May 2011
New FM   Channel 226A
Ferrysburg, Michigan
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 226A (93.1 MHz) with an effective radiated power of 6 kilowatts. Operation is proposed with a 3-element circularly-polarized omni-directional antenna which will be side-mounted on an existing tower with FCC Antenna Structure Registration Number 1205768. Diplexed operation is proposed with WGHN-FM 221A Grand Haven.

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(mW/cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed Ferrysburg 226A antenna system assume a Type 3 element pattern, which is the element pattern for the ERI "rototiller" antenna to be used by the station. The highest calculated ground level power density occurs at a distance of 14 meters from the base of the antenna support structure. At this point the power density is calculated to be 53.6 µW/cm², which is 26.8% of 200 µW/cm² (the FCC standard for uncontrolled environments).

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Calculations of the power density produced by the WGHN-FM antenna system assume a Type 3 element pattern, which is the element pattern for the ERI "rototiller" antenna to be used by the station. The highest calculated ground level power density occurs at a distance of 14 meters from the base of the antenna support structure. At this point the power density is calculated to be 53.6 μW/cm², which is 26.8% of 200 μW/cm^2 (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of Ferrysburg 226A and the present operation of WGHN-FM (were their maxima to coincide) is 107.2 μW/cm^2, which is 10.7% of 1000 μW/cm^2 (the FCC standard for controlled environments) and 53.6% of 200 μW/cm^2 (the FCC standard for uncontrolled environments).

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.

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Power Density vs Distance

Power Density (μW/cm²) vs Distance (m)
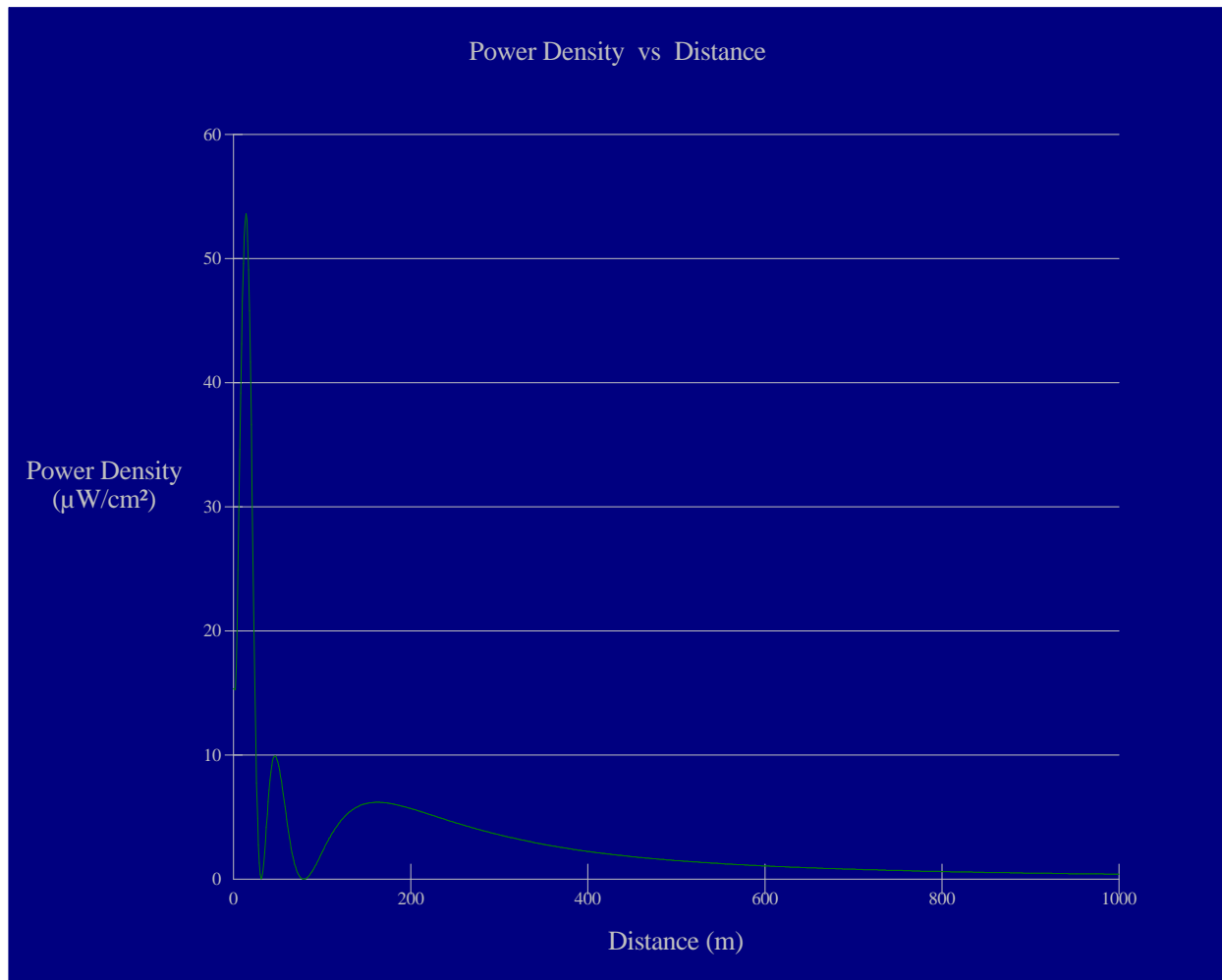
Ground-Level RF Exposure   **OET FMModel**

Ferrysburg 226A

Antenna Type:	ERI "rototiller"
No. of Elements:	3
Element Spacing:	1.0 wavelength

Distance:	1000 meters
Horizontal ERP:	6 kW
Vertical ERP:	6 kW

Antenna Height:	30 meters AGL

Maximum Calculated Power Density is 53.6 : W/cm^2 at 14 meters from the antenna structure.

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Power Density vs Distance

Power Density
(µW/cm²)

Distance (m)

Ground-Level RF Exposure   **OET FMModel**

WGHN-FM 221A Grand Haven
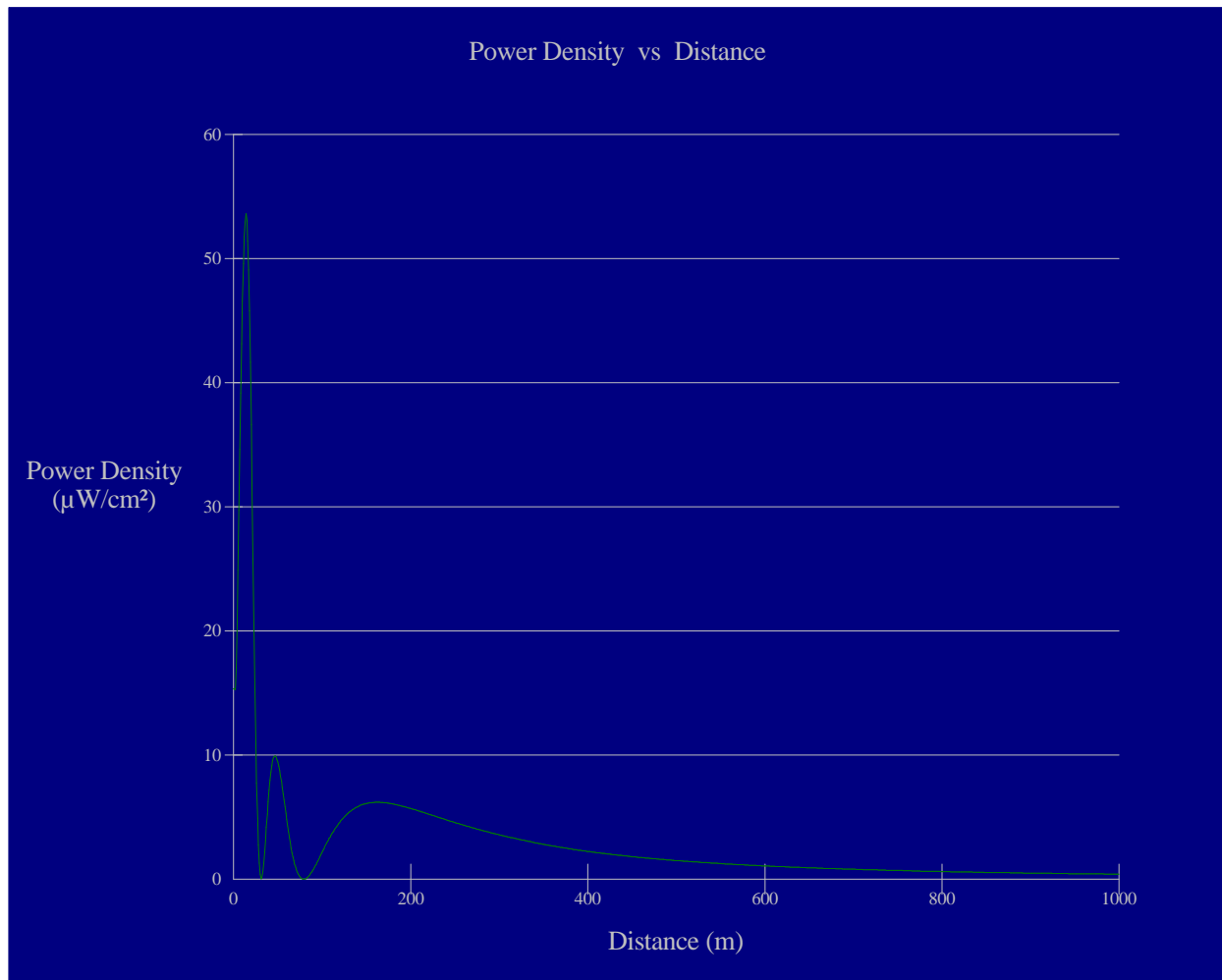Antenna Type: ERI "rototiller"
No. of Elements: 3
Element Spacing: 1.0 wavelength

Distance: 1000 meters
Horizontal ERP: 6 kW
Vertical ERP: 6 kW

Antenna Height: 30 meters AGL

Maximum Calculated Power Density is 53.6 : W/cm^2 at 14 meters from the antenna structure.

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