

# Exhibit E-13

## Freespace Interference Study for a given antenna based on Vertical Radiation Pattern

Antenna Make: ETC

Antenna Model: FM-1CP

| <u>Depression<br/>Angle from<br/>Antenna</u> | <u>Antenna<br/>Relative<br/>Field</u> | <u>ERP<br/>Watts</u> | <u>ERP<br/>dBk</u> | <u>Distance to<br/>Ground from<br/>Antenna (km)</u> | <u>Free Space<br/>Signal (dBu)</u> | <u>2.5 dB Loss<br/>for Reflection</u> | <u>Signal Strength<br/>at Ground (dBu)</u> | <u>Circular Distance<br/>From Tower (m)</u> |
|--|---------------------------------------|----------------------|--------------------|---|------------------------------------|---------------------------------------|--|---|
| 90   | 0.010                                 | 0.001                | -58.86             | 0.1260  | 66.1                               | 0                                     | 66.1                                       | 0.00  |
| 85   | 0.100                                 | 0.130                | -38.86             | 0.1265  | 86.0                               | 0                                     | 86.0                                       | 11.02                                       |
| 80   | 0.180                                 | 0.421                | -33.76             | 0.1279  | 91.0                               | 0                                     | 91.0                                       | 22.22                                       |
| 75   | 0.250                                 | 0.813                | -30.90             | 0.1304  | 93.7                               | 0                                     | 93.7                                       | 33.76                                       |
| 70   | 0.340                                 | 1.503                | -28.23             | 0.1341  | 96.1                               | 0                                     | 96.1                                       | 45.86                                       |
| 65   | 0.430                                 | 2.404                | -26.19             | 0.1390  | 97.9                               | 0                                     | 97.9                                       | 58.75                                       |
| 60   | 0.500                                 | 3.250                | -24.88             | 0.1455  | 98.8                               | 0                                     | 98.8                                       | 72.75                                       |
| 55   | 0.570                                 | 4.224                | -23.74             | 0.1538  | 99.4                               | 0                                     | 99.4                                       | 88.23                                       |
| 50   | 0.640                                 | 5.325                | -22.74             | 0.1645  | 99.9                               | 0                                     | 99.9                                       | 105.73                                      |
| 45   | 0.700                                 | 6.370                | -21.96             | 0.1782  | 99.9                               | 0                                     | 99.9                                       | 126.00                                      |
| 40   | 0.770                                 | 7.708                | -21.13             | 0.1960  | 99.9                               | 0                                     | 99.9                                       | 150.16                                      |
| 35   | 0.820                                 | 8.741                | -20.58             | 0.2197  | 99.5                               | 0                                     | 99.5                                       | 179.95                                      |
| 30   | 0.870                                 | 9.840                | -20.07             | 0.2520  | 98.8                               | 0                                     | 98.8                                       | 218.24                                      |
| 25   | 0.900                                 | 10.530               | -19.78             | 0.2981  | 97.7                               | 0                                     | 97.7                                       | 270.21                                      |
| 20   | 0.940                                 | 11.487               | -19.40             | 0.3684  | 96.2                               | 0                                     | 96.2                                       | 346.18                                      |
| 15   | 0.970                                 | 12.232               | -19.13             | 0.4868  | 94.0                               | 0                                     | 94.0                                       | 470.24                                      |
| 10   | 0.980                                 | 12.485               | -19.04             | 0.7256  | 90.7                               | 0                                     | 90.7                                       | 714.58                                      |
| 5  | 0.990                                 | 12.741               | -18.95             | 1.4457  | 84.8                               | 0                                     | 84.8                                       | 1440.19                                     |

Distance to Ground Level assumes flat ground or a site where the ground level is above average terrain in all azimuths.

Maximum ERP                      13 watts  
Radiation Center AG            0.126 km  
Radiation Center AG            413.386 ft.

Max dBu to Ground Level

99.94