

Section 6 – Noise Barrier and Noise Attenuation Re-Evaluation

Prepared for:

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Ohio River Bridges – East End Crossing for IFA

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Executive Summary

Based upon prior noise analysis studies prepared for the Louisville-Southern Indiana Ohio River Bridges (LSIORB) Project, noise walls were recommended along the north side of the proposed Utica Approach new roadway section surrounding the Boulder Creek Subdivision and areas near Old Tay Bridge and Cottage Rake roads. The Technical Provision (Section 7.7) states that “more detailed barrier analyses and design shall be performed utilizing the more detailed design information that will be available at that time.”

The current design differs from previous alternatives in the following ways:

- The configuration of the State Road (SR) 62 / SR 265 interchange was changed from a Diverging Diamond Interchange to a Dual Roundabout Interchange.
- The IR-8 ramp (SR 265 eastbound to Port Road southbound) was eliminated.
- Lowering of profile grade elevation by approximately five feet at Bridges 9 and 10, which carry SR 265 over an unnamed tributary to Lentzier Creek.
- Raising of profile grade elevation by approximately four feet at Bridges 11 and 12, which carry SR 265 over Lentzier Creek.
- Raising of the profile grade by approximately five feet at Bridge 13, which carries Brookhollow Way over Lentzier Creek.
- Raising of Port Road and lowering of SR 265 at the intersection of these two roadways.
- Lowering of the profile grade of SR 265 by approximately 8 feet at the approach to the bridge over the Ohio River

The final roadway profile and alignment were re-evaluated under current Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) noise assessment guidelines to determine if noise walls are recommended in the final design of this segment. Based upon this analysis, installing noise walls does not meet the “Reasonable and Feasible” technical criteria as described in the 2011 INDOT Traffic Noise Analysis Procedure policy document. Therefore, noise walls as noise abatement mitigation are not recommended along the proposed Section 6 of the LSIORB Project.

Specifically, at Noise Sensitive Areas (NSAs) 5 and 6, the following changes occurred during final design which led to the cost effective criteria not being met:

- Changes to the profile grade of the roadway resulting in a reduced number of impacted receptors.
- Elimination of three properties (Sites 144-146) identified as benefitted receptors in the 2012 SFEIS Study which have been acquired as permanent right-of-way by the project.
- The unit cost of \$39/SFT used to calculate the cost of the barrier on the bridge structure whereas the 2012 SFEIS Study utilized a cost of \$30/SFT for all areas.



Introduction

The LSIORB Project had a Final Environmental Impact Statement (FEIS) completed in 2003, with a corresponding Record of Decision (ROD) the same year. A traffic noise study was prepared as part of this FEIS. A Supplemental Final Environmental Impact Statement (SFEIS) was prepared in 2012 and a revised ROD was approved the same year. The SFEIS re-evaluated the noise analysis from the original FEIS, utilizing updated state methodologies and policies, as well as the current locations for noise receptors (homes, etc.). Both the original FEIS and SFEIS documents contained detailed noise analysis sections, including recommendations for noise abatement at some locations, based upon these analyses. The SFEIS split the noise study into four study areas for the assessment of highway traffic noise. The study areas cover large sections of the overall project area. Each study area was assessed as a “stand-alone” section of the project and contains a receiver set, impact analysis and proposed mitigation. Each study area was further subdivided into Noise Sensitive Areas. These Noise Sensitive Areas are a group of receptors that are exposed to similar noise sources, traffic volumes, vehicle mix and speed, and topographic features.

This document pertains to Section 6 of the overall LSIORB Project, referred to as the Utica Approach. This section of the LSIORB Project is located in Clark County, Indiana, and extends from approximately the terminus of SR 265 at SR 62 to the Ohio River near Utica, Indiana. Section 6 comprises the western approach roadway to a proposed new bridge spanning the Ohio River just north of Utica. Based upon the FEIS and SFEIS methodology, Section 6 was evaluated under Study Area 4. Study Area 4 was divided into nine total Noise Sensitive Areas. A map showing the location of Study Area 4 and the Noise Sensitive Areas is included in Appendix A. Because of their close proximity, Noise Sensitive Areas 5 and 6 are evaluated as one combined area within the noise analyses.

Harris Miller Miller & Hanson, Inc. (HMMH) prepared a noise abatement study for the Utica Approach in October of 2011. That report was included in the SFEIS analysis, and recommended noise walls at Noise Sensitive Areas 5 and 6. The analysis performed for this report accounts for the final roadway design. Because of design modifications that were made between the SFEIS approval and final design, the findings and recommendations made in the SFEIS and the HMMH report are re-evaluated in this document.

Noise Analysis Criteria

The original FEIS noise analysis was completed using methodology and guidance in place at the time. Section 5.5 of the 2003 FEIS provided information regarding impacts, as well as mitigation considered and recommended for the FEIS Selected Alternative. Noise impacts and mitigation considered for that alternative were updated in the SFEIS due to a new design year of study (2030), new traffic projections for that design year, updates to 23 CFR 772 and the DOT noise policy, and the use of a new noise prediction model (Traffic Noise Model [TNM] version 2.5) that was required by the FHWA for use on Federal-aid projects. Since Section 6 of the LSIORB Project is located entirely within Indiana, INDOT and FHWA noise assessment guidelines were utilized for the analysis, including the INDOT Traffic Noise Analysis Procedure (2011).



Highway Noise Impact

In order for noise abatement to be considered, the analysis must first determine if there is an anticipated impact to a 'receptor,' which is a discrete or representative location within a noise sensitive area(s). For Study Area 4 the receptors are residences, which for this study are single family homes; no multi-family units exist within the study area. Several properties evaluated were unimproved land at the time of the study; however, these lots have been permitted for development. According to INDOT and FHWA policy, vacant lots that have been permitted for development must be included in the analysis as potential receptors.

The number of receptors evaluated for this report is consistent with the 2012 SFEIS noise study with the exception of two Noise Sensitive Areas. At NSA 4 five properties were evaluated in the 2012 SFEIS study; seven properties were evaluated at final design. The two properties added consist of two farmstead properties (assessed as residential receptors) determined to be potential receptors due to updated aerial photography. At NSA 5 and 6, 52 properties were evaluated in the 2012 SFEIS study; 49 properties were evaluated at final design. The three properties excluded consist of Site Nos. 144 through 146 which have been acquired as part of project right-of-way acquisition activities, and therefore are no longer considered receptors.

A receptor is considered impacted if the predicted design-year build alternative noise level approaches or exceeds a FHWA determined Noise Abatement Criteria (NAC) level. The NAC are given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). For this analysis, the NAC is equal to or greater than 67 decibels (dBA). A receptor is also considered impacted if the predicted noise level exceeds existing noise levels by 15 decibels or more. Additional information on noise analysis methodology is available in the SFEIS document. Where a noise impact is identified, consideration of traffic noise abatement measures is necessary.

Barrier Wall Noise Abatement Evaluation Criteria

Feasibility of Noise Abatement

INDOT's Traffic Noise Policy requires recommended noise barriers to meet criteria for both acoustic and engineering feasibility:

Acoustic Feasibility:

INDOT requires that noise barriers achieve a 5 dBA reduction at a majority (greater than 50%) of the impacted receptors. If a barrier cannot achieve this acoustic goal, abatement is considered to not be acoustically feasible.

Engineering Feasibility:

INDOT requires noise abatement measures to be based on sound engineering practices and standards and requires that any measures be evaluated at the optimum location. For instances in which the roadway is located on fill and is at a higher location than nearby receptors, a barrier will be evaluated near the

shoulder. For instances in which the roadway is located below the nearby receptors, a barrier will be evaluated near the edge of the right-of-way near the receptors. In addition, noise barriers require long, uninterrupted segments of barrier to be feasible. As such, if there are existing access points and/or driveways, it is not feasible to construct effective noise barriers for the roadway. Engineering feasibility also takes into account topography, drainage, safety, barrier height, utilities, and access/maintenance needs (which may include right-of-way considerations).

Reasonableness of Noise Abatement

Where noise barriers would meet engineering feasibility requirements and also provide at least five decibels of noise reduction for a majority of impacted receptors, barrier reasonableness was then evaluated in accordance with INDOT Policy. To be considered reasonable, recommended noise barriers must meet both INDOT's design goal for noise abatement and INDOT's cost reasonableness criteria. In addition, all evaluations of reasonableness must take into consideration the views of residents and property owners.

INDOT Design Goal for Noise Abatement:

INDOT's goal for substantial noise reduction is to provide at least a 7 dBA reduction for benefited first row receptors in the design year. However, conflicts with adjacent lands may make it impossible to achieve substantial noise reduction at all impacted first row receptors. Therefore, the noise reduction design goal for Indiana is 7 dBA for a majority (greater than 50%) of the impacted first row receptors.

Cost-Effectiveness:

To determine cost effectiveness, the estimated cost of constructing a noise barrier (including installation and additional necessary construction such as foundations or guardrails) is divided by the number of benefited receptors (those who would receive a reduction of at least 5 dBA). A base material and design cost of \$25,000 or less per benefited receptor is currently considered to be cost-effective. Development in which a majority (more than 50%) of the receptors was in place prior to the initial construction of the roadway in its current state (functional classification) will receive additional consideration for noise abatement. Section 6 is proposed along new roadway alignment, and greater than 50% of the receptors are currently in place. Therefore, the cost-effectiveness criterion used for these cases is 20% greater (currently \$30,000 per benefited receptor).

The 2011 INDOT Traffic Noise Analysis Procedure suggests a unit cost for noise barrier construction of \$30/SFT. However, INDOT routinely uses a unit cost of \$39/SFT for barriers that must be mounted on bridge structures. Bridge mounted barriers would be necessary on the modeled barriers at NSA 5 and 6 and NSA 9. A unit cost of \$39/SFT was used at these NSAs where the proposed barriers would be located on planned bridge structures. A unit cost of \$30/SFT was used to calculate the cost of proposed barriers in all other locations.

Updated Roadway Profile Noise Analysis

Relative to Study Area 4, the 2003 FEIS noise analysis was performed on Alignment A15, which was identified as the Preferred Alternative for this section of the LSIORB Project in the FEIS. When the SFEIS noise analysis was prepared, the 2003 FEIS selected alternative was re-evaluated utilizing updated development information, but the same A15 roadway alignment. In addition, during the SFEIS evaluation, a “No-action Alternative” and a modified 2003 selected alternative were evaluated. The modified selected alternative consisted of a “with-tolls” alternative that includes two lanes in each direction instead of the three lanes in each direction proposed in the 2003 selected alternative. The SFEIS modified selected alternative most-closely matches the reference information provided to the design team and the current design. The major differences between the modified selected alternative and the final design are summarized in the Executive Summary section.

Re-Evaluation Results

Noise Impact Results by Noise Sensitive Area

The findings of the updated noise analysis based upon current design are provided below. These findings are also compared to the modified 2003 selected alternative from the 2012 SFEIS and the HMMH study.

Noise Sensitive Area 1 (Morgan Trail, Alvin Drive)

Twenty-one properties located in the southwest quadrant of the interchange of SR 265 and SR 62 were evaluated for potential design year noise impacts. Design-year noise levels are predicted to range from 59 dBA to 63 dBA during the loudest hour of the day. The “loudest hour” is the worst (noisiest) traffic hour, which is used for analysis of existing and future conditions. The predicted noise levels will not approach or exceed the Category B NAC of 67 dBA, L_{eq} . In addition, no substantial increases (15 dBA or higher) are expected. No receptors in this Noise Sensitive Area are predicted to experience noise impact from the proposed project. The location of NSA 1 is shown on the aerial map in the Appendix (page 15).

There was no significant change in the findings between the 2012 SFEIS noise analysis and the current analysis. Minor changes include design-year noise levels predicted to range from 61 dBA to 63 dBA in the 2012 analysis; however, this does not change the results of the analysis.

Noise Sensitive Area 2 (Sellers Court)

Four properties located immediately southwest of the interchange of SR 265 and SR 62 were evaluated for potential design year noise impacts. Design-year noise levels are predicted to range from 55 dBA to 57 dBA during the loudest hour of the day. The predicted noise levels will not approach or exceed the Category B NAC. No substantial increases in noise levels are expected. No receptors in this Noise Sensitive Area are predicted to experience noise impact from the proposed project. The location of NSA 2 is shown on the aerial map in the Appendix (page 15).

There was no significant change in the findings between the 2012 SFEIS noise analysis and the current analysis. Minor changes include design-year noise levels predicted to range from 56 dBA to 58 dBA in the 2012 analysis; however, this does not change the results of the analysis.

Noise Sensitive Area 3 (New Chapel Road)

Fourteen properties located along New Chapel Road in the northeast quadrant of the SR 265/SR 62 interchange were evaluated for potential design year noise impacts. Design-year noise levels are predicted to range from 57 dBA to 63 dBA during the loudest hour of the day. The predicted noise levels will not approach or exceed the Category B NAC. No substantial increases in noise levels are expected. No receptors in this Noise Sensitive Area are predicted to experience noise impact from the proposed project. The location of NSA 3 is shown on the aerial map in the Appendix (page 15).

There was no significant change in the findings between the 2012 SFEIS noise analysis and the current analysis. Minor changes include design-year noise levels predicted to range from 58 dBA to 63 dBA in the 2012 analysis; however, this does not change the results of the analysis.

Noise Sensitive Area 4 (Utica-Sellersburg Road)

Seven properties located along Utica-Sellersburg Road on the north side of SR 265 were evaluated for potential design year noise impacts. Design-year noise levels are predicted to range from 57 dBA to 61 dBA during the loudest hour of the day. Noise levels would not approach or exceed the NAC for Activity Category B and no properties would experience substantial noise increase impacts. No receptors in this Noise Sensitive Area are predicted to experience noise impact from the proposed project. The location of NSA 4 is shown on the aerial map in the Appendix (page 15).

There was no significant change in the findings between the 2012 SFEIS noise analysis and the current analysis. Minor changes include design-year noise levels predicted to range from 58 dBA to 62 dBA in the 2012 analysis, and the evaluation of two fewer receptors; however, this does not change the results of the analysis.

Noise Sensitive Areas 5 and 6 (Old Tay Bridge, Cottage Rake, and Boulder Creek Subdivision [north])

Note: Because of their close proximity, Noise Sensitive Areas 5 and 6 are discussed as one combined area. Forty-nine properties located in the Boulder Creek Subdivision, and along Old Tay Bridge and Cottage Rake on the north side of SR 265 were evaluated for potential future noise impacts. Design-year noise levels are predicted to range from 54 dBA to 70 dBA during the loudest hour of the day. Noise levels would approach or exceed the NAC for Activity Category B at 12 residential properties. Of these properties, 11 would experience substantial noise increase impacts. In addition, 9 other residential properties would experience substantial noise increase impacts, resulting in a total of 21 impacted properties. The number of impacted receptors differs from the 2012 SFEIS due to the change in the profile grade of the roadway and the elimination of three properties (Sites 144-146) acquired by the project as permanent right of way. The location of NSA 5 and 6 is shown on the aerial map in the Appendix (page 16).

The 2012 SFEIS noise analysis found a predicted noise level range of 55 dBA to 72 dBA, 12 residential properties with noise levels approaching or exceeding NAC B, each of these 12 properties with substantial noise increase impacts, and 15 additional residential properties experiencing substantial noise increase impacts; the study found a total of 27 impacted properties.

Noise Sensitive Area 7 (Utica-Sellersburg Road, Surrey Road, Boulder Creek Subdivision [south])

Fifty-six properties located on the south side of SR 265 along Utica-Sellersburg Road, Surrey Road, and within the Boulder Creek Subdivision, were evaluated for potential future noise impacts. Design-year noise levels are predicted to range from 53 dBA to 72 dBA during the loudest hour of the day. Noise levels would approach or exceed the NAC for Activity Category B at 13 residential properties. Of these properties, 12 also would experience a substantial increase in the loudest-hour noise level. In addition, 23 other residential properties would experience substantial noise increase impacts, resulting in a total of 36 impacted properties. The number of impacted receivers differs from the 2012 SFEIS due to the change in the profile grade of the roadway. The location of NSA 7 is shown on the aerial map in the Appendix (page 16).

The 2012 SFEIS noise analysis found a predicted noise level range of 55 dBA to 73 dBA, 15 residential properties with noise levels approaching or exceeding NAC B, each of these 15 properties with substantial noise increase impacts, and 29 additional residential properties experiencing substantial noise increase impacts; the study found a total of 44 impacted properties.

Noise Sensitive Area 8 (Upper River road and Lime Kiln Ridge Subdivision)

Fifteen properties located south of SR 265 along the Ohio River were evaluated for potential future noise impacts. Design-year noise levels are predicted to range from 54 dBA to 64 dBA during the loudest hour of the day. The predicted noise levels will not approach or exceed the Category B NAC. No substantial increases in noise levels are expected. No receptors in this Noise Sensitive Area are predicted to experience noise impact from the proposed project. The location of NSA 8 is shown on the aerial map in the Appendix (page 17).

There was no significant change in the findings between the 2012 SFEIS noise analysis and the current analysis. Minor changes include design-year noise levels predicted to range from 52 dBA to 63 dBA in the 2012 analysis; however, this does not change the results of the analysis.

Noise Sensitive Area 9 (Quarry Ridge Road, Ridge Road, and Upper River Road)

Twenty-seven properties located on Quarry Ridge Road, Ridge Road, and Upper River Road on the north side of SR 265 were evaluated for potential future noise impacts. Design-year noise levels are predicted to range from 57 dBA to 70 dBA during the loudest hour of the day. Noise levels would approach or exceed the NAC for Activity Category B at 9 residential properties. No substantial increases in noise levels are expected at any property. A total of 9 properties will be impacted. The location of NSA 9 is shown on the aerial map in the Appendix (page 17).



The 2012 SFEIS noise analysis found a predicted noise level range of 55 dBA to 70 dBA, 8 residential properties with noise levels approaching or exceeding NAC B, and no substantial increases in noise levels; the study found a total of 8 impacted properties.

Noise Mitigation Recommendations by Noise Sensitive Area

The findings of the updated noise analysis based upon current design are provided below. These findings are also compared to the modified 2003 selected alternative from the 2012 SFEIS and the HMMH study.

Noise Sensitive Areas 1, 2, 3, 4, and 8

No noise-sensitive receptors in this area are predicted to experience noise impact from the proposed project. No noise barrier design was attempted.

There was no change in the findings or recommendations between the 2012 SFEIS noise analysis and the current analysis.

Noise Sensitive Areas 5 and 6

Note: because of their close proximity, Noise Sensitive Areas 5 and 6 are discussed as one combined area. A total of 21 impacted properties were identified in the noise analysis. Several potential noise barriers were modeled at this NSA, varying in lengths from 1,498 feet to 3,700 feet, and varying in height from 12 feet to 20 feet. The final barrier, optimized to benefit the minimum number of receptors while still achieving noise reduction goals, would be 3,426 feet in length and modeled at heights of 16 and 18 feet. This barrier would provide a 7dBA noise reduction to 88% of impacted first-row receptors (for the 18 foot wall). The cost of this wall was calculated to be \$53,906 per benefitted receptor, exceeding that of the minimum optimized wall and the INDOT cost effectiveness criterion.

An additional model was analyzed to verify that a potential noise barrier along the full length of the neighborhood within NSA 6 would/would not meet design and cost effectiveness goals. The final barrier, also optimized, would be 1,498 feet in length with heights ranging from 12 to 18 feet. This barrier would provide a 7 dBA noise reduction to 53 percent of impacted first-row receptors. The cost of this wall was calculated to be \$33,722 per benefitted receptor.

This value of the minimum optimized wall exceeds the INDOT cost-effectiveness criterion of \$30,000 per benefitted residence for homes in place prior to initial construction of the roadway. Therefore, a noise wall at this location meets the technical feasibility criteria and is considered reasonable from a design goal standpoint, but does not meet INDOT's cost effectiveness criteria.

The 2012 SFEIS noise analysis determined that a 10 to 20 foot tall noise wall would benefit 89 percent of the impacted residences and provide a 7 dBA benefit to 93 percent of impacted first-row properties with a noise wall cost of \$29,870 per benefitted receptor. The noise wall from the 2012 SFEIS was found to satisfy all feasibility and reasonableness criteria; however, as noted above, a noise wall in this location is no longer cost-effective. The number of benefitted receivers differs from the 2012 SFEIS due to the change in the



profile grade of the roadway and minor changes to the proposed barrier location. Minor changes to the proposed barrier location are due to more detailed design information available at the time of the analysis.

Noise Sensitive Area 7

A total of 36 impacted properties were identified in the noise analysis. Several potential noise barriers were modeled at this NSA, varying in lengths from 1,957 feet to 2,550 feet, and varying in height from 18 feet to 24 feet. The final barrier, optimized to benefit the minimum number of receptors while still achieving noise reduction goals, would be 1,957 feet in length with heights ranging from 18 to 24 feet (model results shown on Page 30). This barrier would provide a 7 dBA noise reduction to 53 percent of impacted first-row receptors. The cost of this wall was calculated to be \$60,920 per benefitted receptor.

An additional model was analyzed for a noise barrier placed along the shoulder and along the proposed local connector road (model results shown on Page 31). Barriers were modeled for heights ranging from 20 to 24 feet. None of the modeled barriers in this configuration were found to meet the design goal of 7 dBA reduction for benefitted first row receptors.

The value of the optimized barrier exceeds the INDOT cost-effectiveness criterion of \$30,000 per benefitted residence for homes in place prior to initial construction of the roadway. Therefore, a noise wall at this location meets the technical feasibility criteria and is considered reasonable from a design goal standpoint, but does not meet INDOT's cost effectiveness criteria.

The 2012 SFEIS modeled a single barrier, but two barriers were modeled in this analysis due to a side street bisecting the barrier location. The SFEIS noise analysis determined that noise wall construction would benefit 59 percent of the impacted residences and provide a 7 dBA benefit to 56 percent of impacted first-row properties with a noise wall cost of \$32,803 per benefitted receptor, exceeding the INDOT cost-effectiveness criterion of \$30,000 per benefitted residence. Therefore, no noise wall was recommended at this location in the 2012 SFEIS noise analysis. The number of benefitted receivers differs from the 2012 SFEIS due to the change in the profile grade of the roadway and minor changes to the proposed barrier location. Minor changes to the proposed barrier location are due to more detailed design information available at the time of the analysis.

Noise Sensitive Area 9

A total of 9 impacted properties were identified in the noise analysis. Several potential noise barriers were modeled at this NSA, varying in lengths from 4,275 feet to 6,206 feet, and varying in height from 12 feet to 24 feet. The final barrier, optimized to benefit the minimum number of receptors while still achieving sound reduction goals, would be 4,275 feet in length with heights of 12 to 22 feet. This barrier would provide a 7 dBA noise reduction to 50 percent of impacted first-row receptors. The cost of this wall was calculated to be \$174,629 per benefitted receptor.

This value exceeds the INDOT cost-effectiveness criterion of \$30,000 per benefitted residence for homes in place prior to initial construction of the roadway. Therefore, a noise wall at this location meets the



technical feasibility criteria and is considered reasonable from a design goal standpoint, but does not meet the design goal of a 7 dBA reduction to greater than 50% of impacted first row receptors and does not meet INDOT's cost effectiveness criteria

The 2012 SFEIS noise analysis determined that noise wall construction would benefit 75 percent of the impacted residences and provide a 7 dBA benefit to 60 percent of impacted first-row properties with a noise wall cost of \$67,590 per benefitted receptor, exceeding the INDOT cost-effectiveness criterion of \$30,000 per benefitted residence. Therefore, no noise wall was recommended at this location in the 2012 SFEIS noise analysis. The number of benefitted receivers differs from the 2012 SFEIS due to the change in the profile grade of the roadway and minor changes to the proposed barrier location. Minor changes to the proposed barrier location are due to more detailed design information available at the time of the analysis.

The following table summarizes the updated recommendations for noise abatement:

Noise Sensitive Area No.	Noise Sensitive Area Location	Barrier Length (feet)	Range of Heights (feet)	Cost ¹	Number of Benefited Dwelling Units ²	Cost per Benefited Dwelling Unit ³	Recommended for Final Design?
1	Morgan Trail, Alvin Drive, west of SR62 interchange	NA	NA	NA	NA	NA	No (no noise impacts in area)
2	Sellers Court, west of SR62 interchange	NA	NA	NA	NA	NA	No (no noise impacts in area)
3	New Chapel Road, east of SR62 interchange	NA	NA	NA	NA	NA	No (no noise impacts in area)
4	Utica-Sellersburg Road	NA	NA	NA	NA	NA	No (no noise impacts in area)
5-6	Old Tay Bridge, Cottage Rake, and Boulder Creek Subdivision (north)	1,498	12 to 18	\$775,605	23	\$33,722	No (does not meet cost-effectiveness criteria)
7	Utica-Sellersburg Road, Surrey Road, Boulder Creek Subdivision (south)	1,957	18 to 24	\$1,280,370	21	\$60,970	No (does not meet cost-effectiveness criteria)
8	Upper River road and Lime Kiln Ridge Subdivision	NA	NA	NA	NA	NA	No (no noise impacts in area)
9	Quarry Ridge Road, Ridge Road, and Upper River Road	4,275	12 to 22	\$2,619,429	15	\$174,629	No (does not meet design goal or cost-effectiveness criteria)

¹ See Cost Effectiveness on Page 5 for information regarding cost computations.

² Number of dwelling units predicted to receive at least five decibels of noise reduction.

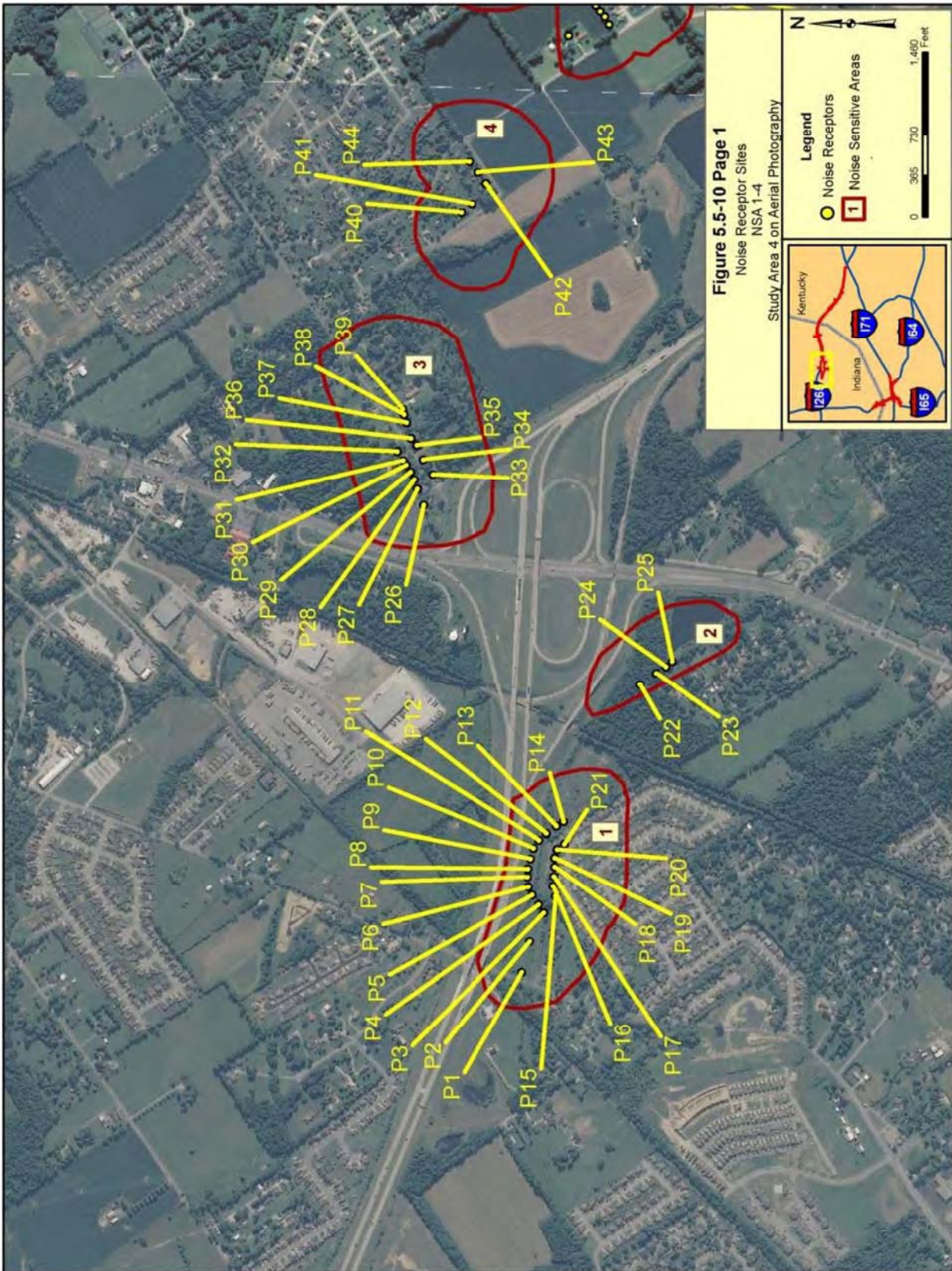
³ Based upon most cost-effective feasible noise barrier.

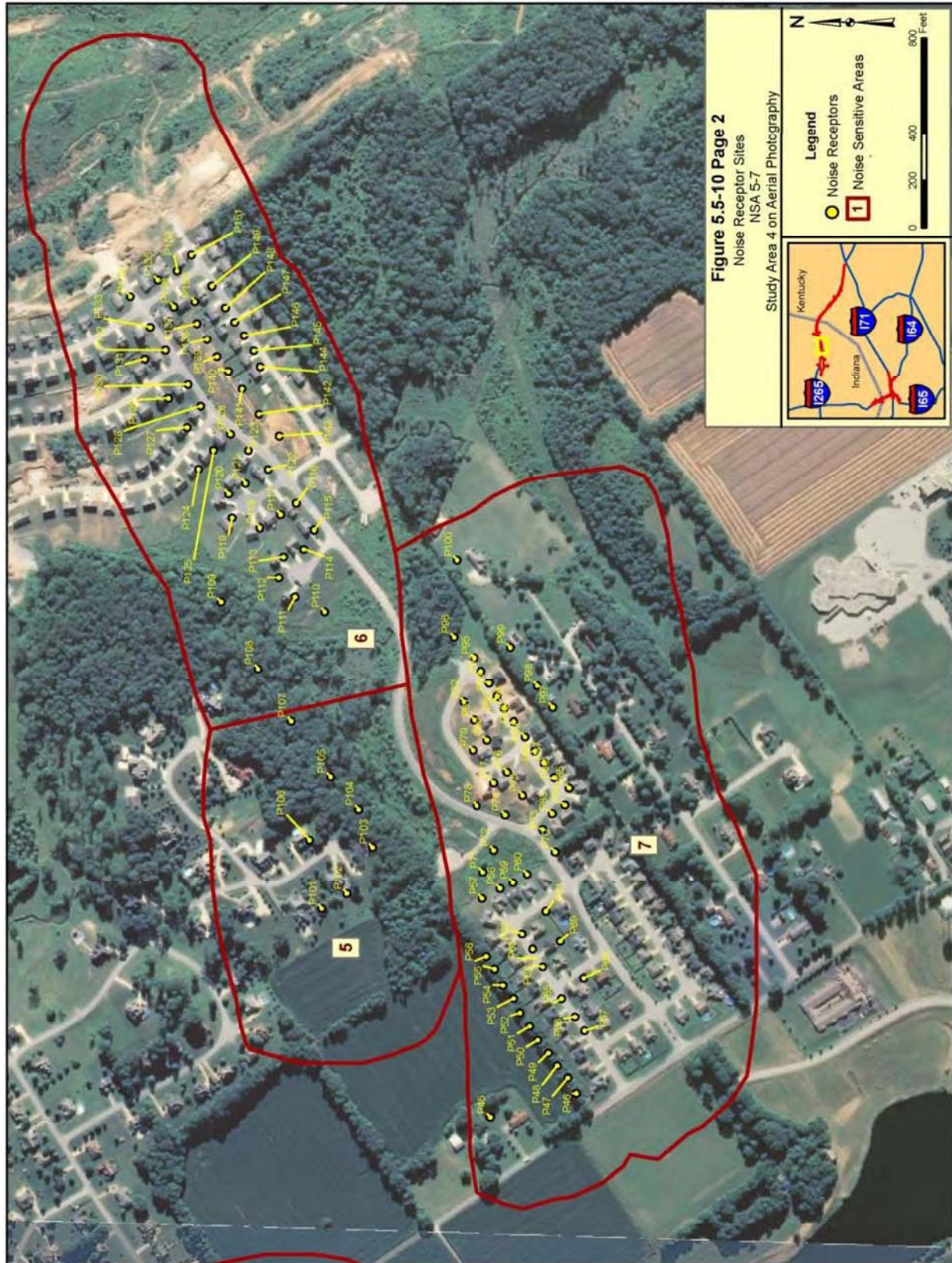


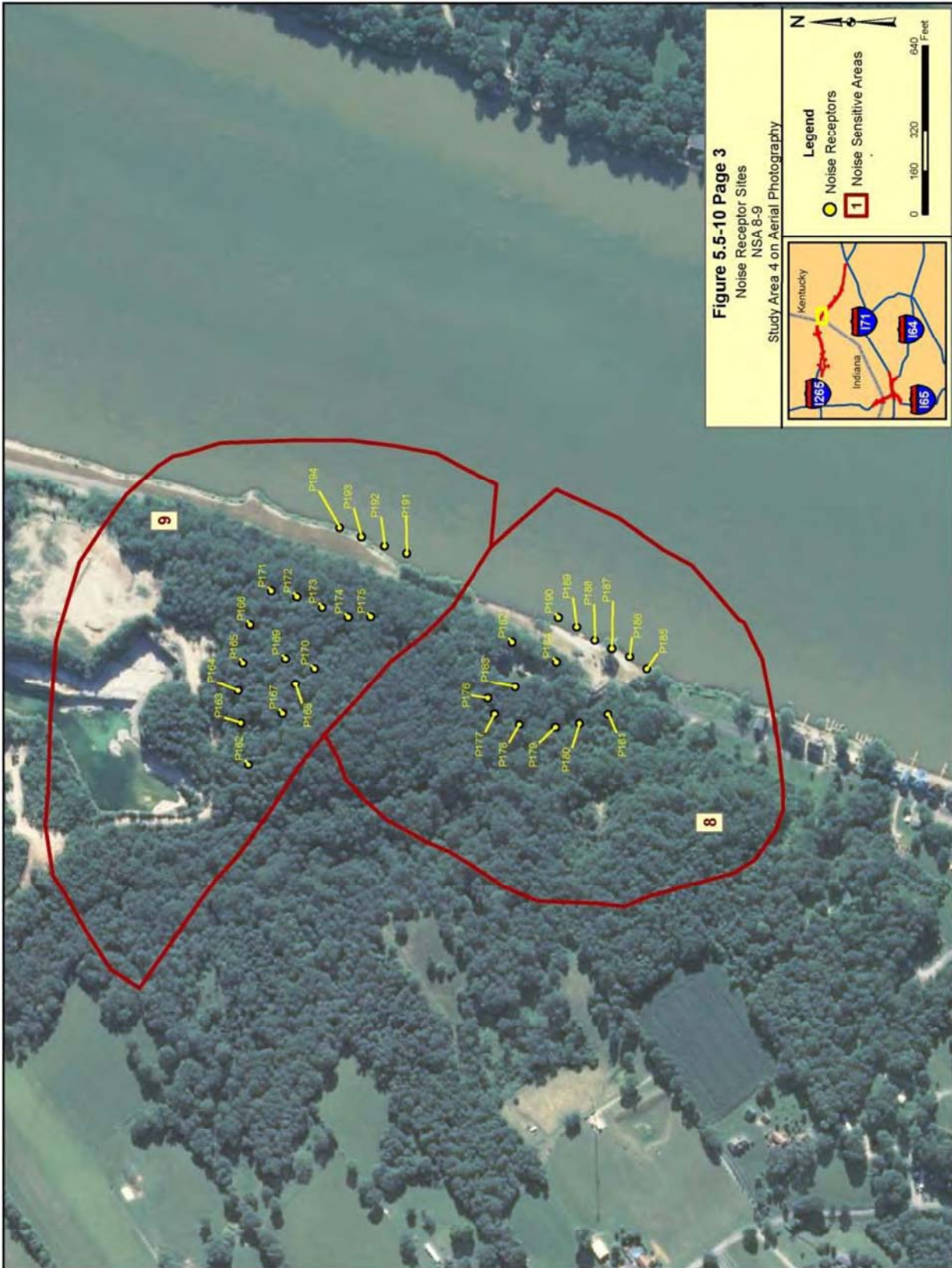
Noise Abatement Recommendation Summary

In summary, the noise data evaluated in the SFEIS Section 6 noise report was re-evaluated based upon the current roadway design. This analysis found impacted receptors in four of the nine Noise Sensitive Areas. The construction of noise walls was evaluated for each of these four Noise Sensitive Areas. Noise Sensitive Areas 5, 6, 7, and 9 would see a benefit to impacted receptors, but modeled barriers do not meet the cost-effectiveness criteria established by INDOT. Therefore, noise abatement is not proposed at any location along Section 6.

APPENDIX A – PROJECT LOCATION EXHIBITS









APPENDIX B – NOISE BARRIER ANALYSIS SUMMARY



NOISE SENSITIVE AREA 1 AND 2

Noise Sensitive Area 1 & 2

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
3434 Charlestown Jeff Pike -Row 1	1	1	54	61.3	61.3	0
3436 Charlestown Jeff Pike -Row 1	2	1	54	61.6	61.6	0
3425 Morgan Trail – Row 1	3	1	54	61.0	61.0	0
3427 Morgan Trail – Row 1	4	1	54	63.3	63.3	0
3429 Morgan Trail – Row 1	5	1	54	61.4	61.4	0
3431 Morgan Trail – Row 1	6	1	54	61.9	61.9	0
3433 Morgan Trail – Row 1	7	1	54	62.0	62.0	0
3435 Morgan Trail – Row 1	8	1	54	62.0	62.0	0
3437 Morgan Trail – Row 1	9	1	54	61.9	61.9	0
3439 Morgan Trail – Row 1	10	1	54	62.1	62.1	0
3441 Morgan Trail – Row 1	11	1	54	61.3	61.3	0
3443 Morgan Trail – Row 1	12	1	54	60.9	60.9	0
3445 Morgan Trail – Row 1	13	1	54	59.9	59.9	0
3447 Morgan Trail – Row 1	14	1	54	59.1	59.1	0
3428 Morgan Trail – Row 2	15	1	54	60.8	60.8	0
3430 Morgan Trail – Row 2	16	1	54	61.9	61.9	0
3432 Morgan Trail – Row 2	17	1	54	62.4	62.4	0
3434 Morgan Trail – Row 2	18	1	54	61.4	61.4	0
3436 Morgan Trail – Row 2	19	1	54	60.3	60.3	0
3442 Morgan Trail – Row 2	20	1	54	60.4	60.4	0
3444 Morgan Trail – Row 2	21	1	54	60.8	60.8	0
2928 Sellers Court – Row 1	22	1	54	55.1	55.1	0
2926 Sellers Court – Row 1	23	1	54	55.8	55.8	0
2924 Sellers Court – Row 1	24	1	54	56.3	56.3	0
2916 Sellers Court – Row 1	25	1	54	56.7	56.7	0

LEGEND	TOTALS
NAC Impact Only	0
Substantial Increase Impact Only	0
NAC and SI Impact	0
Benefited	0



NOISE SENSITIVE AREA 3

Noise Sensitive Area 3

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
4715 New Chapel Rd - Row 1	26	1	57	62.8	62.8	0
4707 New Chapel Rd - Row 1	27	1	57	60.9	60.9	0
4717 New Chapel Rd - Row 1	28	1	57	60.0	60.0	0
4719 New Chapel Rd - Row 1	29	1	57	59.2	59.2	0
4721 New Chapel Rd - Row 1	30	1	57	58.6	58.6	0
4801 New Chapel Rd - Row 1	31	1	57	58.2	58.2	0
4805 New Chapel Rd - Row 1	32	1	57	57.6	57.6	0
4714 New Chapel Rd - Row 1	33	1	57	61.7	61.7	0
4720 New Chapel Rd - Row 1	34	1	57	59.6	59.6	0
4802 New Chapel Rd - Row 1	35	1	57	59.0	59.0	0
4804 New Chapel Rd - Row 1	36	1	57	58.1	58.1	0
4812 New Chapel Rd - Row 1	37	1	57	57.4	57.4	0
4814 New Chapel Rd - Row 1	38	1	57	57.2	57.2	0
4818 New Chapel Rd - Row 1	39	1	57	56.9	56.9	0

LEGEND	TOTALS
NAC Impact Only	0
Substantial Increase Impact Only	0
NAC and SI Impact	0
Benefited	0



NOISE SENSITIVE AREA 4

Noise Sensitive Area 4

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
3304 Utica Sellersburg Road - Row 1	40	1	54	57.4	57.4	0
3302 Utica Sellersburg Road - Row 1	41	1	54	58.5	58.5	0
3218 Utica Sellersburg Road - Row 1	42	1	54	60.5	60.5	0
3216 Utica Sellersburg Road - Row 1	43	1	54	59.2	59.2	0
3214 Utica Sellersburg Road - Row 1	44	1	54	58.0	58.0	0
Farm 1st Row	H1	1	54	58.6	58.6	0
Farm 2nd Row	H1	1	54	57.3	57.3	0

LEGEND	TOTALS
NAC Impact Only	0
Substantial Increase Impact Only	0
NAC and SI Impact	0
Benefited	0



NOISE SENSITIVE AREA 5 AND 6

Noise Sensitive Area 5 & 6

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
3007 Old Tay Bridge - Row 1	101	1	52	63.0	62.5	0.5
3003 Old Tay Bridge - Row 1	102	1	52	64.9	64.6	0.3
3001 Old Tay Bridge - Row 1	103	1	52	65.7	65.4	0.3
Vac Lot 9 Old Tay Bridge - Row 1	104	1	52	64.7	64.2	0.5
Vac Lot 10 Old Tay Bridge - Row 1	105	1	52	63.7	62.8	0.9
3004 Old Tay Bridge - Row 2	106	1	52	64.7	64.0	0.7
3114 Cottage Rake - Row 1	107	1	52	62.3	60.0	2.3
3115 Cottage Rake - Row 1	108	1	52	60.9	57.4	3.5
Vacant Lot 11 - Row 1	109	1	47	58.7	54.7	4.0
2805 Coyote Court - Row 1	110	1	47	65.1	57.6	7.5
2807 Coyote Court - Row 1	111	1	47	65.0	58.6	6.4
Vacant Lot 12 Coyote Court - Row 1	112	1	47	64.4	57.9	6.5
2804 Coyote Court - Row 1	113	1	47	64.3	57.3	7.0
2802 Coyote Court - Row 1	114	1	47	66.2	58.0	8.2
2800 Coyote Court - Row 1	115	1	47	67.7	59.1	8.6
2801 Boulder Court - Row 1	116	1	47	67.6	59.6	8.0
2803 Boulder Court - Row 2	117	1	47	62.3	55.2	7.1
2805 Boulder Court - Row 2	118	1	47	58.9	52.8	6.1
2806 Boulder Court - Row 2	119	1	47	59.3	52.9	6.4
2804 Boulder Court - Row 2	120	1	47	59.5	53.1	6.4
2802 Boulder Court - Row 2	121	1	47	62.5	55.2	7.3
2800 Boulder Court - Row 1	122	1	47	66.5	58.7	7.8
2603 Brookhollow Drive - Row 2	123	1	47	63.2	56.3	6.9
2805 Rolling Creek Drive - Row 3	124	1	46	54.0	49.0	5.0
2803 Rolling Creek Drive - Row 2	125	1	46	57.1	50.6	6.5
2801 Rolling Creek Drive - Row 2	126	1	46	60.1	53.8	6.3
2802 Rolling Creek Drive - Row 3	127	1	46	57.2	51.6	5.5
2800 Rolling Creek Drive - Row 3	128	1	46	58.0	52.8	5.2
2803 Horse Trail Drive - Row 4	129	1	46	57.4	53.3	4.1
2611 Brookhollow Way - Row 3	130	1	46	59.2	54.8	4.4
2804 Horse Trail Drive - Row 4	131	1	46	58.9	57.1	1.8
2800 Horse Trail Road - Row 3	132	1	46	60.2	58.2	2.0
2617 Brookhollow Way - Row 4	133	1	46	60.3	58.8	1.4
2619 Brookhollow Way - Row 4	134	1	46	59.7	59.0	0.7
2620 Brookhollow Way - Row 3	135	1	49	60.9	60.1	0.8
2618 Brookhollow Way - Row 3	136	1	49	61.2	59.9	1.3
2616 Brookhollow Way - Row 2	137	1	49	62.6	59.9	2.7
2614 Brookhollow Way - Row 2	138	1	49	64.2	61.0	3.1
Vacant Lot 13 Brookhollow Way - Row 2	139	1	49	65.7	61.8	3.7
Vacant Lot 14 Brookhollow Way - Row 2	140	1	49	67.3	61.5	5.5
Vacant Lot 15 Brookhollow Way - Row 2	141	1	49	68.8	60.7	7.9
Vacant Lot 16 Brookhollow Way - Row 2	142	1	49	67.3	59.4	7.8
Vacant Lot 17 Brookhollow Way - Row 1	143	1	49	67.7	59.3	8.4
2617 Wood Creek Way - Row 1	147	1	49	69.6	68.8	0.6
2619 Wood Creek Way - Row 1	148	1	49	67.8	67.2	0.6
2321 Wood Creek Way - Row 1	149	1	49	65.3	64.6	0.6
2703 Boulder Ridge Drive - Row 2	150	1	49	61.7	60.4	1.3
2605 Wood Creek Way - Row 1	151	1	49	62.9	62.3	0.6
2702 Boulder Ridge Drive - Row 2	152	1	49	61.8	61.2	0.6

LEGEND	TOTALS
NAC Impact Only	1
Substantial Increase Impact Only	9
NAC and SI Impact	11
Benefited	23

Predicted Sound Levels (dBA) at Noise Receptors in NSA 5 and 6

Residence Location	Receptors	Dwelling Units	Existing Sound Level	No Barrier Sound Level	Increase Over Existing	18'		Jacobs optimized	
						NSA 6 full length		NSA 6 only minimum	
						Sound Level	Noise Reduction	Sound Level	Noise Reduction
NSA 5 & 6 Residents	Site 101 - 3007 Old Tay Bridge" 1st row	1	52	63	11	59.2	3.8	62.5	0.5
	Site 102 - 3003 Old Tay Bridge" 1st row	1	52	64.9	12.9	60.2	4.7	64.6	0.3
	Site 103 - 3001 Old Tay Bridge" 1st row	1	52	65.7	13.7	59.5	6.2	65.4	0.3
	Site 104 - Vac Lot 9 Old Tay Bridge" 1st row	1	52	64.7	12.7	56.6	8.1	64.2	0.5
	Site 105 - Vac Lot 10 Old Tay Bridge" 1st row	1	52	63.7	11.7	54.9	8.8	62.8	0.9
	Site 106 - 3004 Old Tay Bridge"	1	52	64.7	12.7	59.5	5.3	64	0.7
	Site 107 - 3114 Cottage Rake" 1st row	1	52	62.3	10.3	52.7	9.6	60	2.3
	Site 108 - 3115 Cottage Rake" 1st row	1	52	60.9	8.9	51.5	9.4	57.4	3.5
	Site 109 - Vac Lot 11" 1st row	1	47	58.7	11.7	50.7	8	54.7	4
	Site 110 - 2805 Coyote Court" 1st row	1	47	65.1	18.1	54.4	10.6	57.6	7.5
	Site 111 - 2807 Coyote Court" 1st row	1	47	65	18	55	10	58.6	6.4
	Site 112 - Vac Lot 12 Coyote Court" 1st row	1	47	64.4	17.4	54.5	10	57.9	6.5
	Site 113 - 2804 Coyote Court" 1st row	1	47	64.3	17.3	54.6	9.8	57.3	7
	Site 114 - 2802 Coyote Court" 1st row	1	47	66.2	19.2	56.4	9.7	58	8.2
	Site 115 - 2800 Coyote Court" 1st row	1	47	67.7	20.7	58.4	9.3	59.1	8.6
	Site 116 - 2801 Boulder Court" 1st row	1	47	67.6	20.6	58.9	8.7	59.6	8
	Site 117 - 2803 Boulder Court"	1	47	62.3	15.3	54.4	7.9	55.2	7.1
	Site 118 - 2805 Boulder Court"	1	47	58.9	11.9	51.6	7.3	52.8	6.1
	Site 119 - 2806 Boulder Court"	1	47	59.3	12.3	51.4	7.9	52.9	6.4
	Site 120 - 2804 Boulder Court"	1	47	59.5	12.5	51.7	7.8	53.1	6.4
	Site 121 - 2802 Boulder Court"	1	47	62.5	15.5	54.1	8.3	55.2	7.3
	Site 122 - 2800 Boulder Court" 1st row	1	47	66.5	19.5	57.6	8.9	58.7	7.8
	Site 123 - 2603 Brookhollow Drive"	1	47	63.2	16.2	55.2	8	56.3	6.9
	Site 124 - 2805 Rolling Creek Drive"	1	46	54	8	48.6	5.4	49	5
	Site 125 - 2803 Rolling Creek Drive"	1	46	57.1	11.1	50.5	6.6	50.6	6.5
	Site 126 - 2801 Rolling Creek Drive"	1	46	60.1	14.1	53.1	7	53.8	6.3
	Site 127 - 2802 Rolling Creek Drive"	1	46	57.2	11.2	51	6.1	51.6	5.5
	Site 128 - 2800 Rolling Creek Drive"	1	46	58	12	52.2	5.8	52.8	5.2
	Site 129 - 2803 Horse Trail Drive"	1	46	57.4	11.4	51.9	5.6	53.3	4.1
	Site 130 - 2611 Brookhollow Way"	1	46	59.2	13.2	52.9	6.3	54.8	4.4
	Site 131 - 2804 Horse Trail Drive"	1	46	58.9	12.9	55.7	3.2	57.1	1.8
	Site 132 - 2800 Horse Trail Road"	1	46	60.2	14.2	56.7	3.5	58.2	2
Site 133 - 2617 Brookhollow Way"	1	46	60.3	14.3	57.9	2.4	58.8	1.4	
Site 134 - 2619 Brookhollow Way"	1	46	59.7	13.7	58.6	1.1	59	0.7	
Site 135 - 2620 Brookhollow Way"	1	49	60.9	11.9	59.8	1.1	60.1	0.8	
Site 136 - 2618 Brookhollow Way"	1	49	61.2	12.2	59.1	2.2	59.9	1.3	
Site 137 - 2616 Brookhollow Way"	1	49	62.6	13.6	59.1	3.6	59.9	2.7	
Site 138 - 2614 Brookhollow Way"	1	49	64.2	15.2	58.1	6.2	61	3.1	
Site 139 - Vac Lot 13 Brookhollow Way" 1st row	1	49	65.7	16.7	57.8	8	61.8	3.7	
Site 140 - Vac Lot 14 Brookhollow Way" 1st row	1	49	67.3	18.3	57.5	9.7	61.5	5.5	
Site 141 - Vac Lot 15 Brookhollow Way" 1st row	1	49	68.8	19.8	57.7	11.1	60.7	7.9	
Site 142 - Vac Lot 16 Brookhollow Way" 1st row	1	49	67.3	18.3	57.9	9.4	59.4	7.8	
Site 143 - Vac Lot 17 Brookhollow Way" 1st row	1	49	67.7	18.7	58.8	8.9	59.3	8.4	
Site 147 - 2617 Wood Creek Way" 1st row	1	49	69.6	20.6	60.2	9.4	68.8	0.6	
Site 148 - 2619 Wood Creek Way" 1st row	1	49	67.8	18.8	60.8	7.1	67.2	0.6	
Site 149 - 2321 Wood Creek Way" 1st row	1	49	65.3	16.3	60.9	4.4	64.6	0.6	
Site 150 - 2703 Boulder Ridge Drive"	1	49	61.7	12.7	59.5	2.2	60.4	1.3	
Site 151 - 2605 Wood Creek Way" 1st row	1	49	62.9	13.9	61.2	1.7	62.3	0.6	
Site 152 - 2702 Boulder Ridge Drive"	1	49	61.8	12.8	60.4	1.4	61.2	0.6	
Cost/Benefit Calculations	COST/BENEFIT CALCULATIONS								
	cost of barrier					3426	\$1,940,598	1498	\$775,605
	TOTAL							\$1,940,598	\$775,605
	Cost/Benefited Residence							\$53,906	\$33,722
	Impacted/Benefited/over 7 dBA			21 Impacted			36 Benefited > 5 dBA	27 Benefited > 7 dBA	23 Benefited > 5 dBA
% of impacted 1st row that get 7 dBA (goal 50%)							88%		53%
% of the impacted that would be benefited (goal 50%)							95%		71%

Notes:
 Pink highlights - represent an impact (66 dBA or more or substantial increase)
 Dark green highlights - benefit of 7 dBA or more
 Light green highlights - benefit of 5 dBA or more



NOISE SENSITIVE AREA 7

Noise Sensitive Area 7

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
3012 Utica Sellersburg Road - Row 1	45	1	58	72.3	72.3	0.0
2201 Shadowbrook Lane - Row 1	46	1	58	56.6	55.5	1.1
2203 Shadowbrook Lane - Row 1	47	1	58	57.2	55.5	1.7
2205 Shadowbrook Lane - Row 1	48	1	45	57.5	55.6	1.9
2207 Shadowbrook Lane - Row 1	49	1	45	58.2	55.7	2.5
2209 Shadowbrook Lane - Row 1	50	1	45	59.2	55.8	3.4
2211 Shadowbrook Lane - Row 1	51	1	45	60.1	56.0	4.1
2213 Shadowbrook Lane - Row 1	52	1	45	61.7	56.7	5.0
2215 Shadowbrook Lane - Row 1	53	1	45	62.7	56.9	5.8
2217 Shadowbrook Lane - Row 1	54	1	45	64.6	56.9	7.7
2219 Shadowbrook Lane - Row 1	55	1	45	67.0	56.8	10.2
2221 Shadowbrook Lane - Row 1	56	1	45	71.0	53.4	17.6
2301 Cricklecreek Lane - Row 1	57	1	44	70.0	57.2	12.8
2303 Cricklecreek Lane - Row 2	58	1	44	66.8	56.4	10.4
2305 Cricklecreek Lane - Row 3	59	1	44	64.1	56.5	7.6
2307 Cricklecreek Lane - Row 4	60	1	44	61.7	54.3	7.4
2217 Brookhollow Way - Row 3	61	1	45	57.6	52.7	4.9
2220 Shadowbrook Lane - Row 2	62	1	45	63.1	56.8	6.3
2218 Shadowbrook Lane - Row 2	63	1	45	61.4	56.4	5.0
2216 Shadowbrook Lane - Row 2	64	1	45	59.9	55.7	4.2
2212 Shadowbrook Lane - Row 2	65	1	45	57.3	54.3	3.0
2210 Shadowbrook Lane - Row 2	66	1	45	56.0	53.5	2.5
2206 Shadowbrook Lane - Row 2	67	1	45	55.4	53.2	2.2
2811 Springbrook Way - Row 3	68	1	45	54.9	52.7	2.2
2810 Springbrook Way - Row 3	69	1	45	56.6	52.7	3.9
2228 Crickle Creek Lane - Row 5	70	1	44	58.3	52.9	5.4
Vac Lot 1 Springbrook Drive - Row 1	71	1	44	66.2	55.8	10.4
Vac Lot 2 Brookhollow Way - Row 2	72	1	44	66.5	57.6	8.9
2304 Brookview Drive - Row 3	73	1	44	60.0	55.7	4.3
Vac Lot 3 Brookview Drive - Row 2	74	1	44	65.1	58.4	6.7
2313 Brookview Drive - Row 3	75	1	44	62.3	58.5	3.8
2358 Brookview Drive - Row 3	76	1	44	62.8	59.7	3.1
2356 Brookview Drive - Row 2	77	1	44	66.1	62.1	4.0
Vac Lot 4 Brookview Drive - Row 1	78	1	44	69.7	60.7	9.0
2351 Brookview Drive - Row 1	79	1	44	68.5	66.9	1.6
2321 Brookview Drive - Row 2	80	1	44	63.8	61.5	2.3
2323 Brookview Drive - Row 1	81	1	44	63.0	58.0	5.0
Vac Lot 5 Brookview Drive - Row 1	82	1	44	66.6	53.5	13.1
2306 Brookview Drive - Row 4	83	1	44	59.0	55.7	3.3
2308 Brookview Drive - Row 4	84	1	44	57.8	55.3	2.5
2310 Brookview Drive - Row 4	85	1	44	57.1	55.4	1.7
2312 Brookview Drive - Row 4	86	1	44	57.7	56.1	1.6
2314 Brookview Drive - Row 4	87	1	44	57.7	56.2	1.5
2316 Brookview Drive - Row 3	88	1	44	58.1	56.0	2.1
2318 Brookview Drive - Row 3	89	1	44	58.2	55.7	2.5
2320 Brookview Drive - Row 3	90	1	44	58.8	55.9	2.9
2322 Brookview Drive - Row 2	91	1	44	58.6	55.3	3.3
2324 Brookview Drive - Row 2	92	1	44	59.2	55.5	3.7
2326 Brookview Drive - Row 2	93	1	44	60.4	55.9	4.5
Vac Lot 6 Brookview Drive - Row 1	94	1	44	62.5	56.7	5.8
Vac Lot 7 Brookview Drive - Row 1	95	1	44	64.2	57.2	7.0
Vac Lot 8 Brookview Drive - Row 1	96	1	44	68.6	53.6	15.0
2306 Surrey Road - Row 4	97	1	44	54.6	53.7	0.9
2310 Surrey Road - Row 3	98	1	44	55.4	54.6	0.8
2316 Surrey Road - Row 2	99	1	44	59.0	57.8	1.2
2324 Surrey Road - Row 1	100	1	44	65.6	65.6	0.0

LEGEND	TOTALS
NAC Impact Only	1
Substantial Increase Impact Only	23
NAC and SI Impact	12
Benefited	21

Predicted Sound Levels (dBA) at Noise Receptors in NSA 7

Residence Location	Receptors	Dwelling Units	Existing Sound Level	No Barrier Sound Level	Increase Over Existing	22'		24'		optimized		
						Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction	
						Site 45 - 3012 Utica Sellersburg Road" 1st row	1	58.1	72.3	14.2	50.9	21.4
Site 46 - 2201 Shadowbrook Lane" 1st row	1	58.1	56.6	-1.5	54.2	2.4	54.1	2.5	55.5	1.1		
Site 47 - 2203 Shadowbrook Lane" 1st row	1	58.1	57.2	-0.9	54.4	2.8	54.1	3.1	55.5	1.7		
Site 48 - 2205 Shadowbrook Lane" 1st row	1	45.3	57.5	12.2	54.5	3	54.3	3.2	55.6	1.9		
Site 49 - 2207 Shadowbrook Lane" 1st row	1	45.3	58.2	12.9	54.8	3.4	54.5	3.7	55.7	2.5		
Site 50 - 2209 Shadowbrook Lane" 1st row	1	45.3	59.2	13.9	55	4.2	54.9	4.3	55.8	3.4		
Site 51 - 2211 Shadowbrook Lane" 1st row	1	45.3	60.1	14.8	55.8	4.3	55.3	4.8	56	4.1		
Site 52 - 2213 Shadowbrook Lane" 1st row	1	45.3	61.7	16.4	56.5	5.2	56	5.7	56.7	5		
Site 53 - 2215 Shadowbrook Lane" 1st row	1	45.3	62.7	17.4	56.9	5.8	56.3	6.4	56.9	5.8		
Site 54 - 2217 Shadowbrook Lane" 1st row	1	45.3	64.6	19.3	57.2	7.4	56.6	8	56.9	7.7		
Site 55 - 2219 Shadowbrook Lane" 1st row	1	45.3	67	21.7	57.3	9.7	56.7	10.3	56.8	10.2		
Site 56 - 2221 Shadowbrook Lane" 1st row	1	45.3	71	25.7	53.7	17.3	53.2	17.8	53.4	17.6		
Site 57 - 2301 Cricklecreek Lane" 1st row	1	44.1	70	25.9	58.1	11.9	57.2	12.8	57.2	12.8		
Site 58 - 2303 Cricklecreek Lane"	1	44.1	66.8	22.7	57.2	9.6	56.2	10.6	56.4	10.4		
Site 59 - 2305 Cricklecreek Lane"	1	44.1	64.1	20	57	7.1	56.3	7.8	56.5	7.6		
Site 60 - 2307 Cricklecreek Lane"	1	44.1	61.7	17.6	54.9	6.8	54	7.7	54.3	7.4		
Site 61 - 2217 Brookhollow Way"	1	45.3	57.6	12.3	53.5	4.1	52.4	5.2	52.7	4.9		
Site 62 - 2220 Shadowbrook Lane"	1	45.3	63.1	17.8	57.3	5.8	56.4	6.7	56.8	6.3		
Site 63 - 2218 Shadowbrook Lane"	1	45.3	61.4	16.1	56.8	4.6	56.1	5.3	56.4	5		
Site 64 - 2216 Shadowbrook Lane"	1	45.3	59.9	14.6	55.9	4	55.3	4.6	55.7	4.2		
Site 65 - 2212 Shadowbrook Lane"	1	45.3	57.3	12	54.2	3.1	53.9	3.4	54.3	3		
Site 66 - 2210 Shadowbrook Lane"	1	45.3	56	10.7	53.2	2.8	52.9	3.1	53.5	2.5		
Site 67 - 2206 Shadowbrook Lane"	1	45.3	55.4	10.1	52.8	2.6	52.5	2.9	53.2	2.2		
Site 68 - 2811 Springbrook Way"	1	45.3	54.9	9.6	52.8	2.1	52.3	2.6	52.7	2.2		
Site 69 - 2810 Springbrook Way"	1	45.3	56.6	11.3	53.2	3.4	52.4	4.2	52.7	3.9		
Site 70 - 2228 Crickle Creek Lane"	1	44.1	58.3	14.2	53.9	4.4	52.5	5.8	52.9	5.4		
Site 71 - Vac Lot 1 Springbrook Drive" 1st row	1	44.1	66.2	22.1	56.3	9.9	55.7	10.5	55.8	10.4		
Site 72 - Vac Lot 2 Brookhollow Way"	1	44.1	66.5	22.4	57.9	8.6	57.4	9.1	57.6	8.9		
Site 73 - 2304 Brookview Drive"	1	44.1	60	15.9	56.4	3.6	55.1	4.9	55.7	4.3		
Site 74 - Vac Lot 3 Brookview Drive"	1	44.1	65.1	21	59.1	6	57.6	7.5	58.4	6.7		
Site 75 - 2313 Brookview Drive"	1	44.1	62.3	18.2	58.8	3.5	57.9	4.4	58.5	3.8		
Site 76 - 2358 Brookview Drive"	1	44.1	62.8	18.7	59.6	3.2	59.2	3.6	59.7	3.1		
Site 77 - 2356 Brookview Drive"	1	44.1	66.1	22	62	4.1	61.5	4.6	62.1	4		
Site 78 - Vac Lot 4 Brookview Drive" 1st row	1	44.1	69.7	25.6	60.8	8.9	60.3	9.4	60.7	9		
Site 79 - 2351 Brookview Drive" 1st row	1	44.1	68.5	24.4	66.9	1.6	66.8	1.7	66.9	1.6		
Site 80 - 2321 Brookview Drive"	1	44.1	63.8	19.7	61.5	2.3	61.3	2.5	61.5	2.3		
Site 81 - 2323 Brookview Drive" 1st row	1	44.1	63	18.9	58	5	57.6	5.4	58	5		
Site 82 - Vac Lot 5 Brookview Drive" 1st row	1	44.1	66.6	22.5	53.5	13.1	53	13.6	53.5	13.1		
Site 83 - 2306 Brookview Drive"	1	44.1	59	14.9	56	3	55.1	3.9	55.7	3.3		
Site 84 - 2308 Brookview Drive"	1	44.1	57.8	13.7	55.5	2.3	54.9	2.9	55.3	2.5		
Site 85 - 2310 Brookview Drive"	1	44.1	57.1	13	55.5	1.6	54.9	2.2	55.4	1.7		
Site 86 - 2312 Brookview Drive"	1	44.1	57.7	13.6	56.3	1.4	55.8	1.9	56.1	1.6		
Site 87 - 2314 Brookview Drive"	1	44.1	57.7	13.6	56.2	1.5	55.8	1.9	56.2	1.5		
Site 88 - 2316 Brookview Drive"	1	44.1	58.1	14	56	2.1	55.7	2.4	56	2.1		
Site 89 - 2318 Brookview Drive"	1	44.1	58.2	14.1	55.5	2.7	55.2	3	55.7	2.5		
Site 90 - 2320 Brookview Drive"	1	44.1	58.8	14.7	56	2.8	55.6	3.2	55.9	2.9		
Site 91 - 2322 Brookview Drive"	1	44.1	58.6	14.5	55.3	3.3	55	3.6	55.3	3.3		
Site 92 - 2324 Brookview Drive"	1	44.1	59.2	15.1	55.5	3.7	55.2	4	55.5	3.7		
Site 93 - 2326 Brookview Drive"	1	44.1	60.4	16.3	56	4.4	55.6	4.8	55.9	4.5		
Site 94 - Vac Lot 6 Brookview Drive" 1st row	1	44.1	62.5	18.4	56.9	5.6	56.4	6.1	56.7	5.8		
Site 95 - Vac Lot 7 Brookview Drive" 1st row	1	44.1	64.2	20.1	57.4	6.8	56.8	7.4	57.2	7		
Site 96 - Vac Lot 8 Brookview Drive" 1st row	1	44.1	68.6	24.5	53.8	14.8	53	15.6	53.6	15		
Site 97 - 2306 Surrey Road"	1	44.1	54.6	10.5	53.6	1	53.4	1.2	53.7	0.9		
Site 98 - 2310 Surrey Road"	1	44.1	55.4	11.3	54.3	1.1	54.1	1.3	54.6	0.8		
Site 99 - 2316 Surrey Road"	1	44.1	59	14.9	57.1	1.9	56.9	2.1	57.8	1.2		
Site 100 - 2324 Surrey Road" 1st row	1	44.1	65.6	21.5	62.2	3.4	61.7	3.9	65.6	0		
Cost/Benefit Calculations	COST/BENEFIT CALCULATIONS											
	cost of barrier						2550	\$1,683,000	2550	\$1,836,000	1957	\$1,280,370
	TOTAL							\$1,683,000		\$1,836,000		\$1,280,370
	Cost/Benefited Residence							\$84,150		\$79,826		\$60,970
	Impacted/Benefited/over 7 dBA			36 Impacted			20 Benefited > 5 dBA	12 Benefited > 7 dBA	23 Benefited > 5 dBA	15 Benefited > 7 dBA	21 Benefited > 5 dBA	13 Benefited > 7 dBA
	% of impacted 1st row that get 7 dBA (goal 50%)							53%		59%		53%
% of the impacted that would be benefited (goal 50%)							56%		58%		56%	

Notes:
 Pink highlights - represent an impact (66 dBA or more or substantial increase)
 Dark green highlights - benefit of 7 dBA or more
 Light green highlights - benefit of 5 dBA or more

Predicted Sound Levels (dBA) at Noise Receptors in NSA 7 - Barrier Modeled Along Shoulder and Proposed Connector Road

Residence Location	Receptors	Dwelling Units	Existing Sound Level	No Barrier Sound Level	Increase Over Existing	20'		20'		22'		22'		24'			
						two barriers				two barriers							
						Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction		
NSA 7 Residents	Site 45 - 3012 Utica Sellersburg Road" 1st row	1	58.1	72.2	14.1	70.7	1.5	70.7	1	70.7	1.5	70.7	1.5	70.7	1.5		
	Site 46 - 2201 Shadowbrook Lane" 1st row	1	58.1	56.6	-1.5	55.3	1.3	55.3	1.3	55.2	1.4	55.2	1.4	55.1	1.5		
	Site 47 - 2203 Shadowbrook Lane" 1st row	1	58.1	57.2	-0.9	55.4	1.8	55.4	1.8	55.3	1.9	55.3	1.9	55.2	2		
	Site 48 - 2205 Shadowbrook Lane" 1st row	1	45.3	57.5	12.2	55.5	2	55.5	2	55.4	2.1	55.4	2.1	55.2	2.3		
	Site 49 - 2207 Shadowbrook Lane" 1st row	1	45.3	58.3	13	55.6	2.7	55.6	2.7	55.4	2.9	55.4	2.9	55.2	3.1		
	Site 50 - 2209 Shadowbrook Lane" 1st row	1	45.3	59.2	13.9	55.8	3.4	55.8	3.4	55.5	3.7	55.5	3.7	55.3	3.9		
	Site 51 - 2211 Shadowbrook Lane" 1st row	1	45.3	60.1	14.8	55.8	4.3	55.8	4.3	55.4	4.7	55.4	4.7	55.1	5		
	Site 52 - 2213 Shadowbrook Lane" 1st row	1	45.3	61.7	16.4	56.2	5.5	56.2	5.5	55.7	6	55.7	6	55.3	6.4		
	Site 53 - 2215 Shadowbrook Lane" 1st row	1	45.3	62.7	17.4	56.6	6.1	56.6	6.1	56.1	6.6	56.1	6.6	55.6	7.1		
	Site 54 - 2217 Shadowbrook Lane" 1st row	1	45.3	64.6	19.3	57.6	7	57.6	7	57	7.6	57	7.6	56.5	8.1		
	Site 55 - 2219 Shadowbrook Lane" 1st row	1	45.3	67	21.7	58	9	58	9	57.3	9.7	57.3	9.7	56.7	10.3		
	Site 56 - 2221 Shadowbrook Lane" 1st row	1	45.3	71	25.7	59.2	11.8	59.2	11.8	58.5	12.5	58.5	12.5	57.9	13.1		
	Site 57 - 2301 Cricklecreek Lane" 1st row	1	44.1	70	25.9	56.1	13.9	56.1	13.9	55.4	14.6	55.4	14.6	54.8	15.2		
	Site 58 - 2303 Cricklecreek Lane"	1	44.1	66.8	22.7	55.4	11.4	55.4	11.4	55	11.8	55	11.8	54.6	12.2		
	Site 59 - 2305 Cricklecreek Lane"	1	44.1	64	19.9	53.7	10.3	53.7	10.3	53.3	10.7	53.3	10.7	52.8	11.2		
	Site 60 - 2307 Cricklecreek Lane"	1	44.1	61.6	17.5	51.4	10.2	51.5	10.1	50.8	10.8	50.9	10.7	50.4	11.2		
	Site 61 - 2217 Brookhollow Way"	1	45.3	57.6	12.3	50.4	7.2	50.5	7.1	50.1	7.5	50.1	7.5	49.8	7.8		
	Site 62 - 2220 Shadowbrook Lane"	1	45.3	63.2	17.9	55.2	8	55.5	7.7	54.7	8.5	55.1	8.1	54.7	8.5		
	Site 63 - 2218 Shadowbrook Lane"	1	45.3	61.4	16.1	54.5	6.9	55.1	6.3	54	7.4	54.7	6.7	54.4	7		
	Site 64 - 2216 Shadowbrook Lane"	1	45.3	59.8	14.5	54	5.8	54.5	5.3	53.6	6.2	54.1	5.7	53.9	5.9		
	Site 65 - 2212 Shadowbrook Lane"	1	45.3	57.2	11.9	53.4	3.8	53.7	3.5	53.1	4.1	53.5	3.7	53.2	4		
	Site 66 - 2210 Shadowbrook Lane"	1	45.3	55.9	10.6	52.9	3	53.1	2.8	52.7	3.2	52.9	3	52.7	3.2		
	Site 67 - 2206 Shadowbrook Lane"	1	45.3	55.4	10.1	52.8	2.6	52.9	2.5	52.6	2.8	52.8	2.6	52.6	2.8		
	Site 68 - 2811 Springbrook Way"	1	45.3	55	9.7	52	3	52	3	51.7	3.3	51.8	3.2	51.6	3.4		
	Site 69 - 2810 Springbrook Way"	1	45.3	56.7	11.4	50.9	5.8	50.9	5.8	50.6	6.1	50.7	6	50.3	6.4		
	Site 70 - 2228 Crickle Creek Lane"	1	44.1	58.3	14.2	50.8	7.5	50.9	7.4	50.5	7.8	50.5	7.8	50.3	8		
	Site 71 - Vac Lot 1 Springbrook Drive" 1st row	1	44.1	66.1	22	55.2	10.9	55.2	10.9	54.7	11.4	54.7	11.4	54.3	11.8		
	Site 72 - Vac Lot 2 Brookhollow Way"	1	44.1	66.7	22.6	54.6	12.1	54.6	12.1	54.1	12.6	54.2	12.5	53.8	12.9		
	Site 73 - 2304 Brookview Drive"	1	44.1	60	15.9	51.9	8.1	52	8	51.5	8.5	51.5	8.5	51.2	8.8		
	Site 74 - Vac Lot 3 Brookview Drive"	1	44.1	65.1	21	53.9	11.2	54	11.1	53.3	11.8	53.4	11.7	52.8	12.3		
	Site 75 - 2313 Brookview Drive"	1	44.1	62.3	18.2	54.5	7.8	54.6	7.7	54	8.3	54.1	8.2	53.8	8.5		
	Site 76 - 2358 Brookview Drive"	1	44.1	62.8	18.7	55.3	7.5	55.5	7.3	54.8	8	55.1	7.7	54.7	8.1		
	Site 77 - 2356 Brookview Drive"	1	44.1	66	21.9	56.4	9.6	56.7	9.3	55.8	10.2	56	10	55.6	10.4		
	Site 78 - Vac Lot 4 Brookview Drive" 1st row	1	44.1	69.6	25.5	58	11.6	58.2	11.4	57.6	12	57.8	11.8	57.5	12.1		
	Site 79 - 2351 Brookview Drive" 1st row	1	44.1	68.5	24.4	59.6	8.9	60.6	7.9	59	9.5	60	8.5	59.6	8.9		
	Site 80 - 2321 Brookview Drive"	1	44.1	63.6	19.5	57.3	6.3	57.9	5.7	56.9	6.7	57.5	6.1	57.2	6.4		
	Site 81 - 2323 Brookview Drive" 1st row	1	44.1	63.3	19.2	58.6	4.7	59.6	3.7	58.2	5.1	59.1	4.2	58.8	4.5		
	Site 82 - Vac Lot 5 Brookview Drive" 1st row	1	44.1	67.6	23.5	63	4.6	63.5	4.1	62.7	4.9	63.2	4.4	63.1	4.5		
	Site 83 - 2306 Brookview Drive"	1	44.1	59	14.9	53.4	5.6	53.4	5.6	53.1	5.9	53.2	5.8	53	6		
	Site 84 - 2308 Brookview Drive"	1	44.1	57.8	13.7	53.4	4.4	53.4	4.4	53.2	4.6	53.3	4.5	53.2	4.6		
	Site 85 - 2310 Brookview Drive"	1	44.1	57.1	13	53.4	3.7	53.4	3.7	53.2	3.9	53.3	3.8	53.2	3.9		
	Site 86 - 2312 Brookview Drive"	1	44.1	57.8	13.7	54.5	3.3	54.6	3.2	54.3	3.5	54.4	3.4	54.3	3.5		
	Site 87 - 2314 Brookview Drive"	1	44.1	57.7	13.6	55.1	2.6	55.2	2.5	55	2.7	55.1	2.6	55	2.7		
	Site 88 - 2316 Brookview Drive"	1	44.1	58.2	14.1	55.6	2.6	55.7	2.5	55.5	2.7	55.6	2.6	55.5	2.7		
	Site 89 - 2318 Brookview Drive"	1	44.1	58.2	14.1	56.1	2.1	56.2	2	55.9	2.3	56	2.2	56	2.2		
	Site 90 - 2320 Brookview Drive"	1	44.1	58.9	14.8	57	1.9	57.1	1.8	56.8	2.1	57	1.9	56.9	2		
	Site 91 - 2322 Brookview Drive"	1	44.1	58.7	14.6	57.6	1.1	57.7	1	57.5	1.2	57.7	1	57.6	1.1		
	Site 92 - 2324 Brookview Drive"	1	44.1	59.3	15.2	58.5	0.8	58.6	0.7	58.4	0.9	58.5	0.8	58.5	0.8		
	Site 93 - 2326 Brookview Drive"	1	44.1	60.7	16.6	59.9	0.8	60	0.7	59.8	0.9	59.9	0.8	60	0.7		
	Site 94 - Vac Lot 6 Brookview Drive" 1st row	1	44.1	62.7	18.6	61.9	0.8	61.9	0.8	61.9	0.8	62	0.7	61.9	0.8		
	Site 95 - Vac Lot 7 Brookview Drive" 1st row	1	44.1	64.5	20.4	63.9	0.6	64	0.5	63.9	0.6	64	0.5	64	0.5		
	Site 96 - Vac Lot 8 Brookview Drive" 1st row	1	44.1	69.4	25.3	68.5	0.9	68.5	0.9	68.5	0.9	68.5	0.9	68.5	0.9		
	Site 97 - 2306 Surrey Road"	1	44.1	54.6	10.5	54.1	0.5	54.1	0.5	54.1	0.5	54.1	0.5	54.1	0.5		
	Site 98 - 2310 Surrey Road"	1	44.1	55.4	11.3	55	0.4	55	0.4	55	0.4	55	0.4	55	0.4		
	Site 99 - 2316 Surrey Road"	1	44.1	59.1	15	58.9	0.2	58.9	0.2	58.8	0.3	58.9	0.2	58.9	0.2		
	Site 100 - 2324 Surrey Road" 1st row	1	44.1	65.6	21.5	65.6	0	65.6	0	65.6	0	65.6	0	65.6	0		
	Cost/Benefit Calculations	COST/BENEFIT CALCULATIONS															
		TOTAL						2360	\$1,416,000	1863	\$1,117,800	2360	\$1,557,600	1863	\$1,229,580	1863	\$1,341,360
		Cost/Benefited Residence							\$54,462		\$42,992		\$57,689		\$47,292		\$49,680
		Impacted/Benefited/over 7 dBA						26 Benefited > 5 dBA	19 Benefited > 7 dBA	26 Benefited > 5 dBA	19 Benefited > 7 dBA	27 Benefited > 5 dBA	20 Benefited > 7 dBA	26 Benefited > 5 dBA	19 Benefited > 7 dBA	27 Benefited > 5 dBA	21 Benefited > 7 dBA
		% of impacted 1st row that get 7 dBA (goal 50%)							41%		41%		41%		41%		47%
	% of the impacted that would be benefited (goal 50%)							64%		64%		64%		64%		69%	

Notes:
 Pink highlights - represent an impact (66 dBA or more or substantial increase)
 Dark green highlights - benefit of 7 dBA or more
 Light green highlights - benefit of 5 dBA or more



NOISE SENSITIVE AREA 8

Noise Sensitive Area 8

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
Vacant Lot 41 Eagle Landing Drive - Row 1	176	1	57	59.5	59.5	0
Vacant Lot 42 Eagle Landing Drive - Row 2	177	1	57	59.5	59.5	0
Vacant Lot 43 Eagle Landing Drive - Row 3	178	1	57	57.9	57.9	0
Vacant Lot 44 Eagle Landing Drive - Row 2	179	1	57	58.1	58.1	0
Vacant Lot 45 Eagle Landing Drive - Row 2	180	1	57	57.9	57.9	0
Vacant Lot 46 Eagle Landing Drive - Row 3	181	1	57	56.5	56.5	0
Vacant Lot 47 Eagle Landing Drive - Row 1	182	1	57	64.2	64.2	0
Vacant Lot 48 Eagle Landing Drive - Row 1	183	1	57	62.3	62.3	0
5006 Upper River Road - Row 2	184	1	57	60.4	60.4	0
Vacant Lot 49 Upper River Road - Row 6	185	1	57	57.5	57.5	0
Vacant Lot 50 Upper River Road - Row 5	186	1	57	57.5	57.5	0
Vacant Lot 51 Upper River Road - Row 4	187	1	57	56.4	56.4	0
Vacant Lot 52 Upper River Road - Row 3	188	1	57	56.1	56.1	0
Vacant Lot 53 Upper River Road - Row 2	189	1	57	56.1	56.1	0
Vacant Lot 54 Upper River Road - Row 1	190	1	57	54.0	54.0	0

LEGEND	TOTALS
NAC Impact Only	0
Substantial Increase Impact Only	0
NAC and SI Impact	0
Benefited	0



NOISE SENSITIVE AREA 9

Noise Sensitive Area 9

Site Address	Site No.	No. Dus	Loudest-Hour Noise Levels			
			Existing 2005(dBA)	No-Barrier (dBA)	With-Barrier (dBA)	Insertion Loss (dB)
Vac Lot 18 Valley Rock Road - Row 3	153	1	57	58.0	54.9	3.1
Vac Lot 19 Valley Roak Road - Row 3	154	1	57	59.3	55.2	4.1
Vac Lot 20 Valley Rock Road - Row 3	155	1	57	60.6	55.6	5.0
Vac Lot 21 Valley Rock Road - Row 2	156	1	57	60.7	55.2	5.5
Vac Lot 22 Valley Rock Road - Row 2	157	1	57	58.7	53.2	5.5
Vac Lot 23 Valley Rock Road - Row 2	158	1	57	57.9	53.1	4.8
Vac Lot 24 Valley Rock Road - Row 1	159	1	57	62.5	55.0	7.5
Vac Lot 25 Valley Rock Road - Row 1	160	1	57	66.4	58.3	8.1
Vac Lot 26 Valley Rock Road - Row 1	161	1	57	68.8	58.0	10.8
Vac Lot 27 Ridge Road - Row 1	162	1	57	69.8	64.7	5.1
Vac Lot 28 Ridge Road - Row 2	163	1	57	66.6	64.5	2.1
Vac Lot 29 Ridge Road - Row 2	164	1	57	64.2	61.4	2.8
Vac Lot 30 Ridge Road - Row 2	165	1	57	63.3	60.3	3.0
Vac Lot 31 Ridge Road - Row 3	166	1	57	62.4	58.7	3.7
Vac Lot 32 Ridge Road - Row 1	167	1	57	67.7	65.0	2.7
Vac Lot 33 Ridge Road - Row 1	168	1	57	66.1	63.6	2.5
Vac Lot 34 Quarry Ridge Road - Row 2	169	1	57	64.8	61.7	3.1
Vac Lot 35 Quarry Ridge Road - Row 1	170	1	57	65.2	60.2	5.0
Vac Lot 36 Quarry Ridge Road - Row 5	171	1	57	62.8	58.4	4.4
Vac Lot 37 Quarry Ridge Road - Row 4	172	1	57	64.2	59.5	4.7
Vac Lot 38 Quarry Ridge Road - Row 3	173	1	57	66.1	60.9	5.2
Vac Lot 39 Quarry Ridge Road - Row 2	174	1	57	68.2	61.7	6.5
Vac Lot 40 Quarry Ridge Road - Row 1	175	1	57	70.3	63.3	7.0
Vac Lot 55 Upper River Road - Row 1	191	1	57	59.2	50.2	9.0
Vac Lot 56 Upper River Road - Row 2	192	1	57	58.2	49.3	8.9
Vac Lot 57 Upper River Road - Row 3	193	1	57	57.4	49.4	8.0
Vac Lot 58 Upper River Road - Row 4	194	1	57	56.5	49.5	7.0

LEGEND	TOTALS
NAC Impact Only	9
Substantial Increase Impact Only	0
NAC and SI Impact	0
Benefited	15

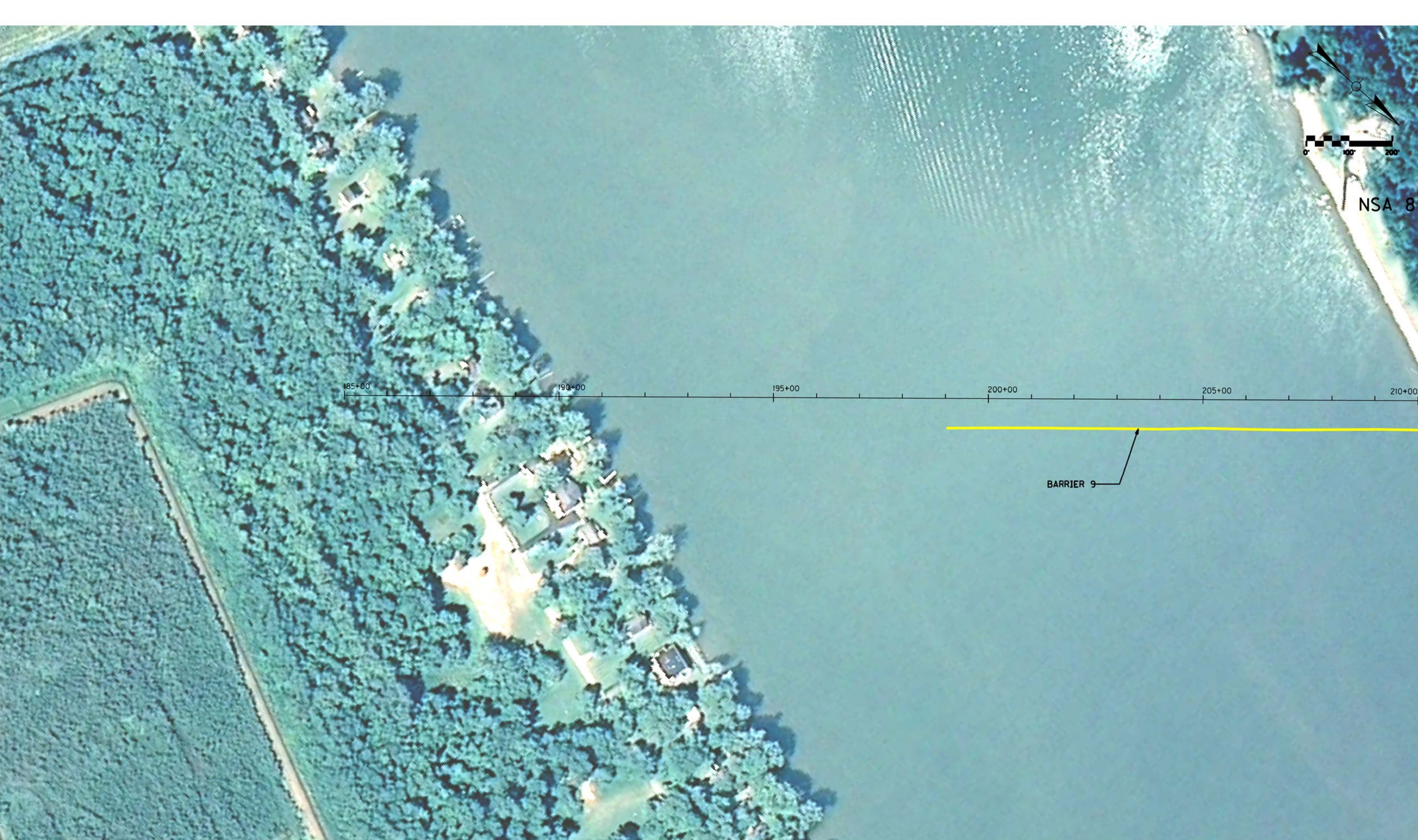
Predicted Sound Levels (dBA) at Noise Receptors in NSA 9

Residence Location	Receptors	Dwelling Units	Existing Sound Level	No Barrier Sound Level	Increase Over Existing	18'		20'		22'		24'		Optimized	
						Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction	Sound Level	Noise Reduction
NSA 9 Residents	Site 153 - Vac Lot 18 Valley Rock Road	1	57	58	1	53.6	4.4	53.1	4.9	52.7	5.3	52.3	5.7	54.9	3.1
	Site 154 - Vac Lot 19 Valley Roak Road"	1	57	59.3	2.3	54.2	5.1	53.6	5.7	53.1	6.2	52.7	6.6	55.2	4.1
	Site 155 - Vac Lot 20 Valley Rock Road"	1	57	60.6	3.6	55	5.6	54	6.6	53.5	7.1	52.9	7.7	55.6	5
	Site 156 - Vac Lot 21 Valley Rock Road"	1	57	60.7	3.7	54.6	6.1	54	6.7	53.5	7.2	52.9	7.8	55.2	5.5
	Site 157- Vac Lot 22 Valley Rock Road"	1	57	58.7	1.7	53.8	4.9	53.2	5.5	52.7	6	52.3	6.4	53.2	5.5
	Site 158 - Vac Lot 23 Valley Rock Road"	1	57	57.9	0.9	53.8	4.1	53.2	4.7	52.7	5.2	52.2	5.7	53.1	4.8
	Site 159 - Vac Lot 24 Valley Rock Road" 1st row	1	57	62.5	5.5	55.7	6.8	55	7.5	54.4	8.1	53.9	8.6	55	7.5
	Site 160 - Vac Lot 25 Valley Rock Road" 1st row	1	57	66.4	9.4	59.6	6.8	57.8	8.6	57	9.4	56.2	10.2	58.3	8.1
	Site 161 - Vac Lot 26 Valley Rock Road" 1st row	1	57	68.8	11.8	58.3	10.5	57.5	11.3	56.8	12	56.1	12.7	58	10.8
	Site 162 - Vac Lot 27 Ridge Road" 1st row	1	57	69.8	12.8	60.5	9.3	59	10.8	58.1	11.7	57.3	12.5	64.7	5.1
	Site 163 - Vac Lot 28 Ridge Road"	1	57	66.6	9.6	63.7	2.9	62.5	4.1	60.7	5.9	59.4	7.2	64.5	2.1
	Site 164 - Vac Lot 29 Ridge Road"	1	57	64.2	7.2	61.2	3	60.1	4.1	58.7	5.5	57.5	6.7	61.4	2.8
	Site 165 - Vac Lot 30 Ridge Road"	1	57	63.3	6.3	60.5	2.8	59.6	3.7	58.3	5	57.2	6.1	60.3	3
	Site 166 - Vac Lot 31 Ridge Road"	1	57	62.4	5.4	59	3.4	58.2	4.2	57.1	5.3	56	6.4	58.7	3.7
	Site 167 - Vac Lot 32 Ridge Road" 1st row	1	57	67.7	10.7	64.4	3.3	63.8	3.9	63.2	4.5	62.6	5.1	65	2.7
	Site 168 - Vac Lot 33 Ridge Road" 1st row	1	57	66.1	9.1	63.9	2.2	63.3	2.8	62.7	3.4	62.1	4	63.6	2.5
	Site 169 - Vac Lot 34 Quarry Ridge Road"	1	57	64.8	7.8	62	2.8	61.4	3.4	60.6	4.2	59.3	5.5	61.7	3.1
	Site 170 - Vac Lot 35 Quarry Ridge Road" 1st row	1	57	65.2	8.2	61.4	3.8	60.8	4.4	59.9	5.3	58.9	6.3	60.2	5
	Site 171 - Vac Lot 36 Quarry Ridge Road"	1	57	62.8	5.8	58.8	4	58	4.8	57	5.8	55.9	6.9	58.4	4.4
	Site 172 - Vac Lot 37 Quarry Ridge Road"	1	57	64.2	7.2	60.3	3.9	59.4	4.8	58.5	5.7	57.2	7	59.5	4.7
Site 173 - Vac Lot 38 Quarry Ridge Road"	1	57	66.1	9.1	62.2	3.9	60.9	5.2	60.2	5.9	58.8	7.3	60.9	5.2	
Site 174 - Vac Lot 39 Quarry Ridge Road"	1	57	68.2	11.2	63.8	4.4	62.6	5.6	61.5	6.7	59.8	8.4	61.7	6.5	
Site 175 - Vac Lot 40 Quarry Ridge Road" 1st row	1	57	70.3	13.3	66	4.3	64.3	6	63.2	7.1	61.5	8.8	63.3	7	
Site 191 - Vac Lot 55 Upper River Road" 1st row	1	57	59.2	2.2	50.3	8.9	49.7	9.5	49.1	10.1	48.6	10.6	50.2	9	
Site 192 - Vac Lot 56 Upper River Road"	1	57	58.2	1.2	49	9.2	48.4	9.8	47.8	10.4	47.3	10.9	49.3	8.9	
Site 193 - Vac Lot 57 Upper River Road"	1	57	57.4	0.4	48.7	8.7	48.1	9.3	47.7	9.7	47.2	10.2	49.4	8	
Site 194 - Vac Lot 58 Upper River Road"	1	57	56.5	-0.5	48.6	7.9	48.1	8.4	47.7	8.8	47.3	9.2	49.5	7	
Cost/Benefit Calculations	COST/BENEFIT CALCULATIONS														
	190+00 to 250+00					6206	\$3,691,440	6206	\$4,101,600	6206	\$4,511,760	6206	\$4,921,920		
	200+00 to 240+00													4275	\$2,619,429
	TOTAL						\$3,691,440		\$4,101,600		\$4,511,760		\$4,921,920		\$2,619,429
	Cost/Benefited Residence						\$335,585		\$273,440		\$187,990		\$189,305		\$174,629
	Impacted/Benefited/over 7 dBA			9 Impacted			11 Benefited > 5 dBA	6 Benefited > 7 dBA	15 Benefited > 5 dBA	8 Benefited > 7 dBA	24 Benefited > 5 dBA	11 Benefited > 7 dBA	26 Benefited > 5 dBA	15 Benefited > 7 dBA	15 Benefited > 5 dBA
% of 1st row that get 7 dBA (goal 50%)							33%		50%		67%		67%		50%
% of the impacted that would be benefited (goal 50%)							33%		67%		78%		89%		67%

Notes:
 Pink highlights - represent an impact (66 dBA or more or substantial increase)
 Dark green highlights - benefit of 7 dBA or more
 Light green highlights - benefit of 5 dBA or more



APPENDIX C – MODELED BARRIER LOCATIONS



0' 100' 200'

NSA 8

185+00

190+00

195+00

200+00

205+00

210+00

BARRIER 9

