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M E M O

Date: March 11, 2020

To: **Michael Lisenbee**
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From: **Steve J. Deines**
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SUBJECT: Equinix SV12, SV18, and SV 19, San José, California
Noise Assessment of Changes to Generators

An environmental noise and vibration assessment (ENA), dated December 23, 2019, assessed the noise and vibration impacts resulting from the construction and operation of the Equinix SV12, SV18, and SV19 Data Centers project proposed to the north of Santa Teresa Boulevard, between San Ignacio Avenue and Great Oaks Boulevard in San José, California. The project proposed to develop the northeastern 18-acres of the 34-acre site with three (3) three-to-four-story data center buildings totaling approximately 564,000 square feet (sf). A total of 36 3.25-MW diesel-fueled generators were proposed and would be located within generator yards adjacent to the north and south sides of each building. A subsequent assessment was completed in June of 2020 to address noise increases resulting from planned changes to heating, ventilation, and air conditioning (HVAC) equipment.

The purpose of this memo is to assess changes in generator noise emissions resulting from the design changes necessary to meet the Bay Area Air Quality Management District requirement that all emergency backup engines with 1,000 or greater brake horsepower meet Tier 4 emissions standards. Noise data provided for generators equipped with the Tier 4 treatment indicates an increase in sound power level of about 5 dBA and a substantial shift in sound energy from higher to lower frequencies. Additionally, Tier 4 treatment would increase the height of the exhaust stack, the location where most noise originates. No other aspects of the project are anticipated to be affected.

The changes in sound power level between the previous design of the silenced generators and the current design equipped to meet Tier 4 standards are shown below in Table 1. This change in the frequency spectrum of generator noise would affect how the noise propagates throughout the site vicinity as lower frequency sound propagates further by diffracting around structures and through receiving less attenuation provided by absorption in the air.

TABLE 1 Change in Sound Power Level Compared to Previous Design

Octave Band Center Frequency (hz)	31.5	63	125	250	500	1,000	2,000	4,000	8,000	Total
Sound Power Level (dBA)	+11.5	+24.7	+19.3	+15.4	+6.5	-3.9	-15.6	-25.2	-27.4	+5.3

The increase in propagation of generator noise under the new design would also result in part from the greater exhaust stack heights. Plans indicate the exhaust tailpipe would reach a height of approximately 27 feet. This would exceed the height of the generator yard screening walls, thereby eliminating most of the noise reduction they would otherwise provide.

Environmental noise calculations for the December 2019 and June 2020 assessments were conducted using SoundPLAN, a three-dimensional noise modeling software that considers site geometry, the characteristics of the noise sources, and shielding from structures and barriers. Adjustments were made to the model to reflect the new generator design and noise data. Previously, the noise assessment considered a worst-case scenario resulting from all generators on site being tested simultaneously at 100% load for the full 8 hour commissioning period. This scenario was analyzed as a generator testing schedule was not available at the times of the assessments. A new testing schedule has since been agreed upon wherein only one generator would be tested at a time for a period of one hour and no more than two generators would be tested during any given day. To best assess the noise exposure at the nearest sensitive uses, three scenarios were considered in this analysis. Each scenario represents operation of all HVAC equipment concurrent with a 100% load test for a period of one hour of a single generator at the worst-case location at each of the three proposed data center buildings: SV12, SV18, and SV19. Calculation results are shown below in Figures 1, 2, and 3 and in Table 2.

FIGURE 1 Noise Exposure Resulting from Testing of One Generator at Building SV12 at 100% Load Concurrent with Operation of HVAC Equipment

FIGURE 2 Noise Exposure Resulting from Testing of One Generator at Building SV18 at 100% Load Concurrent with Operation of HVAC Equipment

FIGURE 2 Noise Exposure Resulting from Testing of One Generator at Building SV19 at 100% Load Concurrent with Operation of HVAC Equipment

TABLE 2 Calculated Noise Levels Resulting from Testing of Single Generator at 100% Load Concurrent with HVAC Operation (dBA L_{eq})

Receiver Location	Generator Location		
	SV12	SV18	SV19
Residential Property Line to the South along Santa Teresa Boulevard	40 to 44	40 to 44	42 to 47
Kaiser Permanente Medical Facility	56 to 57	52	44 to 46
Office, Commercial, and Light Industrial Uses to the West	39 to 44	39 to 45	40 to 44
Office, Commercial, and Light Industrial Uses to the East	36 to 45	36 to 45	38 to 46
Office, Commercial, and Light Industrial Uses to the North	46 to 53	46 to 49	42 to 45

As seen above, when testing only one generator at a time, noise resulting from testing of generators at full load concurrent with HVAC operation would not exceed the 55 dBA L_{eq} Municipal Code limit for residences along properties located to the south. At no location off-site would the noise level exceed the commercial or industrial noise level limits of 60 or 70 dBA L_{eq}. The testing plan would ensure that noise-sensitive uses in the site vicinity would not be exposed to excessive noise resulting from project operations. The overall noise exposure would be less than that which was evaluated in earlier versions of the project, and therefore Impact 1c identified in the 2019 ENA and reevaluated in the 2020 update memo would remain **less-than-significant**.