



The Hon Malcolm Turnbull MP

MINISTER FOR COMMUNICATIONS



02 OCT 2014

Dr Dennis Jensen MP  
Chair  
Standing Committee on Petitions  
Parliament House  
CANBERRA ACT 2600

### Response to Petition Reference 934/1401

Dear ~~Dr Jensen~~

Thank you for your letter dated 14 July 2014, concerning a petition lodged with the Standing Committee on Petitions regarding a proposed National Broadband Network (NBN) tower in Pacific Haven, Queensland.

I have separately addressed the various matters raised in the petition. It should be noted that NBN Co Limited (NBN Co) was consulted on these matters and that information provided by NBN Co is reflected in my response.

#### *Planning processes*

Approvals for the installation of freestanding towers, such as the proposed tower at 300 Pacific Haven Circuit, Pacific Haven in Queensland, are subject to state and territory government planning laws. Planning laws generally require a development application to be submitted to the local council and for the council to consult on the application. Any objections to the development application should be made in accordance with the relevant state and local government requirements. The Commonwealth Government does not have the power to intervene in state, territory and local government planning processes.

NBN Co has advised that it held an informal information session for the Pacific Haven community on 12 June 2014 which was attended by about 30 community members. NBN Co has further advised that, as required by Queensland planning law, a further statutory consultation process took place in August 2014.

I would expect any potential impacts on property land values and road safety resulting from the construction of the tower to be considered as part of the planning processes.

### *Investigation of alternative sites*

Site selection is an operational matter for carriers, including NBN Co. In selecting a site for a tower, a range of factors are considered including the area to be covered, its geography and the availability of suitable sites. The facilities need to be located close to the community they are servicing.

NBN Co has advised that it undertook an analysis of alternative sites, as requested by local residents. Five alternative sites were considered. NBN Co considered that these alternative sites did not present a better planning outcome. Potentially detrimental outcomes included minor to significant loss of service coverage area and reduced signal quality from the tower. That said, to address residents' concerns, I understand that NBN Co sought the permission of the land owner to install the proposed facility a further 40 metres from the front of the property.

### *Visual impacts*

NBN Co seeks to strike a balance between providing valuable communications services and minimising any visual impacts on the community and local environment. NBN Co fixed wireless towers need to be located in, or near, the area for which they are designed to provide service coverage. While radio antennas need to be elevated above their surroundings to provide reliable, unbroken, communications, NBN Co proposes and designs its facilities to the minimum height necessary to provide good service to the local community. Subject to operational needs, NBN Co also seeks to maximise the distance of its proposed facility from the nearest adjoining land owners, so as to reduce any visual intrusion. NBN Co also seeks to take advantage of screening that can be provided by mature vegetation. Ultimately, concerns such as these need to be considered during planning processes.

### *Health concerns*

The Australian Radiation and Nuclear Safety Agency (ARPANSA), within the Health portfolio, is the Government agency responsible for advising about EME emissions. ARPANSA sets public health standards for exposure to EME. The relevant ARPANSA standard is the *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3kHz to 300GHz (2002)* (the ARPANSA Standard).

The Australian Communications and Media Authority (ACMA) radiocommunications licensing regime obligates licensees of radio transmitters to ensure that their facilities do not exceed general public exposure limits of the ARPANSA Standard at publicly accessible places. All fixed wireless base stations in Australia must comply with ARPANSA exposure limits.

The ARPANSA exposure limits are set well below the level at which adverse health effects are known to occur. The ARPANSA Standard is based upon international best practice and is consistent with guidelines published by the International Commission for Non-Ionizing Radiation Protection (ICNIRP) which have been adopted by many countries.

Fixed wireless base stations produce low EME levels in the everyday environment. Sample signal measurements of typical transmitter sites indicate ground-level signals are a very low percentage of the ARPANSA Standard limits. ARPANSA advises that the standards are applicable for all types of radio transmission within stated frequency limits, including wireless broadband technologies.

Before wireless base stations are built, carriers produce a report that shows the predicted maximum levels of EME at ground level around the new facility. The Radio Frequency National Archive website at [www.rfnsa.com.au](http://www.rfnsa.com.au) contains an internet archive of fixed wireless base stations and radiocommunication facilities in Australia. The predicted maximum level of exposure from the proposed facility has been calculated at 0.042 per cent of that allowed under the ARPANSA Standard. A copy of the report is attached for the information of the Committee. It should be noted that predicted EME levels are for a base station operating at its highest capacity and assumes that all transmitters are working at full rated power. In reality, base stations typically operate below full rated power levels.

ARPANSA has produced a factsheet on NBN wireless base stations and health. A copy of the factsheet is also attached for the Committee's information and is available at [www.arpansa.gov.au/RadiationProtection/Factsheets/is\\_nbn.cfm](http://www.arpansa.gov.au/RadiationProtection/Factsheets/is_nbn.cfm).

ARPANSA maintains continual oversight of emerging research into the potential health effects of EME emission in order to provide accurate and up-to-date advice to the Government and the Australian people. ARPANSA published a report on its recent expert review of EME exposure literature in March 2014. The review found that the exposure limits in the ARPANSA Standard continue to provide a high degree of protection against the known health effects of radiofrequency electromagnetic fields. Should scientific evidence indicate that the current ARPANSA Standard does not adequately protect the health of Australians, the Government would take immediate action to rectify the situation.

Further information about EME is available at [www.acma.gov.au/theACMA/electromagnetic-radiation](http://www.acma.gov.au/theACMA/electromagnetic-radiation), which is a site managed by the ACMA. If the Committee or petitioners wish to contact ARPANSA they can do so via [www.arpansa.gov.au](http://www.arpansa.gov.au) or by telephone on 1800 022 333.

Thank you for bringing this petition to my attention. I trust my reply will be conveyed to the residents of Pacific Haven.

  
Yours sincerely

Malcolm Turnbull



# National Broadband Network Fixed Wireless Base Stations and Health

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National Broadband Network (NBN) base stations use electromagnetic radiation to provide high speed broadband services to the community. The highest values of the radiofrequency electromagnetic energy (RF EME) that the public would be exposed to from the NBN base stations that are currently planned are less than 1/100 of the Australian public exposure limit. This means that the highest exposures are well below the levels at which any harmful effects are known to occur.

The NBN makes use of *fixed wireless* communications links to provide high-speed broadband in areas beyond the reach of the fibre network. Typically, this is where residential blocks are large and widely spaced.

The fixed wireless links use RF electromagnetic radiation (EMR), also called electromagnetic energy (EME), in the 2.3 GHz band to communicate between *NBN base stations* and small rooftop installations on residences and business premises.

Wireless base stations used for communications purposes, such as the NBN fixed wireless systems, are regulated by the Australian Communications and Media Authority (ACMA). The base stations must be operated in accordance with the ACMA Radiocommunications Licence Conditions (Apparatus Licence) Determination 2003. These licence conditions make mandatory the limits in the ARPANSA RF Standard which sets limits for human exposure to RF fields from all sources, including mobile phone and NBN base stations.

The ARPANSA RF Standard is based on scientific research that shows the levels at which harmful effects occur and it sets limits, based on international guidelines, well below these harmful levels. It is the assessment of ARPANSA and other national and international health authorities, including the World Health Organization (WHO), that there are no established adverse health effects below current exposure limits. The standard is intended to protect people of all ages and health status.

The maximum levels of exposure of RF EME from the NBN base stations may be calculated from details of the equipment installed. These calculations are made available in the ARPANSA EME reports provided by the telecommunications companies on the Radio Frequency National Site Archive (RFNSA) website, [www.rfnsa.com.au](http://www.rfnsa.com.au). The NBN sites may be located by searching by postcode or town.

For typical 30-40 m high NBN base stations, the highest exposure levels at ground level in the surrounding area are approximately within 0.001 – 0.01 watt/m<sup>2</sup> (0.1 – 1.0 µW/cm<sup>2</sup>) or less than 1/1,000 of the ARPANSA public exposure limit.

Where NBN base station antennas are mounted on the same structure as mobile phone base station antennas, the ARPANSA EME reports provide the overall exposures from the different technologies combined. For more information on mobile phone base station antennas please see **Useful Links** following.

## Summary

NBN base stations use electromagnetic radiation to provide high speed broadband services to the community. The base stations use similar technology to 4G mobile phones and produce very low exposures to EMR (or EME) in the surrounding area, even very close to the installation. There are no established health effects from these very low levels of RF EMR.

## Useful Links

- ARPANSA Factsheets on RF EMR and EME  
[www.arpansa.gov.au/radiationprotection/FactSheets/is\\_antenna.cfm](http://www.arpansa.gov.au/radiationprotection/FactSheets/is_antenna.cfm)
- ARPANSA EME Reports  
[www.arpansa.gov.au/emereports/index.cfm](http://www.arpansa.gov.au/emereports/index.cfm)
- ARPANSA RF Exposure Standard  
[www.arpansa.gov.au/publications/Codes/rps3.cfm](http://www.arpansa.gov.au/publications/Codes/rps3.cfm)
- NBN Co Limited  
[www.nbnco.com.au](http://www.nbnco.com.au)
- Radio Frequency National Site Archive  
[www.rfnsa.com.au](http://www.rfnsa.com.au)
- World Health Organization Factsheet on Wireless Technologies  
[www.who.int/mediacentre/factsheets/fs304/en/index.html](http://www.who.int/mediacentre/factsheets/fs304/en/index.html)

More information is from the ARPANSA website [www.arpansa.gov.au](http://www.arpansa.gov.au).

## **Environmental EME Report**

### **Pacific Haven 300 Pacific Haven Circuit, PACIFIC HAVEN QLD 4659**

**This report provides a summary of Calculated RF EME Levels around the wireless base station**

**Date 20/5/2014**

**RFNSA Site No. 4659010**

### **Introduction**

The purpose of this report is to provide calculations of EME levels from the existing facilities at the site and any proposed additional facilities.

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless base station at Pacific Haven 300 Pacific Haven Circuit PACIFIC HAVEN QLD 4659. These levels have been calculated by Ericsson using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

The maximum EME level calculated for the proposed systems at this site is 0.042% of the public exposure limit.

### **The ARPANSA Standard**

ARPANSA, an Australian Government agency in the Health and Ageing portfolio, has established a Radiation Protection Standard specifying limits for general public exposure to RF transmissions at frequencies used by wireless base stations. The Australian Communications and Media Authority (ACMA) mandates the exposure limits of the ARPANSA Standard.

### **How the EME is calculated in this report**

The procedure used for these calculations is documented in the ARPANSA Technical Report "Radio Frequency EME Exposure Levels - Prediction Methodologies" which is available at <http://www.arpansa.gov.au>.

RF EME values are calculated at 1.5m above ground at various distances from the base station, assuming level ground.

The estimate is based on worst-case scenario, including:

- wireless base station transmitters for mobile and broadband data operating at maximum power
- simultaneous telephone calls and data transmission
- an unobstructed line of sight view to the antennas.

In practice, exposures are usually lower because:

- the presence of buildings, trees and other features of the environment reduces signal strength
- the base station automatically adjusts transmit power to the minimum required.

Maximum EME levels are estimated in 360° circular bands out to 500m from the base station.

These levels are cumulative and take into account emissions from all mobile phone antennas at this site.

The EME levels are presented in three different units:

- volts per metre (V/m) – the electric field component of the RF wave
- milliwatts per square metre (mW/m<sup>2</sup>) – the power density (or rate of flow of RF energy per unit area)
- percentage (%) of the ARPANSA Standard public exposure limit (the public exposure limit = 100%).

### **Results**

The maximum EME level calculated for the proposed systems at this site is 1.25 V/m; equivalent to 4.16 mW/m<sup>2</sup> or 0.042% of the public exposure limit.

## Radio Systems at the Site

There are currently no existing radio systems for this site.

It is proposed that this base station will have equipment for transmitting the following services:

Carrier	Radio Systems
NBN Co	LTE2300 (proposed)

## Calculated EME Levels

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined.

Distance from the antennas at Pacific Haven 300 Pacific Haven Circuit in 360° circular bands	Maximum Cumulative EME Level – All carriers at this site					
	Existing Equipment			Proposed Equipment		
	Electric Field V/m	Power Density mW/m <sup>2</sup>	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m <sup>2</sup>	% ARPANSA exposure limits
0m to 50m				0.49	0.63	0.0063%
50m to 100m				0.55	0.8	0.008%
100m to 200m				0.6	0.94	0.0094%
200m to 300m				1.23	3.98	0.04%
300m to 400m				1.25	4.16	0.042%
400m to 500m				1.18	3.7	0.037%
<b>Maximum EME level</b>				1.25	4.16	0.042
	315.67 m from the antennas at Pacific Haven 300 Pacific Haven Circuit					

## Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest that have been identified through the consultation requirements of the Communications Alliance Ltd Deployment Code C564:2011 or via any other means. The calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Additional Locations	Height / Scan relative to location ground level	Maximum Cumulative EME Level All Carriers at this site Existing and Proposed Equipment		
		Electric Field V/m	Power Density mW/m <sup>2</sup>	% of ARPANSA exposure limits
Residence 1	0m to 3m	0.31	0.25	0.0025%
Residence 2	0m to 3m	0.58	0.91	0.0091%
Residence 3	0m to 3m	1.018	2.75	0.028%
Residence 5	0m to 3m	0.8	1.69	0.017%
Residence 4	0m to 3m	0.47	0.59	0.0059%

## RF EME Exposure Standard

The calculated EME levels in this report have been expressed as percentages of the ARPANSA RF Standard and this table shows the actual RF EME limits used for the frequency bands available. At frequencies below 2000 MHz the limits vary across the band and the limit has been determined at the Assessment Frequency indicated. The four exposure limit figures quoted are equivalent values expressed in different units – volts per metre (V/m), watts per square metre (W/m<sup>2</sup>), microwatts per square centimetre (μW/cm<sup>2</sup>) and milliwatts per square metre (mW/m<sup>2</sup>). Note: 1 W/m<sup>2</sup> = 100 μW/cm<sup>2</sup> = 1000 mW/m<sup>2</sup>.

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m <sup>2</sup> = 450 μW/cm <sup>2</sup> = 4500 mW/m <sup>2</sup>
GSM900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m <sup>2</sup> = 450 μW/cm <sup>2</sup> = 4500 mW/m <sup>2</sup>
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m <sup>2</sup> = 900 μW/cm <sup>2</sup> = 9000 mW/m <sup>2</sup>
UMTS2100, WCDMA2100	2110 – 2170 MHz	2000 MHz	61.4 V/m = 10.00 W/m <sup>2</sup> = 1000 μW/cm <sup>2</sup> = 10000 mW/m <sup>2</sup>

## Further Information

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a Federal Government agency incorporated under the Health and Ageing portfolio. ARPANSA is charged with responsibility for protecting the health and safety of people, and the environment, from the harmful effects of radiation (ionising and non-ionising).

Information about RF EME can be accessed at the ARPANSA website, <http://www.arpansa.gov.au>, including:

- Further explanation of this report in the document "Understanding the ARPANSA Environmental EME Report"
- The procedure used for the calculations in this report is documented in the ARPANSA Technical Report; "Radio Frequency EME Exposure Levels - Prediction Methodologies"
- the current RF EME exposure standard  
 Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2002, 'Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz', Radiation Protection Series Publication No. 3, ARPANSA, Yallambie Australia.  
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The Australian Communications and Media Authority (ACMA) is responsible for the regulation of broadcasting, radiocommunications, telecommunications and online content. Information on EME is available at <http://emr.acma.gov.au>

The Communications Alliance Ltd Industry Code C564:2011 'Mobile Phone Base Station Deployment' is available from the Communications Alliance Ltd website, <http://commsalliance.com.au>.

Contact details for the Carriers (mobile phone companies) present at this site and the most recent version of this document are available online at the Radio Frequency National Site Archive, <http://www.rfnsa.com.au>.