

Cellular Mast Emissions Survey: Belroyal Bunker (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 Belroyal Bunker site located in Jersey.

The Belroyal Bunker site was used by one operator at the time of the survey: JT J. Surveys were however 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
Belroyal Bunker	800	0.2172	JT J	179	0.000198011	1/ 5050
	900	1.213	JT J	34	0.001479519	1/ 676
	1800	0.1213	JT J	481	8.18601E-05	1/ 12216
	2100	0.1897	JT J	322	0.000137658	1/ 7264
	2600	0.00366	Sure J	16667	3.441E-07	1/ 2906134
Total Site EQ					0.001897392	1/ 527

Table 1 - Cumulative Exposure Quotient

The results show that the cumulative EQ was measured at 1/527 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

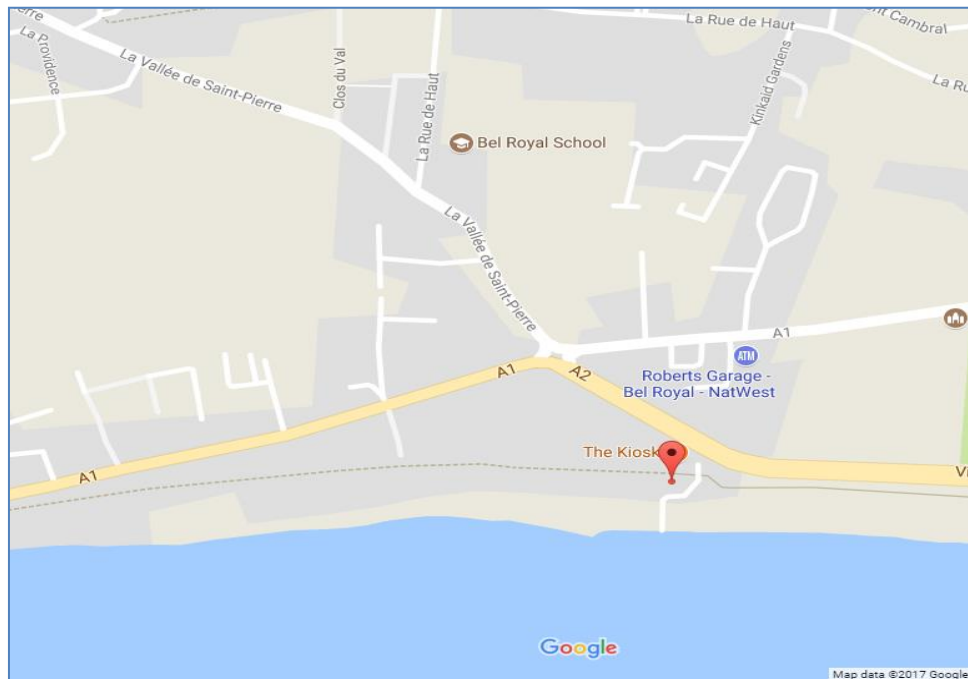


Figure 1 - Map of the Site Area

Site name	Belroyal Bunker
Site address	Public toilets, Belroyal Slip, St Lawrence, Jersey
Site Latitude	49.19684
Site Longitude	-2.14593

1.2 Site Description

Operators	JT J
Antenna types	Omni-directional
Approximate height	6m
Site type	Building – Roof Mount
Description	The antennas at the Belroyal Bunker are located on the roof of the main building, out of reach of the public

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.

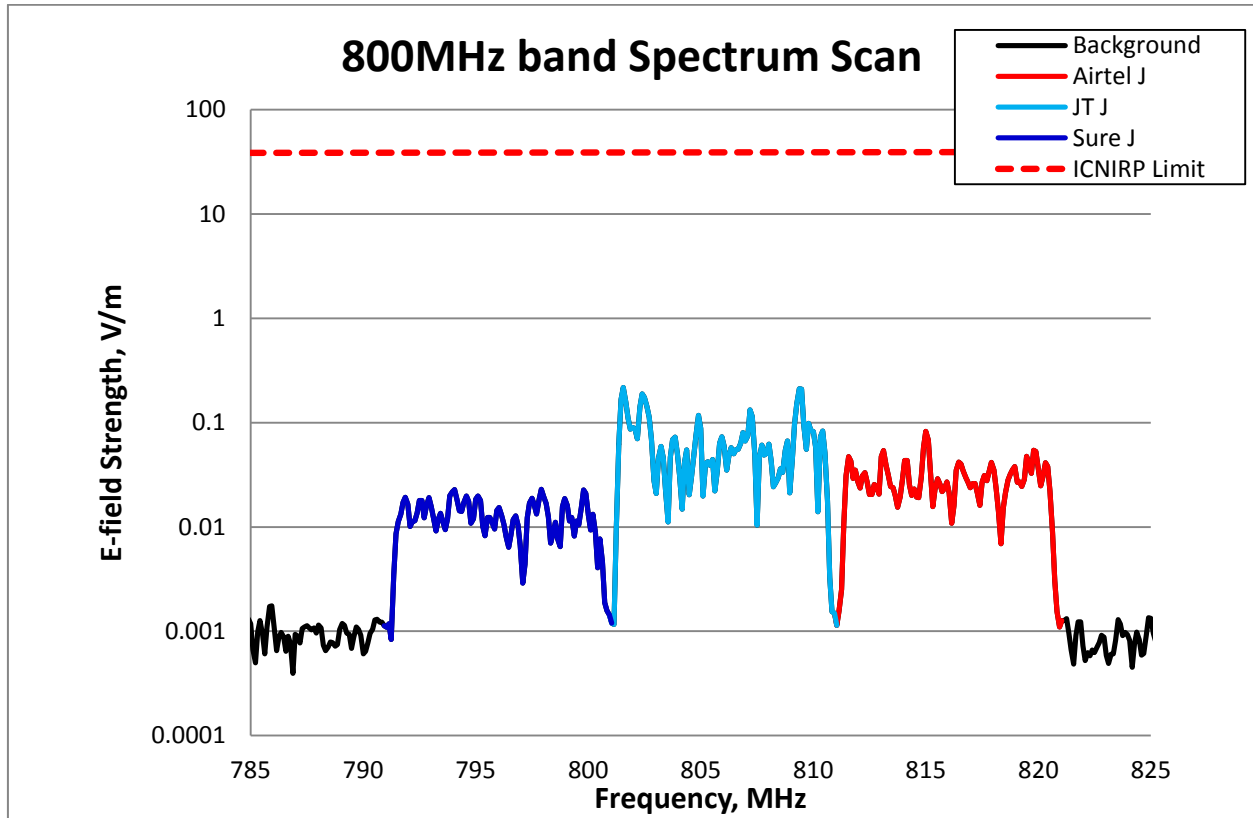


Figure 4 - 800MHz band Spectrum Scan

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 0.2172 V/m (JT J), which is 179 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
Belroyal Bunker	Airtel J	800	0.08267	470	2.54637E-05	1/ 39272
	JT J		0.2172	179	0.000167855	1/ 5958
	Sure J		0.02294	1695	4.69323E-06	1/ 213073
total band EQ					0.000198011	1/ 5050

Table 2– 800MHz band Exposure Quotient at Belroyal Bunker

2.2 900 MHz Band

The graph for the 900 MHz activity is shown below:

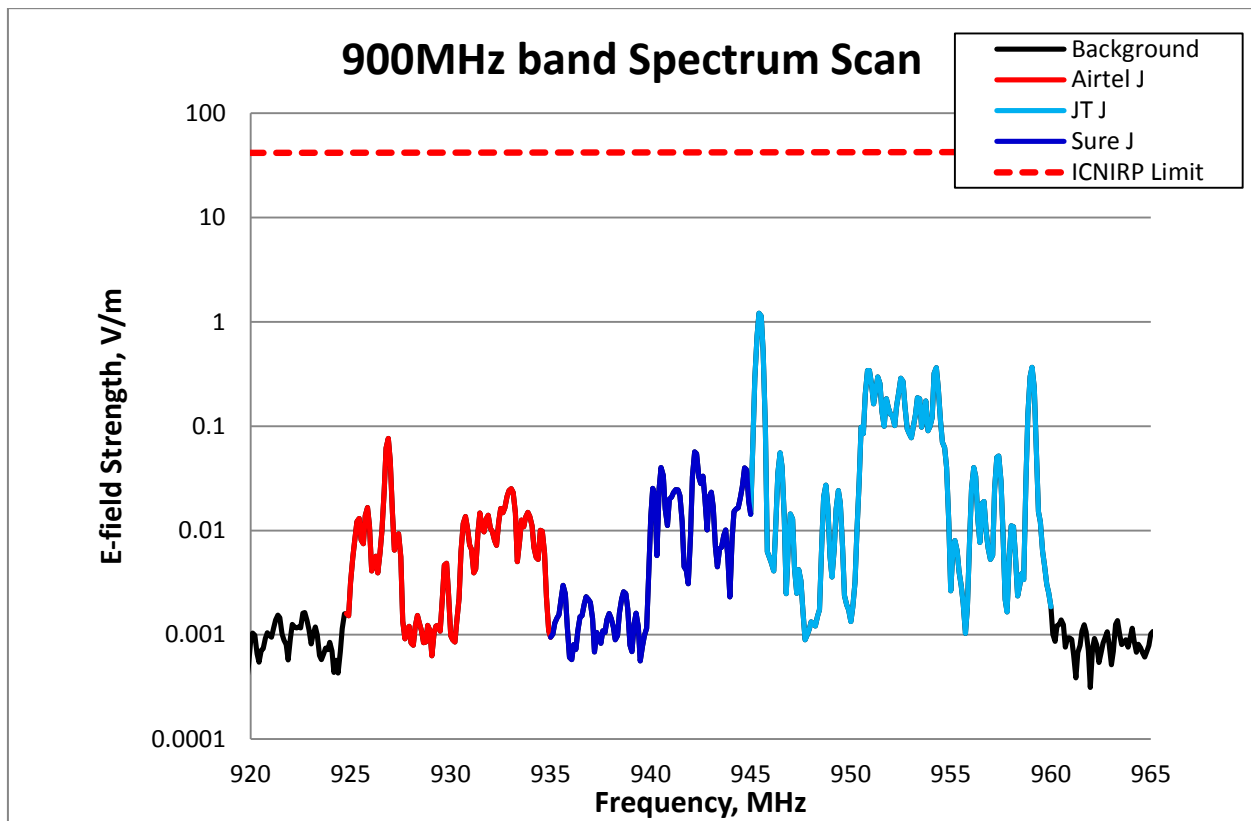


Figure 5 - 900MHz band Spectrum Scan

No field level recorded across the band was higher than 1.213 V/m (JT J), which is 34 times smaller than the ICNIRP Reference level.

The Exposure Quotient results for the 900MHz 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
Belroyal Bunker	Airtel J	900	0.07616	542	5.58856E-06	1/ 178937
	JT J		1.213	34	0.001466825	1/ 682
	Sure J		0.05689	725	7.10484E-06	1/ 140749
total band EQ					0.001479519	1/ 676

Table 3– 900MHz band Exposure Quotient at Belroyal Bunker

2.3 1800 MHz Band

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

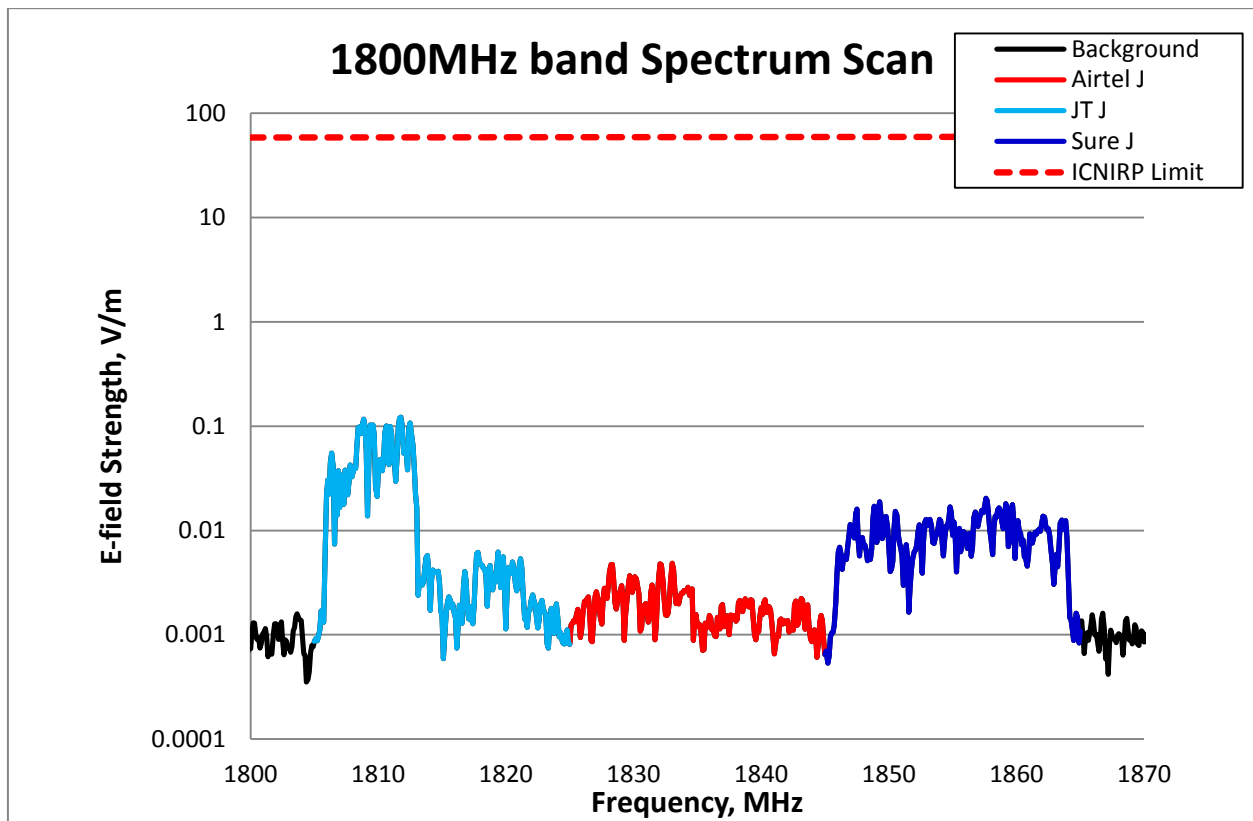


Figure 6 - 1800MHz Spectrum Scan

No field level recorded across the band was higher than 0.1213 V/m (JT J), which is 481 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
Belroyal Bunker	Airtel J	1800	0.004835	12065	2.12434E-07	1/ 4707347
	JT J		0.1213	481	7.66415E-05	1/ 13048
	Sure J		0.02032	2871	5.00615E-06	1/ 199754
total band EQ					8.18601E-05	1/ 12216

Table 4 – 1800MHz band Exposure Quotient at Belroyal Bunker

2.4 2100MHz Band

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

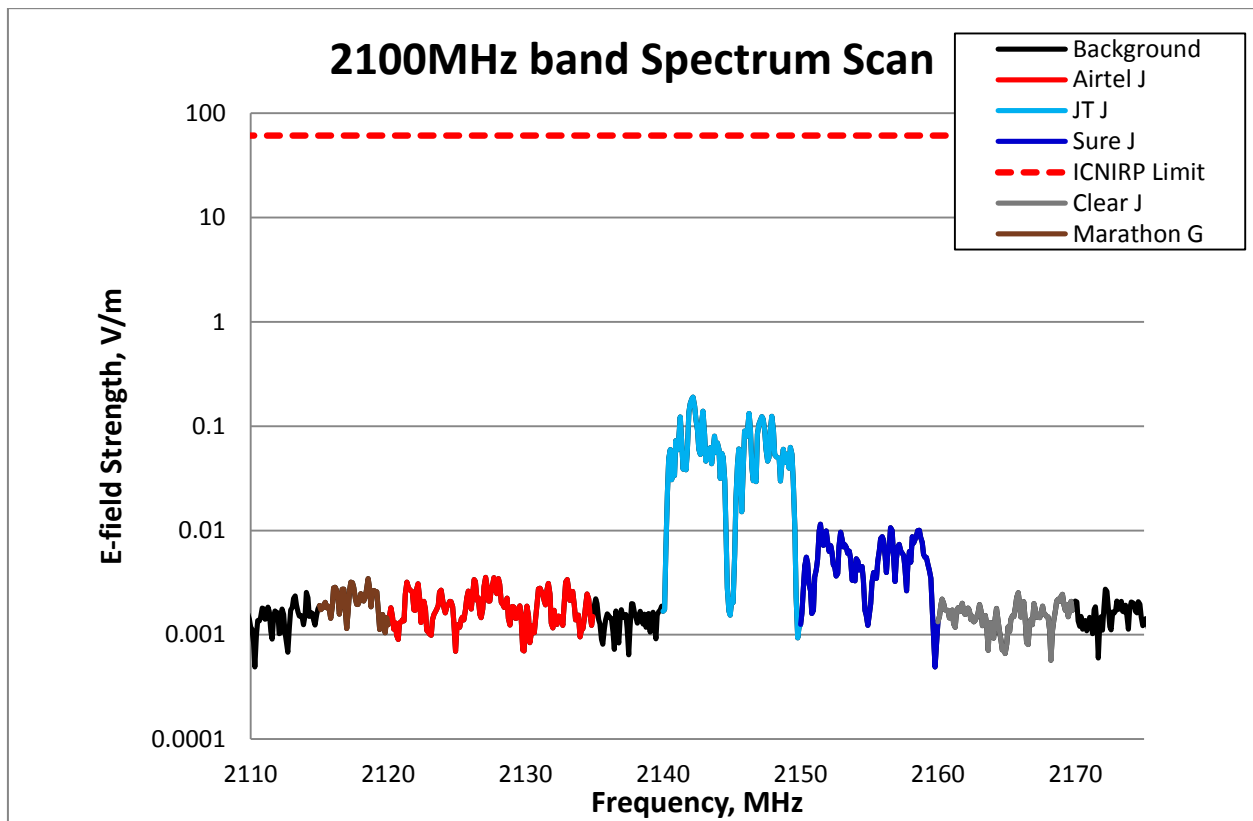


Figure 7 – 2100MHz band Spectrum Scan

No field level recorded across the band was higher than 0.1897 V/m (JT J), which is 322 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
Belroyal Bunker	Airtel J	2100	0.003544	17212	1.5684E-07	1/ 6375941
	Clear J		0.002523	24178	6.47566E-08	1/ 15442435
	JT J		0.1897	322	0.000136448	1/ 7329
	Marathon J		0.003448	17691	6.38082E-08	1/ 15671966
	Sure J		0.01145	5328	9.24137E-07	1/ 1082091
total band EQ					0.000137658	1/ 7264

Table 5 – 2100MHz band Exposure Quotient at Belroyal Bunker

2.5 2600MHz band

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

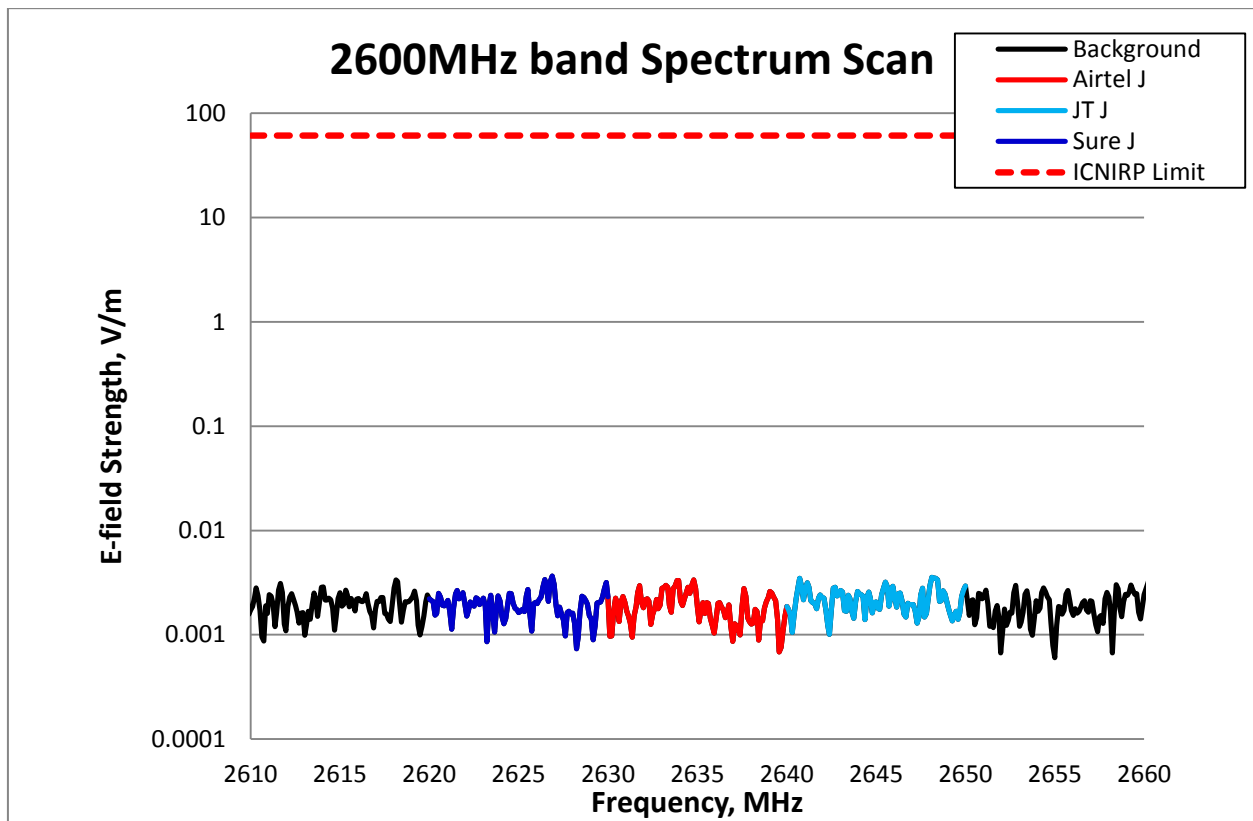


Figure 8 – 2600MHz band Spectrum Scan

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
Belroyal Bunker	Airtel J	2600	0.00336	18155	1.02908E-07	1/ 9717406
	JT J		0.003563	17120	1.33197E-07	1/ 7507652
	Sure J		0.00366	16667	1.07994E-07	1/ 9259757
total band EQ					3.441E-07	1/ 2906134

Table 6 – 2600MHz band Exposure Quotient at Belroyal Bunker

End