Submission to Revised Draft
LAP Variation - Perth

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1 EXECUTIVE SUMMARY

RIGHT advocates that a similar interference investigation to that conducted around the 4kW 6IX transmitter in Wanneroo, the Hamersley transmitter site (containing 50kW, 20kW and 10kW) should be investigated.

With respect to Perth High Power Open Narrowcasting Services, RIGHT proposes the clearance of more MF AM channels in the Perth LAP to be released for DRM in WA. This would eliminate interference around the Hamersley Transmitter site and would make a total of 5 MF channels available for DRM in South West WA.

RIGHT recommends the Perth ABC AM radio programs be transmitted on FM to make 3 more channels, namely 585, 720 and 810 kHz available in SW WA.

- 720 ABC Local Radio goes to 95.3 MHz (>100 kW) and labelled here as 6PLR
- 810 ABC Radio National goes to 98.5 MHz (>100 kW) and labelled here as 6RN
- 585 Parliamentary Broadcast goes to 100.1 MHz (20 kW) and labelled here as 6PNN

This provides benefits to all stakeholders including the listening public, broadcasters, ACMA, the ABC and Broadcast Australia.

This solution provides 3 extra channels for DRM broadcasting with full quality stereo sound. The solution recommended also removes TV & phone interference by high, medium and lower powered transmitters in the middle of suburbia (Hamersley site).

Since there is rapid population growth in the southern corridor, licence areas should be reviewed with consideration to the 2006 Census data.

Pursuant to the variation to Frequency Allotment Plan, RIGHT suggests the frequency chosen is 90.5 MHz, or one of the question marks on the dial presented in our response to “Perth High Power Open Narrowcasting Services”.

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X // 720 ABC Local Radio goes to 95.3 MHz (>100 kW) and labelled here as 6PLR
X // 810 ABC Radio National goes to 98.5 MHz (>100 kW) and labelled here as 6RN
X // 585 Parliamentary Broadcast goes to 100.1 MHz (20 kW) and labelled here as 6PNN
2 ABOUT THE AUTHOR

Mr Alan Hughes (B. Arts (Training & Development), Television Operators Cert of Proficiency, Dip. Electronics and Communications, MBKSTS) worked in the ABC for 25 years training internal staff in radio and television. The areas covered included studio maintenance, operations and end to end quality assessment of signals.

He also has continuing interest in both radio and television since departing from the ABC 12 years ago. He also has been, and continues to be, a member of the British Kinematograph Society for over 20 years.

With the advent of the internet and digital television he has become an avid reader and poster to online forums for digital broadcasting, such as those at http://www.dba.org.au. He regularly helps others overcome interference problems and sort out issues with their reception using both his experience and analytical mind.

In addition, Mr Hughes and his family currently reside within 500 metres of the Hamersley transmitter mentioned within this document and has experienced some of the problems detailed, and applied some of the solutions provided, first hand.

Derek Hughes
Chairperson - RIGHT
B. Bus (Marketing, E-commerce)
3 About RIGHT

Radio Interference Group – Hamersley Towers (RIGHT) was formed with the single aim of educating and informing the community and stakeholders effected by the Hamersley radio transmission towers. RIGHT represents the estimated 26,000 people in the 4 surrounding suburbs, and over 167,000 residents in suburbs within 8 km of the high powered transmission site.

The group consists of local residents effected by the tower and it’s interference. People with a combined experience of 40 years working in radio and television broadcasting (at the ABC), 25 years at Telstra and City of Stirling councillors are also involved with the group.

Formerly named the Hamersley Reference Group, Radio Interference Group – Hamersley Towers (RIGHT) was renamed when it moved from being run by Jann McFarlane (Former Federal Member for Stirling) to complete community management. Ms McFarlane is continuing to provide her invaluable experience to the group.

Residents in the suburbs below are effected by the transmission site are displayed below.
4 RESPONSES

4.1 Commercial Radio 6IX – Wanneroo Translator

ACMA proposes to amend the technical specifications for the 6IX translator at Wanneroo to operate as follows:

105.7 MHz from Wanneroo, with a maximum ERP of 4 kW directional using vertical polarisation.

“In August 2004, an ABA engineering officer in conjunction with an ACA field officer from Perth conducted an investigation into the interference issue. The investigation identified some poor television receive antenna installations where the second harmonic of the 6IX signal was being re-radiated by mast head amplifiers to neighbouring television viewers.

At the expense of the licensee\(^1\) of 6IX, filters were fitted to householders experiencing interference, and in the more complex cases, the whole of the antenna installation was renewed.” – September 2004 LAP \(^2\)

If such a low powered transmitter was investigated by ACMA and rectified by the licensee, similarly ACMA is obligated to investigate the high powered Hamersley transmitter site which contains a 50 kW, 20 kW and 10 kW AM transmitters.

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\(^1\) The requirement to eliminate interference is noted in Section 13(g) of the Technical Planning Guidelines. http://www.acma.gov.au/acmainterwr/aba/newspubs/radio_tv/broadcast_planning/documents/technical_planning_guidelines_dec03.pdf

4.2 **Community Radio – 6TCR Wanneroo**

ACMA proposes to amend the technical specifications for 6TCR to operate as follows:

- 89.7 MHz from Wanneroo with a maximum ERP of 2 kW directional and vertical polarisation.
- ACMA also proposes that the 6TCR licence area be extended to include all of the City of Wanneroo and the City of Joondalup.

RIGHT recommends changing of 6TCR’s frequency to 88.9 MHz. For more information on the basis of this change please refer to “Perth High Power Open Narrowcasting Services”.

4.3 **New Perth City Community Radio Service**

ACMA proposes to make available a new Perth City community radio service to operate as follows:

90.5 MHz from Ardross, with a maximum ERP of 500 W directional and vertical polarisation.

ACMA proposes to define a licence area for a new community radio service to serve the Perth City area in terms of areas defined by the Australian Bureau of Statistics at the Census of 5 August 2001.

No comment.
4.4 **Perth High Power Open Narrowcasting Services**

ACMA withdraws the proposal to make 1170 kHz available for a high power open narrowcasting service in Perth.

In addition to any submissions on this revised ACMA preliminary view, ACMA would be interested to hear from High Power Open Narrowcasting (HPON) aspirants about any other AM options that may be available to meet HPON demand in Perth. This might include lower-power channels of less potential utility for DRM in regional areas for future digital radio services.

RIGHT applaud ACMA for this proposal. This will not increase any interference levels around the Hamersley transmitter site.

It is agreed that it is a big “cost” for a 2 kW community radio station to use a channel, which is only used by 1170 2CH Sydney, 3 292 km away. Using this channel in the WA country for DRM will gradually increase this channel’s “value”.

We also propose the clearance of more MF AM channels in the Perth LAP to be released for DRM in WA. This would eliminate interference around the Hamersley Transmitter site and would make a total of 5 MF channels available for DRM in South West WA.

4.4.1 **Making more Medium Frequency (MF) channels available for DRM**

In South West WA, the ACMA suggests that only 2 channels are available 927 and 1170 kHz.

If the Perth ABC AM radio programs were to be transmitted on FM this would make 3 more channels, namely 585, 720 and 810 kHz available in SW WA. These channels are clear channels. These selections were made on the basis of the greatest physical separation and the greatest coverage area of the sites available. To prevent interference to existing broadcasters you need to find 3 suitable channels together.

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3 DRM is Digital Radio Mondiale which can use the same frequency band that AM radio uses.
4.4.2 Presently achievable allocations for DRM digital Radio in South West WA

**Bold** indicates the channels donated by Perth ABC AM going to FM

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>585 kHz</td>
<td>Radio West South West – 6TZ Bunbury, Collie &amp; Margaret River</td>
</tr>
<tr>
<td>711 kHz</td>
<td>ABC Goldfields – 6GF Kalgoorlie &amp; 6ED Esperance</td>
</tr>
<tr>
<td>801 kHz</td>
<td>Racing Radio – Geraldton, Kalgoorlie, Mandurah, Bunbury, Busselton &amp; Wagin</td>
</tr>
<tr>
<td>945 kHz</td>
<td>Radio National – Dalwallinu, Busselton, Manjimup &amp; Wagin</td>
</tr>
<tr>
<td>1278 kHz</td>
<td>Easy Listening - 6EL Bunbury</td>
</tr>
<tr>
<td>1377 kHz</td>
<td>ABC Mid West – Geraldton, Dalwallinu &amp; Northam</td>
</tr>
<tr>
<td>1341 kHz</td>
<td>ABC Radio Regional - 6WA Wagin</td>
</tr>
<tr>
<td>1521 kHz</td>
<td>Radio West - 6SE Esperance</td>
</tr>
</tbody>
</table>

As you may notice, not all services are given channels, there is a severe shortage until the metropolitan stations switch off AM and go to DAB digital radio and country AM stations convert to DRM digital radio to free more channels.

This shortage is not surprising since there is 120 radio channels in the MF band and you need 3 together to prevent overlapping. It may be that the VHF band used for FM radio will have to be used with DRM as well.

**Note:** All of the above stations will be able to transmit FM stereo quality sound!

4.4.3 Where in the FM spectrum should the ABC programs be moved to?

As you may be aware 88-92MHz and 101-108 MHz are used for TV in South West WA (Mt Lennard). This has been an inhibiting factor in the allocation of FM licences. Things have changed in two ways.

- Firstly there are UHF translators near Pinjarra for the Mandurah region for SSW3 (GWN) and ABSW5 it is about half way between the Bickley and Mt Lennard, which are 155 km apart. There are many UHF antennas pointed at the translator.
- ABSW36 digital is on air. There is an alternative if occasional interference is a problem. They will not get interference into their phones as well.
- The visibility of an interfering signal depends on its frequency relationship with the TV channel’s vision carrier and the chroma subcarrier. If the FM signal is added at around 3.1 MHz above the vision carrier the visibility is minimised to a fine pattern.
- The patterning on the TV will be dependent on the weather and season. Where as the patterning in Hamersley is continuous so is independent of the weather or season and is much stronger.
These interference problems pale into insignificance to the TV patternning, ABC radio in the phones and other serious interference problems that occur in the suburbs which surround the Hamersley transmitter site. Since more people will be affected by continuous interference than the possible occasional interference, then we need more protection against interference.

4.4.4 FM Frequency Selection for the Perth Licence Area.

- All Perth FM stations are 0.8 MHz apart to allow receivers with rotary tuning to separate the stations.
- 92 – 97.5 MHz there is no restriction on power, this makes 6 channels available.
- 97.5 – 101 MHz there is a possibility of interference on channel 9, close to the Bickley transmitter site; however there are no close houses and the tower is tall. The signal is aimed close to the horizon.
- 101 – 108 MHz there is a possibility of interference to the ABC TV service in the South West, however as has been pointed out the closer of those viewers already have alternative signal from Pinjarra. Also they can use a digital TV from Mt Lennard. So middle powered transmitters have been allocated in this frequency range.
- 88 – 92 MHz there is a possibility of interference to GWN South West program. The Pinjarra translator gives a similar situation as the ABC South West except that GWN is yet to start digital TV transmissions.
- Interference from TV signals.

The AM Frequency Spectrum TV Effect on Radio

4.4.5 Possible Frequency allocations for the ABC AM transmitters in Hamersley

- 720 ABC Local Radio goes to 95.3 MHz (>100 kW) and labelled here as 6PLR
• 810 ABC Radio National goes to 98.5 MHz (>100 kW) and labelled here as 6RN
• 585 Parliamentary Broadcast goes to 100.1 MHz (20 kW) and labelled here as 6PNN

4.4.6 Consequential frequency reallocation of existing Perth FM stations
• 89.7 6TCR moves to 106.9 MHz (4 kW)
• 95.3 6EBA moves to 104.1 MHz (16 kW)
• 98.5 6SON moves to 104.9 MHz (16 kW)
• 100.1 6NR moves to 89.7 MHz (6.5 kW)
• 103.3 HPON moves to 88.9 MHz (50 W)
• 104.9 HPON moves to 106.5 (50 W)

Once Analog TV is switched off another 5 FM channels will become available in Perth. The ACMA may wish to use DRM for them.
**Response to ACMA Document PF2005/1233**

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**FM**

- 6CCR (Community HPON 1kW)
- 6HFM (Community HPON 0.2kW)
- 6TCR (Community HPON 4kW)
- Formerly on 104.9 (Community HPON 0.05kW)
- 6IX (Commercial 0.5kW)
- 6SON (Community HPON 16kW)
- 6EBA (Community HPON 16kW)
- ? (Available Commercial)
- 6KCR (Community HPON 0.2kW)
- 6YMS (Community HPON 10kW)
- 6AR (Community HPON 6.5kW)
- 6PNN (National "6PB" 20kW)
- 6JJJ (National 100kW)
- "6RN" (National 100kW)
- 6ABC FM (National 100kW)
- 6SBS (National 100kW)
- 6NOW (Commercial 40kW)
- 6PLR (ABC "6WF" 100kW)
- 6MIX (Commercial 40kW)
- 6PER (Commercial 40kW)
- 6PPM (Commercial 40kW)
- 6RTR (Community HPON 10kW)
- 6PCR (Community HPON 0.2kW)
- ? (Available HPON)
- 6NR (Community HPON 6.5kW)
- Formerly on 103.3 (Community HPON 0.05kW)
- ? (Available HPON)

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**AM**

- 108 1600
- 107
- 106 1500
- 105
- 104 1400
- 103
- 102 1300
- 101
- 1200
- 100
- 99
- 1100
- 98
- 1000
- 97
- 96
- 95 900
- 94
- 93 800
- 92
- 91 700
- 90
- 89
- 88

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6## Existing frequency changed to minimise interference with Bunbury TV

6## AM to FM conversion

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**Proposed Perth Radio Dial with Bunbury Analog TV operating**
4.4.7 Advantages of this approach

- As displayed in maps in appendix 1, this approach provides an ideal test environment for broadcast of DRM, which is as yet untested in production environments. It is
  - around 3,000 km from other transmitters in Australia so interference is not going to be a huge problem.
  - Single Frequency Networking could be well tried in this state. Maps are attached to give monitoring distances.
  - Large areas are of a flat terrain so the propagation characteristics are more reliably tested. There is also tall timber country in the SW corner for comparison. From Busselton to Hamersley there is a predominantly over water path with plenty of weather fronts to bend radio waves vertically.
  - Remote monitoring of signal strength and error rates can be used to compile statistics.
  - With only 2 commercial TV stations, and the ABC telecasting statewide and nearly all country commercial radio stations owned by the one company promotion of DRM is a little easier. If the North West transmitters were included after investigation of possible frequencies then 5% of the Australian population for a test market.

- Provides a high quality sound signal which is not presently available from the ABC. This is because FM is not used for Regional Radio in this state where as it is in the Eastern States.

- Removes TV & phone interference by high, medium and lower powered transmitters in the middle of suburbia (Hamersley site). There are more than 26,000 people in the 4 suburbs immediately surrounding the site. Within 8 km radius there is >167,000 people resident in this area. Census 2001 and the population density is increasing.

- Allows the ABC audience to receive high quality sound from their new digital Perth studios.

- With increasing numbers of DAB receivers, this will solve the legacy problem of keeping high powered AM transmitters running, for diminishing numbers of listeners. All the time the people surrounding the Hamersley transmitting site are still suffering from interference.

4.4.8 Conclusion

RIGHT recommends that the ACMA changes the Perth LAP so that all ABC AM services in the Hamersley site are changed to FM and the frequency allocations of 585, 720 & 810 kHz be abolished within the Perth LAP. This provides benefits to all stakeholders including the listening public, broadcasters, ACMA, the ABC and Broadcast Australia.
4.5 Licence Areas

ACMA proposes that the Armadale, Fremantle and Kalamunda community licence areas be redefined using 2001 Census boundaries, but otherwise remain unchanged.

ACMA also proposes to make a minor variation to the heading of the description of the Perth RA1 commercial and community licence area to remedy a previous drafting error.

Since there is rapid population growth in the southern corridor, the 2006 Census data should be considered.
4.6 Variation to Frequency Allotment Plan

ACMA proposes to vary the frequency allotment plan (FAP) for the VHF FM radio band for R22 Perth as it relates to the preliminary view on a new community service in Perth.

RIGHT suggests the frequency chosen is 90.5 MHz, or one of the question marks on the dial presented in our response to “Perth High Power Open Narrowcasting Services”. This will then enable the conversion of the ABC Perth AM services to convert to FM.
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1. MAPS

a. Southern WA ABC Transmitter Locations
b. **Southern WA Commercial AM Transmitter Locations**

- Geraldton
- Kalgoorlie
- Esperance
- Albany
- Bunbury
- Margaret River
- Bridgetown
- Collie
- Narrogin
- Katanning
- Mandurah
- Northam
- Merredin
- Future Bickley DAB Transmitters

**Legend**
- AM
- AM & FM
- Unique Program Feed
- Transmitter power rings 50, 20, 10, 5, 4, 2, 1, 0.5 kW

**Scale**

- 0 km
- 100 km
- 200 km
- 300 km
- 400 km
- 500 km

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info@right.net.au Page 19 of 20 http://www.right.net.au
2. **INTERNET LINKS**

a. **Regulation**

Department of Communication, Information Technology and the Arts -

Australian Communications and Media Authority (ACMA)

b. **Coverage Areas**


ABC based coverage maps - http://www.abc.net.au/reception/freq/ - Select the station and then click on the coverage area map.

c. **The Technology – DRM**

Official DRM website - http://www.drm.org/

d. **For Planners and Broadcasters**

(We should go for full Stereo, after all we have 2 ears!)


Official DRM website -
http://www.drm.org/broadcastmanual/broadcastermanual.php

e. **Commercial Radio Australia**

Commercial Radio Association of Australia on Digital Radio -
http://www.digitalradioaustralia.com.au

f. **The Broadcasters**

ABC -