Cellular mast emissions survey: St Aubin's Harbour

Document details

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Contents page

1 Executive summary 3
2 Site details 4
2.1 Site location 4
2.2 Site description 4
2.3 Site photo 5
2.4 Test location 5
3 Survey results 6
3.1 800MHz band 6
3.2 900MHz band 7
3.3 1800MHz band 8
3.4 2100MHz band 9
3.5 2600MHz band 10

Lists of figures

Figure 1 – Map of the site area 4
Figure 2 – Location of the peak where emission levels were measured. 5
Figure 3 – Survey area with spot measurement markers 5
Figure 4 – 800MHz band spectrum scan 6
Figure 5 – 900MHz band spectrum scan 7
Figure 6 – 1800MHz spectrum scan 8
Figure 7 – 2100MHz band spectrum scan 9
Figure 8 – 2600MHz band spectrum scan 10

List of tables

Table 1 – Cumulative exposure quotient 3
Table 2 – 800MHz band exposure quotient at St Aubin's Harbour 6
Table 3 – 900MHz band exposure quotient at St Aubin's Harbour 7
Table 4 – 1800MHz band exposure quotient at St Aubin's Harbour 8
Table 5 – 2100MHz band exposure quotient at St Aubin's Harbour 9
Table 6 – 2600MHz band exposure quotient at St Aubin's Harbour 10

1 Executive summary

The Jersey Competition and Regulatory Authority or JCRA regularly monitors emission levels from the cellular masts in Jersey[1] 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 St Aubin's Harbour site in 2024.

The St Aubin's Harbour site was used by a single operators at the time of the survey: 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
St Aubin's Harbour	800	0.1229	Airtel	316	0.000285184	1/ 3507
	900	4.625	JT	9	0.036693853	1/ 27
	1800	1.034	JT	56	0.013280216	1/ 75
	2100	0.1039	Sure	587	4.51212E-05	1/ 22163
	2600	0.02351	JT	2595	1.58044E-05	1/ 63273
				Total Site EQ	0.050320179	1/ 20

The results show that the total EQ was measured at 1/20 and therefore remains below the ICNIRP guidelines.

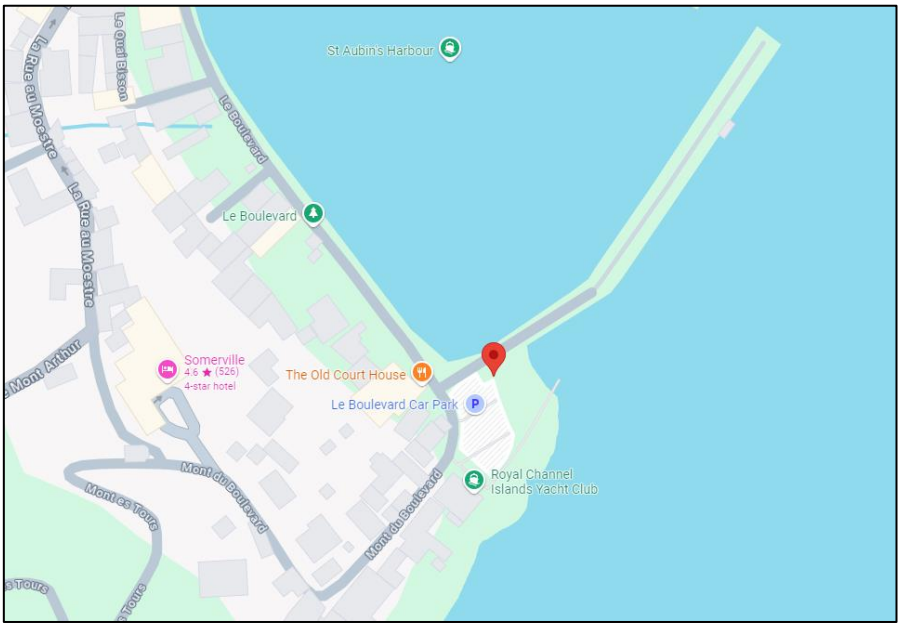
The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the three main operators: Airtel in red, Jersey Telecom in light blue and Sure in dark blue. The graphs are also supported by the equivalent statistical figures derived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



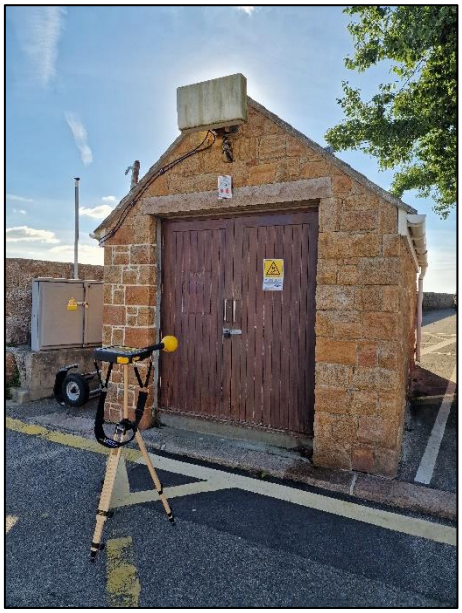
Site name:	St Aubin's Harbour
Site address:	Sub Station, Le Boulevard
Site latitude:	49.185499
Site longitude:	-2.168404

2.2 Site description

Operators:	JT
Antenna types:	Directional Antenna
Approximate height:	3m
Site type:	Outdoor wall
Description:	The antenna at St Aubin's Harbour is wall-mounted, installed on a low height building's front wall.

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.

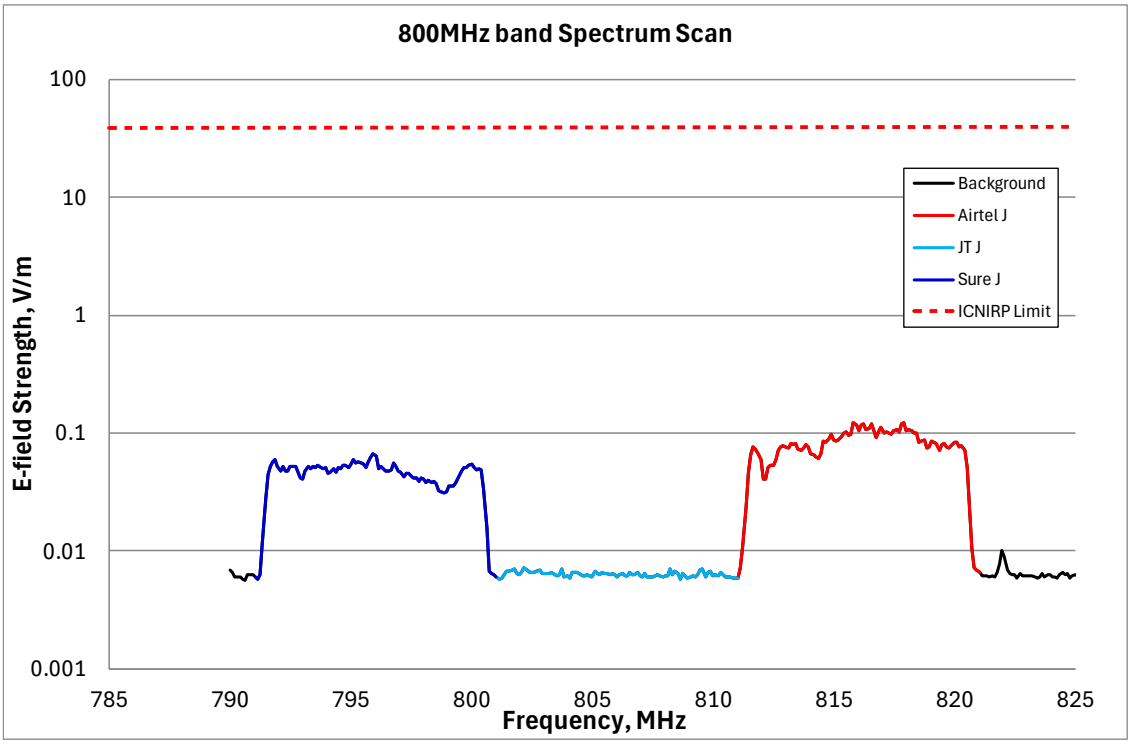
The spectrum readings reported further down this report were recorded over a period of six minutes as advised by ICNIRP.

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 0.1229 V/m (Airtel), which is 316 times smaller than the ICNIRP Reference Level.

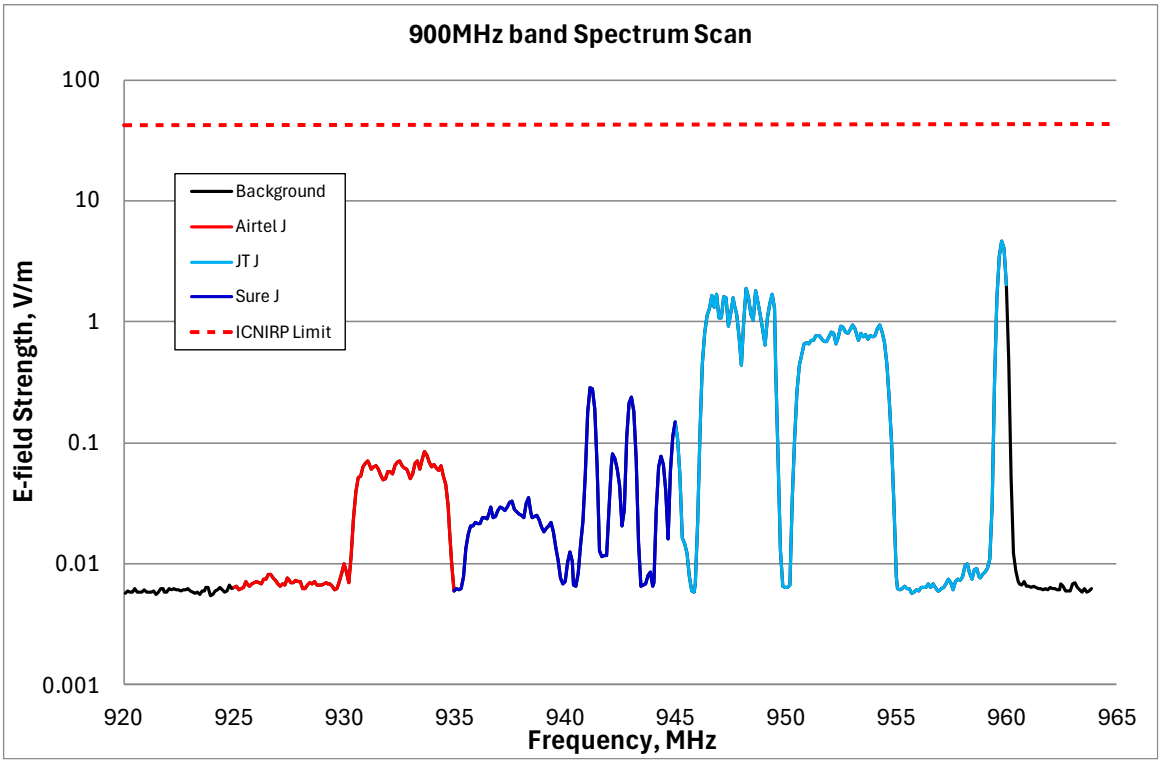
Table 2 – 800MHz band exposure quotient at St Aubin's Harbour

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
St Aubin's Harbour	Airtel	800	0.1229	316	0.000215806	1/ 4634
	JT		0.007123	5460	1.27099E-06	1/ 786788
	Sure		0.06674	583	6.81078E-05	1/ 14683
				total band EQ	0.000285184	1/ 3507

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 4.625 V/m (JT), which is 9 times smaller than the ICNIRP Reference Level.

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

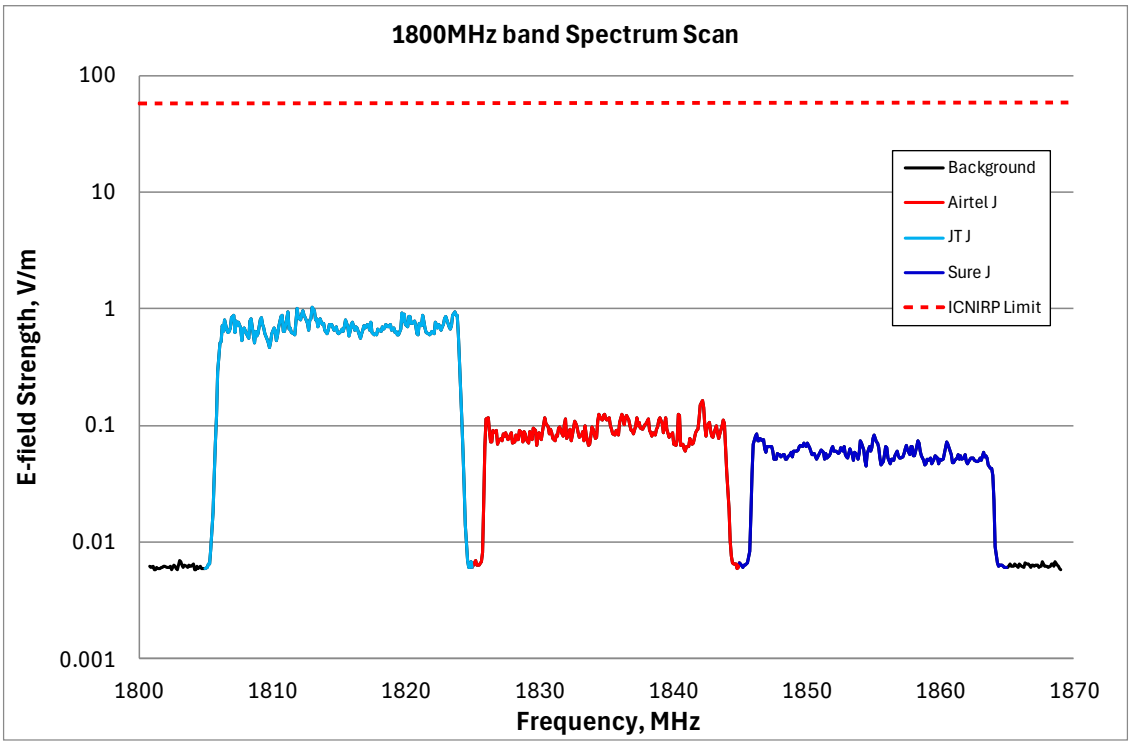
Table 3 – 900MHz band exposure quotient at St Aubin's Harbour

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
St Aubin's Harbour	Airtel	900	0.08538	483	4.4874E-05	1/ 22285
	JT		4.625	9	0.036510584	1/ 27
	Sure		0.2847	145	0.000138394	1/ 7226
				total band EQ	0.036693853	1/ 27

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 1.034 V/m (JT), which is 56 times smaller than the ICNIRP Reference Level.

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

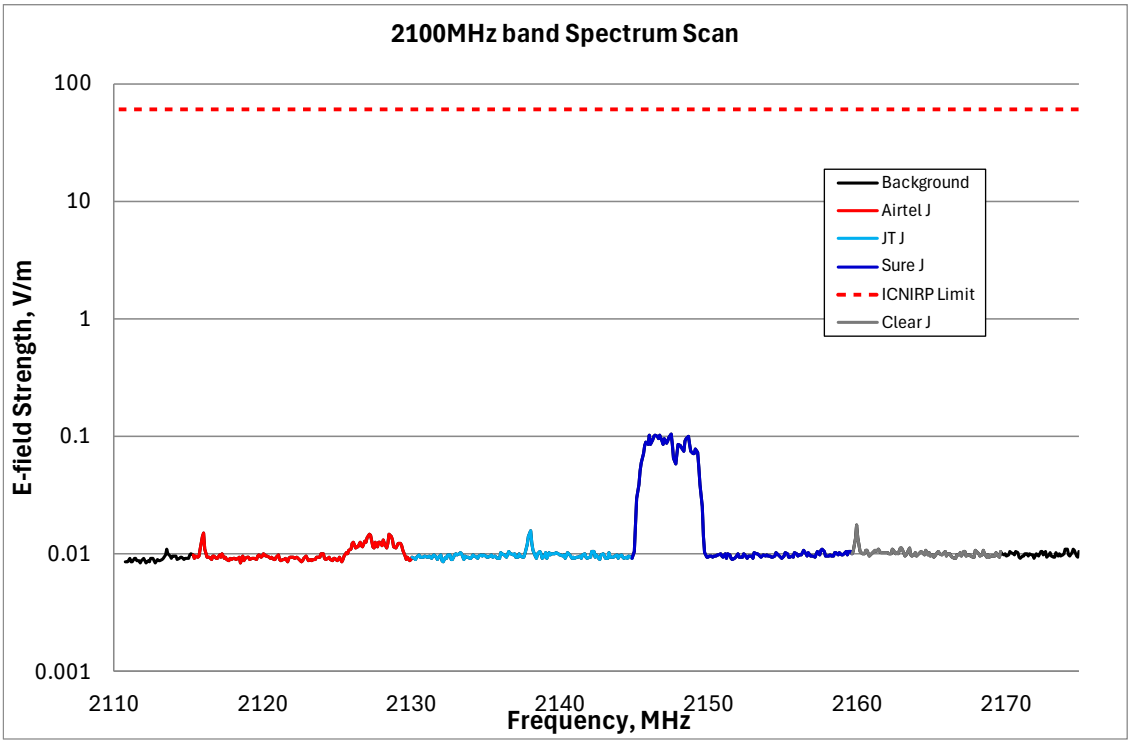
Table 4 – 1800MHz band exposure quotient at St Aubin's Harbour

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
St Aubin's Harbour	Airtel	1800	0.1657	352	0.000216747	1/ 4614
	JT		1.034	56	0.012978432	1/ 77
	Sure		0.08449	690	8.5036E-05	1/ 11760
				total band EQ	0.013280216	1/ 75

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 0.1039 V/m (Sure), which is 587 times smaller than the ICNIRP Guideline Reference Level.

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

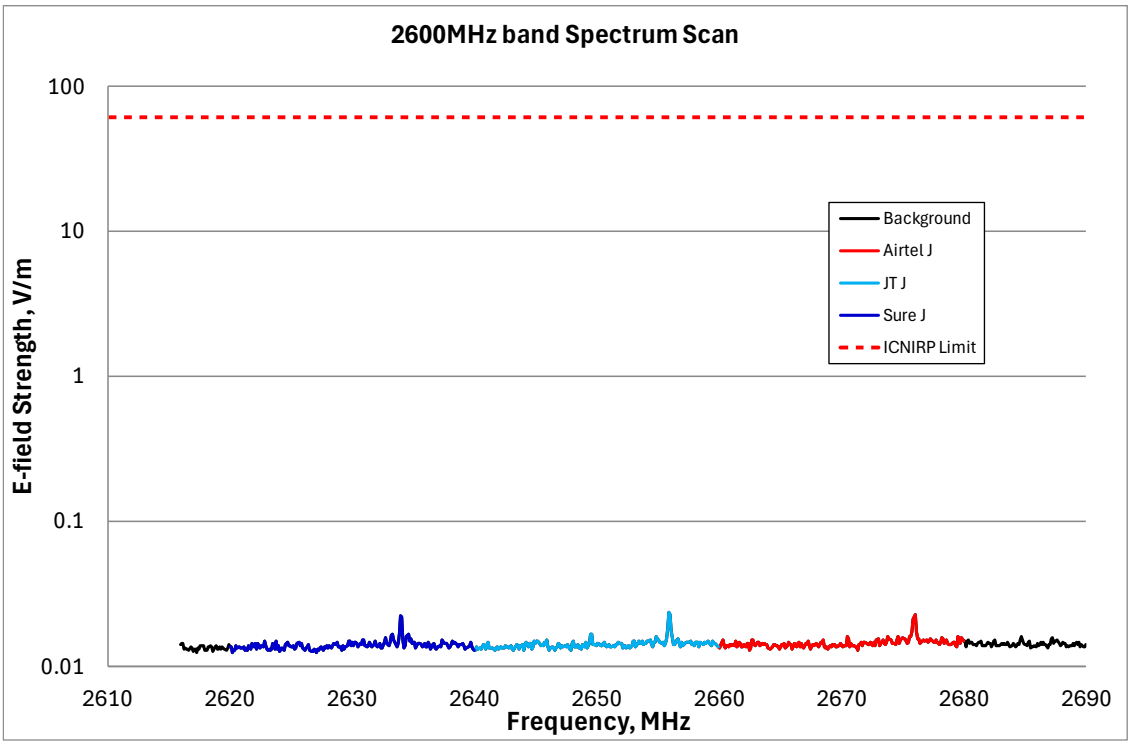
Table 5 – 2100MHz band exposure quotient at St Aubin's Harbour

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
St Aubin's Harbour	Airtel	2100	0.01508	4045	2.0045E-06	1/ 498877
	Clear		0.01756	3474	1.37624E-06	1/ 726615
	JT		0.01573	3878	1.82477E-06	1/ 548014
	Sure		0.1039	587	3.99157E-05	1/ 25053
				total band EQ	4.51212E-05	1/ 22163

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 St Aubin's Harbour

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
St Aubin's Harbour	Airtel	2600	0.02275	2681	5.43849E-06	1/ 183875
	JT		0.02351	2595	5.26061E-06	1/ 190092
	Sure		0.02216	2753	5.10534E-06	1/ 195873
				total band EQ	1.58044E-05	1/ 63273

END