

November 28, 2023

Mr. Chad McKillop  
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**Subject: Noise Impact Study for a Self-Storage Facility in Victorville, CA**

Dear Mr. McKillop:

Yorke Engineering, LLC (Yorke) is pleased to provide this Noise Impact Letter Report. This report includes construction and operational noise analyses for the proposed self-storage facility in Victorville, California. The evaluation will support the Applicant's submittal of a California Environmental Quality Act (CEQA) Initial Study (IS) for a Mitigated Negative Declaration (MND) for the proposed Fort Amethyst Self Storage Project (Project). In order to fulfill City requirements, a noise impact study is required.

### **PROJECT DESCRIPTION**

Westgate Plaza, LLC is proposing to develop a self-storage facility to be located east of Amethyst Road and south of Palmdale Road in the City of Victorville, CA (the City) on Assessor's Parcel Number (APN) 3105-291-01-0000. The 6.84-acre site is in the form of a right triangle. The Fort Amethyst Self-Storage facility will include 24 structures offering an industry standard range of storage unit sizes. The proposed total building area will be 121,899 square feet, which will consist of a 1,254 square feet office and on-site apartment building, and 120,645 square feet of self-storage buildings. Seven parking spaces will be provided on-site as part of the Project.

Construction is proposed to take place in two phases, with Phase I consisting of the office and apartment building along with 14 storage buildings, and Phase II consisting of the remaining nine storage buildings. Since the construction site is already vacant and generally flat, site preparation and grading activities are expected to be relatively minimal, and a demolition phase is not required as there are no existing structures on the site that will be removed. Construction of the Project is expected to take approximately 14 months.

### **ENVIRONMENTAL SETTING**

#### **Noise Descriptors**

Noise is typically described as any dissonant, 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 1 lists common sources of sound and their intensities in dBA.

<b>Table 1: Typical Sound Level Characteristics</b>		
<b>Pressure</b>	<b>Level</b>	<b>Sound Level Characteristic</b>
<b>N/m<sup>2</sup></b>	<b>dBA</b>	
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: Fundamentals of Industrial Hygiene (Niland & Elam), 7<sup>th</sup> Edition, 2021

Notes:

Reference Level  $P_0 = 0.00002 \text{ N/m}^2 = 0.0002 \text{ } \mu\text{bar}$

$\text{N/m}^2$  = 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 ( $1 \text{ kg} \cdot 1 \text{ m/s}^2$ ) in the direction of the applied force.

In most situations, a 3-dB change in sound pressure is considered a “just-detectable” difference. A 5-dB change (either louder or quieter) is readily noticeable, and 10-dB 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 dB 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 2020, FTA 2018).

### **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 2020, FTA 2018).

## **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 the California Department of Transportation (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 2020).

### **City of Victorville General Plan–Noise Element**

The City of Victorville’s General Plan 2030 contains Land Use Compatibility Standards to determine the compatibility of proposed developments. As shown in Table 2, for commercial land

uses, an L<sub>dn</sub> or CNEL limit (threshold) of 70 dBA is considered “Normally Acceptable” and CNEL of 70-75 dBA is considered “Conditionally Acceptable”.

<b>Table 2: City of Victorville Noise and Land Use Compatibility Standards</b>							
<b>Land Use Categories</b>	<b>Community Noise Exposure L<sub>dn</sub> or CNEL, dB</b>						
	<b>55 dBA</b>	<b>60 dBA</b>	<b>65 dBA</b>	<b>70 dBA</b>	<b>75 dBA</b>	<b>80 dBA</b>	<b>+</b>
Residential- Low Density, Single Family, Duplex, Multi-family, Mobile Home	1	1	2	2	3	4	4
Transient Lodging- Motels, Hotels	1	1	2	2	3	3	4
Schools, Libraries, Churches, Hospitals, Nursing Homes	1	1	2	3	3	4	4
Auditoriums, Concert Halls, Amphitheaters	2	2	3	3	4	4	4
Sports Arena, Outdoor Spectator Sports	2	2	2	2	3	3	3
Playgrounds, Neighborhood Parks	1	1	1	2	3	3	3
Golf Courses, Riding Stables, Water Recreation, Cemeteries	1	1	1	2	2	4	4
Office Buildings, Business Commercial, Retail Commercial and Professional	1	1	1	2	2	3	3
Industrial, Manufacturing, Utilities	1	1	1	1	2	2	2
Agriculture	1	1	1	1	1	1	1

Notes:

1. Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
2. Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and Schools, Libraries, Churches, Hospitals, Nursing Homes needed noise insulation features included in the design. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice.
3. Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4. Clearly Unacceptable: New construction or development should generally not be undertaken.

***City of Victorville Municipal Code – Title 13, Chapter 13.01 Noise Control***

For this Project, the City of Victorville Municipal Code, Sections 13.01.040 and 13.01.050, contain the applicable evaluation criteria. Section 13.01.040 includes the base ambient noise levels as shown in Table 3. If the ambient noise level exceeds the applicable limit as noted in Table 3, the ambient noise level shall be the standard. Section 13.01.050 states that noise levels shall not exceed the ambient noise levels in Table 3 by the following dBA levels for the cumulative period of time specified:

- Less than five dBA for a cumulative period of more than thirty minutes in any hour;

- Less than 10 dBA for a cumulative period of more than fifteen minutes in any hour;
- Less than 15 dBA for a cumulative period of more than five minutes in any hour;
- Less than 20 dBA for a cumulative period of more than one minute in any hour; and
- 20 dBA or more for any period of time.

Section 13.01.060, Subpart 9, exempts construction activities on private properties that are determined by the director of building and safety to be essential to the completion of a project.

Zone	Noise Level (dBA)	
	10 p.m. to 7 a.m.	7 a.m. to 10 p.m.
All Residential Zones	55	65
All Commercial Zones	70	
All Industrial Zones	75	

## **NOISE IMPACT ANALYSIS**

### **Noise Analysis Methodology**

The screening-level noise analysis for Project construction was completed 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 coupled with the use of the California Emissions Estimator Model<sup>®</sup> (CalEEMod) to provide equipment and vehicle utilization estimates. 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. CalEEMod is the statewide standard model that is used to estimate pollutant emissions, but also provides information on the expected types of construction equipment and vehicle trips for the construction of different land use types and construction phases based on air basin specific defaults provided by the local air district. This noise analysis did not include field measurements of ambient noise in the vicinity of the Project site.

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.

Noise impacts were evaluated against community noise standards contained in the City General Plan or other state or federal agency as applicable to the vicinity of the Project site. For this Project, the City of Victorville Noise Ordinance, Chapter 13.01, Noise Control, and the Noise Element of the General Plan, contain the applicable evaluation criteria as discussed above in the Regulatory Setting.

During construction activities, the Project would generate noise due to operation of minimal off-road equipment, portable equipment, and vehicles at or near the Project site. No significant

increase in traffic during construction is expected due to this relatively small project. No strong sources of vibrations are planned to be used during construction activities, and the nearest off-site structure is about 500 feet from the northern boundary of the Project site.

Since the Project is near existing roadways, the incremental effect of Project operation (possible slightly increased traffic) would not be quantifiable against existing traffic noise (background) in the Project vicinity (i.e., less than significant impact).

Also, since no public or private use airport is closer than 2 miles from the Project site, an evaluation of aircraft noise upon persons residing or working in the Project area is not required.

### **Construction Noise**

The proposed Project can be characterized as development of a self-storage facility with an office and an on-site apartment building and a parking lot. Most noise would occur during the site preparation, grading, and building construction phases when heavy equipment would be operating.

Construction of the Project is expected to take approximately 14 months of planned work activities (i.e., from mobilization to substantial completion). In order to use CalEEMod to estimate the equipment usage, the construction activities were divided into five phases as follows:

- 1) Site preparation;
- 2) Grading;
- 3) Building construction;
- 4) Paving; and
- 5) Architectural coating.

During each of these five construction phases there would be a different mix of equipment operating and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the Project site. In general, use of off-road equipment 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 (e.g., hard rock-breaking, large pile-driving) are planned to occur during the site work, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

The City of Victorville excludes the construction activities from the noise provisions and also does not establish any limits to the hours during which construction activity can take place. The nearest inhabited dwellings are an average distance of about 850 feet east from the central construction zone. Temporary construction noise would be limited to daylight hours and would permanently cease upon completion of construction.

The City of Victorville does not have a maximum numeric limit for noise levels related to construction activities at the sensitive receptors. However, construction activities typically generate maximum noise levels range of 85 dBA to 90 dBA at a distance of 50 feet. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment provides an eight-hour construction noise level threshold of 80 dBA  $L_{eq}$  during daytime at residential (noise-sensitive) uses, and 85 dBA during the daytime at commercial uses.

CalEEMod defaults were used for construction equipment types and quantities for developing the construction equipment list for the proposed Project. CalEEMod outputs are provided in Attachment 1 of the Air Quality and Greenhouse Gas Study provided as Appendix A prepared by Yorke dated November 28, 2023. The noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) based on the FHWA Study (2006) for the types of equipment derived from CalEEMod are shown in Table 4. Table 5 shows a comparison of FHWA screening-level estimated daytime exterior noise impacts for peak construction activities at nearby receptors with respect to the threshold. If the threshold is not exceeded, then a project should be considered acceptable, i.e., impacts would be Less Than Significant.

**Table 4: FHWA Noise Reference Levels and Usage Factors**

CalEEMod Construction Detail			FHWA Equipment Type	Ref.	Usage Factor	Ref. Level	Percussive Source?
Phase Name	Equipment Description	Qty.			percent	dBA	Yes/No
Site Preparation (1)	Rubber Tired Dozers	3	Tractor (rubber tire)	1	40%	84	No
	Tractors/Loaders/Backhoes	4	Backhoe (with loader)	1	40%	80	No
Grading (2)	Excavators	1	Excavator (hydraulic)	1	40%	85	No
	Graders	1	Grader	1	40%	85	No
	Rubber Tired Dozers	1	Tractor (rubber tire)	1	40%	84	No
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	1	40%	80	No
Building Construction (3)	Cranes	1	Crane	1	16%	85	No
	Forklifts	3	Forklift	1	40%	80	No
	Generator Sets	1	Generator (<25 KVA quiet design)	1	50%	70	No
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	1	40%	80	No
	Welders	1	Welding Machine (arc welding)	1	50%	70	No
Paving (4)	Pavers	2	All Other Equipment > 5 HP	1	50%	85	No
	Paving Equipment	2	Paver (asphalt)	1	50%	85	No
	Rollers	2	Roller	1	20%	85	No
Architectural Coating (5)	Air Compressors	1	Compressor (air)	1	40%	80	No

Source: CalEEMod version 2022.1.1.20, FHWA 2006



<b>Table 5: Estimated Peak Activity Daytime Noise Impacts – Residential Receptors</b>				
<b>Construction Phases</b>	<b>Compatible Criteria</b>			
	<b>Modeled Noise Level (L<sub>eq</sub> dBA)<sup>a</sup></b>	<b>CalEEMod Duration (days)</b>	<b>Significance Threshold (CNEL dBA)<sup>b</sup></b>	<b>Exceeds Threshold (Yes/No)?</b>
Background	65.0	-	-	No
Site Preparation	66.7	11	80	No
Grading	66.8	21	80	No
Building Construction	66.2	230	80	No
Paving	67.5	20	80	No
Architectural Coating	65.2	21	80	No
Long-Term Impact (Operational)	65.0	-	70 <sup>c</sup>	No

Sources: CalEEMod version 2022.1.1.20, FHWA 2006, Niland & Elam, 2021

Notes:

<sup>a</sup> Includes ambient noise (cumulative impacts). Ambient noise is from the City of Victorville Municipal Code, Section 13.01.040

<sup>b</sup> FTA 2018

<sup>c</sup> City of Victorville General Plan, Land Use Compatibility Standards and City of Victorville Municipal Code, Section 13.01.050

**Operational Noise**

Upon completion of construction and occupancy of the proposed Project, on-site operational noise would be generated mainly by heating, ventilation, and air conditioning (HVAC) equipment on the office/apartment building. Commercial/residential type HVAC systems can result in noise levels that average between 50 and 65 dBA L<sub>eq</sub> at 50 feet from the equipment. However, the new HVAC equipment will be of quiet design per commercial/residential standards. As such, the new HVAC equipment associated with the proposed Project would not increase the ambient noise levels for the nearest sensitive receptors (residences), which are approximately 500 feet east of the on-site office/apartment building.

As shown in Table 2, for commercial land uses, an L<sub>dn</sub> or CNEL limit (threshold) of 70 dBA is considered “Normally Acceptable”, and 70-75 dBA is considered “Conditionally Acceptable”. Therefore, the proposed Project will be within the noise limits set by the City of Victorville.

Thus, no adverse impacts are expected from the proposed Project, and no special noise reduction measures would be required for the operation of the proposed Project. Therefore, the operational noise impacts of the proposed Project would be less than significant.



Westgate Plaza, LLC

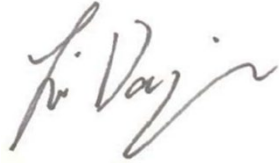
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## CLOSING

Thank you very much for the opportunity to be of assistance to Westgate Plaza, LLC. Should you have any questions, please contact me at (949) 324-9041 or Bradford Boyes at (805) 217-4947.

Sincerely,

A handwritten signature in black ink, appearing to read "Tina Darjazanie".

Tina Darjazanie | Long Beach Office

Senior Engineer

Yorke Engineering, LLC

[TDarjazanie@YorkeEngr.com](mailto:TDarjazanie@YorkeEngr.com)

cc: Bradford Boyes, Yorke Engineering, LLC

## REFERENCES

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. Website (<https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf>) accessed November 9, 2023.

City of Victorville Municipal Code – Title 13, Chapter 13.01 Noise Control. November 8, 2023 Version. Website ([https://library.municode.com/ca/victorville/codes/code\\_of\\_ordinances?nodeId=TIT13PUPESA\\_MO\\_CH13.01NOCO](https://library.municode.com/ca/victorville/codes/code_of_ordinances?nodeId=TIT13PUPESA_MO_CH13.01NOCO)) accessed November 9, 2023.

City of Victorville, Development Department Planning Division. 2008. General Plan 2030, Noise Element. Website (<https://www.victorvilleca.gov/home/showpublisheddocument/1730/636727985816700000>) accessed November 9, 2023.

Niland, Jill and Lucy A. Elam, Fundamentals of Industrial Hygiene – 7th Edition, National Safety Council. 2021.

U.S. Department of Transportation – Federal Highway Administration (FHWA). 2006. Roadway Construction Noise Model User’s Guide. Website ([https://www.fhwa.dot.gov/Environment/noise/construction\\_noise/rcnm/](https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/)) accessed November 9, 2023.

U.S. Department of Transportation – Federal Transit Authority (FTA). 2018. Transit Noise and Vibration Impact Assessment. Website ([https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123\\_0.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf)) accessed November 9, 2023.