Criterion (RBSC, (A-weighted L_{90} + 5 dB)) by more than 20 dB near representative Project property line locations LT-1 and LT-10 when average wind speeds are at least 8 m/s and 7 m/s, respectively. Under these conditions, impacts relative to the County Zoning Ordinance Section 6952 at representative property line locations would be **significant and unavoidable**.

Operation noise from the Project is not expected to have a cumulatively considerable effect on private lands within County jurisdiction.

Operational noise levels from the proposed Boulder Brush Facilities high-voltage substation are predicted to be no louder than 20 dBA L_{eq} at the closest NSLU—approximately 13,000 feet away—and are not expected to produce adverse effects. Please refer to Section III of the accompanying Addendum for more details of this analysis.

Audible corona noise from the Off-Reservation generator transmission [gen-tie] line would not cause adverse effects. Research by the Electric Power Research Institute (EPRI) suggests that the fair-weather audible noise from modern transmission lines is generally indistinguishable from background noise at the edge of a right-of-way (ROW) of 100 feet or more (CEC 2009). For instance, a study for the Tri-Valley project calculated 25 dBA at the ROW for a 230 kV transmission line (CPUC 1999). Similar A-weighted dB levels for audible corona have been predicted for the Boulder Brush Facilities gen-tie lines, as detailed in Section III of the Addendum.

For all but the closest identified Off-Reservation sensitive receptor from roadway improvement activities (the proximity of the receiving line of the occupied property would be approximately 38 feet to the centerline of roadway improvement activities), predicted construction noise would not exceed the San Diego County limit of 75 dBA $L_{eq(8h)}$ at the closest Off-Reservation NSLU. Best management practices for controlling noise emission from construction activities, which could include temporary barrier placement, are recommended as a mitigation measure (M-Construction-1) to help ensure consistency with prediction parameters and help keep construction noise at County-jurisdiction NSLU to levels consistent with the 75 dBA $L_{eq(8h)}$ regulation.

Project-related construction traffic noise and construction vibration are expected to not produce adverse effects on NSLUs on Reservation and off Reservation with implementation of M-Construction-1.

For On-Reservation NSLUs, the highest noise levels are predicted to occur during clearing, grading, and construction of access roads when noise levels from construction activities would be as high as 77 dBA equivalent continuous sound level (Leq) at the nearest existing residences. During other phases of construction work and more typically, the predicted noise levels would range up to 72 dBA Leq at the nearest potential On-Reservation noise sensitive receptors. Since these construction activities would not be expected to generate short-term noise levels greater than 80 dBA Leq at existing NSLU, the construction noise at these On-Reservation receptors is not expected to exceed the Federal Transit Administration's 80 dBA Leq(8hr) noise level criteria and would not be considered an adverse effect.

Special, impulse-producing construction activities (blasting, rock drilling, rock crushing) are expected to comply with the County impulse noise standard (82 dBA maximum sound level (Lmax)), and thus not yield adverse effects for distant Off-Reservation NSLUs.

Acoustical Analysis Report for the Campo Wind Project with Boulder Brush Facilities

1 INTRODUCTION

Dudek has prepared this noise study for the proposed Campo Wind Project with Boulder Brush Facilities (Project), evaluating construction and operation exterior noise and groundborne vibration effects on known pre-existing and potentially sensitive receptors in the Project Area and the surrounding environment. In the context of this study pre-existing sensitive receptors (e.g., residential uses) include privately owned parcels under County of San Diego (County) jurisdiction, while potential sensitive receptors refers to those On-Reservation that may be apparent residential uses.

This report conservatively analyzes noise from the operation of 76 possible Project turbine locations, of which only 60 would be used for turbine installation per the terms of the Campo Lease (Figure 1, Project Location and Site Plan). The Campo Lease provides: "the base of any wind turbine tower shall not be installed on the Leased Property within one-quarter (1/4) of a mile of any residential structure or tribal building existing as of the date that this Wind Lease is made, dated and entered into."

This report also predictively evaluates operation noise emission from the Boulder Brush Facilities, including the high-voltage substation and the gen-tie line. Details of this operation noise analysis from the high-voltage substation and gen-tie transmission lines, along with comparison of predicted noise levels to measured baseline outdoor sound levels along the Boulder Brush Boundary, can be found in Section III of the Campo Wind Project with Boulder Brush Facilities – DEIR Appendix G (Noise) Addendum - DRAFT ("Addendum").

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2 PROJECT DESCRIPTION

The Project consists of both the Campo Wind Facilities that would be located on land leased from the Campo Band of Diegueño Mission Indians (Tribe) within the Campo Band of Diegueño Mission Indians Reservation (Reservation) Boundary (Campo Lease), and the Boulder Brush Facilities that would be located on adjacent land leased from a private landowner within the Boulder Brush Boundary (Private Lease). Collectively, the entire land within both Reservation Boundary and Boulder Brush Boundary comprise the Project Area (see Figure 1, Project Location and Site Plan). Throughout this document, the term "On-Reservation" refers to anything within the Reservation Boundary (or Campo Boundary) while the term "Off-Reservation" refers to anything outside of the Reservation Boundary.

The Campo Wind Facilities, which would consist of 60 wind turbines and associated infrastructure, would be located within a corridor of approximately 2,200 acres of land (Campo Corridor) within the approximately 16,000 acres of Reservation land inside the Reservation Boundary. The Boulder Brush Facilities, which would consist of a portion of the Project generation transmission line and related facilities to connect energy generated by the Project to the existing San Diego Gas & Electric Company (SDG&E) Sunrise Powerlink, would be located within a corridor of approximately 320 acres of land (Boulder Brush Corridor) within the approximately 2,000 acres of Private Lease land inside the Boulder Brush Boundary adjacent to the northeast portion of the Reservation. These Private Lease lands are under the land use and permitting jurisdiction of the County. Collectively, the Campo Corridor and the Boulder Brush Corridor comprise the approximately 2,520-acre Project Site. Project disturbances associated with the construction of the Campo Wind Facilities within the Campo Corridor are expected to be approximately 800 acres while Project disturbances associated with the construction of the Boulder Brush Facilities within the Boulder Brush Corridor are expected to be approximately 131 acres.

The Boulder Brush Facilities would require a Major Use Permit (MUP) from the County of San Diego (County).

The Bureau of Indian Affairs (BIA) is the lead agency for the Project under the National Environmental Policy Act (NEPA) and is preparing an Environmental Impact Statement (EIS) for the Project.

The Project as a whole would consist of the development, financing, construction, operation, maintenance and, ultimately the decommissioning of a renewable wind energy generation project consisting of 60 wind turbines, three permanent meteorological (MET) towers, six temporary MET towers, a temporary concrete batch plant for use during construction, a temporary equipment staging and parking area for use during construction, an operations and maintenance facility, water collection and septic systems, access roads, an electrical collection and communications system, an approximately 8.5-mile-long gen-tie line, a collector substation, a high-voltage substation, and a switchyard to interconnect the Project to the existing SDG&E Sunrise Powerlink. The Project would operate for over 30 years after which it would be decommissioned.

3 FUNDAMENTALS OF NOISE AND VIBRATION

The following is a brief discussion of fundamental noise concepts and terminology.

3.1 Sound, Noise, and Acoustics

Sound is a process that consists of three components: the sound source, sound path, and sound receiver. All three components must be present for sound to exist. Without a source to produce sound, there is no sound. Similarly, without a medium to transmit sound pressure waves, there is no sound. Finally, sound must be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound or noise. In most situations, there are many different sound sources, paths, and receptors rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

3.2 Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micronewton per square meter, also called micropascal. One micropascal is approximately one-hundred billionth (0.00000000001) of normal atmospheric pressure. The pressure of a very loud sound may be 200 million micropascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micropascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the squared ratio of actual sound pressure to a reference pressure. These units are called bels. To provide a finer resolution, a bel is subdivided into 10 decibels (dB).

3.3 Frequency-Weighted Sound Level

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness, or human response, is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies, but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 hertz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average healthy young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g., the C-weighted scale). Community noise levels are typically reported in terms of A-weighted sound, but C-weighted sound levels are also presented and discussed in this report. Table 1 presents a side-by-side comparison of decibel adjustments that, when applied to an "unweighted," "flat," or Z-weighted measurement, produce A-weighted and C-weighted values.

Table 1
Comparison of A-Weighting and C-Weighting Adjustments

Octave Band Center Frequency (Hz)	A-Weighting (dB)	C-Weighting (dB)
31.5	-39.4	-3
63	-26.2	-0.8
125	-16.1	-0.2
250	-8.6	0
500	-3.2	0
1,000	0	0
2,000	+1.2	-0.2
4,000	+1.1	-0.8
8,000	-1.1	-3.0

Source: Engineering ToolBox 2003.
Notes: Hz = hertz; dB = decibels.

Compared to the octave band center frequency (OBCF) weightings of the "A" scale, the C-weighting dB adjustments shown in Table 1 are much less in the lower frequencies. For this reason, C-weighted levels have been used to evaluate entertainment noise levels having high bass (i.e., low-frequency) content. So, while A-weighted sound levels may better represent what humans perceive, C-weighted levels help better describe sounds having energy in the lower end of the audible spectrum.

To help illustrate the large range of sound pressures that are audible to human hearing, examples of typical noise levels for common indoor and outdoor activities are expressed as unweighted dB values in Table 2. Note that "0 dB" is not the absence of sound energy; rather, it is the quietest audible level of sound calculated with respect to a reference pressure of 20 micropascals.

Table 2
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
—	110	Rock band
Jet flyover at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	80	Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area; heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quiet urban, daytime	50	Large business office; dishwasher next room
Quiet urban, nighttime	40	Theater; large conference room (background)
Quiet suburban, nighttime	30	Library
Quiet rural, nighttime	20	Bedroom at night; concert hall (background)
—	10	Broadcast/Recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 1998.

3.4 Human Response to Changes in Noise Levels

It is generally accepted that the average healthy ear can barely perceive a noise level change of 3 dB (Caltrans 2013a). A change of 5 dB is readily perceptible, and a change of 10 dB is perceived as twice or half as loud. A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the average daily numbers of traffic on a road) would result in a barely perceptible change in sound level.

3.5 Noise Descriptors

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level (L_{eq}) is also referred to as the energy-average sound level. The 1-hour A-weighted equivalent sound level, $L_{eq(1h)}$, is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the usual basis for the County of San Diego (County) noise policies and standards. However, the County also uses an 8-hour energy-equivalent sound level ($L_{eq(8h)}$) to assess construction noise.

Because people are generally more sensitive and annoyed by noise occurring during the evening and nighttime hours, two descriptors are often used in community noise assessments as follows:

- Community noise equivalent level (CNEL) represents a time-weighted, 24-hour average noise level calculated from component L_{eq} values for daytime, evening, and nighttime periods. The CNEL value accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dB and 10 dB "penalties," respectively, to the energy-averaged sound levels occurring during the evening and nighttime hours.

- The day-night sound level (L_{dn}) represents sound over a 24-hour period similar to the CNEL descriptor, but it considers the three evening hours (7 p.m. to 10 p.m.) as part of the "daytime" period.

While some jurisdictions use CNEL and L_{dn} interchangeably, and under many conditions they are indeed comparable, the CNEL value will sometimes be slightly higher than the L_{dn} value for the same time period of sound; and, because of the evening and/or nighttime adjustments, CNEL and L_{dn} will always be greater than the 24-hour L_{eq} value for the same time period.

Statistical levels are another descriptor of sound levels measured over a period of time and commonly used for environmental noise monitoring. For this noise metric, L_{xx} is the sound level that was exceeded for xx percent of the time. For example, L_{90} would be the sound level exceed for 90% of the measurement time. The utility of the L_{90} value is that describes sounds that are "steady-state" or continuous in nature, since louder but less-frequently-occurring sound during the measurement would effectively be excluded; hence, L_{90} is commonly used to approximate the "background" sound level, while L_{eq} encompasses all sound in the "ambient" sound environment.

3.6 Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receiver) is influenced by geometric spreading, ground absorption, atmospheric effects, and shielding by natural and/or built features.

Sound levels attenuate (or diminish) at a rate of approximately 6 dB per doubling of distance from an outdoor point source due to the geometric divergence (a.k.a., "hemispherical spreading") of the sound waves. Atmospheric conditions such as humidity, temperature, and wind gradients can also affect sound levels. In general, the greater the distance the receiver is from the source, the greater the potential for variation in sound levels due to atmospheric effects. Additional sound attenuation can result from man-made structures such as intervening walls and buildings, and by natural topography such as hills and dense woods.

A "line" outdoor sound source, such as a roadway with many moving point sources constrained to the linear geometry of the pavement, propagates sound in what can be described as "cylindrical spreading," with the resulting attenuation rate of only 3 dB per doubling of distance. At large distances, the acoustical combination of several identical sound-emitting point sources arranged in a line perpendicular to a common receiver will tend to emulate this cylindrical propagation effect.

3.7 Groundborne Vibration Fundamentals

Groundborne vibration is a rapidly oscillating motion transmitted through the ground. The strength of groundborne vibration attenuates rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration (FTA) are peak particle velocity (PPV), in units of inches per second, and vibration velocity decibel (VdB). The calculation to determine PPV at a given distance is as follows:

$$PPV_{distance} = PPV_{ref}*(25/D)^{1.5}$$

Where:

$PPV_{distance}$ = the peak particle velocity in inches per second of the equipment adjusted for distance

PPV_{ref} = the reference vibration level in inches per second at 25 feet

D = the distance from the equipment to the receiver

The vibration velocity parameter (instead of acceleration or displacement) best correlates with human perception of vibration. Thus, the response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square velocity level in VdB units relative to 1 micro-inch per second. The threshold for perceptibility is approximately 65 VdB, but human response to vibration is not usually significant unless vibration levels exceed 70 VdB (FTA 2006). The calculation to determine the root-mean square at a given distance is as follows:

$$L_v(D) = L_v(25\text{ feet}) - 30*\log(D/25)$$

Where:

$L_v(D)$ = the vibration level at the receiver

$L_v(25\text{ feet})$ = the reference source vibration level

D = the distance from the vibration activity to the receiver

Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB (FTA 2006).

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4 APPLICABLE NOISE REGULATIONS AND STANDARDS

This section reviews regulations related to the Project. Since the Project includes wind turbines associated with the Campo Wind Facilities that would be located on the Reservation, and Boulder Brush Facilities features such as the high-voltage substation that would be built on private lands under County jurisdiction, a number of regulations, codes, and standards at the federal, state, and local level would apply as appropriate..

4.1 Federal

Various federal agencies have established rules and guidelines addressing noise and vibration. For example, the Occupational Safety and Health Administration (OSHA) regulates worker noise exposure in a variety of settings. But while the Project under analysis relates to energy production, there are no applicable federal noise regulations that specifically apply to such power utility infrastructure. In such instances where federal regulations are lacking, the U.S. Environmental Protection Agency (EPA) provides guidance based on its “Levels Document” (EPA 1974).

Under Section 4.5.4 Noise Standards and Guidelines of its Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005), the U.S. Bureau of Land Management (BLM) mentions the EPA public-protecting guideline of 55 dBA L_{dn}, understood to be assessed at the exterior of any existing NSLU where the existing outdoor ambient sound level is not already in excess of this value. NSLUs include but are not limited to residences. In the absence of applicable local noise regulations or other established policies at an On-Reservation NSLU, this EPA-based recommendation of 55 dBA L_{dn} functions as an appropriate criterion for determining potential noise impact from the operation of the Project.

When evaluating potential construction noise impacts at On-Reservation NSLU, and due to lack of other applicable standards, guidance from the FTA recommends a daytime standard at residential land uses of no more than 80 dBA (FTA 2006) energy-averaged over an 8-hour period ($L_{eq(8hr)}$).

4.2 County of San Diego Noise Standards

The County of San Diego has adopted noise policies and standards contained within the County’s General Plan Noise Element, the County Noise Ordinance, and subsequent amendments to the Zoning Ordinance. The County’s noise policies and standards are summarized below. The County noise standards are used only to evaluate noise impacts of the Project on private lands. This analysis does not apply these noise standards to Project impacts on the Reservation.

Three main criteria apply to operation of the Project to the extent noise impacts occur on private lands:

- A CNEL dBA limit accounting for noise levels across a 24-hour period based on the General Plan
- Hourly L_{eq} dBA limits for daytime and nighttime based on zoned land use from Section 36.404 (a) of the Municipal Code (a.k.a., "Noise Abatement and Control")
- A quantified differential between the predicted C-weighted wind turbine sound level and the existing A-weighted outdoor background sound level at a receptor.

4.2.1 County of San Diego General Plan Noise Element

The County General Plan Noise Element (Noise Element) establishes noise and land use compatibility standards and outlines goals and policies to achieve these standards. The Noise Element characterizes the noise environment in the County and provides the context for the County's noise/land use compatibility guidelines and standards. The Noise Element also describes the County's goals for achieving the standards, and introduces policies designed to implement the goals. Under implementation of the General Plan, the County uses the Noise Compatibility Guidelines to determine the compatibility of land uses when evaluating proposed development projects. The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments (County of San Diego 2011a). In this analysis, the Noise Element is relevant only for determining the significance of the Project's potential noise impacts on private lands.

4.2.2 San Diego County Noise Ordinance

The San Diego County Code of Regulatory Ordinances Title 3, Division 6, Chapter 4, Sections 36.401–36.435, Noise Ordinance (Noise Ordinance) establishes prohibitions for disturbing, excessive, or offensive noise, as well as provisions such as sound level limits to secure and promote the public health, comfort, safety, peace, and quiet for its citizens. Planned compliance with sound level limits and other specific parts of the Noise Ordinance allows presumption that the noise is not disturbing, excessive, or offensive. Limits are specified depending on the zoning placed on a property (e.g., varying densities and intensities of residential, industrial, and commercial zones). Where two adjacent properties have different zones, the sound level limit at a location on a boundary between two properties is the arithmetic mean of the respective limits for the two zones, except for extractive industries. It is unlawful for any person to cause or allow the creation of any noise that exceeds the applicable limits of the Noise Ordinance at any point on or beyond the boundaries of the property on which the sound is produced.

Section 36.404 of the Noise Ordinance contains sound level limits specific to receiving land uses. Sound level limits are in terms of a 1-hour average sound level. The allowable noise limits depend on the County's zoning district and time of day. Table 2 (which is a copy of Table 36.404 from the Noise Ordinance) lists the sound level limits for the County. The following is from Section 36.404 of the Noise Ordinance (County of San Diego 2011b):

(a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sounds level limits in Table 36.404 [included as Table 3 in this report], when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

Table 3
San Diego County Noise Ordinance Sound Level Limits

Zone	Time	1-Hour Average Sound Level Limits (dBA)
RS, RD, RR, RMH, A70, A72, S80, S81, S90, S92, RV, and RU with a General Plan Land Use Designation density of less than 10.9 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
RRP, RC, RM, S86, FB-V5, RV and RU with a general Plan Land Use Designation density of 10.9 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
S94, FB-V4, AL-V2, AL-V1, AL-CD, RM-V5, RM-V4, RM-V3, RM-CD and all commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
FB-V1, FB-V2, RM-V1, RM-V2	7 a.m. to 7 p.m.	60
	7 p.m. to 7 a.m.	55
FB-V1, RM-V2	10 p.m. to 7 a.m.	55
FB-V2, RM-V1	10 p.m. to 7 a.m.	50
FB-V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
M50, M52, and M54	Anytime	70
S82, M56, and M58	Anytime	75
S88 (see subsection (c) below)	—	—

Notes: RS, RD, RM, RR, RU, RV, RRO, RMH, RU = Residential uses; A70, A72 = Agricultural uses; S80, S81, S82, S87, S90 = Open space uses, ecological resource areas, or holding area uses; S92 = General rural uses; RC = Residential/commercial uses; S86 = parking uses; V1, V2, V3, V4, V5 = Village uses; M50, M52, M54, M56, M58 = Manufacturing and industrial uses; S88 = Special planning area uses; FB = Fallbrook; RM = Ramona; AL = Alpine.

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in Table 36.404 [included as Table 3 in this report] above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404 [included as Table 3 in this report], subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) If the measures ambient noise level exceeds the applicable limit in Table 36.404 [included as Table 3 in this report], the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

(f) A fixed-location public utility distribution or transmission facility location on or adjacent to a property line shall be subject to the sound level limits of this section measures at or beyond six feet from the boundary of the easement upon which the facility is located.

In 2002, the County added note (b) to this section to allow greater compliance flexibility for projects for which a Major Use Permit has been granted. In the ordinance adopting this amendment, the County explained: “It is the purpose of this ordinance to amend the San Diego County noise control regulations, to permit noise created by a project for which a Major Use Permit has been approved based upon a specific noise study, to be controlled by the noise mitigation conditions of that permit rather than the general standards of the noise ordinance” (County Ordinance 9478, 2002).

In this analysis, the Noise Ordinance is relevant only for the Project’s potential noise impacts on private lands.

4.2.3 County Zoning Ordinance Definitions Related to Large Wind Turbines

The provisions of Section 6950 thru 6959 of the County Zoning Ordinance are known as the Renewable Energy Regulations. The purpose of these provisions is to prescribe reasonable standards and procedures for the installation and operation of Solar Energy Systems and Wind Turbines. Section 6952 specifically applies to large wind turbines.

Section 6952 requires that the applicant prepare and submit an acoustical study which demonstrates that (a) each large wind turbine complies with all applicable sound level limits in the Noise Ordinance, County Code section 36.401 et. seq.; and (b) the C-weighted sound level from each large wind turbine while operating does not exceed the Residual Background Sound Criterion (RBSC) for Wind Energy Facilities by more than 20 decibels as both sound levels are measured at each property line of the lot on which the large turbine is located. This section of the Zoning Ordinance allows for a noise waiver as discussed under subsection 6259.f.2. Applicable noise standards are also reduced if the sound from a large wind turbine contains a pure tone, as set forth in subsection 6259.f.3.

The following definitions from Section 1110 of the County Zoning Ordinance are provided:

> **Background Sound Level (L_{90})**. The sound level that is exceeded for 90 percent of the total measurement period as described in the current edition of Quantities and Procedures for Description and Measurement of Environmental Sound by the American National Standard Institution. Background Sound Level may be measured relative to A-weighting or C-weighting, in which case it would be denoted as LA_{90} and LC_{90}, respectively.
>
> **Residual Background Sound Criterion (RBSCL90) for Wind Energy Facilities**. The Background Sound Level measured relative to A-weighting (LA_{90}) plus 5 dBA.

In this analysis, the County Zoning Ordinance is relevant only for the Project's potential noise impacts on private lands.

County of San Diego Guidelines for Determining Significance

In this analysis, the County Guidelines are used as reference and relevant only for the Project's potential noise impacts on private lands. According to the County's Guidelines for Determining Significance (County of San Diego 2009a), a proposed project would result in a significant impact under CEQA if implementation would result in the exposure of any on-site or off-site existing or reasonably foreseeable future NSLUs to exterior or interior noise (including noise generated from a project combined with noise from roads, railroads, airports, heliports, and all other noise sources) greater than any of the following:

A. Exterior Locations

   i. 60 dB (CNEL); or

   ii. An increase of 10 dB (CNEL) over preexisting noise

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area that adjoins and is on the same lot as the dwelling and that contains at least the following minimum area:

   i. Net lot area up to 4,000 square feet: 400 square feet

   ii. Net lot area 4,000 square feet to 10 acres: 10% of net lot area

   iii. Net lot area over 10 acres: 1 acre

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations

   45 dB (CNEL) except for the following cases:

   i. Rooms that are usually occupied only part of the day (i.e., schools, libraries, or similar facilities) in which the interior 1-hour average sound level due to noise outside should not exceed 50 dBA.

   ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

4.2.4 County of San Diego Construction Noise Regulations

Section 36.408 of the Noise Ordinance sets limits on the time of day and days of the week that construction can occur, as well as setting noise limits for construction activities. In summary, the Noise Ordinance prohibits operating construction equipment on the following days and times:

- Mondays through Saturdays except between 7 a.m. and 7 p.m.
- Sundays or a holiday. A holiday means January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the president as a special national holiday or the governor of the state as a special state holiday.

In addition, Section 36.409 requires that between 7 a.m. and 7 p.m., no equipment shall be operated so as to cause an 8-hour average construction noise level in excess of 75 dBA when measured at the boundary line of the property where the noise source is located, or on any occupied property where the noise is being received (County of San Diego 2008).

Additional sound level limitations are provided in Section 36.410 (County of San Diego 2008):

> In addition to the general limitations on sound levels in Section 36.404 and the limitations on construction equipment in Section 36.409, the following additional sound level limitations shall apply:
>
> (a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 4, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period, as described in Section 36.410(c) of the County's Noise Ordinance. The maximum sound level depends on the use being made of the occupied property.

Table 4
County of San Diego Noise Ordinance, Section 36.410, Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels

Occupied Property Use	dBA
Residential, village zoning, or civic use	82
Agricultural, commercial, or industrial use	85

Note: dBA = A-weighted decibels.

The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the maximum sound level for any portion of any minute it will be deemed that the maximum sound level was exceeded during that minute.

In this analysis, the County Construction Noise Ordinance is relevant only for the Project's potential noise impacts on private lands.

4.2.5 County of San Diego Report Format and Content Requirements – Noise

The County's Report Format and Content Requirements (County of San Diego 2009b) offer insight on what would be considered a "cumulatively considerable" noise impact. A cumulatively considerable contribution from the Project that would require mitigation or design measures would be identified whenever "a more than a one decibel increase from the project was identified in the model analysis." A cumulative impact would occur when the combined sound level exceeds 60 dBA CNEL.

In this analysis, the County Code is relevant only for the Project's potential noise impacts on private lands under County jurisdiction.

4.3 Campo Band of Mission Indians Land Use Code and Plan

Under the Campo Lease, the Tribe's Land Use Code and Plan are not applicable to the Project. The Campo Land Use Code and Plan are described here for reference. The Campo Land Use Code does not contain specific noise level limits nor specific standards for wind turbines. However, Section 303, Restrictions on Use, states "[a]ny tower or other structure erected in or moved into any area must have a setback of a minimum distance of one-fourth (¼) mile from any existing structure including but not limited to any existing or proposed residential structure or tribal building so long as the proposed structure has a pending or active building permit."

Additionally, the Tribe's Land Use Plan includes a Noise Element. In the Noise Element, noise sensitive land uses are defined as single and multiple family residential areas, group homes, business and professional offices, parks, and open space lands where quiet is a basis for use. These uses shall be discouraged in areas where noise levels exceed 65 dBA CNEL. Interior shall be mitigated to 45 dBA for business and professional offices (Campo 2010).

Under the terms of the Campo Lease, Tribal laws are limited or made inapplicable to the Project. Specifically, the terms and conditions of the Campo Lease include (under Section 6(g)): "Lessor shall not enforce any existing or future land use law (including any code, regulation resolution custom and tradition) including but not limited to any setback requirements, in any manner that will adversely interfere with Lessee's ability to develop, build, or operate the Project." However, the Campo Lease does contain a 0.25-mile setback for wind turbines from residences discussed above and in Appendix C, Regulatory Setting, to the Draft EIS. However, the Campo Land Use thresholds are considered in evaluating the Project's potential noise impacts for the purpose of this analysis only.

4.4 Vibration

Although it is possible for groundborne vibrations from construction activity near buildings to cause building damage, the vibrations from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings (FTA 2006). Groundborne vibration generated by construction or demolition activity is usually highest during pile driving, rock drilling and blasting, soil compacting, jackhammering, and demolition-related activities. As an example of construction vibration assessment criteria with respect to building damage risk, the FTA indicates 0.2 inches per second PPV for “non-engineered timber and masonry buildings” (FTA 2006).

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5 EXISTING CONDITIONS

The Project Area and its vicinity can generally be characterized as rural, but containing a few major surface transportation routes and existing residential, commercial, agricultural, and industrial developments. This section provides a summary description of the existing noise emission sources in the Project vicinity, along with a representative quantitative study of the Project sound environment as supported by empirical data measured and collected during recent field surveys.

5.1 Project Vicinity

The Project Area and its surroundings is largely undeveloped, though development includes utilities and recreational, commercial, agricultural, and residential. Land uses within the Reservation are predominately residential but also include several institutional uses north of SR 94 and the Golden Acorn Casino. Existing wind turbine generators operating in the Project Vicinity include those associated with the Kumeyaay Wind Project, Tule Wind Project, and the one at the Golden Acorn Casino. Residential land uses surround the Reservation to the north, south, east, and west. The largest concentrations of residential land uses on private lands are located east of the Reservation in the Live Oaks Springs and Tierra Del Sol communities.

5.2 Existing Noise Levels

5.2.1 Noise Sources

The primary existing noise source within the Project Area is vehicular traffic. Noise sources in the Project Area include traffic on local and regional roadways, I-8, existing turbines, the Golden Acorn Casino, farm equipment, off-highway recreational vehicles, civilian and military aircraft, rural residential land uses, and occasional gunfire from the La Posta Satellite Station/Navy Seal Mountain Training Center. Sound from birds and other fauna, rustling leaves, distant conversations and other human activities, aircraft overflights, and operation of electro-mechanical systems (including HVAC, agricultural equipment, pumps, and wind turbine generators) in the Project Vicinity contribute to the outdoor ambient noise environment. As is the case for many of these localized sound-producing sources, at sufficient proximity the corona noise from existing power transmission lines in the Project Area can also be an audible component of the existing sound setting at a listener position.

5.2.2 Noise Survey

A site visit was conducted in September 2018 to measure existing outdoor ambient noise levels in the vicinity of the Project Site. Locations of pre-existing and operating wind turbines in the Project vicinity were noted, so that subsequent predictive modeling of these noise sources could be performed and help quantitatively assess their contribution to the measured outdoor ambient sound levels at the surveyed representative locations. More detail on the field measurement survey can be found in Appendix A, Baseline Measurement Data.

The existing noise environments at the Project boundaries were measured on September 5, September 6, and September 7, 2018. These noise level measurements were performed with factory-calibrated SoftdB Piccolo Sound Level Meters (SLM), which meet the current ANSI "Type 2" standard. Using a camera tripod, the SLM was consistently positioned at a height of approximately 5 feet above grade. The field survey included 13 unattended "long-term" (LT) monitoring locations, whereby after deployment, the SLM was left to measure and record to onboard instrument memory sound level data at predefined consecutive intervals. These locations are depicted as LT1 through LT13 in Figure 2, Noise Measurement Locations.

As detailed in the Addendum, a supplemental baseline outdoor ambient sound level survey was performed from August 29 to September 4, 2019, using more precise ANSI "Type 1" SLM. Using the combined collected field data, Table 5 shows the calculated L_{dn} based on the hourly measured ambient sound levels.

Table 5
Calculated A-Weighted Day/Night Sound Levels from Field-Collected Survey Data

Receiver ID	Ambient L_{dn} Noise Level (dBA)
LT1	51
LT2	49
LT3	59
LT4	51
LT5	54
LT6	51
LT7	67
LT8	52
LT9	56
LT10	48
LT11	62
LT12	52
LT13	50

Note: L_{dn} = day/night sound level; dBA = A-weighted decibels.

Existing hourly ambient noise levels ranged from 29 dBA to 71 dBA $L_{eq(1h)}$ at the surveyed locations in the site vicinity. Statistical noise data was also collected during the measurements, including average hourly L_{90} results for the surveyed locations that ranged from 26 dBA to 63 dBA. Based on these outdoor ambient sound level measurements and as presented in Table 5, three surveyed locations (LT3, LT9, and LT11) were found to have existing L_{dn} values greater than 55 dBA, the EPA-recommended limit for exterior noise at a sensitive receptor. The other surveyed locations feature L_{dn} values at or below the 55 dBA L_{dn} guidance.

As detailed in Section III of the Addendum, baseline outdoor ambient sound level measurements were also performed at locations along sample positions of the Boulder Brush Boundary during field investigator visits to the Project Vicinity in May, June, and July of 2018. Durations of these sound pressure level measurements captured a night-and-day cycle of the existing sound environment, from which L_{dn} and CNEL values could be calculated.

In general, the surveyed L_{dn} values at On-Reservation locations and on the Boulder Brush Boundary seem reasonably illustrative of the Project vicinity based on the following expectations and acoustical principles:

- Higher hourly sound levels, and corresponding calculated L_{dn}, would tend to be closer to busy roads and highways;
- Lower outdoor sound levels would characterize areas that are remote from sources of regular sound emission; and,
- The acoustical energy from short-duration, intermittent, or even impulsive sounds in proximity to the SLM, such as occasional pass-bys from recreational vehicles or the burst of a truck horn, can skew L_{dn} values higher than what other acoustical metrics might suggest about the surveyed location.

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6 IMPACTS

Operational wind turbine noise and traffic noise are analyzed in the following section. Construction noise impacts are analyzed after operational noise impacts.

6.1 Methodology

6.1.1 Thresholds for Determining Impacts

6.1.1.1 Operational

Based on the noise and vibration standards presented in Chapter 4 of this report, the following criteria are used to assess noise impacts attributed to Project operation:

- For On-Reservation NSLUs,
  - 55 dBA L_{dn} exterior noise level (unless existing outdoor ambient L_{dn} already exceeds this EPA guidance); and
  - More than a 3 dB increase to the "cumulative + existing" L_{dn} (i.e., measured outdoor ambient plus acoustical contribution from any past, present, or foreseeable future projects in the Project vicinity) due to logarithmic addition of Project-attributed noise level that causes the combined or "future" level to exceed 55 dBA L_{dn} (or the existing L_{dn} when it already exceeds 55 dBA). Note that this is suggested guidance on the basis of a 3 dB being considered a perceptible change.
- For Off-Reservation NSLUs (applicable private lands under County jurisdiction), the County noise ordinance provides:
  - 50 dBA hourly L_{eq} during the day (7 a.m. to 10 p.m.) and 45 dBA hourly L_{eq} at night (10 p.m. to 7 a.m.);
  - Up to a 3 dB increase above pre-existing outdoor ambient sound level when it is already higher than the County's Section 36.404 (a) daytime (50 dBA) or nighttime (45 dBA) hourly L_{eq} limit, as applicable;
  - 60 dBA CNEL at the exterior of a noise-sensitive receptor;
  - No more than a 20 dB difference between the predicted C-weighted L_{eq} and the Residual Background Sound Criterion (i.e., 5 dB added to the pre-existing A-weighted measured L_{90} value); and
  - No more than a 1.5 dB difference when the "cumulative + existing" sound level (i.e., measured outdoor ambient plus acoustical contribution from any past, present, or

foreseeable future projects in the Project vicinity) is contrasted with the "cumulative + existing + project" sound level. A cumulative impact would occur when the combined sound level exceeds 60 dBA CNEL.

6.1.1.2 Construction

The FTA daytime standard for residential land uses of 80 dBA $L_{eq(8h)}$ is used in this assessment to evaluate daytime construction noise impacts at On-Reservation residential structures. For private lands that are occupied, the County of San Diego construction noise ordinance (36.409) threshold of 75 dBA $L_{eq(8h)}$ is used.

6.1.2 Traffic Noise

The FHWA Highway Traffic Noise Model algorithms (FHWA 1998) were used within the CadnaA noise modelling software program to predict operational and traffic noise levels at specific receptor locations. Inputs to the model were the three-dimensional coordinates of the roadways, noise receptors, and wind turbine hub locations; vehicle volumes and speeds; and ground absorption. Traffic volumes were taken from the Project traffic report (Dudek 2018).

6.1.3 Operational Noise Modeling Methodology

6.1.3.1 Wind Turbines

A computer program called CadnaA (Computer Aided Noise Abatement) was used to predict the aggregate sound propagation from Project wind turbine operation. CadnaA is a commercially available software program that enables predictive sound propagation in a three-dimensional (3D) model space from multiple point, line, and area-type sources. The outdoor noise propagation formulas and reference data incorporated into the software code adhere to several accepted standards, including the International Organization of Standardization (ISO) Standard 9613-2, "Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation" (ISO 1996). In summary, the CadnaA-based wind turbine operation noise model was setup and "run" with input parameters that included the following:

- Wind turbine sound power level data, at OBCF resolution, from manufacturer specifications and according to appropriate portions of International Electrotechnical Commission (IEC) Standard 61400-11 and -14. Low-frequency sound in the 31.5 Hz, 63 Hz, and 125 Hz OBCF are included in the analysis. (At the time of this analysis, the per-turbine A-weighted sound power level data reflects the values associated with a General Electric 2.X-127 60 Hz model wind turbine.)

- Wind turbines were treated as point sources located at hub height (110 meters, or 361 feet) relative to grade, and receptors were assumed to be 5 feet above grade.
- Respecting recent research findings on wind turbine noise predictive modeling (RSG 2016), the model broadly applies to the Project Area a ground acoustical absorption factor ("G") of 0.5, which is roughly the mean value on a spectrum from zero (acoustically reflective surfaces, such as bodies of water or coated pavement) to unity (acoustically absorptive ground conditions, such as porous soils or dense vegetative cover [grasses]).
- Separate from the manufacturer-recommended +2 dB adjustment to wind turbine sound power levels to account for measurement uncertainties, which was applied to the sound power levels for each modeled operating turbine, an additional +2 dB was applied to the wind turbine operation prediction model on the likelihood of enhancing prediction model precision. "When comparing to the measured five-minute L_{eq}, the ISO 9613 model with mixed ground and a 2 dB penalty (G=0.5 plus 2 dB) showed the greatest precision for receivers at 330 meters downwind. Longer averaging times (15 minutes and one hour) increased the modeling precision" (RSG 2016).
- Topographical data for the Project Area and surrounding vicinity, developed from U.S. Geological Survey sources, was imported to the model and thus accurately portrays the presence of natural terrain features that may affect sound propagation, such as path-intervening ridgelines or prominent hills.
- Meteorological conditions include an air temperature of 10°C (50°F) and 70% relative humidity.
- Consistent with ISO 9613-2, the sound propagation algorithm conservatively presumes a "downwind" condition regardless of actual wind direction.

Appendix B, CadnaA Sound Modeling Input/Output Data, provides additional details on the CadnaA input parameters and analysis results.

To predict Project turbine operation noise emission levels at different average wind velocities as received by the turbine rotors, supplemental predictive noise modeling was performed with Microsoft Excel workbooks containing sound propagation algorithms and input parameters that emulate ISO 9613-2 methodology. Comparison of predicted results between the CadnaA models and these Excel-based techniques at many geographic locations around and within the Project Site exhibit differences of less than +/-3 dB, which is barely a perceptible difference.

6.1.3.2 Other Campo Wind Facilities

Aside from operation of the aforementioned wind turbine generators, other major producers of outdoor noise emission associated with the Campo Wind Facilities could include HVAC equipment at the O&M Facility and a 35 kV / 230 kV transformer at the collector substation. Predictive modeling of sound propagation for operation of such electro-mechanical equipment would involve Excel-based models incorporating relevant algorithms and reference data comparable to the previously mentioned ISO 9613-2 techniques.

6.1.3.3 Boulder Brush Facilities

Operation of the Boulder Brush Facilities would include the high-voltage substation, which would primarily be characterized by continuous noise from the on-site transformer, a single 230 kV/500 kV forced-air and oil-cooled transformer that connects to the adjoining switchyard to the east. While the switching operations involving capacitors and breakers at the switchyard can cause intermittent noises, this analysis assumes that they would be very infrequent (Acentech Incorporated 2015) and thus would not significantly contribute to aggregate noise emission from the high-voltage substation site.

Predictive modeling of sound propagation for the high-voltage substation transformer on private lands would involve comparable ISO 9613-2 techniques as the previously mentioned CadnaA software algorithms. Please see Section III of the Addendum for more detailed Boulder Brush Facilities operation noise analyses.

6.1.4 Construction Noise Modeling Methods

The noise levels generated by construction equipment would vary greatly depending on factors such as the type and specific model of the equipment, the condition of the equipment, and the operation or process being performed. The energy-averaged sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction during the time period.

The Federal Highway Administration's Roadway Construction Noise Model (RCNM) (FHWA 2008) and comparable Excel-based predictive analysis techniques were used to estimate construction noise levels at source-to-receiver distances associated with the nearest noise-sensitive land uses or property line positions as appropriate. Input variables for the modeling consist of the receiver/land use types, the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time the equipment is in operation versus idle, over the workday), and the distance between the construction activity and noise-sensitive receivers. The model space conservatively presumes a flat, featureless plane (i.e., devoid of topographical features and the presence of pre-existing buildings and other structures) over which sound propagates between the studied sources and receptors. As a result, the modeling may over-predict construction activity noise exposure at some receptors that would actually benefit from sound path occlusion due to natural and man-made terrain. The RCNM has default duty cycle and reference maximum sound level (L_{max}) values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Both the default duty cycle and equipment-specific reference L_{max} values, as appropriate, were used for this construction noise analysis.

6.1.5 Vibration

The Project is not anticipated to include post-construction operating equipment or activities capable of producing substantial long-term groundborne vibration or groundborne noise levels. The only ground vibration potential would therefore be associated with the temporary construction phases of the Project.

Table 6 shows peak particle velocity values at a reference distance of 25 feet for samples of typical construction equipment (FTA 2006). Prediction of groundborne vibration exposure at potentially sensitive structures in the Project vicinity can be performed with the mathematical expressions already presented in Section 3.7, which use reference PPV levels to estimate attenuated vibration velocity at an input receptor distance.

Table 6
Typical Construction Equipment Vibration Levels

Equipment	PPV at 25 Feet (Inches per Second)	Approximate Noise Level at 25 Feet*
Jackhammer	0.035	79
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Small bulldozer	0.003	58

Sources: FTA 2006; Caltrans 2013b.
Notes: PPV = peak particle velocity
* Where noise level is the velocity level in decibels (VdB) referenced to 1 micro-inch per second and based on the RMS velocity amplitude.

6.2 Assumptions

6.2.1 Construction Modeling Assumptions

Construction noise and vibration are temporary phenomena. Construction noise and vibration levels will vary from hour to hour and day to day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor.

The Project Site would be developed in successive stages. For analysis purposes, it is assumed that the maximum noise levels (L_{max}) for various pieces of construction equipment at a reference distance of 50 feet are depicted in Table 7, consistent with information from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide (FHWA 2006). The energy-averaged sound level from a piece of operating construction equipment is typically less than the maximum noise level because it operates in alternating cycles of full power and lower power. To quantify this power delivery variance, the Acoustical Use Factor (AUF) shown in Table 7 represents the portion (expressed as a percentage) of time, such as an hour, when the indicated equipment is actually operating at full power and thus under conditions that produce the L_{max} value. The energy-averaged L_{eq} at the 50-foot reference distance is then calculated from these two input values with the following expression:

$$\text{Construction equipment } L_{eq1h} \text{ (at 50 feet)} = L_{max} \text{ (at 50 feet)} + 10*\text{LOG(AUF)}$$

where the AUF value is the decimal equivalent of the percentage shown in Table 7.

Table 7
Construction Equipment Noise Emission Levels

Equipment Description	Impact Device?	Acoustical Usage Factor (AUF, as percentage [%])[1]	Maximum sound pressure level at 50 ft (L_{max} dBA)[1]
Backhoe	No	40	78
Compressor (air)	No	40	78
Concrete batch plant	No	15	83
Crane	No	16	81
Crushing/processing equipment	No	50 [2]	88 [3]
Dozer	No	40	82
Excavator (trencher)	No	40	81
Front-end loader	No	40	79
Generator	No	50	72
Generator (<25 kVA, VMS signs)	No	50	70
Grader	No	40	85
Other equipment (> 5 HP)	No	50	85
Personnel lift / forklift	No	20	75
Paver	No	50	77
Pump	No	50	77
Roller	No	20	80
Scraper	No	40	84
Tractor	No	40	84
Welder	No	40	73

Sources: FHWA 2006; Ldn Consulting Inc. 2011.

Notes: L_{max} = maximum sound level; ft = feet; dBA = A-weighted decibels; kVA = kilovolt-amperes; HP = horsepower; VMS = variable message sign.

1 unless otherwise noted, reference values are from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide (FHWA 2006).

2 assumed same as Other equipment, per FHWA RCNM

3 based on measured levels (Ldn Consulting Inc. 2011)

To predict the overall L_{eq} representing noise exposure at a receptor some distance from a studied construction activity phase, per-phase rosters of construction equipment types and quantities are based on CalEEMod defaults used in the Air Quality Analysis (Dudek 2019a), which are also shown in Table 8. Listed "usage hours" in the rightmost column of Table 8 represent the anticipated hours (within a typical 8-hour per-day period) that the indicated equipment is operating on site. However, due to the large geographic area represented by the Project, this analysis assumes that for some circumstances not all construction equipment listed for a particular phase may be proximate to a studied receptor. In other words, for some situations, the expected quantity of active construction equipment for a phase near a sensitive receptor may be less than what appears in the per-phase breakdown of total equipment as summarized in Table 8. By way of example, a quantity of construction equipment could be split among two or more locations within the Project Area, and at sufficient distance to each other so that noise emission from only one location of activity would be relevant for study with respect to a given noise-sensitive receptor.

The construction noise analysis also applies the expected effect of acoustical ground absorption, which depending on distance offers up to 5 dBA of noise reduction (ISO 1996).

Table 8
Construction Scenario Assumptions

Project Component (and its *Construction Phase*)	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Campo Wind Facilities – *Clearing and grading*	72	108	734	Graders	3	8
				Rubber-tired dozers	8	8
				Scrapers	3	8
				Crushing/processing equipment	1	8
Campo Wind Facilities – *Construction of access roads*	120	0	22	Scrapers	3	8
				Rubber-tired loaders	7	8
Campo Wind Facilities – *Wind turbine foundation construction*	168	20	3,046	Air compressors	3	8
				Generator sets	3	8
				Pumps	1	8
Campo Wind Facilities – *Wind turbine erection*	144	0	720	Cranes	19	7
				Air compressors	2	8
				Generator sets	3	8
				Pumps	2	8
				Welders	7	8

Table 8
Construction Scenario Assumptions

Project Component (and its *Construction Phase*)	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Campo Wind Facilities – *Construction of underground electrical collection system*	240	12	368	Rubber-tired dozers	2	7
				Tractors/loaders/backhoes	4	8
				Trenchers	3	8
Campo Wind Facilities – *Construction of collector substation*	48	3	138	Air compressors	1	8
				Cranes	1	7
				Generator sets	2	8
				Pumps	1	8
				Tractors/loaders/backhoes	3	7
				Welders	2	8
Campo Wind Facilities – *Gen-Tie line foundation construction and tower erection*	96	10	30	Forklifts	1	8
				Welder	1	7
				Air compressor	1	7
				Generator sets	2	6
				Pump	1	7
Campo Wind Facilities – *Gen-Tie line stringing and pulling*	72	10	20	Welder	1	7
				Air compressor	1	7
Campo Wind Facilities – *Operations and maintenance facility*	120	4	20	Cranes	1	7
				Generator sets	1	8
				Tractors/loaders/backhoes	1	7
				Welders	1	8
Campo Wind Facilities – *Meteorological (MET) towers*	24	4	4	Cranes	1	7
				Generator sets	2	8
				Tractors/loaders/backhoes	1	7
				Welders	1	8
Boulder Brush Facilities – *High Voltage Substation and Switchyard*	144	8	415	Air compressors	1	8
				Cranes	2	7
				Generator sets	6	8
				Pumps	3	8
				Tractors/loaders/backhoes	3	7
				Welders	2	8
Boulder Brush Facilities – *Clearing and grading*	48	20	0	Tractors/loaders/backhoes	4	7
				Rubber-tired dozers	4	8
				Graders	2	7

Table 8
Construction Scenario Assumptions

Project Component (and its *Construction Phase*)	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Boulder Brush Facilities – *Unpaved construction access roads*	48	10	32	Pavers	1	8
				Rollers	4	8
				Scrapers	2	8
				Paving equipment	4	8
				Pump	1	7
Boulder Brush Facilities – *Gen-Tie line foundation construction and tower erection*	96	10	30	Forklifts	1	8
				Welder	1	7
				Air compressor	1	7
				Generator sets	2	6
				Pump	1	7
Boulder Brush Facilities – *Gen-Tile stringing and pulling*	72	10	20	Welder	1	7
				Air compressor	1	7
Boulder Brush Facilities – *Paving of switchyard access road*	66	0	0	Pavers	1	8
				Paving equipment	4	8
				Rollers	8	8

Anticipated noise attributed to Campo Wind Facilities construction would also include a temporary concrete batch plant, located near the anticipated O&M Facility approximately one mile from the southeastern corner of the Reservation Boundary.

6.2.2 Operational Modeling Assumptions

Anticipated noise attributed to Campo Wind Facilities operation would be primarily related to aggregate sound emission from the operating wind turbines and the Project collector substation, which includes a 35 kV / 230 kV transformer as its presumed dominant noise emitter). For noise prediction purposes, the turbines and Project collector substation were conservatively assumed to operate at maximum noise output during the day. Actual turbine operation and noise levels would be a function of wind speed, as detailed in the following subsection.

6.2.2.1 Existing Wind Conditions

Wind turbine sound emission levels vary with received wind speed. Per manufacturer specifications that follow IEC 61400 standards and conditions, this variance is quantified via reference sound power levels (at OBCF resolution) that are associated with specific wind speeds, from the established “cut-on” minimum air speed (4 meters per second [m/s]) required for the bladed rotor to begin turning and generating electricity, to what is considered a maximum air speed at which the bladed rotor would not be permitted to spin faster. As the rotor speed increases and allows for more energy production, noise emission increases. At a received wind speed of 10 m/s at hub height, the wind turbine under study generates its highest noise levels and does not get louder—even as wind speeds may exceed this quantity.

In addition to the CadnaA noise prediction model input parameters listed in Section 6.1.3, this study included consideration of historical wind data for the Reservation. Meteorological data supplied by Terra-Gen included a year-long sample of measured wind velocity, collected at ten-minute intervals by On-Reservation anemometers at a height of 58 meters (190 feet) above grade. Table 9 presents the number of diurnal cycles (i.e., complete 24-hour periods, from midnight to the subsequent midnight) within this sample year when the measured average wind speed fell within the indicated ranges. Table 9 also shows the A-weighted sound power level for an individual turbine operating under conditions of the lowest wind speed value for each listed range.

Table 9
Occurrence of Average Wind Speed over Sample Year of Diurnal Cycles

Average Wind Speed (m/s) for 24-hour Period	>10	9-10	8-9	7-8	6-7	5-6	4-5	< 4
Occurrence (number of diurnal cycles)	14	15	12	25	28	55	66	155
Occurrence Percentage (out of 365 Days)	4%	4%	3%	7%	8%	14%	18%	42%
Wind Turbine Sound Power Level (dBA)	110.0	109.2	106.8	103.9	100.4	96.9	96.7	n/a*

Sources: Terra-Gen 2019.
Notes: wind turbine sound power levels are based on General Electric 2.X-127 sound specification, provided via Terra-Gen, for limited purposes of this analysis.
* at wind speeds less than cut-on (4 m/s) velocity, wind turbine rotor will not turn to generate electricity.

Assuming the studied sample year of meteorological data is indicative of present and future wind conditions experienced in the Project Site and immediate vicinity, the key findings revealed by Table 9 are as follows:

- Based on average wind speed over a 24-hour period, maximum operating wind turbine noise emission would only be expected for a cumulative total of two weeks during the year; and,
- For nearly 200 days and nights of the year, average wind speed and corresponding individual wind turbine noise level varies between 4 to 10 m/s and 96.7 to 110.0 dBA, respectively.

6.2.2.2 Amplitude Modulation

Available reports on monitored performance of some existing wind turbine projects suggest that under the right conditions, audible wind turbine noise amplitude modulation occurs. Amplitude modulation is understood to be a cyclical variation of sound pressure due to noise-producing aerodynamic effects that include the wind turbine rotor blades spinning through stratified air masses. Such stratification is due to phenomena such as temperature inversion, which often results in calm conditions near grade, with potentially higher wind speeds near the turbine nacelle or above through which the rotor blades pass. Temperature inversions also refract sound downwards toward the ground surface, rather than upwards into the atmosphere, which can result in wind turbine noise traveling farther. However, as noted in Section 5.5.3.1 of the Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States, “this condition would occur only at low wind speeds, approximately less than 9 ft/s (3 m/s), because stronger winds interfere with this effect. Modern-day wind turbines have a cut-in speed of about 8.2 to 13 ft/s (2.5 to 4 m/s)…; thus, increased noise propagation associated with temperature inversion would be minimal in most operations” (BLM 2005).

Offering insight on the magnitude of such amplitude modulation, recent research of multiple operating wind turbine facilities led to the following conclusions regarding its potential “depth” and frequency of occurrence (RSG 2016):

- Our analysis of data at three monitoring locations showed clear differences in modulation depth between background and turbine sounds. We found amplitude-modulated sounds in the mid-frequency range of about 250 Hz to 2 kHz, but did not find notable amplitude modulation in infrasonic, low, and high frequencies.
- For the flat sites, 91% of the modulation is of 2 dB or less. At the mountain site, 88% of the modulation is of 2 dB or less. Going higher in modulation depth, for the flat sites, 99.87% of the modulation is of 4.5 dB or less. At the mountain site, 99.996% is of 4.5 dB or less. Higher modulation events do occur, but they are rare. Of the 105,907 10-second readings, fewer than 300 had modulation depths of 4 dB or greater.

At these indicated percentages, and if conditions are assumed to be similar for the Project, measurable and audible amplitude modulation is expected to be a very rare event. Nine times out of ten, as suggested by these statistics, the modulation depth of 2 dB (or less) would be accounted for by the 2 dB upward adjustment (i.e., in addition to the 2 dB that accounts for measurement uncertainty, as detailed in Section 6.1.3) to the predicted operation noise levels.

6.2.2.3 Infrasound

Defined as sound of a frequency that is below the range of human hearing, generally below 20 Hz, infrasound is not evaluated in this report. Based on recent research, involving measurements of infrasound at multiple wind turbine facilities, wind turbines do increase infrasound levels—especially at higher wind speeds. However, the resulting levels are, "at the least, 25 dB below ISO 7196 audible perception thresholds, and the difference between measured infrasound levels and the audibility threshold increases as frequency decreases" (RSG 2016).

6.2.2.4 Low Frequency Sound

In order to evaluate low frequency sound emission from operating Project wind turbines, the predictive modeling efforts included consideration of C-weighted individual turbine point-source sound power levels, which were derived from the manufacturer's A-weighted levels by "adding back" the standardized A-weighting dB adjustments prior to applying the standardized C-weighting dB adjustments—both of which are shown in Table 1, Comparison of A-Weighting and C-Weighting Adjustments. The predicted C-weighted levels enable this study to assess the potential effects of the wind turbines associated with the Campo Wind Facilities on the Reservation at NSLU within unincorporated San Diego County jurisdiction as summarized in Section 4.2.

6.2.2.5 Non-Turbine Operations

Noise would also be generated during Project maintenance and inspections, as well as from activities at the O&M building. Based on information from the Project traffic report (Dudek 2018), the Project would generate minimal vehicle trips associated with these ancillary operations.

Please see Section III of the Addendum for more detailed Boulder Brush Facilities operation noise analyses.

6.3 On-Reservation Operation Noise Impact Assessment

Campo Wind Facilities implementation and operation would create stationary noise sources on the Reservation. These sources would include the wind turbines, Project collector substation, transmission lines, and maintenance and inspection activities.

6.3.1 Roadway Traffic Noise

The Campo Wind Facilities would employ approximately 10 to 12 full-time employees, generating up to 24 daily two-way trips, 7 days per week. Security staff traveling throughout the Campo Corridor would use light-duty pickup trucks. Traffic volumes at this level would not have a measurable effect on existing traffic noise levels. Project operation would involve vehicular traffic on access roads for inspection and maintenance. While these activities would increase noise levels immediately adjacent to the access road during vehicle pass-bys, these events would not result in a substantial increase in ambient noise. Operational traffic noise associated with the Campo Wind Facilities would not result in an adverse noise effect.

6.3.2 Wind Turbine Noise Modeling Results

Adoption of EPA guidance sets 55 dBA L_{dn} as the operation noise threshold at On-Reservation NSLU. Table 10 shows the predicted L_{dn} results, per indicated average wind speed, at representative receiver positions at and within the Reservation Boundary. As actual On-Reservation NSLU locations cannot be confirmed, the tagged positions in Table 10 (and as appearing in Figure 2) are intended to represent potential residential or otherwise noise-sensitive areas for purposes of this analysis. Bold italicized values occur when the predicted level exceeds 55 dBA.

Table 10
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels – On Reservation

Representative NSLU Site/Area	Predicted L_{dn} (dBA) at Indicated Average Wind Speed (meters per second [m/s])						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	46	46	49	53	***56***	***58***	***59***
LT-2	43	43	47	50	53	***56***	***56***
LT-3	40	41	44	48	50	53	54
LT-4	42	42	46	49	52	55	55
LT-5	44	45	48	52	55	***57***	***58***
LT-6	31	31	35	38	41	43	44
LT-7	32	33	36	40	43	45	46
LT-8	43	43	47	50	53	55	***56***
LT-9	52	52	***56***	***59***	***62***	***65***	***65***
LT-10	44	45	48	52	54	***57***	***58***
LT-11	38	39	42	46	49	51	52
LT-12	34	35	38	42	45	47	48
LT-13	37	37	41	44	47	50	51

NSLU = noise-sensitive land use; L_{dn} = day/night sound level; dBA = A-weighted decibels.

Among a number of NSLU Site/Areas shown in Table 10 where predicted L_{dn} exceeds the guidance-based threshold of 55 dBA when average wind speeds are 8 m/s or greater, the sensitive receptor site represented by LT-9 is located within 0.25 miles of five turbines. But after respecting a 0.25-mile minimum screening distance required by the Campo Lease between any potential NSLU and a possible turbine site, certain turbine locations (among the 76 sites evaluated) would not be constructed; therefore, the predicted operations noise level at LT-9 without the specified nearby turbines would likely remain less than the 55 dBA L_{dn} guidance-based threshold even under 10 m/s (or greater) average wind speeds over a 24-hour period.

Figure 3, Operational 55 dBA Ldn Noise Contours, illustrates the predicted 55 dBA L_{dn} iso-levels (a.k.a., "noise contours") due to modeled operational Project wind turbines at different average wind speeds received at the turbine hub height above grade.

6.3.3 Low-Frequency Turbine Noise

A study conducted in 2009 measured low-frequency noise associated with two modern turbines: the GE 1.5SLE and the Siemens 2.3-93. The study determined that noise generated by the turbines at distances beyond 1,000 feet were below the interior low-frequency noise criteria for bedrooms, classrooms, and hospitals. In addition to meeting background noise criteria, the measured noise levels also demonstrated that wind turbine setbacks of 1,000 feet would not cause "more than minimal annoyance (if any) from low-frequency noise, and there should be no wind rattles or perceptible vibration of light-weight walls or ceilings within homes" (Epsilon 2009). The Campo Lease provides a minimum setback for turbine units of 1,320 feet (i.e., 0.25 miles) from local residential uses; therefore, low-frequency noise would not result in adverse noise impacts.

6.3.4 Campo Wind Facilities Collector Substation

On-Reservation potential noise-sensitive receptors may be proximate to the collector substation, which would feature a single 35 kV / 230 kV transformer (for purposes of this analysis, a continuous source of noise emission as compared to other ancillary systems and equipment at this site that may only produce noise intermittently). At a source-to-receptor distance of at least 300 feet from this transformer, the expected sound pressure level would be less than 48 dBA L_{eq}, which converted to an L_{dn} value would be less than 55 dBA (the EPA recommended exterior noise level for sensitive receptors) and thus result in a noise impact that would not be considered adverse.

6.3.5 On-Reservation Gen-Tie Line

The On-Reservation gen-tie line associated with the Boulder Brush Facilities may produce corona during normal operation, but even under foul weather conditions that would moisten or wet the conductor surfaces, the resulting noise would only be audible at very close distances and thus not result in an adverse effect. Please see Section III of the Addendum for more detailed Boulder Brush Facilities operation noise analyses.

6.3.6 O&M Facility

The O&M Facility is anticipated to feature an enclosed structure with air-conditioning to provide interior comfort for occupants and electrical control equipment. Such expected components suggest a need for regular, continuous operation of refrigeration units with one or more rooftop air-cooled condenser units having individual sound emission levels of 74 dBA at 3 feet [Johnson Controls 2010]). For purposes of this analysis, during hot summer months a quantity of these rooftop units may be operating, and would thus produce an aggregate noise level of less than 48 dBA L_{eq} at the nearest potential On-Reservation NSLU. Hence, for this continuous noise level under such conditions, which converted to an L_{dn} value would be less than 55 dBA (the EPA recommended exterior noise level for sensitive receptors), noise impact from operation of the O&M Facility HVAC systems would not be considered adverse.

6.3.7 Cumulative Discussion

To assess for cumulatively considerable impacts at potential NSLU within the Reservation, an additional noise model was created that included other nearby existing operating turbines (Kumeyaay, and to a lesser degree the single wind turbine associated with the Golden Acorn Casino) and foreseeable future (proposed Torrey Wind Project) vicinity wind turbines to assess the cumulative impact the Campo Wind Facilities would have in acoustical combination with other wind turbines in the Project vicinity. Acoustical contributions from the currently operating Tule Wind turbines were, due to their average distance from the Project, considered part of the measured existing outdoor ambient level. Logarithmically added together, the cumulative other projects (proposed Torrey Wind Project) and measured existing (Kumeyaay+Tule and other existing noise sources, such as roadways) are represented in Table 11 as a total (albeit excluding the Campo Wind Facilities) "cumulative + Existing" L_{dn} for comparison with the predicted Campo Wind Facilities operations L_{dn} value.

Table 11
Predicted Future Cumulative Noise Levels due to Campo Wind Facilities Operation

Representative Receiver Position ID	Cumulative + Existing* L_{dn} (dBA)	Predicted Campo Wind Facilities Operations** L_{dn} (dBA)	Cumulative + Existing Plus Predicted Campo Wind Facilities*** L_{dn} (dBA)	Cumulative Impact caused by Campo Wind Facilities?
LT-1	51	53	55	No
LT-2	49	50	53	No
LT-3	59	48	59	No
LT-4	51	49	53	No
LT-5	54	52	56	No
LT-6	51	38	51	No
LT-7	67	40	67	No
LT-8	52	50	54	No
LT-9	56	59	61	Yes
LT-10	50	52	54	No
LT-11	62	46	62	No
LT-12	53	42	53	No
LT-13	50	44	51	No

* Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.

** Predicted Campo Wind Facilities Operations is from Table 10, at an average wind speed of 7 meters per second (m/s).

*** This value is the logarithmic sum of Cumulative + Existing and Predicted Campo Wind Facilities, or what could be called a "future" outdoor ambient noise level.

The test for cumulatively considerable in this analysis context is grounded in acoustical principles: when there are two sound sources (in this case, "cumulative + existing" and "predicted Campo Wind Facilities") contributing to the combined level at a receptor, there can only be two possibilities:

1. They are acoustically equivalent, which means their logarithmic sum yields a value that cannot be more than 3 dB higher than the value of either contributor; or,
2. One of them is acoustically greater than the other, which therefore requires their logarithmic sum yields a combined dB value that must be at least 3 dB higher than the lesser of the two acoustical contributors.

For representative location LT-9 shown in Table 11, the predicted Campo Wind Facilities operations noise is the larger of the two acoustical contributors to the "future" logarithmic sum and is cumulatively considerable because its adverse effect is to cause the combined future noise level to exceed the EPA guidance limit. At the other listed locations, for when the average wind speed at turbine hub height is 7 m/s, the predicted Campo Wind Facilities noise level is either not greater than the cumulative + existing level, or its acoustical contribution is not sufficient to result in an adverse effect when compared to the EPA guidance standard.

At higher hub-height average wind speeds, such as 10 m/s received by all 76 potential wind turbine sites as studied in this analysis, the opportunity for cumulative impacts at some of the listed representative locations in Table 11 would arise. Such potential cumulatively considerable contributions would be consistent with predicted aggregate noise exposure levels that exceed 55 dBA L_{dn} as presented in Table 10. Due to the parameters of the aforementioned Campo Lease, which only authorizes 60 turbines to be constructed for the Project, and a quarter-mile turbine site setback from existing residential On-Reservation receptors, there is also an opportunity for reduced cumulative noise exposure at one or more of these studied representative locations. Final Project turbine layout may offer potential reduction of predicted cumulative noise levels at On-Reservation NSLU due to their distance from one or multiple operating turbines. The quantifiable effect of such a layout would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to existing turbines, and the pre-existing outdoor ambient sound level.

6.4 Off-Reservation Operation Noise Impact Assessment

Boulder Brush Facilities implementation and operation would create stationary noise sources off the Reservation. These sources would include the Boulder Brush Facilities high-voltage substation, gen-tie line, SDG&E switchyard, and maintenance and inspection activities. Please see Section III of the Addendum for more detailed Boulder Brush Facilities operation noise analyses.

Additionally, Project components within the Reservation Boundary may cause noise that could travel or 'spill' onto private lands within the jurisdiction of the County; hence, the following subsections include analysis of potential noise exposure impacts at receptors located outside of the Reservation Boundary but within unincorporated San Diego County. This analysis uses County general plan guidelines and ordinances for reference for spillover effects on private lands and to the extent that such policies and ordinances would be applicable to the land within the Boulder Brush Boundary. County general plan policies and its ordinances do not apply on the Reservation.

6.4.1 General Plan

The County of San Diego General Plan limits the noise level from the Project to 60 dBA CNEL at the exterior living area of a noise-sensitive land use. Table 12 shows the modeled CNEL results at a subset of the representative receivers listed in Table 10 that are located on the Reservation Boundary and beyond which are private lands under County jurisdiction. Representative assessment locations from Table 10 not included in Table 12 are inside the Reservation Boundary.

Table 12
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels – Off Reservation

Representative Receiver Position ID	Predicted CNEL (dBA) at Indicated Average Wind Speed (meters per second [m/s])						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	46	46	50	53	56	58	59
LT-10	45	45	48	52	55	57	58
LT-13	38	38	41	45	48	50	51

NSLU = noise-sensitive land use; L_{dn} = day/night sound level; dBA = A-weighted decibels.

When comparing the modeled CNEL results with the 60 dBA CNEL County guidelines, no modeled receptor locations exceed the guideline. Figure 4, Operational 60 dBA CNEL Noise Contour by Average Hub-height Wind Speed, shows predicted 60 dBA CNEL contour lines for operation of the proposed wind turbines at different average wind speeds received at the turbine hub height above grade. At position LT-10, where the measured baseline CNEL was 48 dBA, the corresponding impact significance guidance would be this value plus 10 dBA (i.e., equal to 58 dBA CNEL) consistent with Section 4.1.A.ii of the County guidelines. Hence, per the predicted aggregate turbine operation noise level at LT-10, the County guideline would not be exceeded. Furthermore, there is currently no existing NSLU in the vicinity of LT-10 on private lands under County jurisdiction.

6.4.2 Municipal Code, Noise Ordinance Hourly

Noise thresholds for operational activities are regulated through the County's Noise Ordinance, (County of San Diego 2011b) "Noise Abatement and Control." Section 36.404 includes sound level limits for non-construction-related stationary noise sources (i.e., 1-hour average sound level limits for the Project's operational-related noise sources) such as the proposed wind turbines.

The allowable noise limits depend upon the zoning district and time of day. The 1-hour average sound level limits for residential zoned areas with a density of 11 or less dwelling units per acre is 50 dB from 7 a.m. to 10 p.m., and 45 dB from 10 p.m. to 7 a.m. If the measured ambient noise level exceeds the applicable limit previously noted, the allowable 1-hour average noise levels shall be the ambient noise level.

Assuming wind turbines are constructed at all possible 76 sites (of which only 60 can be constructed under the terms of the Campo Lease), Table 13 shows modeled hourly noise levels from the Project during daytime and nighttime periods, and a determination of exceedances with respect to the County hourly limits. As noted above, this analysis represents a worst case scenario that is unlikely to occur. Values in Table 13 that are bold and italicized show where the County exterior daytime hourly limit (50 dBA L_{eq}) would be exceeded under the indicated average wind speed; and, underlined values are those where the nighttime limit (45 dBA L_{eq}) would be surpassed.

Table 13
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels

Representative Receiver Position ID	Predicted Hourly Leq (dBA) at Indicated Average Wind Speed (meters per second [m/s])						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	39	39	43	46	49	*52*	*53*
LT-10	38	38	42	45	48	50	*51*
LT-13	31	31	35	38	41	43	44

NSLU = noise-sensitive land use; L_{dn} = day/night sound level; dBA = A-weighted decibels.

Figure 5, Operational 50 dBA Leq Noise Contour by Average Hub-height Wind Speed, shows the predicted daytime hourly 50 dBA L_{eq} operational noise contours at different average wind speeds received at the turbine hub height above grade. Figure 6 shows the predicted nighttime hourly 45 dBA L_{eq} operational noise contours at different average wind speeds received at the turbine hub height above grade. These figures show some areas where predicted sound levels greater than or equal to these thresholds extend beyond the Reservation Boundary into private lands within County jurisdiction, such as locations near LT-1, LT-10, LT-11, LT-12, and LT-13.

This noise analysis conservatively predicted noise as if all 76 identified turbine sites featured an operating turbine. Due to the parameters of the aforementioned Campo Lease, which only authorizes 60 turbines to be constructed for the Project, there is an opportunity for reduced noise exposure at one or more of these studied representative locations. Final Project turbine layout may offer potential reduction of predicted aggregate sound pressure level at Off-Reservation NSLUs due to their increased distance from one or multiple operating turbines. The quantifiable effect of such a layout would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to existing turbines, and the pre-existing outdoor ambient sound level. Nonetheless, because the Campo Wind Facilities would be located outside of the jurisdiction of the County, the County would not have authority to require a site layout that reduces these operational impacts to below a level of significance or to impose other feasible mitigation measures. As such, operational noise impacts associated with the Project would remain **significant and unavoidable**.

6.4.3 County Zoning Ordinance Section 6952 – Large Wind Turbine

CadnaA was used to predict the octave band center frequency (OBCF) spectral content of the Campo Wind Facilities aggregate operating wind turbine noise at and beyond the Reservation Boundary. This predicted spectral data was used to determine the potential low frequency noise impacts in terms of L_{eq1h} dBC compared with the A-weighted RBSC (i.e., average hourly L_{90} + 5 dB). Assuming wind turbines at all possible 76 sites, Table 14 shows the predicted dB differentials at each indicated study location, based on RBSC calculated by adding 5 dB to an average of the A-weighted L_{90} values at each listed location from the field measurement survey. Bold italicized values in Table 14 show under what wind conditions the expected difference between the C-weighted predicted level and the RBSC is greater than 20 dB.

Table 14
Predicted C-Weighted Aggregate Project Wind Turbine Noise Levels

Representative Receiver Position ID	Predicted Hourly Leq (dBC) minus Residual Background Sound Criterion (RBSC) at Indicated Average Wind Speed (meters per second [m/s])						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	14	14	17	20	*23*	*26*	*27*
LT-10	16	16	19	*22*	*25*	*28*	*29*
LT-13	6	6	9	12	15	18	19

NSLU = noise-sensitive land use; L_{dn} = day/night sound level; dBA = A-weighted decibels.

For purposes of illustration, Figure 7 shows contour lines, for different average hub-height wind speeds, where the differential between the predicted wind turbine operations C-weighted noise and an A-weighted RBSC of 37 dBA (the lowest of the three studied locations presented in Table 14) exceeds 20 dB. This graphical hypothetical is considered conservative because it applies the RBSC value of 37 dBA everywhere to describe the existing environment in the Project Vicinity. As previously described, this noise analysis conservatively predicted noise as if all 76 identified turbine sites featured an operating turbine. Due to the parameters of the aforementioned Campo Lease, which only authorizes 60 turbines to be constructed for the Project, there is an opportunity for reduced noise exposure at one or more of these studied representative locations. Final Project turbine layout may offer potential reduction of predicted aggregate sound pressure level at Off-Reservation NSLUs due to their increased distance from one or multiple operating turbines. The quantifiable effect of such a layout would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to existing turbines, and the pre-existing outdoor ambient sound level. Nonetheless, because the Campo Wind Facilities would be located outside of the jurisdiction of the County, the County would not have authority to require a site layout that reduces these operational impacts to below a level of significance or to impose other feasible mitigation measures. As such, operational noise impacts associated with the Campo Wind Facilities on the Reservation would remain **significant and unavoidable**.

6.4.4 Cumulative Discussion

To assess for cumulatively considerable impacts at NSLU on private lands, an additional noise model was created that included other existing (e.g., Kumeyaay and Tule) and foreseeable future (Torrey) vicinity wind turbines to assess the cumulative impact the Campo Wind Facilities would have in acoustical combination with these other acoustical contributors in the Project vicinity. Table 15 shows the CNEL results of the cumulative noise model for the 76-turbine Campo Wind Facilities scenario. None of the three studied receiver locations at boundaries with proximate private lands (under County jurisdiction) have a predicted cumulative plus Project noise level that exceeds the 60 dBA CNEL County threshold or result in a cumulative impact.

Table 15
Predicted Cumulative Noise Levels from Campo Wind Facilities Operation

Representative Receiver Position ID	Cumulative + Existing* CNEL (dBA)	Cumulative + Existing Plus Campo Wind Facilities Modeled CNEL (dBA)	Over 60 dBA CNEL Threshold and Cumulative Impact?
LT1	52	60	No
L10	50	59	No
L13	51	54	No

* Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.

None of the other receiver locations near boundaries with County land exceed the 60 dBA CNEL County thresholds when Project operating noise and other vicinity wind turbine projects are cumulatively considered in the modeling. Thus, the Project cumulative impact would be less than significant.

6.4.5 O&M Facility

The O&M facility is anticipated to feature an enclosed structure with air-conditioning to provide interior comfort for occupants and electrical control equipment. Such expected components suggest a need for regular, continuous operation of refrigeration units with one or more rooftop air-cooled condenser units having individual sound emission levels of 74 dBA at 3 feet (Johnson Controls 2010). For purposes of this analysis, during hot summer months if up to 10 of such rooftop units were operating, they would produce an aggregate noise level of less than 25 dBA at the nearest Off-Reservation receptor 1,390 feet away. Hence, noise impact from operation of the O&M facility HVAC systems would not be considered adverse.

The O&M facility is expected to include an emergency generator rated at 150 kW. Although operation of such a back-up power system is generally exempt from noise regulations and standards during actual emergencies, it needs to be regularly tested to ensure mission-critical performance when needed. Testing is anticipated to be during daytime hours and for a thirty-minute period per month. Assuming it is comparable to a Cummins DGFA model with a "Level 1" enclosure, the reference sound emission level would be 77 dBA at a distance of 23 feet (Cummins 2008). At a distance of 1,390 feet, the nearest Off-Reservation sensitive receptor, the expected one-hour noise exposure level would be less than 32 dBA and thus result in a less than significant effect.

6.4.6 Campo Wind Facilities Collector Substation

The closest Off-Reservation potential NSLU within the jurisdiction of the County of San Diego would be located approximately 1,970 feet from the collector substation, where a single 35 kV / 230 kV transformer is planned. At this distance, the expected sound pressure level from continuous operation of the collector substation transformer would be less than 29 dBA L_{eq} and therefore would result in a less than significant impact relative to applicable County noise limits.

The collector substation is expected to include an emergency generator rated at 150 kW. Although operation of such a back-up power system is generally exempt from noise regulations and standards during actual emergencies, it needs to be regularly tested to ensure mission-critical performance when needed. Testing is anticipated to be during daytime hours and for a thirty-minute period per month. Assuming it is comparable to a Cummins DGFA model with a "Level 1" enclosure, the reference sound emission level would be 77 dBA at a distance of 23 feet (Cummins 2008). At a distance of 1,970 feet, the nearest Off-Reservation sensitive receptor, the expected 1-hour noise exposure level would be less than 28 dBA and thus result in a less than significant impact relative to applicable County noise limits.

6.4.7 Boulder Brush Facilities Operation

The closest Off-Reservation potential NSLU within the jurisdiction of the County would be located approximately 13,200 feet from the high-voltage substation and switchyard. At this distance, the expected sound pressure level from continuous operation of the high-voltage substation transformer would be less than 20 dBA L_{eq}; therefore, impacts would be less than significant relative to applicable County noise limits.

The Boulder Brush Facilities are expected to include two 150 kW emergency generators: one at the high-voltage substation and one at the switchyard. Although operation of such systems are generally exempt from noise regulations and standards during actual emergencies, they need to be regularly tested to ensure they perform when needed. Testing is anticipated to be during daytime hours and for a thirty-minute period per month, and such daytime (between 7:00 a.m. and 7:00 p.m.) generator testing is exempt from San Diego County noise limits per Section 36.417 (a)(5). Assuming each generator was comparable to a Cummins DGFA model with a “Level 1” enclosure, the reference sound emission level would be 77 dBA at a distance of 23 feet (Cummins 2008). At a distance of 13,200 feet, the nearest Off-Reservation sensitive receptor within the jurisdiction of the County, the expected one-hour noise exposure level would be less than 10 dBA and thus result in a less than significant impact. See Addendum to this report for further noise analysis for the Boulder Brush Facilities.

6.4.8 Off-Reservation Gen-Tie Line

The Off-Reservation gen-tie line associated with the Boulder Brush Facilities may produce corona during normal operation, but even under foul weather conditions that would moisten or wet the conductor surfaces, the resulting noise would only be audible at very close distances and thus not result in an adverse effect. Please refer to Section III of the Addendum, which provides a detailed analysis of potentially audible corona noise using an industry-accepted prediction technique. Figure 8 depicts predicted Off-Reservation audible noise (AN) from corona effects of electricity conducted by the transmission line during rainy conditions. At a level of 24 dBA L_{eq} under such conditions, this predicted region of gen-tie line corona noise from the Boulder Brush Facilities is far from the nearest NSLU under County jurisdiction.

6.5 Construction Noise Impact Assessment

Construction noise would be generated by workers commuting to and from the job site; by construction-material deliveries; and by the use of construction equipment during site preparation, grading, and construction activities.

Typical heavy construction equipment will include bulldozers, excavators, front-end loaders, and graders. It is assumed that diesel engines would power all construction equipment. As shown in Table 7, Construction Equipment Noise Emission Levels, under Section 6.2.1, maximum noise levels at a distance of 50 feet from an individual piece of construction equipment (or in the case of rock crushing, a set of equipment and processes at a single defined site) can reach as high as 88 dBA. However, with construction equipment moving around the Project Site and pausing for measurements and worker breaks, average hourly noise levels would typically be significant less.

For this analysis, a conservative drop-off rate of 6 dBA per doubling of distance was used for construction noise attenuation. The aforementioned ground attenuation effect (per ISO 9613-2) was also applied, which by way of example yields approximately 2-3 dB of additional attenuation for a source-to-receptor distance of 120 feet over average absorptive ground cover, and up to 4.8 dB of attenuation for much larger distances. An Excel-based model that emulates the FHWA's RCNM construction noise model and defers to its reference data (such as construction equipment L_{max} values and acoustical usage factors [AUF], like those samples shown in Table 7) was used to predicted aggregate construction noise levels per construction phase (as listed in Table 8, Construction Scenario Assumptions) at the nearest noise-sensitive receptor located at a defined distance from the activity. These predicted results at Off-Reservation receptor positions are presented in Table 16. Details of the construction noise model inputs (including assumed equipment types and quantities, as appropriate) and outputs are provided in Appendix C, Construction Noise Modeling Input/Output Data.

Similar to Table 16, Table 17 shows the predicted noise levels from construction of Campo Wind Facilities features at three sample distances to potential On-Reservation sensitive receptors within the Reservation Boundary:

- 120 feet to an unknown potential noise-sensitive receptor, that may be this close to a Campo Wind Facilities feature;
- A quarter-mile, which is consistent with the 1,320-foot setback required as part of the Campo Lease terms; and
- A half-mile (2,640 feet), which depicts the result of construction noise propagating an additional quarter-mile to a potential sensitive receptor.

Table 16
Predicted Construction Noise Modeling Summary Results at Off-Reservation Receptors

Construction Phase (or Specific Equipment/Process)	Distance to Nearest Receptor (feet)	8-Hour L_{eq} (dBA)	Receptor Note
Campo Wind Facilities – Clearing and grading	320	67	A
Campo Wind Facilities – Construction of access roads	250	63	B
Campo Wind Facilities – Wind turbine foundation construction	585	55	C
Campo Wind Facilities – Wind turbine erection	585	61	C
Campo Wind Facilities – Construction of underground electrical collection system	585	60	C
Campo Wind Facilities – Construction of collector substation	1970	46	D
Campo Wind Facilities – Gen-Tie line foundation construction and tower erection	200	63	E
Campo Wind Facilities – Gen-Tie line stringing and pulling	315	54	E
Campo Wind Facilities – Operations and maintenance facility	1390	44	F
Campo Wind Facilities – Meteorological (MET) towers	250	60	G
Campo Wind Facilities – Temporary Concrete Batch Plant	320	54	H
Boulder Brush Facilities – High Voltage Substation and Switchyard	13200	31	I
Boulder Brush Facilities – Clearing and grading	13000	34	I
Boulder Brush Facilities – Unpaved construction access roads	200	72	J
Boulder Brush Facilities – Gen-Tie line foundation construction and tower erection	2500	40	K
Boulder Brush Facilities – Gen-Tile stringing and pulling	2400	36	K
Boulder Brush Facilities – Paving of switchyard access road	38	83	L

Notes: L_{eq} = equivalent energy level; dBA = A-weighted decibels.
A = Center of construction activity to Reservation Boundary that adjoins APN 65804005
B = Construction activity to northeast corner of APN 60811004
C = Center of construction activity to Reservation Boundary that adjoins APN 61005016
D = Center of construction activity to Reservation Boundary that adjoins APN 60918224
E = Construction activity to Reservation Boundary that adjoins APN 60916102
F = Construction activity to Reservation Boundary that adjoins APN 60905023
G = Undetermined location, but no new disturbance area (thus, along any planned access road)
H = Center of construction activity to Reservation Boundary that adjoins APN 65804005
I = Construction activity to northern property line of APN 61102005
J = Construction activity to northwest corner of APN 61102006
K = Construction activity to northwest corner of APN 61102005
L = Centerline of roadway construction activity to western property line of APN 61106101

Table 17
Predicted Campo Wind Facilities Construction Noise Modeling Summary Results at On-Reservation Receivers

Construction Phase (or Specific Equipment/Process)	8-hour L_{eq} (dBA) at 120 feet	8-hour L_{eq} (dBA) at 1,320 feet	8-hour L_{eq} (dBA) at 2,640 feet
Campo Wind Facilities – Clearing and grading	77	55	49
Campo Wind Facilities – Construction of access roads	71	48	42
Campo Wind Facilities – Wind turbine foundation construction	n/a	48	42
Campo Wind Facilities – Wind turbine erection	n/a	54	48
Campo Wind Facilities – Construction of underground electrical collection system	n/a	52	46
Campo Wind Facilities – Construction of collector substation	72	49	43
Campo Wind Facilities – Gen-Tie line foundation construction and tower erection	68	45	39
Campo Wind Facilities – Gen-Tie line stringing and pulling	64	41	35
Campo Wind Facilities – Operations and maintenance facility	67	44	38
Campo Wind Facilities – Meteorological (MET) towers	68	45	39
Campo Wind Facilities – Temporary Concrete Batch Plant	64	42	36

L_{eq} = equivalent energy level; dBA = A-weighted decibels; n/a = not applicable.

Table 18
Predicted Boulder Brush Facilities Construction Noise Modeling Summary Results at Reservation Boundary

Construction Phase (or Specific Equipment/Process)	Distance to Nearest Reservation Boundary (feet)	8-Hour L_{eq} (dBA)
Boulder Brush Facilities – High Voltage Substation and Switchyard	10,400	33
Boulder Brush Facilities – Clearing and grading	120	77
Boulder Brush Facilities – Unpaved construction access roads	120	79
Boulder Brush Facilities – Gen-Tie line foundation construction and tower erection	120	68
Boulder Brush Facilities – Gen-Tile line stringing and pulling	300	54
Boulder Brush Facilities – Paving of switchyard access road	6,000	37

L_{eq} = equivalent energy level; dBA = A-weighted decibels.

As presented in Tables 16 and 17, the highest per-phase construction noise levels are generally predicted to occur during clearing, grading, and construction of access roads when noise levels from construction activities would be as high as 75 dBA L_{eq} at the nearest existing Off-Reservation residences. During other phases of construction work and more typically, the predicted noise levels range from approximately 31 to 72 dBA 8-hour L_{eq} at the nearest noise sensitive receptors. Therefore, noise from construction activities, except for paving of the Off-Reservation access road, would comply with the County's 8-hour L_{eq} threshold of 75 dBA.

Paving of the Off-Reservation portion of the access road leading to the Boulder Brush Facilities high-voltage substation and adjoining SDG&E switchyard would cause predicted noise at the nearest Off-Reservation NSLU to be 83 dBA 8-hour L_{eq}. This apparent exceedance of the County's construction noise limit is due to the proximity of the receiving line of the occupied property—only 38 feet to the centerline of roadway improvement activities. However, for such construction conditions that involve public roadways, Section 36.423 of the County's noise ordinance allows for a variance that could permit a temporary exceedance of the Section 36.409 construction noise threshold of 75 dBA $L_{eq(8hr)}$.

Although On-Reservation and Off-Reservation residences may be exposed to elevated construction noise levels, the exposure would be short term, and would cease upon conclusion of the construction activities. While anticipated construction activities would typically occur between 7 a.m. and 7 p.m., Monday through Friday, construction might occasionally occur during the night and/or on Saturdays and Sundays to enable deliveries or other activities for which Caltrans may restrict hours during which I-8 may be used for oversized loads. Under such conditions, the Project applicant or its contractor would need to request a variance from the County as allowed per Section 36.423 of the noise ordinance.

6.5.1 On-Reservation Construction Noise Impact

As shown in Table 17, construction activities associated with the Campo Wind Facilities would not generate short-term noise levels greater than 80 dBA 8-hour L_{eq} at potential existing On-Reservation NSLU that are at least 120 feet from the construction activity. Thus, the construction noise would not exceed the FTA guidance-based 80 dBA $L_{eq(8hr)}$ noise level criterion.

As shown in Table 18, construction activities associated with the Boulder Brush Facilities would not generate short-term noise levels greater than 80 dBA 8-hour L_{eq} at potential existing On-Reservation NSLU that are at least 120 feet from the construction activity. Thus, the construction noise would not exceed the FTA guidance-based 80 dBA $L_{eq(8hr)}$ noise level criterion.

6.5.2 Off-Reservation Construction Noise Impact

The nearest Off-Reservation receptors for construction assessment purposes with respect to Section 36.409 of the County's noise ordinance are the private parcels under County jurisdiction, listed in Table 16, that adjoin the Reservation Boundary. The construction noise would not exceed the limit in County of San Diego Noise Ordinance Section 36.409 of 75 dBA $L_{eq(8hr)}$. Therefore, noise impacts from construction are considered potentially less than significant.

Road improvements as part of building access to the Boulder Brush Facilities, however, would cause predicted noise levels to exceed the Section 36.409 threshold and thus require mitigation. Thus, MM-

Construction-1 would be needed to help ensure resulting construction noise levels at this nearest receptor would be less than the 75 dBA $L_{eq(8h)}$ threshold.

6.5.3 Potential Off-Site Temporary Construction Traffic Noise Impacts

During construction, the Project would also result in a short-term increase in noise levels from off-site traffic (i.e., beyond both the Reservation Boundary and Boulder Brush Boundary) on the local roadway network, but this increase would not be sufficient to increase traffic noise levels a substantial amount. Trip generation and distribution for workers and delivery trucks would ultimately vary depending on the phase of construction.

It is estimated that construction activities would require a maximum of 1,122 average daily worker trips for Campo Wind Facilities and 288 daily worker trips for Boulder Brush Facilities. These vehicles would access the Project Site via I-8 and SR-94.

It has been conservatively assumed that all construction worker trips would occur during the AM peak traffic period. This increase in traffic volume and change in vehicular mix from the Project would result in a less than 3 dB increase in noise levels along I-8 and SR-94 during the AM peak period. An increase of 3 dB is just barely perceptible to the human ear. Typically, traffic volumes must double to create a perceptible increase (3 dB) in traffic noise (Caltrans 2011). The main access roads of I-8 and SR-94 have existing traffic greater than the construction related trips. Thus, a doubling in the traffic on these roads is not expected during the construction of the Project.

Thus, the vehicles added to the local roadway network from the Project's construction-related traffic would not result in a 3 dB increase in the daily or peak hour traffic noise levels. A 3 dB increase in noise level is a barely perceptible change in sound level. Based on Caltrans (2013a) and CEC (2012), a 10 dB increase is considered a substantial increase in ambient noise. Therefore, impacts associated with the additional construction-related traffic noise relative to a NSLU would be less than significant.

6.5.4 Potential Impulsive Construction Noise Impacts

6.5.4.1 Blasting and Rock Drilling

Potential impulsive noise sources associated with construction activities include rock crushing and blasting. The blasting and rock crushing activities could occur during the clearing, grading, and construction of access roads phases. Blasting activities would occur only on the Reservation.

No more than two blasts per day would occur during construction activities. Blasting would only be required where existing topography or geologic conditions require blasting to be conducted, and potential blasting locations would in the same locations as the proposed turbines only when blasting is deemed necessary. The blasting information provided by Terra-Gen and additional calculation assumptions are provided in Table 19.

Table 19
Anticipated Blasting Characteristics

Activities and Materials	Amount
Total Rock Requiring Blasting (cubic yards)	1,537,480
Rock Blasted per Blast (cubic yards per blast)	15,000
Maximum Blasts per Day (blasts per day)	3
Total Blasts	102 full 1 partial
Maximum Explosive per Blast (tons ANFO per blast)	8.25
Total Explosives Used (tons ANFO)	845.61
Maximum Area Blasted per Day (square feet per day)	4,004
Total Area Blasted (square feet)	136,786

Source: Terra-Gen 2019.
ANFO = ammonium nitrate/fuel oil.

Based on preliminary estimates, potential areas where rock blasting may be necessary are located no closer than 1,030 feet of existing noise- and vibration-sensitive land uses (located Off-Reservation). This distance value is the same as that used in Table 16 to represent the nearest Off-Reservation receiver to a wind turbine foundation site. At this distance, and assuming a per-detonation charge weight of up to 2.4 pounds that is fully contained per industry guidance (Dyno Nobel 2010), a single blast would produce an airblast noise level of less than 107 dB, which roughly converts to an A-weighted value that is 25 dB less (hence, 107−25=82) based on available research (Richards 2008). This A-weighted L_{max} value complies with the County of San Diego impulse noise standard and would thus not produce an adverse effect.

Blasting involves drilling a series of boreholes and placing explosives in each hole. By limiting the amount of explosives in each hole, the blasting contractor can limit the total energy released at any single time, which in turn can reduce noise and vibration levels. Rock drilling generates impulsive noise from the striking of the hammer with the anvil within the drill body, which drives the drill bit into the rock. Rock drilling generates noise levels of approximately 81 dB L_{max} (maximum sound level during the measurement interval) at a distance of 50 feet (FHWA 2006). Given a typical work cycle, this would equate to 74 dBA L_{eq} at 50 feet. Assuming a noise level of 81 dBA L_{max} at 50 feet, the noise level from rock drilling would be less than the County noise standard for impulsive noise (82 dBA L_{max}) at a distance of approximately 350 feet.

6.5.4.2 Portable Rock-Crushing/Processing Facility

A portable rock-crushing/processing facility would be used on site during construction activities. Rock-crushing information was provided by the Developer's construction contractor, and calculation assumptions are provided in Table 20.

Table 20
Rock-Crushing Characteristics

Activities and Materials	Amount
Amount of rock to be processed (cubic yards)	30,770
Number of rock-crushing facilities	1
Number of generators	1
Operating hours per day per generator (hours per day)	8
Total rock processed per day (cubic yards day)	3,077
Total operating days per phase (days)	10

Source: Terra-Gen 2019.

This analysis assumes the rock-crushing equipment would consist of a crusher, screen, and conveyor, and the crushed rock would be stockpiled for future use. Although a single primary crusher and screen may be all that is required, use of a secondary crusher and additional screen would expedite this process.

Based on noise measurements that have been conducted for portable rock-crushing operations, the rock-crushing activity would generate a 1-hour average ($L_{eq(1h)}$) noise level of approximately 85 dBA at a distance of 50 feet. These operations would also generate impulsive noise events. Apparent maximum noise levels associated with a screener could reach approximately 87 dBA at 45 feet (Ldn Consulting 2011). Using this reference data, for a receptor no closer than 125 feet to the rock crushing activity, predicted hourly L_{eq} and L_{max} (impulsive noise) would be 75 dBA and 78 dBA, respectively. These noise levels would not exceed the County's 8-hour construction noise and impulsive noise thresholds of 75 dBA L_{eq} or 82 dBA L_{max}, respectively.

This predicted hourly L_{eq} of 75 dBA for rock crushing would also be less than the 80 dBA $L_{eq(8h)}$ FTA-based guidance limit applied in this analysis to On-Reservation potentially sensitive locations. Therefore, the Project would have less than significant effects from rock-crushing noise.

6.5.5 Design Considerations and Temporary Mitigation Measures

To help maximize the likelihood of resultant Project-attributed construction noise levels complying with the County standards for NSLU on private lands within County jurisdiction, implementation of mitigation measure MM-Construction-1 by the Project contractor(s) is recommended.

6.6 Construction Vibration Impact Assessment

6.6.1 Conventional Construction Equipment

The nearest sensitive receptors to Project construction activities that could produce high vibration levels would be at the residences east of Ribbonwood Road, located approximately 300 feet from the nearest expected construction work. At a distance of 300 feet, vibration levels from a roller are anticipated to be less than 0.005 inches per second PPV from construction activities at these nearest Off-Reservation residences. As this vibration level is less than the previously mentioned 0.2-inch-per-second PPV threshold (FTA 2006), this impact would not produce an adverse effect.

6.6.2 Blast Event Vibration

Assuming a "heavily confined" condition (Dyno Nobel 2010), this analysis predicts the same individual blast event as defined in Section 6.5.4.1 (i.e., charge weight up to 2.4 pounds and an 1,030-foot distance between blast and receptor) would generate groundborne vibration of 0.02 inches per second PPV. As this expected value is far less than the 0.2-inch-per-second PPV threshold adopted by this study, the corresponding impact would be considered less than significant or not a substantially adverse effect.

7 NOISE MITIGATION MEASURES

Construction

Because paving and related construction activity associated with planned roadway improvements for access to the Boulder Brush Facilities is expected to exceed the County standard of 75 dBA $L_{eq(8h)}$ at the receiving property line of an occupied NSLU, the following construction activity best management practices (BMP) are recommended as responsibilities of the construction contractor(s).

The mitigation measure provided below is provided to reduce impacts associated with construction noise to the extent feasible. This mitigation measure shall be required to address impacts identified on private lands within the jurisdiction of the County as part of its Major Use Permit approval.

The County has no ability to require mitigation for impacts occurring on or emanating from activity on the Reservation but refers the reader to the EIS for the Project, which contains the noise mitigation measures summarized below to be implemented to mitigate impacts occurring on or emanating from activities on the Reservation. BIA can and should include these measures as a requirement of approval and in the record of decision.

M-N-1

- Ensure that all construction equipment driven or powered by internal combustion engines shall be equipped with a factory-approved or recommended muffler. If traffic control and construction signs that require power for lighting or flashing are located near residences, the source of power should be batteries, solar cells, or another quiet source.
- Where and when construction activity is expected to occur within 200 feet of an Off-Reservation noise-sensitive land use (NSLU) and/or along the segment of Ribbonwood Road from the intersection of Opalocka Road to the entrance to the Boulder Brush Boundary, provide the owner/occupant at least 24 hours advance notice of anticipated construction schedule and activities. Information should include a contact phone number so that noise concerns can be brought to the contractor's attention.
- Restrict the use of engine exhaust compression braking (a.k.a., "jake braking") on all trucks.
- All stationary construction equipment (especially pieces that are expected to operate frequently, or in a continuous or otherwise "steady-state" manner) should be located as far as practicable from NSLUs.
- Vehicles should observe limitations on duration of engine idling, as defined by applicable standards (e.g., air quality regulations and policies).

- For roadway improvements to Ribbonwood Road, which would benefit members of the community that use this roadway, the Project applicant or its contractors shall apply for a variance per Sections 36.423 through 36.427 of the San Diego County Code. This variance, granted after review and approval by the County's designated noise control officer, provides a means for "non-emergency work on a public right-of-way, public utility facility, public transportation facility or some other project for the benefit of the general public" to temporarily deviate from the 75 dBA $L_{eq(8hr)}$ construction noise standard per 36.409 of the County noise ordinance.

Operation

Depending on the average wind speed received by the Project turbines, their aggregate operation could expose On-Reservation NSLU in the vicinities of LT-1, LT-2, LT-5, LT-8, LT-9, and LT-10 to noise levels that exceed the EPA outdoor noise guideline of 55 dBA L_{dn}. However, this study conservatively predicted noise as if all 76 potential sites featured an operating turbine. Due to the parameters of the Campo Lease, which only authorizes 60 turbines to be constructed for the Project, reduced noise exposure at one or more of these studied representative On-Reservation locations likely will occur. For example, were five of the nearest turbine sites (i.e., considered among the 16 potential installation locations over and above the 60 that the Campo Lease would permit) in proximity to LT-9 avoided, due to compliance with the minimum setback distances of the Campo Lease, the predicted operation noise level would not exceed the EPA-based standard.

Similar turbine pre-installation site selection or re-location considerations and opportunities that could affect the final Project turbine layout may also offer potential reduction of predicted aggregate sound pressure level at Off-Reservation NSLUs due to increased distances from one or multiple operating turbines. The quantifiable effect of such mitigation would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to multiple on-site turbines, and the pre-existing outdoor ambient sound level.

8 CERTIFICATION

This report has been prepared by Mark Storm, a County of San Diego-approved CEQA Consultant for Noise.

Mark Storm, INCE Bd. Cert.
Acoustic Services Manager
Dudek

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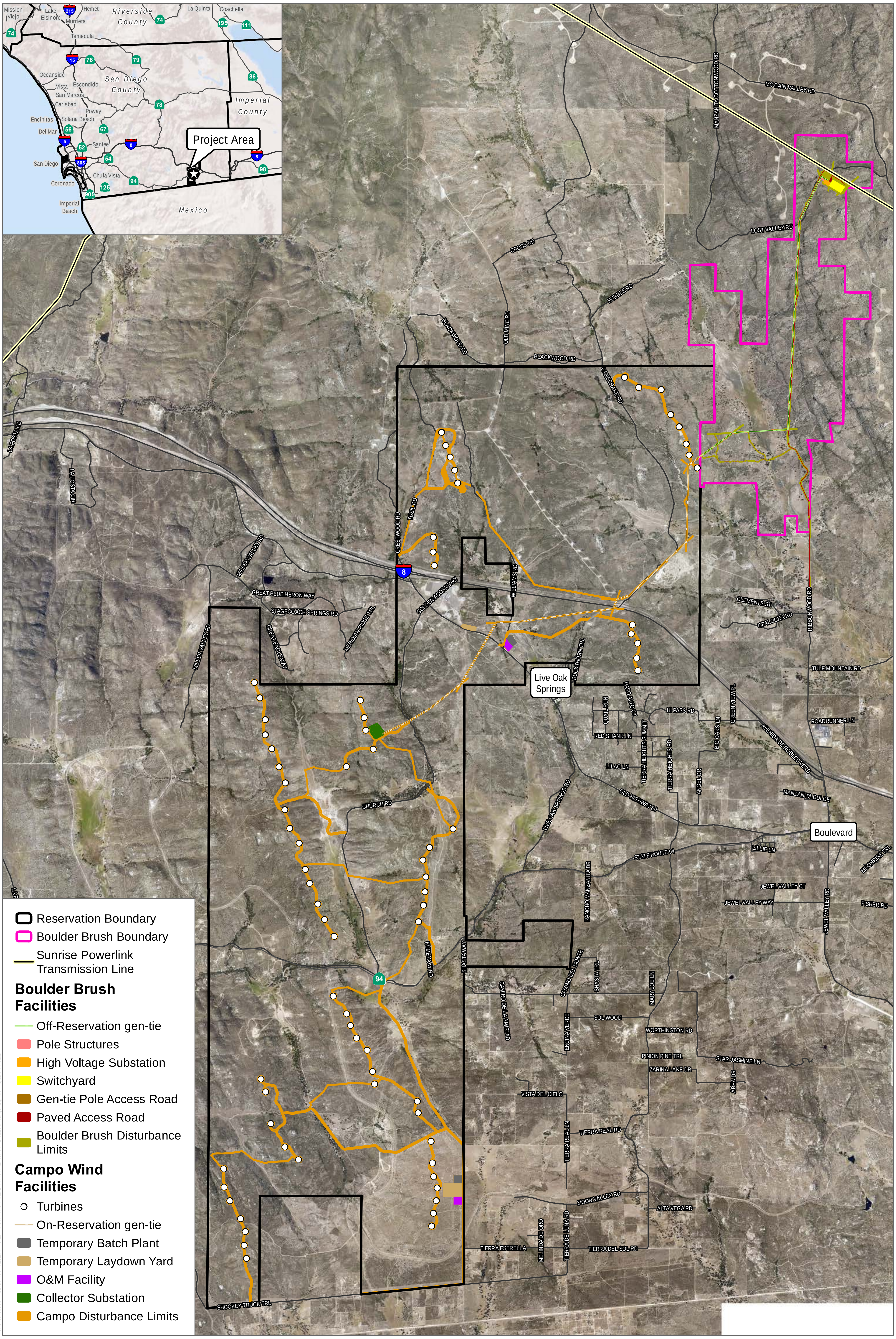

SOURCE: SANGIS 2017

DUDEK

0 1,950 3,900 Feet

FIGURE 1

Project Location and Site Plan

Campo Wind Project with Boulder Brush Facilities

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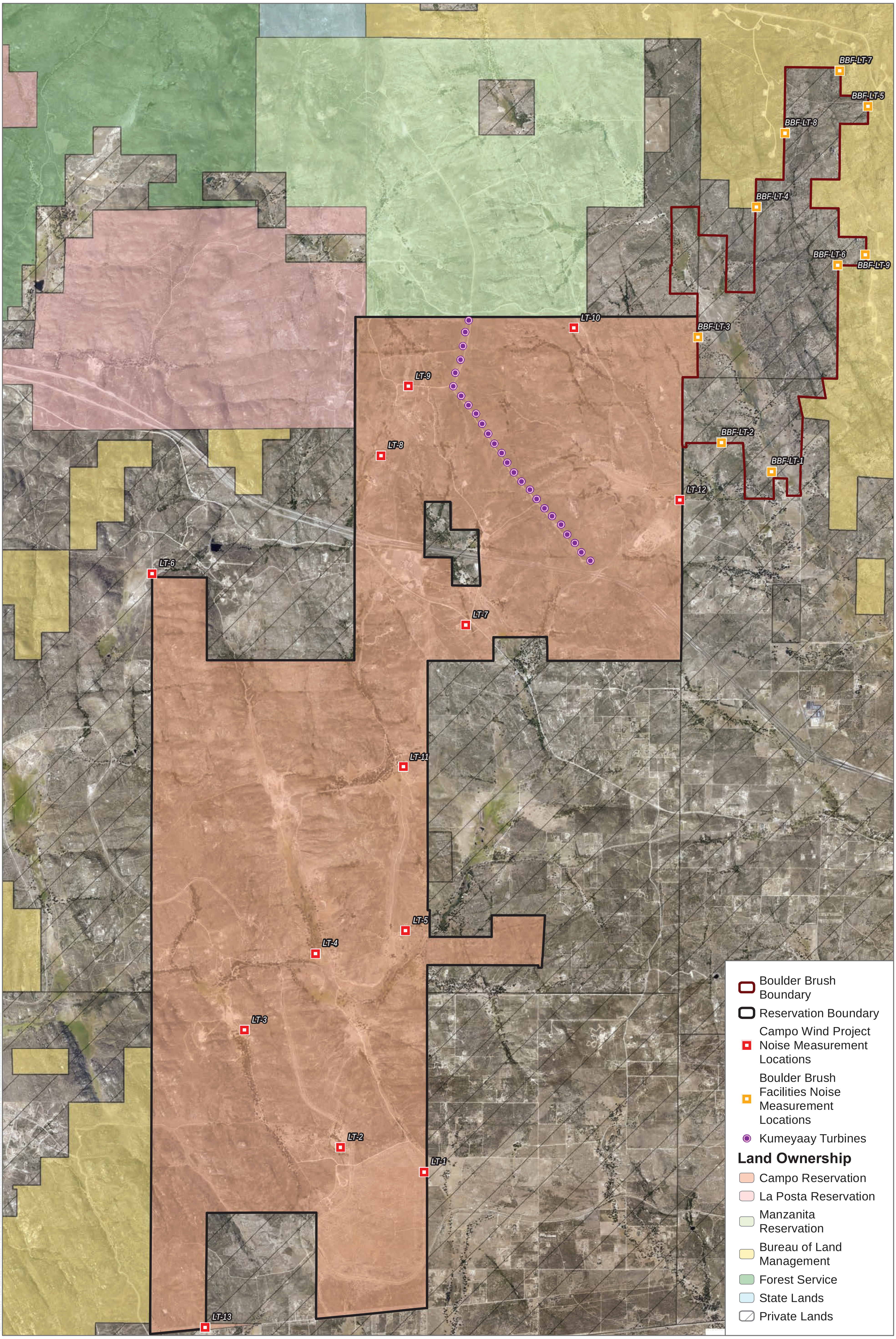

SOURCE: SANGIS 2017

DUDEK 0 2,350 4,700 Feet

FIGURE 2

Noise Measurement Locations

Campo Wind Project with Boulder Brush Facilities

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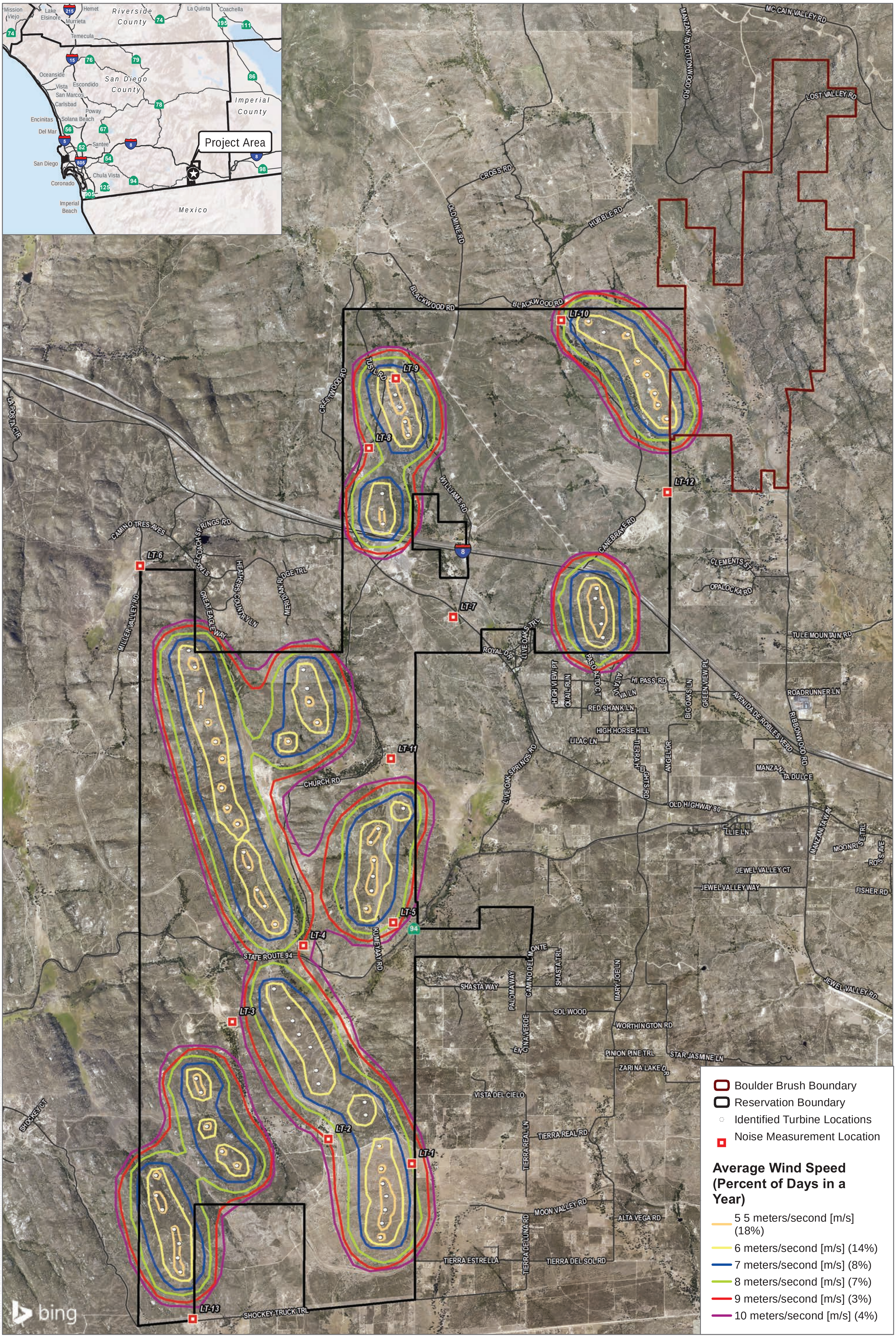

SOURCE: SANGIS 2017

DUDEK

0 1,750 3,500 Feet

FIGURE 3

Operational 55 dBA Ldn Noise Contours

Campo Wind Project with Boulder Brush Facilities

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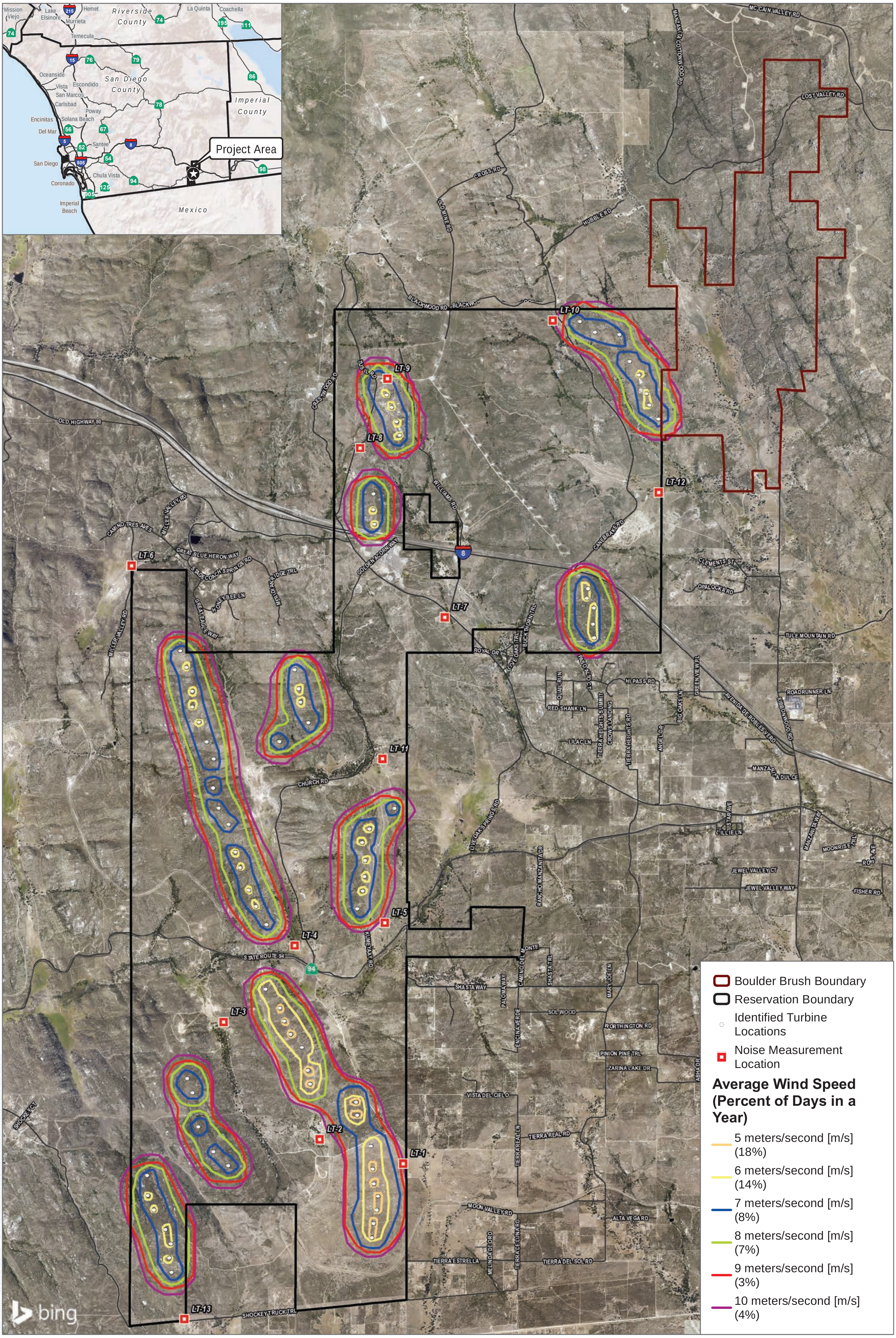

SOURCE: SANGIS 2017

DUDEK

0 1,750 3,500 Feet

FIGURE 4

Operational 60 dBA CNEL Noise Contour by Average Hub-height Wind Speed

Campo Wind Project with Boulder Brush Facilities

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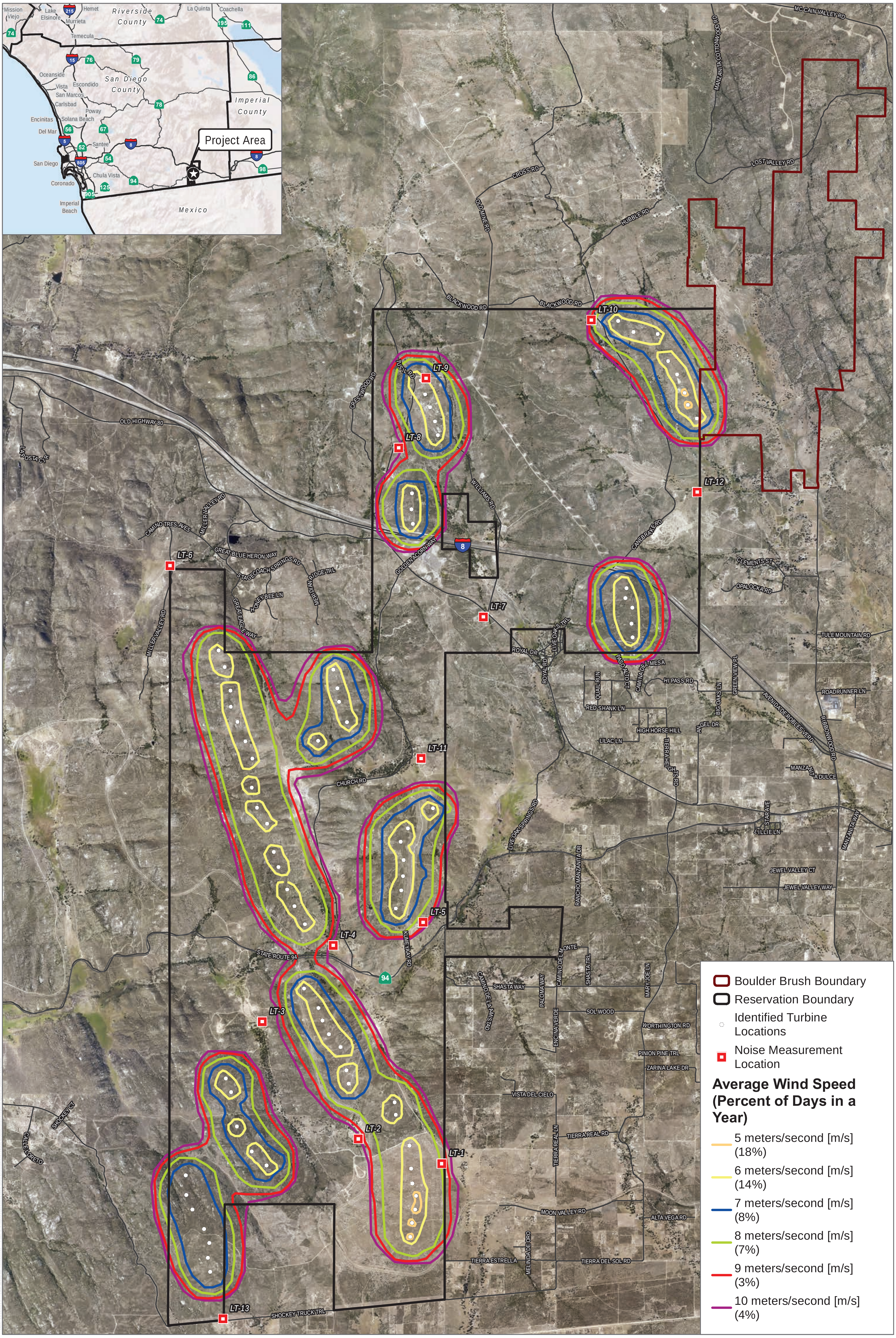

SOURCE: SANGIS 2017

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FIGURE 5

Operational 50 dBA Leq Noise Contour by Average Hub-height Wind Speed

Campo Wind Project with Boulder Brush Facilities

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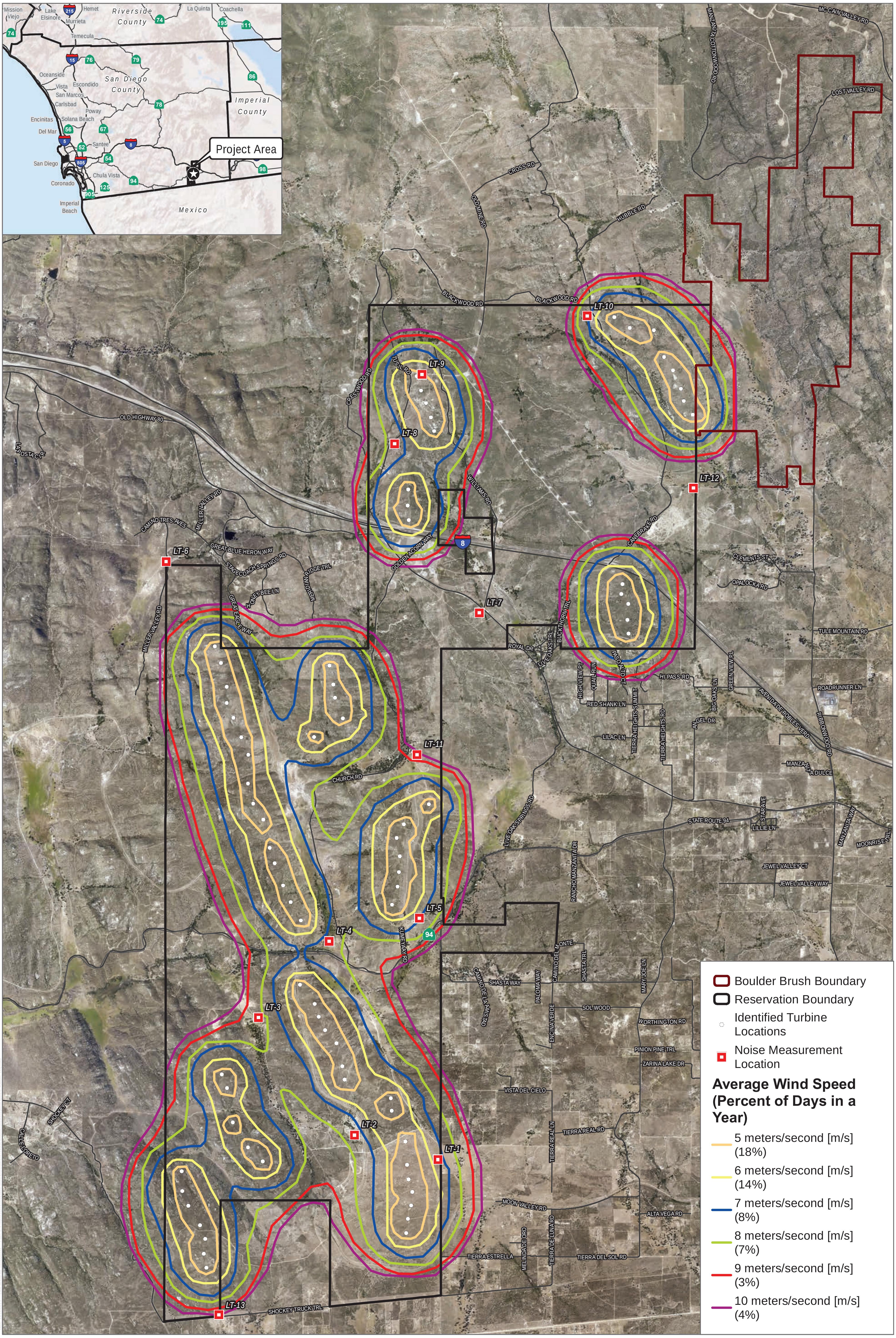

SOURCE: SANGIS 2017

DUDEK

0 1,750 3,500 Feet

FIGURE 6

Operational 45 dBA Leq Nighttime Noise Contour by Average Hub-height Wind Speed

Campo Wind Project with Boulder Brush Facilities

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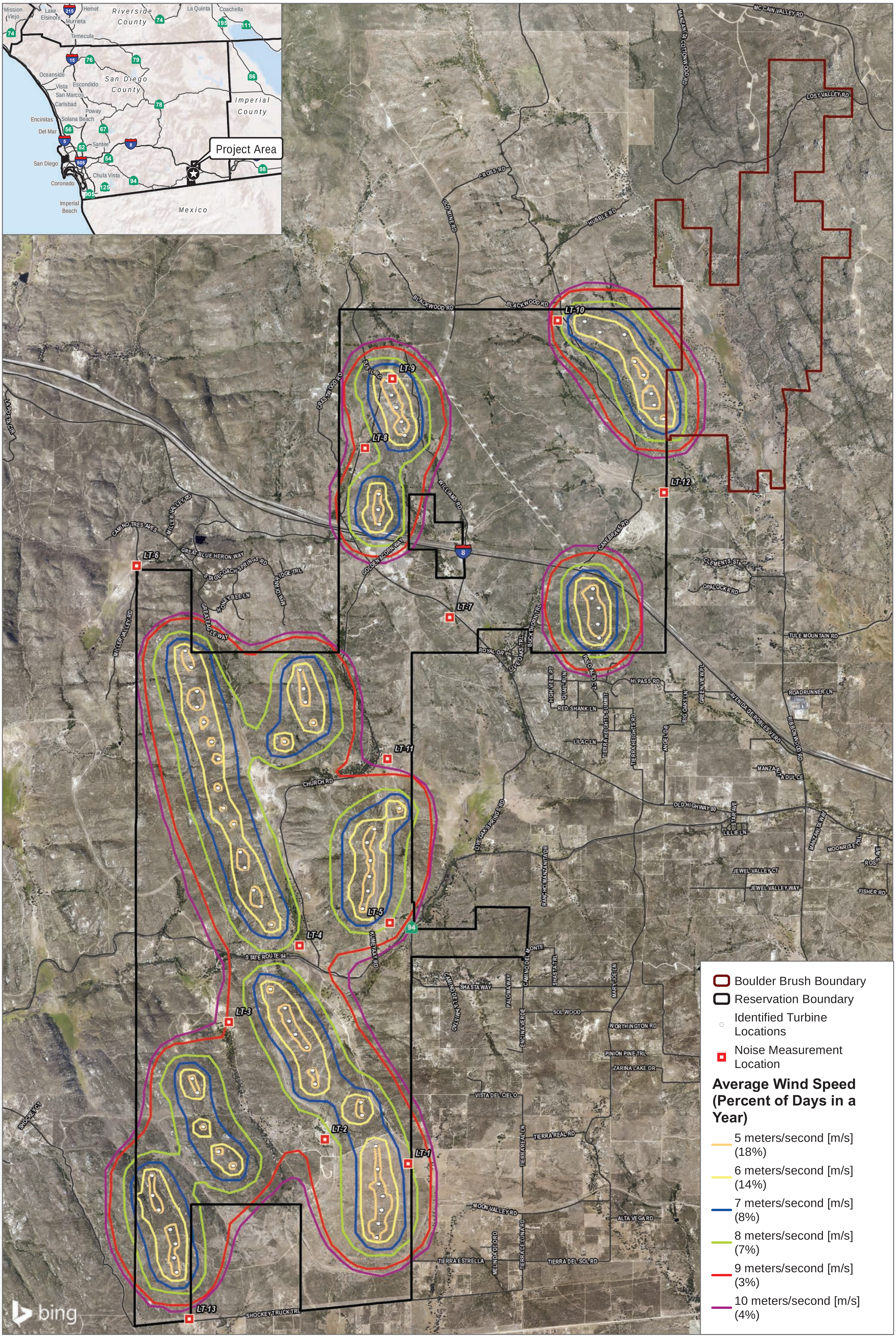

SOURCE: SANGIS 2017

DUDEK

0 1,850 3,700 Feet

FIGURE 7

Operation Noise Contours: LCeq - RBSC = 20 dB by Average Hub-height Wind Speed

Campo Wind Project with Boulder Brush Facilities

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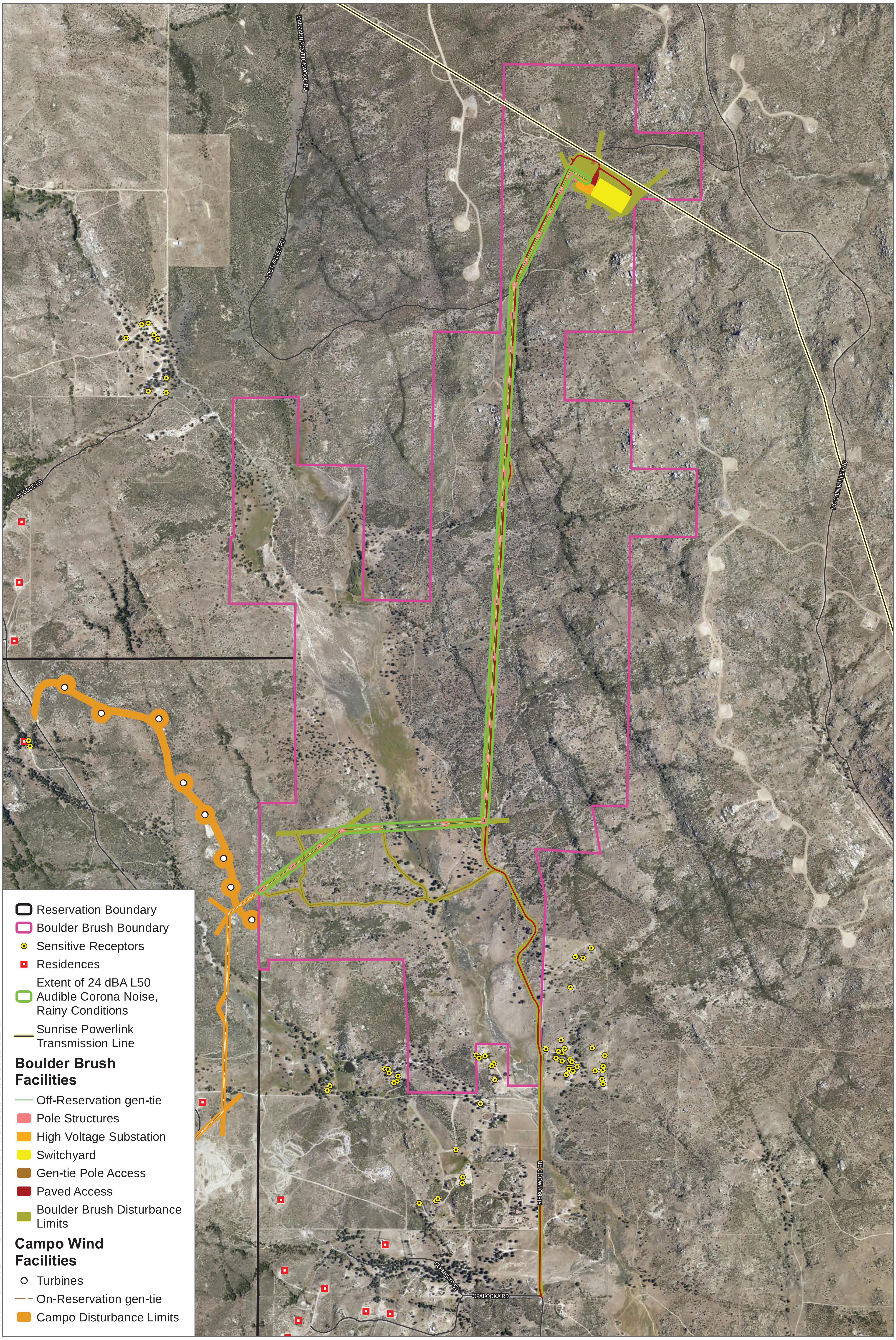

SOURCE: SANGIS 2017

FIGURE 8

Off-Reservation Boulder Brush Facilities Transmission Line Audible Corona Noise - Rainy Conditions

Campo Wind Project with Boulder Brush Facilities

DUDEK

0 750 1,500 Feet

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APPENDIX A
Baseline Measurement Data

Rec 3 to 27	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:55	1.0 hour	53.5	89.1	82.2	36.5	55	47	45	39	35	35	35	39	39.6	4.36	51	45	41
9/5/2018 9:55	1.0 hour	63.7	99.3	92	36.6	67	51	47	39	35	35	35	39	41.2	6.43	63	49	43
9/5/2018 10:55	1.0 hour	47	82.6	70.1	33.6	57	51	49	39	35	35	35	39	39.9	5.55	55	49	41
9/5/2018 11:55	1.0 hour	48	83.6	66	35.5	57	53	51	41	35	35	35	41	41.9	6.13	57	51	45
9/5/2018 12:55	1.0 hour	43.4	79	64.6	33.6	53	49	45	37	35	35	35	37	38.6	4.69	51	47	39
9/5/2018 13:55	1.0 hour	43.2	78.8	66	33.6	55	47	43	35	35	35	35	35	37.4	4.33	51	45	37
9/5/2018 14:55	1.0 hour	38.8	74.4	63.3	33.6	47	39	37	35	35	35	35	35	35.8	2.3	43	39	35
9/5/2018 15:55	1.0 hour	37	72.6	51.7	33.6	45	39	37	35	35	35	35	35	35.7	1.9	43	39	35
9/5/2018 16:55	1.0 hour	42	77.6	66.7	33.6	55	41	39	35	35	35	35	35	36.2	3.26	47	39	35
9/5/2018 17:55	1.0 hour	42.9	78.5	72.2	33.6	47	41	39	35	35	35	35	35	35.8	2.68	43	39	35
9/5/2018 18:55	1.0 hour	39.5	75.1	46.9	33.6	43	43	43	35	35	35	35	35	37.4	3.41	43	43	41
9/5/2018 19:55	1.0 hour	43	78.6	63.2	35.7	53	43	43	39	35	35	35	39	39.5	3.65	51	43	41
9/5/2018 20:55	1.0 hour	43.7	79.3	66.2	33.6	55	41	37	35	35	35	35	35	36.4	3.51	49	39	37
9/5/2018 21:55	1.0 hour	35.8	71.4	54.5	33.6	41	37	35	35	35	35	35	35	35.2	1.27	39	35	35
9/5/2018 22:55	1.0 hour	34.6	70.2	43.1	33.6	37	35	35	35	35	35	35	35	35.1	0.52	37	35	35
9/5/2018 23:55	1.0 hour	36.8	72.4	57.9	33.6	45	41	35	35	35	35	35	35	35.6	2.13	43	37	35
9/6/2018 0:55	1.0 hour	44.4	80	71.1	33.6	53	39	35	35	35	35	35	35	35.6	3.13	47	35	35
9/6/2018 1:55	1.0 hour	34.5	70.1	58.2	33.6	35	35	35	35	35	35	35	35	35.1	0.88	35	35	35
9/6/2018 2:55	1.0 hour	33.5	69.1	40.6	33.6	35	35	35	35	35	35	35	35	35	0.1	35	35	35
9/6/2018 3:55	1.0 hour	33.3	68.9	39.8	33.6	35	35	35	35	35	35	35	35	35	0.09	35	35	35
9/6/2018 4:55	1.0 hour	33.8	69.4	51	33.6	41	35	35	35	35	35	35	35	35.1	0.94	37	35	35
9/6/2018 5:55	1.0 hour	36.2	71.8	55.9	33.6	39	39	39	35	35	35	35	35	35.8	1.7	39	39	35
9/6/2018 6:55	1.0 hour	43.1	78.7	74.8	36.6	43	39	39	37	37	37	35	37	37.9	1.97	41	39	39
9/6/2018 7:55	1.0 hour	40	75.6	59.8	36.6	47	39	39	37	35	35	35	37	37.2	2.1	43	39	37
9/6/2018 8:55	7.3 min	51.5	77.9	75.6	36.6	51	45	43	39	37	35	35	39	39.2	3.89	47	43	39

daytime (9am to 10pm) Leq	53.4	average daytime L90	35.1
daytime (7am to 9am) Leq	41.8	average nighttime L90	35.0
nighttime (10pm to 7am) Leq	37.7	lowest L90	35.0
Ldn	51.5		

Rec 2 to 26 Slow Response dBA weighting 2.0 dB resolution stats

Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:45	1.0 hour	48.1	83.7	80.6	33.4	45	37	35	35	35	35	35	35	35.5	2.62	41	35	35
9/5/2018 9:45	1.0 hour	39.1	74.7	59.5	33.4	51	41	37	35	35	35	35	35	35.9	2.96	49	39	35
9/5/2018 10:45	1.0 hour	43.6	79.2	65.5	33.4	57	45	41	35	35	35	35	35	36.6	4.11	51	43	35
9/5/2018 11:45	1.0 hour	42	77.6	61.4	33.4	53	47	43	35	35	35	35	35	37.6	4.16	51	45	37
9/5/2018 12:45	1.0 hour	39.3	74.9	60.7	33.4	49	43	41	35	35	35	35	35	36.2	2.99	47	41	35
9/5/2018 13:45	1.0 hour	38.4	74	58.1	33.4	47	43	41	35	35	35	35	35	36.4	2.65	45	41	37
9/5/2018 14:45	1.0 hour	42	77.6	58.2	33.4	51	47	45	37	35	35	35	37	38.4	4.17	49	45	39
9/5/2018 15:45	1.0 hour	42.4	78	57.1	33.4	51	47	45	37	35	35	35	37	38.9	4.17	49	45	41
9/5/2018 16:45	1.0 hour	41.1	76.7	55.6	33.4	51	45	43	37	35	35	35	37	37.9	3.73	49	45	39
9/5/2018 17:45	1.0 hour	39.5	75.1	60.9	33.4	47	43	39	35	35	35	35	35	36.5	2.81	45	41	37
9/5/2018 18:45	1.0 hour	43	78.6	64	33.4	47	47	45	35	35	35	35	35	38.4	4.57	47	45	41
9/5/2018 19:45	1.0 hour	44.2	79.8	55.8	38.2	51	45	45	43	41	41	39	43	42.6	2.04	49	45	43
9/5/2018 20:45	1.0 hour	40.9	76.5	55.1	36.3	49	43	41	39	37	35	35	39	38.8	2.47	47	41	39
9/5/2018 21:45	1.0 hour	42.1	77.7	60.8	36.3	53	41	41	39	37	35	35	39	38.6	2.71	47	41	39
9/5/2018 22:45	1.0 hour	37.4	73	49.9	33.4	43	39	37	35	35	35	35	35	35.9	1.55	39	37	37
9/5/2018 23:45	1.0 hour	37.2	72.8	49.8	33.4	45	37	37	35	35	35	35	35	35.5	1.55	41	37	35
9/6/2018 0:45	1.0 hour	37.2	72.8	44.7	33.4	39	39	39	35	35	35	35	35	35.9	1.38	39	39	37
9/6/2018 1:45	1.0 hour	36.8	72.4	45.9	33.4	41	37	37	35	35	35	35	35	35.6	1.27	41	37	35
9/6/2018 2:45	1.0 hour	34.4	70	37	33.4	35	35	35	35	35	35	35	35	35	0.02	35	35	35
9/6/2018 3:45	1.0 hour	33.3	68.9	36.8	33.4	35	35	35	35	35	35	35	35	35	0	35	35	35
9/6/2018 4:45	1.0 hour	33.2	68.8	48.4	33.4	39	35	35	35	35	35	35	35	35.1	0.66	35	35	35
9/6/2018 5:45	1.0 hour	50.1	85.7	83.8	33.4	57	43	37	35	35	35	35	35	36.2	4.03	53	39	35
9/6/2018 6:45	1.0 hour	36.2	71.8	53.6	33.4	43	39	39	35	35	35	35	35	35.8	1.81	41	39	35
9/6/2018 7:45	1.0 hour	39.4	75	69.1	33.4	45	37	35	35	35	35	35	35	35.4	2.04	39	37	35
9/6/2018 8:45	8.5 min	48.8	75.9	72.1	33.4	55.2	39	39	35	35	35	35	35	36.6	3.61	45	39	37

daytime (9am to 10pm) Leq	42.7
daytime (7am to 9am) Leq	38.1
nighttime (10pm to 7am) Leq	42.1
Ldn	48.5

average daytime L90	35.5
average nighttime L90	35.2
lowest L90	35.0

Rec 1 to 25 Slow Response dBA weighting 2.0 dB resolution stats

Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:43	1.0 hour	49.1	84.7	82.2	34.4	53	41	39	35	35	35	35	35	36.3	3.41	47	39	35
9/5/2018 9:43	1.0 hour	43.3	78.9	66.4	34.4	55	45	39	35	35	35	35	35	36.5	3.65	49	41	35
9/5/2018 10:43	1.0 hour	54.3	89.9	81.5	34.4	63	49	43	37	35	35	35	37	38.5	5.21	57	45	37
9/5/2018 11:43	1.0 hour	46.3	81.9	72	34.4	59	45	39	35	35	35	35	35	36.8	4.24	53	41	37
9/5/2018 12:43	1.0 hour	43.9	79.5	68.1	34.4	53	41	39	37	35	35	35	37	37.4	3.07	47	39	37
9/5/2018 13:43	1.0 hour	43.8	79.4	66.6	34.4	53	41	39	37	37	35	35	37	38	2.98	47	41	39
9/5/2018 14:43	1.0 hour	46	81.6	68.5	34.4	57	47	41	37	35	35	35	37	38.4	4.25	53	43	39
9/5/2018 15:43	1.0 hour	41.5	77.1	62.8	34.4	51	43	41	37	35	35	35	37	38.3	3.1	49	41	39
9/5/2018 16:43	1.0 hour	49.2	84.8	73.1	34.4	61	49.1	45	37	35	35	35	37	38.6	5.38	57	47	39
9/5/2018 17:43	1.0 hour	48.2	83.8	73.6	34.4	61	45.1	41	35	35	35	35	35	37.1	4.89	57	43	37
9/5/2018 18:43	1.0 hour	54.4	90	66	34.4	63	63	59	35	35	35	35	35	41.2	9.5	63	59	41
9/5/2018 19:43	1.0 hour	57.2	92.8	62.9	44.5	61	61	59	57	51	51	45	57	55.6	2.9	61	59	57
9/5/2018 20:43	1.0 hour	53.5	89.1	61.1	42.8	59	57	55	51	45	45	43	51	51.1	3.73	57	57	53
9/5/2018 21:43	1.0 hour	51.8	87.4	63.7	39.2	57	55	55	49	41	41	39	49	48	5.65	55	55	53
9/5/2018 22:43	1.0 hour	49.4	85	74.2	37.4	59	45	43	39	39	37	37	39	40.4	3.71	53	43	41
9/5/2018 23:43	1.0 hour	42.6	78.2	61.8	34.4	55	41	41	37	35	35	35	37	37.9	3.3	49	41	39
9/6/2018 0:43	1.0 hour	40	75.6	63.8	34.4	47	41	39	37	35	35	35	37	36.7	2.45	43	39	37
9/6/2018 1:43	1.0 hour	37.3	72.9	58.3	34.4	41	39	39	35	35	35	35	35	36.2	1.75	41	39	37
9/6/2018 2:43	1.0 hour	33.9	69.5	38.8	34.4	37	35	35	35	35	35	35	35	35	0.23	35	35	35
9/6/2018 3:43	1.0 hour	33.4	69	45.9	34.4	35	35	35	35	35	35	35	35	35	0.35	35	35	35
9/6/2018 4:43	1.0 hour	33.7	69.3	45.5	34.4	37	35	35	35	35	35	35	35	35.1	0.56	37	35	35
9/6/2018 5:43	1.0 hour	37.2	72.8	59.2	34.4	45	39	37	35	35	35	35	35	35.7	2.14	43	37	35
9/6/2018 6:43	1.0 hour	47.5	83.1	77.1	34.4	51	45	43	37	35	35	35	37	37.7	3.8	47	43	39
9/6/2018 7:43	1.0 hour	48.1	83.7	75.6	34.4	57	47	43	35	35	35	35	35	37.5	4.73	53	43	37
9/6/2018 8:43	9.0 min	53.5	80.8	79.1	34.4	63	55	49	35	35	35	35	35	38.8	6.91	61	51	37

daytime (9am to 10pm) Leq	51.1	average daytime L90	36.9
daytime (7am to 9am) Leq	47.8	average nighttime L90	37.2
nighttime (10pm to 7am) Leq	45.0	lowest L90	35.0
Ldn	52.9		

Number	Start Date	Start Time	End Time	Duration	LAeq	LAmax	LAmin	LAE	LApeak	L1%	L5%	L10%	L50%	L90%	L95%	L99%
1	9/5/2018	8:24:29 AM	9:00:00 AM	0:35:31	45	64.9	29.9	78.3	95.4	54.9	50.8	48.4	38.5	32	31.2	30.5
2	9/5/2018	9:00:02 AM	10:00:00 AM	0:59:58	46.3	64	30.8	81.9	78.8	55.9	49.8	48.7	43.3	36.3	35	32.7
3	9/5/2018	10:00:02 AM	11:00:00 AM	0:59:58	44.8	57.2	31.1	80.4	75.9	53.5	49.9	48.3	42.3	36.6	34.9	32.7
4	9/5/2018	11:00:02 AM	12:00:00 PM	0:59:58	58.2	81.4	30.3	93.8	102	72.2	52.7	48.4	41.2	34.7	33.2	31.8
5	9/5/2018	12:00:02 PM	1:00:00 PM	0:59:58	45.8	56.8	31.3	81.4	75.4	53.1	51.1	49.7	43.3	37.2	35.6	33.4
6	9/5/2018	1:00:02 PM	2:00:00 PM	0:59:58	55.9	79.5	28.8	91.5	96.6	67.6	50.5	45.6	37.5	31.1	30.4	29.2
7	9/5/2018	2:00:02 PM	3:00:00 PM	0:59:58	53.6	78.7	32.8	89.2	94.9	61.8	53.8	51.5	45.2	39	37.5	34.6
8	9/5/2018	3:00:02 PM	4:00:00 PM	0:59:58	48.3	60.7	29.7	83.9	74.2	55.9	53.8	52.4	45.6	38.3	35.9	31.8
9	9/5/2018	4:00:02 PM	5:00:00 PM	0:59:58	49.4	63.8	33.9	85	90.8	58.6	54.3	52.6	46.6	39.8	38.3	35.7
10	9/5/2018	5:00:02 PM	6:00:00 PM	0:59:58	60	86.3	31.2	95.6	102.4	72.9	54.2	51.2	44.1	36.4	35.3	33.5
11	9/5/2018	6:00:02 PM	7:00:00 PM	0:59:58	44.2	62.3	29.3	79.8	77.5	55.1	50.3	47.7	38.2	32.2	30.7	29.9
12	9/5/2018	7:00:02 PM	8:00:00 PM	0:59:58	49.1	59.2	29.5	84.7	77.5	54.2	52.9	51.9	49.1	35.6	33.2	30.6
13	9/5/2018	8:00:02 PM	9:00:00 PM	0:59:58	52.5	60.3	44.8	88.1	73.9	56.8	55.5	55	51.9	47.9	47.3	46.3
14	9/5/2018	9:00:02 PM	10:00:00 PM	0:59:58	52.3	62.6	39.4	87.9	87.6	57.9	56.7	56.1	51.8	42.5	41.9	41
15	9/5/2018	10:00:02 PM	11:00:00 PM	0:59:58	51.3	74.9	37.1	86.9	90.1	62.7	51.3	48.9	41.2	39.6	39	38.3
16	9/5/2018	11:00:02 PM	12:00:00 AM	0:59:58	55	78.4	33.1	90.6	95.5	68.5	55.2	50.7	39.6	37.5	36.8	34
17	9/6/2018	12:00:02 AM	1:00:00 AM	0:59:58	42.1	62.2	31.1	77.7	76.3	55	47.7	43.6	35	32.8	32.6	31.9
18	9/6/2018	1:00:02 AM	2:00:00 AM	0:59:58	41.7	61.8	30.3	77.3	75.8	53.6	48.8	42.5	34	32.4	32	31.2
19	9/6/2018	2:00:02 AM	3:00:00 AM	0:59:58	38.1	55.9	29.8	73.7	72.5	51.2	42.3	35.8	33.3	32.2	31	30
20	9/6/2018	3:00:02 AM	4:00:00 AM	0:59:58	33.6	55	29.6	69.2	69.9	43.9	33.2	32.4	30.1	29.8	29.7	29.7
21	9/6/2018	4:00:02 AM	5:00:00 AM	0:59:58	37.7	61.4	29.4	73.3	76.4	51.9	36.9	32.7	29.9	29.6	29.6	29.5
22	9/6/2018	5:00:02 AM	6:00:00 AM	0:59:58	40.8	61	29.3	76.4	75.4	53.2	47.4	42.5	30.5	29.6	29.5	29.4
23	9/6/2018	6:00:02 AM	7:00:00 AM	0:59:58	49.2	69.5	29.8	84.8	84.8	59.6	55.5	52.9	42.6	32.5	31.5	30.6
24	9/6/2018	7:00:02 AM	8:00:00 AM	0:59:58	50.4	66.9	31	86	82.7	61.2	56.3	54	44	35.1	33.4	31.8

daytime (9am to 10pm) Leq	53.4
daytime (7am to 9am) Leq	49.8
nighttime (10pm to 7am) Leq	48.8
Ldn	56.1

average daytime L90	37.3
average nighttime L90	32.9
lowest L90	29.6

Rec 1 to 25 Slow Response dBA weighting 2.0 dB resolution stats

Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:35	1.0 hour	48.4	84	74	33.5	57	49	45	37	35	35	35	37	39.2	5	55	47	41
9/5/2018 9:35	1.0 hour	50	85.6	68.8	33.2	61	55	51	41	35	35	35	41	42.6	6.32	59	53	45
9/5/2018 10:35	1.0 hour	53.9	89.5	79.2	33.2	61	53	51	41	35	35	35	41	42.1	6.12	55	51	45
9/5/2018 11:35	1.0 hour	56.1	91.7	80.5	33.2	67	57	53	45	35	35	35	45	44.9	7.16	61	55	49
9/5/2018 12:35	1.0 hour	54.5	90.1	80.7	33.2	61	57	53	41	35	35	35	41	42.4	7.14	59	55	45
9/5/2018 13:35	1.0 hour	52.9	88.5	78.9	33.2	61	51	47	35	35	35	35	35	38.7	5.87	55	49	39
9/5/2018 14:35	1.0 hour	50.4	86	73.6	33.2	63	53	49	39	35	35	35	39	40.7	5.88	57	49	43
9/5/2018 15:35	1.0 hour	49	84.6	77.7	33.2	53	45	43	37	35	35	35	37	38.2	4.17	49	43	39
9/5/2018 16:35	1.0 hour	54	89.6	80.2	33.2	61	55	47	37	35	35	35	37	39.7	6.17	59	49	41
9/5/2018 17:35	1.0 hour	56.8	92.4	83.5	33.2	67	53	47	39	35	35	35	39	39.9	6.22	61	49	39
9/5/2018 18:35	1.0 hour	43.8	79.4	68.6	36.1	55	45	41	37	35	35	35	37	37.5	3.75	51	41	37
9/5/2018 19:35	1.0 hour	42.9	78.5	72.4	37.7	49	43	39	39	37	37	37	39	38.8	2.28	45	41	39
9/5/2018 20:35	1.0 hour	40.4	76	59	36.3	49	43	41	37	37	35	35	37	37.9	2.58	47	41	37
9/5/2018 21:35	1.0 hour	38.3	73.9	53.7	36.2	43	41	39	37	35	35	35	37	36.6	1.95	43	39	37
9/5/2018 22:35	1.0 hour	56.3	91.9	80.5	36.2	69	55	49	37	35	35	35	37	38.9	7.16	63	53	37
9/5/2018 23:35	1.0 hour	48.7	84.3	71.5	36.2	59	47	41	35	35	35	35	35	37.1	4.94	55	43	37
9/6/2018 0:35	1.0 hour	48.7	84.3	69.2	36.2	61	55	49	35	35	35	35	35	38.3	6.5	59	53	37
9/6/2018 1:35	1.0 hour	44.1	79.7	66.8	36.2	57	43	37	35	35	35	35	35	36.1	4.03	53	37	35
9/6/2018 2:35	1.0 hour	45.8	81.4	67.9	36.2	59	51	43	35	35	35	35	35	36.8	5.03	55	45	35
9/6/2018 3:35	1.0 hour	50.1	85.7	69.3	36.2	63	57	49	35	35	35	35	35	37.6	6.74	61	51	35
9/6/2018 4:35	1.0 hour	49	84.6	69.6	36.2	63	55	43	35	35	35	35	35	37.2	6.06	61	47	35
9/6/2018 5:35	1.0 hour	44.1	79.7	66.9	36.2	55	45	41	37	35	35	35	37	37.4	3.93	49	43	37
9/6/2018 6:35	1.0 hour	49.7	85.3	74.3	36.2	61	53	47	39	35	35	35	39	39.9	5.61	57	49	41
9/6/2018 7:35	1.0 hour	51.6	87.2	68.7	33.2	65	59	49	37	35	35	35	37	39.7	7.16	63	53	39
9/6/2018 8:35	9.2 min	54.8	82.2	74.7	33.2	69	59	45	35	35	35	35	35	38.5	7.45	65	51	37

daytime (9am to 10pm) Leq	52.4
daytime (7am to 9am) Leq	50.8
ıighttime (10pm to 7am) Leq	49.8
Ldn	56.6

average daytime L90	35.3
average nighttime L90	35.0
lowest L90	35.0

Rec 28 to 52	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/6/2018 9:34	1.0 hour	41.6	77.2	71.1	36.6	45	41	39	35	35	35	35	35	36.3	2.39	43	39	37
9/6/2018 10:34	1.0 hour	40	75.6	60.7	36.5	51	41	37	35	35	35	35	35	36.1	2.9	47	39	35
9/6/2018 11:34	1.0 hour	38.6	74.2	63.7	36.5	45	39	37	35	35	35	35	35	35.6	1.92	41	37	35
9/6/2018 12:34	1.0 hour	39.1	74.7	59	36.4	49	41.1	39	35	35	35	35	35	36.2	2.71	45	39	35
9/6/2018 13:34	1.0 hour	40.8	76.4	60.8	33.6	51	45	41	35	35	35	35	35	36.8	3.44	49	41	37
9/6/2018 14:34	1.0 hour	52.4	88	80.3	33.6	57	45	43	35	35	35	35	35	37.3	4.69	51	43	37
9/6/2018 15:34	1.0 hour	42.7	78.3	66.3	33.6	53	45	41	35	35	35	35	35	37.1	3.84	51	43	37
9/6/2018 16:34	1.0 hour	36.6	72.2	54.5	33.6	41	39	37	35	35	35	35	35	35.5	1.41	41	37	35
9/6/2018 17:34	1.0 hour	36.6	72.2	58.7	33.6	43	39	37	35	35	35	35	35	35.4	1.59	41	37	35
9/6/2018 18:34	1.0 hour	33.9	69.5	43.3	33.6	37	35	35	35	35	35	35	35	35.1	0.5	37	35	35
9/6/2018 19:34	1.0 hour	39.5	75.1	53.8	34	45	39	39	37	35	35	35	37	37.7	1.85	41	39	39
9/6/2018 20:34	1.0 hour	47.5	83.1	74.6	36.3	57	39	39	35	35	35	35	35	36.5	3.55	47	39	37
9/6/2018 21:34	1.0 hour	36.8	72.4	43.9	34.2	39	37	37	35	35	35	35	35	35.3	0.93	39	37	35
9/6/2018 22:34	1.0 hour	36.1	71.7	42.8	33.6	39	37	35	35	35	35	35	35	35.2	0.72	37	35	35
9/6/2018 23:34	1.0 hour	36.1	71.7	40.3	33.6	37	37	37	35	35	35	35	35	35.3	0.69	37	37	35
9/7/2018 0:34	1.0 hour	35.9	71.5	40.1	33.6	39	37	37	35	35	35	35	35	35.3	0.82	37	37	35
9/7/2018 1:34	1.0 hour	34.1	69.7	43.7	33.6	37	35	35	35	35	35	35	35	35	0.32	35	35	35
9/7/2018 2:34	1.0 hour	34	69.6	40.7	33.6	37	35	35	35	35	35	35	35	35	0.39	35	35	35
9/7/2018 3:34	1.0 hour	35.2	70.8	57.6	33.6	37	35	35	35	35	35	35	35	35.1	1.16	35	35	35
9/7/2018 4:34	1.0 hour	37	72.6	66.4	33.6	43	35	35	35	35	35	35	35	35.2	1.55	37	35	35
9/7/2018 5:34	1.0 hour	35	70.6	54	33.6	41	37	35	35	35	35	35	35	35.3	1.33	39	35	35
9/7/2018 6:34	1.0 hour	38.7	74.3	66	33.6	43	39	37	35	35	35	35	35	36.3	1.95	43	39	37
9/7/2018 7:34	1.0 hour	37.2	72.8	48.2	36.4	41	39	37	35	35	35	35	35	35.5	1.37	39	37	35
9/7/2018 8:34	1.0 hour	40.9	76.5	67.7	36.4	47	39	37	35	35	35	35	35	35.6	2.36	43	37	35
9/7/2018 9:34	20.2 min	40.7	71.5	67	36.5	43.1	37	35	35	35	35	35	35	35.4	2.01	41	37	35

daytime (9am to 10pm) Leq	44.0	average daytime L90	35.0
daytime (7am to 9am) Leq	39.4	average nighttime L90	35.0
nighttime (10pm to 7am) Leq	36.0	lowest L90	35.0
Ldn	44.7		

Number	Start Date	Start Time	End Time	Duration	Meas Mod	LAeq	LAmax	LAmin	LAE	LApeak	L1%	L5%	L10%	L50%	L90%	L95%	L99%
546	9/5/2018	8:07:09 AM	9:00:00 AM	0:52:51	Auto	56.8	80.5	33.7	91.8	98.7	69	59.2	55.8	42.2	37.6	37	35.5
547	9/5/2018	9:00:02 AM	10:00:00 AM	0:59:58	Auto	60.1	75.1	35.5	95.7	89	73	68.8	61.3	46	38.6	37.5	36.3
548	9/5/2018	10:00:02 AM	11:00:00 AM	0:59:58	Auto	48.5	66.1	34.2	84.1	83.1	60	53.6	51	43.8	38.9	37.4	35.5
549	9/5/2018	11:00:02 AM	12:00:00 PM	0:59:58	Auto	49.8	78.6	33.8	85.4	97.1	60.4	52.7	49.4	40	36.3	35.7	35
550	9/5/2018	12:00:02 PM	1:00:00 PM	0:59:58	Auto	49.3	75	33.5	84.9	90.5	59.9	54.1	49.9	39.8	36.6	36	34.6
551	9/5/2018	1:00:02 PM	2:00:00 PM	0:59:58	Auto	51.8	73.4	33.6	87.4	86.9	63.9	58.7	55.3	39.4	36.1	35.5	34.7
552	9/5/2018	2:00:02 PM	3:00:00 PM	0:59:58	Auto	53	79.4	32.6	88.6	99.8	63.9	58.8	55.8	38.8	34.9	34.3	33.7
553	9/5/2018	3:00:02 PM	4:00:00 PM	0:59:58	Auto	51.8	69.4	32.2	87.4	86.4	63	59.2	56.6	39.2	33.9	33.2	32.7
554	9/5/2018	4:00:02 PM	5:00:00 PM	0:59:58	Auto	53.5	75	32.1	89.1	93.7	64.9	59.8	57	39.9	34.1	33.4	32.7
555	9/5/2018	5:00:02 PM	6:00:00 PM	0:59:58	Auto	54.3	73.6	32	89.9	89.6	65.7	61.3	58.4	41.4	34.1	33.3	32.5
556	9/5/2018	6:00:02 PM	7:00:00 PM	0:59:58	Auto	57.6	86.1	31.7	93.2	101.4	68.2	62.1	59	40.1	32.8	32.4	32
557	9/5/2018	7:00:02 PM	8:00:00 PM	0:59:58	Auto	57.1	85.3	32.7	92.7	106.1	65.2	61.8	59	49.6	35.4	34.2	33.3
558	9/5/2018	8:00:02 PM	9:00:00 PM	0:59:58	Auto	54	69.5	44.8	89.6	91.9	64.6	61.2	58.1	48.2	46.5	46.2	45.6
559	9/5/2018	9:00:02 PM	10:00:00 PM	0:59:58	Auto	55	79.6	42.6	90.6	97.8	67.1	61.1	54.3	45.6	44.5	44.1	43.5
560	9/5/2018	10:00:02 PM	11:00:00 PM	0:59:58	Auto	59.5	85.8	42.6	95.1	106.4	70.6	65.7	61.7	45.4	44.3	44	43.6
561	9/5/2018	11:00:02 PM	12:00:00 AM	0:59:58	Auto	53.7	74.5	42.6	89.3	95.2	67.4	57.6	49.5	44.6	43.7	43.5	43.2
562	9/6/2018	12:00:02 AM	1:00:00 AM	0:59:58	Auto	58.7	88.7	42.4	94.3	112.1	68.2	58.5	49.1	44.5	43.4	43.2	43
563	9/6/2018	1:00:02 AM	2:00:00 AM	0:59:58	Auto	52.2	78.8	37.2	87.8	95.5	65.7	51.3	44.8	41.8	38.9	38.4	37.8
564	9/6/2018	2:00:02 AM	3:00:00 AM	0:59:58	Auto	52.6	74.7	36.9	88.2	94.8	67.2	53.8	45.9	40.6	38.3	38	37.6
565	9/6/2018	3:00:02 AM	4:00:00 AM	0:59:58	Auto	53.5	77	37.4	89.1	93.5	67.8	56.9	47.5	40.8	39	38.8	38.4
566	9/6/2018	4:00:02 AM	5:00:00 AM	0:59:58	Auto	55.3	73.4	32.5	90.9	94.5	69.1	63	55.2	39.4	36.1	34.4	33.7
567	9/6/2018	5:00:02 AM	6:00:00 AM	0:59:58	Auto	57.1	75	31.2	92.7	97.2	69.3	65.2	61.1	40.2	32.2	31.8	31.4
568	9/6/2018	6:00:02 AM	7:00:00 AM	0:59:58	Auto	69.6	81.4	39.1	105.2	102.7	79.1	77.2	75.5	60.5	51.1	44	40
569	9/6/2018	7:00:02 AM	8:00:00 AM	0:59:58	Auto	51.2	71.1	34.3	86.8	89	61	57.3	55.1	45.6	38	36.7	35.1
570	9/6/2018	8:00:01 AM	8:20:02 AM	0:20:01	Auto	53.6	69.7	34.5	84.4	96.1	65.2	61.5	56.3	44.2	38.3	36.9	35.3

daytime (8am to 10pm) Leq	55.0
daytime (7am to 8am) Leq	51.2
nighttime (10pm to 7am) Leq	61.4
Ldn	67.3

average daytime L90	37.2
average nighttime L90	40.8
lowest L90	32.2

Rec 27 to 51	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/6/2018 9:40	1.0 hour	55.6	91.2	86.9	36.3	61	55	51	39	35	35	35	39	41.8	6.69	59	53	43
9/6/2018 10:40	1.0 hour	45.9	81.5	67.3	33.4	57	51	47	37	35	35	35	37	39.1	5.54	55	49	41
9/6/2018 11:40	1.0 hour	38.8	74.4	57.6	33.4	47	41	39	35	35	35	35	35	36.6	2.64	45	41	37
9/6/2018 12:40	1.0 hour	43.2	78.8	64.8	33.4	55	47	43	37	35	35	35	37	37.9	4.06	51	45	39
9/6/2018 13:40	1.0 hour	46.8	82.4	67.7	33.6	59	49	45	39	35	35	35	39	39.5	4.77	53	47	41
9/6/2018 14:40	1.0 hour	48.5	84.1	74.9	35.8	59	45	43	37	35	35	35	37	38.1	4.41	53	43	39
9/6/2018 15:40	1.0 hour	42.8	78.4	59	33.4	51	47	45	39	35	35	35	39	39.4	3.86	51	45	41
9/6/2018 16:40	1.0 hour	43.2	78.8	64.7	36.3	51	47	45	39	37	35	35	39	40.1	3.48	49	45	41
9/6/2018 17:40	1.0 hour	41.8	77.4	61	33.4	51	45	43	37	35	35	35	37	38.4	3.4	49	43	39
9/6/2018 18:40	1.0 hour	41.2	76.8	58.1	33.4	47	45	45	37	35	35	35	37	38.6	3.54	45	45	41
9/6/2018 19:40	1.0 hour	46.8	82.4	60.4	44.2	53	47	47	45	45	45	43	45	45.4	1.32	49	47	45
9/6/2018 20:40	1.0 hour	45.7	81.3	54.2	43.2	47	45	45	45	43	43	43	45	44.7	0.99	47	45	45
9/6/2018 21:40	1.0 hour	45	80.6	61.7	42.4	47	45	45	43	43	43	43	43	43.6	1.3	47	45	43
9/6/2018 22:40	1.0 hour	44.8	80.4	54.1	42.4	47	45	45	43	43	43	43	43	43.6	1.13	47	45	43
9/6/2018 23:40	1.0 hour	44.6	80.2	48.7	42.1	47	45	45	43	43	43	43	43	43.5	0.98	45	45	43
9/7/2018 0:40	1.0 hour	43.8	79.4	57.2	40.7	49	45	43	43	41	41	41	43	42.4	1.6	47	45	43
9/7/2018 1:40	1.0 hour	42.7	78.3	57.6	39	47	45	43	41	39	39	39	41	41.4	1.68	45	43	41
9/7/2018 2:40	1.0 hour	42	77.6	52.1	37.9	47	45	43	41	39	39	37	41	40.6	1.95	45	43	41
9/7/2018 3:40	1.0 hour	40.9	76.5	53.6	36.3	45	43	43	39	37	37	35	39	39.4	2.21	45	43	41
9/7/2018 4:40	1.0 hour	41	76.6	51.7	33.4	47	45	43	39	35	35	35	39	38.9	2.92	45	43	41
9/7/2018 5:40	1.0 hour	42.7	78.3	59.2	33.7	51	45	43	41	37	37	35	41	40.4	3	47	45	41
9/7/2018 6:40	1.0 hour	43	78.6	63.4	33.4	49	45	43	39	35	35	35	39	40	3.35	47	45	41
9/7/2018 7:40	1.0 hour	40.6	76.2	63.2	33.4	51	43	41	35	35	35	35	35	37.2	3.32	47	43	37
9/7/2018 8:40	1.0 hour	38.4	74	62.9	33.4	43	41	39	35	35	35	35	35	36.1	2.16	43	39	37
9/7/2018 9:40	18.6 min	54.8	85.3	83.8	33.4	45	41	39	35	35	35	35	35	36.4	3.47	43	39	37

daytime (9am to 10pm) Leq	47.5
daytime (7am to 9am) Leq	39.6
nighttime (10pm to 7am) Leq	43.0
Ldn	50.3

average daytime L90	36.3
average nighttime L90	39.7
lowest L90	35.0

Start Date	Start Time	End Time	Duration	LAeq	L90%	L95%	L99%
9/6/2018	9:44:45 AM	10:00:00 AM	0:15:15	45.9	35.4	35	34.7
9/6/2018	10:00:02 AM	11:00:00 AM	0:59:58	42.1	35.4	34.9	34.1
9/6/2018	11:00:02 AM	12:00:00 PM	0:59:58	38.5	34.8	34.3	33.6
9/6/2018	12:00:02 PM	1:00:00 PM	0:59:58	38.4	34.4	34	33.4
9/6/2018	1:00:02 PM	2:00:00 PM	0:59:58	38.7	34.1	33.8	33.1
9/6/2018	2:00:02 PM	3:00:00 PM	0:59:58	47	33.8	33.1	32.1
9/6/2018	3:00:02 PM	4:00:00 PM	0:59:58	38.2	33.4	32.9	32
9/6/2018	4:00:02 PM	5:00:00 PM	0:59:58	39	31	30.5	29.7
9/6/2018	5:00:02 PM	6:00:00 PM	0:59:58	40.7	31	30.5	30
9/6/2018	6:00:02 PM	7:00:00 PM	0:59:58	36.7	30	29.8	29.4
9/6/2018	7:00:02 PM	8:00:00 PM	0:59:58	39.3	31.1	30.5	30.1
9/6/2018	8:00:02 PM	9:00:00 PM	0:59:58	41.7	38.5	37.9	36.8
9/6/2018	9:00:02 PM	10:00:00 PM	0:59:58	38.4	33.7	33.1	32.3
9/6/2018	10:00:02 PM	11:00:00 PM	0:59:58	39.1	34.8	34.4	33.7
9/6/2018	11:00:02 PM	12:00:00 AM	0:59:58	35.2	31.9	31.4	30.8
9/7/2018	12:00:02 AM	1:00:00 AM	0:59:58	34.9	32.9	32.4	31.7
9/7/2018	1:00:02 AM	2:00:00 AM	0:59:58	34.8	31.9	31.5	31
9/7/2018	2:00:02 AM	3:00:00 AM	0:59:58	36.5	33.4	32.8	32.3
9/7/2018	3:00:02 AM	4:00:00 AM	0:59:58	36.2	34.1	33.6	31.8
9/7/2018	4:00:02 AM	5:00:00 AM	0:59:58	35.8	32.4	31.7	30.6
9/7/2018	5:00:02 AM	6:00:00 AM	0:59:58	34.4	30.9	30.4	30
9/7/2018	6:00:02 AM	7:00:00 AM	0:59:58	36.6	31	30.3	29
9/7/2018	7:00:02 AM	8:00:00 AM	0:59:58	36.6	29.5	28.9	28.7
9/7/2018	8:00:02 AM	9:00:00 AM	0:59:58	37.4	28.6	28.4	28.2
9/7/2018	9:00:02 AM	10:00:00 AM	0:59:58	38.4	31	29.9	29.5
9/7/2018	10:00:01 AM	10:02:54 AM	0:02:53	57	35.9	35	34.2
				38.42			

daytime (10am to 10pm) Leq	40.9	32.7	average daytime L90
daytime (7am to 10am) Leq	37.5	32.6	average nighttime L90
nighttime (10pm to 7am) Leq	36.2	28.6	lowest L90
Ldn	43.5		

Number	Start Date	Start Time	End Time	Duration	Meas Mod	LAeq	LAmax	LAmin	LAE	LApeak	L1%	L5%	L10%	L50%	L90%	L95%	L99%
571	9/6/2018	9:50:02 AM	10:00:00 AM	0:09:58	Auto	43.1	64.2	30.8	70.9	91.7	57.5	43.5	38.2	31.9	30.9	30.9	30.8
572	9/6/2018	10:00:02 AM	11:00:00 AM	0:59:58	Auto	38.3	59.8	30.7	73.9	74.9	50.7	42.6	38.7	31.6	30.9	30.9	30.8
573	9/6/2018	11:00:02 AM	12:00:00 PM	0:59:58	Auto	33.9	50.5	30.8	69.5	64.4	45	37.2	34.4	31.2	30.9	30.9	30.8
574	9/6/2018	12:00:02 PM	1:00:00 PM	0:59:58	Auto	34.4	48.6	30.8	70	64.4	44.7	39.7	35.9	31.4	30.9	30.9	30.8
575	9/6/2018	1:00:02 PM	2:00:00 PM	0:59:58	Auto	40.3	63.3	30.8	75.9	79.5	54.1	38.9	35.6	31.7	31	31	30.9
576	9/6/2018	2:00:02 PM	3:00:00 PM	0:59:58	Auto	40.5	61.7	30.8	76.1	78.2	56	41.1	36.1	31.7	31	30.9	30.9
577	9/6/2018	3:00:02 PM	4:00:00 PM	0:59:58	Auto	36.3	59.1	30.7	71.9	75.3	47	41.3	37.6	31.3	30.9	30.9	30.8
578	9/6/2018	4:00:02 PM	5:00:00 PM	0:59:58	Auto	36.4	59.5	30.6	72	78.1	48.5	39.3	36.2	31.4	30.8	30.7	30.7
579	9/6/2018	5:00:02 PM	6:00:00 PM	0:59:58	Auto	41.2	65.1	31.1	76.8	91.3	54.4	44.1	38.8	32.2	31.5	31.4	31.3
580	9/6/2018	6:00:02 PM	7:00:00 PM	0:59:58	Auto	37.7	58.9	31.1	73.3	75.6	48.2	42.8	39.1	31.9	31.4	31.3	31.2
581	9/6/2018	7:00:02 PM	8:00:00 PM	0:59:58	Auto	46.2	62.8	31	81.8	81.6	53.7	52.3	51.9	38.5	31.4	31.3	31.1
582	9/6/2018	8:00:02 PM	9:00:00 PM	0:59:58	Auto	46.3	66.6	37.2	81.9	89.4	52.9	51	49.6	42.9	39.9	39.3	38.4
583	9/6/2018	9:00:02 PM	10:00:00 PM	0:59:58	Auto	41.9	67.9	35.1	77.5	78.7	48	45.7	44.1	38.3	36.8	36.4	35.9
584	9/6/2018	10:00:02 PM	11:00:00 PM	0:59:58	Auto	41	48.7	34.8	76.6	64.7	48.2	47.1	46.4	38	36.2	35.9	35.5
585	9/6/2018	11:00:02 PM	12:00:00 AM	0:59:58	Auto	36.2	46.9	33.9	71.8	66.7	42.5	38.1	37.2	35.5	34.6	34.4	34.1
586	9/7/2018	12:00:02 AM	1:00:00 AM	0:59:58	Auto	36.8	49.4	34	72.4	62	40.2	38.6	38	36.2	35	34.8	34.5
587	9/7/2018	1:00:02 AM	2:00:00 AM	0:59:58	Auto	38	48.6	33.8	73.6	59.8	47.6	41.9	38.2	36.3	35	34.8	34.3
588	9/7/2018	2:00:02 AM	3:00:00 AM	0:59:58	Auto	41.1	57.3	33.4	76.7	78.2	49.4	47.8	46.3	36.1	34.8	34.5	34.1
589	9/7/2018	3:00:02 AM	4:00:00 AM	0:59:58	Auto	39.7	52.2	32.4	75.3	64.2	50.6	45	42.1	35.6	34	33.5	33
590	9/7/2018	4:00:02 AM	5:00:00 AM	0:59:58	Auto	34.3	40.7	31.1	69.9	56.1	39.6	38.4	36.9	33.3	31.5	31.4	31.2
591	9/7/2018	5:00:02 AM	6:00:00 AM	0:59:58	Auto	35.5	58.9	30.8	71.1	76.6	46.2	36.8	33.1	31.4	30.9	30.9	30.9
592	9/7/2018	6:00:02 AM	7:00:00 AM	0:59:58	Auto	37.1	57.9	30.8	72.7	76.3	48.3	41.7	36.1	31.4	31	31	31
593	9/7/2018	7:00:02 AM	8:00:00 AM	0:59:58	Auto	39.2	65.6	30.7	74.8	86.9	50.8	40.3	37.2	31.6	30.9	30.8	30.8
594	9/7/2018	8:00:02 AM	9:00:00 AM	0:59:58	Auto	39.7	63.4	30.6	75.3	79.1	49.4	41.8	37.5	31.4	30.7	30.7	30.6
595	9/7/2018	9:00:02 AM	10:00:00 AM	0:59:58	Auto	35.9	57.8	30.6	71.5	74.1	45.9	40.3	37	31.4	30.8	30.8	30.7
596	9/7/2018	10:00:00 AM	10:07:46 AM	0:07:46	Auto	52	74.9	30.9	78.7	102.8	67.4	41.5	39.3	31.5	31.1	31	31

daytime (10am to 10pm) Leq	41.3
daytime (7am to 10am) Leq	38.6
nighttime (10pm to 7am) Leq	38.3
Ldn	45.2

average daytime L90	32.0
average nighttime L90	33.7
lowest L90	30.7

Start Date	Start Time	LAeq	LAmax	LAmin	LAE	L1%	L5%	L10%	L50%	L90%	L95%	L99%
9/5/2018	8:17:53 AM	41.4	70.6	39.1	43.0	30.9	59.1	64.2	48.5	47.1	45.4	35.5
9/5/2018	9:17:53 AM	40.4	67.6	38.6	41.7	30.5	58.2	62.7	46.9	45.8	44.5	34.7
9/5/2018	10:17:53 AM	40.7	71.0	38.6	41.8	30.5	58.5	63.0	47.3	46.2	44.8	34.8
9/5/2018	11:17:53 AM	39.5	71.8	38.7	43.1	30.8	57.3	63.0	46.8	44.9	43.2	34.9
9/5/2018	12:17:53 PM	40.3	67.8	40.3	42.8	31.2	58.1	63.1	47.1	45.6	44.0	36.0
9/5/2018	1:17:53 PM	37.3	71.6	38.3	40.9	29.4	55.1	59.9	43.3	41.9	40.4	33.4
9/5/2018	2:17:53 PM	41.9	66.5	39.0	44.5	31.7	59.7	65.4	49.4	47.6	45.7	37.0
9/5/2018	3:17:53 PM	42.7	66.3	40.7	45.8	33.0	60.5	66.3	50.0	48.2	46.6	38.6
9/5/2018	4:17:53 PM	44.0	64.6	39.1	44.1	32.4	61.8	67.4	51.6	50.0	48.5	38.7
9/5/2018	5:17:53 PM	40.3	65.7	40.9	45.2	31.2	58.1	63.2	47.2	45.5	43.9	36.2
9/5/2018	6:17:53 PM	40.4	66.6	41.4	43.7	31.4	58.2	63.7	47.4	45.4	44.0	36.5
9/5/2018	7:17:53 PM	55.5	74.9	46.8	51.2	49.8	73.3	70.8	58.3	57.8	57.1	54.3
9/5/2018	8:17:53 PM	48.6	63.9	45.7	48.2	45.1	66.4	65.2	51.5	50.9	50.3	47.7
9/5/2018	9:17:53 PM	45.8	65.4	43.4	44.7	42.0	63.6	64.2	49.7	49.0	48.1	43.8
9/5/2018	10:17:53 PM	45.0	65.2	42.8	45.1	41.1	62.8	63.4	48.7	47.9	47.1	43.3
9/5/2018	11:17:53 PM	42.6	61.6	41.3	42.9	39.4	60.4	60.5	45.5	44.7	44.1	41.4
9/6/2018	12:17:53 AM	40.6	69.1	40.1	41.2	37.3	58.4	59.3	43.3	42.6	42.1	39.5
9/6/2018	1:17:53 AM	36.0	56.4	39.6	39.2	33.8	53.8	56.4	38.9	37.8	37.1	35.2
9/6/2018	2:17:53 AM	33.6	57.9	37.5	37.0	31.9	51.4	51.8	35.3	34.8	34.5	33.0
9/6/2018	3:17:53 AM	30.9	58.2	34.2	34.0	29.2	48.7	49.2	32.9	32.1	31.7	30.2
9/6/2018	4:17:53 AM	35.8	59.8	36.4	35.8	29.7	53.6	59.1	41.2	39.6	38.3	33.9
9/6/2018	5:17:53 AM	36.6	61.9	37.0	37.4	29.1	54.4	59.6	43.0	40.7	39.0	33.0
9/6/2018	6:17:53 AM	42.3	73.1	38.1	45.3	32.0	60.1	64.9	49.0	47.6	46.2	38.7
9/6/2018	7:17:53 AM	43.7	76.1	38.9	44.5	31.5	61.3	68.0	52.1	49.6	48.0	37.7

ytime (9am to 10pm) Leq	46.6		average daytime L90	47.7
daytime (7am to 9am) Leq	42.7		average nighttime L90	40.9
ttime (10pm to 7am) Leq	41.1		lowest L90	32.1
Ldn	48.7			

Start Date	Start Time	LAeq	LAmax	LAmin	LAE	L1%	L5%	L10%	L50%	L90%	L95%	L99%
9/6/2018	9:57:03 AM	39.1	76.1	43.8	46.1	32.4	56.9	70.9	45.6	43.2	41.8	36.9
9/6/2018	10:57:03 AM	39.0	55.3	43.2	45.9	32.7	56.8	69.1	45.3	43.6	42.1	36.9
9/6/2018	11:57:03 AM	38.9	55.3	43.2	45.8	32.6	56.7	69.0	45.2	43.4	42.0	36.8
9/6/2018	12:57:03 PM	51.7	65.7	44.3	47.7	40.1	69.5	78.1	58.6	56.5	55.1	49.9
9/6/2018	1:57:03 PM	46.6	70.1	43.4	45.8	35.6	64.4	75.4	54.3	52.2	50.2	43.3
9/6/2018	2:57:03 PM	38.2	63.4	41.5	43.7	31.4	56.0	68.4	44.4	42.5	41.1	35.9
9/6/2018	3:57:03 PM	35.5	67.0	39.7	42.2	30.7	53.3	65.2	41.4	39.3	37.8	33.6
9/6/2018	4:57:03 PM	45.2	65.3	46.8	48.6	36.0	63.0	73.8	52.0	50.0	48.5	43.2
9/6/2018	5:57:03 PM	52.3	71.8	46.9	49.6	40.0	70.1	79.6	59.7	57.2	55.7	49.9
9/6/2018	6:57:03 PM	49.7	67.0	46.9	49.4	41.5	67.5	72.0	54.6	53.0	51.9	48.4
9/6/2018	7:57:03 PM	56.3	58.1	52.3	54.2	55.4	74.1	71.3	56.7	56.6	56.5	56.3
9/6/2018	8:57:03 PM	53.4	55.6	49.6	51.2	52.4	71.2	68.7	53.9	53.8	53.7	53.4
9/6/2018	9:57:03 PM	53.0	56.0	49.7	51.1	52.0	70.8	68.3	53.6	53.5	53.4	53.0
9/6/2018	10:57:03 PM	52.4	55.4	47.9	50.4	51.4	70.2	67.6	52.9	52.8	52.7	52.4
9/6/2018	11:57:03 PM	50.5	51.5	48.2	48.8	49.8	68.3	65.9	50.9	50.8	50.7	50.5
9/6/2018	12:57:03 AM	49.6	52.6	46.2	47.5	48.9	67.4	64.9	50.1	50.0	49.9	49.6
9/6/2018	1:57:03 AM	49.3	50.9	46.3	47.2	48.3	67.1	64.6	49.8	49.7	49.6	49.3
9/6/2018	2:57:03 AM	48.4	56.6	45.8	46.2	47.0	66.2	64.8	49.1	48.9	48.8	48.5
9/6/2018	3:57:03 AM	44.8	49.1	42.3	43.0	43.0	62.6	61.9	45.7	45.5	45.3	44.9
9/6/2018	4:57:03 AM	33.7	55.0	36.9	36.6	30.5	51.5	59.8	36.8	35.7	35.1	33.2
9/6/2018	5:57:03 AM	44.9	73.2	38.0	38.5	32.1	62.7	74.1	53.8	50.4	47.6	39.3
9/6/2018	6:57:03 AM	38.7	68.3	40.3	43.7	32.8	56.5	66.0	44.9	42.5	40.9	36.4
9/6/2018	7:57:03 AM	38.8	71.7	37.6	40.4	30.3	56.6	70.7	47.7	43.5	40.2	33.9
9/6/2018	8:57:03 AM	36.6	76.9	39.3	40.6	30.2	54.4	70.3	44.2	40.5	38.3	33.4

ytime (9am to 10pm) Leq	49.9	average daytime L90	48.2
daytime (7am to 9am) Leq	38.1	average nighttime L90	48.6
ttime (10pm to 7am) Leq	49.5	lowest L90	35.7
Ldn	55.8		

Rec 1 to 25	Slow Response		dBA weighting		2.0 dB resolution stats												
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 9:02	1.0 hour	52.4	88	81.1	36.8	65	49	43	37	37	37	37	37	39.5	5.17	59	45	39
9/5/2018 10:02	1.0 hour	51.1	86.7	83.9	36.9	51	45	41	37	37	37	37	37	38.4	3.33	47	43	37
9/5/2018 11:02	1.0 hour	44	79.6	70.4	36.9	53	45	41	37	37	37	37	37	38.2	3.21	49	41	37
9/5/2018 12:02	1.0 hour	41	76.6	62.1	37.1	49	45	41	37	37	37	37	37	38.5	2.69	47	43	39
9/5/2018 13:02	1.0 hour	44.2	79.8	61.9	37.4	53	49	47	39	37	37	37	39	40.8	3.77	51	47	41
9/5/2018 14:02	1.0 hour	45.1	80.7	64.3	37.4	53	49	47	41	37	37	37	41	41.7	3.9	51	47	43
9/5/2018 15:02	1.0 hour	44.6	80.2	65.6	37.4	51	49	47	41	37	37	37	41	41.7	3.57	51	47	43
9/5/2018 16:02	1.0 hour	45.6	81.2	63.9	37.4	55	49	47	41	39	37	37	41	42.4	3.62	53	47	43
9/5/2018 17:02	1.0 hour	54.7	90.3	79.9	37.3	61	47	43	39	37	37	37	39	39.8	4.56	53	45	39
9/5/2018 18:02	1.0 hour	46.4	82	76.4	37.4	53	41	39	39	37	37	37	39	39.2	2.58	45	39	39
9/5/2018 19:02	1.0 hour	41.4	77	64.7	37.2	49	41	41	39	37	37	37	39	38.8	2.35	43	41	39
9/5/2018 20:02	1.0 hour	46.2	81.8	66.8	37.2	57	47	41	37	37	37	37	37	38.3	4.04	55	41	37
9/5/2018 21:02	1.0 hour	45.8	81.4	60.4	36.3	51	47	47	45	37	37	37	45	42.9	4.66	49	47	47
9/5/2018 22:02	1.0 hour	36.8	72.4	57.1	34.4	39	37	37	37	35	35	35	37	36.7	1.01	37	37	37
9/5/2018 23:02	1.0 hour	47.3	82.9	55.8	35	49	49	49	47	37	37	35	47	44.8	4.74	49	49	47
9/6/2018 0:02	1.0 hour	39.7	75.3	51.3	34.4	49	49	37	35	35	35	35	35	36.4	3.21	49	37	37
9/6/2018 1:02	1.0 hour	38.9	74.5	66	34.4	39	37	37	35	35	35	35	35	35.3	1.58	37	37	35
9/6/2018 2:02	1.0 hour	37.4	73	54.4	34.4	45	39	37	35	35	35	35	35	35.7	1.88	43	37	35
9/6/2018 3:02	1.0 hour	36.5	72.1	46.6	34.4	37	37	37	35	35	35	35	35	35.9	1.08	37	37	37
9/6/2018 4:02	1.0 hour	38.9	74.5	66.1	34.4	37	37	37	37	35	35	35	37	36.5	1.47	37	37	37
9/6/2018 5:02	1.0 hour	39.6	75.2	64	34.4	47	37	37	37	35	35	35	37	37	2.04	43	37	37
9/6/2018 6:02	1.0 hour	48.3	83.9	67.9	37.3	51	49	49	47	37	37	37	47	44.1	5.59	51	49	49
9/6/2018 7:02	1.0 hour	40.2	75.8	63.2	34.4	49	39	39	37	35	35	35	37	37.7	2.3	45	39	39
9/6/2018 8:02	1.0 hour	40.1	75.7	66	34.4	43	39	39	37	35	35	35	37	36.8	2.05	39	39	37
9/6/2018 9:02	2.6 min	61.5	83.5	82.4	38.4	75.5	51	49	39	39	37	37	39	41.4	6.63	69	49	39

daytime (9am to 10pm) Leq	48.4		average daytime L90	37.0
daytime (7am to 9am) Leq	40.2		average nighttime L90	35.7
nighttime (10pm to 7am) Leq	42.8		lowest L90	35.0
Ldn	50.4			

	Ldn (from measured Leq hourly values)	geography to explain the Ldn…	Average daytime L90 (from measured L90 hourly values)	Average nighttime L90 (from measured L90 hourly values)	Lowest hourly L90 (from measured L90 hourly values)	
LT1	51.5	distant from major roadway	35.1	35.0	35.0	
LT2	48.5	distant from major roadway	35.5	35.2	35.0	
LT3	52.9	distant from major roadway	36.9	37.2	35.0	
LT4	56.1	near major roadway	37.3	32.9	29.6	
LT5	56.6	near major roadway	35.3	35.0	35.0	
LT6	44.7	distant from major roadway	35.0	35.0	35.0	
LT7	67.3	adjoining Old Highway 80	37.2	40.8	32.2	
LT8	50.3	distant from major roadway	36.3	39.7	35.0	
LT9	43.5	distant from major roadway	32.7	32.6	28.6	
LT10	45.2	distant from major roadway	32.0	33.7	30.7	
LT11	48.7	distant from major roadway	47.7	40.9	32.1	
LT12	55.8	distant from major roadway	48.2	48.6	35.7	
LT13	50.4	distant from major roadway	37.0	35.7	35.0	
energy-avg	**57.5**		37.4	37.1	33.4	<-- arithmetic L90 averages

APPENDIX B

CadnaA Sound Modeling Input/Output Data

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
ProposedGEA_Plus2dB	ProposedGEA2	Lw	A	84.8	94.6	100	102.6	106.2	107.5	104.1	96.1	78	112	126.6	GE Data 2p5_127_plus2dBForModelingAsumption
ExistingTurbines Plus2	ExistTurbsPlus2	Lw	A	87.4	87.4	96.2	101.8	103.4	101.7	97.4	90.6	88.8	108.1	127.3	Tule Noise Report Table 6, GE 1.5 XLE

Cumulative = Campo + Torrey + Kumeyaay

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio	Operating Time Day (min)	Special (min)	Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Height (m)		Coordinates X (m)	Y (m)	Z (m)
Torrey		!08!Torrey0	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996269	565252.9	1360.7
Torrey		!08!Torrey1	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996220	565538.1	1353.58
Torrey		!08!Torrey10	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995517	563727.8	1277.45
Torrey		!08!Torrey11	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995508	563940.8	1284.13
Torrey		!08!Torrey12	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995330	562566.4	1246.09
Torrey		!08!Torrey13	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996258	562678.9	1292.53
Torrey		!08!Torrey14	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996166	562957.8	1280.43
Torrey		!08!Torrey15	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996201	563284.3	1304.82
Torrey		!08!Torrey16	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996293	563532	1321.16
Torrey		!08!Torrey17	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995480	563410.4	1270.82
Torrey		!08!Torrey18	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995461	563214.6	1268.24
Torrey		!08!Torrey19	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995334	562814.9	1256.05
Torrey		!08!Torrey2	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996738	565989.3	1304.82
Torrey		!08!Torrey20	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995438	562138.3	1238.17
Torrey		!08!Torrey21	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995367	562340.6	1241.79
Torrey		!08!Torrey22	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996055	561983.4	1250.81
Torrey		!08!Torrey23	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996207	562456.3	1279.14
Torrey		!08!Torrey24	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996192	562256.2	1269.57
Torrey		!08!Torrey25	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1994667	562311.5	1250.02
Torrey		!08!Torrey26	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1994606	562566.7	1249.36
Torrey		!08!Torrey27	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1994519	562779.4	1252.65
Torrey		!08!Torrey28	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1994831	561519.9	1243.72
Torrey		!08!Torrey29	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1994774	561738.5	1253.44
Torrey		!08!Torrey3	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996295	563743.8	1329.2
Torrey		!08!Torrey4	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996375	563948.9	1341.33
Torrey		!08!Torrey5	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1996295	564149.4	1336.33
Torrey		!08!Torrey6	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995899	564384.8	1312.2
Torrey		!08!Torrey7	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995898	564640.9	1329.2
Torrey		!08!Torrey8	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995905	564908.5	1334.27
Torrey		!08!Torrey9	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1995498	564137.9	1292.62
Kumayaay0		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992848	559419.3	1377.97
Kumayaay1		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992740	559547.8	1384.98
Kumayaay2		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992653	559672.2	1399.9
Kumayaay3		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992537	559800.8	1413.26
Kumayaay4		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992438	559941.8	1426.74
Kumayaay5		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992321	560066.2	1426.74
Kumayaay6		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992205	560194.8	1426.74
Kumayaay7		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992098	560315.1	1424.73
Kumayaay8		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1992002	560451.9	1426.74
Kumayaay9		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991869	560576.3	1438.93
Kumayaay10		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991766	560704.9	1438.93
Kumayaay11		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991675	560850.1	1446.22
Kumayaay12		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991579	560991.1	1451.12
Kumayaay13		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991475	561127.9	1456.79
Kumayaay14		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991388	561273.1	1463.31
Kumayaay15		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991305	561405.8	1475.5
Kumayaay16		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991202	561555.1	1478.81
Kumayaay17		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991110	561687.8	1487.7
Kumayaay18		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1990994	561816.4	1499.59
Kumayaay19		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1990899	561957.4	1512.08
Kumayaay20		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1990940	562168.9	1512.08
Kumayaay21		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1990986	562338.9	1501.15
Kumayaay22		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991044	562567	1499.89
Kumayaay23		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991073	562737.1	1499.89
Kumayaay24		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110	r	1991082	562960.2	1499.89
Campo		!01!CampoC-21	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1987923	555475.2	1207.28
Campo		!01!CampoC-32	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1989072	551890.3	1194.32
Campo		!01!CampoC-35	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1989792	551241.1	1206
Campo		!01!CampoC-26	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988472	554012.7	1170.21
Campo		!01!CampoC-43	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988884	557720.3	1353.58
Campo		!01!CampoC-20	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1987775	555708.1	1231.66
Campo		!01!CampoC-44	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988940	557446.9	1312.47
Campo		!01!CampoC-45	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988967	557248.3	1317.01
Campo		!01!CampoC-14	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1987390	557412.3	1317.01
Campo		!01!CampoC-31	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988988	552226.2	1182.87
Campo		!01!CampoC-29	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988728	552612.2	1158.51
Campo		!01!CampoC-3	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1986832	549860	1210.65
Campo		!01!CampoC-19	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1987699	556001.7	1202.44
Campo		!01!CampoC-25	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110	r	1988321	554276.5	1176.85

Campo	!01!CampoC-27	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988459	553077.2	1146.32
Campo	!01!CampoC-5	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987078	549374.8	1237.12
Campo	!01!CampoC-13	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987305	557757.1	1280.43
Campo	!01!CampoC-52	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989897	554712.5	1217.79
Campo	!01!CampoC-39	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990091	550061.5	1231.66
Campo	!01!CampoC-4	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987003	549576.9	1237.68
Campo	!01!CampoC-8	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987321	551772	1158.51
Campo	!01!CampoC-47	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988663	556680.7	1255.98
Campo	!01!CampoC-48	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990335	555700.3	1256.05
Campo	!01!CampoC-53	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989875	554504.2	1206.45
Campo	!01!CampoC-10	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987480	551072.5	1134.13
Campo	!01!CampoC-37	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990015	550457.2	1224.19
Campo	!01!CampoC-36	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989991	550793	1214.11
Campo	!01!CampoC-46	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989082	556950.7	1285.7
Campo	!01!CampoC-15	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987391	557175.1	1317.01
Campo	!01!CampoC-12	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987915	550506.2	1181.96
Campo	!01!CampoC-42	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990004	549462.5	1227.19
Campo	!01!CampoC-49	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989971	555407.6	1256.05
Campo	!01!CampoC-51	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989908	554944.7	1228.79
Campo	!01!CampoC-28	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988668	552796.8	1158.51
Campo	!01!CampoC-7	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987093	548955.6	1219.47
Campo	!01!CampoC-33	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989107	551695.1	1184.18
Campo	!01!CampoC-16	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987490	556958	1304.82
Campo	!01!CampoC-24	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988213	554518.2	1158.51
Campo	!01!CampoC-18	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987705	556421.6	1231.66
Campo	!01!CampoC-40	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990075	549861.3	1231.66
Campo	!01!CampoC-1	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1986737	550363	1170.7
Campo	!01!CampoC-22	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988018	555066.1	1172.84
Campo	!01!CampoC-41	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990029	549666.7	1231.66
Campo	!01!CampoC-11	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987700	550708	1182.9
Campo	!01!CampoC-23	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988088	554843	1173.96
Campo	!01!CampoC-30	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988821	552415.6	1170.7
Campo	!01!CampoC-50	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989863	555211.4	1243.86
Campo	!01!CampoC-38	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990035	550242	1229.48
Campo	!01!CampoC-54	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989794	554241.4	1195.09
Campo	!01!CampoC-17	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987605	556674.3	1280.43
Campo	!01!CampoC-2	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1986744	550074.3	1195.09
Campo	!01!CampoC-34	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989777	551425.4	1207.28
Campo	!01!CampoC-6	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987057	549160.9	1231.04
Campo	!01!CampoC-9	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987397	551571.4	1158.51
Campo	!01!CampoC-57	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993886	562011.9	1329.2
Campo	!01!CampoC-59	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1994044	561568.9	1314.08
Campo	!01!CampoC-60	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1994173	561371.1	1304.82
Campo	!01!CampoC-58	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993999	561744.9	1329.2
Campo	!01!CampoC-55	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993605	562598	1338.8
Campo	!01!CampoC-56	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993754	562206.2	1329.2
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990042	559837.7	1397.78
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990024	560049.5	1406.42
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990031	560282.9	1414.54
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990409	561132	1451.12
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990364	561330.9	1487.44
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990292	561536.5	1486.65
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993253	562630.2	1353.58
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990221	561722.3	1487.7
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993233	558618.9	1402.35
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993132	558761.5	1388.43
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993150	558904.7	1389.02
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993221	558385.8	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993240	558187.2	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987217	557998.2	1304.82
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990156	561927.9	1487.7
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993029	562789.1	1365.78

Campo Only

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night					X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m^2)		(min)	(min)	(min)	(dB)	(Hz)		(m)	(m)	(m)	(m)
Campo		!01!CampoC-21	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987923	555475.2	1207.28
Campo		!01!CampoC-32	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989072	551890.3	1194.32
Campo		!01!CampoC-35	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989792	551241.1	1206
Campo		!01!CampoC-26	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988472	554012.7	1170.21
Campo		!01!CampoC-43	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988884	557720.3	1353.58
Campo		!01!CampoC-20	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987775	555708.1	1231.66
Campo		!01!CampoC-44	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988940	557446.9	1312.47
Campo		!01!CampoC-45	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988967	557248.3	1317.01
Campo		!01!CampoC-14	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987390	557412.3	1317.01
Campo		!01!CampoC-31	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988988	552226.2	1182.87
Campo		!01!CampoC-29	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988728	552612.2	1158.51
Campo		!01!CampoC-3	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986832	549860	1210.65
Campo		!01!CampoC-19	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987699	556001.7	1202.44
Campo		!01!CampoC-25	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988321	554276.5	1176.85
Campo		!01!CampoC-27	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988459	553077.2	1146.32
Campo		!01!CampoC-5	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987078	549374.8	1237.12
Campo		!01!CampoC-13	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987305	557757.1	1280.43
Campo		!01!CampoC-52	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989897	554712.5	1217.79
Campo		!01!CampoC-39	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990091	550061.5	1231.66
Campo		!01!CampoC-4	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987003	549576.9	1237.68
Campo		!01!CampoC-8	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987321	551772	1158.51
Campo		!01!CampoC-47	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988663	556680.7	1255.98
Campo		!01!CampoC-48	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990335	555700.3	1256.05
Campo		!01!CampoC-53	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989875	554504.2	1206.45
Campo		!01!CampoC-10	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987480	551072.5	1134.13
Campo		!01!CampoC-37	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990015	550457.2	1224.19
Campo		!01!CampoC-36	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989991	550793	1214.11
Campo		!01!CampoC-46	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989082	556950.7	1285.7
Campo		!01!CampoC-15	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987391	557175.1	1317.01
Campo		!01!CampoC-12	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987915	550506.2	1181.96
Campo		!01!CampoC-42	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990004	549462.5	1227.19
Campo		!01!CampoC-49	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989971	555407.6	1256.05
Campo		!01!CampoC-51	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989908	554944.7	1228.79
Campo		!01!CampoC-28	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988668	552796.8	1158.51
Campo		!01!CampoC-7	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987093	548955.6	1219.47
Campo		!01!CampoC-33	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989107	551695.1	1184.18
Campo		!01!CampoC-16	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987490	556958	1304.82
Campo		!01!CampoC-24	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988213	554518.2	1158.51
Campo		!01!CampoC-18	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987705	556421.6	1231.66
Campo		!01!CampoC-40	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990075	549861.3	1231.66
Campo		!01!CampoC-1	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986737	550363	1170.7
Campo		!01!CampoC-22	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988018	555066.1	1172.84
Campo		!01!CampoC-41	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990029	549666.7	1231.66
Campo		!01!CampoC-11	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987700	550708	1182.9
Campo		!01!CampoC-23	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988088	554843	1173.96
Campo		!01!CampoC-30	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988821	552415.6	1170.7
Campo		!01!CampoC-50	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989863	555211.4	1243.86
Campo		!01!CampoC-38	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990035	550242	1229.48
Campo		!01!CampoC-54	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989794	554241.4	1195.09
Campo		!01!CampoC-17	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987605	556674.3	1280.43
Campo		!01!CampoC-2	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986744	550074.3	1195.09
Campo		!01!CampoC-34	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989777	551425.4	1207.28
Campo		!01!CampoC-6	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987057	549160.9	1231.04
Campo		!01!CampoC-9	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987397	551571.4	1158.51
Campo		!01!CampoC-57	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993886	562011.9	1329.2
Campo		!01!CampoC-59	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994044	561568.9	1314.08
Campo		!01!CampoC-60	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994173	561371.1	1304.82
Campo		!01!CampoC-58	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993999	561744.9	1329.2
Campo		!01!CampoC-55	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993605	562598	1338.8
Campo		!01!CampoC-56	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993754	562206.2	1329.2
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990042	559837.7	1397.78
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990024	560049.5	1406.42
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990031	560282.9	1414.54
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990409	561132	1451.12
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990364	561330.9	1487.44
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990292	561536.5	1486.65
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993253	562630.2	1353.58
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990221	561722.3	1487.7
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993233	558618.9	1402.35

Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993132	558761.5	1388.43
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993150	558904.7	1389.02
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993221	558385.8	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993240	558187.2	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987217	557998.2	1304.82
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990156	561927.9	1487.7
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993029	562789.1	1365.78

Cumulative = Campo + Torrey + Kumeyaay

Name	M.	ID	Level Lr Day (dBA)	Level Lr Night (dBA)	Level Lr Ldn (dBA)	Level Lr Lden (dBA)	Limit. Value Day (dBA)	Limit. Value Night (dBA)	Limit. Value Ldn (dBA)	Limit. Value Lden (dBA)	Land Use Type	Land Use Auto	Noise Type	Height (m)	
LT-1		CAMPOLTNAMES00001	53.2	48.2	55.8	55.6	0	0	0	0		x	Total	1.5	r
LT-2		CAMPOLTNAMES00012	52.5	47.5	55.1	54.8	0	0	0	0		x	Total	1.5	r
LT-3		CAMPOLTNAMES00011	50	45	52.6	52.3	0	0	0	0		x	Total	1.5	r
LT-4		CAMPOLTNAMES00008	52	47	54.6	54.4	0	0	0	0		x	Total	1.5	r
LT-5		CAMPOLTNAMES00010	52.8	47.8	55.4	55.2	0	0	0	0		x	Total	1.5	r
LT-6		CAMPOLTNAMES00005	37.1	32.3	39.8	39.8	0	0	0	0		x	Total	1.5	r
LT-7		CAMPOLTNAMES00009	53	48.2	55.7	55.8	0	0	0	0		x	Total	1.5	r
LT-8		CAMPOLTNAMES00003	51.9	46.9	54.5	54.3	0	0	0	0		x	Total	1.5	r
LT-9		CAMPOLTNAMES00002	61.5	56.5	64.1	63.9	0	0	0	0		x	Total	1.5	r
LT-10		CAMPOLTNAMES00004	51.2	46.2	53.8	53.5	0	0	0	0		x	Total	1.5	r
LT-11		CAMPOLTNAMES00007	47.4	42.4	50	49.8	0	0	0	0		x	Total	1.5	r
LT-12		CAMPOLTNAMES00006	46.8	41.8	49.4	49.2	0	0	0	0		x	Total	1.5	r
LT-13		CAMPOLTNAMES00013	46.9	41.9	49.5	49.2	0	0	0	0		x	Total	1.5	r

Name	Coordinates X (m)	Coordinates Y (m)	Coordinates Z (m)	Campo Pro Day Leq dBA	Proposed Campo Daytime Z-Spectrum 32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
LT-1	1990492	550628.4	1115.42	53.2	70.5	67	58.7	51.8	50.4	49.4	41.3	20.1	-41.1
LT-2	1989349	550863.5	1058.53	52.5	70.3	66.9	58.1	51.4	49.8	48.5	39.4	15.4	-53.5
LT-3	1987889	552532.6	976.86	50	68.1	64.6	55.8	49.2	47.5	45.9	35.9	7.5	-76.4
LT-4	1988915	553645.9	989.05	51.5	69.6	66.1	57.2	50.5	48.9	47.4	37.9	13.5	-54.4
LT-5	1989937	553913.7	1061.86	52.8	69.8	66.3	58.4	51.2	49.8	48.9	41.5	23.8	-24.6
LT-6	1986512	559602.6	1097.44	33.6	53.2	49.7	40.8	34	31.6	28.4	13.5	-35	-80.2
LT-7	1991056	558550.9	1223.13	36.5	56.4	52.8	43.5	36.6	34.3	31.6	17	-29.9	-80.2
LT-8	1989745	560906.6	1299.16	51.4	68.6	65.1	57.1	50.7	48.9	47.3	38	12.3	-64.2
LT-9	1990094	561989.3	1379.2	61.4	76.5	73.1	66.5	59.3	58.1	57.5	52	40.5	12.6
LT-10	1992643	562957.8	1266.23	51	67.6	64.2	56.5	49.6	48.1	47.1	39.6	21	-31.7
LT-11	1990056	556519.8	1110.03	47.4	66	62.5	53.6	47	45.1	43.1	32	1.1	-79.8
LT-12	1993994	560325.5	1171.93	44.5	63.7	60.2	51	44.3	42.2	40	27.8	-7.1	-80.2
LT-13	1987202	548246	1075.59	46.9	64.9	61.4	52.6	46	44.3	42.9	33.2	6.9	-70.7

Campo Only

Name	M.	ID	Level Lr				Limit. Value				Land Use			Height	Coordinates		
			Day	Night	Ldn	Lden	Day	Night	Ldn	Lden	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)
LT-1		CAMPOLTNAMES00001	53.2	48.2	55.8	55.6	0	0	0	0		x	Total	1.5 r	1990492	550628.4	1115.42
LT-2		CAMPOLTNAMES00012	52.5	47.5	55.1	54.8	0	0	0	0		x	Total	1.5 r	1989349	550863.5	1058.53
LT-3		CAMPOLTNAMES00011	50	45	52.6	52.3	0	0	0	0		x	Total	1.5 r	1987889	552532.6	976.86
LT-4		CAMPOLTNAMES00008	51.5	46.5	54.1	53.8	0	0	0	0		x	Total	1.5 r	1988915	553645.9	989.05
LT-5		CAMPOLTNAMES00010	52.8	47.8	55.4	55.1	0	0	0	0		x	Total	1.5 r	1989937	553913.7	1061.86
LT-6		CAMPOLTNAMES00005	33.6	28.6	36.2	36	0	0	0	0		x	Total	1.5 r	1986512	559602.6	1097.44
LT-7		CAMPOLTNAMES00009	36.5	31.5	39.2	38.9	0	0	0	0		x	Total	1.5 r	1991056	558550.9	1223.13
LT-8		CAMPOLTNAMES00003	51.4	46.4	54	53.7	0	0	0	0		x	Total	1.5 r	1989745	560906.6	1299.16
LT-9		CAMPOLTNAMES00002	61.4	56.4	64	63.7	0	0	0	0		x	Total	1.5 r	1990094	561989.3	1379.2
LT-10		CAMPOLTNAMES00004	51	46	53.6	53.3	0	0	0	0		x	Total	1.5 r	1992643	562957.8	1266.23
LT-11		CAMPOLTNAMES00007	47.4	42.4	50	49.8	0	0	0	0		x	Total	1.5 r	1990056	556519.8	1110.03
LT-12		CAMPOLTNAMES00006	44.5	39.5	47.1	46.9	0	0	0	0		x	Total	1.5 r	1993994	560325.5	1171.93
LT-13		CAMPOLTNAMES00013	46.9	41.9	49.5	49.2	0	0	0	0		x	Total	1.5 r	1987202	548246	1075.59

Excel-based Model (LT positions per figures)	Day	Night	Ldn
	(dBA)	(dBA)	(dBA)
LT-1	54	49	56
LT-2	51	46	54
LT-3	48	43	51
LT-4	50	45	53
LT-5	53	48	55
LT-6	40	35	43
LT-7	41	36	44
LT-8	51	46	53
LT-9	61	56	64
LT-10	53	48	55
LT-11	47	42	49
LT-12	43	38	45
LT-13	46	41	48

Excel-based Model (LT positions per figures) - CadnaA				**Difference Notes:**
LT-1	1	1	0	apparent location match w/ CadnaA model
LT-2	-1	-1	-1	apparent location match w/ CadnaA model
LT-3	-2	-2	-2	apparent location match w/ CadnaA model
LT-4	-1	-1	-1	apparent location match w/ CadnaA model
LT-5	0	0	0	apparent location match w/ CadnaA model
LT-6	6	6	7	Excel model location is on the prop line corner, in CadnaA model it's north by ~415m
LT-7	5	5	5	decent location match w/ CadnaA model, discrepancy possibly due to CadnaA's incorporated topography
LT-8	-1	-1	-1	apparent location match w/ CadnaA model
LT-9	0	0	0	apparent location match w/ CadnaA model
LT-10	2	2	1	in CadnaA, LT-10 is on the property line; while Excel model is ~600 south into the project site
LT-11	-1	-1	-1	apparent location match w/ CadnaA model
LT-12	-2	-2	-2	Excel model is on the prop line, in CadnaA model it's west by ~240m
LT-13	-1	-1	-2	apparent location match w/ CadnaA model

APPENDIX C
Construction Noise Modeling Input/Output Data

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase, per County = 75

allowable hours over which Leq is to be averaged (example: 8 for County of San Diego, FTA guidance) = 8

Construction Phase	Equipment (FHWA RCNM Table 1 listed type)	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Distance for ground abs. term (feet)
Campo Wind Facilities -- Clearing and grading	Grader	1	40	85	Graders	116	77.7	8	480	74	
	Dozer	1	40	82	Rubber-tired dozers	116	74.7	8	480	71	
	Scraper	1	40	84	Scrapers	116	76.7	8	480	73	
	n/a	1	*50*	*88*	Crushing/processing equipment	1509	58.4	8	480	55	
					Total for Campo Wind Facilities -- Clearing and grading Phase:					**74.7**	116
Campo Wind Facilities -- Construction of access roads	Scraper	1	40	84	Scrapers	116	76.7	8	480	73	
	Front end loader	1	40	79	Rubber-tired loaders	116	71.7	8	480	68	
					Total for Campo Wind Facilities -- Construction of access roads Phase:					**71.3**	116
Campo Wind Facilities -- Wind turbine foundation construction	Compressor (air)	3	40	78	Air compressors	830	53.6	8	480	54	
	Generator	3	50	72	Generator sets	830	47.6	8	480	49	
	Pumps	1	50	77	Pumps	830	52.6	8	480	50	
					Total for Campo Wind Facilities -- Wind turbine foundation construction Phase:					**52.0**	830
Campo Wind Facilities -- Wind turbine erection	Crane	19	16	81	Cranes	830	56.6	7	420	61	
	Compressor (air)	2	40	78	Air compressors	830	53.6	8	480	53	
	Generator	3	50	72	Generator sets	830	47.6	8	480	49	
	Pumps	2	50	77	Pumps	830	52.6	8	480	53	
	Welder / torch	7	40	73	Welders	830	48.6	8	480	53	
					Total for Campo Wind Facilities -- Wind turbine erection Phase:					**58.1**	830
Campo Wind Facilities -- Construction of underground electrical collection system	Dozer	2	40	82	Rubber-tired dozers	830	57.6	7	420	56	
	Backhoe	4	40	78	Tractors/loaders/backhoes	830	53.6	8	480	56	
	Excavator	3	40	81	Trenchers	830	56.6	8	480	57	
					Total for Campo Wind Facilities -- Construction of underground electrical collection system Phase:					**56.6**	830
Campo Wind Facilities -- Construction of collector substation	Compressor (air)	1	40	78	Air compressors	2000	46.0	8	480	42	
	Crane	1	16	81	Cranes	2000	49.0	7	420	40	
	Generator	2	50	72	Generator sets	2000	40.0	8	480	40	
	Pumps	1	50	77	Pumps	2000	45.0	8	480	42	
	Backhoe	3	40	78	Tractors/loaders/backhoes	2000	46.0	7	420	46	
	Welder / torch	2	40	73	Welders	2000	41.0	8	480	40	
					Total for Campo Wind Facilities -- Construction of collector substation Phase:					**45.4**	2000
Campo Wind Facilities -- Gen-Tie foundation construction and tower erection	Man lift	1	20	75	Forklifts	116	67.7	8	480	61	
	Welder / torch	1	40	73	Welder	116	65.7	7	420	61	
	Compressor (air)	1	40	78	Air compressor	116	70.7	7	420	66	
	Generator	2	50	72	Generator sets	116	64.7	6	360	63	
	Pumps	1	50	77	Pump	116	69.7	7	420	66	
					Total for Campo Wind Facilities -- Gen-Tie foundation construction and tower erection Phase:					**68.5**	116
Campo Wind Facilities -- Gen-Tie stringing and pulling	Welder / torch	1	40	73	Welder	116	65.7	7	420	61	
	Compressor (air)	1	40	78	Air compressor	116	70.7	7	420	66	
					Total for Campo Wind Facilities -- Gen-Tie stringing and pulling Phase:					**64.7**	116
Campo Wind Facilities -- Operations and maintenance facility	Crane	1	16	81	Cranes	1509	51.4	7	420	43	
	Generator	1	50	72	Generator sets	1509	42.4	8	480	39	
	Backhoe	1	40	78	Tractors/loaders/backhoes	1509	48.4	7	420	44	
	Welder / torch	1	40	73	Welders	1509	43.4	8	480	39	
					Total for Campo Wind Facilities -- Operations and maintenance facility Phase:					**43.2**	1509
Campo Wind Facilities -- Meteorological towers	Crane	1	16	81	Cranes	116	73.7	7	420	65	
	Generator	2	50	72	Generator sets	116	64.7	8	480	65	
	Backhoe	1	40	78	Tractors/loaders/backhoes	116	70.7	7	420	66	
	Welder / torch	1	40	73	Welders	116	65.7	8	480	62	
					Total for Campo Wind Facilities -- Meteorological towers Phase:					**68.1**	116
Boulder Brush Facilities -- High Voltage Substation and Switchyard	Compressor (air)	1	40	78	Air compressors	15000	28.5	8	480	24	
	Crane	2	16	81	Cranes	15000	31.5	7	420	26	
	Generator	6	50	72	Generator sets	15000	22.5	8	480	27	
	Pumps	3	50	77	Pumps	15000	27.5	8	480	29	

	Backhoe	3	40	78	Tractors/loaders/backhoes	15000	28.5	7	420	29	
	Welder / Torch	2	40	73	Welders	15000	23.5	8	480	22	
					Total for Boulder Brush Facilities -- High Voltage Substation and Switchyard Phase:					**29.9**	15000
Boulder Brush Facilities -- Clearing and grading	Backhoe	4	40	78	Tractors/loaders/backhoes	800	53.9	7	420	55	
	Dozer	4	40	82	Rubber-tired dozers	800	57.9	8	480	60	
	Grader	2	40	85	Graders	800	60.9	7	420	59	
					Total for Boulder Brush Facilities -- Clearing and grading Phase:					**58.8**	800
Boulder Brush Facilities -- Unpaved construction access roads	Paver	1	50	77	Pavers	800	52.9	8	480	50	
	Roller	4	20	80	Rollers	800	55.9	8	480	55	
	Scraper	2	40	84	Scrapers	800	59.9	8	480	59	
	All Other Equipment > 5 HP	4	50	85	Paving equipment	800	60.9	8	480	64	
	Pumps	1	50	77	Pump	800	52.9	7	420	49	
					Total for Boulder Brush Facilities -- Unpaved construction access roads Phase:					**61.2**	800
Boulder Brush Facilities -- Gen-Tie foundation construction and tower erection	Man lift	1	20	75	Forklifts	2000	43.0	8	480	36	
	Welder / torch	1	40	73	Welder	2000	41.0	7	420	36	
	Compressor (air)	1	40	78	Air compressor	2000	46.0	7	420	41	
	Generator	2	50	72	Generator sets	2000	40.0	6	360	39	
	Pumps	1	50	77	Pump	2000	45.0	7	420	41	
					Total for Boulder Brush Facilities -- Gen-Tie foundation construction and tower erection Phase:					**41.6**	2000
Boulder Brush Facilities -- Gen-Tile stringing and pulling	Welder / torch	1	40	73	Welder	2000	41.0	7	420	36	
	Compressor (air)	1	40	78	Air compressor	2000	46.0	7	420	41	
					Total for Boulder Brush Facilities -- Gen-Tile stringing and pulling Phase:					**37.9**	2000
Boulder Brush Facilities -- Paving of switchyard access road	Paver	1	50	77	Pavers	80	72.9	8	480	70	
	All Other Equipment > 5 HP	1	50	85	Paving equipment	80	80.9	8	480	78	
	Roller	1	20	80	Rollers	80	75.9	8	480	69	
					Total for Boulder Brush Facilities -- Paving of switchyard access road Phase:					**77.8**	80
Campo Wind Facilities -- Temporary Batch Plant	Concrete batch plant	1	15	83	Temporary Batch Plant	1509	53.4	8	480	45	
					Total for Campo Wind Facilities -- Temporary Batch Plant Phase:					**40.5**	1509

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noise level limit for construction phase, per FTA = 80

allowable hours over which Leq is to be averaged (example: 8 for County of San Diego, FTA guidance) = 8

Construction Phase	Equipment (FHWA RCNM Table 1 listed type)	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Distance for ground abs. term (feet)
Campo Wind Facilities -- Clearing and grading	Grader	1	40	85	Graders	1320	56.6	8	480	53	
	Dozer	1	40	82	Rubber-tired dozers	1320	53.6	8	480	50	
	Scraper	1	40	84	Scrapers	1320	55.6	8	480	52	
	n/a	1	*50*	*88*	Crushing/processing equipment	1320	59.6	8	480	57	
					Total for Campo Wind Facilities -- Clearing and grading Phase:					**54.7**	1320
Campo Wind Facilities -- Construction of access roads	Scraper	1	40	84	Scrapers	1320	55.6	8	480	52	
	Front end loader	1	40	79	Rubber-tired loaders	1320	50.6	8	480	47	
					Total for Campo Wind Facilities -- Construction of access roads Phase:					**48.1**	1320
Campo Wind Facilities -- Wind turbine foundation construction	Compressor (air)	3	40	78	Air compressors	1320	49.6	8	480	50	
	Generator	3	50	72	Generator sets	1320	43.6	8	480	45	
	Pumps	1	50	77	Pumps	1320	48.6	8	480	46	
					Total for Campo Wind Facilities -- Wind turbine foundation construction Phase:					**47.9**	1320
Campo Wind Facilities -- Wind turbine erection	Crane	19	16	81	Cranes	1320	52.6	7	420	57	
	Compressor (air)	2	40	78	Air compressors	1320	49.6	8	480	49	
	Generator	3	50	72	Generator sets	1320	43.6	8	480	45	
	Pumps	2	50	77	Pumps	1320	48.6	8	480	49	
	Welder / torch	7	40	73	Welders	1320	44.6	8	480	49	
					Total for Campo Wind Facilities -- Wind turbine erection Phase:					**54.0**	1320
Campo Wind Facilities -- Construction of underground electrical collection system	Dozer	2	40	82	Rubber-tired dozers	1320	53.6	7	420	52	
	Backhoe	4	40	78	Tractors/loaders/backhoes	1320	49.6	8	480	52	
	Excavator	3	40	81	Trenchers	1320	52.6	8	480	53	
					Total for Campo Wind Facilities -- Construction of underground electrical collection system Phase:					**52.5**	1320
Campo Wind Facilities -- Construction of collector substation	Compressor (air)	1	40	78	Air compressors	1320	49.6	8	480	46	
	Crane	1	16	81	Cranes	1320	52.6	7	420	44	
	Generator	2	50	72	Generator sets	1320	43.6	8	480	44	
	Pumps	1	50	77	Pumps	1320	48.6	8	480	46	
	Backhoe	3	40	78	Tractors/loaders/backhoes	1320	49.6	7	420	50	
	Welder / torch	2	40	73	Welders	1320	44.6	8	480	44	
					Total for Campo Wind Facilities -- Construction of collector substation Phase:					**49.1**	1320
Campo Wind Facilities -- Gen-Tie foundation construction and tower erection	Man lift	1	20	75	Forklifts	1320	46.6	8	480	40	
	Welder / torch	1	40	73	Welder	1320	44.6	7	420	40	
	Compressor (air)	1	40	78	Air compressor	1320	49.6	7	420	45	
	Generator	2	50	72	Generator sets	1320	43.6	6	360	42	
	Pumps	1	50	77	Pump	1320	48.6	7	420	45	
					Total for Campo Wind Facilities -- Gen-Tie foundation construction and tower erection Phase:					**45.3**	1320
Campo Wind Facilities -- Gen-Tie stringing and pulling	Welder / torch	1	40	73	Welder	1320	44.6	7	420	40	
	Compressor (air)	1	40	78	Air compressor	1320	49.6	7	420	45	
					Total for Campo Wind Facilities -- Gen-Tie stringing and pulling Phase:					**41.5**	1320
Campo Wind Facilities -- Operations and maintenance facility	Crane	1	16	81	Cranes	1320	52.6	7	420	44	
	Generator	1	50	72	Generator sets	1320	43.6	8	480	41	
	Backhoe	1	40	78	Tractors/loaders/backhoes	1320	49.6	7	420	45	
	Welder / torch	1	40	73	Welders	1320	44.6	8	480	41	
					Total for Campo Wind Facilities -- Operations and maintenance facility Phase:					**44.4**	1320
Campo Wind Facilities -- Meteorological towers	Crane	1	16	81	Cranes	1320	52.6	7	420	44	
	Generator	2	50	72	Generator sets	1320	43.6	8	480	44	
	Backhoe	1	40	78	Tractors/loaders/backhoes	1320	49.6	7	420	45	
	Welder / torch	1	40	73	Welders	1320	44.6	8	480	41	
					Total for Campo Wind Facilities -- Meteorological towers Phase:					**44.9**	1320
Campo Wind Facilities -- Temporary Batch Plant	Concrete batch plant	1	15	83	Temporary Batch Plant	1320	54.6	8	480	46	
					Total for Campo Wind Facilities -- Temporary Batch Plant Phase:					**41.7**	1320

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Construction Phase	Equipment (FHWA RCNM Table 1 listed type)	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Distance for ground abs. term (feet)
Campo Wind Facilities -- Clearing and grading	Grader	1	40	85	Graders	120	77.4	8	480	73	
	Dozer	1	40	82	Rubber-tired dozers	120	74.4	8	480	70	
	Scraper	1	40	84	Scrapers	120	76.4	8	480	72	
	n/a	1	*50*	*88*	Crushing/processing equipment	120	80.4	8	480	77	
					Total for Campo Wind Facilities -- Clearing and grading Phase:					**77.5**	120
Campo Wind Facilities -- Construction of access roads	Scraper	1	40	84	Scrapers	120	76.4	8	480	72	
	Front end loader	1	40	79	Rubber-tired loaders	120	71.4	8	480	67	
					Total for Campo Wind Facilities -- Construction of access roads Phase:					**70.9**	120
Campo Wind Facilities -- Wind turbine foundation construction	Compressor (air)	3	40	78	Air compressors	1320	49.6	8	480	50	
	Generator	3	50	72	Generator sets	1320	43.6	8	480	45	
	Pumps	1	50	77	Pumps	1320	48.6	8	480	46	
					Total for Campo Wind Facilities -- Wind turbine foundation construction Phase:					**47.9**	1320
Campo Wind Facilities -- Wind turbine erection	Crane	19	16	81	Cranes	1320	52.6	7	420	57	
	Compressor (air)	2	40	78	Air compressors	1320	49.6	8	480	49	
	Generator	3	50	72	Generator sets	1320	43.6	8	480	45	
	Pumps	2	50	77	Pumps	1320	48.6	8	480	49	
	Welder / torch	7	40	73	Welders	1320	44.6	8	480	49	
					Total for Campo Wind Facilities -- Wind turbine erection Phase:					**54.0**	1320
Campo Wind Facilities -- Construction of underground electrical collection system	Dozer	2	40	82	Rubber-tired dozers	1320	53.6	7	420	52	
	Backhoe	4	40	78	Tractors/loaders/backhoes	1320	49.6	8	480	52	
	Excavator	3	40	81	Trenchers	1320	52.6	8	480	53	
					Total for Campo Wind Facilities -- Construction of underground electrical collection system Phase:					**52.5**	1320
Campo Wind Facilities -- Construction of collector substation	Compressor (air)	1	40	78	Air compressors	120	70.4	8	480	66	
	Crane	1	16	81	Cranes	120	73.4	7	420	65	
	Generator	2	50	72	Generator sets	120	64.4	8	480	64	
	Pumps	1	50	77	Pumps	120	69.4	8	480	66	
	Backhoe	3	40	78	Tractors/loaders/backhoes	120	70.4	7	420	71	
	Welder / torch	2	40	73	Welders	120	65.4	8	480	64	
					Total for Campo Wind Facilities -- Construction of collector substation Phase:					**71.9**	120
Campo Wind Facilities -- Gen-Tie foundation construction and tower erection	Man lift	1	20	75	Forklifts	120	67.4	8	480	60	
	Welder / torch	1	40	73	Welder	120	65.4	7	420	61	
	Compressor (air)	1	40	78	Air compressor	120	70.4	7	420	66	
	Generator	2	50	72	Generator sets	120	64.4	6	360	63	
	Pumps	1	50	77	Pump	120	69.4	7	420	66	
					Total for Campo Wind Facilities -- Gen-Tie foundation construction and tower erection Phase:					**68.1**	120
Campo Wind Facilities -- Gen-Tie stringing and pulling	Welder / torch	1	40	73	Welder	120	65.4	7	420	61	
	Compressor (air)	1	40	78	Air compressor	120	70.4	7	420	66	
					Total for Campo Wind Facilities -- Gen-Tie stringing and pulling Phase:					**64.3**	120
Campo Wind Facilities -- Operations and maintenance facility	Crane	1	16	81	Cranes	120	73.4	7	420	65	
	Generator	1	50	72	Generator sets	120	64.4	8	480	61	
	Backhoe	1	40	78	Tractors/loaders/backhoes	120	70.4	7	420	66	
	Welder / torch	1	40	73	Welders	120	65.4	8	480	61	
					Total for Campo Wind Facilities -- Operations and maintenance facility Phase:					**67.1**	120
Campo Wind Facilities -- Meteorological towers	Crane	1	16	81	Cranes	120	73.4	7	420	65	
	Generator	2	50	72	Generator sets	120	64.4	8	480	64	
	Backhoe	1	40	78	Tractors/loaders/backhoes	120	70.4	7	420	66	
	Welder / torch	1	40	73	Welders	120	65.4	8	480	61	
					Total for Campo Wind Facilities -- Meteorological towers Phase:					**67.7**	120
Campo Wind Facilities -- Temporary Batch Plant	Concrete batch plant	1	15	83	Temporary Batch Plant	120	75.4	8	480	67	
					Total for Campo Wind Facilities -- Temporary Batch Plant Phase:					**64.4**	120

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Construction Phase	Equipment (FHWA RCNM Table 1 listed type)	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Distance for ground abs. term (feet)
Boulder Brush Facilities -- High Voltage Substation and Switchyard	Compressor (air)	1	40	78	Air compressors	15,800	28.0	8	480	24	
	Crane	2	16	81	Cranes	15,800	31.0	7	420	25	
	Generator	6	50	72	Generator sets	15,800	22.0	8	480	27	
	Pumps	3	50	77	Pumps	15,800	27.0	8	480	29	
	Backhoe	3	40	78	Tractors/loaders/backhoes	15,800	28.0	7	420	28	
	Welder / Torch	2	40	73	Welders	15,800	23.0	8	480	22	
					Total for Boulder Brush Facilities -- High Voltage Substation and Switchyard Phase:					**29.5**	15800
Boulder Brush Facilities -- Clearing and grading	Backhoe	4	40	78	Tractors/loaders/backhoes	120	70.4	7	420	72	
	Dozer	4	40	82	Rubber-tired dozers	120	74.4	8	480	76	
	Grader	2	40	85	Graders	120	77.4	7	420	76	
					Total for Boulder Brush Facilities -- Clearing and grading Phase:					**77.2**	120
Boulder Brush Facilities -- Unpaved construction access roads	Paver	1	50	77	Pavers	120	69.4	8	480	66	
	Roller	4	20	80	Rollers	120	72.4	8	480	71	
	Scraper	2	40	84	Scrapers	120	76.4	8	480	75	
	All Other Equipment > 5 HP	4	50	85	Paving equipment	120	77.4	8	480	80	
	Pumps	1	50	77	Pump	120	69.4	7	420	66	
					Total for Boulder Brush Facilities -- Unpaved construction access roads Phase:					**79.5**	120
Boulder Brush Facilities -- Gen-Tie foundation construction and tower erection	Man lift	1	20	75	Forklifts	120	67.4	8	480	60	
	Welder / torch	1	40	73	Welder	120	65.4	7	420	61	
	Compressor (air)	1	40	78	Air compressor	120	70.4	7	420	66	
	Generator	2	50	72	Generator sets	120	64.4	6	360	63	
	Pumps	1	50	77	Pump	120	69.4	7	420	66	
					Total for Boulder Brush Facilities -- Gen-Tie foundation construction and tower erection Phase:					**68.1**	120
Boulder Brush Facilities -- Gen-Tile stringing and pulling	Welder / torch	1	40	73	Welder	120	65.4	7	420	61	
	Compressor (air)	1	40	78	Air compressor	120	70.4	7	420	66	
					Total for Boulder Brush Facilities -- Gen-Tile stringing and pulling Phase:					**64.3**	120
Boulder Brush Facilities -- Paving of switchyard access road	Paver	1	50	77	Pavers	5,000	37.0	8	480	34	
	All Other Equipment > 5 HP	1	50	85	Paving equipment	5,000	45.0	8	480	42	
	Roller	1	20	80	Rollers	5,000	40.0	8	480	33	
					Total for Boulder Brush Facilities -- Paving of switchyard access road Phase:					**38.3**	5000