AMENDMENT RF EXPOSURE ANALYSIS – MARCH 2024

Our radiation hazard analysis, at the Chuckwalla, California site, we plan to place the transmit antennas 70 meters from the nearest pathway, in the unpopulated desert. Our employees will only perform testing in an unpopulated area. To give context to the sparse population of the site, it is in the middle of 1,000 acres of private, unpopulated land.

Measuring the radiation coming back towards the location where employees will be located during the testing, the antennas are placed with the mainlobe of the directional antennas facing directly due east. The back lobe of the antenna facing back towards where the humans will be standing, will be at most -13 dBi in each of the three bands we are applying for. We use different sized antennas at each of the 3 frequency bands such that the gain stays constant between frequency bands with a worse case -13 dBi in the backlobe. We place the antennas on a mast that is 10 meters high, such that a person walking on the ground would be 8 meters below the antenna. The backlobe in the direction of the persons on the ground again is at -13 dBi. With up to a 10 kW power-out amplifier we plan to use in all bands from the radar transmitter. This results in approximately 502 watts of power being transmitted backwards through the backlobe towards where our employees are operating 70 meters away. At 70 meters this results in 8 mW/cm^2 power density and 1.75 V/m electric field at the 450 MHz band, the 220 MHz band, as well as the 20 MHz band for which we are applying, below the limits as listed in *See* 47 C.F.R. 1.1310(e)(1).

The main beam will be pointed skyward at a 20 degree angle above the horizon east, we do not anticipate any general or occupational population anywhere within 50 km of the site. As stated, the land in between our radiator and the very western edge of the town of Midland, California is all private land and will be blocked off during our testing. We anticipate a 4.5 dBi gain in the direction of the main beam for all 3 frequency bands with up to a 10 kW power-out transmitter, resulting in approximately 28.183 kW of EIRP. As stated, the very western outskirts of Midland, CA are approximately 50 km east of the Chuckwalla site, the radiation analysis shows negligible power density of 900 $nanoWatts/cm^2$ (0.0009 mW/cm^2) and 0.018 V/m electric field strength, well below the human safety limits as stated in 47 C.F.R. 1.1310(e)(1).

In our application, we stated up to a 10 dBi main beam gain antenna, in which case the backlobe would be reduced further below -13 dBi. In the case we obtained such an antenna, this would result in up to 100 kW of EIRP in the main beam. This would result in 3.18 uW/cm^2 power density and 0.034 V/m E-field strength, again both well below the limits stated in 47 C.F.R. 1.1310(e)(1). In this case of the 10 dBi main beam antenna, 10 kW power-out transmitter, resulting in 100 kW of EIRP in the main beam, we plan to monitor out to 3 km visible range in the direction of the main beam to ensure no humans accidentally had wandered onto the property. The power density drops to 1.2 mW/cm^2 at 2.5 km in the direction of the beam, again below the limits in 47 C.F.R. 1.1310(e)(1).

For low frequency antennas 20-37 MHz we plan 2 meters of additional increase for the antenna installation height. In other words, the ERP/EIRP stay the same for the 20-37 MHz band because we plan to scale the antenna with the frequency so gain and power out stay constant. The gain and beamwidth of the low frequency antennas will be the same as for all bands including the 220-225 MHz antenna and 450 MHz antenna.

Finally, our occupational workers be inside our building when the RF is transmitting, behind the antenna, such that minimal radiation is received, also well below both the FCC's general population/uncontrolled and the occupational/controlled exposure limits at these frequency bands.