

Cellular mast emissions survey: Castle Quay A



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 Castle Quay A site in 2024.

The Castle Quay A site was used by two operators at the time of the survey: Airtel and JT. 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
Castle Quay A	800	0.009344	Sure	4162	1.66644E-06	1/ 600081
	900	0.9488	JT	43	0.00180063	1/ 555
	1800	0.3584	JT	163	0.001634493	1/ 612
	2100	0.4249	Airtel	144	0.000542464	1/ 1843
	2600	0.008275	JT	7372	2.00513E-06	1/ 498721
Total Site EQ					0.003981257	1/ 251

The results show that the total EQ was measured at 1/251 and therefore remains below the ICNIRP guidelines.

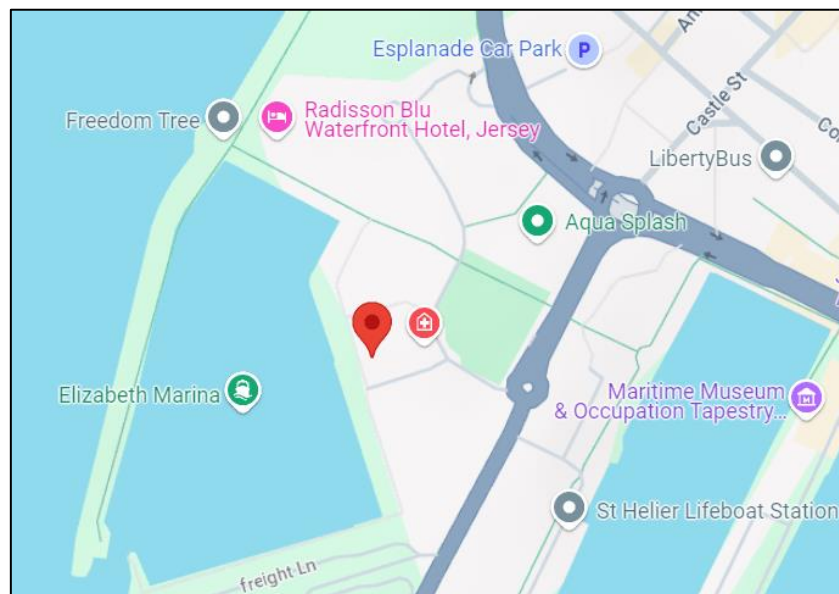
The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the three main operators: Airtel in red, Sure in dark blue, and Jersey Telecom in light blue. The graphs are also supported by the equivalent statistical figures derived 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:	Castle Quay A
Site address:	Castle Quay Apartments, Block A, Waterfront
Site latitude:	49.1821757
Site longitude:	-2.1156357

2.2 Site description

Operators:	Airtel JT
Antenna types:	Directional Antennas
Approximate height:	2.5m
Site type:	Indoor
Description:	The antennas at Castle Quay A are wall-mounted, and installed in the inner courtyard of the building

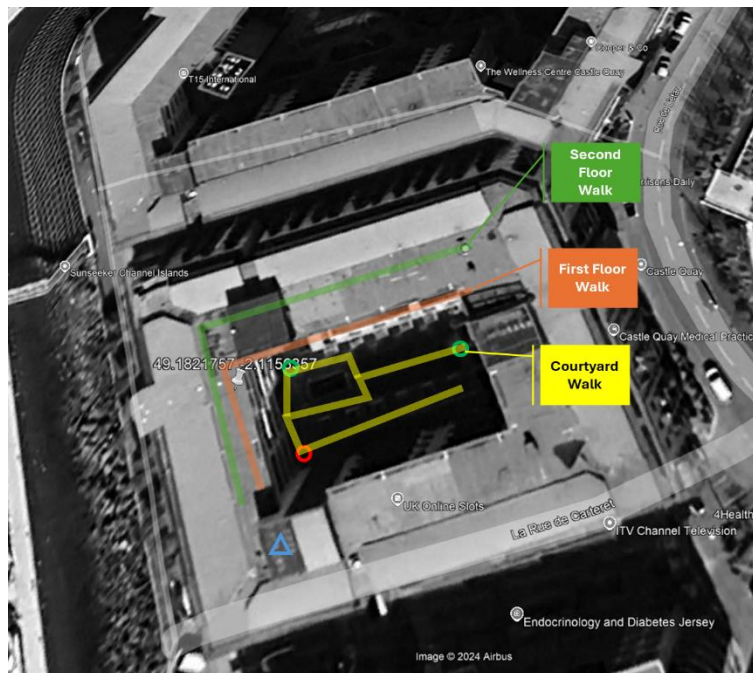
2.3 Site photo

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



2.4 Test location

Figure 3 – Survey area with spot measurement markers



As part of the peak search procedure, spot measurements were taken at locations around the antennas as shown on the above sketch.

The blue triangle is the antenna location, yellow lines are the walk route, the green 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.

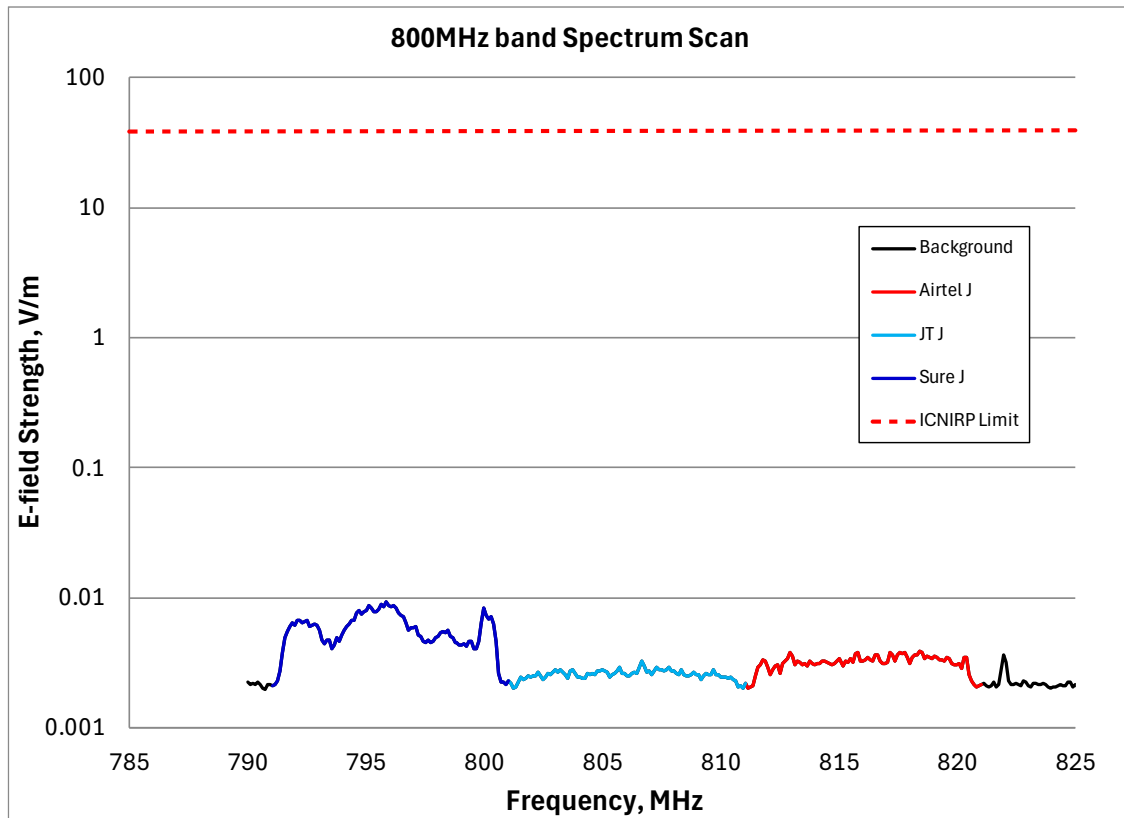
The spectrum readings reported further down this report were recorded over a period of six minutes as advised by ICNIRP.

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 *General Public* Reference level 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 0.009344 V/m (Sure), which is 4162 times smaller than the ICNIRP Reference Level.

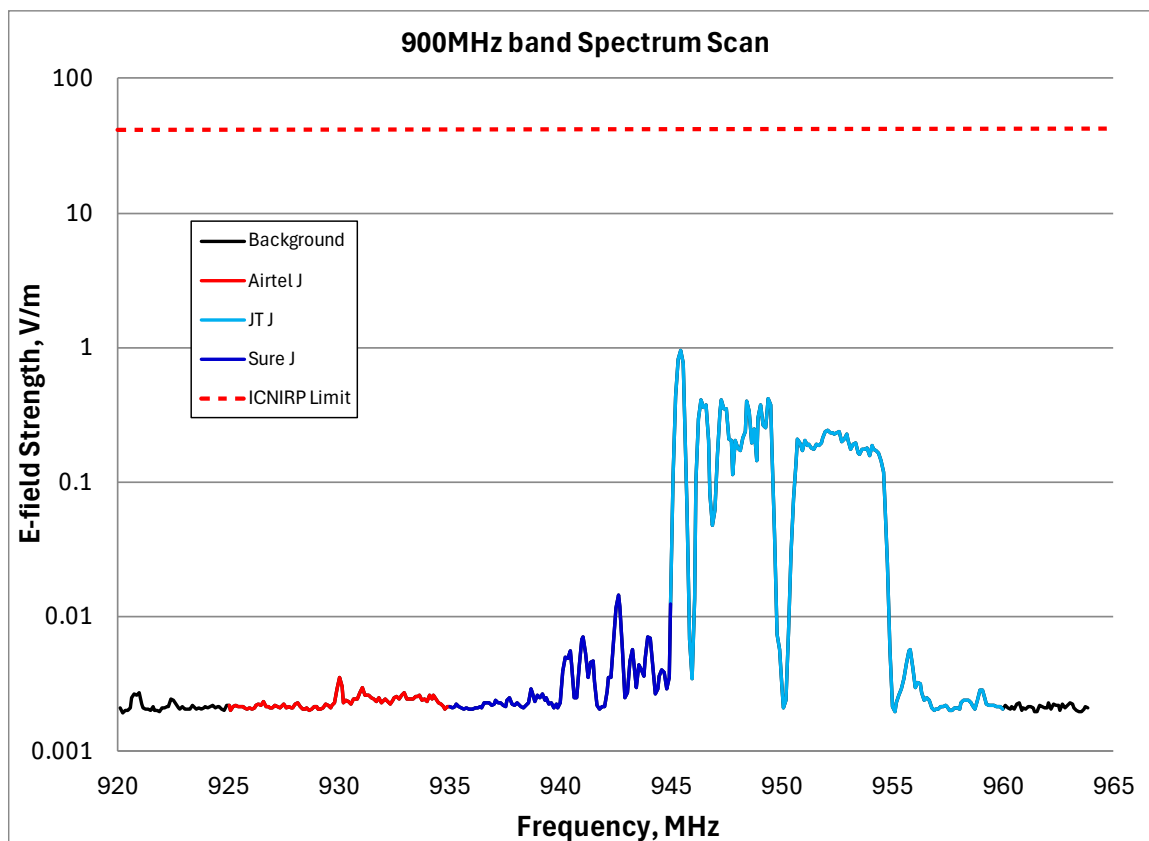
Table 2 – 800MHz band exposure quotient at Castle Quay A

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
Castle Quay A	Airtel	800	0.003844	10117	3.19773E-07	1/ 3127215
	JT		0.003212	12108	2.09811E-07	1/ 4766187
	Sure		0.009344	4162	1.13686E-06	1/ 879618
total band EQ					1.66644E-06	1/ 600081

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 0.9488 V/m (JT), which is 43 times smaller than the ICNIRP Reference Level.

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

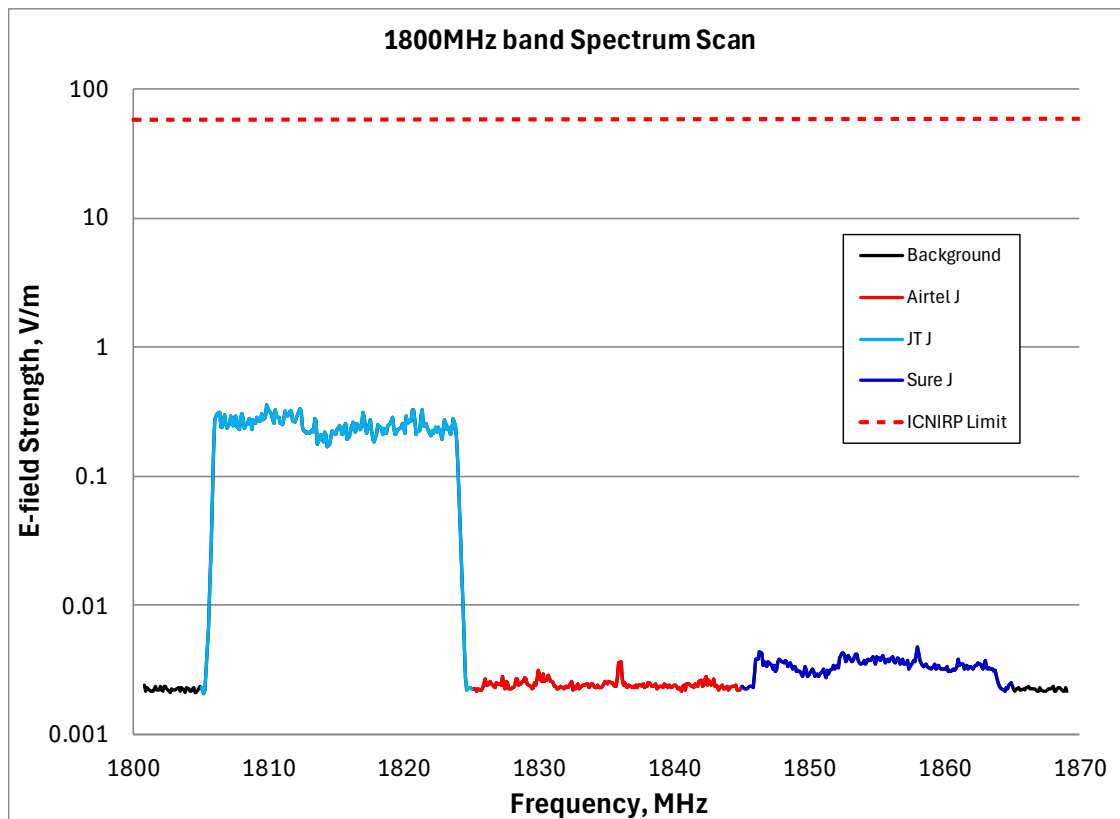
Table 3 – 900MHz band exposure quotient at Castle Quay A

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
Castle Quay A	Airtel	900	0.003543	11643	1.47166E-07	1/ 6795025
	JT		0.9488	43	0.001800004	1/ 556
	Sure		0.01449	2847	4.78649E-07	1/ 2089214
total band EQ					0.00180063	1/ 555

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 0.3584 V/m (JT), which is 163 times smaller than the ICNIRP Reference Level.

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

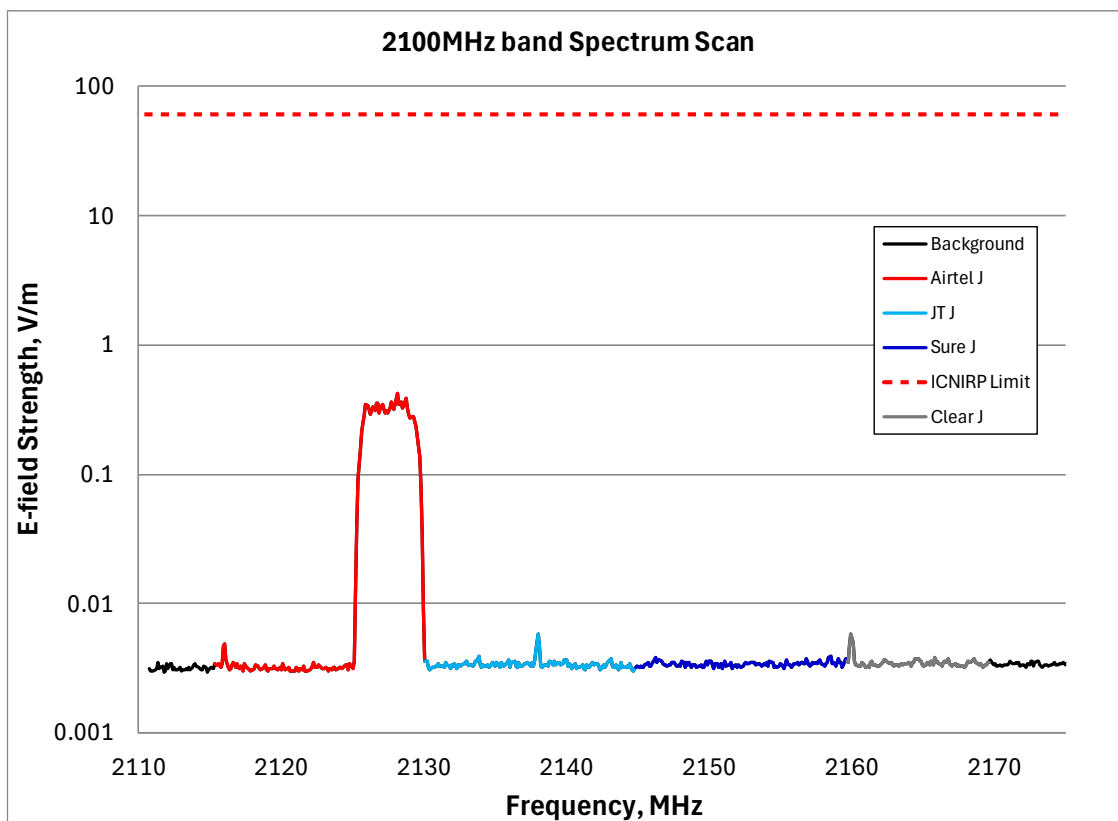
Table 4 – 1800MHz band exposure quotient at Castle Quay A

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
Castle Quay A	Airtel	1800	0.003665	15917	1.64008E-07	1/ 6097265
	JT		0.3584	163	0.001634013	1/ 612
	Sure		0.004782	12199	3.15648E-07	1/ 3168081
total band EQ					0.001634493	1/ 612

3.4 2100MHz band

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

Figure 7 – 2100MHz band spectrum scan



No field level recorded across the band was higher than 0.4249 V/m (Airtel), which is 144 times smaller than the ICNIRP Reference Level.

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

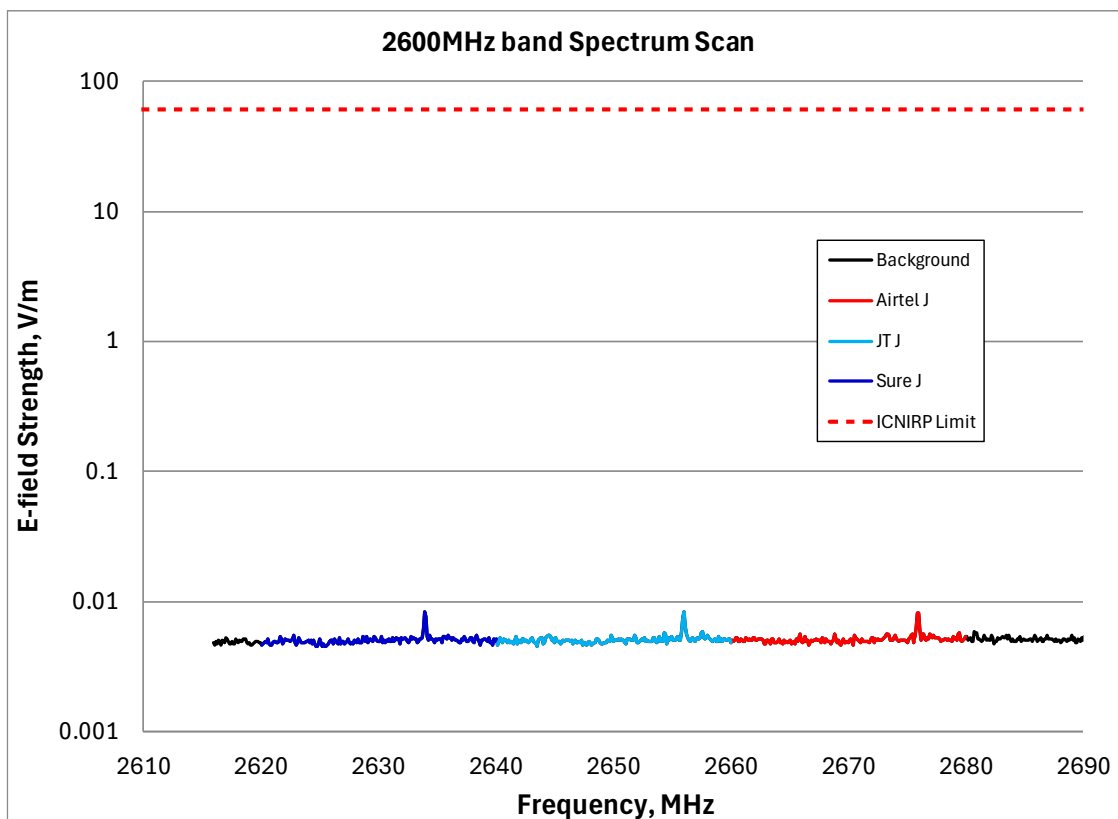
Table 5 – 2100MHz band exposure quotient at Castle Quay A

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
Castle Quay A	Airtel	2100	0.4249	144	0.000541855	1/ 1846
	Clear		0.005876	10381	1.61069E-07	1/ 6208527
	JT		0.005805	10508	2.2279E-07	1/ 4488524
	Sure		0.003882	15714	2.24391E-07	1/ 4456515
total band EQ					0.000542464	1/ 1843

3.5 2600MHz band

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

Figure 8 – 2600MHz band spectrum scan



No meaningful activity was recorded at this site on the 2600MHz band. The EQ results for the band are shown below.

Table 6 – 2600MHz band exposure quotient at Castle Quay A

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
Castle Quay A	Airtel	2600	0.008116	7516	6.78269E-07	1/ 1474342
	JT		0.008275	7372	6.69939E-07	1/ 1492672
	Sure		0.008241	7402	6.56922E-07	1/ 1522251
	total band EQ				2.00513E-06	1/ 498721

END