May 22, 2019

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Subject: CalEEMod FHWA Screening Noise Analysis for a Self-Storage Facility in Van Nuys, California

Dear Mr. Berry:

Yorke Engineering, LLC (Yorke) is pleased to provide this letter Noise Analysis report for a proposed self-storage facility at 15640 Roscoe Boulevard in the Van Nuys neighborhood of Los Angeles, California. The screening-level Noise Analysis includes background on noise analyses in general, applicable regulations/policies for this location, as well as background and construction noise level assessment for the proposed facility. This evaluation will support a Categorical Exemption or a Mitigated Negative Declaration (MND) from the City of Los Angeles under the California Environmental Quality Act (CEQA). The results of the analysis also show noise levels that are below local thresholds during the construction and ongoing operation phases.

PROJECT DESCRIPTION

The proposed Project involves the construction of a seven-story, 123,950-square-foot self-storage facility with a small front office to be located at 15640 Roscoe Boulevard in the Van Nuys neighborhood of the City of Los Angeles, CA (the City). The 1.08-acre parcel is currently occupied by an old single-story commercial building that will be demolished. A total of 46 parking spaces, including 10 electric vehicle charging stations, will be provided for employee and customer use during peak hours.

ASSUMPTIONS

The following basic assumptions were used in developing the noise estimates for the proposed Project using the screening methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center and other technical references consistent with California Emissions Estimator Model® (CalEEMod) outputs (equipment utilization):

- CalEEMod® and FHWA defaults were applied to all phases of the Project, unless specified in the assumptions.
- Some Project design features including sizes of buildings were defined by the Applicant or architectural drawings and replaced some CalEEMod® default settings.

- The default equipment from CalEEMod® for the construction phases, is representative of actual construction equipment used during construction.
- For the construction noise analysis, U.S. Department of Transportation (DOT) equipment categories were correlated with CalEEMod® equipment categories as applicable. Notably "forklifts", which did not have a clear classification, were assumed to be the same noise level as a "front end loader".
- Construction activities will not occur outside of normal daytime working hours.
- Non-Traffic urban ambient noise was assumed to be 40 dBA.

LIST OF TABLES

The Project analyses and results are summarized in the following tables:

- Table 1: Land Use Data for CalEEMod Input – 15640 Roscoe Boulevard
- Table 2: Typical Sound Level Characteristics
- Table 3: FHWA Noise Reference Levels and Usage Factors
- Table 4: Estimated Peak Activity Daytime Noise Impacts – Residential
- Table 5: Estimated Peak Activity Daytime Noise Impacts – Commercial

NOISE IMPACT ANALYSIS

The Noise Section of Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Environmental Checklist Form) contains noise significance criteria. Where applicable, quantitative significance criteria established by the city or county where the proposed Project will be located may be relied upon to make significance determinations based on estimated construction and operational noise impacts, as determined in this report.

Project Activity Estimation

The construction and operation activity analysis was performed using CalEEMod® (California Emissions Estimation Model, version 2016.3.2), the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with both construction and operations of land use projects under CEQA. As the official assessment methodology for land use projects in California, CalEEMod® was relied upon for construction and operational emissions quantification, which also forms the basis for the construction noise impact analysis.

Based on information received from the Applicant, the land use data used for CalEEMod® input is presented in Table 1.

Table 1: Land Use Data for CalEEMod Input – 15640 Roscoe Boulevard							
Project Element	**Land Use Type**	**Land Use Subtype**	**Unit Amount**	**Size Metric**	**Lot Acreage (footprint)**	**Square Feet (est.)**	**Est. Pop.**
Storage Units & Office	Industrial	General Light Industry	123.95	1,000 sq. ft.	0.402	123,950	0
Outdoor Parking	Parking	Parking Lot	29.54	1,000 sq. ft.	0.678	29,545	0
Project Site					**1.080**	**153,495**	0

Source: Applicant 2018, CalEEMod version 2016.3.2

Notes:

Electric utility is LADWP

Site Area = 47,000 sf; no significant landscaping

Vehicle parking spaces = 46; Parking footprint = 29,545 sf (est.)

Total gross square footage = 153,495 sf; Building footprint = 17,500 sf

Noise Analysis Methodology

The screening-level noise analysis for Project construction was based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center and other technical references consistent with CalEEMod® outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston "Big Dig" project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed Project. Noise impacts were evaluated against community noise standards contained in the City or County General Plan or other state or federal agency as applicable to the vicinity of the Project site. The noise study did not include field measurements of ambient noise in the vicinity of the Project site.

For this Project, the noise elements of the L.A. CEQA Thresholds Guide (2006) and General Plan (1999) contained applicable evaluation criteria.

During construction activities, the Project would generate noise due to operation of off-road equipment, portable equipment, and vehicles at or near the Project site. Screening-level Project-generated noise is evaluated in relation to established thresholds of significance. Additionally, the same methods are used to determine noise impacts on the nearest sensitive receptor. No significant increase in operational traffic is expected due to this relatively small project that does not generate residential or worker commuting vehicle trips. No strong sources of vibrations are planned to be used during construction activities.

The FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Environmental Setting

The proposed Project is on a major urban street (Roscoe Boulevard) and a next to heavily traveled freeway (I-405), thus, the incremental effect of Project operation (possible slightly increased traffic) would not be quantifiable against existing traffic noise (background) in the Project vicinity. In addition, Van Nuys Airport is 1 mile west of the Project site, heavily used train tracks are 0.3 mile south of the Project site, and the Anheuser-Busch brewery is 0.1 mile west of the Project site, all of which contribute to the urban noise background in the Project area.

Noise Descriptors

Noise is typically described as any unwanted or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity, the A-weighted decibel scale (dBA). Table 2 lists common sources of sound and their intensities in dBA.

Table 2: Typical Sound Level Characteristics

Pressure	Level	Sound Level Characteristic
N/m^2	dB	
2000	160	Rocket Launch
600	150	Military Jet Plane Takeoff
200	140	Threshold of Pain
60	130	Commercial Jet Plane Takeoff
20	120	Industrial Chipper or Punch Press
6	110	Loud Automobile Horn
2	100	Passing Diesel Truck – Curb Line
0.6	90	Factory - Heavy Manufacturing
0.2	80	Factory - Light Manufacturing
0.06	70	Open Floor Office – Cubicles
0.02	60	Conversational Speech
0.006	50	Private Office – Walled
0.002	40	Residence in Daytime
0.0006	30	Bedroom at Night
0.0002	20	Recording or Broadcasting Studio
0.00006	10	Threshold of Good Hearing - Adult
0.00002	0	Threshold of Excellent Hearing - Child

Sources: Broch 1971, Plog 1988

Notes:

Reference Level $P_O = 0.00002\ N/m^2 = 0.0002\ \mu bar$

N/m^2 = Newtons per square meter (the Newton is the unit of force derived in the metric system); it is equal to the amount of net force required to accelerate one kilogram of mass at a rate of one meter per second squared (1 kg • 1 m/s^2) in the direction of the applied force.

In most situations, a 3-dBA change in sound pressure is considered a "just-detectable" difference. A 5-dBA change (either louder or quieter) is readily noticeable, and 10-dBA change is a doubling (if louder) or halving (if quieter) of the subjective loudness. Sound from a small localized source (a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (drops off) at a rate of 6 dBA for each doubling of the distance.

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise on sensitive receptors. A single number called the equivalent continuous noise level (L_{eq}) may be used to describe sound that is changing in level. It is also used to describe the acoustic range of the noise source being measured, which is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty to the "nighttime" hourly noise levels (HNLs) (i.e., 7:00 p.m. to 10:00 p.m.) and the Day-Night Average Level (L_{dn}) adds a 10-dB penalty to the evening HNLs (Caltrans 2013; FTA 2006).

Vibration Descriptors

Vibration is a unique form of noise because its energy is carried through structures and the earth, whereas noise is carried through the air. Thus, vibration is generally felt rather than heard. Typically, ground borne vibration generated by manmade activities attenuates rapidly as distance from the source of the vibration increases. Actual human and structural response to different vibration levels is influenced by a combination of factors, including soil type, distance between the source and receptor, duration, and the number of perceived events.

While not a direct health hazard, the energy transmitted through the ground as vibration may result in structural damage, which may be costly to repair and dangerous in the event of structural failure. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of point peak velocity/peak particle velocity (PPV) in the vertical and horizontal directions (vector sum). A freight train passing at 100 feet may cause PPVs of 0.1 inch per second, while a strong earthquake may produce PPVs in the range of 10 inches per second. Minor cosmetic damage to buildings may begin in the range of 0.5 inch per second (Caltrans 2013; FTA 2006).

Existing Noise Environment

The Project site is in the Van Nuys neighborhood within the City of Los Angeles, Los Angeles County, in a characteristically urban and densely populated area subject to noise from local traffic on public streets (Roscoe Boulevard), through traffic on highways (I-405), aircraft flyovers (Van Nuys Airport), trains (Metrolink, Amtrak, and freight), industrial (Anheuser-Busch), construction, and small power equipment (e.g., lawn mowers, edgers, etc.). Our noise model puts the expected ambient noise from known sources at about 57 and 59 dBA at the nearest residential and commercial receptors, respectively, to the proposed Project. This estimate is based on traffic on Roscoe Boulevard and I-405, as well as a general 40 dBA urban background noise.

Sensitive and Susceptible Receptors

Some land uses are generally regarded as being more sensitive to noise than others due to the types of population groups or activities involved. Sensitive population groups include children and the elderly. The City of Los Angeles Noise Element also includes residential areas as noise-sensitive land uses. Other sensitive land uses generally include hospitals, schools, child care facilities, senior facilities, libraries, churches, and parks.

The nearest sensitive receptors to the Project site – west of the I-405 freeway – are residences approximately 200 meters (660 feet) north of the construction zone. These residences are behind an existing self-storage facility, which shields them from Roscoe Boulevard, but the residences are directly adjacent to the I-405 freeway with a sound wall.

The nearest susceptible commercial receptors include a Motel 6 to the north across Roscoe Boulevard and a parking lot, approximately 120 meters (400 feet) from of the construction zone. The Motel 6 is partially shielded from the Project site by another commercial building (retail) on the north side of Roscoe Boulevard.

All construction activities would be short-term (i.e., temporary). All construction work is planned to be conducted during daylight hours; no nighttime work is planned to be performed (so the Motel 6 would not be particularly impacted). Upon completion of construction, temporary generation of noise would permanently cease. No significant additional long-term traffic is expected, and therefore no additional Project-related noise is expected over the long term.

Regulatory Setting

California

The State of California does not promulgate statewide standards for environmental noise but requires each city and county to include a noise element in its general plan [California Government Code Section 65302(f)]. In addition, Title 4 of the CCR has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. In general, the guidelines require that community noise standards:

- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

Construction vibration is regulated at the state level in accordance with standards established by the *Transportation and Construction-Induced Vibration Guidance Manual* issued by Caltrans in 2004. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. Transient sources create a single isolated vibration event, such as blasting. Thresholds for continuous sources are 0.5 and 0.1 inch per second PPV for structural damage and annoyance, respectively. Thresholds for transient sources are 1.0 and 0.9 PPV for structural damage and annoyance, respectively (Caltrans 2013).

City of Los Angeles CEQA Threshold Guide and General Plan – Noise Elements

The noise element of the L.A. CEQA Thresholds Guide (2006) clearly states that noise impacts for a construction project would be considered potentially significant if noise is increased by 10 dBA for 10 or less days in a 3-month period, and 5 dBA for any noise created for more than 10 days in a 3-month period.

For residential and commercial lodging land uses, the City of Los Angeles General Plan (1999) lists a normally unacceptable threshold of 70 dB CNEL. For general commercial land uses, the normally unacceptable threshold is 80 dB CNEL.

The Operational Section of the L.A. CEQA Thresholds Guide also very clearly states that operational noise can usually be considered insignificant if the project does not introduce any stationary noise sources that will be heard beyond the property line, does not provide 75 or more dwelling units, does not exceed 100,000 square feet of non-residential space, and does not have the potential to create 1,000 additional daily vehicle trips.

Results

Use of off-road equipment, on-road vehicles, and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, ground friction and displacement, and gravity drops (dumping, unloading). Since no intense percussive actions (strikes, impacts) would occur during the site work, no strong vibrations are planned to be generated that could affect nearby structures.

Types of equipment (FHWA 2006) to be used during the Project and noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) are shown in Table 3 consistent with CalEEMod® outputs.

The Project is expected to require less than one year of planned work activities comprising six construction phases:

1) Demolition
2) Site Preparation;
3) Grading;
4) Building construction;
5) Paving; and
6) Architectural coating.

Deviations from this schedule would not affect the noise analysis because noise does not persist or accumulate in the environment.

Table 3: FHWA Noise Reference Levels and Usage Factors						
CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level
Phase Name	Equipment Description	Qty.			percent	dBA
Demolition (1)	Concrete/Industrial Saws	1	Concrete Saw	1	20%	90
	Rubber Tired Dozers	1	Tractor [or Skidder] (rubber tire)	1	40%	84
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	1	40%	80
			N/A	—	—	—
Site Preparation (2)	Graders	1	Grader	1	40%	85
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80
	Rubber Tired Dozers	1	Tractor [or Skidder] (rubber tire)	1	40%	84
			N/A	—	—	—
Grading (3)	Rubber Tired Dozers	1	Tractor [or Skidder] (rubber tire)	1	40%	84
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80
	Graders	1	Grader	1	40%	85
			N/A	—	—	—
Building Construction (4)	Generator Sets	1	Generator (general purpose utility)	1	50%	82
	Cranes	1	Crane	1	16%	85
	Forklifts	1	Front End Loader	1	40%	80
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80
	Welders	3	All Other Equipment > 5 HP	1	50%	85
			N/A	—	—	—
Paving (5)	Cement and Mortar Mixers	1	Drum Mixer	1	50%	80
	Pavers	1	Paver (asphalt)	1	50%	85
	Rollers	1	Roller	1	20%	85
	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	1	40%	80
	Paving Equipment	1	All Other Equipment > 5 HP	1	50%	85
			N/A	—	—	—
Architectural Coating (6)	Air Compressors	1	Compressor (air)	1	40%	80
			N/A	—	—	—

Sources: CalEEMod v 2016.3.2, FHWA 2006

Tables 4 and 5 show a comparison of FHWA screening-level estimated daytime exterior noise impacts for peak construction activities at the designated residential and commercial receptors versus the noise thresholds outlined in the L.A. CEQA Threshold Guide and General Plan. If the thresholds are not exceeded, then this Project should be considered acceptable.

Table 4: Estimated Peak Activity Daytime Noise Impacts – Residential

Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (L_{eq} dBA)[a]	CalEEMod Duration (days)	Normally Unacceptable Threshold (CNEL dBA)[b]	Exceeds Threshold (Yes/No)?
Pre-Project Background	57	—	70	No
Demolition	59	20	62	No
Site Preparation	59	2	67	No
Grading	59	4	67	No
Building Construction	60	200	62	No
Paving	60	10	62	No
Architectural Coating	57	20	62	No
Post-Project Background	57	—	70	No

Sources: CalEEMod v 2016.3.2, FHWA 2006, Broch 1971, Plog 1988, City 1999, 2006

Table 5: Estimated Peak Activity Daytime Noise Impacts – Commercial

Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (L_{eq} dBA)[a]	CalEEMod Duration (days)	Normally Unacceptable Threshold (CNEL dBA)[b]	Exceeds Threshold (Yes/No)?
Pre-Project Background	59	—	70	No
Demolition	63	20	64	No
Site Preparation	62	2	69	No
Grading	62	4	69	No
Building Construction	64	200	64	No
Paving	63	10	64	No
Architectural Coating	59	20	64	No
Post-Project Background	59	—	70	No

Sources: CalEEMod v 2016.3.2, FHWA 2006, Broch 1971, Plog 1988, City 1999, 2006

Discussion

Under the CEQA Guidelines, this Project is allowed 10 days during which construction-generated noise can be up to 10 dBA higher than ambient noise levels. In this case, that is between 57 dBA and 67 dBA for residential land uses, and between 59 dBA and 69 dBA for commercial land uses. Otherwise, noise cannot exceed 5 dBA above pre-project ambient at a receptor. As shown in Tables 5 and 6, these thresholds would not be exceeded at either sensitive residential or susceptible commercial receptors. Thus, the proposed Project is in compliance with the City CEQA Guidelines. Additionally, all construction noise is expected to take place during the least sensitive times of day, i.e., business hours. Construction noise impacts would be less than significant.

The Operational Noise is expected to be less than significant as well. No significant sources of stationary noise are expected to be implemented such as engines, or machinery. As determined with CalEEMod®, the estimated the number of vehicle trips per day for the proposed storage facility is not expected to exceed 100 vehicle trips per day on average, which is well below the 1,000-trip threshold. The post-project background noise – caused mainly by traffic on Roscoe Boulevard and the I-405 freeway – would remain virtually the same as pre-project background noise consistent with General Plan limits.

PROJECTED IMPACT: Less Than Significant

ADDITIONAL MITIGATION: None Required

CLOSING

Thank you very much for the opportunity to be of assistance to the William Warren Group. Should you have any questions, please contact me at (805) 376-0088 or Cyril Jose at (949) 201-3806.

Sincerely,

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cc: Brian Yorke, Yorke Engineering, LLC

Enclosures/Attachments:

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