

EME ANALYSIS OF DEVELOPMENT AT CHANNEL 9 SITE 6-30 ARTARMON RD, WILLOUGHBY

L.E.P. C9 C/O PLATFORM PROJECT SERVICES PTY LTD

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1. EXECUTIVE SUMMARY

LEP C9 (c/o Platform Project Services Pty Ltd) has requested Kordia to provide an assessment on the impact the radiofrequency (RF) fields propagating from the Willoughby transmission tower may have on the proposed residential development located on the channel 9 studio site at 6-30 Artarmon Road, Willoughby.

The scope of services includes using the existing RF field measurement data obtained from previous reports to analyse the proposed residential development and report on any potential EME related health risks and precautions required to protect human habitants;

Initial design elevation, section and isometric layout drawings have been supplied by Platform Project Services and have been reviewed in preparation of this report.

Previous measurements taken on site

On the 9th of November 2012, Kordia Solutions Pty Ltd conducted an RF Field Survey on the Channel 9 studio site at Willoughby. The location and heights of the measurements provides a good indication of the RF levels expected to be found on the proposed residential development.

The maximum measured RF field on site was 28% of the general public reference level¹. However, this measurement was taken approximately 10-15 metres in front of a Mobile phone base station antenna mounted on an adjacent studio building roof, and therefore is an unrealistic indicator of RF EME levels that could be expected to be found on the proposed site.

A more realistic indicator of RF EME levels that could be expected to be found on the proposed residential development site are the measurements taken on the roof of the existing Studio buildings. The maximum RF EME measurement taken on the rooftop was only 3% of the general public reference level, which is about 10 times lower than in front of the mobile base station antenna.

The measurements taken on the Channel 9 studio site are in line with other RF EME measurements taken on recent development sites adjacent to other nearby broadcast towers in the area. These other measurements confirm the veracity of the measurements provided in the previous Kordia report, and provide a reliable indicator of the RF EME levels anticipated at the proposed residential development.

A cross section of the Willoughby site shows the tower is 230m tall with the broadcast services located at the top. The height of the tallest proposed residential building is about 35-40m high. A small change in the height of the buildings at the base of the broadcast tower has minimal effect on the RF EME levels at these locations.

EME related health risks and precautions required to protect human habitants

Based on the current broadcast services normally operating on the transmission tower and previous RF measurements taken, the RF field strength on the roof levels of the proposed residential development is expected to be approximately 5% of the general public reference level.

With respect to radiofrequency fields, based on current services onsite and statements from the World Health Organisation, Kordia finds no logical reason not to recommend any human habitation at the proposed residential development site at 6-30 Artarmon Rd, Willoughby.

If additional high powered services are added to the transmission tower, then a report by a suitably qualified person should be prepared to assess the potential RF exposure impacts under those new conditions.

2. PROPOSED RESIDENTIAL DEVELOPMENT

2.1 BACKGROUND

The redevelopment of the Site was declared to be a project to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies on 19 November 2010. Nine Network Australia submitted a Concept Plan Application (MP 10_0198) to the NSW Department of Planning & Environment in November 2012.

In December 2014, following a lengthy planning assessment and community engagement process, the NSW Planning Assessment Commission PAC, Willoughby Council and Nine mediated an agreed planning approval before the NSW Land and Environment Court. The mediated outcome was formalised by the PAC in its final determination on 23 December 2014 to approve the Concept Plan Application for:

The use of the site for a residential development with small-scale non-residential uses, incorporating:

- *building envelopes for five residential flat buildings above basement level parking and two rows of terrace houses incorporating;*
 - *up to 400 dwellings and*
 - *up to 500m² floor space of non-residential uses to support the development;*
- *retention and adaptive reuse of No 6 Artarmon Road for retail/commercial purposes;*
- *new internal roadways and other infrastructure works to support the development;*
- *publicly accessible open space and through Site link;*
- *temporary exhibition homes and/or exhibition villages; and*
- *superlot subdivision.*

The approved Concept Plan establishes maximum building footprints and heights, open space areas, road infrastructure and other development parameters, and sets out the future environmental assessment requirements for detailed Development Applications that are required to be submitted to Willoughby City Council.

Euro Properties and Lotus Property Fund No.8 (LEPC9) agreed to purchase the Site from Nine in late-August 2015. Recognising the opportunity to deliver an improved urban design, planning, development and community outcome, LEPC9 engaged five of Australia's leading urban design firms to participate in a design competition to identify the most appropriate residential master plan for the Site. This voluntary design excellence process led to the selection of the CHROFI master plan by a panel of industry experts and, along with a substantial public benefit offering above the requirements of the current approval, has the potential to deliver a substantial improvement to the current approval for all project stakeholders.

2.2 LOCATION

The development is to be located on the channel 9 studio site and is adjacent to the Willoughby broadcast tower. The location of the Willoughby Tower and development is shown below.

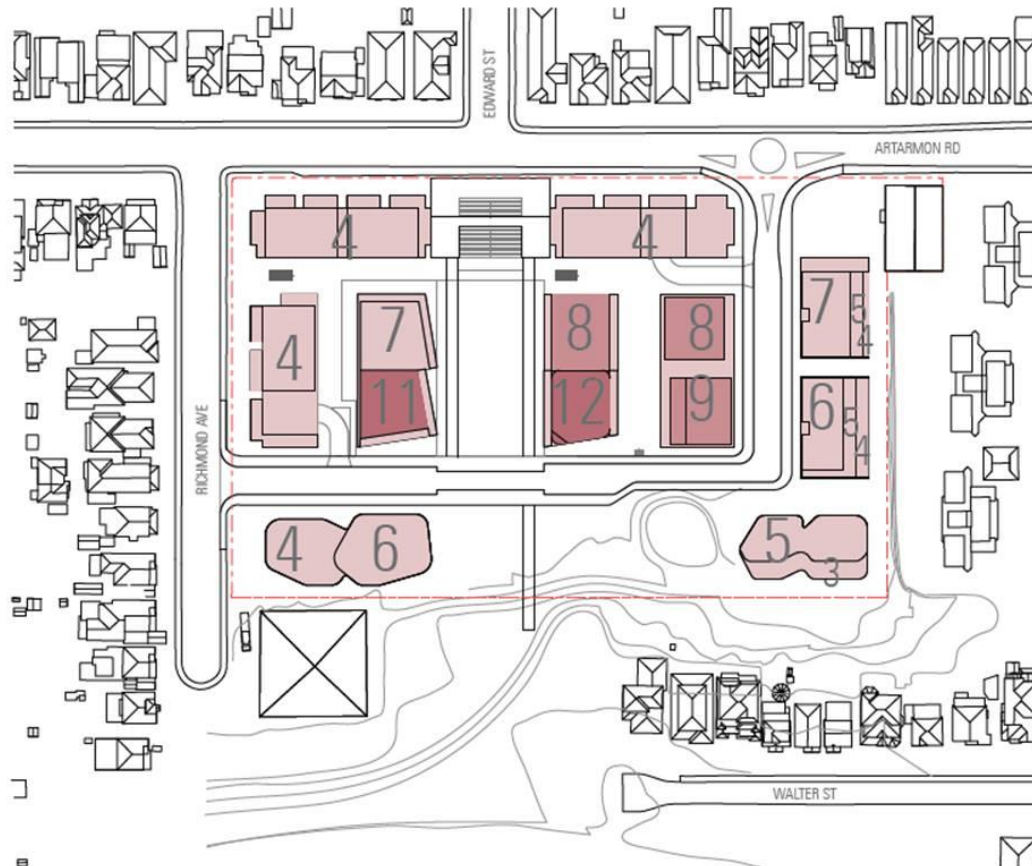


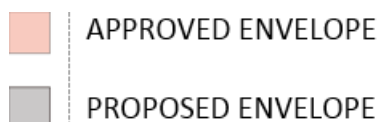
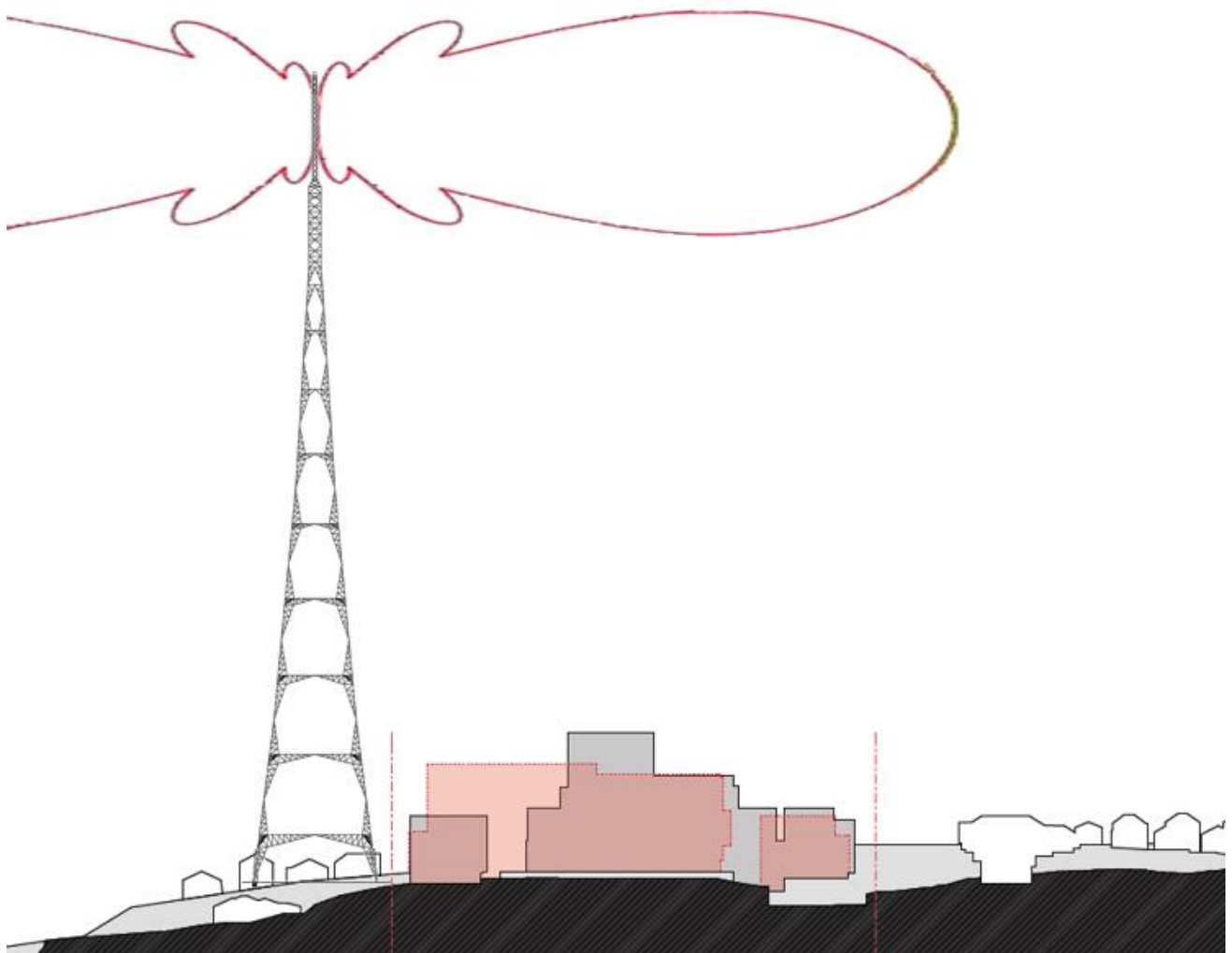
Figure 1: Site layout

2.3 BROADCAST ANTENNAS

The Broadcast antennas are located at the top of the Willoughby tower. The RF EME fields are radiated from the antenna in a predominately horizontal direction away from the tower towards the horizon. An easy way to imagine this is by use of an analogy. If you imagine a light beam emitted from a lighthouse beacon, the light is projected predominantly in a horizontal direction towards the horizon. It is easy to imagine that there is very little light if you stand at the base of the lighthouse. There is a similar effect with RF EME fields propagated from the broadcast antennas on this tower.

A cross section of the Willoughby site shows the tower is 230m tall with the broadcast services located at the top. The height of the tallest proposed residential building is about 35-40m high. A small change in the height of the buildings at the base of the broadcast tower has minimal effect on the RF EME levels at these locations. Refer to diagram below.

RADIATION PATTERN FROM BROADCAST ANTENNAS, INCLUDING PROPOSED SITE LAYOUT



3. RF EME LEVELS

This section provides an assessment on the degree of safety to humans from the radiofrequency fields emitted from the nearby Willoughby Broadcast Tower.

3.1 PREVIOUS EME MEASUREMENTS AT CH 9 STUDIOS

On the 9th of November 2012, Kordia Solutions Pty Ltd conducted an RF Field Survey on the Channel 9 studio site at Willoughby. The location and heights of the previous measurements provides a good indication of the RF levels expected on the proposed residential development. Refer to figure below showing the previous measurement locations overlayed on the proposed development



(x) = measurements on existing rooftops

(x) = measurements at existing ground level

The maximum RF EME measurement taken on the rooftop of the existing Channel 9 studio buildings was only 3% of the general public reference level.

Other RF EME measurements taken at ground level were typically below 1% of the general public reference level.

3.2 PREVIOUS REPORT SUMMARY

During the previous measurements, it was noted that there was an existing base station antenna located on the roof of one of the Ch. 9 Studio buildings. The maximum measured RF field on site was 28% of the general public reference level¹. However, this measurement was taken approximately 10-15 metres in front of a Mobile phone base station antenna mounted on an adjacent studio building roof, and therefore is an unrealistic indicator of RF EME levels that could be expected to be found on the proposed development site.

This base station antenna is not part of the Willoughby Tower infrastructure and it has been assumed that because this studio building will be removed, the base station antennas will also be relocated to another (unknown) location.

A more realistic indicator of RF EME levels that could be expected to be found on proposed residential development site are the measurements taken on the roof of the existing Studio buildings. The maximum RF EME measurement taken on the rooftop was only 3% of the general public reference level, which is about 10 times lower than in front of the mobile base station antenna.

The measurements taken on the Channel 9 studio site are in line with other RF EME measurements taken on other recent development sites adjacent to other nearby broadcast towers in the area. These other measurements confirm the veracity of the measurements provided in the previous Kordia report, and provide a reliable indicator of the RF EME levels anticipated at the proposed residential development.

3.3 SERVICES OPERATING ON WILLOUGHBY TOWER

Services operating from broadcast towers, including the Willoughby Tower do change over time.

Previously, the Willoughby Broadcast Tower was used for TV Broadcast, Digital Radio Broadcast, and FM Radio broadcast services. During the previous EME Measurements performed at the Channel 9 studios, only Analog Television services were broadcasting from the Willoughby tower. However, Analog Television services have now ceased, and only Digital TV services are located on the Willoughby Tower (at the 220m above ground level).

In the future, the configuration of services located on the Willoughby Tower may change. Any changes in service configurations has not been taken into account in this report. Any possible future broadcast antennas are most likely to be located near the top of the tower.

Previous measurements around this site and the other broadcast sites in the area show that RF EME levels at accessible apartment buildings and houses are very low (typically less than 5%) of the safe public limit. Previous measurements have included all FM and TV broadcast services operating nearby, and all nearby mobile phone services. These low RF EME levels at publicly accessible areas provide substantial safety factors from the actual measured levels to the safe public limits.

3.4 PROPOSED DEVELOPMENT USAGE

There has been significant debate in the community over the location of RF Transmission sites such as mobile phone base stations and TV/Radio Broadcast Towers. Many in the community question whether there should be exclusion zones within certain distances of residential areas, schools, hospitals, child care centres etc. However, there is no science-based reason to establish exclusion zones around such areas.

Many local councils have placed further conditions for approval of development applications of these sensitive use facilities such as:

"... where a centre is to be located within 300 metres of these electromagnetic sources, a report by a suitably qualified person is to be prepared to assess the potential exposure impacts on the child care centre..."

Based on current services normally operating on site, and previous measurements performed, the RF levels to be expected at readily accessible areas at/near ground levels of the proposed development would be below 1% of the general public reference level. This is well below the safety limits and is a comparable level that could be expected in any city environment.

If additional high powered services are added to the transmission tower, then a report by a suitably qualified person should be prepared to assess the potential RF exposure impacts under those new conditions.

3.5 RF SAFETY BACKGROUND

There has been a lot of research conducted worldwide to investigate possible health effects of radio communication and wireless technology. In relation to radiofrequency emissions and wireless technology and health, the general conclusion from the World Health Organisation (WHO) is:

"Despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health"

The World Health Organisation (WHO) also says:

"radio and television broadcast stations have been in operation for the past 50 years or more without any adverse health consequence been established"

3.6 RF SAFETY CONCLUSION

Based on the current broadcast services normally operating on the transmission tower and previous RF measurements taken, the RF field strength on the roof levels of the proposed residential development is expected to be approximately 5% of the general public reference level.

If additional high powered services are added to the transmission tower, then a report by a suitably qualified person should be prepared to assess the potential RF exposure impacts under those new conditions.

With respect to radiofrequency fields, and based on:

- the current TV and Radio service configurations on the transmission towers;
- the previous RF measurements taken;
- extrapolated data from previous experience and projects;
- and the statements from the World Health Organisation;

Kordia finds no logical reason not to recommend any human habitation at the proposed residential development site at 6-30 Artarmon Rd, Willoughby.

4. REFERENCES

4.1 TERMS AND DEFINITIONS

Antenna: A device that serves as a transducer between a guided wave (e.g. coaxial cable) and a free space wave, or vice versa. It can be used to emit or receive a radio signal.

General Public limits: The basic restrictions or reference levels as defined in the *ARPANSA RPS3 Standard*.

Radiofrequency (RF): A frequency of electromagnetic field oscillations that is useful for radio transmission and extends between 3 kHz and 300 GHz.

Reference levels: Practical exposure levels derived from the basic restrictions that may be used as a simpler, but more conservative, alternative approach for determining compliance with the basic restrictions.

4.2 ACRONYMS AND SYMBOLS

ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
EME	Electromagnetic energy in relation to effects on human health.
EMF	Electromagnetic fields
EMR	Electromagnetic radiation in relation to effects on human health.
RF	Radiofrequency

4.3 REFERENCE DOCUMENTS

The following references have been used in this report:

1. ARPANSA RP3 "Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz (2002)". This document is available at www.arpansa.gov.au
2. Ch 9 Studios-Willoughby, RF Hazard Survey Report, version R2. By Kordia Solutions, dated 9th November 2012.
3. 6-30 Artarmon Rd, Willoughby, CHROFI competition stage 2, dated 03.02.2016. - 160203_CHROFI_part 2_report_channel 9 Comp