Heritage Wind Project

Case No. 16-F-0546

1001.26 Exhibit 26

Effect on Communications

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EXHIBIT 26 EFFECT ON COMMUNICATIONS

(a) Existing Broadcast Communication Sources

This Exhibit identifies existing broadcast communication sources that are predicted to be receivable in an area extending two miles beyond the Facility and the electric interconnection between the Facility and the point of interconnection, unless otherwise noted.

(1) AM Radio

Pursuant to the Article 10 regulations, Evans Engineering Solutions (Evans) conducted a review of Federal Communications Commission (FCC) license data to identify AM broadcast facilities within 3 kilometers of any proposed turbine (Appendix 26-A). According to Evans, potential interference with AM broadcast signals could only occur if turbines are located within approximately 3 kilometers of AM broadcast stations. Because no AM broadcasting facilities were identified within the 3-kilometer radius study area there is no reasonable expectation of disruption in transmitted signals on AM bands due to the presence of the turbines. To satisfy requirements set forth in the Final Scoping Statement (FSS), AM broadcasting facilities, their frequency, and distance to the AM facilities out to a maximum of 39.3 kilometers from the center of the Facility Area, were also identified; see Table 26-1. Please note that these broadcasting facilities are all well beyond the 3 kilometer range of interference from wind turbines, and no impacts are therefore anticipated.

Table 26-1. AM Radio Stations near the Facility Site

Call Sign	Frequency (MHz)	Distance (km)
WDCX	990	27.2
WHAM	1180	39.3
WBTA	1490	22.1
WRSB	1590	19.7

(2) FM Radio

Evans identified 26 full-service FM stations that have primary signals over at least a portion the Facility Site (Table 26-2). One of the 26 FM transmitters (Call Sign WJCA) was identified in the Facility Site, located approximately 591 meters (1,891 feet) from the nearest turbine. Although these signals and transmitters traverse the Facility Site, no significant impact to FM broadcasting facilities is anticipated. Based on Evans' experience with wind farms, FM broadcasting signals are fairly insensitive to the presence of turbines, even in cases where transmitting antennas

are surrounded by turbines at taller heights than the FM antenna. Although the signal may vary with blade rotation at some receiver locations in the immediate area, high quality FM receivers are anticipated to factor out such variables. Table 26-2 below identifies call, frequency, and distances to an approximate centroid of the Facility Site, with a maximum of 76.1 kilometers (km).

Table 26-2. FM Radio Stations near the Facility Site

Call Sign	Frequency (MHz)	Distance (km)
WCOU	88.3	38.7
WBFO	88.7	50.4
WBSU	89.1	19.8
WGCC-FM	90.7	18.0
WXXI-FM	91.5	49.7
WBEE-FM	92.5	58.2
WBUF	92.9	60.9
WBLK	93.7	64.1
WNED-FM	94.5	76.0
WAIO	95.1	64.7
WMSX	96.1	64.1
WCMF-FM	96.5	49.6
WGRF	96.9	60.9
WPXY-FM	97.9	49.6
WKSE	98.5	67.8
WBZA	98.9	42.3
WDCX-FM	99.5	76.1
WDVI	100.5	64.7
WRMM-FM	101.3	42.3
WJCA[1]	102.1	3.9
WTSS	102.5	67.3
WEDG	103.3	59.6
WHTT-FM	104.1	62.6
WKDL-FM	104.9	33.3
WYRK	106.5	64.1
WLKK	107.7	61.8

1. The FM transmitter for WJCA is located approximately 591 feet from T28.

(3) Television

Interference from wind turbines on off-air broadcast television occurs when signals reflected by turbine blades arrive at a viewer's television antenna along with the direct signal. This phenomenon is known as "multipath interference" and can often take the form of pixilated or freezing pictures. Effects from multipath interference have decreased over time as technology in HDTV receivers and turbine blade material has progressed. Despite these improvements, there is some possibility of signal disruption for residences, specifically where outdoor antennas are directed through the turbine area, residences use "rabbit ear" antennas, and/or residences have older HDTV receivers.

As described in the Evans report, Orleans and Genesee County are in the Buffalo, NY, Designated Market Area (DMA). However, TV stations in the Rochester, NY, DMA are also predicted to reach the Facility Site. Evans identified 16 television stations in both the Buffalo and Rochester DMAs that have been determined to place a predicted FCC primary off-the-air service signal over some portion of the Facility Site, detailed below in Table 26-3, and in Table 4 of Appendix 26-A. If impacts to off-air television services occur, mitigation could include relocation of household antenna for better signal receipt, installation of a new outside antenna (potentially taller), or installation of satellite or cable television.

Table 26-3. TV Stations Predicted to Reach the Facility Site

Call Sign	Network Affiliate	City of License	Antenna Height (m HAAT)	Distance (km)
WBBZ-TV	Independent	Springville, NY	176	80.2
WHEC-TV	NBC	Rochester, NY	153	49.7
WHAM-TV	ABC	Rochester, NY	155	49.7
WUTV	Fox	Buffalo, NY	329	67.3
WXXI-TV	PBS	Rochester, NY	152	49.7
WPXJ-TV	ION	Batavia, NY	374	34.3
WGCE-CD	Heartland	Rochester, NY	128	49.6
WUHF	Fox	Rochester, NY	161	49.6
WNLO	CW	Buffalo, NY	415	61.4
WGRZ	NBC	Buffalo, NY	295	59.0
WKBW-TV	ABC	Buffalo, NY	432	69.2
WIVB-TV	CBS	Buffalo, NY	303	61.4
WNED-TV	PBS	Buffalo, NY	332	61.4
WROC-TV	CBS	Rochester, NY	123	49.7
WBGT-CD	MyTV	Rochester, NY	97	49.6
WNYO-TV	MyTV	Buffalo, NY	329	62.2

(4) Telephone

In their report, Evans determined that the reception of wireless hand-held devices would not be significantly impacted by the Facility. Wireless networks strategically employ diversity and multiple receivers to compensate for disruptions in any one location; therefore, the range within which adverse effects from wind turbines to multidirectional signals emitted from cellular towers may be experienced would be approximately 425 meters (1,395 feet). Based on the Evans report, there are no known multidirectional transmitting facilities within 425 meters of any of the Applicant's proposed wind turbine locations. Therefore, adverse effects to cellphone service due to the presence of the Facility Site are not anticipated. See Appendix 26-A for detailed discussion of communications facilities.

(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. Evans analyzed the likely effect of the proposed turbines on existing microwave paths through a Fresnel x/y/z axis analysis (Appendix 26-A). A total of eight licensed microwave paths were identified in the surrounding area. Of those eight paths, five were identified within close proximity to the Facility Site. Table 26-4 provides the call signs, site names, frequency, and licensee for the five microwave paths within the Facility Site. A map showing the location of the microwave paths is provided in Figures 1 through 3 of Appendix 26-A.

Table 26-4. Microwaves Paths within close proximity to the Facility Site

Call Sign 1	Call Sign 2	Site 1 Name	Site 2 Name	Frequency (MHz)	Worst Case Fresnel Zone (WCFZ) (m)	Licensee
WPVZ322	*Rcv only*	WBJA Studio	WBJA Xmtr	947.0	22.8	Family Worship Center Church
WQSU732	WQSV390	Clarendon	Albion	5974.85/6226.89	10.4	County of Orleans
WQTF916	WQTF925	UNY0006	UNY0123	5974.85/6226.89	16.4	Uniti Fiber LLC
WQVF953	WQVG674	Bristol Center	CCI816547	6123.1-6775	29.6	Highway Networks, LLC
WQVG674	WQVH665	CCI816547	Olcott	10755-11285	17.9	Highway Networks, LLC

To ensure 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. Using a worst-case Fresnel Zone (WCFZ) analysis, Evans determined areas that should be avoided for turbine siting. The WCFZ analysis calculated avoidance areas using the midpoint of a microwave path, where the widest, or worse-case, Fresnel zone occurs. Based on Evans' analysis of the WCFZ, locations of proposed turbines will not interrupt or effect any licensed microwave paths in the Facility Site.

(6) Emergency Services

Evans identified land mobile and public safety transmitter stations within approximately one-half mile of the Town of Barre municipal boundary using the FCC's Universal Licensing System database. A total of 15 separately licensed land mobile and public safety transmitter stations were identified within one-half mile of the Town of Barre. Of the 15 transmitter locations, four are located within the Facility Site. These four transmitter stations are detailed in Table 26-5, including the call sign, antenna height, frequency, and licensee. The remaining 11 sites identified by Evans are detailed in Table 26-6.

Table 26-5. Land Mobiles and Public Safety Stations within the Facility Site

Call Sign	Antenna Height (m AGL)[1]	Frequency (MHz)	Licensee
KEQ549	64	43.1	Keeler Construction Co. Inc.
WPNV412	24	464	Hazel, Harold F.
KYJ477	26	43.1	Keeler Construction Co. Inc.
KFD88	15	151.085	Orleans, County of

[1]AGL- Above Ground Level

Table 26-6. Land Mobiles and Public Safety Stations within One-Half Mile of the Town of Barre

Call Sign	Antenna Height (m AGL)	Frequency (MHz)	Licensee
WQRY382	34	464.5	Dudley, Kurtis R.
WPWL487	107	453.125	Orleans, County of
WQDS443	10	45.44	New York, State of
WQOK406	91.4	159.4725 453.7125	Orleans, County of
WQVG649	146	853.2375	Orleans, County of
KED513	66	46.08	Orleans, County of
KLS640	30	45.44	New York, State of
WPFG916	55	155.43	NY State OPRHP - Genesee Region
WNVR300	146	852.8375	Orleans, County of

Call Sign	Antenna Height (m AGL)	Frequency (MHz)	Licensee
WQSY904	38	852.8375	Orleans, County of
WRCL381	31	159.4725 453.7125	Orleans, County of

Based on Evans' evaluation, multi-direction transmitting facilities within 425 meters of a turbine site should be further evaluated for the possibility of transmitter interference. However, per the Evans report, none of the land mobile stations in or near the Facility Site are within 425 meters of a turbine. Therefore, no adverse impacts to the transmission of licensed land mobile stations are anticipated.

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. Additionally, the Applicant will consult with the Town regarding the feasibility of 911 relay communication system installation on meteorological towers to mitigate any potential interference from the Facility, if needed. Additionally, copies of preliminary site safety plans were provided to the Orleans County Emergency Management Office in November 2019 as part of pre-application outreach efforts (see Exhibit 18 for additional information). The Applicant has been in further discussions with the County, including email correspondence on January 24 and 27, 2020, regarding the locations of two communication towers in proximity to the Facility Site. While the study provided in Appendix 26-A indicates there will be no adverse effect, the Applicant will continue to coordinate with the County.

(7) Municipal/School District Services

Evans identified 9 municipal or school district facility antennas within 20 kilometers (12.4 miles) of the center of the Facility Site. Table 26-7 below includes the owner, location, and tower height of those antennas. This list only accounts for towers at least 200 feet tall, as most towers shorter than 200 feet are not legally required to be registered with the FCC, and therefore may not exist in databases used in Evans' analysis. No impact to the FCC-registered municipal or school district antennas are anticipated (Appendix 26-A). See Section (a)(6) above for additional details.

(8) Public Utility Services

Evans identified FCC-registered communication towers within 20 kilometers of the Facility Site. The results of the search are provided below in Table 26-7, including: owner name, tower location, and antenna height. The Facility is not anticipated to impact the transmitting facilities below, for the reasons set forth in Section (a)(6) above.

Table 26-7. Public Utility Service, Municipal, and School District Communication Towers within 20 Kilometers of the Facility Site

Owner	Location	Antenna Height AGL (m)
Time Warner Cable Northeast	Brockport, NY	80.8
Time Warner Cable Northeast	Medina, NY	70.1
STC Five LLC	Gaines, NY	79.9
STC Five LLC	Pembroke, NY	61.6
STC Five LLC	Byron, NY	73.5
New York Power Authority	Batavia, NY	77.1
American Towers LLC	Bergen, NY	70.1
American Towers LLC	Basom, NY	36.6
American Towers LLC	Stafford, NY	61.8
Crown Atlantic Company, LLC	Holley, NY	59.4
Crown Atlantic Company, LLC	Batavia, NY	79.6
SBC Tower Holdings LLC	Gaines, NY	79.9
SBC Tower Holdings LLC	Barre, NY	90.5
SBC Tower Holdings LLC	Clarkson, NY	90.8
Genesee Media Corporation	Brockport, NY	49
SpectraSite Communications LLC	Batavia, NY	35.6
American Towers Inc	Oakfield, NY	60.6
PTI US Towers I, LLC	Town of Leroy, NY	54.9
SBA Properties, LLC	Kendall, NY	79.2
SBA Towers II LLC	Brockport, NY	32
SBA Towers II LLC	Lyndonville, NY	71.6
SBA Towers II LLC	Holley, NY	38.1
Bell Atlantic Mobile of Allentown	Clarendon, NY	77.7
Bell Atlantic Mobile of Allentown	Barre, NY	61
Bell Atlantic Mobile of Allentown	Batavia, NY	29.9
ITT	Batavia, NY	16.7
Subcarrier Communications	Brockport, NY	59.5
New York State Police	Batavia, NY	30
Genesee Valley BOCES	Batavia, NY	36.3
Genesee County	Batavia, NY	51.8
Genesee County	Batavia, NY	48.7
Genesee County	Batavia, NY	33.5
Genesee County	Bergen, NY	61
Genesee County	Alabama, NY	65.5
Orleans County EM Office	Albion, NY	148.4
New York State Thruway Authority	Batavia, NY	45.7

(9) Doppler/Weather Radar

Next-generation radar (NEXRAD) or Doppler weather radar are operated by the National Weather Service (an agency of the National Oceanic and Atmospheric Administration [NOAA]), the Federal Aviation Administration (FAA), and the U.S. Air Force. NEXRAD detects precipitation, winds, and temperature and humidity discontinuities.

From these data, computer algorithms generate a suite of meteorological and hydrological products and alerts used for determining short-term forecasts, advisories, and warnings for significant weather events such as tornadoes, large hail, wind shear, downbursts, flash floods, and other weather phenomena. Data are also used by FAA air traffic controllers for the safe and efficient operation of the National Airspace System.

Wind turbine and weather spectra can span the same Doppler frequencies and share a similar dynamic range, causing conventional radar clutter filtering algorithms, which only filter energy returned from nearly stationary objects (buildings, terrain, etc.), to fail in isolating the weather signal. When wind farms are in a NEXRAD radar beam/radar line of sight, the spinning blades can reflect unfilterable energy back to the radar system and appear as clutter in the base data. The unfiltered wind turbine clutter can adversely impact radar data quality and the performance of the radar's internal weather detection algorithms.

Turbines sited within 18 kilometers (11.2 miles) of a NEXRAD installation begin to impact multiple elevation scanning angles and create multipath scattering returns that show up as spikes of enhanced reflectivity down range of the wind farm (Vogt et al., 2011; Norin and Haase, 2012). The nearest NEXRAD Doppler facility is in Buffalo, approximately 43 kilometers (27 miles) from the Facility, well outside the typical range of impact.

Evans evaluated the potential impact of obstructions to the NEXRAD Weather Surveillance Doppler Radar Stations using a pre-screening tool. Overall, most of the Facility Site showed as having no impact; however, potential impacts were identified in small areas, primarily in the southwestern corner of the Facility Site. A definitive determination of impact will be facilitated by the National Telecommunications Information Administration (NTIA). The NTIA has established a review process in which the Interdepartmental Radio Advisory Committee (IRAC), which consists of representatives from various agencies, reviews new proposals for wind turbine projects for impact on government frequencies. A letter was submitted to NTIA regarding the Facility on September 13, 2019. The Applicant received a response on November 6, 2019 indicating that only one agency, the Department of Commerce (DOC) had suggested that there may be a potential impact to radar from the Facility. Evans Engineering responded to the DOC on November 18, 2019. While there are no anticipated impacts to radar, the Applicant will continue to coordinate with the DOC as the Facility progresses toward commencement of operations. Additional correspondence has occurred with the New York State Department of Homeland Security (NYSDHS). The Applicant has submitted site security plans to the NYSDHS, as described in Exhibit 18.

Another weather system network within New York State is the Mesonet system, which measures temperature, humidity, wind speed and direction, pressure, solar radiation, snow depth and soil information. 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 in the Town of Batavia, which is approximately 8 miles south of the Facility Site, well outside the range of impact.

(10) Air Traffic Control

The closest air traffic control tower is located approximately 37 kilometers (23 miles) east of the Facility at the Greater Rochester International Airport (AirNav.com, 2019). The FAA is responsible for air traffic control and for evaluating and issuing determinations on notices of construction of tall structures—such as turbines—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 U.S. Department of Defense (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 submitted the proposed Facility layout to the FAA on October 7, 2019 to commence the aeronautical studies of locations of each proposed turbine as required under 49 USC § 44718 and 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.

(11) Armed Forces

According to the Military Bases GIS dataset maintained by the United States Department of Transportation (USDOT), the nearest Armed Forces installation to the Facility is the Niagara Falls Airforce Reserve, located approximately 31 miles west of the proposed Facility (Bureau of Transportation Statistics, 2019). Evans utilized the DoD and DHS Long Range Radar Joint Program pre-screening program to evaluate the potential impact of the proposed turbines on air defense and long-range radar. The results of the program showed possible impacts to Air Defense and Homeland Security radars. However, a definitive determination will be obtained after a formal study or review by the DoD, which is triggered by the FAA notification process described in Section (a)(10) above.

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 to the FAA.

As discussed in Section (a)(10) above, 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 14 CFR Part 77. The FAA will reach out to the DoD Siting Clearinghouse to obtain a determination regarding the impact of the Facility on military readiness. The Applicant will continue to coordinate with the FAA.

In addition, as discussed in Section (a)(9) above, the Applicant supplied written notice of the proposed Facility to the NTIA on September 13, 2019. The NTIA, in turn, distributed the information to the federal agencies represented in the IRAC, including DoD.

(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 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, Interior, Agriculture, Commerce, and Homeland Security, the Joint Chiefs of Staff, and NASA.

The GPS ground facility located closest to the proposed Facility is the Air Force Satellite Control Network remote tracking station located in New Hampshire (National Coordination Office for Space-Based Positioning, Navigation, and Timing, 2017). The NTIA has reviewed the proposed Facility and did not identify any concerns with GPS in their November 6, 2019 response letter. Therefore, adverse impacts are not anticipated. Each of the agencies represented in the National Executive Committee are also represented in the IRAC. See Section (a)(9) above 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 U.S. 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 conducted a search of all amateur radio licenses registered to users with zip codes overlapping a two-mile radius of the Facility Site via the FCC License Data Search on the website of the American Radio Relay League (ARRL, 2019) and via RadioQTH's database of call signs (Lewis, 2019). The search identified 104 active amateur radio licenses registered to zip codes overlapping a two-mile radius of the Facility Site. The call sign and operator class for each license is provided below in Table 26-8.

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

Call Sign	Operator Class	Zip Code
AC2NB	Amateur Extra	14411
AC2SQ	Amateur Extra	14411
AC2TK	Amateur Extra	14411
K2EVN	Amateur Extra	14411
K2EYS	Amateur Extra	14411
K2SRV	Information not available	14411
K4EPS	General	14411
KB2MSN	Technician	14411
KB2RMO	Technician	14411
KC2VCG	Technician	14411
KD2CNZ	Amateur Extra	14411
KD2JLZ	Technician	14411
KD2KOJ	Technician	14411
KD2KT	Advanced	14411
KD2LAR	Technician	14411
KD2POK	Technician	14411
KD2POL	Technician	14411
KD2RWC	General	14411
KD2SJJ	Technician	14411
KD2SJM	General	14411
KD2SLP	Technician	14411
KF2CL	Advanced	14411
N2VPF	Technician	14411

Call Sign	Operator Class	Zip Code
N4ZN	Amateur Extra	14411
W2ORC	Information not available	14411
W2RJH	General	14411
W2RRZ	Technician	14411
WA2DQL	Information not provided	14411
WA2TMC	Advanced	14411
KA2PSS	Technician	14125
KC2WXY	General	14125
KD2NQV	Amateur Extra	14125
KD2OAM	General	14125
KE2XT	Amateur Extra	14125
AC2OT	Amateur Extra	14103
K2EDW	Amateur Extra	14103
K2SNS	Amateur Extra	14103
KA2BCE	General	14103
KA2BCF	General	14103
KB2PGC	Novice	14103
KC2IJB	Technician	14103
KC2MKI	General	14103
KC2ZLS	Technician	14103
KC2ZR	Advanced	14103
KD2EMY	Technician	14103
KD2HGZ	General	14103
KD2ISD	Amateur Extra	14103
KD2KOO	Technician	14103
KD2KOV	Technician	14103
KD2MJK	Technician	14103
KD2MQI	Technician	14103
KD2POJ	Technician	14103
KD2RPJ	General	14103
KE2VA	Advanced	14103-1015
KZ2R	Amateur Extra	14103
N1ZUC	General	14103
N2EEJ	Amateur Extra	14103
N2GJW	General	14103
N2ITI	Technician	14103
N2JYE	Technician	14103
N2LJN	General	14103
N2SPT	Technician	14103
NR2C	Amateur Extra	14103

Call Sign	Operator Class	Zip Code
WZ2MM	Amateur Extra	14103
K2PUL	General	14058
K6EEV	General	14058
KC2OIZ	Technician	14058
N2TOF	Technician	14058
AC2UR	Amateur Extra	14470
K2BMK	General	14470
K2PCA	Information not available	14470
K2RLK	Technician	14470
KA2BVC	Amateur Extra	14470
KA2SYY	General	14470
KB2LXD	Technician	14470
KB2TAK	Technician	14470
KC2GML	Technician	14470
KC2OGW	Technician	14470
KC2OGX	Technician	14470
KC2UAF	Technician	14470
KC2VQD	Technician	14470
KC2YSX	Technician	14470
KD2IRH	Technician	14470
KD2IRK	Technician	14470
KD2JXL	Technician	14470
KD2KFT	Technician	14470
KD2MWB	Technician	14470
KD2POM	General	14470
KD2PQE	Technician	14470
KD2RVZ	Technician	14470
KD2SLQ	Technician	14470
N2CES	General	14470
N2LVW	Technician	14470
N2VRI	Technician	14470
N2WK	Amateur Extra	14470
NY2DS	Amateur Extra	14470
W2AAA	Information not available	14470-9736
W2EV	Amateur Extra	14470-9736
WA2FKU	General	14470
KB2QKE	General	14422
KC2TY	Advanced	14422
KD2FRH	Technician	14422

Call Sign	Operator Class	Zip Code
KD2KOU	Technician	14422
N2MBG	Technician	14422

Source: Lewis, 2019; AARL, 2019

(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

Section (a) above provides a description of the communication systems in and around the Facility and any expected impacts to those systems. The subsections below discuss the anticipated effects of the proposed Facility and the electric interconnection on the communication systems identified above in Sections (a) and (b). The Evans Engineering Report (Appendix 26-A) provides a summary of the potential impacts the Facility may have on communications systems.

(1) Potential Structure Interference with Broadcast Patterns

Sixteen licensed, off-air television stations were identified by Evans as serving the Town of Barre, including portions of the Facility Site. Evans also evaluated the number of receivers that may experience disrupted television viewing. Based on Evans' analysis, approximately 57 HDTV receivers are predicted as potentially experiencing disruptions to off-air television viewing (although the number of receivers actually impacted is likely to be significantly less, if any). A discussion of potential mitigation measures to address disruptions in television service is included below in Section (e), below.

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

As noted in Section (a)(5) above, microwave telecommunication systems are wireless point-to-point links that require clear line-of-sight conditions between each microwave dish. To ensure 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. Evans calculated the WCFZ using the midpoint of the Fresnel zones for the eight microwave paths identified within 2 miles of the Facility Site (see Appendix 26-A). An overlay analysis was conducted using

these Fresnel zones and the final Facility layout. This analysis showed that no turbine would block any of the identified microwave paths; therefore, no impact to microwave communications is anticipated.

(3) 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 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, Inc. 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.

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

Considering the measures discussed in Section (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.

(5) Other Potential for Interference

As discussed in Section (a)(1) and (2) above, interference with radio broadcast coverage is not anticipated. The Facility's wind turbines are sited outside the 3 kilometer exclusion distance recommended for AM frequencies, and FM signals are typically insensitive to turbines (see Appendix 26-A).

As discussed in Section (a)(4) and (6)-(8) above, interference with first responder services, municipal/school district services, industrial/business land mobile sites, area-wide public safety, and mobile telephone communications are not anticipated. Each of these networks is designed to operate reliably in an environment

where obstructions to direct line-of-sight exist. The frequencies of operation for these communication sources allow the signal to propagate around wind turbines. Moreover, mobile phone base station sites are designed with overlap between base transmitter stations to comprise a network, with the objective of maintaining 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 Section (e) below.

As discussed in Sections (a)(9)-(13) above, no impacts to GPS are anticipated. Impacts to Doppler/weather radar, air traffic control, and military readiness are currently being assessed via the FAA and NTIA review processes. The results of these analyses can be found in Appendix 25-D; any unacceptable impacts will be avoided or mitigated.

(d) Evaluation of Design Configuration

Maps and figures illustrating Facility components and relevant communication system constraints (e.g., Fresnel zones, radio station exclusion zones, etc.) are provided in the communications report in Appendix 26-A. 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 sections (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 Section (e) below.

(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 (Appendix 12-B) through which residents can make a formal complaint should any issues, such as degraded off-air television service, arise because of construction or operation of the Facility.

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 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, such as relocating the household antenna for better signal receipt or installing a new and potentially taller outside antenna. Both cable service and direct broadcast satellite service will be unaffected by the presence of the Facility (see Appendix 26-A).

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 above, the Applicant submitted a letter to the NTIA and a notification to the FAA under 49 USC § 44718 on September 13, 2019, both of which seek an assessment of the impact of the Facility on radar. As stated previously in Section (a)(9), the Applicant received a response on November 6, 2019 (Appendix 25-D) indicating that only one agency, the DOC, had suggested that there may be a potential impact to radar from the Facility. Evans responded to the DOC on November 18, 2019, and the Applicant will continue to coordinate with the DOC as the Heritage Wind Facility progresses toward commencement of operations.

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