

Wind Power GeoPlanner™

Microwave Study

411 Reynolds Rd



Prepared on Behalf of
Borrego Solar Systems

February 4, 2021



COMSEARCH
A CommScope Company

Table of Contents

1. Introduction	- 1 -
2. Project Overview	- 1 -
3. Two-Dimensional Fresnel Zone Analysis	- 2 -
4. Conclusion	- 5 -
5. Contact	- 5 -
Appendix: Turbine Locations	- 6 -

1. Introduction

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. 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. This report focuses on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems.

2. Project Overview

Project Information

Name: 411 Reynolds Rd

County: Montgomery

State: New York

Number of Turbines: 1

Blade Diameter: 150 meters

Hub Height: 120 meters

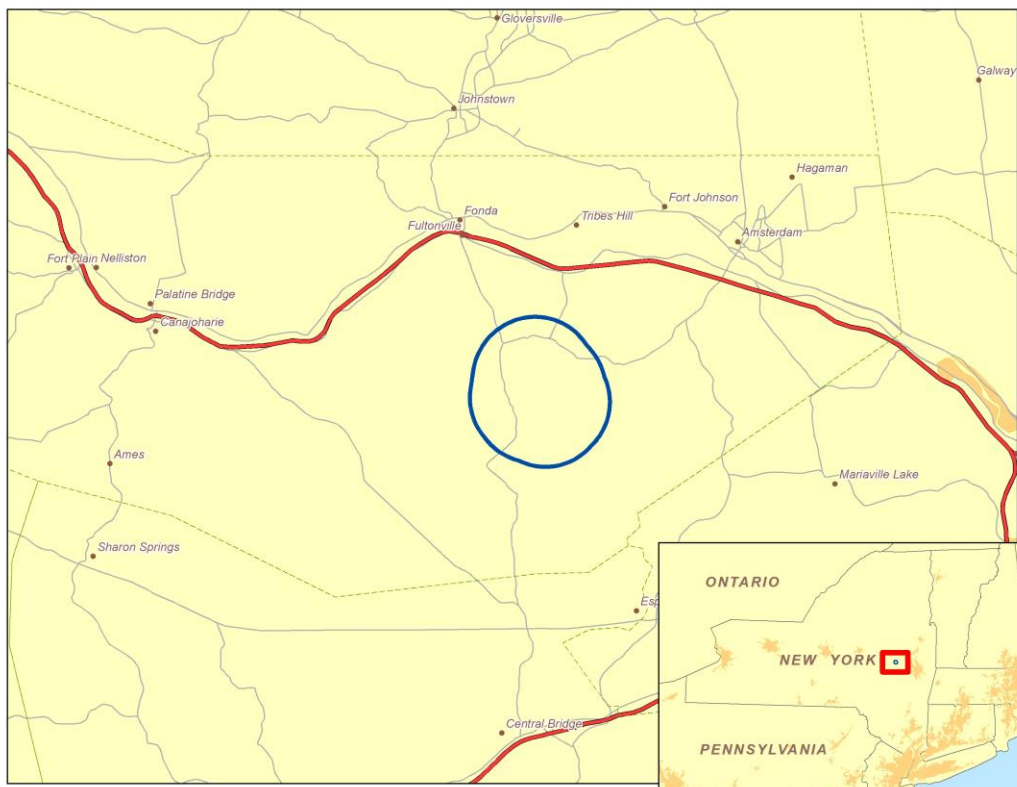


Figure 1: Area of Interest

3. Two-Dimensional Fresnel Zone Analysis

Methodology

Our obstruction analysis was performed using Comsearch’s proprietary microwave database, which contains all non-government licensed, proposed, and applied paths from 0.9 - 23 GHz¹. First, we determined all microwave paths that intersect the area of interest² and listed them in Table 1. The area of interest is defined as two miles from the project area that encompasses the planned turbine locations. These paths are shown in Figure 2.

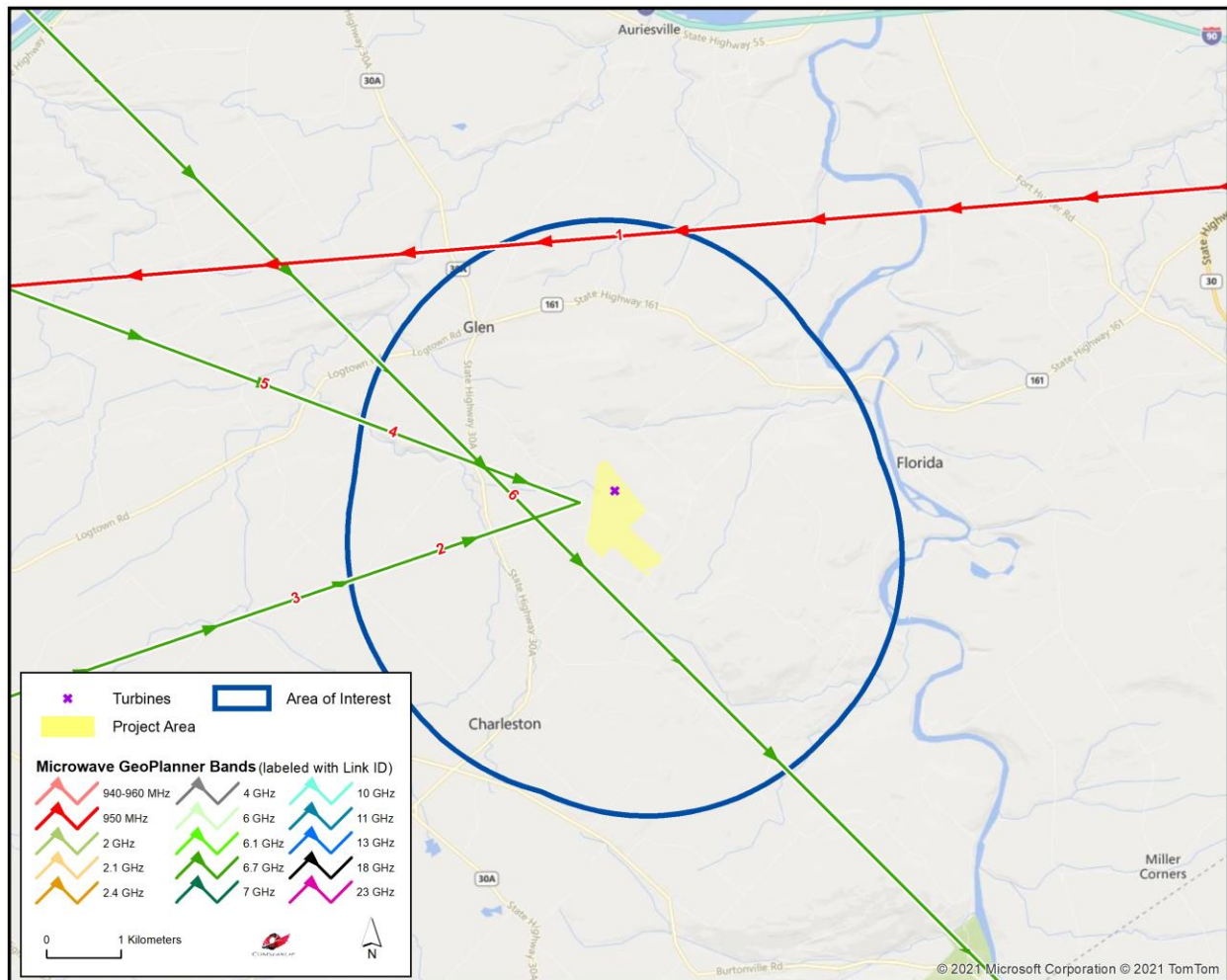


Figure 2: Microwave Paths that Intersect the Area of Interest

¹ Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

² We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

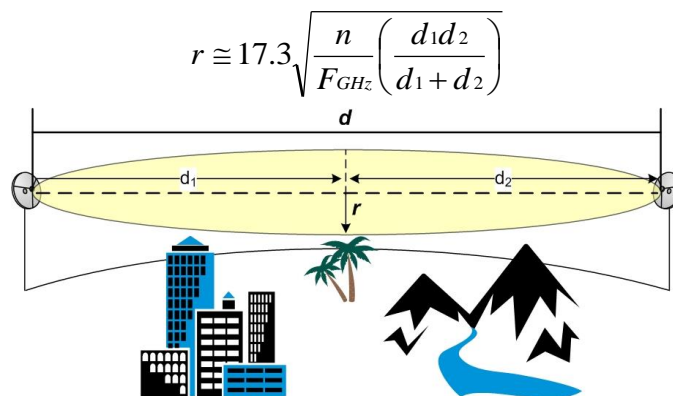
ID	Status	Callsign 1	Callsign 2	Band	Path Length (km)	Licensee
1	Licensed	WLQ247	RXONLY	950 MHz	46.62	Roser Communications Network, Inc.
2	Licensed	WQNJ707	WQNJ703	6.1 GHz	18.60	Montgomery, County of
3	Licensed	WQNJ707	WQNJ703	6.7 GHz	18.60	Montgomery, County of
4	Licensed	WQNJ709	WQNJ703	6.1 GHz	30.78	Montgomery, County of
5	Licensed	WQNJ709	WQNJ703	6.7 GHz	30.78	Montgomery, County of
6	Licensed	WQQG726	WQQG724	6.7 GHz	66.99	Eastern Gas Transmission and Storage, In

*Table 1: Summary of Microwave Paths that Intersect the Area of Interest
(See enclosed mw_geopl.xlsx for more information and
GP_dict_matrix_description.xls for detailed field descriptions)*

Verification of Coordinate Accuracy

It is possible that as-built coordinates may differ from those on the FCC license. For this project, three paths cross within close proximity of the proposed turbines and the tower locations for these paths will have a critical impact on the result. Therefore, we verified these locations using aerial photography and were found to be accurate.

Next, we calculated a Fresnel Zone for each path based on the following formula:



Where,

- r = Fresnel Zone radius at a specific point in the microwave path, meters
- n = Fresnel Zone number, 1
- F_{GHz} = Frequency of microwave system, GHz
- d_1 = Distance from antenna 1 to a specific point in the microwave path, kilometers
- d_2 = Distance from antenna 2 to a specific point in the microwave path, kilometers

In general, this is the area where the planned wind turbines should be avoided, if possible. Likewise, Comsearch recommends that an area directly in front of each microwave antenna should be avoided. This corresponds to the Consultation Zone which measures 1 kilometer along the main beam of the antenna and 24 ft (7.3 meters) wide. A depiction of the Fresnel Zones and Consultation Zones for each microwave path listed can be found in Figure 3, and is also included in the enclosed shapefiles^{3,4}.

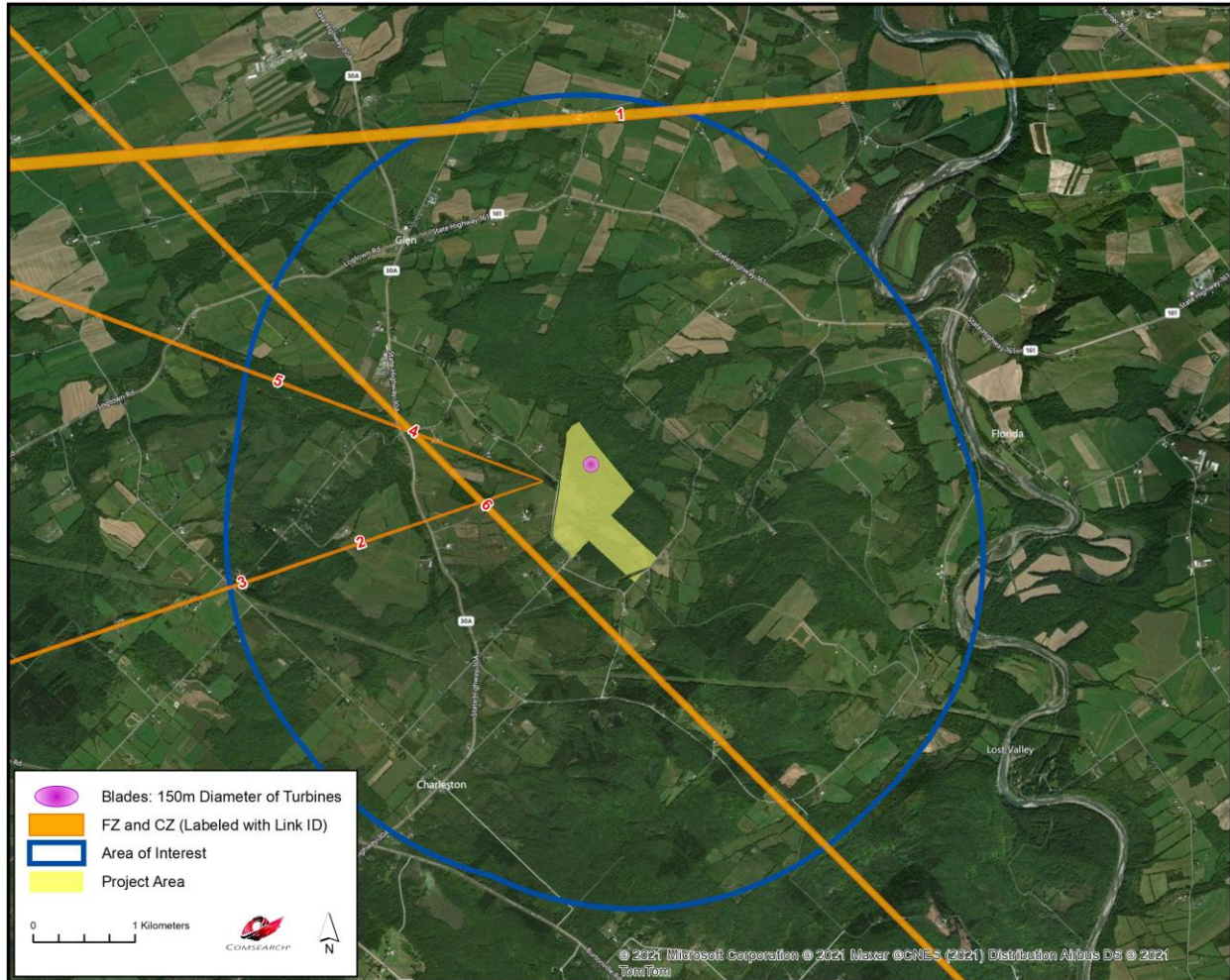


Figure 3: Microwave Paths with Fresnel Zones

³ The ESRI® shapefiles enclosed are in NAD 83 UTM Zone 18 projected coordinate system.

⁴ 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.

4. Conclusion

Total Microwave Paths	Paths with Affected Fresnel Zones	Total Turbines	Turbines intersecting the Fresnel Zones
6	0	1	0

Table 2: Fresnel Zone Analysis Result

Our study identified six microwave paths intersecting the 411 Reynolds Rd wind project area of interest. The Fresnel and Consultation Zones for these microwave paths were calculated and mapped in order to assess the potential impact from the turbines. One turbine was considered in the analysis. It has a blade diameter of 150 meters and a hub height of 120 meters. This turbine was found to have no potential obstruction with the microwave systems in the area.

5. Contact

For questions or information regarding the Microwave Study, please contact:

Contact person: David Meyer
 Title: Senior Manager
 Company: Comsearch
 Address: 19700 Janelia Farm Blvd., Ashburn, VA 20147
 Telephone: 703-726-5656
 Fax: 703-726-5595
 Email: dmeyer@comsearch.com
 Web site: www.comsearch.com

Appendix: Turbine Locations

ID	Latitude	Longitude
T1	42.87418	-74.32240