

Attachment A. Interference Analysis of MDSA Transmitter

Northpoint conducted a comprehensive analysis of the MDSA proposed transmitter. The analysis reveals that a large population would be subject to harmful interference from the MDSA proposed experiment. The analysis also reveals that the PFD contours MDSA has submitted in no manner reflect the actual PFD contours that would result from an antenna of the type MDSA presents in its application.

Assumptions

The Northpoint analysis assumed the transmitter would operate as described in the MDSA application and supplement.

- The antenna patterns in azimuth and elevation as depicted in the MDSA application were used.
- The assumed transmitter power was 39.8 Watts ERP, equal to 48 dBm EIRP.
- The transmit height was altitude of 180 meters above ground level.
- Polarization isolation of 3 dB (between MDS linear and DBS circular polarizations) was afforded MDSA.
- A 1 dB factor for digital-digital interference (as described by the MITRE report) was also generously afforded MDSA.

Method

The PFD and EPFD were calculated for the entire service area (radius 60 km), and the results plotted against the United States Census 2000 data. The census block, which is the smallest region for which census data is available, was used to predict the number of persons who would be within a given EPFD contour.

Results

MDSA PFD Contours: Wrong

MDSA presented a series of round PFD contours in its supplement, but the MDSA antenna has variable gain with azimuth, up to 12 dB; therefore the actual PFD contours are not round, but clover-shaped. Moreover, MDSA did not identify the bandwidth associated with its PFD contours, but in any case, as the following table illustrates, MDSA's contours cannot be rectified with free space propagation.

Figure 1 shows the actual PFD contours of the MDSA antenna described in the supplement.

Attachment A

Distance (km)	MDS Asserted PFD (dBm)	Actual PFD	
		(dBm/m ² - 4 kHz)	(dBW/m ² - 4 kHz)
1.2	-105	-64.3	-94.3
3	-101	-72.3	-102.3
10	-98	-82.7	-112.7
32	-104	-92.8	-122.8
60	-115	-98.3	-128.3

EPFD Levels and Contours of MDSA Proposed Experiment

The EPFD contours are presented in Figures 2 and 3 of this attachment.

Figure 2 shows the allowable EPFD of -168 dBW/m² – 4kHz would be exceeded in a large, populated portion of the MDSA proposed “service area”.

Figure 3 shows the area near Clewiston where the EPFD would be exceeded, along with the year 2000 Census blocks.

From these figures it is clear the MDS proposed experiment certainly would exceed the FCC EPFD contours for a large populated area and would cause harmful interference to any unprotected DBS operation. The analysis shows that more than ten thousand of residents of Clewiston, Florida and the surrounding area would be within the EPFD contours, as shown in the following table. Over 3,000 persons would be within the contour where the EPFD is exceeded by over 12 dB.

EPFD Level (dBW/m ² – 4 kHz)	Exceedence Level	Citizens Affected
> -168.4	Exceeds EPFD	18,298
> -162.4	Exceeds EPFD by at least 6 dB	7,582
> -156.4	Exceeds EPFD by at least 12 dB	3,122

* * *

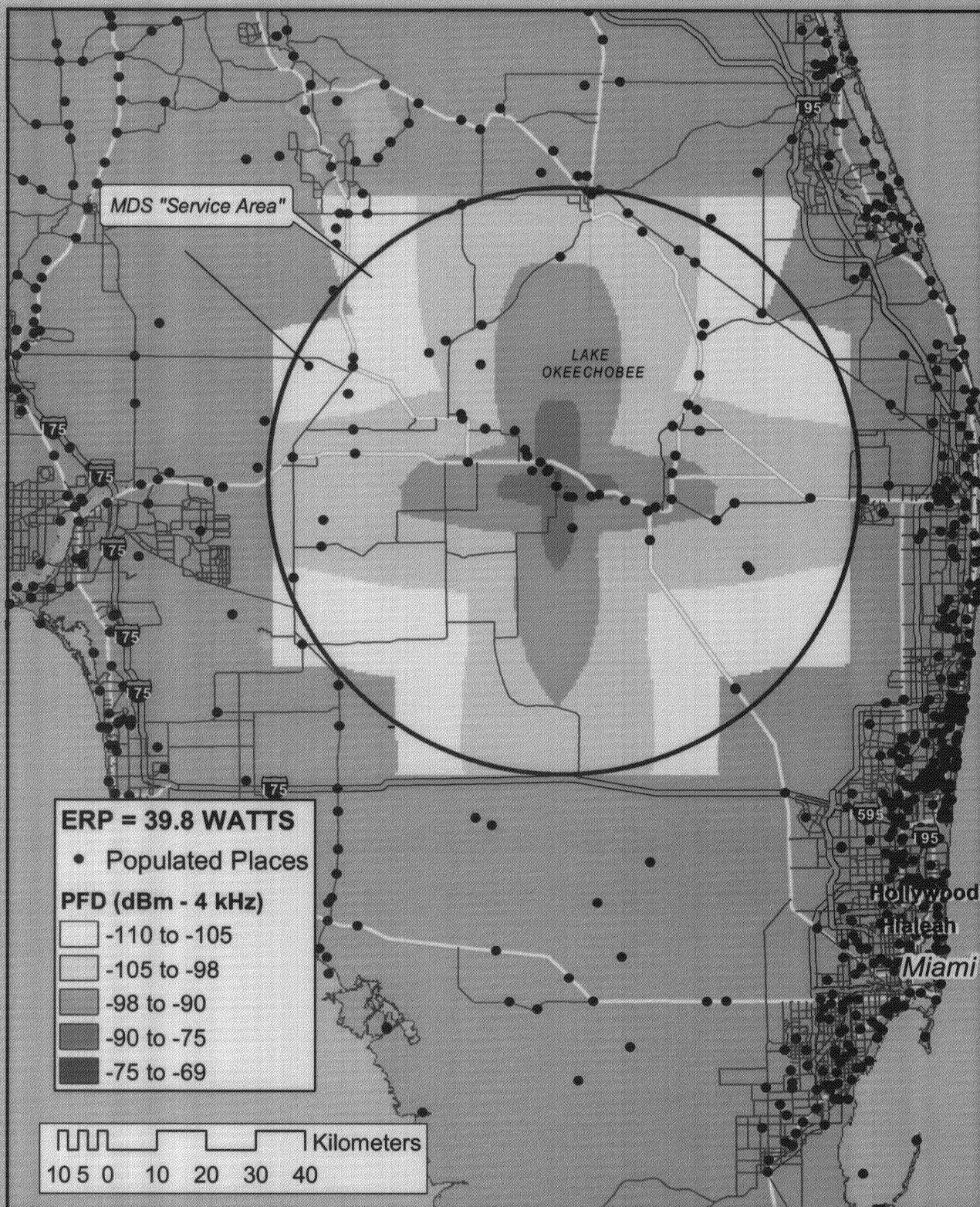


Figure 1. MDS Power Flux Density

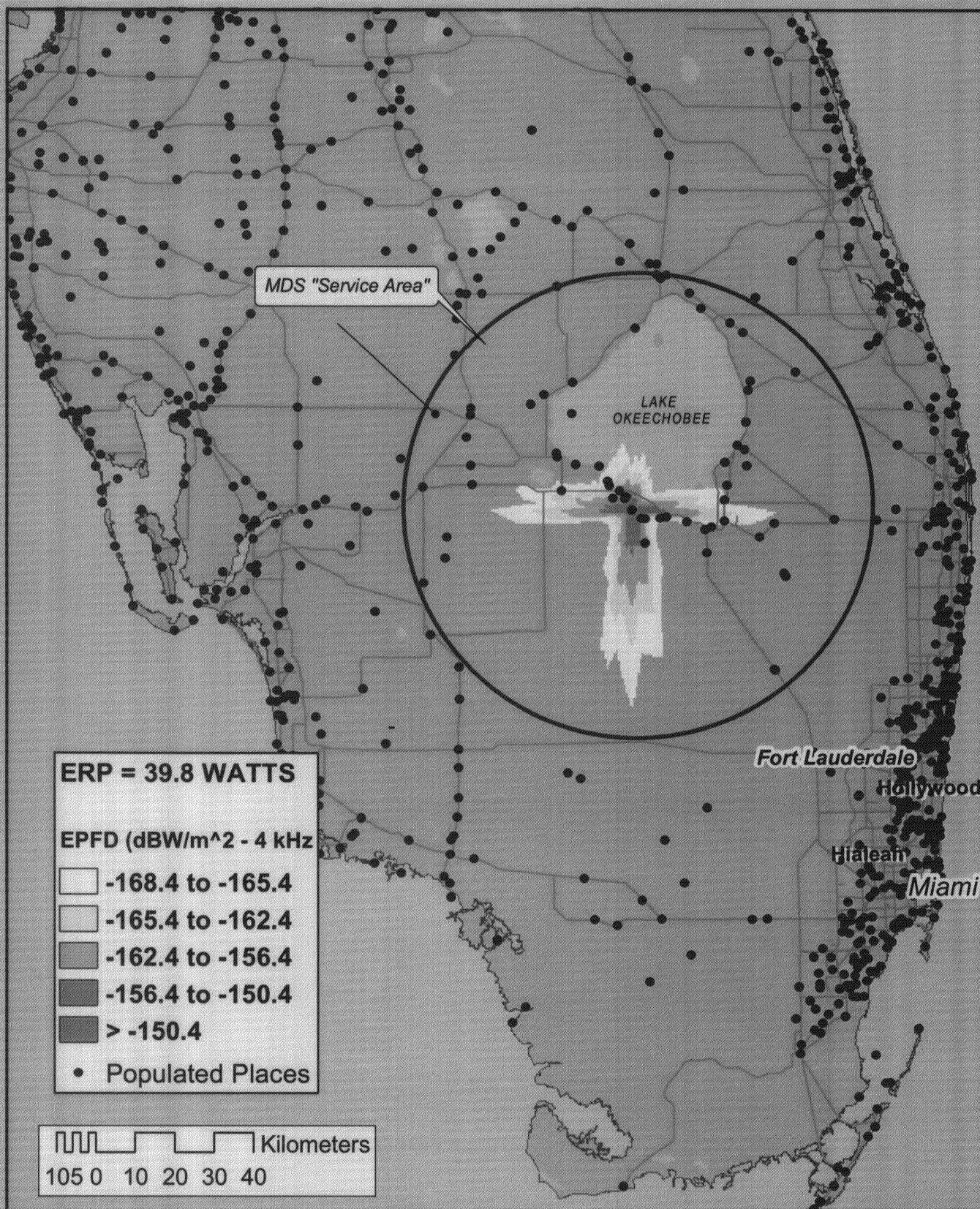


Figure 2. MDS Would Exceed EPFD Levels Over a Huge Populated Area

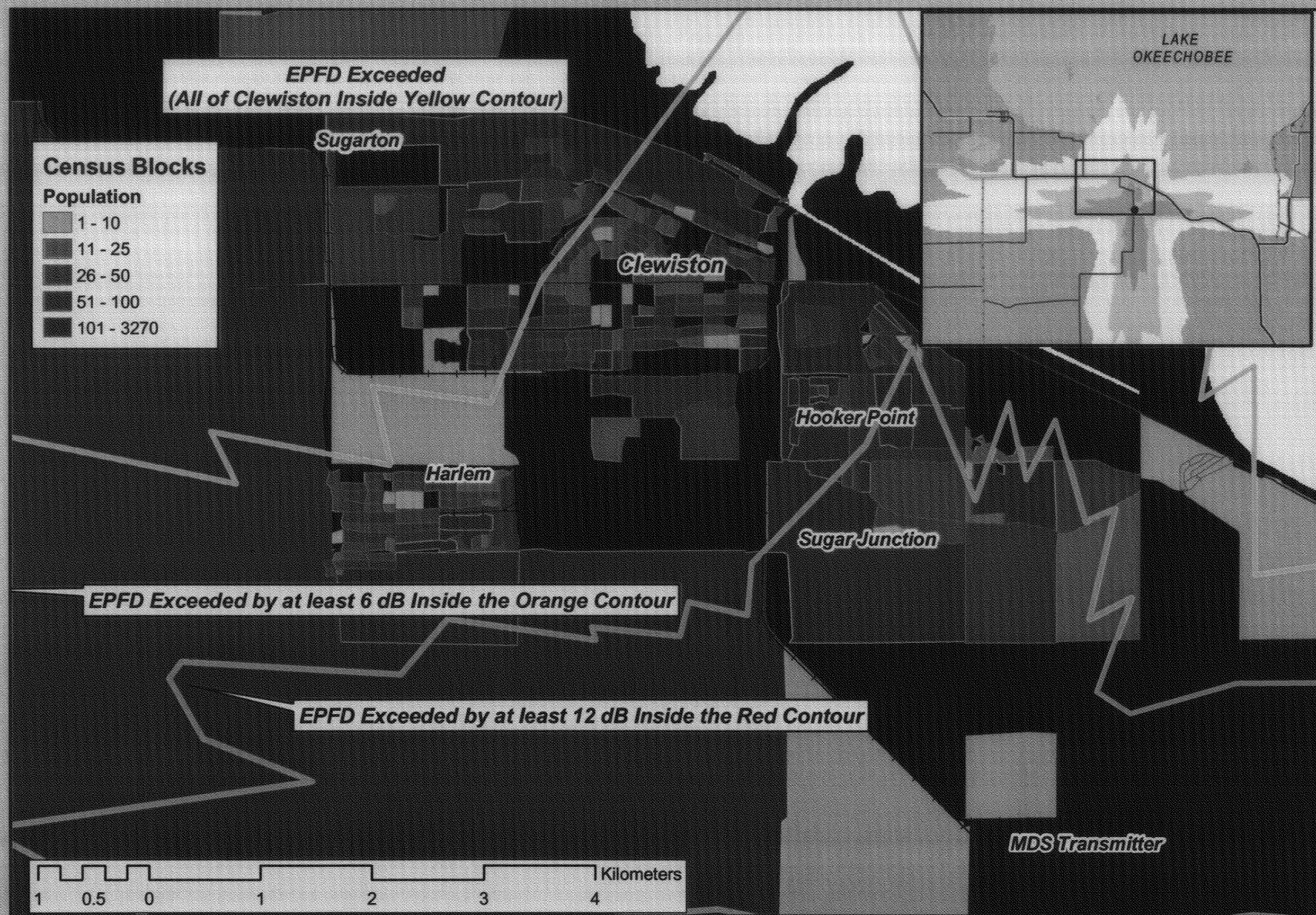


Figure 3. MDS Transmissions Likely to Cause Outage in Clear Air for Highly Populated Area