

Empire Offshore Wind LLC

Empire Wind 2 Project  
Article VII Application

**Exhibit E-5**

**Effect on Communications**

June 2022

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**ACRONYMS AND ABBREVIATIONS**

BOEM	Bureau of Ocean Energy Management
EM&CP	Environmental Management and Construction Plan
Empire, the Applicant	Equinor Offshore Wind LLC
EW 2 Project	Empire Wind 2 Project
FCC	Federal Communications Commission
FM	Frequency modulation
HVAC	high-voltage alternating-current
km	kilometer
kV	kilovolt
Lease Area	BOEM-designated Renewable Energy Lease Area OCS-A 0512
LIRR	Long Island Rail Road
mi	mile
nm	nautical mile
NYISO	New York Independent System Operator, Inc.
NY Project	EW 2 Project transmission facilities in New York
NYSPSC or Commission	New York State Public Service Commission
POI	Point of interconnection at an expansion of the Barrett 138-kV Substation
PSL	New York Public Service Law
TV	television

## EXHIBIT E-5: EFFECT ON COMMUNICATIONS

### E-5.1 Introduction

Empire Offshore Wind LLC (Empire or the Applicant) proposes to construct and operate the Empire Wind 2 (EW 2) Project as one of two separate offshore wind projects to be located within the Bureau of Ocean Energy Management (BOEM) designated Renewable Energy Lease Area OCS-A 0512 (Lease Area). The EW 2 Project will require an electric transmission system to connect the offshore wind farm to the point of interconnection (POI) to the New York State Transmission System. An electric transmission line with a design capacity of 125-kilovolt (kV) or more, extending a distance of one mile or more, is subject to review and approval by the New York State Public Service Commission (Commission or NYSPSC) as a major electric transmission facility pursuant to Article VII of the New York Public Service Law (PSL). The EW 2 Project transmission system will extend a total of approximately 12.1 miles (mi) (19.5 kilometers [km]) within the State of New York and includes 230-kV export cable circuits and 345-kV interconnection cable circuits. As such, this application is being submitted to the Commission pursuant to Article VII of the PSL for the portions of the EW 2 Project transmission system that are located within the State of New York (collectively, the NY Project).

The NY Project will interconnect to the New York State Transmission System operated by the New York Independent System Operator, Inc. (NYISO) at the Oceanside POI, located at an expansion of the Barrett 138-kV Substation. The Barrett 138-kV Substation is owned by the Long Island Power Authority (LIPA) and operated by PSEG Long Island (PSEG-LI) and is located in Oceanside in the Town of Hempstead, New York. The NY Project will enter LIPA's substation at 345 kV, where the voltage will be converted to 138-kV within the POI. The onshore portion of the NY Project will be located entirely within Nassau County, New York.

The NY Project includes:

- Three three-core 230-kV high-voltage alternating-current (HVAC) submarine export cables located within an approximately 7.7-nautical mile (nm, 14.2-km)-long submarine export cable corridor from the boundary of New York State waters 3 nm (5.6 km) offshore to the cable landfall;
- A cable landfall in the City of Long Beach, New York;
- Three 230-kV onshore export cable circuits, each with three single-core HVAC onshore export cables within an approximately 1.5-mi (2.4-km)-long onshore export cable corridor from the cable landfall to the onshore substation;
- An onshore substation in the Village of Island Park, within the Town of Hempstead, New York, which will step up the voltage to 345-kV for the onshore interconnection cables; and
- Up to three 345-kV interconnection cable circuits, each with three single-core HVAC interconnection cables within an approximately 1.7-mi (2.8-km)-long interconnection cable corridor from the onshore substation to the POI.

This Exhibit addresses the requirements of 16 New York Codes, Rules and Regulations § 88.5 by describing the anticipated effects of the NY Project on television (TV), radio and other communications systems.

## E-5.2 Effects on Communications

This Exhibit provides information on existing communication systems located in the vicinity of the NY Project, as well as potential impacts resulting from the construction, operation, and maintenance of the NY Project.

Federal Communications Commission (FCC) databases of frequency modulation (FM) transmission, microwave service, cellular, paging and land mobile towers, TV transmitters, and antenna structures, indicate that there are 50 FCC-registered commercial towers located within 1 mi (1.6 km) of the NY Project (FCC 2018a-2018j), as depicted in **Figure E-5.2-1**. Additional details on the entities' names, locations and FCC identification numbers are provided in **Table E-5.2-1**. Commercial towers include FM transmission towers, microwave service towers, cellular towers, paging transmission towers, private land to mobile transmission towers, commercial land to mobile transmission towers, broadcast land to mobile transmission towers, analog TV station transmitters, digital TV station transmitters, and antenna structures. Given the density of development and structures in the area of Long Island, New York, the 1-mi (1.6-km) radius search was determined to be a reasonable distance for identification of those commercial towers closest to the NY Project.

The onshore export cables and interconnection cables (together, onshore cables) are a source of minor electric and magnetic fields due to the voltage applied to the conductors located within the cables. The onshore cables will be installed underground. As an expected minor source of electric and magnetic fields (see Section 4.13 of **Exhibit 4: Environmental Impact**), the NY Project cables are anticipated to have negligible impacts on communication systems.

Given the New York Bight's long history as a hub of trans-Atlantic and regional telecommunications activity, there are numerous charted cables crossing the submarine export cable route. The current status of many of these charted cables is poorly documented in the public domain, including the National Oceanic and Atmospheric Administration charts, with many of the charted cables dating back to telegraph systems installed up to 135 years ago. As shown in **Exhibit 2: Location of Facilities** and described in **Exhibit E-6: Effect on Transportation**, the NY Project will cross the FLAG Atlantic Telecommunications Cable near where it makes landfall on Long Island. Additional crossings of third-party submarine cables identified for the NY Project are associated with electric transmission cables, out-of-service, or planned (not yet built) communications cables. The Applicant continues to consult with asset owners to confirm the locations of submarine cable assets, including any active communication cables. All existing underground utilities along the onshore export and interconnection cable routes will be identified through surveys and coordination prior to the submission of the Environmental Management and Construction Plan (EM&CP).

As part of the onshore export and interconnection cable routing design, the Applicant conducted aerial surveys and field verification of existing utilities and submitted records requests to utility companies operating in the vicinity of the NY Project, including those operating potential telecommunications lines.

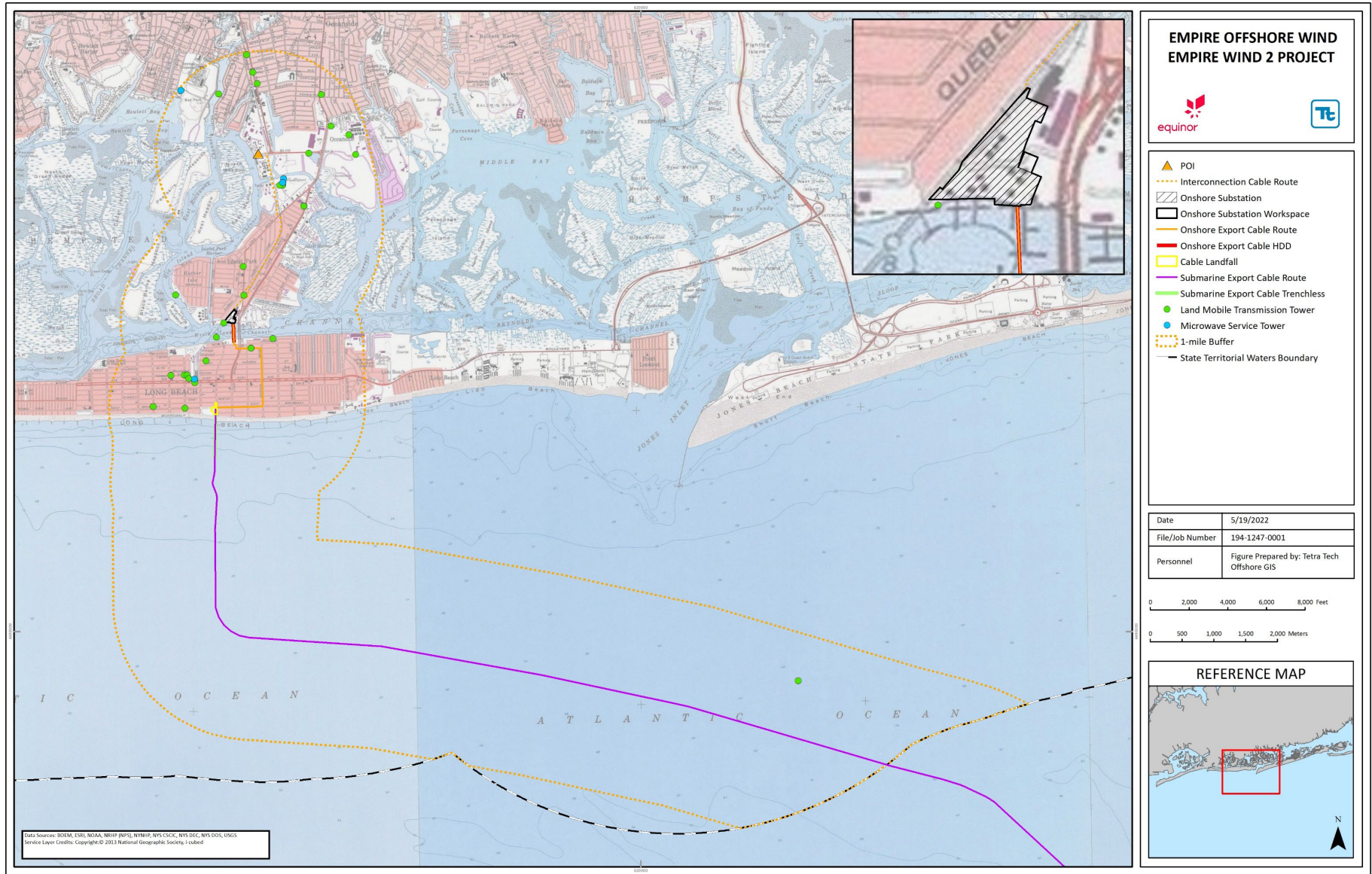


Figure E-5.2-1 FCC Registered Commercial Towers Located within 1 mile of the NY Project

**Table E-5.2-1 FCC Registered Commercial Towers Located within 1 mile of the NY Project**

Distance from Project (ft)	Entity Name	Tower Type	FCC Identification Number
12.91	ISLAND PARK, VILLAGE OF	1192426	Land Mobile Transmission Tower
12.91	ISLAND PARK, VILLAGE OF	2513751	Land Mobile Transmission Tower
161.15	TELMOBILE INC	1785245	Land Mobile Transmission Tower
341.04	KEYSPAN CORP DBA KEYSPAN ENERGY	2381444	Land Mobile Transmission Tower
478.65	KEYSPAN CORP DBA KEYSPAN ENERGY	1887753	Land Mobile Transmission Tower
478.65	KEYSPAN CORP DBA KEYSPAN ENERGY	1882235	Land Mobile Transmission Tower
478.65	KEYSPAN CORP DBA KEYSPAN ENERGY	1895551	Land Mobile Transmission Tower
478.65	KEYSPAN CORP DBA KEYSPAN ENERGY	1898218	Land Mobile Transmission Tower
483.50	MTA-LONG ISLAND RAILROAD	1916977	Land Mobile Transmission Tower
520.39	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
520.39	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
520.39	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
520.39	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
520.39	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
520.39	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
520.39	Nassau County Police Department		Microwave Service Tower
596.31	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
596.31	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
792.45	LONG BEACH MEDICAL CENTER	2550134	Land Mobile Transmission Tower
830.62	NEW YORK, STATE OF	2772441	Land Mobile Transmission Tower
890.20	LONG BEACH, CITY OF	1289816	Land Mobile Transmission Tower
1338.70	ISLAND PARK U F S D	1279279	Land Mobile Transmission Tower
1338.70	ISLAND PARK U F S D	3186966	Land Mobile Transmission Tower
1338.70	ISLAND PARK U F S D	3186966	Land Mobile Transmission Tower
1593.54	CHARLES GREENTHAL	2646903	Land Mobile Transmission Tower
1673.83	LONG BEACH INDEPENDENT TAXI CORP	1921518	Land Mobile Transmission Tower

Distance from Project (ft)	Entity Name	Tower Type	FCC Identification Number
1726.72	KUCIK, LARRY	3026816	Land Mobile Transmission Tower
1809.97	NEW YORK, STATE OF	2774770	Land Mobile Transmission Tower
1873.95	CITY OF LONG BEACH NY		Microwave Service Tower
2094.52	LONG BEACH, CITY OF	1176839	Land Mobile Transmission Tower
2094.52	LONG BEACH, CITY OF	1289816	Land Mobile Transmission Tower
2094.52	LONG BEACH, CITY OF	1295363	Land Mobile Transmission Tower
2094.52	LONG BEACH CITY TAXI ASSOCIATION	1921541	Land Mobile Transmission Tower
2140.05	OCEANSIDE COVE HOMEOWNERS ASSOCIATION INC	2877192	Land Mobile Transmission Tower
2284.55	LONG BEACH SCHOOL DISTRICT	1278630	Land Mobile Transmission Tower
2379.98	LONG BEACH, CITY OF	1177755	Land Mobile Transmission Tower
2867.45	NASSAU, COUNTY OF	1262231	Land Mobile Transmission Tower
2901.67	LONG BEACH, CITY OF	1267450	Land Mobile Transmission Tower
3112.99	LONG BEACH, CITY OF	1249830	Land Mobile Transmission Tower
3235.41	TORAH HIGH SCHOOL	1646113	Land Mobile Transmission Tower
3618.03	ATLANTIC EXPRESS TRANSPORTATION CORP	1644664	Land Mobile Transmission Tower
3621.02	NIKE FACTORY	3070480	Land Mobile Transmission Tower
3904.70	HEMPSTEAD, TOWN OF	1207700	Land Mobile Transmission Tower
4157.47	FRANKLIN PETROLEUM PRODS CO INC	1844935	Land Mobile Transmission Tower
4224.43	COURTESY BUS CO INC	1272647	Land Mobile Transmission Tower
4362.41	ROSEN, MARTIN DBA MARTYS TRUCKING CORP	1834850	Land Mobile Transmission Tower
4483.16	MLEB FAMILY PARTNERSHIP, LP	1945043	Land Mobile Transmission Tower
5172.55	MTA-LONG ISLAND RAILROAD	1919247	Land Mobile Transmission Tower
5160	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower
5160	NASSAU COUNTY POLICE DEPARTMENT		Microwave Service Tower



Cable crossings will typically require a physical separation between cables. For the submarine export cables, concrete mattresses or an exterior protection product will be installed between the cables. The NY Project will comply with applicable standards as they relate to power and communication cable spacing; therefore, the NY Project is not anticipated to impact communications systems due to proximity to existing submarine or underground telecommunications cables. Details on the specific crossings will be included in the EM&CP. The onshore substation will be designed in accordance with industry standards to prevent communications interference.

The NY Project is anticipated to have negligible impacts on communication systems, as detailed in the following sections. While the NY Project's interference with radio, television, or other communication systems is anticipated to be negligible, the Applicant will work to resolve any suspected or identified interference in the event that complaints are received during construction or operations.

### **E-5.2.1 Radio and Television Interference**

Based on the design of the cables and the proposed onshore substation, the NY Project is not anticipated to be a source of radio or television interference. Radio and television interference is typically associated with overhead lines and corona-produced radio-noise. Corona interference occurs when the electrical field around a conductor, typically at high voltage, ionizes the air, resulting in a discharge of electricity. Raindrops, snow, fog, hoarfrost, and condensation accumulated on the conductor surface are also sources of surface irregularities that can increase corona. Radio-noise from a corona discharge is reduced with distance from the source. The submarine export and onshore cables will be installed underground or underwater, with the exception of the crossing of Barnums Channel, which will use an aboveground cable bridge. The cable construction will likewise block the electric field outside the cable. The NY Project will be designed to reduce the potential for corona discharge, including by incorporating cross-linked polyethylene insulation and shielding. As such, the NY Project facilities are not expected to be a material source of radio-noise or television interference.

### **E-5.2.2 Power Line Carrier Interference**

Power line carrier is a communication system used in overhead transmission lines, which transmits by modulation on a carrier signal. Power line carrier interference can occur from electrical transmission lines in the form of noise, which can be a concern for radio services. Since the NY Project's communication and protection signaling will use fiber optic cables rather than power line carrier, and because the proposed cables will be installed predominantly underwater and/or underground, this type of interference is not anticipated.

### **E-5.2.3 Telephone Interference**

The onshore export cables and interconnection cables will be installed predominantly underground, with the exception of the crossing of Barnums Channel, which will use an aboveground cable bridge, so they are not anticipated to cause harmonic distortion sufficient to impact or interfere with existing telephone systems or mobile communications systems. The onshore substation will be designed to minimize the potential for harmonic distortion. The onshore substation design will incorporate measures to address potential telephone or mobile communication system interference and to ensure that local standards are maintained. Moreover, telephone cables are generally manufactured with shielded copper wire for the purpose of minimizing potential interference from transmission lines. Digital and fiber optic telephone communications are not known to be subject to transmission interference. As a result, the NY Project is not expected to cause any interference with telephone signals.

#### **E-5.2.4 Railway Signaling Interference**

Railway signaling interference can happen where there are railway communication facilities in the vicinity of proposed transmission lines. The proposed interconnection cable route will be installed predominantly along the Long Island Rail Road (LIRR) right-of-way between the onshore substation and the POI, through the Village of Island Park. The Applicant will coordinate with the LIRR on the installation of the interconnection cables such that the NY Project does not result in impacts to railway signaling. **Exhibit E-6** provides additional information on the NY Project's potential effects on transportation, including construction along the LIRR corridor.

#### **E-5.2.5 Microwave Interference**

Microwave communications use short wavelengths typically for line-of-sight point-to-point communications, as well as satellite communications, using directional antennas. As such, microwave interference typically would only occur if the interference source were located between two antennas. Because of the short wavelengths and high directionality, microwave communications are designed to be targeted and reduce the potential for interference from other microwave systems. Microwave communication systems or relays also tend to be built in elevated locations to preserve line-of-sight. There are 12 microwave service towers within 1 mile of the submarine and onshore export and interconnection cable routes; however, because the proposed transmission line will be located entirely subsea or belowground, with the exception of the crossing of Barnums Channel via an aboveground cable bridge, it is not expected to produce any microwave interference.

#### **E-5.2.6 Proposed Mitigation**

The NY Project is not expected to result in any significant interference with radio, television, cellular phone reception, railway signaling and communications, or microwave transmissions. The Applicant will comply with applicable provisions of the National Electrical Safety Code related to proposed transmission lines and communication facilities and has designed the transmission lines to minimize corona effects.

The Applicant will follow the Call Before You Dig protocol and contact potential third-party underground communication cable operators to confirm the locations of any underground communication facilities that would be within or crossed by the right-of-way. If underground communication facilities that have not been previously identified are found within the vicinity of the NY Project, the Applicant will ensure that appropriate clearances and interference protection are verified.

#### **E-5.3 References**

FCC (Federal Communications Commission). 2018a. "FM Transmission Towers." Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/fm-transmission-towers>.

FCC. 2018b. "Microwave Service Towers." Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/microwave-service-towers>.

FCC. 2019c. "Cellular Towers." Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/cellular-towers>.

FCC. 2018d. "Paging Transmission Towers." Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/paging-transmission-towers>.

FCC. 2018e. "Land Mobile Private Transmission Towers." Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/land-mobile-private-transmission-towers>.

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FCC. 2018f. “Land Mobile Commercial Transmission Towers.” Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/land-mobile-commercial-transmission-towers>.

FCC. 2018g. “Land Mobile Broadcast Towers.” Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/land-mobile-broadcast-towers>.

FCC. 2018h. “TV Analog Station Transmitters.” Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/tv-analog-station-transmitters>.

FCC. 2018i. “TV Digital Station Transmitters.” Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/tv-digital-station-transmitters>.

FCC. 2018j. “Antenna Structure Registrate.” Accessed February 10, 2020. <https://hifld-geoplatform.opendata.arcgis.com/datasets/antenna-structure-registrate>