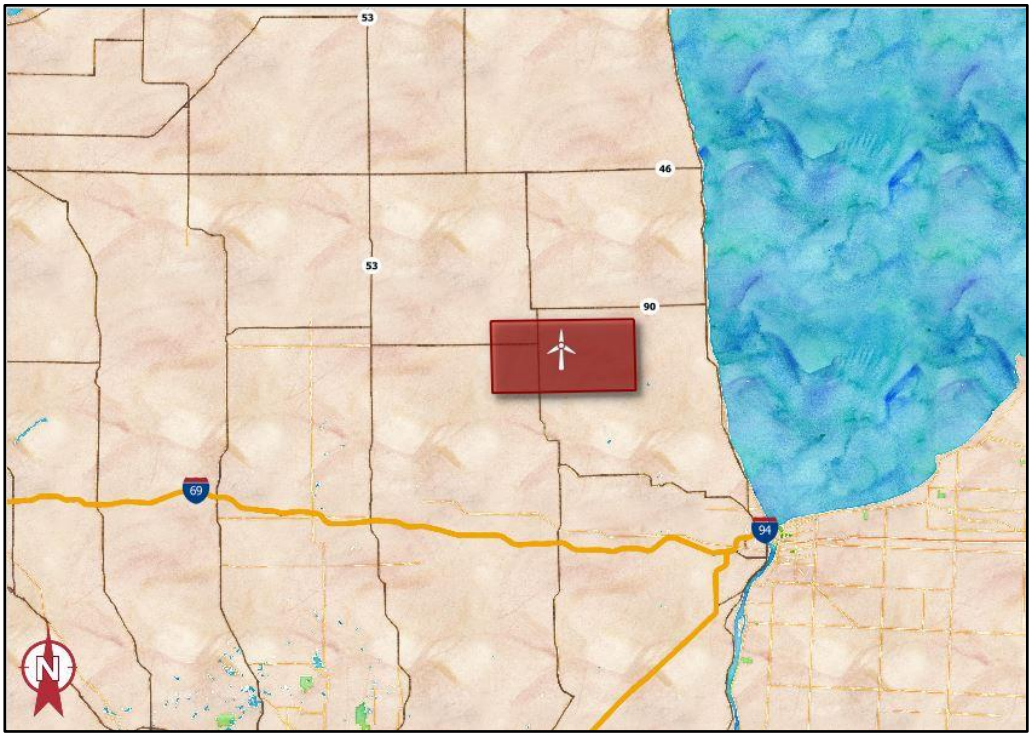
Appendix E: Sound Report

Pre-Construction Wind Turbine Noise Analysis

for the proposed

Riverbend Wind Project
Fremont Township Michigan

September 2, 2022



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HANKARD ENVIRONMENTAL
ACOUSTICS AND VIBRATION CONSULTING

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1. Introduction

This report describes the pre-construction noise analysis conducted by Hankard Environmental for the proposed Riverbend Wind project (Project, Facility). The analysis was conducted at the request of the Project proponent, Algonquin Power (Riverbend Wind), LLC, for the purpose of demonstrating that the Project has been designed to meet the Fremont Township Ordinance noise limits. The Project is expected to produce up to 300 megawatts (MW) of electrical power using 50 wind turbines, all of which are to be located in Sanilac County, Michigan. This analysis includes noise from each of three potential Project layout scenarios, and up to 56 turbines. Only 50 wind turbines will ultimately be constructed upon final design. Also included in the analysis is noise from the Project substation. Figure 1-1 shows the general location of the Project, which is approximately 60 miles northeast of Detroit, Michigan.

Described herein are the applicable noise standards, the Project and its environs, the methods and data used to predict noise levels, and the results of the noise level predictions demonstrating compliance with the Fremont Township Ordinance.

Figure 1-1. General Location of the Proposed Riverbend Wind Energy Center

2. Applicable Noise Standards

There are no federal or state noise laws, rules, or regulations applicable to the Project. Fremont Township, Michigan does have zoning ordinances which are applicable to the project. Fremont Township, Michigan *Zoning Ordinance No. 100, Section 13.12 PUBLIC SERVICE FACILITIES, COMMUNICATION TOWERS, AND WIND ENERGY CONVERSION SYSTEMS 14. (a) Noise Emissions* states:

> *Noise emissions from the operation of a WECS and Testing Facility shall not exceed forty-five (45) decibels on the DBA scale as measured at the nearest property line of a non-Participating Property or road. A baseline noise emission study of the proposed site and impact upon all areas within one mile of the proposed WECS and/or Testing Facility location must be done (at the WECS Applicant's cost) prior to any placement of a WECS and/or Testing Facility and submitted to the Township. The WECS Applicant must also provide estimated noise levels to property lines at the time of Special Land Use application.*

As described in more detail in the following sections, a noise model was created that predicts noise levels from the Project assuming full operations and full acoustic output under normal operating conditions. This model was used to predict noise levels at the exterior of all (both participating and non-participating) principal structures (i.e., residences) in Fremont Township that are located within approximately one mile of any potential Project wind turbine location or the substation. Additionally, predicted noise level contours were compared against the locations of non-participating parcels and roads to determine compliance with the 45 dBA property line noise limit.

3. Project Description

The Project plans to construct 50 wind turbines across Speaker and Fremont Townships, generating up to 300 MW of electric power. This analysis considered three different turbine layouts (Layouts 16, 25, and 16a) which contain up to 56 proposed wind turbine locations. Layouts 16 and 16a include a total of 30 wind turbines in Fremont Township. Layout 25 includes 25 wind turbines in Fremont Township. Associated facilities include gravel access roads, underground cabling, and a substation.

The analyses consider a 6.0-MW turbine with 162-meter rotor diameter (162-6.0) and a 4.5-MW turbine with a 163-meter rotor diameter (163-4.5), such as those manufactured by Vestas. Layouts 16 and 25 utilize 162-6.0 turbines with hub-heights of 119 meters. Layout 16a will consist of both 162-6.0 and 163-4.5 turbines with hub-heights of 119 and 118.5, respectively.

All turbines will be fitted with Serrated Trailing Edge (STE) blades. The substation includes two 150 megavolt ampere (MVA) step-up transformers and is located in Fremont Township. As an example, Figure 3-1 shows the locations of the proposed wind turbines and substation for Layout 16a (other layouts shown in subsequent sections). A table of all Project noise source locations for each turbine layout is provided in Appendix A.

Figure 3-1. Turbine Layout 16a

4. Noise Modeling Method

Noise levels from the proposed Project were predicted using the method set forth in International Organization for Standardization (ISO) Standard 9613-2:1996 - *Attenuation of Sound During Propagation Outdoors*. The method was implemented using the SoundPLAN v8.2 acoustical modeling program. Figure 4-1 shows a representative three-dimensional view of the SoundPLAN model of the Project.

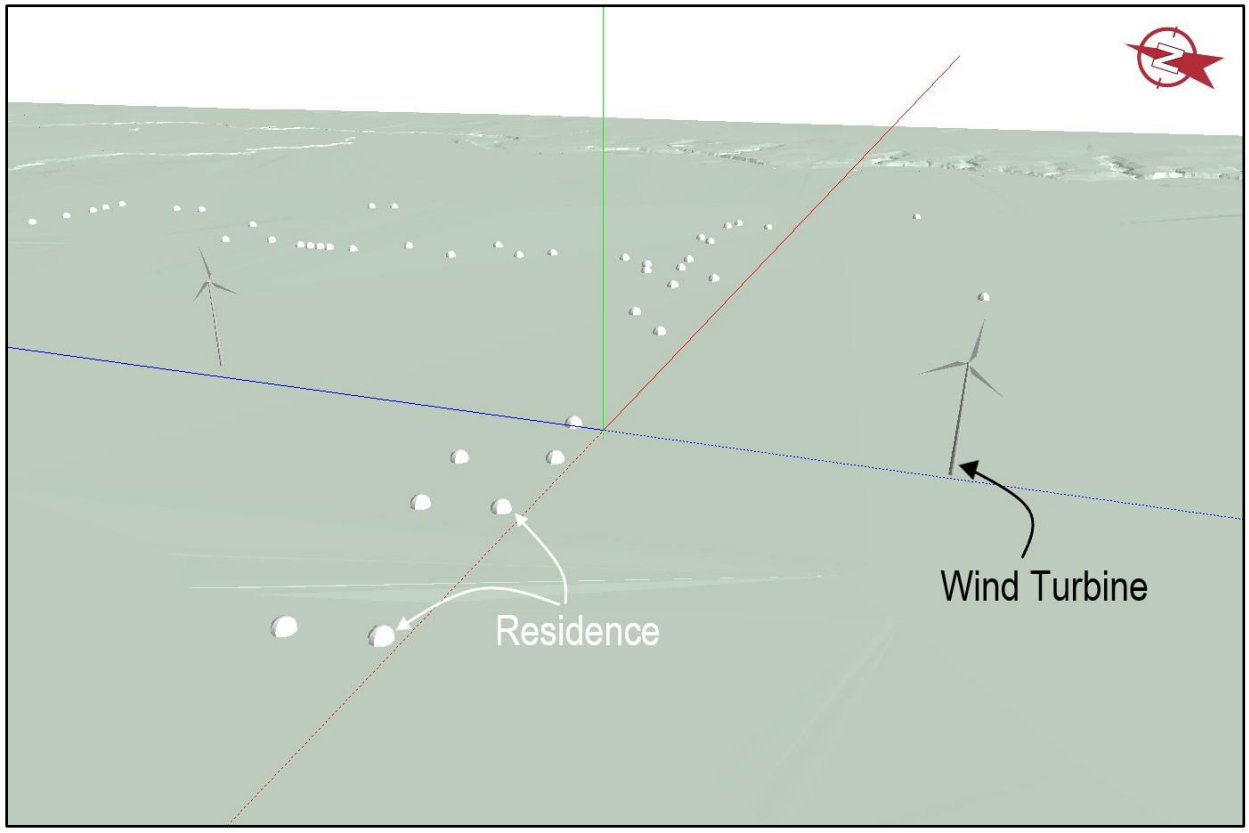

Figure 4-1. Three-Dimensional View of the SoundPLAN Noise Model

The ISO 9613-2:1996 method requires input data and the setting of certain parameters, including the locations of the noise sources and receivers, noise emission factors including frequency characteristics, terrain and ground type, and atmospheric propagation conditions. In general, the ISO method assumes optimal acoustic propagation in all directions, specifically that a "well-developed, moderate ground-based temperature inversion" is present or, equivalently, that all receptors are downwind of all noise sources at all times. The specific ISO 9613-2:1996 settings and input data used in this analysis are described below.

Receptors

In the SoundPLAN model receptor points were located at each of the 336 residences (including 69 participants and 267 non-participants) in Fremont Township. The geographic locations of the

receptors were obtained from the Project. All receptors within approximately one mile of any potential Project wind turbine location were included in the analysis. Each receptor's height was set to 1.5 meters (5 feet) above the ground. The location of each receptor is provided in Appendix B. Predicted noise level contours were also generated to show compliance with the 45 dBA limit. In accordance with ISO 9613-2:1996, the height above ground for the noise level contours was also set to five feet.

Noise Sources

In the SoundPLAN model, each turbine was represented as an acoustical point source located at its hub height that propagates noise assuming no directivity, meaning the maximum acoustical output was assumed in all directions. For each turbine layout, the geographic coordinates, ground elevation, source height, and transformer size are listed in Appendix A.

The analyses consider a 6.0-MW turbine with 162-meter rotor diameter (162-6.0) and a 4.5-MW turbine with a 163-meter rotor diameter (163-4.5), such as those manufactured by Vestas. Layouts 16 and 25 utilize 162-6.0 turbines with hub-heights of 119 meters. Layout 16a will consist of both 162-6.0 and 163-4.5 turbines with hub-heights of 119 and 118.5, respectively.

In the acoustic model of each proposed layout, two turbines will be operated in sound optimized (SO) modes to maintain compliance with the property line noise limit, while the remaining turbines may be operated in normal mode. The operating mode of each turbine used in the noise analysis are listed in Appendix A. For SO modes, the turbine control system reduces the turbine's maximum rotor speed which results in a lower maximum noise emission level. While SO modes are an effective means of controlling noise emissions, they also reduce the amount of energy generated.

Table 4-1 lists the octave band sound power levels used in the model for each source. The levels are expressed in terms of A-weighted decibels (dBA) for each of nine standard frequency octave-bands, as defined by the American National Standards Institute (ANSI) Standard S1.11: Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters. The noise emission levels of each turbine were provided by the manufacturer and were determined according to International Electrotechnical Commission Standard 61400-11. All wind turbine sound power levels included a 2 dB uncertainty factor added to the sound power level data provided by the Project. Wind turbine noise emissions increase with increasing wind speeds, up to approximately 10 to 11 m/s at hub height. Noise levels cease to increase with increasing hub-height wind speeds once a turbine reaches its maximum rotational speed, and the sound emission of a turbine is directly proportional to its rotational speed. This analysis used the octave band noise levels reported by the manufacturer for a wind speed of 10 m/s at hub height.

The Project includes a substation that will contain two step-up transformers, which are the only significant noise-producing equipment. The noise analysis assumed the simultaneous operation of both step-up transformers at their maximum rating (150 MVA), including the operation of the cooling fans. The sound power levels from the step-up transformers are listed in Table 4-1. The step-up transformers were modeled as point sources located three meters (10 feet) above the ground, with no barriers or directivity reductions. The sound level spectrum of the transformers

was estimated using the methodology published in the Edison Electric Institute, "Electric Power Plant Environmental Noise Guide," 2nd Edition, BBN, 1984.

Table 4-1. Source Sound Power Levels

Source	Source or Hub Height (meters)	Octave Band Sound Power Level (dBA)									Overall Level (dBA)
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	
162-6MW STE	119	77.2	87.6	95.1	99.7	101.4	100.3	96.2	89.3	79.5	106.3
162-6MW SO2 STE *	119	75.2	85.6	93.1	97.7	99.4	98.3	94.2	87.3	77.5	104.3
163-4.5MW STE Estimate **	118.5	73	87.1	96.6	102.2	104.1	102.5	96.9	88.4	77.4	108.5
Transformer 150 MVA	3	57.7	76.9	89.0	91.5	96.9	94.1	90.3	85.1	76.0	100.5

* SO noise emission levels were estimated based on a similar turbine model and will be confirmed during final design.
** Manufacturers acoustic data only included standard blade noise levels. STE levels were estimated based on suggestions from the manufacturer

Terrain and Ground Effect

The ground elevations in the Project area were modeled by importing DEM data from the USGS National Elevation Dataset into SoundPLAN. The acoustical effect of the ground was modeled using the ISO 9613-2:1996 General Method. All reductions due to terrain acting as a barrier were removed from the analysis resulting in a more conservative model and higher predicted noise levels. The ground absorption factors for the ground near the source, near the receiver, and in between range from 0.0 to 1.0 and represent the proportion of sound that is absorbed or reflected when sound waves interact with the ground. A value of 0.0 represents completely reflective ground material such as pavement, and results in a higher level of sound reaching a receptor. A value of 1.0 represents absorptive material such as thick grass or fresh snow, and results in a lower level of sound reaching a receptor. For this Project we assumed a ground factor of 0.5 (partially reflective) which is representative of the ground cover in the Project area which is mostly cropland with some forested areas and very low percentages of pavement or other reflective surfaces.

Atmospheric Conditions

The air temperature, relative humidity, and atmospheric pressure were set to conditions of 10°C, 70%, and 1 atmosphere, respectively. These values represent the lowest amount of atmospheric absorption of sound available in the ISO 9613-2:1996 method and result in the highest levels of sound reaching the receptors.

Noise Level Metric

The Fremont Township Zoning Ordinance does not specify a noise level metric to assess noise from wind energy conversion systems. The noise levels predicted in this analysis are in the form of the energy equivalent average noise level (L_{eq}) over a short duration of time (10 minutes to one hour), which is a practical and widely utilized metric for assessing both industrial and community noise levels. The following organizations specify the use of the L_{eq} metric for the purpose of regulating noise from industrial, transportation, and other sources:

- The forthcoming American National Standards Institute (ANSI) standard for the prediction of noise levels from wind turbines calls for a 10-minute to one-hour L_{eq}.
- The current draft IEC 61400-11 standard for the measurement of noise from wind turbines at a residence calls for 10-second to 10-minute L_{eq}.
- The IEC standard used to measure wind turbine emissions specifies the use of the L_{eq}.
- ANSI S12.9 Part 3, the primary standard followed in the U.S. to measure wind turbine noise, calls for the use of the L_{eq}.
- The U.S. EPA guidelines are expressed in terms of the 24-hour and annual average L_{eq}.
- The World Health Organization's standards are in terms of the 8-hour, 24-hour, and annual average L_{eq}.
- Health Canada, the agency that studied wind turbine noise impacts in greater detail than perhaps any other group, did so using the one-hour L_{eq}.
- U.S. government agencies, including highways (FHWA), airports (FAA), and railroads (FTA/FRA), use the one-hour or 24-hour L_{eq}.
- The L_{eq} is used by numerous state public service commissions for wind projects (New York DPS: 8-hour L_{eq}, South Dakota PSC: noise levels averaged over one hour, and West Virginia PSC: 24-hour L_{eq}).
- The L_{eq} is the metric used by states that regulate noise (Illinois: one-hour L_{eq}, Delaware: 24-hour L_{eq}, and Maryland: 24-hour L_{eq}.

Model Validation

The noise level prediction method used by the model has been validated by Hankard Environmental by comparing predicted noise levels to those measured at operating wind farms. An analysis of noise data collected at ten operating wind energy centers consisting of 50 individual measurement locations was conducted. Results of the analysis were presented at NOISECON 2022, the annual conference for the Institute of Noise Control Engineering. The loudest turbine-only noise levels measured at each location, which occur for only a few hours/nights at each site over the course of many weeks of data collection, were compared to the levels predicted at each location using the same methodology employed on this Project (ISO 9613-2:1996 with a 0.5 ground factor). The results show that, on average, the model exactly predicts the measured levels. At a few locations the measured levels were as much as 2 dBA louder than the predicted levels. To account for this, 2 dBA was conservatively added to all wind turbine sound power levels as described above.

5. Predicted Noise Levels

Noise levels were predicted for the full and continuous operation of the proposed Project for each of three potential turbine layouts (Layouts 16, 25, and 16a). Noise levels were predicted at the boundaries of the Project for comparison to the Fremont Township property line limit of 45 dBA, as well as at each of the 336 principal structures identified within one mile of any proposed noise source in Fremont Township.

In Fremont Township, for all layouts considered, the initial modeling results indicated that the Project would need approximately 5 dBA of noise mitigation to the primary step-up transformers to comply with the 45 dBA limit on Burns Line Road. This level of reduction is feasible and can be achieved by some combination of specifying quieter transformers beyond what is shown in Table 4-1 and/or constructing noise barrier walls around the transformers or the substation. All predicted results in this analysis assumes the 5 dB reduction will be implemented as part of final design.

Figures 5-1 to 5-3 show the results of the predictions in terms of the location of the 45 dBA noise level contours. The area inside the contour has a predicted Project noise level in excess of 45 dBA, and the areas outside the contour have a predicted level less than 45 dBA. The shading in the figures indicate the participation status of each parcel. Green indicates a participating parcel, while white, yellow, and red indicate non-participating parcels. White indicates a non-contacted non-participating parcel, yellow indicates that the owner of the parcel is in negotiations with the Project, and red indicates the owner of the parcel has refused participation.

More detailed noise level contour figures, which include turbine labels and participating and non-participating receptors, are shown in Appendix C.

For all layouts, the maximum predicted noise level at any non-participating residence is 44 dBA. All predictions, for each layout, include a +2 dB uncertainty factor applied to the wind turbine sound power levels as previously described and two of the Project wind turbines operating in SO mode as shown in Appendix A. The predicted noise levels at all locations, for each layout, are listed in Appendix B.

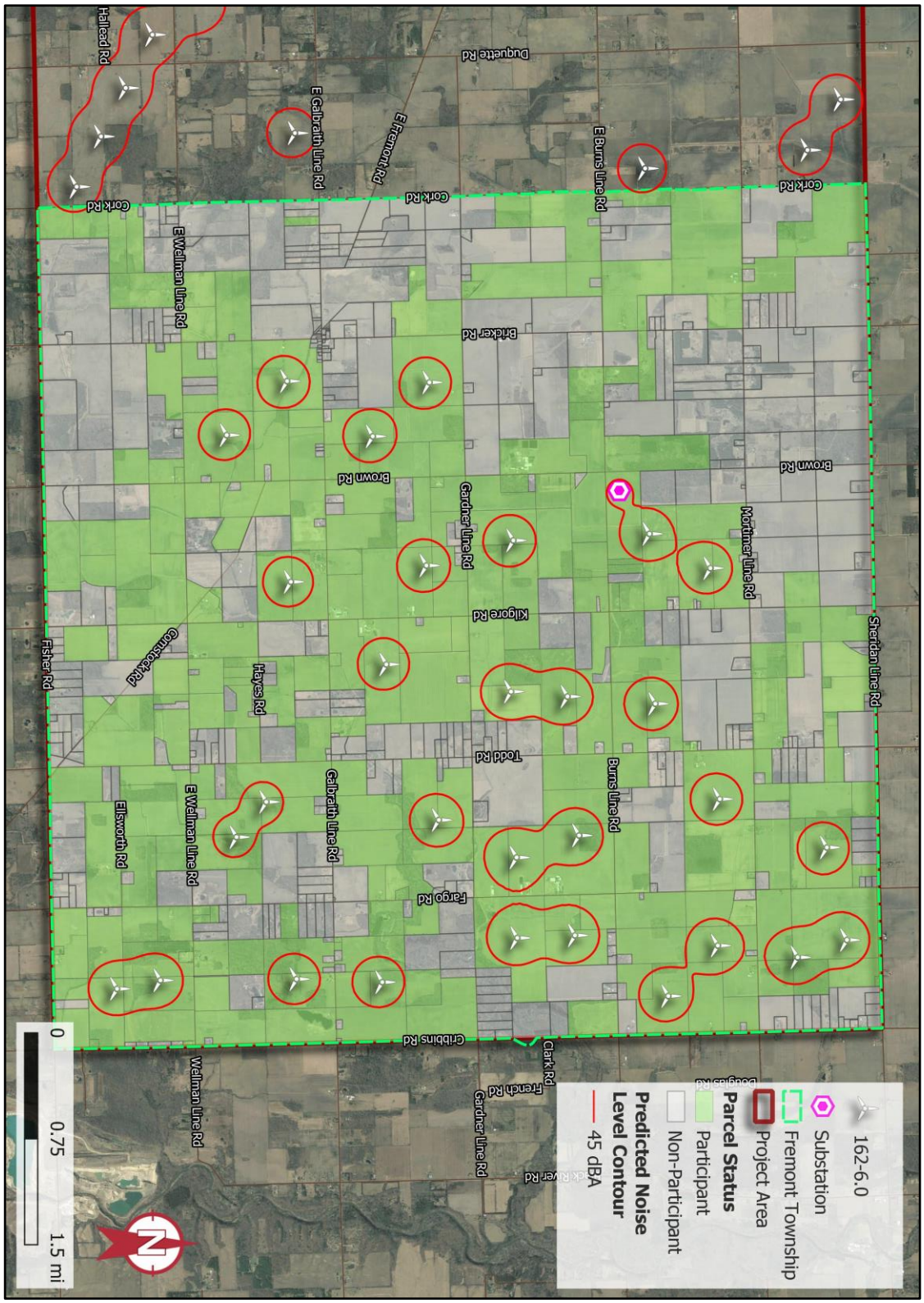

Figure 5-1. Predicted Noise Level Contours – Layout 16

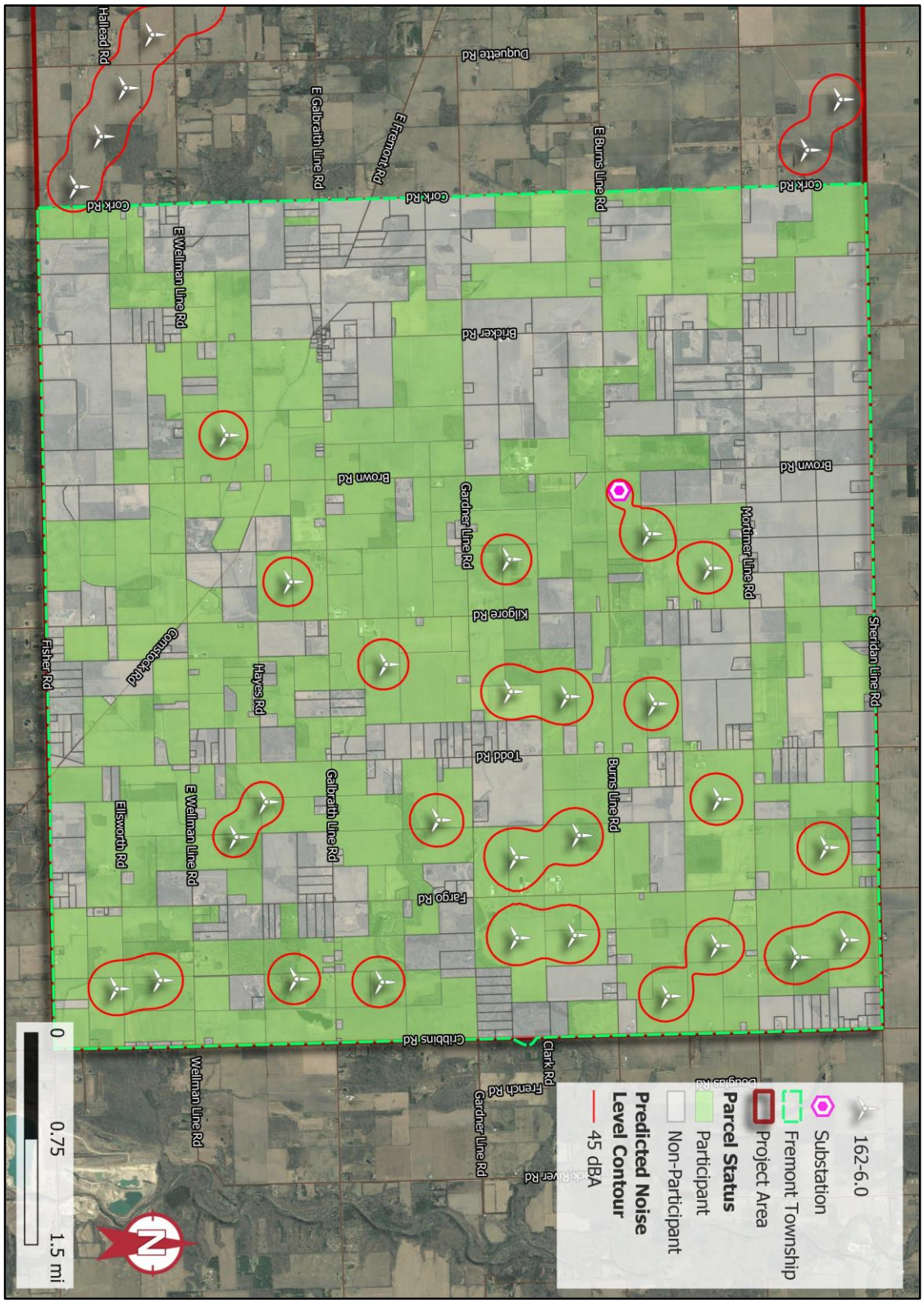

Figure 5-2. Predicted Noise Level Contours – Layout 25

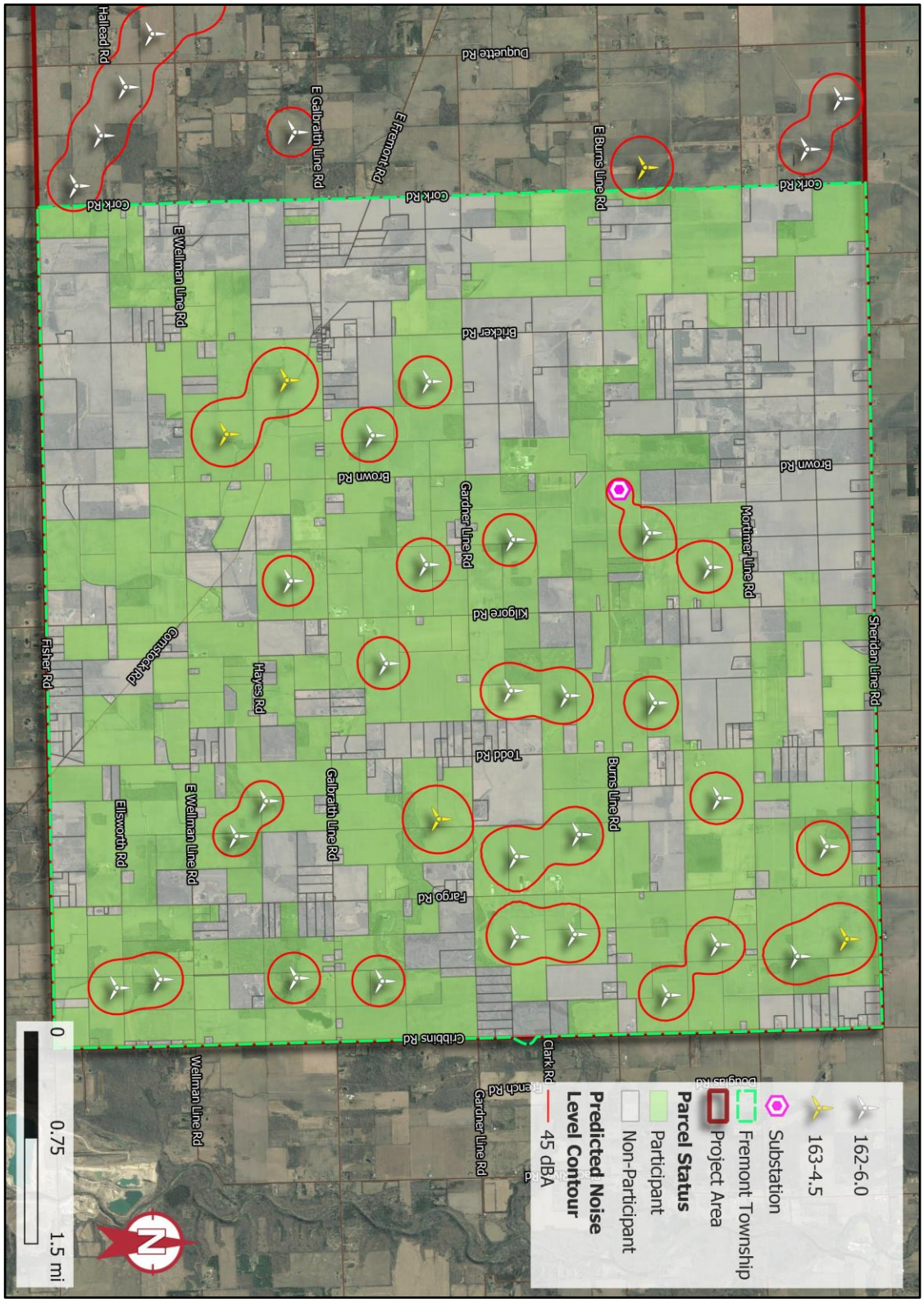

Figure 5-3. Predicted Noise Level Contours – Layout 16a

6. Conclusions

Noise levels from the full and continuous operation of the proposed Project were predicted at the outer boundary of all participating parcels and at each of 336 Fremont Township residences located within approximately one mile of any potential Project noise source. For all layouts, the predicted 45 dBA noise level contour remains on participating land, which demonstrates compliance with the Fremont Township ordinance. The maximum predicted noise level at any non-participating receptor is 44 dBA.

The noise modeling (prediction) method used in this analysis has been demonstrated by Hankard Environmental and other acoustical consultants to result in predicted levels that are equal to or greater than actual measured noise levels. That is, measured noise levels will be less than those described herein, which were predicted using the ISO 9613-2 method, in conjunction with settings of 0.5 ground factor, a 1.5 meter receptor height, and adding 2 dBA of uncertainty to the wind turbine sound power levels.

Furthermore, the analysis focused on the very highest turbine noise levels expected. A majority of the time turbine noise levels will be less than those described herein when the turbines are not producing full acoustic output due to low winds, and/or atmospheric conditions not being as conducive to sound propagation as assumed herein (e.g., unstable atmosphere, receptors crosswind to the nearest turbines).

Note that the results described herein are valid for the receptor locations provided, the turbine layouts and substation location analyzed, the wind turbine sound power levels provided by the manufacturer, and the mode of turbine operation modeled. If the Project makes significant changes to any of these parameters, the noise analysis should be updated to demonstrate compliance with applicable standards.

APPENDIX A
Project Noise Source Locations (Layouts 16, 25, and 16a)

Table A-1. Noise Source Locations – Layout 16

Source Name	UTM 17N		Ground Elevation (m asl)	Source / Hub Height (m agl)	Example Source Type	Sound Power Level (dBA)
	Easting (m)	Northing (m)				
ALTA-1	350709	4782594	250	119	162-6MW STE	106.3
ALTA-2	355459	4781111	245	119	162-6MW STE	106.3
ALTA-3	365116	4786230	225	119	162-6MW STE	106.3
ALTA-4	365366	4788768	226	119	162-6MW STE	106.3
ALTA-5	362394	4786145	229	119	162-6MW STE	106.3
ALTA-6	364228	4785565	225	119	162-6MW STE	106.3
OPA-1	349477	4781358	245	119	162-6MW STE	106.3
OPA-2	360615	4785528	230	119	162-6MW STE	106.3
OPA-3	356167	4788880	235	119	162-6MW STE	106.3
OPA-4	356376	4787030	235	119	162-6MW STE	106.3
OPA-5	362476	4787146	230	119	162-6MW STE	106.3
OPA-6	347755	4785610	242	119	162-6MW STE	106.3
OPA-7	348205	4780537	245	119	162-6MW STE	106.3
OPA-8	365628	4781507	225	119	162-6MW STE	106.3
OPA-9	348194	4786899	240	119	162-6MW STE	106.3
OPA-10	347873	4783436	246	119	162-6MW STE	106.3
OPA-11	365725	4781012	225	119	162-6MW STE	106.3
OPA-12	360901	4784538	230	119	162-6MW STE	106.3
OPA-13	360540	4787080	230	119	162-6MW STE	106.3
OPA-14	363977	4786278	228	119	162-6MW STE	106.3
OPA-15	350735	4786871	245	119	162-6MW STE	106.3
OPA-16	365145	4785573	225	119	162-6MW STE	106.3
OPA-17	363562	4787881	230	119	162-6MW STE	106.3
OPA-18	362028	4784081	227	119	162-6MW STE	106.3
OPA-19	355973	4783039	240	119	162-6MW STE	106.3
OPA-20	359415	4782262	230	119	162-6MW STE	106.3
OPA-21	354852	4781415	245	119	162-6MW STE	106.3
OPA-22	365649	4784035	225	119	162-6MW STE	106.3
OPA-23	360931	4787774	230	119	162-6MW STE	106.3
OPA-24	349812	4789164	236	119	162-6MW STE	106.3
OPA-25	365232	4787858	226	119	162-6MW STE	106.3
OPA-26	365614	4783058	229	119	162-6MW STE	106.3
OPA-27	349007	4780683	245	119	162-6MW STE	106.3

Source Name	UTM 17N		Ground Elevation (m asl)	Source / Hub Height (m agl)	Example Source Type	Sound Power Level (dBA)
	Easting (m)	Northing (m)				
OPA-28	351442	4780545	255	119	162-6MW STE	106.3
OPA-29	356585	4780552	237	119	162-6MW STE	106.3
OPA-30	358814	4784572	232	119	162-6MW STE	106.3
OPA-31	359429	4783926	230	119	162-6MW STE	106.3
OPA-32	353690	4788905	240	119	162-6MW STE	106.3
OPA-33	351540	4787001	243	119	162-6MW STE	106.3
OPA-34	353018	4786959	245	119	162-6MW STE	106.3
OPA-35	362338	4785502	229	119	162-6MW STE	106.3
OPA-36	361087	4782993	229	119	162-6MW STE	106.3
OPA-37	354504	4781969	247	119	162-6MW STE	106.3
OPA-38	356012	4780830	240	119	162-6MW STE	106.3
OPA-39	355590	4789259	235	119	162-6MW STE	106.3
OPA-40	350492	4787415	240	119	162-6MW STE	106.3
OPA-41	350001	4780971	245	119	162-6MW STE	106.3
OPA-42	363801	4784679	225	119	162-6MW STE	106.3
OPA-43	365168	4789330	227	119	162-6MW STE	106.3
OPA-44	364114	4789101	230	119	162-6MW STE	106.3
OPA-45	365807	4787294	225	119	162-6MW STE	106.3
OPA-46	363996	4782374	226	119	162-6MW STE SO2	104.3
OPA-47	358800	4782950	230	119	162-6MW STE	106.3
OPA-48	350889	4781974	250	119	162-6MW STE	106.3
OPA-49	353886	4782524	250	119	162-6MW STE	106.3
OPA-50	363595	4782713	227	119	162-6MW STE SO2	104.3
Transformer 1	360045.85	4786771.7	232	3	Substation Xfrmer 150 MVA -5 dB	95.5
Transformer 2	360087.46	4786772.3	232	3	Substation Xfrmer 150 MVA -5 dB	95.5

Table A-2. Noise Source Locations – Layout 25

Source Name	UTM 17N		Ground Elevation (m asl)	Source / Hub Height (m agl)	Example Source Type	Sound Power Level (dBA)
	Easting (m)	Northing (m)				
1	349477	4781358	245	119	162-6MW STE	106.3
2	360829	4785484	230	119	162-6MW STE	106.3
3	356167	4788880	235	119	162-6MW STE	106.3
4	365366	4788768	226	119	162-6MW STE	106.3
5	362476	4787146	230	119	162-6MW STE	106.3
6	347755	4785610	242	119	162-6MW STE	106.3
7	348205	4780537	245	119	162-6MW STE	106.3
8	365628	4781507	225	119	162-6MW STE	106.3
9	348194	4786899	240	119	162-6MW STE	106.3
10	347873	4783436	246	119	162-6MW STE	106.3
11	365725	4781012	225	119	162-6MW STE	106.3
12	364228	4785565	225	119	162-6MW STE	106.3
13	360540	4787080	230	119	162-6MW STE	106.3
14	363996	4782374	226	119	162-6MW STE SO2	104.3
15	350735	4786871	245	119	162-6MW STE	106.3
16	365145	4785573	225	119	162-6MW STE	106.3
17	363562	4787881	230	119	162-6MW STE	106.3
18	362028	4784081	227	119	162-6MW STE	106.3
19	350709	4782594	250	119	162-6MW STE	106.3
20	359415	4782262	230	119	162-6MW STE	106.3
21	354852	4781415	245	119	162-6MW STE	106.3
22	365649	4784035	225	119	162-6MW STE	106.3
23	360931	4787774	230	119	162-6MW STE	106.3
24	349812	4789164	236	119	162-6MW STE	106.3
25	365232	4787858	226	119	162-6MW STE	106.3
26	365614	4783058	229	119	162-6MW STE	106.3
27	349007	4780683	245	119	162-6MW STE	106.3
28	351442	4780545	255	119	162-6MW STE	106.3
29	356585	4780552	237	119	162-6MW STE	106.3
30	355459	4781111	245	119	162-6MW STE	106.3
31	365116	4786230	225	119	162-6MW STE	106.3
32	353690	4788905	240	119	162-6MW STE	106.3
33	351540	4787001	243	119	162-6MW STE	106.3

Source Name	UTM 17N		Ground Elevation (m asl)	Source / Hub Height (m agl)	Example Source Type	Sound Power Level (dBA)
	Easting (m)	Northing (m)				
34	353018	4786959	245	119	162-6MW STE	106.3
35	362338	4785502	229	119	162-6MW STE	106.3
36	361087	4782993	229	119	162-6MW STE	106.3
37	354504	4781969	247	119	162-6MW STE	106.3
38	356012	4780830	240	119	162-6MW STE	106.3
39	355590	4789259	235	119	162-6MW STE	106.3
40	350492	4787415	240	119	162-6MW STE	106.3
41	350001	4780971	245	119	162-6MW STE	106.3
42	363801	4784679	225	119	162-6MW STE	106.3
43	365168	4789330	227	119	162-6MW STE	106.3
44	364114	4789101	230	119	162-6MW STE	106.3
45	365807	4787294	225	119	162-6MW STE	106.3
46	363977	4786278	228	119	162-6MW STE	106.3
47	362394	4786145	229	119	162-6MW STE	106.3
48	350889	4781974	250	119	162-6MW STE	106.3
49	353886	4782524	250	119	162-6MW STE	106.3
50	363595	4782713	227	119	162-6MW STE SO2	104.3
Transformer 1	360045.85	4786771.7	232	3	Substation Xfrmer 150 MVA -5 dB	95.5
Transformer 2	360087.46	4786772.3	232	3	Substation Xfrmer 150 MVA -5 dB	95.5

Table A-3. Noise Source Locations – Layout 16a

Source Name	UTM 17N		Ground Elevation (m asl)	Source / Hub Height (m agl)	Example Source Type	Sound Power Level (dBA)
	Easting (m)	Northing (m)				
ALTB-1	350709	4782594	250	119	162-6MW STE	106.3
ALTB-2	355459	4781111	245	119	162-6MW STE	106.3
ALTB-3	365116	4786230	225	119	162-6MW STE	106.3
ALTB-4	365366	4788768	226	119	162-6MW STE	106.3
ALTB-5	362394	4786145	229	119	162-6MW STE	106.3
ALTB-6	364228	4785565	225	119	162-6MW STE	106.3
OPB-1	349477	4781358	245	119	162-6MW STE	106.3
OPB-2	360615	4785528	230	119	162-6MW STE	106.3
OPB-3	356167	4788880	235	119	162-6MW STE	106.3
OPB-4	356376	4787030	235	118.5	163-4.5MW STE	108.5
OPB-5	362476	4787146	230	119	162-6MW STE	106.3
OPB-6	347755	4785610	242	118.5	163-4.5MW STE	108.5
OPB-7	348205	4780537	245	119	162-6MW STE	106.3
OPB-8	365628	4781507	225	119	162-6MW STE	106.3
OPB-9	348194	4786899	240	118.5	163-4.5MW STE	108.5
OPB-10	347873	4783436	246	119	162-6MW STE	106.3
OPB-11	365725	4781012	225	119	162-6MW STE	106.3
OPB-12	360901	4784538	230	119	162-6MW STE	106.3
OPB-13	360540	4787080	230	119	162-6MW STE	106.3
OPB-14	363977	4786278	228	119	162-6MW STE	106.3
OPB-15	350735	4786871	245	119	162-6MW STE	106.3
OPB-16	365145	4785573	225	119	162-6MW STE	106.3
OPB-17	363562	4787881	230	119	162-6MW STE	106.3
OPB-18	362028	4784081	227	119	162-6MW STE	106.3
OPB-19	355973	4783039	240	119	162-6MW STE	106.3
OPB-20	359415	4782262	230	118.5	163-4.5MW STE	108.5
OPB-21	354852	4781415	245	119	162-6MW STE	106.3
OPB-22	365649	4784035	225	119	162-6MW STE	106.3
OPB-23	360931	4787774	230	119	162-6MW STE	106.3
OPB-24	349812	4789164	236	119	162-6MW STE	106.3
OPB-25	365232	4787858	226	119	162-6MW STE	106.3
OPB-26	365614	4783058	229	119	162-6MW STE	106.3
OPB-27	349007	4780683	245	119	162-6MW STE	106.3

Source Name	UTM 17N		Ground Elevation (m asl)	Source / Hub Height (m agl)	Example Source Type	Sound Power Level (dBA)
	Easting (m)	Northing (m)				
OPB-28	351442	4780545	255	118.5	163-4.5MW STE	108.5
OPB-29	356585	4780552	237	119	162-6MW STE	106.3
OPB-30	358814	4784572	232	119	162-6MW STE	106.3
OPB-31	359429	4783926	230	119	162-6MW STE	106.3
OPB-32	353690	4788905	240	119	162-6MW STE	106.3
OPB-33	351540	4787001	243	119	162-6MW STE	106.3
OPB-34	353018	4786959	245	119	162-6MW STE	106.3
OPB-35	362338	4785502	229	119	162-6MW STE	106.3
OPB-36	361087	4782993	229	119	162-6MW STE	106.3
OPB-37	354504	4781969	247	119	162-6MW STE	106.3
OPB-38	356012	4780830	240	119	162-6MW STE	106.3
OPB-39	355590	4789259	235	119	162-6MW STE	106.3
OPB-40	350492	4787415	240	119	162-6MW STE	106.3
OPB-41	350001	4780971	245	119	162-6MW STE	106.3
OPB-42	363801	4784679	225	118.5	163-4.5MW STE	108.5
OPB-43	365168	4789330	227	118.5	163-4.5MW STE	108.5
OPB-44	364114	4789101	230	119	162-6MW STE	106.3
OPB-45	365807	4787294	225	119	162-6MW STE	106.3
OPB-46	363996	4782374	226	119	162-6MW STE SO2	104.3
OPB-47	358800	4782950	230	118.5	163-4.5MW STE	108.5
OPB-48	350889	4781974	250	119	162-6MW STE	106.3
OPB-49	353886	4782524	250	119	162-6MW STE	106.3
OPB-50	363595	4782713	227	119	162-6MW STE SO2	104.3
Transformer 1	360045.85	4786771.7	232	3	Substation Xfrmer 150 MVA -5 dB	95.5
Transformer 2	360087.46	4786772.3	232	3	Substation Xfrmer 150 MVA -5 dB	95.5

APPENDIX B
Receptor Locations and Predicted Noise Levels

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-0104	359903	4785519	230	38.8	35.7	38.9	Yes
R-0181	365502	4788308	225	43.5	43.5	43.7	Yes
R-0346	363915	4788356	230	41.1	41.1	41.2	Yes
R-0355	360858	4783485	230	40.8	39.8	41	Yes
R-0458	361588	4782451	226	37.4	37	37.6	Yes
R-0497	361290	4781978	230	34.8	34.2	35.2	Yes
R-0535	357634	4786614	235	32.4	27	33.7	Yes
R-0623	359914	4781721	230	37.2	36.4	39	Yes
R-0714	362903	4788587	230	36.9	36.9	37	Yes
R-0725	365609	4783498	227	43.2	43.2	43.3	Yes
R-0764	361458	4783489	230	40.5	39.9	40.6	Yes
R-0807	364619	4786053	226	43.9	43.9	43.9	Yes
R-0819	361942	4783560	226	40.8	40.5	40.9	Yes
R-0846	365659	4789709	226	39.3	39.3	40.8	Yes
R-0847	361706	4785097	230	40.4	39.8	40.4	Yes
R-0939	364650	4784253	225	38.7	38.7	39.4	Yes
R-0947	364346	4781020	228	34.3	34.2	34.3	Yes
R-1027	363694	4789685	230	37.7	37.7	37.9	Yes
R-1033	357049	4781795	237	35.2	33.9	35.6	Yes
R-1148	359918	4784683	230	39.2	33.8	39.4	Yes
R-1159	364843	4781970	225	37.9	37.9	38	Yes
R-1188	359207	4786553	235	34.6	33.3	34.8	Yes
R-1236	361894	4781896	230	33.4	32.8	33.7	Yes
R-1320	366342	4781895	226	37.5	37.5	37.5	Yes
R-1387	362616	4788355	230	36.8	36.8	36.9	Yes
R-1470	361174	4782213	230	36.9	36.4	37.2	Yes
R-1473	364685	4784020	225	38.3	38.3	38.9	Yes
R-1674	361459	4784376	230	41.8	39.4	41.9	Yes
R-1867	364766	4784047	225	38.5	38.5	39	Yes
R-1892	364533	4788754	228	42	42	42.4	Yes
R-1897	357821	4781881	235	34.2	31.8	35.3	Yes
R-1940	364632	4785716	226	44.7	44.7	44.8	Yes
R-2060	356945	4783298	235	35.2	29.2	35.6	Yes
R-2134	363136	4787652	230	41.9	41.9	41.9	Yes
R-2138	359639	4783447	230	41.3	33.7	41.9	Yes
R-2185	357815	4781688	235	34	32.1	35	Yes
R-2188	364945	4781985	225	38.2	38.2	38.3	Yes
R-2263	362966	4787639	230	40.9	40.9	40.9	Yes
R-2515	361323	4786737	230	39.4	39.2	39.4	Yes
R-2517	364443	4788271	228	40.3	40.3	40.5	Yes
R-2614	365397	4781885	225	42	42	42	Yes
R-2658	362740	4783596	225	37.9	37.6	38.2	Yes
R-2694	362152	4788379	230	35.9	35.8	35.9	Yes

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-2799	361318	4782015	230	35	34.4	35.4	Yes
R-2982	357713	4785009	236	33.8	26.9	34.2	Yes
R-2996	361977	4782545	230	35.8	35.4	36.1	Yes
R-3032	366003	4783513	226	41	41	41	Yes
R-3075	364423	4781034	228	34.7	34.6	34.7	Yes
R-3151	357681	4784417	240	34.4	27.1	35	Yes
R-3308	366348	4780774	223	38.2	38.2	38.2	Yes
R-3351	364972	4783092	225	39.5	39.5	39.6	Yes
R-3448	365153	4783555	225	40.4	40.4	40.5	Yes
R-3490	365311	4780351	225	36.7	36.7	36.7	Yes
R-3634	359785	4785449	230	38.1	34.8	38.2	Yes
R-3639	357124	4781787	237	35.1	33.7	35.4	Yes
R-3641	365442	4781968	225	41.2	41.2	41.2	Yes
R-3703	364636	4788612	228	41.4	41.4	41.8	Yes
R-3713	360836	4783396	230	41.5	40.8	41.7	Yes
R-3762	365324	4781954	225	40.6	40.6	40.6	Yes
R-3841	361543	4783888	230	41.5	40.7	41.6	Yes
R-3879	364798	4785319	225	43.8	43.8	43.9	Yes
R-3936	356767	4785729	238	32	26	33.3	Yes
R-3972	362966	4787548	230	41.1	41.1	41.1	Yes
R-4009	362616	4789124	231	34.1	34.1	34.3	Yes
R-4341	363878	4788255	230	41.8	41.8	41.9	Yes
R-4505	364808	4784055	225	38.7	38.7	39.1	Yes
R-4507	360992	4783405	230	42.3	41.8	42.4	Yes
R-4575	363146	4787724	230	42.3	42.3	42.3	Yes
R-4577	364624	4786098	226	43.8	43.8	43.9	Yes
R-0041	362825	4783523	225	37.5	37.2	37.8	No
R-0042	363212	4781949	229	36.4	36.3	36.5	No
R-0079	366100	4783585	225	40.2	40.2	40.2	No
R-0144	359511	4788146	235	32.8	32.4	32.9	No
R-0148	361516	4784479	230	41.6	39.4	41.6	No
R-0149	365714	4786715	225	41.2	41.2	41.3	No
R-0157	360400	4783403	230	38.9	36.7	39.3	No
R-0158	362504	4782633	230	35.6	35.3	35.8	No
R-0177	356710	4788192	235	36.3	35	37	No
R-0182	363472	4786773	230	40.5	40.5	40.6	No
R-0219	361344	4787687	230	42.4	42.3	42.4	No
R-0225	358339	4781145	235	32.9	31.3	34.1	No
R-0267	363044	4785163	226	40.3	40.2	40.9	No
R-0273	362582	4783338	226	37.4	37	37.6	No
R-0274	362226	4782622	230	35.6	35.2	35.9	No
R-0276	365793	4782578	229	40.7	40.7	40.7	No
R-0315	357473	4783265	235	34.6	29.1	35.5	No

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-0316	358091	4783350	233	37.4	29.7	38.9	No
R-0348	364586	4787178	227	39.8	39.8	39.9	No
R-0349	362993	4785277	226	40.7	40.6	41.1	No
R-0356	358204	4781735	235	34.5	32.1	36	No
R-0386	357645	4785008	237	33.5	26.7	33.9	No
R-0392	364559	4783477	225	37.6	37.6	38	No
R-0424	356919	4781121	238	39.1	38.9	39.2	No
R-0450	357389	4785012	240	32.6	26.9	33.2	No
R-0451	358291	4785431	235	35	28	35.3	No
R-0452	363144	4787475	230	41.3	41.2	41.3	No
R-0489	363067	4787160	230	41.2	41.1	41.2	No
R-0538	362844	4785155	227	41	40.9	41.3	No
R-0547	357209	4783325	235	34.4	29	35.1	No
R-0549	362794	4781920	230	34.3	34.1	34.5	No
R-0552	366320	4782076	225	37	37	37	No
R-0590	365477	4783576	227	42.8	42.8	42.8	No
R-0626	363015	4781526	230	33.3	33.1	33.5	No
R-0658	360460	4784996	230	41.9	38.8	41.9	No
R-0660	363036	4784528	226	39.4	39.3	40.4	No
R-0661	364766	4784347	225	38.9	38.9	39.5	No
R-0667	358424	4783366	232	40.2	30.5	41.8	No
R-0668	358332	4783505	233	38.6	29.8	40	No
R-0722	358439	4782080	232	37	33.8	38.7	No
R-0755	362783	4789633	231	32.9	32.9	33.1	No
R-0757	363007	4786866	230	41.2	41.2	41.3	No
R-0759	365805	4786702	225	40.9	40.9	40.9	No
R-0805	359979	4784313	230	40.1	33.3	40.3	No
R-0817	359625	4783390	230	40.9	34	41.6	No
R-0845	360439	4788269	230	37.9	37.8	38	No
R-0861	361757	4783419	228	39.7	39.2	39.8	No
R-0862	365168	4783478	225	40.6	40.6	40.7	No
R-0906	358531	4783351	232	41.3	31.1	43.1	No
R-0909	364863	4780757	227	36.4	36.4	36.4	No
R-0938	362933	4786510	230	41.4	41.3	41.4	No
R-0979	357249	4789564	240	32	31.7	32.2	No
R-0981	360481	4785112	230	42.8	40.2	42.8	No
R-0993	356856	4781315	240	38.2	37.8	38.3	No
R-0998	364578	4780320	227	32.4	32.4	32.5	No
R-1034	358562	4783351	232	41.6	31.2	43.4	No
R-1065	364205	4789659	230	40.1	40.1	40.5	No
R-1066	365954	4789691	225	36.9	36.9	38.1	No
R-1071	357938	4783303	234	36.4	29.5	37.8	No
R-1106	366213	4786855	225	39.7	39.7	39.8	No

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-1111	363678	4783467	225	38.1	38	38.5	No
R-1158	357226	4781799	235	34.7	33.3	35.2	No
R-1192	362996	4785037	226	40.2	40.1	40.8	No
R-1198	357004	4781433	237	36.2	35.8	36.4	No
R-1199	358398	4783361	231	39.9	30.4	41.6	No
R-1200	364854	4782807	225	38.5	38.5	38.6	No
R-1230	356984	4786530	235	35.8	26.5	37.7	No
R-1265	362965	4785442	226	41.2	41.1	41.5	No
R-1266	365162	4786682	225	42.8	42.8	42.8	No
R-1274	359992	4782429	230	39.6	38.7	41.3	No
R-1309	366137	4789303	225	37.2	37.2	38.1	No
R-1311	363077	4787263	230	41.1	41.1	41.2	No
R-1349	362993	4787305	230	41.5	41.5	41.6	No
R-1350	362186	4785023	230	41.9	41.7	42	No
R-1385	356775	4786640	235	38.8	26.8	40.9	No
R-1392	366356	4781165	223	39.2	39.2	39.2	No
R-1430	365368	4783561	227	42.1	42.1	42.1	No
R-1432	364657	4780325	227	32.8	32.8	32.9	No
R-1461	360525	4788264	230	38.6	38.5	38.7	No
R-1462	357691	4786526	235	32.3	27.4	33.4	No
R-1463	358247	4784200	235	38.7	28.7	39	No
R-1466	363011	4786196	228	41.4	41.4	41.5	No
R-1472	362559	4783608	225	38	37.8	38.2	No
R-1474	365509	4783480	228	43.1	43.1	43.2	No
R-1516	356977	4781696	238	35.8	34.7	36	No
R-1519	363073	4784068	225	38.3	38.1	39.1	No
R-1557	360153	4783487	230	38.9	35.1	39.4	No
R-1630	361543	4786047	230	39.8	39.8	39.9	No
R-1684	358281	4783362	232	38.9	30.2	40.5	No
R-1685	358767	4783525	233	41.1	31.4	42.5	No
R-1686	358401	4781273	235	33.3	31.7	34.6	No
R-1718	359746	4788133	235	34.1	33.8	34.2	No
R-1730	364832	4782282	225	38	38	38	No
R-1766	360049	4781119	230	32.6	31.4	34	No
R-1803	366336	4781611	225	38.7	38.7	38.7	No
R-1834	363214	4781818	229	35.6	35.5	35.7	No
R-1856	362725	4785047	228	41	40.8	41.3	No
R-1863	357231	4783803	238	33.6	27.9	34.3	No
R-1864	358307	4781605	235	34.4	32.3	35.8	No
R-1866	363008	4783446	225	37.3	37.1	37.7	No
R-1891	362878	4789040	230	35.3	35.3	35.5	No
R-1898	360652	4781946	230	35.2	34.2	36.1	No
R-1937	358191	4785746	235	33.2	27.6	33.7	No

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-1944	359194	4783432	231	42.1	33	43.1	No
R-1979	359521	4785059	230	38.4	32.6	38.5	No
R-1988	358019	4783427	233	36.8	29.4	38.1	No
R-2017	360874	4788272	230	40.5	40.4	40.5	No
R-2024	357279	4783410	235	34.3	28.9	35	No
R-2053	363119	4785026	226	40.3	40.2	41.1	No
R-2061	357303	4781801	235	34.7	33.1	35.2	No
R-2089	363996	4789657	230	39.7	39.7	40	No
R-2104	356837	4781670	240	36.4	35.5	36.6	No
R-2105	357366	4780182	235	35.9	35.6	36	No
R-2135	365355	4786713	225	42.1	42.1	42.1	No
R-2175	364519	4788388	228	40.6	40.6	40.9	No
R-2176	363019	4784859	226	39.9	39.8	40.7	No
R-2177	365368	4786771	225	41.8	41.8	41.9	No
R-2186	360731	4782310	230	37.5	36.8	38	No
R-2219	363107	4788758	230	37.2	37.2	37.3	No
R-2227	361574	4783247	227	40.5	40.1	40.6	No
R-2260	360876	4784992	230	43.1	40.8	43.1	No
R-2261	366146	4789455	225	36.5	36.5	37.5	No
R-2273	358273	4783689	235	37.9	29.5	39	No
R-2274	363136	4781983	229	36.2	36.1	36.3	No
R-2302	359989	4788177	232	35.4	35.2	35.4	No
R-2303	361503	4787333	230	39.9	39.8	39.9	No
R-2304	361365	4787375	230	40.7	40.7	40.8	No
R-2347	364645	4784742	225	40.1	40.1	40.8	No
R-2356	366336	4781780	225	38	38	38	No
R-2383	366139	4789539	225	36.2	36.2	37.3	No
R-2387	358446	4783363	232	40.4	30.6	42.1	No
R-2388	358995	4783443	232	42	32.3	43.4	No
R-2390	362385	4782616	230	35.5	35.1	35.7	No
R-2391	363591	4783435	225	38.2	38.1	38.6	No
R-2392	363767	4781961	227	40	40	40	No
R-2425	363072	4788868	230	36.7	36.7	36.8	No
R-2426	365320	4788301	226	44.2	44.2	44.3	No
R-2427	362585	4785121	228	42.4	42.3	42.6	No
R-2435	358304	4782359	232	37.7	32.9	39.5	No
R-2468	359583	4788238	235	32.8	32.4	32.9	No
R-2478	358278	4783453	232	38.4	29.8	39.9	No
R-2516	363111	4789013	230	36.5	36.4	36.6	No
R-2519	363619	4785163	225	42.3	42.3	43.5	No
R-2520	364582	4784993	225	41.4	41.4	41.9	No
R-2534	358479	4783363	232	40.7	30.8	42.4	No
R-2535	358264	4783398	232	38.6	30	40.1	No

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-2573	358870	4785033	233	41.2	29.7	41.3	No
R-2607	363308	4788404	230	40.2	40.2	40.2	No
R-2612	363723	4781127	229	33	32.9	33.1	No
R-2613	366299	4783578	225	38.3	38.3	38.3	No
R-2642	357630	4788213	236	31.5	29.7	32.3	No
R-2647	357495	4785009	240	33.1	27.2	33.6	No
R-2648	364334	4784947	225	42.2	42.2	43.1	No
R-2655	359575	4783379	230	41	33.9	41.8	No
R-2659	364693	4783462	225	37.9	37.9	38.2	No
R-2693	362905	4788693	230	36.5	36.4	36.6	No
R-2695	364670	4787037	227	40.1	40.1	40.2	No
R-2699	358286	4781281	235	33.3	31.7	34.5	No
R-2702	362456	4782630	230	35.5	35.2	35.8	No
R-2703	364797	4783250	225	38.4	38.4	38.6	No
R-2704	364414	4783458	225	37.5	37.5	37.9	No
R-2705	365910	4782688	228	41.1	41.1	41.1	No
R-2758	362471	4783551	225	38.5	38.2	38.7	No
R-2759	363717	4783530	225	37.9	37.8	38.4	No
R-2760	364704	4783184	225	38.1	38.1	38.3	No
R-2786	366187	4788610	225	38	38	38.4	No
R-2877	356988	4784198	238	32.8	27.1	33.4	No
R-2878	358327	4783849	235	38.2	29.4	39	No
R-2880	364846	4780934	227	37.1	37.1	37.1	No
R-2906	359605	4788172	235	33.1	32.7	33.2	No
R-2908	363203	4784261	225	39.2	39.1	40.4	No
R-2909	366140	4785179	220	36.6	36.6	36.7	No
R-2915	357479	4783852	237	34	27.8	34.8	No
R-2962	365741	4782443	229	39.6	39.6	39.7	No
R-2983	359907	4785762	230	38.5	35.9	38.6	No
R-2985	365071	4786700	225	42.6	42.6	42.6	No
R-3024	364515	4789604	229	40.5	40.5	41.4	No
R-3073	364238	4783564	225	37.5	37.5	38.1	No
R-3076	365108	4782145	225	38.5	38.5	38.5	No
R-3113	362353	4783536	225	39.1	38.8	39.3	No
R-3153	363630	4788655	230	40.2	40.2	40.3	No
R-3157	359528	4783376	230	41.2	33.8	42	No
R-3161	363114	4782176	228	37.2	37.1	37.3	No
R-3197	364343	4780392	228	31.6	31.6	31.7	No
R-3245	363015	4784727	226	39.7	39.6	40.6	No
R-3247	364638	4784819	225	40.4	40.4	41	No
R-3253	364718	4781961	225	37.8	37.7	37.8	No
R-3287	358282	4785800	235	33.2	27.8	33.7	No
R-3292	363009	4785131	226	40.3	40.2	40.9	No

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-3301	357283	4783315	235	34.4	29.1	35.1	No
R-3303	359911	4782071	230	40	39.4	41.9	No
R-3304	362015	4782710	229	36.5	36	36.6	No
R-3305	364440	4781157	228	35.1	35.1	35.1	No
R-3350	360873	4782425	229	39	38.5	39.3	No
R-3383	365830	4789694	225	37.9	37.9	39.2	No
R-3392	358435	4783413	233	39.9	30.5	41.5	No
R-3398	365887	4780390	225	38.2	38.2	38.2	No
R-3442	358410	4783411	232	39.7	30.3	41.3	No
R-3444	358373	4782000	232	36.2	33.3	37.9	No
R-3480	362903	4788776	230	36.2	36.2	36.4	No
R-3481	363016	4789375	230	34.9	34.9	35.1	No
R-3482	366135	4789223	225	37.4	37.4	38.3	No
R-3488	359054	4783484	232	42	32.3	43.1	No
R-3521	363622	4786744	230	41.1	41.1	41.2	No
R-3531	362364	4783338	226	37.9	37.6	38.1	No
R-3533	366347	4781397	224	39.1	39.1	39.1	No
R-3569	358350	4783316	231	39.8	30.5	41.5	No
R-3600	364856	4783341	225	38.6	38.6	38.8	No
R-3633	358683	4785836	234	34.2	29.7	34.4	No
R-3668	357320	4781918	235	34.5	32.6	35.1	No
R-3672	364473	4783409	225	37.6	37.5	37.9	No
R-3701	359804	4788813	234	31.5	31.1	31.6	No
R-3714	363251	4783939	225	38.1	37.9	39	No
R-3715	364728	4782477	225	38.3	38.3	38.4	No
R-3716	364837	4782519	225	38.2	38.2	38.3	No
R-3760	357176	4781800	236	34.8	33.4	35.2	No
R-3761	365113	4782876	230	40.5	40.5	40.6	No
R-3794	361352	4786538	230	39.1	39	39.1	No
R-3795	364508	4789545	229	41	41	41.9	No
R-3836	357418	4783314	235	34.5	29	35.3	No
R-3838	359887	4782771	230	39.4	37.6	40.9	No
R-3878	366121	4789140	225	37.8	37.8	38.6	No
R-3885	356864	4781572	240	36.8	36.1	36.9	No
R-3917	357133	4783692	237	33.8	28.2	34.4	No
R-3973	366238	4785438	225	36.4	36.4	36.5	No
R-4010	366189	4788191	225	38.3	38.3	38.5	No
R-4023	359415	4781771	230	40.5	39.9	42.5	No
R-4065	363356	4782231	228	39.7	39.6	39.7	No
R-4098	357075	4786603	235	35.5	26.7	37.4	No
R-4099	362886	4788041	230	39.3	39.3	39.4	No
R-4107	357163	4783407	235	34.4	28.9	35	No
R-4108	357392	4781693	235	34.6	33.1	35.1	No

Receiver	UTM 17N		Ground Elevation (m asl)	Predicted Noise Level (dBA)			Participation
	Easting (m)	Northing (m)		Layout 16	Layout 25	Layout 16a	
R-4137	365717	4786785	225	41.7	41.7	41.8	No
R-4138	365325	4786700	225	42.3	42.3	42.3	No
R-4147	357068	4783410	235	34.5	28.8	35	No
R-4151	363084	4783577	225	37.4	37.2	37.9	No
R-4173	360833	4788203	230	41.5	41.5	41.6	No
R-4175	358214	4785226	235	35.8	27.9	36.1	No
R-4179	366254	4785223	222	36.1	36.1	36.2	No
R-4188	356862	4783278	235	35.6	29.3	35.9	No
R-4190	358294	4783410	232	38.8	30	40.3	No
R-4191	358276	4782901	233	40.3	31.7	42.2	No
R-4192	358286	4781708	234	34.7	32.3	36.1	No
R-4222	359886	4786312	230	38.4	37.5	38.4	No
R-4224	361982	4788241	230	36.4	36.4	36.5	No
R-4279	358407	4781521	235	34.3	32.4	35.8	No
R-4280	362127	4781909	230	33.2	32.6	33.5	No
R-4337	357348	4783175	235	34.5	29.3	35.3	No
R-4339	363145	4784796	226	40.3	40.2	41.4	No
R-4340	362512	4781807	230	33.1	32.7	33.3	No
R-4342	364753	4780654	227	35.1	35.1	35.1	No
R-4345	364901	4783569	225	38.8	38.8	39	No
R-4346	365385	4783483	228	42.4	42.4	42.4	No
R-4504	364693	4788110	227	41.3	41.3	41.5	No
R-4508	362868	4784713	227	39.5	39.3	40.1	No
R-4509	363548	4786779	230	40.7	40.6	40.7	No
R-4510	358375	4783472	233	39.1	30.1	40.6	No
R-4526	359461	4781552	234	37.3	36.5	39.2	No
R-4527	356982	4781401	238	36.7	36.3	36.9	No
R-4565	358257	4783359	232	38.7	30.1	40.3	No
R-4566	362595	4782635	230	35.9	35.5	36	No
R-4567	358849	4785091	233	40.3	29.7	40.4	No
R-4568	365751	4786675	225	40.9	40.9	41	No
R-4573	359102	4786621	236	34	32.6	34.2	No
R-4576	364393	4784928	225	41.8	41.8	42.7	No
R-4580	364340	4780371	228	31.5	31.5	31.6	No
R-4581	364521	4781854	226	37.6	37.6	37.7	No

APPENDIX C
Noise Contour Figures

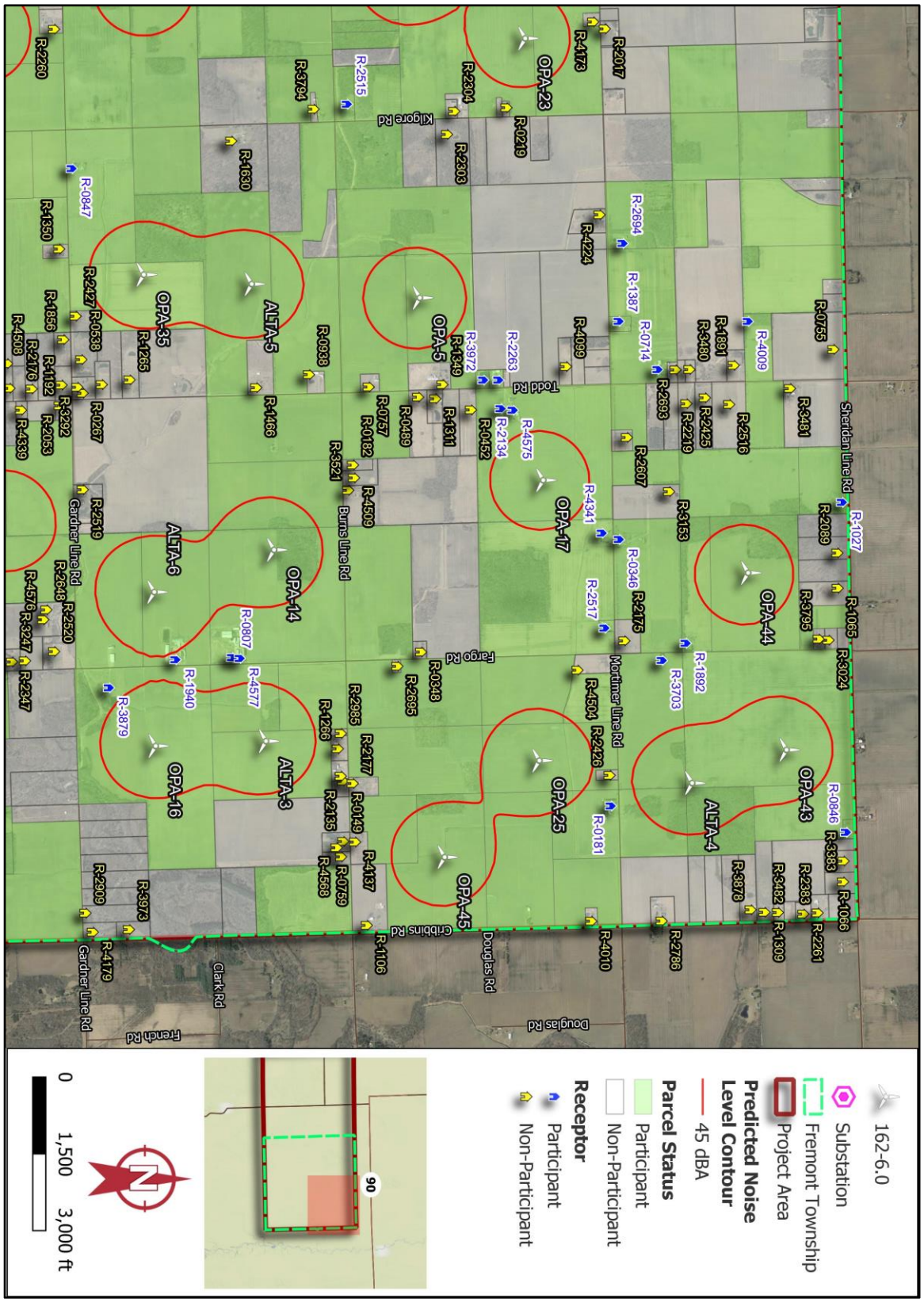

Figure C-1. Predicted Noise Level Contours – L16 Northeast Portion

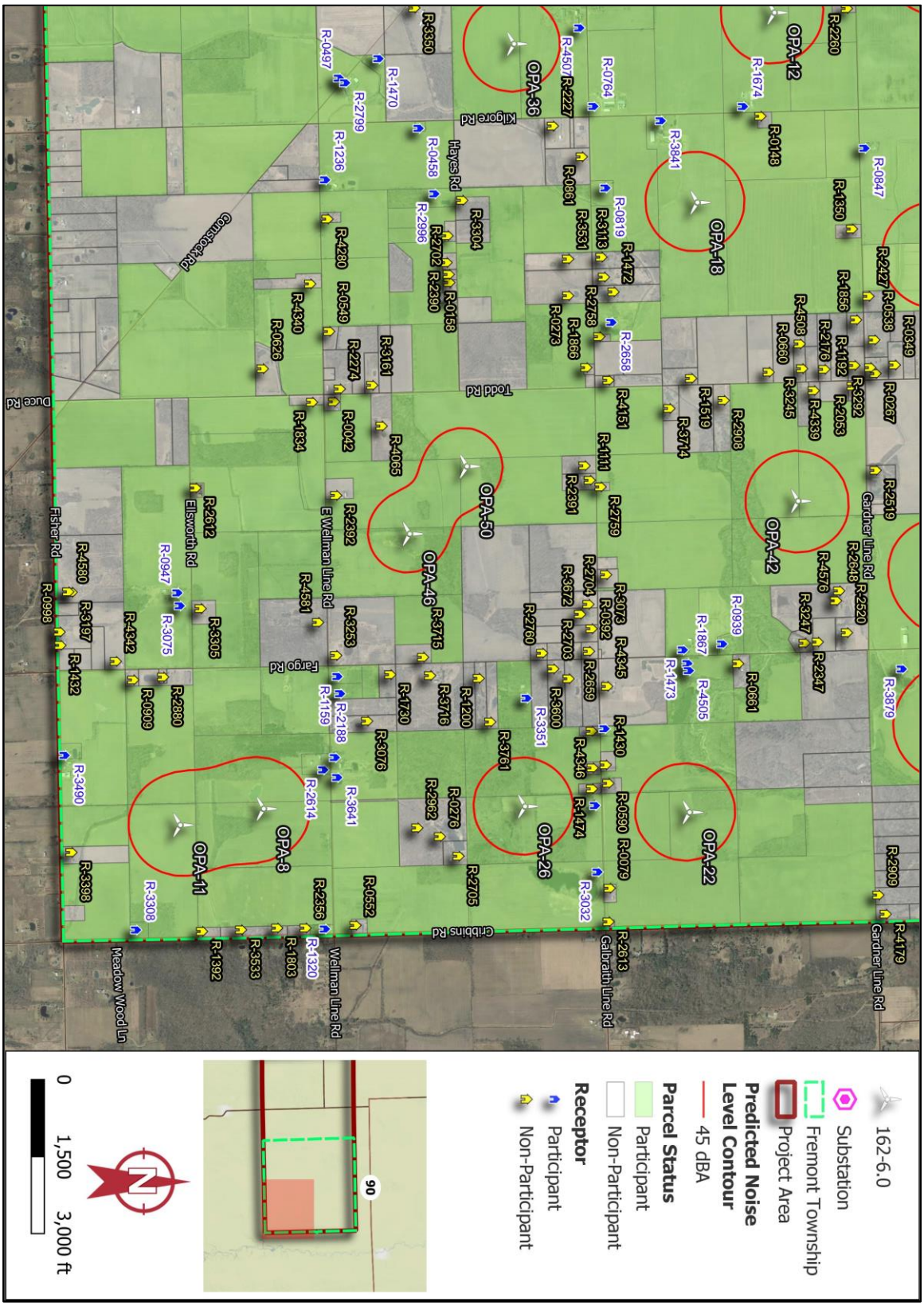

Figure C-2. Predicted Noise Level Contours – L16 Southeast Portion

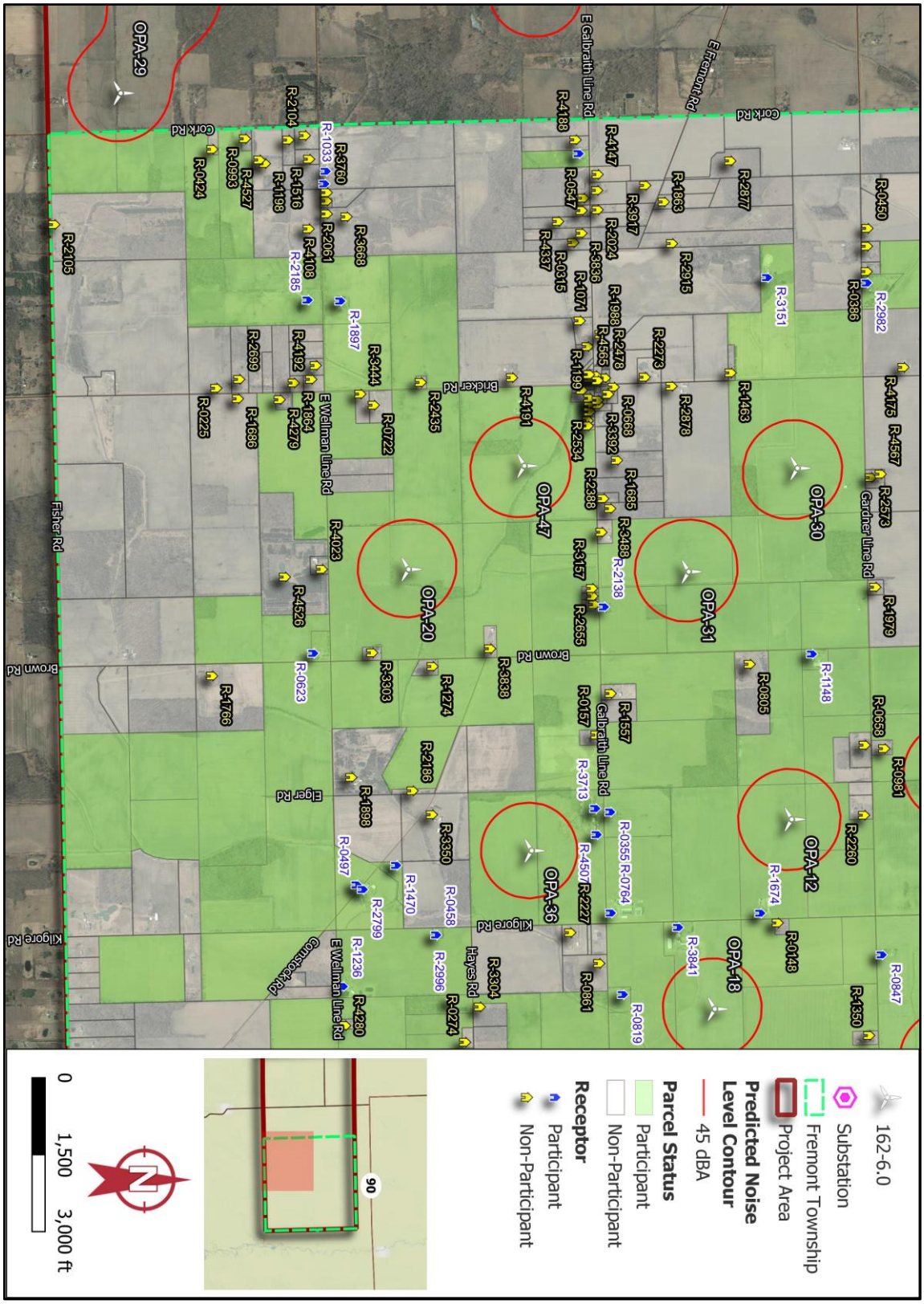

Figure C-3. Predicted Noise Level Contours – L16 Southwest Portion

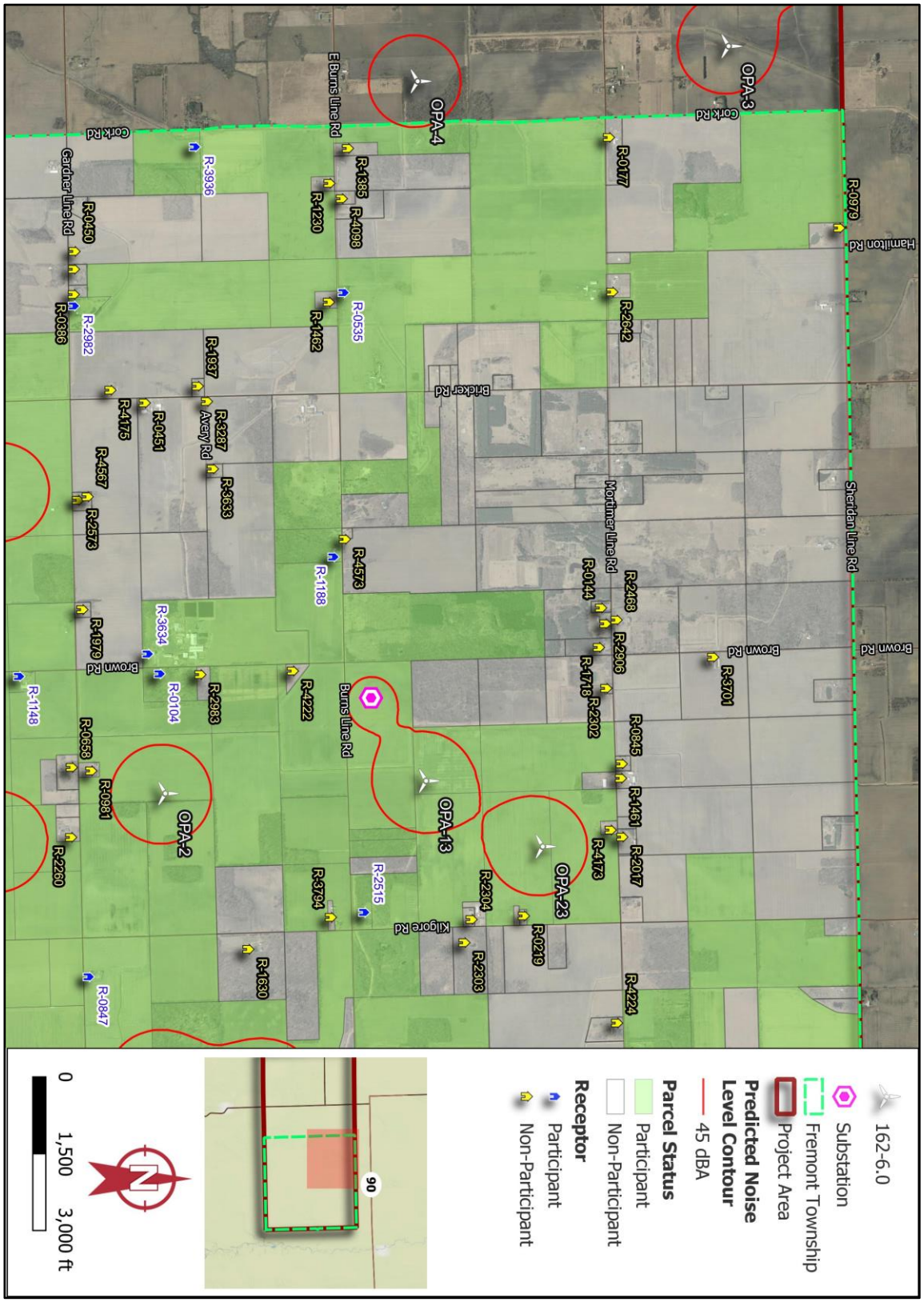

Figure C-4. Predicted Noise Level Contours – L16 Northwest Portion

Figure C-5. Predicted Noise Level Contours – L25 Northeast Portion

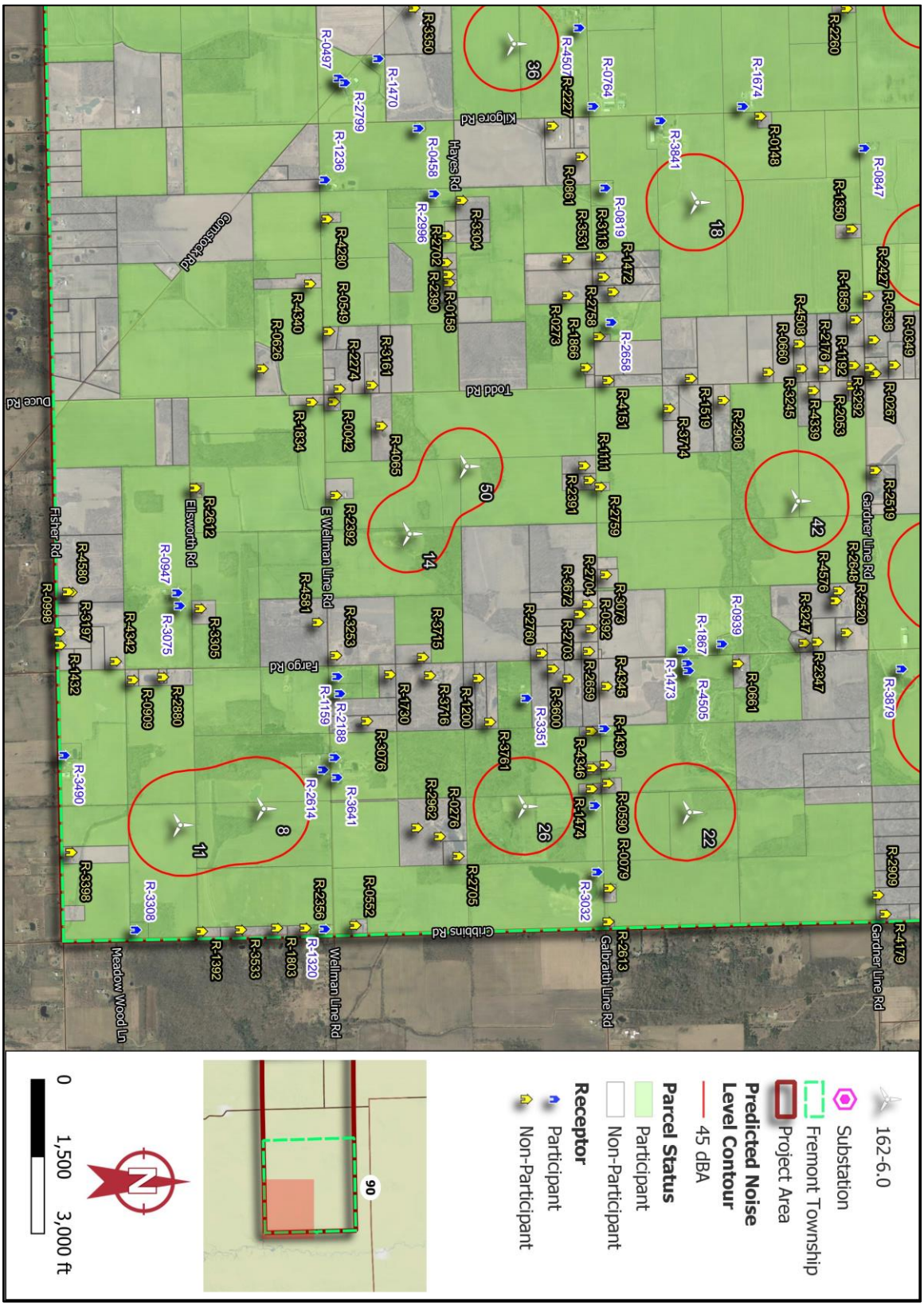

Figure C-6. Predicted Noise Level Contours – L25 Southeast Portion

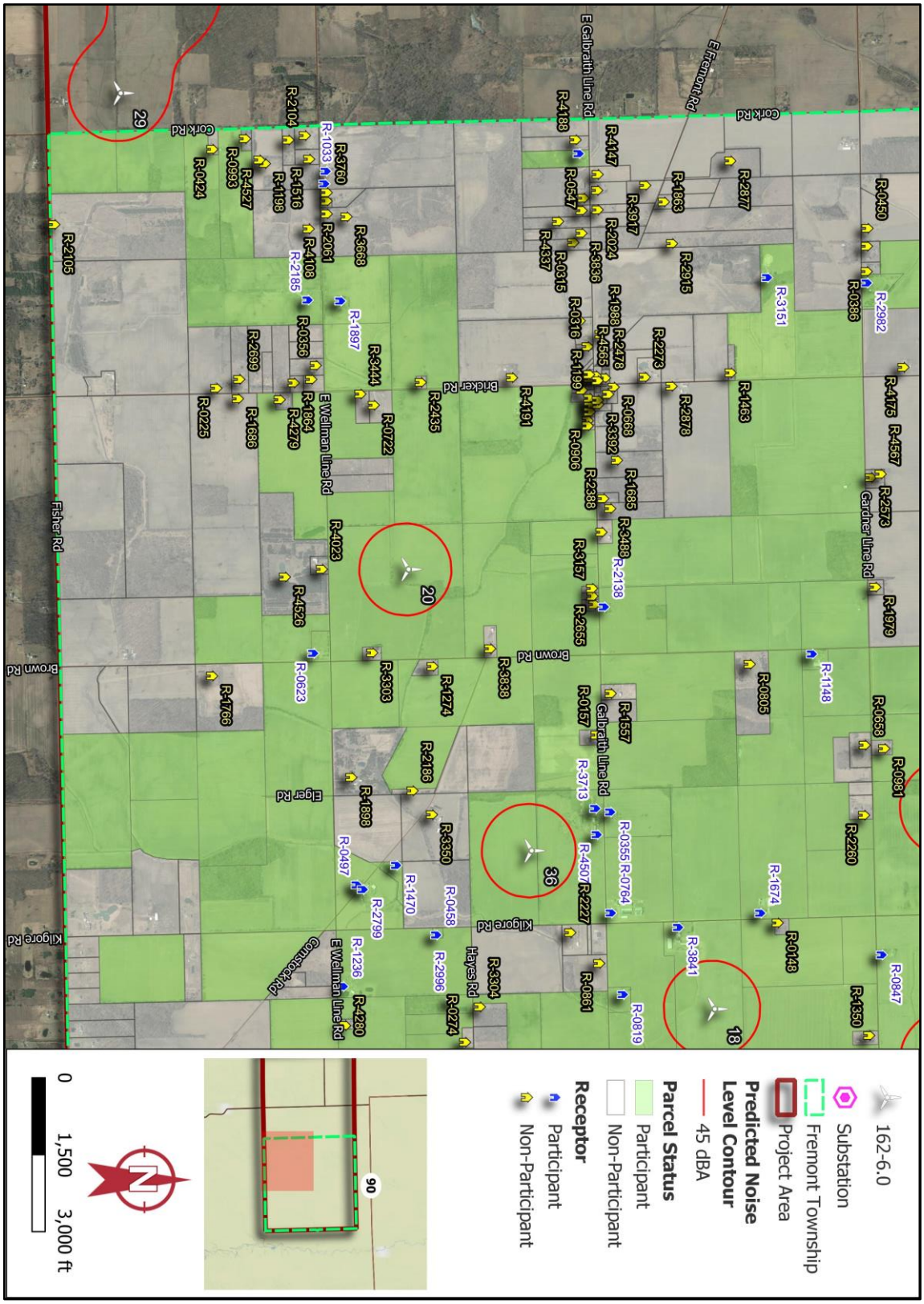

Figure C-7. Predicted Noise Level Contours – L25 Southwest Portion

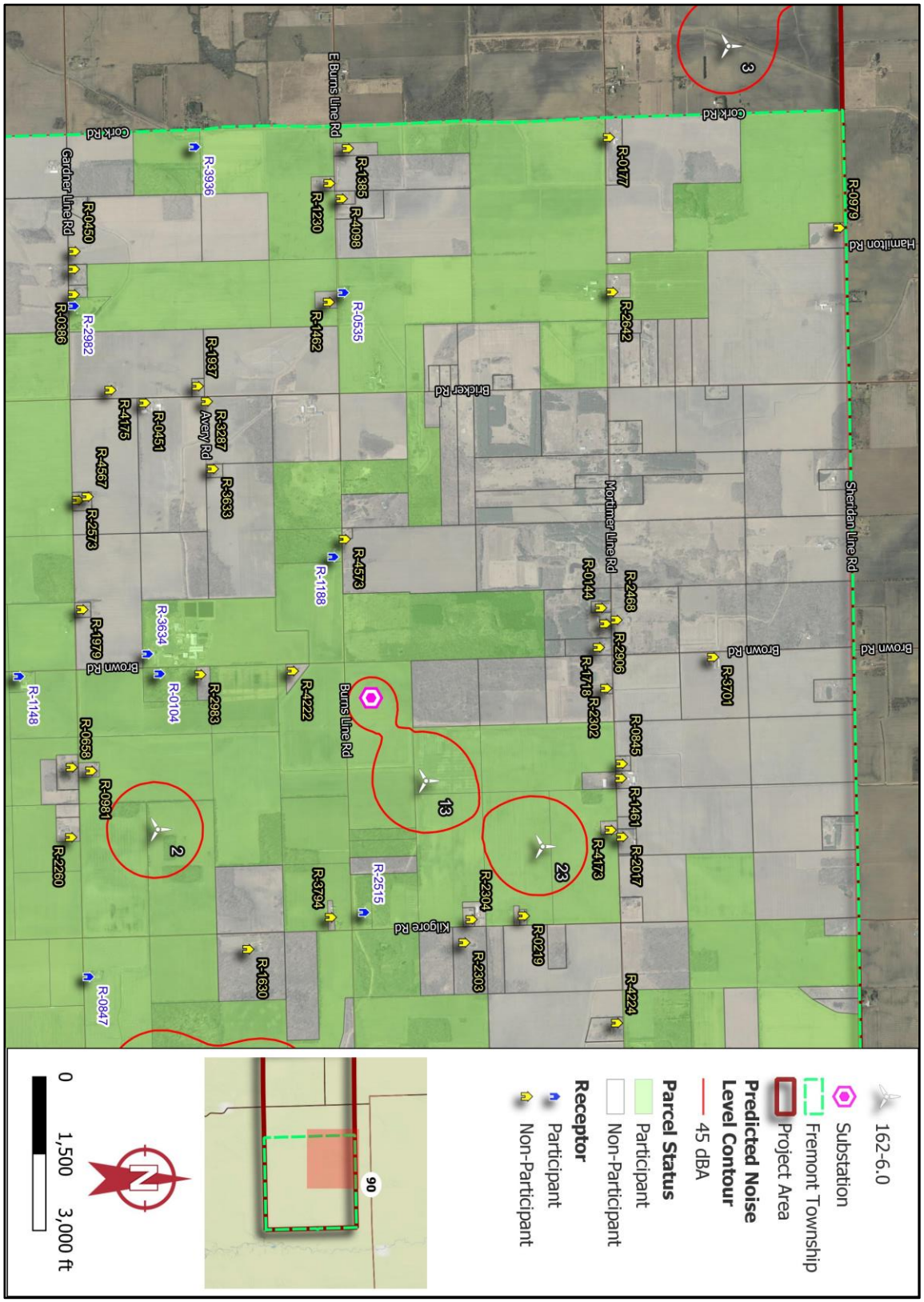

Figure C-8. Predicted Noise Level Contours – L25 Northwest Portion

Figure C-9. Predicted Noise Level Contours – L16a Northeast Portion

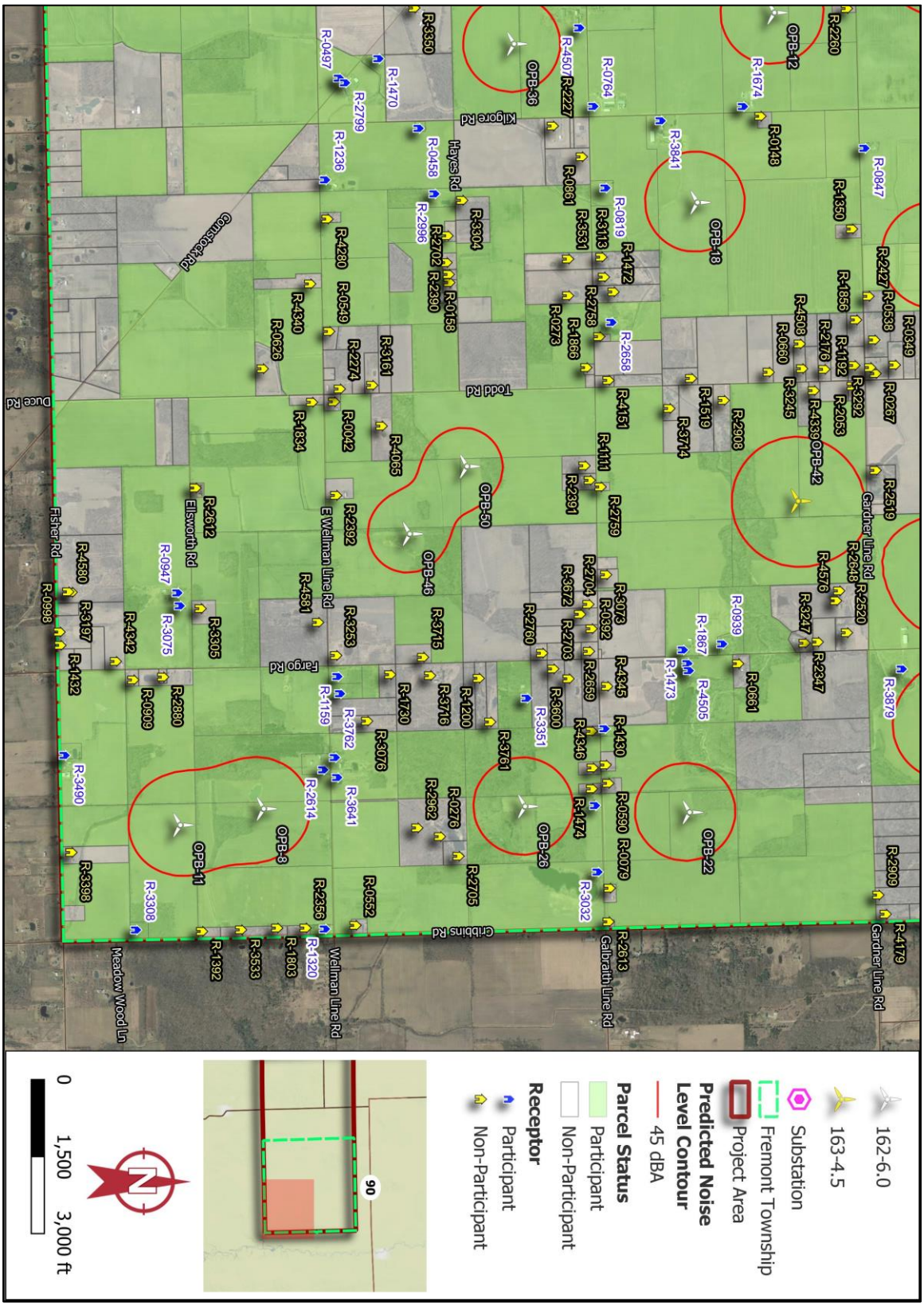

Figure C-10. Predicted Noise Level Contours – L16a Southeast Portion

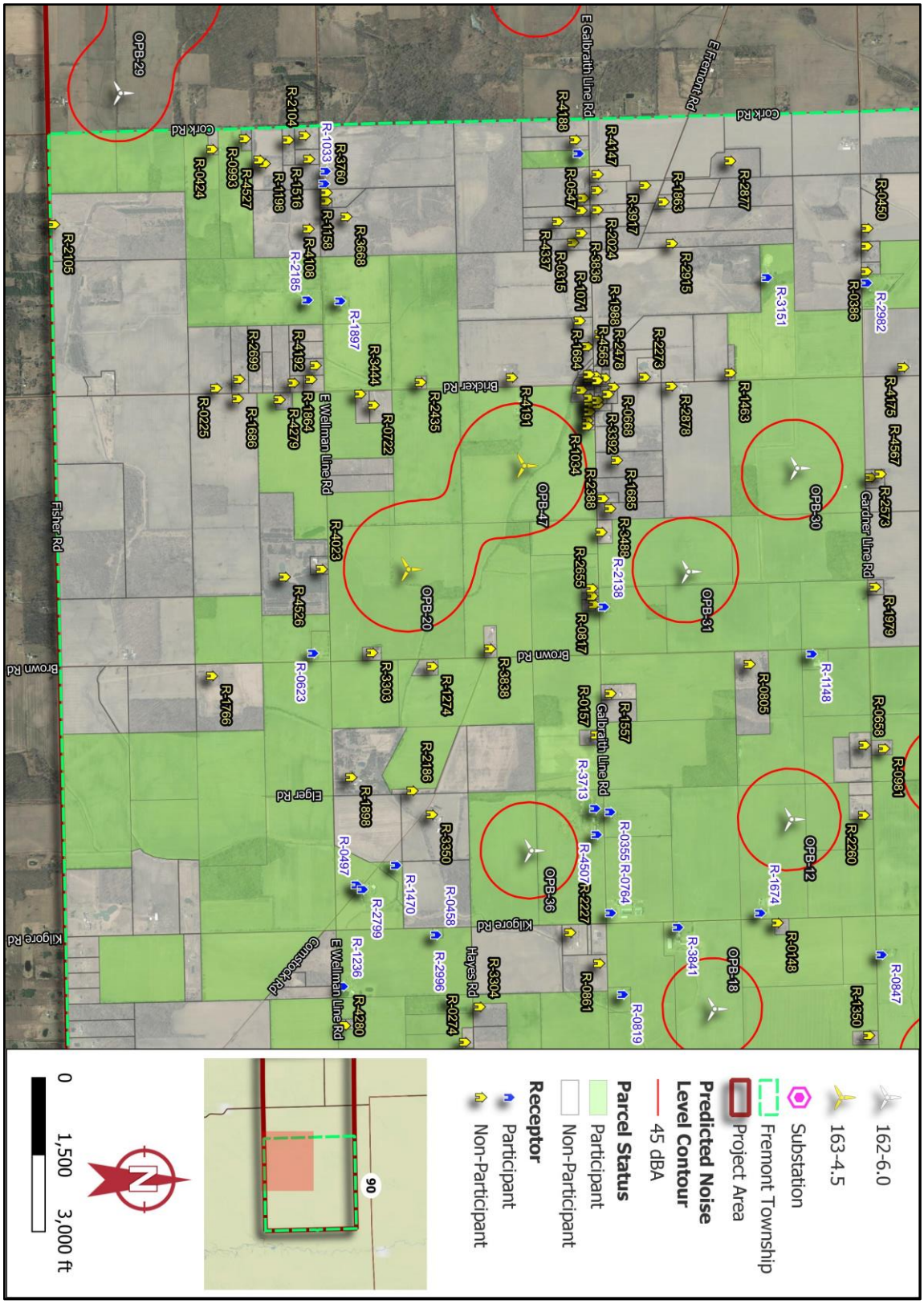

Figure C-11. Predicted Noise Level Contours – L16a Southwest Portion

Figure C-12. Predicted Noise Level Contours – L16A Northwest Portion