RADIO FREQUENCY RADIATION STUDY

TECHNICAL STATEMENT OF RYAN WILHOUR OF THE FIRM OF
KESSLER AND GEHMAN ASSOCIATES, INC., CONSULTING ENGINEERS
IN CONNECTION AN APPLICATION FOR A
8.1 METER FIXED Ku-BAND SATELLITE EARTH STATION

ANALYSIS OF NON-IONIZING RADIATION

PREFACE

This report analyzes the non-ionizing radiation levels for a 8.1 meter fixed Ku-Band earth station. The Office of Science and Technology Bulletin, N0. 65, August 1997, specifies that the maximum level of non-ionizing radiation that a person may be exposed to over a six-minute period is an average power density equal to 5 mW/cm^2 (five milliwatts per square centimeter). It is the purpose of this report to determine the power flux densities of the earth station in the far field, near field, transition region between the feed and reflector surface, at the reflector surface, and between the antenna edge and the ground level of the support structure.

RFR ANALYSIS

The following parameters were used to calculate the various power flux densities for this earth station:

Effective Antenna diameter:	8.1 meters
Antenna surface area:	51.5 $meters^2$
Feed flange size:	105 centimeters
Area of feed flange:	8659 $centimeters^2$
Wavelength at 14.0 GHz:	2.1 centimeters
Transmit power at flange:	692 Watts
Antenna gain:	59.8 dBi
Antenna aperture efficiency:	58 %

1. Far Field Calculations - The distance to the beginning of the far field region is 1837.5 meters. The maximum main beam power density in the far field is 1.56 mW/cm^2 which is 31.2% of the maximum allowable exposure level.

2. Near Field Calculations - The distance to the end of the near field is 765.6 meters. The maximum power density in the near field is 3.12 mW/cm^2 which is 62.3% of the maximum allowable exposure level.

3. Transition Region Calculations - The maximum power density in the transition region will not exceed that calculated for the near field region. The power density in the near field region, as

shown above, will not exceed 3.12 mW/cm^2 which is 62.3% of the maximum allowable exposure level.

4. Main Reflector Region - The power density in the main reflector region is 2.69 mW/cm^2 which is 53.72% of the maximum allowable exposure level.

5. Region between Reflector and Ground - The power density between the reflector and ground is 1.34 mW/cm^2 which is 26.86% of the maximum allowable exposure level.

CONCLUSION

Based on this study, radiation levels in the concerning regions comply with the 5 milliwatts per square centimeter threshold. It is possible that immediately in front of the feed of the prime focus antenna the radiation might be higher such that it would not comply with the guidance; however, this antenna is located in an fenced area and is not accessible by the general public. The transmitter will be turned off if workers require access to the front of the antenna.

Accordingly, this action does not have a significant environmental impact as described in the Commission's rules and does not require the preparation of an environmental assessment. It is understood that it is the applicant's responsibility to ensure that the public and operating personnel are not exposed to harmful levels of radiation.

The foregoing statement and the report regarding the aforementioned engineering work are true and correct to the best of my knowledge. Executed on December 12, 2010.

KGA

Sincerely,

Ryan Wilhour
Consulting Engineer