Appendix Q – Communication Tower Study

Wind Power GeoPlanner™

Communication Tower Study

South Deuel Wind

Prepared on Behalf of
Invenergy

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1. Introduction

This Communication Tower Study was performed for the South Deuel Wind project in Deuel County, South Dakota to identify the tower structures as well as FCC-licensed communication antennas that exist in and around the project area. This information is useful in the planning stages of the wind energy facilities to identify turbine setbacks and to prevent disruption to the services provided by the tenants on the towers. This data can be used in support of the wind energy facilities communications needs in addition to avoiding any potential impact to the current communications services provided in the region.

2. Summary of Results

The communication towers and antennas in the study area were derived from a variety of sources including the FCC's Antenna Structure Registration (ASR) database, Universal Licensing System (ULS), national and regional tower owner databases, and the local planning and zoning boards. The data[1] was imported into GIS software and the structures mapped in the wind energy area of interest. Each tower location is identified with a unique ID number associated with detailed structure and contact information provided in a spreadsheet attachment.

Two tower structures and fourteen communication antennas were identified within or near the South Deuel Wind project area using the data sources described in our methodology above. Both structures found were registered with the FCC, which contain two of the fourteen communication antennas. The remaining antennas may be located on a variety of structure types such as guyed towers, monopoles, silos, rooftops or portable structures. The specific type of structure would normally need to be determined by an on-site visit.

Detailed information about the tower structures and communication antennas is provided in Table 1 and Table 2 including location coordinates, structure height above ground level, and owner-operator name[2].

A discussion of turbine setback distances is provided in section three.

[1] Comsearch makes no warranty as to the accuracy of the data included in this report beyond the date of the report. The data provided in this report is governed by Comsearch's data license notification and agreement located at http://www.comsearch.com/files/data_license.pdf.

[2] Please note that this report analyzes all known operators on the towers from data sources available to Comsearch. Unidentified operators may exist on the towers due to unlicensed or federal government systems, mobile phone operators with proprietary locations, erroneous data on the FCC license, and other factors beyond our control.

Tower ID	ASR Number	Owner	Structure Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
Tower001	1213429	CCATT LLC	86.0	44.61688889	-96.71425000
Tower002	1249142	Rural Cellular Corporation	80.8	44.73344444	-96.68386111

Table 1: Summary of Tower Structures

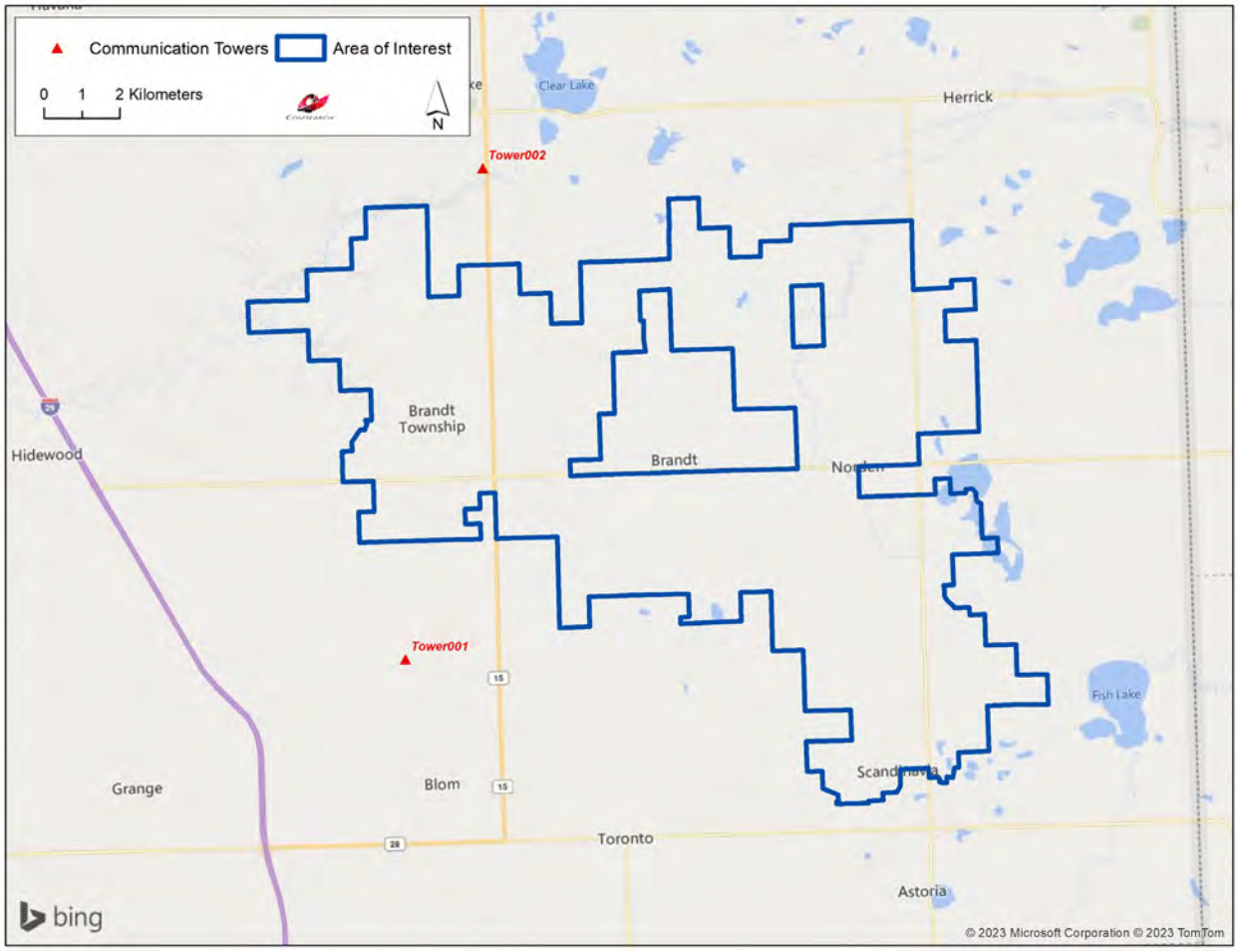

Figure 1: Towers within or near the Area of Interest

ID	Tower ID	Callsign	Service Type	Licensee	Antenna Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
1		WQHE918	Land Mobile	DeBough, Brian S	18.0	44.56755556	-96.57891667
2		WRHT235	Land Mobile	Tatanka Ridge, LLC	31.4	44.58027778	-96.59666667
3		WRFR648	Land Mobile	OTTER TAIL POWER COMPANY	6.2	44.58333333	-96.56861111
4		RXONLY	Microwave	Alpha 3E Licensee, LLC	30.5	44.61219444	-96.67805556
5	Tower001	KNKN384	Cellular	AT&T Mobility Spectrum, LLC	47.7	44.61686111	-96.71425000
6		WQEQ405	Land Mobile	EIDE, STACY	55.0	44.63105556	-96.68005556
7		WPEU910	Land Mobile	CLEAR LAKE VET CLINIC	61.0	44.63108333	-96.68005556
8		WPEC289	Land Mobile	TWO WAY SOLUTIONS INC.	61.0	44.63108333	-96.68005556
9		WPCR283	Land Mobile	BROOKINGS DEUEL RURAL WATER SYSTEM INC	24.0	44.63330556	-96.68366667
10		KEC540	Land Mobile	DEUEL COUNTY AMBULANCE INC	41.0	44.68747222	-96.69727778
11	Tower002	KNKN368	Cellular	Rural Cellular Corporation	Unknown	44.73344444	-96.68386111
12		WQCC520	Land Mobile	DEUEL, COUNTY OF	24.0	44.74636111	-96.58255556
13		KIL379	Land Mobile	BIT/SRC Engineering	41.0	44.75052778	-96.68700000
14		WRG581	Land Mobile	CLEAR LAKE, CITY OF	2.0	44.75080556	-96.68700000

Table 2: Summary of Communication Antennas

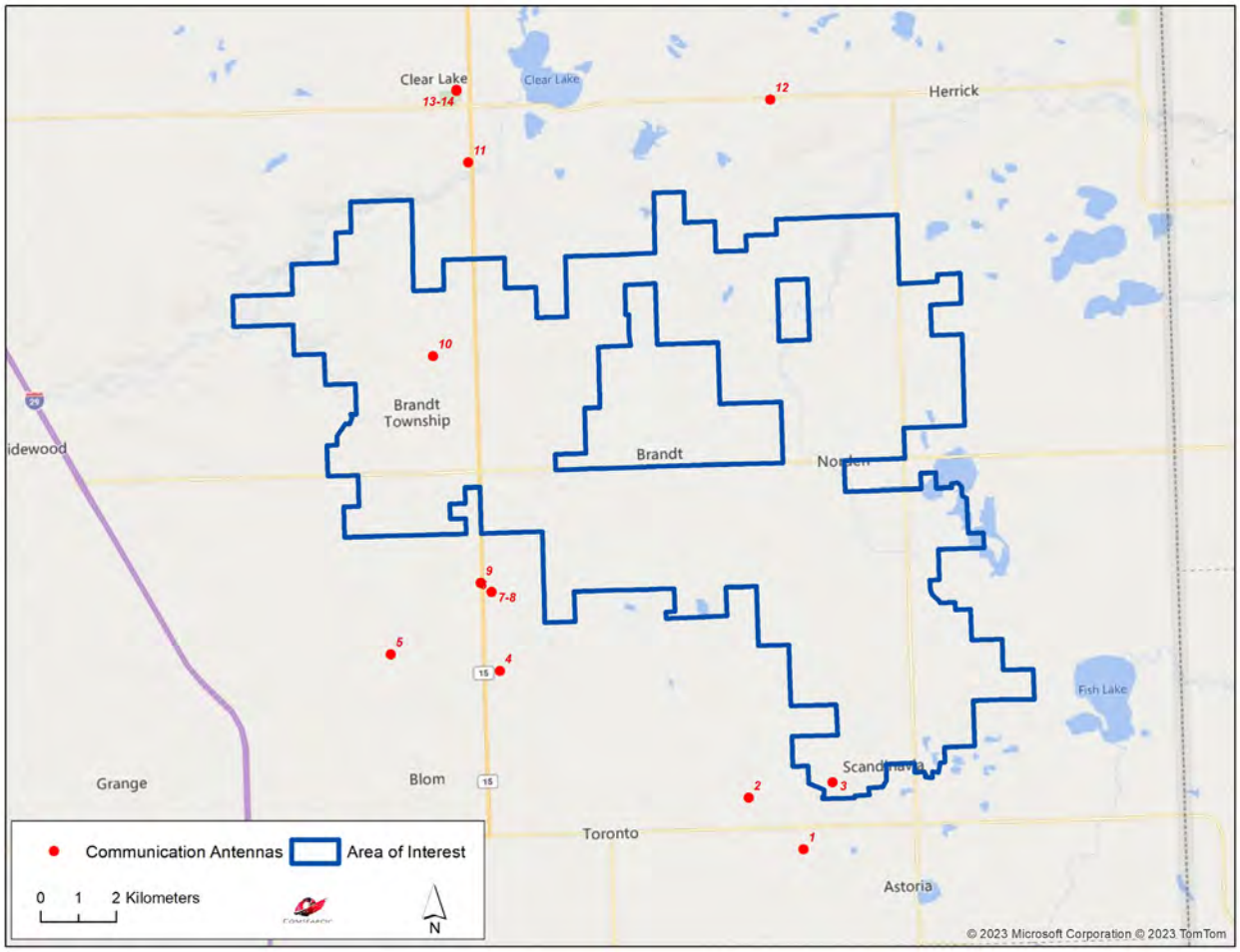

Figure 2: Communication Antennas within or near the Area of Interest

3. Discussion of Separation Distances

In planning the wind energy turbine locations, a conservative approach would dictate not locating any turbines in close proximity to existing tower structures to avoid any possible impact to the communications services provided by the structures. Reasonable distance between communication towers and wind turbine towers is a function of two things: (1) the physical turning radius of the wind turbine blades and (2) the characteristics of the communication systems on the communication tower.

Since wind turbine blades can rotate 360º in both the vertical and horizontal planes, the first consideration of separation distance to other structures is clearance of the rotating blades. If the blade radius is 50 meters, then a separation distance greater than 50 meters is necessary. From a practical standpoint, a setback distance greater than the maximum height of the turbine is necessary to ensure a “fall” safety zone in the unlikely event of a turbine tower failure. Setback requirements for “fall” safety are typically specified by the local zoning ordinances.

The separation distance required based on the characteristics of the communication systems will vary depending on the type(s) of communication antennas located on the tower. For example, AM, FM and TV communication antennas should be separated by distances that allow for normal coverage. For RADAR and microwave systems, line-of-sight (LOS) is used as the criteria for separation distance as well as the physical clearance necessary for the turbine blades. For land mobile, mobile phone, and wireless Internet systems, setback distances are based on FCC interference emissions from electrical devices according to their respective frequency bands.

Finally, the communication tower structures identified herein could be a potential benefit in support of communications network needs for the wind energy facility. An example would be the implementation of a Supervisory Control and Data Acquisition (SCADA) system that monitors and provides communications access to the wind energy facility.

4. Conclusions

Our study identified two tower structures and fourteen communication antennas within or near the project area. They are used for microwave, cellular, and land mobile services in the area.

5. Contact Us

For questions or information regarding the Communication Tower Study, please contact:

Contact person:	David Meyer
Title:	Senior Manager
Company:	Comsearch
Address:	21515 Ridgetop Circle, Suite 300, Sterling, VA 20166
Telephone:	703-726-5656
Fax:	703-726-5595
Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com