

High Bridge Wind Project

Case No. 18-F-0262

1001.26 Exhibit 26

Effect on Communications

TABLE OF CONTENTS

EXHIBIT 26	EFFECT ON COMMUNICATIONS	1
(a)	Existing Broadcast Communication Sources	1
(1)	AM Radio	1
(2)	FM Radio.....	1
(3)	Television	1
(4)	Telephone	2
(5)	Microwave Transmission.....	2
(6)	Emergency Services	3
(7)	Municipal/School District Services	5
(8)	Public Utility Services.....	5
(9)	Doppler/Weather Radar	5
(10)	Air Traffic Control	6
(11)	Armed Forces.....	6
(12)	GPS.....	7
(13)	LORAN.....	7
(14)	Amateur Radio Licenses	8
(15)	New York State Mesonet System.....	9
(b)	Existing Underground Cable and Fiberoptic Lines within Two Miles.....	9
(c)	Anticipated Effects on Communication Systems.....	9
(1)	Potential Structure Interference with Broadcast Patterns.....	9
(2)	Potential for Structures to Block Lines-of-Sight.....	10
(3)	Disruption of Doppler/Weather Radar systems	10
(4)	Physical Disturbance by Construction Activities.....	11
(5)	Adverse Impacts to Co-Located Lines due to Unintended Bonding	11
(6)	Other Potential for Interference	11
(d)	Evaluation of Design Configuration	12
(e)	Post-construction Activities to Identify and Mitigate Adverse Effects on Communication Systems	13
(f)	Potential Interference with Radar.....	13
REFERENCES		14

LIST OF TABLES

Table 26-1. FM Radio Stations within 2 miles of the Facility..... 1

Table 26-2. FCC-licensed Mobile Phone Sites within 2 miles of the Facility..... 2

Table 26-3. Microwaves Paths within the Facility..... 3

Table 26-4. Site-Based Licensed Communication Sources 3

Table 26-5. Area-Wide Licensed Communication Sources..... 4

Table 26-6. Amateur Radio Licenses within 2 Miles of the Facility Site. 8

EXHIBIT 26 EFFECT ON COMMUNICATIONS

(a) Existing Broadcast Communication Sources

This Exhibit identifies existing broadcast communication sources within a two-mile radius of the High Bridge Wind Project ("Facility") and the electric interconnection between the Facility and the point of interconnection, unless otherwise noted.¹

(1) AM Radio

Comsearch conducted a review of Federal Communications Commission (FCC) license data and compiled a list of AM radio stations within approximately 30 kilometers (18.6 miles) of the proposed Facility (see Appendix 26-C). No AM radio stations were identified within 2 miles of the Facility. The nearest AM radio station, WCHN, is located approximately 5.2 kilometers (3.2 miles) north of the Facility.

(2) FM Radio

Comsearch conducted a review of FCC license data and compiled a list of FM radio stations within approximately 30 kilometers (18.6 miles) of the proposed Facility (see Appendix 26-C). Two FM radio stations are located within 2 miles of the Facility. See Table 26-1.

Table 26-1. FM Radio Stations within 2 miles of the Facility

Call Sign	Frequency (MHz)	Distance to Nearest Turbine (km)	Distance to Nearest Turbine (mi)
WSQN	88.1	1.73	1.07
WBKT	95.3	1.79	1.11

(3) Television

Off-air television stations broadcast signals from terrestrial-based facilities directly to television receivers. Television stations within 150 kilometers (93.2 miles) are the most likely to provide off-air coverage to the

¹Except for the Microwave Study (Appendix 26-A), the supporting studies conducted by Comsearch and referenced in this exhibit were developed based on a preliminary turbine layout with a larger footprint. Accordingly, the associated numbers presented in this exhibit, which are based on the Facility layout proposed in this Application, do not exactly match those proposed in Comsearch's studies. However, as indicated in Comsearch's Communication Summary Report (Appendix 26-B), the conclusions reached by Comsearch have not been affected as the footprint of the Facility has decreased in size and the distance between proposed wind turbines and communication systems in the vicinity of the Facility has increased.

communities near the Facility. Comsearch examined the coverage of television stations and communities in the area that could potentially have degraded television reception because of Facility operation (see Appendix 26-D). There are 138 television stations within 150 kilometers of the proposed Facility, of which 104 are currently licensed and operating. Fifty-six of the 104 licensed and operating stations are low-power stations or translators which serve local audiences and have limited ranges; 48 of the 104 licensed and operating stations are full power stations.

(4) Telephone

Wireless operators are granted area-wide licenses from the FCC to deploy their cellular networks, which often include handsets with Emergency 911 capabilities (i.e., phones that automatically provide the location of the phone to emergency services). As mobile phone market boundaries differ from service to service, Comsearch disaggregated the carriers' licensed areas down to the county level (see Appendix 26-E). The type of service (e.g., cellular service at 800 MHz [CELL], advanced wireless service [AWS], personal communication service at 1.9 GHz [PCS], wireless communications service at 2.3 GHz [WCS], lower 700 MHz service [700 MHz]) for each mobile phone carrier with E911 service in Chenango and Otsego Counties is provided below:

- AT&T: AWS, CELL, PCS, WCS, 700 MHz
- Blue Wireless: PCS (Chenango Only)
- Delaware PCS Limited Partnership: PCS (Otsego Only)
- DISH Network: AWS, 700 MHz
- Sprint: PCS
- T-Mobile: AWS, PCS, 700 MHz
- Verizon: AWS, CELL, PCS, 700 MHz

One cellular site located within two miles of Facility components. See Table 26-2 (see also Figure 26-1).

Table 26-2. FCC-licensed Mobile Phone Sites within 2 miles of the Facility

Call Sign	Licensee	Structure Height (m)	Distance to Nearest Turbine (miles)
KNKN827	AT&T	118	1.11

(5) Microwave Transmission

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). These systems are the telecommunication backbone of the country, providing long-

distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services. Comsearch prepared a study evaluating the location of the Facility relative to licensed, proposed, and applied non-federal government microwave systems in the area (see Appendix 26-A). The study identified two microwave paths in the vicinity of the Facility. Table 26-3 provides the call sign, band, and licensee for these paths. A map showing the location of the microwave paths is provided in Figures 4-3 and 26-1.

Table 26-3. Microwaves Paths within the Facility

Callsign 1	Callsign 2	Band	Licensee
WPJE685	RXONLY	950 MHz	Townsquare Media Oneonta License, LLC
WQJB591	WQJB610	6.7 GHz	Chenango County

(6) Emergency Services

Comsearch assessed the emergency services communication sources near the Facility to identify potential impacts from the planned turbines (Appendix 26-F). Registered frequencies for the following types of first responder entities were evaluated: police, fire, emergency medical services, emergency management, hospitals, public works, local school districts, transportation and other state, county, and municipal agencies. Land mobile and emergency services incumbent data were derived from the FCC's Universal Licensing System and the FCC's Public Safety & Homeland Security Bureau. Comsearch identified seven site-based licenses within 2 miles of the Facility and 31 regional area-wide licenses designated for public safety use. The licensee, call sign, frequency bands, antenna height, and distance to nearest turbine for the site-based licenses are provided in Table 26-4. The licensee, area of operation, and frequency band for area-wide licenses are provided in Table 26-5.

Table 26-4. Site-Based Licensed Communication Sources

Licensee	Call Sign	Frequency Bands (MHz)	Antenna Height (meters)	Distance to Nearest Turbine (miles)
Chenango County	KNFP343	25-50	12.0	0.25
Tri-County Communications, Inc	WPQE541	450-470	37.0	0.71
Mesorah Co., LLC dba Camp Mesorah	WQVT310	450-470	4.0	0.90
Tri-County Communications Inc	WNRH607	450-470	37.0	1.07
Burrells Excavating Inc	WPTV351	450-470	36.5	1.07
Chenango County	KNFP344	25-50	12.0	1.39
Chenango County	KDO310	25-50	8.0	1.56

Table 26-5. Area-Wide Licensed Communication Sources

Licensee	Area of Operation	Frequency Band (MHz)
A O Fox Memorial Hospital	Countywide: Chenango	150-174
American National Red Cross	Statewide: New York	25-50, 450-470
Bergen Volunteer Fire Department	Statewide: New York	150-174
Central Islip Hauppauge Volunteer Ambulance, Inc.	Statewide: New York	150-174
Chenango County	Countywide: Chenango	25-50, 150-174, 450-470
Chenango County Bureau of Fire	Countywide: Chenango	4940-4990
Erie County	Statewide: New York	450-470
Massasauga Search and Rescue, Inc.	Statewide: New York	150-174
National Ski Patrol System, Inc.	Statewide: New York	150-174
New York City	Statewide: New York	4940-4990
New York City Police Department	Statewide: New York	150-174
New York State	Statewide: New York	0-10, 25-50, 150-174, 220-222, 4940-4990
New York State Department of Corrections and Community Supervision	Statewide: New York	150-174, 450-470, 4940-4990
New York State Department of Environmental Conservation	Statewide: New York	25-50, 150-174, 450-470
New York State Department of Health Bureau of Emergency Medical Services	Statewide: New York	25-50, 150-174, 450-470
New York State Department of Labor	Statewide: New York	150-174
New York State Department of Transportation	Statewide: New York	0-10, 4940-4990
New York State Division of State Police	Statewide: New York	150-174, 450-470, 800/900, 2450-2500, 4940-4990
New York State Emergency Management Office	Statewide: New York	25-50
New York State Office of Parks, Recreation, and Historic Preservation (OPRHP)	Statewide: New York	450-470
New York State OPRHP - Albany Region	Statewide: New York	150-174
New York State OPRHP - Long Island Region	Statewide: New York	150-174
New York State OPRHP - Niagara Region	Statewide: New York	150-174
Niagara Frontier Search and Rescue	Statewide: New York	150-174
Northeast Mobile Search and Rescue, Inc.	Statewide: New York	150-174
Northeastern Forest Fire Protection Compact	Statewide: New York	25-50
Orleans County	Statewide: New York	150-174, 450-470
Ossining Village	Statewide: New York	25-50
Town of Woodbury	Statewide: New York	4940-4990
Triborough Bridge and Tunnel Authority	Statewide: New York	4940-4990
Western New York Search Dogs, Inc.	Statewide: New York	150-174

(7) Municipal/School District Services

Municipal and school district communication sources were included in the assessment of emergency services communication sources described in Exhibit(a)(6) and in Appendix 26-F. No licenses associated with school districts were identified. Comsearch did identify a municipal communication source licensed to the Town of Guilford. Tables 26-4 and 26-5 in Exhibit 26(a)(6) and Appendix 26-F provide a full listing of site-based and area-wide communication sources in the area, identified by licensee.

(8) Public Utility Services

Public utility communication sources were included in the assessment of emergency services communication sources described in Exhibit 26(a)(6). No licenses issued to public utilities were identified by Comsearch.

(9) Doppler/Weather Radar

Comsearch conducted a search for commercial interest and television station doppler radar systems within 250 kilometers of the proposed Facility's center point. This search radius was chosen by Comsearch based on terrain in the vicinity of the Facility and the location and elevation of individual turbines. Thirteen systems were identified with the closest located 70.1 kilometers from the nearest proposed turbine (see Appendix 26-G).

Comsearch also analyzed the potential impact that the Facility would have on government radar systems, including Department of Defense (DoD) military systems, Federal Aviation Administration (FAA) long range radar systems, and National Weather Service (NWS) NEXRAD WSR-88D systems (Appendix 26-H), using the DoD RADAR screening tool.

In addition, the federal government conducts its own assessment of the impacts of wind projects on government radar systems, including NEXRAD, as part of reviews conducted under the auspices of the National Telecommunications and Information Administration (NTIA) and FAA. The Applicant sent an initial written notification of the proposed Facility to the NTIA on April 11, 2019. The NTIA provided plans for the proposed Facility to the federal agencies represented in the Interdepartmental Radio Advisory Committee (IRAC), which include the NOAA, FAA, and U.S. Air Force, among other agencies. The NTIA's response, dated 06/13/19, has been appended to this Application (see Appendix 25-D). Further consultation with the FAA is discussed in Exhibit 26(a)(10).

(10) Air Traffic Control

The closest air traffic control tower is located approximately 30 miles southwest of the Facility at the Greater Binghamton Airport (AirNav.com, 2018). The FAA is the organization in the United States government responsible for air traffic control and for evaluating and issuing determinations on petitions for objects that penetrate the nation's airspace. Under 49 USC § 44718, any person proposing to undertake any construction that is more than 200 feet above ground level (AGL) must provide notice to the FAA. As part of the required review process, the FAA will reach out both internally and to other agencies, including the DoD Siting Clearinghouse, to determine whether the turbines will adversely affect air safety, including navigational and surveillance systems such as radar.

Any object, such as a wind turbine, that is higher than 499 feet AGL at the site of the object is automatically issued a Notice of Presumed Hazard (NPH). Issuance of an NPH triggers a requirement for the FAA to conduct an aeronautical study of the locations of each proposed turbine. The FAA can issue two types of determinations – a Hazard Determination or a Determination of No Hazard (DNH). The Applicant has submitted the proposed Facility layout to the FAA on 06/17/2019 so that aeronautical studies of locations of each proposed turbine can be conducted under the provisions of 49 USC § 44718 and its implementing regulations at 14 CFR Part 77. The Applicant will continue to coordinate with the FAA and will provide copies of any determinations to the Siting Board upon receipt.

In addition, as discussed in Exhibit 26(a)(9), the FAA is one of the federal agencies represented in the IRAC, which has reviewed the proposed Facility as part of the NTIA review. The response letter from NTIA is included in Appendix 25-D.

(11) Armed Forces

According to the Military Installations, Ranges, and Training Areas GIS dataset maintained by the DoD, the nearest Armed Forces installation to the Facility is the Griffiss Air Force Base, located approximately 75 miles north of the proposed Facility (data.gov, 2018). As discussed in Exhibit 26(a)(9), the Applicant supplied written notice of the proposed Facility to the NTIA on April 11, 2019. The NTIA, in turn, distributed the information to the federal agencies represented in the IRAC, which include the Department of Homeland Security, U.S. Air Force, U.S. Army, U.S. Navy, U.S. Coast Guard, and Department of Veteran Affairs.

Also, as part of its hazard determination process, the FAA must reach out to the DoD Siting Clearinghouse, which is responsible for assessing the impact of possible airspace obstructions on military operations and readiness.

The DoD Siting Clearinghouse, in turn, is required to reach out to any military organizations or facilities potentially impacted by an airspace obstruction to obtain their comments/recommendations concerning a project. The Siting Clearinghouse then evaluates the comments received, determines whether that project will have an adverse impact on military operations and readiness, and reports that information on to the FAA. Receipt of an FAA DNH following the DoD Siting Clearinghouse review process is evidence that the Facility will not impact military operations or readiness.

As discussed in Exhibit 26(a)(10), the Applicant has submitted the proposed Facility layout to the FAA so that aeronautical studies of locations of each proposed turbine can be conducted under the provisions of 49 USC § 44718 and its implementing regulations at 14 CFR Part 77. The Applicant will continue to coordinate with the FAA.

(12) GPS

Global Positioning System (GPS) is a U.S.-owned utility that provides users with positioning, navigation, and timing services. This system consists of three segments: the space segment, the control segment, and the user segment. The U.S. Air Force develops, maintains, and operates the space and control segments. The GPS control segment consists of a global network of ground facilities that track the GPS satellites, monitor their transmissions, perform analyses, and send commands and data to the constellation. The GPS ground facility located closest to the proposed Facility is the Air Force Satellite Control Network remote tracking station located in New Hampshire. The National Executive Committee coordinates GPS-related matters across multiple federal agencies to ensure the system addresses national priorities as well as military requirements. The National Executive Committee is chaired jointly by the Deputy Secretaries of Defense and Transportation, and membership includes top leaders from the Departments of State, the Interior, Agriculture, Commerce, and Homeland Security, the Joint Chiefs of Staff, and NASA (National Coordination Office, 2018).

Each of the agencies represented in the National Executive Committee are also represented in the IRAC. See Exhibit 26(a)(9) for a discussion of the IRAC review process.

(13) LORAN

LORAN was a long-range navigation system developed during World War II that has since been deemed obsolete. Radio signals were sent through a series of towers across long distances as an aid to keep ships and aircraft on course. In accordance with the 2010 Department of Homeland Security Appropriations Act, the U.S. Coast Guard terminated the transmission of all U.S. LORAN signals in 2010. Therefore, no further discussion of LORAN is provided in this Application.

(14) Amateur Radio Licenses

The Applicant conducting a search of the FCC's database record and identified 18 active amateur radio licenses registered to addresses within a two-mile radius of the Facility. In addition, in response to a request from the Chenango Valley Amateur Radio Association (CVARA), the Applicant instructed Comsearch to conduct an analysis of the impact of the proposed Facility on the services of 2 amateur radio stations (operating under call signs W2RME and K2DAR). These stations are operated by the CVARA from a single communications tower located within the proposed Facility Site and are used to provide emergency communication services. The results of the Comsearch's study of the W2RME and K2DAR amateur radio stations were provided to CVARA and are included in Appendix . The Applicant has had ongoing consultations with CVARA in response to Comsearch's study and intends to continue such consultations following the submittal of the Application.

The call sign and operator class for each amateur radio license within 2 miles of the Facility Site is provided below in Table 26-6.

Table 26-6. Amateur Radio Licenses within 2 Miles of the Facility Site.

Call Sign	Operator Class	Distance to Closest Turbine (miles)
K2DAR	Amateur Extra	0.32
W2RME	General/Amateur	0.32
KD2HKC	General	0.35
W2WHT	Amateur Extra	0.37
KC2OFS	Technician	0.45
KC2RTS	Amateur Extra	0.85
KC2SFK	Technician	0.85
KC2WRF	General	1.26
KB2VXT	Technician	1.58
N2RXG	Technician	1.58
KB2MBV	Technician	1.73
AA2FG	Amateur Extra	1.73
WA2SWR	General	1.90
KC2WRE	Amateur Extra	1.91
WB2LYU	General	1.93
WA2QIP	Amateur Extra	1.93
KC2UQJ	General	1.93
KC2OFL	Technician	2.08

(15) New York State Mesonet System

The New York State Mesonet System is a statewide network of weather stations developed and run by the University at Albany. This system collects data on mesoscale meteorological phenomena and is used to supplement data gathered by traditional automated surface observing systems (ASOS), supporting decision-making in agriculture, emergency management, energy, ground transportation, and aviation. The closest Mesonet station to the Facility is located south of the Village of Sherburne, approximately 11.5 miles from the closest turbine (see Appendix 26-G).

(b) Existing Underground Cable and Fiberoptic Lines within Two Miles

The Applicant is not aware of any underground cable or fiber optic lines within the Facility Site. However, the Applicant will design the Facility to avoid interference with all existing utility systems. See Exhibit 12 for a full discussion of the measures the Applicant will take to avoid interference with existing utility systems.

(c) Anticipated Effects on Communication Systems

Exhibit 26(a) provides a description of the communication systems in and around the Facility. The subsections below discuss the anticipated effects of the proposed Facility and the electric interconnection on the communication systems identified in Exhibit 26(a) and (b). The Communications Summary Report (Appendix 26-B) provides a summary of the potential impacts the Facility may have on communications systems.

(1) Potential Structure Interference with Broadcast Patterns

Fourteen licensed full-power television stations (WIVT, WSKG-TV, WICZ-TV, WBNG-TV, WSYR-TV, WSTM-TV, WCNY-TV, WTVH, WSYT, WNYS-TV, WFXV, WUTR, WKTV, WRGB) may have their reception disrupted in and around the Facility. This disruption would primarily occur in locations within 10 kilometers of the Facility that do not have a clear line-of-sight to the television station antennae but do have clear line-of-sight to a wind turbine located between the television station and the receiver (Appendix 26-D).

Communities and homes to the north and east of the Facility may have degraded reception of stations WIVT, WSKG-TV, WICZ-TV, and WBNG-TV, which are located southwest of the Facility. Similarly, stations WSYR-TV, WSTM-TV, WCNY-TV, WTVH, WSYT, and WNYS-TV, which broadcast from northwest of the Facility, may have diminished reception in communities directly to the southeast of the Facility. In the case of stations WFXV, WUTR, and WKTV, which broadcast from the north and northeast, disruption is likely to be limited to communities south

and southwest of the Facility. Station WRGB broadcasts from the east and may cause disruptions in communities to the west of the Facility. A discussion of potential mitigation measures to address disruptions in broadcast television services is included at Exhibit 26(e), below.

(2) Potential for Structures to Block Lines-of-Sight

Microwave telecommunication systems are wireless point-to-point links that require clear line-of-sight conditions between each microwave dish. To assure an uninterrupted line of communication, a microwave link should be clear, not only along the axis between the center point of each microwave dish, but also within a formulaically calculated distance around the center axis of the radio beam, known as the Fresnel Zone. Comsearch calculated the Fresnel Zone for the two microwave paths identified near the proposed Facility (see Appendix 26-A). An overlay analysis was conducted using these Fresnel Zones and the final Facility layout, assuming turbines would be built with 158-meter diameter rotors. This analysis showed that Fresnel Zones will not overlap the rotor-swept area of any of the wind turbines in the proposed Facility layout. Consequently, there will be no impact to microwave communications.

(3) Disruption of Doppler/Weather Radar systems

Wind turbines have the potential to impact radar coverage and produce false targets if the wind turbines are in the line-of-sight (LOS) of the radar systems' transmitted signal. Comsearch's analysis found that the proposed wind turbines are not in the LOS of any of the identified radar systems due to intervening terrain elevations. Therefore, the proposed Facility is not expected to have any negative impact on the identified doppler systems.

Comsearch also determined that the facility is unlikely to have an impact on DoD, FAA, NWS, or other radar systems (see Appendices 26-G and 26-H). The Facility is located within the "Notify" area for a NEXRAD radar system located in Binghamton (see Appendix 26-H), indicating that further consultation is requested. This additional consultation was initiated when the Applicant notified the NTIA of the proposed Facility. In the NTIA response the Department of Commerce (DOC) indicated that although the project falls within the notifications zone for the Binghamton NEXRAD radar system, *"there will be low impact and only the lowest elevation angle will be contaminated"* (see Appendix 25-D). The DOC indicated in their response that further consultation would only be needed if the Facility Site changes or if the turbine heights increase by ten meters or more. No other potential impacts were identified in the NTIA response letter.

(4) Physical Disturbance by Construction Activities

Physical disturbance to communication infrastructure (e.g., towers, buried cables, etc.) during construction is not anticipated. The location of any such infrastructure within and adjacent to the Facility will be indicated on construction drawings and reviewed by the contractor prior to construction. The Applicant will also coordinate with Dig Safely New York prior to commencing any construction activities. All Facility construction and maintenance work that requires excavation will follow the One Call process with Dig Safely New York. This process helps prevent damage by alerting the excavator to the locations of underground utilities, including electric, gas, oil, steam, water, sewer, and communications lines. The excavator flags the area to be excavated and then provides information to Dig Safely New York about the company performing the excavation, the duration of the job, the locations of digging, the depth of the excavation, and other information. Dig Safely New York members, who are utility operators, respond to the request either by noting that the area is clear, or by providing the locations of their facilities. These facilities are then marked above ground, and either avoided or protected during the excavation. If an underground facility cannot be avoided and needs to be exposed, the excavator will provide proper support and protection so that the facility is not damaged. Upon completion of work, the excavator backfills around any exposed utilities.

(5) Adverse Impacts to Co-Located Lines due to Unintended Bonding

Considering the separation and protection measures discussed in Exhibit 26(c)(3), the Applicant does not believe that there is significant potential for the proposed Facility and electrical interconnection to adversely impact co-located lines due to unintended bonding.

(6) Other Potential for Interference

Interference with radio broadcast coverage is not anticipated. Facility wind turbines are sited outside the three-kilometer exclusion distance recommended for AM frequencies and outside the *far field* region of radiating FM antennae (i.e., the area within approximately 1,500 feet of the antenna) near the Facility (see Appendix 26-C). In addition, according to Comsearch, amateur radio stations such as those located within and adjacent to the Facility Site (e.g., W2RME and K2DAR) are typically unaffected by the presence of wind turbines (see Appendix 26-I). The proposed Facility is not anticipated to cause any significant harmful effects to the services of any of the amateur radio stations identified in Exhibit 26(a)(14).

Interference with emergency responder services, municipal/school district services, industrial/business land mobile sites, area-wide public safety, and mobile telephone communications are not anticipated. Although these

sources operate in different frequency ranges and provide different types of service (e.g., voice, video, and/or data), the impact of wind turbines on these services is similar. Each of these networks is designed to operate reliably in a non-line-of-sight environment. The frequencies of operation for these communication sources allow the signal to propagate through wind turbines. Moreover, land mobile systems are designed with overlap between base transmitter stations to maintain reception if the signal to one station is impeded. If a connection cannot be made to one base station, the signal will shift to an adjacent base station to make the connection. In addition, the beam widths of the radiated signal from the base stations and mobile units are wide and the wavelength of the signal is long enough to wrap around objects such as wind turbine towers and blades. This allows wireless networks to provide coverage even in areas that are congested with physical obstructions (e.g., downtown urban areas). As a result, little, if any, change in coverage should occur when the wind turbines are installed. In the unlikely event that interference does occur, it can be mitigated using the methods outlined in Exhibit 26(e).

The potential for wind turbines to interfere with cellular base stations or land mobile units has been considered from an electromagnetic interference standpoint. Comsearch's calculations indicate that the turbines are not expected to interfere with cellular signals if the cellular tower base stations are located 77.5 meters (254 feet) or more from the nearest turbine (see Appendices 26-E and 26-F). Since no turbines are proposed within this distance of a cellular tower, no impact is anticipated.

To ensure the highest quality of data, each station in the New York State Mesonet must be located at least 300 feet from any tall obstacles, such as wind turbines. The closest Mesonet station to the Facility is located approximately 11.5 miles from the closest turbine, well outside the range of impact. In addition, the data from each station is transmitted via the Internet to a central ingest system located at the University of Albany. Therefore, for the reasons outlined in this section, interference from the proposed Facility is unlikely (see Appendix 26-G).

No potential impacts to the GPS system have been identified. This communication source is typically unaffected by wind energy generating facilities.

(d) Evaluation of Design Configuration

A map illustrating Facility components and relevant communication system constraints (e.g., Fresnel zones, radio station exclusion zones, etc.) is provided in Figure 26-1. The Facility has been designed to avoid impacts to communication systems to the extent practicable. In the unlikely event that the Facility has impacts on communications systems as discussed in Exhibit 26(a)(3) (television), (a)(4) (telephone), or (a)(6) (emergency services), the Applicant will take appropriate steps to review and respond to the complaint as set forth in Exhibit 26(e).

(e) Post-construction Activities to Identify and Mitigate Adverse Effects on Communication Systems

The Applicant takes seriously any complaints that it receives from members of the public concerning the impact of the Facility. As discussed in Exhibit 12, the Applicant has developed a Complaint Resolution Plan through which residents can make a formal complaint should any issues, such as degraded television service, arise because of construction or operation of the Facility. This Plan is attached as Appendix 12-B. Complaints may be able to be made in person at the Facility's operation and maintenance building, via phone, or in writing via email or regular mail. The Applicant will contact the individual within 48 hours of receipt of the complaint and implement a multi-step complaint response for all complaints, which includes: (1) community engagement; (2) information gathering; (3) complaint tracking; (4) complaint response; (5) follow up after the response has been issued; and (6) further action, if the complainant believes that the issue has not been satisfactorily resolved. The Applicant will log complaints in writing and supply copies of complaint-related information periodically to the New York State Department of Public Service.

Residents that experience degraded off-air television service after installation of the Facility can file a formal complaint with the Applicant in accordance with the Complaint Resolution Plan (Appendix 12-B). If it is determined that Facility operation has impacted existing off-air television coverage, the Applicant will address each individual problem by analyzing on a case-by-case basis to determine the extent of the impact. After this analysis, the Applicant may offer cable television hookups or direct broadcast satellite reception systems (in areas where cable service is not available/practical) or investigate methods for improving the television reception system. It is important to note that both cable service and direct broadcast satellite service will be unaffected by the presence of the Facility (see Appendix 26-D).

In the unlikely event that a public safety entity believes their coverage has been compromised by the Facility, the Applicant will work with the public safety entity to remedy any interference related to the Facility. Possible solutions include optimizing nearby base transmitters, adding a repeater site, and/or using utility towers, meteorological towers, or even the turbine towers within the Facility as base station or repeater sites.

(f) Potential Interference with Radar

As described in Exhibit 26(a)(9), the NTIA has reviewed the proposed Facility layout and provided a response (see Appendix 25-D).

REFERENCES

AirNav.com. 2019. *Greater Binghamton Airport*. Last updated January 31, 2019. Available at <http://www.airnav.com/airport/KBGM>. (Accessed February 2019).

American Radio Relay League (ARRL). 2018. *FCC License Data Search*. Available at: <http://www.arrl.org/advanced-call-sign-search>. (Accessed January 2019).

Data.gov. 2018. *Military Installations, Ranges, and Training Areas*. GIS Dataset maintained by Department of Defense. Dataset available at <https://catalog.data.gov/dataset/military-installations-ranges-and-training-areas>. (Accessed May 2018).

National Coordination Office for Space-Based Positioning, Navigation, and Timing. 2018. Official U.S. Government Information about the Global Positioning System (GPS) and Related Topics. Available at: <http://www.gps.gov/> (Accessed May 2018).

Norin, L. and G. Haase. 2012. *Doppler Weather Radars and Wind Turbines*. In: *Doppler Radar Observations – Weather Radar, Wind Profiler, Ionospheric Radar, and Other Advanced Applications*, edited by J. Bech and J.L. Chau. InTech, April 2012.

Vogt, R. J., T.D. Crum, W. Greenwood, E.J. Ciardi, and R.G. Guenther. 2011. *New Criteria for Evaluating Wind Turbine Impacts on NEXRAD Radars*. WINDPOWER 2011, American Wind Energy Association Conference and Exhibition, Anaheim, CA.