

# SOUTH AFRICAN RADIO ASTRONOMY OBSERVATORY (SARAO) WRITTEN SUBMISSION ON THE NOTICE OF INTENTION TO AMEND ANNEXURE B OF THE RADIO FREQUENCY SPECTRUM REGULATIONS.

## 1. Introduction

Figure 1 below, shows area polygons that are declared as Karoo Central Astronomy Advantage Area (KCAAA). The sole purpose of the KCAAA is to establish and provide for the preservation and protection of the areas that are uniquely suitable for radio astronomy observations in the Republic of South Africa.

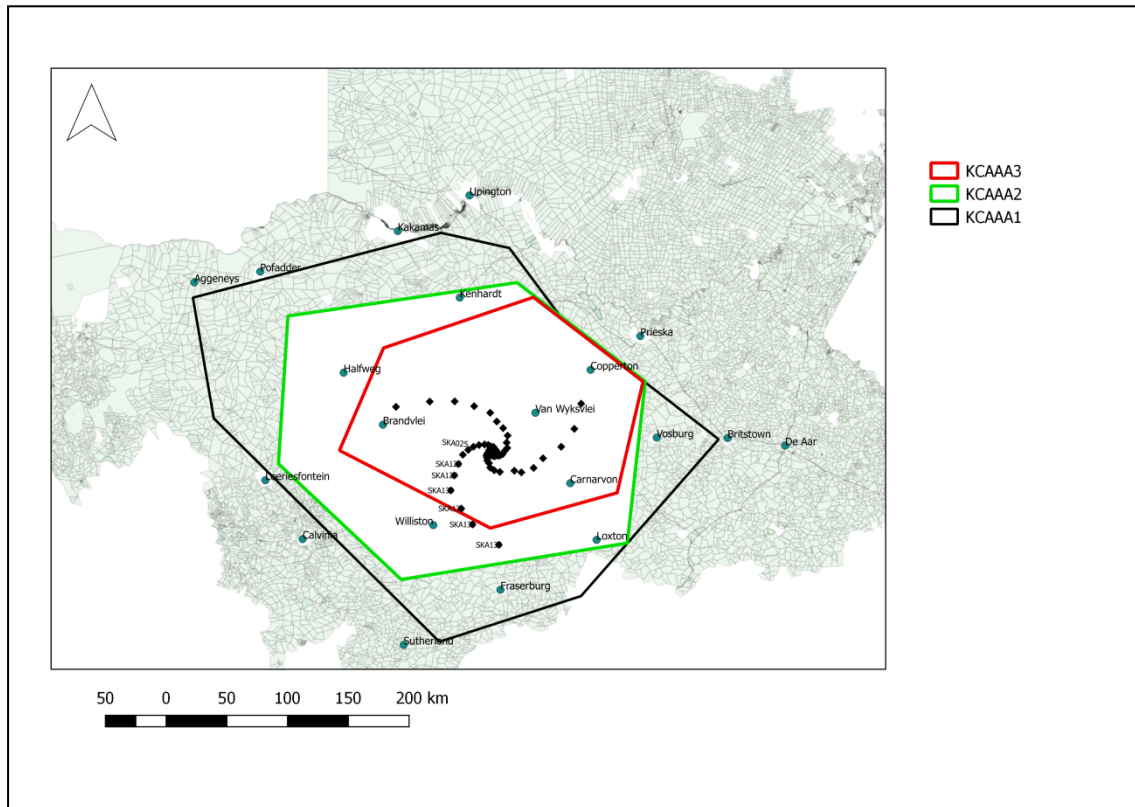


Figure 1: The Declared Karoo Central Astronomy Advantage Areas

The declaration of the KCAAA were implemented in terms of the provisions of the Astronomy Geographic Advantage Act No.21 of 2007 (AGA Act). Subsequent to the declaration of the KCAAA, the KCAAA regulations were put in place to regulate activities within the KCAAA, which could cause

radio frequency interference with radio astronomy or related scientific endeavours in those areas. The KCAAA Regulations are published in the Government Gazette No. 41321 under Notice No. 1411 and **SCHEDULE A** provides for restrictions and prohibitions on the use of certain radio frequency spectrum and activities in the KCAAA.

## **2. Regulatory Framework for Spectrum use in KCAAA**

In terms of sub-section 2(1) and 3(2) of SCHEDULE A of the KCAAA Regulations, the use of the frequency band 100 MHz to 25.5 GHz is prohibited as follows in the KCAAA:

- a) KCAAA 1 with respect to the use of frequency spectrum from 100 to 2 170 MHz,
- b) KCAAA 2 with respect to the use of frequency spectrum from 2 170 to 6 000 MHz; and
- c) KCAAA 3 with respect to the use of frequency spectrum from 6 000 to 25 500 MHz.

However, Regulation 3 of SCHEDULE B of the KCAAA Regulations makes provision for certain frequency bands, as determined by the Minister of Science and Innovation, to be exempted from the above mentioned prohibitions. The list of frequency bands, that are exempted from the prohibitions is currently published in the Government Gazette No. 45045 under Notice No. 753.

In addition to the above, Regulation 5(2) makes provision for exemption of radio equipment, with e.i.r.p of 250mW or less, for which radio frequency spectrum Licence exemptions have been prescribed in Annexure B of ICASA Radio frequency spectrum Regulations.

## **3. Possible Impact of the proposed Amendment in the KCAAA**

In terms of the National Radio Frequency Plan 2021 (NRFP2021), a portion of the band 5 925 – 6 700 MHz is used for the radio astronomy observation of methanol. The band 6 650 – 6 675.2 MHz is an extremely important band for the MeerKAT, SKA and C-Bass telescopes located near Core of the SKA. The band is also protected in terms of footnote **No. 5.149** of the International Telecommunications Union Radio Regulations. The footnote urges administrations to take all practicable steps to protect the radio astronomy service from harmful interference in the band 6 650 – 6 675.2 MHz.

The frequency band 122 – 246 GHz is outside the regulated frequency band in the KCAAA and will not pose any negative impact on the radio astronomy infrastructure.

#### 4. Proposed Way Forward

As stated above the proposed lower 6 GHz band is very close to an important radio astronomy band that is used for the observation of cosmic methanol radiation. The radio astronomy equipment in the KCAAA are of national strategic importance and are extremely sensitive to even low power devices such as RLANs. While SARAo and ICASA have formed a strong set of procedures to handle licensed radiocommunication Permits and interference issues, measures have not yet been created and it is extremely difficult to monitor the location and activities of unlicensed devices. They, therefore, present a very high risk of interference to the SKA.

While we understand and support the Authority's objectives in this process, the use of the lower 6 GHz band by unlicensed devices will remain prohibited in the KCAAA 2 and KCAAA 3. It would be extremely supportive if the Authority can include the following text, to reflect the spectrum use conditions in the KCAAA, below table of radio frequency spectrum Licence Exemptions in the draft document.

(g) The use of the lower 6 GHz band radio apparatus is prohibited in the declared Karoo Central Astronomy Advantage Areas, in the Northern Cape Province.