

Cellular Mast Emissions Survey:

Five Oaks (Jersey)



DOCUMENT DETAILS

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Executive Summary

CICRA regularly monitors radiowave emissions from the cellular masts in the Bailiwicks of Guernsey and Jersey to ensure the mobile network operators who operate their services from those masts comply with their license obligations in terms of power levels and that the emissions from the sites comply with internationally recognised standards and guidelines regarding Health & Safety limits for the public.

In 2017, CICRA commissioned iWireless Solutions to conduct the emission surveys at all sites within the two Bailiwicks. This report is for the Five Oaks site located in Jersey.

The Five Oaks site was used by all the operators at the time of the survey: Airtel J, Sure J and JT J. Surveys were conducted at all cellular frequency bands (800, 900, 1800, 2100 and 2600MHz) for all mobile cellular technologies (GSM, 3G and 4G) and for all three cellular operators as a routine procedure.

The survey established that the emissions around this site were very low and well below the safety limits for the public advised by internationally recognised standards.

The values shown hereafter are the maximum levels that were recorded around the site following a peak search. In most other locations, the levels were lower. The recorded values are only true at the time of testing and can go up or down depending on the level of user activity on the cell.

The Total Exposure Quotient for the site recorded across all detected cellular frequency bands is given at the bottom of the summary table below. A total Site EQ close to 1 (one) would mean that emissions at the site approach the limit advised by ICNIRP in their guidelines.

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Five Oaks and JSY33	800	0.05701	Airtel J	682	2.4234E-05	1/ 41264
	900	0.4345	Sure J	95	0.000246173	1/ 4062
	1800	0.02516	Sure J	2319	9.02707E-06	1/ 110778
	2100	0.06588	JT J	926	4.45372E-05	1/ 22453
	2600	0.002254	Airtel J	27063	1.13905E-07	1/ 8779215
Total Site EQ					0.000324086	1/ 3086

Table 1 - Cumulative Exposure Quotient

The results show that the cumulative EQ was measured at 1/3086 and therefore remains well below the ICNIRP guidelines.

The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the three main operators: Airtel J in red, Sure J in dark blue, and Jersey Telecom J in light blue.

The graphs are also supported by the equivalent statistical figures derived from the measured levels at the site for added clarity.

1. Site Details

1.1 Site Location

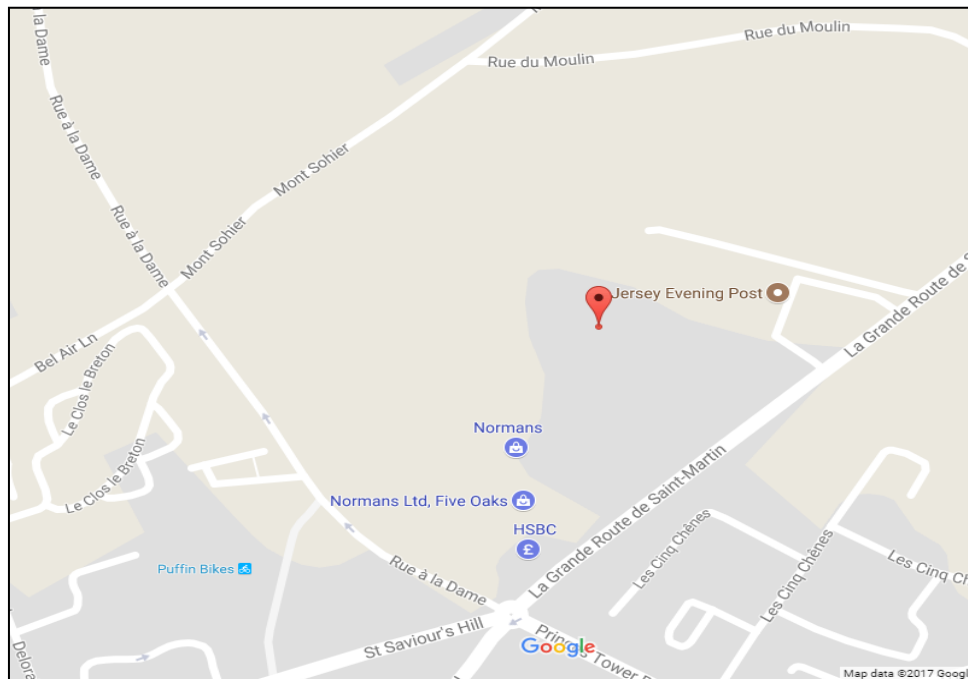


Figure 1 - Map of the Site Area

Site name	Five Oaks
Site address	Engineering Centre, La Grande rue de St Martin, St Saviour, Jersey
Site Latitude	N49.20044
Site Longitude	W02.08065

1.2 Site Description

Operators	Airtel J, JT J, Sure J
Antenna types	Directionals
Approximate height	25m
Site type	Lattice Mast
Description	The antenna at Five Oaks is located

1.3 Site Photo



Figure 2 – Peak Measurement Location

1.4 Test Location

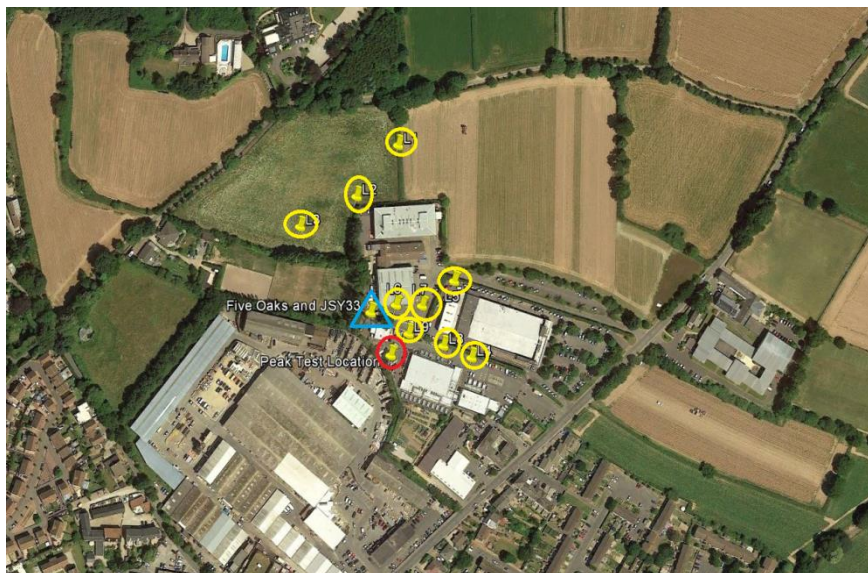


Figure 3- Survey Area with Spot Measurement Markers: The blue triangle is the site location, the yellow circles are intermediate locations measured at during the peak search and the red circle is the spot where the highest spot search reading was obtained and where the detailed survey was carried out

As part of the peak search procedure, spot measurements were taken at locations around the site, as shown on the above sketch. The reported spectrum scans were taken at the peak location (shown in red above) where the highest readings were recorded. The spectrum readings reported further down this report were recorded over a period of 6 minutes as advised by ICNIRP.

2. Survey Results

2.1 800 MHz Band

The graph for the 800 MHz activity is shown below with the E-field strength levels measured at the site plotted on a logarithmic scale.

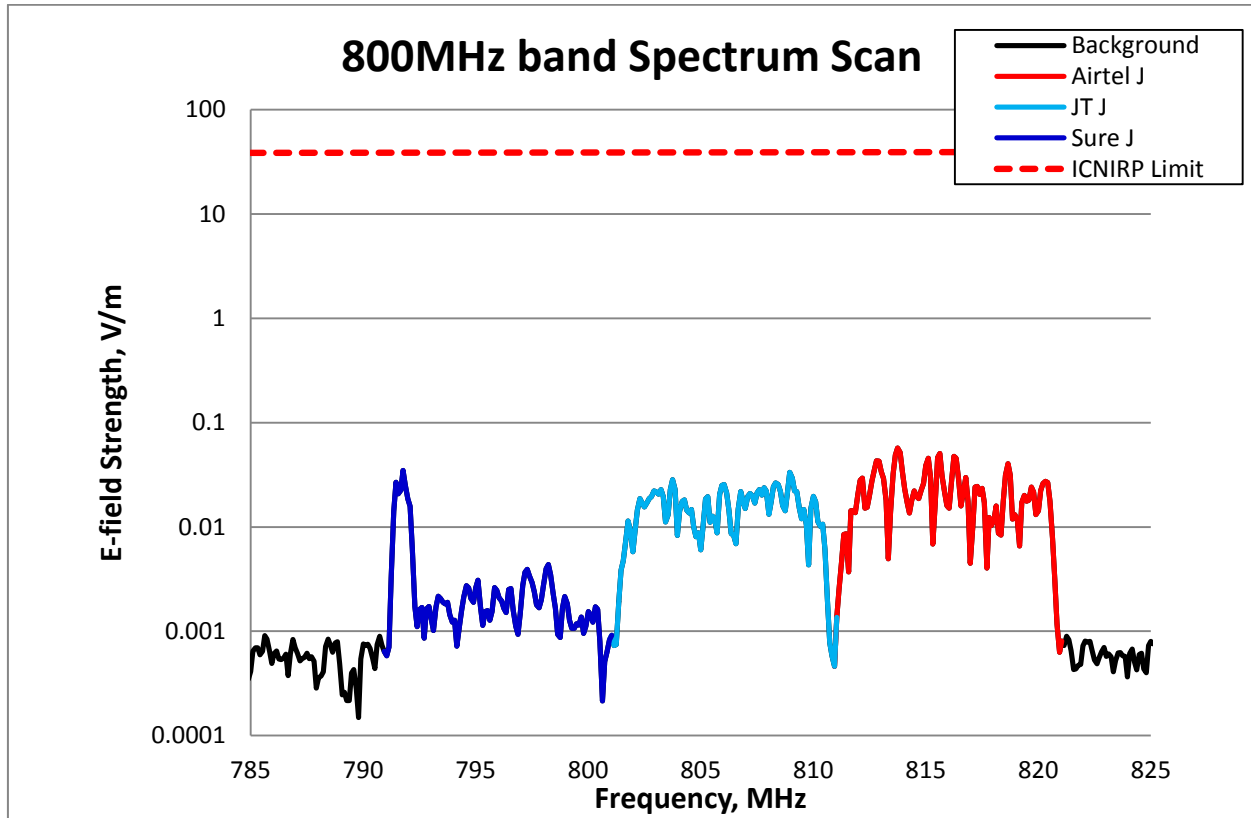


Figure 4 - 800MHz band Spectrum Scan

The red line on the scan represents the Airtel activity, the light blue is JT and the dark blue is Sure. ICNIRP's Reference Level for the General Public is also shown as the straight dashed line at the top of the graph. For clarity, each step on the vertical axis represents a 10-fold increase. The same scaling and colour scheme will be used throughout this report.

No field level recorded across the band was higher than 0.05701 V/m (Airtel J), which is 682 times smaller than the ICNIRP Reference level. The Exposure Quotient results for the 800MHz band are shown below:

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Five Oaks	Airtel J	800	0.05701	682	1.58298E-05	1/ 63172
	JT J		0.03337	1165	7.1495E-06	1/ 139870
	Sure J		0.03481	1117	1.2547E-06	1/ 797004
total band EQ					2.4234E-05	1/ 41264

Table 2– 800MHz band Exposure Quotient at Five Oaks

2.2 900 MHz Band

The graph for the 900 MHz activity is shown below:

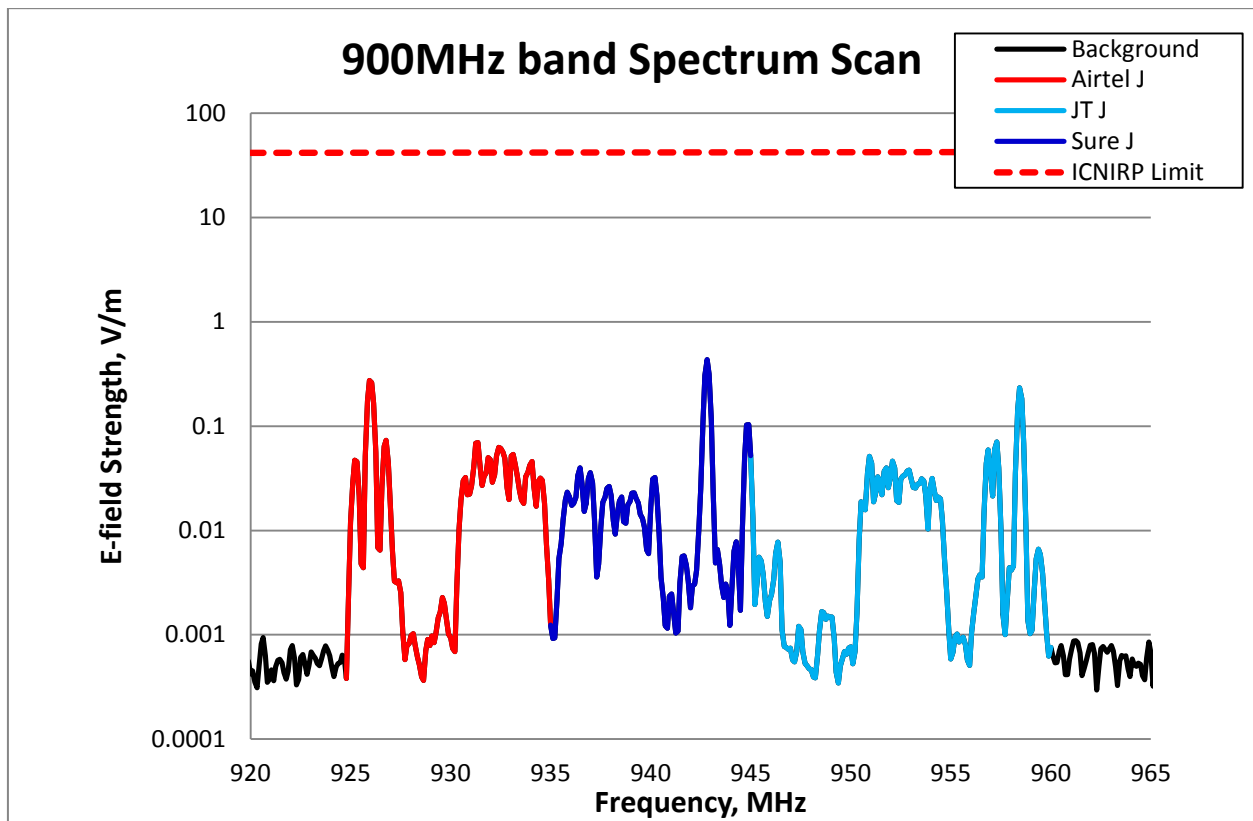


Figure 5 - 900MHz band Spectrum Scan

No field level recorded across the band was higher than 0.4345 V/m (Sure J), which is 95 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 900MHz band are shown below:

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Five Oaks	Airtel J	900	0.2741	150	7.8047E-05	1/ 12813
	JT J		0.2324	177	4.55935E-05	1/ 21933
	Sure J		0.4345	95	0.000122533	1/ 8161
total band EQ					0.000246173	1/ 4062

Table 3– 900MHz band Exposure Quotient at Five Oaks

2.3 1800 MHz Band

The graph for the 1800 MHz activity around the site is shown below:

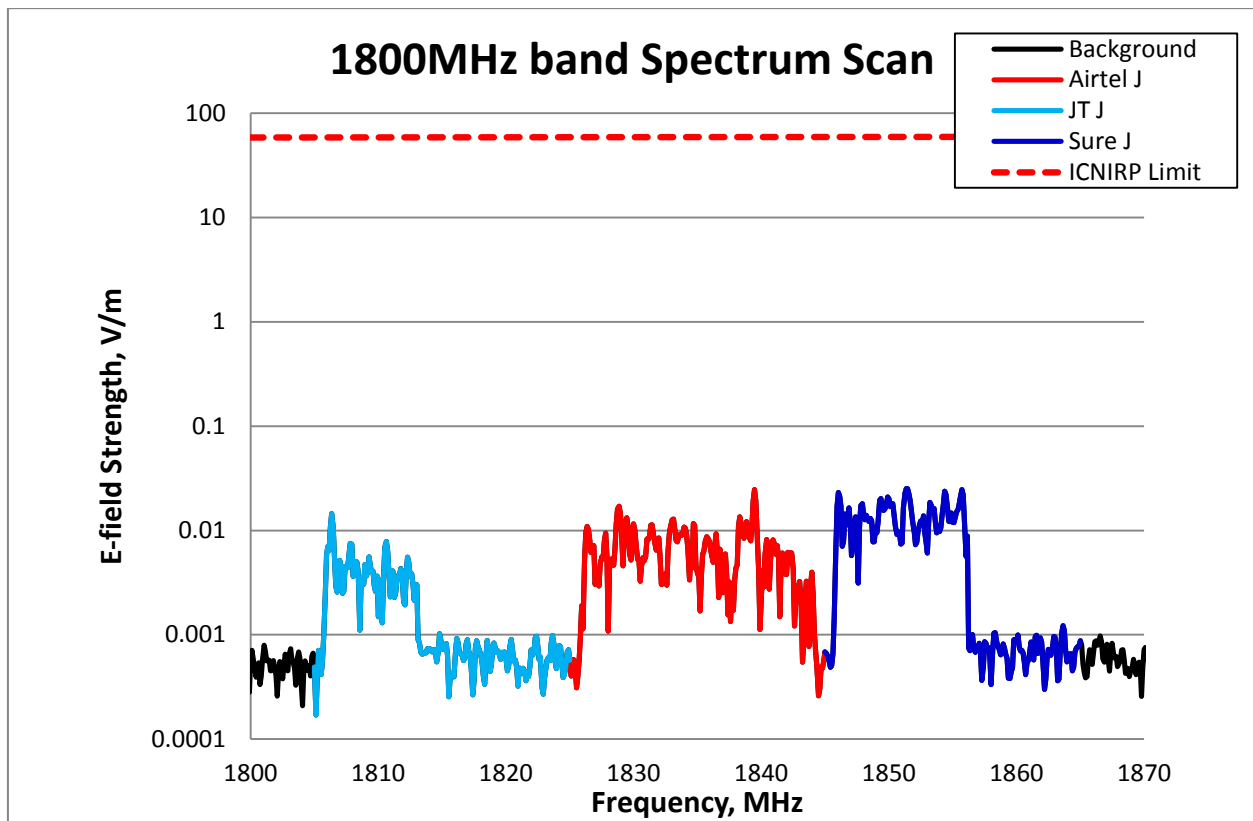


Figure 6 - 1800MHz Spectrum Scan

No field level recorded across the band was higher than 0.02516 V/m (Sure J), which is 2319 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 1800MHz band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Five Oaks	Airtel J	1800	0.02466	2366	2.75142E-06	1/ 363448
	JT J		0.01454	4012	4.5471E-07	1/ 2199202
	Sure J		0.02516	2319	5.82094E-06	1/ 171794
total band EQ					9.02707E-06	1/ 110778

Table 4 – 1800MHz band Exposure Quotient at Five Oaks

2.4 2100MHz Band

The graph for the UMTS activity around the site is shown below:

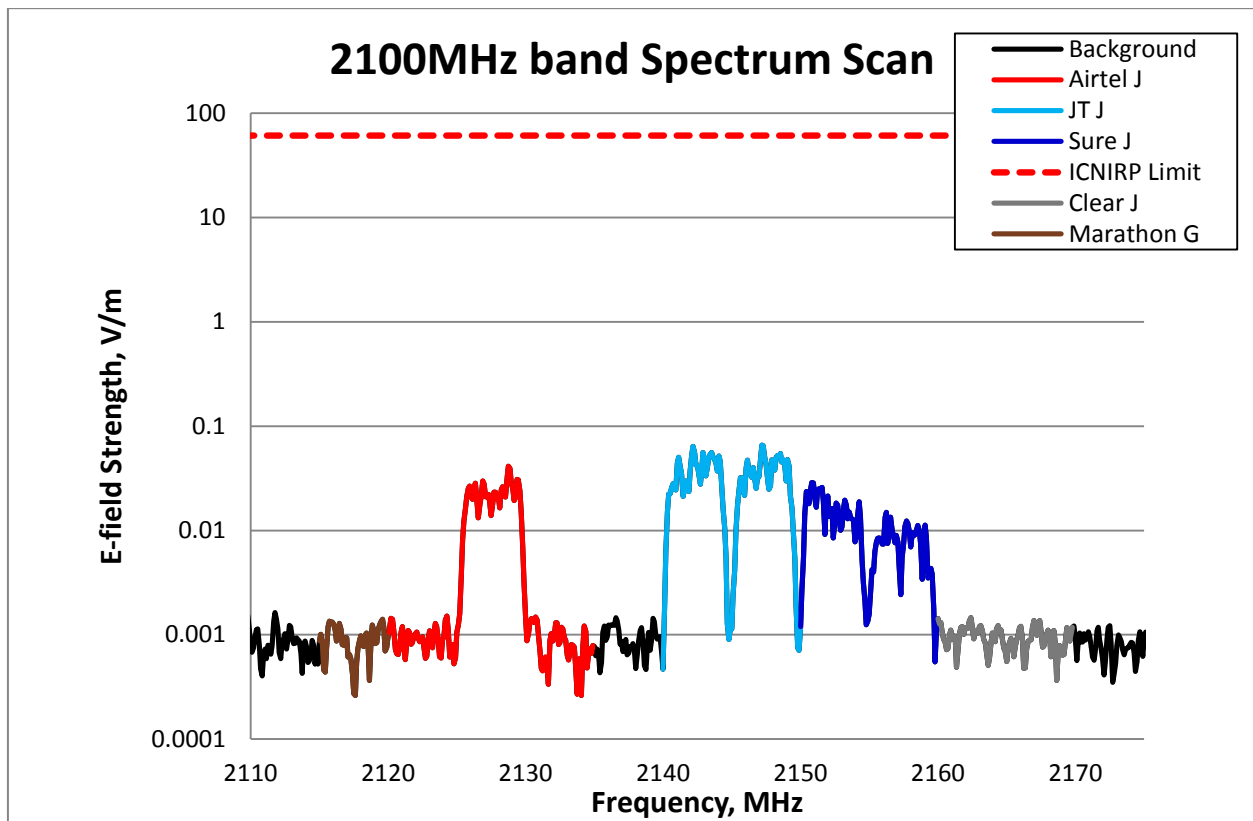


Figure 7 – 2100MHz band Spectrum Scan

No field level recorded across the band was higher than 0.06588 V/m (JT J), which is 926 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 2100MHz band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Five Oaks	Airtel J	2100	0.04129	1477	6.32022E-06	1/ 158222
	Clear J		0.00146	41781	2.45327E-08	1/ 40761858
	JT J		0.06588	926	3.38358E-05	1/ 29555
	Marathon J		0.001413	43171	1.17084E-08	1/ 85408678
	Sure J		0.02886	2114	4.34498E-06	1/ 230150
total band EQ					4.45372E-05	1/ 22453

Table 5 – 2100MHz band Exposure Quotient at Five Oaks

2.5 2600MHz band

The graph for the 2600MHz band activity around the site is shown below:

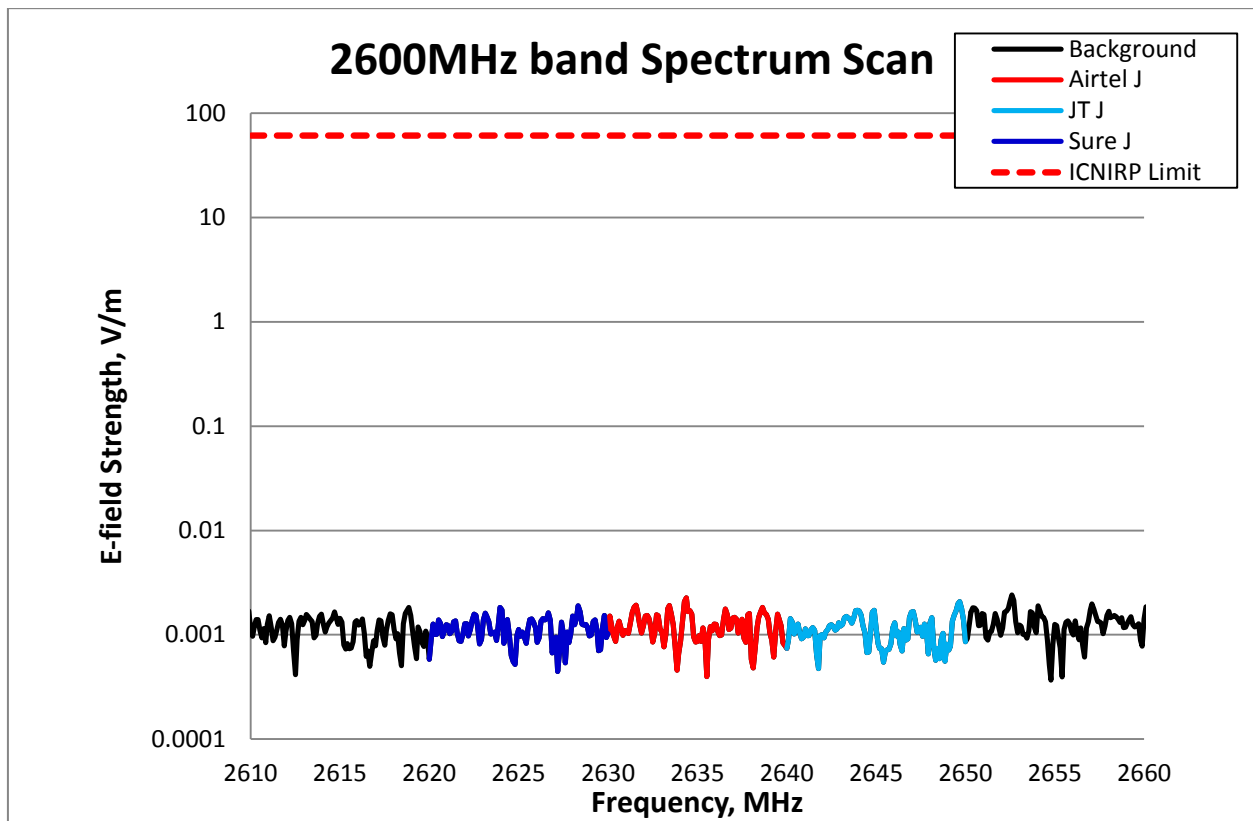


Figure 8 – 2600MHz band Spectrum Scan

No activity was recorded in the 2600MHz as no operator appears to transmit in this band at this site.

The Exposure Quotient results for the 2600MHz band are shown below:

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Five Oaks	Airtel J	2600	0.002254	27063	4.22323E-08	1/ 23678531
	JT J		0.00208	29327	3.58497E-08	1/ 27894243
	Sure J		0.001895	32190	3.58234E-08	1/ 27914744
total band EQ					1.13905E-07	1/ 8779215

Table 6 – 2600MHz band Exposure Quotient at Five Oaks

End