

Mars Hill Broadcasting Co. Inc.
FM Translator W270BX, Facility ID 150636
September 2022 Application for Minor Change Construction Permit

ENGINEERING EXHIBIT

The application requests a minor modification of FM Translator W270BX to change antenna location, antenna elevation, and antenna type. The proposed site is within the Pinnacle Hill antenna farm on an existing tower registered under ASR number 1061133. W270BX will continue to rebroadcast WMHN(FM) as a non-fill-in facility via direct off-air reception. An effective radiated power of 13 watts is proposed, as the highest of the twelve required radials (30 degrees azimuth) has an HAAT of 137 meters.

Figure 1 shows that the proposed W270BX 60 dBu coverage contour overlaps that of the presently-licensed facility, based on FCC 30-second terrain data. The area of overlap with the W300DG 60 dBu contour (as proposed in a contingent application) is 14.2 km², which comprises only 12.8 percent of the total coverage area of 111.3 km² proposed for W270BX.

Figure 2 shows that all co-channel and adjacent-channel stations will be fully protected against prohibited contour overlap with the exception of 3rd-adjacent WRMM-FM, which has a predicted field strength of 93.8 dBu at the proposed site, as shown in **Figure 3**. The calculated 133.8 dBu "free-space" field of W270BX (operating at 13 watts) extends a maximum of 5 meters from the antenna and would not reach ground level or any inhabited structures.

The proposed W270BX facility operating at 13 watts in both horizontal and vertical polarizations will employ a two bay ring-stub antenna centered at 18 meters above ground level, mounted on an existing registered tower. Based on FCC "FM Model" calculations assuming an EPA Type 1 antenna, the maximum radiofrequency power density attributable to W270BX will not exceed 2.1 µW/cm² at two meters above ground level, as shown in **Figure 4**. Applicant, in coordination with other users, will reduce power or cease operation of W270BX as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Figure 1
Proposed Coverage Contour

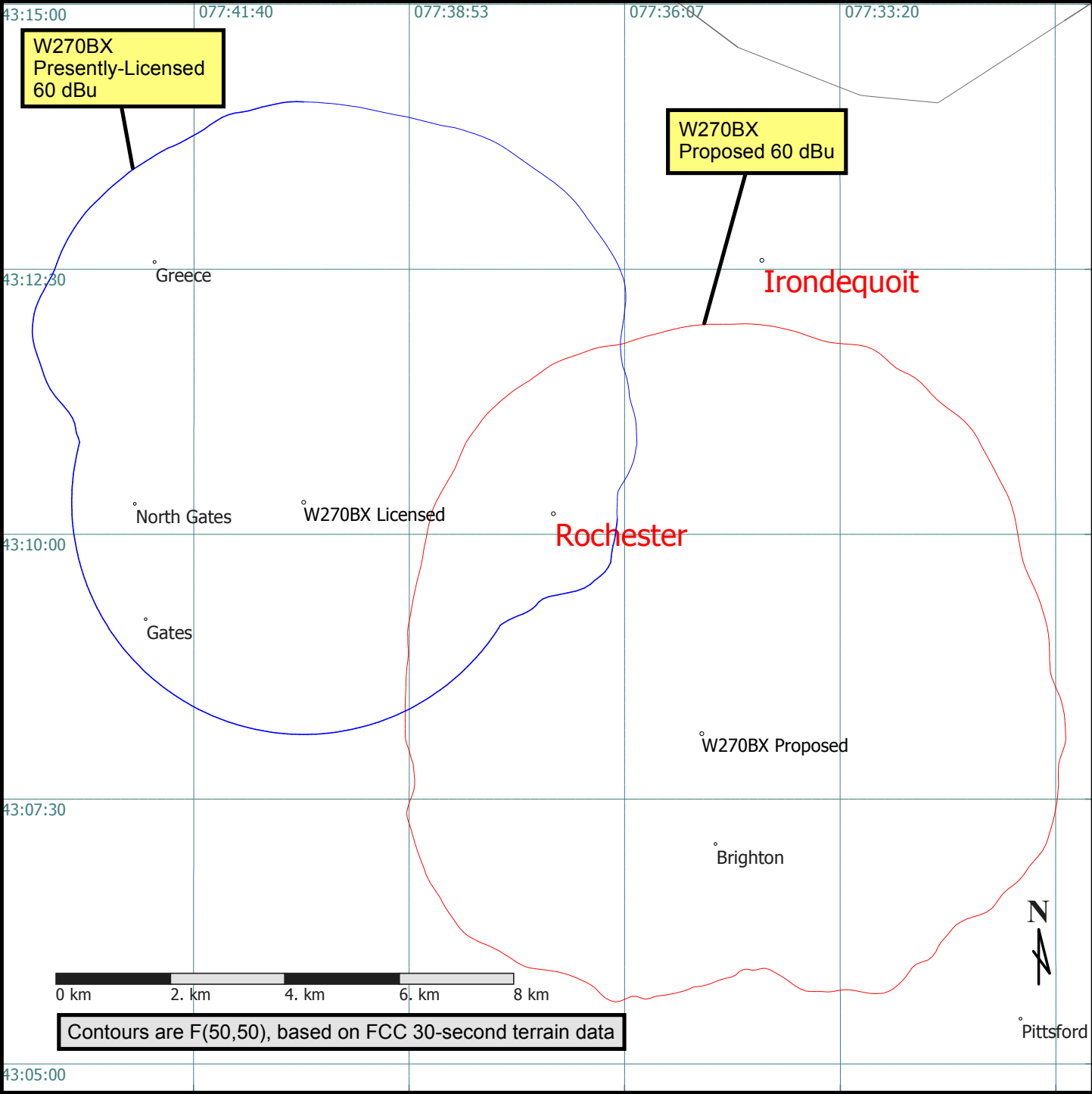


Figure 2
Proposed Contour Protection

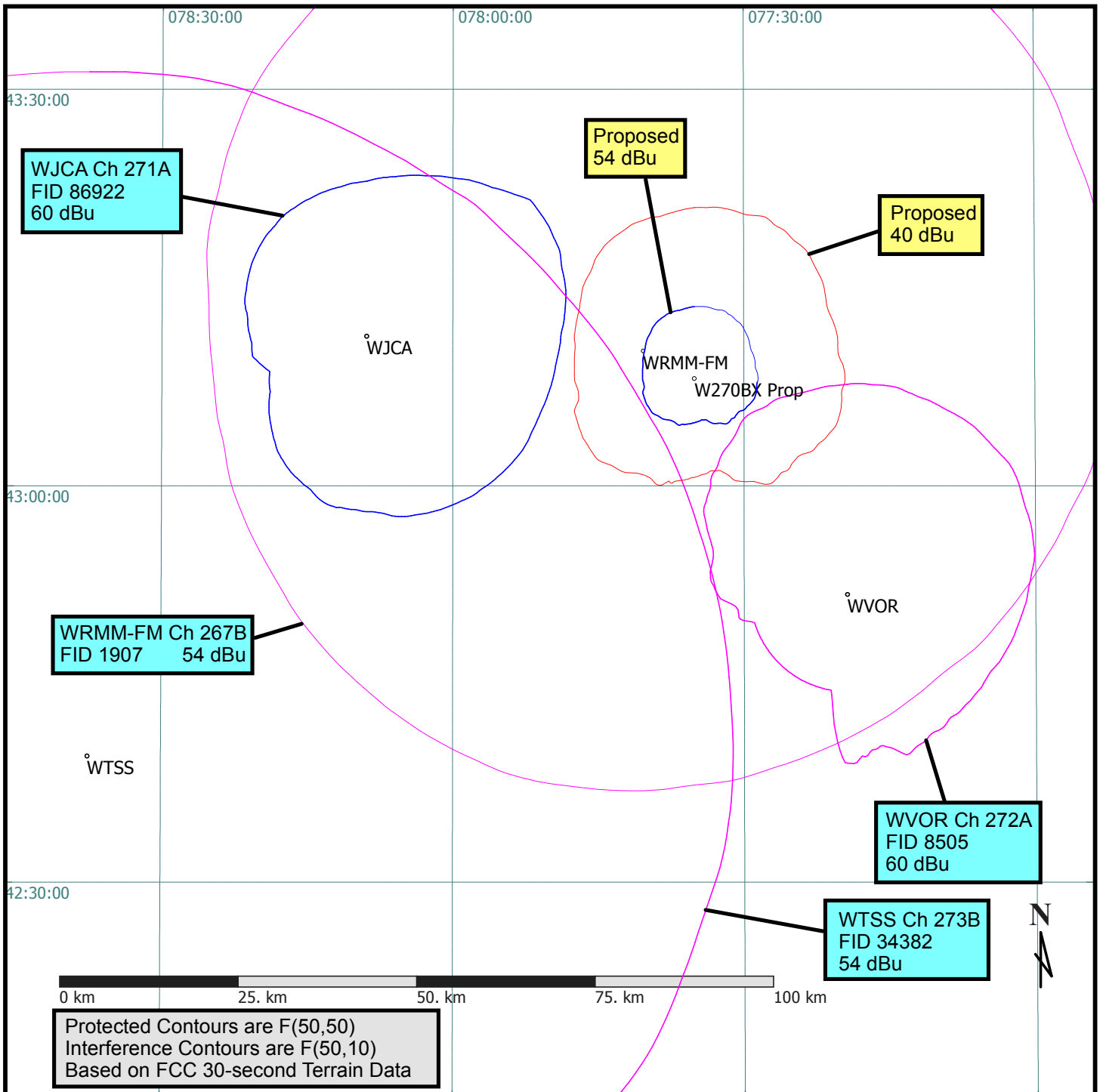


Figure 3
WRMM-FM Third-Adjacent Protection Detail

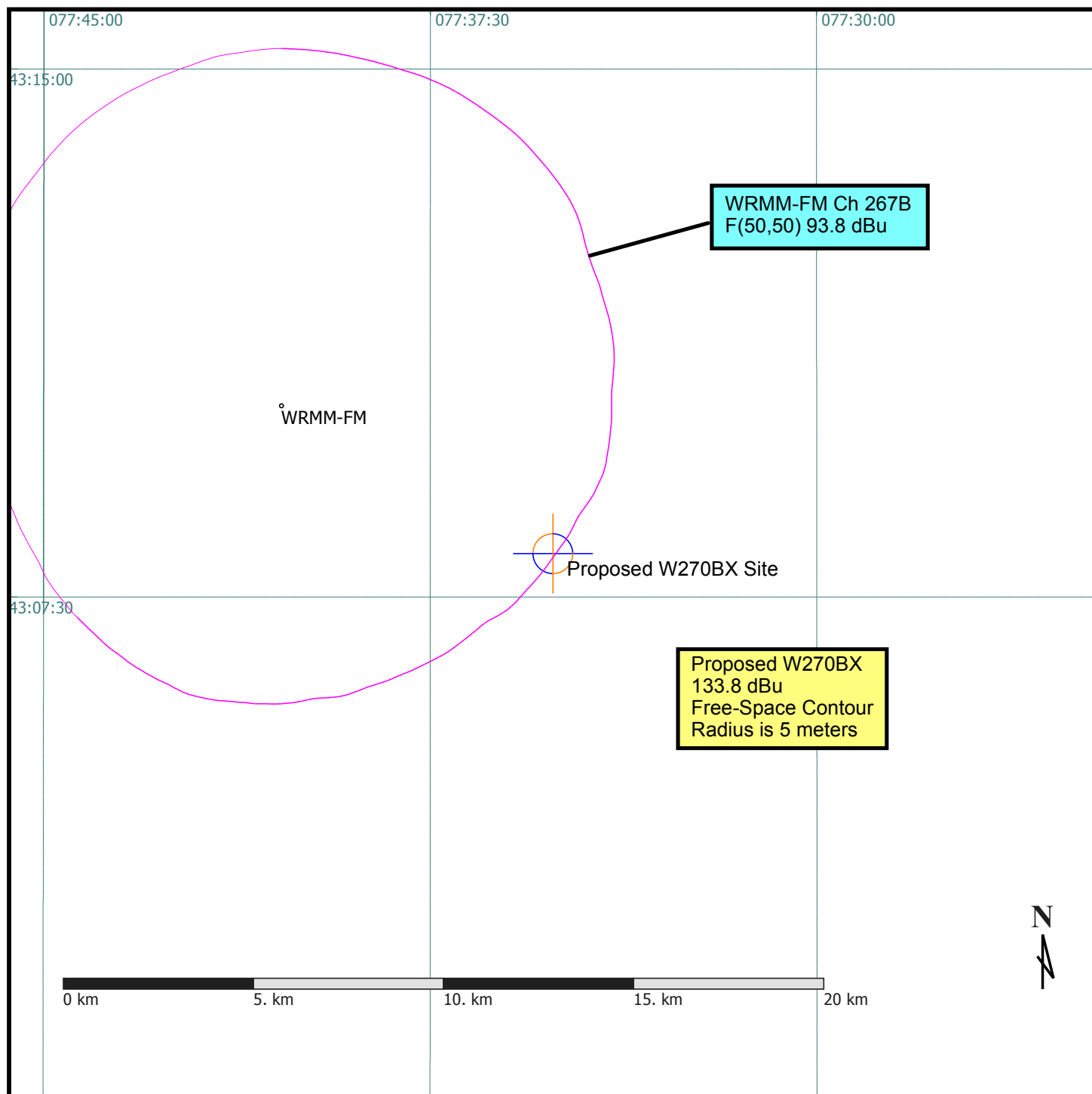
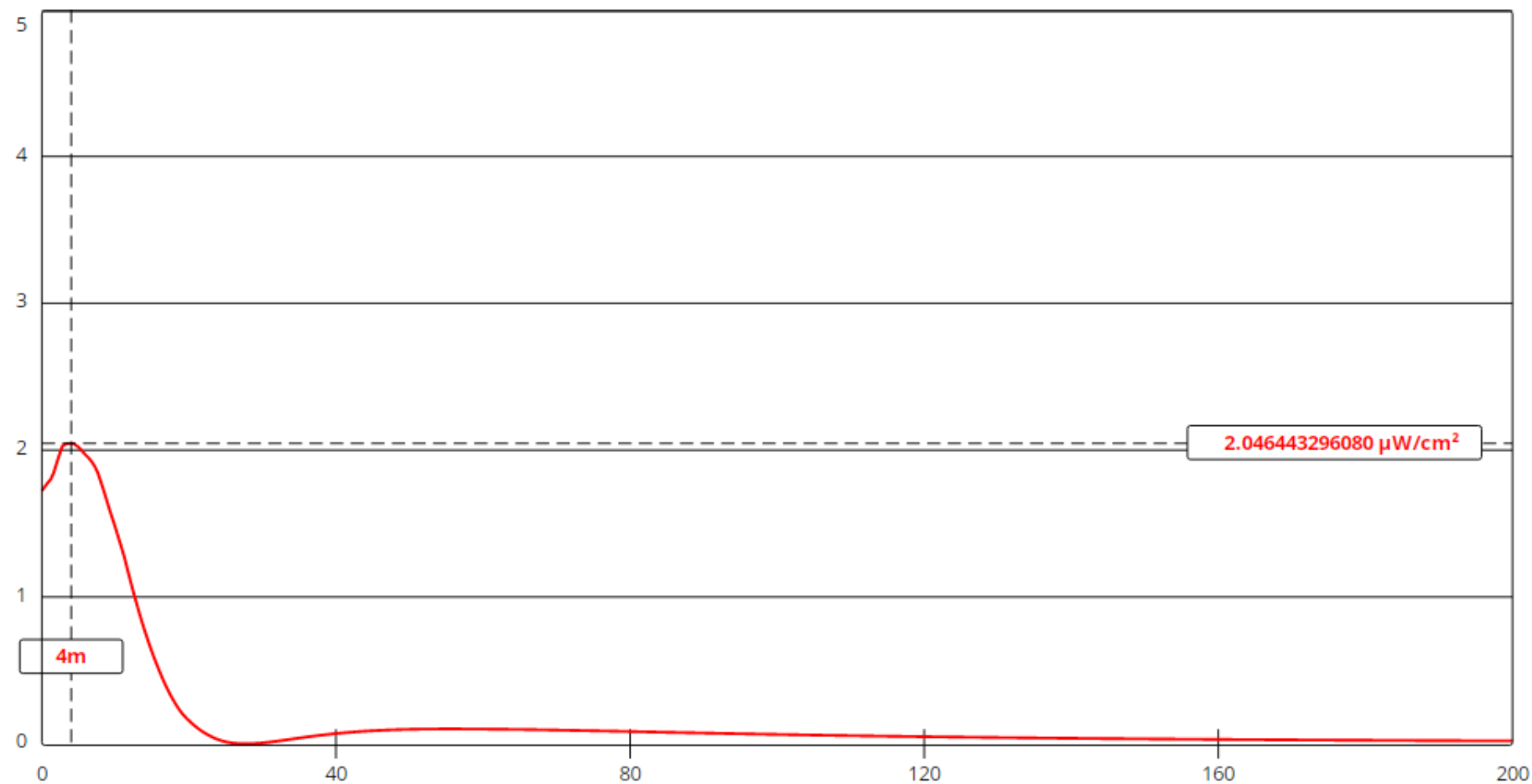


Figure 4 -- "FM Model" Power Density Plot



Channel Selection	Channel 300 (107.9 MHz) ▼		
Antenna Type +	EPA Type 1: Ring-and-Stub or "Other" ▼		
Height (m)	18	Distance (m)	200
ERP-H (W)	13	ERP-V (W)	13
Num of Elements	2	λ	1
Num of Points	500	Apply	