PRELIMINARY ENGINEERING NOISE ANALYSIS REPORT

Pennsylvania Turnpike Commission
SAP Contract No. 4400003926
Total Reconstruction and Widening
MP-308 to MP-312
Chester County, Pennsylvania

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Total Reconstruction and Widening from MP 308 to MP 312

Chester County

PRELIMINARY ENGINEERING NOISE ANALYSIS

September 2015

Executive Summary

The Pennsylvania Turnpike Commission (PTC) proposes to reconstruct its toll road. The proposed project entails the total reconstruction and widening of the Pennsylvania Turnpike from approximately Milepost (MP) 308 to MP 312. The project will result in widening I-76 from four (4) travel lanes to six (6) travel lanes with full, twelve (12) –foot left and right-hand shoulders. The proposed widening consists of approximately four (4) miles of roadway and will include total roadway reconstruction, widening of mainline bridges and medians, the replacement of overhead bridges, culvert extensions, drainage modifications, construction of storm water management facilities, and necessary horizontal or vertical adjustments to approach roadways associated with modified overhead bridges. Construction will generally follow the existing centerline. The study corridor traverses Upper Uwchlan Township in Chester County, Pennsylvania. Noise abatement has been evaluated for the noise study areas which meet the Pennsylvania Department of Transportation (PennDOT) and Federal Highway Administration (FHWA) criteria for a Type I project.

For analysis purposes, the project study area was divided into thirteen (13) Noise Study Areas (NSAs) as shown in Figures 2 through 7. Noise measurements and concurrent traffic counts were conducted in all NSAs and are reported in Table 2. Based on the evaluation of existing and future noise levels and the noise abatement criteria (NAC) described in Table 1, project-related noise impacts were identified in all NSAs except NSAs 7, 10 and 13.

Based on the evaluation of the noise levels associated with the preliminary engineering plans developed to date, noise abatement features were determined to be feasible and reasonable within NSA 12. Various noise barrier options were considered and evaluated in terms of abatement feature lengths, heights and costs. This process resulted in the development of the following feasible and reasonable noise barriers along I-76:

- NSA 12 Barrier – A noise barrier averaging 13.5 feet in height along I-76 Westbound, with a length of approximately 2,210 feet.

Introduction

The Pennsylvania Turnpike Commission (PTC) proposes to reconstruct its toll road. The proposed project entails the total reconstruction and widening of the Pennsylvania Turnpike from approximately Milepost (MP) 308 to MP 312. The project will result in widening I-76 from four (4) travel lanes to six (6) travel lanes with full, twelve (12) –foot left and right-hand shoulders. The proposed widening consists of approximately four (4) miles of roadway and will include total roadway reconstruction, widening of mainline bridges and medians, the replacement of overhead bridges, culvert extensions, drainage modifications, construction of storm water management facilities, and necessary horizontal or vertical adjustments to approach roadways associated with modified overhead bridges. Construction will generally follow the existing centerline. The study corridor traverses Upper Uwchlan Township in Chester County, Pennsylvania. Noise abatement has been evaluated for the noise study areas which meet the Pennsylvania Department of Transportation (PennDOT) and Federal Highway Administration (FHWA) criteria for a Type I project.

PennDOT Noise Abatement Criteria (NAC), described in Table 1, for specific land use activities were used in the evaluation of traffic noise impacts. These criteria are based on criteria established in Title 23 Code of Federal Regulations, Part 772, U.S. Department of Transportation, Federal Highway Administration (FHWA), *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, and guidelines for "increase over existing" noise levels as set forth in PennDOT Publication *Project Level Highway Traffic Noise Handbook Publication No.24*, dated December, 2013. Predicted noise levels were determined using Version 2.5 of the FHWA Traffic Noise Model (FHWA TNM).

The noise level descriptor used for this project was the hourly equivalent noise level ($L_{eq}(h)$). $L_{eq}(h)$ is the steady state, A-weighted sound level, which contains the same amount of acoustic energy as the actual time-varying A-weighted noise level over a one-hour period. The FHWA and PennDOT define noise impact based upon seven activity categories, as identified in Table 1. Individual sites located within a given activity category are designated as noise sensitive receptors.

Noise impacts were also evaluated by comparing the predicted noise levels with existing noise levels. A noise impact was identified if the future (year 2046) noise level was predicted to equal or exceed 66 dB(A) or if future noise levels within the project were predicted to cause a substantial noise increase ($\geq$10 dB(A)) as compared to existing noise levels.

Noise Study Areas

For noise analysis purposes, the project study area was divided into the following noise study areas (NSAs) as shown in Figures 2 through 7:

NSA 1: Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from approximately 1,830 feet west of Styer Road to Styer Road. See Figure 2

NSA 2: Activity Category B land uses are located adjacent to the eastbound travel lanes (south side) of I-76, from east of Styer Road to 2,260 feet east of Styer Road. See Figure 3.

NSA 3: Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from Styer Road to approximately 2,100 feet west of Milford Road. See Figure 3.

NSA 4: Activity Category B land uses are located adjacent to the eastbound travel lanes (south side) of the I-76, from Milford Road to Little Conestoga Road. See Figure 4.

NSA 5: Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from approximately 2,400 feet east of Styer Road to Milford Road. See Figure 4.

NSA 6: Activity Category B land uses are located adjacent to the eastbound travel lanes (south side) of the I-76, from Little Conestoga Road to Green Valley Road. See Figure 5.

NSA 7: An Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from Milford Road to approximately 380 feet east of Milford Road. See Figure 4.

NSA 8: Activity Category C land uses are located adjacent to the eastbound travel lanes (south side) of I-76, from Park Road to approximately 980 feet west of Park Road. See Figure 6.

NSA 9: Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from Little Conestoga Road to approximately 700 feet east of Little Conestoga Road. See Figure 5.

NSA 10: Activity Category C land use (Universal Technical Institute) is located adjacent to the eastbound travel lanes (south side) of I-76. See Figure 7.

NSA 11: An Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, north of Little Conestoga Road within the Frame Property which is proposed for but not yet under development (no building permits issued) and was not

included in the noise mitigation analysis in accordance with PTC policy. See Figure 5.

NSA 12: Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from approximately 1,230 feet east of Little Conestoga Road to Park Road. See Figure 6.

NSA 13: Activity Category B land uses are located adjacent to the westbound travel lanes (north side) of I-76, from Park Road to approximately 330 east of Park Road. See Figure 6.

Noise Measurements and Model Validation

Ambient noise measurements were conducted throughout the project study area. Within each of the above NSAs, short-term (20 minute duration) noise measurements were taken along with concurrent traffic counts at 36 locations using American National Standards Association (ANSI) Type I noise meters. See Appendix A for field data sheets. Calibration certificates related to noise meters and calibrators are contained in Appendix B.

It should be noted that short-term measurements were taken at various times of the day between June 16 and 18, 2014 and did not necessarily represent the noisiest condition at any particular measurement site (receiver[1]). In addition, measurement sites were positioned in order to enable validation of the noise prediction model and to assist in defining existing noise levels for second-row residences and for receivers located approximately 500 feet from I-76. As such, in certain locations, noise measurement sites do not exactly correspond with noise analysis sites (receivers). Measurements were used primarily for purposes of noise model validation, with year 2013 peak hour traffic volumes assumed in the prediction of worst-case existing noise levels. Measured existing L_{eq} noise levels at short-term measurement sites (receptors) ranged from 51 to 72 dB(A).

Using the traffic data obtained concurrently with the short-term noise measurements, noise levels were modeled and compared to measured noise levels. Existing short-term measured noise levels and hourly traffic data based on concurrent traffic counts are summarized in Table 2, with field measurement data sheets contained in Appendix A.

[1] **In this report, the term "receptor" is used to represent a dwelling unit, or in the case of an Activity Category C non-residential land use, an equivalent residential unit (ERU). The term "receiver" is used to describe a particular analysis point in the FHWA TNM. It is important to note that, while in most cases one receiver represents one receptor, there are locations identified in this report where a receiver represents more than one receptor. These locations are identified in the various tables, where the "Receptor ID" column represents the FHWA TNM receiver point and the "Number of Units" column represents the number of receptors represented by that receiver.*

Validation results are shown in Table 3, with FHWA TNM validation data files included on the CD-ROM which accompanies this report. Measured versus modeled noise levels were within the acceptable 3 dB(A) range for all sites evaluated. The results of the validation process was used to "build" the FHWA TNM used for purposes of modeling existing and future year noise levels, determining future year impacts, and evaluating potential noise abatement options.

Noise Modeling

The model used to predict worst case existing and future noise levels and to evaluate noise abatement options was the FHWA's TNM, Version 2.5. The FHWA TNM predicts noise levels at selected locations based on traffic data, roadway design, topographic features, and the relationship of the analysis site (receiver) to nearby roadways. Traffic data used for prediction of existing (year 2013) and future (year 2046) noise levels for both no-barrier and barrier conditions is contained in Appendix C. In addition, it was assumed that the Future No-Build and Future Build traffic are similar. The percentages of automobiles, medium trucks, and heavy trucks used in the FHWA TNM modeling process were developed from review of traffic classification data obtained during the noise measurement periods corresponding to the periods of highest noise levels.

Evaluation of Noise Impacts

Consideration of noise abatement is required in Pennsylvania if noise levels approach or exceed 67 dB(A) (defined as 66 dB(A) or higher) or create a substantial noise increase (10 dB(A)). The future year noise levels were compared to the NAC approach levels (66 dB(A)) and to the increases over existing year noise levels using PennDOT's NAC to determine if there would be any noise impacts. These comparisons are contained in the noise summary tables for each NSA, with the noise measurement sites and analysis sites (receivers) indicated within each NSA. Noise impacts were identified in each NSA based on predicted exterior noise levels exceeding the 66 dB(A) approach criteria level for Activity Category land uses B and C and the 71 dB(A) approach criteria level for Activity Category land use E. "Increase over existing" noise levels were generally the result of normal traffic growth predicted to occur between 2013 and 2046.

In addition to their use in evaluating noise impacts, noise analysis sites (receivers) were used in the consideration of noise abatement for noise sensitive receptors within each NSA. Abatement measures such as traffic management devices and roadway realignment were determined not to be feasible since the purpose of the project is to widen along the existing alignment and any traffic management techniques would be contrary to the efficient functioning of I-76 as an Interstate highway. In addition, the topography and development in the area does not lend itself to the use of noise berms as an effective noise abatement technique. Therefore, noise abatement evaluations focused on the design of noise barrier walls.

Consideration of noise abatement was required in all NSAs (except NSAs 7, 10 and 13) due to noise levels approaching or exceeding the NAC. Under PennDOT noise criteria, feasible noise barriers are those that provide at least 5 dB(A) of noise reduction for at least 50% of impacted receptors, while posing no safety, engineering, maintenance, constructability, drainage, or utility impacts, or access restrictions. If determined to be feasible, a barrier was then evaluated for reasonableness. For a barrier to be reasonable based on PennDOT noise criteria, it must be cost-effective (square footage per benefited residential receptor (SF/BR) must be less than or equal to 2000), and the desires of the affected property owners and residents must be considered. Receptors are considered to be benefited if they receive 5 dB(A) or more noise reduction (insertion loss) from a barrier. To meet PennDOT's reasonableness criteria, a barrier must also achieve at least a 7 dB(A) noise reduction at one receptor.

A summary of abatement considerations within each NSA follows. See referenced tables for more details related to all barrier options considered.

NSA 1 (See Figure 2 and Table 4): Seven of the nine receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following two abatement options were considered for NSA 1:

- Case 1 consisted of a 14 feet high wall and was determined to be not feasible ($\geq$5 dB(A) insertion loss provided for 20% of impacted receptors).

- Case 2 consisted of a 20 feet high wall and was determined to be not feasible ($\geq$5 dB(A) insertion loss provided for 40% of impacted receptors).

NSA 2 (See Figure 3 and Table 5): Six of the twelve receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following three abatement options were considered for NSA 2:

- Case 1 consisted of a 12 feet high wall and was determined to be not feasible ($\geq$5 dB(A) insertion loss provided for 33% of impacted receptors).

- Case 2 consisted of a 14 feet high wall and was determined to be feasible ($\geq$5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 9,303 > 2000).

- Case 3 consisted of an optimizing of Case 2 and was determined to be feasible ($\geq$5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square

footage per benefited receptor SF/BR 2,415 > 2000).

NSA 3 (See Figure 3 and Table 6): Thirteen of the fifteen receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following three abatement options were considered for NSA 3:

- Case 1 consisted of a 14 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 21% of impacted receptors).

- Case 2 consisted of a 16 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 36% of impacted receptors).

- Case 3 consisted of a 20 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 36% of impacted receptors).

NSA 4 (See Figure 4 and Table 7): Four of the nineteen receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following two abatement options were considered for NSA 4:

- Case 1 consisted of a 10 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 10,342 > 2000).

- Case 2 consisted of an optimizing of Case 1 and was determined to be feasible (≥5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 3,217 > 2000).

NSA 5 (See Figure 4 and Table 8): Eleven of the twelve receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following three abatement options were considered for NSA 5:

- Case 1 consisted of a 16 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 82% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 4,633 > 2000).

- Case 2 consisted of an optimizing of Case 1 and was determined to be feasible (≥5 dB(A) insertion loss provided for 64% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 3,258 > 2000).

- Case 3 consisted of an optimizing of Case 2 and was determined to be not feasible (≥5 dB(A) insertion loss provided for 45% of impacted receptors).

NSA 6 (See Figure 5 and Table 9): All three receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following three abatement options were considered for NSA 6:

- Case 1 consisted of a 10 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 0% of impacted receptors).

- Case 2 consisted of a 16 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 33% of impacted receptors).

- Case 3 consisted of a 20 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 33% of impacted receptors).

NSA 7 (See Figure 4 and Table 10): The two receptors representative of the properties within this NSA were not predicted to have levels at or above 66 dB(A) and were not predicted to create a substantial noise increase of 10 dB(A) with the Build Alternative. Therefore consideration of abatement is not required for this NSA.

NSA 8 (See Figure 6 and Table 11): This NSA includes the Upper Uwchlan Township park baseball fields, the receptors were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted. In accordance with PennDOT Pub. 24, the equivalent receptor unit (ERU) to be calculated based on the following assumptions:

- Average event attendance: 75 person
- Average time used by each person per event: 3 hours
- Average number of events per day: 2 events
- Days per Year used: 240 days

Based on these assumptions, the ERU was calculated to be: 75*3*2*240/13578= 7.95 = 8. It was assumed that each of the analyzed sites within this NSA will be represented by 4 receptors to represent the property and to evaluate noise impacts and abatement options.

The following three abatement options were considered for NSA 8:

- Case 1 consisted of a 10 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was not achieved.

- Case 2 consisted of a 12 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was not achieved.

- Case 2 consisted of a 16 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 50% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was not achieved.

NSA 9 (See Figure 5 and Table 12): The receptor representative of this NSA was predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following three abatement options were considered for NSA 9:

- Case 1 consisted of a 10 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 100% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 9,004 > 2000).

- Case 2 consisted of a 8 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 100% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 7,204 > 2000).

- Case 3 consisted of an optimizing of Case 2 and was determined to be feasible (≥5 dB(A) insertion loss provided for 100% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved but square footage per benefited receptor SF/BR 3,815 > 2000).

NSA 10 (See Figure 5 and Table 13): The FHWA TNM receptor in this NSA represents an educational institute. The University Technical Institute doesn't have an outdoor area of frequent human use. Therefore consideration of abatement was not required for this NSA.

NSA 12 (See Figure 6 and Table 14): Fifteen of the thirty receptors evaluated within this NSA were predicted to have levels at or above 66 dB(A) with the Build Alternative. As such, consideration of noise abatement within this NSA was warranted.

The following four abatement options were considered for NSA 12:

- Case 1 consisted of a 10 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 27% of impacted receptors).

- Case 2 consisted of a 12 feet high wall and was determined to be not feasible (≥5 dB(A) insertion loss provided for 47% of impacted receptors).

- Case 3 consisted of a 14 feet high wall and was determined to be feasible (≥5 dB(A) insertion loss provided for 73% of impacted receptors) but not reasonable (goal of 7 dB(A) insertion loss for at least one receptor was not achieved and square footage per benefited receptor SF/BR 2,452 > 2000).

- Case 4 consisted of an optimizing of Case 3 and was determined to be feasible (≥5 dB(A) insertion loss provided for 73% of impacted receptors) and reasonable (goal of 7 dB(A) insertion loss for at least one receptor was achieved and square footage per benefited receptor SF/BR 1,987 < 2000). The recommended barrier is approximately 2,210 feet in length with an average height of 13.5 feet and was predicted to provide an average I.L. of 6.1 dB(A) for the 15 benefited receptors as shown in Figure 8.

NSA 13 (See Figure 6 and Table 15): The receptor representative of the properties within this NSA was not predicted to have levels at or above 66 dB(A) and were not predicted to create a substantial noise increase of 10 dB(A) with the Build Alternative. Therefore consideration of abatement is not required for this NSA.

Construction Noise Considerations

It is recognized that construction, while temporary in nature, will result in increased noise levels during certain periods and at certain locations. If required during the final design noise analysis, a more detailed consideration of construction noise and associated abatement/mitigation will be undertaken, consistent with the availability and detail of anticipated construction scheduling and operations. Construction of temporary noise barriers and the early construction of permanent noise barriers will be considered as will the possibility of developing construction noise specifications and/or special provisions related to construction time periods, duration of construction activities, types of construction equipment, and/or equipment noise levels.

Conclusion

Normal traffic growth can be expected to generally increase noise levels in the project area. Based on the analysis of noise reported herein, noise impacts exist within most NSAs. Based on the evaluation of the noise levels associated with the engineering plans developed to date, a noise barrier was determined to be feasible and reasonable for NSA

12.

During the final design phase, a detailed optimization of barrier length, height, cost and location will be coordinated with the final design engineering process to insure compatibility and the most cost-effective and efficient barrier design. This process may result in barrier height, length, and location changing from those discussed in this document.

The PTC is committed to construction of the feasible and reasonable noise abatement measures discussed above contingent upon the following conditions:

- Detailed noise analyses during the final design process;
- Analysis and determination of the feasibility and reasonableness of noise abatement measures, methodology, and criteria;
- Community input regarding desires, types, height, and location, as well as aesthetic considerations;
- Preferences regarding compatibility with adjacent land uses, particularly as addressed by officials having jurisdiction over such land uses;
- Safety and engineering aspects as related to the roadway user and the adjacent property owner

It is likely that the noise abatement measures for the identified noise impacted areas will be constructed if found to be feasible and reasonable based on the contingencies listed above.

TABLES

Table 1 Hourly Weighted Sound Levels dB(A) For Various Land Use Activity Categories*		
Land Use Activity Category	Leq(h)	Description of Land Use Activity Category
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, day care 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.

* PennDOT has chosen to use Leq(h) [not L10(h)] on all of its transportation improvement projects.

Table 2
Sound Level Measurments Results

Site ID Number	Adress of Measurements Site	Date	Time Period	Hourly Traffic Based on Concurrent Traffic Counts						Measured (Leq)
				Autos	Medium Trucks	Heavy Trucks	Buses	Motor-cycles	Total	
M1-1	672 Greenridge Rd	6.16.14	1:49pm	1023	72	159	9	3	1266	67.2
				1161	33	255	6	3	1458	
M1-2	664 Greenridge Rd	6.16.14	2:16pm	1098	69	138	6	24	1335	62.6
				1293	33	288	0	6	1620	
M1-3	665 Greenridge Rd	6.16.14	2:44pm	1071	45	183	3	6	1308	58.7
				1119	39	249	6	0	1413	
M1-4	195 Styer Rd	6.16.14	3:20pm	1098	45	129	0	0	1272	70.3
				1476	36	276	0	3	1791	
M2-1	Marsh Creek State Park	6.18.14	11:12am	945	84	222	15	0	1266	57.8
				984	45	255	6	3	1293	
M2-2	114 Shoreline Rd	6.17.14	2:28pm	1074	57	174	6	6	1317	61.4
				1095	57	174	6	6	1338	
M2-3	121 Shoreline Rd	6.17.14	2:00pm	951	66	183	0	3	1203	51.1
				1053	66	285	6	0	1410	
M2-4	121 Shoreline Rd	6.17.14	1:32pm	1026	72	210	3	0	1311	62.1
				1068	75	231	12	0	1386	
M3-1	200 Styer Rd	6.16.14	3:55pm	1095	45	165	0	0	1305	62.1
				1824	39	168	3	6	2040	
M3-2	46 Meadow Creek Ln	6.17.14	3:35pm	1080	63	183	3	0	1329	63.1
				1575	54	258	0	0	1887	
M3-3	47 Meadow Creek Ln	6.17.14	3:35pm	1080	63	183	3	0	1329	58.2
				1575	54	258	0	0	1887	
M3-4	38 Meadow Creek Ln	6.16.14	4:27pm	1083	36	105	15	0	1239	66.6
				2001	18	180	0	6	2205	
M4-1	102 Edgefield Dr	6.16.14	10:49am	999	63	210	6	0	1278	60.7
				1122	57	192	3	3	1377	
M4-2	112 Edgefield Dr	6.17.14	4:55pm	1194	51	96	9	0	1350	56.7
				2016	42	180	6	9	2253	
M4-3	115 Edgefield Dr	6.17.14	4:54pm	1194	51	96	9	0	1350	51.6
				2016	42	180	6	9	2253	
M4-4	116 Edgefield Dr	6.16.14	10:18am	1008	39	240	0	3	1290	63.6
				1353	48	312	0	3	1716	
M4-5	118 Edgefield Dr	6.16.14	9:49am	1116	57	186	0	3	1362	63.8
				1179	54	252	9	0	1494	
M5-1	105 Wertz Lane	6.17.14	4:17pm	1233	42	150	9	0	1434	71.2
				1926	66	192	3	0	2187	
M5-2	103 Wertz Lane	6.17.14	4:17pm	1233	42	150	9	0	1434	66.3
				1926	66	192	3	0	2187	
M5-3	9 Blackhorse Circle	6.18.14	11:15am	978	45	195	6	3	1227	61.3
				807	57	234	6	6	1110	
M5-4	102 Hoffman Circle	6.16.14	11:22am	1056	81	207	18	0	1362	72.1
				1215	36	291	0	0	1542	
M6-1	20 Green Valley Rd	6.18.14	12:22pm	966	60	213	3	15	1257	59.8
				906	87	345	9	0	1347	
M6-2	10 Green Valley Rd	6.18.14	12:22pm	966	60	213	3	15	1257	60.9
				906	87	345	9	0	1347	
M6-3	30 Green Valley Rd	6.18.14	10:04am	894	69	162	9	9	1143	60.6
				1047	42	294	9	6	1398	
M7-1	445 Milford Rd	6.16.14	12:00pm	1014	48	186	12	3	1263	56.7
				1008	39	240	0	0	1287	
M7-2	435 Milford Rd	6.16.14	11:55am	1014	48	186	12	3	1263	54.6
				1008	39	240	0	0	1287	
M8-1	Hickory Park Baseball Field	6.17.14	7:39am	2079	69	201	3	3	2355	60.0
				894	30	123	0	3	1050	
M8-2	Hickory Park Baseball Field	6.17.14	7:42am	2079	69	201	3	3	2355	60.9
				894	30	123	0	3	1050	
M9-1	1850 Rosenburger Lane	6.18.14	8:35am	1500	63	255	15	3	1836	64.2
				957	75	141	24	0	1197	
M10-1	750 Pennsylvania Dr. (Universal Technical Inst.)	6.18.14	9:23am	1044	48	216	9	3	1320	63.5
				1065	36	264	9	3	1377	
M11-1	Undeveloped Parcel #1along Little Constoga Rd	6.18.14	8:03am	1797	81	252	12	3	2145	59.9
				1104	57	123	0	0	1284	
M11-2	Undeveloped Parcel #36 along Little Constoga Rd	6.18.14	8:03am	1797	81	252	12	3	2145	60.7
				1104	57	123	0	0	1284	
M12-1	6 Newlin Place.	6.17.14	11:22am	912	39	231	0	0	1182	66.0
				978	30	240	6	3	1257	
M12-2	2 Newlin Place	6.18.14	12:58pm	1050	45	159	3	3	1260	56.2
				1038	72	246	6	3	1365	
M12-3	120 Heather Hill Dr	6.17.14	10:45am	894	54	225	3	6	1182	62.8
				969	60	252	0	0	1281	
M12-4	107 Heather Hill Dr	6.17.14	10:16am	1125	45	219	3	12	1404	62.5
				1026	27	339	15	3	1410	
M12-5	110 Heather Hill Dr	6.17.14	9:47am	879	57	189	6	0	1131	66.4
				933	69	255	39	0	1296	
M12-6	102 Heather Hill Dr	6.17.14	9:07am	1143	69	168	3	0	1383	60.9
				990	57	216	0	0	1263	
M13-1	301 Park Rd	6.17.14	8:28am	1494	81	216	21	0	1812	59.9
				1002	54	153	9	3	1221	

Table 3.
Sound Level Measurement Results

Site ID Number	Address of Measurement Site	TNM Model Validation Noise Levels in dB(A)		
		Modeled Leq(h)	Measured Leq	Difference
M1-1	672 Greenridge Rd	67.3	67.2	0
M1-2	664 Greenridge Rd	63.6	62.6	1
M1-3	665 Greenridge Rd	62.1	58.7	3
M1-4	195 Styer Rd	71.2	70.3	1
M2-1	Marsh Creek State Park	57.6	57.8	0
M2-2	114 Shoreline Rd	61.8	61.4	0
M2-3	121 Shoreline Rd	49.6	51.1	-2
M2-4	121 Shoreline Rd	64.8	62.1	3
M3-1	200 Styer Rd	62.8	62.1	1
M3-2	46 Meadow Creek Ln	63.0	63.1	0
M3-3	47 Meadow Creek Ln	58.3	58.2	0
M3-4	38 Meadow Creek Ln	65.9	66.6	-1
M4-1	102 Edgefield Dr	63.3	60.7	3
M4-2	112 Edgefield Dr	56.4	56.7	0
M4-3	115 Edgefield Dr	53.0	51.6	1
M4-4	116 Edgefield Dr	66.6	63.6	3
M4-5	118 Edgefield Dr	66.9	63.8	3
M5-1	105 Wertz Lane	72.3	71.2	1
M5-2	103 Wertz Lane	66.6	66.3	0
M5-3	9 Blackhorse Circle	61.5	61.3	0
M5-4	102 Hoffman Circle	71.4	72.1	-1
M6-1	20 Green Valley Rd	63.2	59.8	3
M6-2	10 Green Valley Rd	64.0	60.9	3
M6-3	30 Green Valley Rd	61.8	60.6	1
M7-1	445 Milford Rd	55.6	56.7	-1
M7-2	435 Milford Rd	54.3	54.6	0
M8-1	Hickory Park Baseball Field	61.9	60.0	2
M8-2	Hickory Park Baseball Field	63.1	60.9	2
M9-1	1850 Rosenburger Lane	65.6	64.2	1
M10-1	750 Pennsylvania Dr. (Universal Technical Inst.)	66.2	63.5	3
M11-1	Undeveloped Parcel #1along Little Constoga Rd	62.2	59.9	2
M11-2	Undeveloped Parcel #36 along Little Constoga Rd	60.7	60.7	0
M12-1	6 Newlin Place.	66.8	66.0	1
M12-2	2 Newlin Place	56.6	56.2	0
M12-3	120 Heather Hill Dr	65.5	62.8	3
M12-4	107 Heather Hill Dr	61.7	62.5	-1
M12-5	110 Heather Hill Dr	66.6	66.4	0
M12-6	102 Heather Hill Dr	62.2	60.9	1
M13-1	301 Park Rd	60.9	59.9	1

Table 4
NSA 1 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)			
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.
NSA 1	**M1-1**	1	68	71	74	6	71	3	69	5
	M1-2	1	64	66	68	5	67	1	64	4
	M1-3	1	64	67	68	4	68	1	67	1
	M1-4	1	71	74	74	3	Analyzed as part of NSA 3			
	R1-5	1	69	71	74	5	67	6	62	11
	R1-6	1	59	62	64	5	64	0	63	1
	R1-7	1	62	65	67	5	67	0	67	0
	R1-8	1	56	59	62	5	62	0	61	0
	R1-9	1	54	57	59	5	59	0	58	1
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 1 (5.5.15) Case 1: 14 ft		NSA 1 (5.5.15) Case 2: 20 ft	
RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:										
Barrier Area (ft^2)							16881			24116
Total Number of Receptors Impacted							5			5
Impacted Receptors Receiving ≥ 5 dBA I.L.							1			2
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.							20%			40%
Barrier Feasible Based on 5 dBA Reduction Criteria?							**No**			**No**
Benefited Receptors (those receiving ≥ 5 dBA I.L.)							1			2
Square Footage per Benefited Receptor (SF/BR) ≤ 2000										
Barrier Reasonable from a SF/BR Standpoint?										
Average Noise Reduction for Benefited Receptors (dBA)										
Is 7 dBA I.L.goal met for at least one benefited receptor?										
Total Barrier Length (ft)							1206			1206
Barrier Height Range (ft)							14			20
Average Barrier Height (ft)							14.0			20.0

NOTES:
dBA = Decibels on the A-weighted scale
Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.
Impacted Receptors (Build noise levels ≥ 66 dBA)
Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 5
NSA 2 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2014	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)					
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 2	M2-1	1	58	61	66	8	66	1	66	1	66	0
	M2-2	1	60	63	69	9	67	2	66	2	69	0
	M2-3	1	58	60	63	5	60	3	59	4	60	3
	M2-4	1	66	69	70	4	62	8	61	9	63	7
	R2-5	1	60	63	68	8	65	2	65	3	68	0
	R2-6	1	55	57	61	6	60	1	59	2	60	0
	R2-7	1	61	64	65	4	64	1	63	2	64	1
	R2-8	1	61	64	67	6	63	4	61	6	62	5
	R2-9	1	58	61	62	5	58	5	57	5	58	5
	R2-10	1	54	57	62	8	60	1	60	2	61	1
	R2-11	1	56	59	64	8	62	2	62	2	64	0
	R2-12	1	61	64	66	5	59	7	58	8	60	6
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 2 (5.5.15) Case 1: 12 ft		NSA 2 (5.5.15) Case 2: 14 ft		NSA 2 (5.5.15) Case 3: 14 ft Optimized	

RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:					
Barrier Area (ft^2)	31894		37210		9660
Total Number of Receptors Impacted	6		6		6
Impacted Receptors Receiving ≥ 5 dBA I.L.	2		3		3
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.	33%		50%		50%
Barrier Feasible Based on 5 dBA Reduction Criteria?	**No**		**Yes**		**Yes**
Benefited Receptors (those receiving ≥ 5 dBA I.L.)	3		4		4
Square Footage per Benefited Receptor (SF/BR) ≤ 2000			9,303		2,415
Barrier Reasonable from a SF/BR Standpoint?			**No**		**No**
Average Noise Reduction for Benefited Receptors (dBA)					
Is 7 dBA I.L.goal met for at least one benefited receptor?					
Total Barrier Length (ft)	2658		2658		722
Barrier Height Range (ft)	12		14		10 to 14
Average Barrier Height (ft)	12.0		14.0		13.4

NOTES:
dBA = Decibels on the A-weighted scale
Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels ≥ 66 dBA)
Impacted Receptors Units Receiving ≥ 5 dBA I.L.
Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 6
NSA 3 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)					
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 1	**M1-4**	1	71	74	74	3	67	7	65	10	64	10
NSA 3	**M3-1**	2	63	66	71	8	66	5	64	7	61	10
	M3-2	1	61	64	72	11	71	1	71	1	70	2
	M3-3	1	60	63	66	6	65	1	65	1	64	2
	M3-4	1	67	70	71	4	70	1	70	1	70	1
	R3-5	2	64	67	73	9	70	3	68	5	65	7
	R3-6	1	66	69	73	8	72	1	72	2	71	3
	R3-7	2	61	64	66	5	65	1	65	1	65	1
	R3-8	1	68	71	70	1	68	2	68	2	67	2
	R3-9	1	63	66	68	5	68	0	68	0	68	0
	R3-10	1	59	62	63	4	63	1	63	1	63	1
	R3-11	1	58	61	64	6	63	1	63	1	63	1
	R3-12	1	61	64	68	7	67	1	66	2	65	3
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 3 (5.5.15) Case 1: 14 ft		NSA 3 (5.5.15) Case 2: 16 ft		NSA 3 (5.5.15) Case 3: 20 ft	
RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:												
Barrier Area (ft^2)							27055		30920		38651	
Total Number of Receptors Impacted							14		14		14	
Impacted Receptors Receiving ≥ 5 dBA I.L.							3		5		5	
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.							21%		36%		36%	
Barrier Feasible Based on 5 dBA Reduction Criteria?							**No**		**No**		**No**	
Benefited Receptors (those receiving ≥ 5 dBA I.L.)							3		5		5	
Square Footage per Benefited Receptor (SF/BR) ≤ 2000												
Barrier Reasonable from a SF/BR Standpoint?												
Average Noise Reduction for Benefited Receptors (dBA)												
Is 7 dBA I.L.goal met for at least one benefited receptor?												
Total Barrier Length (ft)							1933		1933		1933	
Barrier Height Range (ft)							14		16		20	
Average Barrier Height (ft)							14.0		16.0		20.0	

NOTES:
dBA = Decibels on the A-weighted scale
Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels ≥ 66 dBA)
Impacted Receptors Units Receiving ≥ 5 dBA I.L.
Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 7
NSA 4 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)			
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.
NSA 4	**M4-1**	1	64	67	68	4	66	2	69	0
	M4-2	1	59	62	62	3	60	3	61	2
	M4-3	1	57	59	60	3	58	2	58	2
	M4-4	1	67	69	72	5	64	7	65	7
	M4-5	1	69	71	73	4	67	6	68	5
	R4-6	1	62	64	65	4	63	3	66	0
	R4-7	1	59	61	62	4	59	3	61	1
	R4-8	1	58	61	62	4	59	3	61	1
	R4-9	1	61	63	64	4	61	3	62	3
	R4-10	1	62	65	66	3	63	2	64	2
	R4-11	1	60	63	63	3	61	2	62	2
	R4-12	1	58	61	62	4	60	2	60	2
	R4-13	1	56	59	60	3	57	2	58	2
	R4-14	1	56	58	59	3	56	3	57	2
	R4-15	1	56	58	59	3	56	3	58	1
	R4-16	1	57	59	60	3	56	4	59	1
	R4-17	1	57	60	61	3	57	4	59	1
	R4-18	1	58	61	61	3	58	3	60	1
	R4-19	1	60	62	64	4	62	2	63	1
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 4 (5.5.15) Case 1: 10 ft		NSA 4 (5.5.15) Case 2: 10 ft Optimized	

RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:			
Barrier Area (ft^2)	20684		6434
Total Number of Receptors Impacted	4		4
Impacted Receptors Receiving ≥ 5 dBA I.L.	2		2
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.	50%		50%
Barrier Feasible Based on 5 dBA Reduction Criteria?	**Yes**		**Yes**
Benefited Receptors (those receiving ≥ 5 dBA I.L.)	2		2
Square Footage per Benefited Receptor (SF/BR) ≤ 2000	10,342		3,217
Barrier Reasonable from a SF/BR Standpoint?	**No**		**No**
Average Noise Reduction for Benefited Receptors (dBA)			
Is 7 dBA I.L.goal met for at least one benefited receptor?			
Total Barrier Length (ft)	2068		883
Barrier Height Range (ft)	10		4 to 10
Average Barrier Height (ft)	10.0		7.3

NOTES:
dBA = Decibels on the A-weighted scale
Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels ≥ 66 dBA)
Impacted Receptors Units Receiving ≥ 5 dBA I.L.
Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 8
NSA 5 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)					
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 5	**M5-1**	1	73	76	77	4	67	10	67	9	68	9
	M5-2	1	67	70	72	5	64	9	65	8	66	6
	M5-3	1	62	65	67	5	60	7	61	6	64	3
	M5-4	1	72	75	77	5	62	15	69	8	77	0
	R5-5	1	69	72	73	3	65	8	68	5	68	5
	R5-6	1	64	67	70	5	65	5	67	3	67	3
	R5-7	1	62	65	67	5	63	4	65	3	65	2
	R5-8	1	71	73	75	4	67	8	68	7	68	7
	R5-9	1	65	68	71	5	64	7	65	6	66	5
	R5-10	1	62	65	67	5	63	5	64	4	64	3
	R5-11	1	61	64	64	3	60	5	62	2	64	0
	R5-12	1	63	65	66	4	65	2	66	0	67	-1
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 5 (5.5.15) Case 1: 16 ft		NSA 5 (5.5.15) Case 2: 16 ft Optimized		NSA 5 (5.5.15) Case 3: 16 ft more optimized	

RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:					
Barrier Area (ft^2)	41698		22805		16455
Total Number of Receptors Impacted	11		11		11
Impacted Receptors Receiving≥ 5 dBA I.L.	9		7		5
Percent of Impacted Receptors Receiving≥ 5 dBA I.L.	82%		64%		45%
Barrier Feasible Based on 5 dBA Reduction Criteria?	**Yes**		**Yes**		**No**
Benefited Receptors (those receiving≥ 5 dBA I.L.)	10		7		5
Square Footage per Benefited Receptor (SF/BR)≤ 2000	4,170		3,258		
Barrier Reasonable from a SF/BR Standpoint?	**No**		**No**		
Average Noise Reduction for Benefited Receptors (dBA)					
Is 7 dBA I.L.goal met for at least one benefited receptor?					
Total Barrier Length (ft)	2606		1721		1104
Barrier Height Range (ft)	16		6 to 16		14 to 16
Average Barrier Height (ft)	16.0		13.3		14.9

NOTES:
dBA = Decibels on the A-weighted scale
Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels≥ 66 dBA)
Impacted Receptors Units Receiving≥ 5 dBA I.L.
Non-Impacted Receptors Units Receiving≥ 5 dBA I.L.

Table 9
NSA 6 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)					
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 6	M6-1	1	64	66	67	4	68	-1	68	-1	68	-1
	M6-2	1	67	70	71	4	69	1	69	2	68	3
	M6-3	1	63	66	67	4	63	4	61	6	60	7
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 6 (5.5.15) Case 1: 10 ft		NSA 6 (5.5.15) Case 2: 16 ft		NSA 6 (5.5.15) Case 3: 20 ft	
RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:												
Barrier Area (ft^2)							7005		11208		14010	
Total Number of Receptors Impacted							3		3		3	
Impacted Receptors Receiving≥ 5 dBA I.L.							0		1		1	
Percent of Impacted Receptors Receiving≥ 5 dBA I.L.							0%		33%		33%	
Barrier Feasible Based on 5 dBA Reduction Criteria?							**No**		**No**		**No**	
Benefited Receptors (those receiving≥ 5 dBA I.L.)							0		1		1	
Square Footage per Benefited Receptor (SF/BR)≤ 2000												
Barrier Reasonable from a SF/BR Standpoint?												
Average Noise Reduction for Benefited Receptors (dBA)												
Is 7 dBA I.L.goal met for at least one benefited receptor?												
Total Barrier Length (ft)							700		700		700	
Barrier Height Range (ft)							10		16		20	
Average Barrier Height (ft)							10.0		16.0		20.0	

NOTES:
dBA = Decibels on the A-weighted scale
Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels≥ 66 dBA)
Impacted Receptors Units Receiving≥ 5 dBA I.L.
Non-Impacted Receptors Units Receiving≥ 5 dBA I.L.

Table 10
NSA 7 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)	
					Noise Levels	Increase Over Existing
NSA 7	M7-1	1	57	60	61	3
	M7-2	1	57	60	60	3
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046	

NOTES:
dBA = Decibels on the A-weighted scale Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest wh

Impacted Receptors (Build noise levels ≥ 66 dBA)
Impacted Receptors Units Receiving ≥ 5 dBA I.L.
Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 11
NSA 8 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)					
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 8	M8-1	4	66	69	65	-1	63	2	63	3	62	3
	M8-2	4	68	71	69	1	64	5	63	6	63	6
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 8 (5.5.15) Case 1: 10 ft		NSA 8 (5.5.15) Case 2: 12 ft		NSA 8 (5.5.15) Case 3: 16 ft	
RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:												
Barrier Area (ft^2)								5065		6078		8105
Total Number of Receptors Impacted								8		8		8
Impacted Receptors Receiving ≥ 5 dBA I.L.								4		4		4
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.								50%		50%		50%
Barrier Feasible Based on 5 dBA Reduction Criteria?								**Yes**		**Yes**		**Yes**
Benefited Receptors (those receiving ≥ 5 dBA I.L.)								4		4		4
Square Footage per Benefited Receptor (SF/BR) ≤ 2000								1,266		1,520		2,026
Barrier Reasonable from a SF/BR Standpoint?								**Yes**		**Yes**		**No**
Average Noise Reduction for Benefited Receptors (dBA)								5.2		5.7		
Is 7 dBA I.L.goal met for at least one benefited receptor?								**No**		**No**		
Total Barrier Length (ft)								507		507		507
Barrier Height Range (ft)								10		12		16
Average Barrier Height (ft)								10.0		12.0		16.0

NOTES:

dBA = Decibels on the A-weighted scale

Leq = Equivalent noise level

I.L. = Insertion Loss

All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels ≥ 66 dBA)

Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 12
NSA 9 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)					
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 9	**M9-1**	1	66	69	72	5	63	9	64	8	65	7
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 9 (5.5.15) Case 1: 10 ft		NSA 9 (5.5.15) Case 2: 8 ft		NSA 9 (5.5.15) Case 3: 8 ft Optimized	
RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:												
Barrier Area (ft^2)							9004		7204		3815	
Total Number of Receptors Impacted							1		1		1	
Impacted Receptors Receiving ≥ 5 dBA I.L.							1		1		1	
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.							100%		100%		100%	
Barrier Feasible Based on 5 dBA Reduction Criteria?							**Yes**		**Yes**		**Yes**	
Benefited Receptors (those receiving ≥ 5 dBA I.L.)							1		1		1	
Square Footage per Benefited Receptor (SF/BR) ≤ 2000							9,004		7,204		3,815	
Barrier Reasonable from a SF/BR Standpoint?							**No**		**No**		**No**	
Average Noise Reduction for Benefited Receptors (dBA)												
Is 7 dBA I.L.goal met for at least one benefited receptor?												
Total Barrier Length (ft)							900		900		602	
Barrier Height Range (ft)							10		8		4 to 8	
Average Barrier Height (ft)							10.0		8.0		6.3	

NOTES:

dBA = Decibels on the A-weighted scale

Leq = Equivalent noise level

I.L. = Insertion Loss

All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels ≥ 66 dBA)

Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 13
NSA 10 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)	
					Noise Levels	Increase Over Existing
NSA 10	**M10-1**	1	68	71	70	2
	R10-2	1	65	67	68	4
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046	

NOTES:
dBA = Decibels on the A-weighted scale Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest wh

Table 14
NSA 12 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)		Future Barrier (2046)							
					Noise Levels	Increase Over Existing	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.	Noise Levels	I.L.
NSA 12	**M12-1**	1	67	70	72	5	70	2	68	4	67	5	67	5
	M12-2	1	58	60	61	4	61	1	60	1	60	2	61	1
	M12-3	1	66	69	71	5	67	4	66	5	65	6	65	6
	M12-4	1	61	64	66	5	64	2	64	3	63	3	63	3
	M12-5	1	67	70	72	5	67	5	64	7	62	10	62	10
	M12-6	1	63	66	67	4	66	1	66	1	65	2	66	1
	R12-7	1	67	70	71	4	71	1	70	1	70	2	74	-3
	R12-8	1	62	65	67	4	67	0	66	1	66	1	67	0
	R12-9	1	60	62	64	5	64	0	64	1	63	1	64	0
	R12-10	1	61	64	65	4	65	0	64	1	62	2	63	2
	R12-11	1	65	67	68	4	66	2	65	4	63	6	63	6
	R12-12	1	60	63	63	3	62	2	61	3	59	4	60	4
	R12-13	1	69	72	71	2	64	6	63	7	63	8	63	8
	R12-14	1	63	66	65	2	61	4	60	5	60	6	60	6
	R12-15	1	59	62	62	3	60	3	58	4	58	5	58	5
	R12-16	2	59	62	63	4	61	2	61	2	60	3	60	3
	R12-17	1	65	67	70	6	67	3	67	4	66	5	66	5
	R12-18	1	68	71	73	5	69	4	68	5	66	7	66	7
	R12-19	2	67	69	71	5	66	6	64	7	62	9	62	9
	R12-20	1	67	69	71	5	67	4	67	5	63	8	64	8
	R12-21	1	67	70	71	4	68	3	67	4	66	5	67	5
	R12-22	1	60	62	64	4	62	2	62	2	61	3	62	2
	R12-23	1	61	63	65	4	63	2	63	2	62	3	62	3
	R12-24	1	61	63	65	4	63	2	63	3	60	5	60	5
	R12-25	1	58	60	62	4	60	2	60	2	58	3	59	3
	R12-26	1	60	62	64	4	61	2	61	3	58	6	58	6
	R12-27	1	60	62	64	5	63	2	62	2	61	3	61	3
	R12-28	1	58	61	62	4	61	2	60	2	60	3	60	3
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046		NSA 12 (5.29.15) Case 1: 10 ft		NSA 12 (5.29.15) Case 2: 12 ft		NSA 12 (5.29.15) Case 3: 14 ft		NSA 12 (5.29.15) Case 4: 14 ft Optimized	

RECOMMENDED NOISE ABATEMENT SYSTEM DETAILS:							
Barrier Area (ft^2)	26270		31524		36778		29803
Total Number of Receptors Impacted	15		15		15		15
Impacted Receptors Receiving ≥ 5 dBA I.L.	4		7		11		11
Percent of Impacted Receptors Receiving ≥ 5 dBA I.L.	27%		47%		73%		73%
Barrier Feasible Based on 5 dBA Reduction Criteria?	**No**		**No**		**Yes**		**Yes**
Benefited Receptors (those receiving ≥ 5 dBA I.L.)	4		8		15		15
Square Footage per Benefited Receptor (SF/BR) ≤ 2000					2,452		1,987
Barrier Reasonable from a SF/BR Standpoint?					**No**		**Yes**
Average Noise Reduction for Benefited Receptors (dBA)							6.1
Is 7 dBA I.L.goal met for at least one benefited receptor?							**Yes**
Total Barrier Length (ft)	2627		2627		2627		2210
Barrier Height Range (ft)	10		12		14		10 to 14
Average Barrier Height (ft)	10.0		12.0		14.0		13.5
							Recommended

NOTES:

dBA = Decibels on the A-weighted scale Leq = Equivalent noise level

I.L. = Insertion Loss

All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest whole number.

Impacted Receptors (Build noise levels ≥ 66 dBA)

Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Non-Impacted Receptors Units Receiving ≥ 5 dBA I.L.

Table 15
NSA 13 Noise Barrier Evaluation

NSA	Site ID	Number of Units	Existing 2013	Future No-Build 2046	Future No Barrier (2046)	
					Noise Levels	Increase Over Existing
NSA 13	**M13-1**	1	62	64	65	3
FHWA TNM Data File			Existing 2013	Future No-Build 2046	Future Build 2046	

NOTES:
dBA = Decibels on the A-weighted scale Leq = Equivalent noise level
I.L. = Insertion Loss
All noise levels are calculated to the tenth of a dBA and rounded for presentation purposes to the nearest wh

FIGURES

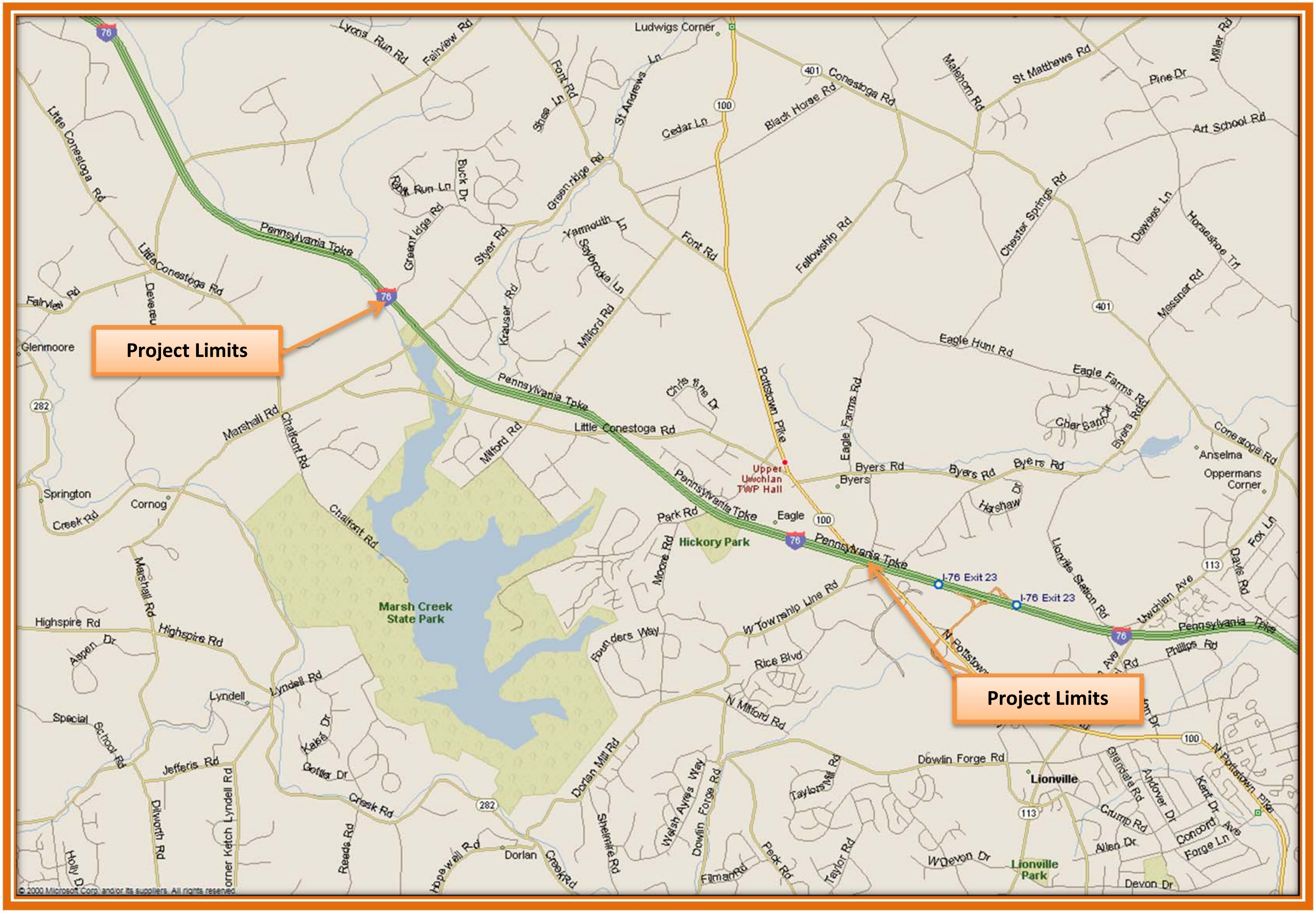


FIGURE 1
Project Location Map
PA Turnpike MP 308-312
Chester County

R1-9
R1-8
R1-6
R1-7
R1-5
M1-1
M1-2
M1-3
M1-4
M3-1
M2-1
GREENRIDGE RD
STYER ROAD
STYER ROAD
I-76 PA TURNPIKE
NSA1
NSA3
NSA2
730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760

Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Noise Study Areas

Noise Study Areas and Noise Measurement and Analysis Sites

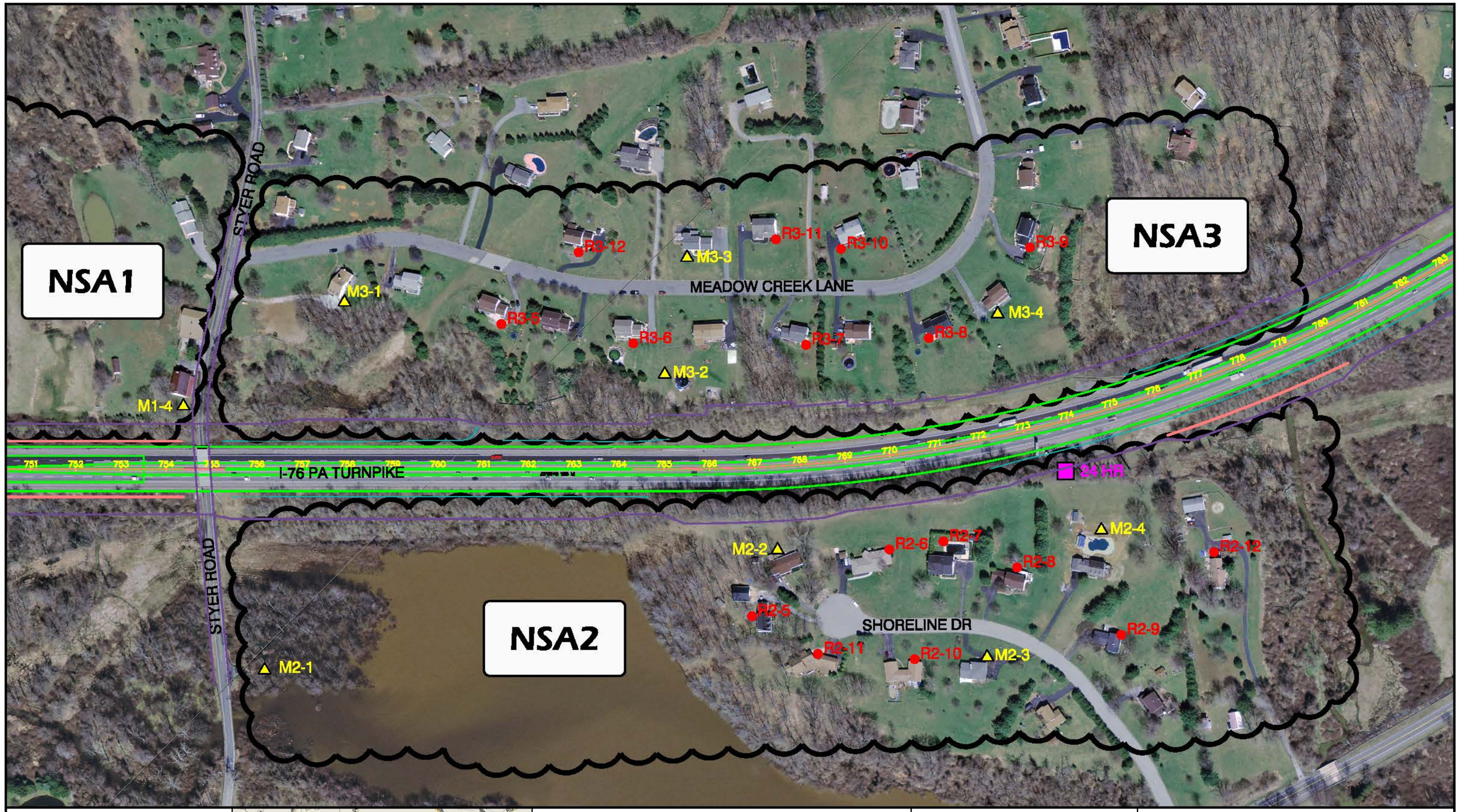
Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 2

Map Created on 5.14.15



Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Noise Study Areas

Noise Study Areas and Noise Measurement and Analysis Sites
Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 3

Map Created on 5.14.15

BLACK HORSE CIR

S WERTZ LN

R5-7
R510
M5-3
R5-6
R5-9
M5-2
R5-5
R5-8
M5-1

NSA5

R5-11
R5-12
M5-4

NSA7

M7-2
M7-1

i-76 PA TURNPIKE

NSA4

M4-1
R4-6
R4-7
R4-8
M4-2
R4-9
M4-4
24HR
M4-5

EDGEFIELD DR

STANLEY DR

R4-19
R4-18
R4-17
R4-16
R4-15
R4-14
M4-3
R4-13
R4-12
R4-11
R410

LITTLE CONESTOGA RD

Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Noise Study Areas

Noise Study Areas and Noise Measurement and Analysis Sites

Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

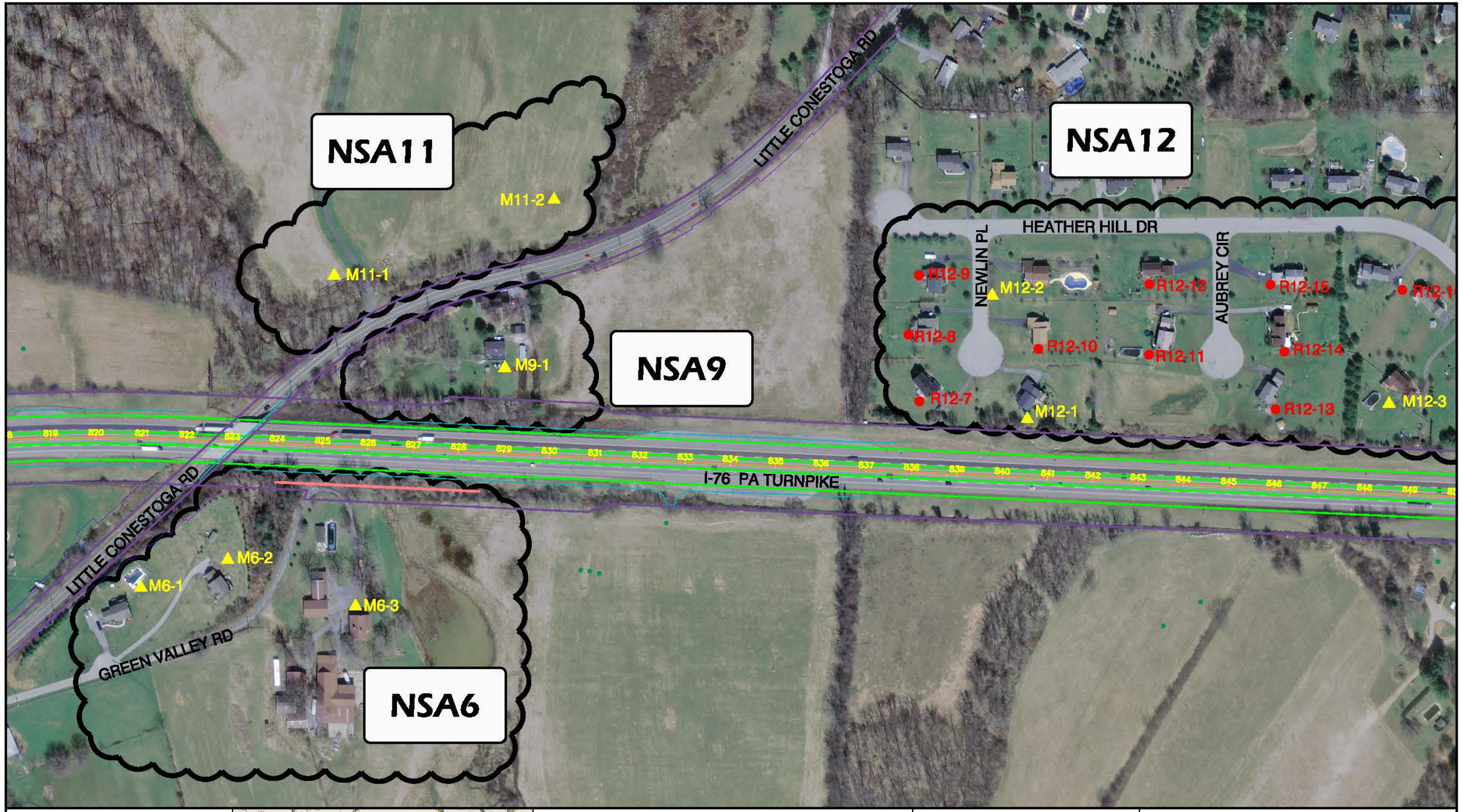
N

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 4

Map Created on 5.14.15



Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Noise Study Areas

Noise Study Areas and Noise Measurement and Analysis Sites

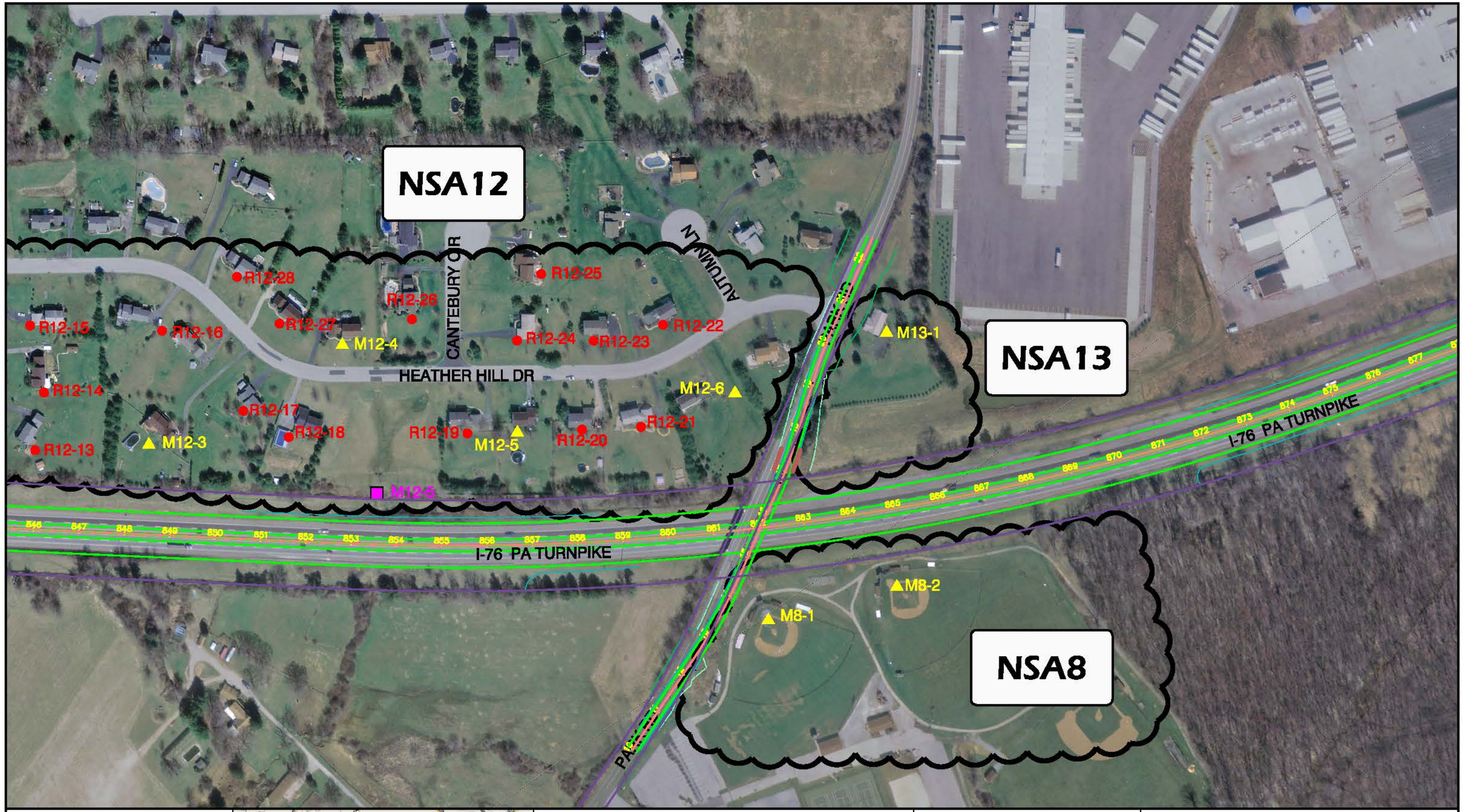
Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 5

Map Created on 5.14.15



Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Noise Study Areas

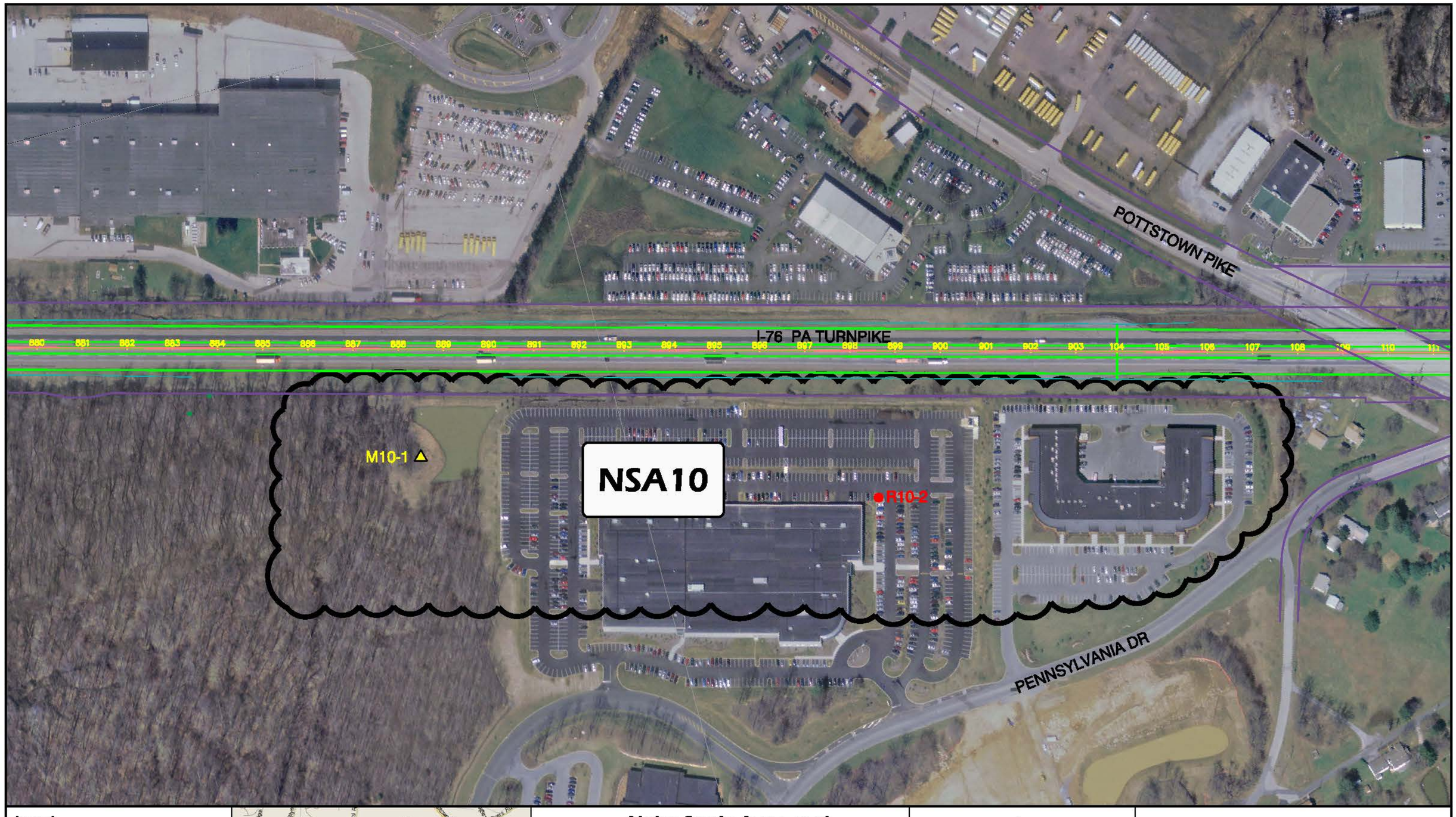
Noise Study Areas and Noise Measurement and Analysis Sites
Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 6

Map Created on 5.14.15



Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Noise Study Areas

Noise Study Areas and Noise Measurement and Analysis Sites

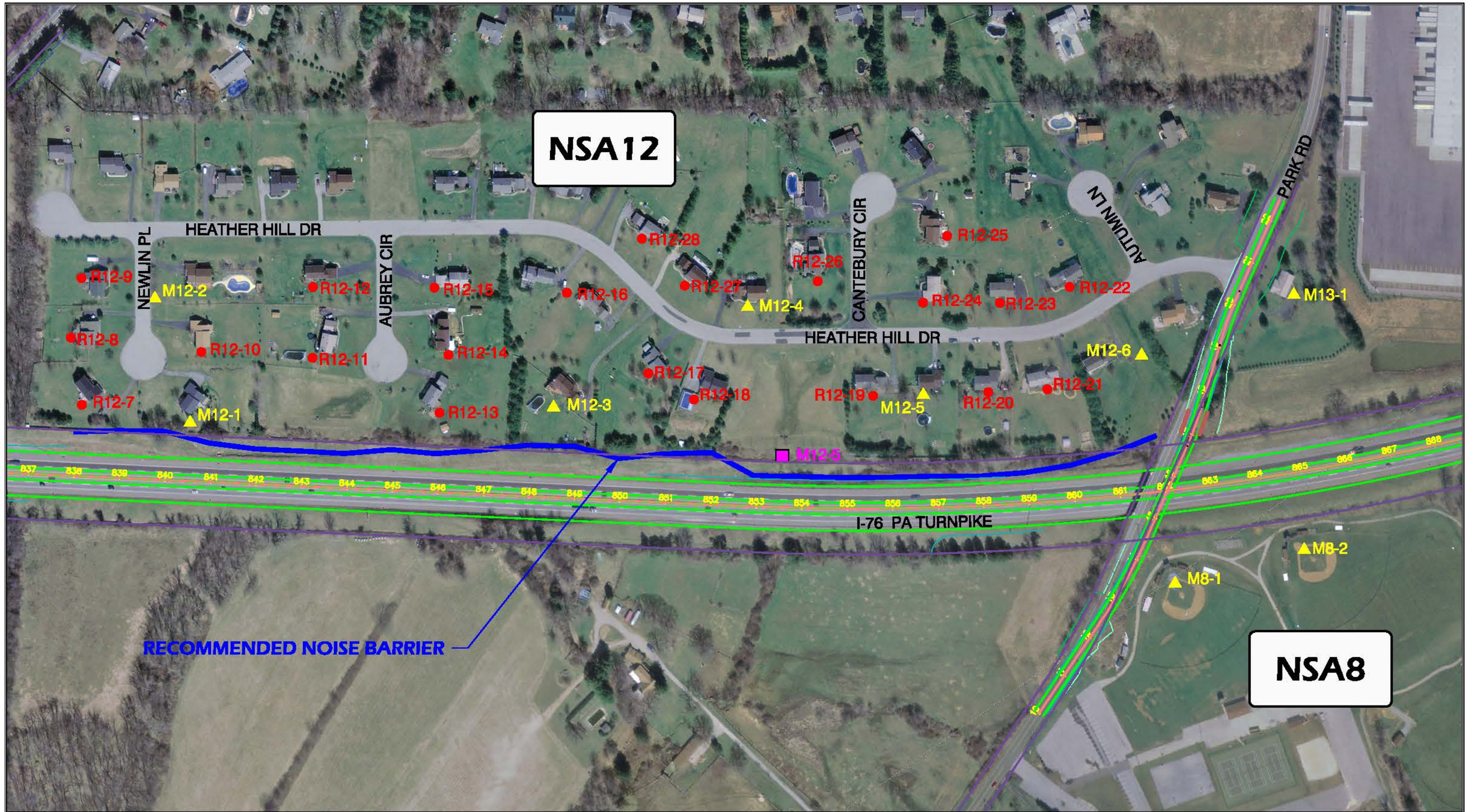
Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 7

Map Created on 5.14.15



Legend

- Noise Measurement Locations
- 24-hour Noise Monitoring Locations
- Noise Analysis Site Locations
- Recommended Noise Barrier

NSA 12
Recommended Noise Barrier
Pennsylvania Turnpike Commission
MP T-308 to T-312
Upper Uwchlan Township, Chester Co., PA

Scale (Feet)
200 100 0 200

Gannett Fleming

Figure 8

Map Created on 5.14.15

APPENDIX A

Short-term Measurements Field Data Sheets

Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATP - 308 - 312

JOB # 056583-1151

SITE ID MP-1

Gannett Fleming, Inc.

ADDRESS: 672 GREENRIDGE RD

Meter Storage # 182

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 110

SLM Calibration before 94.0 after

Weather: temperature 82° wind speed 0-5 cloud cover 0

Time:	1st	start	1:49	stop	2:09	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	67.2	Lmax	73.5	Lmin	52.9	SEL	98.0
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

20-min

Roadway#1 PATP	1st	2nd
Direction EB		
auto	341	
med. trk.	24	
hvy trk.	53	
bus	3	
motorcycle	1	

Roadway#2 PATP	1st	2nd
Direction WB		
auto	387	
med. trk.	11	
hvy trk.	25	
bus	2	
motorcycle	1	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: HOUSE ON HILL

SITE SKETCH

Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATP- 308-312

JOB # 56583, 1151

SITE ID MT-2

Gannett Fleming, Inc.

ADDRESS: 1104 GREENRIDGE RD.

Meter Storage # 183

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 111

SLM Calibration before 94.0 after 94.0

Weather: temperature 84.3 wind speed 0-5 cloud cover 0

Time:	1st	start	2116	stop	2136	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	62.6	Lmax	69.7	Lmin	50.7	SEL	93.4
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	366	
med. trk.	33	
hvy trk.	46	
bus	2	
motorcycle	8	

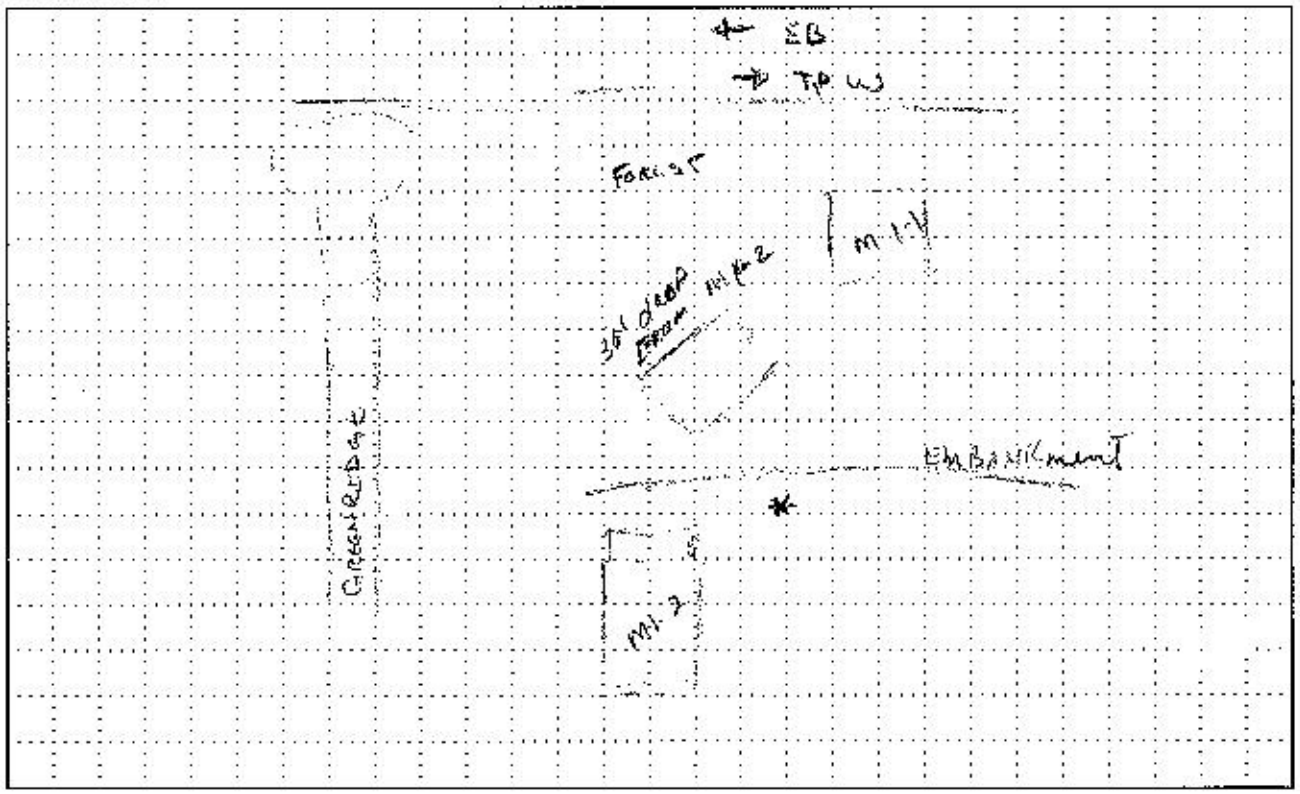
Roadway#2 PATP	1st	2nd
Direction WB		
auto	431	
med. trk.	11	
hvy trk.	96	
bus	0	
motorcycle	2	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PA TP 308.317

JOB # 56583.1151

SITE ID MI-3

Gannett Fleming, Inc.

ADDRESS: 665 GREEN RIDGE RD

Meter Storage # 184

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

SLM NO. _____ SLM Calibration before 94.0 after _____ GPS PT _____

Weather: temperature 84 wind speed 0-5 cloud cover 0

Time:	1st	start	2144	stop		total			
	2nd	start		stop		total			
Data:	1st	Leq	58.7	Lmax	63.2	Lmin	53.2	SEL	89.5
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	357	
med. trk.	15	
hvy trk.	61	
bus	1	
motorcycle	2	

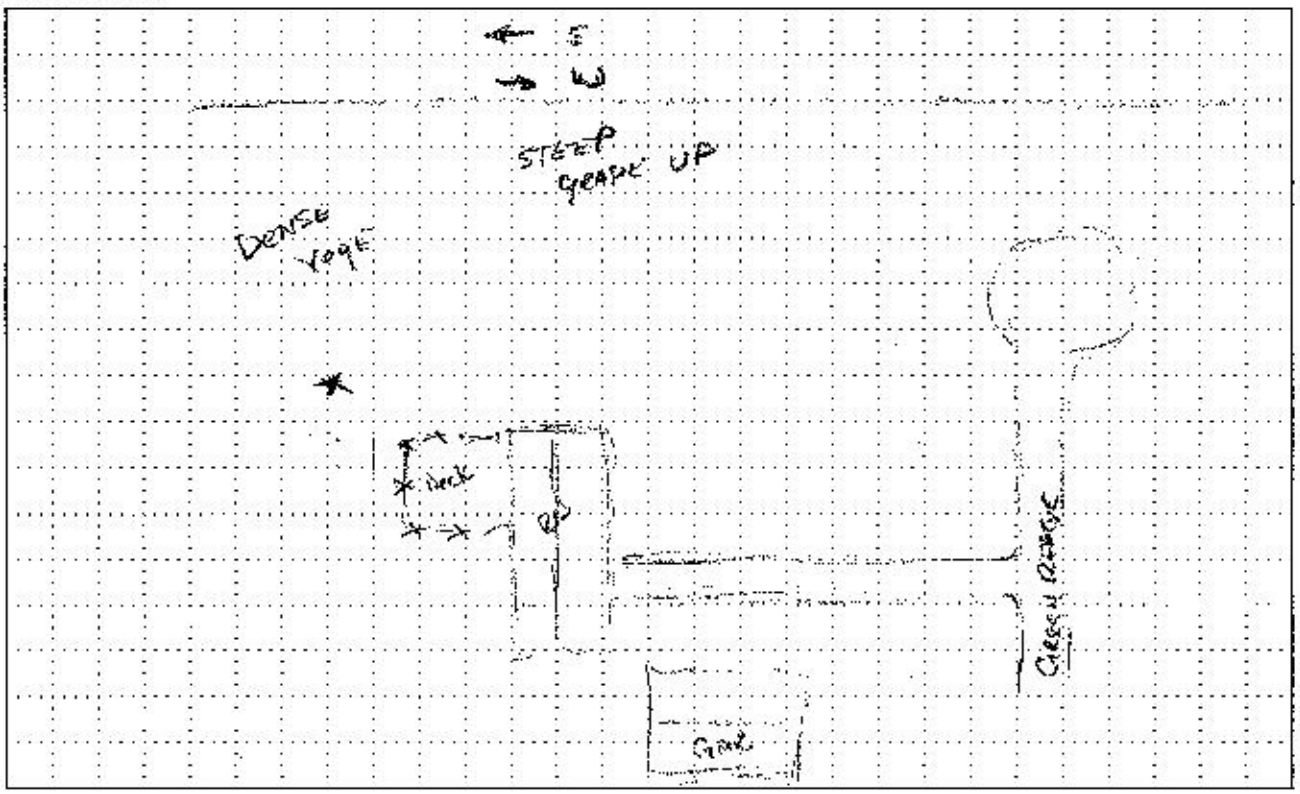
Roadway#2 PATP	1st	2nd
Direction WB		
auto	373	
med. trk.	13	
hvy trk.	83	
bus	2	
motorcycle	0	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATP - 308-312

JOB # 56583.1151

SITE ID M1-4

Gannett Fleming, Inc.

ADDRESS: 195 Styer Rd

Historical House ?

Meter Storage # 126

TYPE ☒ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 013

SLM Calibration before 94 after

Weather: temperature 89 wind speed cloud cover

Time:	1st	start 3:20	stop 3:40	total 20					
	2nd	start	stop	total					
Data:	1st	Leq 70.3	Lmax 79.1	Lmin 57.5	SEL 101.1				
	2nd	Leq	Lmax	Lmin	SEL				

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	366	
med. trk.	15	
hvy trk.	43	
bus	0	
motorcycle	0	

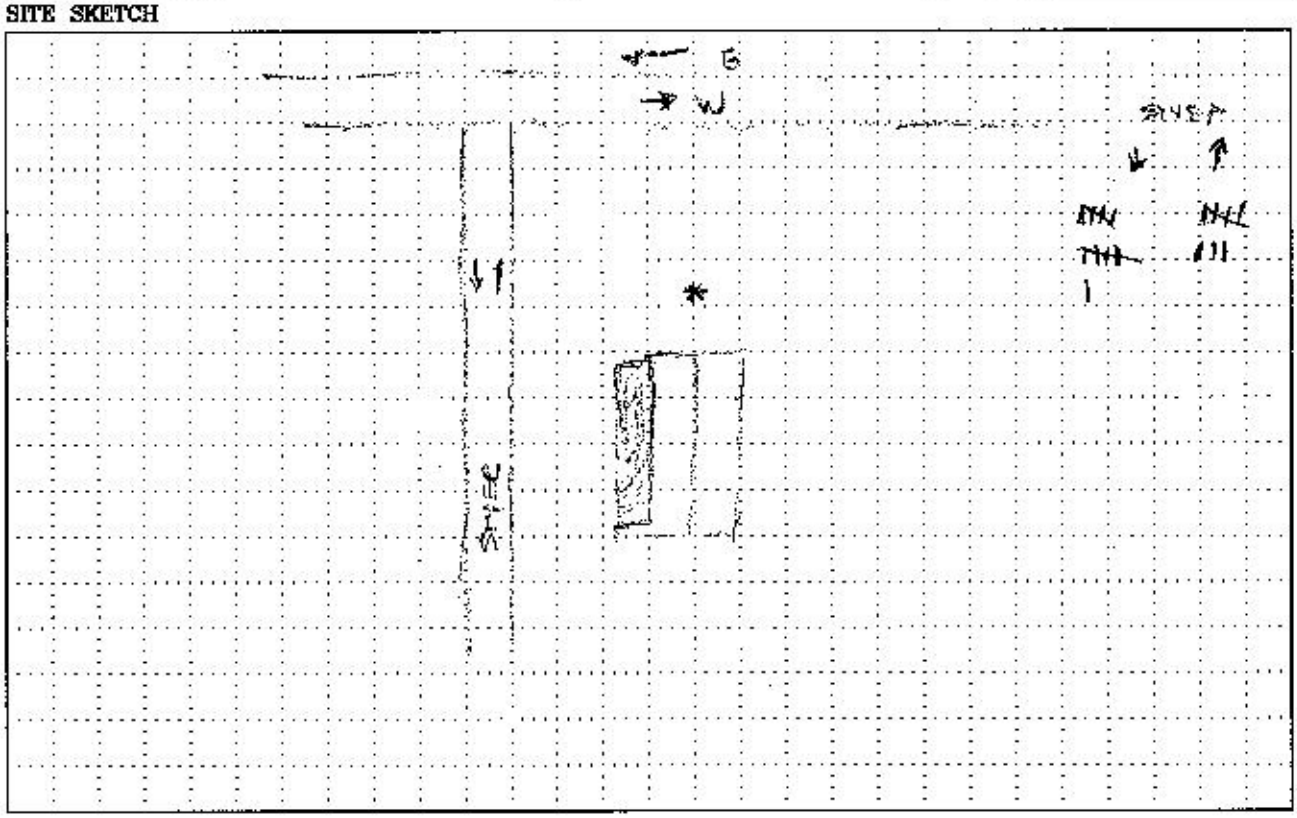
Roadway#2 PATP	1st	2nd
Direction WB		
auto	492	
med. trk.	13	
hvy trk.	22	
bus	0	
motorcycle	1	

Roadway#3 Styer	1st	2nd
Direction ↓ ↑		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: TP ELEVATED 3' ABOVE METER

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-18-14

PROJECT: PATP - 308-312

JOB # 56583.1151

SITE ID M2-1

Gannett Fleming, Inc.

ADDRESS: Marsh Creek State Park

Meter Storage # 207

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☑ Other TRAIL

Measurement Data

Photograph #'s

SLM NO. _____ SLM Calibration before 94.0 after _____ GPS PT 045

Weather: temperature _____ wind speed 0-5 cloud cover 30%

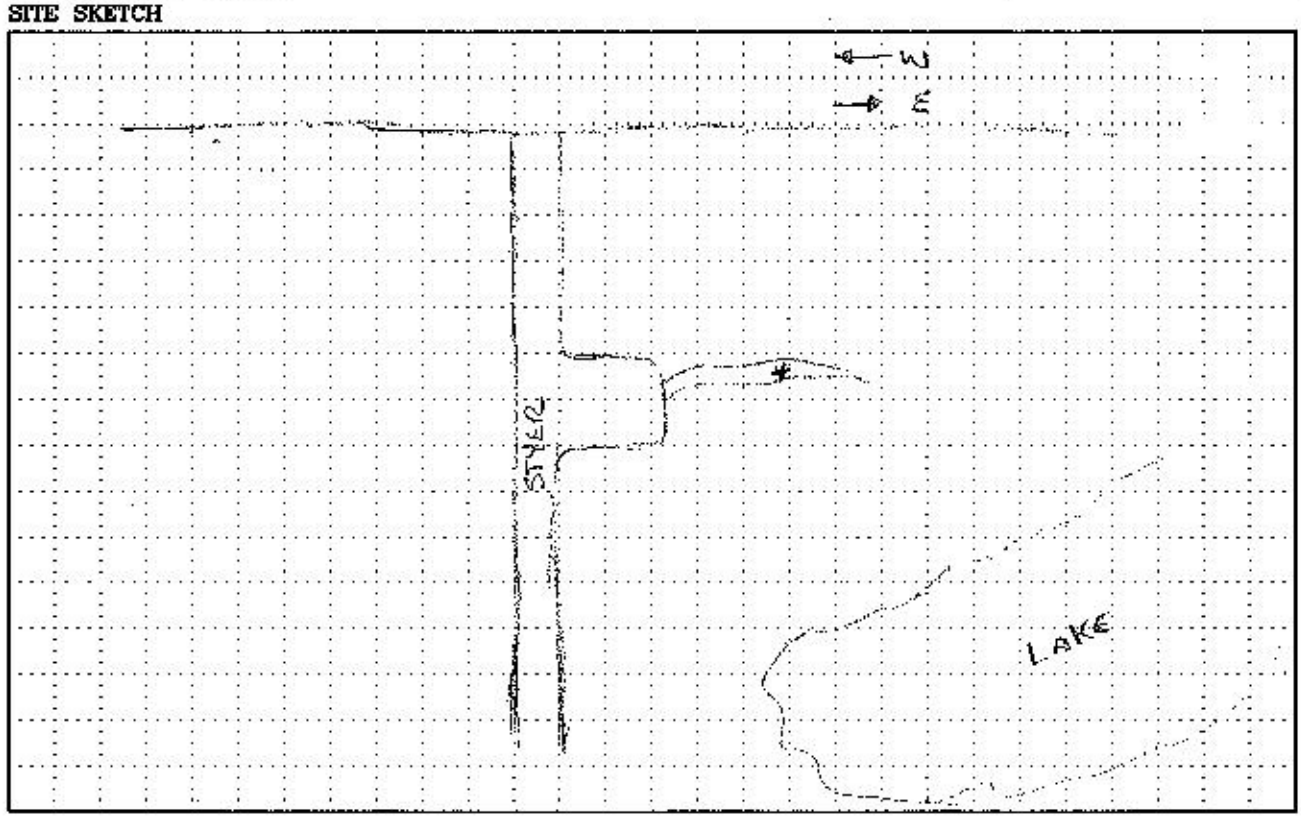
Time:	1st	start	11:12	stop	11:32	total	20			
	2nd	start		stop		total				
Data:	1st	Leq	57.8	Lmax	64.7	Lmin	51.7	SEL	78.6	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3	Spur		Roadway#4		
Direction	EB		Direction	WB		Direction	↓	↑	Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	315		auto	328		auto	11	11	auto		
med. trk.	28		med. trk.	15		med. trk.			med. trk.		
hvy trk.	74		hvy trk.	85		hvy trk.			hvy trk.		
bus	5		bus	2		bus			bus		
motorcycle	0		motorcycle	1		motorcycle			motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID M2-2

Gannett Fleming, Inc.

ADDRESS: 114 Shoesline Rd

Meter Storage # 199

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 030

SLM Calibration before 94.0 after

Weather: temperature 9 wind speed 0-5 cloud cover 0

Time:	1st	start	2:28	stop	2:48	total	20			
	2nd	start		stop		total				
Data:	1st	Leq	61.4	Lmax	67.0	Lmin	53.4	SEL	92.2	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	358	
med. trk.	19	
hvy trk.	58	
bus	2	
motorcycle	2	

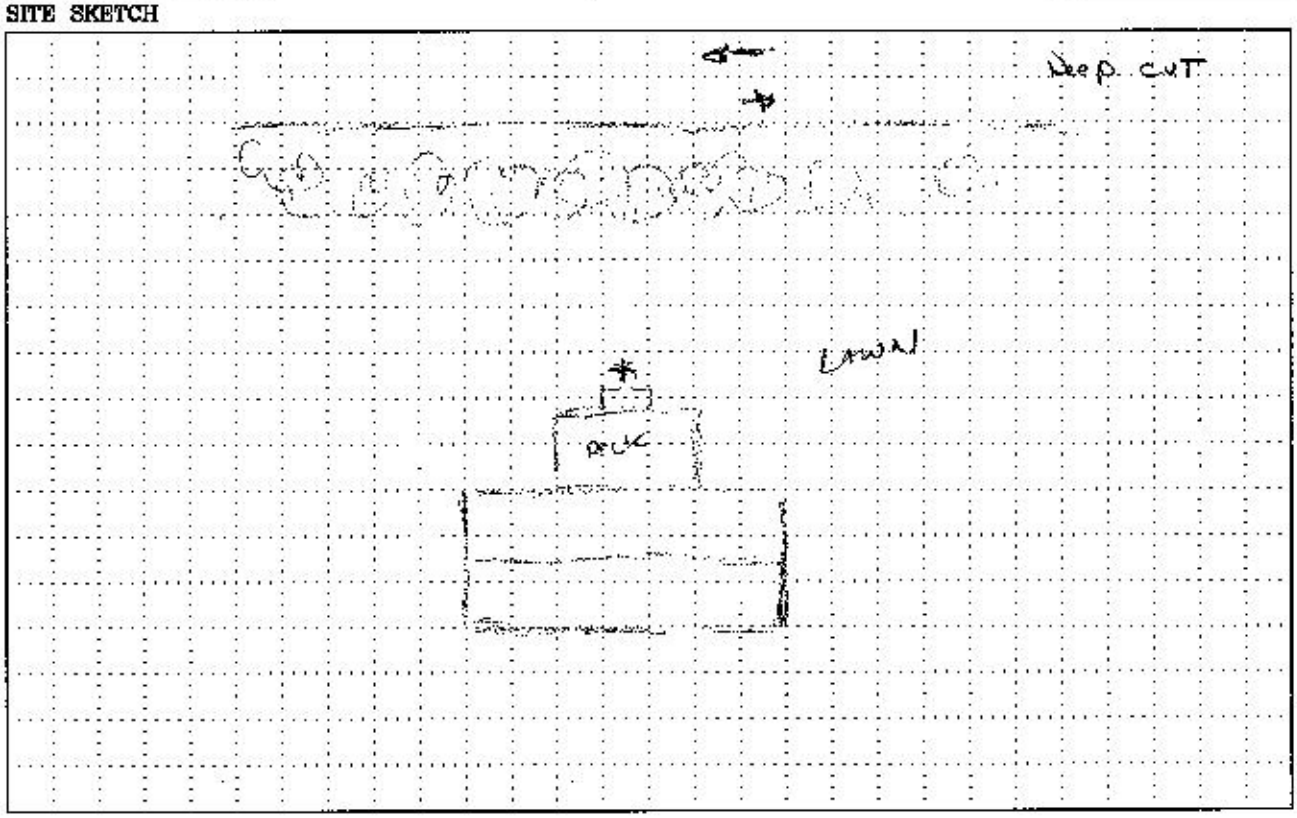
Roadway#2 PATP	1st	2nd
Direction WB		
auto	365	
med. trk.	19	
hvy trk.	58	
bus	2	
motorcycle	2	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 516583.1151

SITE ID 312-3

Gannett Fleming, Inc.

ADDRESS: 121 SNOREline RD

Meter Storage # 198

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT 028

SLM Calibration before 94.0 after _____

Weather: temperature 92.0 wind speed 0.5 cloud cover 0

Time:	1st	start	2:00	stop	2:20	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	57.1	Lmax	58.1	Lmin	44.0	SEL	81.9
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	317	
med. trk.	22	
hvy trk.	61	
bus	0	
motorcycle	1	

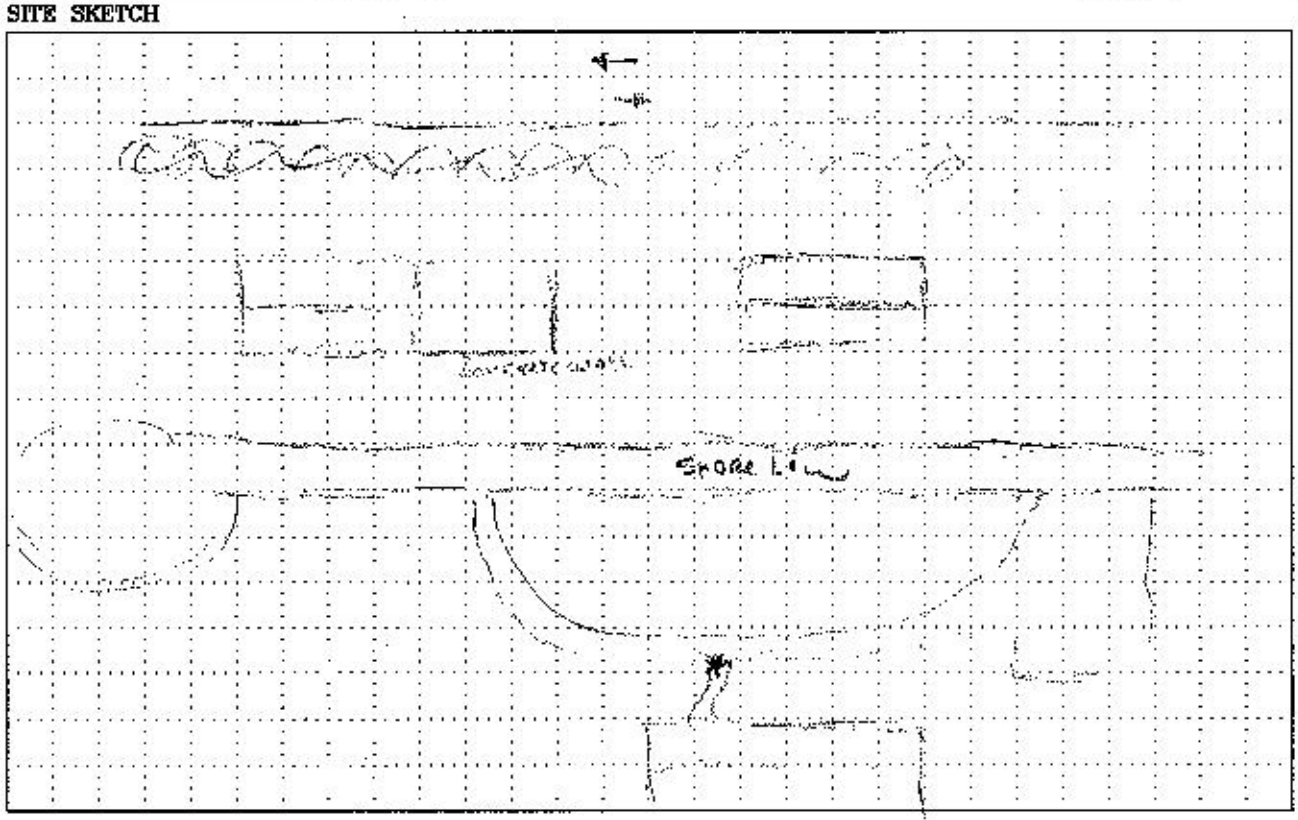
Roadway#2 PATP	1st	2nd
Direction WB		
auto	357	
med. trk.	22	
hvy trk.	25	
bus	21	
motorcycle	0	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 10-17-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID 7m2.4

Gannett Fleming, Inc.

ADDRESS: SHORELINE DR

Meter Storage # 197

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 027

SLM Calibration before 94.0 after

Weather: temperature 88 wind speed 0-5 cloud cover 0

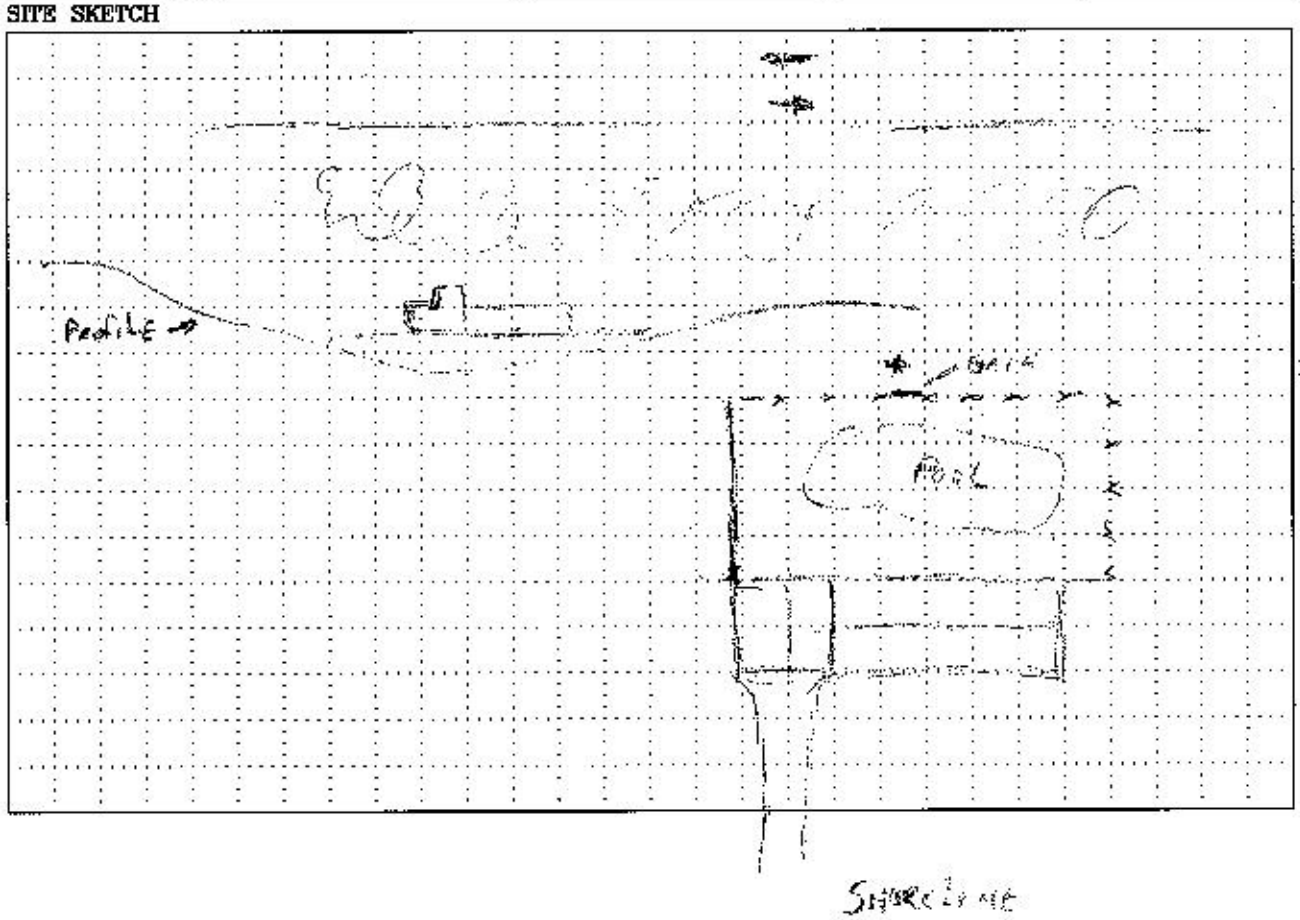
Time:	1st	start	1:33	stop	1:52	total	20			
	2nd	start		stop		total				
Data:	1st	Leq	62.1	Lmax	69.2	Lmin	50.9	SEL	92.9	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	342		auto	356		auto			auto		
med. trk.	24		med. trk.	25		med. trk.			med. trk.		
hvy trk.	70		hvy trk.	77		hvy trk.			hvy trk.		
bus	1		bus	4		bus			bus		
motorcycle	0		motorcycle	0		motorcycle			motorcycle		

NOTES: 2-hr L= 1.25

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATP-308-312

JOB # 56583.115

SITE ID M3-1

Gannett Fleming, Inc.

ADDRESS: 200 STYER RD

Meter Storage # 187

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 114

SLM Calibration before 94.0 after

Weather: temperature 85 wind speed 0-5 cloud cover 0

Time:	1st	start	3:55	stop	4:15	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	62.4	Lmax	78.1	Lmin	52.3	SEL	92.9
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	365	
med. trk.	15	
hvy trk.	55	
bus	0	
motorcycle	0	

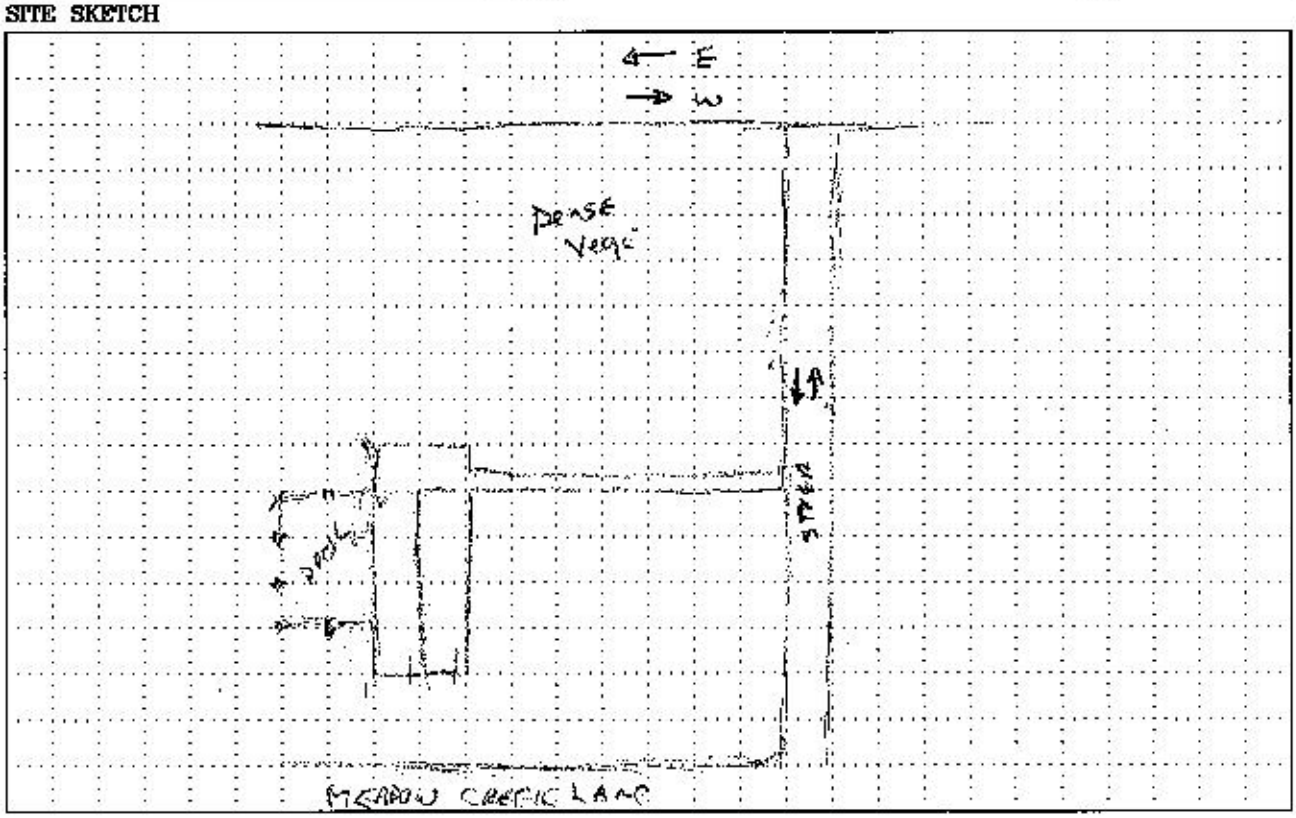
Roadway#2 PATP	1st	2nd
Direction WB		
auto	608	
med. trk.	13	
hvy trk.	56	
bus	1	
motorcycle	2	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4 STYER	1st	2nd
Direction ↓ ↑		
auto	141	41
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 56583.115

SITE ID M3-2

Gannett Fleming, Inc.

ADDRESS: 46 Meadow Creek

Meter Storage # 200

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

SLM NO. _____ SLM Calibration before 94.0 after _____ GPS PT 031

Weather: temperature _____ wind speed 0-5' cloud cover 30%

Time:	1st	start	9:35	stop	9:55	total	20			
	2nd	start		stop		total				
Data:	1st	Leq	63.1	Lmax	109.9	Lmin	55.0	SEL	93.9	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	360	
med. trk.	21	
hvy trk.	61	
bus	1	
motorcycle	0	

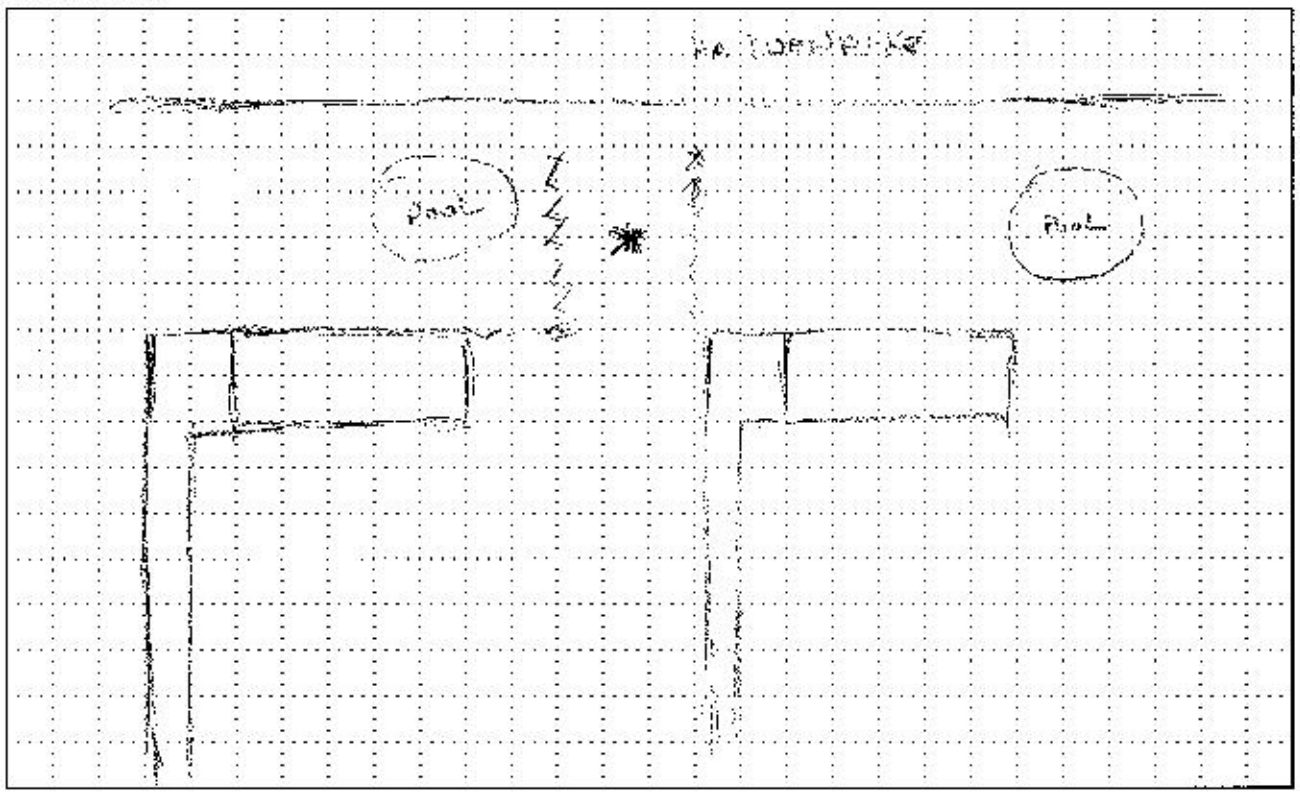
Roadway#2 PATP	1st	2nd
Direction WB		
auto	525	
med. trk.	18	
hvy trk.	56	
bus	0	
motorcycle	0	

Roadway#3 _____	1st	2nd
Direction _____		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4 _____	1st	2nd
Direction _____		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/17/14

PROJECT: PA Turnpike 308-312

JOB # 56583.1157

SITE ID 3-3

Gannett Fleming, Inc.

ADDRESS: 47 Meadowcreek Lane

Meter Storage # 386

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT _____

SLM Calibration before _____ after _____

Weather: temperature _____ wind speed _____ cloud cover _____

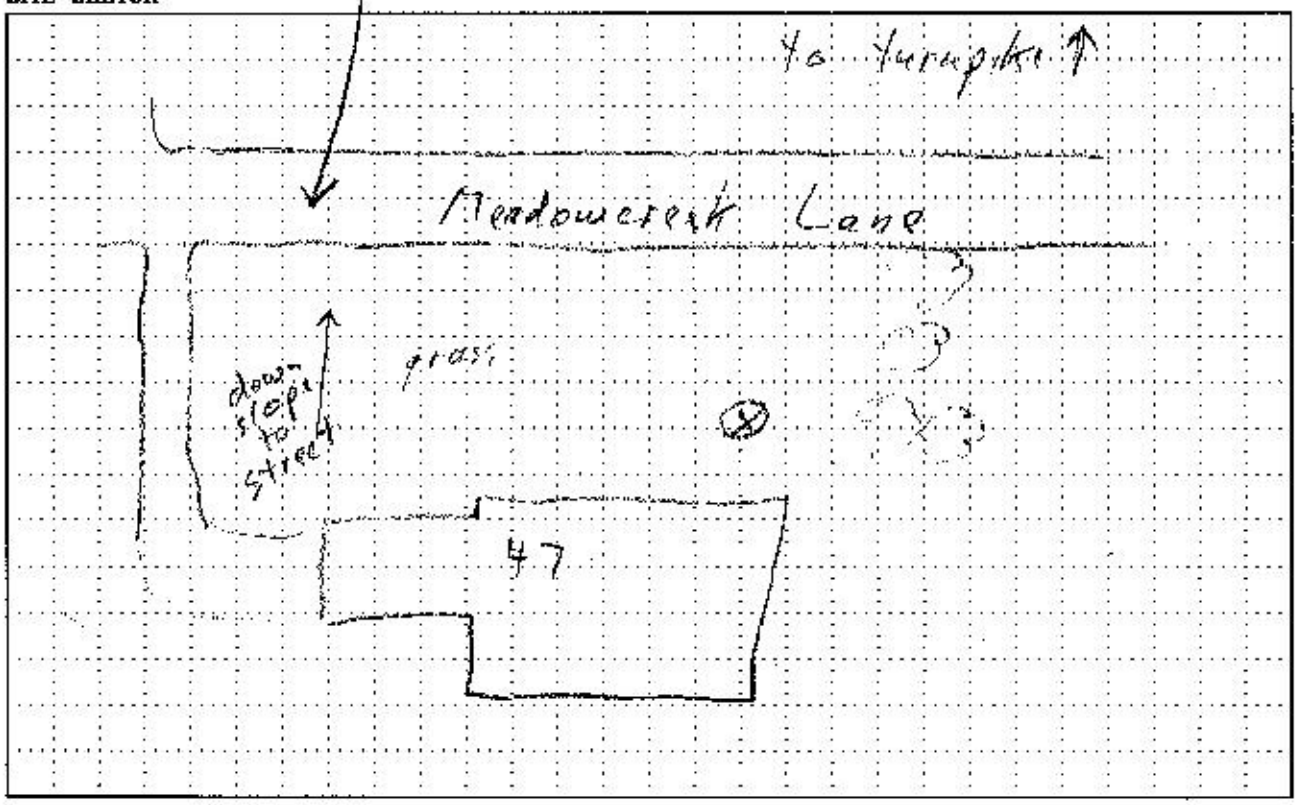
Time:	1st	start	3:35 PM	stop	3:55 PM	total				
	2nd	start		stop		total				
Data:	1st	Leq	58.2	Lmax	73.1	Lmin	53.7	SEL	89.0	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	360		auto	525		auto			auto		
med. trk.	21		med. trk.	18		med. trk.			med. trk.		
hvy trk.	10		hvy trk.	16		hvy trk.			hvy trk.		
bus	1		bus	9		bus			bus		
motorcycle	0		motorcycle	0		motorcycle			motorcycle		

NOTES: School bus, stopped ≈ 1 min

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 10-16-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID M3-4

Gannett Fleming, Inc.

ADDRESS: 38 Meadow Creek Lane

Meter Storage # 188

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Photograph #'s _____

GPS PT 115

Measurement Data

SLM Calibration before 94 after _____

Weather: temperature 55 wind speed 0-5 cloud cover 0

Time:	1st	start 4:27	stop 4:47	total 20					
	2nd	start _____	stop _____	total _____					
Data:	1st	Leq 66.6	Lmax 75.0	Lmin 53.6	SEL 97.4				
	2nd	Leq _____	Lmax _____	Lmin _____	SEL _____				

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	361	
med. trk.	12	
hvy trk.	35	
bus	5	
motorcycle	0	

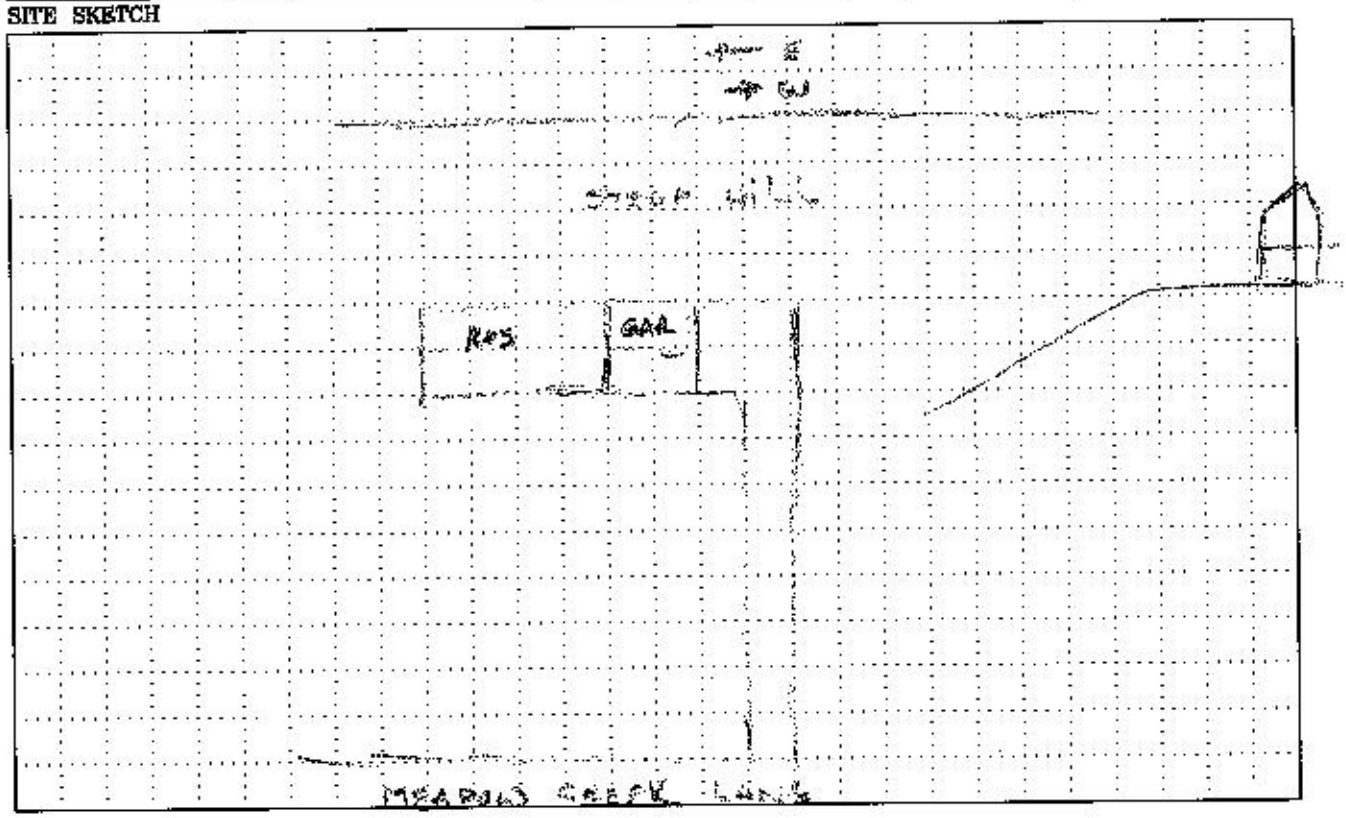
Roadway#2 PATP	1st	2nd
Direction WB		
auto	667	
med. trk.	6	
hvy trk.	60	
bus	0	
motorcycle	2	

Roadway#3 _____	1st	2nd
Direction _____		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4 _____	1st	2nd
Direction _____		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATURNPIKE 308-312

JOB # 056583.1151

SITE ID YM4-1

Gannett Fleming, Inc.

ADDRESS: 102 - EDGEFIELD DR

Meter Storage # 177-178

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Photograph #'s _____

GPS PT 101

Measurement Data

SLM Calibration before 114 after 114

Weather: temperature 84.7 wind speed 0-5 cloud cover 0

Time:	1st	start 10:49	stop 11:09	total 20				
	2nd	start	stop	total				
Data:	1st	Leq 60.7	Lmax 69.7	Lmin 51.9	SEL 91.5			
	2nd	Leq	Lmax	Lmin	SEL			

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	333	
med. trk.	21	
hvy trk.	70	
bus	2	
motorcycle	0	

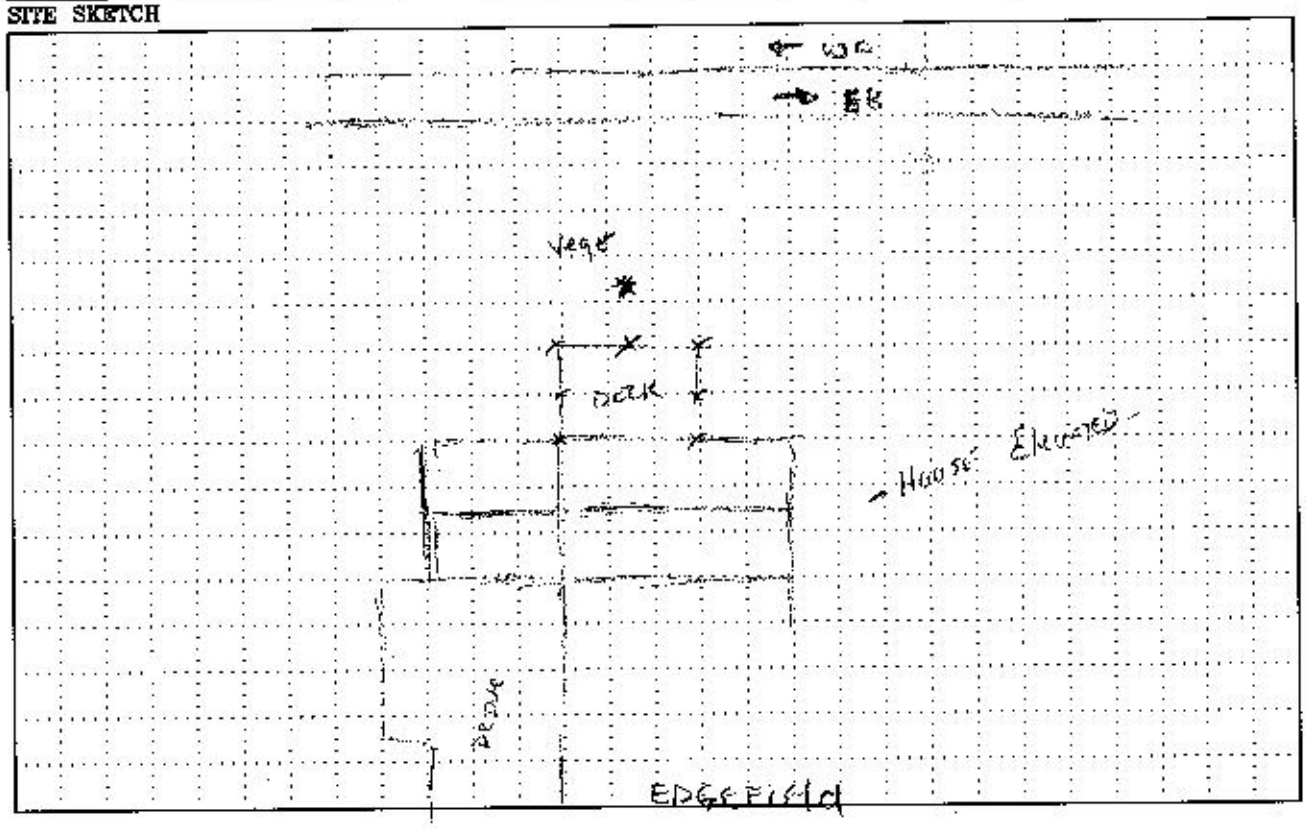
Roadway#2 PATP	1st	2nd
Direction WB		
auto	374	
med. trk.	19	
hvy trk.	64	
bus	1	
motorcycle	1	

Roadway#3 Milford	1st	2nd
Direction		
auto	[illegible]	
med. trk.	11	
hvy trk.		
bus		
motorcycle 1 TRACTOR		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 50383.1151

SITE ID M4-2

Gannett Fleming, Inc.

ADDRESS: 112 Eaglefield Dr.

Meter Storage # 202

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT 036

Measurement Data

SLM NO. _____ SLM Calibration before 94.0 after 94.1

Weather: temperature _____ wind speed _____ cloud cover _____

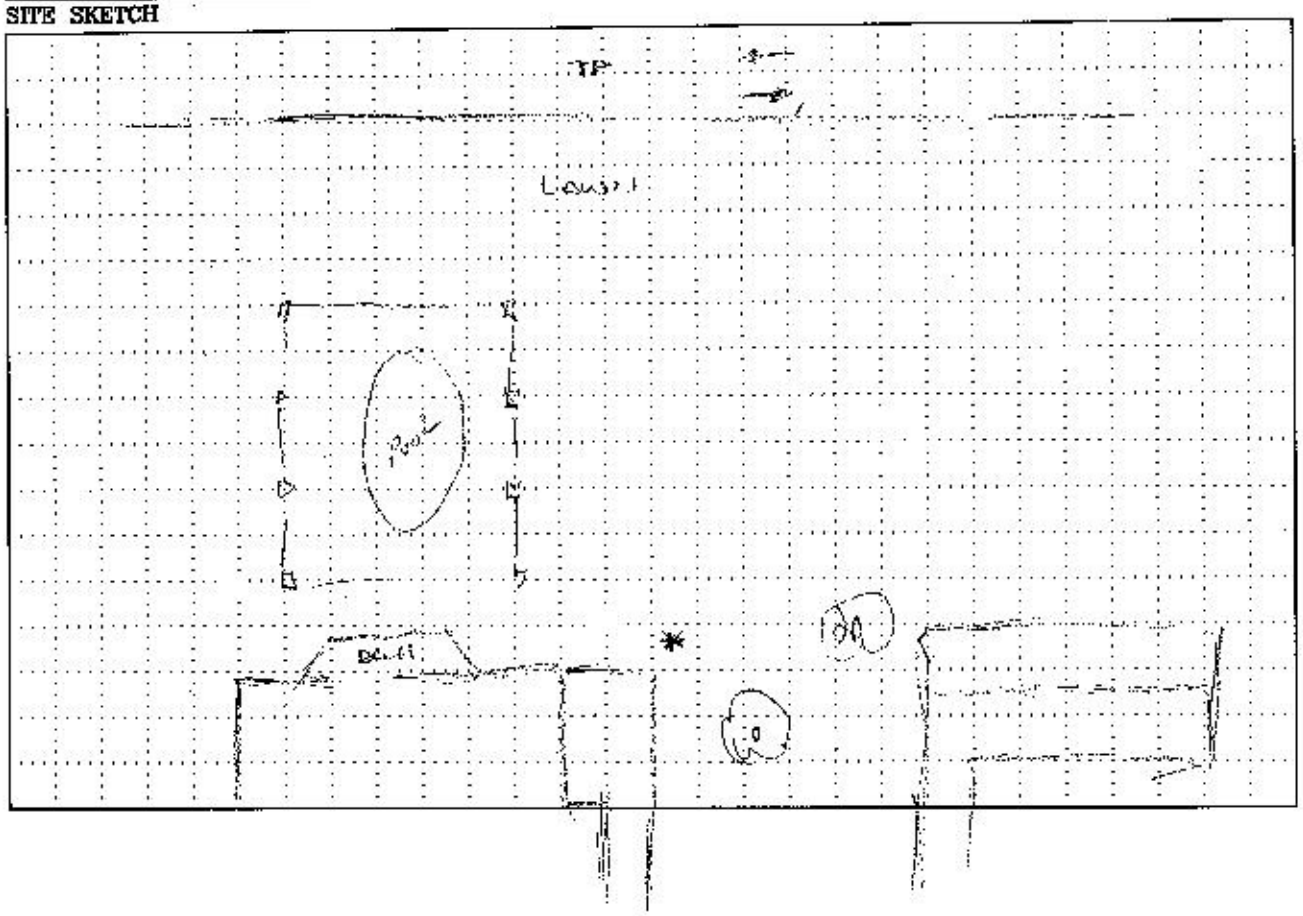
Time:	1st	start		stop		total			
	2nd	start	4:55	stop	5:15	total	20		
Data:	1st	Leq	54.7	Lmax	61.8	Lmin	51.2	SEL	87.5
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	398		auto	672		auto			auto		
med. trk.	17		med. trk.	14		med. trk.			med. trk.		
hvy trk.	32		hvy trk.	40		hvy trk.			hvy trk.		
bus	3		bus	2		bus			bus		
motorcycle	0		motorcycle	3		motorcycle			motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/17/14

PROJECT: PA Turnpike 308-312

JOB # 56583.1151

SITE ID M4-3

Gannett Fleming, Inc.

ADDRESS: 115 Edgefield Dr.

Meter Storage # 388

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT 37

SLM Calibration before _____ after _____

Weather: temperature _____ wind speed _____ cloud cover _____

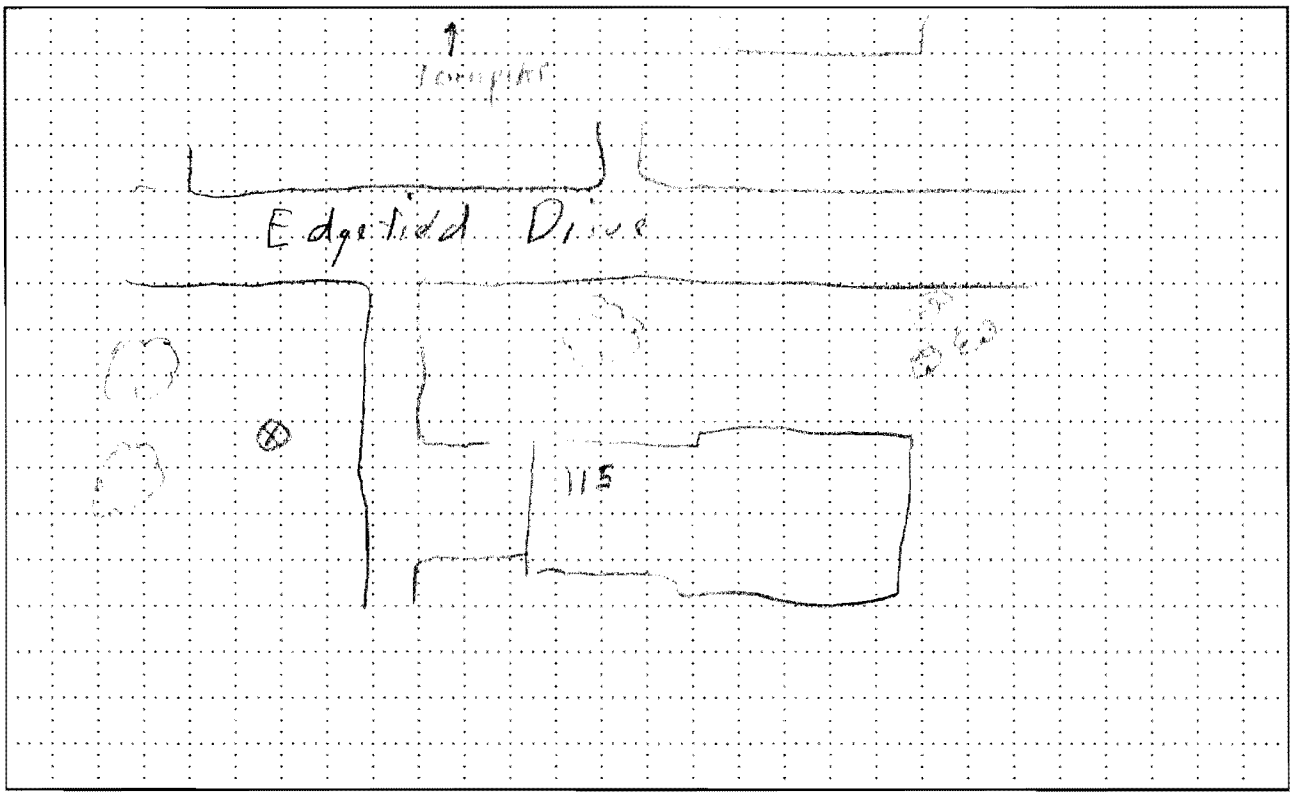
Time:	1st	start	4:54 PM	stop	5:14 PM	total	20 min			
	2nd	start		stop		total				
Data:	1st	Leq	51.6	Lmax	64.5	Lmin	46.0	SEL	82.4	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	398		auto	672		auto			auto		
med. trk.	17		med. trk.	14		med. trk.			med. trk.		
hvy trk.	32		hvy trk.	40		hvy trk.			hvy trk.		
bus	3		bus	2		bus			bus		
motorcycle	0		motorcycle	3		motorcycle			motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATP - 308-312

JOB # 056583.1151

SITE ID MH-4

Gannett Fleming, Inc.

ADDRESS: 116 Edgefield Dr

Meter Storage # 176

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT _____

SLM Calibration before 94.0 after _____

Weather: temperature 84.6 wind speed _____ cloud cover _____

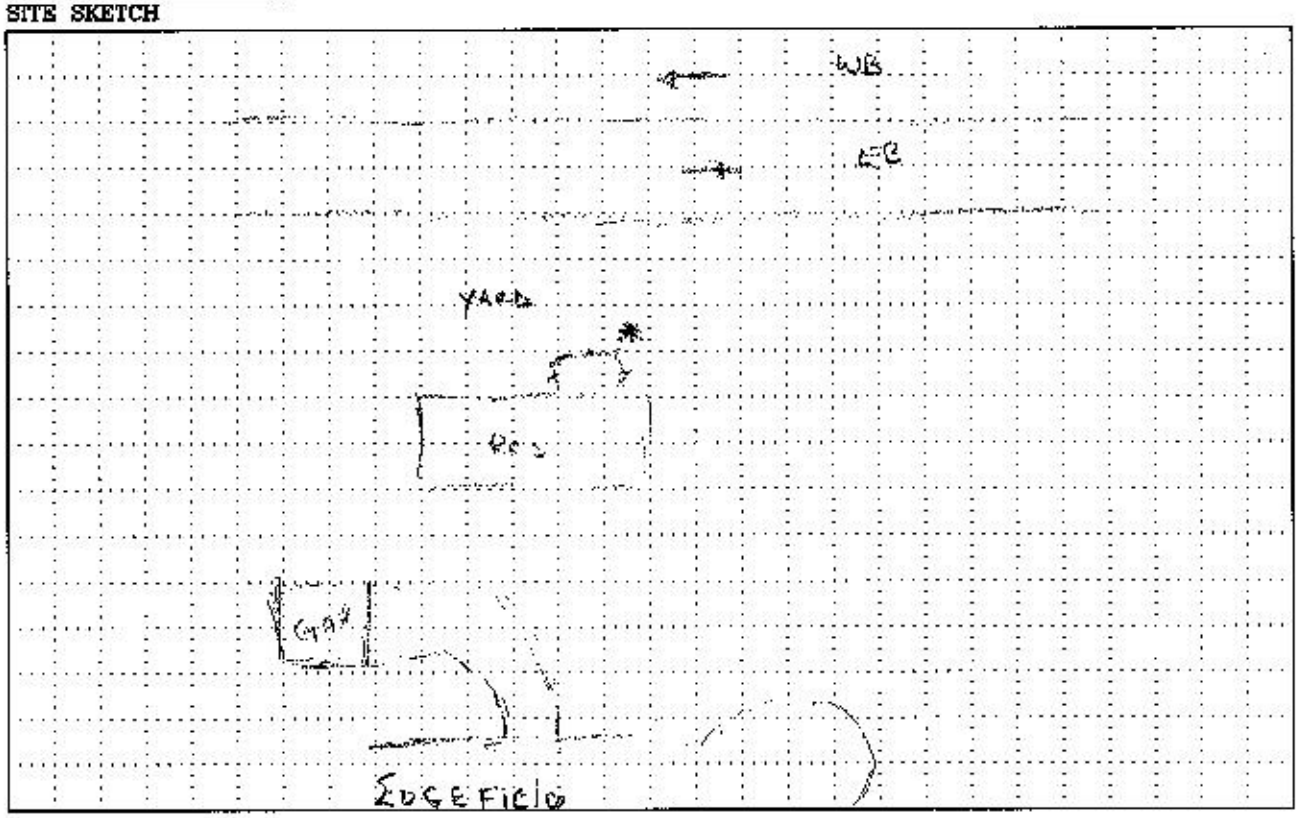
Time:	1st	start	10:18	stop	10:38	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	63.6	Lmax	69.4	Lmin	53.4	SEL	94.4
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	336		auto	451		auto			auto		
med. trk.	13		med. trk.	16		med. trk.			med. trk.		
hvy trk.	80		hvy trk.	104		hvy trk.			hvy trk.		
bus	0		bus	0		bus			bus		
motorcycle	1		motorcycle	1		motorcycle			motorcycle		

NOTES: 'NO WALL' EB TRAFFIC NOT VISIBLE AT CUT - WB VISIBLE -

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PA TPKE 308-312

JOB # 056583-1151

SITE ID -M4-S

Gannett Fleming, Inc.

ADDRESS: 118 EDGEFIELD DR.

#3 Meter Storage # 1715

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT

Measurement Data

SLM Calibration before 94.0 after

Weather: temperature 76.3 wind speed 0-5 cloud cover 0

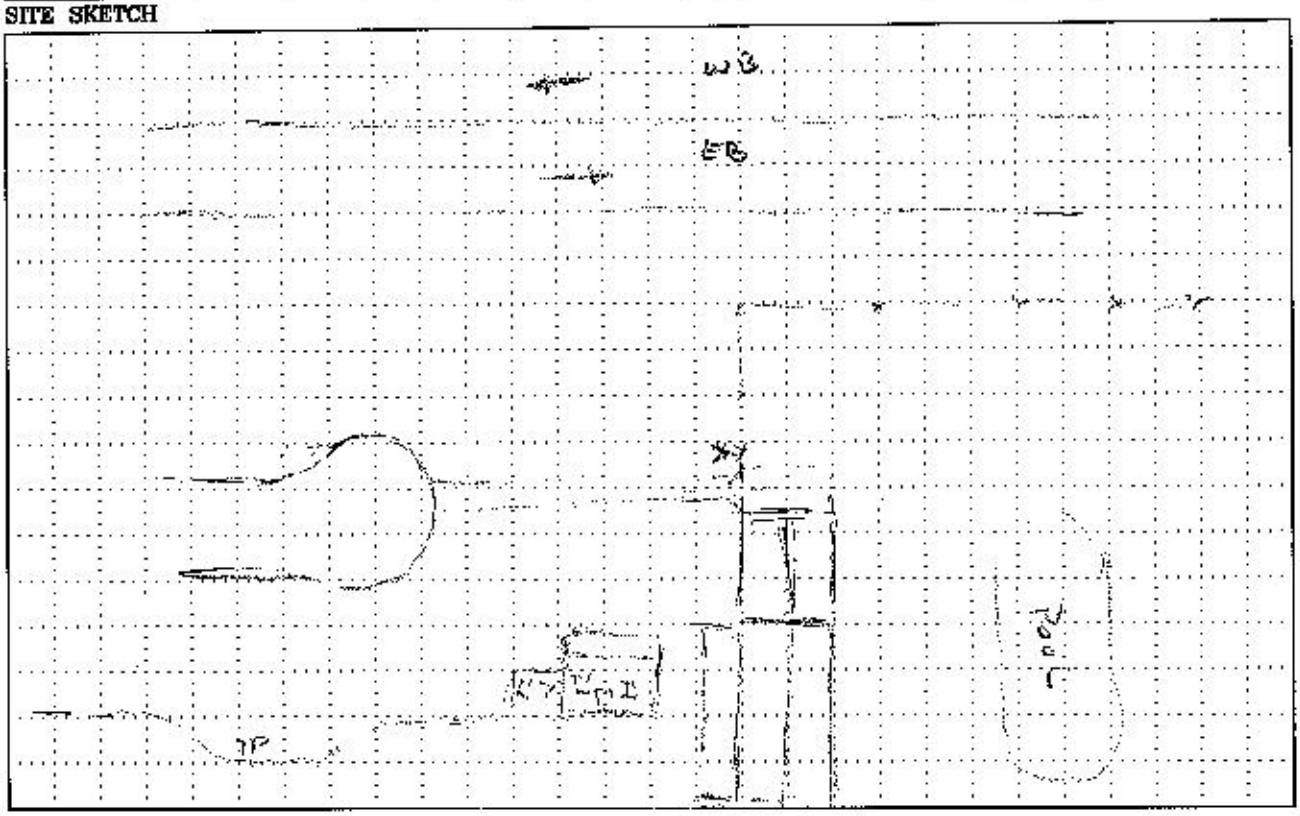
Time:	1st	start	9:49	stop	10:09	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	63.8	Lmax	75.6	Lmin	54.9	SEL	94.6
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	372		auto	393		auto			auto		
med. trk.	19		med. trk.	18		med. trk.			med. trk.		
hvy trk.	62		hvy trk.	84		hvy trk.			hvy trk.		
bus	0		bus	3		bus			bus		
motorcycle	1		motorcycle	0		motorcycle			motorcycle		

NOTES: TURNPIKE IN CUT

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP

JOB # 56583.115

SITE ID MS-1

Gannett Fleming, Inc.

ADDRESS: 105 WERTZ LANE

Meter Storage # 201

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 033

SLM Calibration before 94.0 after

Weather: temperature wind speed 0-5 cloud cover 30%

Time:	1st	start	4:17	stop	4:37	total	20			
	2nd	start		stop		total				
Data:	1st	Leq	71.2	Lmax	77.0	Lmin	60.3	SEL	102.0	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	411	
med. trk.	14	
hvy trk.	50	
bus	3	
motorcycle	0	

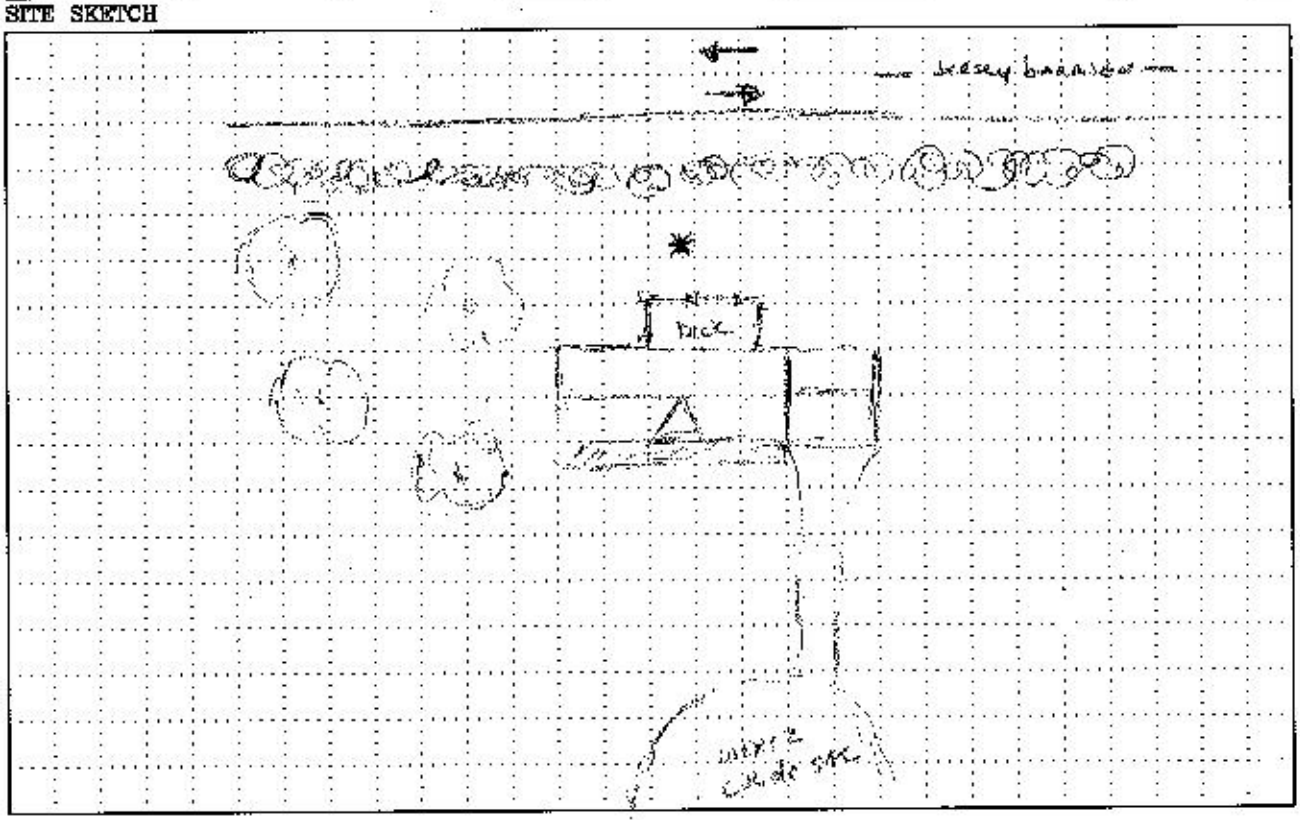
Roadway#2 PATP	1st	2nd
Direction WB		
auto	642	
med. trk.	22	
hvy trk.	64	
bus	1	
motorcycle	0	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/17/14

PROJECT: PA Turnpike 308-312

ADDRESS: 103 Wertz Lane

Highway Noise Monitoring Sheet

DATE: 6/17/14

PROJECT: PA Turnpike 308-312

JOB # 57583.1151

SITE ID M5-2

Gannett Fleming, Inc.

ADDRESS: 103 Wertz Lane

Meter Storage # 387

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT 34

SLM Calibration before _____ after _____

Weather: temperature _____ wind speed _____ cloud cover _____

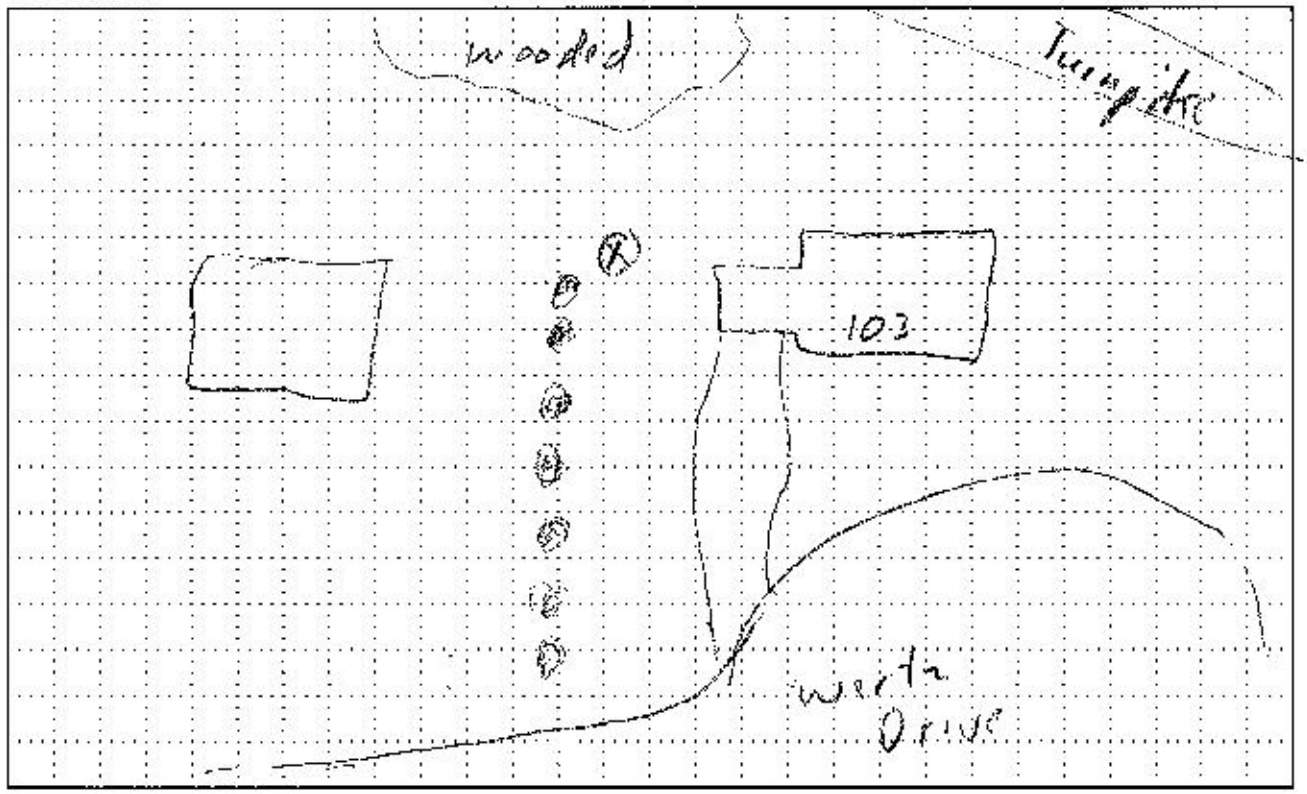
Time:	1st	start	4:17 PM	stop	4:37 PM	total	20 min		
	2nd	start		stop		total			
Data:	1st	Leq	66.3	Lmax	76.1	Lmin	51.7	SEL	97.1
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	411		auto	492		auto			auto		
med. trk.	14		med. trk.	22		med. trk.			med. trk.		
hvy trk.	50		hvy trk.	64		hvy trk.			hvy trk.		
bus	3		bus	1		bus			bus		
motorcycle	0		motorcycle	0		motorcycle			motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/18/14

PROJECT: PA Turnpike 308-312.

JOB # 56583.115

SITE ID 5-3

Gannett Fleming, Inc.

ADDRESS: 9 Blackhorse Circle

Meter Storage # 208

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

SLM NO. _____ SLM Calibration before _____ after _____ GPS PT 046

Weather: temperature _____ wind speed _____ cloud cover _____

Time:	1st	start	11:51 AM	stop	12:11 PM	total			
	2nd	start		stop		total			
Data:	1st	Leq	61.3	Lmax	68.7	Lmin	48.5	SEL	92.1
	2nd	Leq		Lmax		Lmin		SEL	

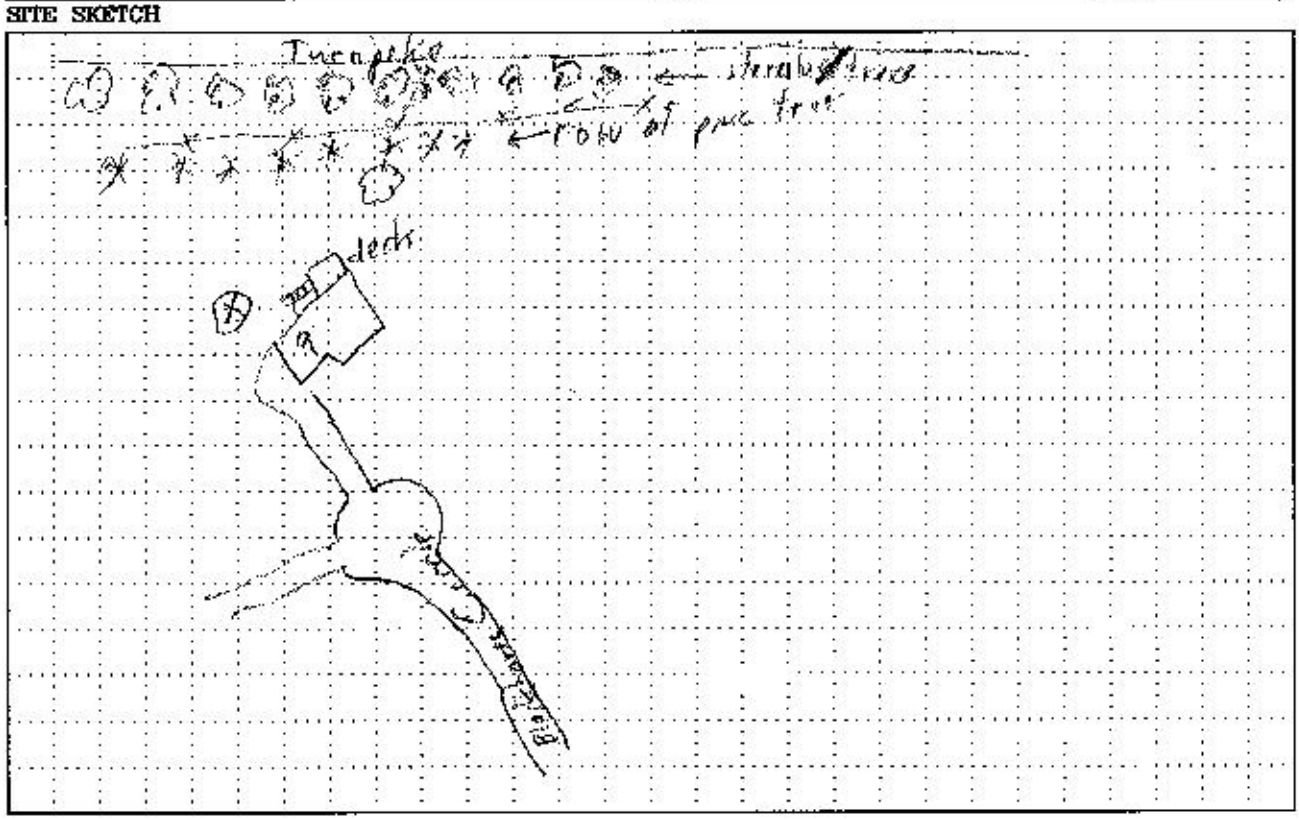
Traffic Data

Roadway#1	PA TP	Roadway#2	PA TP	Roadway#3		Roadway#4	
Direction	EB	Direction	WB	Direction		Direction	

	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	326		269					
med. trk.	15		19					
hvy trk.	65		78					
bus	2		2					
motorcycle	1		2					

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PATP - 308-312

JOB # 36583.1151

SITE ID MS-4

Gannett Fleming, Inc.

ADDRESS: 102 HOFFMAN CIRCLE

Meter Storage # 179-180

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT 102-153

SLM Calibration before 94.0 after _____

Weather: temperature _____ wind speed _____ cloud cover _____

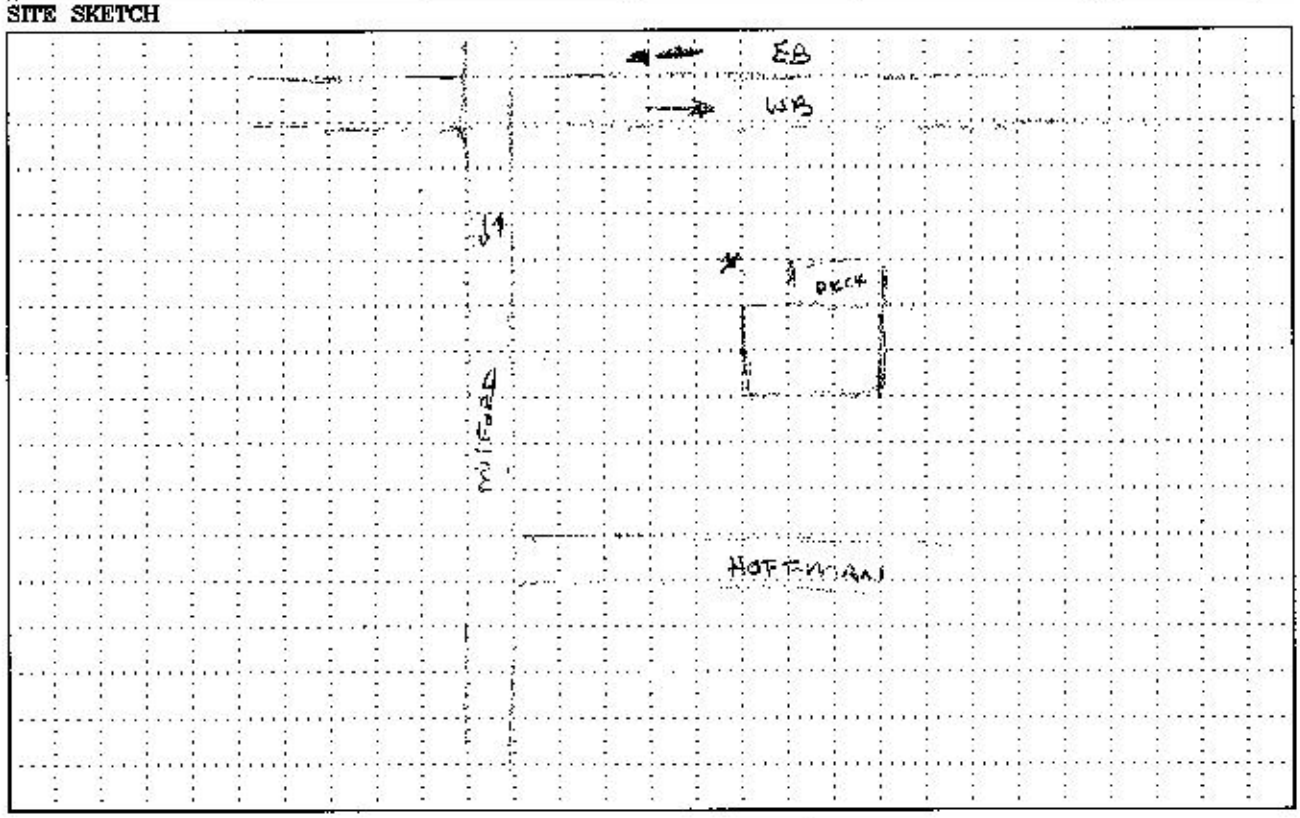
Time:	1st	start	11:22	stop	11:42	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	72.1	Lmax	90.8	Lmin	60.2	SEL	102.9
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

	Roadway#1 PATP		Roadway#2 PATP		Roadway#3 MILFORD		Roadway#4	
	Direction EB		Direction WB		Direction ↓	↑	Direction	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	358		405		IIII	IIII		
med. trk.	27		13					
hvy trk.	69		97					
bus	4		0					
motorcycle	0		0					

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/18/14

PROJECT: PA Turnpike 308-312

JOB # 56583.1151

SITE ID 61/62 (#4 #3)

Gannett Fleming, Inc.

ADDRESS: #3 20 Green Valley Road
#4 10 Green Valley Road

Meter Storage # 209/391 (#3 / #4)

TYPE ☒ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Measurement Data

Photograph #'s _____

GPS PT 47/48 (#3 #4)

SLM NO. _____ SLM Calibration before 94.0 after _____

Weather: temperature _____ wind speed _____ cloud cover _____

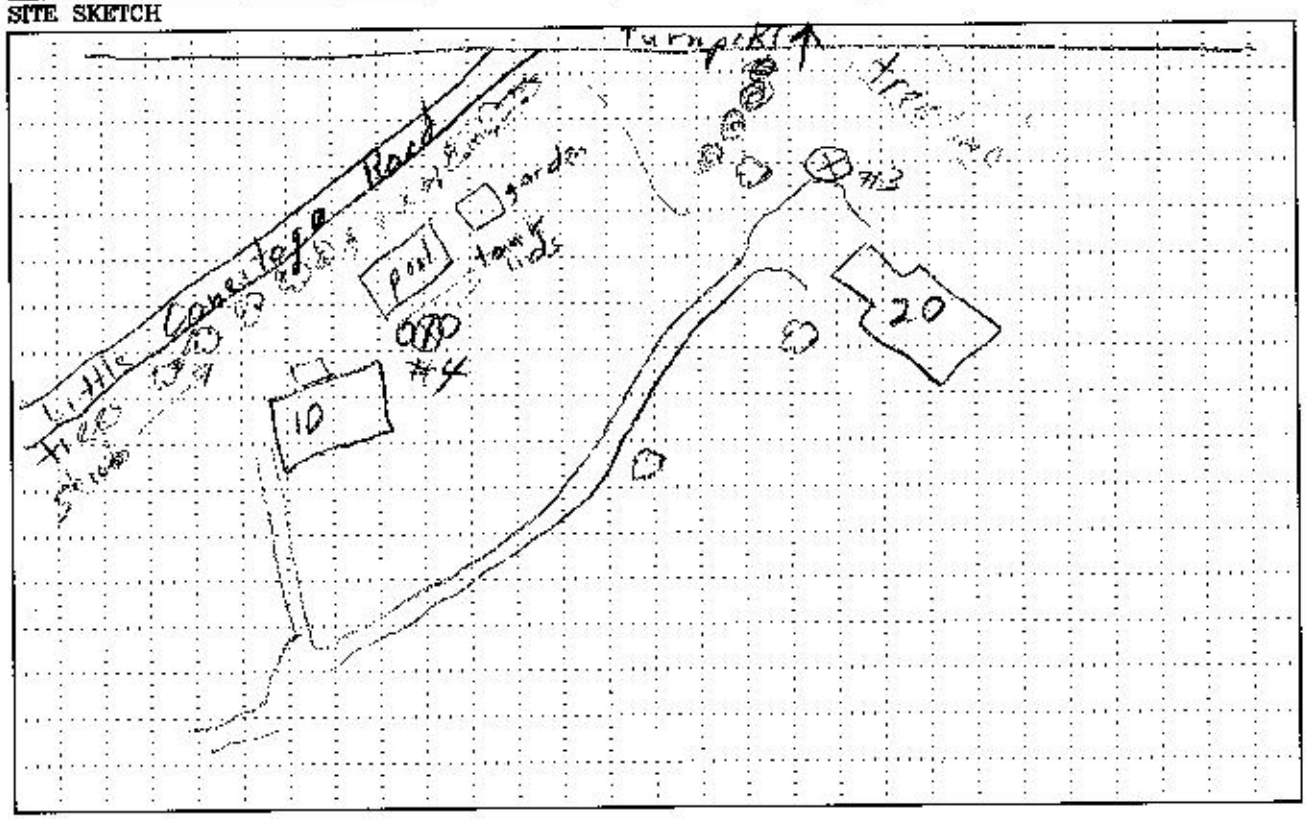
Time:	1st	start	12:22	stop	12:42	total	20				
	2nd	start		stop		total					
Data:	1st	Leq	60.9	Lmax	68.8	Lmin	53.4	SEL	91.7	#3	
	2nd	Leq	54.8	Lmax	65.2	Lmin	47.7	SEL	85.6	#4	

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	332		auto	302		auto			auto		
med. trk.	20		med. trk.	29		med. trk.			med. trk.		
hvy trk.	11		hvy trk.	115		hvy trk.			hvy trk.		
bus	1		bus	3		bus			bus		
motorcycle	5		motorcycle	0		motorcycle			motorcycle		

NOTES: pool pump / hot tub Running - children Running around

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/18/14

PROJECT: PA Turnpike 308-312

JOB # 36583.1151

SITE ID 6-3

Gannett Fleming, Inc.

ADDRESS: 30 Green Valley Rd.

Meter Storage # 206

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 43/44

SLM NO. _____ SLM Calibration before _____ after _____

Weather: temperature _____ wind speed _____ cloud cover _____

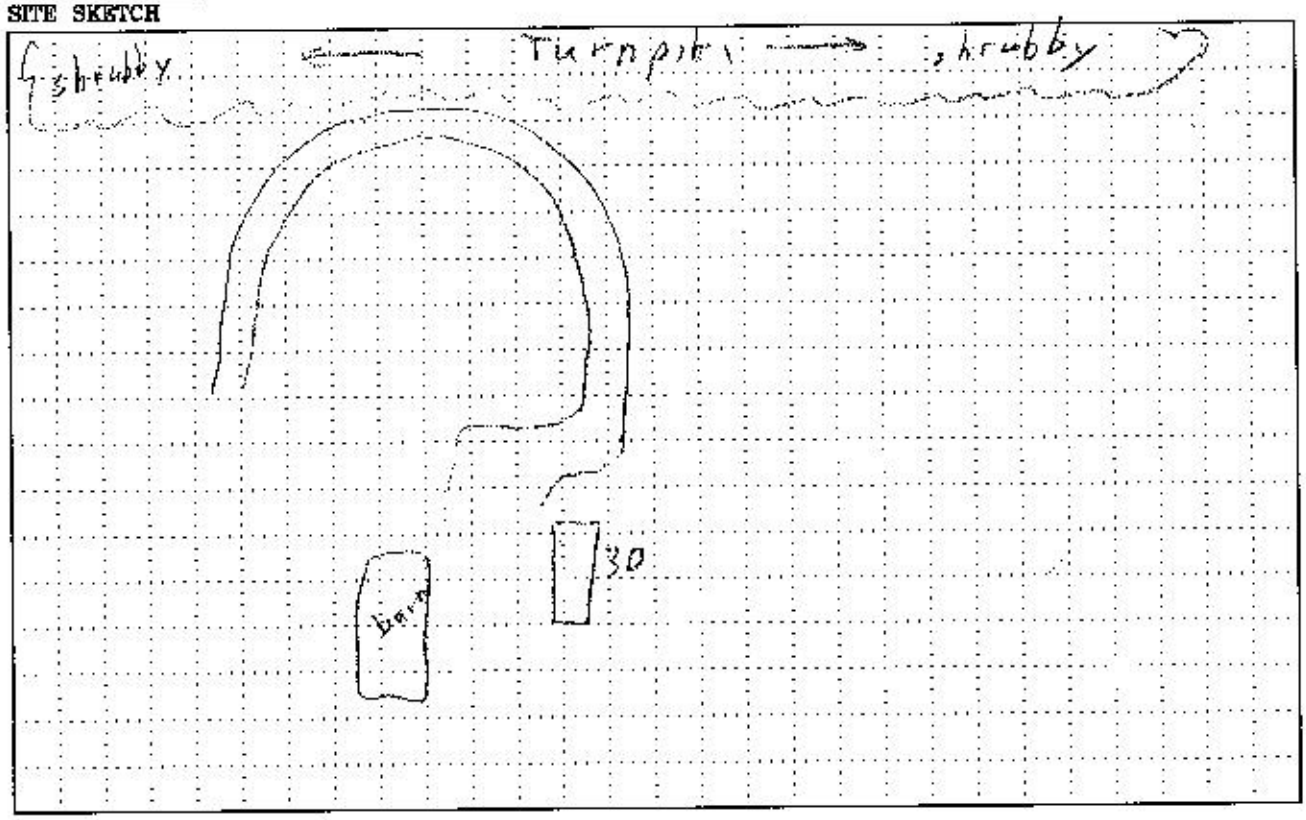
Time:	1st	start	10:04	stop	10:24	total	20			
	2nd	start		stop		total				
Data:	1st	Leq	60.6	Lmax	68.1	Lmin	48.5	SEL	91.4	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	298		auto	349		auto			auto		
med. trk.	23		med. trk.	14		med. trk.			med. trk.		
hvy trk.	54		hvy trk.	98		hvy trk.			hvy trk.		
bus	3		bus	3		bus			bus		
motorcycle	3		motorcycle	2		motorcycle			motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-16-14

PROJECT: PA-TURNPIKE 308.312

JOB # 56583.1151

SITE ID MT-1-1-2

Gannett Fleming, Inc.

ADDRESS: 435/445 Milford Rd

Meter Storage # #3181 #4.394

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT #4.004 #3.008

Measurement Data #4-93.9

SLM Calibration before #3 94.0 after

Weather: temperature wind speed cloud cover

Time:	1st #3	start	11:35	stop	12:15	total	20		
	2nd #4	start	12:40	stop	12:20	total			
Date:	1st #3	Leq	59.6	Lmax	61.6	Lmin	50.5	SEL	88.4
	2nd #4	Leq	56.7	Lmax	87.8	Lmin	45.1	SEL	87.5

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	338	
med. trk.	16	
hvy trk.	62	
bus	4	
motorcycle	1	

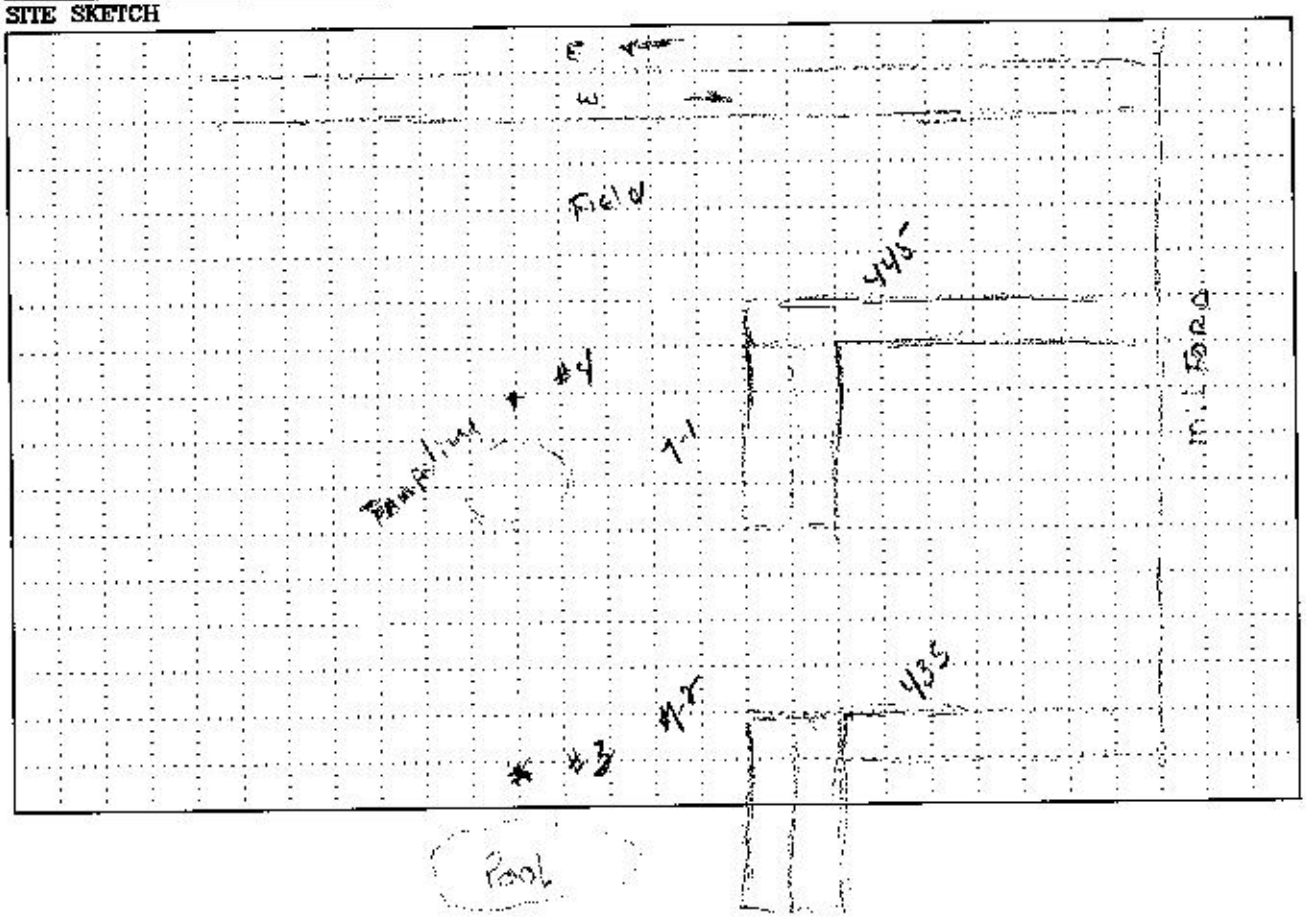
Roadway#2 PATP	1st	2nd
Direction WB		
auto	336	
med. trk.	13	
hvy trk.	60	
bus	0	
motorcycle	0	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID MP-1-16

Gannett Fleming, Inc.

ADDRESS: Ball Fields

Meter Storage # #4-385 #3-189

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☑ Other Ball Field

Photograph #'s

GPS PT #4 117 - #3 118

Measurement Data #3-94.0

SLM Calibration before #4-94.0 after

Weather: temperature wind speed cloud cover

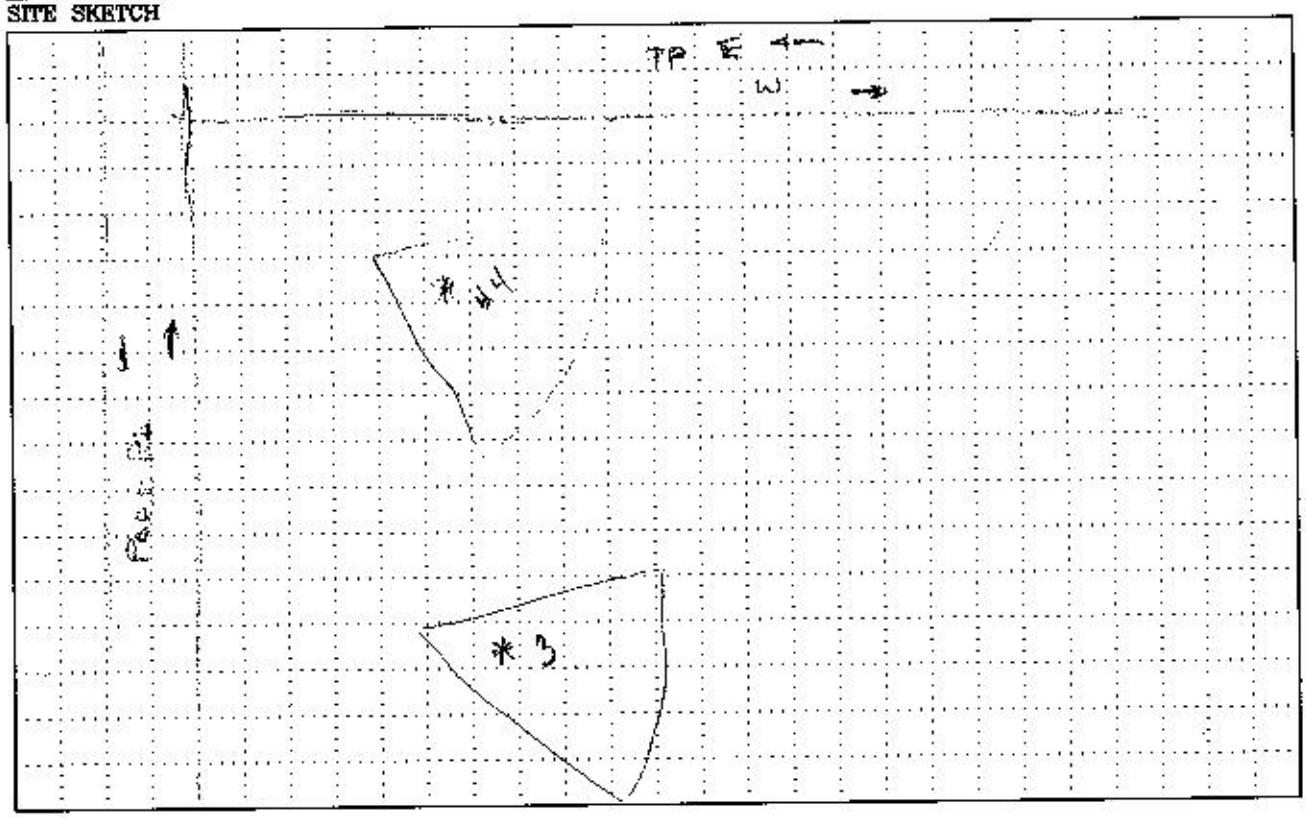
Time:	1st #4	start	7:39	stop	7:59	total	20			
	2nd #3	start	7:42	stop	8:02	total	20			
Data:	1st #4	Leq	60.9	Lmax	68.7	Lmin	53.1	SEL	91.7	
	2nd #3	Leq	60.0	Lmax	74.6	Lmin	51.5	SEL	90.8	

Traffic Data

	Roadway#1 PATP		Roadway#2 PATP		Roadway#3 PARK AVE		Roadway#4	
	Direction EB		Direction WB		Direction		Direction	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	693		298		138			
med. trk.	23		10		2			
hvy trk.	67		41		1			
bus	1		0		2			
motorcycle	1		1					

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/18/14

PROJECT: PA Turnpike 308-312

JOB # 516583.1151

SITE ID 9-1

Gannett Fleming, Inc.

ADDRESS: 1850 Rosenberger Lane

Meter Storage # 204 #3

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Photograph #'s _____

GPS PT 41

Measurement Data

SLM Calibration before _____ after _____

Weather: temperature _____ wind speed _____ cloud cover _____

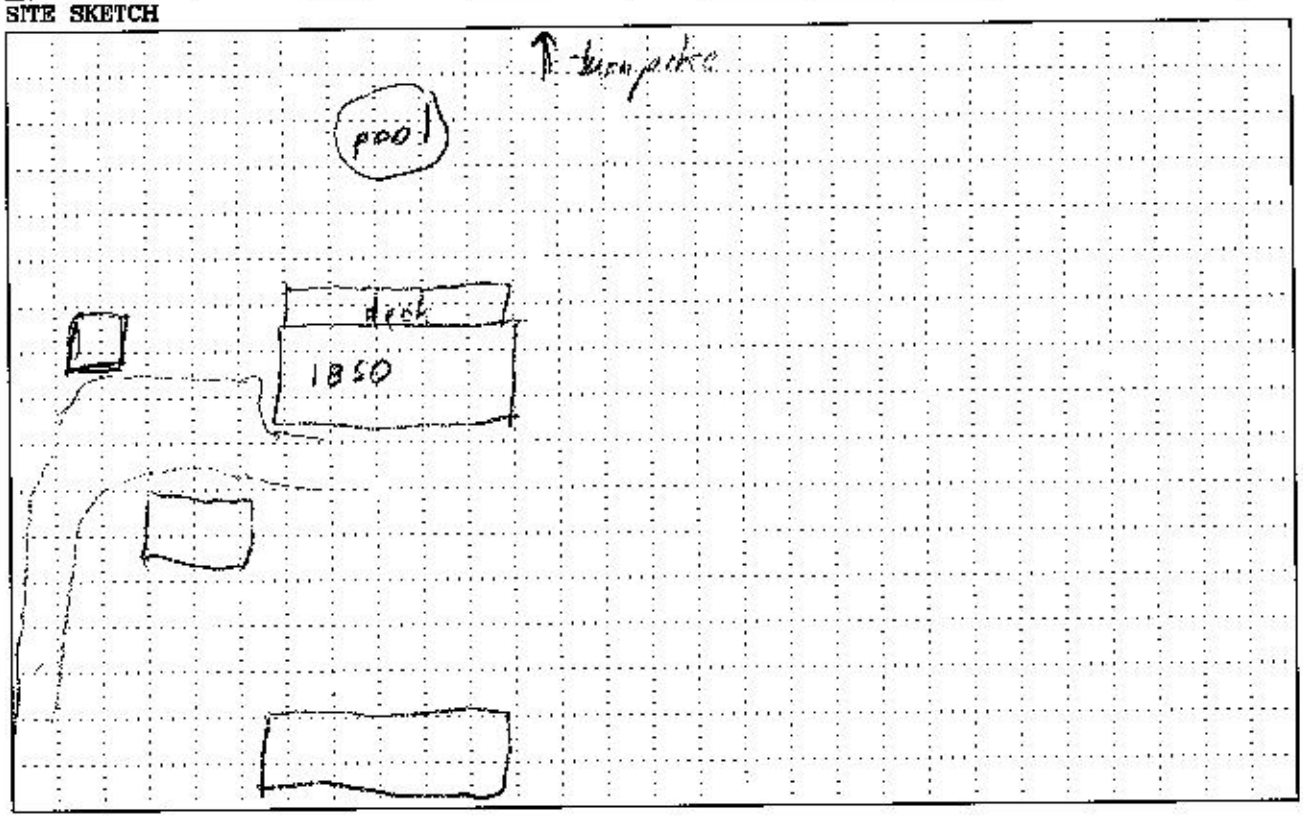
Time:	1st	start	8:35 AM	stop	8:55 AM	total	20 min		
	2nd	start		stop		total			
Data:	1st	Leq	64.2	Lmax	72.5	Lmin	56.1	SEL	95.0
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	500		auto	319		auto			auto		
med. trk.	21		med. trk.	25		med. trk.			med. trk.		
hvy trk.	85		hvy trk.	47		hvy trk.			hvy trk.		
bus	5		bus	8		bus			bus		
motorcycle	1		motorcycle	0		motorcycle			motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

Gannett Fleming, Inc.

DATE: 6/18/14

PROJECT: PA Turnpike 308-312

JOB # 56583.1151

SITE ID 10-1

ADDRESS: 750 Pennsylvania Dr Universal Technical Institute

Meter Storage # 205 #3

TYPE ☐ Residential ☑ Commercial ☐ Religion ☐ Educational ☐ Other ____

Measurement Data

Photograph #'s ____

GPS PT 042

SLM NO. ____ SLM Calibration before 94.0 after ____

Weather: temperature ____ wind speed ____ cloud cover ____

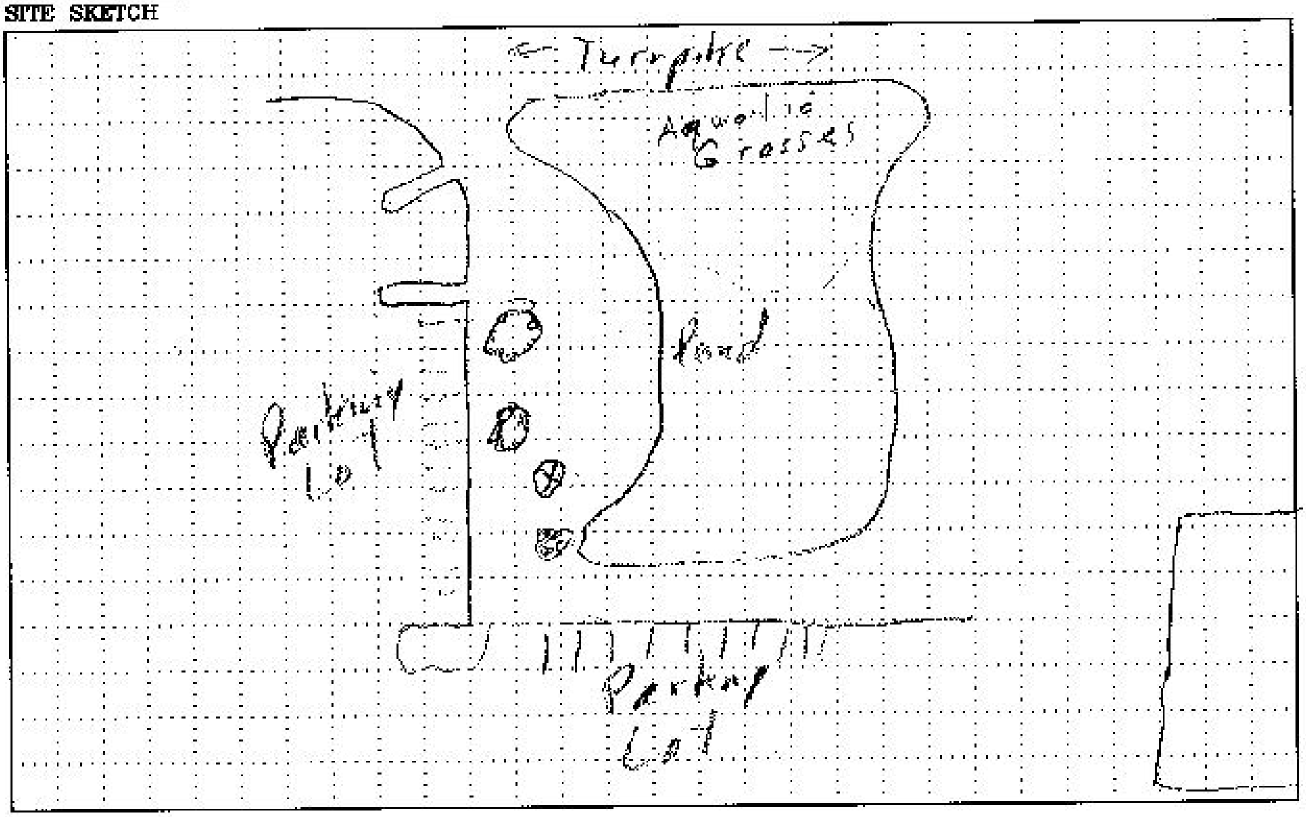
Time:	1st	start	9:23AM	stop	9:43AM	total	20 min		
	2nd	start		stop		total			
Data:	1st	Leq	63.5	Lmax	73.5	Lmin	55.6	SEL	94.3
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

	Roadway#1 PATP, Direction EB 1st	2nd	Roadway#2 PATP, Direction WB 1st	2nd	Roadway#3 1st	2nd	Roadway#4 1st	2nd
auto	348		353					
med. trk.	16		12					
hvy trk.	72		88					
bus	3		3					
motorcycle	1		1					

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

Gannett Fleming, Inc.

DATE: 6/18/14

PROJECT: PA Turnpike 308-312

JOB # 56583.115?

SITE ID M11-1

ADDRESS: Parcel #1 UNDEVELOPED LAND

Meter Storage # 389/390

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Measurement Data

Photograph #'s

GPS PT 039

SLM NO. ______ SLM Calibration before ______ after ______

Weather: temperature ______ wind speed ______ cloud cover ______

Time:	1st	start	7:41 AM	stop	8:01 AM	total	20 min		
	2nd	start	8:03 AM	stop	8:23 AM	total	20 min		
Data:	1st	Leq	60.2	Lmax	70.6	Lmin	53.3	SEL	91.0
	2nd	Leq	59.9	Lmax	65.9	Lmin	54.0	SEL	90.7

Traffic Data

	Roadway#1 PATP, Direction EB 1st	2nd	Roadway#2 PATP, Direction WB 1st	2nd	Roadway#3 Lil Con, Direction EB 1st	2nd	Roadway#4 Lil Con, Direction WB 1st	2nd
auto	709	599	308	366	15		142	
med. trk.	21	27	11	19			2	
hvy trk.	70	84	35	41			2	
bus	0	4	2	0				
motorcycle	1	1	1	0				

NOTES: Little Conelega 10 min count 7:42 - 7:50 AM (142) ← A (tally marks) MT (2) HT (2); (15) → A (tally marks) MT HT; ← (tally marks)

SITE SKETCH

Highway Noise Monitoring Sheet

DATE: 6-18-14

PROJECT: PATP- 338.317

JOB # 56583.1151

SITE ID M11-2

Gannett Fleming, Inc.

ADDRESS: L.L Conestoga

Undeveloped Lands

Parcel # 36

Meter Storage # 203

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Photograph #'s _____

GPS PT 043

Measurement Data

SLM Calibration before 94.0 after _____

Weather: temperature 75 wind speed 0-5 cloud cover 10%

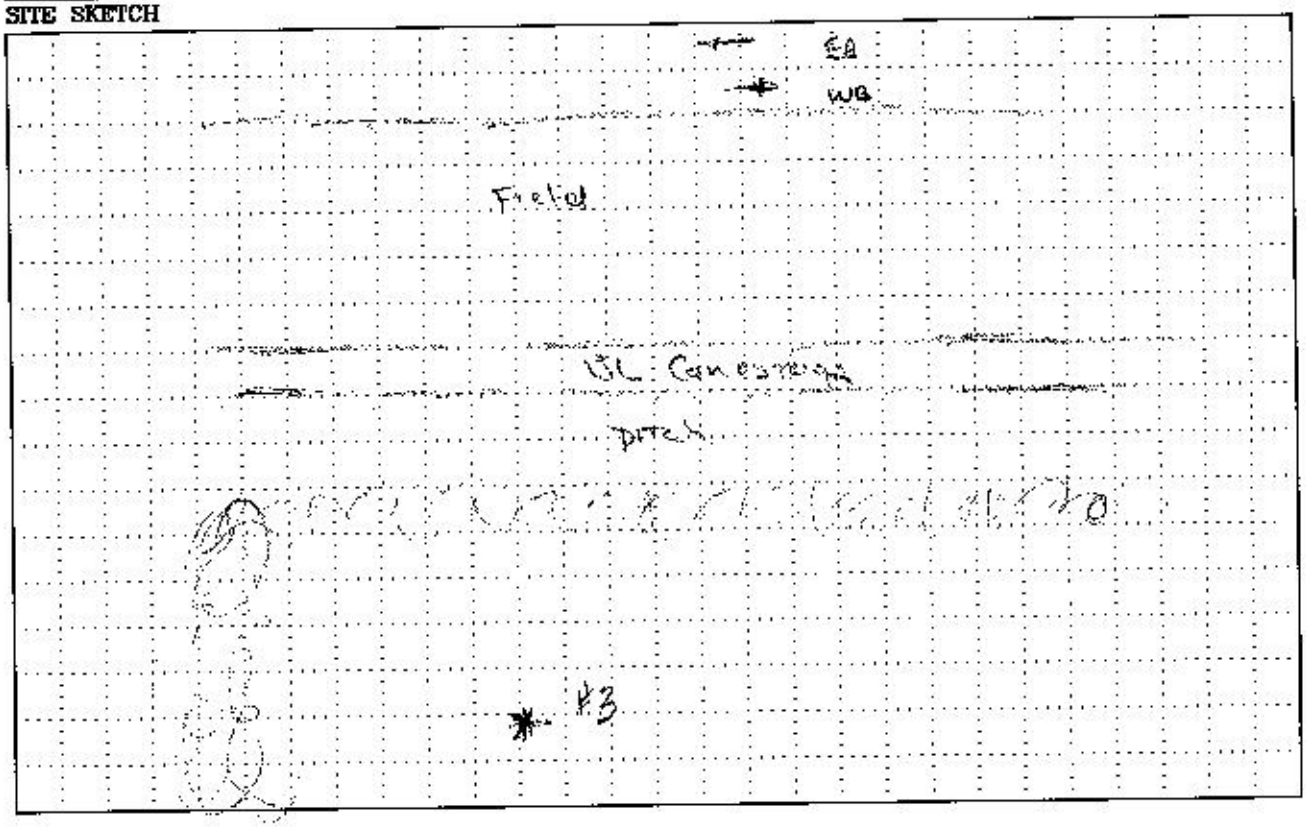
Time:	1st	start	803	stop	8:23	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	60.7	Lmax	75.4	Lmin	55.7	SEL	91.5
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

	Roadway#1 PATP		Roadway#2 PATP		Roadway#3 L.L CON		Roadway#4 L.L CON	
	Direction EB		Direction WB		Direction EB		Direction → WB	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	549		368		142	852	15	90
med. trk.	27		19		2	12		
hvy trk.	84		41		2	12		
bus	4		6					
motorcycle	1		0					

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID NJ12-1

Gannett Fleming, Inc.

ADDRESS: 6 Newton Pl

Meter Storage # 196

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Photograph #'s _____

GPS PT 026

Measurement Data

SLM Calibration before 94.0 after _____

Weather: temperature _____ wind speed _____ cloud cover _____

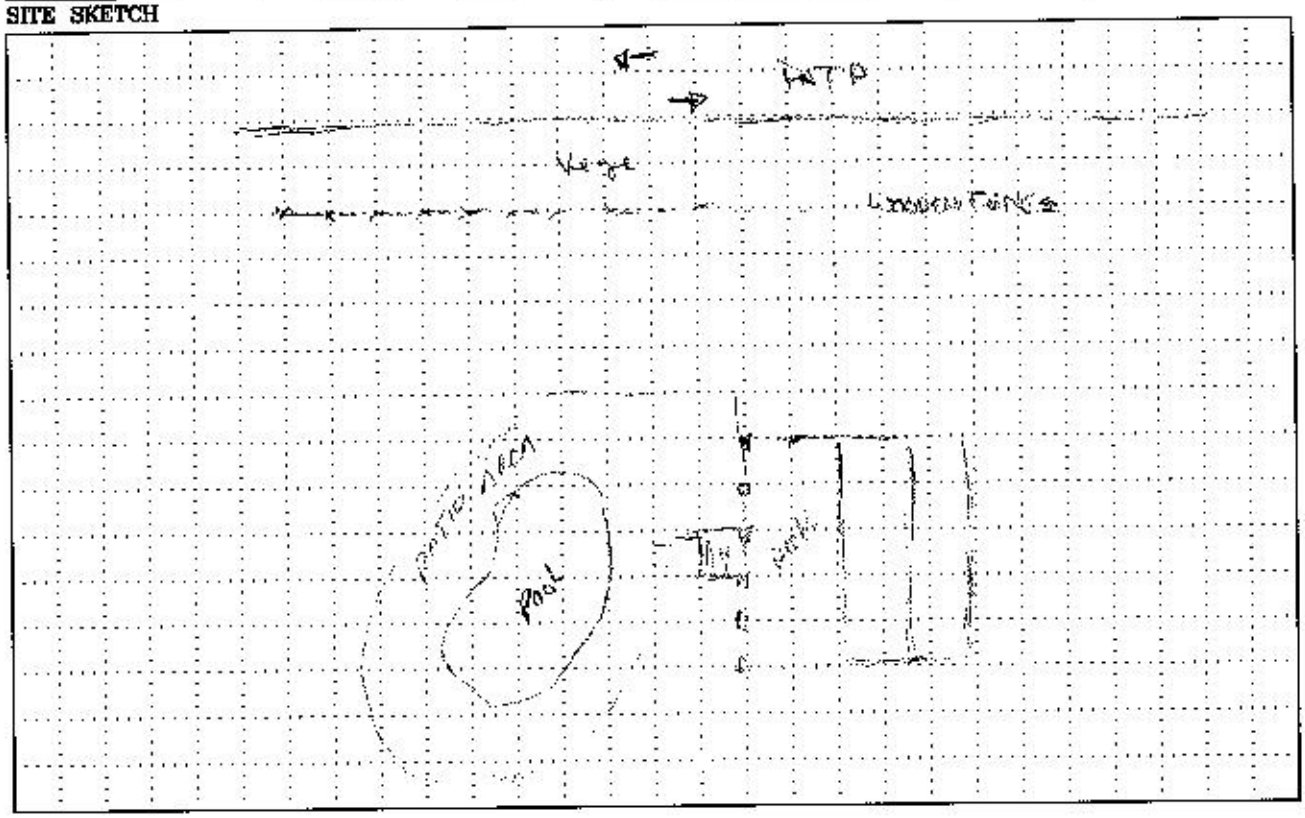
Time:	1st	start	11:32	stop	11:42	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	66.0	Lmax	76.4	Lmin	52.9	SEL	91.8
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

	Roadway#1 PATP		Roadway#2 PA-TP		Roadway#3		Roadway#4	
	Direction EB		Direction WB		Direction		Direction	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	304		326					
med. trk.	13		10					
hvy trk.	17		80					
bus	0		2					
motorcycle	0		1					

NOTES: near pool water running in background. Observer can barely hear it

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6/18/14

PROJECT: PA Turnpike 309-312

JOB # 56583.1151

SITE ID M-12-2

Gannett Fleming, Inc.

ADDRESS: 2 Newlin Pl

Meter Storage # 210

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT 49

Measurement Data

SLM NO. _____ SLM Calibration before 94.0 after _____

Weather: temperature _____ wind speed _____ cloud cover _____

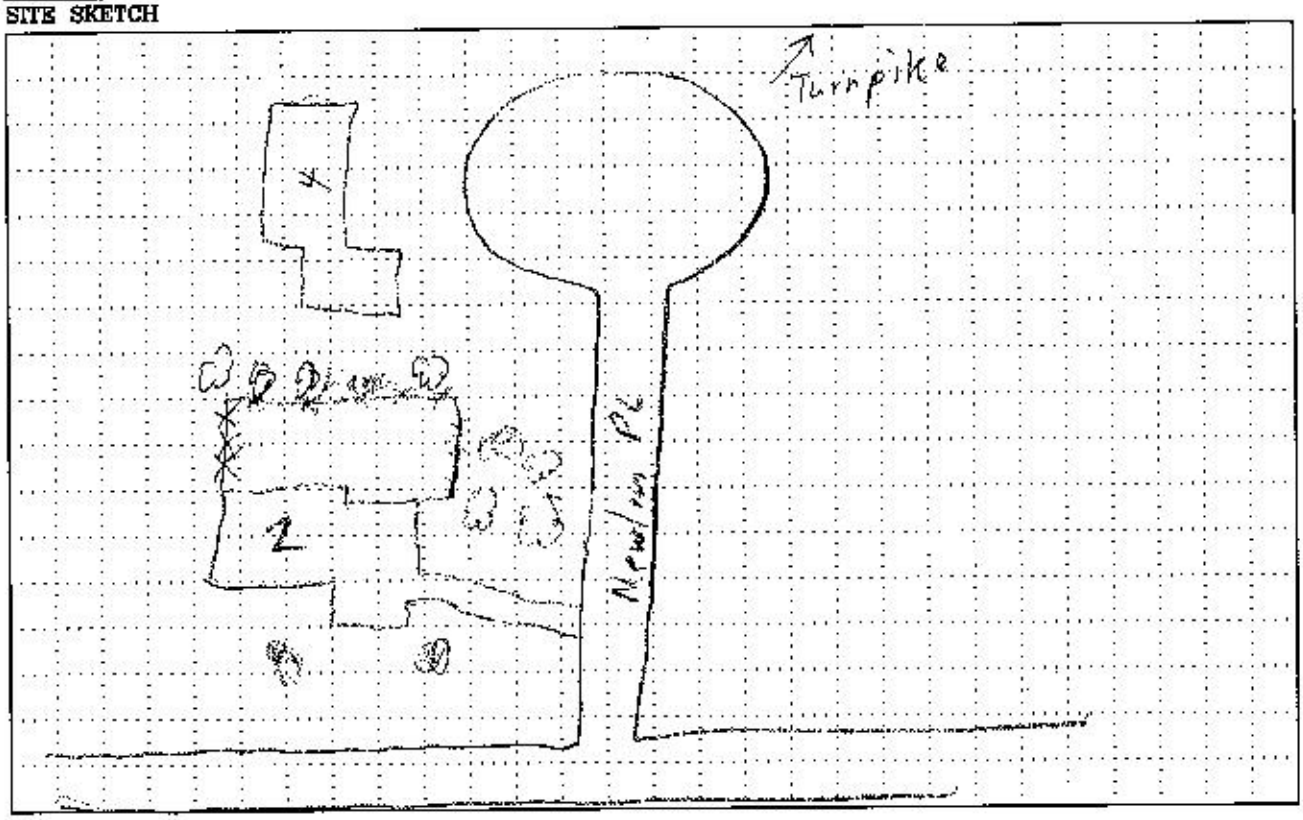
Time:	1st	start	12:58 PM	stop	1:18 PM	total	20 mins			
	2nd	start		stop		total				
Data:	1st	Leq	56.2	Lmax	63.4	Lmin	50.2	SEL	87.0	
	2nd	Leq		Lmax		Lmin		SEL		

Traffic Data

Roadway#1	PATP		Roadway#2	PATP		Roadway#3			Roadway#4		
Direction	EB		Direction	WB		Direction			Direction		
	1st	2nd		1st	2nd		1st	2nd		1st	2nd
auto	350		auto	346		auto			auto		
med. trk.	15		med. trk.	24		med. trk.			med. trk.		
hvy trk.	53		hvy trk.	82		hvy trk.			hvy trk.		
bus	1		bus	2		bus			bus		
motorcycle	1		motorcycle	1		motorcycle			motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP - 308 - 312

JOB # 56583.1151

SITE ID M12-3

Gannett Fleming, Inc.

ADDRESS: 120 HEATHER HILL DR

Meter Storage # _____

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other _____

Photograph #'s _____

GPS PT _____

Measurement Data

SLM Calibration before 94 after _____

Weather: temperature 84 wind speed 0-5 cloud cover 0

Time:	1st	start	10:45	stop	11:05	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	62.8	Lmax	69.9	Lmin	54.6	SEL	93.6
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	298	
med. trk.	18	
hvy trk.	75	
bus	1	
motorcycle	2	

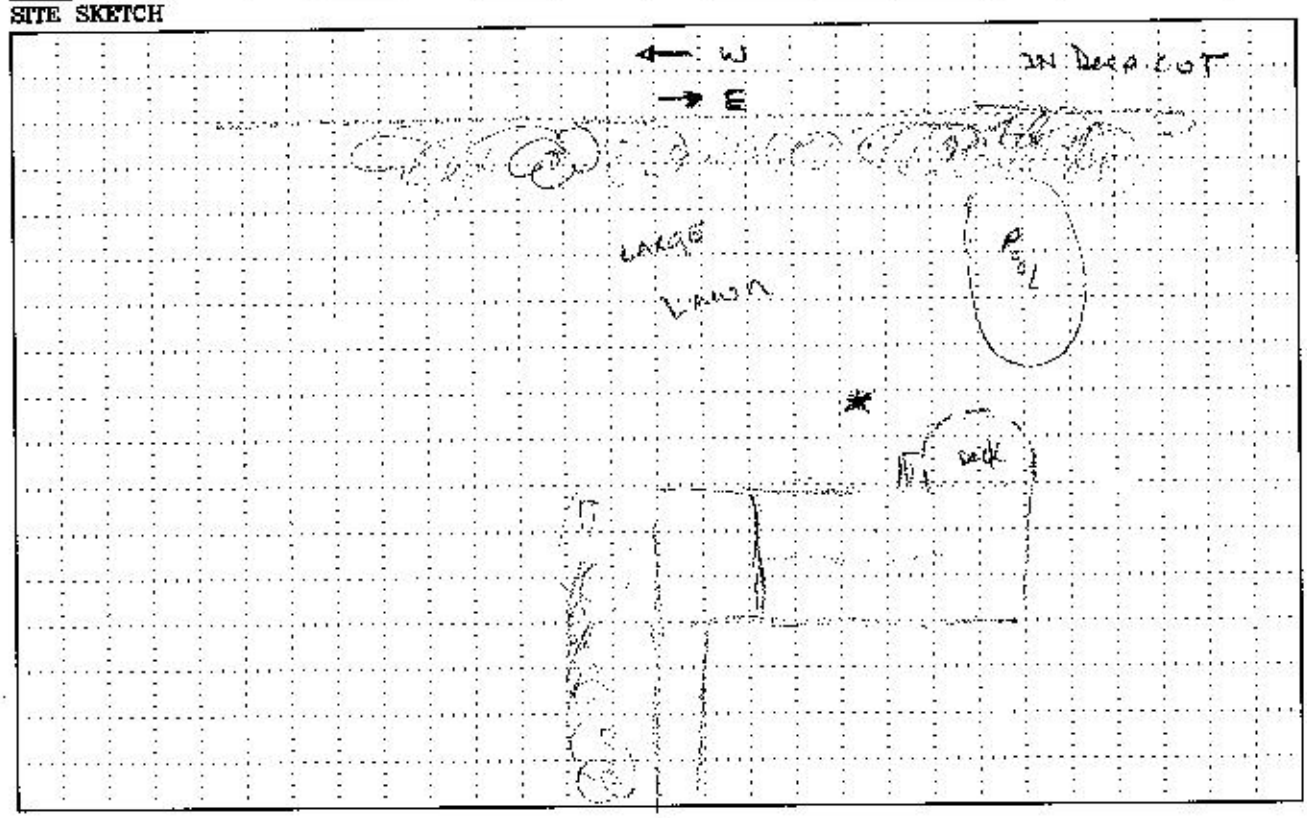
Roadway#2 PATP	1st	2nd
Direction WB		
auto	323	
med. trk.	20	
hvy trk.	64	
bus	0	
motorcycle	0	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES: _____

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID M12.4

Gannett Fleming, Inc.

ADDRESS: 107 HEATHER HILL

Meter Storage # 194

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT 124

Measurement Data

SLM Calibration before 94.6 after

Weather: temperature 82 wind speed 0-5 cloud cover 0

Time:	1st	start	10:16	stop	10:36	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	62.5	Lmax	70.4	Lmin	50.3	SEL	93.3
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	375	
med. trk.	15	
hvy trk.	73	
bus	1	
motorcycle	4	

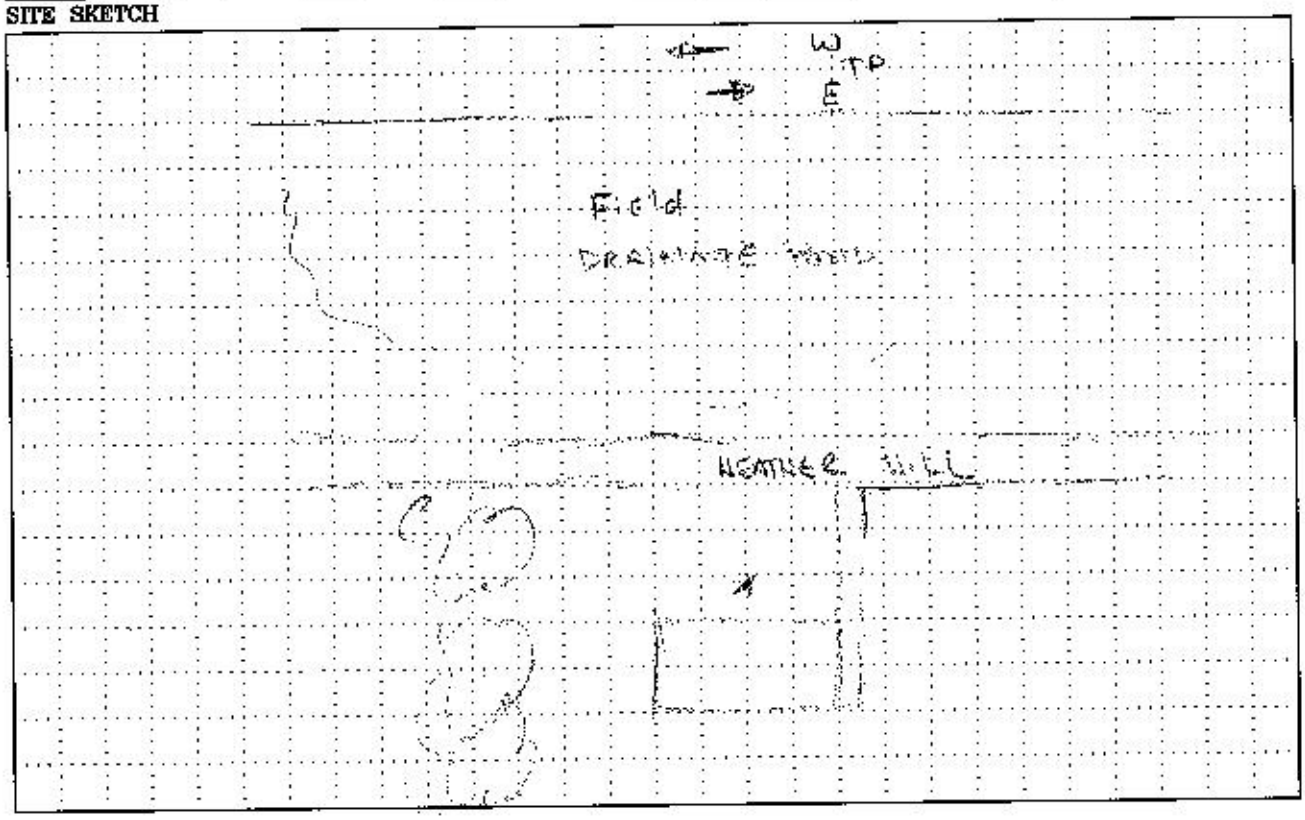
Roadway#2 PATP	1st	2nd
Direction WB		
auto	342	
med. trk.	9	
hvy trk.	113	
bus	5	
motorcycle	1	

Roadway#3 HEATHER	1st	2nd
Direction		
auto	111	
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308-312

JOB # 56583.1151

SITE ID M12-5

Gannett Fleming, Inc.

ADDRESS: 110-HEATHER N.L.C

Meter Storage # 192.193

TYPE ☑ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT 022

Measurement Data

SLM Calibration before 94.0 after

Weather: temperature wind speed cloud cover

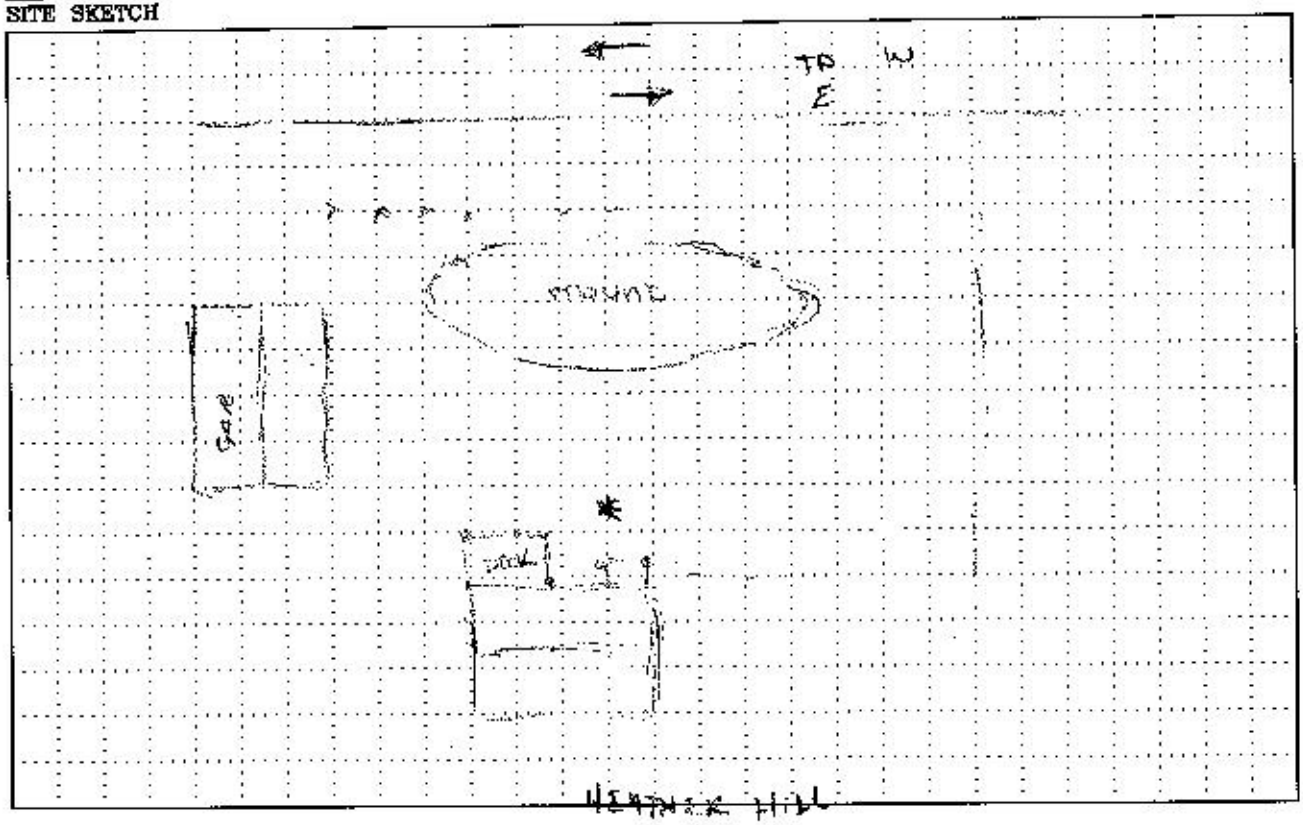
Time:	1st	start	9:47	stop	10:07	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	66.4	Lmax	78.4	Lmin	50.5	SEL	97.2
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

	Roadway#1 PATP		Roadway#2 PATP		Roadway#3		Roadway#4	
	Direction EB		Direction WB		Direction		Direction	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	293		311					
med. trk.	14		23					
hvy trk.	63		65					
bus	2		13					
motorcycle	0		0					

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP 308 312

JOB # 056583.1151

SITE ID 12-6

Gannett Fleming, Inc.

ADDRESS: 1021 HEATHER HILL

Meter Storage # 191

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT 021

Measurement Data

SLM Calibration before 94.0 after

Weather: temperature 81 wind speed 0-5 cloud cover 0

Time:	1st	start 9:07	stop 9:27	total 20					
	2nd	start	stop	total					
Data:	1st	Leq 60.9	Lmax 68.7	Lmin 53.0	SEL 91.7				
	2nd	Leq	Lmax	Lmin	SEL				

Traffic Data

Roadway#1 PATP	1st	2nd
Direction EB		
auto	381	
med. trk.	23	
hvy trk.	56	
bus	1	
motorcycle	0	

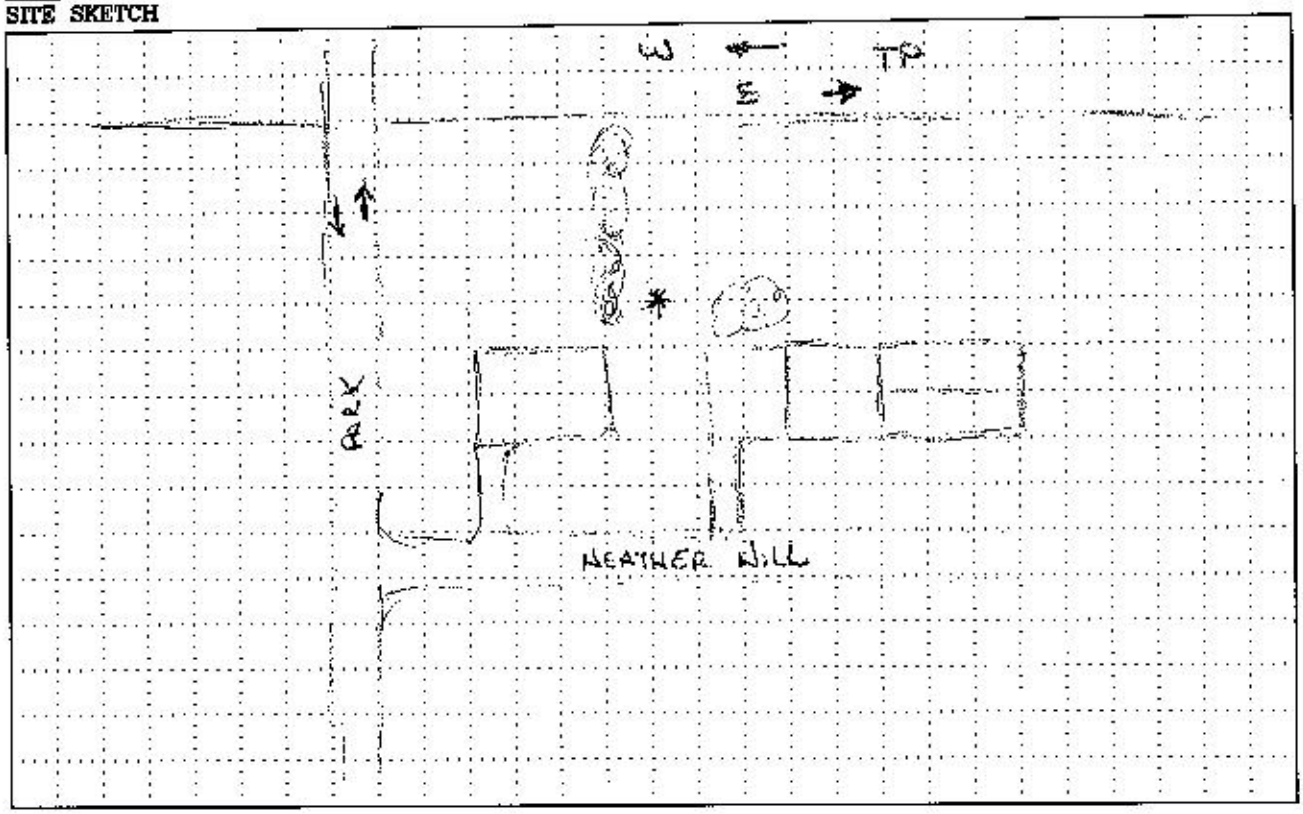
Roadway#2 PATP	1st	2nd
Direction WB		
auto	330	
med. trk.	19	
hvy trk.	72	
bus	0	
motorcycle	0	

Roadway#3	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

Roadway#4	1st	2nd
Direction		
auto		
med. trk.		
hvy trk.		
bus		
motorcycle		

NOTES:

SITE SKETCH



Highway Noise Monitoring Sheet

DATE: 6-17-14

PROJECT: PATP

JOB # 56583.1151

SITE ID 13-1

Gannett Fleming, Inc. #3

ADDRESS: 301 Park Pl

Meter Storage # 190

TYPE ☐ Residential ☐ Commercial ☐ Religion ☐ Educational ☐ Other

Photograph #'s

GPS PT 120

Measurement Data

SIM Calibration before 94.0 after

Weather: temperature wind speed 0-5 cloud cover 0

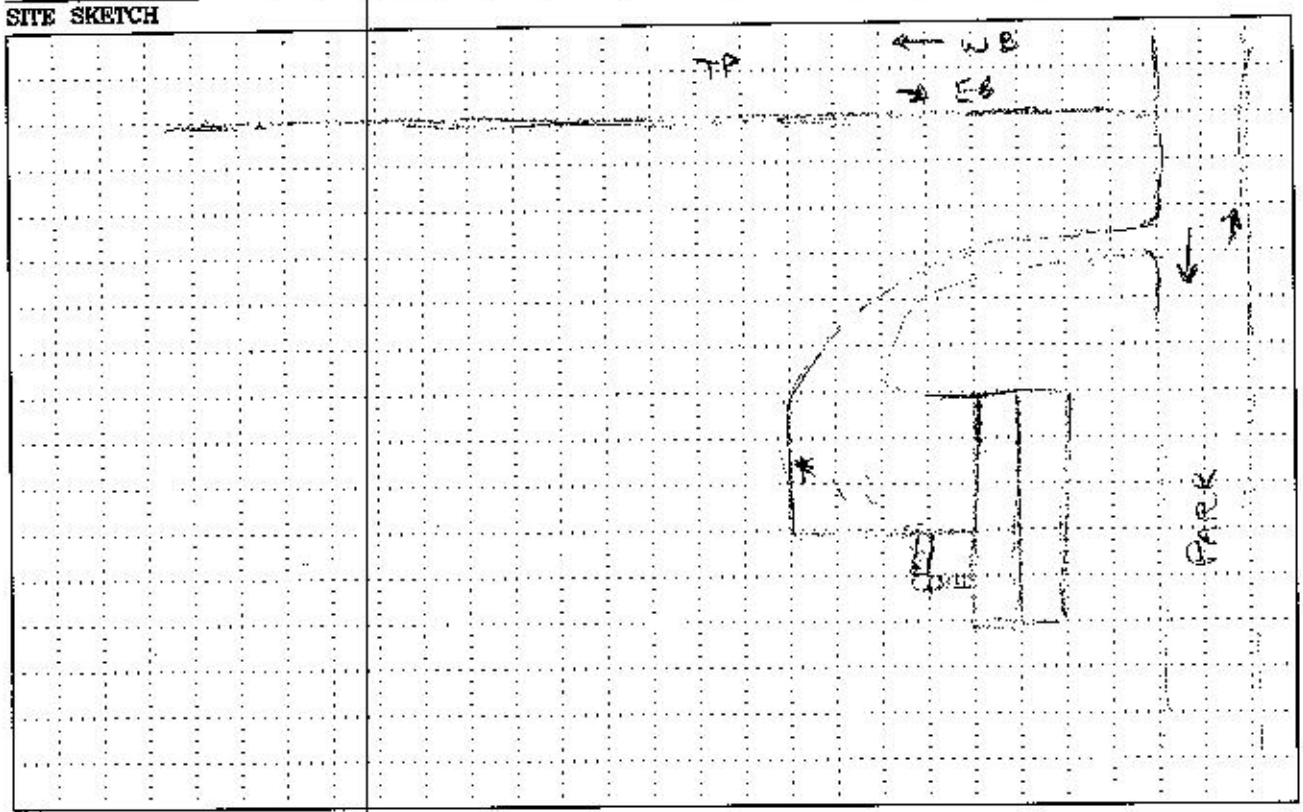
Time:	1st	start	8:28	stop	8:48	total	20		
	2nd	start		stop		total			
Data:	1st	Leq	58.9	Lmax	64.9	Lmin	54.1	SEL	90.7
	2nd	Leq		Lmax		Lmin		SEL	

Traffic Data

	Roadway#1 PATP		Roadway#2 PATP		Roadway#3 Park Ave		Roadway#4	
Direction	EB		WB					
	1st	2nd	1st	2nd	1st	2nd	1st	2nd
auto	198		334		125			
med. trk.	27		18		2			
hvy trk.	73		51		2			
bus	7		3		8			
motorcycle	0		1					

NOTES:

SITE SKETCH



APPENDIX B

Noise Meters
Certification of Calibration

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.30302

Instrument: **Noise Dosimeter / SLM**
Model: **Spark 706**
Manufacturer: **Larson Davis**
Serial number: **01595**
Tested with: **Microphone MPR002 s/n B0565**

Type (class): **2**
Customer: **Environmental Acoustics**
Tel/Fax: **717-730-4680 x19 / -4685**

Date Calibrated: **1/7/2014** *Cal Due:*

Status:	Received	Sent
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes X No
Calibration service: __ Basic X Standard
Address: **1400 Hummel Avenue**
Lemoyne, PA 17403

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 22, 2013	ACR Env. / A2LA	Nov 22, 2014
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233-Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Sep 6, 2012	ACR Env./ A2LA	Mar 6, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014
4226-Brüel&Kjaer	Multifunction calibrator	2305103	Jul 26, 2013	Scantek, Inc./ NVLAP	Jul 26, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
24.7 °C	101.263 kPa	39.6 %RH

Calibrated by:	Valentin Buzduga	Authorized signatory:	Mariana Buzduga
Signature		Signature	
Date	1/08/2014	Date	1/8/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.31082

Instrument:	**Sound Level Meter**	*Date Calibrated:*	**5/6/2014** *Cal Due:*
Model:	**NA28**	*Status:*	**Received** / **Sent**
Manufacturer:	**Rion**	*In tolerance:*	X / X
Serial number:	**00870496**	*Out of tolerance:*	
Tested with:	**Microphone UC-59 s/n 04607**	*See comments:*	
	Preamplifier NH23 s/n 70511	*Contains non-accredited tests:*	__Yes X No
Type (class):	**1**	*Calibration service:*	__ Basic X Standard
ID number:	**80430.000**		
Customer:	**Environmental Acoustics**	*Address:*	**1400 Hummel Avenue**
			Lemoyne, PA 17403-1749
Tel/Fax:	**717-730-4680 x19 / -4685**		

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
4838 Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 22, 2013	ACR Env. / A2LA	Nov 22, 2014
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233 Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Mar 17, 2014	ACR Env./ A2LA	Sep 17, 2015
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
22.9 °C	100.09 kPa	50 %RH

Calibrated by:	Valentin Buzduga	Authorized signatory:	Mariana Buzduga
Signature		Signature	
Date	5/06/2014	Date	5/8/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.31083

Instrument: **Microphone**
Model: **UC-59**
Manufacturer: **Rion**
Serial number: **04607**
Composed of:

Customer: **Environmental Acoustics**
Tel/Fax: **717-730-4680 x19 / -4685**

Date Calibrated: **5/6/2014** *Cal Due:*

Status:	Received	Sent
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes _X_ No

Address: **1400 Hummel Avenue**
Lemoyne, PA 17403-1749

Tested in accordance with the following procedures and standards:
Calibration of Measurement Microphones, Scantek, Inc., Rev. 11/30/2010

Instrumentation used for calibration: N-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
4838-Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 22, 2013	ACR Env. / A2LA	Nov 22, 2014
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233-Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Mar 17, 2014	ACR Env./ A2LA	Sep 17, 2015
PC Program 1017 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	
1253-Norsonic	Calibrator	28326	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014
1203-Norsonic	Preamplifier	14059	Jan 2, 2014	Scantek, Inc./ NVLAP	Jan 2, 2015
4180-Brüel&Kjær	Microphone	2246115	Oct 15, 2013	NPL-UK / UKAS	Oct 15, 2015

Instrumentation and test results are traceable to SI - BIPM through standards maintained by NPL (UK) and NIST (USA)

Calibrated by:	Valentin Buzduga	Authorized signatory:	Mariana Buzduga
Signature		Signature	
Date	5/06/2014	Date	5/8/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.31084

Instrument:	**Sound Level Meter**
Model:	**NA28**
Manufacturer:	**Rion**
Serial number:	**01170630**
Tested with:	**Microphone UC-59 s/n 04608** **Preamplifier NH23 s/n 70648**
Type (class):	**1**
ID number:	**80427.000**
Customer:	**Environmental Acoustics**
Tel/Fax:	**717-730-4680 x19 / -4685**

Date Calibrated: **5/6/2014** *Cal Due:*

Status:	Received	Sent
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes X No
Calibration service: __ Basic X Standard

Address: **1400 Hummel Avenue**
Lemoyne, PA 17403-1749

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 22, 2013	ACR Env. / A2LA	Nov 22, 2014
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233-Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Mar 17, 2014	ACR Env./ A2LA	Sep 17, 2015
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
22.6 °C	100.129 kPa	49.1 %RH

Calibrated by:	Valentin Buzduga	**Authorized signatory:**	Mariana Buzduga
Signature		Signature	
Date	5/06/2014	Date	5/8/2014

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Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.31085

Instrument: **Microphone**
Model: **UC-59**
Manufacturer: **Rion**
Serial number: **04608**
Composed of:

Customer: **Environmental Acoustics**
Tel/Fax: **717-730-4680 x19 / -4685**

Date Calibrated: **5/6/2014** *Cal Due:*

Status:	Received	Sent
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes _X_ No
Address: **1400 Hummel Avenue**
Lemoyne, PA 17403-1749

Tested in accordance with the following procedures and standards:
Calibration of Measurement Microphones, Scantek, Inc., Rev. 11/30/2010

Instrumentation used for calibration: N-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 22, 2013	ACR Env. / A2LA	Nov 22, 2014
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233 Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Mar 17, 2014	ACR Env./ A2LA	Sep 17, 2015
PC Program 1017 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	
1253-Norsonic	Calibrator	28326	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014
1203-Norsonic	Preamplifier	14059	Jan 2, 2014	Scantek, Inc./ NVLAP	Jan 2, 2015
4180-Brüel&Kjær	Microphone	2246115	Oct 15, 2013	NPL-UK / UKAS	Oct 15, 2015

Instrumentation and test results are traceable to SI - BIPM through standards maintained by NPL (UK) and NIST (USA)

Calibrated by:	Valentin Buzduga	Authorized signatory:	Mariana Buzduga
Signature		Signature	
Date	5/06/2014	Date	5/8/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.31087

Instrument:	**Acoustical Calibrator**	*Date Calibrated:* **5/5/2014**	*Cal Due:*
Model:	**NC-74**	*Status:*	**Received** / **Sent**
Manufacturer:	**Rion**	*In tolerance:*	X / X
Serial number:	**01200033**	*Out of tolerance:*	
Class (IEC 60942):	**1**	*See comments:*	
Barometer type:		*Contains non-accredited tests:*	**__Yes _X_ No**
Barometer s/n:			
ID number:	**80289.000**		
Customer:	**Environmental Acoustics**	*Address:*	**1400 Hummel Avenue**
Tel/Fax:	**717-730-4680 x19 / -4685**		**Lemoyne, PA 17403-1749**

Tested in accordance with the following procedures and standards:
Calibration of Acoustical Calibrators, Scantek Inc., Rev. 10/1/2010

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 22, 2013	ACR Env. / A2LA	Nov 22, 2014
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233-Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Mar 17, 2014	ACR Env./ A2LA	Sep 17, 2015
8903A-HP	Audio Analyzer	2514A05691	Dec 12, 2013	ACR Env./ A2LA	Dec 12, 2016
PC Program 1018 Norsonic	Calibration software	v.5.2	Validated March 2011	Scantek, Inc.	-
4134-Brüel&Kjær	Microphone	456005	Nov 13, 2013	Scantek, Inc. / NVLAP	Nov 13, 2014
1203 Norsonic	Preamplifier	14059	Jan 2, 2014	Scantek, Inc./ NVLAP	Jan 2, 2015

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK)

Calibrated by:	Valentin Buzduga	Authorized signatory:	Mariana Buzduga
Signature		Signature	
Date	5/05/2014	Date	5/31/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.
Document stored as: Z:\Calibration Lab\Cal 2014\RIONNC74-0.5in_01200033_M1.doc

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.29566

Instrument:	**Noise Dosimeter / SLM**
Model:	**Spark 706**
Manufacturer:	**Larson Davis**
Serial number:	**01596**
Tested with:	**Microphone MPR002 s/n B0404** **Preamplifier**
Type (class):	**2**
Customer:	**Environmental Acoustics**
Tel/Fax:	**717-730-4680 x19 / -4685**

Date Calibrated: **9/5/2013** *Cal Due:*

Status:	Received	Sent
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes X No
Calibration service: __ Basic X Standard
Address: **1400 Hummel Avenue**
Lemoyne, PA 17403

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 20, 2012	ACR Env. / A2LA	Nov 20, 2013
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233-Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Sep 6, 2012	ACR Env./ A2LA	Mar 6, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Dec 14, 2012	Scantek, Inc./ NVLAP	Dec 14, 2013
4226-Brüel&Kjær	Multifunction calibrator	2305103	Jul 26, 2013	Scantek, Inc./ NVLAP	Jul 26, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
24.1 °C	100.444 kPa	49.1 %RH

Calibrated by:	Valentin Buzduga	**Authorized signatory:**	William D. Gallagher
Signature		Signature	
Date	9/05/2013	Date	9/5/2013

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.29565

Instrument:	**Acoustical Calibrator**
Model:	**Cal150**
Manufacturer:	**Larson Davis**
Serial number:	**3047**
Class (IEC 60942):	**2**
Barometer type:	
Barometer s/n:	

Date Calibrated: **9/3/2013** *Cal Due:*

Status:	Received	Sent
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes _X_ No

Customer:	**Environmental Acoustics**
Tel/Fax:	**717-730-4680 x19 / -4685**
Address:	**1400 Hummel Avenue** **Lemoyne, PA 17403**

Tested in accordance with the following procedures and standards:
Calibration of Acoustical Calibrators, Scantek Inc., Rev. 10/1/2010

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	25747	Jul 2, 2013	Scantek, Inc./ NVLAP	Jul 2, 2014
DS-360-SRS	Function Generator	61646	Nov 20, 2012	ACR Env./ A2LA	Nov 20, 2014
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Nov 20, 2012	ACR Env. / A2LA	Nov 20, 2013
DPI 141-Druck	Pressure Indicator	790/00-04	Nov 21, 2012	ACR Env./ A2LA	Nov 21, 2014
HMP233-Vaisala Oyj	Humidity & Temp. Transmitter	V3820001	Sep 6, 2012	ACR Env./ A2LA	Mar 6, 2014
8903A HP	Audio Analyzer	2514A05691	Dec 1, 2010	ACR Env./ A2LA	Dec 1, 2013
PC Program 1018 Norsonic	Calibration software	v.5.2	Validated March 2011	Scantek, Inc.	-
4134-Brüel&Kjær	Microphone	456005	Mar 29, 2013	Scantek, Inc. / NVLAP	Mar 29, 2014
1203-Norsonic	Preamplifier	14059	Jan 4, 2013	Scantek, Inc./ NVLAP	Jan 4, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK)

Calibrated by:	Valeriy Buzuluga	Authorized signatory:	William D. Gallagher
Signature		Signature	
Date	9/03/2013	Date	9/5/2013

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

APPENDIX C

Traffic Data

Traffic Data for MP 298 to MP 312

Between Morgantown I/C and Downingtown I/C

Traffic Volumes

	2013 Existing	2046 Future No-Build/Build
Eastbound ADT	21,880	35,762
Westbound ADT	31,052	50,754
Peak Hour (EB) 11.16%	2,442	3,991
Peak Hour (WB) 8.71%	2,705	4,421

Peak Month: EB=November, WB=October

Vehicle Composition(%) (Peak Hour):

	EB	WB
PTC Class 1 **(Auto)**=	86%	92%
PTC Classes 2-3 **(Medium Truck)**=	5%	3%
PTC Classes 4-9 **(Heavy Truck)**=	9%	5%

Growth Factors:	1.50%	1.50%