EXHIBIT C

# ADDENDUM TO THE SOUND LEVEL ASSESSMENT

# CROCKER WIND FARM

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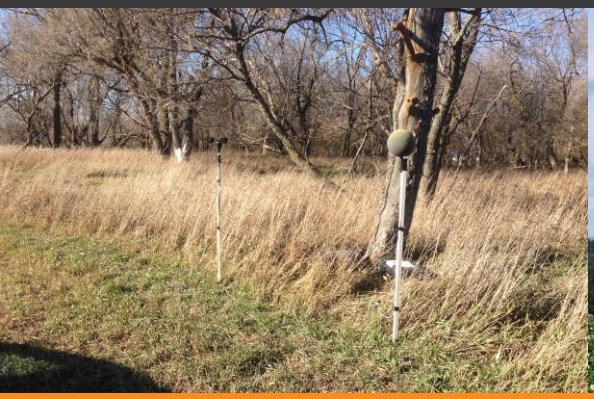
**8.2.2018**



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# 1.0 INTRODUCTION

This is an addendum to the Sound Level Assessment for Crocker Wind Farm dated December 13, 2017. The purpose of this addendum is to provide sound propagation model results for the first phase of wind turbines (Phase 1) for Crocker Wind Farm, LLC which is planned for 200 MW and up to 77 turbines.

The updates included in this addendum are an updated turbine layout for Phase 1, an updated residential dataset, and the proposed turbine model, GE 2.7-116 LNTE with a turbine output of 2.7 MW and a hub height of 90 meters. A map of the project showing only the Phase 1 turbines is provided in Figure 1. The Figure shows a total of 84 turbine locations because it includes the primary locations (shown in white) and the alternate locations (shown in dark green). While only 77 turbines would be installed, we have analyzed the sound levels for this assessment of all 84 turbines operating simultaneously.

Included in this addendum are:

- Sound propagation modeling procedures and results; and
- Conclusions.

The Sound Level Assessment from December 2017 also included information on noise standards, background sound level measurements and a primer on the science of sound. Readers should refer to that document for information on those topics.

The information presented in this report leads us to conclude that the proposed Crocker Wind Farm can be constructed and operated in such a way as to comply with the Clark County noise limits and the noise limits in the Order[1] issued by the South Dakota Public Utilities Commission (PUC) for Crocker Wind Farm.

[1] SD PUC, "Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry", EL17-055, June 12, 2018.

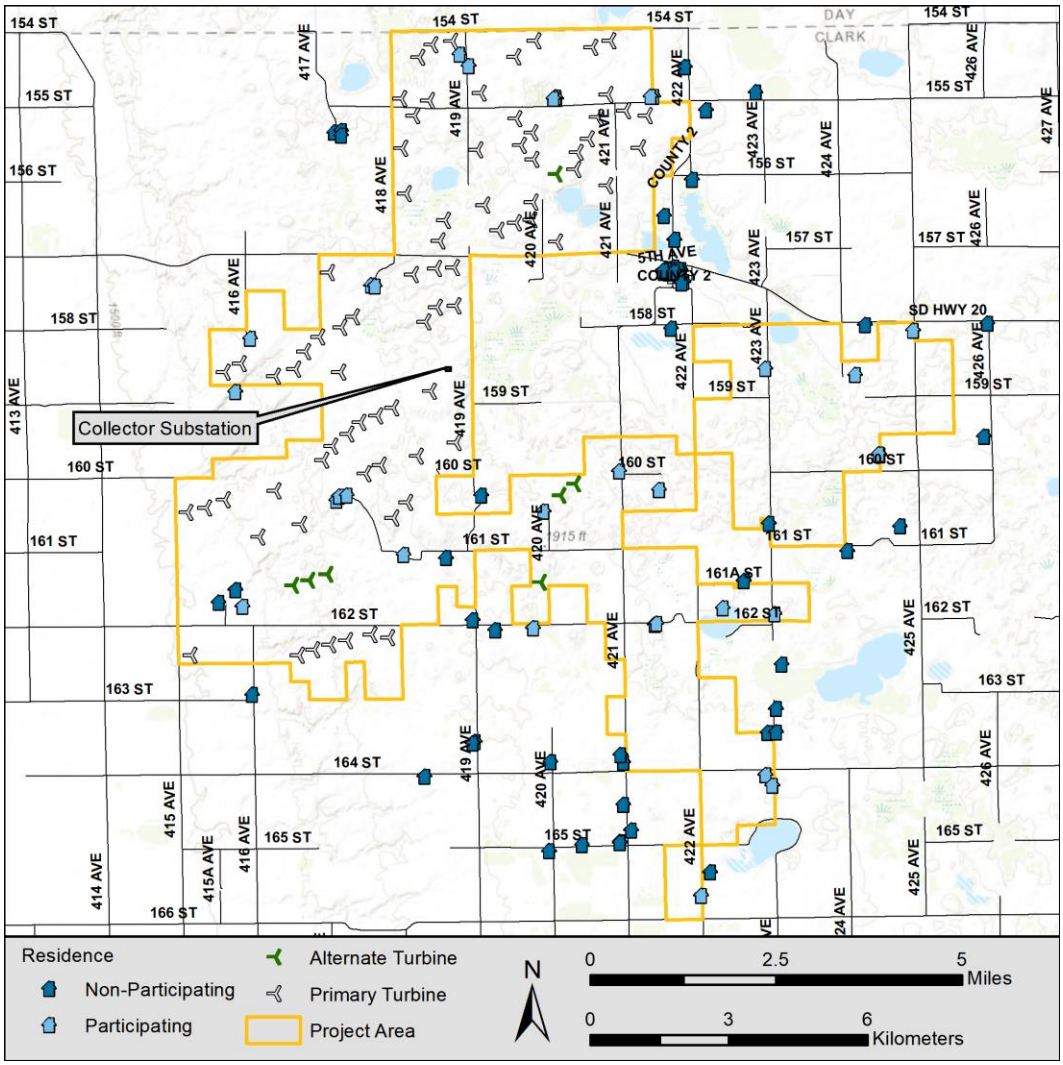


**FIGURE 1: CROCKER WIND FARM AREA MAP (PHASE 1)**

## 2.0 SOUND PROPAGATION MODELING

Modeling conducted for this addendum was conducted in the same manner as modeling conducted for the Sound Level Assessment from December 2017.

### 2.1 | MODELING PROCEDURES

Modeling for the project was in accordance with the standard ISO 9613-2, "Acoustics – Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation." The ISO standard states,

> This part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level … under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation … or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.

The model takes into account source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain. The acoustical modeling software used here was CadnaA, from Datakustik GmbH. CadnaA is a widely accepted acoustical propagation modeling tool, used by many noise control professionals in the United States and internationally.

ISO 9613-2 also assumes downwind sound propagation between every source and every receiver, consequently, all wind directions, including the prevailing wind directions, are taken into account.

Model input parameters are listed in Appendix A including the modeled sound power spectrum for the proposed turbine model, GE 2.7-116 LNTE.

For this analysis, we utilized a ground absorption factor for mixed porous and hard ground of G = 0.5. A 2 dB uncertainty factor was added to the turbine sound power per typical manufacturer specifications.

Two distinct receiver heights are included in the analysis. Residences[2] are modeled as discrete receivers at 4 meters (13 feet) above ground level. The 4-meter (13-foot) receiver height mimics the height of a second-story window. The sound pressure level contours in Figure 2 are calculated at a height of 1.5 meters (5 feet), to represent average listening height outside of homes.

A search distance up to 8,000 meters (5 miles) allows for the contributions of distant turbines to be considered at receivers. The contribution of distant turbines will depend on the geometry and geography of the project.

[2] There are no off-site businesses or governmental buildings in the relevant modeling area.

## 2.2 | MODEL RESULTS

A summary of the sound propagation model results is provided in Table 1, and Appendix B provides a list of the calculated overall sound pressure levels at each receiver and a map showing all receiver identification numbers for reference in the chart.

As shown in Table 1, all residences are projected at 50 dBA or less, and all non-participating residences are projected at 41 dBA or less from the proposed project. The average across all residences is 32 dBA.

**TABLE 1: MODEL RESULTS SUMMARY FOR THE GE 2.7-116 LNTE**

| Residence Classification | Avg. Leq | Max. Leq | Min. Leq |
|---|---|---|---|
| All | 32 dBA | 50 dBA | 9 dBA |
| Participating | 35 dBA | 50 dBA | 11 dBA |
| Non-Participating | 30 dBA | 41 dBA | 9 dBA |

Model results are also shown in Figure 2 in a contour line map format. Results are presented as contour lines representing 5-dB increments of calculated A-weighted sound pressure levels.

At some receivers in Appendix B and some areas shown in Figure 2, sound levels are expected to be less than those shown since all 84 turbines (primary and alternate locations) were included in the model and only 77 are planned to be installed.

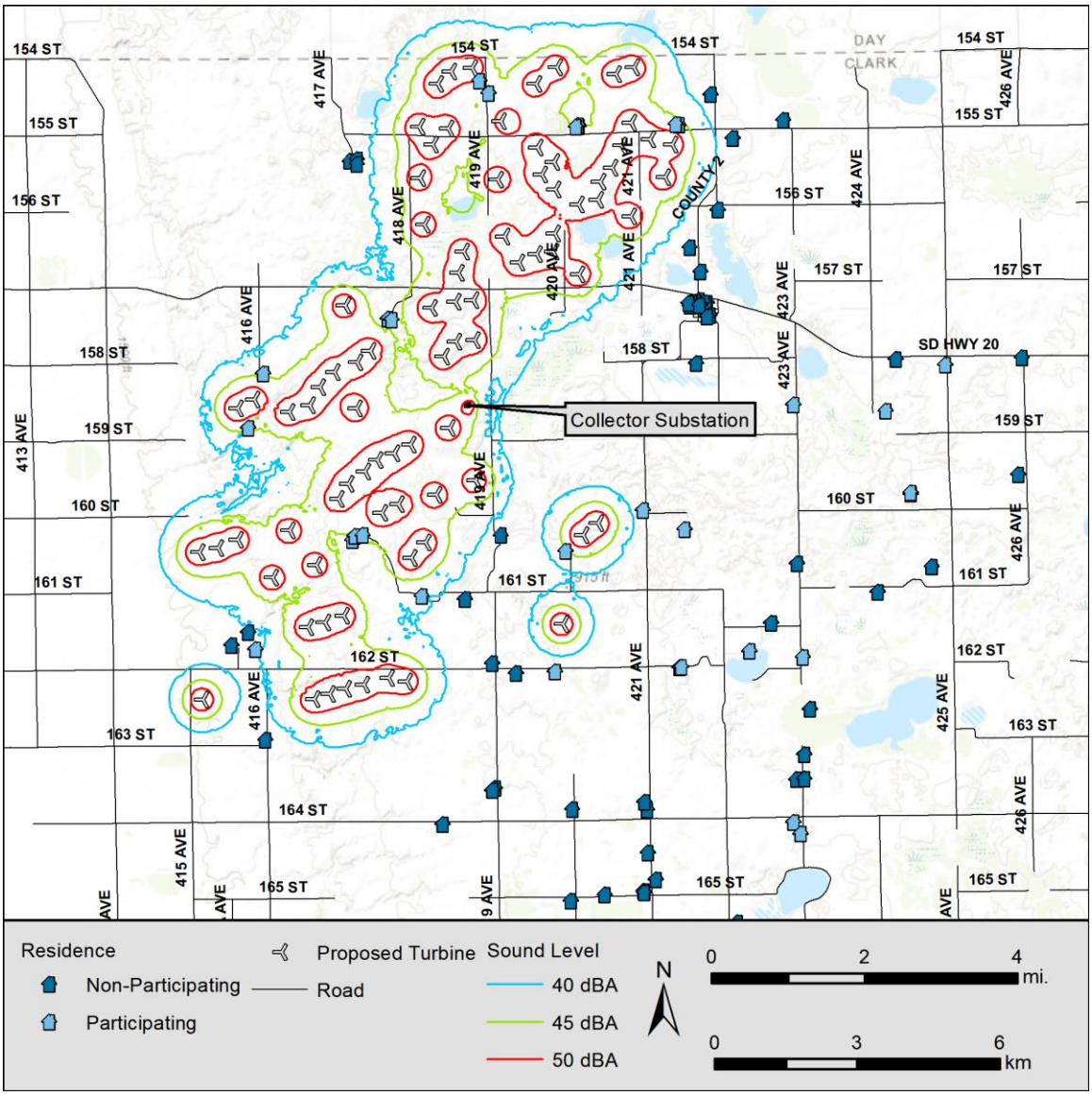


**FIGURE 2: SOUND PROPAGATION MODELING RESULTS FOR GE 2.7-116 LNTE**

## 3.0 CONCLUSIONS

Sound propagation modeling was updated for Crocker Wind Farm utilizing only Phase 1 turbine locations, an updated residential dataset, and the propose turbine model, GE 2.7-116 LNTE with a turbine output of 2.7 MW and a hub height of 90 meters. Conclusions of this addendum are as follows:

1. Projected sound levels from the project are 50 dBA or less at all residences, 41 dBA or less at all non-participating residences, and the average sound level (Leq) across all residences is 32 dBA.
2. These projected sound levels meet the Clark County sound level limit of 50 dBA equivalent continuous sound pressure level (Leq) at residences and the condition limits in the PUC Order which are:
    a. 45 dBA, long-term average sound pressure level (equivalent continuous sound level, Leq), at non-participating residences; and
    b. 50 dBA, long-term average sound pressure level (equivalent continuous sound level, Leq), at participating residences.

# APPENDIX A: SOURCE INFORMATION

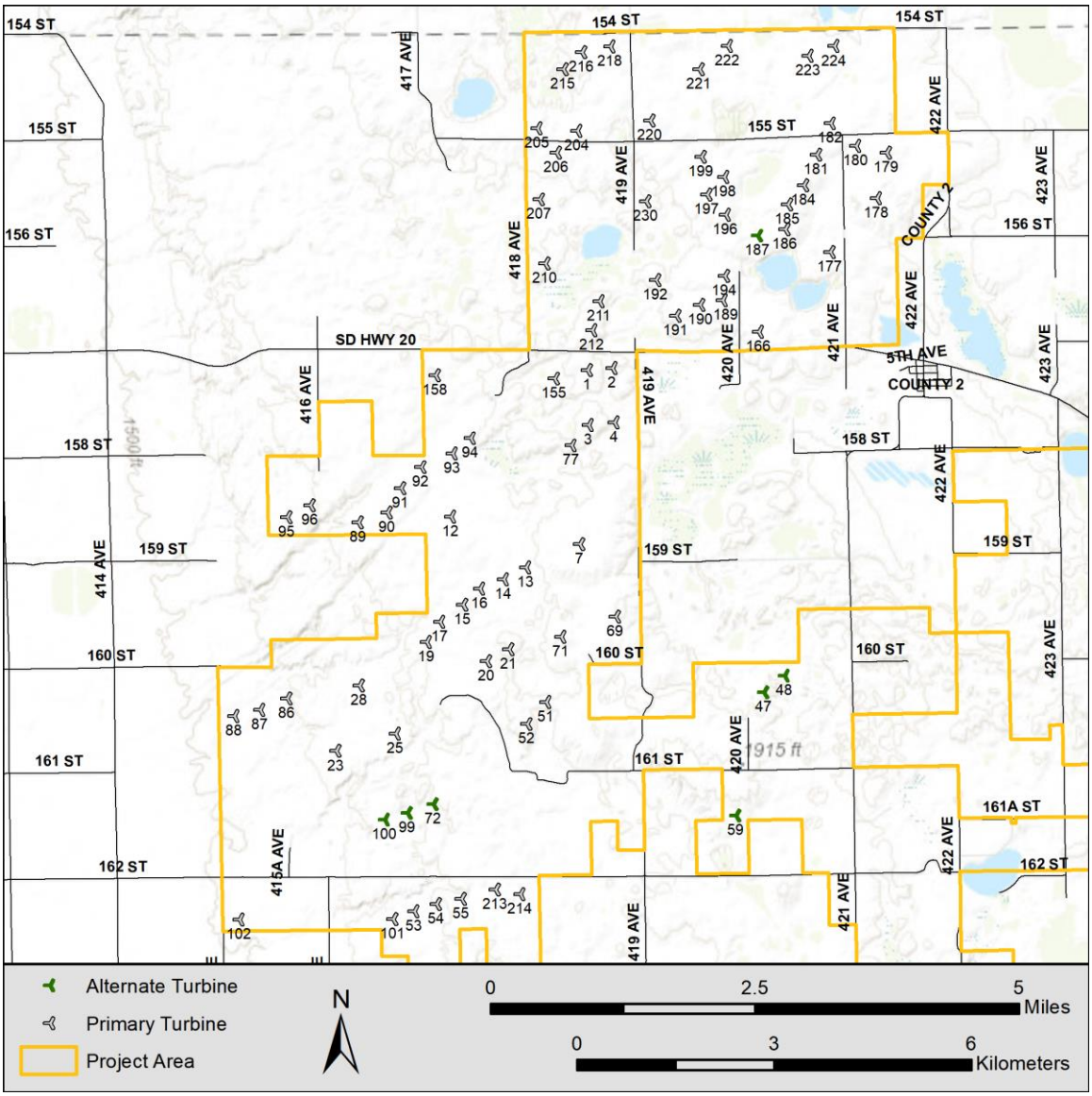


**FIGURE 3: SOURCE LOCATIONS**

**TABLE 2: SOUND PROPAGATION MODELING PARAMETERS**

| Parameter | Setting |
|---|---|
| Ground Absorption | Spectral for all sources, Mixed Ground (G=0.5) |
| Atmospheric Attenuation | Based on 10 Degrees Celsius, 70% Relative Humidity |
| Reflections | None |
| Receiver Height | 4 meters for residences, 1.5 meters for grid |
| Search Distance | 8,000 meters |

**TABLE 3: 1/1 OCTAVE BAND MODELED TURBINE SPECTRUM (dBZ UNLESS OTHERWISE INDICATED)[3]**

| Sound Source | 1/1 Octave Band Center Frequency | | | | | | | | | Sum (dBA) | Sum (dBZ) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 31.5 Hz | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | | |
| GE 2.7-116 LNTE | 119 | 116 | 110 | 106 | 104 | 103 | 100 | 92 | 76 | 107.5 | 121.3 |

**TABLE 4: MODELED TURBINE SOUND POWER LEVEL & LOCATIONS**

| Source ID | GE 2.7-116 LNTE - Modeled Sound Power (dBA) | Coordinates (UTM NAD 83 Z14N) | | |
|---|---|---|---|---|
| | | X (m) | Y (m) | Z (m) |
| 1 | 109.5 | 590446 | 4995368 | 651 |
| 2 | 109.5 | 590826 | 4995399 | 636 |
| 3 | 109.5 | 590462 | 4994532 | 650 |
| 4 | 109.5 | 590856 | 4994567 | 638 |
| 7 | 109.5 | 590325 | 4992719 | 662 |
| 12 | 109.5 | 588367 | 4993133 | 633 |
| 13 | 109.5 | 589507 | 4992362 | 636 |
| 14 | 109.5 | 589170 | 4992179 | 635 |
| 15 | 109.5 | 588544 | 4991795 | 634 |
| 16 | 109.5 | 588805 | 4992040 | 633 |
| 17 | 109.5 | 588196 | 4991533 | 621 |
| 19 | 109.5 | 587993 | 4991224 | 616 |
| 20 | 109.5 | 588910 | 4990931 | 618 |
| 21 | 109.5 | 589252 | 4991113 | 639 |
| 23 | 109.5 | 586613 | 4989565 | 589 |
| 25 | 109.5 | 587518 | 4989827 | 605 |
| 28 | 109.5 | 586966 | 4990561 | 598 |
| 47 | 109.5 | 593136 | 4990460 | 641 |
| 48 | 109.5 | 593455 | 4990714 | 636 |
| 51 | 109.5 | 589815 | 4990311 | 647 |
| 52 | 109.5 | 589526 | 4989977 | 656 |
| 53 | 109.5 | 587806 | 4987122 | 600 |
| 54 | 109.5 | 588146 | 4987232 | 609 |
| 55 | 109.5 | 588519 | 4987316 | 612 |
| 59 | 109.5 | 592709 | 4988584 | 662 |
| 69 | 109.5 | 590874 | 4991609 | 668 |
| 71 | 109.5 | 590045 | 4991307 | 658 |
| 72 | 109.5 | 588098 | 4988758 | 606 |

[3] LNTE stand for Low Noise Trailing Edges.

| Source ID | GE 2.7-116 LNTE - Modeled Sound Power (dBA) | Coordinates (UTM NAD 83 Z14N) | | |
|---|---|---|---|---|
| | | X (m) | Y (m) | Z (m) |
| 77 | 109.5 | 590206 | 4994221 | 647 |
| 86 | 109.5 | 585866 | 4990367 | 576 |
| 87 | 109.5 | 585455 | 4990192 | 564 |
| 88 | 109.5 | 585058 | 4990096 | 553 |
| 89 | 109.5 | 586955 | 4993047 | 622 |
| 90 | 109.5 | 587393 | 4993196 | 623 |
| 91 | 109.5 | 587601 | 4993573 | 626 |
| 92 | 109.5 | 587904 | 4993894 | 626 |
| 93 | 109.5 | 588385 | 4994100 | 635 |
| 94 | 109.5 | 588666 | 4994332 | 634 |
| 95 | 109.5 | 585865 | 4993126 | 610 |
| 96 | 109.5 | 586215 | 4993311 | 601 |
| 99 | 109.5 | 587704 | 4988626 | 595 |
| 100 | 109.5 | 587352 | 4988518 | 597 |
| 101 | 109.5 | 587479 | 4987004 | 591 |
| 102 | 109.5 | 585141 | 4987001 | 551 |
| 155 | 109.5 | 589945 | 4995242 | 638 |
| 158 | 109.5 | 588128 | 4995289 | 642 |
| 166 | 109.5 | 593055 | 4995948 | 659 |
| 177 | 109.5 | 594145 | 4997168 | 653 |
| 178 | 109.5 | 594854 | 4997989 | 669 |
| 179 | 109.5 | 595007 | 4998682 | 665 |
| 180 | 109.5 | 594540 | 4998788 | 656 |
| 181 | 109.5 | 593942 | 4998652 | 659 |
| 182 | 109.5 | 594154 | 4999135 | 661 |
| 184 | 109.5 | 593745 | 4998184 | 667 |
| 185 | 109.5 | 593500 | 4997892 | 666 |
| 186 | 109.5 | 593460 | 4997515 | 666 |
| 187 | 109.5 | 593045 | 4997421 | 646 |
| 189 | 109.5 | 592505 | 4996430 | 658 |
| 190 | 109.5 | 592161 | 4996366 | 655 |
| 191 | 109.5 | 591793 | 4996200 | 651 |
| 192 | 109.5 | 591487 | 4996743 | 650 |
| 194 | 109.5 | 592535 | 4996808 | 661 |
| 196 | 109.5 | 592552 | 4997736 | 660 |
| 197 | 109.5 | 592271 | 4998045 | 659 |
| 198 | 109.5 | 592527 | 4998310 | 660 |
| 199 | 109.5 | 592182 | 4998619 | 652 |
| 204 | 109.5 | 590293 | 4999012 | 655 |
| 205 | 109.5 | 589685 | 4999053 | 659 |
| 206 | 109.5 | 589971 | 4998678 | 655 |

| Source ID | GE 2.7-116 LNTE - Modeled Sound Power (dBA) | Coordinates (UTM NAD 83 Z14N) | | |
|---|---|---|---|---|
| | | X (m) | Y (m) | Z (m) |
| 207 | 109.5 | 589710 | 4997974 | 642 |
| 210 | 109.5 | 589797 | 4996996 | 642 |
| 211 | 109.5 | 590628 | 4996420 | 646 |
| 212 | 109.5 | 590518 | 4995975 | 653 |
| 213 | 109.5 | 589046 | 4987452 | 620 |
| 214 | 109.5 | 589425 | 4987382 | 627 |
| 215 | 109.5 | 590078 | 4999950 | 643 |
| 216 | 109.5 | 590363 | 5000214 | 642 |
| 218 | 109.5 | 590797 | 5000295 | 657 |
| 220 | 109.5 | 591564 | 4999175 | 657 |
| 221 | 109.5 | 592152 | 4999950 | 657 |
| 222 | 109.5 | 592588 | 5000305 | 649 |
| 223 | 109.5 | 593819 | 5000160 | 647 |
| 224 | 109.5 | 594210 | 5000303 | 646 |
| 230 | 109.5 | 591342 | 4997941 | 639 |
| Transformer 1 | 102.9 | 590756 | 4993157 | 574 |
| Transformer 2 | 102.9 | 590723 | 4993159 | 573 |

# APPENDIX B: RECEIVER INFORMATION

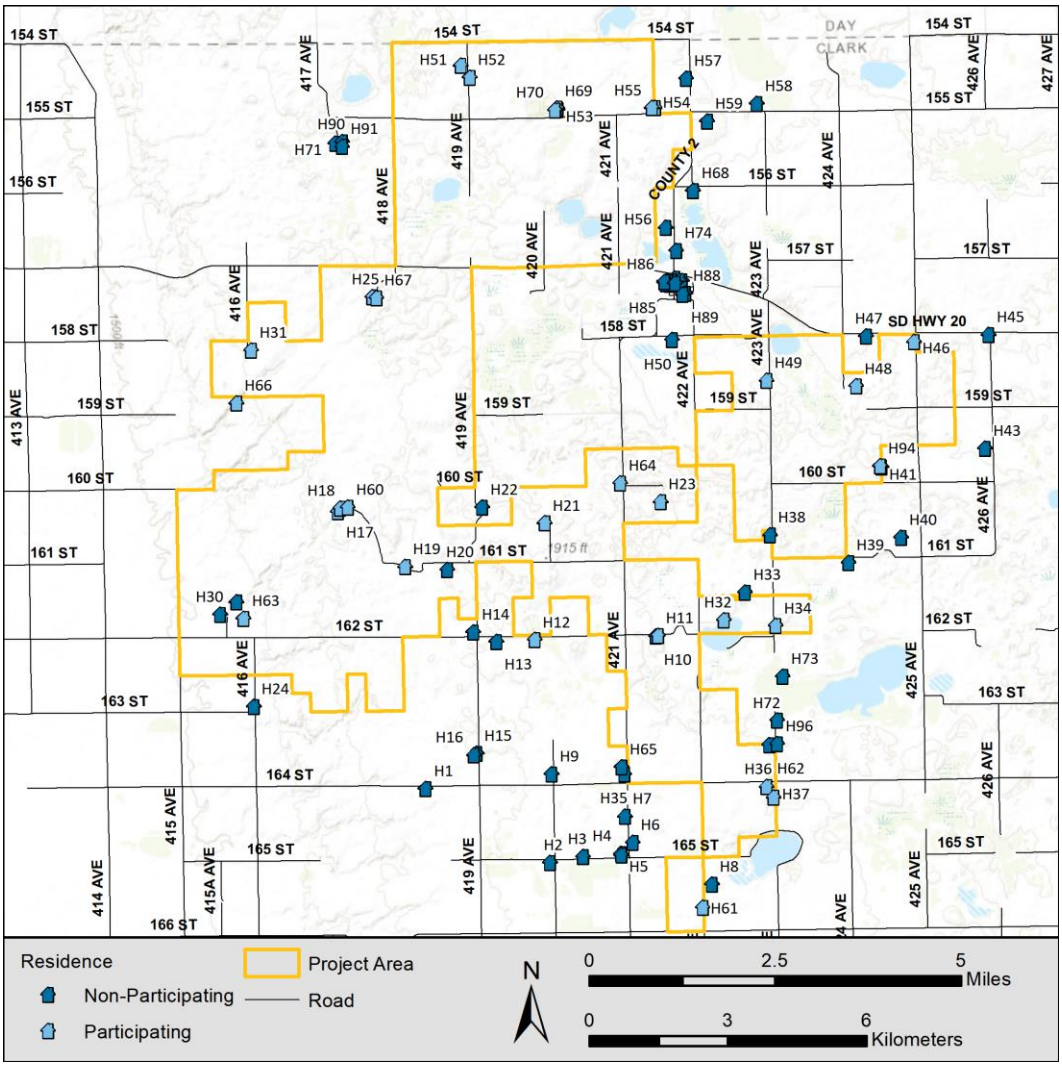


**FIGURE 4: RECEIVER LOCATIONS AND SOUND PROPAGATION MODELING RESULTS**

**TABLE 5: DISCRETE RECEIVER RESULTS**

| Receiver ID | Receiver Status | Modeled Sound Pressure Level (dBA) | Relative Height (m) | Coordinates (UTM NAD83 Z14N) | | |
|---|---|---|---|---|---|---|
| | | | | X (m) | Y (m) | Z (m) |
| H1 | Non-Participating | 31 | 4 | 590214 | 4984376 | 546 |
| H2 | Non-Participating | 23 | 4 | 592904 | 4982768 | 566 |
| H3 | Non-Participating | 20 | 4 | 593620 | 4982900 | 566 |
| H4 | Non-Participating | 19 | 4 | 594437 | 4982966 | 578 |
| H5 | Non-Participating | 17 | 4 | 594440 | 4982939 | 578 |

| Receiver ID | Receiver Status | Modeled Sound Pressure Level (dBA) | Relative Height (m) | Coordinates (UTM NAD83 Z14N) | | |
|---|---|---|---|---|---|---|
| | | | | X (m) | Y (m) | Z (m) |
| H6 | Non-Participating | 21 | 4 | 594692 | 4983211 | 579 |
| H7 | Non-Participating | 22 | 4 | 594518 | 4983774 | 579 |
| H8 | Non-Participating | 9 | 4 | 596399 | 4982306 | 575 |
| H9 | Non-Participating | 27 | 4 | 592935 | 4984692 | 567 |
| H10 | Participating | 24 | 4 | 595191 | 4987671 | 547 |
| H11 | Participating | 24 | 4 | 595234 | 4987683 | 545 |
| H12 | Participating | 38 | 4 | 592571 | 4987592 | 563 |
| H13 | Non-Participating | 36 | 4 | 591744 | 4987551 | 558 |
| H14 | Non-Participating | 37 | 4 | 591249 | 4987762 | 551 |
| H15 | Non-Participating | 29 | 4 | 591308 | 4985134 | 553 |
| H16 | Non-Participating | 30 | 4 | 591253 | 4985098 | 552 |
| H17 | Participating | 46 | 4 | 588306 | 4990357 | 527 |
| H18 | Participating | 46 | 4 | 588362 | 4990440 | 529 |
| H19 | Participating | 43 | 4 | 589764 | 4989175 | 547 |
| H20 | Non-Participating | 38 | 4 | 590677 | 4989109 | 553 |
| H21 | Participating | 45 | 4 | 592787 | 4990119 | 556 |
| H22 | Non-Participating | 40 | 4 | 591433 | 4990460 | 553 |
| H23 | Participating | 32 | 4 | 595289 | 4990578 | 556 |
| H24 | Non-Participating | 39 | 4 | 586482 | 4986149 | 483 |
| H25 | Participating | 46 | 4 | 589052 | 4995012 | 560 |
| H29 | Non-Participating | 41 | 4 | 586122 | 4988415 | 479 |
| H30 | Non-Participating | 40 | 4 | 585758 | 4988140 | 475 |
| H31 | Participating | 46 | 4 | 586436 | 4993857 | 529 |
| H32 | Participating | 25 | 4 | 596670 | 4988022 | 545 |
| H33 | Non-Participating | 24 | 4 | 597127 | 4988614 | 547 |
| H34 | Participating | 18 | 4 | 597789 | 4987895 | 548 |
| H35 | Non-Participating | 20 | 4 | 594514 | 4984684 | 575 |
| H36 | Participating | 12 | 4 | 597594 | 4984416 | 553 |
| H37 | Participating | 16 | 4 | 597744 | 4984181 | 553 |
| H38 | Non-Participating | 19 | 4 | 597663 | 4989857 | 549 |
| H39 | Non-Participating | 17 | 4 | 599365 | 4989264 | 549 |
| H40 | Non-Participating | 14 | 4 | 600501 | 4989800 | 544 |
| H41 | Participating | 17 | 4 | 600067 | 4991330 | 560 |
| H43 | Non-Participating | <9 | 4 | 602317 | 4991734 | 549 |
| H45 | Non-Participating | <9 | 4 | 602396 | 4994190 | 560 |
| H46 | Participating | 18 | 4 | 600783 | 4994038 | 562 |
| H47 | Non-Participating | 18 | 4 | 599751 | 4994157 | 558 |
| H48 | Participating | 18 | 4 | 599531 | 4993078 | 547 |
| H49 | Participating | 29 | 4 | 597588 | 4993203 | 554 |

| Receiver ID | Receiver Status | Modeled Sound Pressure Level (dBA) | Relative Height (m) | Coordinates (UTM NAD83 Z14N) | | |
|---|---|---|---|---|---|---|
| | | | | X (m) | Y (m) | Z (m) |
| H50 | Non-Participating | 34 | 4 | 595548 | 4994076 | 551 |
| H51 | Participating | 50 | 4 | 590972 | 5000014 | 567 |
| H52 | Participating | 47 | 4 | 591168 | 4999758 | 562 |
| H53 | Participating | 47 | 4 | 593070 | 4999056 | 565 |
| H54 | Participating | 48 | 4 | 595172 | 4999096 | 573 |
| H55 | Participating | 48 | 4 | 595105 | 4999100 | 575 |
| H56 | Non-Participating | 35 | 4 | 595404 | 4996511 | 558 |
| H57 | Non-Participating | 39 | 4 | 595848 | 4999736 | 564 |
| H58 | Non-Participating | 34 | 4 | 597375 | 4999190 | 552 |
| H59 | Non-Participating | 39 | 4 | 596303 | 4998806 | 568 |
| H60 | Participating | 47 | 4 | 588527 | 4990461 | 530 |
| H61 | Participating | 11 | 4 | 596207 | 4981798 | 572 |
| H62 | Non-Participating | 16 | 4 | 597640 | 4985323 | 551 |
| H63 | Participating | 41 | 4 | 586274 | 4988056 | 482 |
| H64 | Participating | 39 | 4 | 594425 | 4990983 | 562 |
| H65 | Non-Participating | 19 | 4 | 594453 | 4984844 | 576 |
| H66 | Participating | 47 | 4 | 586112 | 4992711 | 509 |
| H67 | Participating | 45 | 4 | 589138 | 4994988 | 556 |
| H68 | Non-Participating | 38 | 4 | 596005 | 4997305 | 546 |
| H69 | Participating | 46 | 4 | 593049 | 4999085 | 565 |
| H70 | Participating | 47 | 4 | 593007 | 4999048 | 564 |
| H71 | Non-Participating | 39 | 4 | 588255 | 4998326 | 546 |
| H72 | Non-Participating | 18 | 4 | 597824 | 4985846 | 548 |
| H73 | Non-Participating | 19 | 4 | 597941 | 4986803 | 543 |
| H74 | Non-Participating | 37 | 4 | 595632 | 4996006 | 552 |
| H75 | Non-Participating | 35 | 4 | 595760 | 4995351 | 553 |
| H76 | Non-Participating | 36 | 4 | 595603 | 4995405 | 553 |
| H77 | Non-Participating | 36 | 4 | 595521 | 4995356 | 552 |
| H78 | Non-Participating | 35 | 4 | 595551 | 4995280 | 550 |
| H79 | Non-Participating | 36 | 4 | 595498 | 4995279 | 551 |
| H80 | Non-Participating | 36 | 4 | 595447 | 4995369 | 552 |
| H81 | Non-Participating | 36 | 4 | 595449 | 4995337 | 551 |
| H82 | Non-Participating | 35 | 4 | 595704 | 4995308 | 551 |
| H83 | Non-Participating | 35 | 4 | 595709 | 4995351 | 552 |
| H84 | Non-Participating | 35 | 4 | 595767 | 4995197 | 551 |
| H85 | Non-Participating | 36 | 4 | 595400 | 4995287 | 551 |
| H86 | Non-Participating | 36 | 4 | 595386 | 4995334 | 551 |
| H87 | Non-Participating | 35 | 4 | 595614 | 4995299 | 550 |
| H88 | Non-Participating | 35 | 4 | 595826 | 4995087 | 550 |

| Receiver ID | Receiver Status | Modeled Sound Pressure Level (dBA) | Relative Height (m) | Coordinates (UTM NAD83 Z14N) | | |
|---|---|---|---|---|---|---|
| | | | | X (m) | Y (m) | Z (m) |
| H89 | Non-Participating | 35 | 4 | 595777 | 4995057 | 549 |
| H90 | Non-Participating | 40 | 4 | 588407 | 4998361 | 551 |
| H91 | Non-Participating | 39 | 4 | 588407 | 4998261 | 548 |
| H94 | Participating | 17 | 4 | 600048 | 4991352 | 560 |
| H96 | Non-Participating | 18 | 4 | 597825 | 4985337 | 551 |