PRELIMINARY DESIGN
NOISE IMPACT ANALYSIS
TECHNICAL REPORT

Van Buren Road Extension
From Route 234 (Dumfries Road) to Cardinal Drive

UPC: 118643

PRINCE WILLIAM COUNTY, VIRGINIA

PREPARED FOR

DEWBERRY
8401 ARLINGTON BOULEVARD
FAIRFAX, VIRGINIA 22031-4666

PREPARED BY

SKELLY AND LOY
A Terracon COMPANY

449 EISENHOWER BOULEVARD, SUITE 300
HARRISBURG, PENNSYLVANIA 17111

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1.0 EXECUTIVE SUMMARY

This report describes the details of a preliminary design noise impact assessment completed for the proposed Van Buren Road Extension (Route 234 (Dumfries Road) to Cardinal Drive) in Prince William County, Virginia (**Figure 1**). The noise analysis was conducted in accordance with Federal Highway Administration (FHWA) and Virginia Department of Transportation (VDOT) noise assessment regulations and guidelines. The FHWA regulations are set forth in 23 CFR Part 772. VDOT's revised policy was updated most recently on February 20, 2018.

The scope of the proposed Van Buren Road Extension project involves constructing a four-lane divided roadway on new alignment connecting Dumfries Road and Cardinal Drive. The project also includes a shared-use path along the southbound travel lanes, and a connector road connecting Van Buren Road to Old Stage Road between the Comfort Inn and Hampton Inn hotels.

The study involved monitoring of existing noise conditions (2021) and modeling of existing conditions (2020) and future design year (2040) build conditions in the study area with the FHWA-approved computerized Traffic Noise Model. The worst-case noise hour was established for the analysis using VDOT's ENTRADA traffic modeling software. A total of 250 receptors representing 250 noise-sensitive sites were modeled within 6 Common Noise Environments (CNEs) in the project study area. These 250 modeled sites include single family residential dwellings units, a recreational trail (20 trail units), one school, and two hotel patios/outdoor seating areas.

Table 1 provides a summary of existing and future noise levels and impacts for each CNE in the project study area. Impacts are predicted to occur for existing conditions in CNEs C, D, and E. Existing noise impacts were predicted at 10 receptors representing single family residences. The worst-case existing noise levels ranged from 41 to 71 dBA. The future design year (2040) build condition resulted in noise impacts in five CNEs (CNEs A, B, C, D and E). The design year build condition results in an average 3 dBA increase in the acoustical environment over existing conditions. The future design year (2040) build noise levels are predicted to range from 42 to 74 dBA. Future noise impacts were predicted at 28 receptor locations including 25 single-family residential dwelling units, and a community recreational trail (three receptors).

TABLE 1
SUMMARY OF PREDICTED NOISE LEVELS FOR THE WORST HOUR

CNE	Land Use - Description	Activity Category	Range of Predicted Exterior Noise Levels and Impacts for the Worst Hour					
			Existing			2040 Build		
			Sound Level (dBA)		Number of Impacts	Sound Level (dBA)		Number of Impacts
			Min	Max		Min	Max	
A	Single Family Residences in the Copper Mill Estates	B	51	65	0	55	67	1
B	Single Family Residences in the Four Seasons Community	B	44	56	0	45	59	0
	Four Seasons Community Trail	C	43	53	0	50	65	3
C	Single Family Residences in the Cardinal Grove Community north of Van Buren Road	B	45	71	7	48	74	15
D	Single Family Residences in the Cardinal Grove Community south of Van Buren Road	B	45	66	2	49	69	7
E	Single Family Residences along Choate Court	B	49	68	1	51	70	2
	Fannie W Fitzgerald Elementary School (Interior)	D	41		0	42		0
F	Hotel Patios at Comfort Inn and Hampton Inn Hotels	E	49	52	0	55	58	0
Total Impacted Receptors					**10**			**28**

Noise abatement must be considered where noise impact is predicted to occur with the 2040 Build alternative. Noise abatement is evaluated to determine if it is warranted, feasible, and reasonable. **Table 2** summarizes the total length, estimated cost, and benefits that would be provided by the noise barriers that were evaluated in this study. Noise abatement was determined to not be feasible for three of the five CNEs (CNE B, CNE C, and CNE D) in which it was warranted. Noise abatement was not able to be evaluated for CNE A, the northern section of CNE C, and CNE E, as no roadway improvements are proposed for the roadways responsible for the noise impacts within these CNEs.

TABLE 2
SUMMARY OF NOISE BARRIERS EVALUATED IN THIS STUDY

CNE	BARRIER ID	NUMBER OF IMPACTED RECEPTORS	IMPACTED AND BENEFITED RECEPTORS	NON-IMPACTED AND BENEFITED RECEPTORS	NOISE BARRIER DETAILS				SURFACE AREA/ BENEFITED RECEPTOR (SF/BR)[1]	FEASIBLE?	REASONABLE?
					LENGTH (FT)	AVERAGE HEIGHT (FT)	SURFACE AREA (SF)	COST AT $42/SF			
C	Barrier C1	11	3	6	2,221	30	66,632	$2,798,544	7,404	No	No
D	Barrier D1	7	0	2	1,151	30	34,544	$1,450,848	17,272	No	No

1 Where Square Feet/Benefitted Receptor (SF/BR) exceeds VDOT's maximum of 1,600, a noise barrier would not be considered cost-reasonable.

Although noise abatement consideration is warranted for CNE A, evaluation of modeling data determined that noise level increases predicted within CNE A are a result of increased traffic volumes on Dumfries Road and are not a result of the proposed Van Buren Road Extension project. To adequately mitigate for noise at the impacted receptor site, a noise barrier would need to be evaluated on Dumfries Road. However, since there are no roadway improvements proposed on Dumfries Road, a barrier on Dumfries Road was not evaluated as part of this project.

For the three noise impacts predicted to occur for the design year (2040) build condition within CNE B along the Four Seasons Community recreational trail, construction of a noise barrier was determined to not be feasible, as construction of a noise barrier would prohibit access to the 10' shared use path to be constructed adjacent to the southbound lanes of the Van Buren Road Extension. The functionality of the Four Seasons Community recreational trail in this location requires access to the proposed shared use path, affecting the feasibility of noise abatement.

Of the 15 noise impacts predicted within CNE C, 11 impacted receptors in the southern section of CNE C are a result of a combination of traffic noise from I-95 and Van Buren Road. A noise barrier evaluated between Van Buren Road and the 11 noise impacted receptors in the southern section of CNE C was determined to be not feasible. Elevated traffic noise levels at four impacted receptors in the northern section of CNE C are a result of increased traffic volumes on Cardinal Drive and are not a result of the proposed Van Buren Road Extension project. To

adequately mitigate for noise at these four impacted receptor sites, a noise barrier would need to be evaluated on Cardinal Drive. However, since there are no roadway improvements proposed on Cardinal Drive, a barrier on Cardinal Drive was not evaluated as part of this project.

A noise barrier evaluated between Van Buren Road and the seven noise impacted receptors in CNE D was determined to be not feasible.

For the two noise impacts predicted to occur for the design year (2040) build condition within CNE E, evaluation of modeling data determined that noise level increases are a result of increased traffic volumes on Cardinal Drive and are not a result of the proposed Van Buren Road Extension project. To adequately mitigate for noise at the impacted receptor site, a noise barrier would need to be evaluated on Cardinal Drive. However, since there are no roadway improvements proposed on Cardinal Drive, a barrier on Cardinal Drive was not evaluated as part of this project.

A preliminary noise evaluation was performed, and a more detailed review will be completed during final design. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may also not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction.

Construction activity may cause intermittent fluctuations in noise levels. During the construction phase of the project, all reasonable measures will be taken to minimize noise impact from these activities.

2.0 INTRODUCTION

2.1 BACKGROUND AND PURPOSE

A preliminary engineering traffic noise analysis was performed for the Van Buren Road Extension Project in Prince William County, Virginia. All highway noise impact assessment procedures, noise abatement criteria, and documentation are in accordance with the Federal Highway Administration (FHWA) and Virginia Department of Transportation (VDOT) noise assessment regulations and guidelines. FHWA regulations for highway traffic noise for federal-aid highway projects are contained in Title 23 of the United States Code of Federal Regulations Part 772 (23 CFR 772), updated July 13, 2011. The current VDOT State Noise Abatement Policy became effective on July 13, 2011 and was updated on February 20, 2018. The FHWA regulations for mitigation of highway traffic noise in the planning and design of federally aided highway projects contained in 23 CFR 772 state that a "Type I" traffic noise impact analysis is required when there is the construction of a highway on new location.

This report documents a summary of the roadway improvements under study, a description of noise terminology, the applicable standards and criteria, the computations of existing and future noise levels, a projection of future noise levels, identification of potential noise impacts, evaluation of measures to mitigate noise impacts, noise abatement, a discussion of construction noise, and information to assist local officials.

2.2 PROJECT DESCRIPTION

The scope of the Van Buren Road Extension project involves constructing an extension of Van Buren Road on new alignment from its existing termini at the intersection with Dumfries Road (Route 234) north for approximately 2.5 miles to a portion of existing Van Buren Road directly south of Cardinal Drive. The project would construct a four-lane divided urban collector roadway. Construction of a 10-foot wide shared-use path and a 5-foot wide sidewalk would be included to provide non-motorized transportation alternatives. Van Buren Road would be completed in accordance with Urban Collector Street (GS-7) criteria with a design speed of 40 mph. The typical section for these improvements generally varies from 102 feet to 105 feet along the proposed corridor and includes curb and gutter and a raised median. The project would also include construction of an approximately 235' bridge spanning Powell's Creek perpendicular to the waterway and associated stormwater management facilities. The project area is located in

the southeastern region of Prince William County, Virginia (Figure 1.1). This project is currently being funded by local Northern Virginia Transportation Authority (NVTA) funds. Future utilization of Federal Funds is anticipated for this project.

3.0 METHODOLOGY

The Noise Control Act of 1972 gives the United States Environmental Protection Agency (U.S. EPA) the authority to establish noise regulations to control major noise sources, including motor vehicles and construction equipment. Furthermore, the U.S. EPA is required to set noise emission standards for motor vehicles used for interstate commerce and the FHWA is required to enforce the U.S. EPA noise emission standards through the Office of Motor Carrier Safety. The National Environmental Policy Act (NEPA) of 1969 gives broad authority and responsibility to federal agencies to evaluate and mitigate adverse environmental impacts caused by federal actions. FHWA is required to comply with NEPA, including mitigating adverse highway traffic noise effects. The Federal-Aid Highway Act of 1970 mandates FHWA to develop standards for mitigating highway traffic noise. It also requires FHWA to establish traffic noise level criteria for various types of land uses. The Act prohibits FHWA approval of federal aid highway projects unless adequate consideration has been made for noise abatement measures to comply with the standards. FHWA regulations for highway traffic noise for federal-aid highway projects are contained in 23 CFR 772. The regulations contain noise abatement criteria, which represent the maximum acceptable level of highway traffic noise for specific types of land uses. The regulations do not mandate that the abatement criteria be met in all situations but rather require that reasonable and feasible efforts be made to provide noise mitigation when the abatement criteria are approached or exceeded.

The State Noise Abatement Policy was developed to implement the requirements of 23 Code of Federal Regulations (CFR) Part 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2011), FHWA's Highway Traffic Noise Analysis and Abatement Policy and Guidance (December 2011), and the noise related requirements of The National Environmental Policy Act of 1969. The current VDOT State Noise Abatement Policy became effective on July 13, 2011 and was updated on February 20, 2018.

Noise is generally defined as unwanted or annoying sound. Airborne sound occurs by a rapid fluctuation of air pressure above and below atmospheric pressure. Sound pressure levels are usually measured and expressed in decibels (dB). The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level.

Most sounds occurring in the environment do not consist of a single frequency but rather a broad band of differing frequencies. The intensities of each frequency add to generate sound. Because the human ear does not respond to all frequencies equally, the method commonly used

to quantify environmental noise consists of evaluating all of the frequencies of a sound according to a weighting system. It has been found that the A-weighted filter on a sound level meter, which includes circuits to differentially measure selected audible frequencies, best approximates the frequency response of the human ear.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources, creating a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of traffic noise, a statistical noise descriptor called the equivalent hourly sound level, or $L_{eq(h)}$, is commonly used. $L_{eq(h)}$ describes a noise-sensitive receptor's cumulative exposure from all noise-producing events over a one-hour period.

Because decibels are logarithmic units, sound levels cannot be added by ordinary arithmetic means. The following general relationships provide a basic understanding of sound generation and propagation.

- An increase, or decrease, of 10 dB will be perceived by a receptor to be a doubling, or halving, of the sound level.
- Doubling the distance between a highway and receptor will produce a 3 dB sound level decrease.
- A 3 dB sound level increase is barely detectable by the human ear.

3.1 NOISE ABATEMENT CRITERIA

The State Noise Abatement Policy has adopted the Noise Abatement Criteria (NAC) that have been established by FHWA (23 CFR 772) for determining traffic noise impacts for a variety of land uses. The NAC, listed in **Table 3** for various activities, represents the upper limit of acceptable traffic noise conditions and also a balancing of that which may be desirable with that which may be achievable. The NAC applies to areas having regular human use and where lowered noise levels are desired. They do not apply to the entire tract of land on which the activity is based, but only to that portion where the activity takes place. The NAC is given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). The noise impact assessment is made using the guidelines listed in **Table 3**. The study area consists of exterior residential (Category B) land use, recreational trail (Category C), exterior commercial (Category E), the

interior of public/institutional buildings (Category D), as well as other non-noise-sensitive land uses included in Category F and Category G (undeveloped).

TABLE 3
FHWA NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL DECIBELS ($L_{eq(h)}$ IN dBA)

Activity Category	Activity Criteria $L_{eq(h)}$	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B*	67	Exterior	Residential
C*	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E*	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

Source: 23 CFR Part 772
* Includes undeveloped lands permitted for this activity category

3.2 DEFINITION OF NOISE IMPACT

Traffic noise impacts occur if either of the following two conditions is met.

- The predicted traffic noise levels (future design year) approach or exceed the NAC, as shown in **Table 3**.

  The VDOT State Noise Abatement Policy defines an approach level to be used when determining a traffic noise impact. The “Approach” level has been defined by VDOT as one dBA less than the Noise Abatement Criteria

for Activity Categories A to E. For example, for a Category B receptor, 66 dBA would be approaching 67 dBA and would be considered an impact. If design year noise levels "approach or exceed" the NAC, then the activity is impacted, and a series of abatement measures must be considered.

- The predicted traffic noise levels are substantially higher than the existing noise levels.

  A substantial noise increase has been defined by VDOT when the predicted (future design year) highway traffic noise levels exceed existing noise levels by 10 dBA or more for all noise-sensitive exterior activity categories. For example, if a receptor's existing noise level is 50 dBA and if the future noise level is 60 dBA, then it would be considered an impact. The noise levels of the substantial increase impact do not have to exceed the appropriate NAC. Receptors that satisfy this condition warrant consideration of highway traffic noise abatement.

If a traffic noise impact is identified within the project corridor, then consideration of noise abatement measures is necessary. The final decision on whether or not to provide noise abatement along a project corridor will take into account the feasibility of the design and overall cost weighted against the environmental benefit.

3.3 NOISE PREDICTION MODEL

Since roadway noise levels can be determined accurately through computer modeling techniques for areas that are dominated by road traffic, design year traffic noise calculations have been predicted using the FHWA's Traffic Noise Model (FHWA TNM) Version 2.5, which is the latest approved version. The FHWA TNM® was developed and sponsored by the U.S. Department of Transportation and John A. Volpe National Transportation Systems Center, Acoustics facility. The TNM estimates vehicle noise emissions and resulting noise levels based on reference energy mean emission levels. The existing and proposed alignment (horizontal and vertical) are input into the model, along with the receptor locations, traffic volumes of cars, medium trucks (vehicles with two axles and six tires), heavy trucks, average vehicle speeds, pavement type, and any traffic-control devices. The TNM uses its acoustic algorithms to predict noise levels at the selected receptor locations by taking into account sound propagation variables such as, atmospheric absorption, divergence, intervening ground, barriers, building rows, and sometimes heavy vegetation.

Future build TNM runs were developed by modifying the validated existing condition models to account for the proposed highway widening. Roadway design engineering files and

future terrain contour files were supplied by Dewberry. The modeling accounted for the variability in the local terrain and included the following parameters that affect the propagation of traffic noise: terrain lines, ground zones, and fixed height barriers to represent buildings. The default ground type used in the modeling was "lawn." The noise model also included a number of "empty" lanes (e.g., roadways without traffic) to represent paved shoulders and side streets.

To fully characterize future noise levels at all noise-sensitive land uses in the study area, noise prediction receivers (also called "receptors" and/or "sites") were added to the measurement sites in the TNM runs. A link to the TNM models is located in Appendix G.

3.4 TRAFFIC DATA

The Environmental Traffic Data (ENTRADA) Program developed by VDOT standardizes the production of environmental traffic data needed as input for noise analyses. ENTRADA utilizes look-up tables based upon the Highway Capacity Manual (HCM), Special Report 209; NCHRP Reports 365 (187), 387 and 504 (references provided in Section 10.0 of this report); and other nationally and internationally recognized sources to adjust free-flow speeds for different facility types (Freeways, Multi-Lane and Two-Lane Highways, and Urban Streets). It incorporates factors recommended by these documents in order to adjust free-flow speeds based upon number of lanes, access points, lateral clearances, median types, and lane widths.

Traffic volumes in hourly segments for a 24-hour period were provided for Van Buren Road by Wells Associates in ENTRADA format for the 2020 existing conditions and future design year (2040) build conditions.

3.4.1 Worst-Case Noise Hour

The traffic data used in the noise analysis must produce sound levels representative of the loudest ("worst noise") hour of the day in the future design year, per FHWA and VDOT policy. In many cases, experience has shown that the peak traffic hour may coincide with the worst noise hour of the day. However, on occasion, conditions such as capacity, effects of traffic on vehicle speed, higher than normal off-peak truck percentages, or unusual hourly traffic distribution may cause the worst noise hour of the day to be different from the peak traffic hour of the day. Due to peak-hour congestion on major commuter routes, the worst noise hour may occur during the off-peak period on such roadways.

Noise levels have been predicted for that hour of the day when the vehicle volume, operating speed, and number of trucks (vehicles with three or more axles) combine to produce the worst noise conditions. According to FHWA guidance, the “worst hourly traffic noise impact” occurs at a time when truck volumes and vehicle speeds are the greatest, typically when traffic is free-flowing and at or near level of service (LOS) C conditions.

The ENTRADA data for the Van Buren extension corridor was imported into the Loudest Hour Determination (LHD) Tool developed by VDOT to evaluate the calculated noise levels at test receptors 200 feet from the source. The loudest hour was determined to be 4:00 P.M. The 4:00 P.M. ENTRADA data for Van Buren Road was used in conjunction with the PM Peak hour traffic for the side roads. Appendix B provides the ENTRADA loudest-hour traffic data summary.

4.0 EXISTING NOISE ENVIRONMENT

4.1 STUDY AREA/COMMON NOISE ENVIRONMENT (CNE) DESCRIPTION

The majority of noise-sensitive land uses in the project study area include single-family residences within an approximate 500-foot corridor adjacent to both the northbound and southbound lanes of the Van Buren Extension. Following VDOT and FHWA policies and procedures, the receptors used in the model to represent exterior activity areas at noise-sensitive land uses were grouped into Common Noise Environments (CNEs).

A CNE is defined as a group of receptors within the same Activity Category that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. There are 6 distinct geographic areas within the project area containing noise-sensitive land uses within 500 feet or first row receptors where the community is outside of 500 feet but still relevant for analysis of the construction limits that can be considered similar in acoustical environment. The CNEs within the project area (**Figure 2**) consist of exterior residential (Category B) land use, trails (Category C), exterior commercial (Category E), interior of public/institutional buildings (Category D), as well as other non-noise-sensitive land uses included in Category F and Category G (undeveloped). The modeled receptors for the analysis were grouped into the following CNEs:

- CNE A is located west of the Van Buren Extension's southern terminus along Copper Mill Drive. CNE A encompasses noise-sensitive land uses in the Copper Mill Estates community. CNE A contains 14 NAC B modeling-*only* sites (A-001 to A-014) which represent 14 single-family residential homes. Elevated decks were identified for four residential homes and were represented with elevated receptor sites. CNE A also contains one monitoring site (M-01) which was used for model validation only.

- CNE B is located west of the Van Buren Extension along Four Seasons Drive, Chapman Mill Trail, and Secret Grove Court. CNE B encompasses noise-sensitive land uses in the Four Seasons Community. CNE B contains 93 modeling-only sites (B-001 to B-073 and TR-001 to TR-020) which represent 73 NAC B single-family residential homes and 20 NAC C recreational trail sites which were modeled at 100 ft increments along the trail's path. Elevated decks were identified for all residential homes and were represented with elevated receptor sites. CNE B also contains three monitoring sites (M-02 to M-04) which were used for model validation only.

- CNE C is located west of the Van Buren Extension along Soaring Court, Wingspan Court and Labourn Drive. CNE C encompasses noise-sensitive land uses in the Cardinal Grove Community. CNE C contains 82 NAC B modeling-only sites (C-001 to C-082) which represent 82 single-family residential homes. Elevated decks were identified for 30 residential homes and were represented with elevated receptor sites. CNE B also contains one monitoring site (M-06) which was used for model validation only.

- CNE D is located east of the Van Buren Extension along Fledgling Circle and Habitat Court. CNE D encompasses noise-sensitive land uses in the Cardinal Grove Community. CNE D contains 50 NAC B modeling-only sites (D-001 to D-050) which represent 50 single-family residential homes. Elevated decks were identified for 31 residential homes and were represented with elevated receptor sites. CNE D also contains two monitoring sites (M-07 and M-08) which were used for model validation only.

- CNE E is located north of the Van Buren Extension along Choate Court. CNE E encompasses noise-sensitive land uses along Choate Court and the Fannie W Fitzgerald Elementary School which are located west of Benita Fitzgerald Drive and north of Cardinal Drive. CNE E contains nine modeling-only sites (E-001 to E-009) which represent eight NAC B single-family residential homes and one NAC D school site. The School is made of brick construction and is given a 15dBA reduction for the interior sound level prediction. CNE E does not contain any monitoring sites.

- CNE F is located south of the Van Buren Extension on both sides of the connector road from Old Stage Road and the Van Buren Extension road. CNE F encompasses noise-sensitive land uses at the Comfort Inn and Hampton Inn Hotels. CNE F contains two NAC E modeling-only sites (F-001 and F-002) which represent two hotel patios. CNE F does not contain any monitoring sites.

4.2 UNDEVELOPED LANDS AND PERMITTED DEVELOPMENTS

Highway traffic noise analyses are (and will be) performed for developed lands as well as undeveloped lands if they are considered “permitted.” Undeveloped lands are deemed to be permitted when there is a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of at least one building permit.

In accordance with the *VDOT Traffic Noise Policy*, an undeveloped lot is considered to be planned, designed, and programmed if a building permit has been issued by the local authorities prior to the Date of Public Knowledge for the relevant project. VDOT considers the “Date of Public Knowledge” as the date that the final NEPA approval is made. VDOT has no obligation to provide noise mitigation for any undeveloped land that is permitted or constructed after this date.

Prince William County's Planning Pending Cases Interactive Map indicates there is one proposed development with a pending Special Use Permit, Quantico Centre Popeyes (SUP2021-00025). As of the date of this report, the permit for this commercial land use has not been approved. There are no other proposed developments or residential building permits.

4.3 MONITORING OF EXISTING NOISE LEVELS

A noise monitoring program was conducted within the Van Buren Extension study area consistent with FHWA and VDOT recommended procedures. The objectives of the monitoring program were to document existing ambient noise levels in noise-sensitive locations and to provide a means for validation of the traffic noise prediction model.

Short-term noise measurements of 20-minute duration were obtained at seven locations within the project corridor on February 9, 2021. All monitoring was performed using Metrosonics dB-3080 and Rion NL-52 sound analyzers. Field calibration of the meters was performed immediately prior to noise monitoring using a Metrosonics cl-304 and a Rion NC-74 sound level calibrator. The sound analyzers were post-calibrated after the measurements using a Metrosonics cl-304 and a Rion NC-74 sound level calibrator. All of the Metrosonic equipment was lab-calibrated on June 2, 2020, and the Rion equipment was calibrated on January 22, 2020. This equipment meets all requirements of the American National Standard Specification for Sound Level Meters, ANSI S1.4-1983 (R1990), Type 2. Noise measurements were in the A-weighted scale and reported in decibels (dBA). The data collection procedure involved the L_{eq} measurements in consecutive 30-second intervals. This method allows individual time intervals that include noise events unrelated to traffic noise (such as aircraft over flights) to be excluded from consideration. Hourly average noise levels [$L_{eq(h)}$] were derived for each location from the 20-minute L_{eq} values. Existing noise measurements were collected under meteorologically acceptable conditions when the pavement was dry and winds were calm or light. Additional data collected at each monitoring location included atmospheric conditions such as wind speed, humidity, and ambient temperature. Monitoring was conducted in accordance with the U.S. Department of Transportation, FHWA "Measurement of Highway-Related Noise," FHWA Report No. FHWA-PD-96-046, May 1996.

Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is

present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every CNE to validate the computer noise model.

The measured noise levels appear in **Table 4** as equivalent sound levels (L_{eq}). The L_{eq} is a sound-energy average of the fluctuating sound level (in A-weighted decibels, dBA) measured over a specified period of time. **Table 4** provides the site address as well as the date, start time, and duration of each measurement. The traffic data (vehicle composition and speed) were also recorded during the measurement period. According to VDOT procedure, traffic was grouped into one of three categories: automobiles, medium trucks, and heavy trucks. The traffic data were converted to one-hour traffic data based on the measurement duration for validation of the noise model.

TABLE 4
SHORT-TERM NOISE MONITORING SUMMARY

Site ID	Address	Date	Time Start	Duration (minutes)	Monitored L_{eq} (dBA)
M-01	16815 Mill Station Way	02/09/21	14:06:30	20 Minutes	55.2
M-02	17381 Four Seasons Drive	02/09/21	14:06:30	20 Minutes	51.6
M-03	3736 Chapman Mill Trail	02/09/21	14:06:30	20 Minutes	48.6
M-04	3601 Secret Grove Court	02/09/21	14:06:30	20 Minutes	52.0
M-06	3388 Soaring Circle	02/09/21	12:22:00	20 Minutes	59.8
M-07	3215 Fledgling Circle	02/09/21	12:22:00	20 Minutes	63.3
M-08	15606 Habitat Court	02/09/21	12:22:00	20 Minutes	48.2

The location of each noise monitoring site is indicated with a star symbol on **Figure 2**. Additional noise monitoring data (site sketches, meter printouts, and calibration certificates) are located in Appendix A. The monitored L_{eq} in the study corridor ranged from 48 dBA to 63 dBA. Traffic noise from I-95 was the dominant noise source for monitoring locations M-02 through M-07. Traffic noise from Dumfries Road was the dominant noise source for M-01 and traffic noise from Cardinal Drive was the dominant noise source for site M-08.

4.4 NOISE MODEL VALIDATION

The noise monitoring data are primarily used to validate the computer model used to predict existing and future levels. Upon measurement of the existing noise levels, a three-dimensional noise model of the existing roadway network was constructed which incorporates all

significant terrain features that define the propagation path between the roadway and noise-sensitive receptors. Traffic volumes, composition, and speeds that were observed during the short-term monitoring periods were used as inputs to generate the validation models sound levels. FHWA and VDOT consider a difference of ±3 dBA or less between the measured noise levels and the computer modeled noise levels is considered acceptable. This computer model validation verifies that the sound propagation paths within the model are accurate and that the modeling techniques are correct and ensures that reported changes between the existing conditions and future design year (2040) conditions are due to changes in traffic or propagation path and not discrepancies between monitoring and modeling techniques.

A summary of the model validation is presented in **Table 5**. Each of the monitored locations was able to be accurately modeled within the acceptable ±3 dBA range. The project-wide average difference between calculated noise levels and monitored noise levels was 1.5 decibels, which generally shows excellent agreement between monitored and modeled sound levels and suggests confidence in the modeling assumptions.

TABLE 5
COMPUTED VS. MEASURED SOUND LEVELS AT MEASUREMENT SITES

Site ID	CNE	Address	Monitored L_{eq} (dBA)	TNM - Computed L_{eq} (dBA)	Difference (dBA)
M-01	A	16815 Mill Station Way	55.2	57.3	2.1
M-02	B	17381 Four Seasons Drive	51.6	49.1	-2.5
M-03	B	3736 Chapman Mill Trail	48.6	46.0	-2.6
M-04	B	3601 Secret Grove Court	52.0	52.9	0.9
M-06	C	3388 Soaring Circle	59.8	58.9	-0.9
M-07	D	3215 Fledgling Circle	63.3	62.9	-0.4
M-08	D	15606 Habitat Court	48.2	50.1	1.9
Average Difference					**1.5**
Standard Deviation of Difference					**1.6**

4.5 PREDICTED EXISTING NOISE LEVELS

For calculation of loudest-hour noise levels throughout the study area, 250 receptor locations were added to the validated TNM run(s) to provide a comprehensive basis of comparison for the analysis of noise impacts from the existing and future project conditions. Using the appropriate loudest-hour traffic data, existing and future traffic noise levels were predicted for

the 250 receptor locations. The computation methods and predicted noise levels are presented in the next section of this report.

The noise measurements provided valuable information on current noise conditions and the effects of terrain and shielding on sound propagation from the roadway to the nearby residential land uses. However, because existing noise levels are not always measured during the loudest hour of the day, the loudest-hour existing noise levels were computed using the appropriate traffic data as input. The predicted existing noise levels for the loudest hour of the day are then used as the baseline against which predicted future noise levels are compared and potential noise impacts assessed.

Of the 250 total noise receptor sites (grouped into six CNEs), ten receptor sites (within three of the six CNEs) are predicted to approach or exceed the NAC for the existing condition worst-case noise hour. For all studied sites, the predicted existing year noise levels range from 41 dBA to 71 dBA. A discussion of the predicted existing noise levels for each of the CNEs is provided below. **Figure 2** presents the locations of all the CNEs and all of their respective modeled receptor sites. Calculated noise levels for all noise-sensitive sites are presented in **Table 7** and discussed below. Due to the amount of data, this table is located in the Data Tables section.

- Existing loudest hour noise levels within CNE A were predicted to range from 51 to 65 dBA. None of the noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE B were predicted to range from 43 to 56 dBA. None of the noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE C were predicted to range from 45 to 71 dBA. There are seven noise-sensitive sites that are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE D were predicted to range from 45 to 66 dBA. There are two noise-sensitive sites that are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE E were predicted to range from 49 to 68 dBA. An interior noise level was calculated to be 41 dBA at

the Fannie W. Fitzgerald Elementary School. There is one noise-sensitive site that is predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE F were predicted to range from 49 to 52 dBA. None of the noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

5.0 FUTURE NOISE ENVIRONMENT

This section discusses the noise prediction model and traffic data used as input to the noise prediction model and then presents a summary of the predicted noise levels.

5.1 PRESENTATION OF RESULTS

Table 6 summarizes the range of predicted noise levels by CNE. The table includes a description of each CNE and its land use, the FHWA Activity Category, and the loudest-hour traffic noise levels which are presented in terms of the A-weighted equivalent sound level, or L_{eq}, in dBA. Loudest-hour noise levels were computed for 2020 existing conditions as well as the future design year (2040) build of the Van Buren Road Extension. Loudest-hour noise levels were not predicted for the design year (2040) No-Build condition, as they are not required for this project as it qualifies as an Environmental Assessment, is not related to the interstate system, and a "constructive use" 4(f) determination was not made.

TABLE 6
RANGES OF PREDICTED NOISE LEVELS FOR THE WORST HOUR

CNE	Land Use – Description	Activity Category	Range of Predicted Exterior Noise Levels and Impacts for the Worst Hour			
			Existing		2040 Build	
			Sound Level (dBA)		Sound Level (dBA)	
			Min	Max	Min	Max
A	Single Family Residences in the Copper Mill Estates	B	51	65	55	67
B	Single Family Residences in the Four Seasons Community	B	44	56	45	59
	Four Seasons Community Trail	C	43	53	50	65
C	Single Family Residences in the Cardinal Grove Community north of Van Buren Road	B	45	71	48	74
D	Single Family Residences in the Cardinal Grove Community south of Van Buren Road	B	45	66	49	69
E	Single Family Residences along Choate Court	B	49	68	51	70
	Fannie W Fitzgerald Elementary School (Interior)	D	41		42	
F	Hotel Patios at Comfort Inn and Hampton Inn Hotels	E	49	52	55	58

Figure 2 provides a location map for the CNEs, noise-sensitive receptors, 66 dBA L_{eq} "contour" for the 2040 Build alternative, and potential noise barrier locations. Each receptor is shown in **Figure 2** with a color-coded dot that indicates the status of each receptor according to its 2040 Build noise level.

Future design year (2040) noise levels are predicted to exceed the NAC within 5 of the 6 CNEs at a total of 28 noise-sensitive receptor sites. For all studied sites, the future design year (2040) exterior noise levels range from 45 dBA to 74 dBA for the build case. The increase in noise is attributable to an increase in overall traffic volumes through the entire roadway network, particularly the I-95 corridor, as well as alterations in the source/receiver noise propagation path resulting from the construction of the Van Buren Road Extension as well as the connector road.

- Future design year (2040) noise levels within CNE A are predicted to range from 55 dBA to 67 dBA for the build case, with noise levels predicted to approach or exceed the NAC at one noise-sensitive receptor location. There is a maximum of 4 dBA increase over existing sound levels within CNE A.

- Future design year (2040) noise levels within CNE B are predicted to range from 45 dBA to 65 dBA for the build case, with noise levels not predicted to approach or exceed the NAC for any noise-sensitive receptor location. Increase over existing noise impacts are predicted for three receptors representing locations along the recreational trail. There is a maximum of 12 dBA increase over existing sound levels within CNE B.

- Future design year (2040) noise levels within CNE C are predicted to range from 48 dBA to 74 dBA for the build case, with noise levels predicted to approach or exceed the NAC at 15 receptor locations for the build case. There is a maximum of 7 dBA increase over existing sound levels within CNE C.

- Future design year (2040) noise levels within CNE D are predicted to range from 49 dBA to 69 dBA for the build case, with noise levels predicted to approach or exceed the NAC at seven receptor locations for the build case. There is a maximum of 7 dBA increase over existing sound levels within CNE D.

- Future design year (2040) noise levels within CNE E are predicted to range from 51 dBA to 70 dBA for the build case, with noise levels predicted to approach or exceed the NAC at two receptor locations for the build case. There is a maximum of 2 dBA increase over existing sound levels within CNE E.

- Future design year (2040) noise levels within CNE F are predicted to range from 55 dBA to 58 dBA for the build case, with noise levels not predicted to approach or exceed the NAC for any noise-sensitive receptor locations for the future traffic conditions. There is a maximum of 6 dBA increase over existing sound levels within CNE F.

Table 7 (refer to Data Tables for receptor sound data tables) outlines all the computed sound levels at all 250 of the modeled receptors included in the noise assessment. There may be discrepancies in the reported data resulting from rounding to whole numbers. Noise values, comparisons, and insertion losses are calculated to the tenth of a dB(A) and then rounded for presentation purposes. The noise-impacted sites have been highlighted in red. All impacts to residential units result from an approach or exceedance of the NAC. The community trail for the Four Seasons Community are the only impacts associated with the "substantial increase" impact threshold which is due to their close proximity to the Van Buren Extension since it will be on new alignment.

Table 8 presents a summary of the predicted noise impact for the 2020 existing condition and the future design year (2040) build alternative. The impacts are summarized for the entire study area, separately by FHWA Activity Category.

TABLE 8
NOISE IMPACT SUMMARY

Scenario	Impact Type [1]	Number of Impacted Units by Land Use and FHWA Activity Category [2]				
		Residential Exterior (B)	Recreational Exterior (C)	Institutional Interior (D)	Commercial Exterior (E)	Total
Existing	NAC	10	0	0	0	10
Existing	IOE	0	0	0	0	0
Build	NAC	25	0	0	0	25
Build	IOE	0	3	0	0	3

1 "NAC" = Noise levels approach or exceed the FHWA Noise Abatement Criteria (NAC) for applicable Activity Category.
2 The FHWA Activity Category is shown in parenthesis.
3 "IOE"= Noise levels exceed the FHWA acceptable Increase Over Existing (IOE) impact threshold

Table 9 presents a summary of the predicted noise impact for the 2020 existing condition and the future design year (2040) build alternative by CNE.

TABLE 9
PREDICTED TRAFFIC NOISE IMPACT BY COMMON NOISE ENVIRONMENT (CNE)

CNE	Land Use - Description	Activity Category	Range of Predicted Exterior Noise Levels and Impacts for the Worst Hour	
			Existing	2040 Build
			Number of Impacts	Number of Impacts
A	Single Family Residences in the Copper Mill Estates	B	0	1
B	Single Family Residences in the Four Seasons Community	B	0	0
	Four Seasons Community Trail	C	0	3
C	Single Family Residences in the Cardinal Grove Community north of Van Buren Road	B	7	15
D	Single Family Residences in the Cardinal Grove Community south of Van Buren Road	B	2	7
E	Single Family Residences along Choate Court	B	1	2
	Fannie W Fitzgerald Elementary School (Interior)	D	0	0
F	Hotel Patios at Comfort Inn and Hampton Inn Hotels	E	0	0
Total Number Of Impacted Receptors			**10**	**28**

6.0 NOISE ABATEMENT DETERMINATION

Noise Abatement Determination is a three-phased approach. The first phase of the process is to determine if highway traffic noise abatement consideration is warranted for the affected communities and/or affected receptors. The warranted criterion specifically pertains to traffic noise impacted receptors, defined in Section 5. Since predicted noise levels for the future design year (2040) build condition approach or exceed the NAC and/or meet the substantial increase criterion, in accordance with VDOT's State Noise Abatement Policy, noise abatement considerations are warranted for these impacted noise-sensitive areas. Satisfying the warranted criterion is considered to be the first phase (Phase 1) of the three-phased noise abatement determination. Phases 2 and 3 (determining feasibility and reasonableness) are discussed below. Following completion of all three phases, a determination can be made related to the feasibility and reasonableness of the noise abatement options.

6.1 ABATEMENT MEASURES EVALUATION

VDOT guidelines recommend a variety of mitigation measures that should be considered in response to transportation-related noise impacts. While noise barriers and/or earth berms are generally the most effective forms of noise mitigation, additional mitigation measures exist which have the potential to provide considerable noise reductions under certain circumstances. Mitigation measures considered for this project include:

- Traffic-Control Measures,
- Alteration of Horizontal and Vertical Alignments,
- Acoustical Insulation of Public-Use and Non-Profit Facilities,
- Acquisition of Buffer Land,
- Construction of Earth Berms, and
- Construction of Noise Barriers.

6.1.1 Traffic-Control Measures (TCM)

Traffic-control measures (such as speed limit restrictions, truck traffic restrictions, and other traffic-control measures that may be considered for the reduction of noise emission levels)

are not practical for this project. Reducing speeds will not be an effective noise mitigation measure since a substantial decrease in speed is necessary to provide adequate noise reduction. Typically, a 10-mile-per-hour (mph) reduction in speed will result in only a 2 dBA decrease in noise level, which would not eliminate all impacts and is not perceptible to the typical human ear. Additionally, a reduction in speed is not practical for a limited access highway and would be counterproductive to the project objective of alleviating traffic and reducing congestion.

6.1.2 Alteration of Horizontal and Vertical Alignments

Consistent with the Environmental Assessment documentation, complete realignment of Van Buren Road either horizontally or vertically is not included in the scope of the project as it would result in significant amounts of right-of-way and easement impacts to the adjacent private properties. Accordingly, the scope of this project is to build a four-lane extension of Van Buren Road between Dumfries Road and Cardinal Drive with the inclusion of a multi-use path.

6.1.3 Acoustical Insulation of Public-Use and Non-Profit Facilities

This noise abatement measure option applies only to public and institutional use buildings. Since no public use or institutional structures are anticipated to have interior noise levels exceeding FHWA's interior NAC, this noise abatement option will not be applied.

6.1.4 Acquisition of Buffering Land

The purchase of property for noise barrier construction or the creation of a "buffer zone" to reduce noise impacts is only considered for predominantly unimproved properties because the amount of property required for this option to be effective would create significant additional impacts (e.g., in terms of residential displacements), which were determined to outweigh the benefits of land acquisition.

6.1.5 Construction of Berms/Noise Barriers

Construction of noise barriers can be an effective way to reduce noise levels at areas of outdoor activity. Noise barriers can be wall structures, earthen berms, or a combination of the

two. The effectiveness of a noise barrier depends on the distance and elevation difference between roadway and receptor and the available placement location for a barrier. Gaps between overlapping noise barriers also decrease the effectiveness of the barrier, as opposed to a single connected barrier. The barrier's ability to attenuate noise decreases as the gap width increases.

Noise barriers and earth berms are often implemented into the highway design in response to the identified noise impacts. The effectiveness of a free-standing (post and panel) noise barrier and an earth berm of equivalent height are relatively consistent; however, an earth berm is perceived as a more aesthetically pleasing option. In contrast, the use of earth berms is not always an option due to the excessive space they require adjacent to the roadway corridor. At a standard slope of 2:1, every one foot in height would require four feet of horizontal width. This requirement becomes more difficult to meet in urban settings where residential properties often abut the proposed roadway corridor. In these situations, implementation of earth berms can require significant property acquisitions to accommodate noise mitigation, and the cost associated with the acquisition of property to construct a berm can significantly increase the total costs to implement this form of noise mitigation and make it unreasonable.

Availability of fill material to construct the berm also needs to be considered. On projects where proposed grading yields excess waste material, earth berms are often cost-effective mitigation options. On balance or borrow projects, the implementation of earth berms is often an expensive solution due to the need to identify, acquire, and transport the material to the project site. Berms were not considered for this project due to right-of-way constraints.

As a general practice, noise barriers are most effective when placed at a relatively high point between the roadway and the impacted noise-sensitive land use. To achieve the greatest benefit from a potential noise barrier, the goal of the barrier should focus on breaking the line of sight (to the greatest degree possible) from the roadway to the receptor. In roadway fill conditions, where the highway is above the natural grade, noise barriers are typically most effective when placed on the edge of the roadway shoulder or on top of the fill slope. In roadway cut conditions, where the roadway is located below the natural grade, barriers are typically most effective when placed at the top of the cut slope. Engineering and safety issues have the potential to alter these typical barrier locations.

The effectiveness of a noise barrier is measured by examining the barrier's capability to reduce future noise levels. Noise reduction is measured by comparing design year pre- and post-

barrier noise levels. This difference between unabated and abated noise levels is known as insertion loss (IL).

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) states:

> "Whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise barriers or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required."

This documentation is located in **Appendix C.**

6.2 FEASIBILITY, REASONABLENESS, AND DESIGN GOALS

According to FHWA and VDOT guidelines, potential mitigation measures for warranted receptors must also be assessed for feasibility and reasonableness. Noise mitigation is required to be both "feasible" and "reasonable" to be recommended for construction.

6.2.1 Feasibility Criterion for Noise Barriers

All receptors that meet the warranted criterion must progress to the "feasible" phase. Phase 2 of the noise abatement criteria requires that both of the following acoustical and engineering conditions be considered. The noise abatement measure is said to be feasible if it meets both of the following criteria.

- **At least a 5 dBA highway traffic noise reduction at impacted receptors:** According to 23 CFR 772, FHWA requires the highway agency to determine the number of impacted receptors required to achieve at least 5 dBA of reduction. VDOT requires that 50% or more of the impacted receptors experience 5 dBA or more of insertion loss to be feasible.

- **The determination that it is possible to design and construct the noise abatement measure:** The factors related to the design and construction include safety, barrier height, topography, drainage, utilities, environmental impacts and maintenance of the abatement measure, maintenance access

to adjacent properties, and general access to adjacent properties (i.e., arterial widening projects).

6.2.2 Reasonableness Criterion for Noise Barriers

All receptors that meet the feasibility criterion must progress to the "reasonableness" phase. Phase 3 of the noise abatement criteria requires that all of the following conditions be considered.

- **The Viewpoints of the Benefited Receptors:** VDOT shall solicit the viewpoints of all benefited receptors (refer to Section 7.1) through certified mailings and obtain enough responses to document a decision as to whether or not there is a desire for the proposed noise abatement measure. Fifty percent (50%) or more of the respondents shall be required to favor the noise abatement measure in determining reasonableness. Community views in and of themselves are not sufficient for a barrier to be found reasonable if one or both of the other two reasonableness criteria are not satisfied.

- **Cost-effectiveness:** Typically, the limiting factor related to barrier reasonableness is the cost-effectiveness value, where the total surface area of the barrier is divided by the number of benefited receptors receiving at least a 5 dBA reduction in noise level. VDOT's approved cost is based on a maximum square footage of abatement per benefited receptor, a value of 1,600 square feet per benefited receptor (SF/BR).

Where multi-family housing includes balconies at elevations that exceed a 30-foot high barrier or the topography causes receptors to be above the elevation of a 30-foot barrier, these receptors are not assessed for barrier benefits and are not included in the computation of the barrier's reasonableness.

For non-residential properties such as parks and public use facilities, a special calculation is performed in order to quantify the type and duration of activity and compare to the cost effectiveness criterion. The determination is based on cost, severity of impact (both in terms of noise levels and the size of the impacted area and the activity it contains), and amount of noise reduction.

6.2.3 Noise Reduction Design Goals

The design goal is a reasonableness factor indicating a specific reduction in noise levels that VDOT uses to identify that a noise abatement measure effectively reduces noise. The design goal establishes a criterion, selected by VDOT, which noise abatement must achieve. VDOT's noise reduction design goal is defined as a 7 dBA of insertion loss for at least one impacted receptor, meaning that at least one impacted receptor is predicted to achieve a 7 dBA or greater noise reduction with the proposed barrier in place. The design goal is not the same as acoustic feasibility, which defines the minimum level of effectiveness for a noise abatement measure. Acoustic feasibility indicates that the noise abatement measure can, at a minimum, achieve a discernible reduction in noise levels.

Noise reduction is measured by comparing the future design year (2040) build condition pre-and post-barrier noise levels. This difference between unabated and abated noise levels is known as "insertion loss" (IL). It is important to optimize the noise barrier design to achieve the most effective noise barrier in terms of both noise reduction (insertion losses) and cost. Although at least a 5 dBA reduction is required to meet the feasibility criteria, the following tiered noise barrier abatement goals are used to govern barrier design and optimization.

- Reduction of future highway traffic noise by 7 dBA at one or more of the impacted receptor sites (required criterion)
- Reduction of future highway traffic noise levels to the low-60-decibel range when practical (desirable)
- Reduction of future highway traffic noise levels to existing noise levels when practical (desirable)

6.3 NOISE ABATEMENT RESULTS

Noise barriers were evaluated for the noise impacted receptors within CNE C and CNE D that are predicted to experience noise impacts in the design year 2040 build condition. The barrier locations are presented on **Figure 2** and an overview of the evaluated barrier parameters is presented in **Table 10**. Discussions of the individual barriers acoustical performance and statistics can be found in **Tables 11** and **12**. Warranted, Feasible, and Reasonable Worksheets were completed for all impacted CNEs and are included in **Appendix E**.

TABLE 10
SUMMARY OF NOISE BARRIERS EVALUATED IN THIS STUDY

CNE	BARRIER ID	NUMBER OF IMPACTED RECEPTORS	IMPACTED AND BENEFITED RECEPTORS	NON-IMPACTED AND BENEFITED RECEPTORS	NOISE BARRIER DETAILS				SURFACE AREA/ BENEFITED RECEPTOR (SF/BR)[1]	FEASIBLE?	REASONABLE?
					LENGTH (FT)	AVERAGE HEIGHT (FT)	SURFACE AREA (SF)	COST AT $42/SF			
C	Barrier C1	11	3	6	2,221	30	66,632	$2,798,544	7,404	No	No
D	Barrier D1	7	0	2	1,151	30	34,544	$1,450,848	17,272	No	No

1 Where Square Feet/Benefitted Receptor (SF/BR) exceeds VDOT's maximum of 1,600, a noise barrier would not be considered cost-reasonable.

6.3.1 CNE A

Receptor A-001, which represents a single-family residence, is predicted to exceed NAC for the 2040 Build condition. Site A-001 is located on the western side of CNE A and is a third-row receptor away from the new alignment. Upon evaluation of modeling data, it was verified that noise level increases predicted at this receptor are a result of increased traffic volumes on Dumfries Road and are not a result of the proposed Van Buren Road Extension project. To adequately mitigate for noise at the impacted site A-001, a noise barrier would need to be evaluated on Dumfries Road. However, since there is no work proposed on Dumfries Road, a barrier on Dumfries Road was not evaluated as part of this project.

6.3.2 CNE B

Receptors TR-012 through TR-014, which represent three locations along the Four Seasons Community recreational trail within CNE B, are predicted to exceed the substantial noise increase criteria for the 2040 Build condition. Although noise abatement consideration is warranted for these three receptors, construction of a noise barrier was determined to not be feasible, as construction of a noise barrier would prohibit access to the 10' shared-use path to be constructed adjacent to the southbound lanes of the Van Buren Road Extension. The functionality

of the Four Seasons Community recreational trail in this location requires access to the proposed shared-use path, affecting the feasibility of noise abatement.

6.3.3 CNE C

Of the 15 noise impacts predicted within CNE C, 11 impacted receptors in the southern section of CNE C (C-003, C-011 through C-017, C-022, C-025, and C-026) are a result of a combination of traffic noise from I-95 and Van Buren Road. A noise barrier (Barrier C1) was evaluated for these 11 impacted receptors adjacent to the edge of shoulder of the southbound lanes of Van Buren Road, extending from approximately Station 240+00 to Station 217+00. **Table 11** presents the performance of this noise barrier. This noise barrier is 30 feet high, 2,221 feet in length, and has a total surface area of 66,632 SF benefiting 9 receptors, equating to 7,404 SF/BR. This barrier provides a reduction of 5 to 9 dBA and benefits 3 of the 11 impacted receptors. The barrier is **not feasible** since it does not provide at least a 5 dBA reduction to 50% of the impacted receptors (achieves 27%).

To adequately mitigate for noise at these impacted receptors in the southern section of CNE C, noise abatement would need to be evaluated along the southbound lanes of I-95 along with Barrier C1. However, since there are no roadway improvements proposed on I-95, a barrier on I-95 was not evaluated as part of this project

TABLE 11
CNE C - BARRIER C1 OPTIMIZED BARRIER RESULTS

Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Barrier C1				
C-001	1	64	63	0
C-002	1	65	65	0
C-003	1	68	65	3
C-011	1	66	66	1
C-012	1	67	66	1
C-013	1	68	67	1

C-014	1	73	73	0
C-015	1	74	74	1
C-016	1	74	70	4
C-017	1	69	66	4
C-018	1	65	62	3
C-019	1	65	62	3
C-020	1	59	57	2
C-021	1	63	60	3
C-022	1	66	58	8
C-023	1	62	57	5
C-024	1	65	57	8
C-025	1	66	57	8
C-026	1	66	57	9
C-027	1	65	57	9
C-028	1	61	54	7
C-029	1	63	59	4
C-030	1	61	59	2
C-031	1	59	57	2
C-032	1	61	59	2
C-033	1	63	61	2
C-034	1	63	62	1
C-035	1	62	56	6
C-036	1	60	56	5
C-037	1	56	54	2
C-038	1	52	49	3
C-039	1	51	49	2
C-040	1	51	48	3
C-041	1	51	48	3
C-042	1	50	48	3
C-043	1	55	53	3
C-044	1	59	57	2
C-045	1	58	54	4
C-046	1	57	53	3
C-047	1	55	52	3
C-048	1	53	49	4
C-049	1	52	48	4
C-050	1	54	52	3
C-051	1	54	51	2
C-052	1	54	52	2
C-053	1	48	47	1

*	There may be discrepancies in the reported data resulting from rounding to whole numbers. Noise values, comparisons, and insertion losses are calculated to the tenth of a dB(A) and then rounded for presentation purposes.
66	Indicates noise impact (NAC only)
5	Indicates at least a 5 dBA benefit

Elevated traffic noise levels at four impacted receptors in the northern section of CNE C (C-055 through C-057, C-066) are a result of increased traffic volumes on Cardinal Drive and are not a result of the proposed Van Buren Road Extension project. To adequately mitigate for noise at these four impacted receptor sites, a noise barrier would need to be evaluated on Cardinal Drive. However, since there are no roadway improvements proposed on Cardinal Drive, a barrier on Cardinal Drive was not evaluated as part of this project.

6.3.4 CNE D

A noise barrier (Barrier D1) was evaluated for the seven impacted receptors within CNE D, adjacent to the edge of shoulder of the northbound lanes of Van Buren Road, extending from approximately Station 229+50 to Station 240+50. **Table 12** presents the performance of this noise barrier. This noise barrier is 30 feet high, 1,151 feet in length, and has a total surface area of 34,544 SF benefiting 2 receptors, equating to 17,272 SF/BR. This barrier does not provide the required 5 dBA reduction for any of the seven impacted receptors. The barrier is **not feasible** since it does not provide at least a 5 dBA reduction to 50% of the impacted receptors (achieves 0%).

To adequately mitigate for noise at the impacted receptor sites of CNE D, a noise barrier would need to be evaluated along the southbound lanes of I-95. However, since there are no roadway improvements proposed on I-95, a barrier on I-95 was not evaluated as part of this project.

TABLE 12
CNE D - BARRIER D1 OPTIMIZED BARRIER RESULTS

Re-ceptor ID	# of Dwelling /Recrea-tional Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Barrier D1				
D-001	1	64	63	1
D-002	1	64	62	2
D-003	1	64	60	4
D-004	1	64	59	6
D-005	1	64	59	6
D-006	1	66	61	4
D-007	1	67	63	4
D-008	1	67	66	2
D-009	1	68	67	1
D-010	1	68	68	0
D-011	1	68	68	0
D-012	1	69	69	0
D-033	1	55	55	0
D-034	1	55	54	1
D-035	1	55	53	1
D-036	1	55	53	2
D-037	1	54	51	2
D-038	1	55	53	3
D-039	1	57	55	2
D-043	1	51	49	2
D-044	1	49	47	2
D-045	1	53	52	2
D-046	1	52	50	2
D-047	1	49	48	1
D-048	1	50	49	1
D-049	1	62	62	0
D-050	1	62	61	0
*	There may be discrepancies in the reported data resulting from rounding to whole numbers. Noise values, comparisons, and insertion losses are calculated to the tenth of a dB(A) and then rounded for presentation purposes.			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

6.3.5 CNE E

For the two noise impacts predicted to occur for the design year (2040) build condition within CNE E (E-002 and E-009), evaluation of modeling data determined that noise level increases are a result of increased traffic volumes on Cardinal Drive and are not a result of the proposed Van Buren Road Extension project. To adequately mitigate for noise at the impacted receptor site, a noise barrier would need to be evaluated on Cardinal Drive. However, since there are no roadway improvements proposed on Cardinal Drive, a barrier on Cardinal Drive was not evaluated as part of this project.

7.0 PUBLIC INVOLVEMENT/LOCAL OFFICIALS COORDINATION

FHWA and VDOT policies require that VDOT provide certain information to local officials within whose jurisdiction the highway project is located in order to minimize future traffic noise impacts of Type I projects on currently undeveloped lands. (Type I projects involve highway improvements with noise analysis.) This information must include details on noise-compatible land-use planning and noise impact zones for undeveloped lands within the project corridor. The aforementioned details are provided below. Additional information about VDOT's noise abatement program has also been included in this section.

7.1 PUBLIC INVOLVEMENT EFFORTS

For noise barriers determined to be feasible and reasonable, the affected public will be given an opportunity to decide whether they are in favor of construction of the noise barrier. A final determination as to the construction of barriers will be made after the public involvement process. Before final decisions and approvals can be made to construct a noise barrier, a final design noise analysis will be performed. For barriers that are determined to be feasible and reasonable, input from the owners and residents of those receptor units that will be benefited by the proposed mitigation may vote by completing and returning the citizen survey that they receive in the mail. The initial citizen survey is sent out as certified mail so the disposition of the letters can be tracked. Of the votes tallied, 50% or more must be in favor of a proposed noise barrier in order for that barrier to be considered further. Upon completion of the citizen survey, the VDOT Noise Abatement staff will make recommendations to the Chief Engineer for approval. Approved barriers will be incorporated into the road project plans and a Final NADR will be prepared detailing the results of the survey.

7.2 INFORMATION FOR LOCAL GOVERNMENT OFFICIALS NOISE-COMPATIBLE LAND-USE PLANNING

Sections 12.1 and 12.2 of VDOT's current noise policy outline VDOT's approach to communication with local officials and provides information and resources on highway noise and noise-compatible land-use planning. VDOT's intention is to assist local officials in planning the

uses of undeveloped land adjacent to highways to minimize the potential impacts of highway traffic noise.

"Entering the Quiet Zone" is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. A link to this brochure on FHWA's website is provided below: https://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/index.cfm.

A wide variety of administrative strategies may be used to minimize or eliminate potential highway noise impacts, thereby preventing the need or desire for costly noise abatement structures such as noise barriers in future years. There are five broad categories of such strategies:

- Zoning,
- Other legal restrictions (subdivision control, building codes, health codes),
- Municipal ownership or control of the land,
- Financial incentives for compatible development, and
- Educational and advisory services.

"The Audible Landscape: A Manual for Highway and Land Use" is a well-written and comprehensive guide addressing these noise-compatible land-use planning strategies, with significant detailed information. This document is available through FHWA's Website at https://www.fhwa.dot.gov/ENVIRonment/noise/noise_compatible_planning/federal_approach/audible_landscape/.

7.3 NOISE IMPACT ZONES IN UNDEVELOPED LAND ALONG THE STUDY CORRIDOR

Also required under the revised 2011 FHWA and VDOT noise policies is information on the noise impact zones adjacent to project roadways in undeveloped lands. To determine these zones, noise levels are computed at various distances from the edge of the project roadways in each of the undeveloped areas of the project study area. Then, the distances from the edge of the roadway to the noise abatement criteria sound levels are determined through interpolation. Distances vary in the project corridor due to changes in traffic volumes, or terrain features. Any

noise-sensitive sites within these zones should be considered noise impacted if no barrier is present to reduce sound levels.

Noise level contours are lines of equal noise exposure that typically parallel roadway alignments and are often times useful to local officials in undeveloped corridors. Highway traffic noise is considered a linear noise source and sound levels can drop considerably over distance. The degree that sound levels decrease can vary based on a number of different factors including objects that shield the roadway noise, terrain features and ground cover type (e.g., pavement, grass or snow). The use of noise level contours has become increasingly popular over the last several years, as they have been implemented in planning programs for undeveloped areas with roadway noise influence. Through conscious planning efforts and noise contour generation, municipal officials can restrict future development inside the noise impact zone (i.e., the area within the 66-dBA noise contour). **Figure 2** shows the approximate 66-dBA noise level contours for the study area when considering the proposed improvements and the Design Year (2040) traffic volumes, speeds and composition. This 66-dBA noise contour can be used to approximate the distance away from Van Buren Road in which the NAC will be exceeded for an Activity Category B receptor (e.g., the most common receptor).

7.4 VDOT'S NOISE ABATEMENT PROGRAM

Information on VDOT's noise abatement program is available on VDOT's Website at https://www.virginiadot.org/projects/pr-noise-walls-about.asp. The site provides information on VDOT's noise program and policies, noise barriers, and a downloadable noise barrier brochure.

8.0 CONSTRUCTION NOISE

Throughout the construction of Van Buren Extension project, noise-sensitive land uses that are analyzed for traffic noise impacts are also susceptible to construction noise impacts. Typical highway construction/reconstruction equipment such as loaders, dump trucks, graders, bulldozers, etc. is likely to temporarily elevate noise within the project area. Sensitive receptors within 100 to 200 feet of construction activities may experience varying periods and degrees of noise impacts, with potential noise levels between 75 dBA and 85 dBA, depending on the nature of the construction activity, the type of equipment in use, and the relative nearness to the activity.

VDOT is concerned with noise generated during the construction phase of the proposed project. While the degree of construction noise impact will vary, it is directly related to the types and number of equipment used and the proximity to the noise-sensitive land uses within the project area. Land uses that are sensitive to traffic noise, are also potentially considered to be sensitive to construction noise. Any construction noise impacts that do occur as a result of roadway construction measures are anticipated to be temporary in nature and will cease upon completion of the project construction phase. A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, VDOT has developed and FHWA has approved a specification that establishes construction noise limits. This specification can be found in VDOT's 2016 Road and Bridge Specifications, Section 107.16(b.3), “Noise.” The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

Construction noise can be minimized by implementing specific measures to help mitigate the noise at the source. The contractor shall exercise proper maintenance procedures for all construction equipment regularly and thoroughly. Replacement of failing or ineffective muffling and exhaust systems, periodic lubrication of moving parts, and properly tuned engines are necessary in order to keep construction equipment noise emissions to a minimum.

The following construction noise related items are included in VDOT’s 2016 Road and Bridge Specifications:

- The Contractor’s operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall not exceed 80 decibels. Such noise level measurements shall be taken at a point on the perimeter of the construction limit that is closest to the adjoining property on which a noise-sensitive activity is occurring. A noise-sensitive activity is any activity

for which lowered noise levels are essential if the activity is to serve its intended purpose and not present an unreasonable public nuisance. Such activities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks, and recreational areas.

- The Department may monitor construction-related noise. If construction noise levels exceed 80 decibels during noise-sensitive activities, the Contractor shall take corrective action before proceeding with operations. The Contractor shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to noncompliance with these requirements.

- The Department may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 10 P.M. and 6 A.M. If other hours are established by local ordinance, the local ordinance shall govern.

- Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment.

- When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

- These requirements shall not be applicable if the noise produced by sources other than the Contractor's operation at the point of reception is greater than the noise from the Contractor's operation at the same point.

9.0 LIST OF PREPARERS AND REVIEWERS

Noise Monitoring, Noise Modeling, Report Preparation

Alan Dunay
Acoustical and Air Quality Specialist
BS/1997/Biology
24 Years' Experience

William Kaufell
Director of Acoustical and Air Quality Services
BA/1991/Geography, Urban and Regional Planning
29 Years' Experience

Ethan Anderson
Environmental Noise Analyst (TNM Certified)
BS/2017/Geo-Environmental Studies
5 Years' Experience

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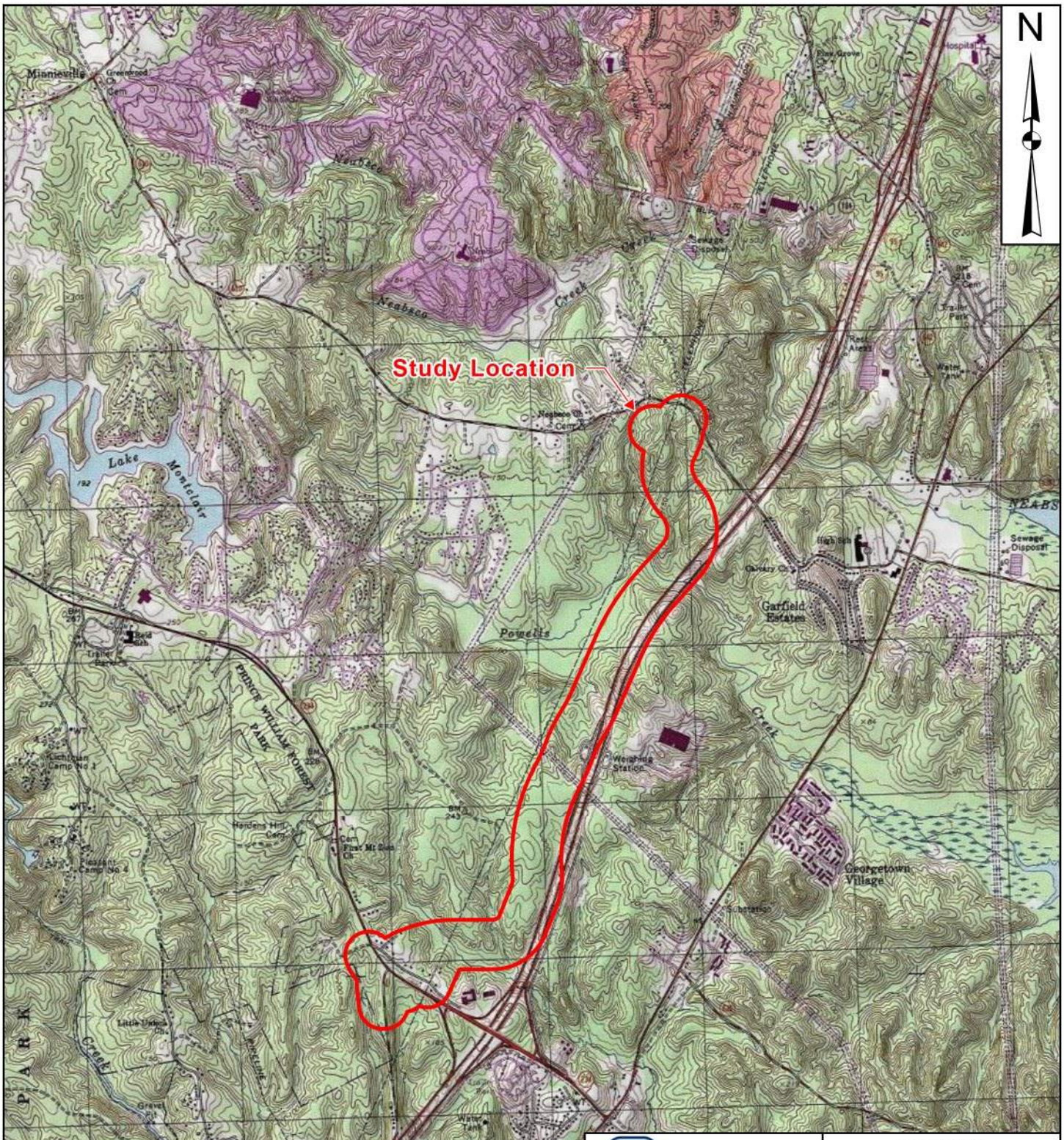
MAPPING



SKELLY AND LOY
A Terracon COMPANY

June 2021

Figure 1

VAN BUREN EXTENSION PROJECT
UPC: TBD

PROJECT LOCATION MAP

PRINCE WILLIAM COUNTY, VIRGINIA

Job No.: JN207542

1 inch = 3,000 Feet

Document Path: D:\Project Sandbox\JN207542_Van_Buren\Maps\Figure 1 - Project Location Map.aprx

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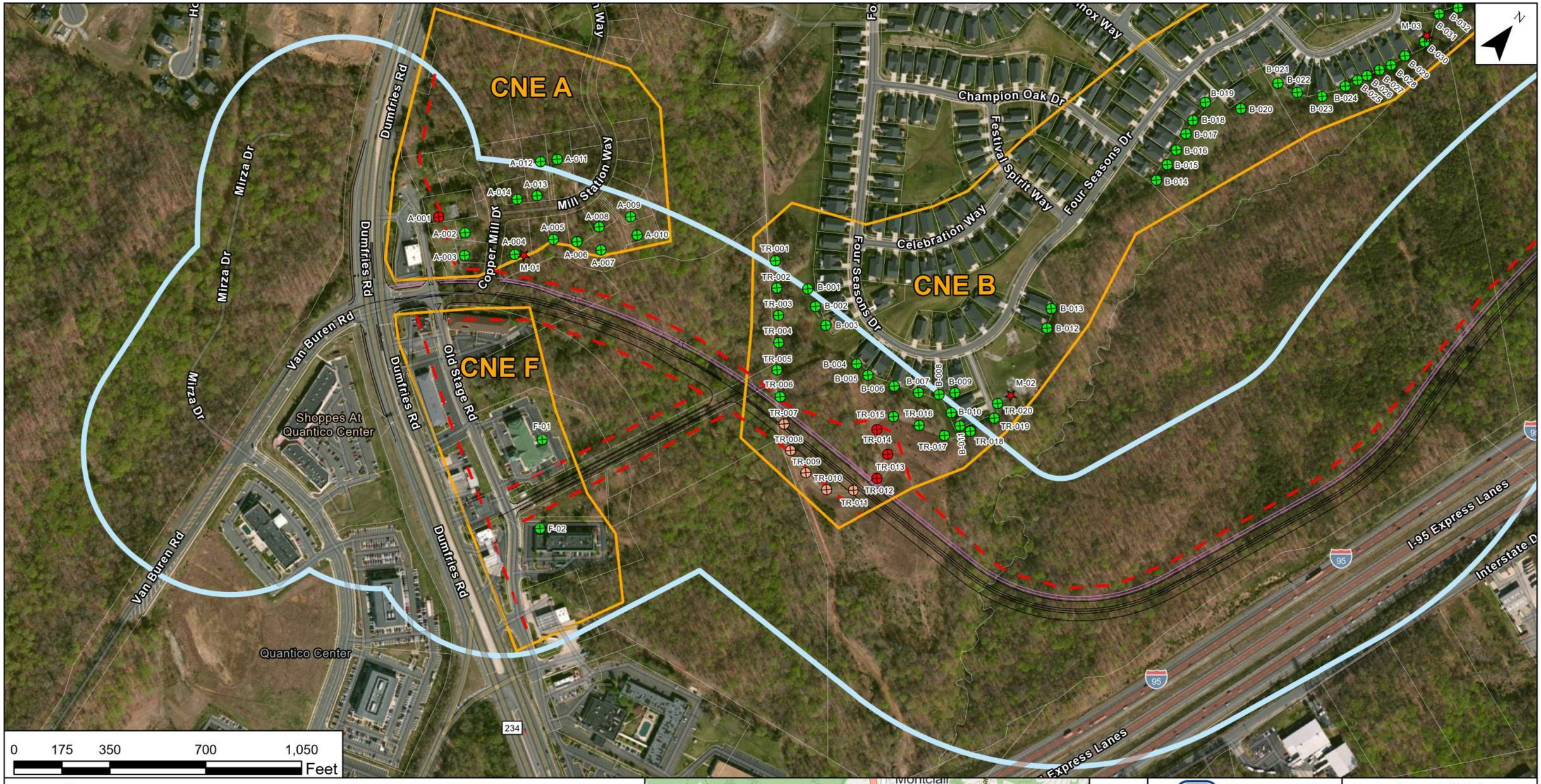

Legend

- ROADWAY DESIGN
- BIKE TRAIL
- 66 DBA CONTOUR
- STUDY AREA (500 FT BUFFER)
- COMMON NOISE ENVIRONMENTS
- PARCELS

POTENTIAL BARRIERS

- WARRANTED, NOT FEASIBLE, NOT REASONABLE

MODELED NOISE RECEPTORS

- ACQUIRED
- IMPACTED, BENEFITTED
- IMPACTED. NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED
- NOISE MEASUREMENT LOCATION

SKELLY AND LOY, A Terracon company

August 2021

Figure 2

VAN BUREN EXTENSION PROJECT
UPC: TBD

PRELIMINARY NOISE REPORT

PRINCE WILLIAM COUNTY, VIRGINIA

Job No. JN207542 | 1 inch = 350 Feet

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Legend

- ROADWAY DESIGN
- BIKE TRAIL
- 66 DBA CONTOUR
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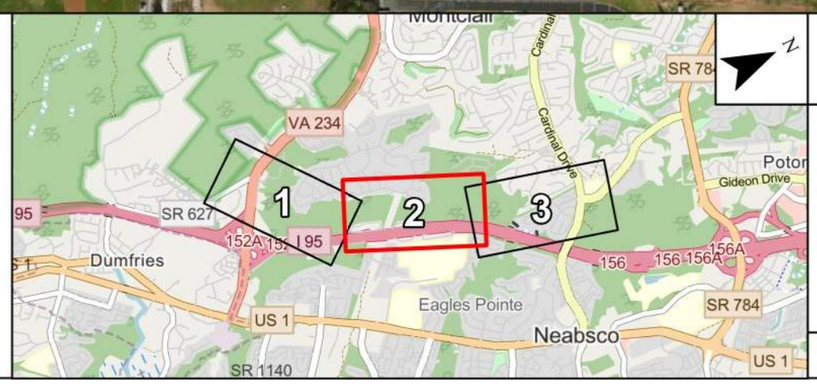
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED
- NOISE MEASUREMENT LOCATION



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August 2021

Figure 2

VAN BUREN EXTENSION PROJECT
UPC: TBD

PRELIMINARY NOISE REPORT

PRINCE WILLIAM COUNTY, VIRGINIA

Job No. JN207542 | 1 inch = 350 Feet

Document Path: D:\Project Sandbox\JN207542_Van_Buren\Maps\Figure 2 - Noise Map.aprx

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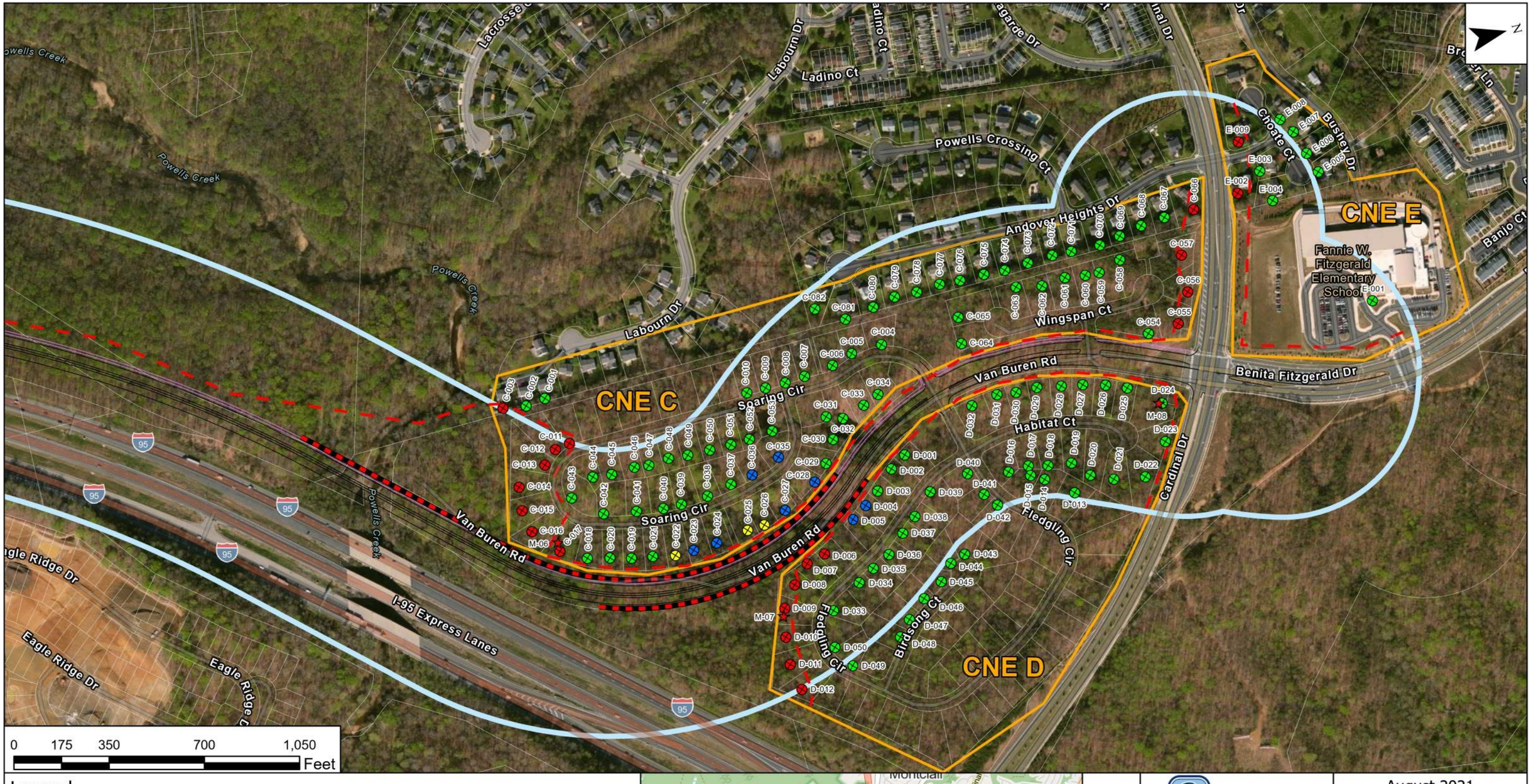

Legend

- ROADWAY DESIGN
- BIKE TRAIL
- 66 DBA CONTOUR
- STUDY AREA (500 FT BUFFER)
- COMMON NOISE ENVIRONMENTS
- PARCELS

POTENTIAL BARRIERS

- WARRANTED, NOT FEASIBLE, NOT REASONABLE

MODELED NOISE RECEPTORS

- ACQUIRED
- IMPACTED, BENEFITTED
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- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED
- NOISE MEASUREMENT LOCATION

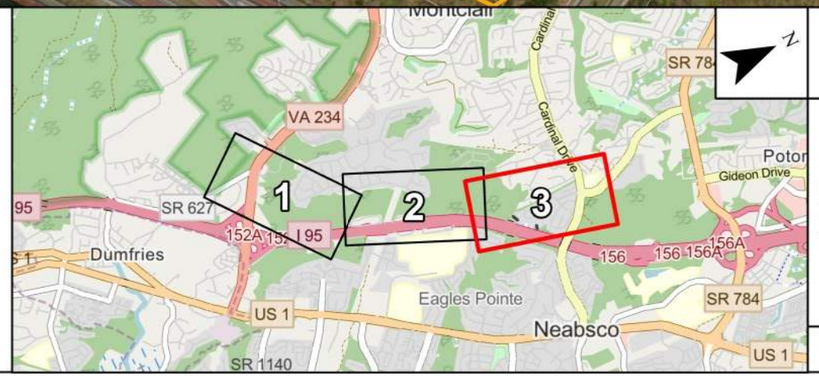

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Figure 2

VAN BUREN EXTENSION PROJECT
UPC: TBD

PRELIMINARY NOISE REPORT

PRINCE WILLIAM COUNTY, VIRGINIA

Job No. JN207542 | 1 inch = 350 Feet

DATA TABLES

TABLE 7

VAN BUREN EXISTING, NO BUILD, AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)	
							2020 Existing	2040 Build
CNE A	A-001	16915 OLD STAGE RD, DUMFRIES VA	1	B	Residence	66	65	67
	A-002	3929 COPPER MILL DR, DUMFRIES VA	1	B	Residence	66	62	64
	A-003	3925 COPPER MILL DR, DUMFRIES VA	1	B	Residence	66	62	65
	A-004	16815 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	58	62
	A-005	16801 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	58	62
	A-006	16797 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	57	61
	A-007	16789 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	55	60
	A-008	16793 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	56	60
	A-009	16781 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	52	55
	A-010	16785 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	51	56
	A-011	16802 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	55	58
	A-012	16806 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	57	59
	A-013	16810 MILL STATION WAY, DUMFRIES VA	1	B	Residence	66	57	59
	A-014	3932 COPPER MILL DR, DUMFRIES VA	1	B	Residence	66	58	60
CNE B	B-001	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	48	54
	B-002	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	56
	B-003	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	50	57
	B-004	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	51	58
	B-005	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	51	58
	B-006	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	52	59
	B-007	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	52	59
	B-008	17393 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	52	59
	B-009	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	51	57
	B-010	17385 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	52	59
	B-011	17381 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	53	59
	B-012	17361 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	52	52
	B-013	17365 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	50	51
	B-014	17309 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	50
	B-015	17309 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	49
	B-016	17309 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	48	49
	B-017	17309 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	48	49
	B-018	17315 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	48	49
	B-019	17313 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	48	49
	B-020	17309 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	50
	B-021	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	50
	B-022	3704 CHAPMAN MILL TRL, DUMFRIES VA	1	B	Residence	66	50	51
	B-023	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	50	51
	B-024	3712 CHAPMAN MILL TRL, DUMFRIES VA	1	B	Residence	66	50	51
	B-025	3716 CHAPMAN MILL TRL, DUMFRIES VA	1	B	Residence	66	49	51
	B-026	3720 CHAPMAN MILL TRL, DUMFRIES VA	1	B	Residence	66	49	51
	B-027	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	51
	B-028	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	50
	B-029	3732 CHAPMAN MILL TRL, DUMFRIES VA	1	B	Residence	66	48	50
	B-030	3736 CHAPMAN MILL TRL, DUMFRIES VA	1	B	Residence	66	48	50
	B-031	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	48	50
	B-032	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	47	50
	B-033	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	46	49
	B-034	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	46	48
	B-035	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	47	49
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	B-037	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	46
	B-038	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	46
	B-039	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	46
	B-040	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	44	45
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	B-044	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	46
	B-045	17213 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	46
	B-046	17195 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	46
	B-047	17127 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	45	47
	B-048	17185 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	46	47
	B-049	17127 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	46	47
	B-050	17127 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	46	47
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	B-054	17127 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	47	49
	B-055	17135 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	49	50

	B-056	17127 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	51	52
	B-057	3667 SECRET GROVE CT, DUMFRIES VA	1	B	Residence	66	50	52
	B-058	3663 SECRET GROVE CT, DUMFRIES VA	1	B	Residence	66	51	53
	B-059	3659 SECRET GROVE CT, DUMFRIES VA	1	B	Residence	66	52	53
	B-060	17041 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	52	55
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	B-066	3631 SECRET GROVE CT, DUMFRIES VA	1	B	Residence	66	53	57
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	B-068	17041 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	54	57
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	B-073	17041 FOUR SEASONS DR, DUMFRIES VA	1	B	Residence	66	56	59
CNE C	C-001	3312 LABOURN DR, WOODBRIDGE VA	1	B	Residence	66	59	64
	C-002	3308 LABOURN DR, WOODBRIDGE VA	1	B	Residence	66	60	65
	C-003	3304 LABOURN DR, WOODBRIDGE VA	1	B	Residence	66	62	68
	C-004	3304 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	48	53
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	C-007	3316 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	58	62
	C-008	3320 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	59	62
	C-009	3324 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	59	63
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	C-011	3364 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	62	66
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	C-016	3384 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	71	74
	C-017	3388 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	66	69
	C-018	3392 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	61	65
	C-019	3396 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	61	65
	C-020	3400 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	56	59
	C-021	3404 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	60	63
	C-022	3408 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	63	66
	C-023	3412 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	60	62
	C-024	3416 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	62	65
	C-025	3420 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	62	66
	C-026	3424 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	61	66
	C-027	3428 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	60	65
	C-028	3432 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	56	61
	C-029	3436 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	56	63
	C-030	3440 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	54	61
	C-031	3444 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	53	59
	C-032	3315 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	54	61
	C-033	3311 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	56	63
	C-034	3307 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	56	63
	C-035	3433 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	58	62
	C-036	3427 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	57	60
	C-037	3421 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	53	56
	C-038	3417 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	49	52
	C-039	3413 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	48	51
	C-040	3407 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	48	51
	C-041	3401 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	48	51
	C-042	3397 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	47	50
	C-043	3379 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	53	55
	C-044	3365 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	56	59
	C-045	3357 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	55	58
	C-046	3353 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	54	57
	C-047	3349 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	53	55
	C-048	3345 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	51	53
	C-049	3341 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	49	52
	C-050	3337 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	52	54
	C-051	3333 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	51	54
	C-052	3329 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	51	54
	C-053	3445 SOARING CIR, WOODBRIDGE VA	1	B	Residence	66	45	48
	C-054	15609 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	62	65
	C-055	15605 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	66	68
	C-056	15601 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	67	68
	C-057	15600 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	65	67
	C-058	15608 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	57	60

	C-059	15612 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	54	57
	C-060	15616 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	52	56
	C-061	15620 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	48	53
	C-062	15624 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	52	55
	C-063	15628 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	52	56
	C-064	15636 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	55	61
	C-065	15632 WINGSPAN CT, WOODBRIDGE VA	1	B	Residence	66	55	60
	C-066	15551 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	66	68
	C-067	15561 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	60	62
	C-068	15571 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	57	59
	C-069	15581 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	54	57
	C-070	15591 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	52	55
	C-071	15601 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	50	54
	C-072	15611 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	50	54
	C-073	15621 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	49	54
	C-074	15631 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	50	55
	C-075	15641 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	52	56
	C-076	15651 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	52	56
	C-077	15661 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	52	56
	C-078	15671 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	51	56
	C-079	15681 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	52	57
	C-080	15691 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	53	58
	C-081	15701 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	51	56
	C-082	15711 ANDOVER HEIGHTS DR, WOODBRIDGE VA	1	B	Residence	66	50	54
CNE D	D-001	3253 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	57	64
	D-002	3249 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	57	64
	D-003	3245 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	58	64
	D-004	3241 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	59	64
	D-005	3237 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	59	64
	D-006	3231 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	61	66
	D-007	3227 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	62	67
	D-008	3223 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	64	67
	D-009	3219 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	65	68
	D-010	3215 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	66	68
	D-011	3211 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	65	68
	D-012	3207 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	66	69
	D-013	3127 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	58	60
	D-014	3123 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	53	56
	D-015	3117 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	54	58
	D-016	15639 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	49	54
	D-017	15629 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	54	57
	D-018	15625 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	55	58
	D-019	15617 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	56	59
	D-020	15611 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	59	61
	D-021	15605 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	50	52
	D-022	15601 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	55	57
	D-023	15602 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	56	58
	D-024	15606 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	59	61
	D-025	15610 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	54	59
	D-026	15614 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	53	57
	D-027	15618 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	52	56
	D-028	15622 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	52	56
	D-029	15626 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	52	56
	D-030	15630 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	52	57
	D-031	15634 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	53	58
	D-032	15638 HABITAT CT, WOODBRIDGE VA	1	B	Residence	66	55	61
	D-033	3226 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	50	55
	D-034	3230 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	51	55
	D-035	3234 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	51	55
	D-036	3238 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	52	55
	D-037	3242 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	51	54
	D-038	3246 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	52	55
	D-039	3250 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	54	57
	D-040	3108 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	55	59
	D-041	3112 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	52	55
	D-042	3116 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	51	54
	D-043	15700 BIRDSONG CT, WOODBRIDGE VA	1	B	Residence	66	48	51
	D-044	15704 BIRDSONG CT, WOODBRIDGE VA	1	B	Residence	66	45	49
	D-045	15710 BIRDSONG CT, WOODBRIDGE VA	1	B	Residence	66	50	53
	D-046	15714 BIRDSONG CT, WOODBRIDGE VA	1	B	Residence	66	48	52
	D-047	15718 BIRDSONG CT, WOODBRIDGE VA	1	B	Residence	66	46	49
	D-048	15722 BIRDSONG CT, WOODBRIDGE VA	1	B	Residence	66	46	50
	D-049	3204 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	60	62
	D-050	3214 FLEDGLING CIR, WOODBRIDGE VA	1	B	Residence	66	59	62
	E-001	15500 BENITA FITZGERALD DR, WOODBRIDGE VA	1	D	School	51	41	42
	E-002	3431 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	68	70

CNE E	E-003	3411 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	58	59
	E-004	3401 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	55	57
	E-005	3400 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	49	51
	E-006	3410 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	51	53
	E-007	3420 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	52	53
	E-008	3430 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	53	54
	E-009	3451 CHOATE CT, WOODBRIDGE VA	1	B	Residence	66	65	66
CNE F	F-01	16931 OLD STAGE RD, DUMFRIES VA	1	C	Hotel Patio	66	49	55
	F-02	16959 OLD STAGE RD, DUMFRIES VA	1	C	Hotel Patio	66	52	58
TRAIL	TR-001	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	46	50
	TR-002	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	46	50
	TR-003	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	46	51
	TR-004	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	46	52
	TR-005	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	45	53
	TR-006	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	45	54
	TR-007	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	44	Acquired
	TR-008	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	44	Acquired
	TR-009	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	43	Acquired
	TR-010	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	50	Acquired
	TR-011	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	52	Acquired
	TR-012	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	53	65
	TR-013	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	49	59
	TR-014	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	47	57
	TR-015	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	48	57
	TR-016	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	49	57
	TR-017	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	49	57
	TR-018	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	51	57
	TR-019	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	51	55
	TR-020	17361 FOUR SEASONS DR, DUMFRIES VA	1	C	Trail	66	51	54

NOTE: There may be discrepancies in the reported data resulting from rounding to whole numbers. Noise values, comparisons, and insertion losses are calculated to the tenth of a dB(A) and then rounded for presentation purposes.

APPENDICES

APPENDIX A -
NOISE MEASUREMENT DATA

Site # **M-01** **Description :** 16815 Mill Station Way

Done By: **AJD**

Meter: → **S&L 2 (SN 5093)**

Monitoring Data:

Date	2/9/21			
Start Time	14:06:30			
End Time	14:26:30			
Duration	20 minutes			
Leq (dBA)	55.2			

Atmospheric Data	
Wind Speed (mph)	8.00
Temp. (°F)	50°
Humidity (%)	50%

Traffic Data: 20 Minute

Roadway	I-95		Van Buren		Dumfries			
Direction	NB	SB	NB	SB	WB	EB		
Traffic Total:	1184	1564	197	53	472	514		
Cars	1020	1434	192	44	430	470		
MT	42	30	3	7	20	16		
HT	122	100	2	2	22	28		

Site Data: Site Surface: Grass Grade: Pavement Type: Average

Monitoring Notes

Notes: Construction noise throughout neighborhood including dumptruck activity and house framing (nail guns). Majority of construction noise shielded due to location of noise meter in back yard of 16815 Mill Station Way.

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	2:06:30 PM	50.5	21	2:16:30 PM	54.3	41			61		
2	2:07:00 PM	58.1	22	2:17:00 PM	55.0	42			62		
3	2:07:30 PM	58.0	23	2:17:30 PM	52.5	43			63		
4	2:08:00 PM	55.8	24	2:18:00 PM	55.1	44			64		
5	2:08:30 PM	51.9	25	2:18:30 PM	57.3	45			65		
6	2:09:00 PM	53.3	26	2:19:00 PM	53.6	46			66		
7	2:09:30 PM	56.7	27	2:19:30 PM	50.8	47			67		
8	2:10:00 PM	57.2	28	2:20:00 PM	50.9	48			68		
9	2:10:30 PM	54.0	29	2:20:30 PM	55.1	49			69		
10	2:11:00 PM	51.0	30	2:21:00 PM	55.6	50			70		
11	2:11:30 PM	53.1	31	2:21:30 PM	54.8	51			71		
12	2:12:00 PM	54.2	32	2:22:00 PM	54.3	52			72		
13	2:12:30 PM	54.1	33	2:22:30 PM	58.3	53			73		
14	2:13:00 PM	51.0	34	2:23:00 PM	56.4	54			74		
15	2:13:30 PM	54.3	35	2:23:30 PM	55.3	55			75		
16	2:14:00 PM	56.4	36	2:24:00 PM	51.3	56			76		
17	2:14:30 PM	56.2	37	2:24:30 PM	55.8	57			77		
18	2:15:00 PM	54.5	38	2:25:00 PM	59.4	58			78		
19	2:15:30 PM	53.9	39	2:25:30 PM	56.3	59			79		
20	2:16:00 PM	56.7	40	2:26:00 PM	54.5	60			80		

Site # M-02 **Description :** 17381 Four Seasons Drive

Done By: AJD, EJA

Meter: → Rion 1 (464709)

Monitoring Data:

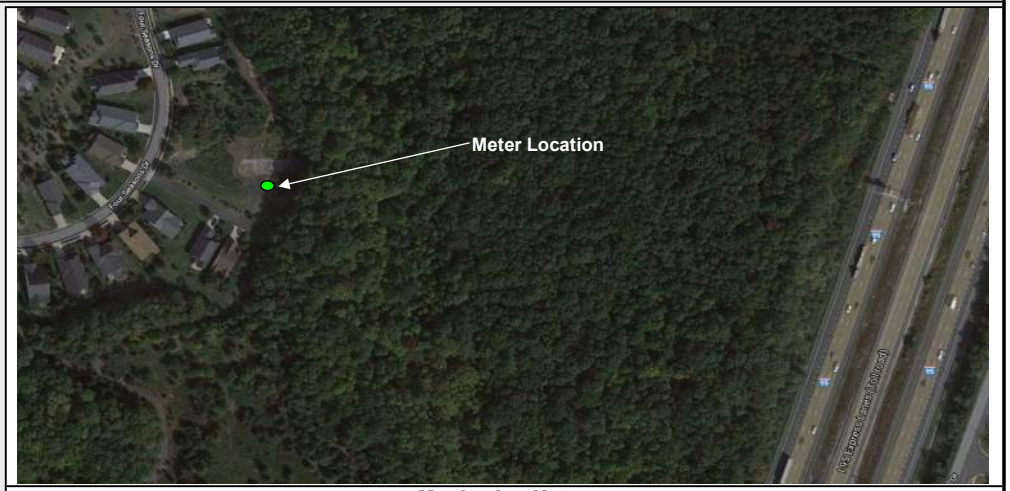
Date	2/9/21			
Start Time	14:06:30			
End Time	14:26:30			
Duration	20 min			
Leq (dBA)	47.7			

Traffic Data: 20 Minute

Roadway	I-95		Van Buren		Dumfries			
Direction	NB	SB	NB	SB	WB	EB		
Traffic Total:	1184	1564	197	53	472	514		
Cars	1020	1434	192	44	430	470		
MT	42	30	3	7	20	16		
HT	122	100	2	2	22	28		

Atmospheric Data	
Wind Speed (mph)	8.00
Temp. (°F)	50°
Humidity (%)	50%

Site Data: Site Surface: Grass Grade: Pavement Type: Average



Monitoring Notes

Notes: Noise meter secured to fencepost of drainage field fence. Hawk in nearby tree was producing loud alarm calls while meter was being placed.

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	2:03:48 PM	46.8	21			41			61		
2	2:08:48 PM	46.7	22			42			62		
3	2:13:48 PM	48.5	23			43			63		
4	2:18:48 PM	48.5	24			44			64		
5	2:23:48 PM	48.3	25			45			65		
6			26			46			66		
7			27			47			67		
8			28			48			68		
9			29			49			69		
10			30			50			70		
11			31			51			71		
12			32			52			72		
13			33			53			73		
14			34			54			74		
15			35			55			75		
16			36			56			76		
17			37			57			77		
18			38			58			78		
19			39			59			79		
20			40			60			80		

Site # M-03 **Description :** 3736 Chapman Mill Trail

Done By: AJD

Meter: → Rion 3 (1198633)

Monitoring Data:

Date	2/9/21		
Start Time	14:06:30		
End Time	14:26:30		
Duration	20 minutes		
Leq (dBA)	**48.6**		

Traffic Data: 20 Minute

Roadway	I-95		Van Buren		Dumfries			
Direction	NB	SB	NB	SB	WB	EB		
Traffic Total:	1184	1564	197	53	472	514		
Cars	1020	1434	192	44	430	470		
MT	42	30	3	7	20	16		
HT	122	100	2	2	22	28		

Atmospheric Data	
Wind Speed (mph)	8.00
Temp. (°F)	50°
Humidity (%)	50%

Site Data: Site Surface: Grass Grade: Pavement Type: Average

Monitoring Notes

Notes:

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	2:06:16 PM	45.4	21	2:16:16 PM	52.5	41			61		
2	2:06:46 PM	46.5	22	2:16:46 PM	50.8	42			62		
3	2:07:16 PM	46.5	23	2:17:16 PM	47.3	43			63		
4	2:07:46 PM	46.3	24	2:17:46 PM	46.2	44			64		
5	2:08:16 PM	47.1	25	2:18:16 PM	47.1	45			65		
6	2:08:46 PM	45.9	26	2:18:46 PM	48.7	46			66		
7	2:09:16 PM	46.3	27	2:19:16 PM	53.5	47			67		
8	2:09:46 PM	46.3	28	2:19:46 PM	53.3	48			68		
9	2:10:16 PM	46.4	29	2:20:16 PM	49.0	49			69		
10	2:10:46 PM	46.6	30	2:20:46 PM	48.4	50			70		
11	2:11:16 PM	46.8	31	2:21:16 PM	45.4	51			71		
12	2:11:46 PM	47.8	32	2:21:46 PM	53.7	52			72		
13	2:12:16 PM	45.9	33	2:22:16 PM	48.3	53			73		
14	2:12:46 PM	46.9	34	2:22:46 PM	49.4	54			74		
15	2:13:16 PM	46.8	35	2:23:16 PM	50.5	55			75		
16	2:13:46 PM	47.3	36	2:23:46 PM	48.8	56			76		
17	2:14:16 PM	49.0	37	2:24:16 PM	46.4	57			77		
18	2:14:46 PM	49.7	38	2:24:46 PM	46.0	58			78		
19	2:15:16 PM	46.4	39	2:25:16 PM	47.7	59			79		
20	2:15:46 PM	48.1	40	2:25:46 PM	47.3	60			80		

Site # M-04 **Description :** 3601 Secret Grove Court

Done By: EJA

Meter: → S&L 1 (SN 3895)

Monitoring Data:

Date	2/9/21		
Start Time	14:06:30		
End Time	14:26:30		
Duration	20 minutes		
Leq (dBA)	**52.0**		

Atmospheric Data

Wind Speed (mph)	**8.00**
Temp. (°F)	**50°**
Humidity (%)	**50%**

Traffic Data: 20 Minute

Roadway	I-95		Van Buren		Dumfries					
Direction	NB	SB	NB	SB	WB	EB				
Traffic Total:	1184	1564	197	53	472	514				
Cars	1020	1434	192	44	430	470				
MT	42	30	3	7	20	16				
HT	122	100	2	2	22	28				

Site Data: Site Surface: Grass Grade: Pavement Type: Average

Monitoring Notes

Notes: Site is relatively quiet. Can hear leaves rustling in wind over I-95 traffic noise, although I-95 traffic noise is the dominant noise source.

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	2:06:30 PM	50.0	21	2:16:30 PM	52.6	41			61		
2	2:07:00 PM	53.6	22	2:17:00 PM	51.7	42			62		
3	2:07:30 PM	49.9	23	2:17:30 PM	51.8	43			63		
4	2:08:00 PM	51.2	24	2:18:00 PM	51.5	44			64		
5	2:08:30 PM	50.7	25	2:18:30 PM	52.3	45			65		
6	2:09:00 PM	51.4	26	2:19:00 PM	54.3	46			66		
7	2:09:30 PM	51.8	27	2:19:30 PM	52.8	47			67		
8	2:10:00 PM	50.9	28	2:20:00 PM	52.8	48			68		
9	2:10:30 PM	52.7	29	2:20:30 PM	50.7	49			69		
10	2:11:00 PM	51.4	30	2:21:00 PM	51.2	50			70		
11	2:11:30 PM	51.1	31	2:21:30 PM	49.9	51			71		
12	2:12:00 PM	52.7	32	2:22:00 PM	53.0	52			72		
13	2:12:30 PM	52.8	33	2:22:30 PM	54.0	53			73		
14	2:13:00 PM	53.2	34	2:23:00 PM	52.0	54			74		
15	2:13:30 PM	52.5	35	2:23:30 PM	50.0	55			75		
16	2:14:00 PM	52.0	36	2:24:00 PM	51.1	56			76		
17	2:14:30 PM	51.5	37	2:24:30 PM	50.4	57			77		
18	2:15:00 PM	49.6	38	2:25:00 PM	51.4	58			78		
19	2:15:30 PM	53.2	39	2:25:30 PM	52.2	59			79		
20	2:16:00 PM	53.2	40	2:26:00 PM	53.9	60			80		

Site # M-06 **Description :** 3388 Soaring Circle

Done By: AJD, EJA

Meter: → S&L 3 (SN 3897)

Monitoring Data:

Date	2/9/21			
Start Time	12:22:00			
End Time	12:42:00			
Duration	20 min			
Leq (dBA)	**59.8**			

Atmospheric Data	
Wind Speed (mph)	**5.00**
Temp. (°F)	**47°**
Humidity (%)	**56%**

Traffic Data: 20 Minute

Roadway	I-95		Cardinal Drive		Van Buren		Benita Fitzgerald	
Direction	NB	SB	EB	WB	NB	SB	NB	SB
Traffic Total:	1344	1334	214	133	5	13	120	96
Cars	1120	1134	214	129	5	11	120	90
MT	46	38	0	4		2	0	6
HT	178	162	0	0			0	0

Site Data: Site Surface: Grass Grade: Pavement Type: Average

Monitoring Notes

Notes: Noise meter secured to deck post. Wooden noise barrier (ineffective) present in back yard.
I-95 travel lanes visible from site of meter placement.

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	12:20:00 PM	59.5	21			41			61		
2	12:25:00 PM	59.5	22			42			62		
3	12:30:00 PM	60.0	23			43			63		
4	12:35:00 PM	60.0	24			44			64		
5	12:40:00 PM	60.1	25			45			65		
6			26			46			66		
7			27			47			67		
8			28			48			68		
9			29			49			69		
10			30			50			70		
11			31			51			71		
12			32			52			72		
13			33			53			73		
14			34			54			74		
15			35			55			75		
16			36			56			76		
17			37			57			77		
18			38			58			78		
19			39			59			79		
20			40			60			80		

Site # M-07 **Description :** 3215 Flegling Circle

Done By: AJD

Meter: → S&L 2 (SN 5093)

Monitoring Data:

Date	2/9/21			
Start Time	12:22:00			
End Time	12:42:00			
Duration	20 minutes			
Leq (dBA)	63.3			

Atmospheric Data	
Wind Speed (mph)	5.00
Temp. (°F)	47°
Humidity (%)	56%

Traffic Data: 20 Minute

Roadway	I-95		Cardinal Drive		Van Buren		Benita Fitzgerald	
Direction	NB	SB	EB	WB	NB	SB	NB	SB
Traffic Total:	1344	1334	214	133	5	13	120	96
Cars	1120	1134	214	129	5	11	120	90
MT	46	38	0	4		2	0	6
HT	178	162	0	0			0	0

Site Data: Site Surface: Grass Grade: Pavement Type: Average

Monitoring Notes

Notes:

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	12:22:00 PM	61.9	21	12:32:00 PM	63.8	41			61		
2	12:22:30 PM	61.7	22	12:32:30 PM	69.7	42			62		
3	12:23:00 PM	61.4	23	12:33:00 PM	64.0	43			63		
4	12:23:30 PM	62.3	24	12:33:30 PM	64.1	44			64		
5	12:24:00 PM	62.1	25	12:34:00 PM	64.1	45			65		
6	12:24:30 PM	62.2	26	12:34:30 PM	63.2	46			66		
7	12:25:00 PM	61.2	27	12:35:00 PM	64.2	47			67		
8	12:25:30 PM	61.9	28	12:35:30 PM	63.5	48			68		
9	12:26:00 PM	61.5	29	12:36:00 PM	64.0	49			69		
10	12:26:30 PM	63.0	30	12:36:30 PM	62.4	50			70		
11	12:27:00 PM	63.1	31	12:37:00 PM	62.6	51			71		
12	12:27:30 PM	63.8	32	12:37:30 PM	61.8	52			72		
13	12:28:00 PM	63.4	33	12:38:00 PM	62.4	53			73		
14	12:28:30 PM	63.0	34	12:38:30 PM	62.2	54			74		
15	12:29:00 PM	62.7	35	12:39:00 PM	61.0	55			75		
16	12:29:30 PM	63.3	36	12:39:30 PM	63.4	56			76		
17	12:30:00 PM	62.4	37	12:40:00 PM	62.2	57			77		
18	12:30:30 PM	63.5	38	12:40:30 PM	63.1	58			78		
19	12:31:00 PM	63.6	39	12:41:00 PM	63.2	59			79		
20	12:31:30 PM	64.3	40	12:41:30 PM	62.5	60			80		

Site # M-08 **Description :** 15606 Habitat Court

Done By: AJD

Meter: → Rion 3 (1198633)

Atmospheric Data	
Wind Speed (mph)	5.00
Temp. (°F)	47°
Humidity (%)	56%

Monitoring Data:

Date	2/9/21
Start Time	12:22:00
End Time	12:42:00
Duration	20 minutes
Leq (dBA)	**48.2**

Traffic Data: 20 Minute

Roadway	I-95		Cardinal Drive		Van Buren		Benita Fitzgerald	
Direction	NB	SB	EB	WB	NB	SB	NB	SB
Traffic Total:	1344	1334	214	133	5	13	120	96
Cars	1120	1134	214	129	5	11	120	90
MT	46	38	0	4		2	0	6
HT	178	162	0	0			0	0

Site Data: Site Surface: Grass Grade: Pavement Type: Average

Monitoring Notes

Notes:

Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)	Num	Time	Lav (dBA)
1	12:21:51 PM	45.6	21	12:31:51 PM	47.6	41			61		
2	12:22:21 PM	44.5	22	12:32:21 PM	44.9	42			62		
3	12:22:51 PM	44.4	23	12:32:51 PM	44.7	43			63		
4	12:23:21 PM	47.4	24	12:33:21 PM	45.3	44			64		
5	12:23:51 PM	44.9	25	12:33:51 PM	45.5	45			65		
6	12:24:21 PM	47.9	26	12:34:21 PM	43.8	46			66		
7	12:24:51 PM	49.1	27	12:34:51 PM	43.7	47			67		
8	12:25:21 PM	49.7	28	12:35:21 PM	46.2	48			68		
9	12:25:51 PM	45.7	29	12:35:51 PM	45.9	49			69		
10	12:26:21 PM	46.0	30	12:36:21 PM	48.1	50			70		
11	12:26:51 PM	46.6	31	12:36:51 PM	56.0	51			71		
12	12:27:21 PM	53.1	32	12:37:21 PM	47.2	52			72		
13	12:27:51 PM	54.6	33	12:37:51 PM	44.2	53			73		
14	12:28:21 PM	46.6	34	12:38:21 PM	45.4	54			74		
15	12:28:51 PM	49.2	35	12:38:51 PM	47.9	55			75		
16	12:29:21 PM	43.2	36	12:39:21 PM	46.1	56			76		
17	12:29:51 PM	45.3	37	12:39:51 PM	48.6	57			77		
18	12:30:21 PM	51.9	38	12:40:21 PM	47.6	58			78		
19	12:30:51 PM	43.6	39	12:40:51 PM	45.6	59			79		
20	12:31:21 PM	47.7	40	12:41:21 PM	45.7	60			80		

```
**********************************************************************
Filename..............M01
Test Location..........16815 Mill Station Way
Employee Name..........AJD
Employee Number........
Department.............ENV
          VDOT Van Buren Road Exten
          sion 20 minute short-term
           traffic noise measuremen
          ts
Calibrator Type........Metrosonics CL304 SN4480
Calibrator Cal. Date...2020-06-02
**********************************************************************

METROSONICS db-3080  V1.20  SERIAL # 5093
REPORT PRINTED ON 02/10/21 at 04:25:22

User ID: _____________________________




LOGGING STARTED......02/09/21 at 13:58:30
TOTAL LOGGING TIME...0 DAYS 00:41:36
LOGGING STOPPED......02/09/21 at 14:40:06
TOTAL INTERVALS......84
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....02/09/21 AT 10:27:25
PRE-TEST CALIBRATION RANGE...40.9 TO 140.9 dB
POST-TEST CALIBRATION TIME...02/10/21 AT 04:12:35
POST-TEST CALIBRATION RANGE...40.9 TO 140.9
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS.............. 80dB  90dB
CEILING...............115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS
```

Lav..... 56.3dB
Lav (80)...... 40.9dB
Lav (90)...... 40.9dB
SEL..... 90.2dB

TWA..... 45.8dB
TWA (80)...... 40.9dB
TWA (90)...... 40.9dB

Lmax..... 80.0dB 02/09/21 at 14:32:02
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)........   0.00%
PROJ. DOSE (80)..   0.00%
DOSE (90)........   0.00%
PROJ. DOSE (90)..   0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
02/09/21					
13:58:30	60.8	73.5	UNDER	61.9	51.9
13:59:00	55.6	59.6	UNDER	57.9	52.9
13:59:30	52.7	55.3	UNDER	54.9	50.9
14:00:00	51.3	55.1	UNDER	52.9	49.9
14:00:30	52.0	55.7	UNDER	54.9	48.9
14:01:00	58.3	65.5	UNDER	61.9	54.9
14:01:30	56.6	60.4	UNDER	59.9	52.9
14:02:00	52.7	55.2	UNDER	54.9	50.9
14:02:30	53.6	55.7	UNDER	54.9	50.9
14:03:00	54.7	58.3	UNDER	55.9	53.9
14:03:30	55.2	57.0	UNDER	56.9	52.9
14:04:00	52.7	56.4	UNDER	54.9	50.9
14:04:30	51.2	52.4	UNDER	51.9	50.9
14:05:00	54.5	58.3	UNDER	57.9	51.9
14:05:30	55.5	59.5	UNDER	57.9	53.9
14:06:00	54.2	60.0	UNDER	57.9	50.9
14:06:30	50.5	51.6	UNDER	51.9	49.9
14:07:00	58.1	64.1	UNDER	62.9	49.9
14:07:30	58.0	63.9	UNDER	59.9	55.9
14:08:00	55.8	57.7	UNDER	57.9	52.9
14:08:30	51.9	53.9	UNDER	52.9	50.9
14:09:00	53.3	59.5	UNDER	55.9	49.9
14:09:30	56.7	60.9	UNDER	60.9	51.9
14:10:00	57.2	61.1	UNDER	60.9	53.9
14:10:30	54.0	57.9	UNDER	56.9	51.9

14:11:00	51.0	52.4	UNDER	52.9	49.9
14:11:30	53.1	55.5	UNDER	54.9	51.9
14:12:00	54.2	55.2	UNDER	55.9	53.9
14:12:30	54.1	57.9	UNDER	56.9	49.9
14:13:00	51.0	53.1	UNDER	51.9	49.9
14:13:30	54.3	56.8	UNDER	56.9	51.9
14:14:00	56.4	59.3	UNDER	58.9	53.9
14:14:30	56.2	59.6	UNDER	58.9	53.9
14:15:00	54.5	58.7	UNDER	56.9	51.9
14:15:30	53.9	64.7	UNDER	55.9	49.9
14:16:00	56.7	62.0	UNDER	60.9	50.9
14:16:30	54.3	55.6	UNDER	55.9	52.9
14:17:00	55.0	62.8	UNDER	58.9	50.9
14:17:30	52.5	56.7	UNDER	54.9	50.9
14:18:00	55.1	57.9	UNDER	57.9	51.9
14:18:30	57.3	59.9	UNDER	59.9	54.9
14:19:00	53.6	56.7	UNDER	55.9	50.9
14:19:30	50.8	53.3	UNDER	51.9	49.9
14:20:00	50.9	54.3	UNDER	53.9	48.9
14:20:30	55.1	58.0	UNDER	56.9	52.9
14:21:00	55.6	56.7	UNDER	56.9	53.9
14:21:30	54.8	60.7	UNDER	58.9	50.9
14:22:00	54.3	57.5	UNDER	55.9	50.9
14:22:30	58.3	63.6	UNDER	62.9	54.9
14:23:00	56.4	57.6	UNDER	57.9	54.9
14:23:30	55.3	60.9	UNDER	58.9	51.9
14:24:00	51.3	54.7	UNDER	53.9	49.9
14:24:30	55.8	59.9	UNDER	58.9	49.9
14:25:00	59.4	63.1	UNDER	62.9	56.9
14:25:30	56.3	60.2	UNDER	58.9	52.9
14:26:00	54.5	56.8	UNDER	56.9	52.9
14:26:30	56.0	60.2	UNDER	58.9	52.9
14:27:00	56.2	59.1	UNDER	57.9	54.9
14:27:30	55.0	58.0	UNDER	56.9	52.9
14:28:00	52.0	56.7	UNDER	53.9	49.9
14:28:30	53.8	58.7	UNDER	56.9	50.9
14:29:00	60.9	70.0	UNDER	63.9	53.9
14:29:30	52.9	54.8	UNDER	54.9	51.9
14:30:00	52.5	58.7	UNDER	54.9	49.9
14:30:30	51.7	54.5	UNDER	53.9	49.9
14:31:00	58.4	71.5	UNDER	59.9	52.9
14:31:30	54.6	59.1	UNDER	56.9	52.9
14:32:00	65.5	80.0	UNDER	67.9	49.9
14:32:30	54.2	56.8	UNDER	55.9	51.9
14:33:00	58.4	62.9	UNDER	61.9	53.9
14:33:30	59.4	68.0	UNDER	62.9	49.9
14:34:00	56.0	63.5	UNDER	60.9	49.9
14:34:30	50.3	52.4	UNDER	51.9	47.9
14:35:00	52.8	56.1	UNDER	54.9	48.9
14:35:30	56.8	62.9	UNDER	59.9	53.9

14:36:00	53.8	58.4	UNDER	56.9	50.9
14:36:30	52.5	56.2	UNDER	54.9	50.9
14:37:00	53.0	59.5	UNDER	56.9	49.9
14:37:30	55.1	56.8	UNDER	56.9	53.9
14:38:00	55.2	59.1	UNDER	57.9	53.9
14:38:30	52.0	53.6	UNDER	52.9	50.9
14:39:00	53.2	55.4	UNDER	54.9	51.9
14:39:30	65.8	72.9	UNDER	70.9	51.9
14:40:00	65.8	77.4	UNDER	65.9	57.9

Measurement Site M-02
17381 Four Seasons Drive

CSV
[Setting]

[Property]
System Version,1.7
NX-42EX Version,1.6
NX-42WR Version,1.6
NX-42RT Version,1.6
NX-42FT Version,1.2
Serial Number,464709

[NL-42]
Store Name,1001
Type,NL-52
Index Number,1
Frequency Weighting,A
Time Weighting,S
Output Level Range Upper,130
Output Level Range Lower,30
Delay Time,Off
Windscreen Correction,WS-10
Diffuse Sound Field Correction,Off
LN Mode,Leq_1s
Display Leq,On
Display LE,Off
Display Lmax,On
Display Lmin,On
Display Ly,Off
Display LN1,Off
Display LN2,Off
Display LN3,Off
Display LN4,Off
Display LN5,Off
Display Time Level,On
Percentile 1,5
Percentile 2,10
Percentile 3,50
Percentile 4,90
Percentile 5,95.0
Ly Type,Off
AC OUT,Main
DC OUT,Off
Comparator,Off
Comparator Level,70
Comparator Channel,Main
Battery Type,Alkaline
Communication Interface,RS232C

Baud Rate,9600
Language,English

[NX-42EX]
Lp Store Interval,Leq_1s
Leq Calculation Interval,5 m
Timer Auto Start Time,-
Timer Auto Stop Time,-
Timer Auto Interval,-
Sleep Mode,Off

[Status]
Measurement Start Time,2021/02/09 10:18:48
Measurement Stop Time,2021/02/10 13:12:08
Lp Data Number,96799
Leq Data Number,323
Measure Time,01d 02:53:19.4

Address,Start Time,Measurement
Time,Leq,LE,Lmax,Lmin,Ly,LN1,LN2,LN3,LN4,LN5,Over,Under,
1,2021/02/09 10:18:48,00d 00:05:00.0, 78.9,103.7,103.0, 46.8, -.-, 71.9, 66.9, 48.8, 47.3, 47.1,----,-----,
2,2021/02/09 10:23:48,00d 00:05:00.0, 69.7, 94.5, 88.2, 46.7, -.-, 72.7, 68.2, 49.5, 47.3, 47.1,----,-----,
3,2021/02/09 10:28:48,00d 00:05:00.0, 50.2, 75.0, 55.8, 46.4, -.-, 54.4, 53.7, 48.7, 47.3, 47.0,----,-----,
4,2021/02/09 10:33:48,00d 00:05:00.0, 51.4, 76.2, 59.6, 46.3, -.-, 54.8, 54.3, 50.4, 47.4, 47.1,----,-----,
5,2021/02/09 10:38:48,00d 00:05:00.0, 50.1, 74.9, 56.0, 46.2, -.-, 54.2, 53.6, 48.4, 47.0, 46.7,----,-----,
6,2021/02/09 10:43:48,00d 00:05:00.0, 50.2, 75.0, 60.2, 44.9, -.-, 55.9, 52.6, 48.2, 46.3, 45.5,----,-----,
7,2021/02/09 10:48:48,00d 00:05:00.0, 49.0, 73.8, 54.0, 46.5, -.-, 51.2, 50.4, 48.6, 47.3, 47.1,----,-----,
8,2021/02/09 10:53:48,00d 00:05:00.0, 47.9, 72.7, 53.0, 45.8, -.-, 49.9, 49.2, 47.7, 46.4, 46.3,----,-----,
9,2021/02/09 10:58:48,00d 00:05:00.0, 47.3, 72.1, 51.6, 44.2, -.-, 48.9, 48.4, 47.2, 45.8, 45.3,----,-----,
10,2021/02/09 11:03:48,00d 00:05:00.0, 46.6, 71.4, 51.0, 44.1, -.-, 48.5, 48.0, 46.3, 45.1, 44.8,----,-----,
11,2021/02/09 11:08:48,00d 00:05:00.0, 46.4, 71.2, 50.1, 44.4, -.-, 48.1, 47.3, 46.3, 45.3, 45.1,----,-----,
12,2021/02/09 11:13:48,00d 00:05:00.0, 46.2, 71.0, 49.2, 44.8, -.-, 47.8, 47.4, 46.1, 45.1, 45.0,----,-----,
13,2021/02/09 11:18:48,00d 00:05:00.0, 47.2, 72.0, 52.8, 45.1, -.-, 49.3, 48.7, 46.9, 45.6, 45.5,----,-----,
14,2021/02/09 11:23:48,00d 00:05:00.0, 47.0, 71.8, 51.3, 44.9, -.-, 48.6, 48.2, 46.8, 45.8, 45.6,----,-----,
15,2021/02/09 11:28:48,00d 00:05:00.0, 47.7, 72.5, 53.9, 45.4, -.-, 50.1, 49.2, 47.3, 45.9, 45.7,----,-----,
16,2021/02/09 11:33:48,00d 00:05:00.0, 47.2, 72.0, 50.1, 45.3, -.-, 48.8, 48.4, 47.1, 45.9, 45.7,----,-----,
17,2021/02/09 11:38:48,00d 00:05:00.0, 48.1, 72.9, 52.8, 45.4, -.-, 50.9, 49.6, 47.5, 46.5, 46.3,----,-----,
18,2021/02/09 11:43:48,00d 00:05:00.0, 47.8, 72.6, 53.8, 44.3, -.-, 51.4, 49.8, 47.1, 45.6, 44.8,----,-----,
19,2021/02/09 11:48:48,00d 00:05:00.0, 55.6, 80.4, 68.7, 44.8, -.-, 61.8, 59.8, 48.7, 46.0, 45.6,----,-----,
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Measurement Site M-03
3736 Chapman Mill Trail

CSV
[Setting]

[Property]
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NX-42EX Version,1.9
NX-42WR Version,1.7
NX-42RT Version,1.9
NX-42FT Version,1.3
Serial Number,1198633

[NL-42]
Store Name,3002
Type,NL-52
Index Number,1
Frequency Weighting,A
Time Weighting,S
Output Level Range Upper,130
Output Level Range Lower,30
Delay Time,Off
Windscreen Correction,WS-10
Diffuse Sound Field Correction,Off
LN Mode,Leq_1s
Display Leq,On
Display LE,Off
Display Lmax,On
Display Lmin,On
Display Ly,Off
Display LN1,Off
Display LN2,Off
Display LN3,Off
Display LN4,Off
Display LN5,Off
Display Time Level,On
Percentile 1,5
Percentile 2,10
Percentile 3,50
Percentile 4,90
Percentile 5,95.0
Ly Type,Off
AC OUT,Main
DC OUT,Main
Comparator,Off
Comparator Level,70
Comparator Channel,Main
Battery Type,Alkaline
Communication Interface,Off

Baud Rate,9600
Language,English

[NX-42EX]
Lp Store Interval,Leq_1s
Leq Calculation Interval,30 s
Timer Auto Start Time,-
Timer Auto Stop Time,-
Timer Auto Interval,-
Sleep Mode,Off

[Status]
Measurement Start Time,2021/02/09 13:37:46
Measurement Stop Time,2021/02/09 15:01:02
Lp Data Number,4996
Leq Data Number,167
Measure Time,00d 01:23:16.3

Address,Start Time,Measurement
Time,Leq,LE,Lmax,Lmin,Ly,LN1,LN2,LN3,LN4,LN5,Over,Under,
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130,2021/02/09 14:42:16,00d 00:00:30.0, 45.6, 60.4, 46.7, 44.9, -.-, 46.9, 46.2, 45.6, 45.0, 45.0,----,-----,
131,2021/02/09 14:42:46,00d 00:00:30.0, 44.7, 59.5, 47.5, 43.7, -.-, 46.8, 46.3, 44.5, 44.0, 43.8,----,-----,
132,2021/02/09 14:43:16,00d 00:00:30.0, 45.0, 59.8, 47.6, 43.5, -.-, 47.2, 47.2, 44.8, 43.9, 43.6,----,-----,
133,2021/02/09 14:43:46,00d 00:00:30.0, 49.6, 64.4, 53.7, 44.8, -.-, 52.9, 52.8, 47.2, 45.2, 44.9,----,-----,
134,2021/02/09 14:44:16,00d 00:00:30.0, 52.5, 67.3, 54.3, 49.3, -.-, 54.1, 54.0, 52.8, 51.0, 50.1,----,-----,
135,2021/02/09 14:44:46,00d 00:00:30.0, 49.0, 63.8, 52.9, 44.2, -.-, 52.1, 51.9, 49.1, 44.6, 44.3,----,-----,
136,2021/02/09 14:45:16,00d 00:00:30.0, 47.4, 62.2, 52.3, 44.2, -.-, 52.0, 51.8, 45.3, 44.6, 44.5,----,-----,
137,2021/02/09 14:45:46,00d 00:00:30.0, 45.7, 60.5, 46.8, 44.9, -.-, 46.7, 46.6, 45.8, 45.0, 44.9,----,-----,
138,2021/02/09 14:46:16,00d 00:00:30.0, 45.3, 60.1, 47.1, 44.1, -.-, 46.9, 46.9, 45.2, 44.3, 44.2,----,-----,
139,2021/02/09 14:46:46,00d 00:00:30.0, 45.3, 60.1, 46.7, 44.1, -.-, 46.7, 46.5, 45.2, 44.6, 44.5,----,-----,
140,2021/02/09 14:47:16,00d 00:00:30.0, 46.4, 61.2, 48.6, 45.5, -.-, 48.4, 47.3, 46.1, 45.6, 45.5,----,-----,
141,2021/02/09 14:47:46,00d 00:00:30.0, 44.5, 59.3, 45.7, 43.7, -.-, 45.2, 45.2, 44.6, 44.0, 43.9,----,-----,
142,2021/02/09 14:48:16,00d 00:00:30.0, 44.4, 59.2, 45.4, 43.5, -.-, 45.5, 45.3, 44.3, 43.7, 43.4,----,-----,
143,2021/02/09 14:48:46,00d 00:00:30.0, 45.1, 59.9, 47.4, 43.7, -.-, 47.5, 46.3, 44.8, 44.0, 43.8,----,-----,
144,2021/02/09 14:49:16,00d 00:00:30.0, 46.3, 61.1, 48.7, 45.0, -.-, 48.4, 48.2, 45.9, 45.6, 44.9,----,-----,
145,2021/02/09 14:49:46,00d 00:00:30.0, 43.9, 58.7, 45.0, 43.2, -.-, 44.6, 44.5, 43.9, 43.4, 43.3,----,-----,
146,2021/02/09 14:50:16,00d 00:00:30.0, 44.9, 59.7, 46.0, 43.8, -.-, 45.9, 45.8, 45.0, 44.1, 44.1,----,-----,
147,2021/02/09 14:50:46,00d 00:00:30.0, 45.6, 60.4, 49.1, 43.9, -.-, 48.6, 48.1, 45.2, 44.1, 43.9,----,-----,
148,2021/02/09 14:51:16,00d 00:00:30.0, 45.5, 60.3, 46.7, 44.8, -.-, 46.8, 46.4, 45.4, 44.9, 44.8,----,-----,
149,2021/02/09 14:51:46,00d 00:00:30.0, 45.2, 60.0, 47.0, 44.3, -.-, 46.5, 46.4, 45.3, 44.5, 44.4,----,-----,

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   150,2021/02/09 14:52:16,00d 00:00:30.0, 44.8, 59.6, 45.3, 44.2,  -.-, 45.3, 45.2,
44.8, 44.3, 44.2,----,-----,
   151,2021/02/09 14:52:46,00d 00:00:30.0, 46.2, 61.0, 47.6, 44.5,  -.-, 47.7, 47.6,
46.0, 44.8, 44.6,----,-----,
   152,2021/02/09 14:53:16,00d 00:00:30.0, 46.3, 61.1, 48.5, 45.5,  -.-, 47.5, 47.3,
46.2, 45.7, 45.6,----,-----,
   153,2021/02/09 14:53:46,00d 00:00:30.0, 46.6, 61.4, 47.9, 44.3,  -.-, 48.0, 47.8,
46.7, 45.5, 44.2,----,-----,
   154,2021/02/09 14:54:16,00d 00:00:30.0, 45.7, 60.5, 47.0, 44.2,  -.-, 46.7, 46.5,
45.7, 44.9, 44.6,----,-----,
   155,2021/02/09 14:54:46,00d 00:00:30.0, 46.2, 61.0, 48.4, 44.7,  -.-, 47.9, 47.4,
45.9, 45.0, 44.7,----,-----,
   156,2021/02/09 14:55:16,00d 00:00:30.0, 44.8, 59.6, 45.8, 43.8,  -.-, 45.7, 45.6,
45.0, 43.9, 43.9,----,-----,
   157,2021/02/09 14:55:46,00d 00:00:30.0, 44.5, 59.3, 45.8, 43.3,  -.-, 45.5, 45.4,
44.6, 43.4, 43.3,----,-----,
   158,2021/02/09 14:56:16,00d 00:00:30.0, 44.5, 59.3, 48.4, 42.6,  -.-, 48.2, 47.5,
43.7, 42.7, 42.6,----,-----,
   159,2021/02/09 14:56:46,00d 00:00:30.0, 42.8, 57.6, 47.1, 41.4,  -.-, 46.6, 45.1,
42.1, 41.7, 41.6,----,-----,
   160,2021/02/09 14:57:16,00d 00:00:30.0, 43.5, 58.3, 45.8, 42.0,  -.-, 45.7, 45.4,
43.3, 42.6, 42.4,----,-----,
   161,2021/02/09 14:57:46,00d 00:00:30.0, 44.9, 59.7, 48.6, 42.4,  -.-, 48.5, 48.0,
43.7, 42.8, 42.6,----,-----,
   162,2021/02/09 14:58:16,00d 00:00:30.0, 42.8, 57.6, 44.2, 41.9,  -.-, 43.9, 43.6,
42.9, 42.1, 41.9,----,-----,
   163,2021/02/09 14:58:46,00d 00:00:30.0, 43.7, 58.5, 45.8, 42.3,  -.-, 45.5, 45.5,
43.7, 42.6, 42.5,----,-----,
   164,2021/02/09 14:59:16,00d 00:00:30.0, 43.7, 58.5, 45.4, 42.4,  -.-, 45.1, 45.0,
43.7, 42.6, 42.5,----,-----,
   165,2021/02/09 14:59:46,00d 00:00:30.0, 45.4, 60.2, 48.5, 43.2,  -.-, 48.3, 47.7,
44.6, 43.3, 43.1,----,-----,
   166,2021/02/09 15:00:16,00d 00:00:30.0, 45.6, 60.4, 50.1, 43.4,  -.-, 48.8, 48.6,
44.9, 43.6, 43.5,----,-----,
   167,2021/02/09 15:00:46,00d 00:00:16.3, 44.7, 56.8, 45.9, 43.4,  -.-, 45.7, 45.7,
44.8, 43.4, 43.3,----,-----,
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**********************************************************************
Filename..............M04
Test Location..........3601 Secret Grove Court
Employee Name..........AJD, EJA
Employee Number........
Department.............ENV
          VDOT Van Buren Road Exten
          sion 20 minute short-term
           traffic noise measuremen
          ts
Calibrator Type........Metrosonics CL304 SN4480
Calibrator Cal. Date...2020-06-02
**********************************************************************

METROSONICS db-3080  V1.12  SERIAL # 3895
REPORT PRINTED ON 02/11/21 at 15:44:18

User ID: _____________________________




LOGGING STARTED......02/09/21 at 13:31:00
TOTAL LOGGING TIME...0 DAYS 01:08:21
LOGGING STOPPED......02/09/21 at 14:39:21
TOTAL INTERVALS......137
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....02/09/21 AT 10:26:40
PRE-TEST CALIBRATION RANGE...39.1 TO 139.1 dB
POST-TEST CALIBRATION TIME...02/10/21 AT 04:11:42
POST-TEST CALIBRATION RANGE...39.1 TO 139.1
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS.............. 80dB  90dB
CEILING...............115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS
```

Lav..... 52.3dB
Lav (80)...... 39.1dB
Lav (90)...... 39.1dB
SEL..... 88.3dB

TWA..... 43.9dB
TWA (80)...... 39.1dB
TWA (90)...... 39.1dB

Lmax..... 76.0dB 02/09/21 at 14:39:09
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)........   0.00%
PROJ. DOSE (80)..   0.00%
DOSE (90)........   0.00%
PROJ. DOSE (90)..   0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
02/09/21					
13:31:00	55.2	56.8	UNDER	56.1	53.1
13:31:30	54.0	56.8	UNDER	56.1	52.1
13:32:00	53.6	54.8	UNDER	54.1	53.1
13:32:30	53.1	53.6	UNDER	53.1	52.1
13:33:00	54.6	56.0	UNDER	56.1	52.1
13:33:30	53.0	54.0	UNDER	53.1	52.1
13:34:00	52.5	53.6	UNDER	53.1	51.1
13:34:30	53.1	54.4	UNDER	54.1	51.1
13:35:00	50.6	51.9	UNDER	51.1	49.1
13:35:30	51.8	53.2	UNDER	52.1	50.1
13:36:00	52.1	52.8	UNDER	52.1	51.1
13:36:30	53.0	58.0	UNDER	53.1	52.1
13:37:00	51.1	52.0	UNDER	51.1	50.1
13:37:30	51.2	52.4	UNDER	52.1	49.1
13:38:00	51.8	53.0	UNDER	52.1	51.1
13:38:30	53.4	55.6	UNDER	54.1	52.1
13:39:00	52.9	54.4	UNDER	54.1	50.1
13:39:30	51.4	52.8	UNDER	52.1	50.1
13:40:00	51.8	53.1	UNDER	52.1	50.1
13:40:30	51.2	51.9	UNDER	51.1	50.1
13:41:00	51.7	52.9	UNDER	52.1	50.1
13:41:30	51.4	52.2	UNDER	52.1	50.1
13:42:00	54.5	66.8	UNDER	52.1	50.1
13:42:30	51.9	57.2	UNDER	52.1	50.1
13:43:00	53.2	55.6	UNDER	54.1	51.1

13:43:30	52.1	53.5	UNDER	52.1	51.1
13:44:00	51.6	53.0	UNDER	52.1	50.1
13:44:30	51.2	52.0	UNDER	51.1	50.1
13:45:00	52.0	58.4	UNDER	52.1	50.1
13:45:30	51.2	53.6	UNDER	52.1	49.1
13:46:00	51.9	53.0	UNDER	52.1	50.1
13:46:30	52.3	52.8	UNDER	52.1	50.1
13:47:00	52.7	53.6	UNDER	53.1	52.1
13:47:30	52.8	54.1	UNDER	53.1	52.1
13:48:00	54.3	57.2	UNDER	56.1	51.1
13:48:30	51.6	54.8	UNDER	53.1	49.1
13:49:00	51.8	54.0	UNDER	52.1	50.1
13:49:30	53.3	54.4	UNDER	54.1	51.1
13:50:00	51.4	53.2	UNDER	52.1	50.1
13:50:30	51.6	52.5	UNDER	52.1	50.1
13:51:00	51.7	52.8	UNDER	52.1	50.1
13:51:30	51.2	52.5	UNDER	51.1	50.1
13:52:00	51.2	51.8	UNDER	51.1	50.1
13:52:30	51.0	51.6	UNDER	51.1	50.1
13:53:00	50.8	51.6	UNDER	51.1	50.1
13:53:30	51.0	52.4	UNDER	51.1	50.1
13:54:00	54.7	64.3	UNDER	56.1	51.1
13:54:30	52.8	53.6	UNDER	53.1	52.1
13:55:00	53.7	55.7	UNDER	55.1	52.1
13:55:30	51.5	52.4	UNDER	52.1	50.1
13:56:00	50.7	51.2	UNDER	51.1	49.1
13:56:30	51.4	52.9	UNDER	51.1	50.1
13:57:00	52.4	55.6	UNDER	53.1	51.1
13:57:30	52.8	53.5	UNDER	53.1	52.1
13:58:00	52.6	53.6	UNDER	53.1	50.1
13:58:30	51.0	52.5	UNDER	52.1	50.1
13:59:00	53.0	54.4	UNDER	53.1	51.1
13:59:30	51.7	53.6	UNDER	52.1	50.1
14:00:00	51.6	53.2	UNDER	52.1	50.1
14:00:30	50.4	51.2	UNDER	50.1	49.1
14:01:00	51.3	57.2	UNDER	51.1	50.1
14:01:30	50.5	52.4	UNDER	51.1	48.1
14:02:00	49.3	50.0	UNDER	49.1	48.1
14:02:30	50.0	51.1	UNDER	50.1	49.1
14:03:00	50.2	51.6	UNDER	50.1	49.1
14:03:30	50.6	51.6	UNDER	51.1	49.1
14:04:00	49.4	50.4	UNDER	50.1	48.1
14:04:30	49.7	50.9	UNDER	50.1	48.1
14:05:00	50.8	51.8	UNDER	51.1	49.1
14:05:30	51.0	54.4	UNDER	52.1	49.1
14:06:00	50.0	50.9	UNDER	50.1	49.1
14:06:30	50.0	51.2	UNDER	51.1	49.1
14:07:00	53.6	56.0	UNDER	55.1	50.1
14:07:30	49.9	52.0	UNDER	50.1	48.1
14:08:00	51.2	52.8	UNDER	52.1	49.1

14:08:30	50.7	52.5	UNDER	51.1	49.1
14:09:00	51.4	52.4	UNDER	52.1	50.1
14:09:30	51.8	54.0	UNDER	53.1	50.1
14:10:00	50.9	54.4	UNDER	51.1	49.1
14:10:30	52.7	56.0	UNDER	53.1	51.1
14:11:00	51.4	53.1	UNDER	52.1	50.1
14:11:30	51.1	53.2	UNDER	52.1	49.1
14:12:00	52.7	54.6	UNDER	54.1	50.1
14:12:30	52.8	54.8	UNDER	53.1	50.1
14:13:00	53.2	54.8	UNDER	54.1	52.1
14:13:30	52.5	54.8	UNDER	54.1	50.1
14:14:00	52.0	57.2	UNDER	53.1	50.1
14:14:30	51.5	57.2	UNDER	52.1	49.1
14:15:00	49.6	51.0	UNDER	50.1	48.1
14:15:30	53.2	57.6	UNDER	54.1	50.1
14:16:00	53.2	54.8	UNDER	54.1	51.1
14:16:30	52.6	54.4	UNDER	53.1	51.1
14:17:00	51.7	53.2	UNDER	52.1	50.1
14:17:30	51.8	53.6	UNDER	53.1	50.1
14:18:00	51.5	52.3	UNDER	52.1	50.1
14:18:30	52.3	54.0	UNDER	53.1	50.1
14:19:00	54.3	56.8	UNDER	55.1	52.1
14:19:30	52.8	53.6	UNDER	53.1	52.1
14:20:00	52.8	54.4	UNDER	54.1	50.1
14:20:30	50.7	52.0	UNDER	51.1	49.1
14:21:00	51.2	52.2	UNDER	52.1	49.1
14:21:30	49.9	51.2	UNDER	50.1	49.1
14:22:00	53.0	56.4	UNDER	55.1	50.1
14:22:30	54.0	55.6	UNDER	54.1	51.1
14:23:00	52.0	54.0	UNDER	53.1	50.1
14:23:30	50.0	52.0	UNDER	50.1	48.1
14:24:00	51.1	53.1	UNDER	52.1	49.1
14:24:30	50.4	51.6	UNDER	51.1	49.1
14:25:00	51.4	53.1	UNDER	52.1	50.1
14:25:30	52.2	55.2	UNDER	54.1	49.1
14:26:00	53.9	57.6	UNDER	56.1	51.1
14:26:30	51.7	54.1	UNDER	52.1	50.1
14:27:00	51.3	53.4	UNDER	52.1	49.1
14:27:30	50.8	52.8	UNDER	51.1	49.1
14:28:00	49.8	50.4	UNDER	50.1	49.1
14:28:30	51.2	57.4	UNDER	52.1	49.1
14:29:00	52.1	53.4	UNDER	53.1	50.1
14:29:30	51.3	54.8	UNDER	52.1	49.1
14:30:00	51.0	52.0	UNDER	51.1	50.1
14:30:30	50.6	51.6	UNDER	51.1	49.1
14:31:00	53.0	54.4	UNDER	54.1	51.1
14:31:30	52.7	53.6	UNDER	53.1	51.1
14:32:00	52.9	54.0	UNDER	53.1	51.1
14:32:30	52.4	55.6	UNDER	54.1	50.1
14:33:00	53.7	57.3	UNDER	54.1	52.1

14:33:30	52.0	53.2	UNDER	53.1	50.1
14:34:00	51.6	52.2	UNDER	52.1	51.1
14:34:30	51.5	53.0	UNDER	52.1	50.1
14:35:00	52.2	53.6	UNDER	53.1	50.1
14:35:30	51.5	52.4	UNDER	52.1	50.1
14:36:00	51.5	52.4	UNDER	52.1	50.1
14:36:30	52.1	52.9	UNDER	52.1	51.1
14:37:00	51.7	52.8	UNDER	52.1	50.1
14:37:30	51.7	53.6	UNDER	52.1	50.1
14:38:00	51.8	52.8	UNDER	52.1	50.1
14:38:30	51.6	52.4	UNDER	52.1	50.1
14:39:00	63.2	76.0	UNDER	67.1	50.1

```
**********************************************************************
Filename..............M06
Test Location.........3388 Soaring Circle
Employee Name.........AJD, EJA
Employee Number........
Department............ENV
          VDOT Van Buren Road Exten
          sion 24 hour ambient traf
          fic noise measurement

Calibrator Type........Metrosonics CL304 SN4480
Calibrator Cal. Date...2020-06-02
**********************************************************************

METROSONICS db-3080  V1.12  SERIAL # 3897
REPORT PRINTED ON 02/11/21 at 15:44:24

User ID: _____________________________




LOGGING STARTED......02/09/21 at 11:20:00
TOTAL LOGGING TIME...1 DAY 00:43:09
LOGGING STOPPED......02/10/21 at 12:03:09
TOTAL INTERVALS......297
INTERVAL LENGTH......00:05:00

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....02/09/21 AT 10:24:46
PRE-TEST CALIBRATION RANGE...39.3 TO 139.3 dB
POST-TEST CALIBRATION TIME...02/11/21 AT 15:13:46
POST-TEST CALIBRATION RANGE...39.3 TO 139.3
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS.............. 80dB  90dB
CEILING...............115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS
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Lav..... 59.7dB
Lav (80)...... 49.4dB
Lav (90)...... 47.1dB
SEL..... 109.0dB

TWA..... 64.6dB
TWA (80)...... 54.3dB
TWA (90)...... 52.0dB

Lmax..... 93.8dB 02/09/21 at 11:20:04
Lpk..... 124.1dB 02/09/21 at 16:15:10
TIME OVER 115dB...00:00:00.00

DOSE (80)........   0.02%
DOSE (90)........   0.01%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
02/09/21					
11:20:00	72.3	93.8	115.6	63.3	58.3
11:25:00	60.3	63.2	UNDER	61.3	57.3
11:30:00	60.3	64.6	UNDER	61.3	53.3
11:35:00	60.4	63.8	UNDER	61.3	57.3
11:40:00	60.4	63.4	UNDER	62.3	56.3
11:45:00	60.7	64.2	UNDER	61.3	58.3
11:50:00	60.5	63.2	UNDER	61.3	57.3
11:55:00	61.0	67.8	UNDER	62.3	57.3
12:00:00	60.7	66.0	UNDER	61.3	56.3
12:05:00	61.6	68.1	UNDER	62.3	56.3
12:10:00	59.8	63.9	UNDER	61.3	56.3
12:15:00	58.7	61.4	UNDER	60.3	55.3
12:20:00	59.5	65.8	UNDER	60.3	57.3
12:25:00	59.5	62.0	UNDER	60.3	56.3
12:30:00	60.0	62.5	UNDER	61.3	57.3
12:35:00	60.0	65.0	UNDER	61.3	56.3
12:40:00	60.1	67.0	UNDER	61.3	55.3
12:45:00	60.4	64.0	UNDER	61.3	56.3
12:50:00	60.4	65.4	UNDER	61.3	57.3
12:55:00	60.1	63.4	UNDER	61.3	57.3
13:00:00	59.9	62.6	UNDER	61.3	55.3
13:05:00	60.8	63.0	UNDER	62.3	58.3
13:10:00	60.7	63.0	UNDER	61.3	58.3
13:15:00	59.9	61.9	UNDER	61.3	57.3
13:20:00	60.0	62.4	UNDER	61.3	56.3
13:25:00	60.6	66.2	UNDER	61.3	56.3
13:30:00	60.9	63.8	UNDER	62.3	56.3

13:35:00	59.9	63.0	UNDER	61.3	56.3
13:40:00	60.3	62.6	UNDER	61.3	58.3
13:45:00	59.9	62.7	UNDER	61.3	57.3
13:50:00	59.1	68.2	UNDER	60.3	55.3
13:55:00	58.7	61.0	UNDER	59.3	56.3
14:00:00	58.9	61.2	UNDER	60.3	56.3
14:05:00	59.2	66.6	UNDER	60.3	56.3
14:10:00	59.1	61.2	UNDER	60.3	56.3
14:15:00	59.7	67.1	UNDER	60.3	56.3
14:20:00	58.9	62.2	UNDER	60.3	55.3
14:25:00	59.2	62.3	UNDER	60.3	56.3
14:30:00	59.0	62.2	UNDER	60.3	57.3
14:35:00	58.7	62.6	UNDER	59.3	56.3
14:40:00	58.8	61.4	UNDER	59.3	55.3
14:45:00	59.5	62.6	UNDER	60.3	56.3
14:50:00	59.4	63.0	UNDER	60.3	57.3
14:55:00	59.3	66.2	UNDER	60.3	55.3
15:00:00	59.3	65.4	UNDER	60.3	53.3
15:05:00	59.5	64.2	UNDER	60.3	55.3
15:10:00	59.8	63.4	UNDER	60.3	57.3
15:15:00	59.8	64.2	UNDER	60.3	58.3
15:20:00	59.7	62.7	UNDER	61.3	55.3
15:25:00	60.1	65.4	UNDER	61.3	57.3
15:30:00	59.6	62.6	UNDER	60.3	56.3
15:35:00	60.0	67.8	UNDER	60.3	57.3
15:40:00	59.9	65.3	UNDER	61.3	56.3
15:45:00	59.7	62.9	UNDER	60.3	57.3
15:50:00	59.3	61.8	UNDER	60.3	56.3
15:55:00	59.5	62.3	UNDER	60.3	57.3
16:00:00	59.4	61.8	UNDER	60.3	57.3
16:05:00	59.9	62.6	UNDER	61.3	57.3
16:10:00	60.5	70.6	UNDER	62.3	55.3
16:15:00	68.5	91.4	124.1	68.3	57.3
16:20:00	59.8	66.2	UNDER	61.3	57.3
16:25:00	60.1	67.4	UNDER	61.3	57.3
16:30:00	59.9	63.7	UNDER	61.3	57.3
16:35:00	60.4	69.0	UNDER	61.3	56.3
16:40:00	60.9	65.1	UNDER	62.3	58.3
16:45:00	62.0	75.8	UNDER	62.3	57.3
16:50:00	60.3	64.6	UNDER	61.3	57.3
16:55:00	61.7	69.4	UNDER	63.3	59.3
17:00:00	62.5	72.6	UNDER	64.3	59.3
17:05:00	62.2	71.0	UNDER	64.3	58.3
17:10:00	60.9	71.8	UNDER	61.3	57.3
17:15:00	60.6	62.6	UNDER	61.3	58.3
17:20:00	60.5	63.0	UNDER	61.3	59.3
17:25:00	60.2	66.1	UNDER	61.3	57.3
17:30:00	59.8	62.2	UNDER	60.3	57.3
17:35:00	58.6	68.6	UNDER	59.3	52.3
17:40:00	55.4	59.8	UNDER	57.3	52.3

17:45:00	58.6	65.4	UNDER	60.3	55.3
17:50:00	58.9	66.0	UNDER	60.3	57.3
17:55:00	58.4	64.6	UNDER	59.3	56.3
18:00:00	58.7	65.9	UNDER	59.3	56.3
18:05:00	59.1	63.4	UNDER	59.3	57.3
18:10:00	58.5	61.8	UNDER	59.3	56.3
18:15:00	58.7	61.3	UNDER	59.3	56.3
18:20:00	59.2	64.6	UNDER	60.3	55.3
18:25:00	59.3	63.0	UNDER	60.3	57.3
18:30:00	59.3	61.8	UNDER	60.3	57.3
18:35:00	59.3	68.6	UNDER	60.3	56.3
18:40:00	58.8	62.2	UNDER	59.3	56.3
18:45:00	59.3	61.4	UNDER	60.3	56.3
18:50:00	59.5	63.0	UNDER	60.3	57.3
18:55:00	59.7	64.7	UNDER	61.3	57.3
19:00:00	59.4	62.6	UNDER	60.3	55.3
19:05:00	59.6	65.4	UNDER	61.3	56.3
19:10:00	64.8	79.8	UNDER	61.3	53.3
19:15:00	58.7	75.4	UNDER	59.3	51.3
19:20:00	55.5	60.0	UNDER	57.3	51.3
19:25:00	55.4	63.4	UNDER	57.3	51.3
19:30:00	67.8	81.0	UNDER	69.3	53.3
19:35:00	55.3	61.4	UNDER	57.3	51.3
19:40:00	56.1	63.7	UNDER	57.3	53.3
19:45:00	55.6	57.9	UNDER	56.3	53.3
19:50:00	56.0	59.4	UNDER	57.3	52.3
19:55:00	58.6	64.6	UNDER	59.3	55.3
20:00:00	58.3	64.6	UNDER	60.3	55.3
20:05:00	58.9	62.6	UNDER	60.3	55.3
20:10:00	59.1	66.2	UNDER	60.3	54.3
20:15:00	58.2	61.8	UNDER	60.3	55.3
20:20:00	58.5	62.8	UNDER	60.3	54.3
20:25:00	58.6	63.0	UNDER	60.3	55.3
20:30:00	58.0	66.2	UNDER	59.3	53.3
20:35:00	58.0	65.0	UNDER	59.3	52.3
20:40:00	57.2	59.9	UNDER	58.3	51.3
20:45:00	57.7	61.6	UNDER	59.3	54.3
20:50:00	57.9	61.3	UNDER	59.3	53.3
20:55:00	57.6	63.4	UNDER	59.3	53.3
21:00:00	57.7	61.0	UNDER	59.3	51.3
21:05:00	58.3	67.0	UNDER	59.3	53.3
21:10:00	58.4	62.2	UNDER	59.3	54.3
21:15:00	57.4	61.2	UNDER	59.3	52.3
21:20:00	57.1	60.0	UNDER	58.3	53.3
21:25:00	57.8	61.4	UNDER	59.3	52.3
21:30:00	56.8	60.6	UNDER	58.3	52.3
21:35:00	58.2	62.2	UNDER	60.3	54.3
21:40:00	57.8	64.3	UNDER	59.3	53.3
21:45:00	57.6	61.8	UNDER	59.3	52.3
21:50:00	57.1	61.0	UNDER	59.3	53.3

21:55:00	57.0	60.9	UNDER	58.3	51.3
22:00:00	57.4	64.4	UNDER	58.3	51.3
22:05:00	58.2	63.0	UNDER	59.3	54.3
22:10:00	57.2	63.9	UNDER	58.3	51.3
22:15:00	56.3	61.3	UNDER	58.3	52.3
22:20:00	56.5	59.7	UNDER	58.3	51.3
22:25:00	55.6	59.9	UNDER	57.3	49.3
22:30:00	55.8	65.0	UNDER	57.3	50.3
22:35:00	55.8	59.8	UNDER	57.3	51.3
22:40:00	56.2	59.6	UNDER	57.3	51.3
22:45:00	56.1	60.6	UNDER	57.3	51.3
22:50:00	55.6	62.8	UNDER	58.3	50.3
22:55:00	55.4	59.2	UNDER	57.3	49.3
23:00:00	56.4	63.0	UNDER	59.3	49.3
23:05:00	56.5	65.4	UNDER	58.3	48.3
23:10:00	56.3	60.2	UNDER	58.3	48.3
23:15:00	55.9	59.2	UNDER	58.3	48.3
23:20:00	55.8	60.2	UNDER	58.3	44.3
23:25:00	56.5	61.0	UNDER	58.3	48.3
23:30:00	56.5	60.5	UNDER	58.3	49.3
23:35:00	57.2	64.1	UNDER	59.3	51.3
23:40:00	57.0	62.4	UNDER	58.3	51.3
23:45:00	56.0	59.7	UNDER	58.3	50.3
23:50:00	55.0	60.2	UNDER	57.3	51.3
23:55:00	55.6	60.2	UNDER	58.3	50.3
00:00:00	55.2	58.8	UNDER	57.3	48.3
00:05:00	55.9	64.2	UNDER	58.3	47.3
00:10:00	56.2	61.8	UNDER	59.3	49.3
00:15:00	55.7	62.4	UNDER	57.3	47.3
00:20:00	55.6	60.1	UNDER	57.3	50.3
00:25:00	56.5	60.4	UNDER	59.3	50.3
00:30:00	58.8	76.9	UNDER	58.3	50.3
00:35:00	56.7	63.4	UNDER	58.3	50.3
00:40:00	56.9	61.8	UNDER	59.3	51.3
00:45:00	57.2	63.7	UNDER	59.3	47.3
00:50:00	56.6	60.0	UNDER	58.3	50.3
00:55:00	55.9	60.2	UNDER	58.3	49.3
01:00:00	55.4	59.2	UNDER	57.3	49.3
01:05:00	55.7	61.4	UNDER	58.3	44.3
01:10:00	56.1	61.0	UNDER	58.3	51.3
01:15:00	56.2	64.6	UNDER	58.3	50.3
01:20:00	56.4	61.0	UNDER	58.3	51.3
01:25:00	57.3	64.2	UNDER	60.3	47.3
01:30:00	55.8	63.8	UNDER	58.3	49.3
01:35:00	55.3	60.6	UNDER	57.3	47.3
01:40:00	54.3	65.0	UNDER	55.3	46.3
01:45:00	52.4	57.6	UNDER	55.3	43.3
01:50:00	53.0	58.2	UNDER	56.3	42.3
01:55:00	55.9	60.3	UNDER	58.3	47.3
02:00:00	54.7	58.8	UNDER	57.3	48.3

02:05:00	54.6	60.7	UNDER	58.3	46.3
02:10:00	55.1	61.4	UNDER	58.3	43.3
02:15:00	55.5	66.2	UNDER	58.3	44.3
02:20:00	56.0	61.6	UNDER	58.3	49.3
02:25:00	57.2	61.8	UNDER	59.3	50.3
02:30:00	56.5	61.6	UNDER	59.3	51.3
02:35:00	57.9	63.8	UNDER	60.3	50.3
02:40:00	58.3	62.1	UNDER	60.3	53.3
02:45:00	59.3	63.4	UNDER	61.3	54.3
02:50:00	60.3	65.4	UNDER	62.3	55.3
02:55:00	58.6	61.7	UNDER	61.3	51.3
03:00:00	59.5	62.6	UNDER	61.3	51.3
03:05:00	59.4	69.0	UNDER	61.3	54.3
03:10:00	59.0	64.3	UNDER	61.3	53.3
03:15:00	59.1	64.6	UNDER	61.3	52.3
03:20:00	59.7	65.0	UNDER	61.3	54.3
03:25:00	60.1	65.1	UNDER	62.3	54.3
03:30:00	61.0	66.6	UNDER	63.3	55.3
03:35:00	58.4	63.0	UNDER	61.3	51.3
03:40:00	58.7	62.6	UNDER	60.3	54.3
03:45:00	58.8	64.5	UNDER	60.3	51.3
03:50:00	59.7	65.4	UNDER	62.3	55.3
03:55:00	58.0	63.2	UNDER	60.3	52.3
04:00:00	58.1	63.8	UNDER	60.3	52.3
04:05:00	57.2	60.2	UNDER	59.3	50.3
04:10:00	58.9	66.2	UNDER	61.3	53.3
04:15:00	57.5	61.5	UNDER	59.3	52.3
04:20:00	58.8	63.1	UNDER	60.3	53.3
04:25:00	58.2	61.8	UNDER	60.3	54.3
04:30:00	57.7	63.0	UNDER	59.3	53.3
04:35:00	58.6	65.6	UNDER	60.3	53.3
04:40:00	59.2	63.1	UNDER	60.3	55.3
04:45:00	59.3	65.0	UNDER	61.3	54.3
04:50:00	57.8	61.5	UNDER	59.3	53.3
04:55:00	58.6	63.2	UNDER	60.3	52.3
05:00:00	58.3	61.4	UNDER	60.3	54.3
05:05:00	58.0	61.3	UNDER	59.3	54.3
05:10:00	58.3	63.0	UNDER	60.3	54.3
05:15:00	59.4	63.8	UNDER	60.3	56.3
05:20:00	59.3	61.8	UNDER	60.3	56.3
05:25:00	59.3	63.5	UNDER	60.3	56.3
05:30:00	59.5	62.8	UNDER	61.3	56.3
05:35:00	59.8	64.6	UNDER	61.3	55.3
05:40:00	59.3	62.8	UNDER	60.3	56.3
05:45:00	58.8	62.2	UNDER	60.3	55.3
05:50:00	58.7	61.8	UNDER	60.3	54.3
05:55:00	59.2	62.1	UNDER	60.3	55.3
06:00:00	59.9	64.2	UNDER	61.3	56.3
06:05:00	58.8	61.4	UNDER	60.3	55.3
06:10:00	59.3	62.3	UNDER	60.3	56.3

06:15:00	58.8	61.2	UNDER	60.3	55.3
06:20:00	59.6	62.6	UNDER	60.3	56.3
06:25:00	59.7	62.6	UNDER	61.3	56.3
06:30:00	59.8	63.8	UNDER	60.3	57.3
06:35:00	60.2	63.7	UNDER	61.3	56.3
06:40:00	60.0	71.4	UNDER	60.3	56.3
06:45:00	60.0	62.1	UNDER	61.3	56.3
06:50:00	60.3	62.6	UNDER	61.3	57.3
06:55:00	60.0	62.6	UNDER	61.3	56.3
07:00:00	60.4	64.6	UNDER	61.3	57.3
07:05:00	60.3	63.4	UNDER	61.3	58.3
07:10:00	59.6	61.8	UNDER	61.3	56.3
07:15:00	60.4	64.3	UNDER	61.3	57.3
07:20:00	60.4	63.7	UNDER	61.3	56.3
07:25:00	60.6	64.0	UNDER	61.3	57.3
07:30:00	60.4	63.0	UNDER	61.3	58.3
07:35:00	60.4	62.5	UNDER	61.3	57.3
07:40:00	60.2	64.6	UNDER	61.3	56.3
07:45:00	60.5	64.2	UNDER	61.3	58.3
07:50:00	60.7	62.8	UNDER	61.3	58.3
07:55:00	59.9	62.4	UNDER	61.3	56.3
08:00:00	59.7	62.1	UNDER	61.3	56.3
08:05:00	59.7	62.1	UNDER	60.3	54.3
08:10:00	60.3	62.6	UNDER	61.3	57.3
08:15:00	60.5	65.7	UNDER	61.3	55.3
08:20:00	60.2	63.5	UNDER	61.3	57.3
08:25:00	60.0	65.8	UNDER	61.3	57.3
08:30:00	59.8	62.5	UNDER	61.3	56.3
08:35:00	60.0	63.2	UNDER	61.3	56.3
08:40:00	60.2	63.4	UNDER	61.3	56.3
08:45:00	60.3	64.6	UNDER	61.3	56.3
08:50:00	60.0	63.5	UNDER	61.3	57.3
08:55:00	60.1	62.2	UNDER	61.3	57.3
09:00:00	59.3	63.8	UNDER	60.3	54.3
09:05:00	60.0	62.5	UNDER	61.3	57.3
09:10:00	59.7	62.2	UNDER	61.3	55.3
09:15:00	59.6	63.0	UNDER	61.3	56.3
09:20:00	59.7	62.4	UNDER	60.3	55.3
09:25:00	59.6	63.8	UNDER	61.3	56.3
09:30:00	59.5	62.6	UNDER	60.3	57.3
09:35:00	59.9	61.8	UNDER	61.3	56.3
09:40:00	59.7	65.8	UNDER	61.3	55.3
09:45:00	59.9	62.6	UNDER	61.3	57.3
09:50:00	59.2	61.6	UNDER	60.3	56.3
09:55:00	59.2	63.0	UNDER	60.3	55.3
10:00:00	60.1	66.2	UNDER	61.3	55.3
10:05:00	59.3	62.2	UNDER	60.3	55.3
10:10:00	58.6	61.4	UNDER	60.3	55.3
10:15:00	58.8	61.2	UNDER	60.3	55.3
10:20:00	58.1	61.2	UNDER	59.3	53.3

10:25:00	58.6	61.0	UNDER	59.3	55.3
10:30:00	58.6	69.4	UNDER	59.3	53.3
10:35:00	58.4	63.8	UNDER	59.3	54.3
10:40:00	59.4	62.2	UNDER	60.3	56.3
10:45:00	60.1	63.4	UNDER	61.3	57.3
10:50:00	59.5	61.8	UNDER	60.3	57.3
10:55:00	60.9	70.2	UNDER	62.3	56.3
11:00:00	60.0	62.6	UNDER	61.3	57.3
11:05:00	59.9	65.3	UNDER	61.3	56.3
11:10:00	60.6	70.2	UNDER	61.3	57.3
11:15:00	60.0	64.2	UNDER	61.3	55.3
11:20:00	60.0	62.2	UNDER	61.3	57.3
11:25:00	61.0	64.6	UNDER	61.3	58.3
11:30:00	61.0	65.7	UNDER	62.3	56.3
11:35:00	60.0	64.1	UNDER	61.3	55.3
11:40:00	63.7	72.6	UNDER	67.3	58.3
11:45:00	61.1	63.8	UNDER	62.3	58.3
11:50:00	60.6	63.1	UNDER	61.3	58.3
11:55:00	60.1	65.4	UNDER	61.3	56.3
12:00:00	70.9	92.1	120.2	71.3	56.3

```
**********************************************************************
Filename..............M07
Test Location.........3215 Fledgling Circle
Employee Name.........AJD, EJA
Employee Number........
Department............ENV
          VDOT Van Buren Road Exten
          sion 20 minute short-term
           traffic noise measuremen
          ts
Calibrator Type........Metrosonics CL304 SN4480
Calibrator Cal. Date...2020-06-02
**********************************************************************

METROSONICS db-3080  V1.20  SERIAL # 5093
REPORT PRINTED ON 02/11/21 at 15:44:34

User ID: _____________________________




LOGGING STARTED......02/09/21 at 11:50:30
TOTAL LOGGING TIME...0 DAYS 01:08:50
LOGGING STOPPED......02/09/21 at 12:59:20
TOTAL INTERVALS......138
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....02/09/21 AT 10:27:25
PRE-TEST CALIBRATION RANGE...40.9 TO 140.9 dB
POST-TEST CALIBRATION TIME...02/10/21 AT 04:12:35
POST-TEST CALIBRATION RANGE...40.9 TO 140.9
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS.............. 80dB  90dB
CEILING...............115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS
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Lav..... 63.5dB
Lav (80)...... 44.5dB
Lav (90)...... 40.9dB
SEL..... 99.5dB

TWA..... 55.1dB
TWA (80)...... 40.9dB
TWA (90)...... 40.9dB

Lmax..... 83.1dB 02/09/21 at 12:32:41
Lpk..... 116.0dB 02/09/21 at 12:32:41
TIME OVER 115dB...00:00:00.00

DOSE (80)........   0.00%
PROJ. DOSE (80)..   0.00%
DOSE (90)........   0.00%
PROJ. DOSE (90)..   0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
02/09/21					
11:50:30	64.4	68.8	UNDER	65.9	62.9
11:51:00	62.8	65.3	UNDER	63.9	61.9
11:51:30	65.0	66.7	UNDER	65.9	62.9
11:52:00	64.2	65.2	UNDER	64.9	63.9
11:52:30	64.1	67.4	UNDER	65.9	62.9
11:53:00	62.8	64.6	UNDER	63.9	61.9
11:53:30	63.5	65.4	UNDER	64.9	61.9
11:54:00	62.7	63.9	UNDER	63.9	60.9
11:54:30	63.9	65.5	UNDER	65.9	61.9
11:55:00	64.1	65.2	UNDER	64.9	62.9
11:55:30	65.1	66.6	UNDER	66.9	62.9
11:56:00	67.6	75.3	UNDER	70.9	62.9
11:56:30	63.6	64.8	UNDER	64.9	62.9
11:57:00	64.4	65.5	UNDER	65.9	63.9
11:57:30	64.2	65.8	UNDER	65.9	62.9
11:58:00	63.7	65.1	UNDER	64.9	62.9
11:58:30	64.0	65.9	UNDER	65.9	61.9
11:59:00	63.9	66.3	UNDER	65.9	62.9
11:59:30	64.2	65.5	UNDER	65.9	63.9
12:00:00	63.1	65.2	UNDER	64.9	61.9
12:00:30	63.5	64.3	UNDER	64.9	62.9
12:01:00	64.9	73.3	UNDER	64.9	62.9
12:01:30	65.6	67.9	UNDER	66.9	64.9
12:02:00	65.7	67.6	UNDER	66.9	64.9
12:02:30	64.7	69.9	UNDER	66.9	62.9

12:03:00	63.7	64.9	UNDER	64.9	62.9
12:03:30	62.4	64.8	UNDER	64.9	60.9
12:04:00	63.8	65.2	UNDER	64.9	62.9
12:04:30	63.6	65.1	UNDER	64.9	62.9
12:05:00	64.0	66.4	UNDER	64.9	63.9
12:05:30	64.2	67.5	UNDER	65.9	61.9
12:06:00	66.3	70.3	UNDER	69.9	63.9
12:06:30	63.6	65.1	UNDER	64.9	61.9
12:07:00	64.9	66.4	UNDER	65.9	63.9
12:07:30	64.8	66.4	UNDER	65.9	63.9
12:08:00	65.0	67.4	UNDER	65.9	63.9
12:08:30	64.5	65.2	UNDER	65.9	63.9
12:09:00	65.0	66.7	UNDER	66.9	63.9
12:09:30	66.3	68.3	UNDER	67.9	64.9
12:10:00	64.1	66.8	UNDER	65.9	62.9
12:10:30	65.6	68.1	UNDER	67.9	63.9
12:11:00	65.2	67.9	UNDER	67.9	61.9
12:11:30	63.0	64.1	UNDER	63.9	62.9
12:12:00	63.3	64.4	UNDER	64.9	61.9
12:12:30	65.5	66.6	UNDER	66.9	62.9
12:13:00	64.0	65.2	UNDER	65.9	62.9
12:13:30	63.1	63.9	UNDER	63.9	62.9
12:14:00	63.1	64.4	UNDER	63.9	62.9
12:14:30	61.9	63.6	UNDER	62.9	60.9
12:15:00	62.5	65.1	UNDER	63.9	61.9
12:15:30	63.6	64.8	UNDER	64.9	62.9
12:16:00	62.9	66.0	UNDER	64.9	60.9
12:16:30	62.1	64.0	UNDER	63.9	59.9
12:17:00	62.8	68.0	UNDER	64.9	60.9
12:17:30	61.8	62.8	UNDER	62.9	60.9
12:18:00	62.7	67.3	UNDER	63.9	61.9
12:18:30	62.1	63.6	UNDER	62.9	59.9
12:19:00	62.2	64.3	UNDER	63.9	61.9
12:19:30	61.2	62.4	UNDER	61.9	60.9
12:20:00	61.2	62.3	UNDER	61.9	60.9
12:20:30	62.1	63.2	UNDER	62.9	60.9
12:21:00	64.1	66.2	UNDER	64.9	62.9
12:21:30	63.8	66.3	UNDER	65.9	62.9
12:22:00	61.9	62.7	UNDER	62.9	60.9
12:22:30	61.7	62.3	UNDER	62.9	60.9
12:23:00	61.4	62.3	UNDER	62.9	59.9
12:23:30	62.3	63.2	UNDER	62.9	61.9
12:24:00	62.1	63.1	UNDER	62.9	60.9
12:24:30	62.2	63.2	UNDER	63.9	60.9
12:25:00	61.2	62.8	UNDER	61.9	60.9
12:25:30	61.9	62.8	UNDER	62.9	60.9
12:26:00	61.5	62.4	UNDER	62.9	60.9
12:26:30	63.0	64.0	UNDER	63.9	62.9
12:27:00	63.1	64.0	UNDER	63.9	62.9
12:27:30	63.8	65.5	UNDER	64.9	62.9

12:28:00	63.4	65.5	UNDER	64.9	62.9
12:28:30	63.0	65.9	UNDER	64.9	61.9
12:29:00	62.7	63.9	UNDER	63.9	61.9
12:29:30	63.3	63.9	UNDER	63.9	62.9
12:30:00	62.4	63.1	UNDER	62.9	61.9
12:30:30	63.5	65.5	UNDER	64.9	61.9
12:31:00	63.6	65.5	UNDER	64.9	62.9
12:31:30	64.3	65.1	UNDER	64.9	63.9
12:32:00	63.8	65.0	UNDER	64.9	62.9
12:32:30	69.7	83.1	116.0	70.9	62.9
12:33:00	64.0	65.5	UNDER	65.9	62.9
12:33:30	64.1	66.0	UNDER	64.9	62.9
12:34:00	64.1	65.9	UNDER	65.9	62.9
12:34:30	63.2	64.8	UNDER	64.9	62.9
12:35:00	64.2	68.3	UNDER	66.9	61.9
12:35:30	63.5	65.9	UNDER	64.9	61.9
12:36:00	64.0	65.9	UNDER	64.9	63.9
12:36:30	62.4	63.8	UNDER	63.9	61.9
12:37:00	62.6	63.9	UNDER	63.9	60.9
12:37:30	61.8	63.1	UNDER	62.9	59.9
12:38:00	62.4	65.2	UNDER	63.9	60.9
12:38:30	62.2	64.3	UNDER	63.9	60.9
12:39:00	61.0	63.2	UNDER	62.9	59.9
12:39:30	63.4	64.7	UNDER	64.9	62.9
12:40:00	62.2	64.1	UNDER	63.9	59.9
12:40:30	63.1	65.2	UNDER	64.9	59.9
12:41:00	63.2	64.4	UNDER	63.9	62.9
12:41:30	62.5	64.0	UNDER	63.9	60.9
12:42:00	64.8	70.3	UNDER	66.9	62.9
12:42:30	63.3	64.8	UNDER	64.9	61.9
12:43:00	62.9	66.4	UNDER	63.9	61.9
12:43:30	62.4	63.5	UNDER	63.9	61.9
12:44:00	63.7	65.9	UNDER	64.9	61.9
12:44:30	63.5	64.7	UNDER	64.9	62.9
12:45:00	62.9	64.0	UNDER	63.9	61.9
12:45:30	63.8	66.7	UNDER	65.9	62.9
12:46:00	63.9	66.0	UNDER	64.9	61.9
12:46:30	62.6	65.2	UNDER	64.9	59.9
12:47:00	62.9	65.2	UNDER	64.9	61.9
12:47:30	62.3	64.3	UNDER	63.9	60.9
12:48:00	63.1	65.5	UNDER	64.9	60.9
12:48:30	62.5	64.0	UNDER	63.9	61.9
12:49:00	63.4	65.5	UNDER	64.9	61.9
12:49:30	62.0	64.1	UNDER	63.9	59.9
12:50:00	61.6	63.6	UNDER	63.9	60.9
12:50:30	61.7	63.9	UNDER	62.9	60.9
12:51:00	62.4	65.3	UNDER	64.9	61.9
12:51:30	61.6	67.5	UNDER	62.9	59.9
12:52:00	62.7	63.9	UNDER	63.9	61.9
12:52:30	62.6	63.6	UNDER	63.9	61.9

12:53:00	62.0	64.0	UNDER	63.9	60.9
12:53:30	60.7	61.9	UNDER	61.9	58.9
12:54:00	62.3	63.9	UNDER	63.9	60.9
12:54:30	62.8	64.3	UNDER	63.9	61.9
12:55:00	62.9	64.8	UNDER	64.9	61.9
12:55:30	62.0	67.9	UNDER	62.9	60.9
12:56:00	60.7	61.9	UNDER	61.9	59.9
12:56:30	60.7	61.9	UNDER	61.9	59.9
12:57:00	61.4	63.5	UNDER	62.9	59.9
12:57:30	61.4	63.1	UNDER	62.9	60.9
12:58:00	62.3	69.9	UNDER	62.9	60.9
12:58:30	60.8	61.6	UNDER	61.9	59.9
12:59:00	65.5	76.7	UNDER	61.9	60.9

Measurement Site M-08
15606 Habitat Court

CSV
[Setting]

[Property]
System Version,2.0
NX-42EX Version,1.9
NX-42WR Version,1.7
NX-42RT Version,1.9
NX-42FT Version,1.3
Serial Number,1198633

[NL-42]
Store Name,3001
Type,NL-52
Index Number,1
Frequency Weighting,A
Time Weighting,S
Output Level Range Upper,130
Output Level Range Lower,30
Delay Time,Off
Windscreen Correction,WS-10
Diffuse Sound Field Correction,Off
LN Mode,Leq_1s
Display Leq,On
Display LE,Off
Display Lmax,On
Display Lmin,On
Display Ly,Off
Display LN1,Off
Display LN2,Off
Display LN3,Off
Display LN4,Off
Display LN5,Off
Display Time Level,On
Percentile 1,5
Percentile 2,10
Percentile 3,50
Percentile 4,90
Percentile 5,95.0
Ly Type,Off
AC OUT,Main
DC OUT,Main
Comparator,Off
Comparator Level,70
Comparator Channel,Main
Battery Type,Alkaline
Communication Interface,Off

Baud Rate,9600
Language,English

[NX-42EX]
Lp Store Interval,Leq_1s
Leq Calculation Interval,30 s
Timer Auto Start Time,-
Timer Auto Stop Time,-
Timer Auto Interval,-
Sleep Mode,Off

[Status]
Measurement Start Time,2021/02/09 12:18:51
Measurement Stop Time,2021/02/09 12:53:00
Lp Data Number,2049
Leq Data Number,69
Measure Time,00d 00:34:09.1

Address,Start Time,Measurement
Time,Leq,LE,Lmax,Lmin,Ly,LN1,LN2,LN3,LN4,LN5,Over,Under,
1,2021/02/09 12:18:51,00d 00:00:30.0, 45.7, 60.5, 49.3, 42.4, -.-, 48.9, 48.5, 44.5, 42.6, 42.4,----,-----,
2,2021/02/09 12:19:21,00d 00:00:30.0, 46.2, 61.0, 49.7, 42.4, -.-, 49.2, 48.6, 45.8, 44.1, 42.8,----,-----,
3,2021/02/09 12:19:51,00d 00:00:30.0, 45.8, 60.6, 47.7, 44.0, -.-, 47.8, 47.3, 45.6, 44.3, 44.2,----,-----,
4,2021/02/09 12:20:21,00d 00:00:30.0, 45.9, 60.7, 49.0, 43.2, -.-, 48.7, 48.3, 45.8, 43.9, 43.7,----,-----,
5,2021/02/09 12:20:51,00d 00:00:30.0, 48.7, 63.5, 52.3, 44.6, -.-, 51.9, 51.9, 48.5, 44.9, 44.6,----,-----,
6,2021/02/09 12:21:21,00d 00:00:30.0, 46.3, 61.1, 49.6, 42.5, -.-, 49.8, 49.6, 45.1, 42.8, 42.6,----,-----,
7,2021/02/09 12:21:51,00d 00:00:30.0, 45.6, 60.4, 49.2, 42.3, -.-, 48.8, 48.3, 45.3, 42.7, 42.1,----,-----,
8,2021/02/09 12:22:21,00d 00:00:30.0, 44.5, 59.3, 47.1, 42.2, -.-, 47.0, 46.6, 44.0, 42.8, 42.4,----,-----,
9,2021/02/09 12:22:51,00d 00:00:30.0, 44.4, 59.2, 45.8, 42.3, -.-, 45.8, 45.5, 44.6, 42.6, 42.4,----,-----,
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11,2021/02/09 12:23:51,00d 00:00:30.0, 44.9, 59.7, 46.4, 43.7, -.-, 45.9, 45.7, 44.9, 43.9, 43.7,----,-----,
12,2021/02/09 12:24:21,00d 00:00:30.0, 47.9, 62.7, 50.5, 45.2, -.-, 50.5, 50.5, 46.9, 45.4, 45.2,----,-----,
13,2021/02/09 12:24:51,00d 00:00:30.0, 49.1, 63.9, 54.1, 44.5, -.-, 52.7, 52.4, 47.0, 44.8, 44.6,----,-----,
14,2021/02/09 12:25:21,00d 00:00:30.0, 49.7, 64.5, 55.9, 45.2, -.-, 53.9, 53.3, 48.7, 45.7, 45.6,----,-----,
15,2021/02/09 12:25:51,00d 00:00:30.0, 45.7, 60.5, 49.4, 43.2, -.-, 48.5, 48.2, 45.3, 43.5, 43.2,----,-----,
16,2021/02/09 12:26:21,00d 00:00:30.0, 46.0, 60.8, 48.6, 42.2, -.-, 48.6, 48.4, 46.5, 43.2, 42.3,----,-----,
17,2021/02/09 12:26:51,00d 00:00:30.0, 46.6, 61.4, 50.5, 43.7, -.-, 50.1, 49.5, 45.9, 43.7, 43.7,----,-----,
18,2021/02/09 12:27:21,00d 00:00:30.0, 53.1, 67.9, 61.8, 43.6, -.-, 61.8, 59.5, 46.5, 44.1, 43.9,----,-----,
19,2021/02/09 12:27:51,00d 00:00:30.0, 54.6, 69.4, 63.4, 41.4, -.-, 62.8, 61.1, 48.9, 41.8, 41.3,----,-----,
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22,2021/02/09 12:29:21,00d 00:00:30.0, 43.2, 58.0, 44.6, 41.3, -.-, 44.5, 44.3, 43.4, 41.5, 41.4,----,-----,
23,2021/02/09 12:29:51,00d 00:00:30.0, 45.3, 60.1, 48.6, 42.4, -.-, 48.4, 47.0, 44.5, 43.2, 42.8,----,-----,
24,2021/02/09 12:30:21,00d 00:00:30.0, 51.9, 66.7, 57.7, 43.5, -.-, 57.2, 57.0, 47.8, 43.9, 43.8,----,-----,

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    28,2021/02/09 12:32:21,00d 00:00:30.0, 44.9, 59.7, 49.5, 41.4,  -.-, 48.0, 46.1,
44.6, 41.9, 41.4,----,-----,
    29,2021/02/09 12:32:51,00d 00:00:30.0, 44.7, 59.5, 50.3, 42.4,  -.-, 48.6, 47.0,
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    31,2021/02/09 12:33:51,00d 00:00:30.0, 45.5, 60.3, 47.6, 44.1,  -.-, 47.6, 46.9,
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    59,2021/02/09 12:47:51,00d 00:00:30.0, 44.8, 59.6, 47.4, 42.3,  -.-, 47.1, 46.9,
44.5, 42.6, 42.2,----,-----,
    60,2021/02/09 12:48:21,00d 00:00:30.0, 47.8, 62.6, 54.1, 41.5,  -.-, 51.6, 51.3,
47.3, 42.4, 41.7,----,-----,
    61,2021/02/09 12:48:51,00d 00:00:30.0, 48.9, 63.7, 55.2, 44.4,  -.-, 55.0, 51.5,
47.1, 45.0, 44.4,----,-----,
    62,2021/02/09 12:49:21,00d 00:00:30.0, 54.8, 69.6, 60.9, 42.2,  -.-, 60.5, 60.2,
50.6, 42.5, 42.2,----,-----,
    63,2021/02/09 12:49:51,00d 00:00:30.0, 51.4, 66.2, 61.7, 42.0,  -.-, 59.4, 55.9,
43.1, 42.4, 42.3,----,-----,
    64,2021/02/09 12:50:21,00d 00:00:30.0, 53.5, 68.3, 63.7, 44.9,  -.-, 61.3, 58.3,
46.7, 45.1, 44.8,----,-----,
    65,2021/02/09 12:50:51,00d 00:00:30.0, 42.9, 57.7, 46.0, 41.3,  -.-, 44.8, 44.4,
42.8, 41.6, 41.4,----,-----,
    66,2021/02/09 12:51:21,00d 00:00:30.0, 45.2, 60.0, 50.4, 41.9,  -.-, 50.4, 50.3,
43.8, 42.1, 42.1,----,-----,
    67,2021/02/09 12:51:51,00d 00:00:30.0, 49.2, 64.0, 56.4, 44.6,  -.-, 54.9, 51.9,
48.3, 44.7, 44.6,----,-----,
    68,2021/02/09 12:52:21,00d 00:00:30.0, 45.7, 60.5, 48.5, 43.5,  -.-, 48.1, 47.9,
44.8, 43.9, 43.6,----,-----,
    69,2021/02/09 12:52:51,00d 00:00:09.1, 44.8, 54.4, 47.3, 44.0,  -.-, 47.5, 47.5,
44.3, 43.6, 43.6,----,-----,
```

RION CO., LTD.

3-20-41 Higashimotomachi Kokubunji Tokyo 185-8533
Phone:042(359)7888, Facsimile:042(359)7442

Certificate of Calibration

Name : **Sound Level Meter, Class 1**

Model : **NL-52** **S/No.** : **01198634**

Date of Calibration : **January, 22, 2020**

We hereby certify that the above product was tested and calibrated according to the prescribed Rion procedures, and that it fulfills specification requirements.
The measuring equipment and reference devices used for testing and calibrating this unit are managed under the Rion traceability system and are traceable according to official Japanese standards and official standards of countries belonging to the International Committee of Weights and Measures.

RION CO., LTD.

K. Okeda

Manager, Quality Control Department

RION Supplied Accessories

Model	NL-52	Product Name	Sound Level Meter, Class 1

Ensure all the items below are in the package.
If there is a missing part, please contact your supplier.

Type	Description	Quantity	Note
NL-52	Main unit	1	
NL-42-025	Storage case	1	
WS-10	Windscreen	1	
NL-42-033	Windscreen fall prevention rubber	1	attached to the main unit
VM-63-017	Hand strap	1	
LR6	Size AA alkaline batteries	4	
	CD-ROM (Instruction manual, Serial interface manual, Technical notes, Program option manual)	1	
	Description for IEC 61672-1	1	
	SD memory card (512 MByte)	1	only when NX-42EX is pre-installed
	Inspection certificate	1	This sheet
	Document for China RoHS	1	only to China

Inspection Certificate

INSPECTOR

M. Nidaka

We hereby certify that this product has been tested and calibrated at our factory according to RION specifications and that the product satisfies all relevant requirements.

RION CO., LTD.
3-20-41 Higashimotomachi, Kokubunji,
Tokyo 185-8533,
Japan

Sound and Vibration Measuring Instrument Section Product information and software downloads can be found on our web-site:
https://rion-sv.com/
Please check it out.

№C11030502

RION CO., LTD.

3-20-41 Higashimotomachi Kokubunji Tokyo 185-8533
Phone:042(359)7888, Facsimile:042(359)7442

Certificate of Calibration

Name : **Sound Level Meter, Class 1**

Model : **NL-52** **S/No.** : **01198633**

Date of Calibration : **January, 22, 2020**

We hereby certify that the above product was tested and calibrated according to the prescribed Rion procedures, and that it fulfills specification requirements.
The measuring equipment and reference devices used for testing and calibrating this unit are managed under the Rion traceability system and are traceable according to official Japanese standards and official standards of countries belonging to the International Committee of Weights and Measures.

RION CO., LTD.

K. Okeda

Manager, Quality Control Department

RION Supplied Accessories

Model	NL-52	Product Name	Sound Level Meter, Class 1

Ensure all the items below are in the package.
If there is a missing part, please contact your supplier.

Type	Description	Quantity	Note
NL-52	Main unit	1	
NL-42-025	Storage case	1	
WS-10	Windscreen	1	
NL-42-033	Windscreen fall prevention rubber	1	attached to the main unit
VM-63-017	Hand strap	1	
LR6	Size AA alkaline batteries	4	
	CD-ROM (Instruction manual, Serial interface manual, Technical notes, Program option manual)	1	
	Description for IEC 61672-1	1	
	SD memory card (512 MByte)	1	only when NX-42EX is pre-installed
	Inspection certificate	1	This sheet
	Document for China RoHS	1	only to China

Inspection Certificate

INSPECTOR

We hereby certify that this product has been tested and calibrated at our factory according to RION specifications and that the product satisfies all relevant requirements.

RION CO., LTD.
3-20-41 Higashimotomachi, Kokubunji,
Tokyo 185-8533,
Japan

Sound and Vibration Measuring Instrument Section Product information and software downloads can be found on our web-site:
https://rion-sv.com/
Please check it out.

№C11030502

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

SOUND LEVEL METER

Manufactured by:	RION
Model No:	NL-52
Serial No:	00464709
Calibration Recall No:	31445

Submitted By:

Customer:

Company:	ROBERT C. KOLMANSBERGER
Address:	151 RENO AVENUE
	NEW CUMBERLAN PA 17070

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. NL-52 RION

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2. Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: 23-Nov-20

Certificate No: 31445 - 1

QA Doc. #1051 Rev. 3.0 5/29/20

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	RION
Model No:	UC-59
Serial No:	09270
Calibration Recall No:	31445

Submitted By:

Customer:

Company:	ROBERT C. KOLMANSBERGER
Address:	151 RENO AVENUE
	NEW CUMBERLAN PA 17070

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. UC-59 RION

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2. Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: 23-Nov-20

Certificate No: 31445 - 2

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

SOUND LEVEL METER

Manufactured by:	RION
Model No:	NL-52
Serial No:	00464710
Calibration Recall No:	31445

Submitted By:

Customer:

Company:	ROBERT C. KOLMANSBERGER
Address:	151 RENO AVENUE
	NEW CUMBERLAN PA 17070

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. NL-52 RION

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2. Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: 23-Nov-20

Certificate No: 31445 - 4

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	RION
Model No:	UC-59
Serial No:	09271
Calibration Recall No:	31445

Submitted By:

Customer:

Company:	ROBERT C. KOLMANSBERGER
Address:	151 RENO AVENUE
	NEW CUMBERLAN PA 17070

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. UC-59 RION

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2. Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: 23-Nov-20

Certificate No: 31445 - 5

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

SOUND CALIBRATOR

Manufactured by:	RION
Model No:	NC-74
Serial No:	34167534
Calibration Recall No:	31445

Submitted By:

Customer:

Company:	ROBERT C. KOLMANSBERGER
Address:	151 RENO AVENUE
	NEW CUMBERLAN PA 17070

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. NC-74 RION

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2. Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: 23-Nov-20

Certificate No: 31445 - 7

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Conformance

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**3895**
Calibration Recall No:	**30971**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2.Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager
ISO/IEC 17025:2017

Calibration Date: 02-Jun-20

Certificate No: 30971 - 1

QA Doc. #1051 Rev. 3.0 5/29/20

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2017
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: dB3080 **Serial No.: 3895**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X.....

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	21.8	°C
Ambient Humidity:	40.6	% RH
Ambient Pressure:	99.362	kPa
Calibration Date:	2-Jun-2020	
Calibration Due:	2-Jun-2021	
Report Number:	30971 -1	
Control Number:	30971	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 dB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A), ISO 9001:2015 and ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2205492	10-Jul-2019	684.07/O-0000001126-20	10-Jul-2020
Brüel & Kjær	4226	S/N 2220624	11-Jul-2019	684.07/O-0000001126-20	11-Jul-2020

Cal. Date: 2-Jun-2020
Calibrated on WCCL system type 9700

Measurements performed by: MB
Matthew Smith

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for
Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3895
Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.0		94.0	
		103.4	104.6	104dB	104.2		104.2	
		113.4	114.6	114dB	114.0		114.0	
,2.	Frequency Response	88.0	97.8	8kHz	95.0		89.7	
	A Weighting	92.1	97.9	4kHz	97.8		97.8	
		93.3	97.1	2kHz	95.6		95.6	
		92.6	95.4	1kHz	94.0		94.0	
		89.4	92.2	500Hz	90.9		90.9	
		84.0	86.8	250Hz	85.2		85.2	
		76.5	79.3	125Hz	77.5		77.5	
		65.9	69.7	63Hz	66.8		66.8	
		51.8	57.5	31.5Hz	54.0		54.0	
	C Weighting	86.1	95.9	8kHz	88.4		88.4	
		90.3	96.1	4kHz	95.0		95.0	
		91.9	95.7	2kHz	94.4		94.4	
		92.6	95.4	1kHz	94.2		94.2	
		92.6	95.4	500Hz	94.3		94.3	
		92.6	95.4	250Hz	94.4		94.4	
		92.4	95.2	125Hz	94.4		94.4	
		91.3	95.1	63Hz	93.3		93.3	
		88.2	93.9	31.5Hz	90.4		90.4	
,3								
	SLM	113.4	114.6		113.6		113.6	
	L avg. / Leq	113.4	114.6		113.6		113.6	
	L max.	113.4	114.6		114.1		114.1	
	L pk	116.1	117.9		117.0		117.0	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.20%		0.20%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.80%		0.80%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.27%		3.27%	
4	Inherent noise level				49.3		49.3	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Acoustic Level ([114 & 94] dB @ 1 kHz):	0.2	0.1	0.30
Meter linearity (Attenuation Generation):	0.46	0.1	0.56
Attenuator accuracy (Attenuation Measure):	0.46	0.1	0.56
Acoustic Freq. Response: 63 Hz to 8 kHz	0.2	0.1	0.30
Inherent noise level:	0.3	0.1	0.40
Functions:	0.2	0.1	0.30
Sensitivity:	0.2	0.1	0.30
Dose:	0.33	0.1	0.43

Measurements performed by:

Calibration Date: 2-Jun-2020

Matthew Smith

West Caldwell Calibration Laboratories Inc.

Certificate of Conformance

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**3897**
Calibration Recall No:	**30971**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **db3080 METR**

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2.Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager
ISO/IEC 17025:2017

Calibration Date: **02-Jun-20**

Certificate No: **30971 - 2**

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2017
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: dB3080 **Serial No.: 3897**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X.....

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	**21.8**	°C
Ambient Humidity:	**40.6**	% RH
Ambient Pressure:	**99.362**	kPa
Calibration Date:	**2-Jun-2020**	
Calibration Due:	**2-Jun-2021**	
Report Number:	**30971 -2**	
Control Number:	**30971**	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 dB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A), ISO 9001:2015 and ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2205492	10-Jul-2019	684.07/O-0000001126-20	10-Jul-2020
Brüel & Kjær	4226	S/N 2220624	11-Jul-2019	684.07/O-0000001126-20	11-Jul-2020

Cal. Date: 2-Jun-2020
Measurements performed by: MB
Matthew Smith

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3897

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.3		94.3	
		103.4	104.6	104dB	104.3		104.3	
		113.4	114.6	114dB	114.3		114.3	
,2.	Frequency Response	88.0	97.8	8kHz	95.0		94.3	
	A Weighting	92.1	97.9	4kHz	95.5		95.5	
		93.3	97.1	2kHz	95.0		95.0	
		92.6	95.4	1kHz	94.3		94.3	
		89.4	92.2	500Hz	91.1		91.1	
		84.0	86.8	250Hz	85.5		85.5	
		76.5	79.3	125Hz	77.8		77.8	
		65.9	69.7	63Hz	67.0		67.0	
		51.8	57.5	31.5Hz	54.7		54.7	
	C Weighting	86.1	95.9	8kHz	94.3		94.3	
		90.3	96.1	4kHz	94.5		94.5	
		91.9	95.7	2kHz	93.9		93.9	
		92.6	95.4	1kHz	94.2		94.2	
		92.6	95.4	500Hz	94.3		94.3	
		92.6	95.4	250Hz	94.4		94.4	
		92.4	95.2	125Hz	94.3		94.3	
		91.3	95.1	63Hz	93.5		93.5	
		88.2	93.9	31.5Hz	91.1		91.1	
,3								
	SLM	113.4	114.6		113.9		113.9	
	L avg. / Leq	113.4	114.6		113.9		113.9	
	L max.	113.4	114.6		114.0		114.0	
	L pk	116.1	117.9		117.2		117.2	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.18%		0.18%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.83%		0.83%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.12%		3.12%	
4	Inherent noise level				51.3		51.3	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Acoustic Level ([114 & 94] dB @ 1 kHz):	0.2	0.1	0.30
Meter linearity (Attenuation Generation):	0.46	0.1	0.56
Attenuator accuracy (Attenuation Measure):	0.46	0.1	0.56
Acoustic Freq. Response: 63 Hz to 8 kHz	0.2	0.1	0.30
Inherent noise level:	0.3	0.1	0.40
Functions:	0.2	0.1	0.30
Sensitivity:	0.2	0.1	0.30
Dose:	0.33	0.1	0.43

Measurements performed by:

Calibration Date: 2-Jun-2020

Matthew Smith

West Caldwell Calibration Laboratories Inc.

Certificate of Conformance

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**4618**
Calibration Recall No:	**30971**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **db3080 METR**

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2.Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager
ISO/IEC 17025:2017

Calibration Date: **02-Jun-20**

Certificate No: **30971 - 3**

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2017
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: dB3080 **Serial No.: 4618**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:

Before data: ..... After data: .....
Before & after data same: ...X.....

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	21.8	°C
Ambient Humidity:	40.6	% RH
Ambient Pressure:	99.362	kPa
Calibration Date:	2-Jun-2020	
Calibration Due:	2-Jun-2021	
Report Number:	30971 -3	
Control Number:	30971	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 dB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A), ISO 9001:2015 and ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2205492	10-Jul-2019	684.07/O-0000001126-20	10-Jul-2020
Brüel & Kjær	4226	S/N 2220624	11-Jul-2019	684.07/O-0000001126-20	11-Jul-2020

Cal. Date: 2-Jun-2020
Calibrated on WCCL system type 9700

Measurements performed by: MB
Matthew Smith

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for
Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 4618
Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.2		94.2	
		103.4	104.6	104dB	104.4		104.4	
		113.4	114.6	114dB	114.3		114.3	
,2.	Frequency Response	88.0	97.8	8kHz	95.0		95.0	
	A Weighting	92.1	97.9	4kHz	97.3		97.3	
		93.3	97.1	2kHz	95.6		95.6	
		92.6	95.4	1kHz	94.2		94.2	
		89.4	92.2	500Hz	91.1		91.1	
		84.0	86.8	250Hz	85.6		85.6	
		76.5	79.3	125Hz	78.2		78.2	
		65.9	69.7	63Hz	67.9		67.9	
		51.8	57.5	31.5Hz	55.2		55.2	
	C Weighting	86.1	95.9	8kHz	87.6		87.6	
		90.3	96.1	4kHz	95.6		95.6	
		91.9	95.7	2kHz	94.4		94.4	
		92.6	95.4	1kHz	94.2		94.2	
		92.6	95.4	500Hz	94.2		94.2	
		92.6	95.4	250Hz	94.3		94.3	
		92.4	95.2	125Hz	94.2		94.2	
		91.3	95.1	63Hz	93.4		93.4	
		88.2	93.9	31.5Hz	90.4		90.4	
,3								
	SLM	113.4	114.6		113.9		113.9	
	L avg. / Leq	113.4	114.6		113.9		113.9	
	L max.	113.4	114.6		114.0		114.0	
	L pk	116.1	117.9		117.3		117.3	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.18%		0.18%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.83%		0.83%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.12%		3.12%	
4	Inherent noise level				51.9		51.9	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Acoustic Level ([114 & 94] dB @ 1 kHz):	0.2	0.1	0.30
Meter linearity (Attenuation Generation):	0.46	0.1	0.56
Attenuator accuracy (Attenuation Measure):	0.46	0.1	0.56
Acoustic Freq. Response: 63 Hz to 8 kHz	0.2	0.1	0.30
Inherent noise level:	0.3	0.1	0.40
Functions:	0.2	0.1	0.30
Sensitivity:	0.2	0.1	0.30
Dose:	0.33	0.1	0.43

Measurements performed by:

Calibration Date: 2-Jun-2020

Matthew Smith

West Caldwell Calibration Laboratories Inc.

Certificate of Conformance

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**5093**
Calibration Recall No:	**30971**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2.Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager
ISO/IEC 17025:2017

Calibration Date: 02-Jun-20

Certificate No: 30971 - 4

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2017
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: dB3080 **Serial No.: 5093**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X.....

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	21.8	°C
Ambient Humidity:	40.6	% RH
Ambient Pressure:	99.362	kPa
Calibration Date:	2-Jun-2020	
Calibration Due:	2-Jun-2021	
Report Number:	30971 -4	
Control Number:	30971	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 dB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A), ISO 9001:2015 and ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2205492	10-Jul-2019	684.07/O-0000001126-20	10-Jul-2020
Brüel & Kjær	4226	S/N 2220624	11-Jul-2019	684.07/O-0000001126-20	11-Jul-2020

Cal. Date: 2-Jun-2020

Measurements performed by: MB
Matthew Smith

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter — Model No.: db-3080 — S/N: 5093

Submitted by, — Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.4		94.4	
		103.4	104.6	104dB	104.4		104.4	
		113.4	114.6	114dB	114.4		114.4	
,2.	Frequency Response	88.0	97.8	8kHz	95.0		95.0	
	A Weighting	92.1	97.9	4kHz	97.2		97.2	
		93.3	97.1	2kHz	95.9		95.9	
		92.6	95.4	1kHz	94.4		94.4	
		89.4	92.2	500Hz	91.3		91.3	
		84.0	86.8	250Hz	85.8		85.8	
		76.5	79.3	125Hz	78.4		78.4	
		65.9	69.7	63Hz	68.3		68.3	
		51.8	57.5	31.5Hz	56.4		56.4	
	C Weighting	86.1	95.9	8kHz	94.8		94.8	
		90.3	96.1	4kHz	95.7		95.7	
		91.9	95.7	2kHz	94.7		94.7	
		92.6	95.4	1kHz	94.7		94.7	
		92.6	95.4	500Hz	94.8		94.8	
		92.6	95.4	250Hz	94.8		94.8	
		92.4	95.2	125Hz	94.8		94.8	
		91.3	95.1	63Hz	94.3		94.3	
		88.2	93.9	31.5Hz	91.9		91.9	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.1		114.1	
	L pk	116.1	117.9		117.6		117.6	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.18%		0.18%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.82%		0.82%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.12%		3.12%	
4	Inherent noise level				51.1		51.1	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Acoustic Level ([114 & 94] dB @ 1 kHz):	0.2	0.1	0.30
Meter linearity (Attenuation Generation):	0.46	0.1	0.56
Attenuator accuracy (Attenuation Measure):	0.46	0.1	0.56
Acoustic Freq. Response: 63 Hz to 8 kHz	0.2	0.1	0.30
Inherent noise level:	0.3	0.1	0.40
Functions:	0.2	0.1	0.30
Sensitivity:	0.2	0.1	0.30
Dose:	0.33	0.1	0.43

Measurements performed by:

Calibration Date: 2-Jun-2020

Matthew Smith

West Caldwell Calibration Laboratories Inc.

Certificate of Conformance

for

ACOUSTICAL CALIBRATOR

Manufactured by:	**METROSONICS**
Model No:	**CL304**
Serial No:	**4480**
Calibration Recall No:	**30971**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **CL304** **METR**

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statment of conformance for ALL given specifications and standards fall under the decision rule: A=(L-(U95)), where A is acceptance limit, L is manufacturer specifications and U95 is confidence level of 95% at k=2. This includes but not limited to:1. Measured value does not meet manufacturer's tolerance, 2.Manufacturer's tolerance is too small compared to calibration and measurment capability uncertainties, 3. Test uncertainty ratio does not meet the 4:1 ratio due to test instrumentation limitations. The decision rule has been communicated and approved by customer during contract

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager
ISO/IEC 17025:2017

Calibration Date: **02-Jun-20**

Certificate No: **30971 - 5**

QA Doc. #1051 Rev. 3.0 5/29/20

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2017
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 4480**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:

Before data: ..... **After data:** .....
Before & after data same: ...X.....

Sound Pressure Level at 1000.3 Hz and pressure of 1013 hPa (mbar)
was 101.83 dB re 20µPa

Sound Pressure Level:	**Pass**
Frequency:	**Pass**
Distortion:	**Pass**
Stability:	**Pass**
All tested parameters:	**Pass**

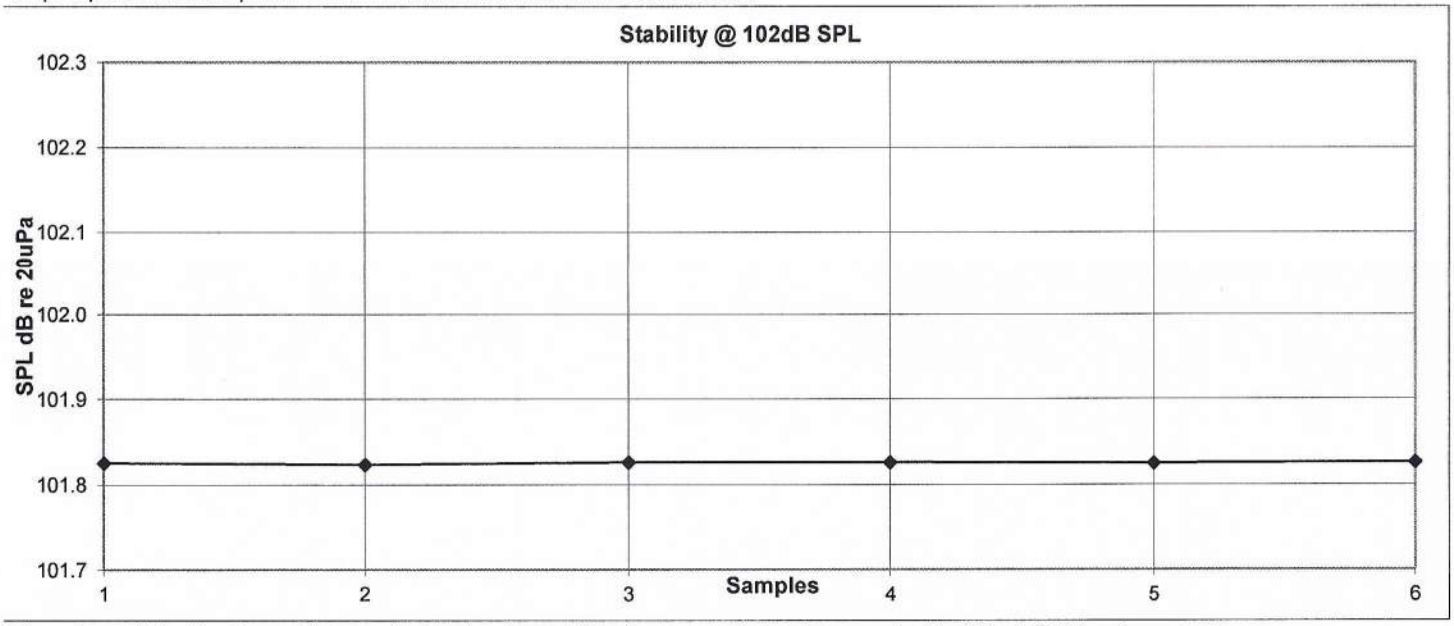
Laboratory Environment:		
Ambient Temperature:	21.8	°C
Ambient Humidity:	40.6	% RH
Ambient Pressure:	99.362	kPa
Calibration Date:	2-Jun-2020	
Calibration Due:	2-Jun-2021	
Report Number:	30971 -5	
Control Number:	30971	

The above listed instrument meets or exceeds the tested manufacturer's specifications.

This Calibration is traceable through NIST test numbers: 684.07/O-0000001126-20

The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 CL304METR**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A), ISO 9001:2015 and ISO 17025

Cal. Date: 2-Jun-2020

Measurements performed by: MS
Matthew Smith

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 4480**
Company: Skelly & Loy, Inc.

All tested parameters: Pass

Measured Sound Pressure Level (Six samples measured at 5 sec. interval)

Sample	1	101.83 dB re 20µPa	
	2	101.82	
	3	101.83	
	4	101.83	
	5	101.82	
	6	101.83	
	Average	**101.83**	Spec. 102dB ± 0.3dB

Frequency measured (Three samples at 30 sec. Interval)

Sample	1	1000.33 Hz	
	2	1000.30	
	3	1000.32	
	Average	**1000.32**	Spec. 1000Hz ± 2.0%

Distortion measured -38.5 dB Spec. ≤-34dB

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Acoustic Level ([114 & 94] @ 1 kHz):	**0.18**	**0.1**	**0.28**
Frequency Measure (DC to 10 MHz):	**6.0 parts in [10^6] Hz**		

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2205492	10-Jul-2019	684.07/O-0000001126-20	10-Jul-2020
Brüel & Kjær	4134	S/N 173494	1-Jul-2019	684.07/O-0000001126-20	1-Jul-2020
Brüel & Kjær	2669	S/N 1835080	8-Jul-2019	684.07/O-0000001126-20	8-Jul-2020
HP	34401A	S/N US361009	3-Jul-2019	,1010733	3-Jul-2020
Brüel & Kjær	2636	S/N 1487493	10-Jul-2019	684.07/O-0000001126-20	10-Jul-2020

Cal. Date: 2-Jun-2020 **Tested by: Matthew Smith**

Calibrated on WCCL system type 9700

APPENDIX B -
TRAFFIC DATA

Van Buren Monitoring Traffic

Run	Roadway/Direction	Speed	20 Min Light	20 Min Medium	20 Min Heavy	Hour Light	Hour Medium	Hour Heavy
1	95 SB	65-70	1134	38	162	3402	114	486
1	95 Hot Lane	65-70	180	8	0	540	24	0
1	95 NB	65-70	1120	46	178	3360	138	534
1	Cardinal DR WB Thru	45	104	4	0	312	12	0
1	Cardinal DrR WB RT to Benita Fitzgeral Dr	45	24	0	0	72	0	0
1	Cardinal DR WB LT to Van Buren Rd	45	1	0	0	3	0	0
1	Cardinal DR EB Thru	45	120	4	0	360	12	0
1	Cardinal DR EB LT to Benita Fitzgeral Dr	45	92	0	0	276	0	0
1	Cardinal DR EB RT to Van Buren Rd	45	2	0	0	6	0	0
1	Van Buren NB Thru	25	4	0	0	12	0	0
1	Van Buren NB RT to Cardinal EB	25	1	0	0	3	0	0
1	Van Buren NB LT to Cardinal WB	25	0	0	0	0	0	0
1	Benita Fitzgerald Thr	45	8	2	0	24	6	0
1	Benita Fitzgerals Dr SB RT to Cardinal DR WB	45	52	0	0	156	0	0
1	Benita Fitzgerals Dr SB LT to Cardinal DR EB	45	30	4	0	90	12	0
1	Cardinal DR WB Depart	45	156	4	0	468	12	0
1	Cardinal DR EB Depart	45	151	8	0	453	24	0
1	Van Buren Rd SB Depart	45	11	2	0	33	6	0
1	Benita Fitzgerald Dr NB Depart	45	120	0	0	360	0	0
2	95 SB	65-70	1434	30	100	4302	90	300
2	95 SB Hot Lane	65-70	126	0	0	378	0	0
2	95 NB	65-70	1020	42	122	3060	126	366
2	Van Buren Rd SB Thru	25	6	0	0	18	0	0
2	Van Buren Rd SB RT	25	10	6	0	30	18	0
2	Van Buren Rd SB LT	25	28	1	2	84	3	6
2	Dumfries RD WB Thru	50	330	20	22	990	60	66
2	Dumfries RD WB RT	50	2	0	0	6	0	0
2	Dumfries RD WB LT	50	98	0	0	294	0	0
2	Dumfries RD EB Thru	50	358	16	28	1074	48	84
2	Dumfries RD EB RT	50	110	0	0	330	0	0
2	Dumfries RD EB LT	50	2	0	0	6	0	0
2	Van Buren Rd NB Thru	25	20	0	0	60	0	0
2	Van Buren Rd NB RT	25	48	1	1	144	3	3
2	Van Buren Rd NB LT	25	124	2	1	372	6	3
2	Dumfries RD EB Depart	50	492	24	29	1476	72	87
2	Dumfries RD WB Depart	50	388	27	23	1164	81	69
2	VanBuren NB Depart	25	24	0	0	72	0	0
2	Van Buren SB Depart	25	214	0	0	642	0	0

LHD
Loudest Hour Determination

LHD | Loudest Hour Determination

FINAL ADJUSTED FREE FLOW SPEEDS

Time	EXISTING			NO-BUILD			BUILD		
	EB or NB Hourly Interrupted Speed (mph)	WB or SB Hourly Interrupted Speed (mph)	FFS Speed (two way) (mph)	EB or NB Hourly Interrupted Speed (mph)	WB or SB Hourly Interrupted Speed (mph)	FFS Speed (two way) (mph)	EB or NB Hourly Interrupted Speed (mph)	WB or SB Hourly Interrupted Speed (mph)	FFS Speed (two way) (mph)
0:00	71.0	46.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
1:00	71.0	46.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
2:00	71.0	45.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
3:00	71.0	45.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
4:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
5:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
6:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
7:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
8:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
9:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
10:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
11:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
12:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
13:00	71.0	43.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
14:00	71.0	41.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
15:00	71.0	36.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
16:00	71.0	31.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
17:00	71.0	31.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
18:00	71.0	32.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
19:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
20:00	71.0	44.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0

21:00	71.0	45.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
22:00	71.0	45.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0
23:00	71.0	45.0	0.0	1.0	1.0	1.0	71.0	1.0	1.0

TRAFFIC INPUTS FOR WORST CASE NOISE HOUR CALCUATION

Time	EXISTING						NO-BUILD						BUILD					
	EB or NB			WB or SB			EB or NB			WB or SB			EB or NB			WB or SB		
	Autos	Med	Heavy	Autos	Med	Heavy	Autos	Med	Heavy	Autos	Med	Heavy	Autos	Med	Heavy	Autos	Med	Heavy
0:00	13.0	0.0	0.0	18.0	0.0	0.0	14.0	0.0	0.0	19.0	0.0	0.0	46.9	0.0	0.0	64.9	0.1	0.1
1:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00	13.0	0.0	0.0	18.0	0.0	0.0	14.0	0.0	0.0	18.0	0.0	0.0	47.9	0.0	0.0	62.9	0.1	0.1
5:00	26.9	0.0	0.0	35.9	0.0	0.0	27.9	0.0	0.0	37.9	0.0	0.0	95.8	0.1	0.1	127.7	0.1	0.1
6:00	39.9	0.0	0.0	56.9	0.1	0.1	40.9	0.0	0.0	57.9	0.1	0.1	137.7	0.1	0.1	197.6	0.2	0.2
7:00	50.9	0.1	0.1	76.8	0.1	0.1	52.9	0.1	0.1	79.8	0.1	0.1	177.6	0.2	0.2	268.5	0.3	0.3
8:00	61.9	0.1	0.1	97.8	0.1	0.1	63.9	0.1	0.1	100.8	0.1	0.1	217.6	0.2	0.2	340.3	0.3	0.3
9:00	61.9	0.1	0.1	97.8	0.1	0.1	63.9	0.1	0.1	100.8	0.1	0.1	217.6	0.2	0.2	340.3	0.3	0.3
10:00	61.9	0.1	0.1	97.8	0.1	0.1	63.9	0.1	0.1	100.8	0.1	0.1	217.6	0.2	0.2	340.3	0.3	0.3
11:00	63.9	0.1	0.1	95.8	0.1	0.1	65.9	0.1	0.1	98.8	0.1	0.1	222.6	0.2	0.2	334.3	0.3	0.3
12:00	78.8	0.1	0.1	113.8	0.1	0.1	81.8	0.1	0.1	116.8	0.1	0.1	275.4	0.3	0.3	395.2	0.4	0.4
13:00	93.8	0.1	0.1	129.7	0.1	0.1	96.8	0.1	0.1	133.7	0.1	0.1	327.3	0.3	0.3	453.1	0.5	0.5
14:00	95.8	0.1	0.1	127.7	0.1	0.1	98.8	0.1	0.1	131.7	0.1	0.1	335.3	0.3	0.3	445.1	0.4	0.4
15:00	98.8	0.1	0.1	125.7	0.1	0.1	101.8	0.1	0.1	129.7	0.1	0.1	343.3	0.3	0.3	437.1	0.4	0.4
16:00	117.8	0.1	0.1	137.7	0.1	0.1	121.8	0.1	0.1	142.7	0.1	0.1	410.2	0.4	0.4	481.0	0.5	0.5
17:00	120.8	0.1	0.1	135.7	0.1	0.1	124.8	0.1	0.1	139.7	0.1	0.1	420.2	0.4	0.4	473.1	0.5	0.5
18:00	120.8	0.1	0.1	135.7	0.1	0.1	124.8	0.1	0.1	139.7	0.1	0.1	420.2	0.4	0.4	473.1	0.5	0.5
19:00	102.8	0.1	0.1	121.8	0.1	0.1	105.8	0.1	0.1	124.8	0.1	0.1	359.3	0.4	0.4	422.2	0.4	0.4
20:00	71.9	0.1	0.1	87.8	0.1	0.1	73.9	0.1	0.1	90.8	0.1	0.1	251.5	0.3	0.3	306.4	0.3	0.3

21:00	41.9	0.0	0.0	53.9	0.1	0.1	43.9	0.0	0.0	54.9	0.1	0.1	147.7	0.1	0.1	187.6	0.2	0.2
22:00	26.9	0.0	0.0	35.9	0.0	0.0	27.9	0.0	0.0	37.9	0.0	0.0	95.8	0.1	0.1	127.7	0.1	0.1
23:00	13.0	0.0	0.0	18.0	0.0	0.0	14.0	0.0	0.0	18.0	0.0	0.0	47.9	0.0	0.0	62.9	0.1	0.1

LHD
Loudest Hour Determination Tool

LHD | Loudest Hour Determination

50 ft Test Receiver (Existing, No-Build, Build)

Time	EXISTING			NO-BUILD			BUILD		
	EB/NB	WB/SB	2 Way	EB/NB	WB/SB	2 Way	EB/NB	WB/SB	2 Way
Hour	17:00	19:00	19:00	17:00	16:00	16:00	17:00	16:00	16:00
Leq	60.8	54.1	61.1	53.2	53.8	56.4	66.2	59.0	66.9

Inputs

1. Purpose of Analysis:	3-Scenario: Existing, Interim & Design		
1a. Period:	24-hour		
1b. Segment Length (mi.):	1		
2. Is the Analysis Segment Signalized:	Yes		
2a. Does it Remain Signalized After Project Completion:	Yes		
3. Analysis Facility Name & Number:	Van Buren Road		
3a. Area Type:	Suburban		
4. Project Title/Proj. Number/UPC Number:	Van Buren Road Extension		
4a. Analysis Segment Begining:	Dumfries Road (Route 234)		
4b. Facility Direction:	North-South		
4c. Analysis Segment Ending:	Cardinal Drive		
4d. Reverse Direction:	No		
5. VDOT District:	Northern_Virginia		
5a. Jurisdiction:	Prince William Co		
5b. Terrain:	Level		
6. Name/ Year 1-3	Existing|2020	Interim|2025	Design|2040
7. Analysis Facility Type (FT):	Local	Major Collector with PS>35 mph	Major Collector with PS>35 mph
8. Facility Cross Section:	Undivided	Divided	Divided
9. Posted Speed (PS, mph):	25	45	45
11. Number of Lane (bound-A| bound-B):	1|1	2|2	2|2
12. Lane Width (ft.):	12	12	12
13. Shoulder Width (Inside|Outside):	0|2.0	0|2.0	0|2.0
14. Access Density (# of access/mi.):	3	3	3
15. Analysis Segment No. of Signals:	2	2	2
16. Average Cycle Length (sec.):	140	140	140
17. Average Green Time per Cycle (sec.):	13	30	30
18. Signal Coordination:	No Coordination	No Coordination	No Coordination
Note	NA		
19. Volume-Delay Function (Travel-Time Model):	BPR Model (Noise Study)		
20. Truck Input Type:	Daily		
20a. Daily (%):	2	2	2
21. Eastbound ADT or AADT :	3200	10240	11180
21a. Is No-build Condition Eastbound ADT or AADT Available:	Yes	3300	3300
22. Interim & Design - Build & No-Build Traffic Assignment:	1. Demand Speed & Volume		
22a. Is Current Hourly Speed Available:	No		
22b. User Initial:	WFJ		
23. Apply Existing K & D Factors to the Interim and Design Year:	Yes		
23b. Apply Existing Hourly % Truck to Interim and Design:	Yes		

25. K & D factors, Truck Data and Existing Speed:

Starting Time	K-factor	D-factor	A bound % Truck: 2X-6T	A bound % Tru	B bound % Tru	B bound % Tru	A bound Exist	B bound Existi	Interim year K	Desgin year K	Interim year D	Desgin year D	Interim Truck	Design Truck
0:00	0.00501	0.37243	0.00748	0.0405	0.02792	0.06751	42.50033234	46.05677975	0.00501	0.00501	0.37243	0.37243	0.02792	0.06751
1:00	0.00296	0.49045	0.01882	0.09908	0.04611	0.06671	43.08981597	45.93922576	0.00296	0.00296	0.49045	0.49045	0.04611	0.06671
2:00	0.00198	0.45725	0.06539	0.0883	0.05722	0.09588	42.54753795	45.06034328	0.00198	0.00198	0.45725	0.45725	0.05722	0.09588
3:00	0.00236	0.54617	0.05242	0.02116	0.07901	0.04236	44.23624752	45.06901366	0.00236	0.00236	0.54617	0.54617	0.07901	0.04236
4:00	0.0055	0.62041	0.05219	0.00288	0.06033	0.03419	45.10601879	44.33261999	0.0055	0.0055	0.62041	0.62041	0.06033	0.03419
5:00	0.02257	0.76997	0.05537	0.0142	0.04331	0.02263	45.02243042	44.44905492	0.02257	0.02257	0.76997	0.76997	0.04331	0.02263
6:00	0.05524	0.82379	0.03023	0.02293	0.06003	0.02382	40.662329	44.14581115	0.05524	0.05524	0.82379	0.82379	0.06003	0.02382
7:00	0.06855	0.77913	0.02409	0.02728	0.04921	0.02139	38.44252577	43.92053519	0.06855	0.06855	0.77913	0.77913	0.04921	0.02139
8:00	0.07071	0.76567	0.02631	0.02546	0.0418	0.02222	38.37532059	44.10739941	0.07071	0.07071	0.76567	0.76567	0.0418	0.02222
9:00	0.06177	0.7015	0.0348	0.02924	0.04428	0.02498	39.35967618	43.83986856	0.06177	0.06177	0.7015	0.7015	0.04428	0.02498
10:00	0.04553	0.56878	0.03494	0.02778	0.04195	0.02761	39.93951711	44.05846412	0.04553	0.04553	0.56878	0.56878	0.04195	0.02761
11:00	0.04503	0.49601	0.03463	0.02767	0.04088	0.02399	40.79318379	43.71967583	0.04503	0.04503	0.49601	0.49601	0.04088	0.02399
12:00	0.0484	0.47072	0.03304	0.02425	0.04172	0.02476	40.33874685	43.8052175	0.0484	0.0484	0.47072	0.47072	0.04172	0.02476
13:00	0.04994	0.40291	0.03637	0.02213	0.0374	0.02415	40.7451487	43.31894765	0.04994	0.04994	0.40291	0.40291	0.0374	0.02415
14:00	0.05317	0.36011	0.03367	0.02736	0.03192	0.02747	41.14091109	40.52004238	0.05317	0.05317	0.36011	0.36011	0.03192	0.02747
15:00	0.06968	0.29257	0.03698	0.01919	0.0277	0.02837	41.8846445	36.04119057	0.06968	0.06968	0.29257	0.29257	0.0277	0.02837
16:00	0.07564	0.29375	0.02747	0.01646	0.02058	0.02236	41.91819385	30.88208996	0.07564	0.07564	0.29375	0.29375	0.02058	0.02236
17:00	0.07787	0.32949	0.02894	0.01108	0.0169	0.02526	41.82341587	31.195653	0.07787	0.07787	0.32949	0.32949	0.0169	0.02526
18:00	0.07629	0.34077	0.02142	0.01094	0.01539	0.01645	41.7915316	32.16497003	0.07629	0.07629	0.34077	0.34077	0.01539	0.01645
19:00	0.05779	0.39854	0.01995	0.01203	0.01755	0.01086	41.16505151	44.18901931	0.05779	0.05779	0.39854	0.39854	0.01755	0.01086
20:00	0.04364	0.41567	0.02142	0.00953	0.01692	0.01151	42.00853909	44.31156776	0.04364	0.04364	0.41567	0.41567	0.01692	0.01151
21:00	0.02959	0.43332	0.01484	0.00759	0.00866	0.00791	42.81982592	45.44042807	0.02959	0.02959	0.43332	0.43332	0.00866	0.00791
22:00	0.0197	0.43951	0.01009	0.01173	0.01095	0.02812	42.97062999	44.67890526	0.0197	0.0197	0.43951	0.43951	0.01095	0.02812
23:00	0.01108	0.4425	0.0095	0.02387	0.01366	0.02306	42.63698148	45.31084249	0.01108	0.01108	0.4425	0.4425	0.01366	0.02306

Table
Summary of Peak Hour Traffic Volumes (Bi-Directional)

	2020		2025				2040			
	Existing		No Build		Build		No Build		Build	
Roadway Link	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Dumfries Road (West of Van Buren Road)	4,717	4,506	3,892	5,082	3,824	5,932	5,060	6,535	4,893	7,231
Dumfries Road (East of Van Buren Road)	4,619	4,196	3,729	4,857	3,290	4,954	4,897	6,310	4,317	6,254
Van Buren Road (South of Dumfries Road)	943	1,357	785	1,383	1,325	1,936	785	1,383	1,514	2,145
Cardinal Drive (West of Benita Fitzgerald Drive)	1,416	1,994	928	1,817	1,240	2,578	1,095	2,072	1,365	2,771
Cardinal Drive (East of Benita Fitzgerald Drive)	1,350	2,067	885	1,409	1,154	1,988	1,052	1,664	1,265	2,182
Benita Fitzgerald Drive (North of Cardinal Drive)	1,308	1,632	816	1,752	1,070	2,336	816	1,752	1,149	2,437

			Van Buren		
PM Peak	**ENTRADA 2040 Output 16:00**	2040	Cars	Mt	Ht
	EB/SB	410	**402**	**4**	**4**
	WB/NB	482	**472**	**5**	**5**
				1%	1%

Extension Road

2040 Build: 130 AM Peak Hour/**483 PM Peak Hour/**4,830 ADT

2025 Build: 126 AM Peak Hour/477 PM Peak Hour/4,770 ADT

	I95 SB 2035	**I95 NB 2035**	**2035 Hot Lane**	
Cars	4812	3889	1555	***Taken From UPC 70849 Hot Lane I***
MT	107	38	8	
HT	194	286	3	
	I95 SB 2040	**I95 NB 2040**	**2040 Hot Lane**	
Cars	5313	4294	1717	Assumed 2% growth rate
MT	118	42	9	
HT	214	316	3	

Project

APPENDIX C -
HB 2577 DOCUMENTATION

PRINCE WILLIAM COUNTY

Department of Transportation
Ricardo Canizales
Director of Transportation

July 22, 2021

Virginia Department of Transportation
Attn: LJ Muchenje, PE
Environmental Division, Noise Abatement
1401 E. Broad Street
Richmond, VA 23219

RE: UPC 118643 Van Buren Road North Extension From Route 234 (Dumfries Road) to Cardinal Drive

Dear Mr. Muchenje,

The 2009 General Assembly passed Chapter 120 (HB 2577, as amended by HB2025), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement.

House Bill 2025 States: Requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required.

In an effort to honor the intent of HB 2025 Prince William County Department of Transportation is providing our input (per Chapter VI of Materials Division's Manual of Instruction and Section 2B-3 Determination of Roadway Design of the VDOT Road Design manual (pages 2B-5 and 2B-6)). As part of the Noise Technical Report and technical files, we are providing comments for the project noted above.

Should you have any questions, please contact me at (703) 792-6822. Thank you for your time and consideration regarding this request.

Sincerely,

Sherry Djouharian
Project Manager
Prince William County Department of Transportation

Enclosure: Comment Responses

Comment Responses:

Comment: Is noise reducing design feasible in lieu of construction of noise walls or sound barriers? For example, the roadway alignment can be shifted away from noise sensitive receptors, or the roadway can be placed in deep cut.

Response: Significant noise studied with the noise analysis are associated with I-95 and local roads other than proposed Van Buren Road. Noise reducing design including horizontal and vertical shifts to the Van Buren Road North Extension alignment would thus not be applicable to improving noise conditions for the corridor. Aligning Van Buren Road as close to I-95 as possible has already been incorporated in order to reduce the likelihood of noise impacts to the nearby neighborhoods. (Sherry Djouharian, Project Manager, Prince William County Department of Transportation.)

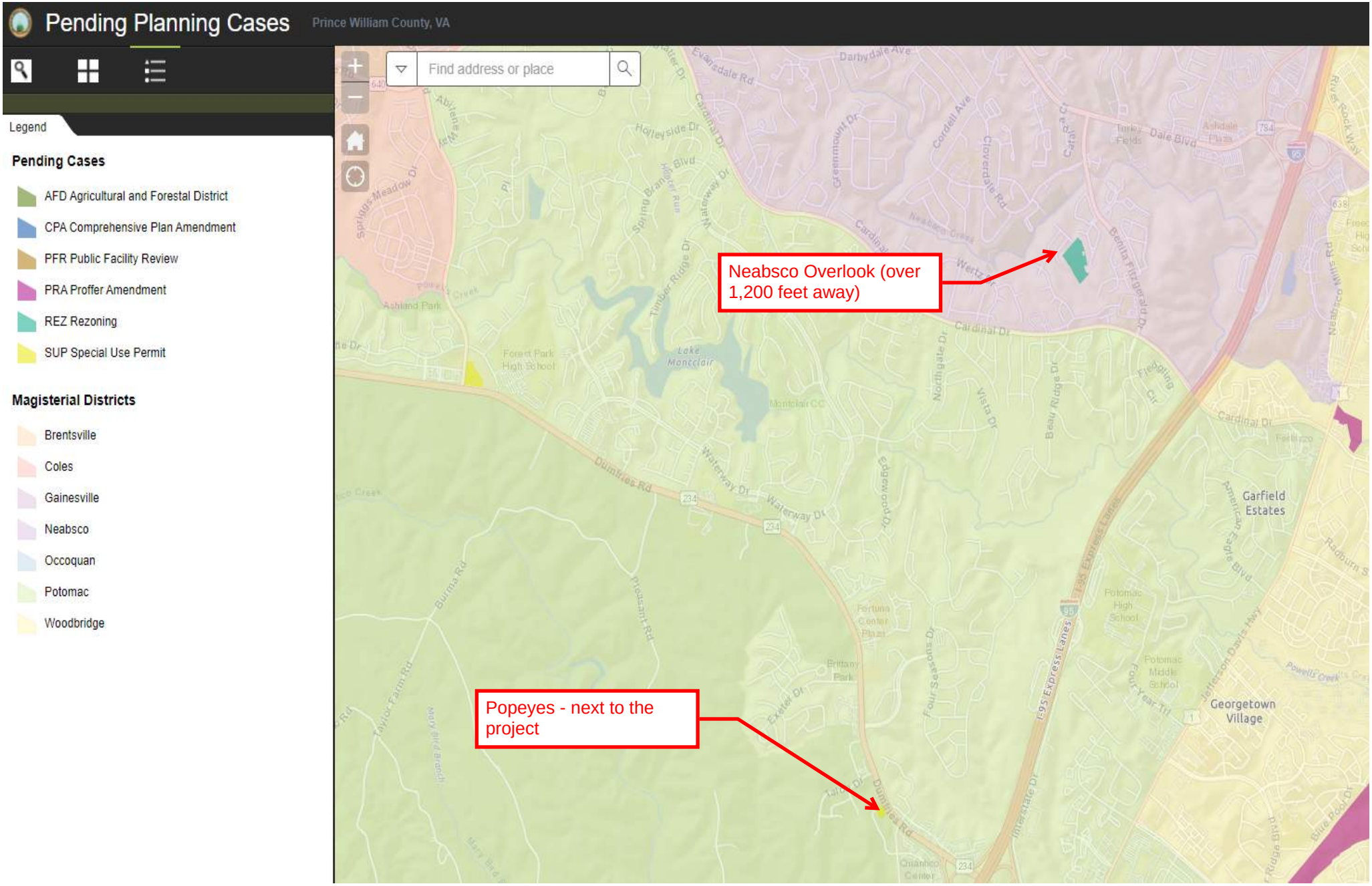
Comment: Can the project support the use of low noise pavement in lieu of construction of noise walls or sound barriers?

Response: The Virginia Department of Transportation is not authorized by the Federal Highway Administration to use "quiet pavement" at this time as a form of noise mitigation. Upon completion of the Quiet Pavement Pilot Program and approval from FHWA, the use of "quiet pavement" will be given additional consideration. (Sherry Djouharian, Project Manager, Prince William County Department of Transportation.)

Comment: Can landscaping be utilized to act as a visual screen if visual screening is required? (Location & Design to address)

Response: No landscaping to provide a visual screen is presently proposed as part of the project. Landscaping could be used as a visual screen if it is required but would be limited by project design constraints, including deep cuts required to construct the project. The landscaping must be placed outside of the clear zone, must not decrease driver sight distance, and must not require additional right of way. (Sherry Djouharian, Project Manager, Prince William County Department of Transportation.)

APPENDIX D -
UNDEVELOPED LANDS


Pending Planning Cases
Prince William County, VA
Find address or place
Legend
Pending Cases
AFD Agricultural and Forestal District
CPA Comprehensive Plan Amendment
PFR Public Facility Review
PRA Proffer Amendment
REZ Rezoning
SUP Special Use Permit
Magisterial Districts
Brentsville
Coles
Gainesville
Neabsco
Occoquan
Potomac
Woodbridge
Neabsco Overlook (over 1,200 feet away)
Popeyes - next to the project
Garfield Estates
Georgetown Village

APPENDIX E - WARRANTED, FEASIBLE, AND REASONABLE WORKSHEETS

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	7/26/21
Project No. and UPC:	Van Buren Road Extension, UPC: 118643
County:	Prince William County
District:	Northern Virginia
Barrier System ID:	Barrier C1
Community Name and/or CNE#	CNE C
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	No
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	11
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	3
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	27%
d.	Is the percentage 50 or greater?	No
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	66,632 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	3
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	6
d.	Total number of benefited receptors.	9
e.	Surface Area per benefited receptor unit. (ft^2/BR)	7,404 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	2,221 ft
b.	Height range of the proposed noise barrier. (ft)	30-30 ft
c.	Average height of the proposed noise barrier. (ft)	30.0 ft
d.	Cost per square foot. ($/$ft^2$)	$42/SF
e.	Total Barrier Cost ($)	$2,798,544
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	No
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	7/26/21
Project No. and UPC:	Van Buren Road Extension, UPC: 118643
County:	Prince William County
District:	Northern Virginia
Barrier System ID:	Barrier D1
Community Name and/or CNE#	CNE D
Noise Abatement Category(s)	B
Design phase:	Preliminary design

Warranted

1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	NA
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	NA
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	No
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

Feasibility

1	Impacted receptor units	
a.	Number of impacted receptor units:	7
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	0
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	0%
d.	Is the percentage 50 or greater?	No
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

Reasonableness

1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	34,544 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	2
d.	Total number of benefited receptors.	2
e.	Surface Area per benefited receptor unit. (ft^2/BR)	17,272 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	No
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	1,151 ft
b.	Height range of the proposed noise barrier. (ft)	30-30 ft
c.	Average height of the proposed noise barrier. (ft)	30.0 ft
d.	Cost per square foot. ($/$ft^2$)	$42/SF
e.	Total Barrier Cost ($)	$1,450,848
f.	Barrier Material	NA

3 **Community Desires Related to the Barrier**

Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”

Decision

Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	No
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

APPENDIX F -
NOISE REPORT GUIDANCE
AND ACCOUNTABILITY CHECKLIST

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOISE REPORT GUIDANCE AND ACCOUNTABILITY CHECKLIST

VERSION 3.0

This checklist is not an inclusive document that accounts for all projects. However this guidance checklist outlines the most common items that will be reviewed during VDOT's review process. This checklist follows guidance set forth in VDOT's Highway Traffic Noise Manual.

Checked Items are Required		Preliminary	Final Design
		✓	✓

UPC:	**TBD**
Completed By:	**Skelly and Loy/W Kaufell**
Date:	**6/30/2021**

✘	This Item has been verified by the document writer
N/A	This item is "Not/Applicable" to this project
D	This Item is Project Dependent

1.0 TITLE PAGE

1.1	X	✓	✓	- Report is Appropriately Named, with Correct Project Limits, Project Number(s), UPC(s) (Universal Project Code), and Submission Date
1.2	X	✓	✓	- Person Performing the Noise Analysis is Prequalified in the State of Virginia

2.0 TABLE OF CONTENTS (TOC)

2.1	X	✓	✓	- Items listed in TOC are Accurately Numbered, Including the Report Sections, Tables, Figures, Graphics, and Appendices

3.0 EXECUTIVE SUMMARY

3.1	X	✓	✓	- Brief Project Description provided with Project Location Information
3.2	X	✓	✓	- Summary of the Number (and sound level ranges) of Impacts for Existing, No-Build (if applicable), and the Future Design Year
3.3	X	✓	✓	- Noise Abatement Summary and Barrier Analyses Summary - (If Future Design Year Impacts are Predicted)
3.4	X	✓		- "Conversely . . . " Statement Added
3.5	X	✓	✓	- Construction Noise Summary
3.6	X	✓		- Discussion of Futher Noise Abatement Considerations during Final Design - eg. Rail noise, Aviation noise, Reflected Noise from Existing or Proposed Barriers / Retaining Walls, Commitments for further evaluation based on new design information, Alternatives to proposed noise barrier placement. . .

4.0 INTRODUCTION

4.1	X	✓	✓	- Discussion of the Project Description of the Proposed Project. Should include the Project Limits, Number of Proposed Lanes and/or Proposed Modification, Lane Widths etc.

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent

Modification, Lane Widths etc . . .

4.2 | X | ✓ | ✓ | - Discussion of the History of the Project, Background, Future Design Year, Specific Pertanent Project Details, Including the Preferred Alternative and other Road Improvements.

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✔	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent

4.3	X	✓	✓	- Project Location Figure (See VDOT's Noise Report Development and Guidance Document)
4.4	X	**D**	**D**	- Additional NEPA documentation (If Necessary - Documents to support an older ROD or Date of Public Knowledge)

5.0 METHODOLOGY

5.1	X	✓	✓	- FHWA and State Policy Discussion and Compliance Regulations
5.2	X	✓	✓	- Sound Level Metrics Defined
5.3	X	✓	✓	- NAC Defined
5.4	X	✓	✓	- Definiton of Noise Impact
5.5	X	✓	✓	- Analysis Proceedure Defined
5.6	X	✓	✓	- TNM Model Version Defined and Program Overview Description given
	Source of Model Inputs Documented			
5.7	X	✓	✓	- Discussion of the Source of Design Files / Typical Sections/ Profiles / Cross Sections, or Study Corridor Limits if Engineering is not Available
5.8	X	✓	✓	- Discussion of Traffic Volumes / Speeds / Truck %'s
5.9	X	✓	✓	- Document the Source of Survey Information
5.10	X	**D**	**D**	- Additional Data (Existng or Proposed Retaining Walls, Existing Noise Barriers or Berms, GIS Layers and/or Supplemental Elevation Data)

6.0 EXISTING NOISE ENVIRONMENT

6.1 NOISE MONITORING

6.1.1	X	✓	✓	- Noise Monitoring Methodology is Clearly Defined
6.1.2	X	✓	✓	- The Date(s) of Monitoring are Documented
6.1.3	X	✓	✓	- Type of Meter is Noted and Pertainent Calibration Information is Included

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent
6.1.4	**X**	✓	✓	- Number of Sites (Short-term or Long-term) are Identified and Located on Figure			

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✔	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent
6.1.5	X	✓	✓	- Documentation of Noise Monitoring Data Sheets and other monitoring factors such sampling interval, weather . . .			
6.1.6	X	✓	✓	- Table and Discussion of Ambient Noise Monitoring Results and Required Sample Text Regarding Monitoring			
6.1.7	X	✓	✓	- Table and Discussion of Noise Validation Results			
6.2	**UNDEVELOPED LANDS AND PERMITTED DEVELOPMENTS**						
6.2.1	X	✓	✓	- "Undeveloped Lands and Permitted Developments" Sample Text Added			
6.2.2	X	✓	✓	- Documentation of the Coordination Dates and Contact Information for the Undeveloped Lands and Permitted Developments Search			
6.3	**COMMON NOISE ENVIRONMENT (CNE) DETERMINATION**						
6.3.1	X	✓	✓	- Are all Noise Sensitive Receptors within at least 500 feet of the Proposed Edge of Pavement Considered for Evaluation?			
6.3.2	X	✓	✓	- Discussion of Existing Land Uses for each CNE			
6.3.3	X	✓	✓	- Are all non noise sensitive land uses addressed in the report (reasons why they are not noise sensitive)?			
6.3.4	X	✓	✓	- CNE's Boundaries Located on Figure			
6.4	**WORST NOISE HOUR**						
6.4.1	X	✓	✓	- The Worst Noise Hour selected needs to be the same for ALL roadways. Review to ensure this is accurate.			
6.4.2	X	✓	✓	- Discussion of the Selection of the Worst Noise Hour			
6.4.3	X	✓	✓	- Was 24-Hour (Long Term Monitoring) Utilized to Determine the Worst Noise Hour			
6.4.4	X	**D**	**D**	- State if Multiple Sets of TNM runs were Created / Modeled to Determine the Worst Noise Hour (or were there dual worst noise hours)			

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent
6.4.5	X	**D**	**D**	-	Were other Factors Considered for the Selection of the Worst Noise Hour		

6.5 RECEPTOR IDENTIFICATION AND NAC CATEGORIZATION

If NAC A's are present, is the Criteria met and the Items Listed Below are Discussed:

6.5.1		**D**	**D**	-	Serenity and Quiet - The site under consideration meets the serenity and quiet criterion if the current Leq noise level does not approach or exceed the Activity Category A Noise Abatement Criterion (NAC) during any period when serving its intended purpose.

Checked Items are Required		Preliminary	Final Design	UPC:	106689/109790	✘	This Item has been verified by the document writer
				Completed By:	Skelly and Loy/W Kaufell	N/A	This item is "Not/Applicable" to this project
				Date:	10/10/2018	D	This Item is Project Dependent

6.5.2		D	D	-	Public Need - The site under consideration provides an important benefit of the public visiting or using the site due to its historical, religious, cultural, or natural significance
6.5.3		D	D	-	Intended Purpose - Is the Preservation of Serenity and Quiet Essential to Continue to Serve its Intended Purpose
6.5.4		D	D	-	Frequent Human Use - Can the public can access the site during all times when it is available and able to serve its intended purpose?
6.5.5		D	D	-	Is the FHWA Supporting Documentation Included
	If NAC B's are present, is the Criteria met and the Items Listed Below are Discussed:				
6.5.5	X	D	D	-	Are the Number of Receptors Equal to or Representative to a Number of Dwelling Units
6.5.6	X	D	D	-	Are there Multi-floor Residential Units and do they have Outdoor Use Areas
6.5.7	X	D	D	-	Are Outdoor Use Areas (Balconies) Identified and Discussed
	If NAC C's are present, is the Criteria met and the Items Listed Below are Discussed:				
6.5.8	X	D	D	-	Are the Outdoor Use Areas Documented for Each of the Identified Receptors
6.5.9	X	D	D	-	Was the "Grid system" Used and Shown on Figures for Recreational Areas, Trails, Campgrounds, Cemeteries, etc. . .
	If NAC D's are present, is the Criteria met and the Item Listed Below is Discussed:				
6.5.10	X	D	D	-	Discuss the Building Materials and Interior Reduction Factor for each Identified Receptor
	If NAC E's are present, is the Criteria met and the Item Listed Below is Discussed:				
6.5.11	X	D	D	-	Are Outdoor Use Areas Identified and Discussed
6.5.12	X	D	D	-	If "No", Text Should be Provided that the Land Use was Identified but not Evaluated due to the Lack of Outdoor Use
	Historic Properties				
6.5.13		D	D	-	Discuss if any Section 106 (Historic) Properties were Identified
6.5.14		D	D	-	Discuss if any Section 4(f) Properties were Identified

Checked Items are Required		Preliminary	Final Design	UPC:	106689/109790	✘	This Item has been verified by the document writer
				Completed By:	Skelly and Loy/W Kaufell	N/A	This item is "Not/Applicable" to this project
				Date:	10/10/2018	D	This Item is Project Dependent

6.5.15		D	D	- If Section 4(f) Properties are Identified, Does it Constitute a "Constructive Use" Determination

6.6 MODELED EXISTING ENVIRONMENT

6.6.1	X	✓	D	- Are Existing and Future Design Years Stated
6.6.2	X	D	D	- Are Existing Noise Barriers Present within the Proposed Project Area
6.6.3	X	D	D	- If Existing Noise Barriers are Present, Does the Project Involve In-Kind Barrier Replacement
6.6.4	X	✓	✓	- Discussion of the Overall Numbers of Existing Condition Impacts and Sound Level Ranges (all CNEs)
6.6.5	X	✓	✓	- Discussion of the Determination and Identification of Noise Impacts (by CNE under Existing Condition)
6.6.6	X	✓	D	- Existing Noise Environment discussion

7.0 FUTURE NOISE ENVIRONMENT

7.1 MODELED FUTURE ENVIRONMENT

7.1.1	X	✓	✓	- Is there Documentation why a No-Build Condition evaluation was/wasn't warranted?
7.1.2	X	D	D	- Discussion of the Overall Numbers of No-Build Condition Impacts and Sound Level Ranges (all CNEs)
7.1.3	X	D	D	- Discussion of the Determination and Identification of Noise Impacts (by CNE under No-Build Condition)
7.1.4	X	✓	✓	- Discussion of the Overall Numbers of Build Condition Impacts and Sound Level Ranges (all CNEs)
7.1.5	X	✓	✓	- Discussion of the Determination and Identification of Noise Impacts (by CNE under Build Condition)
7.1.6	X	✓	D	- Comparison of existing and future total noise levels for all identified receptors
7.1.7	X	✓	✓	- Future Noise Environment Discussion
7.1.8	X	✓	✓	- Table of Predicted Noise Levels (By CNE)

7.2 NOISE ABATEMENT DETERMINATION

7.2.1	X	✓	✓	- Alternative Abatement Measures Discussion

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent
7.2.2	X	✓	✓	- Was VDOT's Single Receptor Methodology Utilized?			
	WARRANTED CRITERIA						
7.2.3	X	✓	✓	- Is Warranted Criteria Defined?			
7.2.3.1	X	✓	✓	- NAC Impact Definition ("Approach or Exceed") Provided			
7.2.3.2	X	✓	✓	- Substantial Increase Impact Definiton Provided			
7.2.3.3	X	✓	✓	- Has the NAC for Each Evaluated Land Use Category been Defined			
	FEASIBILITY CRITERIA						
7.2.4	X	✓	✓	- Is Feasibility Defined?			
7.2.4.1	X	✓	✓	- Included definition regarding "Are at least 50% of the impacted receptors predicted to experience at least a 5dB(A) benefit?"			
7.2.4.2	X	✓	✓	- Included definition regarding "Is the barrier able to be constructed?"			
	REASONABLENESS CRITERIA						
7.2.5	X	✓	✓	- Is Reasonableness Defined?			
7.2.5.1	X	✓	✓	- Included definition regarding "Noise Reduction Design Goals"			
7.2.5.2	X	✓	✓	- Included definition regarding "Cost-effectiveness"			
7.2.5.3	X	✓	✓	- Included definition regarding "The Viewpoints of the Benefited Receptors"			
	NOISE BARRIER EVALUATION						
7.2.6	X	✓	✓	- Barrier Documentation should Include: Discussion of Total Number of Impacts, Benefitted Impacts, Additional Benefits, Total Benefits, Feasibility, Reasonablity, Barrier Length, Range of Panel Heights, Barrier Location, Ground or Structure Mounted, Barrier Systems, etc. . .			
7.2.7	X	✓	✓	- Reason for Barrier Placement, Barrier Termini, Barrier Location etc. . .			

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✔	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent
7.2.8	X	✓	✓	- All Evaluated Barrriers shown on Figures			
7.2.9	X		✓	- Barriers were Optimized to Maximize Benefits while Minimizing Cost (Diminishing Returns)			

Checked Items are Required		Preliminary	Final Design	UPC:	106689/109790	✘	This Item has been verified by the document writer
				Completed By:	Skelly and Loy/W Kaufell	N/A	This item is "Not/Applicable" to this project
				Date:	10/10/2018	D	This Item is Project Dependent

7.2.10	X	✓	✓	- Table was included that shows the Barrier name, Insertion Loss, Panel Height Range, Total Length, Total Surface Area, Total Benefits, Total sq.ft. / no. of benefits, Cost (for Planning Purposes Only)
7.2.11	X	✓	✓	- Table that shows the Sound Levels, Barrier Insertion Loss for each Receptor included in the Barrier Analysis
7.2.12	X	D	✓	- Table that shows the Approximate Stationing, Northing, Easting, Bottom and Top of barrier, Panel Heights by Segment
7.2.13	X	D	D	- Does the Barrier (System) Work Independently or is it Dependent on Another Barrier (Existing or Proposed)

8.0 CONSTRUCTION NOISE

8.1	X	✓	✓	- Construction Noise Discussion

9.0 PUBLIC INVOLVEMENT PROCESS

9.1 NOISE COMPATIBLE CONTOURS

9.1.1	X	✓	✓	- 66 dBA Contour Discussion and Shown on Figure(s)
9.1.2	X	D	D	- Discussion of Public Involvement Efforts (including Community Information Meetings, Individual Meetings, and Special Coordination)

9.2 VOTING PROCEEDURES

9.2.1		✓	✓	- Voting Process Defined?
9.2.2			✓	- How many / when were Certified Letters Sent?
9.2.3			✓	- What were the Voting Results Related to Desire for a Barrier?
9.2.4			✓	- Summary of Barrier Survey Results and Comments?
9.2.5			✓	- How many Surveys were Unresponsive or Undeliverable?
9.2.6			✓	- Voting Graphic showing the Results of the Barrier Survey?
9.2.7			✓	- Were there any Special Abatement Commitments / Acoustic Profiles/ Aesthetics Considerations

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent
9.2.8			✓	- Is this an Addendum Report with Revised Impact / Barrier Results			

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	**✘**	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent

10.0 OTHER CONSIDERATIONS

10.1	X	**D**	**D**	- Absorptive or Reflective Noise Barriers Proposed?
10.2	X	**D**	**D**	- Was Reflection Noise Considered?
10.3		**D**	**D**	- Was Structure Noise Considered?
10.4		**D**	**D**	- Was Rail or Aviation Noise Considered?

11.0 APPENDICES

11.1	X	✓	✓	- List of References
11.2	X	✓	✓	- List of Preparers / Reviewers
11.3	X	✓	✓	- Traffic Data
11.4	X	✓	✓	- Noise Monitoring Field Logs
11.5	X	✓	✓	- Warranted, Feasible, Reasonable, Worksheets
11.6	X	✓	✓	- Alternative Mitigation Measures Response Form from Project Manager
11.7	X	✓	✓	- Other Site Sketches of Monitored Locations, Noise Meter Printouts, Noise Meter Calibration Reports, Pertinent Correspondance
11.8		✓	✓	- TNM Certification Certificates
11.9	X	✓	✓	- Noise Report Guidance and Accountability Form

12.0 TNM RUNS

12.1	X	✓	✓	- Actual TNM Runs (Electronic Files) must be Submitted for Review with Report, TNM Output Tables are Not Required for Inclusion into the Report, However a Copy of the Printed Modeling Information shall be Supplied Upon Request

Checked Items are Required		Preliminary	Final Design				
				UPC:	**106689/109790**	✘	This Item has been verified by the document writer
				Completed By:	**Skelly and Loy/W Kaufell**	**N/A**	This item is "Not/Applicable" to this project
				Date:	**10/10/2018**	**D**	This Item is Project Dependent

13.0 GENERAL

13.1 [X] ✓ ✓ - Figures were Developed in Accordance with VDOT's Noise Report Development and Guidance Document

APPENDIX G -
TNM FILES

APPENDIX G TNM FILES

All TNM models associated with the UPC 118643 Van Buren Road Extension Preliminary Design Noise Impact Analysis including 2021 Validation, 2020 Loudest Hour Existing Conditions, 2040 Loudest Hour Design Build and 2040 Loudest Hour mitigation models can be downloaded from:

https://terracon.sharefile.com/d-s18048f3eee08467f894879a2e80c3c4a