

**APPENDIX I – Telecommunications Study/Electromagnetic
Interference Analysis**

Dodge County Wind, MN Electromagnetic Interference Analysis

The following document was prepared by NextEra Analytics, an indirect wholly-owned subsidiary of NextEra Energy Resources, LLC (NEER) for the use of Dodge County Wind, LLC, as an indirect wholly-owned subsidiary of NEER. NextEra Analytics has prepared this report based on available government information by the Federal Communications Commission (FCC) and internal analysis methods. We cannot guarantee the accuracy of the data collected by the FCC. Microwave tower and link information may be inaccurate or incomplete due to FCC applicant error.

Executive Summary

NextEra Analytics, an affiliate of Dodge County Wind LLC (Dodge County) assessed the potential for interference of licensed communication links in close proximity to the proposed Dodge County Wind Project area for the purposes of determining exclusion zones to aid the design of a proposed wind energy generation project. This report summarizes the microwave links and towers along with local cellular towers, media towers (AM and FM), television, and aviation towers, identified within and near the assessment area.

A review of the Federal Communications Commission (FCC) national database and the Universal Licensing System was conducted to identify these possible constraints. Wind turbine offset distances were taken in consideration for the design of the wind turbine array.

Electromagnetic analysis results show that interference is not expected to impact nearby microwave, AM, FM, cellular, TV, and aviation towers based on the array design.

The analysis is current as of July 21, 2021. NextEra Analytics recommends a refresh of this analysis if the proposed wind energy generation project has not been constructed after two years.

This report only provides analysis for licensed radio towers and links found within the FCC database. Many local municipalities (police, fire, etc.) do not license microwave links, NextEra Analytics recommends that Dodge County LLC coordinate with the appropriate local municipality officials. Also not included within the database are microwave towers and links utilized by the Federal government (Dept. of Defense, Dept. of Commerce, etc.), again for public safety concerns. A letter stating “No Harmful Interference Anticipated (NHIA)” has been received from the National Telecommunications and Information Agency (NTIA).

Dodge County Wind, MN – Electromagnetic Interference

NextEra Analytics, an affiliate of Dodge County Wind LLC (Dodge County) assessed the potential for interference of licensed communication links in close proximity to the proposed Dodge County Wind Project area for the purposes of determining exclusion zones to aid the design of a proposed wind energy generation project. This report summarizes the microwave links and towers along with local cellular towers, media towers (AM and FM), television, and aviation towers, identified within and near the assessment area.

A review of the FCC national database and the Universal Licensing System was conducted to identify these possible constraints. Wind turbine offset distances were taken into consideration for the design of the wind turbine array.

The site is located in Dodge and Steele County, Minnesota, roughly 28 kilometers west of the city of Rochester, Minnesota. Figure 1 below, depicts the project location of Dodge County Wind.

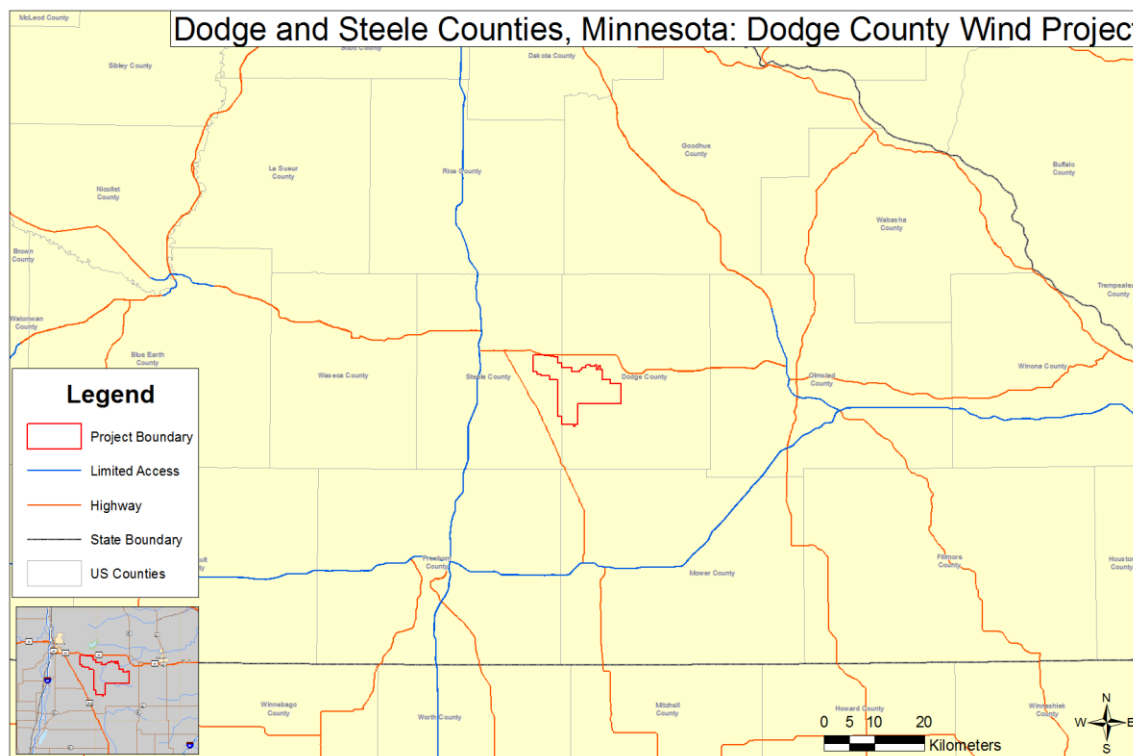


Figure 1: Dodge County Wind Project Location

Turbine Technology

Dodge County Wind is a proposed wind energy generation site that consists of 79 turbine locations. The layout is composed of 60 GE3.40-140-98 turbines (3.40MW rated capacity; 140m rotor diameter, or RD; 98m hub height, or HH), 8 GE3.40-140-81 turbines (3.40MW rated capacity; 140m RD; 81m HH), and 11 GE2.52-116-90 turbines (2.52MW rated capacity; 116.5m RD; 90m HH) for a total capacity of 258.92MW. Turbine layout details are included in Table 1 and Figure 2.

Turbine Technology	GE3.40-140-98 / GE3.40-140-81 / GE2.52-116-90
Turbine Count	60 / 8 / 11
Hub Height (m)	98 / 81 / 90
Rotor Diameter (m)	140 / 140 / 116.5
Turbine Rated Power (MW)	3.40 / 3.40 / 2.52
Total Capacity (MW)	258.92

Table 1: Dodge County Layout Summary

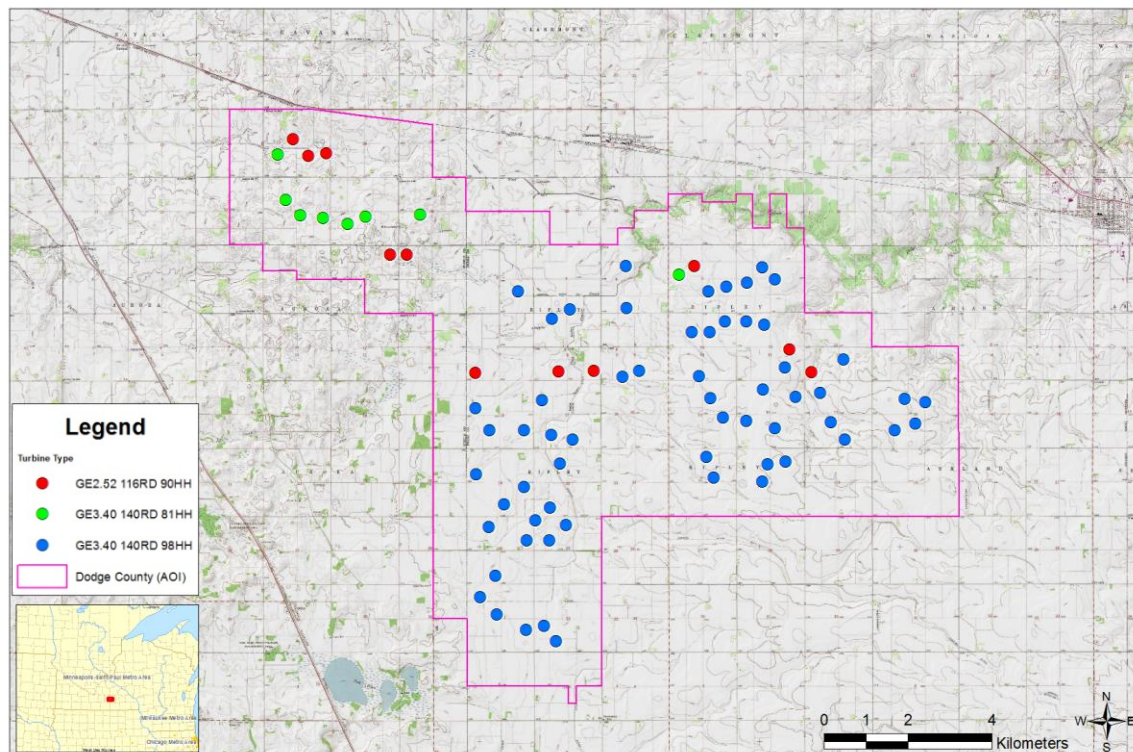


Figure 2: Dodge County Wind Turbine Technology Allocation

It should be noted that the technology of some of the turbines in this layout may be changed prior to construction. In that event, provided that the rotor diameter of the turbine in question does not increase and the location of the turbine is not

shifted, the conclusions outlined in this report regarding the telecommunications impact from Dodge County will not materially change. Any modifications to turbine capacity and hub height will also not change the telecommunications impact of the wind farm.

Data Sources

Within the United States, the location of industrial and commercial telecommunication systems, including microwave links, are collected and maintained by the Wireless Telecommunications Bureau (WTB), a division of the FCC. This data is made publicly available through the ULS database, which contains licensing information on both current and permit pending facilities for microwave, cellular, media, and several radio services utilized by private industry (non-Federal telecommunication systems). License information supplied within the ULS database is updated daily, and is dependent upon information provided by each individual applicant.

NextEra Analytics used several data sources (ESRI satellite imagery, Google Earth, etc.) of high resolution imagery to aid in assessing the accuracy of the geographic locations of each microwave tower with links intersecting the project boundary or area of interest (AOI).

Methodology

The ULS database, described earlier, was used to identify the microwave towers, microwave links, cellular, AM, FM, and aviation towers within a 25-kilometer radius that may impact the Dodge County Wind Farm. Television towers were identified within a 100-kilometer radius. The database provides detailed information for each radio tower and link, which was used to calculate turbine exclusion zones to ensure interference compliance.

Exclusion zones for wind turbines near microwave links are calculated using a theory proposed by Bacon (2002), which identifies the radius of the 2nd Fresnel zone, a theoretical sphere representative of a propagating radio wave, as an appropriate offset distance. Calculations of the 2nd Fresnel zone can be determined by:

$$\text{2nd Fresnel zone Radius} = \sqrt{\frac{2\lambda d_1 d_2}{d_1 + d_2}} \quad (1)$$

Where:

d_1, d_2 = distances from each end of the radio path.

λ = wavelength of the corresponding radio frequency.

To account for precision errors within the ULS database, and to further reduce the potential for interference from a wind turbine, a Worst Case Fresnel Zone (WCFZ) was calculated for each microwave link. The WCFZ provides the maximum offset distance required, and is determined by the 2nd Fresnel zone radius obtained at the midpoint of the link, where $d_1 = d_2$. Adjusting Eq. 1 to calculate the WCFZ in meters yields the following:

$$WCFZ = 17.32 \sqrt{\frac{nD}{4(F)}} \quad (2)$$

Where:

D = distance between the transmitter and receiver towers.

F = frequency in GHz.

n = Fresnel zone, which for the 2nd Fresnel Zone $n = 2$.

The calculated radius distance from Eq. 2 provides a three-dimensional turbine exclusion zone around each microwave link that can be used to guide wind turbine array design.

In addition to the WCFZ calculated for each microwave link, NextEra Analytics applies an offset of one-half RD plus 10 meter to account for turbine blade overhang. A turbine overhang offset using a 140 m turbine technology is included within this analysis to represent the GE3.40-140 wind turbine generator, which is the generator with the largest rotor diameter at the site, and is thus the turbine technology that would potentially cause the greatest interference.

The WTB cannot provide quality assurance for every license within the ULS database, so accuracy of the data relies on applicant certifications, and, in extreme cases, license audits. It has been NextEra Analytics' experience that most inaccuracies occur with regard to the location of the radio towers, where approximation or lack of precision of the geographic coordinates can result in a difference in the position of the tower by as much as 500 meters.

To fully account for these location errors, NextEra Analytics recommends on-site verification to identify the exact location of the transmitter and receiver towers. However, for this analysis, NextEra Analytics used high-resolution satellite imagery to identify possible tower location errors. Most microwave, media, and cellular towers extend well over 80m above ground level, and can be clearly viewed within high resolution satellite imagery. Each tower that may impact the project boundary was investigated for potential location error. Adjustments to the location of the microwave, media, and cellular towers are only made if clear evidence from the satellite imagery shows an inaccuracy.

Microwave Links and Microwave Towers

No microwave towers were identified within the Project area. However, fourteen microwave links have been identified near the project area and seven have been found to intersect the AOI. The WCFZ for all of these links has been calculated, and the appropriate turbine offset has been used to minimize any harmful impact from the proposed turbine layout.

Figure 3 below illustrates the position of each microwave link with respect to the project boundary and turbine locations.

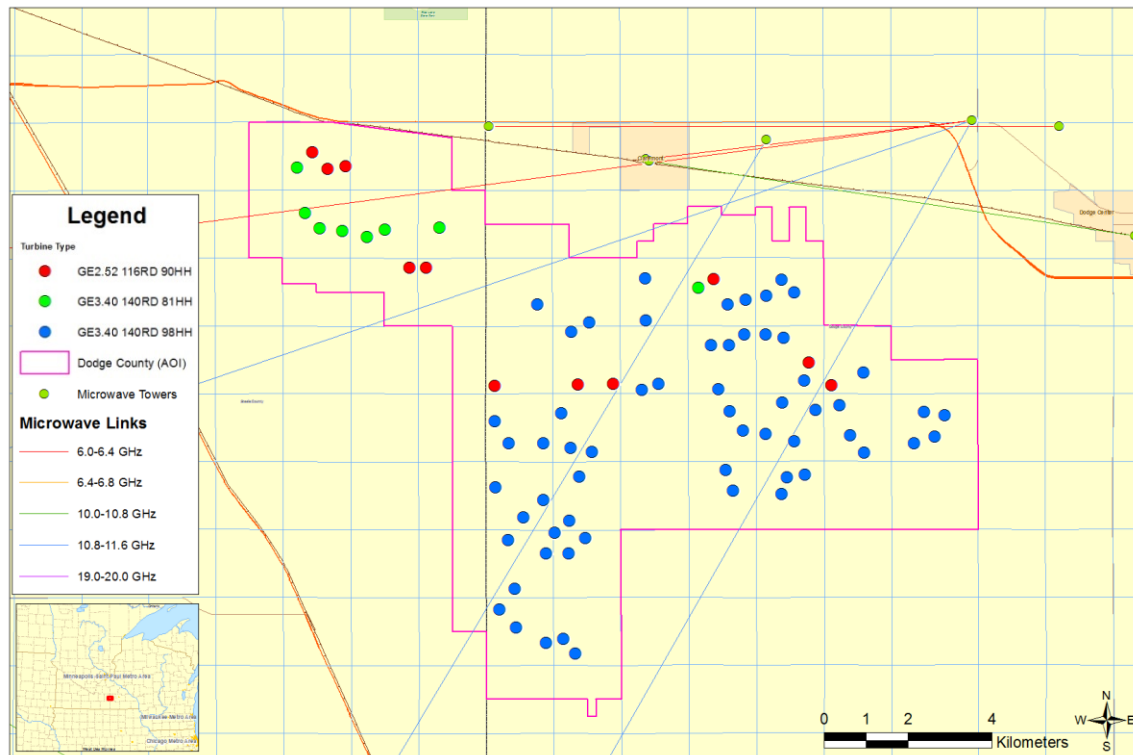


Figure 3: Dodge County Wind with Microwave Links

Table 2 provides more detailed information on each microwave link in proximity to the area with the calculated WCFZ.

ID	STATUS	TRANSMITTER CALLSIGN	MICROWAVE NAME	BAND FREQ (GHz)	WCFZ (m)	BEAM LENGTH (km)
1	Active	WQJE209	Minnesota, State of	6.6	27.20	32.74
2	Active	WQJY578	Minnesota, State of	6.3	27.82	32.74
3	Active	WQPN825	Cellco Partnership	6	18.40	13.59
4	Active	WQPN827	Cellco Partnership	6.3	18.03	13.59
5	Active	WQQD451	Radio Link Internet	10.8	17.18	21.16
6	Active	WQQD451	Radio Link Internet	10.8	18.14	23.77
7	Active	WQQD513	Radio Link Internet	11.2	20.63	31.92
8	Active	WQQD513	Radio Link Internet	11.3	17.74	23.77
9	Active	WQQD513	Radio Link Internet	19.6	7.74	7.84
10	Active	WQWJ905	T-MOBILE LICENSE LLC	11	15.44	17.50
11	Active	WQWJ906	T-MOBILE LICENSE LLC	11.5	15.11	17.50
12	Active	WQZP635	Radio Link Internet	6	13.99	7.84
13	Pending	WRAU529	Minnesota WiFi	11.6	12.33	11.72
14	Active	WRF5598	Minnesota Wifi	10.8	12.78	11.72

Table 2: Detailed Information on Microwave Links in Proximity with the Project Boundary

There are a number of links that are within relatively close proximity to turbines. The Worst Case Fresnel Zone was calculated for each microwave link and a conservative offset of 80 meters was used to reduce the probability of harmful interference. Figures 4-7 provide aerial imagery of the turbine layout relative to the Fresnel zones and their offsets that intersect the project boundary.

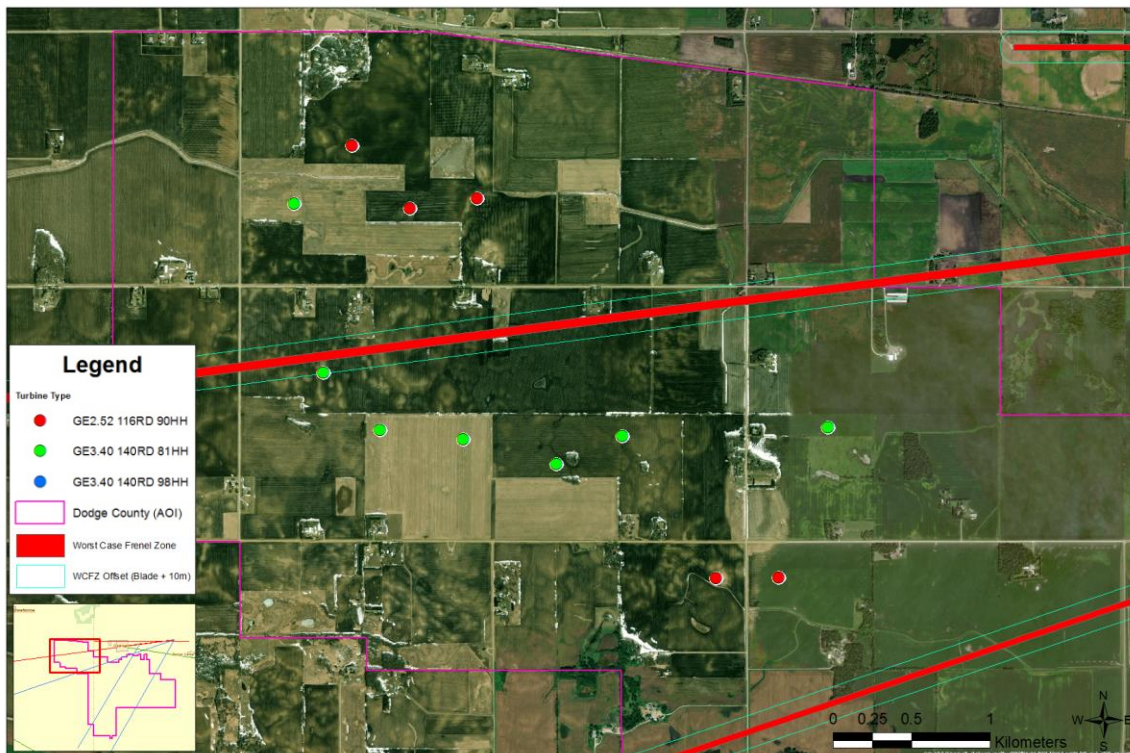


Figure 4: Dodge County Wind Fresnel Zone Northwest

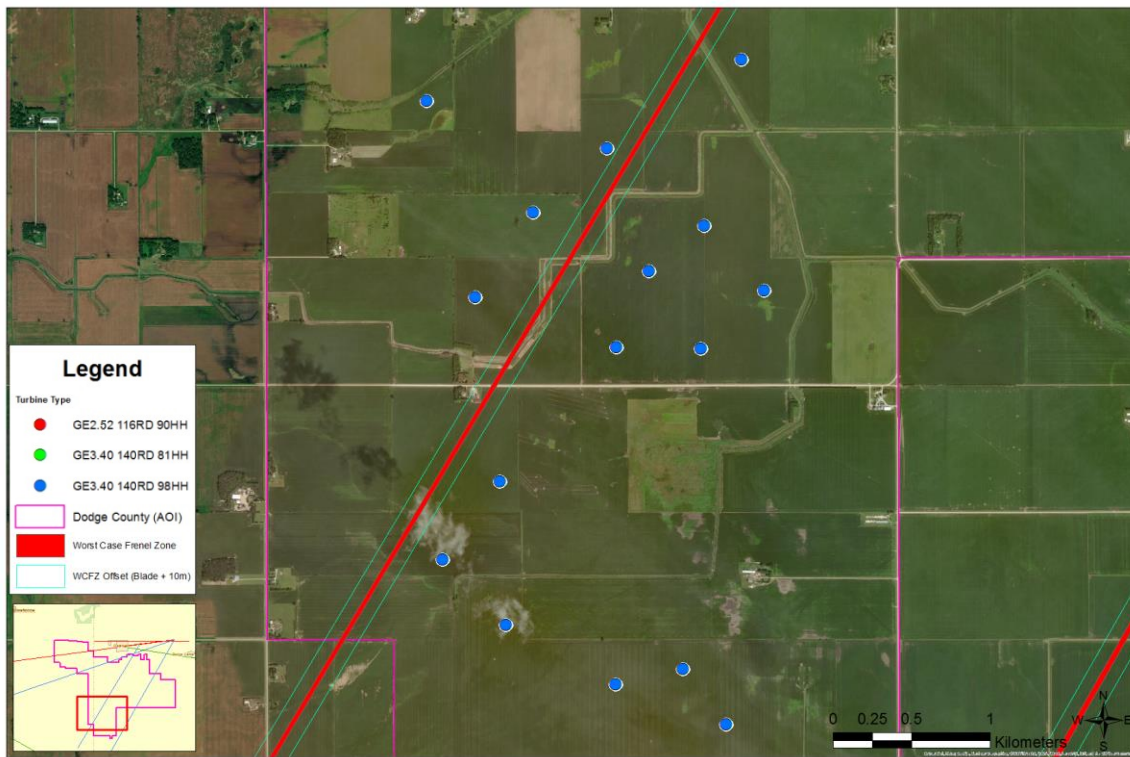


Figure 5: Dodge County Wind Fresnel Zone South

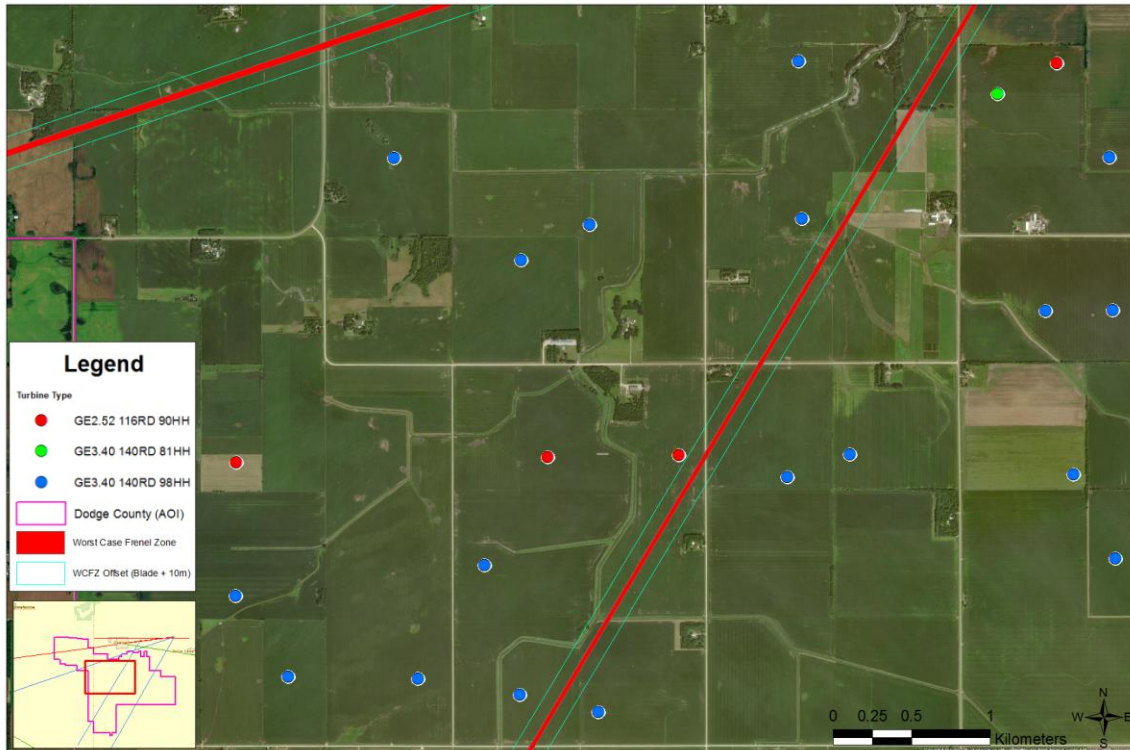


Figure 6: Dodge County Wind Fresnel Zone North

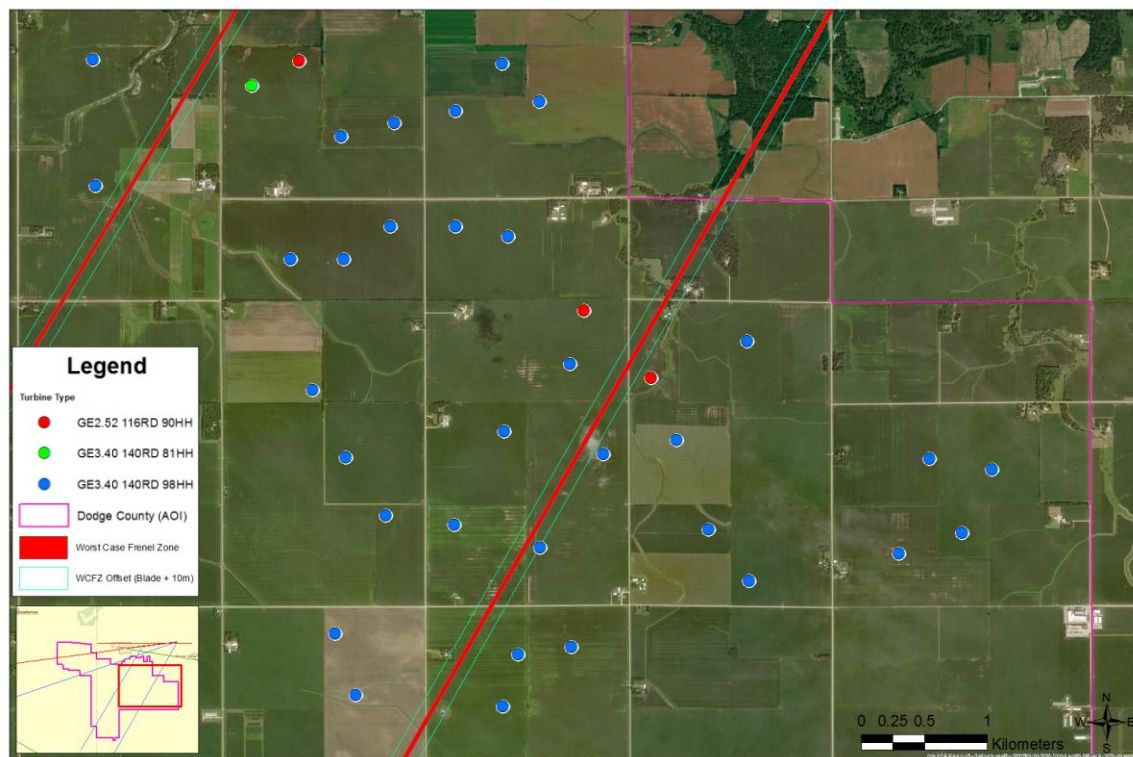


Figure 7: Dodge County Wind Fresnel Zone East

Cellular Towers

No cellular towers were identified within the project boundary. Thirteen cellular towers were discovered within 25 km of the project boundary and are identified in Table 3 and figure 8.

Harmful interference associated with cellular towers is not likely as cellular transitions or packet switching occurs when a cellular link becomes unavailable.

ID	CALLSIGN	LICENSEE	STATUS	LATITUDE	LONGITUDE	DISTANCE TO AOI (km)
1	KNKA667	AT&T Mobility Spectrum LLC	Active	44.02406	-92.59833	24.28
2	KNKA667	AT&T Mobility Spectrum LLC	Active	44.00672	-92.71861	14.52
3	KNKN403	ALLTEL Corporation	Active	43.87508	-93.04958	5.94
4	KNKN403	ALLTEL Corporation	Active	44.09361	-93.25389	11.96
5	KNKN403	ALLTEL Corporation	Active	44.11167	-93.18278	8.51
6	KNKN416	ALLTEL Corporation	Active	44.09556	-92.79833	13.26
7	KNKN416	ALLTEL Corporation	Active	44.25556	-92.98167	23.74
8	KNKN416	ALLTEL Corporation	Active	43.88539	-92.81933	10.91
9	KNKN572	AT&T Mobility Spectrum LLC	Active	43.91286	-93.07444	2.90
10	KNKN572	AT&T Mobility Spectrum LLC	Active	44.06072	-93.16472	4.00
11	KNLH690	Cellco Partnership	Active	44.08283	-93.22025	9.01
12	WPSJ612	ALLTEL Corporation	Active	44.00694	-92.71942	14.46
13	WPSJ612	ALLTEL Corporation	Active	44.05111	-92.87639	5.85

Table 3: Cellular Towers within 25 km of the Project Boundary

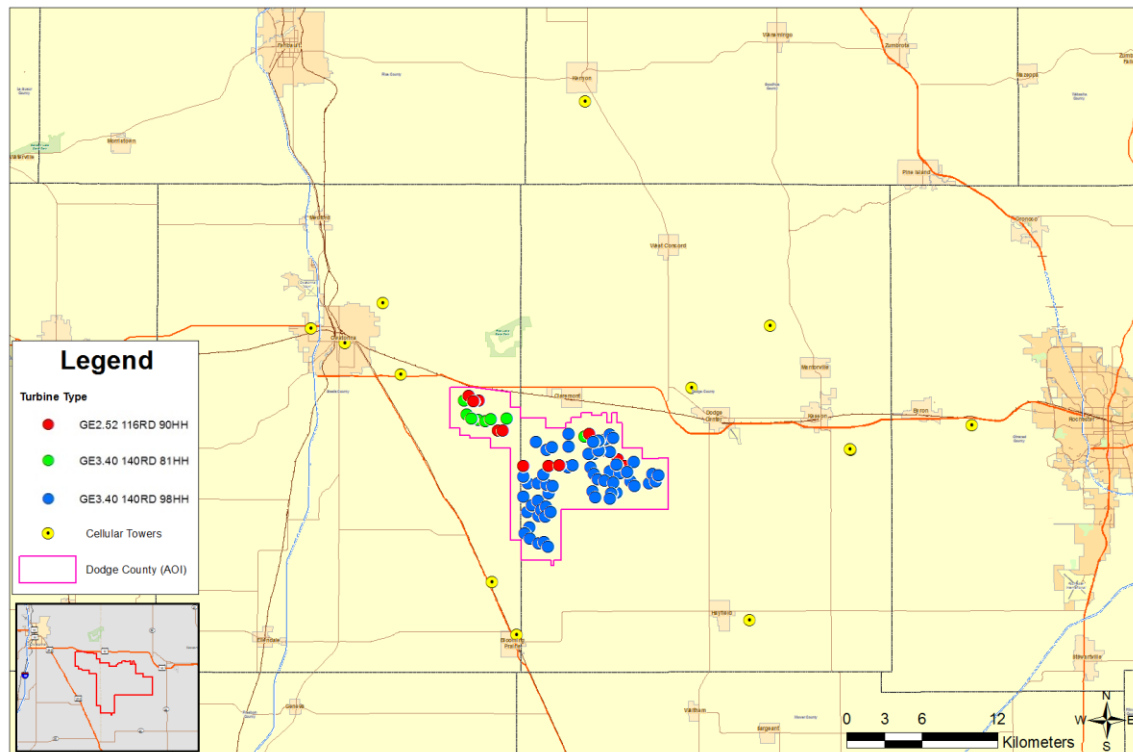


Figure 8: Cellular Towers within 25 km of the Project Boundary

Media Towers

No active AM radio towers were identified within the project boundary. Three AM towers were discovered within 25 km of the project boundary and are included in Table 4 and figure 9.

While no harmful interference to the AM towers is expected, reception of AM radio stations near each individual turbine may be impacted, especially for areas on the edge of AM radio coverage. The exclusion distance from AM towers is 1 wavelength from non-directional antennas and 10 wavelengths or 3 kilometers from directional antennas (Marlowe, 2015). Given most AM radio receptors will be nearby dwellings, which should have a sufficient offset from each turbine, any interruption to reception from the installation of wind turbines is expected to be minimal. The closest AM tower, KRFO, is located 5.7 km from the project boundary, and has a broadcasting frequency of 1390 kHz, which corresponds to a wavelength of 216 m. Thus, the proposed layout is greater than 10 wavelengths away from the closest station.

ID	CALLSIGN	LICENSEE	FREQUENCY (kHz)	LATITUDE	LONGITUDE	DISTANCE TO AOI (km)
1	KFOW	MAIN STREET BROADCASTING, INC.	1170	44.04472	-93.38556	21.57
2	KQAQ	REAL PRESENCE RADIO	970	43.70750	-92.94583	24.73
3	KRFO	TOWNSQUARE MEDIA FARIBAULT LICENSE, LLC	1390	44.07389	-93.18000	5.66

Table 4: AM Transmitter Towers within 25 km of the Project Boundary

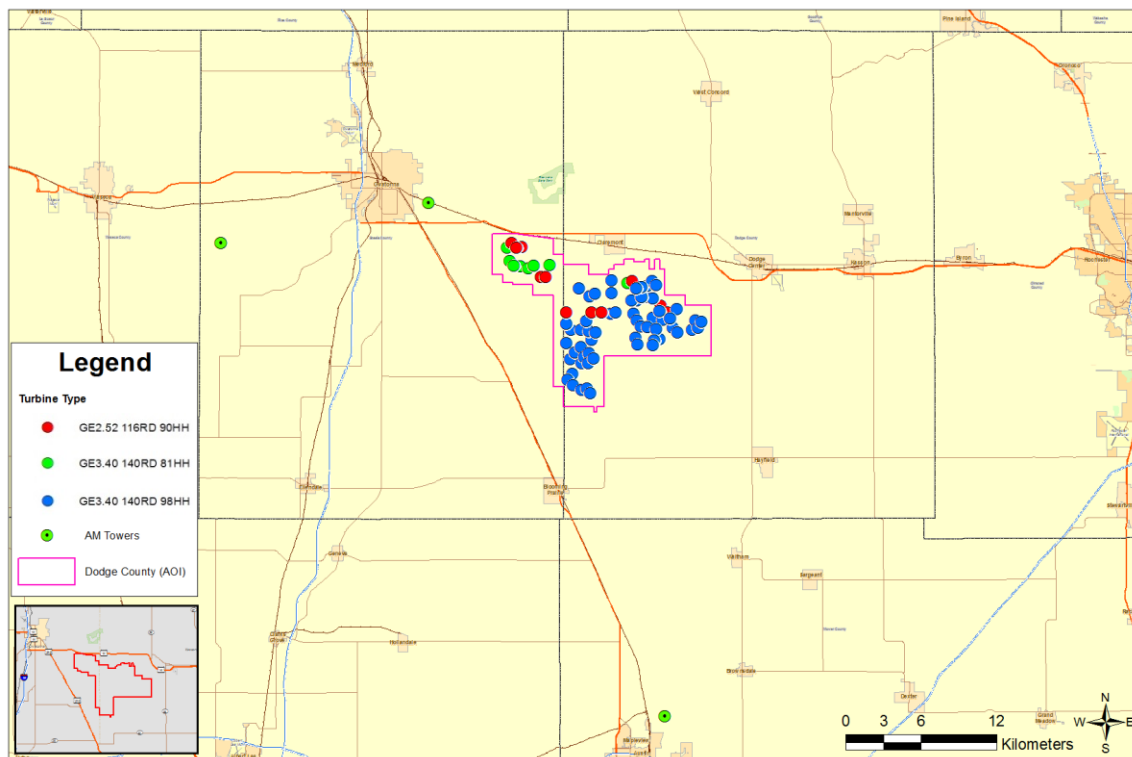


Figure 9: AM Transmitter Towers within 25 km of the Project Boundary

No active FM radio towers were identified within the project boundary. Thirteen FM towers were discovered within 25 km of the project boundary and are included in Table 5 and figure 10.

While no harmful interference to the FM towers is expected, reception of FM radio stations near each individual turbine may be impacted, especially for areas

on the edge of FM radio coverage. The recommended exclusion distance for FM towers is approximately 4 kilometers. FM stations that are closer than 4 kilometers to wind turbines have the potential to experience interference (Marlowe, 2015). Given most FM radio receptors will be nearby dwellings, which should have a sufficient offset from each turbine, any interruption to reception from the installation of wind turbines is expected to be minimal. One FM tower is located less than 4 km from the AOI, KCJL-LP, which is the most vulnerable tower to experience interference. The nearest wind turbine is located 3.97 km away from this tower.

ID	CALLSIGN	LICENSEE	FREQUENCY (MHz)	LATITUDE	LONGITUDE	DISTANCE TO AOI (km)
1	KRUE	MAIN STREET BROADCASTING, INC.	92.1	44.04556	-93.38389	21.44
2	K228DR	OWATONNA AREA CHRISTIAN RADIO, INC.	93.5	44.08983	-93.22464	9.65
3	K232FY	REAL PRESENCE RADIO	94.3	43.78806	-92.90806	17.36
4	K234DB	TOWNSQUARE MEDIA FARIBAULT LICENSE, LLC	94.7	44.07389	-93.18000	5.66
5	KCJL-LP	ONE DAY CHURCH PROJECT, INC.	95.1	43.99250	-92.86000	3.17
6	KWWK	TOWNSQUARE MEDIA ROCHESTER LICENSE, LLC	96.5	44.03306	-92.60278	24.05
7	K255AN	MINN-IOWA CHRISTIAN BROADCASTING, INC.	98.9	43.88708	-92.84894	9.53
8	KOWZ	BLOOMING PRAIRIE FARM RADIO INC.	100.9	44.04556	-93.38389	21.44
9	KRCH	IHM LICENSES, LLC	101.7	44.11639	-92.68944	21.14
10	K280EC	MINNESOTA PUBLIC RADIO	103.9	44.08861	-93.14028	4.51
11	KRFO-FM	TOWNSQUARE MEDIA FARIBAULT LICENSE, LLC	104.9	44.07389	-93.18000	5.66
12	K289AE	MINNESOTA PUBLIC RADIO	105.7	44.08861	-93.14028	4.51
13	K292GU	MAIN STREET BROADCASTING, INC.	106.3	44.04556	-93.38389	21.44

Table 5: FM Transmitter Towers within 25 km of the Project Boundary

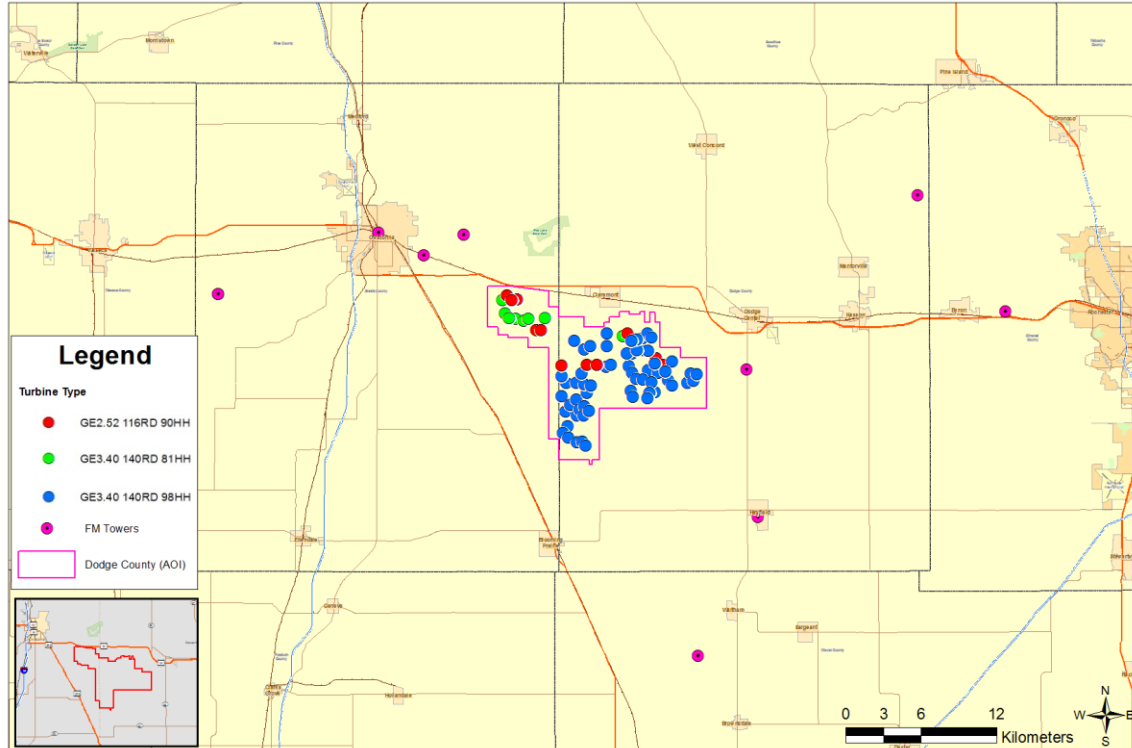


Figure 10: FM Transmitter Towers within 25 km of the Project Boundary

Television Stations

No digital or analog television stations were identified within the project boundary. Table 6 and figure 11 identifies television stations with approved or pending licenses within 100 km of the project boundary as determined by the FCC. There are 31 stations less than 50 km from the project boundary which are likely to be broadcasting to the region.

Electromagnetic Interference

ID	CALLSIGN	LICENSEE	SERVICE	CHANNEL	ERP (kW)	LATITUDE	LONGITUDE	DISTANCE TO AOI (km)
1	W22FD-D	EDGE SPECTRUM, INC.	LPD	22	15	43.88806	-92.85783	9.15
2	K21NU-D	EDGE SPECTRUM, INC.	LPD	21	5	44.04553	-93.38408	21.46
3	K48KJ-D	EDGE SPECTRUM, INC.	LPD	48	4.92	44.04553	-93.38408	21.46
4	K14PU-D	LANDOVER 2 LLC	LPD	14	1	43.65964	-93.08675	30
5	K19KB-D	LANDOVER 2 LLC	LPD	19	1	43.65964	-93.08675	30
6	K34MP-D	LANDOVER 2 LLC	LPD	34	1	43.65964	-93.08675	30
7	K47OF-D	LANDOVER 2 LLC	LPD	47	1	43.65964	-93.08675	30
8	K43OH-D	LANDOVER 2 LLC	LPD	43	1	43.80403	-92.58022	31.24
9	K45MO-D	LANDOVER 2 LLC	LPD	45	1	43.80403	-92.58022	31.24
10	K27OW-D	DIGITAL NETWORKS-MIDWEST, LLC	LPT	27	5.62	43.67256	-92.83031	31.63
11	K48KJ-D	THREE ANGELS BROADCASTING NETWORK, INC.	LD	48	1.5	43.82532	-93.43253	32.98
12	DK43DH	TELEVIEW SYSTEMS OF MINNESOTA	TX	43	1.47	43.63832	-93.14712	33.24
13	DK53DI	TELEVIEW SYSTEMS OF MINNESOTA	TX	53	1.47	43.63832	-93.14712	33.24
14	DK55FJ	TELEVIEW SYSTEMS OF MINNESOTA	TX	55	1.47	43.63832	-93.14712	33.24
15	DK57EU	TELEVIEW SYSTEMS OF MINNESOTA	TX	57	1.47	43.63832	-93.14712	33.24
16	DK61EU	TELEVIEW SYSTEMS OF MINNESOTA	TX	61	1.47	43.63832	-93.14712	33.24
17	K35PC-D	HC2 STATION GROUP, INC.	LPD	35	15	43.97028	-92.41833	38.58
18	K31LN-D	EDGE SPECTRUM, INC.	LPD	31	4	43.98614	-92.41767	38.64
19	K52HH	MS COMMUNICATIONS, LLC	TX	52	0.004	43.97112	-92.41520	38.84
20	K30NI-D	LANDOVER 2 LLC	LPD	30	1	43.69033	-93.41778	39.95
21	K32LB-D	LANDOVER 2 LLC	LPD	32	1	43.69033	-93.41778	39.95
22	K38OU-D	LANDOVER 2 LLC	LPD	38	1	43.69033	-93.41778	39.95
23	K44LT-D	LANDOVER 2 LLC	LPD	44	1	43.69033	-93.41778	39.95
24	K41MP-D	SPECTRUM EVOLUTION, INC.	LPD	41	1	43.91744	-92.40433	40.07
25	K40JT	DIGITAL NETWORKS-MIDWEST, LLC	LPX	40	10.7	43.62778	-93.36389	42.09
26	K25NK-D	THREE ANGELS BROADCASTING NETWORK, INC.	LPD	25	15	44.04111	-92.34056	45.02
27	K56HW	TRINITY BROADCASTING NETWORK	TX	56	75	44.04222	-92.34080	45.02
28	K58GC	THREE ANGELS BROADCASTING NETWORK, INC.	TX	58	29	44.04222	-92.34079	45.02
29	KAAL	KAAL-TV, LLC	DTV	36	620	43.64278	-92.52667	46.67
30	KSMQ-TV	KSMQ PUBLIC SERVICE MEDIA, INC.	DTV	20	319.2	43.64278	-92.52667	46.67
31	KXLT-TV	SAGAMOREHILL OF MINNESOTA LICENSES, LLC	DTV	26	108	43.64278	-92.52667	46.67
32	KIMT	ROCHESTER TV LICENSE COMPANY, LLC	DTV	24	472	43.47556	-92.70833	55.6
33	KYIN	IOWA PUBLIC BROADCASTING BOARD	DTV	18	533	43.47556	-92.70833	55.6
34	KTTC	KTTC LICENSE, LLC	DTV	10	43.1	43.57083	-92.42722	57.95
35	K22LG-D	LANDOVER 2 LLC	LPD	22	1	43.65253	-93.74222	63.89
36	K26MG-D	LANDOVER 2 LLC	LPD	26	1	43.65253	-93.74222	63.89
37	K28MU-D	LANDOVER 2 LLC	LPD	28	1	43.65253	-93.74222	63.89
38	K50NB-D	LANDOVER 2 LLC	LPD	50	1	43.65253	-93.74222	63.89
39	K1LW-LD	DTV AMERICA CORPORATION	LD	28	6	44.69528	-93.01830	71.7
40	KMQV-LD	DTV AMERICA CORPORATION	LD	49	6	44.69528	-93.01810	71.7
41	KWJM-LD	DTV AMERICA CORPORATION	LD	15	6	44.69528	-93.01830	71.7
42	K19IT-D	SPECTRUM EVOLUTION, INC.	LPD	19	1	43.93217	-91.96233	75.27
43	K27KL-D	SPECTRUM EVOLUTION, INC.	LPD	27	1	43.93217	-91.96233	75.27
44	K29JH-D	SPECTRUM EVOLUTION, INC.	LPD	29	1	43.93217	-91.96233	75.27
45	K31KX-D	SPECTRUM EVOLUTION, INC.	LPD	31	1	43.93217	-91.96233	75.27
46	K40NI-D	LANDOVER 2 LLC	LPD	40	1	43.93217	-91.96233	75.27
47	K40JS-D	BLUE EARTH-NICOLLET FARIBAUT COOPERATIVE ELECTRIC ASSOCIATION	LD	40	3	43.58582	-93.92960	80.71
48	K49JG-D	BLUE EARTH-NICOLLET FARIBAUT COOPERATIVE ELECTRIC ASSOCIATION	LD	49	3	43.58582	-93.92960	80.71
49	K51KB-D	SOUTH CENTRAL ELECTRIC ASSOCIATION	LD	51	3	43.58582	-93.92965	80.71
50	K14KD-D	SOUTH CENTRAL ELECTRIC ASSOCIATION	LPD	14	3	43.58583	-93.92972	80.72
51	K16MA-D	BLUE EARTH-NICOLLET FARIBAUT COOPERATIVE ELECTRIC ASSOCIATION	LPT	16	3	43.58583	-93.92972	80.72
52	K17MX-D	COOPERATIVE TELEVISION ASSOCIATION OF SOUTHERN MINNESOTA	LPD	17	3	43.58583	-93.92972	80.72
53	K19LJ-D	BLUE EARTH-NICOLLET FARIBAUT COOPERATIVE ELECTRIC ASSOCIATION	LPT	19	3	43.58583	-93.92972	80.72
54	K21KF-D	COOPERATIVE TELEVISION ASSOCIATION OF SOUTHERN MINNESOTA	LPD	21	3	43.58583	-93.92972	80.72
55	K23FY-D	COOPERATIVE TELEVISION ASSOCIATION OF SOUTHERN MINNESOTA	LPT	23	3	43.58583	-93.92972	80.72
56	K27FI-D	SOUTH CENTRAL ELECTRIC ASSOCIATION	LPT	27	3	43.58583	-93.92972	80.72
57	K29IF-D	BLUE EARTH-NICOLLET FARIBAUT COOPERATIVE ELECTRIC ASSOCIATION	LPD	29	3.1	43.58583	-93.92972	80.72
58	K31EF-D	SOUTH CENTRAL ELECTRIC ASSOCIATION	LPT	31	3	43.58583	-93.92972	80.72
59	K34NV-D	SOUTH CENTRAL ELECTRIC ASSOCIATION	LPT	34	3	43.58583	-93.92972	80.72
60	K35IU-D	SOUTH CENTRAL ELECTRIC ASSOCIATION	LPT	35	3	43.58583	-93.92972	80.72
61	K47MI-D	COOPERATIVE TELEVISION ASSOCIATION OF SOUTHERN MINNESOTA	LD	47	3	43.58583	-93.92970	80.72
62	K45MN-D	LANDOVER 2 LLC	LPD	45	1	43.65856	-94.17675	94.36
63	K25QC-D	EDGE SPECTRUM, INC.	LPD	25	7.5	44.05150	-94.29997	94.82
64	K43JE-D	EDGE SPECTRUM, INC.	LPD	43	10.82	44.05150	-94.29997	94.82
65	W19EN-D	STATE OF WISCONSIN - EDUCATIONAL COMMUNICATIONS BOARD	LPT	19	6	44.90278	-92.69111	98.72
66	W47CO-D	STATE OF WISCONSIN - EDUCATIONAL COMMUNICATIONS BOARD	LD	47	1.6	44.90282	-92.69131	98.72
67	K22LJ-D	EDGE SPECTRUM, INC.	LPD	22	5	43.06664	-93.36525	99.14
68	K27MI-D	EDGE SPECTRUM, INC.	LPD	27	3	43.06664	-93.36525	99.14
69	K35PA-D	EDGE SPECTRUM, INC.	LPD	35	15	43.06664	-93.36525	99.14

Table 6: Television Stations within 100 km of the Project Boundary

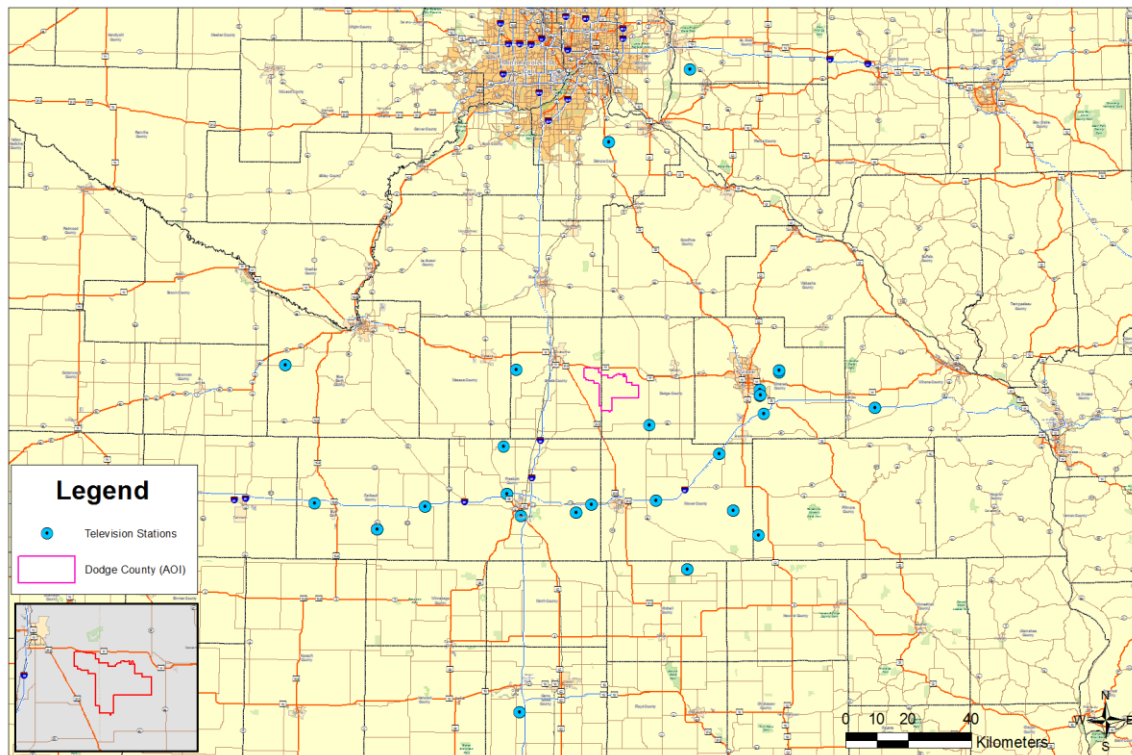


Figure 11: Television Stations within 100 km of the Project Boundary

While the impact of wind turbines on digital television reception is not well known due to limited cases and testing, any interference is expected to be limited to areas near the edge of station reception, areas near a turbine that is within the line-of-sight between the transmit tower and receptor, and areas of complex topography (OfCom, 2009). Most of the stations within 100km are low power stations or translator stations and have limited range and are not anticipated to experience reception degradation. There are six full power stations, KXLT-TV, KSMQ-TV, KAAL, KIMT, KYIN, and KTTC, which have a possibility of experiencing reception degradation if the proposed wind farm is located in the line-of-sight.

It is important to note that this assessment is based on broad assumptions, as it is difficult to accurately pinpoint the impact a large wind farm may have on each individual household due to a large number of external variables (topography, weather, antennae, etc.) which affect the propagation of the television radio signal.

Aviation Towers

No active Aviation towers were identified within the project boundary. Seven aviation towers were discovered within 25 km of the project boundary and are included in Table 7 and figure 12.

While no harmful interference is expected for the aviation towers; Dodge County Wind is subject to a Federal Aviation Agency (FAA) to determine any exclusion zones. Proposed turbine locations will maintain the standard appropriate offset distances in addition to any setbacks set by the agency to minimize harmful impact.

ID	STATUS	CALLSIGN	LICENSEE	SERVICE	LATITUDE	LONGITUDE	DISTANCE TO AOI (km)
1	Active	WGE2	MINNESOTA, STATE OF	AF Aeronautical and Fixed	44.02025	-92.82964	5.99
2	Active	WJZ8	MINNESOTA, STATE OF	AF Aeronautical and Fixed	44.12139	-93.25028	13.22
3	Active	WQSR490	Minnesota, State of MNDOT Aeronautics	AR Aviation Radionavigation	44.12975	-93.27192	15.17
4	Active	WRLA2017	MINNESOTA, STATE OF	AR Aviation Radionavigation	44.07389	-93.12194	2.49
5	Active	WRLB2051	MINNESOTA, STATE OF	AR Aviation Radionavigation	44.07389	-93.15556	3.99
6	Active	WRLG2026	MINNESOTA, STATE OF	AR Aviation Radionavigation	44.11969	-93.25578	13.47
7	Active	WRL2041	MINNESOTA, STATE OF	AR Aviation Radionavigation	44.12914	-93.27272	15.18

Table 7: Aviation Towers within 25 km of the Project Boundary

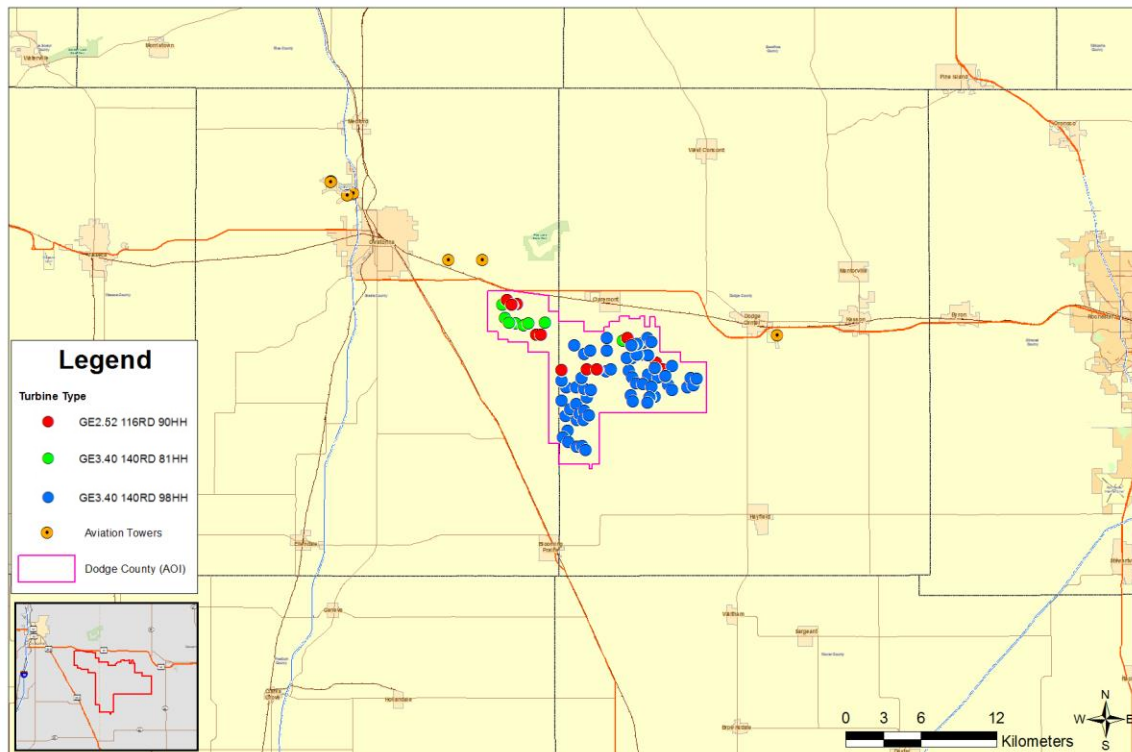


Figure 12: Aviation Towers within 25 km of the Project Boundary

Conclusion and Recommendations

NextEra Analytics analyzed the potential for wind turbine interference on licensed microwave links located within the proposed Dodge County Wind Project energy generation site. This report summarizes the microwave towers, microwave links, cellular towers, media towers, television towers, and aviation towers within and near the project boundary.

Seven microwave links were found to intersect the project boundary, and an appropriate offset to the WCFZ has been utilized to mitigate harmful interference from the proposed turbine layout. No interference from the proposed turbine layout is expected near microwave, AM, FM, cellular, aviation, and TV towers. This analysis is current as of July 21, 2021. NextEra Analytics recommends a refresh of this analysis if the proposed wind energy generation project has not been constructed after two years.

It is important to note that this report only provides analysis for licensed radio towers and links found within the FCC-ULS database. Many local municipalities (police, fire, etc.) do not license microwave links, NextEra Analytics recommends Dodge County Wind LLC coordinate with the appropriate local municipality officials. Also not included within the database are microwave towers and links utilized by the Federal government (Dept. of Defense, Dept. of Commerce, etc.), again for public safety concerns. A Federal communications study by the National Telecommunications and Information Agency (NTIA) has been conducted stating no harmful interference is expected in the project area.

References

Bacon, David F., "A proposed method for establishing an exclusion zone around a terrestrial fixed radio link outside of which a wind turbine will cause negligible degradation of the radio link performance."

<http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/Windfarms/windfarmdavidbacon.pdf>, Version 1.1, Oct 2002.

Ofcom, "Tall structures and their impact on broadcast and other wireless services."

http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/fixed/Windfarms/tallstructures/tall_structures.pdf, August 2009.

Marlowe, Frank. "The Importance of Electromagnetic-impact Analyses for Wind Permitting." *Windpower Engineering & Development*. Broadcast Wind, 2015. Web. 19 July 2017.