



Release of the 3.6 GHz band for wireless access services (WAS)

Spectrum Planning Discussion Paper

SPP 02/09

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1 Introduction

The Australian Communications and Media Authority (ACMA) manages Australia's radiofrequency spectrum. The continual evolution and increasing sophistication of wireless technologies, and the rapidly growing and competing demand for spectrum from different users and services, means that spectrum management is becoming increasingly challenging. Part of ACMA's task is to facilitate spectrum access for new technologies in a flexible and responsive manner while balancing the needs of existing spectrum users.

ACMA understands the nature of the multi-tiered communications industry and acknowledges that some wireless internet service providers (ISPs) are currently inhibited by a lack of available spectrum capable of supporting wireless access services (WAS). Wireless ISPs play a key role in making broadband available in towns and regional areas, and ACMA recognises that there needs to be spectrum available to support both Australia-wide networks and regional-based networks.

Purpose

The purpose of this document is to provide the policy context and supporting information to enable a discussion between ACMA and interested stakeholders regarding the proposed release of the frequency range 3575-3700 MHz (the 3.6 GHz band) for WAS in regional and remote areas of Australia.

The technical and regulatory policies proposed in this paper attempt to demonstrate the balance that ACMA is trying to achieve in making suitable spectrum available to support the deployment of WAS in regional areas of Australia meanwhile addressing the concerns of incumbent users regarding protection of existing infrastructure. In order for ACMA to generate an environment that is supportive of regional ISPs obtaining access to suitable spectrum, ACMA has considered the following policy options in the development of this paper:

- The development of a policy for the treatment of licence applications that will facilitate the timely processing of those applications and speed access to the band by prospective licensees. This is discussed further in Chapter 3.
- The implementation of a maximum available bandwidth to licensees of 20 MHz, or 25 MHz in certain circumstances. This is explained further in Chapter 4.
- Encouraging involvement from Accredited Persons (APs) in the assessment of licence applications and technical coordination for nominated sites. ACMA proposes several options for greater AP involvement in Chapter 6.

Scope

Essentially, the chapter outline for this paper is as follows:

- Chapter 2 – Provides the background and indicative time frames for the release of the 3.6 GHz band and incumbency issues in the band;
- Chapter 3 – Outlines the proposed licensing arrangements and provides a summary of the proposed allocation mechanisms to release the 3.6 GHz band;
- Chapter 4 – Outlines the technical issues under consideration to ensure appropriate, technology flexible, coordination criteria are developed for the introduction of WAS;
- Chapter 5 – Outlines the regulatory policy and other legislative issues associated with the release of the 3.6 GHz band; and
- Chapter 6 – Encourages discussion on the role of APs in the release of the 3.6 GHz band.

It is important to note that this paper does not address the following issues:

- The cost to access spectrum in regional areas of Australia; or
- Discussion on the development of proposed policy and technical coordination criteria related to the establishment of satellite parks and Earth stations more generally.

Context

The *Australian Communications and Media Authority Act 2005* (the ACMA Act) sets out the spectrum management functions of ACMA including:

- Managing the radiofrequency spectrum in accordance with the *Radiocommunications Act 1992* (the Act); and
- To advise and assist the radiocommunications community.

In managing the radiofrequency spectrum, ACMA is guided by the object of the Act. Two of the principal objects outlined in section 3 of the Act are to:

(a) Maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum.

...

(e) Provide an efficient, equitable and transparent system of charging for the use of spectrum, taking account of the value of both commercial and non-commercial use of spectrum.

...

Further to this, ACMA has developed spectrum management principles that guide ACMA's approach to a range of spectrum management initiatives. The principles are designed to increase the transparency, predictability and consistency of ACMA's decision making in a climate of rapid technological change and increasing demand for new services.

ACMA's spectrum management principles are consistent with the principles of good regulatory process. They provide directions that will generally result in welfare being

maximised and, together with use of a total welfare standard, articulate ACMA's proposed standard approach to spectrum management. The principles are listed below.

- Principle 1—Allocate spectrum to the highest value use or uses
- Principle 2—Enable and encourage spectrum to move spectrum to its highest value use or uses
- Principle 3—Use the least cost and least restrictive approach to achieving policy objectives
- Principle 4—To the extent possible, promote both certainty and flexibility
- Principle 5—Balance the cost of interference and the benefits of greater spectrum utilisation

Further discussion on the principles is provided in Chapter 2.

ACMA will consider the principles when analysing responses to this discussion paper.

Submissions

Comments on the issues set out in the discussion paper, or any other issues relevant to the release of the 3.6 GHz band, must be forwarded by close of business on **15 May 2009** to:

**Assistant Manager – WAS
Spectrum Planning Branch
Australian Communications and Media Authority
PO Box 78
BELCONNEN ACT 2616**

Fax: 02 6219 5133

E-mail: WAS-planning@acma.gov.au

Media enquiries should be directed to Mr Donald Robertson on (02) 9334 7980 or by email to media@acma.gov.au.

Any other enquiries may be directed to Nevio Marinelli on (02) 6219 5249 or by email to WAS-planning@acma.gov.au

Publication of submissions

In general, ACMA publishes all submissions it receives. However, ACMA will not publish submissions that it considers contain defamatory or irrelevant material.

ACMA prefers to receive submissions which are not claimed to be confidential. However, ACMA accepts that a submitter may sometimes wish to provide information in confidence. In these circumstances, submitters are asked to identify the material over which confidentiality is claimed and provide a written explanation for confidentiality claims.

ACMA will not automatically accept all claims of confidentiality. ACMA will consider each claim for confidentiality on a case-by-case basis. If ACMA accepts a confidentiality claim, it will not publish the confidential information unless required to do so by law.

When can ACMA be required by law to release information?

ACMA may be required to release submissions by law under the *Freedom of Information Act 1982* (Cth) or for other reasons, including for the purpose of parliamentary processes or court subpoena. ACMA will seek to consult submitters of confidential information before that information is provided to another body or agency, but ACMA cannot guarantee that confidential information will not be released through these or other legal means.

Sharing of information

Under the *Australian Communications and Media Authority Act 2005*, ACMA is able to disclose submissions to the Minister, Department including authorised officials, Royal Commissions and certain Commonwealth authorities such as the Australian Competition and Consumer Commission and Australian Securities and Investment Commission.

If information is accepted by ACMA as confidential, ACMA will seek to consult with the submitter of the information where ACMA intends to share that information.

2 Release of the 3.6 GHz band

Previous consultations

ACMA released a public discussion paper in February 2006 in an attempt to gauge the demand for WAS and associated spectrum requirements. The discussion paper, titled [Strategies for Wireless Access Services](#), provided information about wireless access demand drivers, international trends and current WAS bands and initiatives. Forty-seven responses were received to the discussion paper including responses from small and large WAS operators, equipment manufacturers and suppliers, WAS interest groups and forums, and incumbent service operators.

Several respondents indicated that more WAS spectrum needed to be made available in the short term, particularly in regional and rural areas. The reasons given included:

- Allowing small and medium operators to test business models and gain some market share before larger operators dominate the market;
- To satisfy unmet demand for services; and
- The availability of equipment for particular candidate bands.

In December 2006, ACMA released a second public discussion paper that identified this band as a suitable candidate band for WAS titled [Strategies for Wireless Access Services: Spectrum Access Options](#). The December 2006 discussion paper sought feedback from stakeholders about the suitability of a number of identified bands for WAS (including the 3.6 GHz band), the potential impact on incumbent services, and the best way to segment the bands and license operation of WAS. In all, 28 submissions commented on the use of the 3.6 GHz band for WAS. These ranged from providers and users of services in the 3.6 GHz band, to current and prospective WAS providers, suppliers and manufacturers of WAS equipment.¹

In October 2008, ACMA released the paper [Strategies for Wireless Access Services: Consultation Outcomes](#). This paper provided a summary of submissions to the December paper, as well as presenting the outcomes of the consultation process. ACMA also announced its intention to allow the use of the 3.6 GHz band (3575-3700 MHz) for the

¹ The discussion paper and responses are available on the ACMA website at http://www.acma.gov.au/WEB/STANDARD/pc=PC_100424.

deployment of wireless access services (WAS) in regional and remote areas of Australia. This band is seen as a way to provide a short to medium term solution for the demand for WAS in these areas ([MR 124](#)).

The 3.6 GHz Project

ACMA announced its intention to use the 3.6 GHz band as a solution to provide broadband in regional, rural and remote areas of Australia in a media release on 14 October 2008.² This was followed by an announcement at a Spectrum Tune-Up held in Brisbane on 15 October 2008.

The October 2008 paper identified the 3.6 GHz band to be a suitable frequency band for WAS and announced that it would be made available in regional and remote areas in 2009. The release of the 3.6 GHz band provides an opportunity for both large and small operators wishing to deploy services in a specific area or areas.

The 3.6 GHz project is aligned with the spectrum management principles. A summary of the analysis of the spectrum management principles completed by ACMA is provided below. The complete analysis against the spectrum management principles is provided in Appendix A.

Table 1: Summary of the Spectrum Management Principles and the 3.6 GHz Project

<p>Principle 1 – Allocate spectrum to the highest value use or uses</p> <ul style="list-style-type: none">• The 3.6 GHz band is being targeted by many wireless access services (WAS) manufacturers worldwide and has been allocated for use in numerous countries.• The increased availability of WiMAX equipment provides evidence of the development of economies of scale.• Sharing between incumbent services and WAS in regional and remote areas of Australia has the potential to allow use of spectrum by WAS that would otherwise remain unused.• ACMA has identified future policy issues, such as the development of satellite parks, which will encourage incumbent services to relocate from high or medium spectrum density areas to those with lower spectrum density. This will enable greater spectrum efficiency in the longer term. <p>Principle 2 – Enable and encourage spectrum to move to its highest value use or uses</p> <ul style="list-style-type: none">• ACMA is proposing minimal regulatory criteria to enable licensees to adapt to changing market requirements and technological advances. <p>Principle 3 – Use the least cost and least restrictive approach to achieving policy objectives</p> <ul style="list-style-type: none">• The status quo does not support ACMA's policy objectives, that is, the objects of the Act and Government policy objectives to make broadband services widely available, with particular focus on bridging the digital divide in regional and remote areas of Australia.• ACMA intends to apply two different allocation processes that will be run in parallel to each other. These processes are intended to release the spectrum to the market quickly, while providing adequate protection of incumbent services.

² A copy of the Media Release (MR124/2008) is available from the ACMA website at: http://www.acma.gov.au/WEB/STANDARD/pc=PC_311443

Principle 4 – To the extent possible, promote both certainty and flexibility

- ACMA’s decision to open the 3.6 GHz band for WAS is consistent with international technology and industry trends.
- The flexibility of the coordination criteria is demonstrated in the ability of incumbent services to coexist with WAS. This also provides increased certainty to incumbent licensees by ensuring their services are adequately protected.
- Embargo 42 will initially remain in place on all services in the 3.6 GHz band other than WAS in regional and remote Australia. This will prevent the investment in and licensing of other services that may be required to relocate or cease transmission in the near future, until the level of demand for WAS is better understood and an Earth station siting policy is developed.

Principle 5 – Balance the cost of interference and the benefits of greater spectrum utilisation

- ACMA has developed coordination criteria that will enable both WAS and incumbent services to coexist in the 3.6 GHz band. This will reduce the financial burden on incumbent licensees in particular, as incumbent services are not facing relocation to alternative spectrum bands.
- Greater spectrum utilisation can be made without significant risk of interference to existing or new services through the development of coordination criteria and exclusion zones around major cities.
- The development and implementation of future regulatory policies, such as the establishment of satellite parks or the development of the Earth station siting policy, will increase utility of the spectrum while ensuring protection from interference to incumbent services.

Parameters of the 3.6 GHz Project

ACMA intends to release the 3.6 GHz spectrum for initial allocation in areas of regional, rural and remote Australia to relieve the demand for spectrum for WAS in these areas. It is proposed that major city areas will be excluded from the initial assignment and allocation processes to preserve future planning options and facilitate a faster release of spectrum in regional and remote areas. It is important to note that these areas will be defined by ACMA and further discussion on this issue can be found in Chapter 3.

ACMA intends to develop coordination criteria between WAS and existing services to facilitate coexistence and ongoing use of the band by incumbent services. Once the appropriate protection and coordination criteria are developed, the current embargo will be modified to allow licences for WAS to be issued in the 3.6 GHz band in regional and remote areas only. This will initially allow new wireless access services to be licensed in those areas. The embargo will remain in place for metropolitan areas.

The table below provides an overview of the 3.6 GHz project. The project has been broken into separate phases that refer to the different bodies of work undertaken by ACMA to facilitate the release of the 3.6 GHz spectrum for WAS. The release of this discussion paper in April at the beginning of Quarter 2 (Q2) of 2009 represents the beginning of Phase 3 of the 3.6 GHz project.

The consultation period closes on 7 May 2009. While the consultation period is underway, ACMA will consider the advantages and disadvantages of the proposed allocation options discussed in Chapter 3. This will include consideration of other mechanisms within any allocation process for supporting the objectives of this exercise outlined in Chapters 1 and 2 – a matter on which views are generally sought. After the close of the consultation period, ACMA will consider the responses it receives in making its decision on which allocation

option to implement. Once a decision is made, ACMA will develop an appropriate allocation package and publish further information regarding the proposed allocation options via its website in late Q2 or the beginning of Q3 2009.

ACMA is aiming to commence the allocation period in late Q3 of 2009, depending on the nature of submissions to the discussion paper, and following finalisation of the relevant legal instruments and technical documents.

It is noted that the development of an Earth station siting policy and RALI will be conducted over the next year in parallel with the allocation process for WAS. The Earth Station RALI is intended to facilitate coordination with Earth stations across numerous satellite bands, including the 3600-4200 MHz band.

ACMA has identified a need to develop an Earth station siting policy to contribute to the successful coexistence of FSS with other services, including (but not limited to) WAS in the 3.6 GHz band. Consultation on the Earth station siting policy will identify potential geographic areas that could be made into satellite parks on the east coast, west coast and in the northern region of Australia respectively. Existing and future FSS will be encouraged to relocate to or establish services in these satellite parks. In return, ACMA may consider offering greater protection to the FSS through flexible licensing arrangements. A further aspect to the creation of satellite parks will be their potential to minimise the spectrum denial footprint of the FSS to other services and therefore enable greater spectrum efficiency while facilitating the continued use of the band by the FSS.

The body of work related to the development of the Earth station siting policy and RALI will be undertaken by ACMA in parallel to the current issues under discussion in this paper, and are subsequently outside the scope of this paper.

Table 2: Helicopter View of the 3.6 GHz Project

Phases	Time Frame	Details	Status
Phase 1	2006 – Sept 2008	WAS Consultation Process <ul style="list-style-type: none"> • 2 papers released, 1 seminar • Review of submissions • Review of international developments / trends • Investigation of options • Decision on way forward 	Completed
Phase 2	Oct 2008 – Q1 2009	Announcement on consultation outcomes & further work <ul style="list-style-type: none"> • Targeted stakeholder consultation • Development of proposed allocation, licensing and coordination documentation • Development of exclusion (embargo) areas for major cities • Commence development on Earth station siting policy and RALI 	Underway / Near completion
Phase 3	Q2 2009 – Q1 2010	Public Consultation Period <ul style="list-style-type: none"> • Release of discussion paper and associated documents (April 09) • RadComms09 presentation (April 09) • Analysis of responses (May 09) Allocation Period (Q3 or Q4 2009) <ul style="list-style-type: none"> • Release of final licensing and coordination documents (May - July 09) • Lift embargo in regional and remote areas to allow a staged release administrative allocation process (July - August 09) • Allocate areas identified for price-based allocation (PBA) (July - August 09) 	Underway
Phase 4	Approx. 1 year after WAS release	Earth Stations (Q3 or Q4 2010) <ul style="list-style-type: none"> • Release Earth station siting policy and Earth station RALI • Lift embargo in regional areas for assignment of Earth stations 	Planned
	Approx. 2 years after WAS release	Fixed Services (Q3 or Q4 2011) <ul style="list-style-type: none"> • Review demand for WAS in regional areas • Review status of fixed services in 3.6 GHz band 	Planned
Phase 5	Long Term	City / Metropolitan Areas (2010 and beyond) <ul style="list-style-type: none"> • Review demand for WAS • Review demand for incumbent Earth stations • Review spectrum arrangements 	Planned

3 Allocation arrangements

Radiocommunications Licensing

ACMA has considered a number of licensing options for the release of the 3.6 GHz band for WAS in regional and remote areas of Australia. The licensing options included:

- Issuing class licences; or
- Issuing apparatus licences; or
- Re-allocating the 3.6 GHz band for spectrum licensing; or
- Developing a private park model; or
- Implementing a hybrid arrangement that would allow both apparatus and class licensing in the different or overlapping geographic areas or frequency ranges.

It became evident to ACMA that the optimal licensing solution at this point of time is the issue of apparatus licences. ACMA has considered the following issues in its analysis of the licensing options:

- ACMA's announcement in October 2008 signalled an intention to release the 3.6 GHz band to the market quickly, in the first half of 2009;
- The time it would take for ACMA to develop a spectrum marketing plan and accompanying technical framework, should spectrum licensing be the preferred licensing option;
- The level of policy and technical analysis required to develop either the private park model or hybrid arrangement precludes them from being considered appropriate licensing options at this time;
- ACMA cannot guarantee that an adequate quality of service (QoS) for WAS could be provided under the class licensing arrangement;
- The need to provide a framework for interference management in the 3.6 GHz band;
- The need to provide certainty to adjacent spectrum licensees and other incumbent licensees regarding protection to existing infrastructure from interference; and
- Considering the objects of the Act such as ensuring the efficient allocation of spectrum, combined with the need to maximise the overall public benefit from its use.

Although the idea of issuing a class licence for WAS deployments in remote Australia is attractive in a policy sense, the technical issues that arise implies that this is not an attractive

licensing option at this point in time. Recent experience with class licensed spectrum for WAS has demonstrated that degraded QoS and other issues, such as interference from nearby transmitters, are problematic. ACMA needs time to consider these issues and how they can be mitigated. This means that the class licensing option is not open to consideration for the release of the 3.6 GHz band at this point in time.

By issuing apparatus licences for WAS, ACMA will be able to provide incumbent licensees with certainty regarding issues such as interference management. This licensing option also provides ACMA with the ability to release the spectrum more efficiently than other licensing options outlined above. The issue of apparatus licences for WAS in the 3.6 GHz band can be achieved under an existing licensing arrangement for fixed services. ACMA will issue fixed point to multipoint (P-MP) apparatus licences for WAS.

P-MP apparatus licences are subject to the licence conditions set out in the *Radiocommunications Licence Conditions (Fixed Licence) Determination 1997* (Fixed LCD) and the *Radiocommunications Licence Conditions (Apparatus Licences) Determination 2003* (Apparatus Licences LCD) respectively. The Fixed LCD sets out licence conditions that are specific to the operation of a P-MP transmitter in frequency bands specified for WAS. The 3.6 GHz band is included in the definition of WAS frequency bands. The Apparatus Licences LCD sets out licence conditions, including electromagnetic energy requirements (EME), on licensees of certain transmitters.

The cost to issue a P-MP apparatus licence will be based on the current apparatus licence fee schedule taking into account the geographic location of the site, for example if it is in a high, medium, low or remote spectrum density area. However, if a nominated site is within a defined geographic area that will be allocated via a price-based allocation (PBA) process, additional costs will be applied. These costs are attributed to the application fees and the total bid price, should the applicant be successful at allocation. The successful applicant in a PBA process will also be required to pay licence application fees. Further information on the PBA process is provided below.

ACMA is aware of concerns expressed within industry regarding the cost to access spectrum in regional areas of Australia. This issue does not fall within the scope of the present paper. ACMA intends to shortly release a discussion paper dealing with the general issue of transmitter licence fees and costs, including the potential to use opportunity cost pricing to set apparatus licence fees. This discussion paper will provide an opportunity to raise any concerns about the price to access spectrum.

The allocation options being considered by ACMA for apparatus licences in the 3.6 GHz band are set out below.

Allocation options

There are two ways in which ACMA can issue apparatus licences. It can issue them via an administrative allocation process, referred to as an “over the counter” (OTC) allocation in accordance with section 100 of the Act. In these cases, ACMA will generally issue an apparatus licence on a first in time, or order of receipt, basis.

The other option is to issue licences via a price-based allocation (PBA) process in accordance with section 106 of the Act. ACMA applies a price-based allocation (PBA) process where the demand for access to spectrum exceeds its supply. ACMA has applied

PBA processes to the issuing of apparatus licences including the WAS in the 1.9 GHz band and low power open narrowcasting (LPON) services.

PBA processes for apparatus licences in recent years have focused on applicants bidding for particular sites or frequencies. Generally, applicants have submitted applications for licences that have undergone assessment by ACMA to determine their overall success for coordination purposes prior to the PBA occurring. However, a different approach was used in 1999 when the “right to apply” for a licence in a particular geographic area was used.

ACMA is considering a combination of these approaches in relation to licences in the 3.6 GHz band. The allocation options currently being considered by ACMA are discussed in further detail below.

It is important to note that the possible allocation options set out below are intended to provide a high level, conceptual overview of how each option could be implemented by ACMA. The actual detail involved in the allocation processes is yet to be determined, and may be based on the information obtained by ACMA as a result of this consultation process.

Further information regarding the allocation options, once decided by ACMA, will be made available via the ACMA website.

OPTION 1 – PRICE-BASED ALLOCATION (PBA) OF 3.6 GHZ

Under this option, ACMA proposes to allocate the “right to apply” to successful applicants. ACMA may decide to include the 3.6 GHz band into the *Radiocommunications (Transmitter Licences – Auction) Determination 2006* (the Auction Determination) and allocate the “right to apply” via a price-based allocation process. This would mean that the 3.6 GHz band would be allocated via PBA processes across the whole of Australia. Further legislative amendments would be required for ACMA to deviate from this approach once it has been implemented.

Allocation Process

ACMA may call for applications within a specified period of time for a particular geographic area, such as a state or territory, for example, and proceed to allocation via PBA. Interested parties will be required to register with ACMA in order to participate in the PBA. Another option available to ACMA for consideration is to allocate the band via PBA on a national basis rather than going state by state, or some other geographic combination.

ACMA will release an Applicant Information Package that explains the registration and participation processes. The PBA process will determine which successful applicant is given the first right to apply in a defined PBA area. The remaining applicants will be placed on a list in order of the value of their bids respectively. That is, the second highest bid will receive the second right to apply, and so on.

Once the PBA process has ended, successful applicants will be advised in writing of the outcome of the PBA process and given a time frame in which their complete applications must be received by ACMA.

Applicants who are successful in obtaining the first right to apply in an area will have their applications coordinated and assessed by an AP or ACMA as soon as practicable after the PBA. Other applicants who may have the second or third right to apply, in some cases, will be advised of the outcome and applicable time frames for applications to be submitted and assessed. Applicants will be encouraged to review their original applications after licences

are issued to earlier applicants to determine whether the nominated sites and preferred frequencies are still available.

OPTION 2 – COMBINATION OF OVER THE COUNTER (OTC) & PBA

Administrative allocation process

Under this option, ACMA will consider implementing a staged approach to the release of the 3.6 GHz band. This approach would see the release of the 3.6 GHz band occur in particular states or territories at certain times throughout the remainder of 2009 and the first half of 2010. ACMA intends to determine the order in which states or territories, or combination of the two, are to be released based on one or more of the following criteria:

- The level of interest, as indicated by responses to this discussion paper, in obtaining apparatus licences for the deployment of WAS in the band; or
- The presence of a business case with some reliance on government funding via an established Government program (e.g. Clever Networks); or
- Proof of an established project delivery deadline connected to the receipt of funding, public or otherwise.

It is important to note that the above list is not exhaustive. ACMA has not yet agreed to criteria for determining the order of the states or territories to be released, and the issue is open to discussion as part of the consultation process.

However, once ACMA has determined the order in which the states and territories will be made available for the staged allocation, ACMA will announce the proposed release dates.

Application Process

Under this proposed approach, ACMA will only accept applications for the relevant state or territory during the applicable time frame for the staged release. However, once all the states and territories have been released through the staged approach, ACMA will then proceed to accept applications from any location in Australia.

Applications for services in the 3.6 GHz band that are received via an OTC process will be considered and assessed on a “first in time” basis. However, where ACMA determines that there is a significant number of licence applications for the same geographic area, ACMA will refuse the applications and proceed with making legislative amendments to include the geographic area for allocation via the PBA process instead.

ACMA will create a specific e-mail address that applications may be e-mailed to; as well as providing specific contact details for mailed applications and any other enquiries.

PBA process

ACMA will apply a PBA process allocating the “right to apply” to applicants, in accordance with the information provided in Option 1 above.

However, this approach differs in that ACMA will conduct the PBA process only in defined geographic areas, referred to as PBA areas, which may be included or referred to, in the Auction Determination. ACMA could achieve this by making the following amendments to the Auction Determination:

- Including the 3.6 GHz frequency band into the scope of the Determination; and

- Including reference to particular, or defined, geographic areas in a Schedule to the Determination.

The proposed PBA areas are outlined in the map below in the section titled “Development of Allocation Areas”. The actual allocation process undertaken by ACMA would be similar to that outlined in Option 1.

OPTION 3 – EXPRESSION OF INTEREST (EOI)

Under this option, ACMA may decide to accept Expressions of Interest (EOI) from interested parties within a specific time frame. Applicants will be requested to provide an abbreviated application to ACMA for preliminary assessment. The type of technical information required may include:

- The preferred operational frequency and bandwidth (or range of bandwidths such as 25 MHz or 20 MHz);
- Whether there is a preference for ACMA or an Accredited Person (AP) to complete the frequency assignment/coordination;
- The location of the nominated site, within 100m;
- The proposed antenna height; and
- The proposed maximum EIRP.

The list of information provided above may not be exhaustive, and should not be relied upon by prospective applicants in providing an EOI to ACMA. Further and complete details would be provided on ACMA’s website regarding the information that is to be submitted in the EOI.

Application Process

The EOI process will be used by ACMA to determine which applicants are considered “first in time”. ACMA will determine the “first in time” by the date and time the EOI is received. This will be determined either by e-mail headers or ACMA’s physical date stamp for hand delivered/mailed submissions. The “first in time” process will also be used to determine which applicant is successful in obtaining the 25 MHz that is available.

After the closing date on the EOI process, ACMA will assess the information provided in the EOI submissions with a view to determining which applications for nominated sites fall into the categories listed below. The way in which an apparatus licence will be issued is dependent on which category the nominated site falls into.

- **Straight Forward** – These are simple assignments where no further coordination is necessary. After technical analysis, the applicant will be asked to submit an application for an apparatus licence to ACMA.
- **Requires Coordination** – After further technical analysis conducted by ACMA, the applicant will be advised:
 - That a licence application will be accepted by ACMA for the nominated site; or
 - That the applicant will need to participate in a PBA process.

- **Demand Exceeds Supply** – After technical analysis, ACMA will advise applicants that they will need to participate in a PBA process.

After determining which category the EOI falls into, ACMA will write to applicants and advise under which allocation process their respective application may be accepted by ACMA. Applicants who have indicated that they wish to use the services of an AP will then be able to have the assignments completed and submitted to ACMA within a specified time frame.

It should be noted that interested parties who do not submit an EOI in the specified time frame will not be considered in the initial release of the 3.6 GHz band. Future opportunities to access spectrum in the 3.6 GHz band may be available after this process is finalised however, it should be noted that a nominated site or preferred frequency may not be available if it falls under either category 2 or 3 outlined above.

ACMA is seeking comment on the advantages and disadvantages of each of the options outlined above.

Development of Allocation Areas

ACMA has identified areas where access to spectrum in the 3.6 GHz band may be limited. These limitations are typically due to the presence of incumbent services in the band. The limited spectrum coupled with potential demand for WAS services has guided the development of the PBA areas. Additionally, the states and territories have been separated into potential allocation areas for the staged administrative allocation process. The map below sets out these areas.

The following cities or regional areas were identified in previous spectrum allocations as areas where increasing demand for access to spectrum for WAS is evident:

- Northern Queensland;
- Uralla;
- Mildura; and
- Hobart.

ACMA has not included these areas in the list of possible PBA areas set out in the map below. It is ACMA's view that sufficient spectrum should be available in these areas.

It is to the advantage of stakeholders to provide ACMA with information regarding areas where there may be high demand for spectrum. If it is determined during the allocation process (either OTC or EOI) that high demand exists in a particular area, ACMA will refuse to issue licences and proceed to a PBA process instead. This may cause further delay in stakeholders accessing spectrum in the 3.6 GHz band as a result of administrative and legislative amendments that will need to occur.

DEVELOPMENT OF PBA AREAS

The PBA areas identified in the map below were created around geographic areas where contention for spectrum is likely to occur. The following factors were considered in the development of the PBA areas:

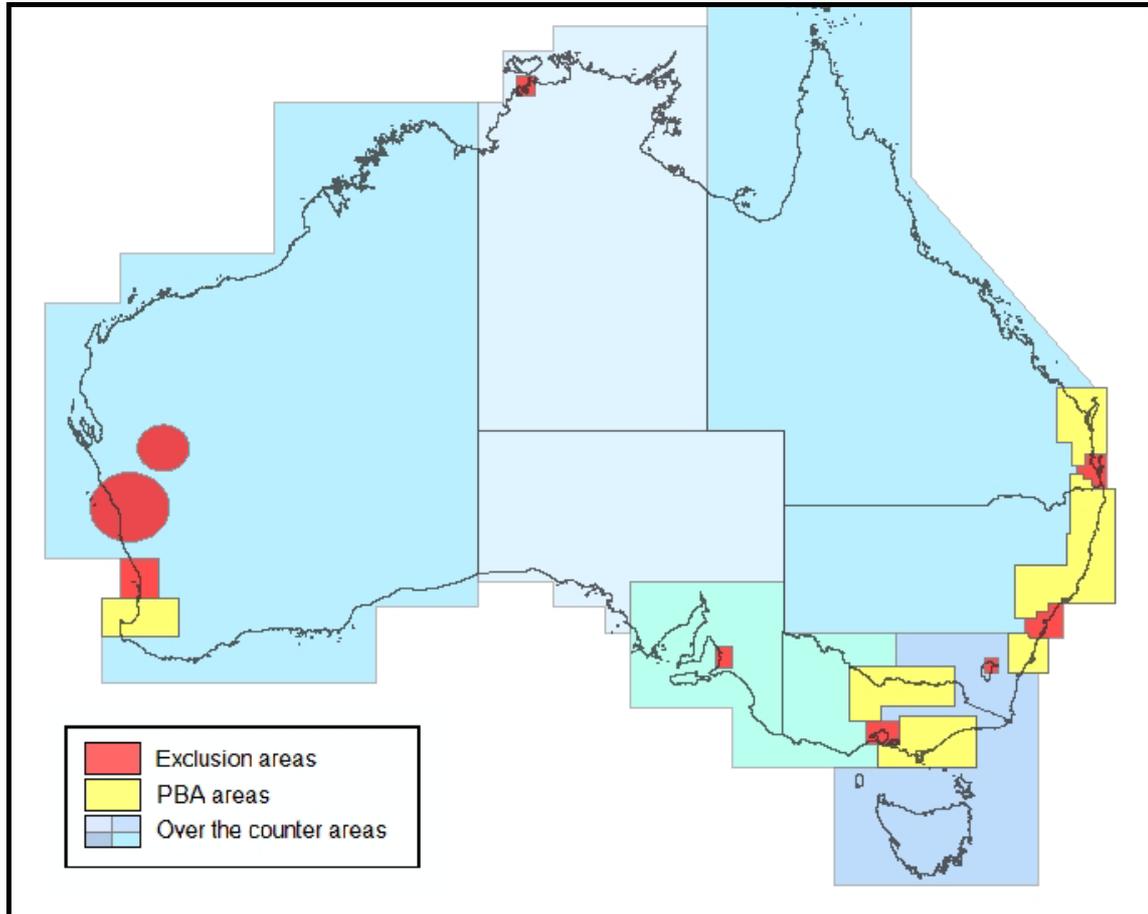
- Limitation of available spectrum due to incumbent services in the 3.6 GHz band;

- Evidence of demand in the past for spectrum for WAS; and
- The boundaries of significant population centres.

ACMA has included “buffer zones” around the larger population centres inside the PBA areas in order to increase these centres separation from the PBA area boundary. The aim is to reduce the likelihood of WAS licensed outside PBA areas affecting the ability to coordinate and licence WAS inside these areas.

It is noted that, if OTC areas are released before PBA areas, the defined boundaries may not protect all locations in a PBA area (particularly those near the boundary edges) from the potential spectrum denial created by WAS services licensed nearby. However, due to the ‘buffer zones’ created, the impact of this is designed to be small or negligible.

Map of Proposed Staged Release & PBA Areas for 3.6 GHz



Issues for Comment

ACMA is seeking comment from industry and interested parties on:

- The advantages or disadvantages of the proposed allocation options, including the identification of a preferred option;
- What other factors ACMA should take into account when assessing which state or Territory, or combination of the two, should be released first;
- The suitability of the proposed PBA process (allocating the right to apply);
- The suitability of the geographic areas for the proposed staged administrative allocation process;
- The suitability of the proposed geographic areas for the PBA process;
- Whether there are any other areas that should be included as PBA areas to allocate the 3.6 GHz band; and
- An indication of which geographic areas are anticipated to have significant demand for access to spectrum and could potentially be included in the PBA process.

4 Technical parameters for WAS in the 3.6 GHz band

Development of Coordination Criteria

Coordination criteria in the 3.6 GHz band have been developed to support the deployment and operation of WAS technologies using TDD (time division duplex) single frequency configurations. It is assumed that technologies based on the IEEE 802.16 standard (that is, WiMAX technologies) are the most likely technologies to be deployed in the band.

The following incumbent services and specific geographic areas were considered when developing coordination criteria:

- Fixed point-to-point services (fixed services);
- Adjacent band spectrum licences (3442.5-3475/3542.5-3575 MHz);
- Other WAS services;
- Fixed satellite services (FSS);
- Radiolocation services;
- Amateur services; and
- The Mid-West Radio Quiet Zone and other specific areas near Darwin and Geraldton.

PROTECTION FOR INCUMBENT SERVICES

Coordination requirements for many of the services operating in and around in the 3.6 GHz band are already defined in various Radiocommunications Assignment and Licensing Instructions (RALI), the Radiocommunications Advisory Guidelines (RAG) made under section 262 of the Act, or contained within the relevant spectrum licence technical framework. Services for which coordination criteria have not been previously defined in the 3.6 GHz band include the FSS, Amateur Services and Radiolocation Services. In developing coordination criteria for these services ACMA undertook various research and consultation processes. The summary of these processes are outlined below:

- In order to develop coordination criteria between WAS and the FSS, ACMA initially conducted research and gathered information from various local and international sources, such as Earth Station licensees, the CEPT, APT, ITU³ and WiMAX Forum⁴. ACMA also established the 3.6 GHz Industry Working Group to provide advice on the finalisation of coordination criteria between WAS and FSS Earth stations (see below for further information on the IWG).
- In order to develop coordination criteria between WAS and Amateur services in the 3.6 GHz band, consideration was given to the Amateur services low density usage of the band, their potential transient nature, the *Radiocommunications Licence Conditions (Amateur Licence) Determination No. 1 of 1997* and secondary status in the band. ACMA consulted with members of the Wireless Institute of Australia (the peak organisation for Amateurs in Australia) before developing the proposed criteria.
- In order to assess the potential effect Radiolocation services may have on WAS deployments and the need for coordination criteria, ACMA is consulting with the Department of Defence (DoD) on their current and planned use of radiolocation services in the band. Information currently available indicates that WAS deployments in the 3.6 GHz band will neither severely affect nor be severely affected by these radiolocation services. The potential for interference between WAS and Radiolocation services will be low and transient in nature and therefore manageable. ACMA will continue to consult on and monitor this issue with DoD in the future.

Further information on the proposed coordination criteria can be referred to in the draft update to *Radiocommunications Assignment and Licensing Instruction FX19*.

3.6 GHZ INDUSTRY WORKING GROUP

Since no criteria had previously been defined for the coordination of WAS and FSS Earth stations in the 3.6 GHz band, the 3.6 GHz Industry Working Group (IWG) was established to seek advice from industry on the development of coordination criteria between these services in the band.

The IWG includes representatives from the FSS community as well as WAS equipment manufacturers and operators. Although the IWG did not include every interested and potentially affected party, its membership was large and broad enough to be considered representative of different interest groups, as well as containing relevant expertise. Furthermore, the coordination criteria developed through the advice of this group is now available for broader consultation to all interested and affected parties, through the issues set out for discussion in this paper and the proposed update to RALI FX19.

The IWG considered key characteristics relating to parameters and procedures to coordinate future wireless access services (WAS) in the 3.6 GHz band with licensed Earth stations. The coordination criteria that were developed addressed the following issues:

³ CEPT – European Conference of Postal and Telecommunications Administrations; APT – Asia-Pacific Telecommunity; ITU – International Telecommunication Union.

⁴ The WiMAX Forum is an industry-led, not-for-profit organization formed to certify and promote the compatibility and interoperability of WiMAX products and services.

- co-channel interference;
- adjacent channel interference; and
- Earth station receiver non-linear operation.

The IWG also provided initial comment and feedback on the exclusion areas developed by ACMA.

Channel Plan

In the 3.6 GHz band there are a number of potential system bandwidths that may be deployed by licensees. Current equipment supports typical profile bandwidths of 3.5 MHz, 5 MHz, 7 MHz and 10 MHz, with future equipment expected to support 20 MHz channels respectively. ACMA expects that in many cases, channel sizes of > 7 MHz will be used in order to deploy a metropolitan comparable service.

In order to provide support for future 20 MHz channels and to maximise spectrum availability in areas where fixed links and Earth Stations are in use, WAS channel arrangements in the 3.6 GHz band have been aligned with the 3.8 GHz fixed link channel plan⁵. For this reason a 10 MHz and 20 MHz channel raster is employed, with one 15 MHz channel, see figure 1.

To provide flexibility for licensees wishing to deploy services using smaller system bandwidths than specified on the channel plan, ACMA has created arrangements which allow operators to flexibly use their spectrum. For example, a licensee in the 15 MHz channel (channel 1) described in the channel plan below may deploy two 7 MHz channels in their licence space provided they adhere to relevant conditions⁶.

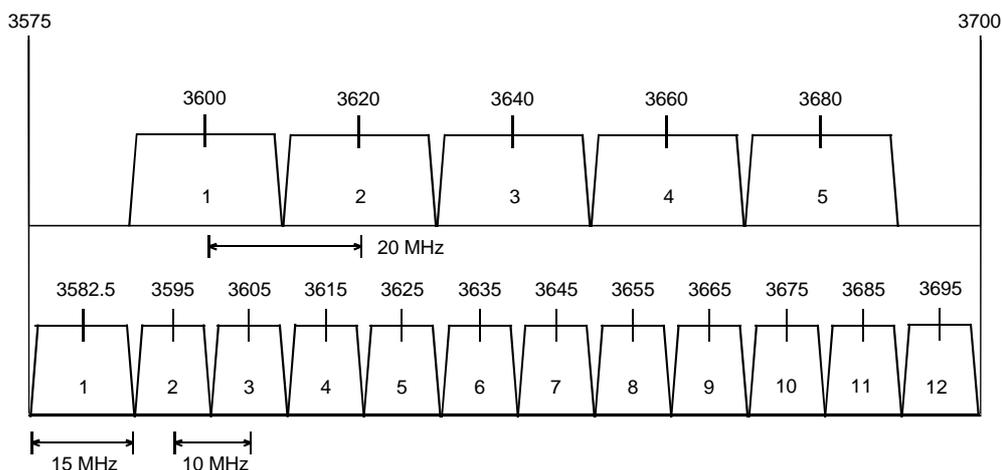


Figure 1. Proposed WAS channel plan for the 3.6 GHz band, encompassing 10 MHz and 20 MHz channelling, with one 15 MHz channel

⁵ Refer to *Radiocommunications Assignment and Licensing Instruction FX3*

⁶ Refer to section 5 of the proposed update to *Radiocommunications Assignment and Licensing Instruction FX19* for more information.

Maximum available bandwidth

ACMA has considered implementing maximum available bandwidths to be allocated to a single licensee in a nominated geographic area. The nominated maximum available bandwidth would be 20 MHz, or 25 MHz for licensees who hold the 15 MHz channel in the proposed channel plan outlined above. The following options have been considered:

- Applying the maximum available bandwidth to geographic areas subject to OTC processes during the initial staged release or EOI process only. Geographic areas referred for PBA would not be subject to maximum available bandwidths.
- Applying the maximum available bandwidth to geographic areas subject to both OTC and PBA processes for a specified period of time. The time frame may be until ACMA has determined the actual level of demand for access to spectrum in the 3.6 GHz band.
- Not applying a maximum available bandwidth to any geographic area. This essentially allows an interested party to obtain the amount of spectrum they consider necessary to meet their requirements.

ACMA seeks comments on the advantages and disadvantages of each of these potential approaches.

Exclusion areas

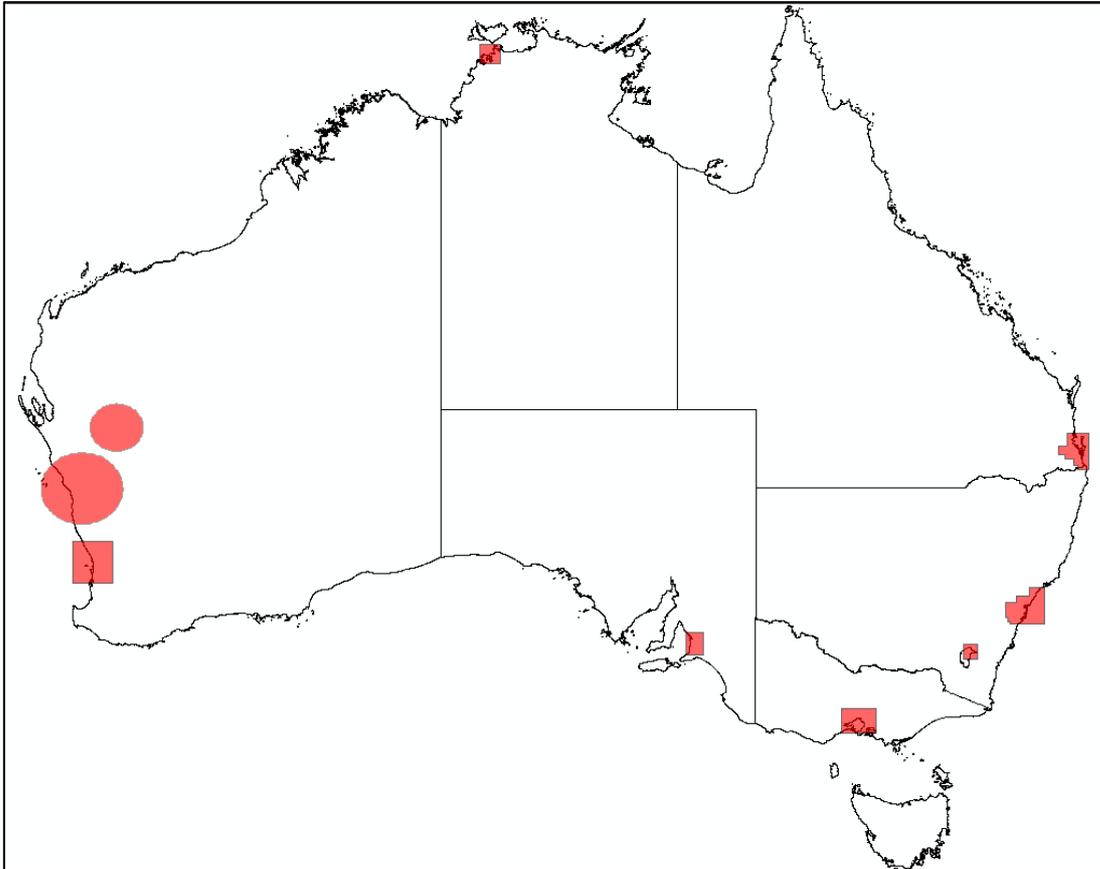
ACMA has defined exclusion areas where it will not allow the deployment of WAS. These areas were developed considering factors such as:

- the protection of incumbent satellite services from harmful interference in major city areas;
- preserving future planning options in major city areas; and
- maximising availability of spectrum in fringe areas located close to major cities.

In addition to these exclusion areas, a number of spectrum embargoes contained in RALI MS3 also apply to the 3.6 GHz band. These embargoes relate to the protection of the Mid West Radio Quiet Zone located in Western Australia and the development of future Satellite Parks designed to protect satellite services in bands of shared use between satellite and terrestrial services.

The exclusion areas for the 3.6 GHz band are defined in Appendix B and the exclusion areas and existing embargoes are displayed in figure 2.

Figure 2. Exclusion and embargo areas defined for the 3.6 GHz band (in red)



Issues for Comment

ACMA is seeking comment from industry and interested parties on:

- The suitability of the coordination criteria developed and set out in RALI FX19;
- The suitability of the proposed channel plan set out in Figure 1 above; and
- Whether ACMA should consider implementing maximum available bandwidths in geographic areas for the allocation of the 3.6 GHz band?

5 Regulatory framework

Spectrum planning

The *Australian Radiofrequency Spectrum Plan 2009* (the Spectrum Plan) divides the Australian radiofrequency spectrum into a number of frequency bands and specifies the general purpose for which the bands may be used.

Whilst the Australian allocations in the Spectrum Plan are broadly aligned with the ITU requirements for Region 3, a number of variations exist and are reflected in the Australian allocations listed in Column 2 of the Table of Frequency Band Allocations in the Spectrum Plan.

The Spectrum Plan is recognised as a technical document that, at the broadest level, shows the allocation of frequency bands to various types of services. The Spectrum Plan is also the ACMA's starting point for technical and policy factors that contribute to the ACMA's overall spectrum management responsibilities. Other contributing factors include:

- Band plans and channel plans;
- Spectrum embargoes;
- Frequency assignment requirements in legal instruments and administrative policy documents; and
- Technical conditions applied to spectrum licences, apparatus licences and class licences, including licence conditions determinations and any requirements for compliance with standards.

The Australian table of frequency allocations set out in the Spectrum Plan for the frequency range 3575-3700 MHz includes the following services:

- Fixed
- Radiolocation
- Fixed satellite
- Mobile
- Amateur

Radiocommunications Licensing

Generally, the Act requires that the users of transmitters must be licensed. ACMA's regulatory arrangements provide for three broad licensing options including the issue of spectrum licences, apparatus licences and class licences respectively. A summary of the three licensing options is provided below.

Apparatus licences

This licensing option generally specifies the category of service, such as whether the service is fixed or mobile, and the technical characteristics including the location, power, frequency of operation and the radiofrequency emission type. These licences are usually site-based, usually issued over-the-counter, and represent the majority of ACMA's licensing activity.

Spectrum licences

Spectrum licences authorise the use of a parcel of spectrum space. Licensees are able to deploy transmitters or devices from any site within their spectrum space, as long as the operation of the device complies with the core conditions and technical framework applicable to the spectrum licensed band.

Class licences

This licensing option is generally considered to be a type of umbrella licence that is designed to provide "public parks" for the authorised use of various low powered devices that have a low interference potential. Common examples of these devices are garage door openers, remote car door locks and intruder alarms, wireless microphones, automatic tollway systems and tag security systems. Provided these transmitters comply with the conditions of the class licence, then individual licences are not required.

Discussion on the proposed licensing options considered by ACMA for the release of the 3.6 GHz band for WAS is provided in Chapter 3. However, it may be noted here that services in the 3.6 GHz band will be authorised to operate under an apparatus licence.

Amendments to legal instruments and other documents

The policy review undertaken as part of the 3.6 GHz project highlighted various issues with the legislative instruments set out below. As a result, the proposed amendments also refer to sections of legislative instruments that may not be associated with the 3.6 GHz project only. For example, the proposed amendments may, in some cases, relate to frequency bands other than the 3.6 GHz band.

ACMA is proposing amendments to the following legislative instruments and technical documents:

- *Radiocommunications Licence Conditions (Fixed Licence) Determination 1997* (the Fixed LCD);
- the *Radiocommunications (Transmitter Licences – Auction) Determination 2006* (the Auction Determination);
- the *Radiocommunications Advisory Guidelines (Managing Interference to Apparatus Licensed Receivers – 3.4 GHz Band) 2000* (the Advisory Guideline); and
- Radiocommunications Assignment and Licensing Instruction FX19 (RALI FX19).

The proposed amendments to the various instruments or documents are summarised below.

FIXED LCD

ACMA proposes to amend the **Fixed LCD** in the following way:

- Includes the frequency bands 1427-1535 MHz and 3400-3700 MHz into the scope of the Fixed LCD;
- Includes a new definition for wireless access service (WAS) bands;
- Exempts stations that operate using WAS bands from the licence conditions detailed in Part 3 of the Fixed LCD;
- Removes Part 3D and Schedule 3 regarding roll out obligations from the Fixed LCD;
- Includes a grandfathering clause applying the roll out obligations to point to multipoint licences in the 1900-1920 MHz band issued on or before 15/02/2008;
- Includes new Part 3E, that sets out conditions for fixed licences (point to multipoint stations) that operate in WAS bands.

The inclusion of the 1427-1535 MHz band in the Fixed LCD is a minor amendment unrelated to the proposed release of the 3.6 GHz band. The frequency band was previously included in the licence conditions set out in the Fixed LCD, however was not mentioned in the scope in subsection 2 (1) (b) respectively.

The inclusion of the 3400-3700 MHz band will ensure that the Fixed LCD applies to any other frequency bands in this range that may also be made available for fixed services such as WAS by way of apparatus licensing.

The new definition for WAS bands is aimed at increasing administrative efficiency by providing a collective definition for the frequency bands 1427-1535 MHz, 1900-1920 MHz, 2010-2025 MHz and 3400-3700 MHz respectively.

The licence conditions previously set out in RALI FX19 regarding remote stations, adjacent channel interference and adaptive transmit power control have been incorporated into Part 3E of the Fixed LCD. Part 3E applies to stations that operate in WAS bands.

Provision of service obligations

The proposed amendment to Part 3D provides a grandfather clause regarding the application of roll out obligations on apparatus licences issued in the 1900-1920 MHz band. Because some apparatus licences are currently subject to the roll out obligations, or in the process of providing evidence of meeting the obligation, it is ACMA's view that the grandfathering clause provides certainty to current and future licensees in the band. The rationale for removing the roll out obligations from apparatus licences issued in the 1900-1920 MHz band is because the level of demand for access to the 1900-1920 MHz band, in particular, has considerably decreased.

ACMA does not propose to apply provision of service obligations, also known as "use it or lose it" conditions or roll out obligations, will not be applied to the issue of apparatus licences for WAS in the 3.6 GHz band.

This is because the amount of spectrum available in the 3.6 GHz band in most geographic areas of regional and remote Australia is sufficient to facilitate the deployment of services by multiple providers. In situations where the amount of spectrum available in a geographic

area is restricted, as a result of incumbent services for example, ACMA intends to apply a price-based allocation (PBA) process.

PBA processes will ensure that spectrum is allocated to its highest value use in an open and transparent manner. As a result, ACMA considers the application of provision of service obligations to be unnecessary for the 3.6 GHz band.

AUCTION DETERMINATION

ACMA proposes to amend the **Auction Determination** in the following way:

- Inclusion of the frequency band 3575-3700 MHz to enable allocation via a price based allocation (PBA) process
- Removes the frequency band 1900-1920 MHz from the Auction Determination
- Amends the definition of *bank transfer*
- Updates the ACMA's banking details

ACMA intends to include the 3.6 GHz band into the scope of the Auction Determination in such a way that it only specific geographic areas identified by ACMA will be allocated by PBA. Other geographic areas will be subject to assignment via ACMA's traditional administrative apparatus licence application process where applications are received by ACMA "over the counter" (OTC) and coordinated in order of receipt. Further information regarding the licensing and allocation options for the 3.6 GHz band are in chapter 5.

The removal of the 1900-1920 MHz band from the Auction Determination ensures that the assignment of apparatus licences in this band will be conducted by the traditional OTC apparatus licence application process. The reason to revert to OTC assignment for apparatus licences in this band is because of a demonstrated slow down in demand for access to this part of the spectrum. ACMA accepts that to continue allocation for apparatus licences in the 1900-1920 MHz band via a PBA method is resource intensive and not a viable market option where there is limited demand.

ADVISORY GUIDELINE

ACMA proposes to amend the **Advisory Guideline** in the following way:

- Includes the frequency range 3575-3700 MHz into the scope of the Advisory Guideline
- Includes new definitions for *3.6 GHz band* and *RALI FX19*
- Updates the compatibility requirements to include RALI FX19 into the scope of the Advisory Guidelines and explain its purpose.

The Advisory Guideline essentially provides spectrum licensees in the 3.4 GHz band with further information when assessing the deployment of transmitters in spectrum licensed areas with existing services in adjacent geographic areas or frequency bands.

RALI FX19

ACMA proposes to amend **RALI FX19** in the following way:

- Inclusion of relevant information and coordination criteria between WAS and the following services in and around the 3.6 GHz band:
 - Fixed point-to-point services
 - Fixed satellite services
 - Amateur services
 - Services in adjacent band 3.4 GHz spectrum licence space; and
 - Other WAS services
- Inclusion of coordination requirements with the Mid-West Radio Quiet Zone and other specific regional areas near Darwin and Geraldton
- Removal of specific licence special conditions and advisory notes (with replacement into the Fixed LCD)
- Removal of roll-out obligations in the 1900-1920 MHz and 2010-2025 MHz bands
- Removal of the 10 MHz per operator spectrum limits in the 1900-1920 MHz band

Issues for Comment

ACMA is seeking comment from industry and interested parties on:

- The suitability of the proposed amendments to the legislative instruments; and
- The effectiveness of the protection criteria and other amendments set out in RALI FX19;
- Whether any other changes to relevant legislative instruments and technical documents are required or would be desirable;
- Whether provision of service obligations should be applied to the issue of apparatus licences for WAS in the 3.6 GHz band; and
- If provision of service obligations should be applied, how the provisions should be applied.

6 Role of Accredited Persons

This section provides discussion on the involvement of Accredited Persons (APs) in the release of the 3.6 GHz band for WAS in regional and remote areas of Australia. As discussed in Chapter 3, ACMA proposes to establish a policy for the treatment of licence applications that will facilitate timely processing of those applications and speed access to the band by prospective licensees.

AP involvement in the Administrative Allocation Process

ACMA has identified a number of policy approaches that could be implemented in relation to the proposed administrative allocation process for the 3.6 GHz band, and seeks comment on each approach. The policy approaches under consideration are that ACMA:

- Only accepts licence applications for WAS where the application is accompanied by a Frequency Assignment Certificate (FAC) issued by an AP;
- Will accept licence applications for WAS whether or not the licence application is accompanied by a FAC but will preferentially process licence applications accompanied by FAC's before, and without regard to, licence applications that are not accompanied by FACs;
- Will not process licence applications for any particular area for WAS if more than [xx] licence applications are received for any particular area of [yy] square kilometers or less. Instead, ACMA will refuse the licence applications and proceed to amend the Auction Determination to include the particular area;
- Will only accept applications on a first in time basis for the administrative allocation process. ACMA will publish a list for use by APs on which applications are to be considered in order of receipt. Any applications received by APs will need to be complete, that is, include completed application forms and FACs, in order to prevent "paper filings" (see next section for definition).

ACMA seeks comments on the advantages and disadvantages of each of these potential approaches to processing licence applications for WAS in the 3.6 GHz band.

AP involvement in the Price-based Allocation Process

ACMA anticipates further involvement by APs in assigning services in the 3.6 GHz band once the outcome of the PBA process is determined. As outlined above, the PBA process

will determine the first right to apply for a successful applicant, with second and third applicants (in some cases) also being awarded.

Successful applicants will be given a timeframe within which to submit an application to ACMA. If an AP is completing the assignment, a complete application will need to be submitted by the AP. This will ensure that ACMA does not receive “paper filings”. This is where spectrum is reserved by an AP, via the submission of a frequency assignment certificate (FAC), but the application is not submitted by the licensee.

Issues for Comment

ACMA is seeking comment from industry and interested parties, and Accredited Persons in particular, in response to the following specific questions:

- Are there enough APs with appropriate tools and expertise to:
 - Meet the likely demand from applicants seeking WAS licences in the 3.6 GHz band?
 - Ensure that applicants will be able to obtain the services of an AP that does not have a potential conflict of interest because they are also representing a competitor to an applicant?
- Do APs have sufficient technical guidance from ACMA about coordination criteria to be able to issue FACs if the arrangements set out in this discussion paper were to be implemented?
 - If the answer is no, please indicate the additional guidance that would be required from ACMA to allow APs to issue FACs in the 3.6 GHz band.
- Are there any disadvantages to requiring applicants to use the services of an AP or discriminating in favour of applicants who have used the services of an AP?
- If ACMA does require applicants to use APs, or discriminates in favour of applicants who use APs, how important is the expected benefit of earlier access to the 3.6 GHz band to prospective applicants?
- What would be the appropriate thresholds for licence applications and geographic area for ACMA to decide to refuse licence applications in a particular area and instead auction the right to apply for a licence in the area?
- What is the minimum geographic area that this approach could be used in?
- What other factors or other approaches should ACMA consider in order to encourage the involvement of APs in coordinating applications for WAS in the 3.6 GHz band?

7 Summary of Issues for Comment

ACMA welcomes comment from interested stakeholders of the issues raised in this paper. A summary of the issues raised for comment is provided below.

Chapter 3 – Allocation Arrangements

ACMA is seeking comment from industry and interested parties on:

- The advantages or disadvantages of the proposed allocation options, including the identification of a preferred option;
- What factors ACMA should take into account when assessing which state or territory, or combination of the two, should be released first;
- The suitability of the proposed PBA process (allocating the right to apply);
- The suitability of the proposed geographic areas for the PBA process;
- Whether there are any other areas that should be included as PBA areas to allocate the 3.6 GHz band; and
- An indication of which geographic areas are anticipated to have significant demand for access to spectrum and could potentially be included in the PBA process.

Chapter 4 – Assignment Model

ACMA is seeking comment from industry and interested parties on:

- The suitability of the coordination criteria developed and set out in RALI FX19;
- The suitability of the proposed channel plan set out in Figure 1; and
- Whether ACMA should consider implementing maximum available bandwidths for geographic areas in the allocation of the 3.6 GHz band?

Chapter 5 – Regulatory Framework

ACMA is seeking comment from industry and interested parties on:

- The suitability of the proposed amendments to the legislative instruments;
- The effectiveness of the protection criteria and other amendments set out in RALI FX19;
- Whether any other changes to relevant legislative instruments and technical documents are required or would be desirable;

- Whether provision of service obligations should be applied to the issue of apparatus licences for WAS in the 3.6 GHz band; and
- If provision of service obligations should be applied, how the provisions should be applied.

Chapter 6 – Role of Accredited Persons (APs)

ACMA is seeking comment from industry and interested parties, and Accredited Persons (APs) in particular, on:

- Are there enough APs with appropriate tools and expertise to:
 - Meet the likely demand from applicants seeking WAS licences in the 3.6 GHz band?
 - Ensure that applicants will be able to obtain the services of an AP that does not have a potential conflict of interest because they are also representing a competitor to an applicant?
- Do APs have sufficient technical guidance from ACMA about coordination criteria to be able to issue FACs if the arrangements set out in this discussion paper were to be implemented?
 - If the answer is no, please indicate the additional guidance that would be required from ACMA to allow APs to issue FACs in the 3.6 GHz band.
- Are there any disadvantages to requiring applicants to use the services of an AP or discriminating in favour of applicants who have used the services of an AP?
- If ACMA does require applicants to use APs, or discriminates in favour of applicants who use APs, how important is the expected benefit of earlier access to the 3.6 GHz band to prospective applicants?
- What would be the appropriate thresholds for licence applications and geographic area for ACMA to decide to refuse licence applications in a particular area and instead auction the right to apply for a licence in the area?
- What is the minimum geographic area that this approach could be used in?
- What other factors, or other approaches, should ACMA consider in order to encourage the involvement of APs in coordinating applications for WAS in the 3.6 GHz band?

Appendix A

Analysis of the 3.6 GHz Project Against the Spectrum Management Principles

Principle 1 - Allocate spectrum to the highest value use or uses

Recent technology and market developments in the 3.6 GHz band indicate that it may no longer be at its highest value use.

Technology & Market Developments

The 3.6 GHz band has been identified as suitable frequency band for the deployment of wireless access services (WAS) for the following reasons:

- the 3.6 GHz band is targeted by WiMAX equipment manufacturers;
- the availability of equipment for WAS is increasing and provides evidence of the development of economies of scale;
- a number of countries have allocated the band for WAS (including the USA and some European, Asian and South American countries); and
- the responses to previous consultation processes conducted by ACMA indicated a strong demand from local WAS operators for access to spectrum. This was followed up at the Radcomms08 conference with a petition signed by 21 interested stakeholders, including regional WAS operators, regional economic development bodies and equipment suppliers requesting the release of the band.

One of the major benefits of WAS is that it has the potential to provide communities with metro comparable services such as broadband, in regional and remote areas of Australia where fixed line infrastructure would be impractical or too expensive to deploy.

Value to Incumbent Services

The value of the band to incumbent services, in particular the Fixed Satellite Service (FSS), is also recognised. However, there are only a small number of FSS licences in the 3600-3700 MHz band and these are located specifically in Sydney and Perth. Most FSS licences operating in the standard C-band (3700-4200 MHz) are located in

major city areas. As a result, it is believed that there is potential for the FSS and WAS to share the 3.6 GHz band in regional and remote areas of Australia.

Similarly sharing with other services, such as fixed point-to-point links, is also considered feasible due to factors such as the existence of alternative spectrum options for this service, the limited number of services in the 3.6 GHz band.

In light of the issues discussed above, ACMA believes that incumbent services and WAS can effectively share the 3.6 GHz band, particularly in regional and remote areas of Australia. Such sharing of the band between services has the potential to allow the use of spectrum by WAS that would otherwise remain unused by other services, thus resulting in a higher value use for the band.

Future Regulatory Policies

Although there is demand for WAS in the 3.6 GHz band, the actual extent of this demand is unknown and may change over time as technologies advance. It may be that the level of demand for WAS in the short to medium term enables the successful coexistence with other services. However, should the level of initial demand be high, or increase over time, a further review on the status of the Fixed services in the 3.6 GHz band may also be required. This review will determine the future status of the Fixed service in the band, particularly whether they will become secondary, be relocated or continue to operate on a co-primary basis.

ACMA has identified a need to develop an Earth station siting policy to contribute to the successful coexistence of FSS and WAS in the 3.6 GHz band⁷. Consultation on the Earth station siting policy will identify potential geographic areas that could be made into satellite parks on the east coast, west coast and in the northern region of Australia respectively. Existing and future FSS licences will be encouraged to relocate to these satellite parks. In return, ACMA may consider offering greater protection to the FSS through flexible licensing arrangements. A further aspect to the creation of Satellite parks will be their potential to minimise the spectrum denial footprint of the FSS to other services and therefore enable greater spectrum efficiency while facilitating the continued use of the band by the FSS.

Principle 2 – Enable and encourage spectrum to move to its highest value use or uses

In designing regulatory procedures proposed in this paper, ACMA has been careful to impose the minimum regulatory criteria to enable licensees to adapt to changing market requirements and technological advances.

⁷ It is noted that the development of an Earth station siting policy will be conducted over the next year in a process separate to this discussion paper.

Principle 3 - Use the least cost and least restrictive approach to achieving policy objectives

While maintaining the status quo would be the least costly approach, it does not support ACMA policy objectives, including the objects of the *Radiocommunications Act 1992* (the Act) and Government policy objectives to make broadband services widely available, with a particular focus on bridging the digital divide in regional and remote areas of Australia.

Incumbent Services

By creating conditions that allow for the harmonious coexistence of WAS and incumbent services, it is recognised that this will reduce the financial burden on incumbent licensees as they will not face relocation to alternative spectrum bands.

The creation of exclusion zones around major city areas also reduces the impact on incumbent services, such as the FSS, while also preserving future planning options in these areas.

Incumbent Fixed services will not be required to relocate or clear the band initially. Any decisions to do so would be subject to a review of demand for WAS and public consultation.

Allocation Issues

ACMA has also sought to identify options to facilitate the release of spectrum for WAS to relieve demand in regional and remote areas in a reasonable time frame. A further consideration for ACMA is the need to balance demand on resources. For this reason, ACMA intends to apply two different allocation processes that will be run in parallel to issue licences for WAS in the 3.6 GHz band.

The first process is a staged release of spectrum via an administrative allocation process. The process essentially sees ACMA issuing apparatus licences to successful applicants on a “first in time” basis. The staged release refers to the geographic areas that are identified by ACMA to accept applications for apparatus licences for services in the 3.6 GHz band. ACMA may decide to issue licences on a state by state, or territory, basis, or a combination of the two areas. ACMA will not accept applications for areas outside of the areas nominated at the specified time.

The second process is allocating the “right to apply” via a price-based allocation (PBA) process (auction or pre-determined price) for specific geographic areas identified by ACMA. The geographic areas identified based on the amount of spectrum available, perceived level of demand for access to the spectrum and other socio-economic factors including population density.

Allocation via these two processes will ensure that ACMA applies its resources effectively; meanwhile ensuring that spectrum is allocated in an open and transparent manner.

Development of Satellite Parks

Although ACMA acknowledges that the cost to relocate existing FSS stations may be high, satellite parks are considered a viable, long term regulatory option for ACMA. Existing and future FSS licences will be encouraged to relocate to these satellite parks. By undertaking an incremental approach, ACMA believes this will give licensees time to recoup money on current investments as well as consider and plan

their long term options. ACMA will also continue to encourage all new licences in the band to locate at these sites to give long term certainty of tenure and greater security on investment.

Principle 4 – To the extent possible, promote both certainty and flexibility

The international allocation of the 3.6 GHz band for WAS should provide potential WAS operators and incumbent licensees with some confidence that ACMA's decision to open the band for WAS is consistent with international technology and industry trends. ACMA believes it can facilitate a balance between both certainty and flexibility for licensees in its current approach to the 3.6 GHz band. This is especially the case in relation to the development of coordination criteria to allow for the coexistence of WAS with other services, along with policy development on an Earth station siting policy and identification of satellite parks.

The current embargo (Embargo 42) on the 3.6 GHz band will remain in place for all services other than WAS during the initial roll-out phase (12 months). This will prevent the investment and licensing of other services that may be required to relocate or cease transmission in the near future. Once the level of demand for WAS is better understood, a review on the status of fixed service will also be conducted.

Development of coordination criteria with the FSS

ACMA facilitated an industry working group process to provide input into the development of coordination criteria between the FSS and WAS deployments in the 3.6 GHz band. The industry working group provided input and agreed to technical requirements and coordination procedures that have been included in the coordination criteria set out in RALI FX19. The advice provided by this group will ensure that WAS services can coexist with existing and future FSS services in the band.

Because industry representatives were consulted and agreed to the content of the coordination criteria, ACMA believes that this offers potential and existing licensees certainty regarding the technical policies and procedures that will be applied in the assignment of services in the 3.6 GHz band.

The Earth station siting policy and identification and creation of satellite parks will provide greater long-term certainty for the FSS. These operators have received informal advice that, in some instances, future siting policy may require them to eventually move to geographic areas where there is lower spectrum demand. ACMA will also continue to encourage all new FSS licensees in the 3.6 GHz band to locate their intended services at areas identified for potential satellite parks in order to provide long term certainty of tenure and greater security of investment.

Principle 5 - Balance the cost of interference and the benefits of greater spectrum utilisation

ACMA is of the view that greater utilisation can be made of the 3.6 GHz band without significant risk of interference to existing or new services, through the

development of exclusion areas around major cities and the application of appropriate coordination criteria. Incumbent services will be protected while WAS services are being introduced in the 3.6 GHz band.

ACMA has developed appropriate coordination criteria to encourage the deployment of WAS infrastructure in regional and remote areas of Australia. The coordination criteria sets out technical requirements that must be met for WAS to successfully coordinate and coexist with other services. This criteria is provided in an update to Radiocommunications Assignment and Licensing Instruction FX19 (RALI FX19).

The amendments to the legislative instruments include:

- The development of appropriate conditions applicable to licences issued in the 3.6 GHz band for WAS;
- Provide information to spectrum licensees in the adjacent 3.4 GHz band regarding protection requirements for receivers that may be deployed in the 3.6 GHz band; and
- Provides for the issuing of apparatus licences in the 3.6 GHz band via two different allocation processes that will occur in parallel.

ACMA considers the development of future regulatory policies, such as the Earth station siting policy and the establishment of satellite parks, will have the benefit of increasing spectrum utilisation by other services while facilitating the continued use of the band by the FSS.

Appendix B

Exclusion Areas

ACMA has defined exclusion areas where WAS will not be allowed to deploy, these areas are detailed in the tables below. In addition to these exclusion areas, a number of spectrum embargoes contained in RALI MS3 also apply to the 3.6 GHz band. These embargoes relate to the protection of the Western Australia Radio Quiet Zone and future Satellite Parks designed to protect satellite services in bands of shared use between satellite and terrestrial services.

BRISBANE

° ' " East	° ' " South
152 50 0	26 55 0
153 40 0	26 55 0
153 40 0	28 20 0
153 15 0	28 20 0
153 15 0	28 10 0
153 05 0	28 10 0
153 05 0	27 55 0
152 45 0	27 55 0
152 45 0	27 45 0
152 30 0	27 45 0
152 30 0	27 25 0
152 50 0	27 25 0
152 50 0	26 55 0

SYDNEY

° ' " East	° ' " South
150 30 0	33 25 0
150 55 0	33 25 0
150 55 0	33 10 0
151 25 0	33 10 0
151 25 0	32 50 0
152 00 0	32 50 0
152 00 0	34 15 0
150 40 0	34 15 0
150 40 0	34 10 0
150 35 0	34 10 0
150 35 0	34 00 0
150 30 0	34 00 0
150 30 0	33 25 0

CANBERRA

° ' " East	° ' " South
148 55 0	35 00 0
149 25 0	35 00 0
149 25 0	35 35 0
148 55 0	35 35 0
148 55 0	35 00 0

MELBOURNE

° ' " East	° ' " South
144 15 0	37 30 0
145 35 0	37 30 0
145 35 0	38 25 0
144 15 0	38 25 0
144 15 0	37 30 0

ADELAIDE

° ' " East	° ' " South
138 20 0	34 35 0
139 00 0	34 35 0
139 00 0	35 25 0
138 20 0	35 25 0
138 20 0	34 35 0

DARWIN

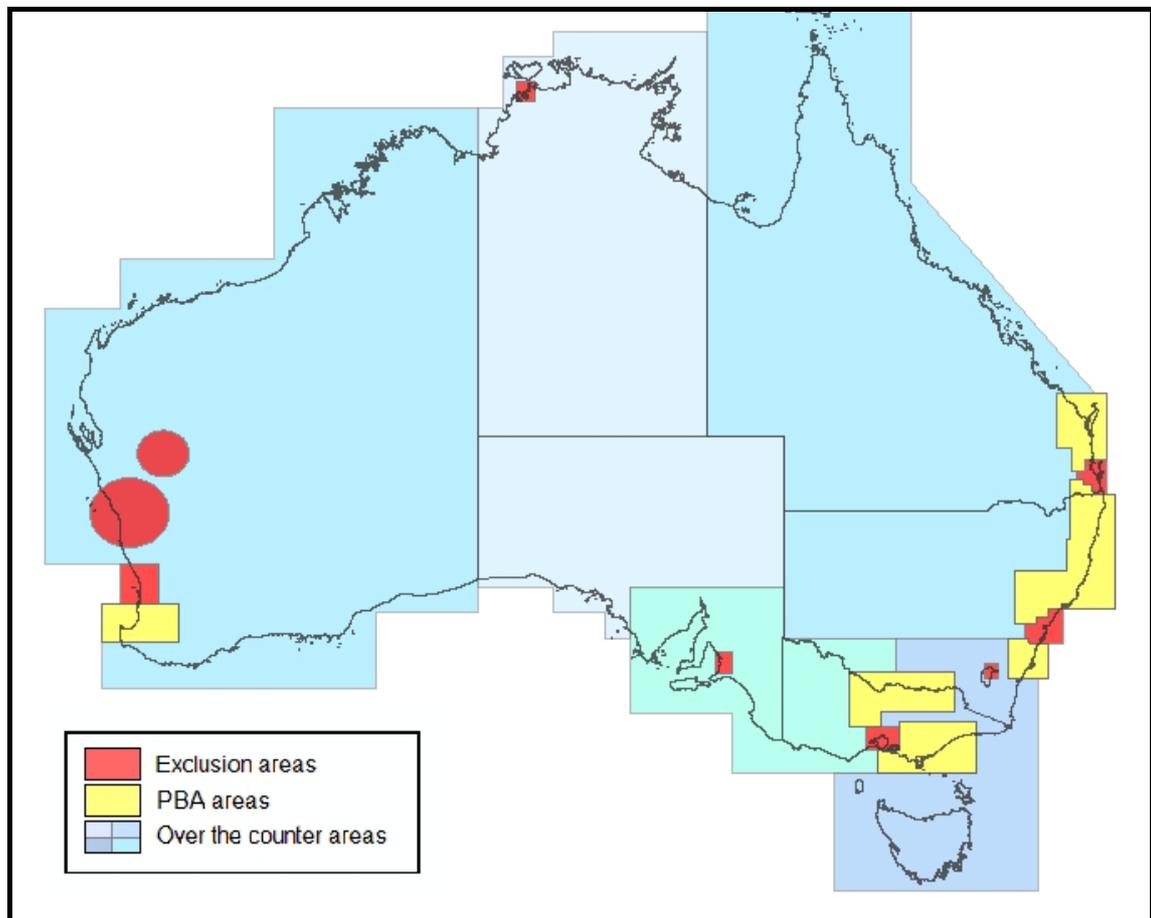
° ' " East	° ' " South
130 30 0	12 00 0
131 15 0	12 00 0
131 15 0	12 45 0
130 30 0	12 45 0
130 30 0	12 00 0

PERTH

° ' " East	° ' " South
115 00 0	31 05 0
116 30 0	31 05 0
116 30 0	32 40 0
115 00 0	32 40 0
115 00 0	31 05 0

Appendix C

Coordinates for Staged Release of 3.6 GHz



WESTERN AUSTRALIA

° ' " East	° ' " South
121 00 0	13 00 0
129 00 0	13 00 0
129 00 0	33 00 0
125 00 0	33 00 0
125 00 0	36 00 0
114 15 0	36 00 0
114 15 0	34 10 0
117 15 0	34 10 0
117 15 0	32 40 0
116 30 0	32 40 0
116 30 0	31 05 0
112 00 0	31 05 0
112 00 0	21 00 0
115 00 0	21 00 0
115 00 0	19 00 0
121 00 0	19 00 0
121 00 0	13 00 0

CENTRAL AUSTRALIA

° ' " East	° ' " South
132 00 0	10 00 0
138 00 0	10 00 0
138 00 0	26 00 0
141 00 0	26 00 0
141 00 0	32 00 0
135 00 0	32 00 0
135 00 0	34 00 0
134 00 0	34 00 0
134 00 0	33 00 0
132 00 0	33 00 0
132 00 0	32 00 0
129 00 0	32 00 0
129 00 0	13 00 0
130 00 0	13 00 0
130 00 0	11 00 0
132 00 0	11 00 0
132 00 0	10 00 0

QUEENSLAND

° ' " East	° ' " South
138 00 0	9 20 0
146 00 0	9 20 0
146 00 0	16 00 0
153 15 0	24 20 0
151 45 0	24 20 0
151 45 0	26 30 0
152 20 0	26 30 0
152 20 0	27 25 0
152 30 0	27 25 0
152 30 0	27 45 0
152 15 0	27 45 0
152 15 0	30 05 0
152 05 0	30 05 0
152 05 0	31 20 0
150 05 0	31 20 0
150 05 0	33 25 0
150 30 0	33 25 0
150 30 0	34 00 0
141 00 0	34 00 0
141 00 0	26 00 0
138 00 0	26 00 0
138 00 0	9 20 0

SA/WEST VICTORIA

° ' " East	° ' " South
135 00 0	32 00 0
141 00 0	32 00 0
141 00 0	34 00 0
145 25 0	34 00 0
145 25 0	35 20 0
143 35 0	35 20 0
143 35 0	37 30 0
144 15 0	37 30 0
144 15 0	38 25 0
144 40 0	35 25 0
144 40 0	39 20 0
139 00 0	39 20 0
139 00 0	37 00 0
135 00 0	37 00 0
135 00 0	32 00 0

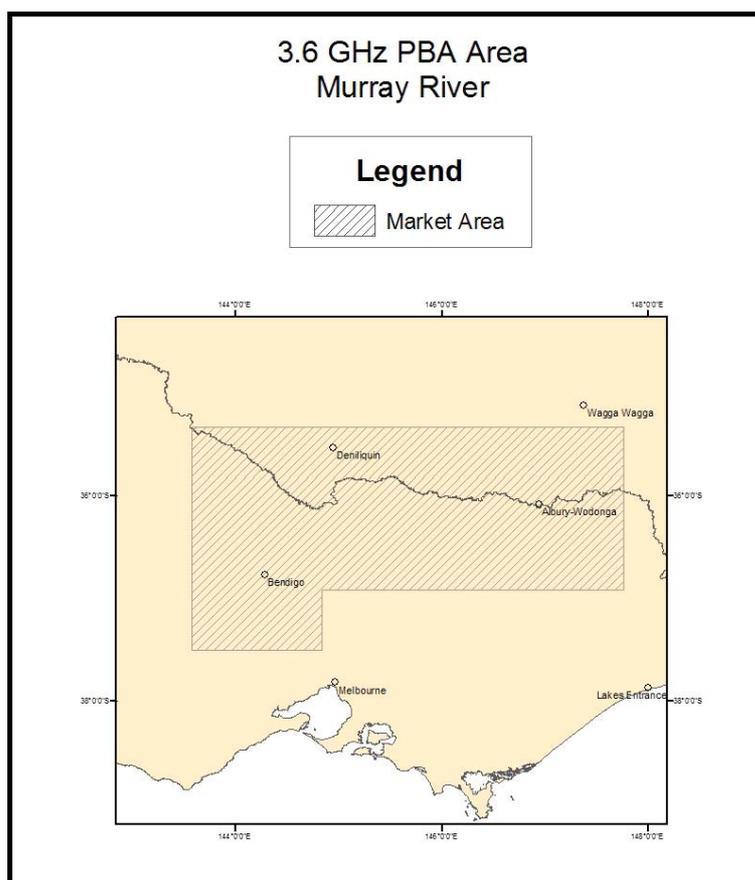
SOUTH EAST AUSTRALIA

° ' " East	° ' " South
145 25 0	34 00 0
149 50 0	34 00 0
149 50 0	35 35 0
151 00 0	35 35 0
143 00 0	44 00 0
143 00 0	39 20 0
148 35 0	39 20 0
148 35 0	37 20 0
145 35 0	37 20 0
145 35 0	37 30 0
144 50 0	37 30 0
144 50 0	36 55 0
147 45 0	36 55 0
147 45 0	35 20 0
145 25 0	35 20 0
145 25 0	34 00 0

Appendix D

Coordinates for PBA Areas for release of 3.6 GHz

MURRAY RIVER

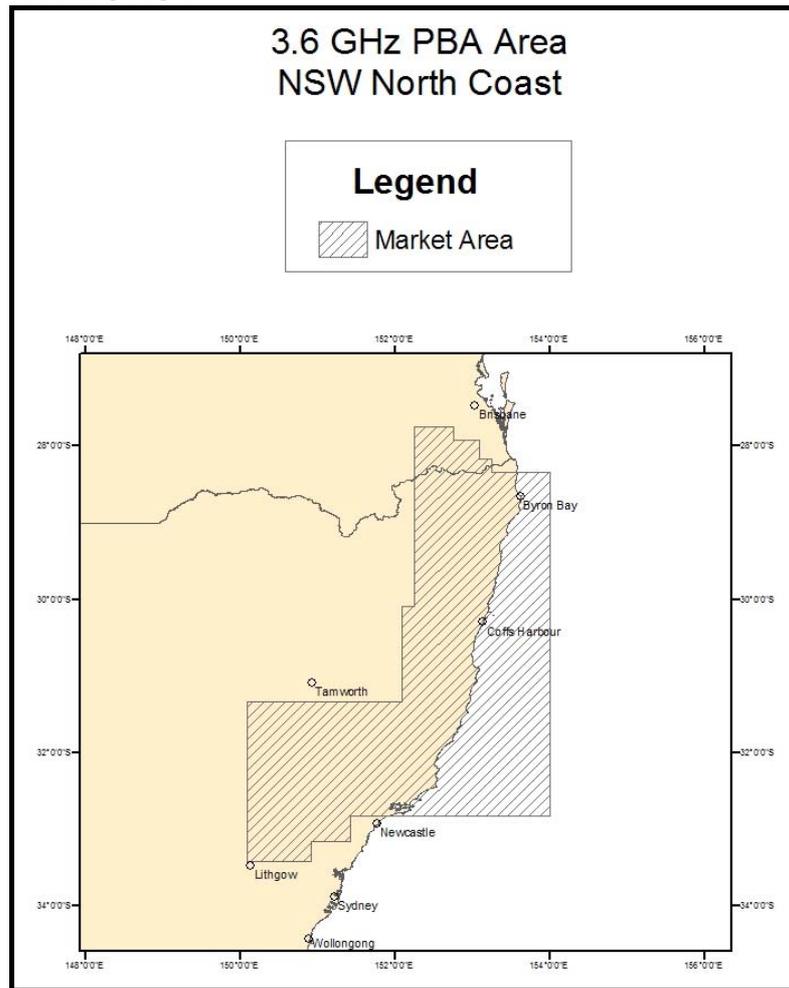


MURRAY RIVER

° ' " East	° ' " South
143 35 0	35 20 0
147 45 0	35 20 0
147 45 0	36 55 0

144 50 0	36 55 0
144 50 0	37 30 0
143 35 0	37 30 0
143 35 0	35 45 0

NSW NORTH COAST

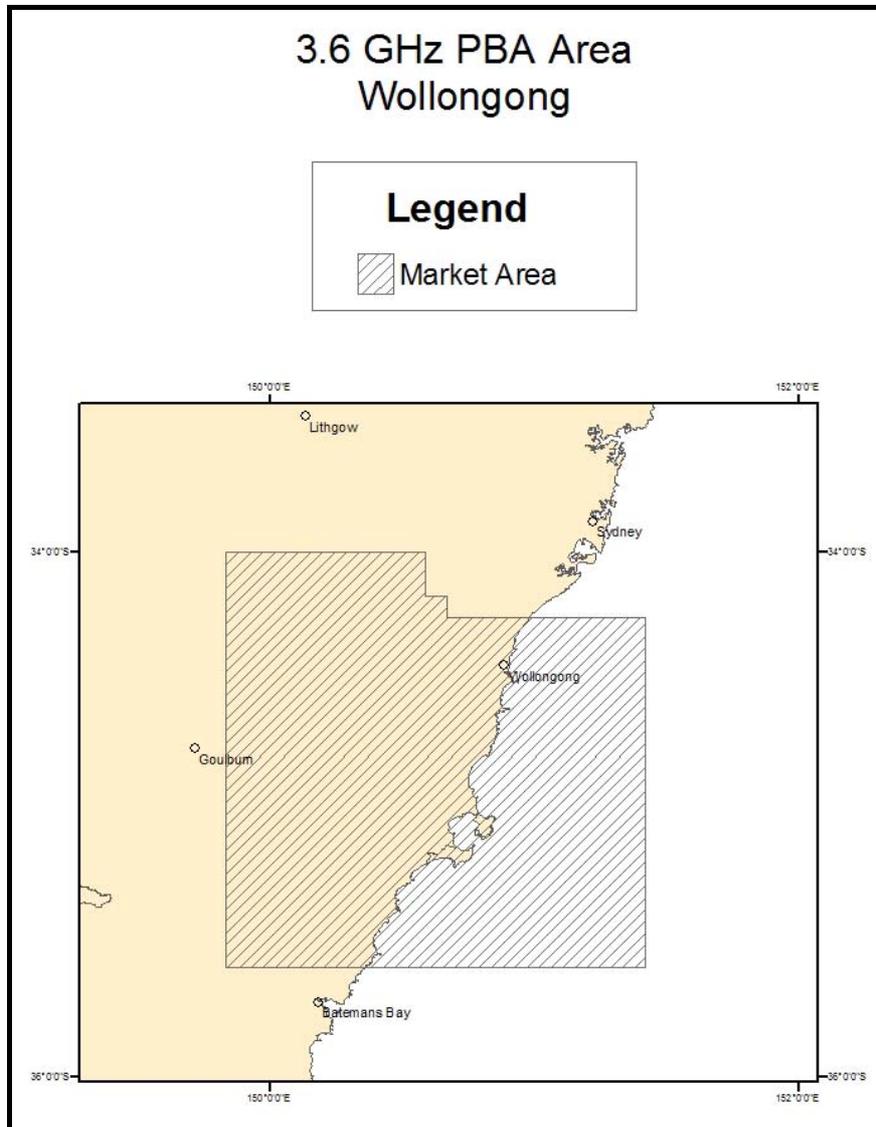


NSW NORTH COAST

° ' " East	° ' " South
152 15 0	27 45 0
152 45 0	27 45 0
152 45 0	27 55 0
153 05 0	27 55 0
153 05 0	28 10 0
153 15 0	28 10 0
153 15 0	28 20 0
154 00 0	28 20 0

154 00 0	32 50 0
151 25 0	32 50 0
151 25 0	33 10 0
150 55 0	33 10 0
150 55 0	33 25 0
150 05 0	33 25 0
150 05 0	31 20 0
152 05 0	31 20 0
152 05 0	30 05 0
152 15 0	27 45 0

WOLLONGONG

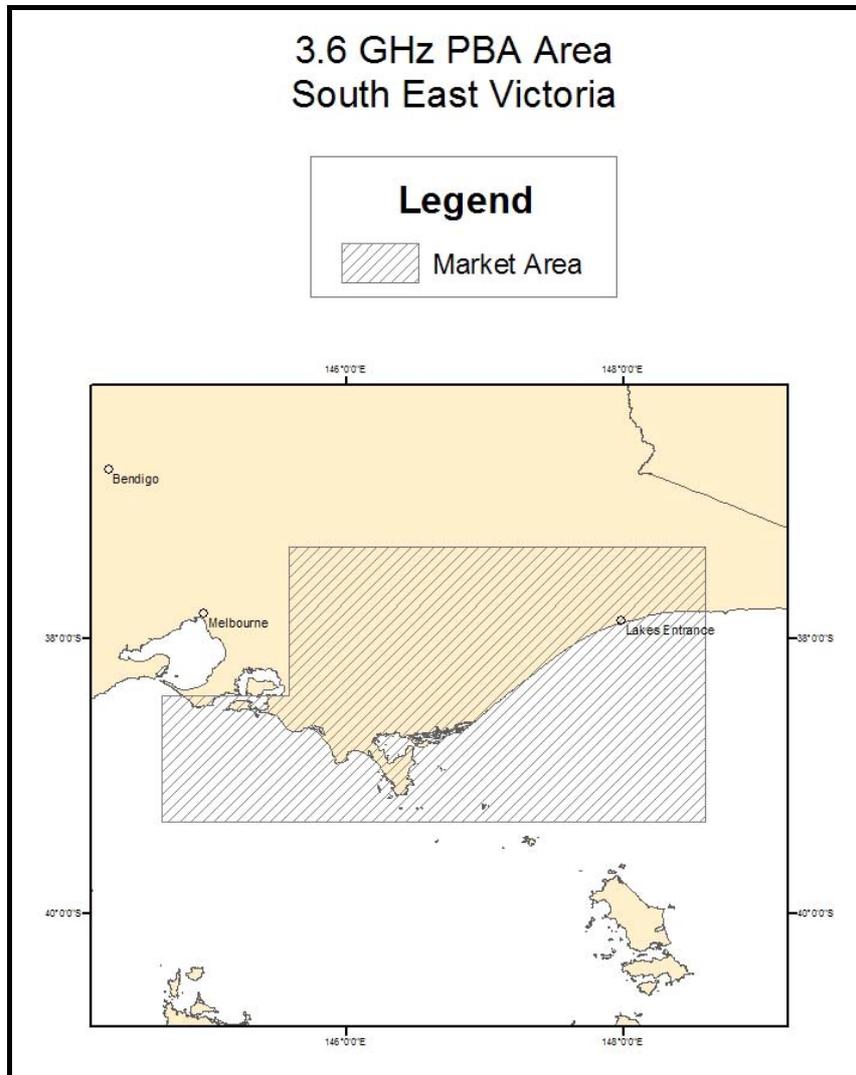


WOLLONGONG

° ' " East	° ' " South
149 50 0	34 00 0
150 35 0	34 00 0
150 35 0	34 10 0
150 40 0	34 10 0
150 40 0	34 15 0
151 25 0	34 15 0

151 25 0	35 35 0
149 50 0	35 35 0
149 50 0	34 00 0

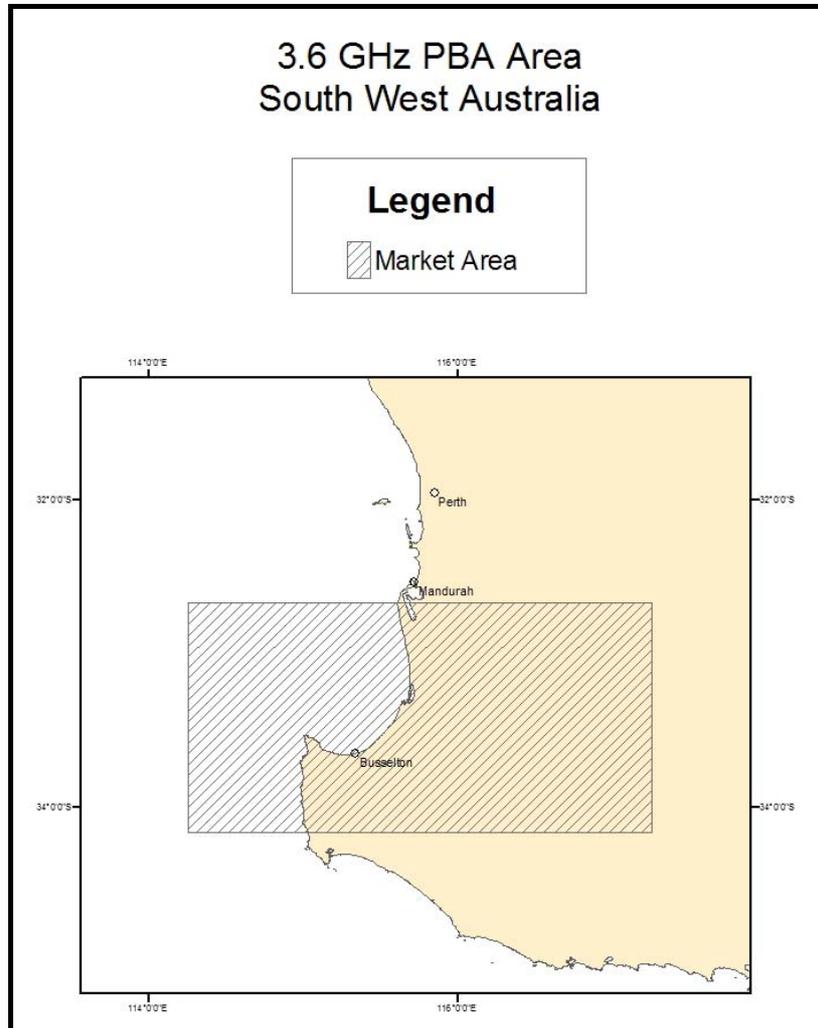
SOUTH EAST VICTORIA



SOUTH EAST VICTORIA

° ' " East	° ' " South
145 35 0	37 20 0
148 35 0	37 20 0
148 35 0	39 20 0
144 40 0	39 20 0
144 40 0	38 25 0
145 35 0	38 25 0
145 35 0	37 20 0

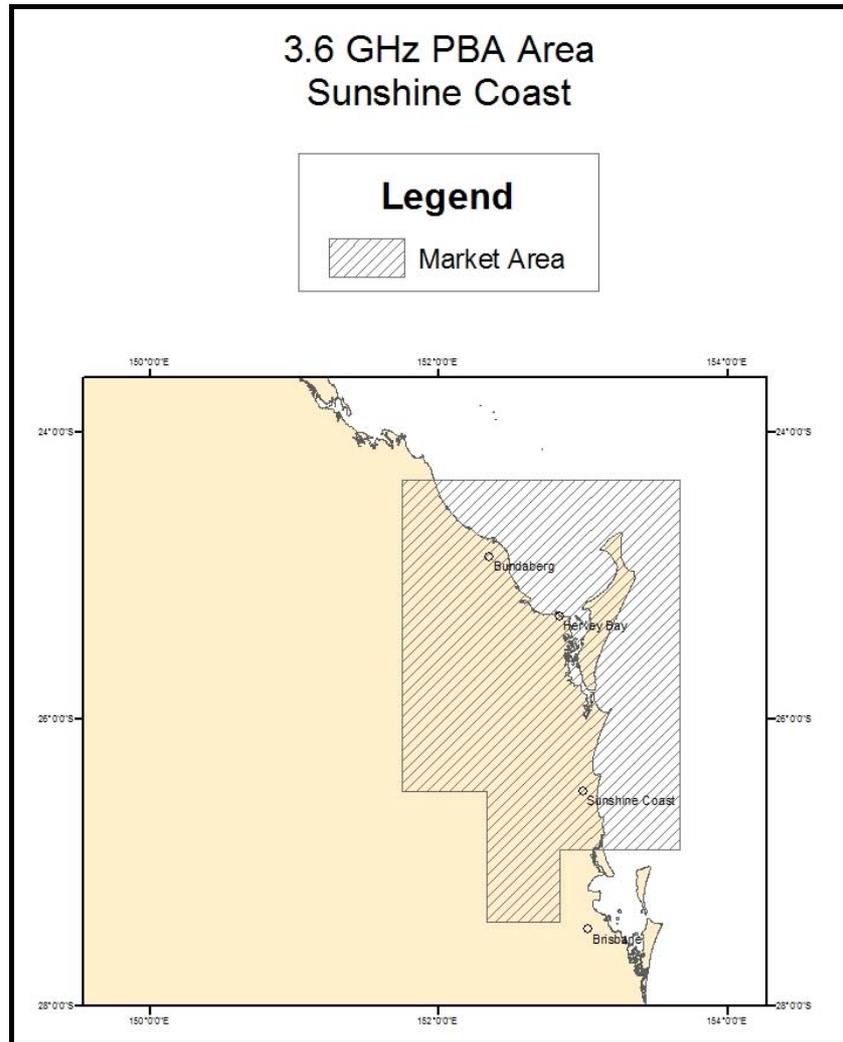
SOUTH WEST AUSTRALIA



SOUTH WEST AUSTRALIA

° ' " East	° ' " South
114 15 0	32 40 0
117 15 0	32 40 0
117 15 0	34 10 0
114 15 0	34 10 0
114 15 0	32 40 0

SUNSHINE COAST



SUNSHINE COAST

° ' " East	° ' " South
151 45 0	24 20 0
153 40 0	24 20 0
153 40 0	26 55 0
152 50 0	26 55 0
152 50 0	27 25 0
152 20 0	27 25 0
152 20 0	26 30 0
151 45 0	26 30 0
151 45 0	24 20 0

