LANDAU ASSOCIATES

TECHNICAL MEMORANDUM

TO: Chris Beale, City of Puyallup

FROM: Amy Maule, Kristen Wallace

DATE: July 17, 2025

RE: Noise Assessment Technical Memorandum
Freeman Road Logistics
Puyallup, Washington
Landau Project No. 0567003.010

INTRODUCTION

At the request of the City of Puyallup (City), Landau Associates, Inc. (Landau) prepared this technical memorandum, which provides background information and analysis to support the Noise section of the State Environmental Policy Act (SEPA) Checklist for the Freeman Road Logistics project (project) in Puyallup, Washington.

The proposed project consists of two warehouse structures, totaling approximately 495,000 square feet (ft) of warehouse space, located at 4723 Freeman Road East in Puyallup, Washington (facility; see Figure 1). Landau understands that the City is concerned about potential noise associated with warehouse operations reaching nearby residences to the east and west of the proposed facility, including one residence located between and to the east of the two proposed buildings.

The following sections describe the existing conditions and current regulatory environment for the facility and nearby noise-sensitive receiver locations.

NOISE LEVEL TERMINOLOGY AND HUMAN HEARING

The human ear responds to a very wide range of sound intensities. The decibel scale (dB) used to describe sound is a logarithmic rating system that accounts for the large differences in audible sound intensities. This scale accounts for the human perception of a doubling of loudness as an increase of 10 dB. Therefore, a 70-dB sound level will sound about twice as loud as a 60-dB sound level. People generally cannot detect differences of 1 dB; in ideal laboratory situations, differences of 2 or 3 dB can be detected by people, but such a change probably would not be detectable in an average outdoor environment. A 5-dB change would probably be perceived under normal listening conditions.

When addressing the effects of noise on people, it is useful to consider the frequency response of the human ear. Sound-measuring instruments are therefore often programmed to weight measured sounds based on the way people hear. The frequency-weighting most often used is A-weighting because it approximates the frequency response of human hearing and is highly correlated to the effects of noise

on people. Measurements from instruments using this system are reported in "A-weighted decibels," or dBA. All sound levels in this evaluation are reported in A-weighted decibels.

Distance from the source, the frequency of the sound, the absorbency of the intervening ground, obstructions, and the duration of the noise-producing event all affect the transmission and perception of noise. The degree of this effect also depends on who is listening and on existing sound levels.

REGULATORY FRAMEWORK

City of Puyallup

The project site and surrounding property to the north, east, and south are located in the city of Puyallup, Washington. As such, the Puyallup Municipal Code (PMC) noise rules are applicable to this project. Chapter 6.16 of the PMC does not contain quantitative noise limits and adopts by reference Chapters 173-58, 173-60, and 173-62 of the Washington Administrative Code (WAC).

As described in the following section, allowable "maximum permissible" sound levels promulgated in the WAC depend on the Environmental Designation of Noise Abatement (EDNA). The PMC identifies the EDNA based on zoning. Zones designated in Title 20 of the PMC as single-family residential zones (RS), multiple-family residential zones (RM), and planned residential development zones (PDR) are considered Class A EDNAs. Zones designated as commercial zones (C), professional office zones (OP), and planned community development zones (PDC) are considered Class B EDNAs. The Class C EDNA includes zones designed as manufacturing zones (M).

Section 6.16.060 of the PMC exempts the following noises from the provisions of Chapter 6:

- Noise created by warning devices not operated continuously for more than 30 minutes per incident
- Noise created by motor vehicles when regulated by PMC 6.16.030
- Noise created by motor vehicles, licensed or unlicensed, when operated off public highways except when such sounds are received in residential zones of the city
- Noise emanating from temporary construction sites except between the hours of 10:00 p.m. and 7:00 a.m. PMC 6.16.060(2)(c) gives the public works director the authority to prohibit, or to allow with or without mitigating conditions, noise that emanates from construction or related activity during evening or nighttime hours.

City of Fife

Land to the west of the project is located within the city of Fife, Washington. Similar to the PMC, Chapter 9.56 of the Fife Municipal Code (FMC) adopts the noise limits contained in WAC Chapters 173-58, 173-60, and 173-62.

The FMC defines the EDNA based on the zoning designations in FMC Title 19. Class A EDNAs include properties zoned Single-Family Residential (SFR), Small Lot Residential (SLR), Medium-Density Residential (MDR), High-Density Residential (HDR), and Neighborhood Residential (NR). Class B EDNAs

include properties zoned Neighborhood Commercial (NC), Community Mixed Use (CMU), and Regional Commercial (RC). Class C EDNAs include properties zoned Industrial (I).

Washington Administrative Code

Chapter 173-60 WAC limits the levels and durations of noise crossing property boundaries (Table 1). Allowable maximum permissible sound levels depend on the EDNA of the source of the noise and the EDNA of the receiving property. WAC 173-60-030 stipulates that EDNA land classification shall conform to land uses unless a local jurisdiction has adopted a program in which EDNA classifications are based on zoning, which the PMC does as described in Section 2.1. Generally, lands of residential use are considered Class A EDNAs, commercial properties are considered Class B EDNAs, and industrial areas are considered Class C EDNAs.

Table 1: Washington Administrative Code Maximum Permissible Sound Levels

EDNA of Sound Source	EDNA of Receiving Property (dBA)		
	Class A[a]	Class B	Class C
Class A	55/45	57	60
Class B	57/47	60	65
Class C	60/50	65	70

Notes:

(a) The limits for noise received in Class A EDNAs are reduced by 10 dBA during nighttime hours (10 p.m. to 7 a.m.).

Source: WAC 173-60-040

Abbreviations and Acronyms

dBA = A-weighted decibels

EDNA = Environmental Designation of Noise Abatement

The maximum permissible environmental noise levels in Table 1 may be exceeded for short periods as defined in WAC 173-60-040. The allowed short-term increases are as follows:

- Up to 5 dBA for no more than 15 minutes in any hour, or
- Up to 10 dBA for no more than 5 minutes in any hour, or
- Up to 15 dBA for no more than 1.5 minutes in any hour.

These allowed short-term increases can be described in terms of L_ns that represent the percentage of time certain levels are exceeded. For example, the hourly L_{25} metric represents the sound level that is exceeded 25 percent of the time, or 15 minutes in an hour. Similarly, the $L_{8.3}$ and $L_{2.5}$ are the sound levels exceeded 5 and 1.5 minutes in an hour, respectively. The maximum permissible levels are not to be exceeded by more than 15 dBA at any time, and this limit is represented by the L_{max} noise metric.

WAC 173-60-050 exempts the following sources from the above-noted noise limits:

- Temporary construction noise, except when received in Class A EDNA properties between the hours of 10 p.m. and 7 a.m.
- Sounds created by motor vehicles when regulated by the state noise limit (WAC 173-62)

- Sounds created by motor vehicles, licensed or unlicensed, when operated off public highways, except when such sounds are received in Class A EDNAs
- Sounds created by warning devices not operating continuously for more than 5 minutes (such as backup alarms on vehicles or emergency vehicle sirens).

Traffic Noise Regulations

Although the City has no limits applicable to noise from traffic traveling on public roadways, the Federal Highway Administration (FHWA) Noise Abatement Criteria (NAC), and the Washington State Department of Transportation's (WSDOT's) implementation of these criteria, provide a means to consider traffic noise. The FHWA NAC are not applicable to this project; however, they are presented here as a quantitative measure for evaluating the impacts of traffic noise on receivers within the study area (project area and immediate surroundings).

The NAC identify noise levels for various land-use categories to determine whether traffic noise impacts occur. The criterion for residential areas, schools, active sport areas, parks, and trails is a level "approaching or exceeding" 67 dBA at exterior use locations, and WSDOT characterizes "approaching or exceeding" as within 1 dBA of the level, or 66 dBA. Therefore, consistent with the NAC, WSDOT defines a traffic noise impact as either of the following:

- A peak-hour traffic noise level of 66 dBA (equivalent sound level or L_{eq}) or greater at the exterior outdoor use area of any existing or future dwelling
- An increase in peak-hour traffic noise of 10 dBA L_{eq} or greater (future project level minus existing level) at the exterior outdoor use area of any existing dwelling (considered a "substantial increase").

EXISTING NOISE ENVIRONMENT

Land Use and Zoning

The project site is located in the City, but the western property boundary is adjacent to the City of Fife. The project site is zoned Limited Manufacturing (ML). Adjacent properties are zoned ML to the north and east, Medium-Density Multi-Family Residential (RM-10) to the south, and Community Commercial (CC) and MDR to the west. The adjacent properties zoned RM-10, MDR, and CC are considered Class A EDNA receiving properties. The adjacent properties zoned ML are generally considered Class C EDNA receiving properties. Although the existing residence to the east of the site property and surrounded by the site on three sides is zoned ML and classified as a Class C EDNA receiving property, it is considered a Class A EDNA receiving property for the purposes of considering the potential for noise impacts in this SEPA assessment. Existing residences adjacent to the north of the property boundary are owned by WSDOT; demolition is planned for July 2025.

Ambient Sound Survey

An ambient sound survey was conducted at the facility property between 12:00 p.m. on April 30 and 12:00 p.m. on May 2, 2025. Sound level measurements (SLMs) were collected at three locations

representative of existing residential receivers to the west and east of the facility property. The SLM locations are shown on Figure 2. The measurements were taken using Class 1 sound level meters that had been factory-calibrated within the previous 12 months and were field-calibrated immediately prior to the measurements. The microphone of each meter was fitted with a wind screen and set approximately 5 ft above the ground at a typical listening height.

SLMs were taken at the following locations:

- SLM1: Near the eastern property boundary, north of an existing residence
- SLM2: Near the western property boundary at the intersection of Freeman Rd and 48th Street East
- SLM3: Near the southwest property boundary.

The measured sound levels at each location are summarized in Table 2, and the locations of the SLMs are shown on Figure 1. A summary of hourly data at each SLM location is provided in Attachment 1. Based on observations during setup and breakdown of the SLMs, the primary source of noise at SLM2 and SLM3 was traffic along Freeman Road East. At SLM1, the primary source of noise was operational noise from nearby industrial facilities to the east. The sound level impacts from increased traffic along Freeman Road East are discussed in more detail in the noise assessment section below.

Table 2: Measured Ambient Sound Levels

Location	Time Period[a,b]	Range of Hourly Sound Levels (dBA)				
		L_{eq}	$L_{2.5}$	$L_{8.3}$	L_{25}	L_{max}
SLM1	Day	48 – 55	56 – 63	52 – 61	47 – 55	63 – 86
	Night	44 – 54	47 – 61	45 – 56	44 – 52	54 – 80
SLM2	Day	53 – 57	61 – 64	57 – 62	51 – 58	68 – 84
	Night	44 – 57	49 – 65	45 - 62	43 – 56	64 – 79
SLM3	Day	52 – 55	59 – 62	56 - 59	52 – 56	67 – 81
	Night	44 – 54	49 – 60	45 - 57	43 – 54	61 – 73

Notes:

(a) Day refers to the hours between 7:00 a.m. and 10:00 p.m. Night refers to the hours between 10:00 p.m. and 7:00 a.m.

(b) Sound level measurements at SLM1 and SLM2 were collected between 12:00 p.m. on April 30, 2025 and 12:00 p.m. on May 2, 2025. The measurements at SLM3 were collected between 12:00 p.m. on April 30, 2025 and 8:00 a.m. on May 1, 2025.

Abbreviations and Acronyms:

Leq = equivalent sound level
Lmax = maximum sound level
L2.5 = sound level exceeded 1.5 minutes in an hour
L8.3 = sound level exceeded 5 minutes in an hour
L25 = sound level exceeded 15 minutes in an hour

State Route 167 Completion

The fully funded State Route 167 (SR167) Completion Project is scheduled to be complete in 2030. On completion, SR167 will extend northwest and southeast, passing within approximately 500 ft of the eastern facility property boundary. SR167 will significantly increase traffic-related sound levels in the

project vicinity. Analysis of noise associated with SR167 is outside the scope of this study; however, WSDOT completed a sound study as part of the SR167 Master Plan.

Maximum permissible sound levels in Puyallup and Fife are not based on existing ambient sound levels, so, while sound associated with the project may be less noticeable once the SR167 expansion is completed, the project will still be required to comply with the regulations summarized above.

NOISE IMPACT ASSESSMENT

Noise impacts of the proposed project on existing sensitive receivers were considered for temporary construction activities and long-term operational activities and equipment. Because temporary construction activities and offsite traffic are exempt from the applicable noise regulations, impacts from such activities were considered qualitatively. Predicted sound levels at nearby sensitive receivers due to long-term operation of the facility were modeled using the methodology described in this section.

Temporary Construction Noise

Construction of the proposed facility would require clearing and grading of the property and construction of new roads and buildings. These activities would cause a temporary increase in noise due to the use of heavy equipment and hauling of construction materials. The increase in sound levels at nearby sensitive receivers would depend on the existing sound levels, the types of equipment being used, and the duration of construction. Table 3 lists maximum noise levels (L_{max}) associated with commonly used construction equipment at a distance of 50 ft. The location of construction activities associated with the project will range from approximately 50 ft to 800 ft or greater, so actual sound levels received at nearby sensitive receivers will be expected to be lower than the levels listed in Table 4.

Table 3: Noise Levels of Common Construction Equipment

Equipment Description	Sound Level (dBA)	
	At 50 ft	At 800 ft
Backhoe	78	54
Compressor (air)	78	54
Concrete Mixer Truck	79	55
Crane	81	57
Dozer	82	58
Drum Mixer	80	56
Dump Truck	76	52
Excavator	81	57
Flat Bed Truck	74	50
Front End Loader	79	55
Generator	81	57
Paver	77	53
Roller	80	56

Source: USDOT FHWA. 2006. Final Report: Construction Noise Handbook. FHWA-HEP-06-015. US Department of Transportation Federal Highway Administration. August. https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/.

Abbreviations and Acronyms:
dBA = A-weighted decibels ft = feet

As noted above, noise originating from temporary construction sites and received at Class A EDNA properties is exempt from the WAC maximum permissible sound level limits between 7:00 a.m. and 10:00 p.m. If nighttime construction is necessary, PMC 6.16.060(2)(c) gives the public works director the authority to prohibit, or to allow with or without mitigating conditions, noise that emanates from construction or related activity during evening or nighttime hours. Such mitigating conditions could include the following:

- Locate stationary equipment away from receiving properties.
- Erect portable noise barriers around loud stationary equipment located near sensitive receivers.
- Turn off idling construction equipment.
- Require contractors to rigorously maintain all equipment.
- Train construction crews to avoid unnecessarily loud actions (e.g., dropping bundles of rebar on the ground or dragging steel plates across pavement) near noise sensitive areas.

Construction noise may have a temporary, localized impact on nearby residences; however, due to the temporary nature of the noise and the restriction of construction activities to daytime hours unless authorized, any sound level increases are expected to be less than significant.

Noise Modeling Methodology

Sound level increases at existing residential receivers from long-term operational activities, including mechanical equipment and onsite truck traffic, were predicted using the CadnaA[1] sound model based on the site plan dated June 14, 2024 and supplemental information provided by the City. The site plan includes two warehouse buildings. The southern building has six loading docks, and the northern building has four loading docks. There are a total of three entrances to the facility at the southern end, northern end, and in the middle. It is Landau's understanding that the southern entrance will be restricted for use by emergency services only, while the northern and middle entrances may be used by passenger vehicles and heavy trucks.

The nearest sensitive receiver to the facility is an existing residence located adjacent to the facility's eastern property boundary, which will be approximately 125 ft from the nearest loading dock. There are additional residences to the west of the facility, across Freeman Road East. Several receivers were placed to represent the nearest residential receivers to the east and west of the facility.

The model layout and receiver locations are shown on Figure 2.

Operational Noise

The following noise sources associated with typical operation at the facility were included in the model:

- Rooftop mechanical cooling equipment

[1] CadnaA (Computer-Aided Noise Abatement) is a computer program that calculates sound levels from specified sources after considering the noise reductions or enhancements caused by distance, topography, ground surfaces, atmospheric absorption, and meteorological conditions in compliance with International Organization for Standardization 9613-2.

- Loading dock activity, including truck idling, loading and unloading, and doors opening and closing.

Sound levels for the modeled loading dock activities and mechanical equipment are summarized below in Table 4. All equipment in Table 4 was represented in the model as point sources.

Table 4: Modeled Operational Noise Sources

Equipment/Activity	Quantity	Height (ft)	Sound Power Level (dBA)
Exhaust Fan	6 per building	4	90
Makeup Air Unit	12 per building	4	88
HVAC Unit	6 per building	4	86
Truck Idling	1 per loading dock and truck parking area	12	101
Pallet Roll-Off	1 per loading dock	4	119
Loading Bay Door Rolldown	1 per loading dock	12	117

Abbreviations and Acronyms:
dBA = A-weighted decibels
ft = feet
HVAC = heating, air conditioning and ventilation

Because the types, quantity, and sound level data for the specific mechanical cooling equipment that will be installed at the facility were not available at the time of this report, Landau selected representative equipment from similar facilities for use in the model. It was assumed that the mechanical cooling equipment would operate continuously. Short-term noise-producing activities at a typical loading dock include doors opening and closing and pallet loading and unloading. Because these types of sounds are intermittent and instantaneous by nature, they are not likely to cause a significant increase in overall ambient sound levels. However, because the nearest residential receiver is within 125 ft of the nearest loading dock at this facility, these activities have been included in the modeling assessment. Sound caused by backup alarms is exempt from applicable regulations and is not included in the modeling assessment.

Onsite Truck Traffic and Idling

The most significant source of long-term operational noise at the facility is sound associated with heavy trucks entering, exiting, and idling at the facility. A traffic impact analysis (TIA) was conducted by Kimley Horn and Associates, Inc. to document existing traffic in the vicinity of the proposed facility and to estimate traffic volumes associated with the proposed facility.[2] Landau used the TIA to estimate the maximum number of heavy trucks entering and exiting the facility during daytime and nighttime hours. Sound levels caused by passenger vehicles entering and exiting the site are likely not significant and were therefore not included in the model.

The specific future use of the property is not currently known, so the TIA assessed traffic volumes associated with several Land Use Codes (LUCs) representing potential future uses. To assess potential worst-case sound levels associated with truck traffic at the facility, Landau used the peak hour traffic

[2] Kimley-Horn. 2024. Traffic Impact Analysis. Kimley-Horn and Associates, Inc. June.

volumes associated with the LUC 130 scenario, which has the highest peak hour truck traffic volume. Peak hour traffic volumes, as opposed to daily average volumes, are used because regulatory compliance is based on hourly and partial-hour increments. The peak hour truck traffic volumes for LUC 130 are shown in Table 5. Note that the TIA defines AM as the hours between 7:00 a.m. and 9:00 a.m. and PM as the hours between 4:00 p.m. and 6:00 p.m., meaning both AM and PM fall within the daytime period of 7:00 a.m. to 10:00 p.m., as defined in WAC 173-60-040. The highest AM or PM truck traffic volume was chosen for the model.

Table 5: Land Use Code 130 Peak Hour Truck Traffic Volumes

Period[a]	In	Out	Total
AM Peak Hour	9 trips	11 trips	20 trips
PM Peak Hour	8 trips	12 trips	20 trips

Notes:

(a) The TIA defines AM as the hours between 7:00 a.m. and 9:00 a.m. and PM as the hours between 4:00 p.m. and 6:00 p.m. Both periods are considered "daytime" as defined by WAC 173-60-040 (7:00 a.m. to 10:00 p.m.).

(b) Trips have been rounded to the nearest whole trip.

As shown on Table 5, during the worst-case daytime peak hour, 9 trucks will enter and 11 trucks will exit, for a total of 20 trucks per hour. TIA estimates that nighttime operations will be approximately 10 to 30 percent of daytime operations; however, the TIA also states that traffic to and from the facility is expected to increase slightly between the hours of 4:00 a.m. and 7:00 a.m., which are considered nighttime hours per the applicable regulations. Traffic during the 4:00 a.m. and 7:00 a.m. period was used to represent worst-case nighttime operations. The TIA does not provide a peak hour traffic volume for this period but estimates that it will be between the daytime peak hour volume and the nighttime peak hour volume. The worst-case nighttime operations were calculated assuming that peak nighttime-hour traffic volume will be 50 percent of the daytime peak hour volume, or 10 trucks per hour. As the southern onsite road is reserved for emergency vehicles, all trucks will enter and exit through the middle and northern entrances.

Although between 10 and 20 trucks will enter and exit the facility during peak hours, it is unlikely that all of these trucks will be idling at the loading docks simultaneously. Landau assumed that up to five trucks may be idling at a time during daytime operations and up to three trucks at a time during nighttime hours. All trucks are limited to a maximum of 15 minutes of idling. In addition to the trucks idling in the loading bays, the day and night modeling scenarios each included a truck idling in the parking area to the north of the nearest residential receiver.

Offsite Traffic Noise

The project is expected to increase traffic along nearby offsite roads, including Freeman Road East. Table 6 below compares the 2025 baseline traffic quantity along Freeman Road East with development traffic quantity estimates from the TIA for the LUC 130 scenario. The 2025 baseline volume was calculated by applying a 3 percent annual compounding growth rate to the traffic volumes documented in 2023. A doubling of traffic (i.e., 100 percent increase over existing volume) is typically associated with a 3 dBA increase in ambient sound levels, which is not readily perceptible by the average person in an

outdoor environment. As shown in Table 6, development of the facility is expected to result in a 27 percent increase in traffic volume along Freeman Road East compared to the 2025 baseline; therefore, sound level impacts from offsite traffic will likely not have a perceptible impact on ambient sound levels at nearby residential receivers.

Table 6: Existing vs. Future with Development Traffic Volume on Freeman Road East

Scenario	Peak Hour Volume
2025 Baseline	309 trips
Future with Development	392 trips
Percent Increase Over Existing	27 percent

Noise Mitigation

Based on the site plan dated June 14, 2024, a berm and noise barrier will be constructed around the nearest existing residential receiver to the east of the facility. The berm and barrier were included in the model at a total height of 16 ft above grade. As discussed in the following section, the layout of the barrier was adjusted slightly to reduce sound levels at the nearest residential receiver. The adjusted locations of the berm and barrier are shown on Figure 2. Increased barrier height was modeled in an attempt to further mitigate sound at the residential receiver; however, no improvement was gained by increasing the barrier beyond 16 ft above grade.

Based on the modeled results below, noise associated with rooftop equipment was not expected to contribute to an exceedance of noise level limits, so rooftop noise barriers (i.e., parapets) were not evaluated.

Noise Modeling Results

The results of the noise impact assessment modeling are presented below. The methods used to calculate the overall sound level at each receptor from different operational sources are described, and the overall sound levels are compared to regulatory limits. In addition, the increase in sound levels from the project are compared to existing ambient levels.

Sound Level Calculation Methodology

As discussed previously, WAC 173-60-040 identifies maximum permissible sound level limits as well as allowances for short-term increases over the limits, which can be represented by L_n levels. The activities included in the model vary in duration and may not occur simultaneously, so calculations must be done using the modeled sound levels from each source to predict the overall sound levels for comparison with the limits. These calculations were based on the following assumptions:

- Mechanical cooling equipment and onsite truck traffic activity may occur for a full hour.
- As discussed previously, nine loading docks will be active during the day, and five loading docks will be active at night, but it is unlikely that all loading docks will be active at the same time. For the purposes of modeling truck idling and loading dock activity, Landau assumed that up to five

loading docks will be active concurrently during the day, and three loading docks may be active concurrently during the night.

- Each truck is limited to 15 minutes of idling in an hour.
- Loading dock doors will open and close once per truck. Opening and closing each take 1 second. Because loading dock door opening and closing is so short term and intermittent, the sound levels will be considered separately from the other noise sources, and the maximum modeled sound level will be compared to the Lmax limits.
- A typical 53-foot truck can accommodate 26 pallets, and the loudest sound associated with pallet roll-off is approximately one second per pallet, meaning the loudest pallet roll-off sounds will occur for 26 seconds per truck.

Compliance with Regulatory Sound Level Limits

Using the above assumptions, the overall sound level at each receptor location was calculated for each second in an hour, and the 1-second levels were used to calculate the Ln levels, which are compared to the applicable sound level limits for a Class C EDNA affecting a Class A EDNA. The resulting sound levels and applicable limits are shown in Table 7.

As shown, the results indicate that sound levels at all receiver locations will comply with applicable daytime noise level limits. During nighttime operations, modeled noise levels exceeded noise level limits at R1, the residence to the east. Truck idling and other activity in the loading bays nearest this residence are the main contributors to this exceedance, and additional mitigation (i.e., increasing barrier height around the residence) does not significantly affect the sound levels from these sources.

Table 7: Model Predicted Sound Levels

Parameter	Maximum Permissible Sound Level (day/night, dBA)[a]	Model Predicted Sound Level (day/night, dBA)					
		R1	R2	R3	R4	R5	R6
Mechanical Equipment, Truck Traffic, Truck Idling, and Pallet Rolloff							
Lmax	75/65	63/63	59/59	51/50	49/48	46/45	45/44
L2.5	70/60	58/54	57/54	51/50	49/48	45/45	45/44
L8.3	65/55	55/54	55/54	51/50	48/48	45/45	44/44
L25	60/50	52/51[b]	50/48	48/46	46/45	45/44	44/43
Loading Dock Door Opening/Closing							
Lmax	75/65	64	60	44	44	43	42

Notes:
(a) As defined by WAC 173-60-040.
(b) Cells shaded in red indicate an exceedance of the nighttime noise limit.

Abbreviations and Acronyms:
dBA = A-weighted decibel
Lmax = maximum sound level
L2.5 = sound level exceeded 1.5 minutes in an hour
L8.3 = sound level exceeded 5 minutes in an hour
L25 = sound level exceeded 15 minutes in an hour

Increases Over Ambient Sound Level

An assessment of increases in noise over existing ambient conditions was completed to determine the potential for noise impacts at each existing model receptor location. The assessment was completed

using the data collected during the ambient sound survey documented in a previous section of this memo. The modeled sound level over the entire hour (i.e., the hourly Leq) at each receptor location was added to the Leq sound level for the entire daytime and nighttime periods (i.e., the period Leq) at each representative model receptor location.

Sound level increases due to the project are summarized in Table 8 below. It should be noted that because the increase shown in Table 8 is relative to the period Leq, as opposed to the minimum or maximum hourly Leq (see Table 2), perceived increase over ambient conditions may be higher or lower during quieter or louder hours (e.g., should the worst-case noise conditions at the facility occur during the quietest nighttime or daytime hours, the perceived ambient increase would be higher than what is shown in Table 8 and vice versa). In general, during most hours of operation, sound levels at the facility would be lower than the worst case, and the resulting increase over ambient conditions would be less than are presented in Table 8.

As shown, the worst-case noise increases at all receptor locations range from 1 to 3 dBA during daytime and nighttime hours. As noted previously, an increase of 3 dBA is not readily perceptible to the average person in an outdoor environment.

Table 8: Sound Level Increase Over Ambient Conditions

Receptor	Representative SLM Location	Daytime Sound Levels (dBA)[a]			Nighttime Sound Levels (dBA)[a]		
		Modeled Hourly Leq	Ambient Period Leq	Cumulative Sound Level (Increase)	Modeled Hourly Leq	Ambient Period Leq	Cumulative Sound Level (Increase)
R1	SLM1	53	53	56 (+3)	51	51	54 (+3)
R2	SLM1	51	53	55 (+2)	50	51	54 (+3)
R3	SLM2	49	55	56 (+1)	47	52	54 (+1)
R4	SLM2	46	55	56 (+1)	45	52	53 (+1)
R5	SLM3	45	53	54 (+1)	44	51	52 (+1)
R6	SLM3	43	53	54 (+0)	43	51	51 (+1)

Note:

(a) Daytime refers to the hours between 7:00 a.m. and 10:00 p.m. Nighttime refers to the hours between 10:00 p.m. and 7:00 a.m.

Abbreviations and Acronyms:

Leq = equivalent sound level
SLM = sound level measurements

CONCLUSIONS

The results of the noise assessment demonstrate that daytime sound levels at all receiver locations will comply with applicable sound level limits, assuming a berm/barrier combination is installed surrounding the nearest residential receiver to the east at or above a height of 16 ft above grade. Sound levels during nighttime operations exceed the conservatively applied Class A EDNA noise limit at the residential receiver closest to the facility (R1), primarily due to trucks idling at the nearest loading bays and trailer parking area nearest to the residence. The sound levels presented in this memo are based on the best available information, but actual sound levels may vary depending on the final use of the facility. Because the final occupant of the facility has not been determined at the time of this report, Landau recommends that a sound study be conducted when the occupant is known to determine which mitigation measures may be required to comply with the sound level limits.

LANDAU ASSOCIATES, INC.

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Principal

AEM/SRB/KLW/bkc
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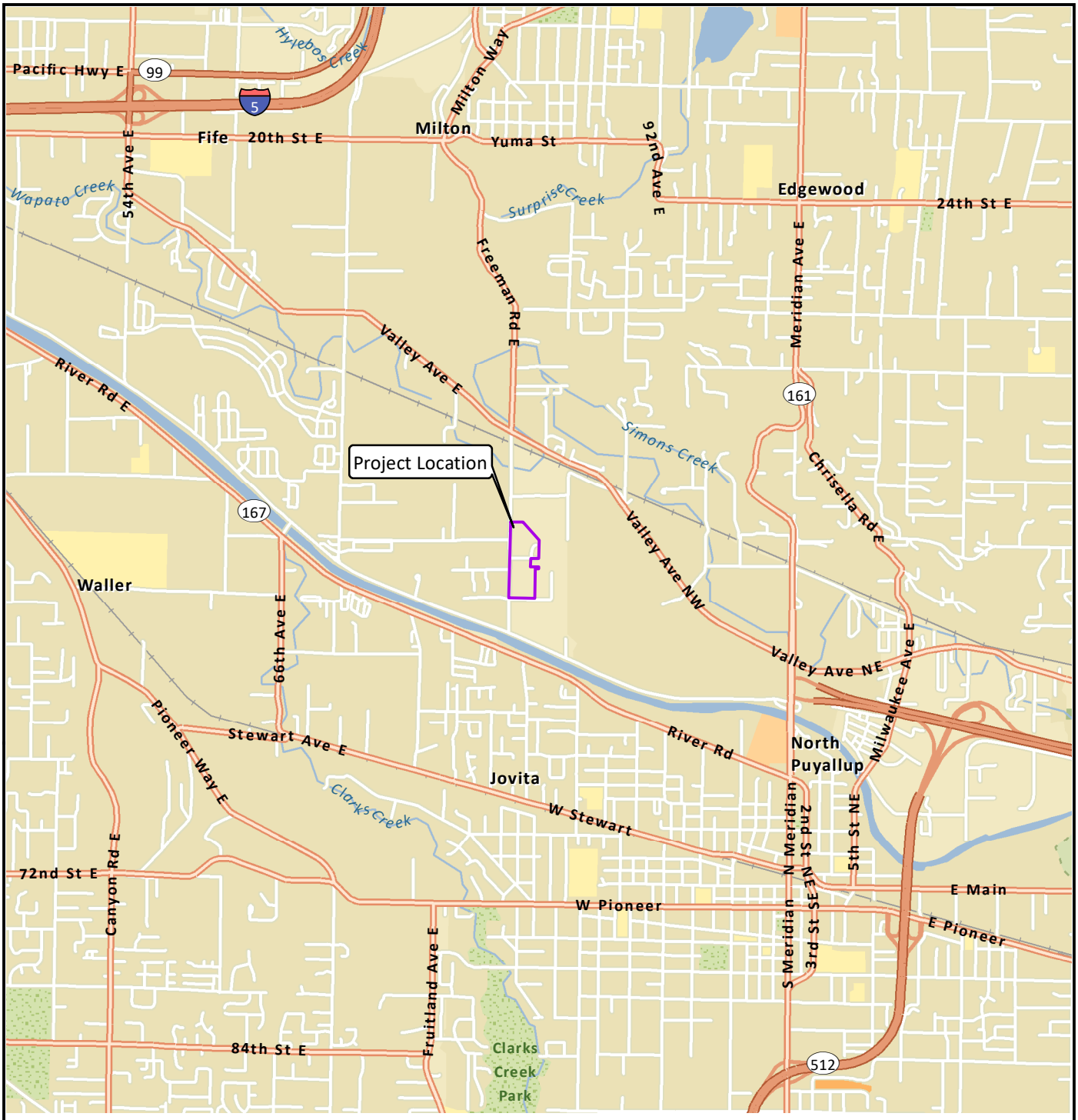
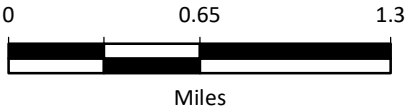
Attachments

Figure 1: Vicinity Map
Figure 2: Model Layout, Receptor Locations, and Sound Level Measurement (SLM) Locations
Attachment 1: Hourly Sound Level Measurement Summary





Data Source: Esri.

G:\Projects\567\003\01_VicinityMap.mxd 6/16/2025

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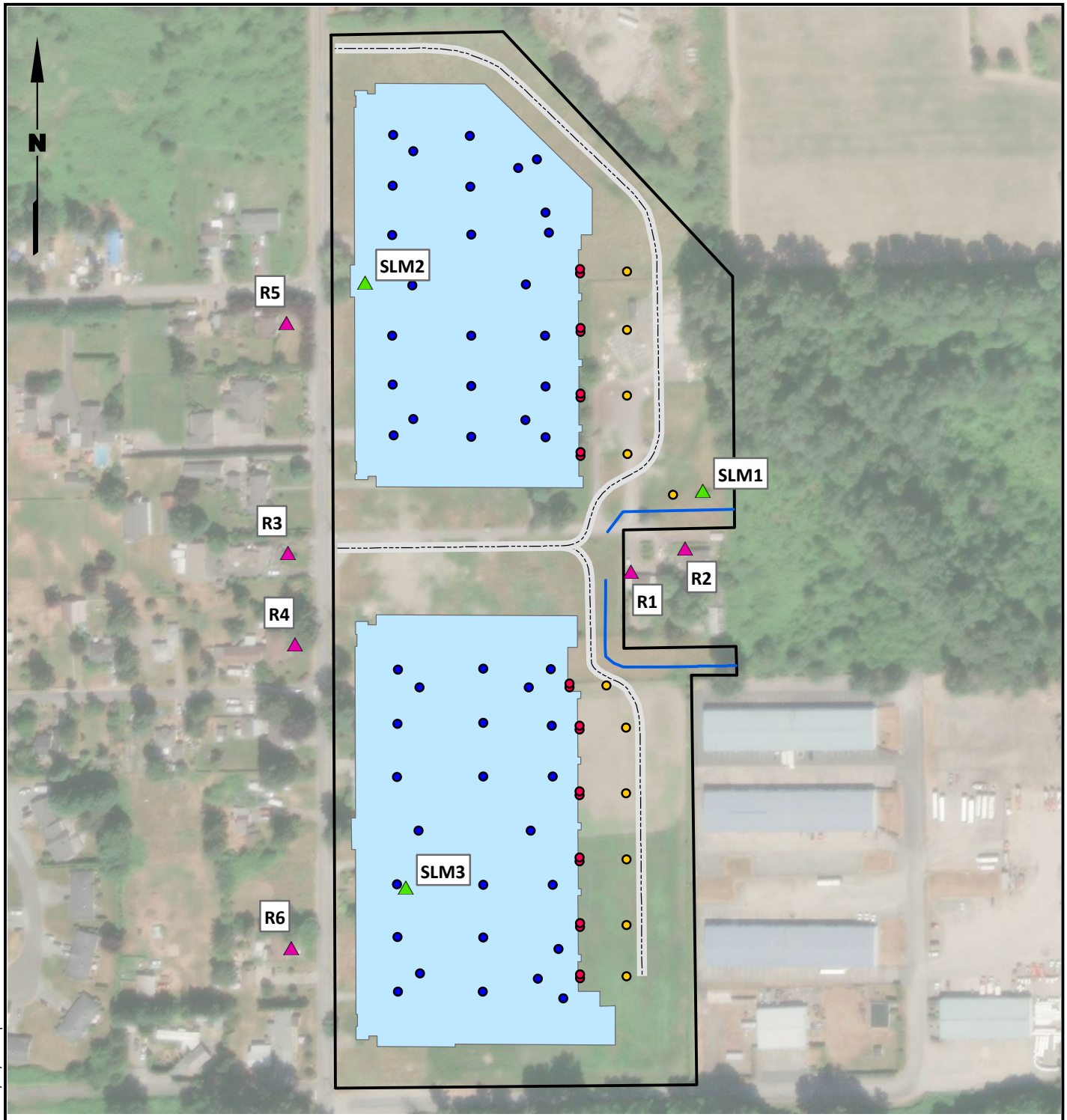
Freeman Road Logistics Puyallup, Washington	**Vicinity Map**	Figure 1



Legend

Noise Sources

- Mechanical Equipment
- Loading Dock
- Truck Idling
- On-Site Roads

- Model Receptor Locations
- SLM Locations
- 16-foot Barriers
- Facility Property Boundary
- Buildings

Data Source: Esri World Imagery.

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 225 450

Scale in Feet

G:\Projects\567\003\02_ModelSetup_SLMs.mxd 6/16/2025 | sburr

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Freeman Road Logistics Puyallup, Washington	**Model Layout, Receptor Locations, and Sound Level Measurement (SLM) Locations**	Figure 2

Attachment 1

Hourly Sound Level Measurement Summary

Table A-1
Hourly Sound Level Measurement Data - SLM1
Puyallup Freeman Logistics
Puyallup, Washington

Date	Time	L_{eq}	$L_{2.5}$	$L_{8.3}$	L_{25}	L_{max}
4/30/2025	12:00:00 PM	54.3	62.7	58.8	53.1	71.7
4/30/2025	1:00:00 PM	51.6	59.9	55	50	70.1
4/30/2025	2:00:00 PM	51.7	60.1	55.8	50	69.1
4/30/2025	3:00:00 PM	50.2	58.5	52.6	47.7	69.0
4/30/2025	4:00:00 PM	55.3	62.4	59	54.2	82.0
4/30/2025	5:00:00 PM	51.8	60.7	56.6	49.3	68.0
4/30/2025	6:00:00 PM	53.4	61.3	57.4	51.1	73.3
4/30/2025	7:00:00 PM	54.8	60.3	57	52.4	86.3
4/30/2025	8:00:00 PM	52.5	60.2	56.8	51.5	70.1
4/30/2025	9:00:00 PM	55.1	61.9	58.9	54	77.5
4/30/2025	10:00:00 PM	51.2	59.7	55.7	49.3	65.4
4/30/2025	11:00:00 PM	52.5	60.6	52.5	47.8	75.2
5/1/2025	12:00:00 AM	51.3	58	52	46.6	77.7
5/1/2025	1:00:00 AM	43.9	46.7	44.7	43.7	62.7
5/1/2025	2:00:00 AM	51.2	59.2	51.9	46.3	76.8
5/1/2025	3:00:00 AM	49.5	56.4	47.9	45.6	75.4
5/1/2025	4:00:00 AM	51.3	57.2	52.7	49.5	73.2
5/1/2025	5:00:00 AM	51.4	56.4	53.3	51.4	65.8
5/1/2025	6:00:00 AM	52.9	60	55	51.7	73.7
5/1/2025	7:00:00 AM	51.4	58	54.3	50.6	65.5
5/1/2025	8:00:00 AM	53.4	61	58.7	53.6	65.8
5/1/2025	9:00:00 AM	55.1	63.3	60.5	54.7	72.7
5/1/2025	10:00:00 AM	53.0	61.5	58	51.7	70.8
5/1/2025	11:00:00 AM	50.4	59.3	55.4	47.6	67.7
5/1/2025	12:00:00 PM	51.6	60.2	56.6	50.2	67.8
5/1/2025	1:00:00 PM	52.4	60.1	55.9	51.7	69.7
5/1/2025	2:00:00 PM	53.0	59.9	55.6	51.2	77.3
5/1/2025	3:00:00 PM	50.5	57.6	51.7	48.4	73.4
5/1/2025	4:00:00 PM	51.6	59.7	55.8	50.8	67.7
5/1/2025	5:00:00 PM	50.8	59.2	53.5	47.5	73.6
5/1/2025	6:00:00 PM	54.4	62.2	57.4	51.6	77.4
5/1/2025	7:00:00 PM	51.3	59.6	56.4	50.6	70.9
5/1/2025	8:00:00 PM	53.8	61.2	58.4	53.7	71.1
5/1/2025	9:00:00 PM	54.5	62.5	59	53.2	74.9
5/1/2025	10:00:00 PM	53.2	59.9	53.4	48.9	79.2
5/1/2025	11:00:00 PM	48.5	57.5	50.3	45.8	68.1
5/2/2025	12:00:00 AM	46.7	52.8	48.2	45.7	64.7
5/2/2025	1:00:00 AM	54.1	58.8	50.8	46	79.7
5/2/2025	2:00:00 AM	46.4	52.1	48.6	45.8	63.1
5/2/2025	3:00:00 AM	45.2	48	46.9	45.7	54.0
5/2/2025	4:00:00 AM	50.2	56.5	51.8	49.2	74.0

Table A-1
Hourly Sound Level Measurement Data - SLM1
Puyallup Freeman Logistics
Puyallup, Washington

5/2/2025	5:00:00 AM	51.3	55.5	53.5	51.6	69.3
5/2/2025	6:00:00 AM	52.5	58.1	54.1	52	73.0
5/2/2025	7:00:00 AM	53.5	60.5	56.4	52.5	72.4
5/2/2025	8:00:00 AM	48.3	55.7	52.5	47.8	64.4
5/2/2025	9:00:00 AM	47.8	55.6	51.6	47	63.2
5/2/2025	10:00:00 AM	51.6	59	54.6	49.5	75.7
5/2/2025	11:00:00 AM	49.7	56.8	51.8	47.8	71.2

Abbreviations and Acronyms:

L_{eq} = equivalent sound level

$L_{2.5}$ = sound level exceeded 2.5 percent of the time

$L_{8.3}$ = sound level exceeded 8.3 percent of the time

L_{25} = sound level exceeded 25 pecent of the time

L_{max} = maximum sound level

Table A-2
Hourly Sound Level Measurement Data - SLM2
Puyallup Freeman Logistics
Puyallup, Washington

Date	Time	L_{eq}	$L_{2.5}$	$L_{8.3}$	L_{25}	L_{max}
4/30/2025	12:00:00 PM	54.9	62.8	59.6	55	72.6
4/30/2025	1:00:00 PM	53.1	61.4	57.7	52.5	68.4
4/30/2025	2:00:00 PM	54.8	62.1	59.1	55	78.6
4/30/2025	3:00:00 PM	57.2	62.8	60.8	58.3	76.4
4/30/2025	4:00:00 PM	57.0	63	60.5	57.8	77.4
4/30/2025	5:00:00 PM	55.1	62.5	59.8	55.9	70.3
4/30/2025	6:00:00 PM	55.9	62.4	59.5	55	77.9
4/30/2025	7:00:00 PM	56.2	61.3	58.5	54.6	83.7
4/30/2025	8:00:00 PM	54.0	61.2	58.3	53.7	73.1
4/30/2025	9:00:00 PM	55.5	62.4	59.6	55.2	76.8
4/30/2025	10:00:00 PM	51.7	60	56.7	50	69.0
4/30/2025	11:00:00 PM	51.7	60.7	52.9	47	73.5
5/1/2025	12:00:00 AM	50.6	58.8	53.1	46.4	74.7
5/1/2025	1:00:00 AM	44.3	49.1	44.7	43	65.2
5/1/2025	2:00:00 AM	50.7	59.9	52.9	46.8	72.0
5/1/2025	3:00:00 AM	49.8	57.1	51.4	45.1	76.0
5/1/2025	4:00:00 AM	51.9	57.6	54.1	49.7	77.4
5/1/2025	5:00:00 AM	55.5	64.1	60.6	54.1	71.8
5/1/2025	6:00:00 AM	56.7	64.2	61.2	56.2	77.5
5/1/2025	7:00:00 AM	55.1	61.6	59	55.6	74.6
5/1/2025	8:00:00 AM	56.3	62.4	60.1	56.9	79.4
5/1/2025	9:00:00 AM	56.8	64.1	61.5	57.4	75.6
5/1/2025	10:00:00 AM	56.2	63.7	60.8	56.4	74.5
5/1/2025	11:00:00 AM	56.2	63.4	60.7	56.1	78.1
5/1/2025	12:00:00 PM	53.5	61.3	58.4	53.7	72.8
5/1/2025	1:00:00 PM	52.8	60.6	57.4	52.7	70.1
5/1/2025	2:00:00 PM	55.0	61.6	58.9	54.9	75.8
5/1/2025	3:00:00 PM	53.5	61.1	57.9	53.7	71.6
5/1/2025	4:00:00 PM	55.8	62.6	59.7	56.2	76.1
5/1/2025	5:00:00 PM	55.3	62.4	59.3	55	77.2
5/1/2025	6:00:00 PM	55.2	63.4	59.2	54.6	75.5
5/1/2025	7:00:00 PM	54.4	61.1	58.8	55	77.0
5/1/2025	8:00:00 PM	54.6	61.6	58.9	55.3	70.4
5/1/2025	9:00:00 PM	55.2	62.6	59.5	55.1	76.8
5/1/2025	10:00:00 PM	53.7	61.6	54.9	50.3	78.9
5/1/2025	11:00:00 PM	49.0	58	52.2	46.3	67.1
5/2/2025	12:00:00 AM	46.9	54.7	48.2	44.9	64.6
5/2/2025	1:00:00 AM	52.5	58.3	52.3	45.2	78.2
5/2/2025	2:00:00 AM	46.8	51.2	48.3	45.9	68.1
5/2/2025	3:00:00 AM	45.8	51.6	47.1	45	64.1
5/2/2025	4:00:00 AM	51.6	59.5	55.2	50	71.5

Table A-2
Hourly Sound Level Measurement Data - SLM2
Puyallup Freeman Logistics
Puyallup, Washington

5/2/2025	5:00:00 AM	54.5	62	58.6	53.7	78.9
5/2/2025	6:00:00 AM	56.8	64.8	62.2	56.1	69.6
5/2/2025	7:00:00 AM	56.0	64	60.5	55.9	72.1
5/2/2025	8:00:00 AM	53.3	61.3	58.1	53.4	76.4
5/2/2025	9:00:00 AM	52.8	61.1	57.8	52.5	69.6
5/2/2025	10:00:00 AM	53.0	61.3	57.7	52.1	72.1
5/2/2025	11:00:00 AM	53.0	60.9	57	51	77.0

Abbreviations and Acronyms:

L_{eq} = equivalent sound level

$L_{2.5}$ = sound level exceeded 2.5 percent of the time

$L_{8.3}$ = sound level exceeded 8.3 percent of the time

L_{25} = sound level exceeded 25 pecent of the time

L_{max} = maximum sound level

Table A-3
Hourly Sound Level Measurement Data - SLM3
Puyallup Freeman Logistics
Puyallup, Washington

Date	Time	L_{eq}	$L_{2.5}$	$L_{8.3}$	L_{25}	L_{max}
4/30/2025	12:00:00 PM	54.0	61.8	58.6	54.0	69.8
4/30/2025	1:00:00 PM	52.0	59.4	55.7	51.9	72.5
4/30/2025	2:00:00 PM	52.6	59.7	56.9	53.0	70.3
4/30/2025	3:00:00 PM	51.8	59.3	56.0	52.0	67.1
4/30/2025	4:00:00 PM	55.3	61.7	59.0	55.8	79.6
4/30/2025	5:00:00 PM	52.9	60.2	57.5	53.3	68.8
4/30/2025	6:00:00 PM	53.3	60.5	57.5	52.9	74.7
4/30/2025	7:00:00 PM	52.8	59.8	57.0	52.6	75.3
4/30/2025	8:00:00 PM	52.2	59.0	56.3	51.8	71.3
4/30/2025	9:00:00 PM	53.6	60.7	58.2	53.9	71.6
4/30/2025	10:00:00 PM	51.2	59.2	55.7	50.4	65.1
4/30/2025	11:00:00 PM	51.1	58.5	52.3	47.9	73.5
5/1/2025	12:00:00 AM	49.8	57.9	52.8	47.4	70.3
5/1/2025	1:00:00 AM	44.0	49.0	44.8	43.4	61.2
5/1/2025	2:00:00 AM	49.5	57.9	52.3	46.9	70.4
5/1/2025	3:00:00 AM	47.2	54.8	49.9	45.3	70.8
5/1/2025	4:00:00 AM	51.2	57.2	54.0	50.4	72.6
5/1/2025	5:00:00 AM	52.0	58.4	55.6	52.0	67.1
5/1/2025	6:00:00 AM	53.8	60.2	57.2	54.1	71.9
5/1/2025	7:00:00 AM	53.8	59.6	56.9	53.4	81.3

Abbreviations and Acronyms:

L_{eq} = equivalent sound level

$L_{2.5}$ = sound level exceeded 2.5 percent of the time

$L_{8.3}$ = sound level exceeded 8.3 percent of the time

L_{25} = sound level exceeded 25 pecent of the time

L_{max} = maximum sound level