1. **Detailed description and configuration of the operation to be conducted as well its objectives**. Testing of the TLS system will consist of two locations. The receive site is located on Windy Hill Road and the transmit site located at Grassy Lane Rd located in Cazenovia, NY.

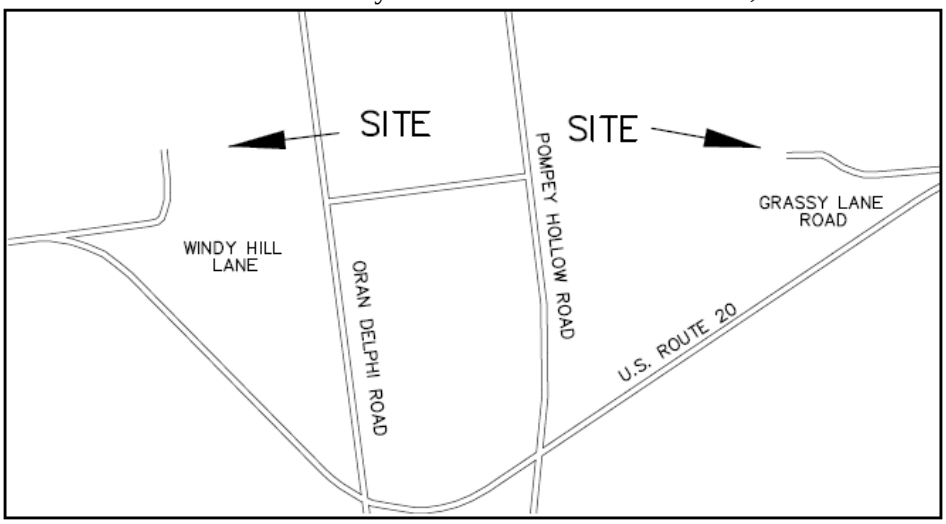


Figure 1. Receive and Transmit Site Location

The TLS system will be strategically located at the receive site to capture RF transmissions from the transmit site. These received signals will function as the stimuli to assess various system features. Once the signal of interest has been captured by the TLS system, transmission will cease and preparations for the next signal transmission will commence. At the transmit site, a trailer equipped with a signal generator will produce a series of test emitters, one at a time, across the spectrum using different antennas. The LB-180400-25-C, QMS-01091, and QMS-00827 will be affixed to the trailer via a mount bar, while the ARA SAS-524, ARA-276, B1304-800, and B1029-800 will be mounted on a Blue-Sky Mast. Only one transmitting antenna will be used at a time, with an operator present at both sites to oversee the transmission process.

Below is the antenna test setup below:

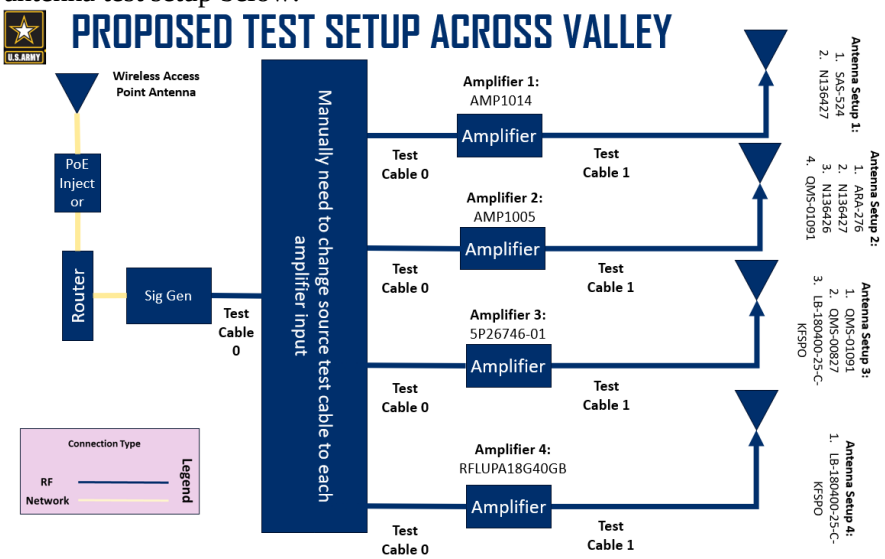


Figure 2. Transit Setup

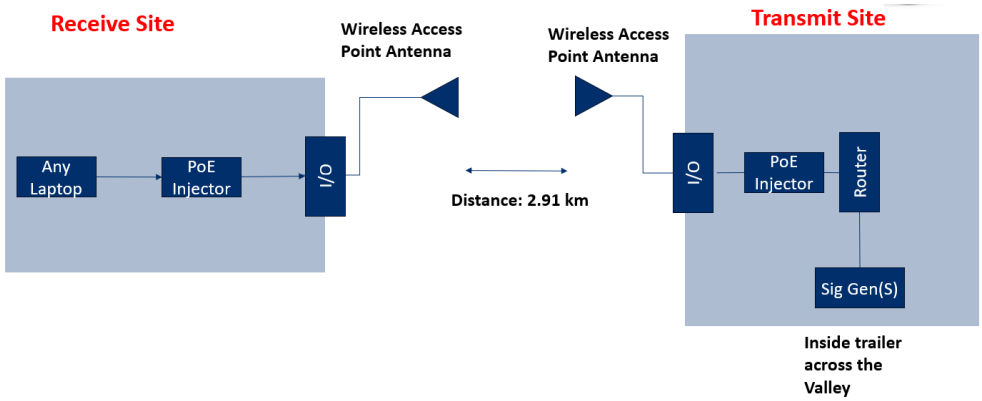


Figure 3. Network Connection Across Valley

2. Detailed technical information on antenna actual characteristics such as antenna radiation patterns, antenna radiation center height AGL and AMSL.

	SAS-524	**ARA-276**	**N136427-1**	**N136426-1**
Antenna Pattern	Omni directional in azimuth	Omni directional in azimuth	Omni directional in azimuth	Omni directional in azimuth
Antenna AGL while mounted on mast **(feet)**	4.5’	7’	4.5’	7’
Antenna AMSL while mounted on mast **(feet)**	1316.08’	1318.58’	1316.08’	1318.58’
Polarization	Linear Vertical	Linear Vertical	Linear Vertical	Linear Vertical

Figure 4. ARA Antenna Details

3. If directional antenna, please provide antenna beam width, the direction that the antenna will point at, elevation angle etc,.

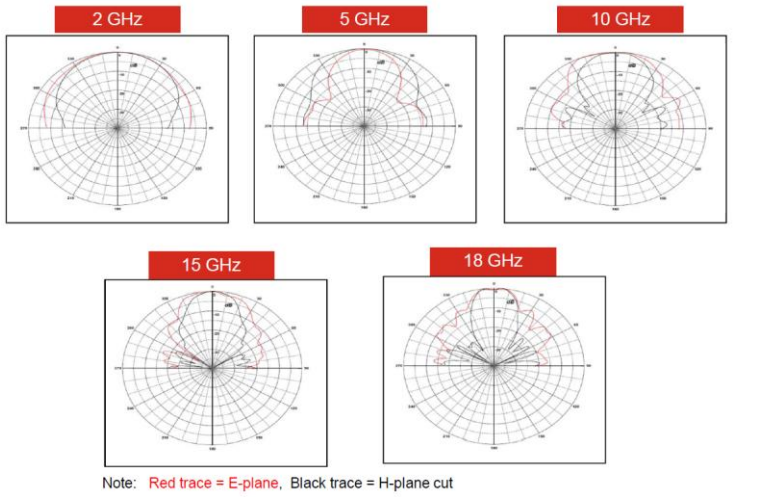
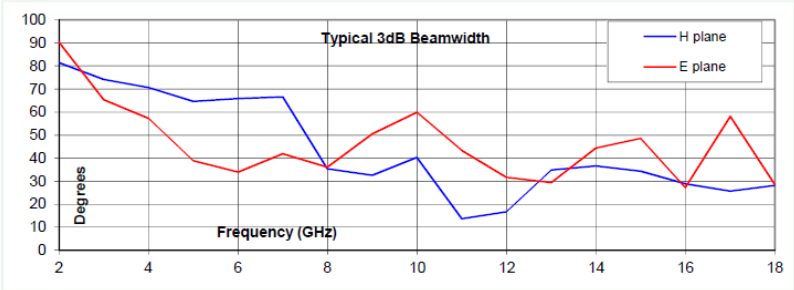
	QMS-01091
Antenna Pattern	
Antenna Beamwidth	
Peak Gain	12 dBi
Antenna AGL while mounted on mast **(feet)**	11.48’
Antenna AMSL while mounted on mast **(feet)**	1323.06’
Polarization	Linear Vertical
Direction of Antenna	West
Elevation Angle	89.9 degree

Figure 5. QMS-01091 Antenna Details

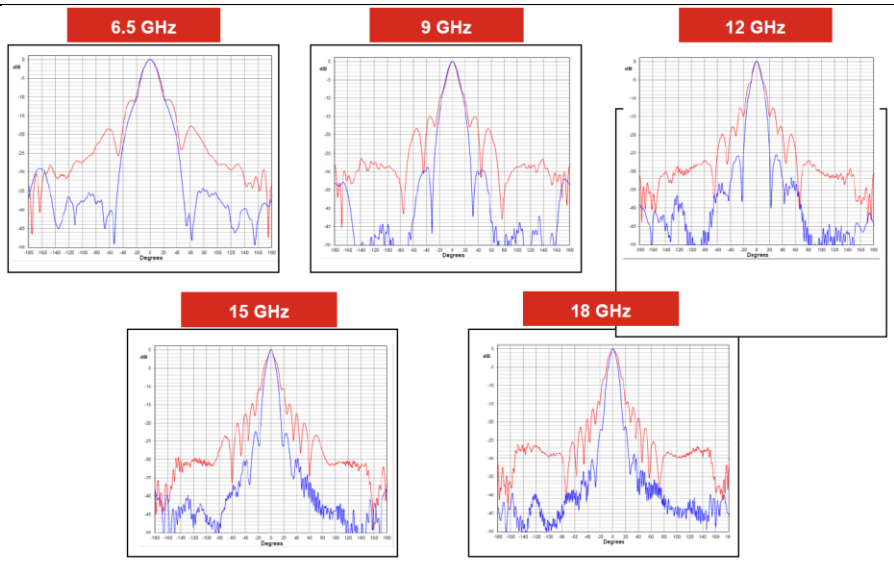
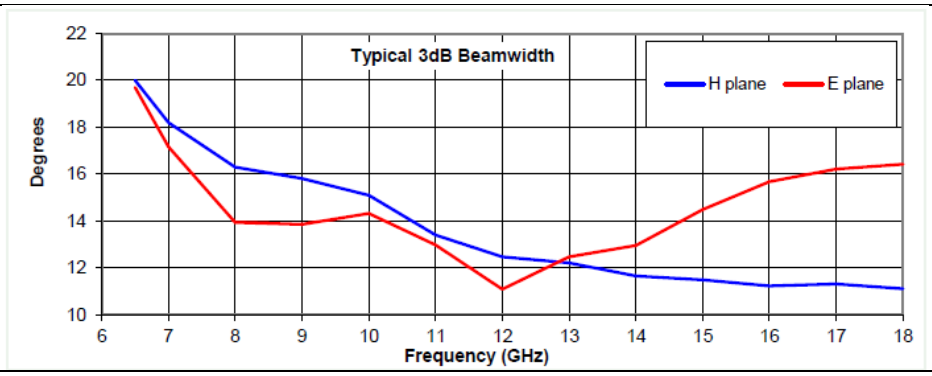
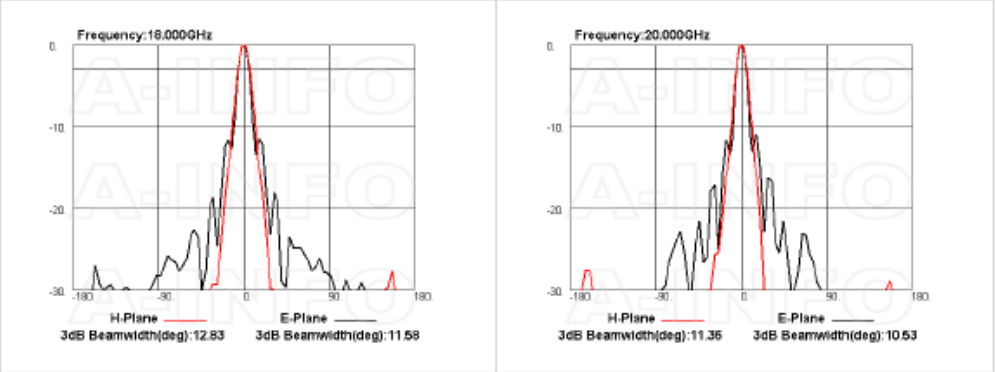
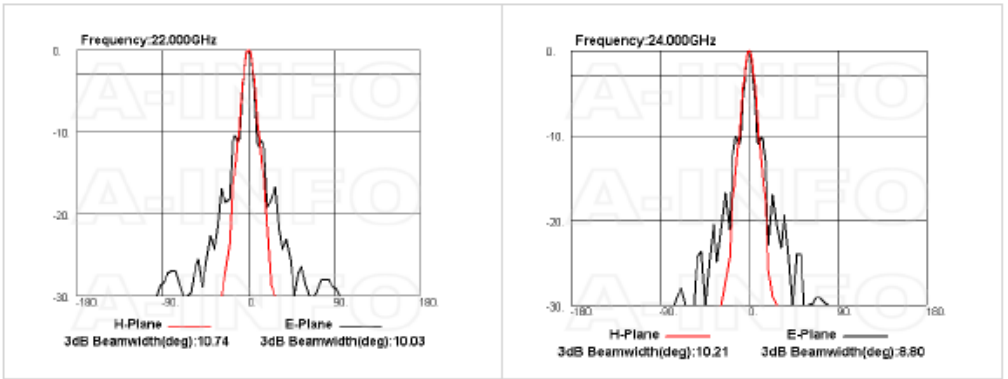
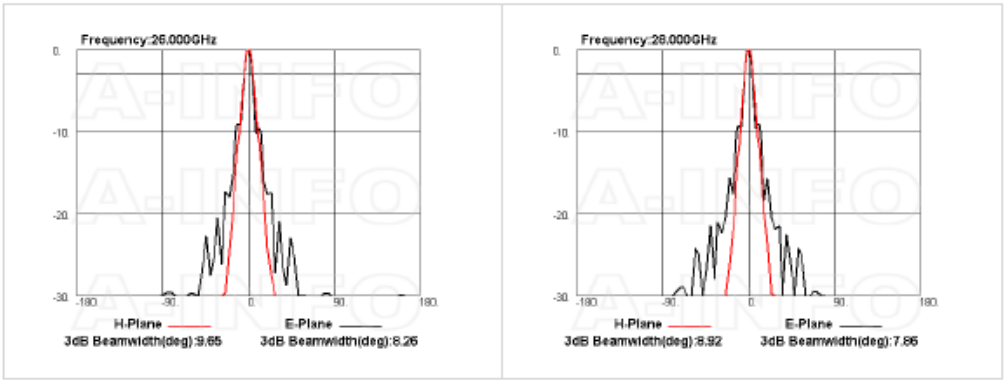
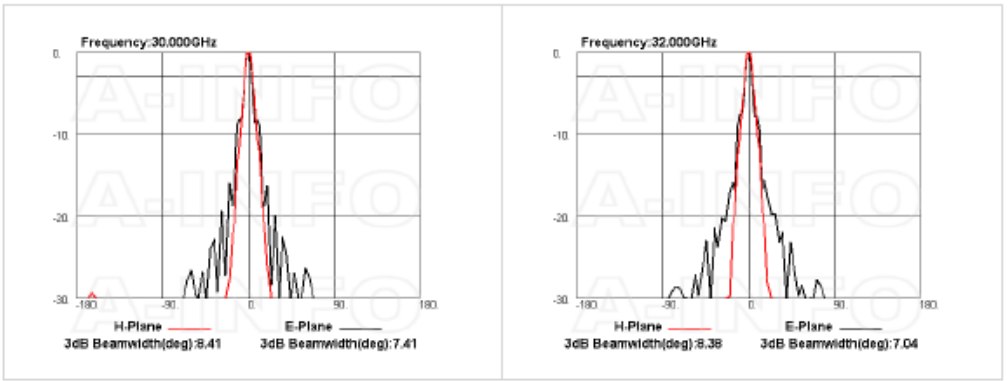
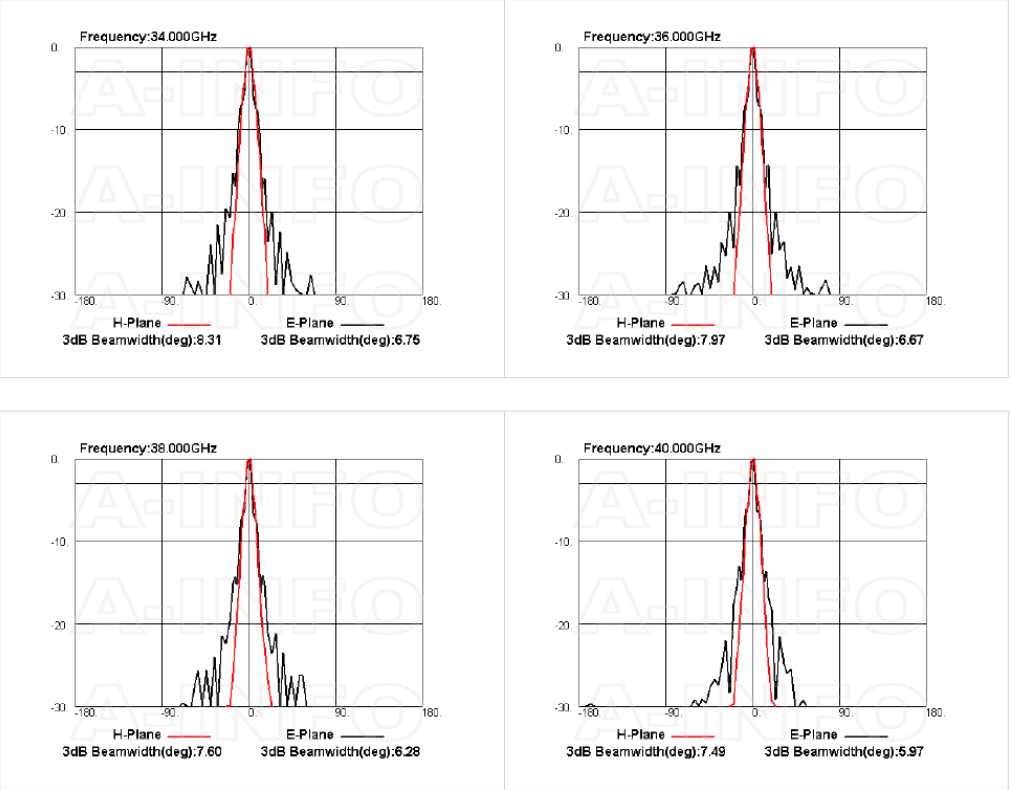
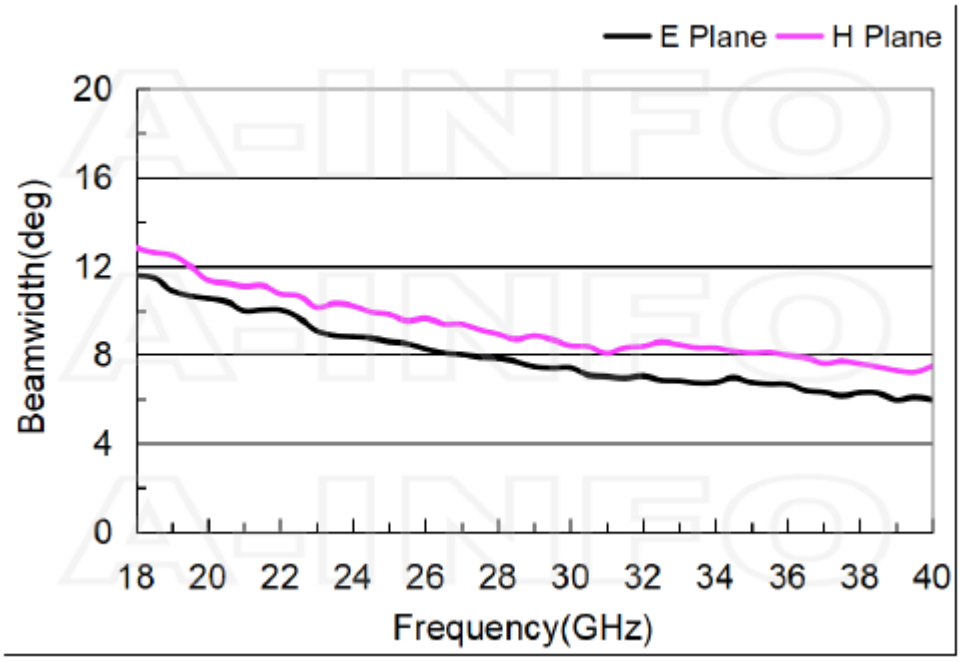
	QMS-00827
Antenna Pattern	 Red trace = E-plane, Blue trace = H-plane cut
Antenna Beamwidth	
Peak Gain	21.8 dBi
Antenna AGL while mounted on mast **(feet)**	11.58’
Antenna AMSL while mounted on mast **(feet)**	1323.16’
Polarization	Linear Vertical
Direction of Antenna	West
Elevation Angle	89.9 degrees

Figure 6. QMS-00827 Antenna Details

	LB-180400-25-C
Antenna Pattern	   

	
Antenna Beamwidth	
Peak Gain	26 dBi

Antenna AGL while mounted on mast **(feet)**	11.5’
Antenna AMSL while mounted on mast **(feet)**	1323.08’
Polarization	Linear
Direction of Antenna	West
Elevation Angle	89.9 degrees

Figure 7. LB-180400-25-C Antenna Details

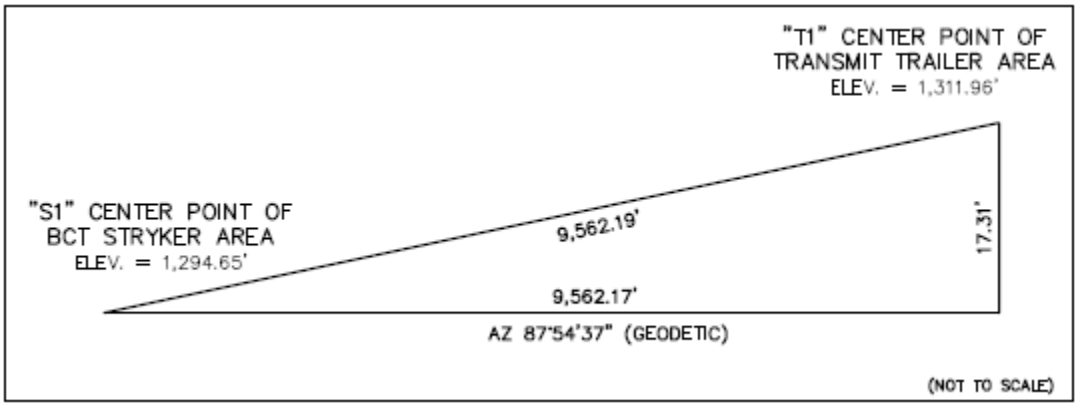


Figure 8. Center Point of Transmit Trailer To Center Point of the BCT Stryker

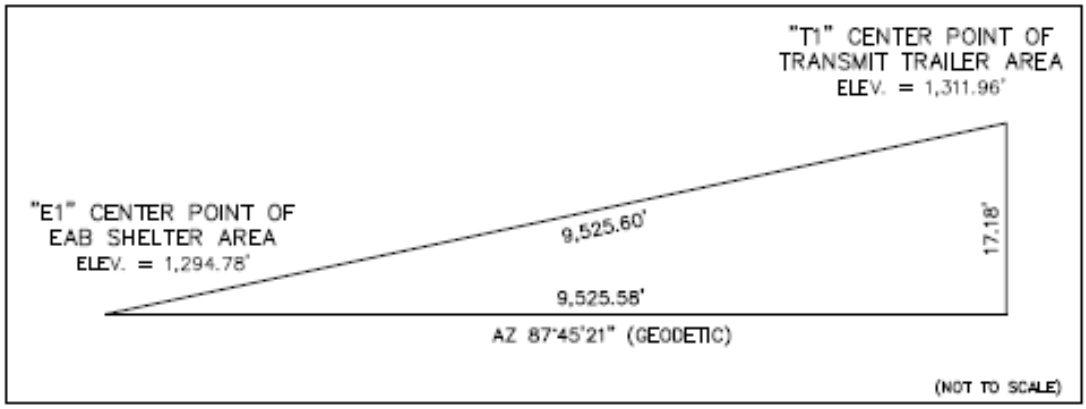


Figure 9. Center Point of Transmit Trailer To Center Point of the EAB Shelter

4. **An engineering analysis and explanation of how it would specifically avoid causing harmful interference to the incumbent AWS, UMFUS, Fixed Microwave, TV Broadcast Auxiliary and 600 Megahertz Band (Service Code: WT) licensees.**

Harmful unwanted interference to incumbent systems will be minimized due to the remote location and geography surrounding the test range. The closest major city (Syracuse, NY) is 20 miles away. The closest population center (Cazenovia, NY pop. 2835) is 3 miles away, however line-of-site to the test range transmitter is blocked by hills along US RTE 92 and Oran Delphi Rd. Furthermore, neither Syracuse nor Cazenovia are in the main lobe of the proposed directional antennas.

A heat map depicting the transmission levels from various antennas will be provided alongside this document. This heat map considers the different transmitters across the spectrum, as well as terrain effects in the nearby vicinity, to confirm the veracity of the aforementioned statement.

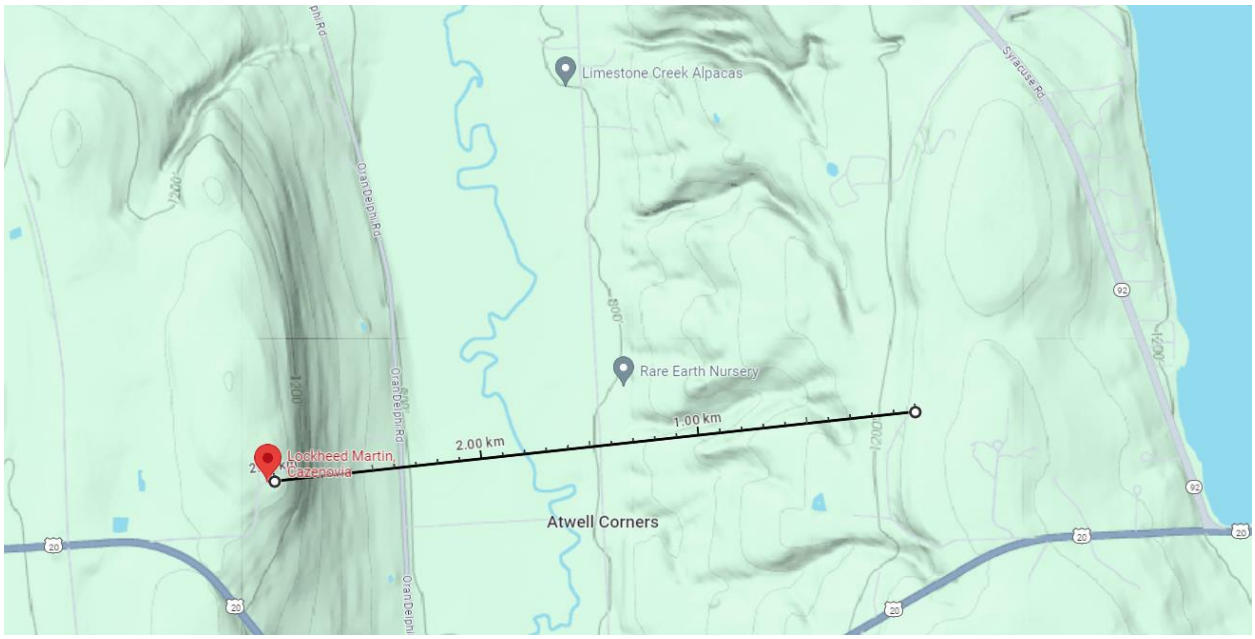


Figure 10. Terrain View of Cazenovia Test Site

5. **Stop buzzer point of contact in the event that harmful interference occurs.**

	POC 1	POC 2	POC 3
Name Email Number	Nicholas Roney nicholas.o.roney@lmco.com (315) 456-1047	Nasiah Johnson Nasiah.johnson@lmco.com (315) 456-1657	Michael Curtis michael.j.curtis@lmco.com (315) 456-4499

Figure 11. POCs