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Australian Communications and Media Authority

Frequency coordination and licensing procedures for Area-Wide Licences (AWL) in the 3400–4000 MHz band

Radiocommunications Assignment and Licensing Instruction

RALI MS 47

DATE OF EFFECT: 29/09/2025

Amendment history

Date	Comments
February 2022	Draft for public consultation
September 2022	Revision after public consultation. Version for accompanying 3.4-4.0 GHz spectrum licence technical liaison group paper.
October 2022	Version with initial mitigations for radio altimeters
February 2023	Version for attachment to spectrum licensing allocation consultation for supporting information
May 2023	Version for remote allocation, including final mitigations for radio altimeters and changes to coordination after consultation
May 2023	Draft for consultation for regional and metro AWL public consultation
February 2024	Version for 3.8 GHz allocation
1 May 2024	Small changes to version ahead of effective date, including: • Addition of spectrum assignment policy outside of remote areas, under 3.2.1-9 • Update of parameters to be used for coordination with the Defence radiodetermination service at Exmouth, under 4.12.1 • Formatting improvements
7 May 2024	Correction: fixing an error in 4.10.1 in relation to coexistence with earth receive stations
29 September 2025	Implementation of changes proposed in Highly Localised Wireless Broadband (HL WBB) consultation: • Inclusion of arrangements for managing interference with point-to-multipoint system licences. • Improvements to Figures 1, 2 and Table 7. • Update to maximum power in Defence radiodetermination service at Exmouth, under 4.12.1 • Provision of PTS for underground use • Proposed new methods for earth receive coordination • Permitting earth receive within an AWL by the same licensee

Suggestions for improvements to Radiocommunications Assignment and Licensing Instruction should be addressed to:

The Manager, Spectrum Planning Section
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

or by email to: fregplan@acma.gov.au.

Please notify the ACMA of any inaccuracy or ambiguity found in this RALI.

Contents

1 Introduction

1.1 Purpose

The purpose of this Radiocommunications Assignment and Licensing Instruction (RALI) is to provide information about, and describe necessary steps for, the frequency coordination and licensing of Area-Wide Licences (AWL) and area-wide receive licences (AWL rx) in the 3400–4000 MHz band. As of this revision it includes both AWLs for transmitting, with associated receivers, intended to mainly support wireless broadband (WBB) applications and AWL rx (only) licences, intended to mainly support earth receive stations.

The information in this document reflects the ACMA's statement of current policy in relation to frequency coordination for devices authorised under an AWL in the 3400–4000 MHz band. In making decisions, Accredited Persons and ACMA staff should take all relevant factors into account and decide each case on its merits. Issues relating to this document that appear to fall outside the stated policy should be referred to:

The Manager, Spectrum Planning Section
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

or by email to: freqplan@acma.gov.au

1.2 Background

In January 2021, the ACMA released the *Replanning of the 3700 - 4000 MHz band— Outcomes Paper*, which contained planning decisions and preliminary views on the future use of the band and signalled the progression of the 3700–4200 MHz band to the 'implementation' phase under our spectrum planning process. This RALI was developed as an outcome of that review.

The first version of this RALI was released to support the allocation of AWLs for WBB applications in remote areas in 3400-4000 MHz.

The February 2024 version was for release with the application information pack (AIP) to support the allocation of AWLs in specified spectrum spaces in regional and metropolitan areas within 3750 MHz to 3950 MHz. This allocation incudes AWLs for WBB and AWL rx licences to support earth receive stations under an area-wide service.

The May 2024 version made minor changes and supports the 1 May 2024 effective date.

The September 2025 version implemented the changes detailed in the amendment history table.

1.3 Scope

The scope of the RALI covers frequency assignment and coordination arrangements for AWLs and AWL rxs in the 3400-4000 MHz frequency range. It also describes the ACMA's policy in relation to the issue of other apparatus licence types in the 3400-4000 MHz range.

This RALI includes elements relevant to coordination of earth receive stations licensed under an earth receive licence[1] and point-to-point (PTP, fixed) apparatus licences with both AWLs and spectrum-licensed services.

This RALI provides instructions to be used by the ACMA and Accredited Persons when assessing whether proposed new systems will cause (or receive) unacceptable interference to (or from) existing services.

For the purposes of the remaining parts of this RALI, the following definitions are used to describe the applicability of any relevant clause:

- AWL: The clause applies to both area-wide licences, and area-wide receive licences. i.e., for the purposes of this RALI, AWLs for WBB and AWL rx for earth receive stations.
- AWL tx or AWL txs: The clause applies only to area-wide licences, not to area-wide receive licences. i.e. for the purposes of this RALI, AWLs for WBB only.
- AWL rx or AWL rxs: The clause applies only to area-wide receive licences, not to area-wide licences. i.e. for the purposes of this RALI, AWL receive for earth receive stations only.

If interference occurs after an AWL is issued and an AWL transmitter is registered, and the issue cannot be resolved between the relevant parties, the ACMA will have regard to this RALI and relevant legislative instruments and other RALIs when resolving the matter.

1.3.1 Basic principles

The basic principles for AWLs in the 3400-4000 MHz range are:

- An AWL provides service-flexible and technology-flexible access to a frequency range and geographic area (its 'licence area') specified on the licence. Conditions applicable to all AWL txs in the 3400-4000 MHz range are detailed in the Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2020 (the AWL LCD),[2] as in force from time to time.
- For AWL rxs, although some specific coordination requirements assume the receivers are earth receive stations, they can be used for any receiver application within the technical framework.
- Consistent with the Radiocommunications (Interpretation) Determination 2015 (the Interpretation Determination), an AWL tx may be used to operate radiocommunications transmitters under an area-wide service that consists of one or more area-wide stations (radiocommunications transmitters), and which may also consist of one or more area-wide receive stations. An AWL only authorises the operation of radiocommunications transmitters. For interference management purposes, certain types of fixed receivers (e.g. base station receivers) may also be recorded as operating in relation to an AWL on the RRL.
- The technical arrangements for AWL txs in the 3400-4000 MHz bands have been designed to accommodate wireless broadband services – although other services may be deployed if the transmitters comply with the applicable licence conditions, including those in the AWL LCD.
- An overview of how the AWL technical framework operates is provided in section 1.4.

[1] As opposed to earth receive stations licenced under an area-wide receive licence

[2] The AWL LCD and all other legislative instruments referred to in this RALI may be accessed, free of charge, on the Federal Register of Legislation at www.legislation.gov.au.

- Radiofrequency (RF) arrangements, including frequency ranges and geographic areas where AWLs may be issued, and channel arrangements are detailed in Chapter 2.
- An AWL is issued prior to device coordination (if required). An AWL will generally only be issued if it complies with the licensing arrangements detailed in Chapter 3 of this RALI.
- Where applicable, any necessary device coordination is to be undertaken prior to including applicable devices in the Register of Radiocommunications Licences (RRL) – see Chapter 4.

1.4 Operation of the technical framework

The technical framework for AWLs in the frequency range 3400–4000 MHz sets out the minimum conditions and arrangements that allow coexistence with other services operating in and adjacent to the 3400–4000 MHz range. The conditions or arrangements are set out in:

- individual licences
- For AWL tx/s, the Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2020 ("AWL LCD"), as in force from time to time.
- the Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015, as in force from time to time.
- this RALI.

The technical framework operates using the three steps described below.

Step 1: Determine your needs, then apply for a licence

Define the area and frequency range first:

- Unlike most other types of apparatus licences, AWLs are issued *before* formal device coordination. You will need to know the area and frequency range you wish to operate in before applying for an AWL.
- Go to the ACMA's Register of Radiocommunications Licences to check if your desired geographical area(s) and frequency range(s) are available.
- Additional spectrum and/or area may be required so that:
  - The intended operation complies with all requirements at the frequency and area boundaries of the licence (for AWL tx/s, detailed in the AWL LCD and for all AWLs section 4 of this RALI).
  - There is enough frequency and/or geographic separation from existing and potential future transmitters to satisfy the desired level of protection for receivers operated under the AWL (especially in cases where the required protection is greater than explicitly provided by the technical framework (e.g., where an AWL tx licensee seeks to avoid invoking the fall-back synchronisation requirement in the AWL LCD).
  - Given an AWL rx device has to largely accept defined co-channel signal levels across any AWL tx to AWL rx boundary, an AWL rx may need a spectrum space large enough to allow the AWL rx devices to operate with a level of interference acceptable to the operator Similarly, they also have limited protection from adjacent frequency AWL txs or SL devices, that may result in RF filter attenuation being needed inside the assigned bandwidth of the AWL rx.

  This will make sure that sufficient 'spectrum space' (geographic area and bandwidth) is licensed. This may require some device to device "coordination-like" activities to be prudently undertaken.

Applicants should seek the services of an Accredited Person to check the areas and frequencies to ensure an AWL they wish to obtain will be fit for purpose. Importantly, existing apparatus licences will be afforded ongoing protection as detailed in this RALI unless otherwise specified in licence conditions. An Accredited Person can assist in determining whether existing apparatus licences or any other technical restrictions will affect the availability and utility of spectrum in an area.

Apply to the ACMA:

- Information on how to apply is available on the ACMA website. Additional processes may also apply from time to time for managed administrative allocations.
- Chapter 3 of this RALI contains the basic arrangements for AWLs in the 3400-4000 MHz range.
- You should engage an Accredited Person to assist with your application.

After you apply:

- After we receive your application, we will send you an invoice for the application fee.
- If you receive an invoice for apparatus licence tax, your licence may be issued after the amount of tax is paid.
- You may only operate a transmitter once your licence is issued (and all conditions below are met).

Follow the conditions and registration requirements – see next steps.

Step 2: Coordinate and register devices

Before registering a device, meet the coordination requirements in Chapter 4 of this RALI. Note that for earth receive stations operated under an AWL rx, there are no formal coordination requirements before the device can be registered. Licensees should ensure the size of their licence applied for (in both area and frequency) is sufficient to protect services deployed.

These include:

- Complying with area boundary conditions
- Coordinating with existing services
- Complying with arrangements detailed in other documents to be met prior to registration.

Register the device, after meeting coordination requirements:

- Engage an Accredited Person to register the device in the Register of Radiocommunications Licences.
- You must register any transmitters *before operation,* unless they are exempt. Subclause 3(2) of Schedule 4 to the AWL LCD shows the types of transmitters that are exempt from registration – registration-exempt transmitters must still comply with all other applicable licence conditions (see Step 3).
- Receivers associated with a transmitter operating under an AWL tx can be optionally registered. Only registered devices will be afforded the protection detailed in this RALI.
- For earth station receivers authorised under an AWL rx, receivers can be optionally registered. Only registered devices generally will be afforded any protection from other services detailed in this RALI, where applicable.

Step 3: Follow all required conditions summarised below

- Conditions for operation are detailed on the licence, in the AWL LCD for AWL txs and in the Apparatus LCD. Some of those conditions incorporate parts of this RALI.
- All transmitters (including transmitters exempt from registration) must comply with conditions where applicable, including:
  - Maximum power levels (within the licensed frequency range and in adjacent frequencies) – see clause 2 of Schedule 4 to the AWL LCD.
  - Any technical restrictions that may apply in certain frequency ranges and geographic areas
  - Obligations for licensees to help manage and resolve interference – for AWL txs see clauses 5, 6, 7 and 8 of Schedule 4 to the AWL LCD.

2 RF arrangements

2.1 Frequency ranges and areas available for AWLs

This RALI defines arrangements for the frequency assignment and coordination of AWLs in the frequency ranges and areas described in Table 1 and Table 1a. HCIS descriptions of the geographic areas are provided in Appendix A. Assignment of AWLs are subject to the rules detailed in Part 3, therefore not all frequency ranges will be available in all locations within an AWL geographic area.

Table 1 AWL tx frequency ranges and areas [Note 1]

Geographic area	Frequency range
Remote	3400-4000 MHz
Specified rural areas	3750-3950 MHz
Specified regional and metropolitan areas	3800-3950 MHz

Note 1: point-to-multipoint apparatus licensing applies outside of the defined remote, regional and metropolitan area.

Table 1a AWL rx frequency ranges and areas [Note 2]

Geographic area	Frequency range
Specified regional areas	3750-3800 MHz
Specified rural areas	3750-4000 MHz
Specified regional and metropolitan areas	3800-4000 MHz

Note 2: earth receive apparatus licensing applies outside the defined areas and ranges.

2.2 Channel arrangements

The RF channel arrangements for AWL txs in 3400-4000 MHz range provides for a total of 60 x 10 MHz channels across the frequency range – see Table 2. The upper and lower frequency limits of the 10 MHz channels for AWL txs are derived as follows:

f_r be the frequency of the lower edge of the band of frequencies occupied (MHz)
f_L be the frequency of the lower edge of the RF channel (MHz)
f_U be the frequency of the upper edge of the RF channel (MHz)
f_n be the centre frequency of the RF channel (MHz)

n be the channel number (integer range is between 1 to 60).

$f_n = f_r + 5*(2n-1)$ in MHz
$f_L = (f_n - 5)$ in MHz
$f_U = (f_n + 5)$ in MHz,

where n = 1,2,3,4,5….60. The value of f_r is 3 400 MHz.

An AWL tx licence can be issued which authorises operation over multiple, aggregated, 10 MHz channels.

The channel raster and minimum 10 MHz requirement do not apply to AWL rx licences. An AWL rx may be issued on any frequency and bandwidth consistent with this RALI.

Table 2 10 MHz channel plan centre frequencies for the 3400–4000 MHz band.

10 MHz channel number	Centre frequency (MHz)
A1	3405
A2	3415
A3	3425
A4	3435
A5	3445
A6	3455
A7	3465
A8	3475
A9	3485
A10	3495
A11	3505
A12	3515
A13	3525
A14	3535
A15	3545
A16	3555
A17	3565
A18	3575
A19	3585
A20	3595
A21	3605
A22	3615
A23	3625
A24	3635
A25	3645
A26	3655
A27	3665
A28	3675
A29	3685
A30	3695

10 MHz channel number	Centre frequency (MHz)
A31	3705
A32	3715
A33	3725
A34	3735
A35	3745
A36	3755
A37	3765
A38	3775
A39	3785
A40	3795
A41	3805
A42	3815
A43	3825
A44	3835
A45	3845
A46	3855
A47	3865
A48	3875
A49	3885
A50	3895
A51	3905
A52	3915
A53	3925
A54	3935
A55	3945
A56	3955
A57	3965
A58	3975
A59	3985
A60	3995

3 Licensing

This chapter provides an overview of the licensing arrangements for AWLs in the 3400-4000 MHz range and sets out the ACMA' s policy for considering applications for these licences.

3.1 Overview of Licensing

An AWL authorises the operation of radiocommunications devices within a frequency range and geographic area specified on the licence, subject to the conditions applicable to the licence. The ACMA' s policy is to only issue AWLs authorising operation in the 3400-4000 MHz band in geographic areas that are located outside those embargoed frequencies and areas defined in *RALI MS03* and spectrum licensed spectrum spaces defined in *RALI SM26.*

3.2 AWL issue

This section outlines the ACMA policy in relation to the issue of an AWL in the 3400-4000 MHz range. An AWL in the band can be issued, subject to consideration of the matters in this section, prior to device coordination requirements detailed in Chapter 4.

3.2.1 AWL issue policy

The ACMA's policy will be to consider applications for AWLs per the following:

1. AWLs in the 3400-4000 MHz band should not authorise operation of devices in geographic areas that are subject to a spectrum embargo defined in *RALI MS03*[3]*,* or in areas described in sections 3.2.2, 3.2.3, 3.2.4 and 3.2.5, as applicable.
2. No AWL tx or AWL rx is to be issued if any part of the AWL is proposed to be within 20 km of a licensed co-frequency Point to Multipoint (PMP) service, or within 5 km if the proposed AWL is adjacent in frequency by less than 10 MHz, unless the applicant has the written agreement of the PMP licensee. For the purposes of this clause the incumbent PMPs in the table in clause 4.8 are also to be assumed to exist in the frequencies listed for AWL applications before 17 July 2027.
3. The upper and lower frequency limits authorised by the licence should comply with the frequencies and areas defined in section 2.1 and, for AWL txs, align with the channel raster in section 2.2.
4. AWLs should follow assignment priority guidelines in section 3.2.6.
5. An AWL should not be issued if its frequency range would overlap with the frequency range authorised by an existing AWL tx in the same HCIS cell. (An AWL rx may overlap with another AWL rx).
6. The geographic area authorised by an AWL will consist of only whole HCIS cells incorporating levels 0 and above (level 00 cells are not to be used). The smallest geographic area authorised by an AWL is a single HCIS level 0 cell which comprises an area of approximately 1.8 km x 1.8 km.
7. In the spectrum spaces in rural, regional and metropolitan areas as described in Appendix A, unless an applicant can demonstrate satisfactory coordination measures, the ACMA will generally not issue an AWL authorising the operation of radiocommunications transmitters in in the 15 MHz of spectrum directly adjacent to a spectrum licence.

[3] Available on the ACMA website.

8. For any given HCIS level 0 cell in a remote area, the total spectrum assigned to all AWL txs for a given licensee is not to exceed 100 MHz in the 3400-4000 MHz range.
9. For any given HCIS level 0 cell not in a remote area, the total spectrum assigned to all AWL txs for a given licensee is not to exceed 50 MHz in the 3750-3950 MHz range.
10. For any given HCIS level 0 cell not in a remote area, there is no restriction on spectrum for each AWL rx assignment in the 3400-4000 MHz range.
11. AWL txs should not authorise the operation of devices within or proximate to (as applicable) the geographical areas, coordination zones and protection areas referred to in sections 3.2.2 (Defence radiolocation), 3.2.3 (Darwin and Geraldton coordination zones), 3.2.4 (Woomera Protection Area) and 3.2.5 (Exmouth coordination zone).
12. AWL rxs should not authorise the operation of devices within or proximate to (as applicable) the geographical areas, coordination zones and protection areas referred to in sections 3.2.2 (Defence radiolocation), 3.2.4 (Woomera Protection Area) and 3.2.5 (Exmouth coordination zone).
13. An AWL will not generally be issued within earth station protection zones (ESPZs) as described in RALI MS44 *Frequency coordination procedures for the earth station protection zones.*
14. Operation under the Mobile Satellite Service is not authorised by an AWL rx in the band under this RALI.

3.2.2 Radiolocation issued consistently with section 10(7) of the Australian Radiofrequency Spectrum Plan (the Spectrum Plan)

Existing Defence radiolocation services operate in the range 3400-4000 MHz consistent with section 10(7) of the Spectrum Plan. These radiolocation licences have the following special condition on their licence: “No interference shall be caused to any Radiocommunication station or service and no protection from interference by such stations or services shall be afforded.”

Because of the higher potential for mutual interference caused by the introduction of AWL services compared with existing service types in the area across 3400-4000 MHz, AWLs will not normally be issued in the range of 3700-4000 MHz and within 100 km of, or within 3600-3700 MHz and within 60km of, latitude 15°38’55” South and longitude 131°54’04” East (GDA94 Datum).

3.2.3 Darwin and Geraldton coordination zones

There are existing provisions in several RALIs [4]stating that “Requests for any assignments within 150 km of latitude 12˚26’59” South and longitude 130˚50’0” East (GDA94 Datum) in Darwin (NT) and latitude 28˚45’59” South and longitude 114˚37’0” East (GDA94 Datum) in Geraldton (WA), are to be referred to the ACMA for preliminary coordination consultation.”

Because of the higher potential for mutual interference caused by the introduction of AWL services compared with existing service types in these areas within the 3400-4000 MHz frequency range, the ACMA’s policy is not to issue AWL txs within the Darwin and Geraldton coordination zones. HCIS descriptions of the coordination zones are provided in Appendix B.

3.2.4 Woomera Protected Area (WPA)

Embargo 52 has been amended to include the frequency ranges 3400-3580 MHz and 3580-4000 MHz and AWLs, from 3400-3575 MHz and 3600-3700 MHz. Noting that, at time of

[4] RALI FX19, FX 03

publication, no licences have been issued within the WPA, the permitted range has changed to 3580-3600 MHz to align with the current channel raster for AWL.

Embargo 52 now also includes a HCIS based definition of the applicable geographic area for the WPA.

An advisory note is to be placed on all AWLs issued within 100 km of the WPA stating that "*no protection from interference from transmissions from within the WPA is afforded*".

3.2.5 Exmouth coordination zone

The ACMA's policy is not to issue AWLs within the Exmouth coordination zones. HCIS descriptions of the coordination zone in two frequency ranges are defined in Appendix B.

Section 4.12.1 also gives guidance on radio-determination services generally, and on assessing potential interference from a radio-determination station within the Exmouth coordination zone to receivers.

3.2.6 Assignment priority

AWL txs are to be assigned using contiguous channels of 10 MHz consistent with the following guidance:

a. for all AWL txs in remote areas, where possible:
   - Existing spectrum licence holders in the range 3400-3800 MHz should be assigned spectrum below 3800 MHz and preferably occupying the same frequencies as any of their existing spectrum licences.
   - Entities without 3.4 GHz spectrum licence holdings should be assigned spectrum above 3800 MHz, unless available equipment frequency range limitations exist or coordination fails, and preferably occupying the same frequencies as any existing apparatus licences in 3400- 4000 MHz.

b. for all AWL txs in regional and metropolitan areas, where possible:
   - Existing AWL tx licence holders should preferably be assigned spectrum occupying the same frequencies as any existing apparatus licences.

c. subject to 3.2.6a and b, an AWL tx should be assigned spectrum in ascending order (from lowest frequency available).

These assignment priority guidelines are designed to improve spectral efficiency, maximising spectrum availability for prospective licensees and enabling the prospect of contiguous spectrum holdings for existing licensees across geographic boundaries. Alternative ways of assigning spectrum can be considered on a case-by-case basis by the ACMA where it can be demonstrated to improve the efficiency in use and allocation of spectrum.

For AWL rxs, assignment is preferably in descending order (highest frequency available) but recognising that many assignments will be determined by other factors.

3.3 Licence conditions

The operation of radiocommunications devices authorised by an AWL in the 3400-4000 MHz band are subject to:

- conditions specified on an individual licence.
- Requirements of the *Radiocommunications Act 1992* (the Act), including an obligation to comply with the Act;

- Relevant conditions specified in an applicable determination made by the ACMA under section 107(1)(f) of the Act, including the *Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015*, the AWL LCD, for AWL txs only, which includes reference to parts of this RALI;

If interference occurs after a licence is issued and the device is registered, and the issue cannot be resolved between the affected parties, the ACMA will have regard to this, and other RALIs, and relevant legislative instruments when considering the matter.

3.3.1 Advisory notes – all AWLs

The following advisory note is to be included on all AWLs in the 3400-4000 MHz range.

Coexistence with radiolocation services

Allocations exist in the Australian Radiofrequency Spectrum Plan for the Radiolocation service in the 3100–3300 MHz and the 3300–3600 MHz bands on a primary or co-primary basis under the AUS 1 and AUS11 footnotes respectively. The licensee is advised that the operation of Radiolocation devices by the Department of Defence in these bands may result in interference to receivers which may reduce system performance.

The ACMA will continue to consult on and monitor this issue with AWL licensees and Defence to best enable the coexistence of both services.

3.3.2 Advisory notes – all AWL txs

The following advisory notes are to be included on all AWLs in the 3400-4000 MHz range.

Coexistence with existing apparatus licensed services

A radiocommunications receiver, that is:

a) *Receiving wanted radio emissions from a radiocommunications transmitter that is operated under this licence;*
b) *A primary service as defined by the Australian Radiofrequency Spectrum Plan;*
c) *Located within an area authorised by this licence; and*
d) *Recorded on the register of radiocommunications licences;*

is not afforded protection from interference caused by a radiocommunications transmitter that:

a) *Is operated under another apparatus licence which was first issued before the commencement of this licence;*
b) *Is a primary service as defined by the Australian Radiofrequency Spectrum Plan*

This provision does not apply if the transmitter is operated under another area-wide licence.

In planning deployments under this licence, the licensee should take account of existing apparatus licensed services and plan their services accordingly.

Notional level of receiver performance for AWL tx receivers

The notional receiver performance level and compatibility requirement detailed in schedules 1 and 2 to the Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 3.4 GHz Band) 2015 (RAG Rx), as in force from time to time, or in any instrument made under s.262 of the Radiocommunications Act 1992 as a replacement to those guidelines (as in force from time to time), applies for radiocommunications receivers that:

a) *Has details, including the location, recorded in the ACMA register of radiocommunications licences;*
b) *Receive radio emissions from radiocommunications transmitters that are operated under this licence; and*
c) *Are located within an area authorised by this licence;*

For application of the receiver blocking criteria, the frequency range in subsection 5(a) of schedule 1 of RAG Rx should be replaced with 3340-4060 MHz when assessing coordination with AWL receivers~~;~~

While compliance with these provisions is not mandatory, the ACMA will take them into account when assessing any interference disputes.

3.4 Other licence types

The ACMA's policy in relation to the issue of licence types other than AWLs in the 3400-4000 MHz range is as follows:

1. No new Public Telecommunications Service apparatus licences are to be issued in the 3400-4000 MHz range unless they support underground use only, have licence special condition C24 attached to the licence and are issued outside of spectrum licensed spaces. See 3.4.1.
2. No new Point to Multipoint apparatus licences are to be issued in the 3400-4000 MHz range in the areas defined by Appendix A. However, licences may be issued in areas outside the Australia Spectrum Map Grid.
3. No new earth receive apparatus licences are to be generally issued in the 3400-4000 MHz range in regional and metropolitan areas defined at Appendix A, with the exception that Earth Receive licences may be issued within earth station protection zones as defined in RALI MS44.
4. No new Earth Receive or PTP licences are to be issued that authorise the operation of device in a frequency range and area encompassed by an existing AWL tx, unless agreed to by the affected licensee(s) and in a remote area as defined in Appendix A. Coordination requirements are still required to be satisfied for all other affected AWL tx licensee(s) for which agreement has not been obtained.
5. No new PTP apparatus licences are to be issued that authorise the operation of a device below 3800 MHz.
6. No new PTP apparatus licences are to be issued that authorise operation between 3800 MHz and 4000 MHz in areas described by the geographic area in Appendix I.
7. Services under an existing non-AWL apparatus licence may generally continue to operate, unless the licence was issued with conditions stating that renewal may not be considered, as the ACMA's policy at this time will be to offer such incumbent licences renewal and suitable protection from interference.
8. PMPS licences may be issued within the 3400-3475 MHz and 3950-4000 MHz band as defined in RALI MS 50.

3.4.1 Use of PTS for underground applications

As per 3.4 (1) above, a PTS licence may be issued to support underground applications. Special Condition C24 must be attached to any such licences. This special condition limits the emissions at the entrance(s) to an underground environment (higher emissions can apply within the underground environment itself) and requires that stations operate under a 'no interference and no protection basis'.

Due to restrictions in place through the application of Special Condition C24, no formal coordination is required with other licensed services. Also, except for restrictions on the issue of licences within a spectrum licensed space, there is no limit on how much of the 3400-4000 MHz band can be used in an underground environment under these conditions.

Coordination among multiple underground PTS licensees within the same underground environment is a site management issue and should be resolved by underground site managers.

When applying for a licence, a notional PTS transmitter is to be recorded on the RRL at all entrances to the underground environment. This is to provide visibility to other licensees for interference management purposes. Provided the requirements of Special Condition C24 are not exceeded, multiple underground devices may be operated under any licence issued, without the requirement to record their location on the RRL.

Parameters that should be recorded for notional PTS transmitters are:

- EIRP: limited to a maximum EIRP density of 3 nW/MHz or -55 dBm/MHz across any operating bandwidth. This EIRP is the limit on the level of emissions leaving the entrance(s) of an underground location.
- Antenna ID: 80219 (dummy antenna as per RALI MS34 that flags underground operation)
- Antenna height: 1.5 m
- Antenna azimuth: omni directional

Special Condition C24

A person must not operate a:

*a) radiocommunications transmitter that is, or is part of, a station other than a registration exempt station otherwise than in accordance with section 8 of the Radiocommunications Licence Conditions (PTS Licence) Determination 2024 (**PTS LCD**); or*
b) registration exempt station otherwise than in accordance with sections 9, 12 and 13 of the PTS LCD.

*In this condition, **registration exempt station** has the same meaning as in the PTS LCD and also means a base station:*

*a) that is, or incorporates, one or more radiocommunications transmitters (a **relevant transmitter**); and*
b) that is located in an underground space; and
c) for which each relevant transmitter:
(i) is operated with a EIRP density not greater than 3 nano-watts per MHz bandwidth, when measured at an opening above ground that connects to the underground space; and
(ii) is operated on a frequency specified in this licence for the operation of a radiocommunications transmitter; and
(iii) if this licence specifies an emission designator for emissions made by a radiocommunications transmitter – is operated in accordance with that emission designator; and

d) *if a radiocommunications receiver is part of the station – the receiver is operated on a frequency specified in this licence.*

4 Frequency coordination procedures and pre-registration requirements

This chapter details the coordination procedures and requirements for completion before the details of a radiocommunications transmitter are included in the RRL. As required by clause 3 of Schedule 4 to the AWL LCD, a transmitter, other than a transmitter that is exempt from registration requirements, must not be operated under an AWL in the range 3400-4000 MHz if its details are not included in the RRL. Clause 4 of Schedule 4 provides that a transmitter must not be operated under an AWL in the range 3400-4000 MHz of the operation would be consistent with the requirements of this RALI in relation to coordination with radiocommunications devices, or the permitted location of the device boundary for the transmitter.

This chapter also details the process for the registration of receivers associated with AWL txs and registration of receivers under AWL rxs.

4.1 Overview of device registration

The details of a device to be operated under an AWL rx or AWL tx (other than a transmitter exempt from registration) generally will not be included in the RRL unless they meet the requirements set out in this chapter.

4.2 Coordination at the geographic boundary

4.2.1 Coordination at the AWL tx geographic boundary of another AWL tx or AWL rx

The details of an AWL tx transmitter generally will not be included in the RRL if any part of the device boundary of the transmitter lies outside a geographic area authorised by the licence, except when one or more of the following apply:

- In situations as described in subsection 9(3) of *Radiocommunications (Unacceptable Levels of Interference - 3.4 GHz Band) Determination 2015* or any instrument made under s.145 of the *Radiocommunications Act 1992* as a replacement of that determination (as in force from time to time) (referred to in this RALI as the “ULOI”), and when the area authorised by the licence is directly adjacent to an area described in RALI MS44.
- In situations as described in subsection 9(4) of the ULOI.
- The part of the device boundary that is outside the area authorised by the licence falls entirely within an area authorised by an AWL tx or AWL rx (which also authorises operation in the frequency range of the proposed transmitter), and there is an active agreement in place with the other licensee(s). This exception would no longer apply if any relevant AWL were no longer effective in the future (e.g., they have expired or were cancelled).

For the purposes of this section, the device boundary is to be calculated in accordance with the ULOI and is applicable for the calculation of AWL tx device boundaries across the entire 3400-4000 MHz range, noting that the ULOI for spectrum licences is only defined across 3400-3800 MHz.

4.2.2 Coordination at the geographic boundary of a spectrum licensed (SL) area

The details of an AWL transmitter generally will not be included in the RRL if one or more of the following apply:

- Any part of the device boundary of the AWL transmitter lies inside a geographic area defined by, and would operate in a frequency range described by, any relevant section of RALI SM26 (only spectrum subject to spectrum licensing in the 3400-3800 MHz band applies in this case).

The above requirement does not apply if the non-compliant part of the device boundary falls entirely within an area authorised by a spectrum licence (which authorises operation in the frequency range of the proposed transmitter), and there is an active agreement in place with the applicable spectrum licensee. This exception would no longer apply if any relevant spectrum licence is no longer effective in the future (e.g., the spectrum licence has expired, was cancelled or traded to a different entity).

For the purposes of this section, the device boundary is to be calculated in accordance with the ULOI, with the following amendments:

- The maximum value of 'm' is 2000 (max radial length = 200 km, 100 m increments)
- Level of protection (LOP) is to be set to -115 dBm/MHz;
- Nominal receiver antenna gain (G_r) is set to 24 dBi;
- The height of the nominal receiver is set to 30 m above ground level.

4.3 Coordination with AWL tx receivers

This section outlines the coordination procedures for the protection of receivers registered for operation in relation to an AWL tx ("AWL tx receiver"). These procedures are to be followed for all proposed apparatus licensed transmitters (including AWL transmitters but excepting AWL transmitters that are exempt from registration). In this RALI, 'AWL tx receiver' means a radiocommunications receiver which:

- Is used for the reception of radio emissions from an associated area-wide transmitter; and
- Is located within the area authorised by the licence under which the area-wide transmitter is operating.

4.3.1 Co-channel coordination

For proposed AWL transmitters, co-channel interference to AWL tx receivers is managed through coordination with the area authorised by an existing AWL tx (detailed in section 4.2.1) and the fallback synchronisation requirement included in the AWL LCD. As the device boundary location calculated in section 4.2.1 assumes that area-adjacent AWL tx services are capable of adhering to the synchronisation requirement, if more protection is desired, the AWL tx licensee can consider taking out a licence with a larger geographical area to protect any given receiver.

For all other apparatus licence types, co-channel interference to AWL tx receivers is solely managed through coordination with the area authorised by an existing AWL tx (i.e., no assumption of possible synchronisation). The proposed transmitter will be considered to cause interference if the device boundary of the transmitter, calculated using the amended device boundary location calculation in section 4.2.2, intrudes into the licence area of a co-channel AWL tx. As per section 11, any potential interference from new PTP transmitters should also be minimised by the specified coordination method in that section.

4.3.2 Adjacent-channel coordination

Licensees planning to deploy radiocommunications transmitters under an apparatus licence, including AWL transmitters that are not exempt from registration, must have regard to 3400-4000 MHz band AWL tx receivers that are recorded in the RRL and are operating on adjacent frequencies. The coordination performed must:

- Use the parameters of the radiocommunications receivers as recorded in the Register;

- Use the compatibility requirement set out in Schedule 2 to the *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 3.4 GHz Band) 2015* as in force from time to time, or any instrument made under section 262 of the Act as a replacement of those guidelines, as in force from time to time (referred to in this RALI as the RAG Rx). For the purposes of this RALI, assume that the RAG Rx also applies to AWL tx receivers as well as spectrum licenced receivers;
- Use the notional receiver performance level set out in Schedule 1 to the RAG Rx for coordination purposes for AWL tx receivers. It is noted that licensees can choose to deploy equipment that does not meet this minimum level or performance. However, in this case, licensees must then be prepared to accept a higher level of interference as all coordination will be based on the notional receiver performance. For application of the receiver blocking criteria, the frequency range in paragraph 5(a) of Schedule 1 to RAG Rx should be replaced with *3340-4060* MHz;
- Make use of a suitable propagation model for path loss, that considers terrain and any other relevant factors, using a 3 second digital elevation model or better, between the fixed transmitters and radiocommunications receivers[5] and
- Consider any special conditions and/or advisory notes which are included on the relevant licences.

4.3.3 Failure of coordination

In the event that the above co-channel or adjacent channel coordination with AWL tx receivers does not meet the coordination requirements, the licensee of the proposed transmitter should consider:

- Replanning the deployment of the transmitter to avoid causing harmful interference; or
- Negotiating with the licensee of the affected receiver to find a resolution.

In the event that replanning the deployment is not possible and a negotiated resolution cannot be reached:

- For proposed AWL transmitters: interference is managed in accordance with the synchronisation requirement condition included in the AWL LCD, unless other arrangements are agreed to by the affected licensees.
- For all other proposed apparatus-licensed transmitters: the proposed licence will not be issued.

Note: For a device with an active antenna system (AAS), the radiated power in the direction of a receiver operated under another licence is defined as the sum of the gain of the antenna in the direction of the receiver (accounting for azimuth and elevation) and the Total Radiated Power (dBm). This allowance is based on the assumption that beam pointing angles and/or power can be controlled dynamically to ensure a defined level of radiated power in a specific direction is not exceeded.

The procedure detailed above, should also be used when planning to deploy radiocommunications receivers associated with a transmitter in the 3400-4000 MHz band under an AWL.

The ACMA will take these coordination procedures into account when assessing cases of interference.

[5] An example of a suitable propagation model is that set out in section 4.5.2 of ITU-R Recommendation P.526-14 *Propagation by diffraction.*

4.4 Registration of receivers operating in relation to an AWL tx

Receivers for an associated transmitter operating under an AWL are not required to be registered. However, registration of fixed location receivers is encouraged as generally only registered devices will be afforded protection. An AWL tx receiver may be registered if it complies with the spurious emission limits detailed in section 4.4.1.

There are no coordination procedures, other than the requirements detailed in section 4.3, defined for the protection for AWL tx receivers from existing apparatus licensed services. Prospective licensees should assess the risk of interference from existing services before deploying services – also see the advisory note detailed in section 3.3.

4.4.1 AWL tx receiver spurious emission limits

Spurious emission limits for registered AWL tx receivers are detailed in Tables 3 and 4 for non-AAS and AAS receivers respectively. The applicable limits in Tables 3 and 4 apply at frequencies outside the 3360-4040 MHz frequency range[6], during periods when any associated transmitter is not transmitting (in its off period).

Table 3 Spurious emission limits for non-AAS receivers

Frequency range (f)	Mean power per receiver (dBm)	Specified Bandwidth
30 MHz ≤ f < 1 GHz	-57	100 kHz
1 GHz ≤ f < 19 GHz	-47	1 MHz

Table 4 Spurious emission limits for AAS receivers

Frequency range (f)	Total radiated power per cell/sector (dBm)	Specified Bandwidth
30 MHz ≤ f < 1 GHz	-27	100 kHz
1 GHz ≤ f < 19 GHz	-21	1 MHz

[6] It is expected that receivers that are not registered will comply with the limits in Tables 3 and 4, for frequencies outside the 3295-4105 MHz frequency range. The ACMA will take into account these limits when dealing with interference complaints.

4.5 Coordination with AWL rx receivers

This section outlines the coordination procedures for the protection of AWL receivers registered under an AWL rx ("AWL rx receiver"). These procedures are to be followed for all proposed apparatus licensed transmitters (including AWL transmitters but excepting AWL transmitters that are exempt from registration). In this RALI, 'AWL rx receiver' means a radiocommunications receiver which Is located within the area authorised by the AWL rx licence under which the area-wide receiver is operating.

4.5.1 Co-channel coordination

For proposed AWL rx receivers, co-channel interference to AWL rx receivers from spectrum licence transmitters (SL txs), AWL txs and other apparatus licenced transmitters is solely managed by the device boundary criterion detailed in the ULOI. Transmitters operating under a spectrum licence, AWL tx or apparatus licence will not be considered to cause interference into AWL rx receivers if they meet this device boundary criterion.

4.5.2 Adjacent-channel coordination

While any receiver type can be registered under an AWL rx, for coordination purposes if they are earth receive stations, part 4.10.2 is applicable for the consideration of the adjacent channel coordination.

4.5.3 Failure of coordination

In the event that the above co-channel or adjacent channel coordination with AWL rx receivers does not meet the coordination requirements, the licensee of the proposed transmitter should consider:

- Replanning the deployment of the transmitter to avoid causing harmful interference; or
- Negotiating with the licensee of the affected AWL rx licensee to find a resolution.

In the event that replanning the deployment is not possible and a negotiated resolution cannot be reached:

- For proposed AWL transmitters, the transmitter is not to be registered under the AWL tx licence.
- For all other proposed apparatus-licensed transmitters: the ACMA may not issue the proposed licence.

Note: For a device with an AAS, the radiated power in the direction of a receiver operated under another licence is defined as the sum of the gain of the antenna in the direction of the receiver (accounting for azimuth and elevation) and the Total Radiated Power (dBm). This allowance is based on the assumption that beam pointing angles and/or power can be controlled dynamically to ensure a defined level of radiated power in a specific direction is not exceeded.

This same procedure detailed above, should also be used when planning to deploy radiocommunications receivers associated with a transmitter in the 3400-4000 MHz band under an AWL.

The ACMA will take these coordination procedures into account when assessing cases of interference.

4.6 Registration of AWL rx receivers

AWL rx receivers are not required to be registered before operation. However, registration of fixed location receivers is encouraged as only registered devices will generally be afforded protection.

This RALI does not cover all matters relevant to coordination and licensing for earth stations. It should be read in conjunction with other applicable documentation including earth station licensing procedures contained in the ACMA Business Operating Procedure: Submission and processing of applications for earth, earth receive apparatus licences and device registrations under area-wide apparatus licences for fixed earth stations (the earth station BOP).

There are no terrestrial coordination procedures defined for new AWL rx receivers. However, registered AWL rx receivers will generally only be afforded the protection detailed in section 4.5.

Taking this into account, prospective AWL rx licensees should:

- assess the risk of interference from existing services before deploying services
- consider the size of the AWL rx spectrum space (both in areas and frequency) need to licence to ensure they are provided suitable co-channel and adjacent channel protection from existing and future registered transmitters.

4.7 Coordination requirements contained in other RALIs

AWL transmitters that are required to be registered must be coordinated with existing receivers from other licensed services. The details of an AWL transmitter will generally not be included in the RRL if the protection and coordination requirements of receivers of other services are not met. These requirements are detailed in the individual RALIs for those services which are available from the *RALIs* page of the ACMA website. Note that some RALIs provide protection for geographic areas rather than an individual service.

Applicable RALIs to consider include, but are not limited to:

- For fixed links, refer to *RALI FX3*. The applicable protection ratios for the coordination of AWL transmitters with fixed link receivers are detailed in Appendix 1 of RALI FX3. In this instance the size of the first adjacent channel is defined as being the larger bandwidth of the two services being coordinated.
- For earth station protection zones (ESPZs), refer to *RALI MS44*.
- For the Australian Radio Quiet Zone in Western Australia (ARQZWA), refer to *RALI MS32*.

Details of existing services for performing coordination calculations can be found on the *Register of Radiocommunications Licences* (RRL) page of the ACMA website.

Some services that require protection from AWL transmitters do not have dedicated RALIs. The coordination requirements for these services are detailed later in this RALI.

4.7.1 Protection from AWL transmitters that are registration exempt

If the proposed AWL tx base station site is within 20 km of a receiver from another service, other than an AWL, that requires protection, not including ESPZs, detailed coordination is required. Coordination is deemed to be successful if it can be shown that the coverage area of the AWL system does not overlap the interference zone of the receiver (where the receiver is provided protection to the levels defined in the RALI that the receiver is coordinated by). Refer to Appendix C for details.

Note that this does not completely remove the risk of interference from registration exempt transmitters. Licensees should use judgement to assess transmitters that have a high potential to cause interference such as those on hills higher than the associated base station. If interference occurs the AWL LCD contains a condition that transmitters exempt from registration must not cause interference to other services.

4.8 Coexistence with incumbent point to multipoint services

This section outlines the requirements for the protection of existing point to multipoint services from transmitters operated under an AWL tx. This coordination procedure is also to be used when coordinating spectrum licensed transmitters with existing point to multipoint receivers.

As no new PMP licences will generally be issued in the 3400-4000 MHz range in areas where AWLs are available (as detailed at Appendix A), no procedure is defined for the protection of AWL tx or AWL rx receivers from PMPs. Consequently, AWL tx or AWL rx receivers are not afforded protection from existing point to multipoint services. Prospective licensees should assess the risk of interference from existing PMP services before deploying services. Details of existing services for performing coordination calculations against can be found on the RRL page of the ACMA website and in Appendix D.

Incumbent PMPs affected by spectrum reallocation declarations are also being assisted in migrating to AWL txs in applicable spectrum spaces.

For the purposes of coordinating with incumbent PMPs, the following additional services and details are also to be assumed to exist and to be coordinated around in the below frequency ranges, for coordination occurring before 17 July 2027. This is in addition to the frequency range where the incumbent licences exist today. The technical details, except for the frequency range, can be used from the existing applicable licence:

Licensee	Licence number (as of 26/4/2023)	ACMA Site id	Frequency range to coordinate against
Bm Alliance Coal Operations Pty Limited	10615470/1	10014668	3765-3770 MHz
	10615471/1		3770-3775 MHz
	10615472/1		3765-3770 MHz
	10615473/1		3770-3775 MHz
	10615474/1	10014677	3770-3775 MHz
	10615475/1		3775-3780 MHz
	10615476/1		3770-3775 MHz
	10615477/1		3775-3780 MHz
	10615478/1	10014667	3775-3780 MHz
	10615479/1		3765-3770 MHz
	10615480/1		3775-3780 MHz
	10615481/1		3765-3770 MHz
	10615482/1	10014669	3765-3770 MHz
	10615483/1		3770-3775 MHz
	10615484/1		3765-3770 MHz
	10615485/1		3770-3775 MHz
Loy Yang Power Management Pty Ltd	10501450/1	52625	3815-3825 MHz
MACH MOUNT PLEASANT OPERATIONS PTY LTD	10397784/4	10008121	3815-3835 MHz
	10397786/4	10008122	3815-3835 MHz
	10397788/4	10008120	3815-3835 MHz
March IT Pty Ltd	11017396/1	136455	3780-3795 MHz
	10526824/1	9025962	3765-3780 MHz
	11017397/1	9025962	3780-3795 MHz
	10526825/1	10010747	3765-3780 MHz
	10675863/1	10016795	3765-3775 MHz
	10682649/1	10016944	3765-3780 MHz
	10773862/1	10017871	3765-3775 MHz

MAULES CREEK COAL PTY LTD	10317309/1	10005408	3765-3780 MHz
	10956247/1	10020288	3765-3800 MHz
Wujal Wujal Aboriginal Shire Council	12030990/1	10007599	3780-3795 MHz
	10334476/2		3765-3780 MHz

4.8.1 Protection criteria for incumbent point to multipoint base stations

Existing PMP base station receivers will generally be protected to the levels listed in Table 5 for base stations with bandwidths of 20 MHz or less, or Table 6 for base stations with bandwidths greater than 20 MHz.

Table 5 Protection criteria for incumbent point to multipoint base station receivers with bandwidths of 20 MHz or less.

Frequency offset	Base station protection criteria (at the input of the receiver)
Co-channel	–115 dBm/MHz
$F_{offset} \leq 5$ MHz	–57.5 dBm/MHz
5 MHz < $F_{offset} \leq 15$ MHz	–50 dBm/MHz
$F_{offset} > 15$ MHz	No coordination required, however before registering an AWL transmitter, the AWL licensee (or their Accredited Person) is to notify the licensee of any receivers identified in the below steps. This allows time for affected parties to negotiate with prospective licensees and implement any additional mitigation that may be required. See Appendix E for notification requirements.

Table 6 Protection criteria for incumbent point to multipoint base station receivers with bandwidths greater than 20 MHz.

Frequency offset	Base station protection criteria (at the input of the receiver)
Co-channel	–115 dBm/MHz
$F_{offset} \leq 20$ MHz	–63.5 dBm/MHz
20 MHz < $F_{offset} \leq 30$ MHz	–56 dBm/MHz
$F_{offset} > 30$ MHz	No coordination required, however before registering an AWL transmitter, the AWL licensee (or their Accredited Person) is to notify the licensee of any receivers identified in the below steps. This allows time for affected parties to negotiate with prospective licensees and implement any additional mitigation that may be required. See Appendix E for notification requirements

Frequency offset (F_{offset}) is the frequency separation between the edge of the transmitter's occupied bandwidth and the receiver's licence channel edge.

The following minimum separation distance between the proposed AWL transmitter and existing PMP base station receivers applies:

- For co-channel operation, a minimum separation distance of 20 km
- For adjacent channel operation with a F_{offset} of less than 10 MHz, a minimum separation distance of 5 km

- For adjacent channel operation with a F_{offset} of 10 MHz or greater, there is no minimum separation distance required.

When coordinating a proposed AWL transmitter with a PMP receiver, the following procedure applies:

1. Area Cull: Identify any licensed PMP receivers within a 95km radius.
2. Frequency Cull: include all PMP receivers that are co-channel or within a:
   a. 40 MHz offset for PMP receivers with a bandwidth of 20 MHz or less
   b. 60 MHz offset for PMP receivers with a bandwidth of greater than 20 MHz.
3. To manage interference, two scenarios need to be assessed:
   a. Assessment of interference potential from AWL transmitters which are required to be included in the RRL. Unwanted emissions into a PMP receiver must not exceed the values in Table 5 or Table 6, and logarithmic scaling should be used to find the appropriate protection level for different PMP receiver bandwidths. The scaling must be based on the values in Table 5 for receivers operating in 20 MHz of bandwidth or less, or the values in Table 6 for all other receivers.
   b. Assessment of interference potential from AWL transmitters which are not required to be in the RRL (e.g. user equipment). If the geographical location of an AWL transmitter that is required to be included in the RRL, associated with the user equipment that is not required to be included in the RRL, is within 20 km of the PMP receiver, coordination is deemed to fail. However, the associated AWL transmitter (that is required to be included in the RRL) may still be included in the RRL if it can be shown that the coverage area of the associated AWL transmitter does not overlap the interference zone of the PMP receiver – also see section 4.4.1 and Appendix C.

In the event interference occurs to remote or supplemental stations from AWL transmitters, section 4.6.2 of this RALI applies.

4.8.2 Protection of remote and supplemental base stations

Remote PMP stations are authorised to operate under licences that are subject to the Radiocommunications Licence Conditions (Fixed Licence) Determination 2025, (the Fixed Licence LCD 2025). The Fixed Licence LCD 2025 includes conditions that allow the use of remote stations only when communicating with a base station or supplemental base station operating under a valid fixed licence (point to multipoint station).

The Fixed Licence LCD 2025 includes conditions that restrict the use of supplemental base stations to overcoming deficiencies within the coverage area of a base station. Supplemental base stations cannot be used to extend the coverage of a base station.

The Fixed Licence LCD 2025 provides that remote stations and supplemental base stations must not cause interference to another radiocommunications service. Since the location of remote stations is not recorded, it is also ACMA policy that these stations are not afforded protection from interference from another radiocommunications services. This includes customer premises equipment. However, remote stations are afforded a degree of protection via the coordination requirements in place for the base station.

4.9 Coexistence with radio-altimeters

This section contains requirements intended to manage coexistence with of radio altimeters on aircraft that are used in a range of safety-critical and other operational uses, for an interim period.

Radio-altimeters are an aircraft station used for radionavigation in the 4200-4400 MHz frequency range under the *Radiocommunications (Aircraft and Aeronautical Mobile Stations) Class Licence 2016*.

The requirements in this section only apply for the registration of devices under an AWL tx before 1 April 2026.

4.9.1 Definitions

An "**identified runway**" is a landing approach identified by CASA, reproduced in *Appendix G:*.

An "**exclusion zone**" is an area comprised of three segments:

1) A segment of length "**exclusion zone extension length**" from the landing end of an identified runway.
2) A segment of length "**exclusion zone half-width**" at the opposite end of the landing end of an identified runway"
3) A segment the length of the runway.

The width of each segment is the "**exclusion zone half-width**" either side of the identified runway's centreline. Dimensions are the applicable maximum operating frequency row in Table 7 columns B and C.

A **"restricted zone**" is defined as an area extending lengthwise from each end of the exclusion zone, and horizontally from an identified runway centreline. The applicable dimensions that apply for a given transmitter is the *maximum* operating frequency row in Table 7 column C. Figure 1 below is instructive for an example specific maximum operating frequency.

The "**PFD limit**" value that applies for a given transmitter is defined in table 7 column E for the *maximum* operating frequency row of the transmitter.

The "**PFD limit height**" value that applies for a given transmitter is defined in table 7 column F for the *maximum* operating frequency row of the transmitter.

Figure 1: Example zone sizes definitions – where both approaches to a runway require protection (not to scale)

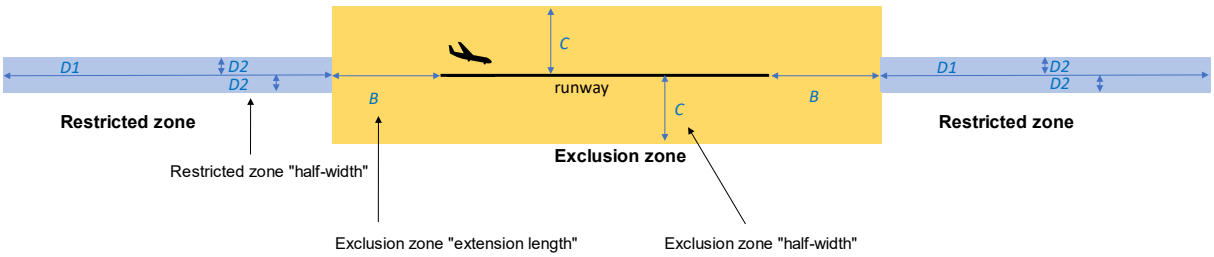
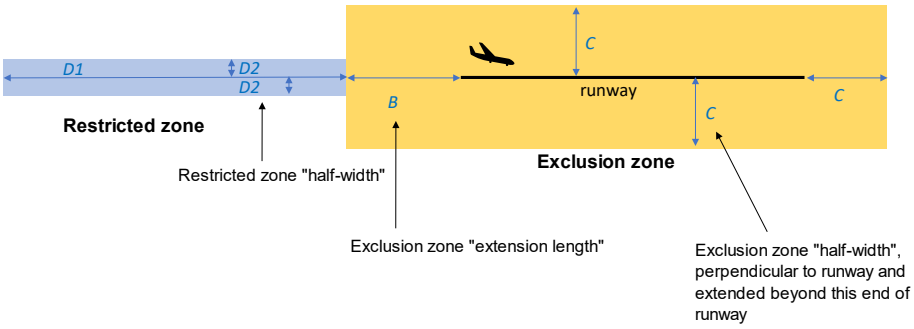


Figure 2: Example zone sizes definitions – where only one approach to a runway requires protection (not to scale)



It should be noted that potential identified runways may need to change as airport runways are re-developed or upgraded to improved landing systems.

Table 7 Radio altimeter frequency-specific limits

A	B	C	D	E	F
Base station operating frequency (MHz)	**Exclusion zone extension length (m) 'B'**	**Exclusion zone half-width (m) 'C'**	**Restricted zone size (m) (Length x half-width) 'D1 x D2'**	**Power flux density limit (dBW/m^2/MHz)**	**Power flux density limit restriction height (m)**
>3700 to 3750	2570	1440	5630 x 260	-39.0	120
>3750 to 3800	2720	1590	5480 x 270	-39.9	130
>3800 to 3850	2890	1760	5310 x 280	-41	140
>3850 to 3900	3000	1870	5200 x 350	-42.4	145
>3900 to 3950	3110	1980	5090 x 420	-43.7	150
>3950 to 4000 (remote areas)	3230	2100	4970 x 520	-45.2	155

4.9.2 Registration requirements

A non-exempt AWL tx transmitter must not operate or have its details included in the RRL if the proposed transmitter would operate above 3700 MHz and one or more of the following apply:

4.9.2.1 The transmitter is located in an *exclusion zone*.

4.9.2.2 The transmitter is located in a *restricted zone* and the power flux density from the transmitter exceeds the applicable *PFD limit* at the applicable *PFD limit height* above the ground, for any percentage of the time for all combinations of elevation and azimuth angles above the horizon, in any part of the restricted zone.

4.9.3 Licence special condition requirements

For the purposes of coordination with radio altimeters (see clause 4 of Schedule 4 to the AWL LCD), the following requirements apply to the operation of a transmitter above 3700 MHz under an AWL tx:

4.9.3.1 If the transmitter is located in a restricted zone, the power flux density from the transmitter must not exceed the applicable *PFD limit* at the applicable *PFD limit height* above the ground, for any percentage of the time for all combinations of elevation and azimuth angles above the horizon, in any part of the restricted zone.

4.9.3.2 The transmitter of a WBB antenna system must restrict both fixed mechanical tilt and fixed electrical tilt components such that both are directed towards the horizon or below. If one component is at the horizon, the other must be below the horizon.

4.9.3.3 The transmitter should, as much as is practicable, avoid the formation of grating lobes in the antenna array.

4.10 Coexistence with earth receive stations

4.10.1 Earth receive station receivers authorised under an earth receive licence

This section only applies for coordination of AWL txs with earth receive stations registered under an earth receive licence, not earth receive stations registered under an area-wide receive licence (AWL rx).

3400–3600 MHz band

Coordination of AWL tx transmitters with Earth receive stations authorised under an earth receive licence operating in the 3400–3600 MHz band is the same as detailed in Part 4.2 of the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 3.4 GHz Band) 2015*, as in force from time to time, or any instrument made under section 262 of the Act as a replacement of those guidelines, as in force from time to time (referred to in this RALI as the RAG Tx).

Earth receive stations operate on a secondary basis in the 3400–3600 MHz band. Therefore, in the event coordination indicates that interference may occur, the AWL tx licensee must notify[7] and make reasonable efforts to work with the affected Earth station licensees operating in the 3400–3600 MHz band to enable coexistence. If there is no practical solution, services operated under an AWL tx have priority.

3600–4200 MHz band

Coordination of AWL transmitters with Earth receive stations authorised under an earth receive apparatus licence operating in the 3600–4200 MHz band is the same as detailed in section 4.3 of the RAG Tx, read as if the AWL transmitter is a radiocommunications transmitter operating under a spectrum licence in the 3.4 GHz band for purposes of the RAG Tx.

Subsection 4.3(2) of the RAG Tx describes co-channel coordination to apply between AWL transmitters and Earth receive stations.

Subsection 4.3(3) of the RAG Tx describes the coordination procedure for unwanted emissions from AWL transmitters into earth receive stations.

Subsection 4.3(4) of the RAG Tx describes overload mechanism coordination to apply between AWL transmitters and Earth receive stations registered under an earth receive licence.

While earth receive stations in remote areas will be able to be licensed using earth receiver licences, the intent is that any new earth station registrations should minimise impact on the utility of any existing AWL tx or spectrum licences. This is so AWL tx and spectrum licences have a reasonable opportunity to register new devices under their licences in the future. Appendix F describes the relevant coordination procedure.

Where AWLs or spectrum licences have existing device registrations (i.e., an AWL or spectrum licence device registration is first-in-time), a new earth receive station receives no specific protection from those existing devices.

When new transmitter devices are registered under an existing AWL, or new AWL transmitter devices are second-in-time to an earth station in the 3700-4200 MHz range, then protection is afforded to the earth station as per the referenced parts of 4.3 of the RAG Tx. For earth receive stations established after the licensing of the AWL, that will have undergone coordination as per

[7] Refer to Appendix E for details of the notification requirements.

Appendix F, in most cases, the new AWL device coordination with earth receive stations should be successful due to this previous earth receive station coordination.

4.10.2 Earth station receivers authorised under an Area-Wide Receive licence (AWL rx)

This section only applies for coordination of AWL txs with earth receive stations registered under an AWL rx, not earth receive stations registered under an earth receive licence.

Coordination of AWL transmitters with Earth receive stations registered under an AWL rx is the same as detailed in section 4.5 of the RAG Tx, read as if the AWL transmitter is a radiocommunications transmitter operating under a spectrum licence in the 3.4 GHz band for purposes of the RAG Tx.

4.11 Coordination of new point-to-point stations with AWLs and SLs

4.11.1 General principles

Like the intent for new proposed earth receive stations, any new PTP station registrations, either transmit or receive, should minimise impact upon the utility of any existing AWL or spectrum licences, even if AWL or spectrum licence device registrations have yet to be made i.e., the AWL or spectrum is first-in-time, but not all devices have been registered.

New PTP stations, transmit or receive, will not be able to be registered within the geographic area of an AWL or spectrum licence on a frequency if the necessary bandwidth of the PTP system overlaps the AWL or spectrum licence frequencies, noting that under RALI FX03, the PTP necessary bandwidth in the 3.8 GHz PTP band is permitted to exceed the PTP channel bandwidth by up to 20%. Consequently, the provisions of this part apply to possible new PTP stations located outside the geographical area of AWLs or spectrum licences.

For the purposes of this part then, “co-channel” refers to any overlap of a PTP station’s necessary bandwidth or licensed bandwidth with an AWL or spectrum licence frequency. “Adjacent-channel” then refers to frequencies that overlap outside both the PTP station’s necessary bandwidth and licensed bandwidth.

New PTP stations can generally be registered within AWL or spectrum licence geographic areas on adjacent channels exceeding the PTP necessary bandwidth, assuming that coordination in line with RALI FX03 to any registered AWL or spectrum licence devices are successful.

4.11.2 Co-channel point-to-point transmitters to potential future AWL or spectrum licenced receivers

To manage potential co-channel interference, the method described under 4.3.1 for general apparatus licensed transmitters into AWLs is to be used also into spectrum licence geographic areas. i.e. a device boundary is to be calculated for the PTP transmitter using the “non-synchronised” parameters and if the device boundary is determined to be within the AWL or spectrum licence area, coordination is deemed to have failed.

4.11.3 Adjacent-channel point-to-point transmitters to potential future AWL or spectrum licenced receivers

To manage potential adjacent-channel interference, the same method as above in 4.11.2 is to be used to assess first adjacent and second adjacent channels, using actual or reasonable assumptions, such as ITU-R SM.1541 and SM.329, about the point-to-point transmitter unwanted emissions into AWL tx receivers, AWL rx or SL receivers.

4.11.4 Co-channel and adjacent channel point-to-point receivers from potential future AWL tx or spectrum licenced transmitters

Again, to ensure that a potential point-to-point receiver near the geographic boundary of an AWL tx or SL does not unduly constrain the ability of the AWL tx or spectrum licence to register new transmitter devices.

New PTP receiver stations proposed to be registered under a fixed licence need to demonstrate that within a 200km radius, that the protection ratio criteria in RALI FX03 Appendix 1 for the 3.8 GHz PTP band can be met for any possible AWL tx or spectrum licenced device that could be registered under the AWL tx or spectrum licence that would meet the device boundary criteria as described at 4.2.1. Appendix H describes a method to be used to perform this coordination requirement to accommodate future AWL and spectrum licenced device registrations under any AWL or spectrum licence.

Where AWL txs or spectrum licences have existing device registrations (i.e. an AWL tx or spectrum licence device registration is first-in-time), a new PTP receiver station receives no specific protection from those existing devices, but the Appendix H method should also minimise potential interference from existing registered AWL or spectrum licence devices.

When new devices are registered under an existing AWL, or new AWL are second-in-time to a PTP receiver station in the 3800-4200 MHz range, then normal coordination requirements under RALI FX03 apply.

4.11.5 Other methods of compliance

If the PTP transmitter or receiver fails any of the above criteria, but the applicant can demonstrate additional mitigations, such as site shielding, will enable it to pass these criteria, the applicant can apply for an exemption from RALI MS47 and/or FX03 on that basis.

If the PTP transmitter or receiver fails any of the above criteria, but the applicant can come to an agreement with all of the relevant AWL/SL licensee/s, the applicant can apply for an exemption from RALI MS47 and/or FX03 on that basis.

4.12 Other coordination scenarios

4.12.1 Radiodetermination services

High power radiolocation services in the 3100–3600 MHz range are operated by the Department of Defence on a largely itinerant basis. These radiolocation services have the potential to disrupt the throughput of receivers operating in-band or in the adjacent band to radiolocation services, particularly on the uplink channel (base station receiver).

The Exmouth coordination zone, described at 3.2.5, has been designed to manage coexistence with a Defence radiodetermination facility which is expected to be operating on a more than itinerant basis. Consequently, interference management requires special consideration of these arrangements.

The Department of Defence is expected to take all reasonable measures to minimise the impact of radiolocation services to other in-band and adjacent band services and work with any affected licensees to do so, as required. However, there will be occasions when interference cannot be fully mitigated. In such instances the interference may be due to blocking, strong out-of-band radar emissions or other susceptibilities within a fixed or mobile wireless network configuration.

When planning service deployments, 3400–4000 MHz band apparatus licensees are urged to consider additional measures to reduce the likelihood of impact to services operating under

their licence. If such measures are necessary, it is likely that they would only apply in specific areas that are subject to regular radar use. They may include additional RF filtering, network redundancy, or resilience of network configuration where vulnerabilities to radar signal interference are identified. The ACMA will work with the Department of Defence to make available, where feasible, any additional information that may assist existing or prospective 3400–4000 MHz band apparatus licensees on this matter.

Radiocommunications transmitters operated under an AWL in the 3400 MHz to 4000 MHz band, in accordance with the conditions of the licence, are not taken to cause unacceptable interference to radiolocation services operating in the 3100-3400 MHz or 3400-3600 MHz bands.

The parameters in the following table can be used to assess the potential of interference to receivers from the Defence radiodetermination facility in Exmouth.

Table 8 Parameters for modelling interference from the Defence radiodetermination facility at Exmouth

Parameter	Value
Transmitter location	21°53'24.99"S, 114° 7'8.81"E
Centre Frequency	3400 MHz
Carrier Bandwidth	151 MHz
Maximum transmit power	63.1 dBW total power in carrier bandwidth
Transmit Mask breakpoints (offset from centre frequency)	-3 dB: 74.90 MHz -20 dB: 75.50 MHz -40 dB: 79.70 MHz -60 dB: 92.30 MHz or greater offsets
Transmitter antenna gain (average)	26 dBi
Transmitter antenna pattern	Omnidirectional
Transmitter antenna height above terrain	10m

4.12.2 Amateur service

The *Radiocommunications Licence Conditions (Amateur Licence) Determination 2015* allows the Advanced Amateur licensees to operate in various portions of the 3400–3600 MHz band in defined geographical areas. The *Australian Radiofrequency Spectrum Plan* sets a secondary status for all Amateur services in the 3400–3600 MHz band. This status means that incumbent amateur services must not cause interference to a primary service and cannot claim protection from interference from a primary service.

Coordination of Amateur Beacon or Repeater licences with registered AWL receivers operating in the 3400–3600 MHz band is conducted using the notional receiver performance level set out in Schedule 1 to the RAG Rx, as in force from time to time. In the event coordination indicates that interference may occur to a registered AWL receiver, it is recommended that the AWL

licensee notify[8] and make reasonable efforts to work with the affected amateur licensees operating to enable coexistence and prevent harmful interference from occurring. However, in the event there is no practical solution, services operated under an AWL have priority (i.e., Amateur services cannot claim protection from or cause interference to an AWL service as Amateur services are secondary in the and AWLs are services operated under the mobile service type in the band which are primary).

4.12.3 PMPS licences

RALI MS 50 *Frequency coordination and licensing procedures for point-to-multipoint licences in the 3400-3475 MHz and 3950-4000 MHz bands* defines the frequency assignment criteria for proposed new PMPS licences. This includes frequency coordination procedures with AWL tx and AWL rx. The same frequency coordination procedures can be used to coordinate proposed new AWL tx and AWL rx licences with existing PMPS licences.

Note that:

- AWL tx and AWL rx licences cannot be issued within the spectrum space of a PMPS licence unless agreed to by the affected licensee(s);
- AWL tx (in the 3400-4000 MHz band) and PMPS licences (in the 3950-4000 MHz band) are subject to the same fallback synchronisation condition. For PMPS licences, this requirement is defined in Part 10 of the Fixed Licence LCD 2025. Licensees only need to synchronise their services with PMPS licensees if interference occurs and there are no other agreed measures to manage it.

4.13 Site engineering aspects

At shared locations, that is sites within 500 m of each other, several potential interference mechanisms other than co-channel or adjacent channel interference may occur. These include intermodulation, transient and spurious emissions, receiver desensitisation, and physical blocking. These mechanisms are caused by non-linear and often complex processes that are, usually, not readily predicted using information contained in the ACMA's *RRL*. Nevertheless, several site engineering methods can be applied to address these potential interference scenarios. These include, but are not limited to, RF filtering, site shielding, frequency separation, site location and power reduction.

Most of the methods mentioned above require co-operation and co-ordination between licensees. This is easily achieved where the two systems are owned by the same licensee. Where neighbouring systems are not owned by the same licensee formal discussions may be required.

In the case of co-siting with spectrum licensed devices or other AWL licensees (i.e., sites within 500 m of each other), if interference occurs and both devices are operating in accordance with the condition of their licence and any other conditions that may apply, then licensees must take reasonable steps to negotiate arrangements likely to reduce the interference to acceptable levels. To assist in such situations, operators are also referred to the relevant Radiocommunications Advisory Guideline (stated on the spectrum licence) which specifies a minimum spectrum licence notional receiver performance, with also applies to AWL receivers. The advisory guidelines are part of the *3.4 GHz Spectrum Licence Technical Framework*.

[8] Refer to Appendix E for details of the notification requirements.

It is a condition in the AWL LCD that licensees (or their site managers) work cooperatively with other co-sited licensees and apply good site engineering practice to resolve problems when they occur.

4.14 Additional information on technical records

The following applies when providing details of AWL stations to be recorded on the RRL:

- Where sectored antennas are used, details of the antenna model, down-tilt, polarisation and azimuth should be recorded for each sector.
- Where steerable beam (including beam forming) antennas are used, details of the highest gain achievable through antenna phasing should be recorded.

5 Exceptions

Exceptions to the requirements of this RALI for prospective assignments and device registrations require case-by-case consideration by the Manager, Spectrum Planning Section.

A request for an exemption from the requirements of this RALI would need to be accompanied by evidence to support the request.

For exemptions related to AWL transmitter coordination and device boundary criteria please also see the formal requirements under the AWL LCD.

All requests for exemptions should be submitted to: freqplan@acma.gov.au

6 RALI Authorisation

Approved 29/09/2025

Manager
Spectrum Planning Section
Spectrum Planning and Engineering Branch

Communications Infrastructure Division
Australian Communications and Media Authority

Appendix A: Areas available for AWL licensing

In this RALI, the areas available for AWL licensing are defined by the HCIS area descriptions in the following tables, except where otherwise precluded in this RALI.

The Australian Spectrum Map Grid (ASMG) is used to define geographical areas over which spectrum licences are issued. The Hierarchical Cell Identification Scheme (HCIS) is a naming convention developed by the ACMA that applies unique 'names' to each of the cells that make up the ASMG. The ASMG and HCIS are described in detail in the document The Australian spectrum map grid 2012. HCIS descriptions of areas can be converted into a Placemark file (viewable in Google Earth) through a facility on the ACMA website.

AWL tx licences will not be issued outside of the ASMG, where point to multipoint licences can be issued.

AWL rx licences will not be issued outside of the ASMG, where apparatus licences earth receive licences can be issued.

In the rural, regional and metropolitan areas, unless an applicant can demonstrate satisfactory coordination measures, the ACMA will generally not issue an AWL authorising the operation of radiocommunications transmitters in in the 15 MHz of spectrum directly adjacent to a spectrum licence.

AWL tx licensing

Area (frequency)	HCIS
Remote (3400-4000 MHz)	BR, BS, BT, CR, CS, CT, CU, DQ, DR, DS, DT, DU, EP, EQ, ER, ES, ET, EU, FP, FQ, FR, FS, FT, FU, GP, GQ, GR, GS, GT, GU, HO, HP, HQ, HR, HS, HT, HU, IO, IP, IQ, IR, IS, IT, IU, JO, JP, JQ, JR, JS, JT, JU, KR, KS, KT, KU, LS, LT, LU, AR8, AR9, AS2, AS3, AS5, AS6, AS8, AS9, AT1, AT2, AT3, AT5, AT6, AT8, AT9, AU2, AU3, BU1, BU2, BU3, BU6, GO3, GO4, GO5, GO6, GO7, GO8, GO9, AU6A, AU6B, AU6C, AU6D, AU6E, AU6F, AU6G, AU6H, BU4A, BU4B, BU4C, BU4D, BU4E, BU4F, BU4G, BU5A, BU5B, BU5C, BU5D, BU9C, BU9D, BU9G, BU9H, BU9K, BU9L, BU9O, BU9P
Rural (3750-3950 MHz)	CV, DV, KQ, KV, LR, LV, MS, CW1, CW2, CW3, CW4, DW1, DW2, DW3, EV1, EV2, EV3, EV4, EV5, EV6, EV7, FV1, FV2, FV3, FV4, FV5, GV1, GV2, GV3, GV6, HV1, HV2, HV3, HV4, HV5, HV6, HV8, HV9, HW3, HW6, IV1, IV2, IV3, IV4, IV5, IV6, IV7, JV1, JV2, JV3, JV4, JV5, JV6, JV9, JW3, JW6, JW9, JX1, JX2, JX3, JX5, JX6, KO1, KO4, KO5, KO7, KO8, KP1, KP2, KP4, KP5, KP6, KP7, KP8, KP9, KW1, KW2, KW3, KW4, KY2, KY3, KY6, LP4, LP7, LQ1, LQ2, LQ4, LQ5, LQ7, LQ8, LW1, LW2, LW5, LW9, LX9, LY1, LY2, LY3, LY4, LY5, LY6, LY7, LZ1, MR1, MR4, MR5, MR7, MR8, MR9, MT1, MT2, MT3, MT6, MT7, MT8, MT9, MU1, MU2, MU3, MU4, MU7, MU8, MU9, MV1, MV4, MX1, MX4, MX7, MY1, MY4, MY7, MZ1, NS4, NS7, NS8, NS9, NT1, NU4, NU8, NU9, BV3D, BV3H, BV3K, BV3L, BV3O, BV3P, BV6C, BV6D, BV6G, BV6H, BV6K, BV6L, BV6O, BV6P, BV9D, BV9H, BV9K, BV9L, BV9O, BV9P, BW3B, BW3C, BW3D, BW3E, BW3F, BW3G, BW3H, BW3I, BW3J, BW3K, BW3L, BW3N, BW3O, BW3P, BW6B, BW6C, BW6D, BW6F, BW6G, BW6H, BW6J, BW6K, BW6L, BW6N, BW6O, BW6P, IV8A, IV8B, IV8C, IV8D, IV8E, IV8F, IV8G, IV8I, IV8M, IV9A, IV9B, IV9C, IV9D, IV9H, IW1A, IW1B, IW1C, IW1D, IW1E, IW1F, IW1G, IW1H, IW1I, IW1J, IW1K, IW1M, IW1N, IW1O, IW4A, IW4B, IW4C, IW4E, IW4F, IW4I, IW4J, IW4M, JV7A, JV7B, JV7C, JV7D, JV7E, JV7F, JV7G, JV7H, JV8A,

Area (frequency)	HCIS
	JV8B, JV8C, JV8D, JV8E, JV8F, JV8G, JV8H, JV8J, JV8K, JV8L, JV8P, JW2P, JW5D, JW5G, JW5H, JW5K, JW5L, JW5O, JW5P, JW7H, JW7J, JW7K, JW7L, JW7M, JW7N, JW7O, JW7P, JW8C, JW8D, JW8E, JW8F, JW8G, JW8H, JW8I, JW8J, JW8K, JW8L, JW8M, JW8N, JW8O, JW8P, KW5A, KW5B, KW5C, KW5D, KW5E, KW5F, KW5G, KW5H, KW5I, KW5J, KW5K, KW5L, KW5M, KW5N, KW5O, KW6A, KW6B, KW6C, KW6D, KW6E, KW6F, KW6G, KW6H, KW6I, KW6J, KW6K, KW6L, KW7A, KW7B, KW7C, KW7E, KW7F, KW7G, KW7I, KW7J, KW7M, KW7N, KX1A, KX1B, KX1E, KX1F, KX1I, KX1M, KX4A, KX4E, KX4I, KX4M, KX8I, KX8J, KX8K, KX8L, KX8M, KX8N, KX8O, KX8P, KX9I, KX9J, KX9K, KX9L, KX9M, KX9N, KX9O, KX9P, LW3A, LW3B, LW3C, LW3D, LW3E, LW3F, LW3G, LW3H, LW3I, LW3J, LW3K, LW3M, LW3N, LW3O, LW4A, LW4B, LW4C, LW4D, LW4E, LW4F, LW4G, LW4H, LW4I, LW4J, LW4K, LW4L, LW4N, LW4O, LW4P, LW6A, LW6B, LW6C, LW6E, LW6F, LW6G, LW6I, LW6J, LW6K, LW6M, LW6N, LW6O, LW7D, LW8A, LW8B, LW8C, LW8D, LW8E, LW8F, LW8G, LW8H, LW8I, LW8J, LW8K, LW8L, LW8N, LW8O, LW8P, LX2B, LX2C, LX2D, LX2F, LX2G, LX2H, LX2J, LX2K, LX2L, LX3A, LX3B, LX3C, LX3D, LX3E, LX3F, LX3G, LX3H, LX3I, LX3J, LX3K, LX3L, LX3N, LX3O, LX3P, LX6C, LX6D, LX6G, LX6H, LX6K, LX6L, LX6O, LX6P, LX7I, LX7J, LX7K, LX7L, LX7M, LX7N, LX7O, LX7P, LX8I, LX8J, LX8K, LX8L, LX8M, LX8N, LX8O, LX8P, LY8A, LY8B, LY8C, LY8D, LY8E, LY8F, LY8G, LY8I, LY8J, LY8K, LY8M, LY8N, LY8O, LY9A, LY9B, LY9C, LY9D, LZ2A, LZ2B, LZ2C, LZ2E, LZ2F, LZ2G, LZ2I, LZ2J, LZ2K, LZ2M, LZ2N, LZ2O, LZ2P, LZ3M, LZ3N, LZ3O, LZ3P, MT4A, MT4B, MT4C, MT4D, MT4E, MT4I, MT4M, MT4N, MT5A, MT5B, MT5C, MT5D, MT5F, MT5G, MT5H, MT5J, MT5K, MT5L, MT5N, MT5O, MT5P, MU5A, MU5B, MU5E, MU5F, MU5I, MU5J, MU5M, MU5N, MU5O, MU5P, MU6B, MU6C, MU6D, MU6F, MU6G, MU6H, MU6J, MU6K, MU6L, MU6M, MU6N, MU6O, MU6P, MV2A, MV2B, MV2C, MV2D, MV2E, MV2F, MV2G, MV2H, MV2I, MV2J, MV2K, MV2L, MV2M, MV2N, MV2O, MV3A, MV3B, MV3E, MV3I, MV5A, MV5B, MV5C, MV5E, MV5F, MV5I, MV5J, MV5M, MV5N, MV5O, MV7A, MV7B, MV7C, MV7D, MV7E, MV7F, MV7G, MV7H, MV7I, MV7J, MV7M, MV8A, MV8B, MV8C, MX2E, MX2F, MX2G, MX2H, MX2I, MX2J, MX2K, MX2L, MX2M, MX2N, MX2O, MX2P, MX3E, MX3F, MX3G, MX3H, MX3I, MX3J, MX3K, MX3L, MX3M, MX3N, MX3O, MX3P, NT2A, NT2B, NT2C, NT2D, NT2E, NT2F, NT2G, NT2H, NT2I, NT2J, NT2K, NT2L, NT2M, NT2N, NT3A, NT3B, NT3C, NT3D, NT3E, NT3F, NT3G, NT3H, NT3I, NT3J, NT3K, NT3L, NT4A, NT4B, NT4E, NT4F, NT4I, NT4J, NT4M, NT4N, NU1A, NU1E, NU1F, NU1G, NU1I, NU1J, NU1K, NU1L, NU1M, NU1N, NU1O, NU1P, NU2I, NU2M, NU2N, NU2O, NU5A, NU5B, NU5C, NU5E, NU5F, NU5G, NU5H, NU5I, NU5J, NU5K, NU5L, NU5M, NU5N, NU5O, NU5P, NU6I, NU6J, NU6K, NU6L, NU6M, NU6N, NU6O, NU6P, NU7A, NU7B, NU7C, NU7D, NU7E, NU7F, NU7G, NU7H, NU7I, NU7J, NU7L, NU7M, NU7N, NU7O, NU7P, NV1A, NV1B, NV1C, NV1D, NV1E, NV1F, NV1G, NV1H, NV2A, NV2B, NV2C, NV2D, NV3A, NV3B, NV3C, NV3D, BV3C3, BV3C6, BV3C9, BV3G3, BV3G6, BV3G7, BV3G8, BV3G9, BV9C3, BV9C6, BV9C9, BV9G3, BV9G6, BV9G9, BW3M1, BW3M2, BW3M3, BW3M5, BW3M6, BW3M9, IV8H1, IV8H2, IV8H3, IV8H4, IV8H5, IV8H6, IV8H7, IV8H8, IV8J1, IV8J2, IV8J3, IV8J4, IV8J5, IV8J6, IV8J7, IV9E1, IV9E2, IV9G3, IW1L1, IW1L2, IW1L3, IW1L4, IW1L5, IW1L7, IW1L8, JV7I1, JV7I2, JV7I3, JV7I4, JV7I5, JV7I6, JV7J1, JV7J2, JV7J3, JV7J4, JV7J5, JV7J6, JV7K1, JV7K2, JV7K3, JV7K4, JV7K5, JV7K6, JV7L1, JV7L2, JV7L3, JV7L4, JV7L5, JV7L6, JV8I1, JV8I2, JV8I3, JV8I4, JV8I5, JV8I6, JV8N2, JV8N3, JV8O1, JV8O2, JV8O3, JV8O4, JV8O5, JV8O6, JV8O8, JV8O9, JW2D3, JW2L7, JW2L8, JW2L9, JW5N3, JW5N6, JW5N9, JW8B3, JW8B5, JW8B6, JW8B7, JW8B8, JW8B9, KW5P1, KW5P2, KW5P3, KW5P4, KW5P5, KW5P6, KW5P7, KW6M1, KW6M2, KW6M3,

Area (frequency)	HCIS
	KW6M4, KW6M5, KW6M6, KW6N1, KW6N2, KW6N3, KW6N4, KW6N5, KW6N6, KW6O1, KW6O2, KW6O3, KW6O4, KW6O5, KW6O6, KW6P1, KW6P2, KW6P3, KW6P4, KW6P5, KW6P6, KW7D1, KW7D2, KW7D3, KW7D4, KW7D5, KW7D6, KW7D7, KW7D8, KW7H1, KW7H2, KW7H4, KW7H7, KW7K1, KW7K2, KW7K3, KW7K4, KW7K7, KW8A1, KX1J1, KX1J2, KX1J3, KX1J4, KX1J5, KX1J6, KX1J7, KX1J8, KX1N1, KX1N2, KX1N4, KX1N5, KX1N7, KX1N8, KX4B1, KX4B2, KX4B4, KX4B5, KX4B7, KX4B8, KX4F1, KX4F2, KX4F4, LW3L1, LW3L2, LW3L4, LW3L7, LW3P1, LW3P2, LW3P4, LW3P5, LW3P7, LW3P8, LW4M1, LW4M2, LW4M3, LW4M4, LW4M5, LW4M6, LW6D1, LW6D2, LW6D4, LW6D5, LW6D7, LW6D8, LW6H1, LW6H2, LW6H4, LW6H5, LW6H7, LW6H8, LW6L1, LW6L2, LW6L4, LW6L5, LW6L7, LW6L8, LW6P1, LW6P2, LW6P4, LW6P5, LW6P7, LW6P8, LW7B2, LW7B3, LW7B6, LW7C1, LW7C2, LW7C3, LW7C4, LW7C5, LW7C6, LW7C9, LW7G3, LW7H1, LW7H2, LW7H3, LW7H4, LW7H5, LW7H6, LW7H8, LW7H9, LW7L3, LW7L6, LW7L9, LW8M1, LW8M2, LW8M3, LW8M6, LX2P1, LX2P2, LX2P3, LX3M1, LX3M2, LX3M3, LX3M4, LX3M5, LX3M6, LX6B1, LX6B2, LX6B3, LX6B5, LX6B6, LX6B8, LX6B9, LX6F2, LX6F3, LX6F5, LX6F6, LX6F8, LX6F9, LX6J2, LX6J3, LX6J5, LX6J6, LX6J8, LX6J9, LX6N2, LX6N3, LX6N5, LX6N6, LX6N7, LX6N8, LX6N9, LY8H1, LY8H2, LY8H3, LY9E1, LY9E2, LY9E3, LY9F1, LY9F2, LY9F3, LY9G1, LY9G2, LY9G3, LY9H1, LY9H2, LY9H3, LZ2L4, LZ2L5, LZ2L6, LZ2L7, LZ2L8, LZ2L9, LZ3I4, LZ3I5, LZ3I6, LZ3I7, LZ3I8, LZ3I9, LZ3J4, LZ3J5, LZ3J6, LZ3J7, LZ3J8, LZ3J9, LZ3K4, LZ3K5, LZ3K6, LZ3K7, LZ3K8, LZ3K9, LZ3L4, LZ3L5, LZ3L6, LZ3L7, LZ3L8, LZ3L9, MT4F1, MT4F2, MT4F3, MT4F4, MT4F5, MT4F6, MT4F7, MT4F8, MT4G1, MT4J1, MT4J2, MT4J4, MT4J5, MT4J7, MT4J8, MT4J9, MT4O4, MT4O5, MT4O7, MT4O8, MT4O9, MT4P6, MT4P7, MT4P8, MT4P9, MT5E1, MT5E2, MT5E3, MT5E5, MT5E6, MT5E8, MT5E9, MT5I3, MT5I6, MT5I8, MT5I9, MT5M2, MT5M3, MT5M4, MT5M5, MT5M6, MT5M7, MT5M8, MT5M9, MU5C1, MU5C2, MU5C3, MU5C4, MU5C5, MU5C6, MU5C7, MU5D1, MU5D2, MU5D3, MU5D4, MU5D5, MU5D6, MU5K7, MU6A1, MU6A2, MU6A3, MU6A4, MU6A5, MU6A6, MU6A8, MU6A9, MU6E3, MU6E6, MU6E9, MU6I3, MU6I6, MU6I8, MU6I9, MV3C1, MV3C2, MV3C3, MV3C4, MV3C5, MV3C6, MV3C7, MV3D1, MV3D2, MV3D3, MV3D4, MV3D5, MV3D6, MV3D8, MV3D9, MV3F1, MV3F2, MV3F4, MV3F7, MV3J1, MV3J4, MV3J7, MV3J8, MV5G1, MV5G2, MV5G3, MV5G4, MV5G7, MV5K1, MV5K4, MV5K5, MV5K6, MV5K7, MV5K8, MV5K9, MV7K1, MV7K2, MV7K3, MV7K4, MV7K5, MV7K7, MV7N1, MV7N2, MV7N3, MV7N4, MV7N5, MV7N6, MV7N7, MV7N8, MV8E1, MV8E2, MV8E3, MV8E4, MV8E5, MV8E7, MV8E8, MV8F1, MV8F2, MV8F3, MV8G1, MV8G2, MV8G3, NT2O1, NT2O2, NT2O4, NT2O7, NT4C1, NT4C2, NT4C3, NT4C4, NT4C5, NT4C7, NT4C8, NT4D1, NT4D2, NT4D3, NT5A1, NT5A2, NT5A3, NT5B1, NT5B2, NT5B3, NT5C1, NT7A1, NT7A2, NT7A3, NT7A4, NT7A5, NT7A7, NT7B1, NT7E1, NT7M4, NT7M7, NT7M8, NU1B1, NU1B4, NU1B7, NU1B8, NU1B9, NU1C7, NU1C8, NU1C9, NU1D7, NU1D8, NU1H1, NU1H2, NU1H4, NU1H5, NU1H6, NU1H7, NU1H8, NU1H9, NU2J1, NU2J2, NU2J4, NU2J5, NU2J6, NU2J7, NU2J8, NU2J9, NU2K4, NU2K5, NU2K6, NU2K7, NU2K8, NU2K9, NU5D4, NU5D5, NU5D6, NU5D7, NU5D8, NU5D9, NU6E7, NU6E8, NU6E9, NU6F7, NU6F8, NU6F9, NU6G7, NU6G8, NU6G9, NU6H7, NU6H8, NU6H9, NU7K1, NU7K2, NU7K3, NU7K5, NU7K6, NU7K7, NU7K8, NU7K9.
Regional (3800-3950 MHz)	AU9, AV9, AW3, BU7, BU8, BV7, BV8, BW1, BW2, BW5, IW2, IW5, IW7, IW8, IW9, JW1, JW4, KW9, KX2, LX5, MV6, MW1, MW2, MW6, MW7, MW8, MW9, NT6, NU3, AU6I, AU6J, AU6K, AU6L, AU6M, AU6N, AU6O, AU6P, BU4H, BU4I, BU4J, BU4K,

Area (frequency)	HCIS
	BU4L, BU4M, BU4N, BU4O, BU4P, BU5E, BU5F, BU5G, BU5H, BU5I, BU5J, BU5K, BU5L, BU5M, BU5N, BU5O, BU5P, BU9A, BU9B, BU9E, BU9F, BU9I, BU9J, BU9M, BU9N, BV1A, BV1B, BV1C, BV1D, BV2A, BV2B, BV2C, BV2D, BV2G, BV2H, BV2K, BV2L, BV2O, BV2P, BV3A, BV3B, BV3E, BV3F, BV3I, BV3J, BV3M, BV3N, BV5C, BV5D, BV5G, BV5H, BV5K, BV5L, BV5O, BV5P, BV6A, BV6B, BV6E, BV6F, BV6I, BV6J, BV6M, BV6N, BV9A, BV9B, BV9E, BV9F, BV9I, BV9J, BV9M, BV9N, BW3A, BW6A, BW6E, BW6I, BW6M, IV8K, IV8L, IV8N, IV8O, IV8P, IV9F, IV9I, IV9J, IV9K, IV9L, IV9M, IV9N, IV9O, IV9P, IW1P, IW3A, IW3B, IW3C, IW3D, IW3G, IW3H, IW4D, IW4G, IW4H, IW4K, IW4L, IW4N, IW4O, IW4P, IW6H, IW6I, IW6J, IW6K, IW6L, IW6M, IW6N, IW6O, IW6P, JV7M, JV7N, JV7O, JV7P, JV8M, JW2A, JW2B, JW2C, JW2E, JW2F, JW2G, JW2H, JW2I, JW2J, JW2K, JW2M, JW2N, JW2O, JW5A, JW5B, JW5C, JW5E, JW5F, JW5I, JW5J, JW5M, JW7A, JW7B, JW7C, JW7D, JW7E, JW7F, JW7G, JW7I, JW8A, KW7L, KW7O, KW7P, KW8B, KW8C, KW8D, KW8E, KW8F, KW8G, KW8H, KW8I, KW8J, KW8K, KW8L, KW8M, KW8N, KW8O, KW8P, KX1C, KX1D, KX1G, KX1H, KX1K, KX1L, KX1O, KX1P, KX3A, KX3B, KX3C, KX3D, KX3E, KX3I, KX4C, KX4D, KX4G, KX4H, KX4J, KX4K, KX4L, KX4N, KX4O, KX4P, KX5A, KX5B, KX5C, KX5E, KX5F, KX5G, KX5I, KX5J, KX5K, KX5M, KX5N, KX5O, KX5P, KX6M, KX6N, KX6O, KX6P, KX8A, KX8B, KX8C, KX8D, KX8E, KX8F, KX8G, KX8H, KX9A, KX9B, KX9C, KX9D, KX9E, KX9F, KX9G, KX9H, LW7A, LW7E, LW7F, LW7I, LW7J, LW7K, LW7M, LW7N, LW7O, LW7P, LX1A, LX1B, LX1C, LX1D, LX1F, LX1G, LX1H, LX1K, LX1L, LX1O, LX1P, LX2A, LX2E, LX2I, LX2M, LX2N, LX2O, LX4C, LX4D, LX4F, LX4G, LX4H, LX4J, LX4K, LX4L, LX4M, LX4N, LX4O, LX4P, LX6A, LX6E, LX6I, LX6M, LX7A, LX7B, LX7C, LX7D, LX7E, LX7F, LX7G, LX7H, LX8A, LX8B, LX8C, LX8D, LX8E, LX8F, LX8G, LX8H, MV2P, MV3M, MV3N, MV5D, MV5H, MV5L, MV5P, MV7L, MV7O, MV7P, MV8D, MV8H, MV8I, MV8J, MV8K, MV8L, MV8M, MV8N, MV8O, MV8P, MV9A, MV9B, MV9C, MV9E, MV9F, MV9I, MV9J, MV9M, MV9N, MW3A, MW3B, MW3E, MW3F, MW3I, MW3J, MW3K, MW3L, MW3M, MW3N, MW3O, MW3P, MW4A, MW4B, MW4C, MW4E, MW4F, MW4I, MW4J, MW4M, MW4N, MW4O, MW5C, MW5D, MW5G, MW5H, MW5J, MW5K, MW5L, MW5N, MW5O, MW5P, MX2A, MX2B, MX2C, MX2D, MX3A, MX3B, MX3C, MX3D, NT2P, NT3M, NT3N, NT3O, NT3P, NT4G, NT4H, NT4K, NT4L, NT4O, NT4P, NT5D, NT5E, NT5F, NT5G, NT5H, NT5I, NT5J, NT5K, NT5L, NT5M, NT5N, NT5O, NT5P, NT7C, NT7D, NT7F, NT7G, NT7H, NT7I, NT7J, NT7K, NT7L, NT7N, NT7O, NT7P, NT8A, NT8B, NT8E, NT8F, NT8I, NT8J, NT8M, NT8N, NT9D, NT9H, NT9L, NT9N, NT9O, NT9P, NU2A, NU2B, NU2C, NU2D, NU2E, NU2F, NU2G, NU2H, NU2L, NU2P, NU6A, NU6B, NU6C, NU6D, NV1I, NV1J, NV1K, NV1L, NV1M, NV1N, NV1O, NV1P, NV2E, NV2F, NV2G, NV2H, NV2I, NV2J, NV2K, NV2L, NV2M, NV2N, NV2O, NV2P, NV3E, NV3F, NV3G, NV3H, NV3I, NV3J, NV3K, NV3L, NV3M, NV3N, NV3O, NV3P, NV4A, NV4B, NV4C, NV4D, NV4E, NV4F, NV4G, NV4H, NV4I, NV4J, NV4K, NV5A, NV5B, NV5C, NV5D, NV5E, NV5F, NV5G, NV5H, NV5K, NV5L, NV5O, NV5P, NW1E, NW1F, NW1G, NW1H, NW1I, NW1J, NW1K, NW1L, NW1M, NW1N, NW1O, NW1P, BV1E1, BV1E2, BV1E3, BV1E4, BV1E5, BV1E6, BV1F1, BV1F2, BV1F3, BV1F4, BV1F5, BV1F6, BV1G1, BV1G2, BV1G3, BV1G4, BV1G5, BV1G6, BV1H1, BV1H2, BV1H3, BV1H4, BV1H5, BV1H6, BV2E1, BV2E2, BV2E3, BV2E4, BV2E5, BV2E6, BV2F1, BV2F2, BV2F3, BV2F4, BV2F5, BV2F6, BV3C1, BV3C2, BV3C4, BV3C5, BV3C7, BV3C8, BV3G1, BV3G2, BV3G4, BV3G5, BV4M4, BV4M5, BV4M6, BV4M7, BV4M8, BV4M9, BV4N4, BV4N5, BV4N6, BV4N7, BV4N8, BV4N9, BV4O4, BV4O5, BV4O6, BV4O7, BV4O8, BV4O9, BV4P4, BV4P5, BV4P6, BV4P7, BV4P8, BV4P9, BV5M4, BV5M5, BV5M6, BV5M7, BV5M8, BV5M9, BV5N4, BV5N5, BV5N6, BV5N7, BV5N8, BV5N9, BV9C1, BV9C2, BV9C4, BV9C5, BV9C7, BV9C8, BV9G1, BV9G2,

Area (frequency)	HCIS
	BV9G4, BV9G5, BV9G7, BV9G8, BW3M4, BW3M7, BW3M8, IV8H9, IV8J8, IV8J9, IV9E3, IV9E4, IV9E5, IV9E6, IV9E7, IV9E8, IV9E9, IV9G1, IV9G2, IV9G4, IV9G5, IV9G6, IV9G7, IV9G8, IV9G9, IW1L6, IW1L9, IW3E1, IW3E2, IW3E3, IW3E4, IW3E7, IW3F1, IW3F2, IW3F3, IW3F6, IW3I1, IW3I4, IW3I7, IW3L1, IW3L2, IW3L3, IW3L5, IW3L6, IW3L8, IW3L9, IW3M1, IW3M4, IW3M7, IW6A1, IW6A4, IW6A7, IW6D7, IW6D8, IW6D9, IW6E1, IW6E4, IW6E5, IW6E6, IW6E7, IW6E8, IW6E9, IW6F4, IW6F5, IW6F6, IW6F7, IW6F8, IW6F9, IW6G4, IW6G5, IW6G6, IW6G7, IW6G8, IW6G9, JV7I7, JV7I8, JV7I9, JV7J7, JV7J8, JV7J9, JV7K7, JV7K8, JV7K9, JV7L7, JV7L8, JV7L9, JV8I7, JV8I8, JV8I9, JV8N1, JV8N4, JV8N5, JV8N6, JV8N7, JV8N8, JV8N9, JV8O7, JW2D1, JW2D2, JW2D4, JW2D5, JW2D6, JW2D7, JW2D8, JW2D9, JW2L1, JW2L2, JW2L3, JW2L4, JW2L5, JW2L6, JW5N1, JW5N2, JW5N4, JW5N5, JW5N7, JW5N8, JW8B1, JW8B2, JW8B4, KW5P8, KW5P9, KW6M7, KW6M8, KW6M9, KW6N7, KW6N8, KW6N9, KW6O7, KW6O8, KW6O9, KW6P7, KW6P8, KW6P9, KW7D9, KW7H3, KW7H5, KW7H6, KW7H8, KW7H9, KW7K5, KW7K6, KW7K8, KW7K9, KW8A2, KW8A3, KW8A4, KW8A5, KW8A6, KW8A7, KW8A8, KW8A9, KX1J9, KX1N3, KX1N6, KX1N9, KX3F1, KX3F2, KX3F3, KX3F4, KX3F5, KX3F6, KX3F7, KX3G1, KX3G2, KX3G3, KX3G4, KX3G5, KX3G6, KX3H1, KX3H2, KX3H3, KX3H4, KX3H5, KX3H6, KX3J1, KX3J4, KX3J7, KX3M1, KX3M2, KX3M3, KX3M4, KX3M7, KX3N1, KX4B3, KX4B6, KX4B9, KX4F3, KX4F5, KX4F6, KX4F7, KX4F8, KX4F9, KX5D1, KX5D4, KX5D7, KX5H1, KX5H4, KX5H7, KX5L1, KX5L4, KX5L7, LW3L3, LW3L5, LW3L6, LW3L8, LW3L9, LW3P3, LW3P6, LW3P9, LW4M7, LW4M8, LW4M9, LW6D3, LW6D6, LW6D9, LW6H3, LW6H6, LW6H9, LW6L3, LW6L6, LW6L9, LW6P3, LW6P6, LW6P9, LW7B1, LW7B4, LW7B5, LW7B7, LW7B8, LW7B9, LW7C7, LW7C8, LW7G1, LW7G2, LW7G4, LW7G5, LW7G6, LW7G7, LW7G8, LW7G9, LW7H7, LW7L1, LW7L2, LW7L4, LW7L5, LW7L7, LW7L8, LW8M4, LW8M5, LW8M7, LW8M8, LW8M9, LX1E1, LX1E2, LX1E3, LX1E4, LX1E5, LX1E6, LX1J2, LX1J3, LX1J6, LX1J9, LX1N3, LX2P4, LX2P5, LX2P6, LX2P7, LX2P8, LX2P9, LX3M7, LX3M8, LX3M9, LX4B2, LX4B3, LX4B5, LX4B6, LX4B8, LX4B9, LX4E8, LX4E9, LX4I2, LX4I3, LX4I5, LX4I6, LX4I8, LX4I9, LX6B4, LX6B7, LX6F1, LX6F4, LX6F7, LX6J1, LX6J4, LX6J7, LX6N1, LX6N4, MV3O4, MV3O5, MV3O6, MV3O7, MV3O8, MV3O9, MV3P2, MV3P3, MV3P4, MV3P5, MV3P6, MV3P7, MV3P8, MV3P9, MV5G5, MV5G6, MV5G8, MV5G9, MV5K2, MV5K3, MV7K6, MV7K8, MV7K9, MV7N9, MV8E6, MV8E9, MV8F4, MV8F5, MV8F6, MV8F7, MV8F8, MV8F9, MV8G4, MV8G5, MV8G6, MV8G7, MV8G8, MV8G9, MV9D1, MV9D2, MV9D3, MV9D4, MV9D5, MV9D7, MV9D8, MV9G1, MV9G2, MV9G3, MV9H1, MV9H2, MW3D9, MW3G4, MW3G5, MW3G6, MW3G7, MW3G8, MW3G9, MW3H2, MW3H3, MW3H4, MW3H5, MW3H6, MW3H7, MW3H8, MW3H9, MW4D1, MW4D2, MW4D3, MW4D4, MW4D5, MW4D6, MW4G4, MW4G7, MW4K1, MW4K4, MW4K7, MW4K8, MW4K9, MW4P1, MW4P2, MW4P4, MW4P5, MW4P7, MW4P8, MW4P9, MW5B1, MW5B2, MW5B3, MW5B5, MW5B6, MW5B9, MW5F3, MW5F4, MW5F5, MW5F6, MW5F7, MW5F8, MW5F9, MW5M3, MW5M6, MW5M7, MW5M8, MW5M9, NT2O3, NT2O5, NT2O6, NT2O8, NT2O9, NT4C6, NT4C9, NT4D4, NT4D5, NT4D6, NT4D7, NT4D8, NT4D9, NT5A4, NT5A5, NT5A6, NT5A7, NT5A8, NT5A9, NT5B4, NT5B5, NT5B6, NT5B7, NT5B8, NT5B9, NT5C2, NT5C3, NT5C4, NT5C5, NT5C6, NT5C7, NT5C8, NT5C9, NT7A6, NT7A8, NT7A9, NT7B2, NT7B3, NT7B4, NT7B5, NT7B6, NT7B7, NT7B8, NT7B9, NT7E2, NT7E3, NT7E4, NT7E5, NT7E6, NT7E7, NT7E8, NT7E9, NT7M1, NT7M2, NT7M3, NT7M5, NT7M6, NT7M9, NT8C1, NT8C2, NT8C4, NT8C5, NT8C7, NT8C8, NT8G4, NT8G7, NT8K1, NT8K4, NT8K5, NT8K7, NT8K8, NT8O1, NT8O2, NT8O4, NT8O5, NT8O6, NT8O7, NT8O8, NT8O9, NT8P4, NT8P5, NT8P6, NT8P7, NT8P8, NT8P9, NT9C2, NT9C3, NT9C5, NT9C6, NT9C8, NT9C9, NT9G2, NT9G3, NT9G5,

Area (frequency)	HCIS
	NT9G6, NT9G8, NT9G9, NT9I9, NT9J7, NT9J8, NT9J9, NT9K2, NT9K3, NT9K5, NT9K6, NT9K7, NT9K8, NT9K9, NT9M3, NT9M4, NT9M5, NT9M6, NT9M7, NT9M8, NT9M9, NU1B2, NU1B3, NU1B5, NU1B6, NU1C1, NU1C2, NU1C3, NU1C4, NU1C5, NU1C6, NU1D1, NU1D2, NU1D3, NU1D4, NU1D5, NU1D6, NU1D9, NU1H3, NU2J3, NU2K1, NU2K2, NU2K3, NU5D1, NU5D2, NU5D3, NU6E1, NU6E2, NU6E3, NU6E4, NU6E5, NU6E6, NU6F1, NU6F2, NU6F3, NU6F4, NU6F5, NU6F6, NU6G1, NU6G2, NU6G3, NU6G4, NU6G5, NU6G6, NU6H1, NU6H2, NU6H3, NU6H4, NU6H5, NU6H6, NV4L1, NV4L2, NV4L3, NV4M1, NV4M2, NV4M3, NV4M4, NV4M7, NV4N1, NV4N2, NV4N3, NV4O1, NV4O2, NV5I1, NV5I2, NV5I3, NV5J1, NV5J2, NV5J3, NV5J5, NV5J6, NV5J8, NV5J9, NV5N2, NV5N3, NV5N5, NV5N6, NV5N8, NV5N9, NV7A1, NW1A7, NW1A8, NW1A9, NW1B7, NW1B8, NW1B9, NW1C7, NW1C8, NW1C9, NW1D7, NW1D8, NW1D9.
Metro (3800-3950 MHz)	IW3J, IW3K, IW3N, IW3O, IW3P, IW6B, IW6C, IW3E5, IW3E6, IW3E8, IW3E9, IW3F4, IW3F5, IW3F7, IW3F8, IW3F9, IW3I2, IW3I3, IW3I5, IW3I6, IW3I8, IW3I9, IW3L4, IW3L7, IW3M2, IW3M3, IW3M5, IW3M6, IW3M8, IW3M9, IW6A2, IW6A3, IW6A5, IW6A6, IW6A8, IW6A9, IW6D1, IW6D2, IW6D3, IW6D4, IW6D5, IW6D6, IW6E2, IW6E3, IW6F1, IW6F2, IW6F3, IW6G1, IW6G2, IW6G3, NT8D, NT8H, NT8L, NT9A, NT9B, NT9E, NT9F, NT8C3, NT8C6, NT8C9, NT8G1, NT8G2, NT8G3, NT8G5, NT8G6, NT8G8, NT8G9, NT8K2, NT8K3, NT8K6, NT8K9, NT8O3, NT8P1, NT8P2, NT8P3, NT9C1, NT9C4, NT9C7, NT9G1, NT9G4, NT9G7, NT9I1, NT9I2, NT9I3, NT9I4, NT9I5, NT9I6, NT9I7, NT9I8, NT9J1, NT9J2, NT9J3, NT9J4, NT9J5, NT9J6, NT9K1, NT9K4, NT9M1, NT9M2, MW4H, MW4L, MW5A, MW5E, MW5I, MW4D7, MW4D8, MW4D9, MW4G1, MW4G2, MW4G3, MW4G5, MW4G6, MW4G8, MW4G9, MW4K2, MW4K3, MW4K5, MW4K6, MW4P3, MW4P6, MW5B4, MW5B7, MW5B8, MW5F1, MW5F2, MW5M1, MW5M2, MW5M4, MW5M5, LY8L, LY8P, LY9I, LY9J, LY9K, LY9L, LY9M, LY9N, LY9O, LY9P, LZ2D, LZ2H, LZ3A, LZ3B, LZ3C, LZ3D, LZ3E, LZ3F, LZ3G, LZ3H, LY8H4, LY8H5, LY8H6, LY8H7, LY8H8, LY8H9, LY9E4, LY9E5, LY9E6, LY9E7, LY9E8, LY9E9, LY9F4, LY9F5, LY9F6, LY9F7, LY9F8, LY9F9, LY9G4, LY9G5, LY9G6, LY9G7, LY9G8, LY9G9, LY9H4, LY9H5, LY9H6, LY9H7, LY9H8, LY9H9, LZ2L1, LZ2L2, LZ2L3, LZ3I1, LZ3I2, LZ3I3, LZ3J1, LZ3J2, LZ3J3, LZ3K1, LZ3K2, LZ3K3, LZ3L1, LZ3L2, LZ3L3, KX3K, KX3L, KX3O, KX3P, KX6A, KX6B, KX6C, KX6D, KX6E, KX6F, KX6G, KX6H, KX6I, KX6J, KX6K, KX6L, LX1I, LX1M, LX4A, KX3F8, KX3F9, KX3G7, KX3G8, KX3G9, KX3H7, KX3H8, KX3H9, KX3J2, KX3J3, KX3J5, KX3J6, KX3J8, KX3J9, KX3M5, KX3M6, KX3M8, KX3M9, KX3N2, KX3N3, KX3N4, KX3N5, KX3N6, KX3N7, KX3N8, KX3N9, KX5D2, KX5D3, KX5D5, KX5D6, KX5D8, KX5D9, KX5H2, KX5H3, KX5H5, KX5H6, KX5H8, KX5H9, KX5L2, KX5L3, KX5L5, KX5L6, KX5L8, KX5L9, LX1E7, LX1E8, LX1E9, LX1J1, LX1J4, LX1J5, LX1J7, LX1J8, LX1N1, LX1N2, LX1N4, LX1N5, LX1N6, LX1N7, LX1N8, LX1N9, LX4B1, LX4B4, LX4B7, LX4E1, LX4E2, LX4E3, LX4E4, LX4E5, LX4E6, LX4E7, LX4I1, LX4I4, LX4I7, BV1I, BV1J, BV1K, BV1L, BV1M, BV1N, BV1O, BV1P, BV2I, BV2J, BV2M, BV2N, BV4A, BV4B, BV4C, BV4D, BV4E, BV4F, BV4G, BV4H, BV4I, BV4J, BV4K, BV4L, BV5A, BV5B, BV5E, BV5F, BV5I, BV5J, BV1E7, BV1E8, BV1E9, BV1F7, BV1F8, BV1F9, BV1G7, BV1G8, BV1G9, BV1H7, BV1H8, BV1H9, BV2E7, BV2E8, BV2E9, BV2F7, BV2F8, BV2F9, BV4M1, BV4M2, BV4M3, BV4N1, BV4N2, BV4N3, BV4O1, BV4O2, BV4O3, BV4P1, BV4P2, BV4P3, BV5M1, BV5M2, BV5M3, BV5N1, BV5N2, BV5N3, MV9K, MV9L, MV9O, MV9P, MW3C, NV4P, NV5M, NV7B, NV7C, NV7D, NV7E, NV7F, NV7G, NV7H, NV7I, NV7J, NV7K, NV7L, NV7M, NV7N, NV7O, NV7P, MV9D6, MV9D9, MV9G4, MV9G5, MV9G6, MV9G7, MV9G8, MV9G9, MV9H3, MV9H4, MV9H5, MV9H6,

Area (frequency)	HCIS
	MV9H7, MV9H8, MV9H9, MW3D1, MW3D2, MW3D3, MW3D4, MW3D5, MW3D6, MW3D7, MW3D8, MW3G1, MW3G2, MW3G3, MW3H1, NV4L4, NV4L5, NV4L6, NV4L7, NV4L8, NV4L9, NV4M5, NV4M6, NV4M8, NV4M9, NV4N4, NV4N5, NV4N6, NV4N7, NV4N8, NV4N9, NV4O3, NV4O4, NV4O5, NV4O6, NV4O7, NV4O8, NV4O9, NV5I4, NV5I5, NV5I6, NV5I7, NV5I8, NV5I9, NV5J4, NV5J7, NV5N1, NV5N4, NV5N7, NV7A2, NV7A3, NV7A4, NV7A5, NV7A6, NV7A7, NV7A8, NV7A9, NW1A1, NW1A2, NW1A3, NW1A4, NW1A5, NW1A6, NW1B1, NW1B2, NW1B3, NW1B4, NW1B5, NW1B6, NW1C1, NW1C2, NW1C3, NW1C4, NW1C5, NW1C6, NW1D1, NW1D2, NW1D3, NW1D4, NW1D5, NW1D6.

AWL rx licensing

Area (frequency)	HCIS
Rural (3750-4000 MHz)	CV, DV, KQ, KV, LR, LV, MS, CW1, CW2, CW3, CW4, DW1, DW2, DW3, EV1, EV2, EV3, EV4, EV5, EV6, EV7, FV1, FV2, FV3, FV4, FV5, GV1, GV2, GV3, GV6, HV1, HV2, HV3, HV4, HV5, HV6, HV8, HV9, HW3, HW6, IV1, IV2, IV3, IV4, IV5, IV6, IV7, JV1, JV2, JV3, JV4, JV5, JV6, JV9, JW3, JW6, JW9, JX1, JX2, JX3, JX5, JX6, KO1, KO4, KO5, KO7, KO8, KP1, KP2, KP4, KP5, KP6, KP7, KP8, KP9, KW1, KW2, KW3, KW4, KY2, KY3, KY6, LP4, LP7, LQ1, LQ2, LQ4, LQ5, LQ7, LQ8, LW1, LW2, LW5, LW9, LX9, LY1, LY2, LY3, LY4, LY5, LY6, LY7, LZ1, MR1, MR4, MR5, MR7, MR8, MR9, MT1, MT2, MT3, MT6, MT7, MT8, MT9, MU1, MU2, MU3, MU4, MU7, MU8, MU9, MV1, MV4, MX1, MX4, MX7, MY1, MY4, MY7, MZ1, NS4, NS7, NS8, NS9, NT1, NU4, NU8, NU9, BV3D, BV3H, BV3K, BV3L, BV3O, BV3P, BV6C, BV6D, BV6G, BV6H, BV6K, BV6L, BV6O, BV6P, BV9D, BV9H, BV9K, BV9L, BV9O, BV9P, BW3B, BW3C, BW3D, BW3E, BW3F, BW3G, BW3H, BW3I, BW3J, BW3K, BW3L, BW3N, BW3O, BW3P, BW6B, BW6C, BW6D, BW6F, BW6G, BW6H, BW6J, BW6K, BW6L, BW6N, BW6O, BW6P, IV8A, IV8B, IV8C, IV8D, IV8E, IV8F, IV8G, IV8I, IV8M, IV9A, IV9B, IV9C, IV9D, IV9H, IW1A, IW1B, IW1C, IW1D, IW1E, IW1F, IW1G, IW1H, IW1I, IW1J, IW1K, IW1M, IW1N, IW1O, IW4A, IW4B, IW4C, IW4E, IW4F, IW4I, IW4J, IW4M, JV7A, JV7B, JV7C, JV7D, JV7E, JV7F, JV7G, JV7H, JV8A, JV8B, JV8C, JV8D, JV8E, JV8F, JV8G, JV8H, JV8J, JV8K, JV8L, JV8P, JW2P, JW5D, JW5G, JW5H, JW5K, JW5L, JW5O, JW5P, JW7H, JW7J, JW7K, JW7L, JW7M, JW7N, JW7O, JW7P, JW8C, JW8D, JW8E, JW8F, JW8G, JW8H, JW8I, JW8J, JW8K, JW8L, JW8M, JW8N, JW8O, JW8P, KW5A, KW5B, KW5C, KW5D, KW5E, KW5F, KW5G, KW5H, KW5I, KW5J, KW5K, KW5L, KW5M, KW5N, KW5O, KW6A, KW6B, KW6C, KW6D, KW6E, KW6F, KW6G, KW6H, KW6I, KW6J, KW6K, KW6L, KW7A, KW7B, KW7C, KW7E, KW7F, KW7G, KW7I, KW7J, KW7M, KW7N, KX1A, KX1B, KX1E, KX1F, KX1I, KX1M, KX4A, KX4E, KX4I, KX4M, KX8I, KX8J, KX8K, KX8L, KX8M, KX8N, KX8O, KX8P, KX9I, KX9J, KX9K, KX9L, KX9M, KX9N, KX9O, KX9P, LW3A, LW3B, LW3C, LW3D, LW3E, LW3F, LW3G, LW3H, LW3I, LW3J, LW3K, LW3M, LW3N, LW3O, LW4A, LW4B, LW4C, LW4D, LW4E, LW4F, LW4G, LW4H, LW4I, LW4J, LW4K, LW4L, LW4N, LW4O, LW4P, LW6A, LW6B, LW6C, LW6E, LW6F, LW6G, LW6I, LW6J, LW6K, LW6M, LW6N, LW6O, LW7D, LW8A, LW8B, LW8C, LW8D, LW8E, LW8F, LW8G, LW8H, LW8I, LW8J, LW8K, LW8L, LW8N, LW8O, LW8P, LX2B, LX2C, LX2D, LX2F, LX2G, LX2H, LX2J, LX2K, LX2L, LX3A, LX3B, LX3C, LX3D, LX3E, LX3F, LX3G, LX3H, LX3I, LX3J, LX3K, LX3L, LX3N, LX3O, LX3P, LX6C, LX6D, LX6G, LX6H, LX6K, LX6L, LX6O, LX6P, LX7I, LX7J, LX7K, LX7L, LX7M, LX7N, LX7O, LX7P, LX8I, LX8J, LX8K, LX8L,

Area (frequency)	HCIS
	LX8M, LX8N, LX8O, LX8P, LY8A, LY8B, LY8C, LY8D, LY8E, LY8F, LY8G, LY8I, LY8J, LY8K, LY8M, LY8N, LY8O, LY9A, LY9B, LY9C, LY9D, LZ2A, LZ2B, LZ2C, LZ2E, LZ2F, LZ2G, LZ2I, LZ2J, LZ2K, LZ2M, LZ2N, LZ2O, LZ2P, LZ3M, LZ3N, LZ3O, LZ3P, MT4A, MT4B, MT4C, MT4D, MT4E, MT4I, MT4M, MT4N, MT5A, MT5B, MT5C, MT5D, MT5F, MT5G, MT5H, MT5J, MT5K, MT5L, MT5N, MT5O, MT5P, MU5A, MU5B, MU5E, MU5F, MU5I, MU5J, MU5M, MU5N, MU5O, MU5P, MU6B, MU6C, MU6D, MU6F, MU6G, MU6H, MU6J, MU6K, MU6L, MU6M, MU6N, MU6O, MU6P, MV2A, MV2B, MV2C, MV2D, MV2E, MV2F, MV2G, MV2H, MV2I, MV2J, MV2K, MV2L, MV2M, MV2N, MV2O, MV3A, MV3B, MV3E, MV3I, MV5A, MV5B, MV5C, MV5E, MV5F, MV5I, MV5J, MV5M, MV5N, MV5O, MV7A, MV7B, MV7C, MV7D, MV7E, MV7F, MV7G, MV7H, MV7I, MV7J, MV7M, MV8A, MV8B, MV8C, MX2E, MX2F, MX2G, MX2H, MX2I, MX2J, MX2K, MX2L, MX2M, MX2N, MX2O, MX2P, MX3E, MX3F, MX3G, MX3H, MX3I, MX3J, MX3K, MX3L, MX3M, MX3N, MX3O, MX3P, NT2A, NT2B, NT2C, NT2D, NT2E, NT2F, NT2G, NT2H, NT2I, NT2J, NT2K, NT2L, NT2M, NT2N, NT3A, NT3B, NT3C, NT3D, NT3E, NT3F, NT3G, NT3H, NT3I, NT3J, NT3K, NT3L, NT4A, NT4B, NT4E, NT4F, NT4I, NT4J, NT4M, NT4N, NU1A, NU1E, NU1F, NU1G, NU1I, NU1J, NU1K, NU1L, NU1M, NU1N, NU1O, NU1P, NU2I, NU2M, NU2N, NU2O, NU5A, NU5B, NU5C, NU5E, NU5F, NU5G, NU5H, NU5I, NU5J, NU5K, NU5L, NU5M, NU5N, NU5O, NU5P, NU6I, NU6J, NU6K, NU6L, NU6M, NU6N, NU6O, NU6P, NU7A, NU7B, NU7C, NU7D, NU7E, NU7F, NU7G, NU7H, NU7I, NU7J, NU7L, NU7M, NU7N, NU7O, NU7P, NV1A, NV1B, NV1C, NV1D, NV1E, NV1F, NV1G, NV1H, NV2A, NV2B, NV2C, NV2D, NV3A, NV3B, NV3C, NV3D, BV3C3, BV3C6, BV3C9, BV3G3, BV3G6, BV3G7, BV3G8, BV3G9, BV9C3, BV9C6, BV9C9, BV9G3, BV9G6, BV9G9, BW3M1, BW3M2, BW3M3, BW3M5, BW3M6, BW3M9, IV8H1, IV8H2, IV8H3, IV8H4, IV8H5, IV8H6, IV8H7, IV8H8, IV8J1, IV8J2, IV8J3, IV8J4, IV8J5, IV8J6, IV8J7, IV9E1, IV9E2, IV9G3, IW1L1, IW1L2, IW1L3, IW1L4, IW1L5, IW1L7, IW1L8, JV7I1, JV7I2, JV7I3, JV7I4, JV7I5, JV7I6, JV7J1, JV7J2, JV7J3, JV7J4, JV7J5, JV7J6, JV7K1, JV7K2, JV7K3, JV7K4, JV7K5, JV7K6, JV7L1, JV7L2, JV7L3, JV7L4, JV7L5, JV7L6, JV8I1, JV8I2, JV8I3, JV8I4, JV8I5, JV8I6, JV8N2, JV8N3, JV8O1, JV8O2, JV8O3, JV8O4, JV8O5, JV8O6, JV8O8, JV8O9, JW2D3, JW2L7, JW2L8, JW2L9, JW5N3, JW5N6, JW5N9, JW8B3, JW8B5, JW8B6, JW8B7, JW8B8, JW8B9, KW5P1, KW5P2, KW5P3, KW5P4, KW5P5, KW5P6, KW5P7, KW6M1, KW6M2, KW6M3, KW6M4, KW6M5, KW6M6, KW6N1, KW6N2, KW6N3, KW6N4, KW6N5, KW6N6, KW6O1, KW6O2, KW6O3, KW6O4, KW6O5, KW6O6, KW6P1, KW6P2, KW6P3, KW6P4, KW6P5, KW6P6, KW7D1, KW7D2, KW7D3, KW7D4, KW7D5, KW7D6, KW7D7, KW7D8, KW7H1, KW7H2, KW7H4, KW7H7, KW7K1, KW7K2, KW7K3, KW7K4, KW7K7, KW8A1, KX1J1, KX1J2, KX1J3, KX1J4, KX1J5, KX1J6, KX1J7, KX1J8, KX1N1, KX1N2, KX1N4, KX1N5, KX1N7, KX1N8, KX4B1, KX4B2, KX4B4, KX4B5, KX4B7, KX4B8, KX4F1, KX4F2, KX4F4, LW3L1, LW3L2, LW3L4, LW3L7, LW3P1, LW3P2, LW3P4, LW3P5, LW3P7, LW3P8, LW4M1, LW4M2, LW4M3, LW4M4, LW4M5, LW4M6, LW6D1, LW6D2, LW6D4, LW6D5, LW6D7, LW6D8, LW6H1, LW6H2, LW6H4, LW6H5, LW6H7, LW6H8, LW6L1, LW6L2, LW6L4, LW6L5, LW6L7, LW6L8, LW6P1, LW6P2, LW6P4, LW6P5, LW6P7, LW6P8, LW7B2, LW7B3, LW7B6, LW7C1, LW7C2, LW7C3, LW7C4, LW7C5, LW7C6, LW7C9, LW7G3, LW7H1, LW7H2, LW7H3, LW7H4, LW7H5, LW7H6, LW7H8, LW7H9, LW7L3, LW7L6, LW7L9, LW8M1, LW8M2, LW8M3, LW8M6, LX2P1, LX2P2, LX2P3, LX3M1, LX3M2, LX3M3, LX3M4, LX3M5, LX3M6, LX6B1, LX6B2, LX6B3, LX6B5, LX6B6, LX6B8, LX6B9, LX6F2, LX6F3, LX6F5, LX6F6, LX6F8, LX6F9, LX6J2, LX6J3, LX6J5, LX6J6, LX6J8, LX6J9, LX6N2, LX6N3, LX6N5, LX6N6, LX6N7, LX6N8, LX6N9, LY8H1, LY8H2, LY8H3, LY9E1, LY9E2, LY9E3,

Area (frequency)	HCIS
	LY9F1, LY9F2, LY9F3, LY9G1, LY9G2, LY9G3, LY9H1, LY9H2, LY9H3, LZ2L4, LZ2L5, LZ2L6, LZ2L7, LZ2L8, LZ2L9, LZ3I4, LZ3I5, LZ3I6, LZ3I7, LZ3I8, LZ3I9, LZ3J4, LZ3J5, LZ3J6, LZ3J7, LZ3J8, LZ3J9, LZ3K4, LZ3K5, LZ3K6, LZ3K7, LZ3K8, LZ3K9, LZ3L4, LZ3L5, LZ3L6, LZ3L7, LZ3L8, LZ3L9, MT4F1, MT4F2, MT4F3, MT4F4, MT4F5, MT4F6, MT4F7, MT4F8, MT4G1, MT4J1, MT4J2, MT4J4, MT4J5, MT4J7, MT4J8, MT4J9, MT4O4, MT4O5, MT4O7, MT4O8, MT4O9, MT4P6, MT4P7, MT4P8, MT4P9, MT5E1, MT5E2, MT5E3, MT5E5, MT5E6, MT5E8, MT5E9, MT5I3, MT5I6, MT5I8, MT5I9, MT5M2, MT5M3, MT5M4, MT5M5, MT5M6, MT5M7, MT5M8, MT5M9, MU5C1, MU5C2, MU5C3, MU5C4, MU5C5, MU5C6, MU5C7, MU5D1, MU5D2, MU5D3, MU5D4, MU5D5, MU5D6, MU5K7, MU6A1, MU6A2, MU6A3, MU6A4, MU6A5, MU6A6, MU6A8, MU6A9, MU6E3, MU6E6, MU6E9, MU6I3, MU6I6, MU6I8, MU6I9, MV3C1, MV3C2, MV3C3, MV3C4, MV3C5, MV3C6, MV3C7, MV3D1, MV3D2, MV3D3, MV3D4, MV3D5, MV3D6, MV3D8, MV3D9, MV3F1, MV3F2, MV3F4, MV3F7, MV3J1, MV3J4, MV3J7, MV3J8, MV5G1, MV5G2, MV5G3, MV5G4, MV5G7, MV5K1, MV5K4, MV5K5, MV5K6, MV5K7, MV5K8, MV5K9, MV7K1, MV7K2, MV7K3, MV7K4, MV7K5, MV7K7, MV7N1, MV7N2, MV7N3, MV7N4, MV7N5, MV7N6, MV7N7, MV7N8, MV8E1, MV8E2, MV8E3, MV8E4, MV8E5, MV8E7, MV8E8, MV8F1, MV8F2, MV8F3, MV8G1, MV8G2, MV8G3, NT2O1, NT2O2, NT2O4, NT2O7, NT4C1, NT4C2, NT4C3, NT4C4, NT4C5, NT4C7, NT4C8, NT4D1, NT4D2, NT4D3, NT5A1, NT5A2, NT5A3, NT5B1, NT5B2, NT5B3, NT5C1, NT7A1, NT7A2, NT7A3, NT7A4, NT7A5, NT7A7, NT7B1, NT7E1, NT7M4, NT7M7, NT7M8, NU1B1, NU1B4, NU1B7, NU1B8, NU1B9, NU1C7, NU1C8, NU1C9, NU1D7, NU1D8, NU1H1, NU1H2, NU1H4, NU1H5, NU1H6, NU1H7, NU1H8, NU1H9, NU2J1, NU2J2, NU2J4, NU2J5, NU2J6, NU2J7, NU2J8, NU2J9, NU2K4, NU2K5, NU2K6, NU2K7, NU2K8, NU2K9, NU5D4, NU5D5, NU5D6, NU5D7, NU5D8, NU5D9, NU6E7, NU6E8, NU6E9, NU6F7, NU6F8, NU6F9, NU6G7, NU6G8, NU6G9, NU6H7, NU6H8, NU6H9, NU7K1, NU7K2, NU7K3, NU7K5, NU7K6, NU7K7, NU7K8, NU7K9.
Regional (3800-4000 MHz)	AU9, AV9, AW3, BU7, BU8, BV7, BV8, BW1, BW2, BW5, IW2, IW5, IW7, IW8, IW9, JW1, JW4, KW9, KX2, LX5, MV6, MW1, MW2, MW6, MW7, MW8, MW9, NT6, NU3, AU6I, AU6J, AU6K, AU6L, AU6M, AU6N, AU6O, AU6P, BU4H, BU4I, BU4J, BU4K, BU4L, BU4M, BU4N, BU4O, BU4P, BU5E, BU5F, BU5G, BU5H, BU5I, BU5J, BU5K, BU5L, BU5M, BU5N, BU5O, BU5P, BU9A, BU9B, BU9E, BU9F, BU9I, BU9J, BU9M, BU9N, BV1A, BV1B, BV1C, BV1D, BV2A, BV2B, BV2C, BV2D, BV2G, BV2H, BV2K, BV2L, BV2O, BV2P, BV3A, BV3B, BV3E, BV3F, BV3I, BV3J, BV3M, BV3N, BV5C, BV5D, BV5G, BV5H, BV5K, BV5L, BV5O, BV5P, BV6A, BV6B, BV6E, BV6F, BV6I, BV6J, BV6M, BV6N, BV9A, BV9B, BV9E, BV9F, BV9I, BV9J, BV9M, BV9N, BW3A, BW6A, BW6E, BW6I, BW6M, IV8K, IV8L, IV8N, IV8O, IV8P, IV9F, IV9I, IV9J, IV9K, IV9L, IV9M, IV9N, IV9O, IV9P, IW1P, IW3A, IW3B, IW3C, IW3D, IW3G, IW3H, IW4D, IW4G, IW4H, IW4K, IW4L, IW4N, IW4O, IW4P, IW6H, IW6I, IW6J, IW6K, IW6L, IW6M, IW6N, IW6O, IW6P, JV7M, JV7N, JV7O, JV7P, JV8M, JW2A, JW2B, JW2C, JW2E, JW2F, JW2G, JW2H, JW2I, JW2J, JW2K, JW2M, JW2N, JW2O, JW5A, JW5B, JW5C, JW5E, JW5F, JW5I, JW5J, JW5M, JW7A, JW7B, JW7C, JW7D, JW7E, JW7F, JW7G, JW7I, JW8A, KW7L, KW7O, KW7P, KW8B, KW8C, KW8D, KW8E, KW8F, KW8G, KW8H, KW8I, KW8J, KW8K, KW8L, KW8M, KW8N, KW8O, KW8P, KX1C, KX1D, KX1G, KX1H, KX1K, KX1L, KX1O, KX1P, KX3A, KX3B, KX3C, KX3D, KX3E, KX3I, KX4C, KX4D, KX4G, KX4H, KX4J, KX4K, KX4L, KX4N, KX4O, KX4P, KX5A, KX5B, KX5C, KX5E, KX5F, KX5G, KX5I, KX5J, KX5K, KX5M, KX5N, KX5O, KX5P, KX6M, KX6N, KX6O, KX6P, KX8A, KX8B, KX8C,

Area (frequency)	HCIS
	KX8D, KX8E, KX8F, KX8G, KX8H, KX9A, KX9B, KX9C, KX9D, KX9E, KX9F, KX9G, KX9H, LW7A, LW7E, LW7F, LW7I, LW7J, LW7K, LW7M, LW7N, LW7O, LW7P, LX1A, LX1B, LX1C, LX1D, LX1F, LX1G, LX1H, LX1K, LX1L, LX1O, LX1P, LX2A, LX2E, LX2I, LX2M, LX2N, LX2O, LX4C, LX4D, LX4F, LX4G, LX4H, LX4J, LX4K, LX4L, LX4M, LX4N, LX4O, LX4P, LX6A, LX6E, LX6I, LX6M, LX7A, LX7B, LX7C, LX7D, LX7E, LX7F, LX7G, LX7H, LX8A, LX8B, LX8C, LX8D, LX8E, LX8F, LX8G, LX8H, MV2P, MV3M, MV3N, MV5D, MV5H, MV5L, MV5P, MV7L, MV7O, MV7P, MV8D, MV8H, MV8I, MV8J, MV8K, MV8L, MV8M, MV8N, MV8O, MV8P, MV9A, MV9B, MV9C, MV9E, MV9F, MV9I, MV9J, MV9M, MV9N, MW3A, MW3B, MW3E, MW3F, MW3I, MW3J, MW3K, MW3L, MW3M, MW3N, MW3O, MW3P, MW4A, MW4B, MW4C, MW4E, MW4F, MW4I, MW4J, MW4M, MW4N, MW4O, MW5C, MW5D, MW5G, MW5H, MW5J, MW5K, MW5L, MW5N, MW5O, MW5P, MX2A, MX2B, MX2C, MX2D, MX3A, MX3B, MX3C, MX3D, NT2P, NT3M, NT3N, NT3O, NT3P, NT4G, NT4H, NT4K, NT4L, NT4O, NT4P, NT5D, NT5E, NT5F, NT5G, NT5H, NT5I, NT5J, NT5K, NT5L, NT5M, NT5N, NT5O, NT5P, NT7C, NT7D, NT7F, NT7G, NT7H, NT7I, NT7J, NT7K, NT7L, NT7N, NT7O, NT7P, NT8A, NT8B, NT8E, NT8F, NT8I, NT8J, NT8M, NT8N, NT9D, NT9H, NT9L, NT9N, NT9O, NT9P, NU2A, NU2B, NU2C, NU2D, NU2E, NU2F, NU2G, NU2H, NU2L, NU2P, NU6A, NU6B, NU6C, NU6D, NV1I, NV1J, NV1K, NV1L, NV1M, NV1N, NV1O, NV1P, NV2E, NV2F, NV2G, NV2H, NV2I, NV2J, NV2K, NV2L, NV2M, NV2N, NV2O, NV2P, NV3E, NV3F, NV3G, NV3H, NV3I, NV3J, NV3K, NV3L, NV3M, NV3N, NV3O, NV3P, NV4A, NV4B, NV4C, NV4D, NV4E, NV4F, NV4G, NV4H, NV4I, NV4J, NV4K, NV5A, NV5B, NV5C, NV5D, NV5E, NV5F, NV5G, NV5H, NV5K, NV5L, NV5O, NV5P, NW1E, NW1F, NW1G, NW1H, NW1I, NW1J, NW1K, NW1L, NW1M, NW1N, NW1O, NW1P, BV1E1, BV1E2, BV1E3, BV1E4, BV1E5, BV1E6, BV1F1, BV1F2, BV1F3, BV1F4, BV1F5, BV1F6, BV1G1, BV1G2, BV1G3, BV1G4, BV1G5, BV1G6, BV1H1, BV1H2, BV1H3, BV1H4, BV1H5, BV1H6, BV2E1, BV2E2, BV2E3, BV2E4, BV2E5, BV2E6, BV2F1, BV2F2, BV2F3, BV2F4, BV2F5, BV2F6, BV3C1, BV3C2, BV3C4, BV3C5, BV3C7, BV3C8, BV3G1, BV3G2, BV3G4, BV3G5, BV4M4, BV4M5, BV4M6, BV4M7, BV4M8, BV4M9, BV4N4, BV4N5, BV4N6, BV4N7, BV4N8, BV4N9, BV4O4, BV4O5, BV4O6, BV4O7, BV4O8, BV4O9, BV4P4, BV4P5, BV4P6, BV4P7, BV4P8, BV4P9, BV5M4, BV5M5, BV5M6, BV5M7, BV5M8, BV5M9, BV5N4, BV5N5, BV5N6, BV5N7, BV5N8, BV5N9, BV9C1, BV9C2, BV9C4, BV9C5, BV9C7, BV9C8, BV9G1, BV9G2, BV9G4, BV9G5, BV9G7, BV9G8, BW3M4, BW3M7, BW3M8, IV8H9, IV8J8, IV8J9, IV9E3, IV9E4, IV9E5, IV9E6, IV9E7, IV9E8, IV9E9, IV9G1, IV9G2, IV9G4, IV9G5, IV9G6, IV9G7, IV9G8, IV9G9, IW1L6, IW1L9, IW3E1, IW3E2, IW3E3, IW3E4, IW3E7, IW3F1, IW3F2, IW3F3, IW3F6, IW3I1, IW3I4, IW3I7, IW3L1, IW3L2, IW3L3, IW3L5, IW3L6, IW3L8, IW3L9, IW3M1, IW3M4, IW3M7, IW6A1, IW6A4, IW6A7, IW6D7, IW6D8, IW6D9, IW6E1, IW6E4, IW6E5, IW6E6, IW6E7, IW6E8, IW6E9, IW6F4, IW6F5, IW6F6, IW6F7, IW6F8, IW6F9, IW6G4, IW6G5, IW6G6, IW6G7, IW6G8, IW6G9, JV7I7, JV7I8, JV7I9, JV7J7, JV7J8, JV7J9, JV7K7, JV7K8, JV7K9, JV7L7, JV7L8, JV7L9, JV8I7, JV8I8, JV8I9, JV8N1, JV8N4, JV8N5, JV8N6, JV8N7, JV8N8, JV8N9, JV8O7, JW2D1, JW2D2, JW2D4, JW2D5, JW2D6, JW2D7, JW2D8, JW2D9, JW2L1, JW2L2, JW2L3, JW2L4, JW2L5, JW2L6, JW5N1, JW5N2, JW5N4, JW5N5, JW5N7, JW5N8, JW8B1, JW8B2, JW8B4, KW5P8, KW5P9, KW6M7, KW6M8, KW6M9, KW6N7, KW6N8, KW6N9, KW6O7, KW6O8, KW6O9, KW6P7, KW6P8, KW6P9, KW7D9, KW7H3, KW7H5, KW7H6, KW7H8, KW7H9, KW7K5, KW7K6, KW7K8, KW7K9, KW8A2, KW8A3, KW8A4, KW8A5, KW8A6, KW8A7, KW8A8, KW8A9, KX1J9, KX1N3, KX1N6, KX1N9, KX3F1, KX3F2, KX3F3, KX3F4, KX3F5, KX3F6, KX3F7, KX3G1, KX3G2, KX3G3, KX3G4, KX3G5, KX3G6, KX3H1, KX3H2, KX3H3, KX3H4, KX3H5, KX3H6, KX3J1, KX3J4, KX3J7, KX3M1, KX3M2,

Area (frequency)	HCIS
	KX3M3, KX3M4, KX3M7, KX3N1, KX4B3, KX4B6, KX4B9, KX4F3, KX4F5, KX4F6, KX4F7, KX4F8, KX4F9, KX5D1, KX5D4, KX5D7, KX5H1, KX5H4, KX5H7, KX5L1, KX5L4, KX5L7, LW3L3, LW3L5, LW3L6, LW3L8, LW3L9, LW3P3, LW3P6, LW3P9, LW4M7, LW4M8, LW4M9, LW6D3, LW6D6, LW6D9, LW6H3, LW6H6, LW6H9, LW6L3, LW6L6, LW6L9, LW6P3, LW6P6, LW6P9, LW7B1, LW7B4, LW7B5, LW7B7, LW7B8, LW7B9, LW7C7, LW7C8, LW7G1, LW7G2, LW7G4, LW7G5, LW7G6, LW7G7, LW7G8, LW7G9, LW7H7, LW7L1, LW7L2, LW7L4, LW7L5, LW7L7, LW7L8, LW8M4, LW8M5, LW8M7, LW8M8, LW8M9, LX1E1, LX1E2, LX1E3, LX1E4, LX1E5, LX1E6, LX1J2, LX1J3, LX1J6, LX1J9, LX1N3, LX2P4, LX2P5, LX2P6, LX2P7, LX2P8, LX2P9, LX3M7, LX3M8, LX3M9, LX4B2, LX4B3, LX4B5, LX4B6, LX4B8, LX4B9, LX4E8, LX4E9, LX4I2, LX4I3, LX4I5, LX4I6, LX4I8, LX4I9, LX6B4, LX6B7, LX6F1, LX6F4, LX6F7, LX6J1, LX6J4, LX6J7, LX6N1, LX6N4, MV3O4, MV3O5, MV3O6, MV3O7, MV3O8, MV3O9, MV3P2, MV3P3, MV3P4, MV3P5, MV3P6, MV3P7, MV3P8, MV3P9, MV5G5, MV5G6, MV5G8, MV5G9, MV5K2, MV5K3, MV7K6, MV7K8, MV7K9, MV7N9, MV8E6, MV8E9, MV8F4, MV8F5, MV8F6, MV8F7, MV8F8, MV8F9, MV8G4, MV8G5, MV8G6, MV8G7, MV8G8, MV8G9, MV9D1, MV9D2, MV9D3, MV9D4, MV9D5, MV9D7, MV9D8, MV9G1, MV9G2, MV9G3, MV9H1, MV9H2, MW3D9, MW3G4, MW3G5, MW3G6, MW3G7, MW3G8, MW3G9, MW3H2, MW3H3, MW3H4, MW3H5, MW3H6, MW3H7, MW3H8, MW3H9, MW4D1, MW4D2, MW4D3, MW4D4, MW4D5, MW4D6, MW4G4, MW4G7, MW4K1, MW4K4, MW4K7, MW4K8, MW4K9, MW4P1, MW4P2, MW4P4, MW4P5, MW4P7, MW4P8, MW4P9, MW5B1, MW5B2, MW5B3, MW5B5, MW5B6, MW5B9, MW5F3, MW5F4, MW5F5, MW5F6, MW5F7, MW5F8, MW5F9, MW5M3, MW5M6, MW5M7, MW5M8, MW5M9, NT2O3, NT2O5, NT2O6, NT2O8, NT2O9, NT4C6, NT4C9, NT4D4, NT4D5, NT4D6, NT4D7, NT4D8, NT4D9, NT5A4, NT5A5, NT5A6, NT5A7, NT5A8, NT5A9, NT5B4, NT5B5, NT5B6, NT5B7, NT5B8, NT5B9, NT5C2, NT5C3, NT5C4, NT5C5, NT5C6, NT5C7, NT5C8, NT5C9, NT7A6, NT7A8, NT7A9, NT7B2, NT7B3, NT7B4, NT7B5, NT7B6, NT7B7, NT7B8, NT7B9, NT7E2, NT7E3, NT7E4, NT7E5, NT7E6, NT7E7, NT7E8, NT7E9, NT7M1, NT7M2, NT7M3, NT7M5, NT7M6, NT7M9, NT8C1, NT8C2, NT8C4, NT8C5, NT8C7, NT8C8, NT8G4, NT8G7, NT8K1, NT8K4, NT8K5, NT8K7, NT8K8, NT8O1, NT8O2, NT8O4, NT8O5, NT8O6, NT8O7, NT8O8, NT8O9, NT8P4, NT8P5, NT8P6, NT8P7, NT8P8, NT8P9, NT9C2, NT9C3, NT9C5, NT9C6, NT9C8, NT9C9, NT9G2, NT9G3, NT9G5, NT9G6, NT9G8, NT9G9, NT9I9, NT9J7, NT9J8, NT9J9, NT9K2, NT9K3, NT9K5, NT9K6, NT9K7, NT9K8, NT9K9, NT9M3, NT9M4, NT9M5, NT9M6, NT9M7, NT9M8, NT9M9, NU1B2, NU1B3, NU1B5, NU1B6, NU1C1, NU1C2, NU1C3, NU1C4, NU1C5, NU1C6, NU1D1, NU1D2, NU1D3, NU1D4, NU1D5, NU1D6, NU1D9, NU1H3, NU2J3, NU2K1, NU2K2, NU2K3, NU5D1, NU5D2, NU5D3, NU6E1, NU6E2, NU6E3, NU6E4, NU6E5, NU6E6, NU6F1, NU6F2, NU6F3, NU6F4, NU6F5, NU6F6, NU6G1, NU6G2, NU6G3, NU6G4, NU6G5, NU6G6, NU6H1, NU6H2, NU6H3, NU6H4, NU6H5, NU6H6, NV4L1, NV4L2, NV4L3, NV4M1, NV4M2, NV4M3, NV4M4, NV4M7, NV4N1, NV4N2, NV4N3, NV4O1, NV4O2, NV5I1, NV5I2, NV5I3, NV5J1, NV5J2, NV5J3, NV5J5, NV5J6, NV5J8, NV5J9, NV5N2, NV5N3, NV5N5, NV5N6, NV5N8, NV5N9, NV7A1, NW1A7, NW1A8, NW1A9, NW1B7, NW1B8, NW1B9, NW1C7, NW1C8, NW1C9, NW1D7, NW1D8, NW1D9.
Metro (3800-4000 MHz)	IW3J, IW3K, IW3N, IW3O, IW3P, IW6B, IW6C, IW3E5, IW3E6, IW3E8, IW3E9, IW3F4, IW3F5, IW3F7, IW3F8, IW3F9, IW3I2, IW3I3, IW3I5, IW3I6, IW3I8, IW3I9, IW3L4, IW3L7, IW3M2, IW3M3, IW3M5, IW3M6, IW3M8, IW3M9, IW6A2, IW6A3, IW6A5, IW6A6, IW6A8, IW6A9, IW6D1, IW6D2, IW6D3, IW6D4, IW6D5, IW6D6,

Area (frequency)	HCIS
	IW6E2, IW6E3, IW6F1, IW6F2, IW6F3, IW6G1, IW6G2, IW6G3, NT8D, NT8H, NT8L, NT9A, NT9B, NT9E, NT9F, NT8C3, NT8C6, NT8C9, NT8G1, NT8G2, NT8G3, NT8G5, NT8G6, NT8G8, NT8G9, NT8K2, NT8K3, NT8K6, NT8K9, NT8O3, NT8P1, NT8P2, NT8P3, NT9C1, NT9C4, NT9C7, NT9G1, NT9G4, NT9G7, NT9I1, NT9I2, NT9I3, NT9I4, NT9I5, NT9I6, NT9I7, NT9I8, NT9J1, NT9J2, NT9J3, NT9J4, NT9J5, NT9J6, NT9K1, NT9K4, NT9M1, NT9M2, MW4H, MW4L, MW5A, MW5E, MW5I, MW4D7, MW4D8, MW4D9, MW4G1, MW4G2, MW4G3, MW4G5, MW4G6, MW4G8, MW4G9, MW4K2, MW4K3, MW4K5, MW4K6, MW4P3, MW4P6, MW5B4, MW5B7, MW5B8, MW5F1, MW5F2, MW5M1, MW5M2, MW5M4, MW5M5, LY8L, LY8P, LY9I, LY9J, LY9K, LY9L, LY9M, LY9N, LY9O, LY9P, LZ2D, LZ2H, LZ3A, LZ3B, LZ3C, LZ3D, LZ3E, LZ3F, LZ3G, LZ3H, LY8H4, LY8H5, LY8H6, LY8H7, LY8H8, LY8H9, LY9E4, LY9E5, LY9E6, LY9E7, LY9E8, LY9E9, LY9F4, LY9F5, LY9F6, LY9F7, LY9F8, LY9F9, LY9G4, LY9G5, LY9G6, LY9G7, LY9G8, LY9G9, LY9H4, LY9H5, LY9H6, LY9H7, LY9H8, LY9H9, LZ2L1, LZ2L2, LZ2L3, LZ3I1, LZ3I2, LZ3I3, LZ3J1, LZ3J2, LZ3J3, LZ3K1, LZ3K2, LZ3K3, LZ3L1, LZ3L2, LZ3L3, KX3K, KX3L, KX3O, KX3P, KX6A, KX6B, KX6C, KX6D, KX6E, KX6F, KX6G, KX6H, KX6I, KX6J, KX6K, KX6L, LX1I, LX1M, LX4A, KX3F8, KX3F9, KX3G7, KX3G8, KX3G9, KX3H7, KX3H8, KX3H9, KX3J2, KX3J3, KX3J5, KX3J6, KX3J8, KX3J9, KX3M5, KX3M6, KX3M8, KX3M9, KX3N2, KX3N3, KX3N4, KX3N5, KX3N6, KX3N7, KX3N8, KX3N9, KX5D2, KX5D3, KX5D5, KX5D6, KX5D8, KX5D9, KX5H2, KX5H3, KX5H5, KX5H6, KX5H8, KX5H9, KX5L2, KX5L3, KX5L5, KX5L6, KX5L8, KX5L9, LX1E7, LX1E8, LX1E9, LX1J1, LX1J4, LX1J5, LX1J7, LX1J8, LX1N1, LX1N2, LX1N4, LX1N5, LX1N6, LX1N7, LX1N8, LX1N9, LX4B1, LX4B4, LX4B7, LX4E1, LX4E2, LX4E3, LX4E4, LX4E5, LX4E6, LX4E7, LX4I1, LX4I4, LX4I7, BV1I, BV1J, BV1K, BV1L, BV1M, BV1N, BV1O, BV1P, BV2I, BV2J, BV2M, BV2N, BV4A, BV4B, BV4C, BV4D, BV4E, BV4F, BV4G, BV4H, BV4I, BV4J, BV4K, BV4L, BV5A, BV5B, BV5E, BV5F, BV5I, BV5J, BV1E7, BV1E8, BV1E9, BV1F7, BV1F8, BV1F9, BV1G7, BV1G8, BV1G9, BV1H7, BV1H8, BV1H9, BV2E7, BV2E8, BV2E9, BV2F7, BV2F8, BV2F9, BV4M1, BV4M2, BV4M3, BV4N1, BV4N2, BV4N3, BV4O1, BV4O2, BV4O3, BV4P1, BV4P2, BV4P3, BV5M1, BV5M2, BV5M3, BV5N1, BV5N2, BV5N3, MV9K, MV9L, MV9O, MV9P, MW3C, NV4P, NV5M, NV7B, NV7C, NV7D, NV7E, NV7F, NV7G, NV7H, NV7I, NV7J, NV7K, NV7L, NV7M, NV7N, NV7O, NV7P, MV9D6, MV9D9, MV9G4, MV9G5, MV9G6, MV9G7, MV9G8, MV9G9, MV9H3, MV9H4, MV9H5, MV9H6, MV9H7, MV9H8, MV9H9, MW3D1, MW3D2, MW3D3, MW3D4, MW3D5, MW3D6, MW3D7, MW3D8, MW3G1, MW3G2, MW3G3, MW3H1, NV4L4, NV4L5, NV4L6, NV4L7, NV4L8, NV4L9, NV4M5, NV4M6, NV4M8, NV4M9, NV4N4, NV4N5, NV4N6, NV4N7, NV4N8, NV4N9, NV4O3, NV4O4, NV4O5, NV4O6, NV4O7, NV4O8, NV4O9, NV5I4, NV5I5, NV5I6, NV5I7, NV5I8, NV5I9, NV5J4, NV5J7, NV5N1, NV5N4, NV5N7, NV7A2, NV7A3, NV7A4, NV7A5, NV7A6, NV7A7, NV7A8, NV7A9, NW1A1, NW1A2, NW1A3, NW1A4, NW1A5, NW1A6, NW1B1, NW1B2, NW1B3, NW1B4, NW1B5, NW1B6, NW1C1, NW1C2, NW1C3, NW1C4, NW1C5, NW1C6, NW1D1, NW1D2, NW1D3, NW1D4, NW1D5, NW1D6.

Appendix B: coordination zone definitions

AWL txs in the ranges specified in the “frequency range” column will not normally be issued in the areas defined by the HCIS area description the following table.

Coordination Zone	Frequency range (MHz)	HCIS
Darwin (NT)	3400 - 4000	GO7, GO8, FP3D, GO4F, GO4G, GO4H, GO4I, GO4J, GO4K, GO4L, GO4M, GO4N, GO4O, GO4P, GO5E, GO5F, GO5I, GO5J, GO5K, GO5M, GO5N, GO5O, GO5P, GP1A, GP1B, GP1C, GP1D, GP1E, GP1F, GP1G, GP1H, GP1K, GP1L, GP2A, GP2B, GP2C, GP2E, GP2F, GP2I, FP3C3, FP3C6, FP3H2, FP3H3, FP3H5, FP3H6, GO4B8, GO4B9, GO4C7, GO4C8, GO4C9, GO4D4, GO4D5, GO4D7, GO4D8, GO4D9, GO4E3, GO4E5, GO4E6, GO4E7, GO4E8, GO4E9, GO5A7, GO5A8, GO5A9, GO5B7, GO5G4, GO5G7, GO5G8, GO5G9, GO5L1, GO5L4, GO5L5, GO5L7, GO5L8, GO6M7, GO9A1, GO9A4, GO9A5, GO9A7, GO9A8, GO9E1, GO9E2, GO9E4, GO9E5, GO9E7, GO9E8, GO9I1, GO9I2, GO9I4, GO9I5, GO9I7, GO9I8, GO9M1, GO9M2, GO9M4, GO9M7, GP1I2, GP1I3, GP1J1, GP1J2, GP1J3, GP1J4, GP1J5, GP1J6, GP1J9, GP2D1, GP2D2, GP2D3, GP2D4, GP2D5, GP2D6, GP2D7, GP2D8, GP2G1, GP2G2, GP2G3, GP2G4, GP2G5, GP2G6, GP2G7, GP2G8, GP2H1, GP2H4, GP2J1, GP2J2, GP2J3, GP2J4, GP2J5, GP2K1, FP3C1E, FP3C1J, FP3C2A, FP3C2B, FP3C2C, FP3C2D, FP3C2E, FP3C2F, FP3C2G, FP3C2H, FP3C2I, FP3C2J, FP3C2K, FP3C2L, FP3C2M, FP3C2N, FP3C2O, FP3C2P, FP3C2Q, FP3C2R, FP3C2S, FP3C2T, FP3C2V, FP3C2W, FP3C2X, FP3C2Y, FP3C5B, FP3C5C, FP3C5D, FP3C5E, FP3C5H, FP3C5I, FP3C5J, FP3C5M, FP3C5N, FP3C5O, FP3C5S, FP3C5T, FP3C5X, FP3C5Y, FP3C8E, FP3C9A, FP3C9B, FP3C9C, FP3C9D, FP3C9E, FP3C9F, FP3C9G, FP3C9H, FP3C9I, FP3C9J, FP3C9K, FP3C9L, FP3C9M, FP3C9N, FP3C9O, FP3C9Q, FP3C9R, FP3C9S, FP3C9T, FP3C9W, FP3C9X, FP3C9Y, FP3G3D, FP3G3E, FP3G3I, FP3G3J, FP3G3O, FP3H1A, FP3H1B, FP3H1C, FP3H1D, FP3H1E, FP3H1F, FP3H1G, FP3H1H, FP3H1I, FP3H1J, FP3H1K, FP3H1L, FP3H1M, FP3H1N, FP3H1O, FP3H1P, FP3H1Q, FP3H1R, FP3H1S, FP3H1T, FP3H1V, FP3H1W, FP3H1X, FP3H1Y, FP3H4C, FP3H4D, FP3H4E, FP3H4H, FP3H4I, FP3H4J, FP3H4N, FP3H4O, FP3H4T, FP3H8B, FP3H8C, FP3H8D, FP3H8E, FP3H8H, FP3H8I, FP3H8J, FP3H8N, FP3H8O, FP3H9A, FP3H9B, FP3H9C, FP3H9D, FP3H9E, FP3H9F, FP3H9G, FP3H9H, FP3H9I, FP3H9J, FP3H9K, FP3H9L, FP3H9M, FP3H9N, FP3H9O, FP3H9P, FP3H9Q, FP3H9R, FP3H9S, FP3H9T, FP3H9V, FP3H9W, FP3H9X, FP3H9Y, FP3L3C, FP3L3D, FP3L3E, FP3L3I, FP3L3J, GO4A9S, GO4A9T, GO4A9V, GO4A9W, GO4A9X, GO4A9Y, GO4B5X, GO4B5Y, GO4B6Q, GO4B6R, GO4B6S,

Coordination Zone	Frequency range (MHz)	HCIS
		GO4B6T, GO4B6U, GO4B6V, GO4B6W, GO4B6X, GO4B6Y, GO4B7I, GO4B7J, GO4B7K, GO4B7L, GO4B7M, GO4B7N, GO4B7O, GO4B7P, GO4B7Q, GO4B7R, GO4B7S, GO4B7T, GO4B7U, GO4B7V, GO4B7W, GO4B7X, GO4B7Y, GO4C4K, GO4C4L, GO4C4M, GO4C4N, GO4C4O, GO4C4P, GO4C4Q, GO4C4R, GO4C4S, GO4C4T, GO4C4U, GO4C4V, GO4C4W, GO4C4X, GO4C4Y, GO4C5F, GO4C5G, GO4C5H, GO4C5I, GO4C5J, GO4C5K, GO4C5L, GO4C5M, GO4C5N, GO4C5O, GO4C5P, GO4C5Q, GO4C5R, GO4C5S, GO4C5T, GO4C5U, GO4C5V, GO4C5W, GO4C5X, GO4C5Y, GO4C6D, GO4C6E, GO4C6F, GO4C6G, GO4C6H, GO4C6I, GO4C6J, GO4C6K, GO4C6L, GO4C6M, GO4C6N, GO4C6O, GO4C6P, GO4C6Q, GO4C6R, GO4C6S, GO4C6T, GO4C6U, GO4C6V, GO4C6W, GO4C6X, GO4C6Y, GO4D6A, GO4D6B, GO4D6F, GO4D6G, GO4D6H, GO4D6I, GO4D6J, GO4D6K, GO4D6L, GO4D6M, GO4D6N, GO4D6O, GO4D6P, GO4D6Q, GO4D6R, GO4D6S, GO4D6T, GO4D6U, GO4D6V, GO4D6W, GO4D6X, GO4D6Y, GO4E1T, GO4E1X, GO4E1Y, GO4E2E, GO4E2I, GO4E2J, GO4E2L, GO4E2M, GO4E2N, GO4E2O, GO4E2P, GO4E2Q, GO4E2R, GO4E2S, GO4E2T, GO4E2U, GO4E2V, GO4E2W, GO4E2X, GO4E2Y, GO4E4B, GO4E4C, GO4E4D, GO4E4E, GO4E4F, GO4E4G, GO4E4H, GO4E4I, GO4E4J, GO4E4K, GO4E4L, GO4E4M, GO4E4N, GO4E4O, GO4E4P, GO4E4Q, GO4E4R, GO4E4S, GO4E4T, GO4E4U, GO4E4V, GO4E4W, GO4E4X, GO4E4Y, GO5A4F, GO5A4G, GO5A4H, GO5A4I, GO5A4J, GO5A4K, GO5A4L, GO5A4M, GO5A4N, GO5A4O, GO5A4P, GO5A4Q, GO5A4R, GO5A4S, GO5A4T, GO5A4U, GO5A4V, GO5A4W, GO5A4X, GO5A4Y, GO5A5K, GO5A5L, GO5A5M, GO5A5N, GO5A5O, GO5A5P, GO5A5Q, GO5A5R, GO5A5S, GO5A5T, GO5A5U, GO5A5V, GO5A5W, GO5A5X, GO5A5Y, GO5A6P, GO5A6Q, GO5A6R, GO5A6U, GO5A6V, GO5A6W, GO5A6X, GO5A6Y, GO5B4U, GO5B4V, GO5B8F, GO5B8G, GO5B8K, GO5B8L, GO5B8M, GO5B8N, GO5B8P, GO5B8Q, GO5B8R, GO5B8S, GO5B8T, GO5B8U, GO5B8V, GO5B8W, GO5B8X, GO5B8Y, GO5B9P, GO5B9Q, GO5B9U, GO5B9V, GO5B9W, GO5B9X, GO5G1F, GO5G1G, GO5G1K, GO5G1L, GO5G1M, GO5G1N, GO5G1P, GO5G1Q, GO5G1R, GO5G1S, GO5G1T, GO5G1U, GO5G1V, GO5G1W, GO5G1X, GO5G1Y, GO5G2P, GO5G2U, GO5G2V, GO5G5A, GO5G5B, GO5G5C, GO5G5D, GO5G5F, GO5G5G, GO5G5H, GO5G5I, GO5G5J, GO5G5K, GO5G5L, GO5G5M, GO5G5N, GO5G5O, GO5G5P, GO5G5Q, GO5G5R, GO5G5S, GO5G5T, GO5G5U, GO5G5V, GO5G5W, GO5G5X, GO5G5Y, GO5G6K, GO5G6P, GO5G6Q,

Coordination Zone	Frequency range (MHz)	HCIS
		GO5G6R, GO5G6U, GO5G6V, GO5G6W, GO5G6X, GO5H7F, GO5H7K, GO5H7L, GO5H7P, GO5H7Q, GO5H7R, GO5H7U, GO5H7V, GO5H7W, GO5H7X, GO5L2F, GO5L2K, GO5L2L, GO5L2P, GO5L2Q, GO5L2R, GO5L2U, GO5L2V, GO5L2W, GO5L2X, GO5L6K, GO5L6P, GO5L6Q, GO5L6U, GO5L6V, GO5L6W, GO5L9A, GO5L9B, GO5L9C, GO5L9F, GO5L9G, GO5L9H, GO5L9I, GO5L9K, GO5L9L, GO5L9M, GO5L9N, GO5L9O, GO5L9P, GO5L9Q, GO5L9R, GO5L9S, GO5L9T, GO5L9U, GO5L9V, GO5L9W, GO5L9X, GO5L9Y, GO6I7U, GO6M1A, GO6M1B, GO6M1F, GO6M1G, GO6M1K, GO6M1L, GO6M1M, GO6M1P, GO6M1Q, GO6M1R, GO6M1U, GO6M1V, GO6M1W, GO6M1X, GO6M4A, GO6M4B, GO6M4C, GO6M4D, GO6M4F, GO6M4G, GO6M4H, GO6M4I, GO6M4J, GO6M4K, GO6M4L, GO6M4M, GO6M4N, GO6M4O, GO6M4P, GO6M4Q, GO6M4R, GO6M4S, GO6M4T, GO6M4U, GO6M4V, GO6M4W, GO6M4X, GO6M4Y, GO6M5P, GO6M5U, GO6M8A, GO6M8B, GO6M8F, GO6M8G, GO6M8K, GO6M8L, GO6M8M, GO6M8P, GO6M8Q, GO6M8R, GO6M8U, GO6M8V, GO6M8W, GO9A2A, GO9A2B, GO9A2C, GO9A2D, GO9A2F, GO9A2G, GO9A2H, GO9A2I, GO9A2K, GO9A2L, GO9A2M, GO9A2N, GO9A2P, GO9A2Q, GO9A2R, GO9A2S, GO9A2T, GO9A2U, GO9A2V, GO9A2W, GO9A2X, GO9A2Y, GO9A6F, GO9A6K, GO9A6P, GO9A6U, GO9A9A, GO9A9F, GO9A9G, GO9A9K, GO9A9L, GO9A9P, GO9A9Q, GO9A9U, GO9A9V, GO9E3A, GO9E3B, GO9E3F, GO9E3G, GO9E3H, GO9E3K, GO9E3L, GO9E3M, GO9E3P, GO9E3Q, GO9E3R, GO9E3U, GO9E3V, GO9E3W, GO9E6A, GO9E6B, GO9E6C, GO9E6F, GO9E6G, GO9E6H, GO9E6K, GO9E6L, GO9E6M, GO9E6P, GO9E6Q, GO9E6R, GO9E6U, GO9E6V, GO9E6W, GO9E9A, GO9E9B, GO9E9C, GO9E9F, GO9E9G, GO9E9H, GO9E9K, GO9E9L, GO9E9M, GO9E9P, GO9E9Q, GO9E9R, GO9E9U, GO9E9V, GO9E9W, GO9I3A, GO9I3B, GO9I3C, GO9I3F, GO9I3G, GO9I3H, GO9I3K, GO9I3L, GO9I3M, GO9I3P, GO9I3Q, GO9I3R, GO9I3U, GO9I3V, GO9I3W, GO9I6A, GO9I6B, GO9I6C, GO9I6F, GO9I6G, GO9I6H, GO9I6K, GO9I6L, GO9I6M, GO9I6P, GO9I6Q, GO9I6U, GO9I6V, GO9I9A, GO9I9B, GO9I9F, GO9I9G, GO9I9K, GO9I9L, GO9I9P, GO9I9Q, GO9I9U, GO9M3A, GO9M3F, GO9M3K, GO9M5A, GO9M5B, GO9M5C, GO9M5D, GO9M5E, GO9M5F, GO9M5G, GO9M5H, GO9M5I, GO9M5J, GO9M5K, GO9M5L, GO9M5M, GO9M5N, GO9M5P, GO9M5Q, GO9M5R, GO9M5S, GO9M5U, GO9M5V, GO9M5W, GO9M5X, GO9M8A, GO9M8B, GO9M8C, GO9M8F, GO9M8G, GO9M8H, GO9M8K, GO9M8L, GO9M8P, GO9M8Q, GO9M8U, GO9M8V, GP1I1A, GP1I1B, GP1I1C, GP1I1D, GP1I1E, GP1I1F, GP1I1G, GP1I1H, GP1I1I, GP1I1J, GP1I1K,

Coordination Zone	Frequency range (MHz)	HCIS
		GP1I1L, GP1I1M, GP1I1N, GP1I1O, GP1I1Q, GP1I1R, GP1I1S, GP1I1T, GP1I1W, GP1I1X, GP1I1Y, GP1I4E, GP1I5A, GP1I5B, GP1I5C, GP1I5D, GP1I5E, GP1I5G, GP1I5H, GP1I5I, GP1I5J, GP1I5M, GP1I5N, GP1I5O, GP1I5T, GP1I6A, GP1I6B, GP1I6C, GP1I6D, GP1I6E, GP1I6F, GP1I6G, GP1I6H, GP1I6I, GP1I6J, GP1I6K, GP1I6L, GP1I6M, GP1I6N, GP1I6O, GP1I6P, GP1I6Q, GP1I6R, GP1I6S, GP1I6T, GP1I6V, GP1I6W, GP1I6X, GP1I6Y, GP1I9D, GP1I9E, GP1J7A, GP1J7B, GP1J7C, GP1J7D, GP1J7E, GP1J7F, GP1J7G, GP1J7H, GP1J7I, GP1J7J, GP1J7M, GP1J7N, GP1J7O, GP1J8A, GP1J8B, GP1J8C, GP1J8D, GP1J8E, GP1J8F, GP1J8G, GP1J8H, GP1J8I, GP1J8J, GP1J8K, GP1J8L, GP1J8M, GP1J8N, GP1J8O, GP1J8P, GP1J8Q, GP1J8R, GP1J8S, GP1J8T, GP1J8X, GP1J8Y, GP1N3B, GP1N3C, GP1N3D, GP1N3E, GP1O1A, GP1O1B, GP1O1C, GP1O1D, GP1O1E, GP1O1F, GP1O1G, GP1O1H, GP1O1I, GP1O1J, GP1O1O, GP1O2A, GP1O2B, GP1O2C, GP1O2D, GP1O2E, GP1O2F, GP1O2G, GP1O2H, GP1O2I, GP1O2J, GP1O2K, GP1O2L, GP1O2M, GP1O2N, GP1O2O, GP1O3A, GP1O3B, GP1O3C, GP1O3D, GP1O3E, GP1O3F, GP1O3G, GP1O3H, GP1O3I, GP1O3J, GP1O3K, GP1O3L, GP1O3M, GP1O3N, GP1O3O, GP1O3Q, GP1O3R, GP1O3S, GP1O3T, GP1P1A, GP1P1B, GP1P1C, GP1P1D, GP1P1E, GP1P1F, GP1P1G, GP1P1H, GP1P1I, GP1P1J, GP1P1K, GP1P1L, GP1P1M, GP1P1N, GP1P1O, GP1P1P, GP1P1Q, GP1P1R, GP1P1S, GP1P1T, GP1P2A, GP1P2B, GP1P2C, GP1P2D, GP1P2E, GP1P2F, GP1P2G, GP1P2H, GP1P2I, GP1P2J, GP1P2K, GP1P2L, GP1P2M, GP1P2N, GP1P2O, GP1P2P, GP1P2Q, GP1P2R, GP1P2S, GP1P2T, GP1P3A, GP1P3B, GP1P3C, GP1P3D, GP1P3E, GP1P3F, GP1P3G, GP1P3H, GP1P3I, GP1P3J, GP1P3K, GP1P3L, GP1P3M, GP1P3N, GP1P3O, GP1P3P, GP1P3Q, GP1P3R, GP2D9A, GP2D9B, GP2D9C, GP2D9D, GP2D9E, GP2D9F, GP2D9G, GP2D9H, GP2D9I, GP2D9J, GP2D9K, GP2D9L, GP2D9M, GP2D9N, GP2D9P, GP2D9Q, GP2D9R, GP2D9S, GP2D9U, GP2D9V, GP2D9W, GP2G9A, GP2G9B, GP2G9C, GP2G9D, GP2G9E, GP2G9F, GP2G9G, GP2G9H, GP2G9I, GP2G9J, GP2G9K, GP2G9L, GP2G9M, GP2G9N, GP2G9O, GP2G9P, GP2G9Q, GP2G9R, GP2G9S, GP2G9T, GP2G9U, GP2G9V, GP2G9W, GP2G9X, GP2H2A, GP2H2B, GP2H2C, GP2H2D, GP2H2E, GP2H2F, GP2H2G, GP2H2H, GP2H2I, GP2H2J, GP2H2K, GP2H2L, GP2H2M, GP2H2N, GP2H2O, GP2H2P, GP2H2Q, GP2H2R, GP2H2S, GP2H2T, GP2H2U, GP2H2V, GP2H2W, GP2H2X, GP2H3A, GP2H3B, GP2H3F, GP2H3G, GP2H3K, GP2H5A, GP2H5B, GP2H5C, GP2H5F, GP2H5G, GP2H5K, GP2H5P, GP2H7A, GP2H7B, GP2H7C, GP2H7D, GP2H7F, GP2H7G, GP2H7K, GP2J6A, GP2J6B, GP2J6C, GP2J6D, GP2J6E, GP2J6F, GP2J6G, GP2J6H, GP2J6I, GP2J6J,

Coordination Zone	Frequency range (MHz)	HCIS
		GP2J6K, GP2J6L, GP2J6M, GP2J6N, GP2J6O, GP2J6P, GP2J6Q, GP2J6R, GP2J6S, GP2J6T, GP2J6U, GP2J6V, GP2J6W, GP2J6X, GP2J7A, GP2J7B, GP2J7C, GP2J7D, GP2J7E, GP2J7F, GP2J7G, GP2J7H, GP2J7I, GP2J7J, GP2J7K, GP2J7L, GP2J7M, GP2J7N, GP2J7O, GP2J7P, GP2J7Q, GP2J7R, GP2J7S, GP2J7T, GP2J7U, GP2J7V, GP2J8A, GP2J8B, GP2J8C, GP2J8D, GP2J8E, GP2J8F, GP2J8G, GP2J8H, GP2J8I, GP2J8J, GP2J8K, GP2J8L, GP2J8M, GP2J9A, GP2J9B, GP2K2A, GP2K2B, GP2K2C, GP2K2D, GP2K2E, GP2K2F, GP2K2G, GP2K2H, GP2K2I, GP2K2J, GP2K2K, GP2K2L, GP2K2M, GP2K2N, GP2K2O, GP2K2P, GP2K2Q, GP2K2R, GP2K2S, GP2K2U, GP2K2V, GP2K3A, GP2K3B, GP2K3C, GP2K3F, GP2K3G, GP2K4A, GP2K4B, GP2K4C, GP2K4D, GP2K4E, GP2K4F, GP2K4G, GP2K4H, GP2K4I, GP2K4K, GP2K4L, GP2K4M, GP2K4P, GP2K5A, GP2M1A, GP2M1B, GP2M1C, GP2M1D, GP2M1E, GP2M1F, GP2M1G, GP2M1H, GP2M1I, GP2M1J, GP2M1K, GP2M1L, GP2M1M, GP2M1N, GP2M1O, GP2M2A, GP2M2B, GP2M2C, GP2M2D, GP2M2E, GP2M2F, GP2M2G, GP2M2H, GP2M2I, GP2M2J, GP2M2K, GP2M3A, GP2M3B, GP2M3C, GP2M3D, GP3A1A, GP3A1B, GP3A1C, GP3A1D, GP3A1E, GP3A1F, GP3A1G, GP3A1H, GP3A1I, GP3A1J, GP3A1K, GP3A1L, GP3A1M, GP3A1N, GP3A1O, GP3A1P, GP3A1Q, GP3A1R, GP3A1S, GP3A1T, GP3A1U, GP3A1V, GP3A1W, GP3A1X, GP3A2A, GP3A2F, GP3A4A, GP3A4B, GP3A4C, GP3A4D, GP3A4F, GP3A4G, GP3A4H, GP3A4K, GP3A4L, GP3A4M, GP3A4P, GP3A4Q, GP3A4U, GP3A7A.
Geraldton (WA)	3400 - 4000	AU3, AU6, AT8P, AT9J, AT9K, AT9L, AT9M, AT9N, AT9O, AT9P, AU2C, AU2D, AU2F, AU2G, AU2H, AU2J, AU2K, AU2L, AU2N, AU2O, AU2P, BT7M, BT7N, BU1A, BU1B, BU1C, BU1E, BU1F, BU1G, BU1H, BU1I, BU1J, BU1K, BU1L, BU1M, BU1N, BU1O, BU1P, BU4A, BU4B, BU4C, BU4D, BU4E, BU4F, BU4G, BU4I, BU4J, BU4M, AT8L5, AT8L6, AT8L7, AT8L8, AT8L9, AT8N9, AT8O2, AT8O3, AT8O4, AT8O5, AT8O6, AT8O7, AT8O8, AT8O9, AT9F9, AT9G7, AT9G8, AT9G9, AT9H7, AT9I2, AT9I3, AT9I4, AT9I5, AT9I6, AT9I7, AT9I8, AT9I9, AU2B2, AU2B3, AU2B5, AU2B6, AU2B7, AU2B8, AU2B9, AU2E6, AU2E9, AU2I3, AU2I5, AU2I6, AU2I8, AU2I9, AU2M2, AU2M3, AU2M5, AU2M6, AU2M8, AU2M9, AU9B1, AU9B2, AU9B3, AU9C1, AU9C2, AU9C3, AU9D1, AU9D2, AU9D3, BT7I1, BT7I2, BT7I4, BT7I5, BT7I6, BT7I7, BT7I8, BT7I9, BT7J4, BT7J7, BT7J8, BT7J9, BT7O1, BT7O4, BT7O5, BT7O6, BT7O7, BT7O8, BT7O9, BT7P7, BU1D1, BU1D4, BU1D5, BU1D7, BU1D8, BU1D9, BU2E4, BU2E7, BU2I1, BU2I4, BU2I7, BU2M1, BU2M2, BU2M4, BU2M7, BU4H1, BU4H2, BU4H3, BU4H4, BU4H5, BU4H7, BU4H8, BU4K1, BU4K2, BU4K3, BU4K4, BU4K5, BU4K6, BU4K7, BU4K8, BU4L1, BU4N1, BU4N2, BU4N3, BU4N4, BU4N5, BU4O1, BU5A1,

Coordination Zone	Frequency range (MHz)	HCIS
		BU5A4, AT8K6X, AT8K6Y, AT8K8O, AT8K8R, AT8K8S, AT8K8T, AT8K8V, AT8K8W, AT8K8X, AT8K8Y, AT8K9C, AT8K9D, AT8K9E, AT8K9F, AT8K9G, AT8K9H, AT8K9I, AT8K9J, AT8K9K, AT8K9L, AT8K9M, AT8K9N, AT8K9O, AT8K9P, AT8K9Q, AT8K9R, AT8K9S, AT8K9T, AT8K9U, AT8K9V, AT8K9W, AT8K9X, AT8K9Y, AT8L2T, AT8L2W, AT8L2X, AT8L2Y, AT8L3J, AT8L3M, AT8L3N, AT8L3O, AT8L3P, AT8L3Q, AT8L3R, AT8L3S, AT8L3T, AT8L3U, AT8L3V, AT8L3W, AT8L3X, AT8L3Y, AT8L4I, AT8L4J, AT8L4M, AT8L4N, AT8L4O, AT8L4P, AT8L4Q, AT8L4R, AT8L4S, AT8L4T, AT8L4U, AT8L4V, AT8L4W, AT8L4X, AT8L4Y, AT8N6E, AT8N6I, AT8N6J, AT8N6M, AT8N6N, AT8N6O, AT8N6Q, AT8N6R, AT8N6S, AT8N6T, AT8N6U, AT8N6V, AT8N6W, AT8N6X, AT8N6Y, AT8N8E, AT8N8I, AT8N8J, AT8N8M, AT8N8N, AT8N8O, AT8N8R, AT8N8S, AT8N8T, AT8N8V, AT8N8W, AT8N8X, AT8N8Y, AT8O1J, AT8O1M, AT8O1N, AT8O1O, AT8O1Q, AT8O1R, AT8O1S, AT8O1T, AT8O1U, AT8O1V, AT8O1W, AT8O1X, AT8O1Y, AT9E7Y, AT9E8S, AT9E8T, AT9E8U, AT9E8V, AT9E8W, AT9E8X, AT9E8Y, AT9E9L, AT9E9M, AT9E9N, AT9E9O, AT9E9P, AT9E9Q, AT9E9R, AT9E9S, AT9E9T, AT9E9U, AT9E9V, AT9E9W, AT9E9X, AT9E9Y, AT9F7G, AT9F7H, AT9F7I, AT9F7J, AT9F7K, AT9F7L, AT9F7M, AT9F7N, AT9F7O, AT9F7P, AT9F7Q, AT9F7R, AT9F7S, AT9F7T, AT9F7U, AT9F7V, AT9F7W, AT9F7X, AT9F7Y, AT9F8B, AT9F8C, AT9F8D, AT9F8E, AT9F8F, AT9F8G, AT9F8H, AT9F8I, AT9F8J, AT9F8K, AT9F8L, AT9F8M, AT9F8N, AT9F8O, AT9F8P, AT9F8Q, AT9F8R, AT9F8S, AT9F8T, AT9F8U, AT9F8V, AT9F8W, AT9F8X, AT9F8Y, AT9G4V, AT9G4W, AT9G4X, AT9G4Y, AT9G5U, AT9G5V, AT9G5W, AT9G5X, AT9G5Y, AT9G6U, AT9G6V, AT9G6W, AT9H8A, AT9H8B, AT9H8C, AT9H8F, AT9H8G, AT9H8H, AT9H8I, AT9H8J, AT9H8K, AT9H8L, AT9H8M, AT9H8N, AT9H8O, AT9H8P, AT9H8Q, AT9H8R, AT9H8S, AT9H8T, AT9H8U, AT9H8V, AT9H8W, AT9H8X, AT9H8Y, AT9H9F, AT9H9G, AT9H9H, AT9H9K, AT9H9L, AT9H9M, AT9H9N, AT9H9O, AT9H9P, AT9H9Q, AT9H9R, AT9H9S, AT9H9T, AT9H9U, AT9H9V, AT9H9W, AT9H9X, AT9H9Y, AT9I1C, AT9I1D, AT9I1E, AT9I1F, AT9I1G, AT9I1H, AT9I1I, AT9I1J, AT9I1K, AT9I1L, AT9I1M, AT9I1N, AT9I1O, AT9I1P, AT9I1Q, AT9I1R, AT9I1S, AT9I1T, AT9I1U, AT9I1V, AT9I1W, AT9I1X, AT9I1Y, AU2A6Y, AU2A9E, AU2A9I, AU2A9J, AU2A9N, AU2A9O, AU2A9R, AU2A9S, AU2A9T, AU2A9W, AU2A9X, AU2A9Y, AU2B1J, AU2B1O, AU2B1S, AU2B1T, AU2B1W, AU2B1X, AU2B1Y, AU2B4C, AU2B4D, AU2B4E, AU2B4G, AU2B4H, AU2B4I, AU2B4J, AU2B4K, AU2B4L, AU2B4M, AU2B4N, AU2B4O, AU2B4P, AU2B4Q, AU2B4R, AU2B4S, AU2B4T, AU2B4U, AU2B4V, AU2B4W, AU2B4X, AU2B4Y, AU2E2Y, AU2E3B, AU2E3C, AU2E3D, AU2E3E, AU2E3G, AU2E3H, AU2E3I, AU2E3J, AU2E3K, AU2E3L, AU2E3M, AU2E3N, AU2E3O, AU2E3P, AU2E3Q, AU2E3R,

Coordination Zone	Frequency range (MHz)	HCIS
		AU2E3S, AU2E3T, AU2E3U, AU2E3V, AU2E3W, AU2E3X, AU2E3Y, AU2E5E, AU2E5J, AU2E5N, AU2E5O, AU2E5S, AU2E5T, AU2E5X, AU2E5Y, AU2E8C, AU2E8D, AU2E8E, AU2E8H, AU2E8I, AU2E8J, AU2E8M, AU2E8N, AU2E8O, AU2E8Q, AU2E8R, AU2E8S, AU2E8T, AU2E8V, AU2E8W, AU2E8X, AU2E8Y, AU2I2B, AU2I2C, AU2I2D, AU2I2E, AU2I2G, AU2I2H, AU2I2I, AU2I2J, AU2I2L, AU2I2M, AU2I2N, AU2I2O, AU2I2P, AU2I2Q, AU2I2R, AU2I2S, AU2I2T, AU2I2U, AU2I2V, AU2I2W, AU2I2X, AU2I2Y, AU2I7J, AU2I7O, AU2I7T, AU2I7Y, AU2M1E, AU2M1J, AU2M1O, AU2M1T, AU2M1Y, AU2M4E, AU2M4J, AU2M4O, AU9A1A, AU9A1B, AU9A1C, AU9A1D, AU9A1E, AU9A1G, AU9A1H, AU9A1I, AU9A1J, AU9A1O, AU9A2A, AU9A2B, AU9A2C, AU9A2D, AU9A2E, AU9A2F, AU9A2G, AU9A2H, AU9A2I, AU9A2J, AU9A2K, AU9A2L, AU9A2M, AU9A2N, AU9A2O, AU9A2R, AU9A2S, AU9A2T, AU9A3A, AU9A3B, AU9A3C, AU9A3D, AU9A3E, AU9A3F, AU9A3G, AU9A3H, AU9A3I, AU9A3J, AU9A3K, AU9A3L, AU9A3M, AU9A3N, AU9A3O, AU9A3P, AU9A3Q, AU9A3R, AU9A3S, AU9A3T, AU9A3V, AU9A3W, AU9A3X, AU9A3Y, AU9B4A, AU9B4B, AU9B4C, AU9B4D, AU9B4E, AU9B5A, AU9B5B, AU9B5C, AU9B5D, AU9B5E, AU9B5F, AU9B5G, AU9B5H, AU9B5I, AU9B5J, AU9B6A, AU9B6B, AU9B6C, AU9B6D, AU9B6E, AU9B6F, AU9B6G, AU9B6H, AU9B6I, AU9B6J, AU9C4A, AU9C4B, AU9C4C, AU9C4D, AU9C4E, AU9C4F, AU9C4G, AU9C4H, AU9C4I, AU9C4J, AU9C4K, AU9C4L, AU9C4M, AU9C4N, AU9C4O, AU9C5A, AU9C5B, AU9C5C, AU9C5D, AU9C5E, AU9C5F, AU9C5G, AU9C5H, AU9C5I, AU9C5J, AU9C5K, AU9C5L, AU9C5M, AU9C5N, AU9C5O, AU9C6A, AU9C6B, AU9C6C, AU9C6D, AU9C6E, AU9C6F, AU9C6G, AU9C6H, AU9C6I, AU9C6J, AU9C6K, AU9C6L, AU9C6M, AU9C6N, AU9D4A, AU9D4B, AU9D4C, AU9D4D, AU9D4E, AU9D4F, AU9D4G, AU9D4H, AU9D4I, AU9D4J, AU9D5A, AU9D5B, AU9D5C, AU9D5D, AU9D5E, AU9D5F, AU9D5G, AU9D5H, AU9D6A, AU9D6B, AU9D6C, AU9D6D, BT7E7K, BT7E7L, BT7E7P, BT7E7Q, BT7E7R, BT7E7S, BT7E7T, BT7E7U, BT7E7V, BT7E7W, BT7E7X, BT7E7Y, BT7E8P, BT7E8U, BT7E8V, BT7E8W, BT7E8X, BT7I3A, BT7I3B, BT7I3F, BT7I3G, BT7I3H, BT7I3I, BT7I3J, BT7I3K, BT7I3L, BT7I3M, BT7I3N, BT7I3O, BT7I3P, BT7I3Q, BT7I3R, BT7I3S, BT7I3T, BT7I3U, BT7I3V, BT7I3W, BT7I3X, BT7I3Y, BT7J1K, BT7J1L, BT7J1P, BT7J1Q, BT7J1R, BT7J1S, BT7J1T, BT7J1U, BT7J1V, BT7J1W, BT7J1X, BT7J1Y, BT7J2U, BT7J2V, BT7J5A, BT7J5B, BT7J5C, BT7J5D, BT7J5F, BT7J5G, BT7J5H, BT7J5I, BT7J5J, BT7J5K, BT7J5L, BT7J5M, BT7J5N, BT7J5O, BT7J5P, BT7J5Q, BT7J5R, BT7J5S, BT7J5T, BT7J5U, BT7J5V, BT7J5W, BT7J5X, BT7J5Y, BT7J6F, BT7J6K, BT7J6L, BT7J6P, BT7J6Q, BT7J6R, BT7J6S, BT7J6U, BT7J6V, BT7J6W, BT7J6X, BT7J6Y, BT7K4U, BT7K7A, BT7K7B, BT7K7F, BT7K7G, BT7K7H, BT7K7I, BT7K7K,

Coordination Zone	Frequency range (MHz)	HCIS
		BT7K7L, BT7K7M, BT7K7N, BT7K7O, BT7K7P, BT7K7Q, BT7K7R, BT7K7S, BT7K7T, BT7K7U, BT7K7V, BT7K7W, BT7K7X, BT7K7Y, BT7K8P, BT7K8U, BT7K8V, BT7K8W, BT7O2A, BT7O2B, BT7O2C, BT7O2D, BT7O2F, BT7O2G, BT7O2H, BT7O2I, BT7O2J, BT7O2K, BT7O2L, BT7O2M, BT7O2N, BT7O2O, BT7O2P, BT7O2Q, BT7O2R, BT7O2S, BT7O2T, BT7O2U, BT7O2V, BT7O2W, BT7O2X, BT7O2Y, BT7O3K, BT7O3P, BT7O3Q, BT7O3R, BT7O3U, BT7O3V, BT7O3W, BT7O3X, BT7P4F, BT7P4K, BT7P4L, BT7P4P, BT7P4Q, BT7P4R, BT7P4U, BT7P4V, BT7P4W, BT7P4X, BT7P8K, BT7P8P, BT7P8Q, BT7P8U, BT7P8V, BT7P8W, BU1D2A, BU1D2B, BU1D2C, BU1D2D, BU1D2F, BU1D2G, BU1D2H, BU1D2I, BU1D2K, BU1D2L, BU1D2M, BU1D2N, BU1D2O, BU1D2P, BU1D2Q, BU1D2R, BU1D2S, BU1D2T, BU1D2U, BU1D2V, BU1D2W, BU1D2X, BU1D2Y, BU1D3P, BU1D3U, BU1D3V, BU1D6A, BU1D6B, BU1D6F, BU1D6G, BU1D6H, BU1D6K, BU1D6L, BU1D6M, BU1D6N, BU1D6P, BU1D6Q, BU1D6R, BU1D6S, BU1D6U, BU1D6V, BU1D6W, BU1D6X, BU1D6Y, BU2A7F, BU2A7K, BU2A7P, BU2A7Q, BU2A7U, BU2A7V, BU2E1A, BU2E1B, BU2E1C, BU2E1F, BU2E1G, BU2E1H, BU2E1K, BU2E1L, BU2E1M, BU2E1N, BU2E1P, BU2E1Q, BU2E1R, BU2E1S, BU2E1U, BU2E1V, BU2E1W, BU2E1X, BU2E5K, BU2E5P, BU2E5U, BU2E8A, BU2E8B, BU2E8F, BU2E8G, BU2E8K, BU2E8L, BU2E8P, BU2E8Q, BU2E8U, BU2E8V, BU2E8W, BU2I2A, BU2I2B, BU2I2C, BU2I2F, BU2I2G, BU2I2H, BU2I2K, BU2I2L, BU2I2M, BU2I2P, BU2I2Q, BU2I2R, BU2I2U, BU2I2V, BU2I2W, BU2I2X, BU2I5A, BU2I5B, BU2I5C, BU2I5D, BU2I5F, BU2I5G, BU2I5H, BU2I5I, BU2I5K, BU2I5L, BU2I5M, BU2I5N, BU2I5P, BU2I5Q, BU2I5R, BU2I5S, BU2I5U, BU2I5V, BU2I5W, BU2I5X, BU2I8A, BU2I8B, BU2I8C, BU2I8D, BU2I8F, BU2I8G, BU2I8H, BU2I8I, BU2I8K, BU2I8L, BU2I8M, BU2I8N, BU2I8P, BU2I8Q, BU2I8R, BU2I8S, BU2I8T, BU2I8U, BU2I8V, BU2I8W, BU2I8X, BU2I8Y, BU2M5A, BU2M5B, BU2M5C, BU2M5D, BU2M5F, BU2M5G, BU2M5H, BU2M5I, BU2M5K, BU2M5L, BU2M5M, BU2M5N, BU2M5P, BU2M5Q, BU2M5R, BU2M5S, BU2M5U, BU2M5V, BU2M5W, BU2M5X, BU2M8A, BU2M8B, BU2M8C, BU2M8D, BU2M8F, BU2M8G, BU2M8H, BU2M8I, BU2M8K, BU2M8L, BU2M8M, BU2M8N, BU2M8P, BU2M8Q, BU2M8R, BU2M8S, BU2M8U, BU2M8V, BU2M8W, BU4H6A, BU4H6B, BU4H6C, BU4H6D, BU4H6E, BU4H6F, BU4H6G, BU4H6H, BU4H6I, BU4H6J, BU4H6K, BU4H6L, BU4H6M, BU4H6N, BU4H6O, BU4H6P, BU4H6Q, BU4H6R, BU4H6S, BU4H6T, BU4H6U, BU4H6V, BU4H6W, BU4H6X, BU4H9A, BU4H9B, BU4H9C, BU4H9F, BU4H9G, BU4H9H, BU4H9K, BU4H9L, BU4H9P, BU4H9Q, BU4H9U, BU4K9A, BU4K9B, BU4K9C, BU4K9D, BU4K9E, BU4K9F, BU4K9G, BU4K9H, BU4K9I, BU4K9J, BU4K9K, BU4K9L, BU4K9M, BU4K9N, BU4K9P, BU4K9Q, BU4K9R, BU4K9U, BU4K9V, BU4L2A,

Coordination Zone	Frequency range (MHz)	HCIS
		BU4L2B, BU4L2C, BU4L2D, BU4L2E, BU4L2F, BU4L2G, BU4L2H, BU4L2I, BU4L2K, BU4L2L, BU4L2M, BU4L2N, BU4L2P, BU4L2Q, BU4L2R, BU4L2U, BU4L2V, BU4L4A, BU4L4B, BU4L4C, BU4L4D, BU4L4E, BU4L4F, BU4L4G, BU4L4H, BU4L4I, BU4L4J, BU4L4K, BU4L4L, BU4L4M, BU4L4N, BU4L4P, BU4L4Q, BU4L4R, BU4L4U, BU4L4V, BU4L5A, BU4L7A, BU4N6A, BU4N6B, BU4N6C, BU4N6D, BU4N6E, BU4N6F, BU4N6G, BU4N6H, BU4N6I, BU4N6J, BU4N6K, BU4N6L, BU4N6M, BU4N6N, BU4N6O, BU4N6P, BU4N6Q, BU4N6R, BU4N6S, BU4N6T, BU4N6U, BU4N6V, BU4N6W, BU4N7A, BU4N7B, BU4N7C, BU4N7D, BU4N7E, BU4N7F, BU4N7G, BU4N7H, BU4N7I, BU4N7J, BU4N7K, BU4N7L, BU4N7M, BU4N7N, BU4N7O, BU4N7P, BU4N7Q, BU4N7R, BU4N7S, BU4N7T, BU4N7U, BU4N7V, BU4N7W, BU4N8A, BU4N8B, BU4N8C, BU4N8D, BU4N8E, BU4N8F, BU4N8G, BU4N8H, BU4N8I, BU4N8K, BU4N8L, BU4N9A, BU4O2A, BU4O2B, BU4O2C, BU4O2D, BU4O2E, BU4O2F, BU4O2G, BU4O2H, BU4O2I, BU4O2J, BU4O2K, BU4O2L, BU4O2M, BU4O2P, BU4O2Q, BU4O2U, BU4O3A, BU4O4A, BU4O4B, BU4O4C, BU4O4D, BU4O4F, BU4O4G, BU4O4H, BU4O4K, BU5A2A, BU5A2B, BU5A2C, BU5A2F, BU5A2G, BU5A2H, BU5A2K, BU5A2L, BU5A2M, BU5A2P, BU5A2Q, BU5A2R, BU5A2U, BU5A2V, BU5A5A, BU5A5B, BU5A5F, BU5A5G, BU5A5K, BU5A5L, BU5A5P, BU5A5U, BU5A7A, BU5A7B, BU5A7C, BU5A7D, BU5A7E, BU5A7F, BU5A7G, BU5A7H, BU5A7I, BU5A7J, BU5A7K, BU5A7L, BU5A7M, BU5A7N, BU5A7O, BU5A7P, BU5A7Q, BU5A7R, BU5A7S, BU5A7U, BU5A7V, BU5A7W, BU5A7X, BU5A8A, BU5E1A, BU5E1B, BU5E1C, BU5E1D, BU5E1F, BU5E1G, BU5E1H, BU5E1K, BU5E1L, BU5E1M, BU5E1P, BU5E1Q, BU5E1U, BU5E1V, BU5E4A, BU5E4F, BU7A1A, BU7A1B, BU7A1C, BU7A1D, BU7A1E, BU7A1F, BU7A1G, BU7A1H, BU7A1I, BU7A1J, BU7A1K, BU7A1L, BU7A1M, BU7A1N, BU7A1O, BU7A1P, BU7A1Q, BU7A1R, BU7A1S, BU7A1T, BU7A1U, BU7A1V, BU7A1W, BU7A2A, BU7A2B, BU7A2C, BU7A2D, BU7A2E, BU7A2F, BU7A2G, BU7A2H, BU7A2I, BU7A2J, BU7A2K, BU7A2L, BU7A2M, BU7A2N, BU7A2O, BU7A2P, BU7A2Q, BU7A3A, BU7A3B, BU7A3C, BU7A3D, BU7A3E, BU7A3F, BU7A3G, BU7A3H, BU7B1A.

AWLs (AWL tx or AWL rx) in the ranges specified in the “frequency range” column will not normally be issued in the areas defined by the HCIS area description the following table.

Coordination Zone	Frequency range (MHz)	HCIS
Exmouth (WA)	3400 – 3510	AR8, AR9, AS3, AS2A, AS2B, AS2C, AS2D, AS2G, AS2H, AS2K, AS2L, AS6B, AS6C, AS6D, BR4A, BR4B, BR4C, BR4E, BR4F, BR4G, BR4I, BR4J, BR4K, BR4L, BR4M, BR4N, BR4O, BR4P, BR5F, BR5I, BR5J, BR5M, BR7A, BR7B, BR7C, BR7D, BR7E, BR7F, BR7G, BR7H, BR7I, BR7J, BR7K, BR7L, BR7M, BR7N, BR7O, BR8A, BR8E, BR8I, BS1A, BS1B, BS1E, BS1F, BS1I, BS1J, BS1M, AS2E1, AS2E2, AS2E3, AS2E5, AS2E6, AS2F1, AS2F2, AS2F3, AS2F4, AS2F5, AS2F6, AS2F8, AS2F9, AS2J2, AS2J3, AS2N3, AS2O1, AS2O2, AS2P1, AS2P2, AS2P3, AS2P5, AS2P6, AS2P8, AS2P9, AS5D3, AS5D6, AS6A1, AS6A2, AS6A3, AS6A4, AS6A5, AS6A6, AS6A7, AS6A9, AS6F1, AS6F2, AS6F3, AS6F6, AS6G1, AS6G2, AS6G3, AS6G4, AS6G5, AS6G6, AS6H1, AS6H2, AS6H3, BR4D1, BR4D3, BR4D4, BR4D5, BR4D6, BR4D7, BR4D8, BR4D9, BR4H1, BR4H2, BR4H4, BR4H5, BR4H6, BR4H7, BR4H8, BR4H9, BR5A1, BR5A2, BR5A4, BR5B5, BR5B6, BR5B7, BR5B8, BR5B9, BR5C1, BR5C4, BR5E2, BR5E3, BR5E4, BR5E5, BR5E6, BR5E7, BR5E8, BR5E9, BR5G1, BR5G2, BR5G4, BR5K1, BR5K4, BR5N1, BR7P1, BR7P2, BR7P3, BR7P4, BR7P5, BR7P6, BR7P7, BR7P8, BR8B4, BR8B5, BR8B7, BR8B8, BR8J7, BS1C1, BS1C2, BS1C3, BS1C4, BS1C5, BS1C6, BS1C7, BS1C8, BS1D1, BS1D2, BS1D4, BS1D8, BS1G1, BS1G2, BS1G4, BS1G5, BS1G7, BS1G8, BS1H2, BS1K1, BS1K2, BS1K4, BS1K7, BS1N1, BS1N2, BS1N3, BS1N4, BS1N5, BS1N6, BS1N7, BS1N8, BS1O1, BS4A1, BS4A2, BS4A3, BS4A4, BS4A5, BS4A6, BS4A7, BS4A8, BS4B1, BS4B2
Exmouth (WA)	3510 – 4000	AR9E, AR9I, AR9J, AR9M, AR9N, AR8H3, AR8H6, AR8H8, AR8H9, AR8L2, AR8L3, AR8L6, AR8L9, AR8P3, AR8P6, AR9A5, AR9A6, AR9A7, AR9A8, AR9A9, AR9F1, AR9F4, AR9F5, AR9F7, AR9F8, AR9K7, AR9O1, AR9O4, AR9O7, AS2D3, AS2D6, AS3A1, AS3A2, AS3A3, AS3A4, AS3A5, AS3A6, AS3A8, AS3A9, AS3B1, AS3B2, AS3B3, AS3B4, AS3B5, AS3B6, AS3B7, AS3B8, AS3C1, AS3E3

Appendix C: Coverage and interference calculations

C.1 Coverage area

Unless specifically provided by the AWL tx licensee to a licensee to assist with coordination, the coverage area of a registered AWL transmitter is the area around the registered transmitter that a notional customer premises equipment (CPE) (see below) can receive a signal of –103 dBm/MHz[9] or greater when measured at the input to the receiver.

For the purpose of determining coverage area:

- the propagation model defined in *Recommendation ITU-R P.452*, with the parameter p = 50%[10], should be used to calculate propagation loss.
- Transmit power = min(PSD_{BS}, PSD_{CPE}), where:
  - PSD_{BS} is the power spectral density of the proposed base station
  - PSD_{CPE} is the power spectral density of the notional CPE, set to 28 dBm per occupied bandwidth
- the notional CPE parameters below should be assumed for CPE communicating with the base station:
  - Maximum antenna gain of 18 dBi.
  - Antenna height of 5 metres.
  - Maximum cell radius of 15 km. For AWL licences the coverage area cannot extend beyond the area occupied by the licence.

C.2 Interference area

The interference area of a fixed receiver (including for point-to-point) is defined as those locations (or the area) where a registration exempt transmitter, when deployed, would exceed the protection criteria defined for the fixed receiver.

For the purpose of determining interference area:

- the propagation model defined in *Recommendation ITU-R P.452*, with the parameter p = 20%, should be used to calculate propagation loss.
- the notional CPE parameters detailed in section C.1 should be used to model the interferer, with the following clarifications:
  - a maximum transmitter power of 28 dBm per occupied bandwidth should also be assumed, where occupied bandwidth is the minimum of receiver licensed bandwidth or 20 MHz.
  - the CPE antenna is assumed to be pointed towards the proposed base station and meets the radiation pattern envelope in ETSI EN 302 085 V1.2.3 (Pattern TS 2, Range 1).

[9] The level –103 dBm/MHz is the reference sensitivity for which throughput meets or exceeds the minimum requirements for CPE operating in the 3400–3600 MHz band as specified in the 3GPP document TS 36.101.

[10] The parameter p is the required time percentage for which the calculated basic transmission loss is not exceeded.

Appendix D: Incumbent Apparatus Licenced Point to Multipoint (PMP) Services

The incumbent PMP services will continue to operate in the frequency band 3400-3700 MHz, noting that no new PMP licences are to be issued in any area where AWLs are available. Given that AWL tx or AWL rx receivers are not afforded protection from existing PMP services, the legacy PMP operating arrangements set out in this appendix are intended to aid AWL licensees in determining the likely interference to their receivers.

The arrangements for incumbent PMP systems in the 3400–3700 MHz frequency range are intended for both single frequency deployments using time division duplex (TDD) and paired channels using frequency division duplex (FDD).

Licensed PMP base station receivers are afforded protection and the frequency coordination procedures for protection of TDD and legacy FDD PMP services are defined in Section 4.8.1 and 4.8.2.

D.1 TDD PMP emission limits

Incumbent PMP services operate in in the 3400-3700 MHz band are subject to band specific conditions detailed below. Some of these conditions include EIRP density limits, constraints, and relevant technical standards that need to be adhered to. These arrangements were previously detailed in RALI FX19.

Table D.1 Band Specific Requirements

Devices with AAS	• Coordination is to be conducted based on the highest achievable gain of a system
Emission Masks	• All transmitters are to adhere to relevant emission masks stated in ETSI EN 302 326. • The additional limits detailed in D.1.1 and D.1.2 also apply where relevant.

D.1.1 Out-of-band Emission Limits

PMP transmitters (both base and remote stations) in the 3575-3700 MHz band should comply with the applicable out-of-band spectrum density masks as detailed in ETSI EN 302 326-2. PMP licensees are required to take reasonable steps to ensure that any device operating on their networks comply with this standard.

In addition, band edge masks are specified at both the 3575 MHz and 3700 MHz frequency boundaries. It is expected that all PMP base stations adhere to the band edge masks specified here and ensure that emissions leaving the band adhere to the required levels.

The equivalent isotropic radiated power (EIRP) of PMP base stations should not exceed the following levels below the 3575 MHz band edge:

(a) +20 dBm *eirp* per 30 kHz within the range 3574.75 MHz to 3575 MHz;
(b) -5 dBm *eirp* per 30 kHz within the range 3574 MHz to 3574.75 MHz;
(c) -30 dBm *eirp* per 30 kHz within the range 3573 MHz to 3574 MHz; and

(d) -40 dBm *eirp* per 30 kHz lower than 3573 MHz.

The equivalent isotropic radiated power (EIRP) of PMP base stations should not exceed the following levels at and above the 3700 MHz band edge:

(e) -5 dBm in the 30 kHz bandwidth within the frequency range 3700-3700.03 MHz;
(f) -15 dBm measured in any 30 kHz bandwidth in the frequency range 3700.2-3700.7 MHz; and
(g) -40 dBm measured in any 30 kHz bandwidth at any point above the frequency 3701.6 MHz.

For frequencies between the ranges defined by (e) and (f), or (f) and (g) the EIRP should not exceed the level defined by a straight line joining the levels specified in (e), (f) and (g).

D.2 FDD PMP emission limits

Transmitters operated under a FDD PMP licence are subject to the in-band emission limit defined as in Table A.2. FDD Transmitter emission limits are symmetrical about the assigned frequency.

Table D.2: FDD PMP Transmitter emission limits

Frequency offset (f_{offset})	EIRP (dBm)	Specified Bandwidth
Co-channel	+35	30 kHz
0 kHz ≤ f_{offset} < 100 kHz	+35 – (1/4) × f_{offset} (kHz)	30 kHz
100 kHz ≤ f_{offset} < 350 kHz	+10	30 kHz
350 kHz ≤ f_{offset} < 600 kHz	+45 – (1/10) × f_{offset} (kHz)	30 kHz
600 kHz ≤ f_{offset} < 1.1 MHz	–15	30 kHz
1.1 MHz ≤ f_{offset} < 2 MHz	+16 – (1/36) × f_{offset} (kHz)	30 kHz
f_{offset} ≥ 2 MHz	-40	30 kHz

Appendix E: Notification requirements

When notifying licensees, the following information (as a minimum) must be provided:

- The reason the licensee is being notified, for example:

  In accordance with section [section number] of RALI MS47, [the licensee] is being notified of a proposed new area-wide licensed service that will be operated within [X] MHz of [one/a number] of your existing licensed point to multipoint services.
- Information identifying the affected licensed service or services (e.g., licence number, site ID)
- Details of the proposed area-wide licensed service required for the coordination of services (e.g., location, transmitter characteristics, receiver characteristics etc); and,
- Contact details of an appropriate person for further discussion of the issue.

Appendix F: Earth receive stations under earth receive licences coordination with existing AWL txs or spectrum licences

As described under 4.10.1, new earth receive apparatus licences for earth receive stations will generally only be issued where there is limited impact on the ability to register future devices under any existing AWL tx or spectrum licences in the 3400 – 4000 MHz range. This includes whether the AWL txs are on the same frequency or on any frequency that has the potential to cause interference. To ensure this is likely, the earth receive station performs coordination checks against all existing AWL txs and spectrum licences using the following method.

1. Path loss (PL) between the proposed earth station receiver to a notional AWL or spectrum licence transmitter is calculated using the same procedure detailed for the device boundary criteria (DBC) in the *Radiocommunications (Unacceptable Levels of Interference - 3.4 GHz Band) Determination 2015* or any instrument made under s.145 of the *Radiocommunications Act 1992* as a replacement of that determination (as in force from time to time) (referred to in this RALI as the "ULOI"). In this case, the following changes are made to the DBC PL calculation:
    a. the proposed earth station receiver replaces the proposed transmitter,
    b. the notional AWL or SL transmitter replaces the notional receiver and has a height of 30m.
    c. the propagation model detailed in Recommendation ITU-R P.452 with p = 20% should be used.
2. The proposed earth station receiver should be modelled using the parameters intended for inclusion on the licence with the following additions:
    a. If the earth station antenna pattern is not known, then the antenna gain with a particular azimuth and elevation, should be modelled using Recommendation ITU-R S.465.
    b. The earth station should be assumed to have earth station filter as detailed in section 4.10.1.
3. A device boundary (DB) for the proposed earth station receiver is calculated using a modified procedure for DBC ULOI. For the following scenarios:

    <u>*Co-channel emissions from AWL txs/spectrum licences into the earth station*</u>:

    a. Calculate DB to check all existing AWL tx/spectrum licence areas within 200 km of the proposed earth station receiver assuming:
        i. Modifications detailed in (1) and (2) above.
        ii. Use m values of 2 through 2010 under Part 1 Step 1 (a) in the ULOI.
        iii. Use a value of m of 2010 under Part 1 Step 2 (b) in the ULOI.
        iv. a notional AWL/SL transmitter with an EIRP density of 61dBm/10 MHz[11] across the entire AWL licensed bandwidth in all directions.
        v. Level of protection equal to -128.6 dBm/MHz, which assumes a receiver noise temperature of 100K which is not to be exceeded for more than 20% of the time (as per TX RAG)

[11] Based on ITU-R M.2292 rural macro < 3GHz or macro suburban 3-6 GHz, no activity or loading factors or downtilt

Unwanted emissions from AWL txs/spectrum licences into the earth station, for frequency offsets of up to 50 MHz from the AWL tx/spectrum licence frequency boundary:

b. Calculate DB to check with existing AWL tx/spectrum licence areas within 100 km of the proposed earth station receiver assuming:
    i. Modifications detailed in (1) and (2) above.
    ii. a notional AWL tx or spectrum licence transmitter using an Active Antenna System (AAS) with unwanted emissions as detailed in clause 9 of Schedule 4 to the AWL LCD and an antenna gain of 23.7 dBi in all directions.
    iii. Level of protection equal to -128.6 dBm/MHz, which assumes a receiver noise temperature of 100K which is not to be exceeded for more than 20% of the time (as per RAG Tx).

Overload from AWL tx/spectrum licence emissions to the earth station:

c. Calculate DB to check all existing AWL tx/spectrum licence areas within 100 km of the proposed earth station receiver assuming:
    i. Modifications detailed in (1) and (2) above.
    ii. a notional AWL tx/SL transmitter with an EIRP density of 61dBm/10 MHz[12] across the entire AWL tx/spectrum licence licensed bandwidth in all directions.
    iii. Level of protection equal to -65 dBm (as per RAG Tx).
    iv. Checks only need to be conducted for AWL/SL frequency offsets from proposed earth receive licence upper and lower frequency limits <= 200 MHz before 16 July 2027 and <=100 MHz on or after 16 July 2027.

4. If all parts of the DBs calculated in (3) above fall outside all existing AWL tx/spectrum licence areas, the earth station is deemed to pass these criteria.
5. If the DBs of the proposed earth station receiver fails the DB criteria, but the applicant can demonstrate additional mitigations, such as site shielding, will enable it to pass these criteria, the applicant can apply for an exemption from RALI MS47 on that basis.
6. If the DBs of the proposed earth station receiver fails the DB criteria, but the applicant can come to an agreement with all of the relevant AWL tx/Spectrum licence licensee/s, the applicant can apply for an exemption from RALI MS47 on that basis.

[12] Based on ITU-R M.2292 rural macro < 3GHz or macro suburban 3-6 GHz, no activity or loading factors or downtilt

Appendix G: List of Identified Runways

This section described the identified runways and coordinates. These have been provided by CASA. An explanation of runway numbering can be found at the Airservices Australia website.

The coordinates for each “runway” are the runway centreline landing end threshold and the far end for the specific approach. Consequently, the same physical runway may have slightly different coordinates, and slightly different zone locations, when the same physical runway has a landing approach from either end.

Identifier	Location	Runway	Landing end coordinate (WGS84)	Far end coordinate (WGS84)
YMAV	Avalon	36	38°3'15.98"S, 144°27'53.44"E	38°1'38.0"S, 144°28'9.95"E
YPAD	Adelaide	05	34°57'27.54"S, 138°31'6.50"E	34°56'26.23"S, 138°32'35.75"E
YBAS	Alice Springs	12	23°48'3.71"S, 133°53'36.10"E	23°48'43.63"S, 133°54'50.50"E
YBAS	Alice Springs	30	23°48'43.63"S, 133°54'50.50"E	23°48'3.71"S, 133°53'36.10"E
YBNA	Ballina	06	28°50'8.65"S, 153°33'6.51"E	28°49'51.11"S, 153°34'13.70"E
YBNA	Ballina	24	28°49'51.11"S, 153°34'13.70"E	28°50'8.65"S, 153°33'6.51"E
YBBN	Brisbane	01L	27°22'59.5"S, 153°6'24.49"E	27°21'23.56"S, 153°7'19.9"E
YBBN	Brisbane	01R	27°24'10.7"S, 153°7'5.59"E	27°22'28.79"S, 153°8'3.50"E
YBBN	Brisbane	19L	27°22'28.79"S, 153°8'3.50"E	27°24'10.7"S, 153°7'5.59"E
YBBN	Brisbane	19R	27°21'23.56"S, 153°7'19.9"E	27°22'59.5"S, 153°6'24.49"E
YBRM	Broome	10	17°56'45.53"S, 122°13'0.78"E	17°57'4.71"S, 122°14'12.94"E
YBRM	Broome	28	17°57'4.71"S, 122°14'12.94"E	17°56'45.53"S, 122°13'0.78"E
YBCS	Cairns	15	16°51'56.94"S, 145°44'36.85"E	16°53'31.9"S, 145°45'19.41"E
YBCS	Cairns	33	16°53'31.9"S, 145°45'19.41"E	16°51'56.94"S, 145°44'36.85"E
YSCB	Canberra	17	35°17'26.26"S, 149°11'39.99"E	35°18'53.31"S, 149°11'40.0"E

Identifier	Location	Runway	Landing end coordinate (WGS84)	Far end coordinate (WGS84)
YSCB	Canberra	35	35°18'53.31"S, 149°11'40.0"E	35°17'26.26"S, 149°11'39.99"E
YPDN	Darwin	11	12°24'33.85"S, 130°51'54.94"E	12°25'9.22"S, 130°53'39.99"E
YPDN	Darwin	29	12°25'9.22"S, 130°53'39.99"E	12°24'33.85"S, 130°51'54.94"E
YBCG	Gold Coast	14	28°9'23.44"S, 153°30'2.54"E	28°10'21.25"S, 153°30'39.31"E
YBCG	Gold Coast	32	28°10'21.25"S, 153°30'39.31"E	28°9'23.44"S, 153°30'2.54"E
YBHM	Hamilton Is	14	20°21'4.76"S, 148°56'48.18"E	20°21'49.1"S, 148°57'23.69"E
YBHM	Hamilton Is	32	20°21'49.1"S, 148°57'23.69"E	20°21'4.76"S, 148°56'48.18"E
YMML	Melbourne	16	37°39'11.45"S, 144°50'5.69"E	37°41'8.80"S, 144°50'27.60"E
YBMA	Mount Isa	16	20°39'18.15"S, 139°29'9.17"E	20°40'39.51"S, 139°29'27.97"E
YBMA	Mount Isa	34	20°40'39.51"S, 139°29'27.97"E	20°39'18.15"S, 139°29'9.17"E
YSNF	Norfolk Is	11	29°2'11.68"S, 167°55'47.99"E	29°2'44.46"S, 167°56'47.11"E
YSNF	Norfolk Is	29	29°2'44.46"S, 167°56'47.11"E	29°2'11.68"S, 167°55'47.99"E
YPPH	Perth	03	31°57'31.46"S, 115°57'34.86"E	31°55'42.94"S, 115°58'6.47"E
YPPH	Perth	21	31°55'42.94"S, 115°58'6.47"E	31°57'31.46"S, 115°57'34.86"E
YBSU	Sunshine Coast	13	26°34'59.57"S, 153°4'28.26"E	26°36'2.62"S, 153°5'22.37"E
YBSU	Sunshine Coast	31	26°36'2.62"S, 153°5'22.37"E	26°34'59.57"S, 153°4'28.26"E
YSSY	Sydney	16L	33°57'5.89"S, 151°11'19.85"E	33°58'14.72"S, 151°11'37.72"E
YSSY	Sydney	16R	33°55'48.35"S, 151°10'18.43"E	33°57'51.35"S, 151°10'50.33"E
YSSY	Sydney	34L	33°57'51.35"S, 151°10'50.33"E	33°55'48.35"S, 151°10'18.43"E
YSSY	Sydney	34R	33°58'14.72"S, 151°11'37.72"E	33°57'5.89"S, 151°11'19.85"E

Identifier	Location	Runway	Landing end coordinate (WGS84)	Far end coordinate (WGS84)
YBTL	Townsville	01	19°15'29.90"S, 146°45'53.0"E	19°14'17.53"S, 146°46'27.18"E
YBTL	Townsville	19	19°14'17.53"S, 146°46'27.18"E	19°15'29.90"S, 146°45'53.0"E
YBWW	Wellcamp	12	27°32'55.51"S, 151°47'4.19"E	27°33'58.66"S, 151°48'21.19"E

Appendix H: Point-to-point receive station coordination with existing AWL txs or spectrum licences

As described under section 4.11, new apparatus licensed fixed PTP receive stations will only be permitted where there is low impact on the ability to register future devices under any existing AWL txs or spectrum licences in the 3400 – 4000 MHz range. This includes whether the AWL txs are on the same frequency or on any frequency that has the potential to cause interference. To ensure this is likely, the PTP receive station should perform coordination checks against all existing AWL txs and spectrum licences using the following method. Because protection requirements for PTP receivers under RALI FX03 are specified to the second adjacent channel, only AWL txs and spectrum licences in the 3670 to 4000 MHz range, based on the channel raster in RALI FX03 are included for the frequency cull.

1. Determine the wanted receive signal levels of the proposed PTP receiver from its transmitter, and the corresponding maximum co, first and second adjacent (wrt PTP channelling) permitted unwanted signal levels using the protection ratios for co, first, and second adjacent channels for the 3.8 GHz PTP band in RALI FX03.
2. Path loss (PL) between the proposed PTP station receiver to a notional AWL or spectrum licence transmitter is calculated using the same procedure detailed for the device boundary criteria (DBC) in the *Radiocommunications (Unacceptable Levels of Interference - 3.4 GHz Band) Determination 2015* or any instrument made under s.145 of the *Radiocommunications Act 1992* as a replacement of that determination (as in force from time to time) (referred to in this RALI as the "ULOI"). In this case, the following changes are made to the DBC PL calculation:
    a. the proposed PTP station receiver replaces the proposed transmitter,
    b. the notional AWL tx or spectrum licence transmitter replaces the notional receiver and has a height of 30m.
3. The proposed PTP receive station receiver should be modelled using the parameters and antenna intended for inclusion on the licence.
4. A device boundary (DB) for the proposed point-to-point station receiver needs to be calculated using a modified procedure for DBC ULOI. For the following scenarios:

    AWL/spectrum licence in-band emissions into the point-to-point receive station co, first and second adjacent channels:

    a. Calculate DB to check all existing AWL tx/spectrum licence areas within 200 km of the proposed PTP receiver assuming:
        i. Modifications detailed in (2) above.
        ii. Use m values of 2 through 2010 under Part 1 Step 1 (a) in the ULOI.
        iii. Use a value of m of 2010 under Part 1 Step 2 (b) in the ULOI.
        iv. a notional AWL tx/spectrum licence transmitter with an EIRP density of 61dBm/10 MHz[13] across the entire AWL licensed bandwidth in all directions.
        v. Levels of protection determined from step 1.

[13] Based on ITU-R M.2292 rural macro < 3GHz or macro suburban 3-6 GHz, no activity or loading factors or downtilt

AWL tx/spectrum licence unwanted emissions into the point-to-point receive station co, first and second adjacent channels, for frequency offsets of up to 40 MHz from the AWL tx/spectrum licence frequency boundary:

b. Calculate DB to check all existing AWL tx/spectrum licence areas within 100 km of the proposed PTP receiver assuming:
    i. Modifications detailed in (2) above.
    ii. a notional AWL tx or spectrum licence transmitter using an Active Antenna System (AAS) with unwanted emissions as detailed in clause 9 of Schedule 4 to the AWL LCD and an antenna gain of 23.7 dBi in all directions.
    iii. Levels of protection determined from step 1.

5. If all parts of the DBs calculated in (4) above fall outside all existing AWL tx/spectrum licence areas, the PTP receive station is deemed to pass these criteria.

Appendix I: Areas not available for Point-to-point licensing

The areas where new point-to-point licences will not generally be issued are defined by the HCIS area descriptions in the following table, and as otherwise precluded in this RALI.

PTP licensing

Area (frequency)	HCIS
Metropolitan (3800-4000 MHz)	IW3J, IW3K, IW3N, IW3O, IW3P, IW6B, IW6C, IW3E5, IW3E6, IW3E8, IW3E9, IW3F4, IW3F5, IW3F7, IW3F8, IW3F9, IW3I2, IW3I3, IW3I5, IW3I6, IW3I8, IW3I9, IW3L4, IW3L7, IW3M2, IW3M3, IW3M5, IW3M6, IW3M8, IW3M9, IW6A2, IW6A3, IW6A5, IW6A6, IW6A8, IW6A9, IW6D1, IW6D2, IW6D3, IW6D4, IW6D5, IW6D6, IW6E2, IW6E3, IW6F1, IW6F2, IW6F3, IW6G1, IW6G2, IW6G3, NT8D, NT8H, NT8L, NT9A, NT9B, NT9E, NT9F, NT8C3, NT8C6, NT8C9, NT8G1, NT8G2, NT8G3, NT8G5, NT8G6, NT8G8, NT8G9, NT8K2, NT8K3, NT8K6, NT8K9, NT8O3, NT8P1, NT8P2, NT8P3, NT9C1, NT9C4, NT9C7, NT9G1, NT9G4, NT9G7, NT9I1, NT9I2, NT9I3, NT9I4, NT9I5, NT9I6, NT9I7, NT9I8, NT9J1, NT9J2, NT9J3, NT9J4, NT9J5, NT9J6, NT9K1, NT9K4, NT9M1, NT9M2, MW4H, MW4L, MW5A, MW5E, MW5I, MW4D7, MW4D8, MW4D9, MW4G1, MW4G2, MW4G3, MW4G5, MW4G6, MW4G8, MW4G9, MW4K2, MW4K3, MW4K5, MW4K6, MW4P3, MW4P6, MW5B4, MW5B7, MW5B8, MW5F1, MW5F2, MW5M1, MW5M2, MW5M4, MW5M5, LY8L, LY8P, LY9I, LY9J, LY9K, LY9L, LY9M, LY9N, LY9O, LY9P, LZ2D, LZ2H, LZ3A, LZ3B, LZ3C, LZ3D, LZ3E, LZ3F, LZ3G, LZ3H, LY8H4, LY8H5, LY8H6, LY8H7, LY8H8, LY8H9, LY9E4, LY9E5, LY9E6, LY9E7, LY9E8, LY9E9, LY9F4, LY9F5, LY9F6, LY9F7, LY9F8, LY9F9, LY9G4, LY9G5, LY9G6, LY9G7, LY9G8, LY9G9, LY9H4, LY9H5, LY9H6, LY9H7, LY9H8, LY9H9, LZ2L1, LZ2L2, LZ2L3, LZ3I1, LZ3I2, LZ3I3, LZ3J1, LZ3J2, LZ3J3, LZ3K1, LZ3K2, LZ3K3, LZ3L1, LZ3L2, LZ3L3, KX3K, KX3L, KX3O, KX3P, KX6A, KX6B, KX6C, KX6D, KX6E, KX6F, KX6G, KX6H, KX6I, KX6J, KX6K, KX6L, LX1I, LX1M, LX4A, KX3F8, KX3F9, KX3G7, KX3G8, KX3G9, KX3H7, KX3H8, KX3H9, KX3J2, KX3J3, KX3J5, KX3J6, KX3J8, KX3J9, KX3M5, KX3M6, KX3M8, KX3M9, KX3N2, KX3N3, KX3N4, KX3N5, KX3N6, KX3N7, KX3N8, KX3N9, KX5D2, KX5D3, KX5D5, KX5D6, KX5D8, KX5D9, KX5H2, KX5H3, KX5H5, KX5H6, KX5H8, KX5H9, KX5L2, KX5L3, KX5L5, KX5L6, KX5L8, KX5L9, LX1E7, LX1E8, LX1E9, LX1J1, LX1J4, LX1J5, LX1J7, LX1J8, LX1N1, LX1N2, LX1N4, LX1N5, LX1N6, LX1N7, LX1N8, LX1N9, LX4B1, LX4B4, LX4B7, LX4E1, LX4E2, LX4E3, LX4E4, LX4E5, LX4E6, LX4E7, LX4I1, LX4I4, LX4I7, BV1I, BV1J, BV1K, BV1L, BV1M, BV1N, BV1O, BV1P, BV2I, BV2J, BV2M, BV2N, BV4A, BV4B, BV4C, BV4D, BV4E, BV4F, BV4G, BV4H, BV4I, BV4J, BV4K, BV4L, BV5A, BV5B, BV5E, BV5F, BV5I, BV5J, BV1E7, BV1E8, BV1E9, BV1F7, BV1F8, BV1F9, BV1G7, BV1G8, BV1G9, BV1H7, BV1H8, BV1H9, BV2E7, BV2E8, BV2E9, BV2F7, BV2F8, BV2F9, BV4M1, BV4M2, BV4M3, BV4N1, BV4N2, BV4N3, BV4O1, BV4O2, BV4O3, BV4P1, BV4P2, BV4P3, BV5M1, BV5M2, BV5M3, BV5N1, BV5N2, BV5N3, MV9K, MV9L, MV9O, MV9P, MW3C, NV4P, NV5M, NV7B, NV7C, NV7D, NV7E, NV7F, NV7G, NV7H, NV7I, NV7J, NV7K, NV7L, NV7M, NV7N, NV7O, NV7P, MV9D6, MV9D9, MV9G4, MV9G5, MV9G6, MV9G7, MV9G8, MV9G9, MV9H3, MV9H4, MV9H5, MV9H6, MV9H7, MV9H8, MV9H9, MW3D1, MW3D2, MW3D3, MW3D4, MW3D5, MW3D6, MW3D7, MW3D8, MW3G1, MW3G2, MW3G3, MW3H1, NV4L4, NV4L5, NV4L6, NV4L7, NV4L8, NV4L9, NV4M5, NV4M6, NV4M8, NV4M9, NV4N4, NV4N5, NV4N6, NV4N7, NV4N8, NV4N9, NV4O3, NV4O4, NV4O5, NV4O6, NV4O7, NV4O8,

Area (frequency)	HCIS
	NV4O9, NV5I4, NV5I5, NV5I6, NV5I7, NV5I8, NV5I9, NV5J4, NV5J7, NV5N1, NV5N4, NV5N7, NV7A2, NV7A3, NV7A4, NV7A5, NV7A6, NV7A7, NV7A8, NV7A9, NW1A1, NW1A2, NW1A3, NW1A4, NW1A5, NW1A6, NW1B1, NW1B2, NW1B3, NW1B4, NW1B5, NW1B6, NW1C1, NW1C2, NW1C3, NW1C4, NW1C5, NW1C6, NW1D1, NW1D2, NW1D3, NW1D4, NW1D5, NW1D6.