

Cellular mast emissions survey

JEC Powerhouse



Document details

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1 Executive summary

The Jersey Competition and Regulatory Authority or JCRA regularly monitors emission levels from the cellular masts in Jersey¹ 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 levels from the sites meet the internationally recognised standards and guidelines regarding health and safety limits for the public.

In 2017, JCRA commissioned EM emission level surveys at all the sites within the island. The surveys were repeated in each subsequent year for all new sites and sites where major changes were made by the operators in the previous year. This report presents the results of the survey conducted at the JEC Powerhouse site in 2022.

The JEC Powerhouse site was used by two mobile operator at the time of the survey: Airtel and Sure. 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. Even though the reported levels are expected to be predominantly emitted from this site, the test equipment does not discriminate between nearby sites which means that the levels are cumulated over all site emissions detected by the test instrument.

The survey established that the emission levels around the 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 recorded around the site following a peak search. The levels were found to be lower at all the other locations round this site. The recorded values are true at the time of testing and can go up or down depending on the level of user activity on the site.

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

Table 1 – Cumulative exposure quotient

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
JEC Powerhouse	800	0.7471	Airtel	52	0.007070231	1/ 141
	900	0.706	Sure	58	0.000884647	1/ 1130
	1800	0.1782	Airtel	327	0.000119427	1/ 8373
	2100	0.09682	Airtel	630	1.77036E-05	1/ 56486
	2600	0.01122	JT	5437	2.91635E-06	1/ 342894
Total Site EQ					0.008094925	1/ 124

The results show that the total EQ was measured at 1/124 and therefore remains below the ICNIRP guidelines.

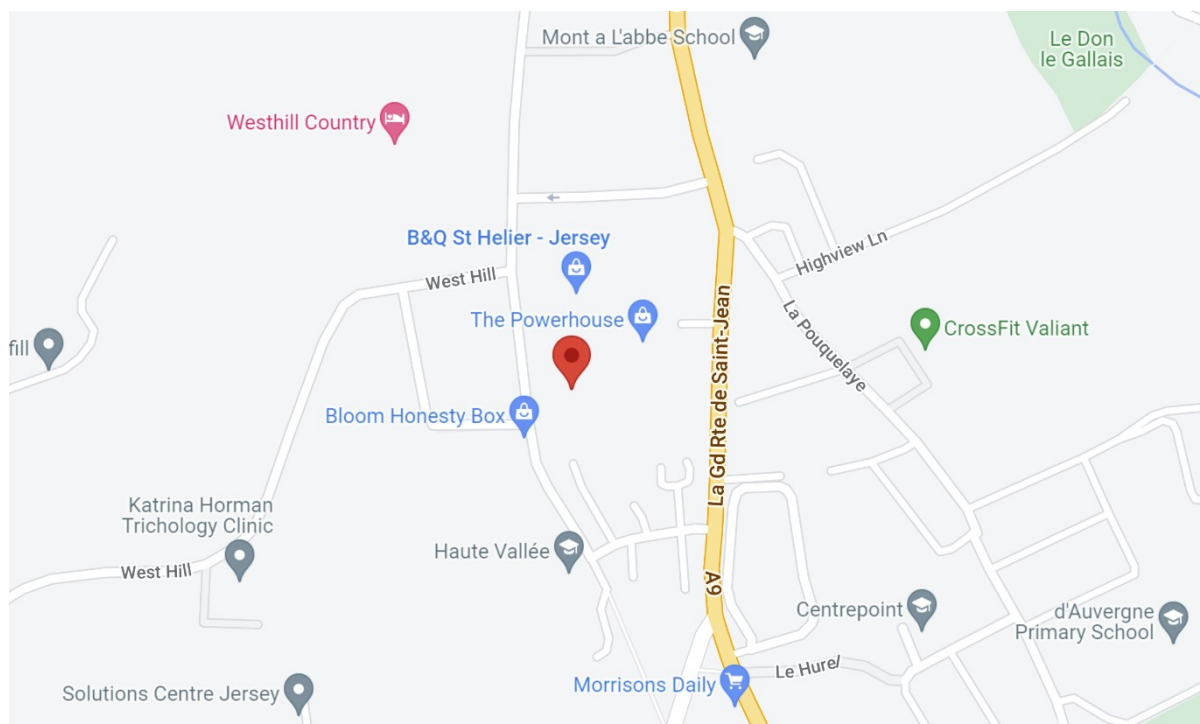
The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the three main operators: Airtel in red, Sure in dark blue, and Jersey Telecom in light blue. The graphs are also supported by the equivalent statistical figures derived from the measured levels at the site for added clarity.

¹ Prior to 1 July 2020, the JCRA and the Guernsey Competition & Regulatory Authority coordinated their activities in the Channel Islands as the Channel Islands Competition Regulatory Authorities (CICRA). Earlier reports may refer to CICRA rather than JCRA.

2 Site details

2.1 Site location

Figure 1 – Map of the site area



Site name:	JEC Powerhouse
Site address:	Queen's Road
Site latitude:	49.1999550
Site longitude:	-2.114985

2.2 Site description

Operators:	Airtel, Sure
Antenna types:	Directional
Approximate height:	20m
Site type:	Rooftop
Description:	The antennas are located on the rooftop within a compound with restricted access. Public access to the antenna is not possible without prior permission or without the use of a climbing aid.

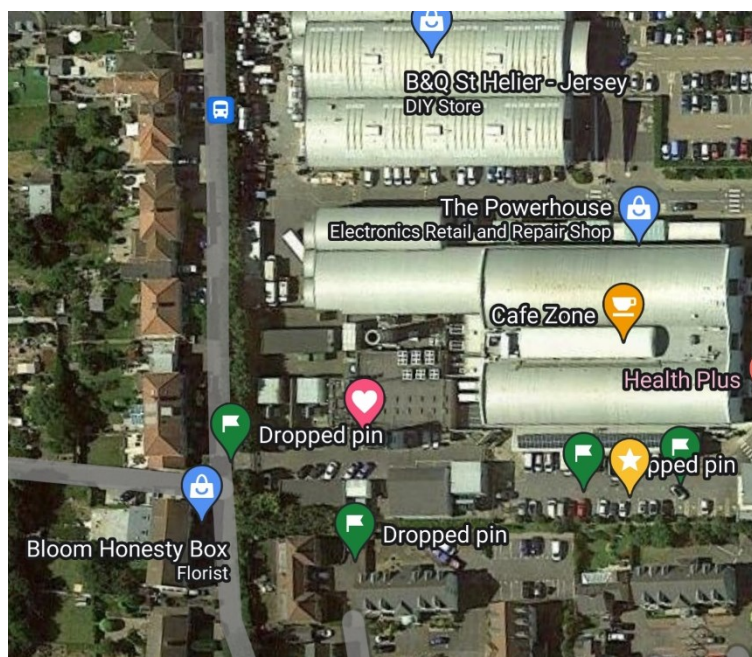
2.3 Site photo

Figure 2 – Location of the peak and where emission levels were measured



2.4 Test location

Figure 3 – Survey area with spot measurement markers



The red heart pin is the site location, the green flag pins are intermediate locations measured at during the peak search and the yellow star pin is the spot where the highest spot search reading was obtained and where the detailed survey was carried out.

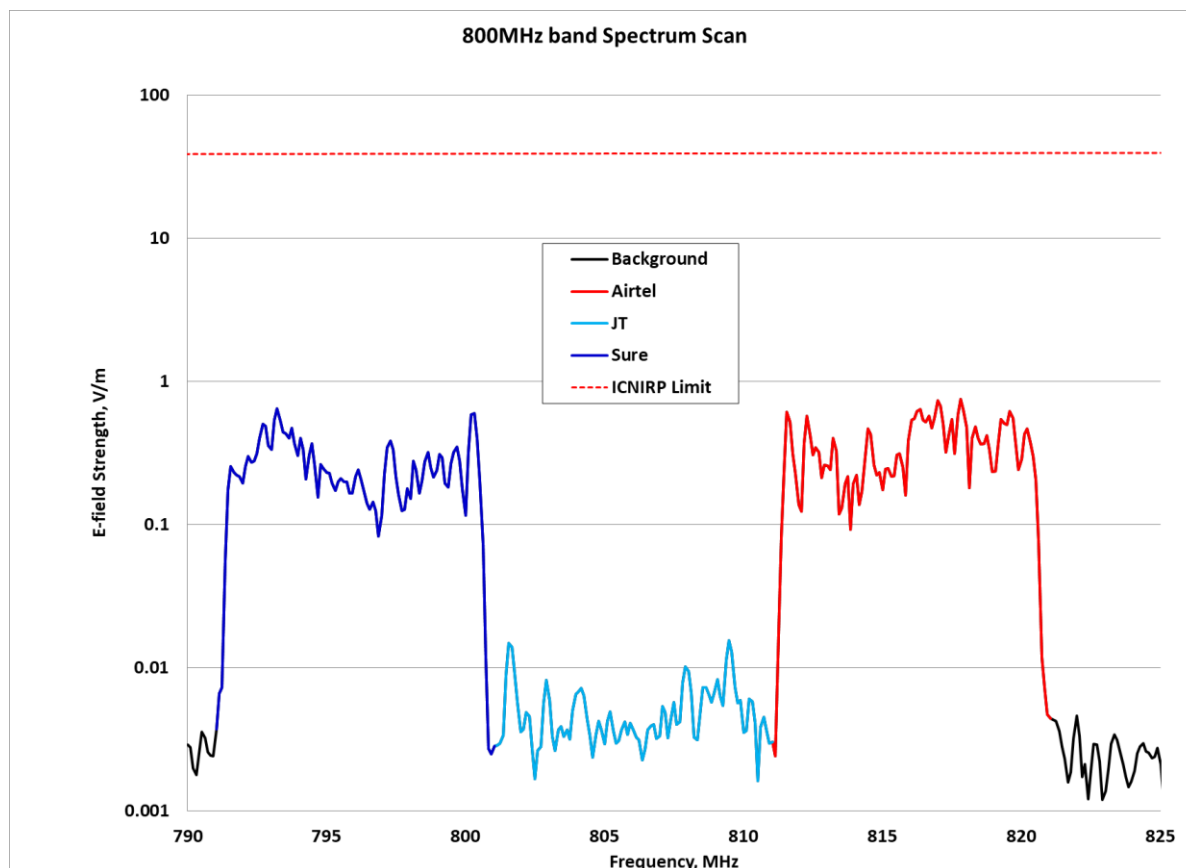
As part of the peak search procedure, spot measurements were taken at locations around the antennas as shown on the above sketch. The reported spectrum scans were taken at the peak location (shown in red above) where the highest readings were recorded. The spectrum readings reported further down this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

3 Survey results

3.1 800MHz band

The graph for the 800MHz 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 0.7471 V/m (Airtel), which is 52 times smaller than the ICNIRP Guideline Reference Level.

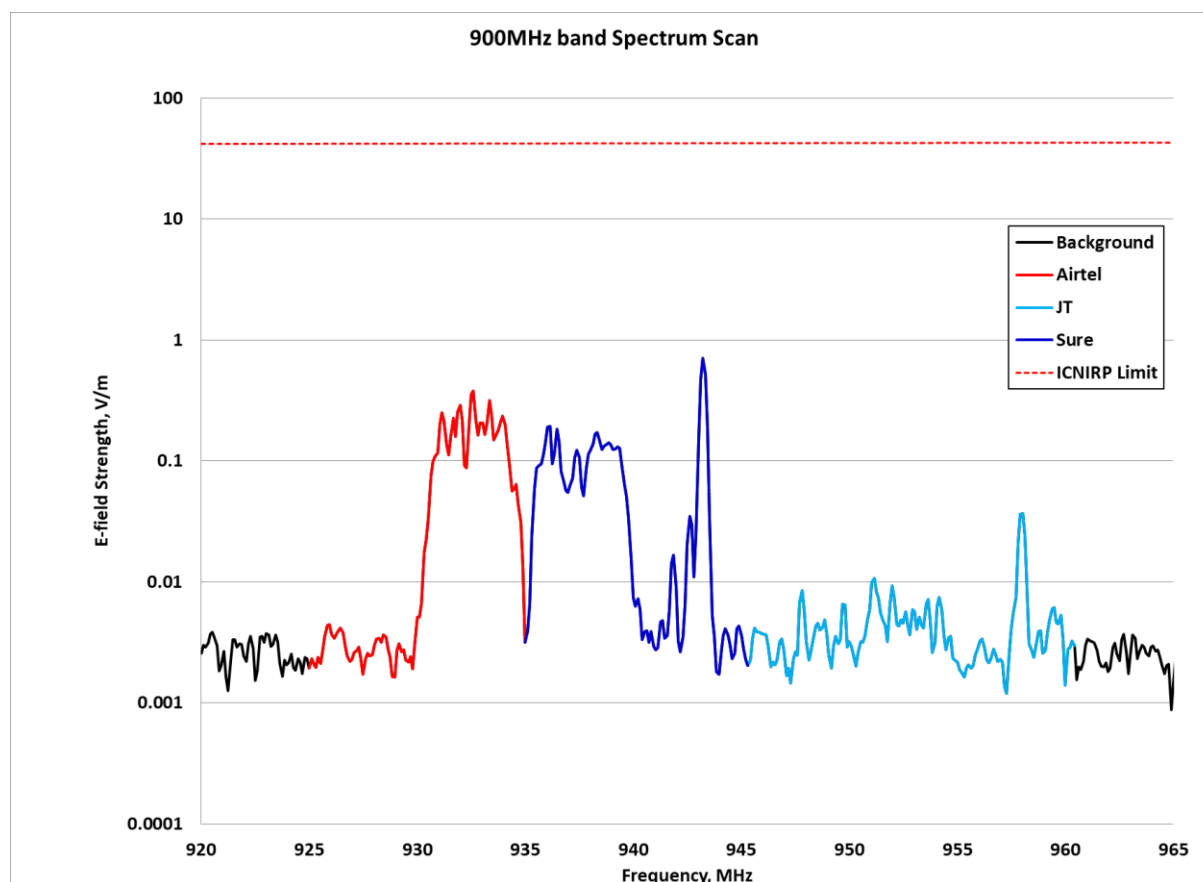
Table 2 – 800MHz band exposure quotient at JEC Powerhouse

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
JEC Powerhouse	Airtel	800	0.7471	52	0.004501425	1/ 222
	JT		0.01539	2527	1.03553E-06	1/ 965688
	Sure		0.6436	60	0.002567771	1/ 389
total band EQ					0.007070231	1/ 141

3.2 900MHz band

The graph for the 900MHz activity is shown below.

Figure 5 – 900MHz band spectrum scan



No field level recorded across the band was higher than 0.706 V/m (JT), which is 58 times smaller than the ICNIRP Guideline Reference Level.

The EQ results for the 900MHz band are shown below.

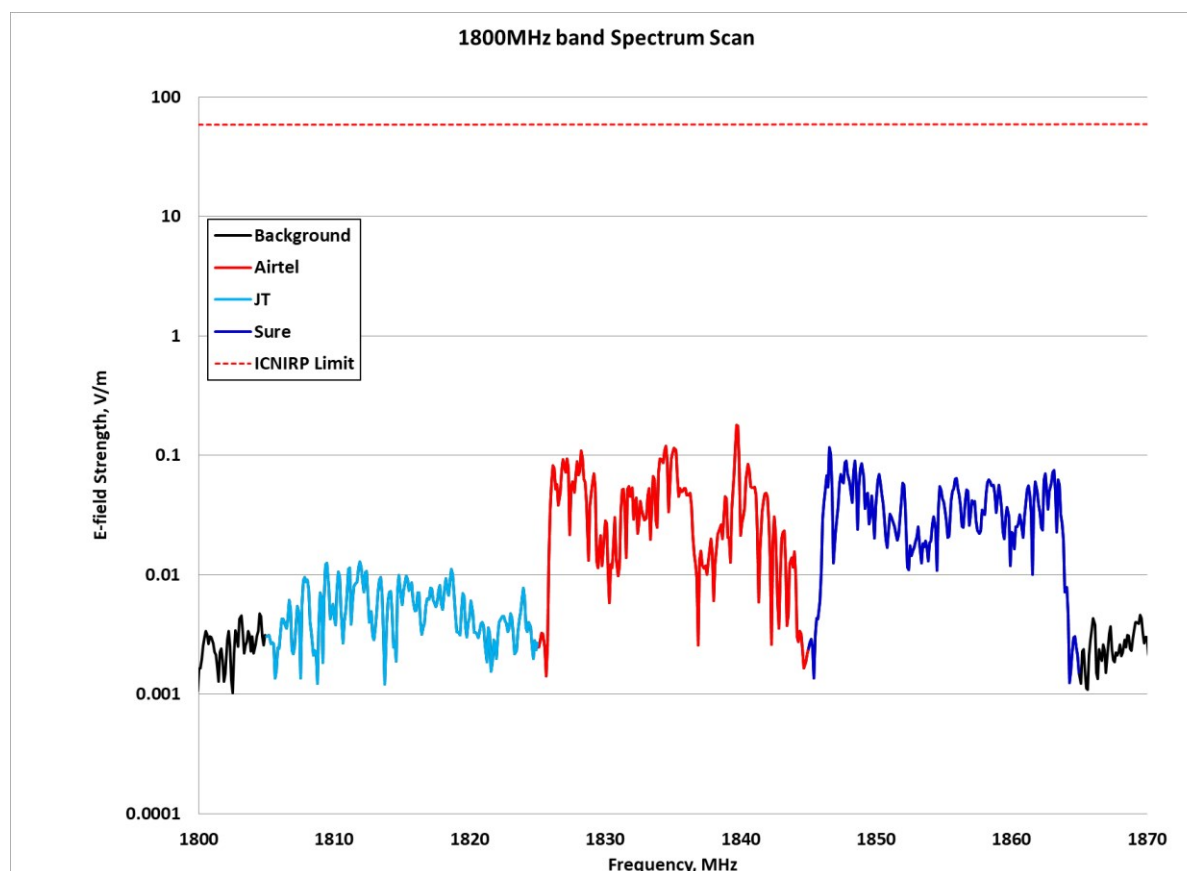
Table 3 – 900MHz band exposure quotient at JEC Powerhouse

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
JEC Powerhouse	Airtel	900	0.3786	109	0.000421272	1/ 2374
	JT		0.03682	1120	1.726E-06	1/ 579374
	Sure		0.706	58	0.000461648	1/ 2166
	total band EQ				0.000884647	1/ 1130

3.3 1800MHz band

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

Figure 6 – 1800MHz spectrum scan



No field level recorded across the band was higher than 0.1782 V/m (Airtel), which is 327 times smaller than the ICNIRP Guideline Reference Level.

The EQ results for the 1800MHz band are shown below.

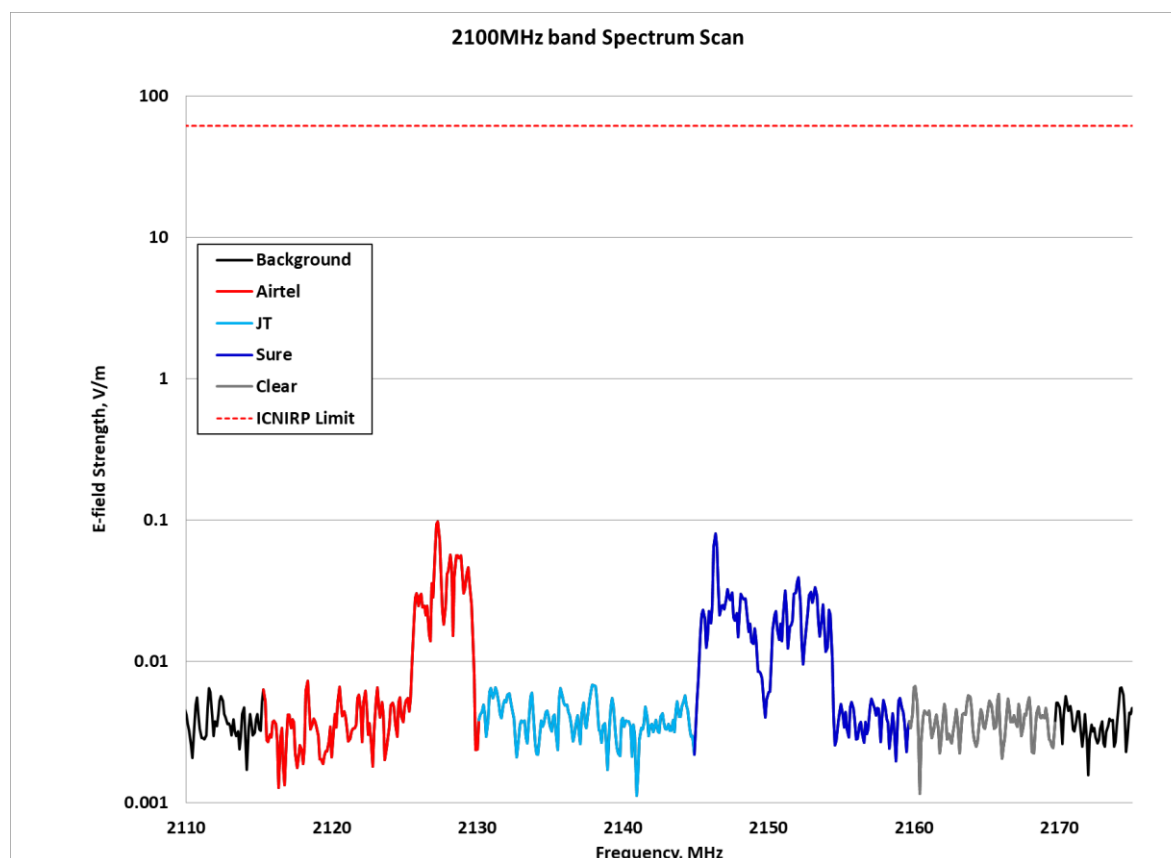
Table 4 – 1800MHz band exposure quotient at JEC Powerhouse

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
JEC Powerhouse	Airtel	1800	0.1782	327	7.02036E-05	1/ 14244
	JT		0.0129	4522	9.7728E-07	1/ 1023248
	Sure		0.1162	502	4.82466E-05	1/ 20727
total band EQ					0.000119427	1/ 8373

3.4 2100MHz band

The graph for the 2100MHz band activity around the site is shown below.

Figure 7 – 2100MHz band spectrum scan



Only marginal activity was recorded in the 2100MHz band at this site.

The EQ results for the 2100MHz band are shown below.

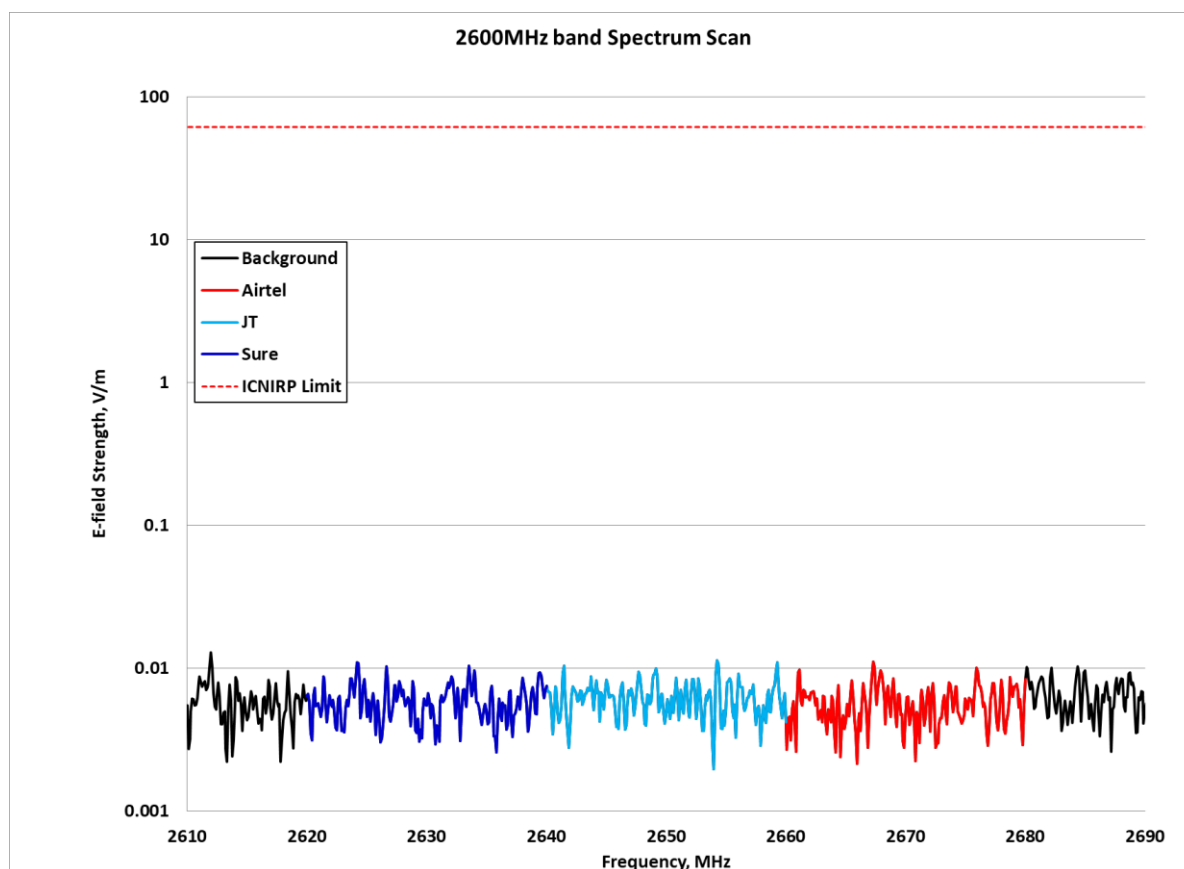
Table 5 – 2100MHz band exposure quotient at JEC Powerhouse

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
JEC Powerhouse	Airtel	2100	0.09682	630	9.82194E-06	1/ 101813
	JT		0.006796	8976	3.27159E-07	1/ 3056617
	Sure		0.08017	761	7.35063E-06	1/ 136043
	Clear		0.006638	9190	2.0382E-07	1/ 4906300
total band EQ					1.77036E-05	1/ 56486

3.5 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 band at this site.

The EQ results for the 2600MHz band are shown below.

Table 6 – 2600MHz band exposure quotient at JEC Powerhouse

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
JEC Powerhouse	Airtel	2600	0.01102	5535	8.99218E-07	1/ 1112077
	JT		0.01122	5437	1.05928E-06	1/ 944041
	Sure		0.01092	5586	9.57859E-07	1/ 1043995
	total band EQ			2.91635E-06	1/ 342894	

END