

**August 2019**  
**WUBE-FM Channel 286B**  
**Cincinnati, Ohio**  
**Auxiliary Antenna Engineering**

**Facilities Proposed**

The proposed auxiliary antenna operation for WUBE-FM will be on Channel 286B (105.1 MHz) with an effective radiated power of 15.4 kilowatts. Operation is proposed with a 2-element circularly-polarized omni-directional antenna which will be side-mounted on an existing tower with FCC Antenna Structure Registration Number 1013618.

This antenna system will be a combined operation, shared by auxiliary operations for WUBE-FM 286B Cincinnati and WKRQ 270B Cincinnati. FCC Form 301 applications for these facilities are being simultaneously filed.

The attached contour map demonstrates that the proposed auxiliary 60 dBu contour is completely encompassed by the main facility 60 dBu contour, as required by §73.1675 (which specifies the use of the 60 dBu for all FM stations, including Class B and B1 stations.)

**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.

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

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.

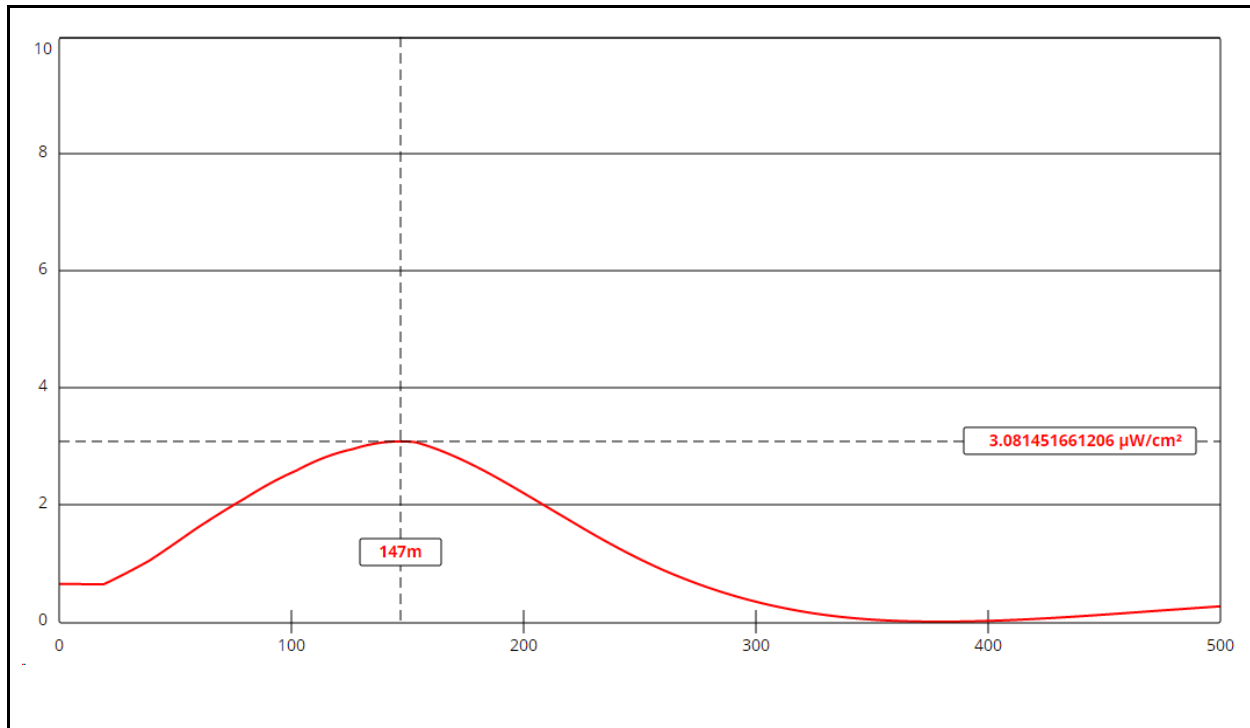
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Hatfield & Dawson Consulting Engineers

Calculations of the power density produced by the proposed antenna system assume a Type 3 element pattern, which is the element pattern for the ERI SHPX-2AC-SP antenna proposed for use. The highest calculated ground level power density occurs at a distance of 147 meters from the base of the antenna support structure. At this point the power density is calculated to be  $3.1 \mu\text{W}/\text{cm}^2$ , which is 1.55% of  $200 \mu\text{W}/\text{cm}^2$  (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 alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

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 exposure in excess of FCC guidelines.



## Ground-Level RF Exposure

OET FMModel

### WUBE-FM 286B Cincinnati Auxiliary

Antenna Type: ERI SHPX-2AC-SP "rototiller" (Type 3)

No. of Elements: 2

Element Spacing: 1.0 wavelength

Distance: 500 meters

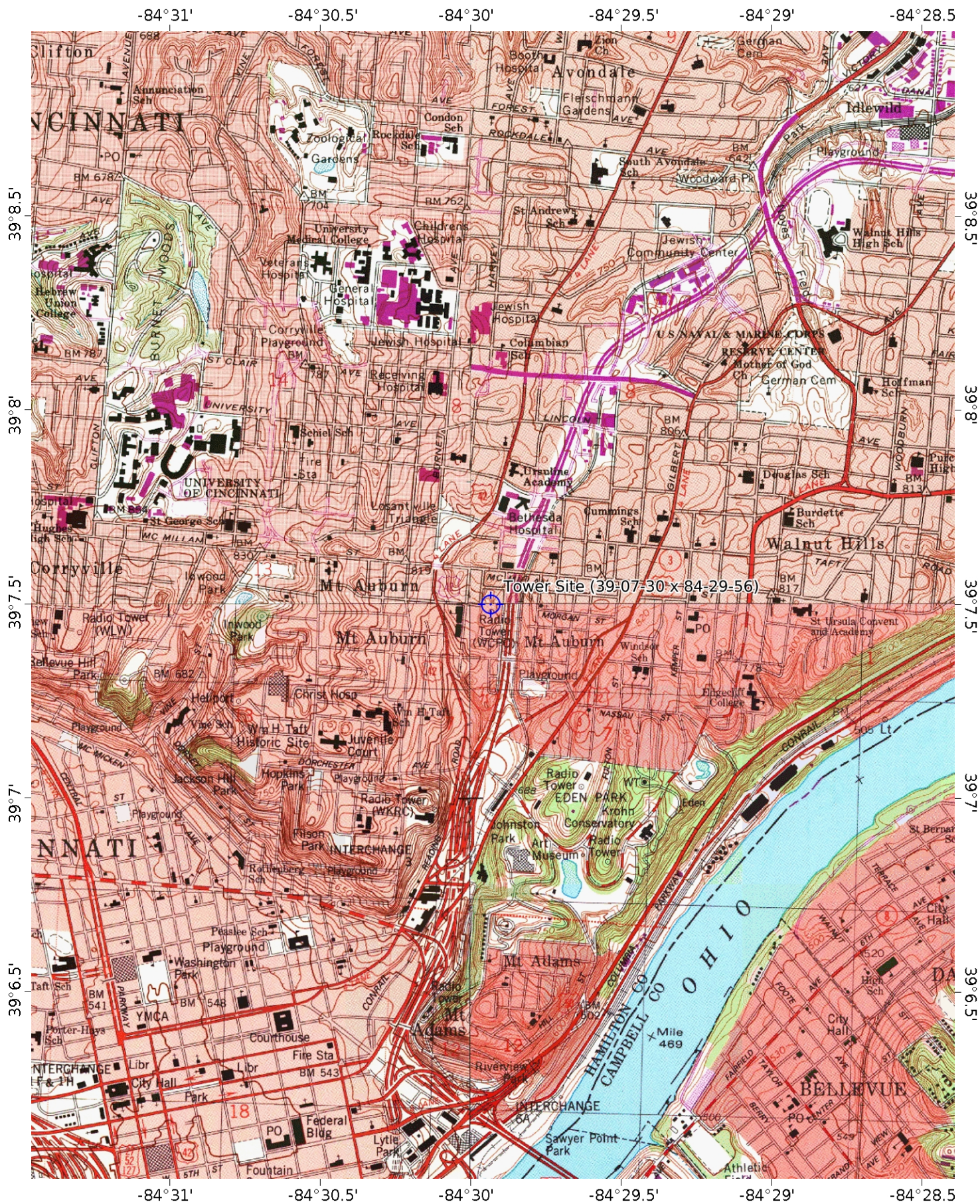
Horizontal ERP: 15.4 kW

Vertical ERP: 15.4 kW

Antenna Height: 221 meters AGL

Maximum Calculated Power Density is 3.1  $\mu\text{W}/\text{cm}^2$  at 147 meters from the antenna structure.





Mercator Projection  
NAD27 Conus  
USNG Zone 16SGJ

CalTopo

0.5 1.0 1.5 2.0 2.5 km

0.5 1.0 1.5 mi

Scale 1:24000 1 inch = 2000 feet



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MN  
-6°



