5.1. MATERIAL CHANGE OF USE (CODE ASSESSMENT) - TELECOMMUNICATION FACILITIES - 21R SPRING CREEK ROAD, MOWBRAY

REPORT AUTHOR(S):	Susanna Andrews
GENERAL MANAGER:	Michael Kriedemann, Acting General Manager Operations
DEPARTMENT:	Development and Environment

PROPOSAL	Material Change of Use (Code Assessment) - Telecommunication Facilities
APPLICANT	NBN Co Limited c/- Aurecon Australasia Pty Ltd Locked Bag 331 BRISBANE QLD 4001
LOCATION OF SITE	21R Spring Creek Road, Mowbray
PROPERTY	Lot 11 on SP212654
LOCALITY PLAN	
LOCALITY	Rural Areas and Rural Settlements
PLANNING AREA	Rural
PLANNING SCHEME	Douglas Shire Planning Scheme 2008
REFERRAL AGENCIES	None
NUMBER OF SUBMITTERS	Not Applicable
STATUTORY ASSESSMENT DEADLINE	30 September 2015

APPLICATION DATE 6 August 2015

RECOMMENDATION

That Council approves the development application for Telecommunication Facilities (41 metre high monopole) over land described as Lot 11 on SP212654, located at 21R Spring Creek Road, Mowbray, subject to the following:

APPROVED DRAWING(S) AND / OR DOCUMENT(S)

The term 'approved drawing(s) and / or document(s)' or other similar expressions means:

ASSESSMENT MANAGER CONDITIONS

Drawing or Document	Reference	Date
Overall Site Plan	4MOS-51-09MOWB-C2 Rev 01	3 August 2015
Site Set Out Plan	4MOS-51-09MOWB-C3 Rev 01	3 August 2015
Site Elevation and Details	4MOS-51-09MOWB-C4 Rev 01	3 August 2015

1. **Carry out the approved development generally in accordance with the approved drawing(s) and/or document(s), and in accordance with:**

   a. **The specifications, facts and circumstances as set out in the application submitted to Council; and**

   b. **The following conditions of approval and the requirements of Council's Planning Scheme and the *FNQROC Development Manual*.**

   Except where modified by these conditions of approval

Timing of Effect

2. **The conditions of the Development Permit must be effected prior to Commencement of Use, except where specified otherwise in these conditions of approval.**

Colours

3. **The exterior finishes and colours of the facility must be non-reflective and must blend with the natural colours of the surrounding environment.**

Fencing and Signage

4. **Construct fencing for the perimeter of the facility with a minimum 1.8 metre high mesh security fence painted the same or similar colour as the facility. The facility is to be signed with appropriate hazard and warning signs.**

Damage to Council Infrastructure

5. **In the event that any part of Council's existing infrastructure is damaged as a result of construction activities occurring on the site, including but not limited to, mobilisation of heavy construction equipment, stripping or grubbing, the applicant/owner must notify Douglas Shire Council immediately of the affected**

infrastructure and have it repaired or replaced at the developer's cost, prior to Commencement of Use.

Lawful Point of Discharge

6. All stormwater from the property must be directed to a lawful point of discharge such that it does not adversely affect surrounding properties or properties downstream from the development, all to the requirements and satisfaction of the Chief Executive Officer.

Health

7. The facility must comply with all relevant State and National Standards in relation to emission of light, vibration, odour and radiation.

ADVICE

1. This approval, granted under the provisions of the *Sustainable Planning Act* 2009, shall lapse four (4) years from the day the approval takes effect in accordance with the provisions of the *Sustainable Planning Act* 2009.

2. All building site managers must take all action necessary to ensure building materials and / or machinery on construction sites are secured immediately following the first cyclone watch and that relevant emergency telephone contacts are provided to Council officers, prior to commencement of works.

3. This approval does not negate the requirement for compliance with all other relevant Local Laws and other statutory requirements.

4. For information relating to the *Sustainable Planning Act* 2009 log on to www.dilgp.qld.gov.au . To access the *FNQROC Development Manual*, Local Laws and other applicable Policies log on to www.douglas.qld.gov.au .

LAND USE DEFINITIONS*

In accordance with the Douglas Shire Planning Scheme 2008, the approved land use of Telecommunication Facilities is defined as:

Means the use of premises for the provision of telecommunication services.

The use excludes Low Impact Telecommunications Facilities as defined by the Telecommunications (Low Impact Facilities Determination) 1997 under the Telecommunications Act.

*This definition is provided for convenience only. This Development Permit is limited to the specifications, facts and circumstances as set out in the application submitted to Council and is subject to the abovementioned conditions of approval and the requirements of Council's Planning Scheme and the *FNQROC Development Manual*.

EXECUTIVE SUMMARY

Approval is sought for the use and development of a telecommunications facility, comprising a 41 metre monopole and an outdoor cabinet to be located at the base of the facility within a secure compound which measures approximately 100m^2 in area.

The site subject to the application is located at 21 Spring Creek Road, Mowbray and is included within the Rural Planning Area under the Douglas Shire Planning Scheme 2008.

The central issue of non-compliance relates to the Acceptable Measure for height within the Rural Areas and Rural Settlements Locality Code. Although exceeding the Acceptable Measure for height within the code, the nature of the facility requires a height of 41m to operate effectively. The excess of height is considered acceptable due to the facility having a slim line appearance which will not compromise the surrounding development or environment, having a small footprint which will maintain the character of the locality and the existing vegetation on the site will assist in screening the facility from surrounding views.

Overall the proposed facility is consistent with similar facilities scattered throughout the shire and approval is recommended subject to conditions.

TOWN PLANNING CONSIDERATIONS

Background

The subject site is located at 21 Spring Creek Road, Mowbray, legally described as Lot 11 on SP212654 and is made up of two separate parcels that are separated by a road reserve. The site is currently included within the Rural Planning Area under the Douglas Shire Planning Scheme 2008.

The site borders Tresize Road to the west, and private rural/rural residential properties to the north, east and south. The northern parcel is currently vacant, primarily containing a large area of mature vegetation and sugar cane. The southern parcel currently contains a dwelling and shed and is used predominantly for sugar cane cultivation. Vehicular access is via an unsealed track off Tresize Road.

The site and surrounding area predominantly consists of rural and rural residential land uses with large allotments and associated dwellings. The closest dwelling is situated approximately 125m south of the proposed facility. Another dwelling is located approximately 175 metres to the north east of the facility.

Proposal

The layout plan is included in Attachment 1. It is proposed to site a 10 metre x 10 metre NBN compound in the north western portion of the property in the northern parcel of land. Access to the compound will be via the existing unsealed track connected to Tresize Road. The compound will contain a 41 metre high telecommunications monopole and a 7.5m^2 outdoor cabinet. The cabinet will be located on a concrete slab at the base of the facility surrounded by secure fencing. The proposed monopole will feature a circular head frame at the top of the pole with three panel antennas measuring approximate 1.2 metres in length. One parabolic dish will also be installed close to the top of the monopole. The photographs below indicate the location of the monopole.

Site access is appropriate for the proposed use. Once operational, the facility will require once annual maintenance visits, but will be unattended at all other times.

Proposed location of the facility (indicated by arrow)

View from Tresize Road looking north-east towards the proposed facilities (arrowed)

Photomontages of the telecommunications tower are shown in Attachment 3.

The proposed facility is deemed necessary to provide NBN fixed wireless coverage to the rural residential areas within the Mowbray Valley.

State Planning Requirements

State Planning Regulatory Provisions

No State Planning Regulatory Provisions are relevant to this application.

State Planning Policy

The State Planning Policy is relevant to the assessment of this application where a State interest is not appropriately reflected in the Planning Scheme relevant to the site. 'Part E: Interim development assessment requirements' outlines the State interests and associated development requirements which are to be considered in relation to certain development applications. An assessment against Part E reveals that none of the State interests apply to the proposed development.

Douglas Shire Planning Scheme Assessment

The proposed monopole is defines as 'Telecommunication Facilities' in the Planning Scheme. Telecommunication facilities are code assessable development in the Rural Planning Area. The following codes apply:

Douglas Shire Rural Areas and Rural Settlements Planning Locality		Code Applicability	Compliance
Locality	Rural Areas and Rural Settlements	✓	✓ ***(see comments below)***
Planning Area	Rural	✓	✓ ***(see comments below)***
Defined Use	Telecommunications Facilities	✓	✓ ***(see comments below)***
Overlay Codes	Acid Sulfate Soils Code	✓	n/a
	Cultural Heritage and Valuable Sites Code	✓	n/a
	Natural Hazards Code	✓	✓
General Codes	Design and Siting of Advertising Devices Code	✓	n/a
	Filling and Excavation Code	✓	n/a
	Landscaping Code	✓	✓
	Natural Areas and Scenic Amenity Code	✓	✓
	Reconfiguring a Lot Code	✓	n/a
	Vehicle Parking and Access Code	✓	✓
	Sustainable Development Code	✓	n/a

Compliance Issues

Rural Areas and Rural Settlements Code

A1.1 of the Rural Areas and Rural Settlements Locality Code identifies that in all Planning Areas in this locality the maximum height of buildings/structures is 6.5m and 2 storeys.

The proposed facility (41 metre monopole) would be defined as a structure under the Douglas Shire Planning Scheme 2008. Notwithstanding this, the proposed Telecommunications facility is not consistent with A1.1 as it exceeds 6.5m in height. It is noted the height of the proposed tower is necessary in order to ensure that there is sufficient coverage for the whole of the Mowbray Valley.

Despite non-compliance with the acceptable solution, it is considered that the proposed height of the facility will not adversely affect the character of the locality by means of the following:

- The facility will have a slim line appearance which will not compromise the surrounding development or environment;
- The facility will have a small footprint which will maintain the character of the locality and will not result in the degradation of the environment; and
- The existing vegetation and surrounding undulating topography on the site and in surrounding areas will assist in screening the facility from surrounding views.

Based on the above and given the nature of the facility, the excess in height is considered acceptable in this case.

Rural Planning Area Code:

Performance Criteria P2 of the Rural Planning Area Code Relating to Good Quality Agricultural Land (GQAL) identifies that GQAL is only used for agricultural uses and primary production purposes.

The part of the site subject to the application is not currently used for agricultural production (sugar cane). The small lease area of 100m² will therefore not impact on the agricultural capabilities of the surrounding land and is therefore not in conflict with the GQAL specifications in the Douglas Shire Planning Scheme 2008.

Telecommunication Facilities Code:

The Telecommunication Facilities Code identifies that Telecommunication Facilities are located so as to minimise their impact on the landscape or townscape.

The Acceptable Measure A1.1 of the Telecommunication Facilities Code identifies that Telecommunication Facilities are located underground; OR Telecommunication Facilities are co-located with other telecommunication Facilities; OR Telecommunication Facilities are located in or on an existing structure AND Telecommunication Facilities are not located on the exterior of any Building identified on any relevant Cultural Heritage/Valuable Site Overlay on any relevant Locality Map.

The proposed facility is not compliant with A1.1. The applicant proposes to construct a new telecommunication facility as the closest facility (3.4km away) is not adequate to extend coverage into the Mowbray River Valley. As a result, a new 41m monopole is proposed.

Although the facility comprises a significant height, it has been intentionally located within a rural area with the aim of balancing coverage objectives and resulting environmental and visual impacts.

The impact on the townscape will be minimised as the monopole is designed to have a slim line appearance from all viewpoints. This design is appropriate for agricultural areas as it will effectively blend with rural backdrops.

Based on the above and given the nature of the facility the proposal is likely to have a minimal impact on the landscape and townscape and is considered acceptable in this case.
A Performance Criteria of the Telecommunication Facilities Code identifies that Telecommunication Facilities are sited and designed such that they are visually integrated, as much as possible, with the landscape or townscape so as not to be visually obtrusive. The subsequent Acceptable Measures identifies that:

- (A2.1) The height of any Telecommunication facility does not protrude more than 1m above the level of existing tree canopy or ridgelines or the Building rooftops in the townscape;
- (A2.2) The Telecommunication Facilities are painted a colour which blends in with the surrounding landscape/townscape;
- (A2.3) Telecommunication Facilities are sited to minimise the potential of over shadowing on adjoining and nearby land uses; and
- (A2.4) Telecommunication Facilities are located predominantly in industrial, commercial and rural areas.

The proposed telecommunications facility will extend some 10-12m above the existing tree canopy and will not be consistent with A2.1. However the proposed facility will be consistent with the Performance Criteria by means of the following:

- The proposed facility will not obstruct any significant views or landmarks in the community or vicinity;
- The proposed facility is setback 125 metres from the closest residential dwelling. This will minimise visual impact on the rural landscape and the Mowbray Valley;
- The proposed monopole has been designed to have a slim line appearance to enable the facility to visually integrate with existing mature vegetation and rural backdrop; and
- The proposed monopole is to be located in an area surrounded by dense vegetation. This location has been selected based on its ability to screen the proposed facility.

With respect to A2.2, the facility will be colour matched to the area which will effectively blend with the landscape of the area. Conditions have been included to ensure compliance.

With respect to A2.3, given the location and form of the facility, the proposed monopole will not result in overshadowing of residential properties.

With respect to A2.4, the proposed telecommunication facility is located in a rural area which is a preferred location. Impacts on the continued use of the site are considered to be minimal. The use of this part of the lot will not detrimentally affect the agricultural use of the balance site.

Based on the above and given the nature of the facility the proposal is likely to have minimal impact on the landscape and townscape and is considered acceptable in this case.

With reference to Community Safety A4.1 of the code identifies that emission of light, vibration, smell or radiation beyond the site meets the state and national standards. The applicant has indicated that the telecommunications facility will be operated in compliance with the mandatory standard for human exposure to Electromagnetic Frequency (EME), using methodology used by the Australian Radiation protection and Nuclear Safety Agency (ARPANSA). The EME Report attached in Appendix 3 demonstrates the maximum cumulative EME will be 0.09% of the mandated exposure limit. Based on this, no concerns are raised in relation to community safety.

Natural Areas and Scenic Amenity Code:

The site selected for the proposed telecommunications facility is considered acceptable due to its large lot size and its current use as agricultural land. The proposal is also set back over 150 metres from Tresize Road. Additionally, the lease area is a mere 10m x 10m and site disruption is negligible. Given these factors, it is considered the establishment of a telecommunications facility will not in any way impact upon the environmental values of the site.

Based on the above and given the nature of the facility the proposal is likely have minimal impact on natural areas and scenic amenity of the locality.

Vehicle Parking and Access Code:

Access to the site will be via an existing access track off Tresize Road. The proposed telecommunications facility is self-contained and operates on a continuous un-staffed basis. Once operational, and integrated within the network, the facility typically requires only annual or half-yearly maintenance inspections. However, this would not be for a prolonged period and is not anticipated to be frequent enough to require designated parking spaces. There is sufficient space already associated with the existing use of the site that will provide ample parking spaces if required.

As the proposed development requires minimal car parking and access, the existing facilities are considered sufficient. Overall, the proposal is compliant with the code.

Referral Agency Requirements

Not applicable

Public Notification / Submissions

As the application is Code assessable, notification of the application is not required.

However the applicant's consultants (Aurecon) undertook voluntary consultation which included a mail out to people living within 1 kilometre of the proposed telecommunications facility and a community information session held on 3 September 2015 which was attended by fifteen (15) residents. Aurecon has supplied a copy of the submission and their response to that submission (see Attachment 4).

ADOPTED INFRASTRUCTURE CHARGES

The proposed development does not trigger Adopted Infrastructure Charges.

COUNCIL'S ROLE

Council can play a number of different roles in certain circumstances and it is important to be clear about which role is appropriate for a specific purpose or circumstance. The implementation of actions will be a collective effort and Council's involvement will vary from information only through to full responsibility for delivery.

The following area outlines where Council has a clear responsibility to act:

Regulator: Meeting the responsibilities associated with regulating activities through legislation or local law.

Under the *Sustainable Planning Act* 2009 and the *Sustainable Planning Regulation* 2009, Council is the assessment manager for the application.

ATTACHMENTS

Attachment 1 – Approved Plan(s) & Document(s)
Attachment 2 – Supporting Information to Planning Report
Attachment 3 – Aurecon's response to submission

SITE LOCATION

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http://creativecommons.org/licences/by-sa/2.0/
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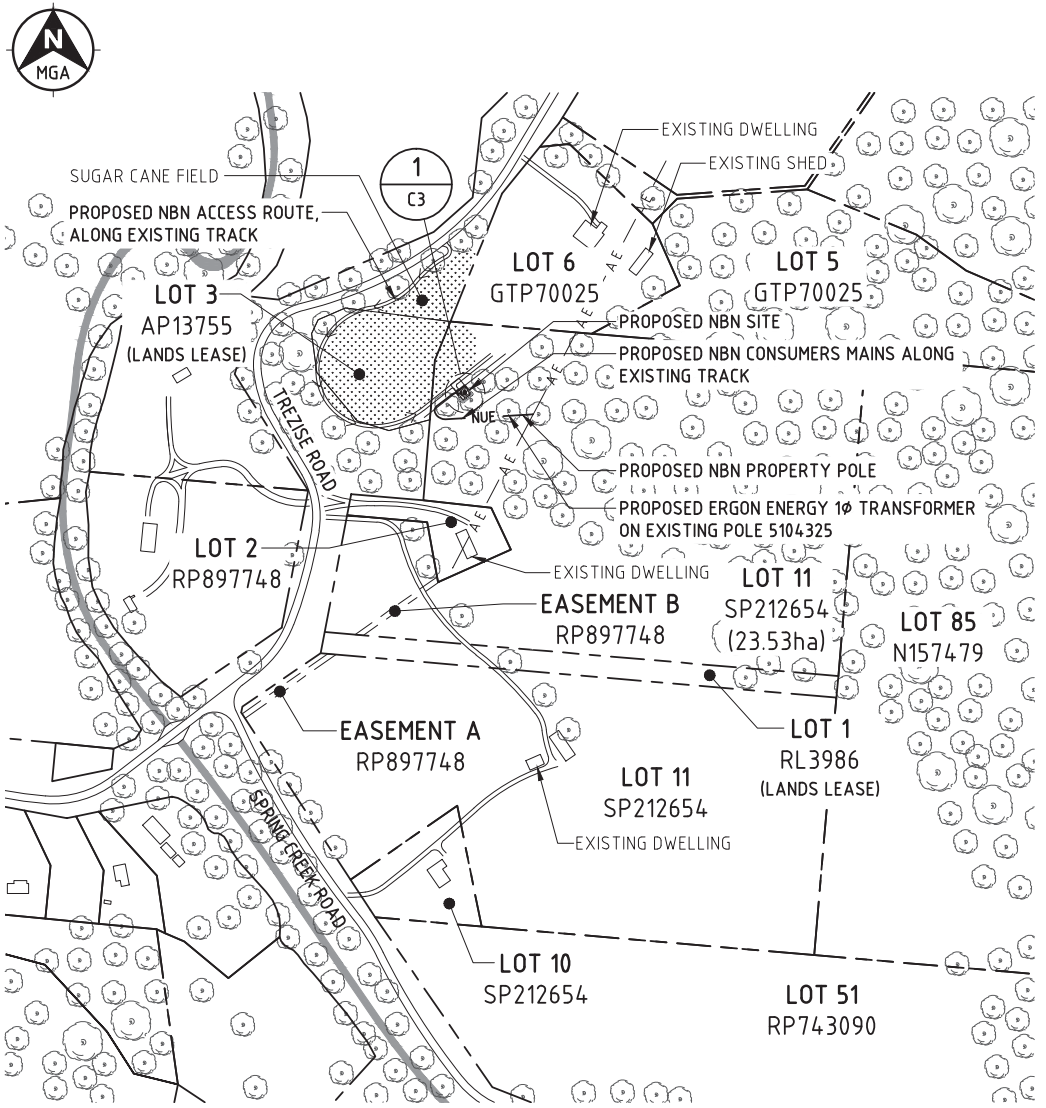
SITE CO-ORDINATES

MONOPOLE LOCATION

DATUM: MGA (GDA94)	ZONE: 55
LATITUDE	-16.56446°
LONGITUDE	145.47917°
EASTING	337 732
NORTHING	8 168 011



OVERALL SITE PLAN

SCALE 1:5000

LEGEND

- NUE NUE — NBN UNDERGROUND ELECTRICAL ROUTE
- AE AE — EXISTING AERIAL ELECTRICAL ROUTE
- PROPERTY BOUNDARY

NOTE:

THE NBN CONSUMER MAINS ROUTE SHOWN ON THE DRAWINGS IS INDICATIVE ONLY. ELECTRICAL CONTRACTOR TO DETERMINE EXACT ROUTE. ELECTRICAL CONTRACTOR TO LOCATE AND IDENTIFY EXISTING U/G SERVICES PRIOR TO COMMENCEMENT OF WORK.

Client: nbn

Client: ERICSSON

Client:

Project:

NATIONAL BROADBAND NETWORK
SITE No: 4MOS-51-09-MOWB
MOWBRAY
21 SPRING CREEK ROAD
MOWBRAY
QLD 4877

PRELIMINARY

Rev	Date	Revision Details
01	03.08.15	PRELIMINARY ISSUE

aurecon
Aurecon Australia Pty Ltd ABN 54 005 139 873

DESIGNED:	MR
CHECKED:	JR
APPROVED:	LS

Drawing Title:
OVERALL SITE PLAN

Drawing No.	Revision
4MOS-51-09-MOWB-C2	01

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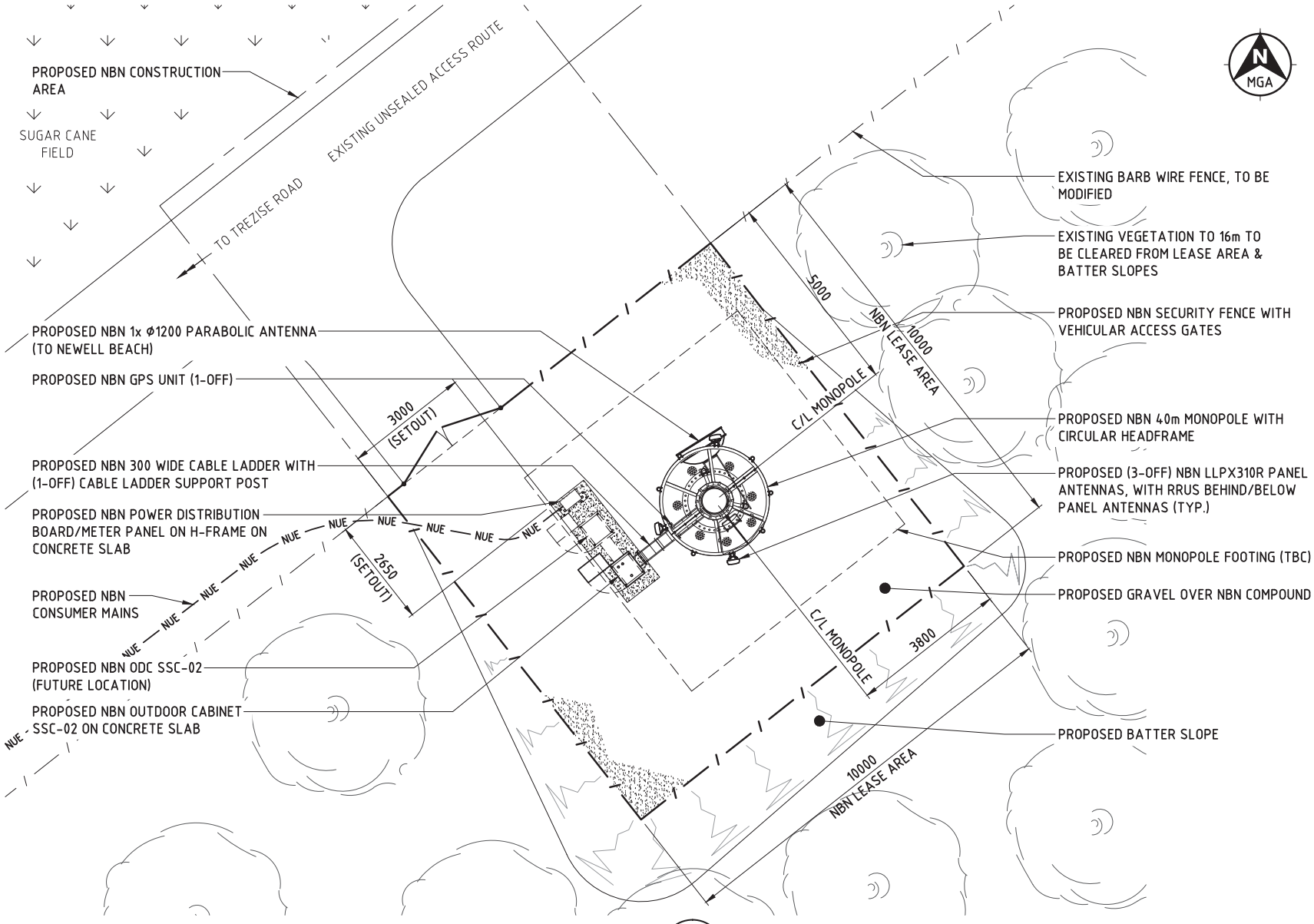
A3



DETAIL 1/C2
SCALE 1:100

LEGEND

- NUE — NUE — NBN UNDERGROUND ELECTRICAL ROUTE
- ec — ec — FINAL ELECTRICAL CIRCUITS IN 2x50ø HDPVC UNDERGROUND ELECTRICAL CONDUIT
- / — / — NBN COMPOUND FENCE LEASE AREA
- — — — PROPERTY BOUNDARY

NOTES:

1. REFER STANDARD DRAWING NBN-STD-0026 FOR CONDUIT DEPTHS AND COVER AND FOR CLEARANCE FROM OTHER CARRIERS AND SERVICES.
2. THE NBN AND CONSUMER MAINS ROUTE SHOWN ON THE DRAWINGS IS INDICATIVE ONLY. ELECTRICAL CONTRACTOR TO DETERMINE EXACT ROUTE. ELECTRICAL CONTRACTOR TO LOCATE AND IDENTIFY EXISTING U/G SERVICES PRIOR TO COMMENCEMENT OF WORK.

Client: nbn

Client: ERICSSON

Client:

Project:
NATIONAL BROADBAND NETWORK
SITE No: 4MOS-51-09-MOWB
MOWBRAY
21 SPRING CREEK ROAD
MOWBRAY
QLD 4877

PRELIMINARY

Rev	Date	Revision Details
01	03.08.15	PRELIMINARY ISSUE

aurecon
Aurecon Australia Pty Ltd ABN 54 005 139 873

DESIGNED:	MR
CHECKED:	JR
APPROVED:	LS

Drawing Title:
SITE SETOUT PLAN

Drawing No.: 4MOS-51-09-MOWB-C3
Revision: 01

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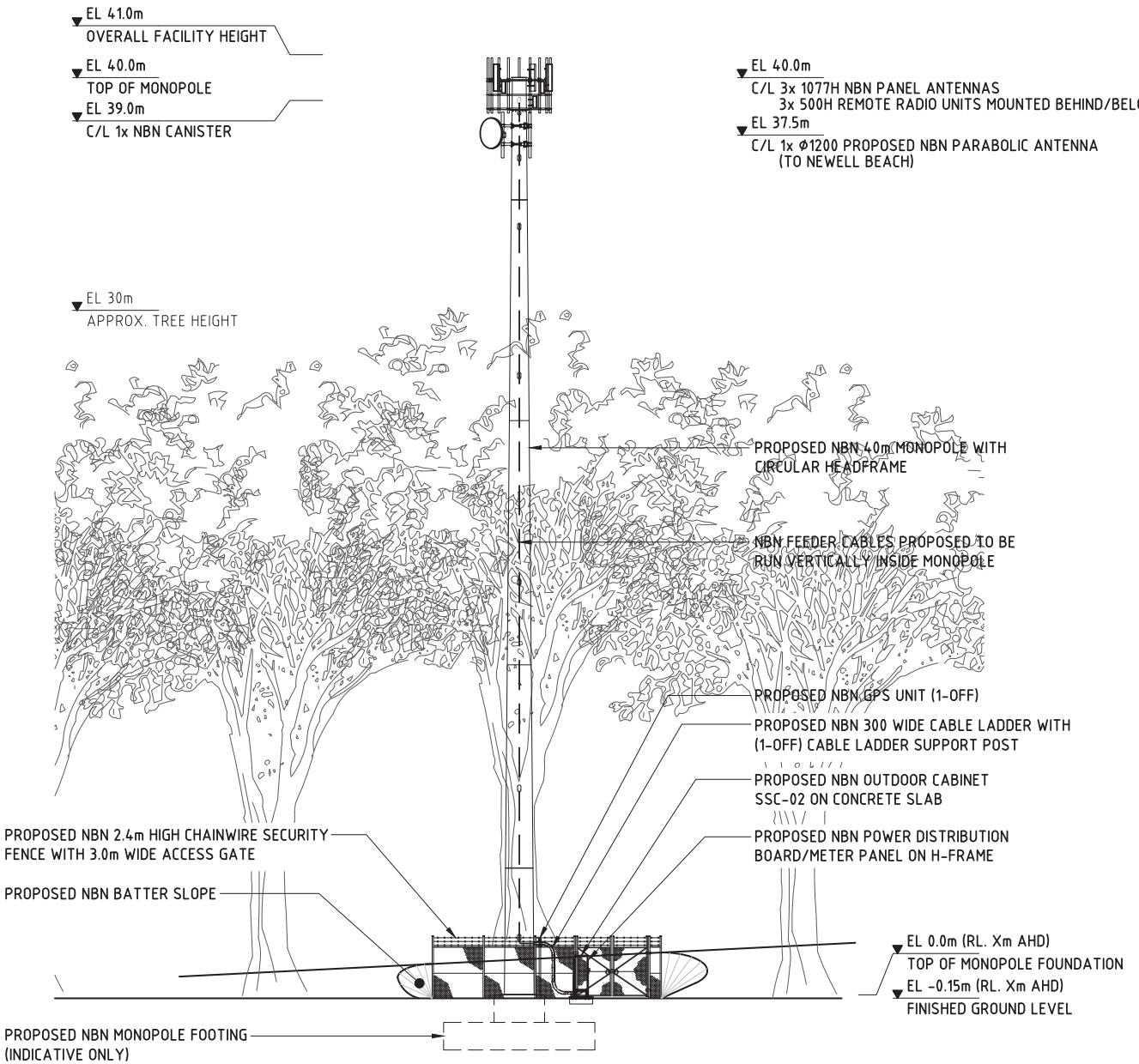
A3



NORTHWEST ELEVATION

SCALE 1:200

Client:

Client:

ERICSSON

Client:

Project:

NATIONAL BROADBAND NETWORK
SITE No: 4MOS-51-09-MOWB
MOWBRAY
21 SPRING CREEK ROAD
MOWBRAY
QLD 4877

PRELIMINARY

Rev	Date	Revision Details
01	03.08.15	PRELIMINARY ISSUE

aurecon
Aurecon Australia Pty Ltd ABN 54 005 139 873

DESIGNED:	MR
CHECKED:	JR
APPROVED:	LS

Drawing Title:
SITE ELEVATION AND DETAILS

Drawing No. 4MOS-51-09-MOWB-C4
Revision 01

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A3

Environmental EME Report
Mowbray 21 Spring Creek Road, MOWBRAY QLD 4877

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

Date 15/7/2015 RFNSA Site No. 4877004

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 Mowbray 21 Spring Creek Road MOWBRAY QLD 4877 . 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 0.09% 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/m²) – 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 1.84 V/m; equivalent to 8.98 mW/m² or 0.09% 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 Mowbray 21 Spring Creek Road in 360° circular bands	Maximum Cumulative EME Level – All carriers at this site					
	Existing Equipment			Proposed Equipment		
	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m²	% ARPANSA exposure limits
0m to 50m				0.71	1.35	0.013%
50m to 100m				0.6	0.94	0.0094%
100m to 200m				1.55	6.38	0.064%
200m to 300m				1.84	8.98	0.09%
300m to 400m				1.74	8.069	0.081%
400m to 500m				1.36	4.92	0.049%
Maximum EME level				1.84	8.98	0.09
				253.13 m from the antennas at Mowbray 21 Spring Creek Road		

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/m²	% of ARPANSA exposure limits
Residence 2 on Trezise Road	0m to 3m	0.44	0.51	0.0051%
Residence 1 on Spring Creek road	0m to 3m	1.37	5.0046	0.05%
Residence 1 On Trezise road	0m to 3m	1.036	2.85	0.028%
Residence 2 On Spring Creek road	0m to 3m	1.21	3.89	0.039%

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/m²), microwatts per square centimetre (µW/cm²) and milliwatts per square metre (mW/m²). Note: 1 W/m² = 100 µW/cm² = 1000 mW/m².

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
LTE 700	758 – 803 MHz	750 MHz	37.6 V/m = 3.75 W/m² = 375 µW/cm² = 3750 mW/m²
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM900, LTE900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m² = 450 µW/cm² = 4500 mW/m²
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m² = 900 µW/cm² = 9000 mW/m²
LTE2100, WCDMA2100	2110 – 2170 MHz	2100 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2300	2302 – 2400 MHz	2300 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE2600	2620 – 2690 MHz	2600 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²
LTE3500	3425 – 3575 MHz	3500 MHz	61.4 V/m = 10.00 W/m² = 1000 µW/cm² = 10000 mW/m²

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.
  [Printed version: ISBN 0-642-79400-6 ISSN 1445-9760] [Web version: ISBN 0-642-79402-2 ISSN 1445-9760]

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.

Response to Public Submissions, Telecommunications Proposal for 21 Spring Creek Road, Mowbray

Prepared for: Douglas Shire Council

Visual Impact

The submission received raised concerns regarding the potential visual impact of the proposed facility on the surrounding area.

Before lodging this Development Application, **nbn** C/- Aurecon thoroughly investigated a number of sites for the most appropriate and technically feasible location to service Mowbray. From these initial investigations, a candidate was selected that best fulfilled the radio frequency, planning, property and engineering discipline requirements, as well as taking into account anticipated community and local Council concerns.

The Mowbray community comprises predominately of rural land uses. These properties typically contain dwellings that are separated by areas of agricultural land and vegetated corridors. The Mowbray area is surrounded by high ridgelines that extend across all directions. Like all radio communications, fixed wireless facilities need to be located in elevated positions, above their surroundings to achieve constant, reliable communications. The proposed location was chosen as it was considered to be the best location given:

- The undulating topography in conjunction with the existing vegetation in the wider area, will provide screening to the facility when travelling along Spring Creek Road, Trezise Road and from viewpoints within the wider area;

- The proposed location provides separation from neighbouring dwellings (closest dwelling located approximately 125 m to the south) and is within proximity to only five (5) residential dwellings within a 400m radius; and

- Given the natural ground elevation, the height of the proposed facility can be restricted to 40 m and a monopole structure (compared to higher facilities required at alternative candidates), whilst still achieving reliable coverage to the Mowbray community.

It is considered the likelihood of viewing the proposed facility from the Mowbray township will be negligible due to the separation distance to the facility as well as the dense vegetation surrounding the subject property which will provide a significant buffer between the proposed facility and the township of Mowbray. When travelling along Spring Creek Road and Trezise Road, the existing vegetation lining the road corridor and within the wider area will provide screening to the facility. While the proposed facility may be visible from certain viewpoints in the area, it is anticipated that only the top of the facility will be visible. With trees directly adjacent to the facility extending 30 m in height, the small visible portion of the facility top will not have a significant impact on scenic amenity or the rural landscape.

The visual impact of the facility when viewed from dwellings within the wider area will be minimal given the separation distances afforded to the facility, the existing mature vegetation in the area and the undulating terrain. Photomontages of the proposed facility are provided within **Appendix 2**. View 1 is provided from Spring Creek Road looking north-east towards the proposed facility, and View 2 is provided from Trezise Road looking south-west towards the proposed facility. The two (2) photomontages illustrate the facility's integration into the surrounding landscape, in turn, reducing its

visual dominance. The one (1) submission received was from a property owner who's dwelling is located north-east of the proposed facility. Photomontage 2 provides a view of the proposed facility from this direction, and therefore illustrates a view that this landowner would likely have from his dwelling. While the photomontage is taken from a slightly further distance, when viewed from the north-east, the proposed facility is not visually intrusive to the area due to the existing vegetation backdrop and screening in the immediate area.

Overall, the site selected for the proposed facility is considered to demonstrate an appropriate balance between providing an essential service; while minimising potential visual impacts as much as practicable.

Economic Justification for Fixed Wireless Technology

nbn notes the received submission states that the use of **nbn**™ Fixed Wireless technology *"…rather than the installation of FTTP or FTTN is the act of a company desperate to save money."*

nbn is upgrading the current telecommunications network in the most cost-efficient way using best-fit technology and taking into account existing infrastructure, in keeping with the Government's Multi-Technology-Mix model. This will vary from place to place and will include technologies such as Fibre to the Node, Fibre to the Premises, Fixed Wireless, HFC and Satellite.

Due to Australia's size and particular geographic challenges the cost of providing fixed line services to all Australian premises is prohibitive. More specifically, the density of development is insufficient across the Mowbray area to warrant the expense of fixed line services, which will require kilometres of fibre to be run to purpose built nodes servicing large, sparsely developed blocks. It is outside the economy of scale for this national rollout.

Health and Safety

The received submission raised concerns regarding effects of radiofrequency, electromagnetic energy and radiation from the proposed **nbn™** Fixed Wireless facility.

The proposed facility will operate in compliance with the ACMA mandatory standard for human exposure to EME – currently the Radio communications (Electromagnetic Radiation-Human Exposure) Standard 2003 & Radio Protection Standard for Maximum Exposure levels to radiofrequency fields – 3kHz to 300 gHz. The EME Report provided to Council demonstrates that the predicted cumulative EME will be well under the ACMA mandated exposure limit.

nbn advises Council that a precautionary approach has already been built into the World Health Organisation (WHO) recommended safety standard, which sets the safety limit at a level below that which is known to cause any health effects. The relevant Australian safety standard defines the precautionary approach as follows:

> *"Minimising, as appropriate, RF exposure which is unnecessary or incidental to achievement of service objectives or process requirements, provided this can be readily achieved at reasonable expense. Any such precautionary measures should follow good engineering practice and relevant codes of practice. The incorporation of arbitrary additional safety factors beyond the exposure limits of this Standard is not supported."* [Australian Radiation Protection Standard, Maximum Exposure Levels to Radiofrequency Fields 3kHz to 300GHz]

By proposing a facility that operates at a maximum power level that is just 0.09% of the allowable signal strength, **nbn** maintains that it has applied a genuine and effective precautionary approach to the proposal.

With regards to the radio transmissions, there is no planning, scientific or public health justification for Council to impose any limitations on the proposed facility beyond what is required by the national safety standards. Further Health and Safety fact sheets are providing in **Appendix 3 – Health and Safety Fact Sheets**.

Impacts on Property Values

The submission received raises the point that the **nbn™** fixed wireless facilities have an effect on property values for homeowners in area due to both visual pollution and potential health concerns.
While property value is not a town planning matter and a decision by Council should not be made on this basis, it is acknowledged that this issue is of concern to some local residents.

It should be noted that property valuation is an extremely complex issue, with fluctuations in price being subject to a vast number of factors. Many of these are subjective, and may be as diverse as aspect, views, condition of the property, local amenity and access to services, such as high quality communications.

Since the mid-1990s, thousands of telecommunications facilities have been installed throughout Australian metropolitan and regional areas. During this period, property values have continued to increase, showing no clear signs of deterioration as a result of the location of communications facilities. International studies have shown that there is no evidence to show that mobile phone installations have negative impacts on property values. **nbn** highlights that the **nbn™** network.

Preservation of the Natural Environments

The received submission mentioned the Douglas Shire Council's *'Welcome to Douglas – A guide for New Residents'*, and the document's concern for the preservation of natural environments.

A number of environmental searches were conducted prior to the lodgement of the Development Application, include a search of the Koala Conservation in South East Queensland State Planning regulatory Provisions which indicated that the facility was not located within a SPRP Koala Assessable Development Area. Furthermore, the proposed facility will be located outside of the identified Regulated Vegetation on the site, and therefore the clearing of Regulated Vegetation will not be required for the proposed facility.

Appendix 1 – Photomontages

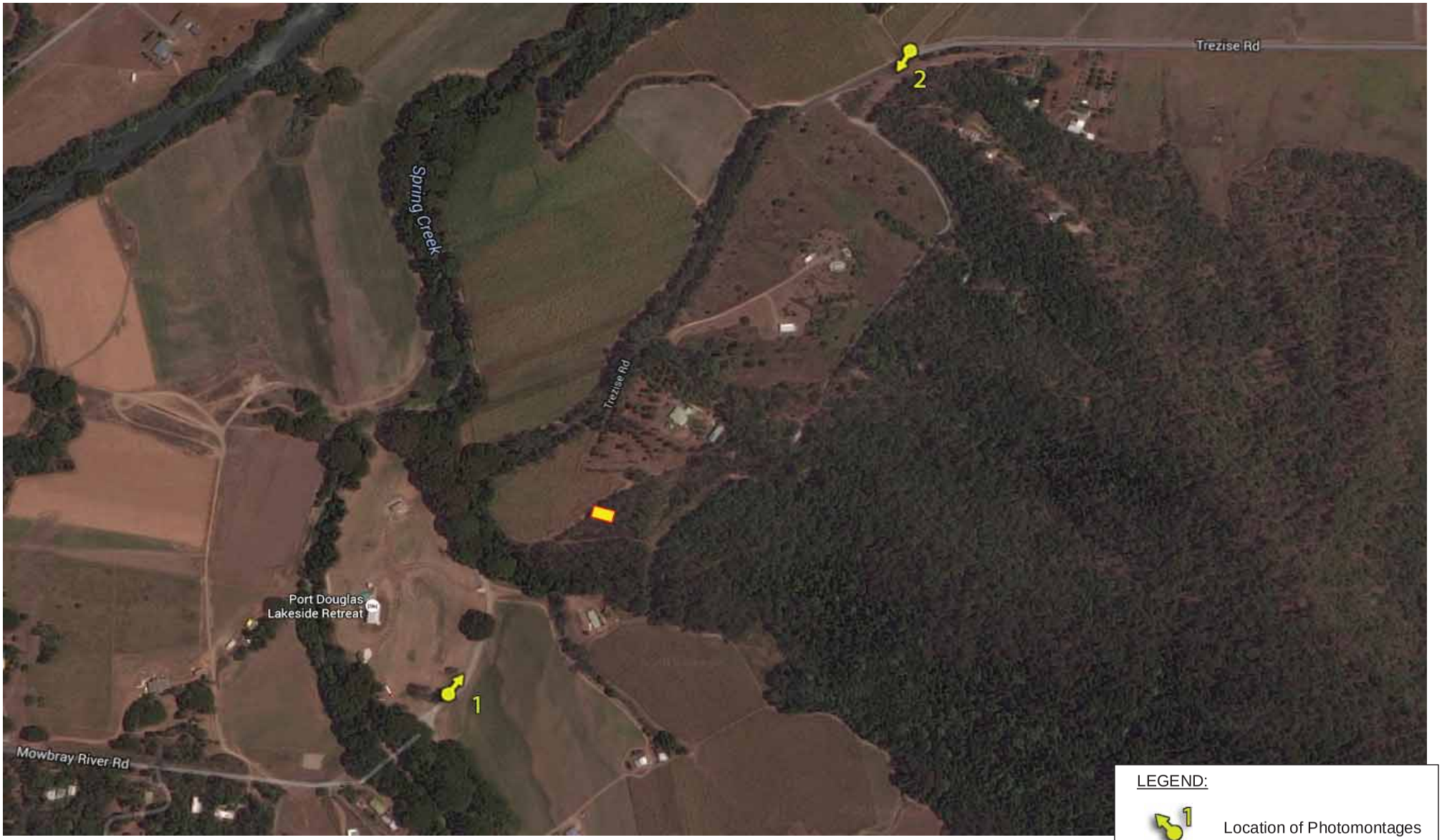

Photo Locations

Rev.	Date	Created	Revision Description
A	01.09.15	ZV	Preliminary

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Site Address	**21 Spring Creek Road Mowbray QLD 4877**
Document title	**Photo Locations Map**
BTS Site Name :	**Mowbray**
Site Number. :	**4MOS-51-09-MOWB**
Document No. :	**L01**
Approved :	
Date :	01.09.15
REV.	A

View looking north east toward the proposed facility from Trezie Road (approx. 320 m separation distance).

This is a representation only. The final installation may vary slightly in size, shape and/or colour.

Rev.	Date	Created	Revision Description
A	01.09.15	ZV	Preliminary

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Site Address
21 Spring Creek Road
Mowbray
QLD 4877

BTS Site Name :
Mowbray

Site Number. :
4MOS-51-09-MOWB

Document title
Photomontage View 1

Document No. :
M01

Approved :

Date :
01.09.15

REV.
A

View looking south west toward the proposed facility from 67 Trezie Road (approx. 770 m separation distance).

This is a representation only. The final installation may vary slightly in size, shape and/or colour.

Rev.	Date	Created	Revision Description
A	01.09.15	ZV	Preliminary

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Site Address
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QLD 4877

BTS Site Name :
Mowbray

Site Number. :
4MOS-51-09-MOWB

Document title
Photomontage View 2

Document No. :
M02

Approved :

Date :
01.09.15

REV.
A

Appendix 2 – Health and Safety Fact Sheets

Australian Government
Australian Radiation Protection and Nuclear Safety Agency

Fact Sheet 10

National Broadband Network Fixed Wireless Base Stations and Health

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) web site, www.rfnsa.com.au. The NBN sites may be located by searching by postcode or town.

For a typical 40 m high NBN base station, the highest exposure levels at ground level in the surrounding area are approximately 0.0004 watt/m^2 (0.04 µW/cm^2) or less than 1/25,000 of the ARPANSA public exposure limit. This means that the highest exposure levels at ground level in the surrounding area are well below the known safe exposure limits of the ARPANSA RF Standard. There are no established health effects from these very low levels of RF EMR.

 © *Australian Radiation Protection and Nuclear Safety Agency 2012*

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 our *Useful Links* below.

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
http://www.arpansa.gov.au/radiationprotection/FactSheets/is_antenna.cfm

ARPANSA EME Reports
http://www.arpansa.gov.au/emereports/index.cfm

ARPANSA RF Exposure Standard
http://www.arpansa.gov.au/publications/Codes/rps3.cfm

NBN Co Limited
http://www.nbnco.com.au

WHO Factsheet on Wireless Technologies
http://www.who.int/mediacentre/factsheets/fs304/en/index.html

Electromagnetic fields and public health

Base stations and wireless technologies

Fact sheet N°304

May 2006

Mobile telephony is now commonplace around the world. This wireless technology relies upon an extensive network of fixed antennas, or base stations, relaying information with radiofrequency (RF) signals. Over 1.4 million base stations exist worldwide and the number is increasing significantly with the introduction of third generation technology.

Other wireless networks that allow high-speed internet access and services, such as wireless local area networks (WLANs), are also increasingly common in homes, offices, and many public areas (airports, schools, residential and urban areas). As the number of base stations and local wireless networks increases, so does the RF exposure of the population. Recent surveys have shown that the RF exposures from base stations range from 0.002% to 2% of the levels of international exposure guidelines, depending on a variety of factors such as the proximity to the antenna and the surrounding environment. This is lower or comparable to RF exposures from radio or television broadcast transmitters.

There has been concern about possible health consequences from exposure to the RF fields produced by wireless technologies. This fact sheet reviews the scientific evidence on the health effects from continuous low-level human exposure to base stations and other local wireless networks.

Health concerns

A common concern about base station and local wireless network antennas relates to the possible long-term health effects that whole-body exposure to the RF signals may have. To date, the only health effect from RF fields identified in scientific reviews has been related to an increase in body temperature (> 1 °C) from exposure at very high field intensity found only in certain industrial facilities, such as RF heaters. The levels of RF exposure from base stations and wireless networks are so low that the temperature increases are insignificant and do not affect human health.

The strength of RF fields is greatest at its source, and diminishes quickly with distance. Access near base station antennas is restricted where RF signals may exceed international exposure limits. Recent surveys have indicated that RF

exposures from base stations and wireless technologies in publicly accessible areas (including schools and hospitals) are normally thousands of times below international standards.

In fact, due to their lower frequency, at similar RF exposure levels, the body absorbs up to five times more of the signal from FM radio and television than from base stations. This is because the frequencies used in FM radio (around 100 MHz) and in TV broadcasting (around 300 to 400 MHz) are lower than those employed in mobile telephony (900 MHz and 1800 MHz) and because a person's height makes the body an efficient receiving antenna. Further, radio and television broadcast stations have been in operation for the past 50 or more years without any adverse health consequence being established.

While most radio technologies have used analog signals, modern wireless telecommunications are using digital transmissions. Detailed reviews conducted so far have not revealed any hazard specific to different RF modulations.

Cancer: Media or anecdotal reports of cancer clusters around mobile phone base stations have heightened public concern. It should be noted that geographically, cancers are unevenly distributed among any population. Given the widespread presence of base stations in the environment, it is expected that possible cancer clusters will occur near base stations merely by chance. Moreover, the reported cancers in these clusters are often a collection of different types of cancer with no common characteristics and hence unlikely to have a common cause.

Scientific evidence on the distribution of cancer in the population can be obtained through carefully planned and executed epidemiological studies. Over the past 15 years, studies examining a potential relationship between RF transmitters and cancer have been published. These studies have not provided evidence that RF exposure from the transmitters increases the risk of cancer. Likewise, long-term animal studies have not established an increased risk of cancer from exposure to RF fields, even at levels that are much higher than produced by base stations and wireless networks.

Other effects: Few studies have investigated general health effects in individuals exposed to RF fields from base stations. This is because of the difficulty in distinguishing possible health effects from the very low signals emitted by base stations from other higher strength RF signals in the environment. Most studies have focused on the RF exposures of mobile phone users. Human and animal studies examining brain wave patterns, cognition and behaviour after exposure to RF fields,

such as those generated by mobile phones, have not identified adverse effects. RF exposures used in these studies were about 1000 times higher than those associated with general public exposure from base stations or wireless networks. No consistent evidence of altered sleep or cardiovascular function has been reported.

Some individuals have reported that they experience non-specific symptoms upon exposure to RF fields emitted from base stations and other EMF devices. As recognized in a recent WHO fact sheet "Electromagnetic Hypersensitivity", EMF has not been shown to cause such symptoms. Nonetheless, it is important to recognize the plight of people suffering from these symptoms.

From all evidence accumulated so far, no adverse short- or long-term health effects have been shown to occur from the RF signals produced by base stations. Since wireless networks produce generally lower RF signals than base stations, no adverse health effects are expected from exposure to them.

Protection standards

International exposure guidelines have been developed to provide protection against established effects from RF fields by the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998) and the Institute of Electrical and Electronic Engineers (IEEE, 2005).

National authorities should adopt international standards to protect their citizens against adverse levels of RF fields. They should restrict access to areas where exposure limits may be exceeded.

Public perception of risk

Some people perceive risks from RF exposure as likely and even possibly severe. Several reasons for public fear include media announcements of new and unconfirmed scientific studies, leading to a feeling of uncertainty and a perception that there may be unknown or undiscovered hazards. Other factors are aesthetic concerns and a feeling of a lack of control or input to the process of determining the location of new base stations. Experience shows that education programmes as well as effective communications and involvement of the public and other stakeholders at appropriate stages of the decision process before installing RF sources can enhance public confidence and acceptability.

Conclusions

Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.

WHO Initiatives

WHO, through the International EMF Project, has established a programme to monitor the EMF scientific literature, to evaluate the health effects from exposure to EMF in the range from 0 to 300 GHz, to provide advice about possible EMF hazards and to identify suitable mitigation measures. Following extensive international reviews, the International EMF Project has promoted research to fill gaps in knowledge. In response national governments and research institutes have funded over $250 million on EMF research over the past 10 years.

While no health effects are expected from exposure to RF fields from base stations and wireless networks, research is still being promoted by WHO to determine whether there are any health consequences from the higher RF exposures from mobile phones.

The International Agency for Research on Cancer (IARC), a WHO specialized agency, is expected to conduct a review of cancer risk from RF fields in 2006-2007 and the International EMF Project will then undertake an overall health risk assessment for RF fields in 2007-2008.

Further Reading

ICNIRP (1998) www.icnirp.org/documents/emfgdl.pdf

IEEE (2006) IEEE C95.1-2005 "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz"

For more information contact:

WHO Media centre

Telephone: +41 22 791 2222

E-mail: mediainquiries@who.int

Radio Communications in the Community

Explained Series – Wireless Technology and Health

Issue Date – July 2008

Introduction

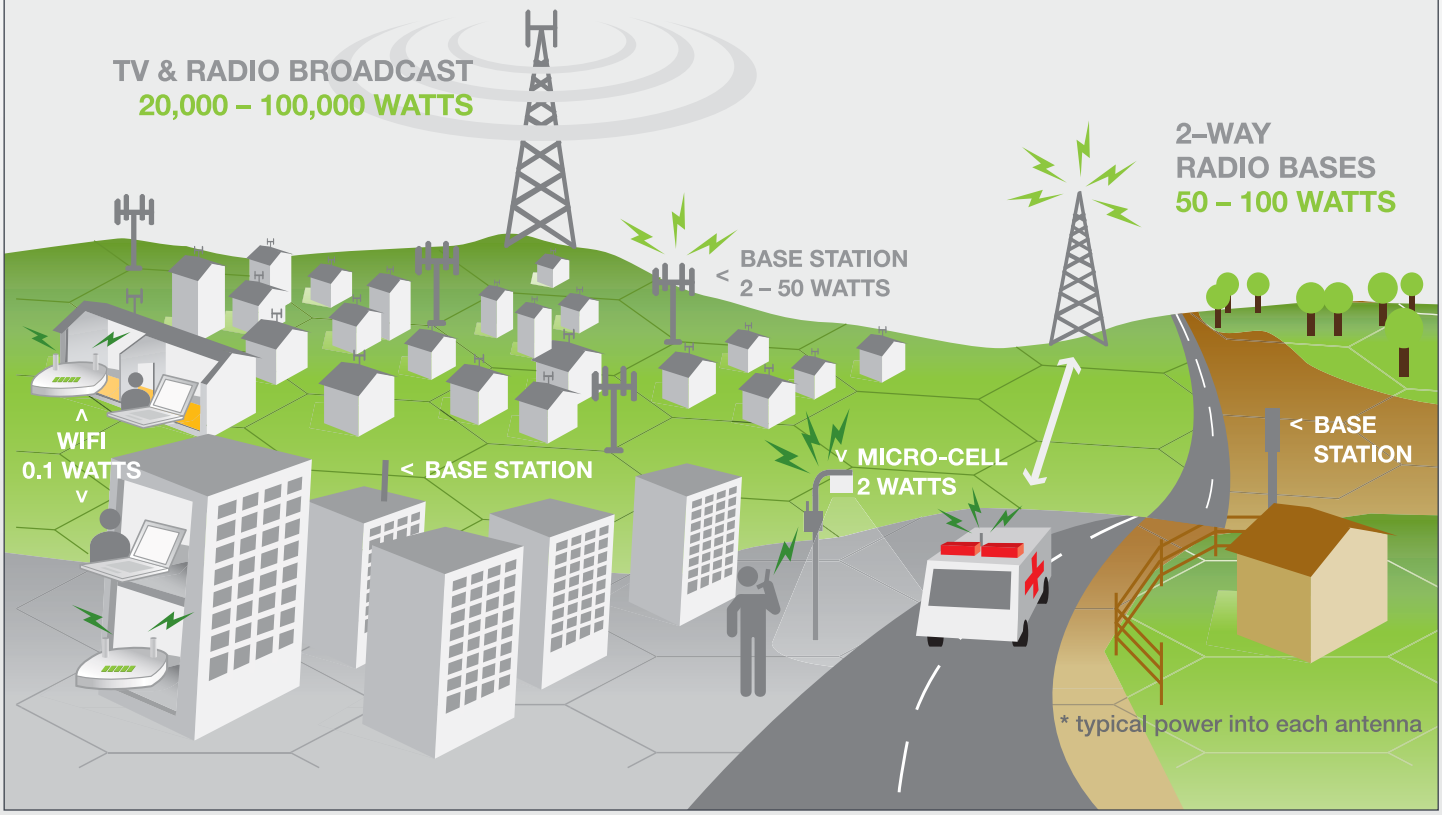
Radio communications are a part of everyday life in today's society. All radio communications systems utilise EMF in the radiofrequency (RF) part of the electromagnetic spectrum. Typical background EMF levels from radio communications systems are very low and well below safety guidelines.

What communications systems use radio frequency technology?

Radio frequency technology is used by

- TV and AM / FM broadcasts
- Mobile phones and their base stations
- Wireless broadband
- Radio paging services
- Cordless phones
- Baby monitors
- Emergency services communications (police, fire, ambulance)
- Government communications
- Air traffic control
- Rural and country communications.

RADIO COMMUNICATIONS IN THE COMMUNITY



Radio Communications in the Community

Explained Series – Wireless Technology and Health

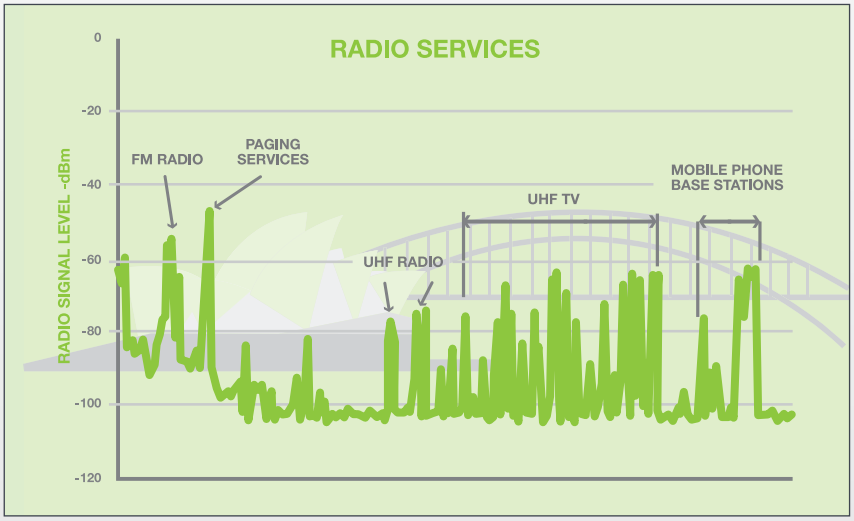
Issue Date – July 2008

How do the transmitter powers compare?

Radio Systems*	Typical Transmitter Power (Watts)
TV & Radio broadcast	5,000 – 100,000
Air traffic control radars	5000 – 20,000
Radio paging services	50 – 100
Emergency communications	50 – 100
Government radio systems	50 – 100
Mobile phone base station	2 – 50
Wireless Broadband base station	2 – 50

Radio Devices	Typical Transmitter Power (Watts)
Walkie Talkies	0.1 – 5
Mobile phones	0.002 – 0.2
Wi-Fi Modem	0.1
Cordless phones	0.01 – 0.2
Baby monitors	0.01 – 0.1
Car remote control	0.001 – 0.1

* typical power into antenna



Spectrum plot showing typical radio communications signals in a community

This picture is a plot from a spectrum analyser (specialised radio measurement equipment) showing the various radio communications signals measured in a typical community. The plot is taken at one location to illustrate typical radio communication signals present, and to make a comparison of signal level.

The type of radio service is indicated on the plot along the horizontal axis and signal level in dBm (level relative to 1 milli-watt) on the left hand axis. The units are not really important here except to show relative levels. The picture also shows how many radio services are used in a typical community.

How strong are the environmental or background EMF levels in the community?

In a typical community, broadcast television and radio signals are similar in strength to signals from mobile phone networks and other two-way communications systems. These signals are overall very low and well below the established safety guidelines.

The World Health Organisation has reviewed the background EMF levels from wireless systems and says,

> *"Recent surveys have shown that the RF exposures from base stations range from 0.002% to 2% of the levels of international exposure guidelines, depending on a variety of factors such as the proximity to the antenna and the surrounding environment. This is lower or comparable to RF exposures from radio or television broadcast transmitters"*

Specifically on EMF levels in public areas the WHO says,

> *"Recent surveys have indicated that RF exposures from base stations and wireless technologies in publicly accessible areas (including schools and hospitals) are normally thousands of times below international standards."*

What research has been done on radio communications and EMF safety?

There has been a lot of research conducted worldwide to investigate possible health effects of radio communications and wireless technology.

In relation to radio frequency exposures 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 WHO also says,

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