EXPLANATORY STATEMENT

Issued by the Australian Communications and Media Authority

*Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 2.5 GHz Band) 2012*

*Radiocommunications Act 1992*

Purpose

The purpose of these *Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 2.5 GHz Band) 2012* (the **Advisory Guidelines**) is to provide information to spectrum licensees to assist in managing the potential for interference to radiocommunications receivers operating in, or adjacent to, the 2.5 GHz band from radiocommunications transmitters operated under a spectrum licence in the 2.5 GHz band. The Advisory Guidelines also provide advice regarding the protection of radio-astronomy services operating in the Mid-West Radio Quiet Zone (**RQZ**) in Western Australia.

Legislative Provisions

Under section 262 of the *Radiocommunications Act 1992* (the **Act**), the Australian Communications and Media Authority (the **ACMA**) may make written advisory guidelines about any aspect of radiocommunication or radio emissions.

Subsection 262(2) of the Act gives the following as examples of matters on which advisory guidelines may be made:

* any matter in respect of which standards may be made under Part 4.1 of the Act; or
* the use, construction, design or performance of any thing; or
* interference with radiocommunications; or
* frequency allocation and coordination.

The examples provided in the Act are not exhaustive. The ACMA may make written advisory guidelines about any aspect of radiocommunication or radio emissions.

Background

The 2.5 GHz band is currently used primarily by free to air broadcasters and the Australian Broadcasting Corporation (ABC) for television outside broadcasting (**TVOB**), including electronic news-gathering (**ENG**). However, broadcasters have faced uncertainty about long-term spectrum arrangements since 2000, when the band was identified internationally for broadband wireless access services (**WAS**).

In January 2010, the ACMA commenced a review of the 2500-2690 MHz frequency band to:

* plan and allocate the band to maximise the overall benefit derived from the spectrum; and
* provide incumbent licensees with greater long-term certainty in light of strong emerging demand for the band to be used for competing purposes—for example, for WAS.

In January 2010, the ACMA released a discussion paper, ‘*Review of the 2.5 GHz band and long-term arrangements for ENG’.[[1]](#footnote-1)* The paper indicated that the ACMA had formed a preliminary view on its preferred approach for the band, which was broadly:

* reallocation of the 2500–2570 MHz and 2620–2690 MHz bands via spectrum licensing, with technical frameworks that are technology flexible but are optimised for WAS;
* conversion of ENG apparatus licences to spectrum licences in the 2570–2620 MHz band; and
* facilitation of ENG/TVOB access to identified alternative bands.

Following consideration of responses received to its January discussion paper, in October 2010 the ACMA announced its intention to give existing ENG services access to the 2570-2620 MHz band (the **mid-band gap**) and to make the 2500-2570 MHz and the 2620-2690 MHz bands (together, the **2.5 GHz band**) available in Australia to support WAS, including 4G mobile broadband.[[2]](#footnote-2) To assist stakeholders in understanding how the ACMA reached a view on appropriate future arrangements in the 2.5 GHz and alternative bands, the ACMA released a Response to Submissions paper which summarised issues raised in response to the January discussion paper and provided the ACMA’s preliminary response to those issues.[[3]](#footnote-3)

To enable spectrum in the 2.5 GHz band to support WAS, the ACMA will need to put in place a spectrum licence technical framework for the 2.5 GHz band. The technical framework will define a spectrum licensee’s rights and obligations and provide an interference management framework for the 2.5 GHz band.

These Advisory Guidelines are part of a set of legal instruments which will give effect to the spectrum licence technical framework applicable to the 2.5 GHz band. The set of instruments required for this purpose is listed below:

* *Radiocommunications (Spectrum Designation) Notice No. 1 of 2012*;
* *Radiocommunications (Spectrum Re-allocation) Declaration No. 2 of 2011;*
* *Radiocommunications Spectrum Marketing Plan (2.5 GHz Band) 2012*;
* *Radiocommunications (Unacceptable Levels of Interference — 2.5 GHz Band) Determination 2012*;
* these Advisory Guidelines; and
* *Radiocommunications Advisory Guidelines (Managing Interference to Receivers – 2.5 GHz Band) 2012.*

Operation

A spectrum licence consists of a frequency band and a geographic area. Interference occurring between adjacent spectrum licences consists of:

* in-band interference, across the geographic boundaries; and
* out-of-band interference, across the frequency boundaries.

However, interference can also occur between spectrum licensed services and services operating under apparatus and class licensing arrangements respectively.

Receivers of other licensed services have operated in frequency bands adjacent to the 2.5 GHz band since before the Minister’s designation of the band for spectrum licensing, and continue to do so. The types of services operated in frequency bands adjacent to the 2.5 GHz band include:

* fixed services, such as point-to-point links authorised under apparatus licences and operating in spectrum adjacent to the spectrum licensed 2.5 GHz band;
* TVOB services operating in the frequency band 2570-2620 MHz, adjacent to the spectrum licensed 2.5 GHz band;
* space services, including space research systems receiving signals from deep space in spectrum below the spectrum licensed 2.5 GHz band; and
* radiolocation receivers operating authorised for use under apparatus licences in the band 2700-2800 MHz, immediately above the spectrum licensed 2.5 GHz band.

Further details of these services can be found in *‘Technical Framework Development 2.5 GHz Spectrum Licence Band, TLG-Discussion Paper No. 3, Design Requirements for the Technical Framework Radiocommunications Advisory Guidelines’,* which is available from the ACMA’s website.[[4]](#footnote-4)

Potentially, these radiocommunications receivers could suffer interference from unwanted emissions, blocking and intermodulation products caused by radiocommunications transmitters operated under a spectrum licence in the 2.5 GHz band.

Interference is generally managed by a set of interference management tools given effect by the Act and implemented by the ACMA. These tools include:

* the core conditions of the spectrum licence;
* a determination made under section 145 of the Act about what constitutes acceptable interference; and
* advisory guidelines made under section 262 of the Act about managing interference in specific circumstances.

The Advisory Guidelines are made under section 262 of the Act. These Advisory Guidelines are part of the spectrum licence technical framework that the ACMA is implementing to enable WAS to be supported in the 2.5 GHz band.

These Advisory Guidelines attempt to manage the three types of interference to receivers operating in and adjacent to the 2.5 GHz band by setting out the technical parameters that spectrum licensees should use to assist in mitigating interference to receivers operating in or adjacent to the 2.5 GHz band.

The ACMA will also take these Advisory Guidelines into account when determining whether a spectrum licensee is causing interference to a licensed receiver that is operating in accordance with its licence conditions.

These Advisory Guidelines do not limit the actions of a spectrum licensee in negotiating operating or protection requirements with another licensee.

Consultation

The ACMA has engaged extensively with stakeholders about its plans to develop a spectrum licensing technical framework for the 2.5 GHz band.

In July 2011, the ACMA set up a short-term industry technical liaison group (**TLG**) to support the development of a technical framework to support the introduction of 4th generation broadband mobile/wireless access services in the 2500-2570 GHz and 2620-2690 MHz bands within the 2.5 GHz band.

The TLG was asked to consider and provide advice to the ACMA on technical aspects required for the development of the spectrum licence technical framework. These included:

* the development of the core conditions of the spectrum licensed band in accordance with section 66 of the Act;
* the development of the determination on unacceptable levels of interference made under section 145 of the Act;
* the development of any associated advisory guidelines made under section 262 of the Act;
* the development of the draft spectrum licence; and
* the development of the minimum contiguous bandwidth for spectrum licences in the 2.5 GHz band.

The ACMA developed three papers which outlined its proposed approach to the spectrum licensing framework for the 2.5 GHz band. These papers were made available by the ACMA to TLG members for comment. These papers can be found on the ACMA website.[[5]](#footnote-5)

The ACMA had regard to the views expressed by TLG members when preparing these Advisory Guidelines.

The ACMA has also undertaken public consultation in relation to these Advisory Guidelines. On 11 April 2012, the ACMA released the draft legislative instruments for the digital dividend auction (including these Advisory Guidelines) for comment. These instruments were accompanied by an information paper to explain the draft instruments and provide context to assist interested parties in making a submission.

The information paper was made available on the ACMA’s website[[6]](#footnote-6), and was publicised via a media release on 11 April 2012, notices on the ACMA’s website and in the Spectrum Auction e-Bulletin publication. On 24 April 2012, the ACMA also held an industry briefing on the draft legislative instruments for the digital dividend auction. This briefing (conducted through an online seminar) outlined key aspects of the ACMA’s draft instruments and was aimed at assisting interested parties to make a submission.

Submissions to the consultation were originally due on 9 May 2012, although this was subsequently extended to 14 May 2012. A total of 11 responses were received.

Statement of compatibility with human rights

Subsection 9(1) of the *Human Rights (Parliamentary Scrutiny) Act 2011* requires the rule maker in relation to a legislative instrument to which section 42 (disallowance) of the *Legislative Instruments Act 2003* (the LIA) applies to cause a statement of compatibility to be prepared in respect of that legislative instrument. This statement is in Attachment B.

Regulatory Impact Analysis

The Office of Best Practice and Regulation (the **OBPR**) advised in August 2011 that these Advisory Guidelines, being an outcome of the 2.5 GHz review, are covered by the existing regulation impact statement for the 2.5 GHz review (OBPR ID 11300) and that no further impact statement is required.

On the 17 August 2012, OBPR confirmed that no further impact statement is required as OBPR considers these Advisory Guidelines will have only minor and machinery impacts. The OBPR reference for this later assessment is ID 14150.

**Documents Incorporated into these Advisory Guidelines by Reference or Otherwise Referred to**

These Advisory Guidelines incorporate the following documents by reference, or otherwise refers to them:

* The Australian Radiofrequency Spectrum Plan 2009 which is a statutory instrument that divides the Australian radiofrequency spectrum into a number of frequency bands and specifies the general purpose for which the bands may be used. A copy of this instrument may be obtained from the ACMA’s website at www.acma.gov.au.
* A number of legislative instruments, namely, the *Radiocommunications Spectrum Marketing Plan (2.5 GHz Band) 2012*, the *Radiocommunications (Unacceptable Levels of Interference -2.5 GHz Band) Determination 2012* and the *Radiocommunications (Mid-West Radio Quiet Zone) Frequency Band Plan 2011*. These instruments may be found on the Australian Government ComLaw website (www.comlaw.gov.au).
* RALI FX-03 Microwave Fixed Services Frequency Coordination, which are Radiocommunications Assignment and Licensing Instructions produced by the ACMA that provide important radiocommunication technical policy, guidelines and useful information for the coordination and licensing of microwave fixed services. Copies of these instructions are available from the ACMA’s website at www.acma.gov.au.
* RALI MS-31 Notification Zones for Apparatus Licensed Services Around Radio Astronomy Facilities, which are Radiocommunications Assignment and Licensing Instructions produced by the ACMA that prescribe a process notifying the Commonwealth Scientific and Industrial Research Organisation of prospective frequency assignments to apparatus licensed services that might impede or degrade the operation of key radio astronomy facilities. A copy of these instructions is available from the ACMA’s website at [www.acma.gov.au](http://www.acma.gov.au).
* RALI MS-32 Coordination of Apparatus Licensed Services Within the Mid-West Radio Quiet Zone, which are Radiocommunications Assignment and Licensing Instructions produced by the ACMA that provide processes for co-ordination with the Mid-West Radio Quiet Zone. Copies of these instructions are available from the ACMA’s website at [www.acma.gov.au](http://www.acma.gov.au).
* ITU-R Recommendation SA.609: “Protection criteria for telecommunications links for Manned and Unmanned near-Earth research satellites” which are recommendations made by the International Telecommunication Union Radiocommunications Sector (the **ITU-R**) which specifies the protection criteria needed to successfully control, command and operate manned and unmanned near-Earth research satellites. These recommendations are available for download from the ITU-R’s internet site (www.itu.int).
* ITU-R Recommendation M.1464-1 “Characteristics of radiolocation radars and characteristics and protection criteria for sharing studies for the aeronautical radionavigation and meteorological radars in the radiodetermination service operating in the 2700-2900 MHz band” which are recommendations made by the ITU-R for performing analyses between systems operating in the radiodetermination service and systems operating in other services. It should not be used for radar to radar analyses. These recommendations are available for download from the ITU-R’s internet site (www.itu.int).
* ITU-R Recommendation M.1461 “Procedures for determining the potential for interference between radars operating in the radiodetermination service and systems in other services” which are recommendations made by the ITU-R for determining the potential for interference between radars operating in the radiodetermination service and systems in other services. These recommendations are available for download from the ITU-R’s internet site (www.itu.int).
* ITU-R RA.769-2 “Protection criteria used for radio astronomic measurements” which are recommendations made by the ITU-R for the protection of radio astronomical measurements. These recommendations are available for download from the ITU-R’s internet site (www.itu.int).
* ITU Radio Regulations – Appendix 7 (Rev.WRC-03) “Methods for the determination of the coordination area around an earth station in the frequency bands between 100 MHz and 105 GHz”. The ITU Radio Regulations contains Articles, Appendices, Resolutions and Recommendations of the International Telecommunication Union relating to international radiocommunications coordination. This document can be found on the ITU’s internet site (www.itu.int).

In accordance with subsection 314A(2) of the Act, a legislative instrument made under the Act may incorporate a matter contained in any other instrument or writing as in force from time to time.

Detailed Description of the Instrument

Details of the instrument are in Attachment A.

attachment A

NOTES ON SECTIONS

**Part 1 – Preliminary**

**Section 1.1 – Name of Advisory Guidelines**

This section gives the citation for the Advisory Guidelines.

**Section 1.2 – Commencement**

This section provides that these Advisory Guidelines commence on the day after they are registered.

**Section 1.3 – Purpose of these Advisory Guidelines**

This section states the purpose of these Advisory Guidelines is to assist in the management of interference from transmitters operated under a spectrum licence in order to provide protection to receivers operating under other radiocommunications licences in or adjacent to the 2.5 GHz band.

This section also indicates ACMA’s intention to take these Advisory Guidelines into account in settling any interference dispute that may arise between spectrum licensees and any licensees in or adjacent to the licensed areas and bands.

**Section 1.4 – Interpretation**

This section provides definitions for the terms used in these Advisory Guidelines. Some terms have the same meaning as in the Australian Radiofrequency Spectrum Plan, the Act and the *Radiocommunications (Unacceptable Levels of Interference - 2.5 GHz Band) Determination 2012.*

**Part 2 – Background**

**Section 2.1 – Background**

This section provides general information and guidance in order to mitigate interference to receivers operating in and adjacent to the 2.5 GHz band from transmitters operated under the 2.5 GHz spectrum licence. The section provides a list of services covered by these Advisory Guidelines. The section also recommends **ITU-R**) Recommendation P.1144 as a guide to be followed for the suitable propagation model for determining path loss for planning transmitters to minimise the risk of interference to receivers covered by these Advisory Guidelines.

**Part 3 – Other spectrum licensed receivers**

**Section 3.1 – Background**

This section describes the general types of services operating in the two other spectrum licensed bands close to the 2.5 GHz band.

**Section 3.2 – Electronic news gathering**

This section provides a general description of TVOB links used in ENG operating in the band 2.5 GHz Mid-band Gap (2570-2620 MHz). A note points to ITU‑R Recommendation F.1777 for more information.

**Section 3.3 – Protection requirements**

This section sets out the protection requirements for fixed ENG receivers or collection stations operated under a spectrum licence in the 2.5 GHz Mid-band Gap that exist prior to the registration of transmitters operated under spectrum licences in the 2.5 GHz band. These protection requirements mean that it is typically necessary for fixed outdoor transmitters operating under spectrum licences in the 2.5 GHz band to operate in coordination with nearby ENG fixed receivers. This section provides directions to location and antenna information of fixed ENG receivers to facilitate this coordination.

This section also sets out protection requirements of TDD WAS receivers operating in the 2.3 GHz spectrum licensed band (2302–2400 MHz) that exist prior to the registration of fixed transmitters under a 2.5 GHz band spectrum licence. These protection requirements mean that coordination is also typically necessary between fixed outdoor transmitters operating under spectrum licences in the 2.5 GHz band and nearby TDD WAS fixed receivers in the 2.3 GHz band. This section provides directions to location and antenna information of TDD WAS fixed receivers to facilitate this coordination.

**Part 4 - Fixed service receivers**

**Section 4.1 – Background**

This section explains that Part 4 addresses the protection requirements for receivers in systems operating as fixed services in spectrum in and adjacent to the 2.5 GHz band. The types of systems referred to include point-to-point fixed links operating on an ad hoc basis and those in formalised point to-point link bands.

The formal point-to-point fixed link bands are assigned in accordance with criteria set out in Radiocommunications Assignment and Licensing Instruction (**RALI**) FX-3 and this section refers spectrum licensees to the RALI when considering the deployment of infrastructure under the spectrum licence. The section also points to the register of radiocommunications licenses for details of existing fixed service receivers. There is a note indicating that a copy of the latest version of RALI FX-03 is available from the ACMA’s website.

**Section 4.2 – Protection requirements**

This section sets out the protection requirements that spectrum licensees should refer to in order to ensure that they do not cause interference to point-to-point fixed links currently in the register of radiocommunications licenses.

For apparatus-licensed point-to-point fixed links not located in the 2.1 GHz and 2.2 GHz bands, protection requirements are found in relevant recommendations of the ITU-R and RALI FX-03.

For apparatus–licensed point-to-point fixed links located in the 2.1 GHz and 2.2 GHz bands, protection requirements are found in RALI FX-03.

**Part 5 – Space services receivers**

**Section 5.1 – Background**

This section explains that Part 5 deals with the protection that is required for receivers that operate as part of the Mobile Satellite (**MSS**), Radiodetermination Satellite (**RSS**), Space Research (**SRS**) and Earth Exploration Satellite (**EES**) services in spectrum adjacent to the 2.5 GHz band.

**Section 5.2 – Space services**

This section details that the band 2690-2700 MHz band is allocated the ESS and SRS for passive use only, e.g. receiver use only. Receivers in the ESS are located on board satellites and SRS receivers are located at fixed earth stations. The MSS and RSS receivers operate in the band 2483.5-2500 MHz to earth stations. The section notes that there are currently no licensed earth stations operating in these frequency bands and that should any be issued in the future, the ACMA will take a first in time coordination approach.

**Section 5.3 – Protection requirements**

This section outlines protection requirements for earth stations. This section explains that protection requirements are set out in relevant ITU-R Recommendations (including ITU-R Recommendation SA.609: “Protection criteria for telecommunications links for Manned and Unmanned near-Earth research satellites”) and Appendix 7 of the ITU-R Regulations.

**Part 6 – Radio astronomy service receivers**

**Section 6.1 – Background**

This section explains that Part 6 applies to the protection of sensitive radio astronomy service receivers operated in a number of bands in and adjacent to the 2.5 GHz band. Radio astronomy services operate in these bands under a number of regulatory arrangements which are explained in this section.

Radio astronomy receivers operate in the 2500-2550 MHz band on a fortuitous basis using frequencies in and adjacent to the 2.5 GHz band subject to Australian footnote AUS87 in the Australian Radiofrequency Spectrum Plan. The site coordinates for these receivers are tabled.

The 2655-2690 MHz band in the Australian Radiofrequency Spectrum Plan is allocated on a secondary service basis to radio astronomy service. However, at the time the Advisory Guidelines are made there were no assignments in this band.

The 2690-2700 MHz band in the Australian Radiofrequency Spectrum Plan is allocated on a primary service basis to the radio astronomy service and several radio astronomy sites around Australia hold apparatus licences for the use of these bands. This section indicates that at two of the sites tabled, the Paul Wild Observatory and the Parkes Observatory apparatus licenses are held for the band 2690-2700 MHz.

The Mid-West Radio Quiet Zone, a site in remote central Western Australia, has been established across the radio spectrum from 100 MHz through to 2.5 GHz.

**Section 6.2 Radio astronomy sites and the Mid-West Radio Quiet Zone**

This section introduces the site details of radio-astronomy facilities operating under footnote AUS87 to the Australian Radiofrequency Spectrum Plan. The section also describes the site located in remote central Western Australia which has been identified for future radio astronomy use and has been protected by the establishment of the RQZ by the *Radiocommunications (Mid-West Radio Quiet Zone) Frequency Band Plan 2011*.

**Section 6.3 – Protection requirements**

This section indicates that the radio astronomy services operate on a fortuitous reception basis in the bands subject to the footnote AUS 87 in the Australian Radiofrequency Spectrum Plan, however ACMA encourages spectrum licensees to liaise directly with radio astronomy station operators in order to minimise the potential for interference to occur.

This section indicates that spectrum licensees must meet the coordination requirements to protect assignments in the 2690-2700 MHz band in the Register of radiocommunications licenses. A note to this section indicates that site information can be found in RALI MS-31 and protection criteria in ITU-R Recommendation RA.769-2.

This section provides information on the location of the RQZ and its protection via RALI MS-32.

**Part 7 – Radiodetermination services receivers**

**Section 7.1 – Background**

This section provides information about the types of apparatus licensed receivers operating as part of the radiodetermination receivers, including the Aeronautical Radionavigation Service and the Radiolocation Service , operating in the band 2700-2900 MHz including those operated by Defence. The stations operating in these services are typically radar stations used for air traffic control or weather monitoring.

**Section 7.2 – Protection requirements**

This section provides references for spectrum licensees to further information regarding the characteristics and protection criteria that they should be aware of for these radar stations in ITU-R Recommendations M.1464-1 and M.1461. A maximum power flux density limit at the radar site antenna height is specified for Defence radiodetermination receivers. The section also notes that a RALI providing further information could be developed in the future to assist coordination with radar stations in the band 2700-2900 MHz.

**ATTACHMENT B**

**Statement of Compatibility with Human Rights**

Prepared in accordance with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011

***Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 2.5 GHz Band) 2012***

This legislative instrument is compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

**Overview of the Legislative Instrument**

Section 262 of the Radiocommunications Act 1992 (the **Act**) permits the Australian Communications and Media Authority (the **ACMA**) to may make advisory guidelines about any aspect of radiocommunication or radio emissions.

The purpose of the *Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 2.5 GHz Band) 2012* (the **Advisory Guidelines**) is to provide guidance to assist with the management of interference to radiocommunications receivers operating under an apparatus licence in or adjacent to the 2.5 GHz band.

Subsection 9(1) of the *Human Rights (Parliamentary Scrutiny) Act 2011* requires the rule maker in relation to a legislative instrument to which section 42 (disallowance) of the *Legislative Instruments Act 2003* (the **LIA**)applies to cause a statement of compatibility to be prepared in respect of that legislative instrument.

The Advisory Guidelines are a legislative instrument that is subject to disallowance under section 42 of the LIA.

**Human Rights Implications**

The Advisory Guidelines do not engage any of the applicable rights or freedoms.

**Conclusion**

The Advisory Guidelines are compatible with human rights as it does not raise any human rights issues.

1. The full discussion paper can be accessed at:http://www.acma.gov.au. [↑](#footnote-ref-1)
2. See ACMA media release 132/2010 at http://www.acma.gov.au. [↑](#footnote-ref-2)
3. Response to submissions paper, and submissions received, can be accessed at: www.acma.gov.au [↑](#footnote-ref-3)
4. These documents can be accessed at: http://www.acma.gov.au [↑](#footnote-ref-4)
5. The papers can be accessed at: http://www.acma.gov.au [↑](#footnote-ref-5)
6. The information paper can be accessed at: http://engage.acma.gov.au [↑](#footnote-ref-6)