Mr. Manyaapelo Richard Makgotlho
350 Witch-Hazel Avenue
Eco Point Office Park
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Centurion

Attention:
Mr. Manyaapelo Richard Makgotlho
Email: rmakgotlho@icasa.org.za

Date: 28 January 2020

Dear Mr. Makgotlho

RE: NOTICE INVITING COMMENTS REGARDING THE DRAFT RADIO FREQUENCY SPECTRUM ASSIGNMENT PLAN FOR THE FREQUENCY BAND 470 TO 694 MHz FOR DIRECT MIGRATION FROM ANALOGUE TELEVISION AND THE RELEASE OF THE BAND 694 TO 862 MHz

The attached submission is made by the South African Radio Astronomy Observatory (SARAO), a facility of the National Research Foundation (NRF) established in terms of the National Research Foundation Act, Act 23 of 1998. It is made in response to the incitation to comments on the above mention Notice, with respect to the Draft Radio Frequency Spectrum Assignment Plan for the frequency band 470 to 694 MHz as published in Vol. 636 of the Government Gazette No. 428887 on 6 December 2019.

We congratulate the Authority in its continued effort to facilitate the provision of broadband services and thank you for the opportunity given to raise our concerns, as an affected stakeholder, in relation to the protection of radio astronomy observations in the Karoo Central and Karoo Core Astronomy Advantage Areas. Applicable legislation and regulations are available on the Astronomy Management Authority website: https://ama.dst.gov.za

This submission is made in good faith, to support the development of DTT while ensuring that radio frequency interference in the KCAAA is limited to levels that are compliant with already established thresholds for the protection of radio astronomy. We further confirm our willingness to participate in any further public consultation processes that may be undertaken by the Authority in this project.

Kind Regards

Mr. Selaelo Matlhane
Spectrum and Telecommunications Manager
South African Radio Astronomy Observatory

South African Radio Astronomy Observatory

Submission (SARAO)

NOTICE ON THE DRAFT RADIO FREQUENCY SPECTRUM ASSIGNMENT PLAN FOR THE FREQUENCY BAND 470 TO 694 MHz FOR DIRECT MIGRATION FROM ANALOGUE TELEVISION AND THE RELEASE OF THE BAND 694 TO 862 MHz

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1. Introduction

South African Radio Astronomy Observatory (SARAO) is a facility of the National Research Foundation and it spearheads South Africa's activities in the engineering, science and construction of the Square Kilometre Array radio telescope (SKA). SARAO is also responsible for the human capital development to create the required technical capacity to support the SKA radio telescope site operations and scientific research. We are irresponsible for the management of all radio astronomy initiatives and facilities in South Africa, including the 64-dish MeerKAT, the Geodesy and VLBI at HartRAO and coordinates the involvement of the African VLBI network for the eight SKA partner countries in Africa (Botswana, Ghana, Kenya, Madagascar, Mauritius, Namibia and Zambia).

The design and pre-construction activities of the SKA are overseen by the SKA Organisation (SKAO) an intergovernmental organisation based in UK based, which currently comprises 13 participating countries; Australia, Canada, China, France, Germany, India, Italy, New Zealand, South Africa, Spain, Sweden, The Netherlands and the United Kingdom and it is has been declared as a Key Science Projects (KSP) in each of the participating countries.

The SKA is a global mega-science project, building an advanced radio-telescope facility linked to research infrastructure and aimed at contributing and providing opportunities for South Africa and Africa in global advanced science projects. It will enable transformational science at metre and centimetre wavelengths for many years to come. When fully constructed and commissioned, the SKA will be the largest and most powerful general-purpose radio telescope operating between 50 MHz to 15 GHz. The SKA and MeerKAT are government strategic infrastructure projects identified under the National Infrastructure Plan in 2012 (SIP 16) and has been identified as key projects in the recent state of the nation address by President Thabo Mbeki in 2019.

In the Northern Cape province, the project has already given back so much and has become a beacon of hope to the marginalised communities of the northern cape, amongst the others, the construction of access road from Carnarvon to SKA site, employment opportunities to communities around the construction area, partnering with local schools to improve maths and science subjects and bursary awards to deserving students. SARAO continues to work with the Northern Cape Provincial government to improve the socio-economic conditions to the people of the Norther Cape.

1.1 Technical Characteristics of the SKA radio telescope

The MeerKAT is an array of 64 interlinked receptors that is formally recognised as a precursor to the Square Kilometre Array (SKA) radio telescope. The MeerKAT will be integrated into the mid-frequency component of SKA Phase 1, a 197-dish telescope array, which will undertake observations in the frequency band 100 MHz to 25.5 GHz. The frequency ranges of SKA1 observational categories are given in Figure 3 together with the band that are of high priority to the SKA. The telescope location is indicated in Figure 1 and the full scope of receiver deployment for MeerKAT will include the S-Band (1750 MHz – 3500 MHz) and X-Band (8 GHz – 14.5 GHz) receivers, but it is currently comprised of the L-Band (900 MHz – 1670 MHz) and UHF-band (580 MHz – 1015 MHz) receivers and digitizers. The MeerKAT antenna consists of a 13.5 m diameter offset Gregorian main reflector and a 3.8 m diameter sub-reflector mounted on a steel support framework.

The construction and commissioning of the 64-dish array MeerKat telescope was completed in July 2019, it is already undertaking science observations and discoveries. It is short span, the MeerKAT has already discovered the existence of “bubbles” at the center of our milky way, a phenomenon that has never been observed before and it has created wild spread interest within the global science communities. The project timelines and schedule for the construction and commissioning of the 197-dish array SKA telescope is indicated in figure 2 below. It is anticipated that the project will be completed in June 2023.

FIGURE 1

THE SKA PHASE 1 TELESCOPES TO BE LOCATED IN SOUTH AFRICA CONSIST OF 133 SPIRALLY DISTRIBUTED PARABOLIC DISHES OF 15m DIAMETER. SIXTY-FOUR (64) MeerKAT DISHES ARE ALSO LOCATED AT THE CENTER OS THE SKA, BRINGING THE TOTAL NUMBER OF SKA DISHES TO 197.

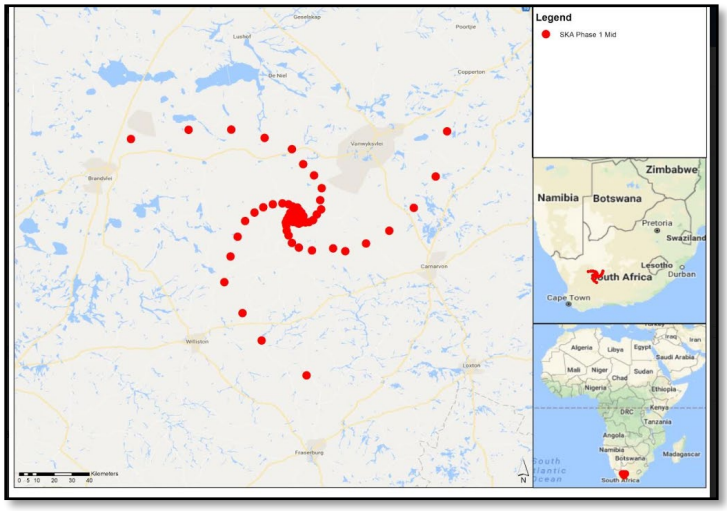


FIGURE 2

SKA RADIO TELESCOPE PROJECT SCHEDULE

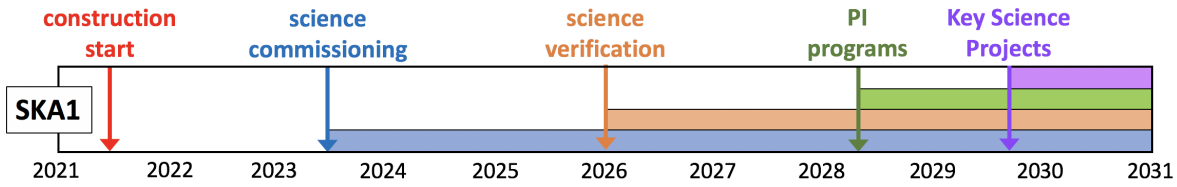
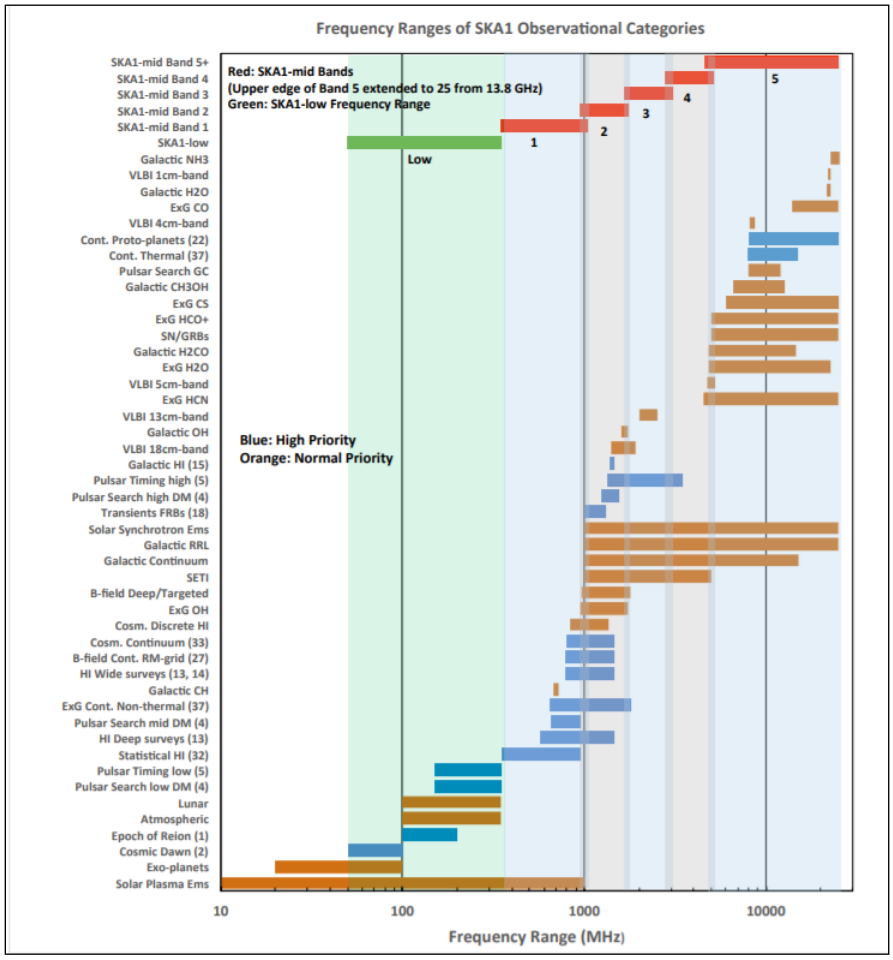


FIGURE 3

SKA RADIO TELESCOPE FREQUENCY RANGES AND PRIORITY BANDS



1.2 SKA Design Objectives

FIGURE 4

ANTICIPATED SKA-1 SENSITIVITY (top) AND SURVEY SPEED (bottom) AS A FUNCTION OF FREQUENCY IN COMPARISION TO EXISTING (LOFAR, JVLA, ALMA) AND FUTURE (uGMRT, ngVLA) IMAGING FACILITIES.

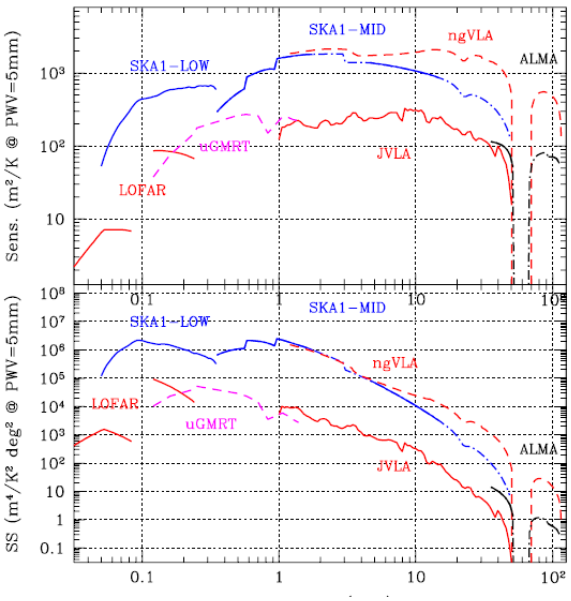


Figure 4 indicates the comparison between existing and future radio astronomy facilities against the SKA1 in terms of sensitivity and survey speed. SKA1 is poised to make fundamental advances across a broad range of fields by virtue of its combination of sensitivity, angular resolution, imaging quality and frequency coverage.

The SKA1 radio telescope comprises of 133 x 15m dishes as well as 64 x 13.5m dishes from the MeerKAT SKA working in concert from 350 MHz – 15+ GHz, with a maximum interferometric baseline of 150 km. The scientific goals and key science projects for the SKA1 are embodied by the themes as indicated in Figure 5.

FIGURE 5

SKA KEY SCIENCE DRIVERS

2. The Impact of Radio Frequency Interference (RFI) on radio astronomy observation.

Astronomical signals are many factors of ten below the noise floor of the receiving system Hence the power level at which RFI begins to be detrimental is far lower for radio astronomy that it is for other radio communication services. SKA is poised to make

fundamental advances across a broad range of fields by virtue of its combination of sensitivity, angular resolution, imaging quality and frequency coverage. As a result of these ambitious design objectives and key science drivers, the effect of RFI on the SKA is a much bigger problem than in present-day radio astronomy and it varies greatly from noise levels that can be mitigated to levels that can destroy the receivers in the telescope.

Both cosmic and man-made signals which cross the main beam are received with a very high gain, owing to large apertures needed to detect weak cosmic signals. For man-made signals the combination of high receiving gain and high incident signal could suffice to permanently degrade the performance of the SKA receivers or perhaps even destroy it.
When RFI signals are of sufficient strength to drive the amplifiers in a radio telescopes receivers into saturation or even just into non-linear regime, the radio observations cannot be accurately calibrated and hence no useful data could be obtained.

3. Protection of SKA and MeerKAT radio telescope.

The establishment of radio quiet zone and maintenance of the inherent low levels of RFI provides the greatest protection measure for the SKA receivers and radio astronomy observations. In order to protect the SKA from increased level of interference, the protection of the observation area is critical. The protection criteria were developed in terms of the Astronomy Geographic Advantage Act, 2010, which paved the way for the declarations of Astronomy Advantage Areas and development of protection criteria for the SKA and other areas that are deemed suitable for undertaking astronomy or related scientific endeavours. Figure 1 indicates the declared area to ensure the establishment of the RQZ for the SKA. This next sections of this submission provides and overview of the protection criteria developed under the AGA Act.

3.1 Policy and Regulatory Control

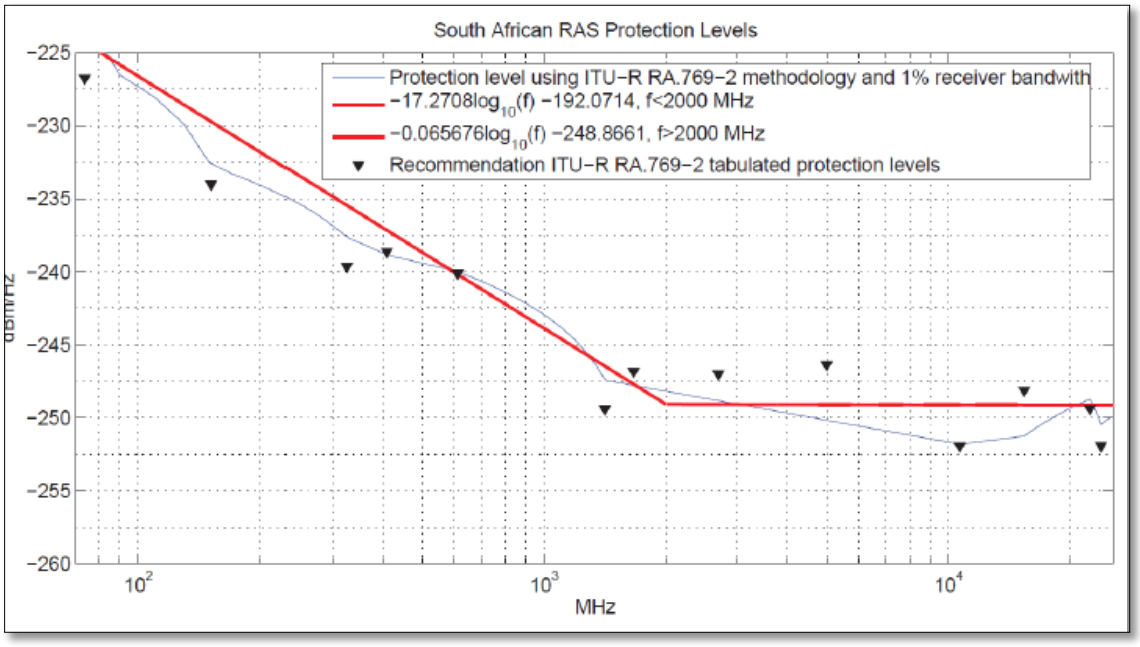
The purpose of this section is to provide an overview of the regulatory framework that has been established for the protection of the SKA.

3.1.1 South African Radio Astronomy Protection Levels

Observation to be made by the SKA will be highly susceptible to detrimental interference from unwanted emissions by active sources. The conditions under which the SKA will be protected will be in accordance with the regulations on the radio astronomy protection levels in Astronomy Advantage Areas declared for the purposes of radio astronomy. The regulations were published in 2012 by the Minister of Science and Technology. The protection levels in these regulations were derived using the methodology described in ITU Recommendation ITU-R RA.769-2 and they are equivalent to threshold levels of interference for new generation radio astronomy observations. The thresholds are described by the equations and the graph as in Figure X below.

FIGURE 6

SOUTH AFRICAN RADIO ASTRONOMY SERVICES PROTECTION LEVELS

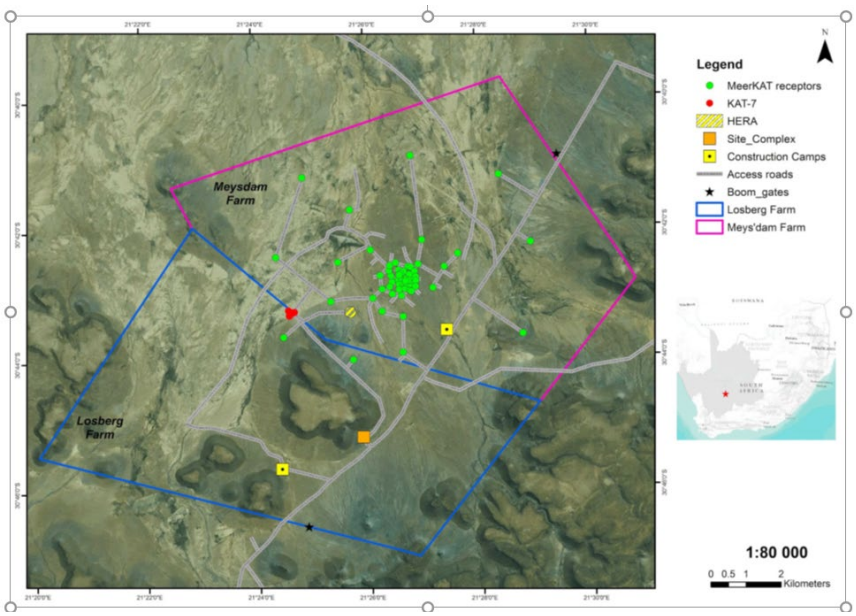


3.1.2 Karoo Core and Central Astronomy Advantage Areas Regulations.

In June 2012, the regulations to prohibit or restrict certain activities in core astronomy advantage areas were published. The core area is shown in Figure XX and it is where 50% of the collecting area will be located in a densely packed configuration and requires the highest level of protection. Amongst other activities, regulations prohibit possession or ownership of RF devices and the use of radio frequency spectrum from 9kHz to 3000 GHz, in the SKA Core area, unless if such use is for the purpose of radio astronomy or related scientific endeavours.

FIGURE 7

THE DECLARED KAROO CORE ASTRONOMY ADVANTAGE AREA



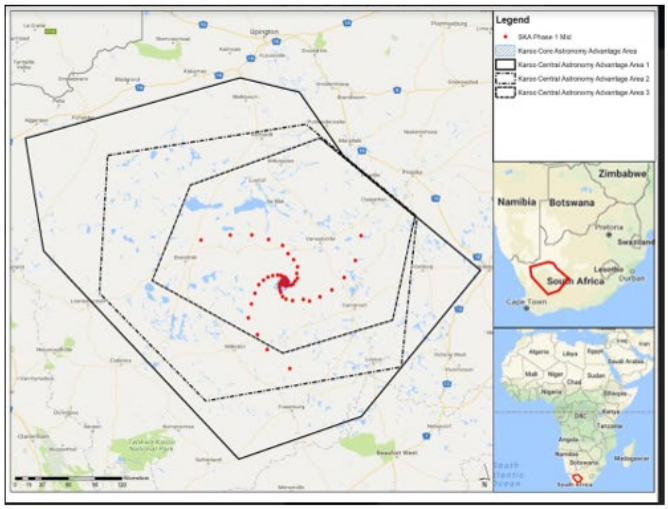
3.1.3 Karoo Central Astronomy Advantage Areas Regulations

In 2018 the regulations to govern the use of radio frequency spectrum in the Karoo central astronomy advantage areas were developed. The main purpose of these regulations is to regulate the use of RFS between 100 MHz and 25.5 GHz as well as activities that can be undertaken in the in the declared KCAAA. The regulations specify that the SARAS protection levels should not be

exceeded within the core of the SKA at the Virtual Centre, given by the geographical coordinate's 30.71292 degrees South and 21.44380 degrees East. The regulations also prescribe that the received signal level at any radio telescope should not exceed the saturation level of -100 dBm. These compliance limits are the basis of assessment of RFI used by SARAO to determine whether or not the incidental signal is detrimental to the SKA.

FIGURE 8

THE DECLARED KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS



Protected Area and prohibited frequency range

Declared Area	Prohibited Band
Core	9kHz to 3000 GHz
KCAAA 1	100 MHz to 2170 MHz
KCAAA 2	100 MHz to 6 GHz
KCAAA 3	100 MHz to 25.5 GHz

3.1.4 Frequency bands exempted from the prohibition of use

In December 2018, the Minister published a list of frequency band, in terms of sub-regulation 3(2) of SCHEDULE B of KCAAA Regulations, that can be used in the KCAAA within the limits prescribed in the sub-section above. The purpose of this list is to isolate possible RFI and ensure that usage is confined to specific portions of the entire spectrum of the observational bandwidth of the SKA. The list of allowed frequency bands is attached as Annexure A of this submission. All frequency bands not included in the list will not be allowed to be used in the KCAAA.

3.2 Registration of the MeerKAT to ITU Radiocommunication Bureau

In 2018, SARAO undertook a process to notify and register the MeerKAT and Hartebeest radio astronomy facilities with the ITU-R. The purpose of this activity was to ensure that the MeerKAT receives international recognition and protection from, especially, satellites and over flight transmissions in frequency bands allocated to RAS in Article 5 of the ITU-R Radio Regulations. The registration was recorded in the MIFR and published in BR IFIC 2883 on 20.04.2018.

FIGURE 9

ITU MIFR REGISTRATION FOR RAS EARTH STATIONS IN RSA

Country	Station Name	Satellite Name	Adm	Category	Date of Protection	Status	WIC
AFS	HART15M		AFS	N	20.04.2018	50	2883
AFS	HARTRAO		AFS	N	20.04.2018	50	2883
AFS	HARTVGS		AFS	N	20.04.2018	50	2883
AFS	MEERKAT		AFS	N	20.04.2018	50	2883
TOTAL:							4

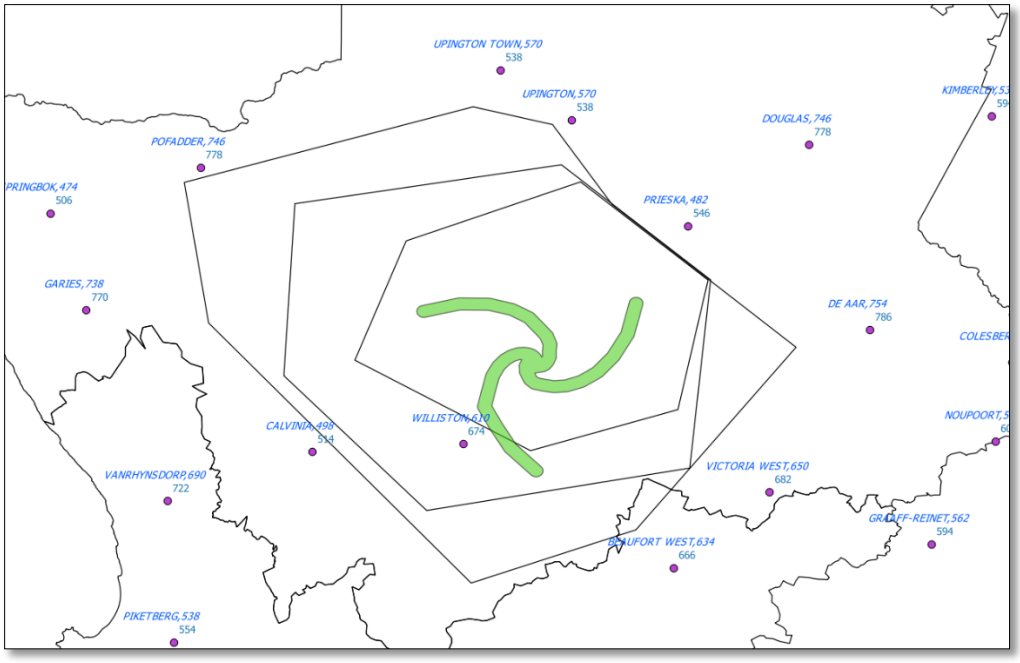
4. SARAO's view on the Draft RFSAP for the band 694 to 862 MHz

By far, both DTT and analog TV transmission remains the biggest thread of terrestrial radio frequency interference to the SKA and MeerKAT radio telescope. Figure 10 below, indicates the two MUX DTT radio frequency spectrum assignment plan in the immediate surrounding of the SKA radio telescope in the Northern Cape Province.

Firstly, SARAO has raised its concern, through the ministerial PMO office and the JSAG on the continued radio frequency interference from DTT to the SKA radio telescope in the Northern Cape Province and while we believe that DTH at select sites will provide a lasting mitigation solution, we continue to engage with Sentech to try and find solution that makes both parties equally unhappy.

FIGURE 10

DTT PLAN IN THE IMMEDIATE VICINITY OF THE KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS



4.1 DTT transmitters within KCAAA.

The radio frequency spectrum between 100 MHz and 25.5 GHz in the Karoo Central Astronomy Advantage Areas used in compliance with the provisions on the KCAAA Regulations and its related regulatory publications. As described in sub-section 3.1.4 above, certain frequency bands are prohibited for use in the KCAAA. The entire VHF and UHF television broadcasting bands are prohibited in the KCAAA in favour of DTH implementation.

4.2 DTT transmitters in the Karoo Coordinated Radio Astronomy Advantage Area.

The declaration of areas within the Republic of South Africa as Astronomy Advantage Areas was published in February 2009, the Notice No.82 of the Government Gazette No. 31855. In terms of this Notice, the whole territory of the Northern Cape Province, excluding Sol Plaatjie Municipality is declared for the purpose of radio astronomy.

On the 16 September 2014, the Authority imposed the following restrictions on the DTT transmitters that are located within the vicinity on the KCAAA. These limitations were published in the first update of the Terrestrial Broadcasting Frequency Plan 2013, in the Government Gazette No. 38005. The known transmission characteristics of high powered transmitters within the Karoo Coordinated Astronomy Advantage Area are indicated in Table 1, below. The coverage predictions, on the basis of only published information are given in Annexure B of this submission.

TABLE

CHARACTERISTICS OF MUX 1 TRANSMITTERS AROUND THE KCAAA

SITE NAME	LATITUDE	LONGITUDE	MUX 1	ERP (kW)	HEIGHT (m)	AZIMUTH	BEAMWIDTH
BEAUFORT WEST	-32.2583	22.50638889	634	56.1009	214	160	236
CALVINIA	-31.3842	19.78222222	498	3	221	225	150
DE AAR	-30.4639	23.98694444	754	79	210	90	236
DOUGLAS	-29.0692	23.52861111	746	10	253	60	236
GARIES	-30.3144	18.07861111	738	25.1785	241	260	284
KURUMAN HILLS	-27.8869	23.56055556	490	79	240	30	230
POFADDER	-29.2419	18.93944444	746	30	155	345	150
PRIESKA	-29.6811	22.61583333	482	10	272	35	160
SPRINGBOK	-29.5844	17.8075	474	10	241	270	284
UPINGTON	-28.8828	21.73638889	570	100	272	35	160
VANRHYNSDORP	-31.7547	18.68944444	690	100	210	230	230
VICTORIA WEST	-31.6875	23.23055556	650	0.5012	103	130	240
WILLISTON	-31.3250	20.91777778	610	0.1	12	225	150

In sub-section 2.4 of the update of the terrestrial broadcasting frequency plan 2013, published on 2 April 2013, in the Government Gazette No. 36321, the Authority has commented on the SKA and the protection measures that need to be adhered to by television broadcasting. In particular, the Authority also mentions that in the case of DTT stations, ERP reductions may be considered when the necessary proof is provided that DTT transmission levels exceeds the prescribed compliance levels.

6. Conclusions

As indicated in section 4.1, the Williston transmitter is located inside the KCAAA and the entire UHF TV band has not been included in the list of frequency bands to be allowed in the KCAAA. On this basis, it can be concluded that this assignment should not be in the terrestrial TV broadcasting plan during dual illumination and in the seven MUX plan.

The assignments indicated in Table 1 above, poses a very high risk to the SKA and as such, limitations were imposed by the Authority on the transmission configuration. Based on the SARAO's interactions with Sentech, the Ministerial PMO and the JSAG, it is clear that RFI from TV broadcasting is still being received by the SKA. At this moment, it is not clear if the limitations were implemented by Sentech or not. On the basis of the discussion in section 4.2 above, it can be concluded that there is a very high likelihood the DTH will be implement in the coverage area of those transmitters.

The transmission characteristics that are given under the broadcasting plan, both in Annexure A and B of the draft RFSAP and also in the terrestrial broadcasting frequency plan 2013 are not sufficient to undertake accurate predictions and interference assessment by affected parties does not show some critical information as given in the technical section of the radio frequency spectrum licence.

7. Recommendations

We would appreciate if the Authority in its final publication of the RFSAP can make reference to the prohibitions and restriction of spectrum use in the KCAAA. In particular, we recommend that the Authority should remove the Williston transmitter from the frequency assignment tables in Annexure A of the draft RFSAP and in Annexure J of the Terrestrial Broadcasting Frequency Plan 2013 and further undertake the GE06 digital plan modification procedure to reflect the suppression of this assignment in the MIFR.

This will give assurance to the international community of South Africa's commitment to ensuring radio quiet zone for the protection of the SKA radio telescope.

Given the risk of transmission sites located in the Karoo coordinated Astronomy Advantage Areas, as indicated in section 4.2 above, SARAO would like to recommend the following:

- The timelines indicated under section 8.4 of the draft RFSAP be reviewed and that the Northern Cape be migrated at the end of the migration period. This will be done to allow the discussion between Sentech and SARAO to conclude on which sites may be implemented on DTH rather than DTT. If the Authority implements DTT prior to the conclusions of these technical discussions, it poses a risk of rolling out terrestrial STBs in areas that will later be migrated to DTH. Migrating the Northern Cape Province later in the schedule will prevent the risk of wasteful and fruitless expenditure.

- At the very minimum, the azimuth, beamwidths and height of the antenna should be included in the terrestrial broadcasting plan. To Authority could go further to indicate the antenna part number and the manufacturer. This will facilitate compliance and interference assessment by interested stakeholders and it will also ensure that the equipment that is being deployed in the DTT network adheres to the high standards set by the Authority.

- The Authority, together with Sentech and SARAO, should undertake a compliance assessment and enforcement process to ensure that the limitations on the transmission of sites around the KCAAA are implemented as per the terrestrial broadcasting frequency plan and that any further requirement for ERP reduction is determined.

The SKA and the MeerKAT project are key infrastructure projects in the Republic of South Africa, and as such, SARAO will appreciate the support and collaboration from the Authority on our recommendations above. We wish you success in your aspirations with DTT migration and our office remains open for further engagements on the above issues.

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Contents

GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

DEPARTMENT OF SCIENCE AND TECHNOLOGY

NO. 926 **14 JUNE 2019**

NOTICE OF THE RADIO FREQUENCY SPECTRUM EXEMPTED FOR USE WITHIN THE KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS

Former Minister of Science and Technology, honorable Mmamoloko Kubayi-Ngubane, published her decision regarding the proposed exemption of the radio frequency spectrum for use in the Karoo Central Astronomy Advantage Areas (KCAAAs), in Government Gazette No.42399, under Notice No. 583, on 12 April 2019 as prescribed by section 42(5) of the Astronomy Geographic Advantage Act, 2007 (Act No. 21 of 2007) (AGA Act).

In accordance with Regulation 3(4) of Schedule B of the regulations for the protection of the Karoo Central Astronomy Advantage Area (the KCAAA Regulations), and having received concurrence from the Independent Communications Authority of South Africa (ICASA), I, Dr. Bonginkosi Emmanuel Nzimande, Minister of Higher Education, Science and Technology hereby publish the radio frequency spectrum exempted for use within the KCAAAs as set out in the attached schedule.

In terms of Regulation 3(2) of Schedule A of the KCAAA Regulations (Effective from 15 December 2018), from one year after these regulations become effective, the use of the radio frequency spectrum from 100 MHz to 25 500 MHz (25.5 GHz) within the KCAAAs will be prohibited. Only the radio frequency spectrum exempted from the prohibition as stated in the attached schedule may subsequently be used and if a permit has been issued in terms of Regulation 4 of Schedule B of the KCAAA Regulations.

All licensees and licence exempt operators who conduct radio transmissions within the KCAAAs, except for those who are exempted in terms of Regulation 5 of Schedule A of the KCAAA Regulations, are required to apply for a permit from the Astronomy Management Authority (AMA), a unit of the Department of Science and Technology, in order to be able to continue to operate within the KCAAAs.

The application forms for permits were published in Government Gazette No.42085, under Notice No. 1337, on 05 December 2018. They are available at the Department of Science and Technology office and online at the web address: https://ama.dst.gov.za

Any enquiries regarding this notice may be addressed to Mr. Mere Kgampe at telephone number: (012) 843 6644 or E-mail address: mere.kgampe@dst.gov.za

DR B E NZIMANDE, MP
MINISTER OF HIGHER EDUCATION, SCIENCE AND TECHNOLOGY

SCHEDULE

RADIO FREQUENCY SPECTRUM BANDS EXEMPTED FROM THE PROHIBITION OF ITS USE WITHIN THE KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS.

1. The band between 100 MHz to 200 MHz is exempted from the prohibition of its use, for all existing radio communication transmissions which were lawful immediately before the promulgation of the Regulations on the protection of the Karoo Central Astronomy Advantage Areas as published in Notice No. 1411 of Government Gazette No. 41321 (Regulations).

2. In the paired bands allocated to mobile services, all uplink frequency bands are exempted from the prohibition in terms of sub-regulation 5(3) of SCHEDULE A of the Regulations.

3. All space-to-earth frequency bands allocated in terms of ICASA's National Radio Frequency Plan 2018, published in terms of section 34 (2) and 34(5) of the Electronic Communications Act, 2005, in Government Gazette No. 41650, are exempted from the prohibition in sub-regulation 3(2) of SCHEDULE A of the Regulations.

4. All allocations must comply with the specifications in ICASA's National Radio Frequency Plan and Radio Frequency Spectrum Regulations.

TABLE OF EXEMPTED FREQUENCY BAND ALLOCATIONS FOR THE DECLARED KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS

Frequency band	Allocation to services
138 – 144 MHz	FIXED
	MOBILE
144 – 146 MHz	AMATEUR
366 – 380 MHz	GOVERNMENT SERVICES AND PUBLIC SAFETY
440 – 441 MHz	FIXED
416.1 – 417.625	MOBILE
450 – 453 MHz	FIXED
460 – 463 MHz	FIXED
464 – 470 MHz	MOBILE
935.2 – 946 MHz	MOBILE
946.6 – 948.8 MHz	MOBILE
951.2 – 959.6 MHz	MOBILE

Frequency band	Allocation to services
1880 – 1900 MHz	MOBILE
2110 – 2125 MHz	MOBILE
2307 – 2387 MHz	FIXED
2401 – 2481 MHz	FIXED
5470 – 5720 MHz	MOBILE
7443 – 7583 MHz	FIXED
7611 – 7751 MHz	FIXED
8282 – 8297 MHz	FIXED
8408 – 8423 MHz	FIXED
10154 – 10295 MHz	FIXED
10450 – 10500 MHz	RADIOLOCATION
10504 – 10644 MHz	FIXED.
13.75 – 14.5 GHz	FIXED SATELLITE (Earth-to-space)

The following frequency bands are exempted in terms of sub-regulation 5(2) of SCHEDULE A of the Regulations for apparatus exempt from the possession of ICASA radio frequency spectrum licences that transmit an EIRP of 250 mW or less and must operate in accordance with the specifications in Annexure B of ICASA's Radio Frequency Spectrum Regulations 2015.

Frequency Band	Apparatus
141 – 142 MHz	Remote control industrial apparatus.
148 – 152 MHz	Wild life telemetry tracking.
402 – 406 MHz	Medical Implants, Doppler shift movement detectors, wireless microphones, garage door openers and motor car alarm systems.
433.05 – 434.79 MHz	Non-specific SRDs
863 – 865 MHz	Wireless Audio Systems / Wireless microphones
865 – 868 MHz	RFID
869.25 – 869.3 MHz	Alarms
915.1 – 915.2 MHz	Real time location system
2400 – 2483 MHz	WLAN / Non-specific SRDs/ FDDA / Low Power Video surveillance
5150 – 5350 MHz	WAS/RLAN (indoor)

DEPARTEMENT VAN WETENSKAP EN TEGNOLOGIE

NO. 926 **14 JUNIE 2019**

KENNISGEWING VIR DIE VRYSTELLING VAN RADIOFREKWENSIE SPEKTRUM VIR GEBRUIK BINNE DIE KAROO SENTRALE ASTRONOMIEVOORDEELGEBIEDE

Voormalige Minister van Wetenskap en Tegnologie, Eerwaarde Mmamoloko Kubayi-Ngubane, het haar besluit rakende die voorgestelde vrystelling van radiofrekwensiespektrum, vir gebruik binne die Karoo Sentrale Astronomievoordeelgebiede (KCAAAs), gepubliseer in die Staatskoerant No. 42399, onder Kennisgewing No 583, op 12 April 2019, om die openbare deelnameproses, soos voorgeskryf deur Regulasie 3 van Skedule B van die KCAAA Regulasies vir die beskerming van die KCAAAs (die KCAAA Regulasies), gemaak kragtens die Wet op Geografiese Astronomievoordeel, 2007 (Wet No. 21 van 2007) (AGA Wet) , af te sluit.

In ooreenstemming met Regulasie 3 (4) van Bylae B van die KCAAA Regulasies, en met instemming van die Onafhanklike Kommunikasie-owerheid van Suid-Afrika (ICASA), publiseer ek, Dr. Bonginkosi Emmanuel Nzimande, Minister van Hoër Onderwys, Wetenskap and Tegnologie hiermee die radio frekwensiespektrum wat vrygestel is vir gebruik binne die KCAAA's soos uiteengesit in die aangehegte skedule.

Ingevolge Regulasie 3 (2) van Bylae A van die KCAAA Regulasies (effektief vanaf 15 Desember 2018), sal die gebruik van die radiofrekwensiespektrum tussen 100 MHz tot 25 500 MHz (25.5 GHz), binne die KCAAA's verbied wees vanaf 15 Desember 2019. Slegs die radiofrekwensiespektrum wat vrygestel is van die verbod soos vermeld in die aangehegte skedule, mag daarna gebruik word en slegs indien 'n permit uitgereik is ingevolge Regulasie 4 van Bylae B van die KCAAA Regulasies.

Alle lisensiehouers en lisensie-vrygestelde operateurs wat radio-uitsendings binne die KCAAA's uitvoer, behalwe van dié wat ingevolge regulasie 5 van Skedule A van die KCAAA Regulasies vrygestel is, moet aansoek doen vir 'n permit van die Astronomie Bestuursgesag (AMA), 'n eenheid van die Departement van Wetenskap en Tegnologie, om te kan voortgaan om binne die KCAAAs te funksioneer.

Die aansoekvorms vir permitte is gepubliseer in die Staatskoerant No. 42085 onder Kennisgewing No. 1337 op 05 Desember 2018. Hulle is beskikbaar by die Departement van Wetenskap en Tegnologie en aanlyn by die webadres: https://ama.dst.gov .za

Enige navrae aangaande hierdie kennisgewing kan gerig word aan Mnr. Mere Kgampe by telefoonnommer: (012) 843 6644 of e-pos: mere.kgampe@dst.gov.za

DR. BONGINKOSI EMMANUEL NZIMANDE, LP
MINISTER VAN HOËR ONDERWYS, WETENSKAP EN TEGNOLOGIE

SKEDULE

RADIO FREKWENSIESPEKTRUM BANDE VRYGESTEL VAN DIE VERBOD OP DIE GEBRUIK DAARVAN BINNE DIE KAROO SENTRALE ASTRONOMIEVOORDEELGEBIEDE.

1. Die band tussen 100 MHz tot 200 MHz is vrygestel van die verbod op die gebruik daarvan, vir alle bestaande radiokommunikasie uitsendings wat wettig was onmiddellik voor die uitvaardiging van die Regulasies oor die beskerming van die Karoo Sentrale Astronomievoordeelgebiede soos gepubliseer in Kennisgewing No.1411 van Staatskoerant No.41321 (Regulasies).

2. In die gepaarde bande aan mobiele dienste toegewys, is al die opskakel bande vrygestel van die verbod kragtens subregulasie 5(3) van Skedule A van die Regulasies.

3. Alle ruimte-na-aarde frekwensiebande toegewys kragtens OKOSA se Nasionale Radio Frekwensieplan, 2018, gepubliseer kragtens artikels 34(2) en 34(5) van die Wet op Elektroniese Kommunikasie, 2005, in Staatskoerant No.41650, is vrygestel van die verbod in subregulasie 3(2) van Skedule A van die Regulasies.

4. Alle toewysings moet voldoen aan die spesifikasies in OKOSA se Nasionale Radio Frekwensieplan en die Radiofrekwensiespektrum Regulasies.

TABEL VAN VRYGESTELDE FREKWENSIEBAND TOEWYSINGS VIR DIE VERKLAARDE KAROO SENTRALE ASTRONOMIEVOORDEELGEBIEDE

Frekwensieband	Toewysing aan dienste
138 – 144 MHz	VASTE
	MOBIELE
144 – 146 MHz	AMATEUR
366 – 380 MHz	STAATSDIENSTE EN OPENBARE VEILIGHEID
440 – 441 MHz	VASTE
416.1 – 417.625	MOBIELE
450 – 453 MHz	VASTE
460 – 463 MHz	VASTE
464 – 470 MHz	MOBIELE
935.2 – 946 MHz	MOBIELE
946.6 – 948.8 MHz	MOBIELE
951.2 – 959.6 MHz	MOBIELE

Frekwensieband	Toewysing aan dienste
1880 – 1900 MHz	MOBIELE
2110 – 2125 MHz	MOBIELE
2307 – 2387 MHz	VASTE
2401 – 2481 MHz	VASTE
5470 – 5720 MHz	MOBIELE
7443 – 7583 MHz	VASTE
7611 – 7751 MHz	VASTE
8282 – 8297 MHz	VASTE
8408 – 8423 MHz	VASTE
10154 – 10295 MHz	VASTE
10450 – 10500 MHz	RADIO-OPSPORING
10504 – 10644 MHz	VASTE
13.75 – 14.5 GHz	VASTE SATELLIET (Aarde-na-ruimte)

Die volgende frekwensiebande is vrygestel kragtens subregulasie 5(2) van Skedule A van die Regulasies vir toestelle vrygestel van die besit van OKOSA radiofrekwensie spektrum lisensiëring, met 'n uitgestraalde krag van 250 mW of minder, en wat in ooreenstemming met die spesifikasies in Bylae B van OKOSA se Radiofrekwensie Spektrum Regulasies 2015 gebruik moet word.

Frekwensieband	Toestelle
141 – 142 MHz	Afstandbeheer industriële toerusting
148 – 152 MHz	Natuurlewe telemetrie opsporing
402 – 406 MHz	Mediese inplantings, Doppler-verskuiwing bewegingsdetektors, draadlose mikrofone, motorhuisdeur oopmakers and motor voertuig alarmstelsels
433.05 – 434.79 MHz	Nie-Spesifieke kortaftand toestelle
863 – 865 MHz	Draadlose Klanksisteme / Radio mikrofone
865 – 868 MHz	RFID
869.25 – 869.3 MHz	Alarms
915.1 – 915.2 MHz	Intydse opsporingstelsel
2400 – 2483 MHz	WLAN / Nie-Spesifieke kortaftand toestelle / FDDA / Lae krag videowaarneming
5150 – 5350 MHz	Draadlose Toegangstelsels (WAS) & Plaaslike Radio Toegangsnetwerk (router) (RLAN) (binnenshuis)

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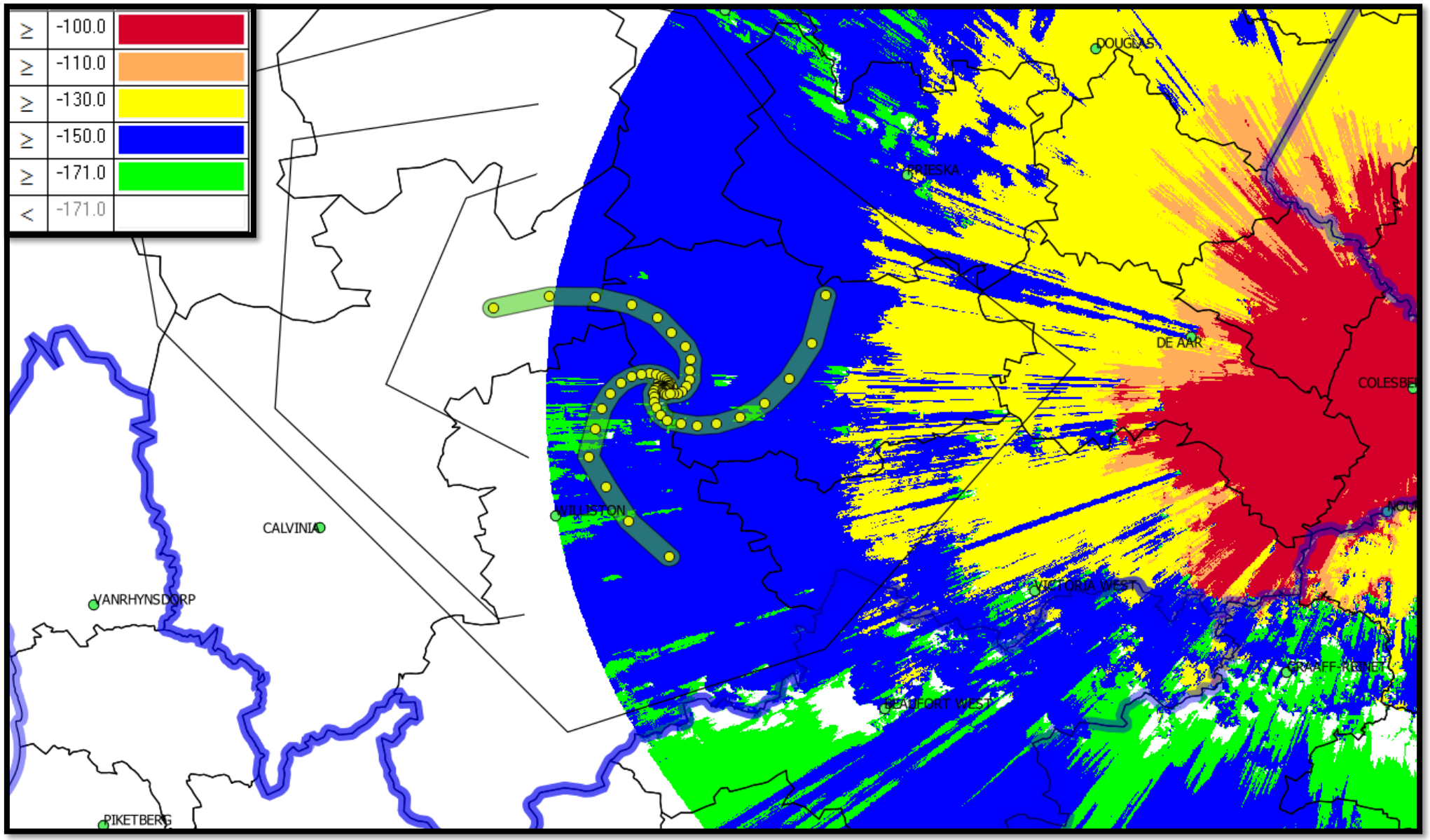
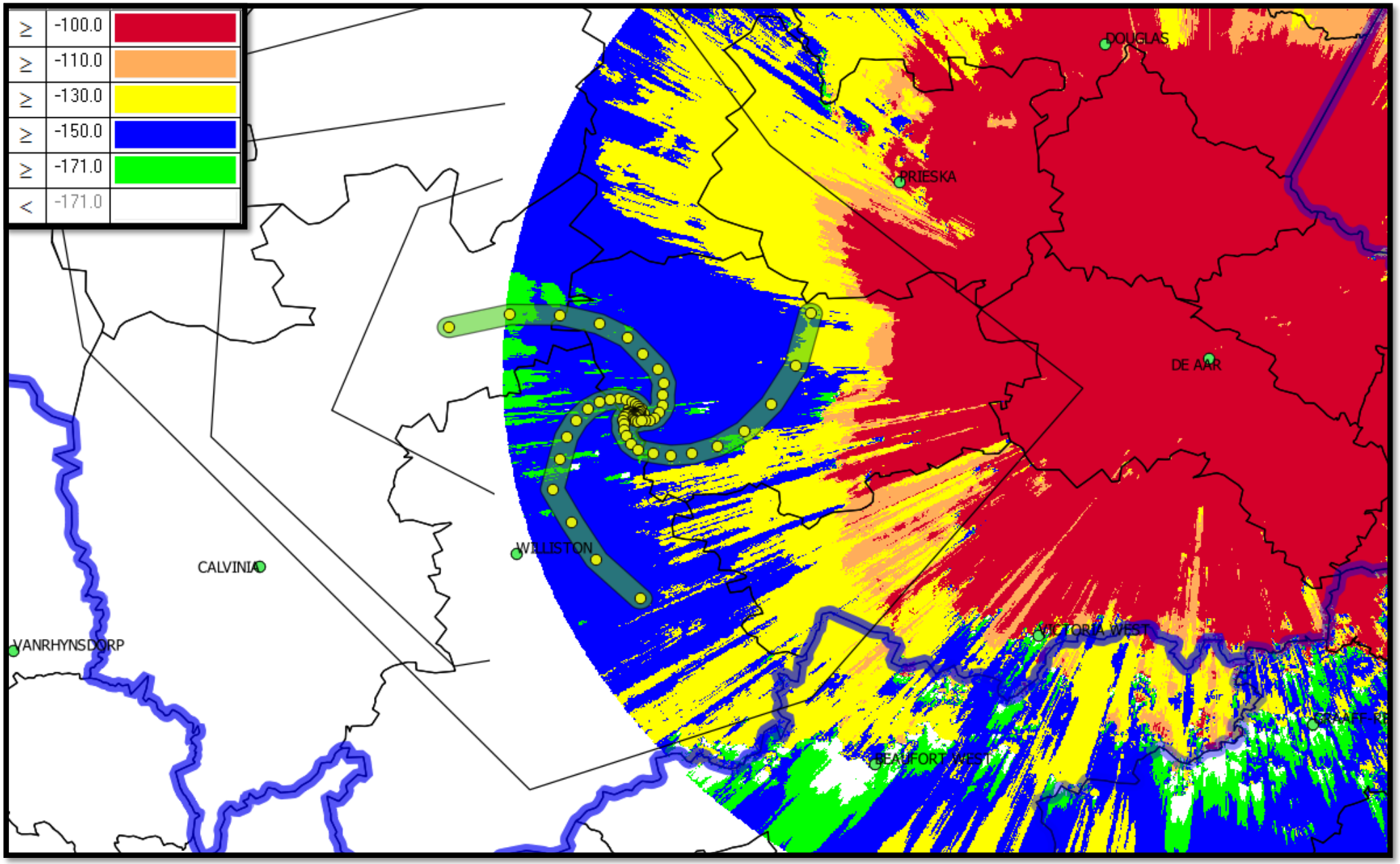
COLESBURG (dBm)



DE AAR (dBm)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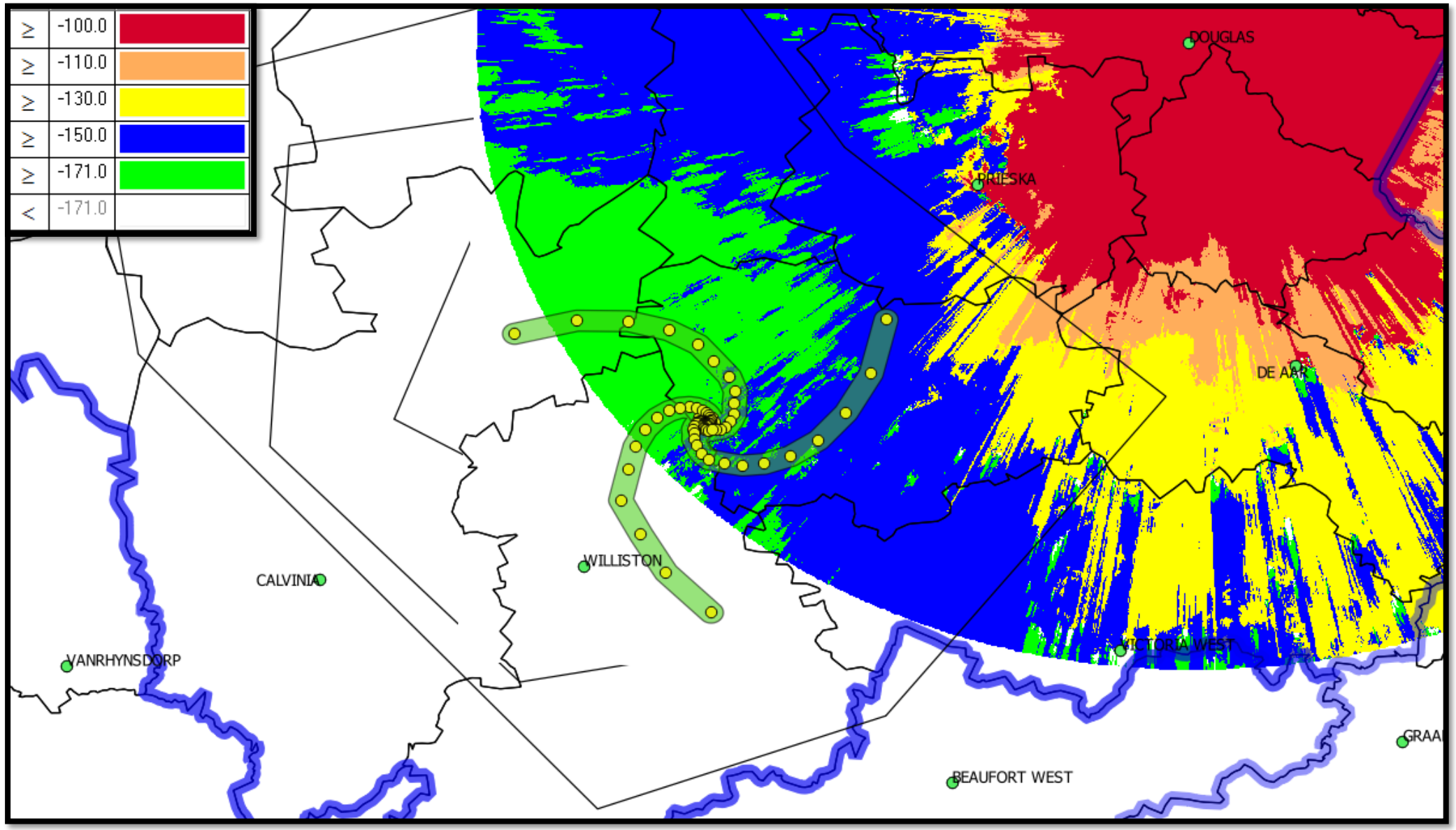
WILLISTON
CALVINIA
VANRHYNSDORP
VICTORIA WEST
BEAUFORT WEST

DOUGLAS (dBm)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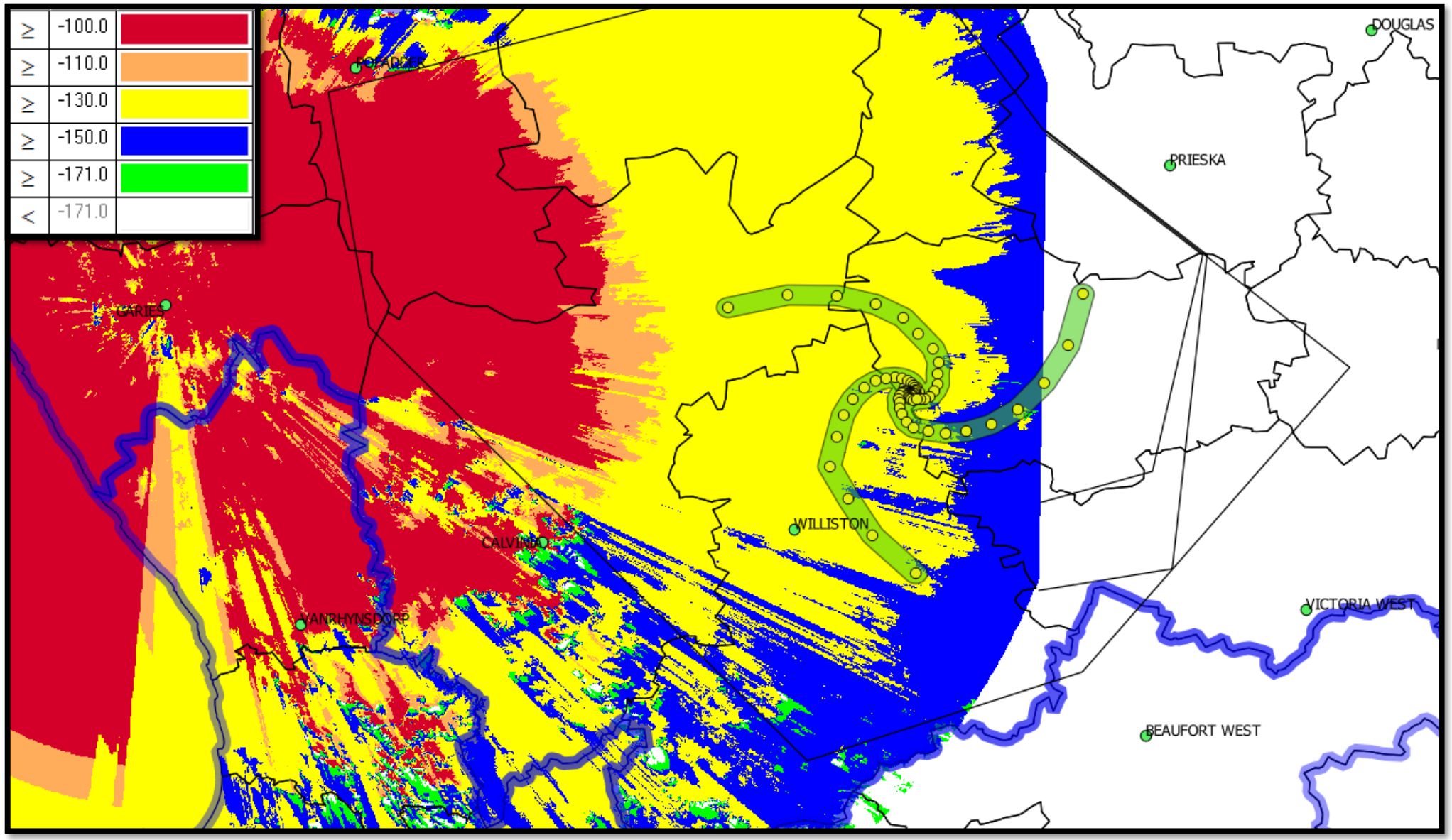
VANRHYNSDORP
VICTORIA WEST
BEAUFORT WEST

GARIES (dBm)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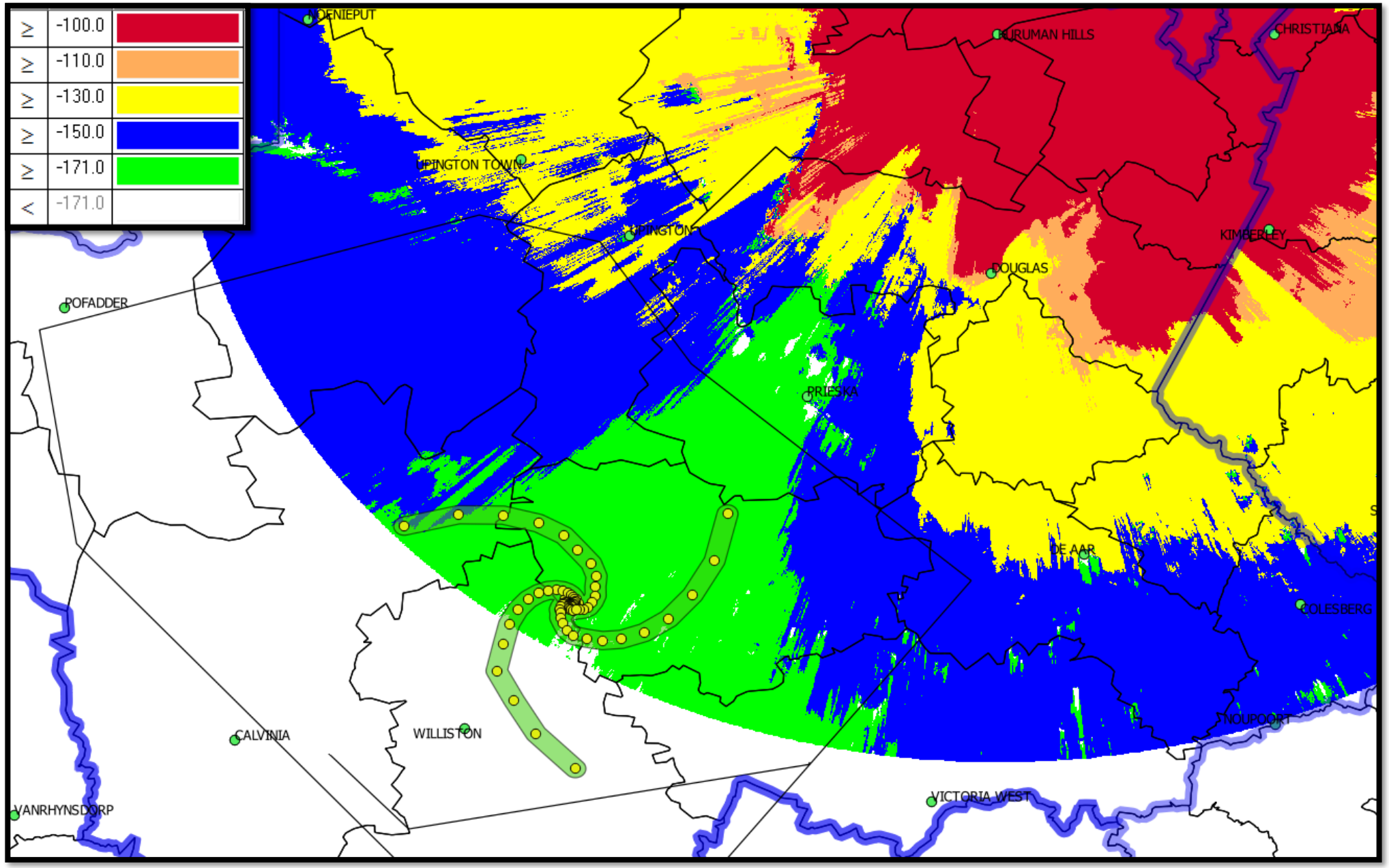
POFADDER
PRIESKA
GARIES
WILLISTON
CALVINIA
VANRHYNSDORP
VICTORIA WEST
BEAUFORT WEST

KURUMAN HILLS (dBm)



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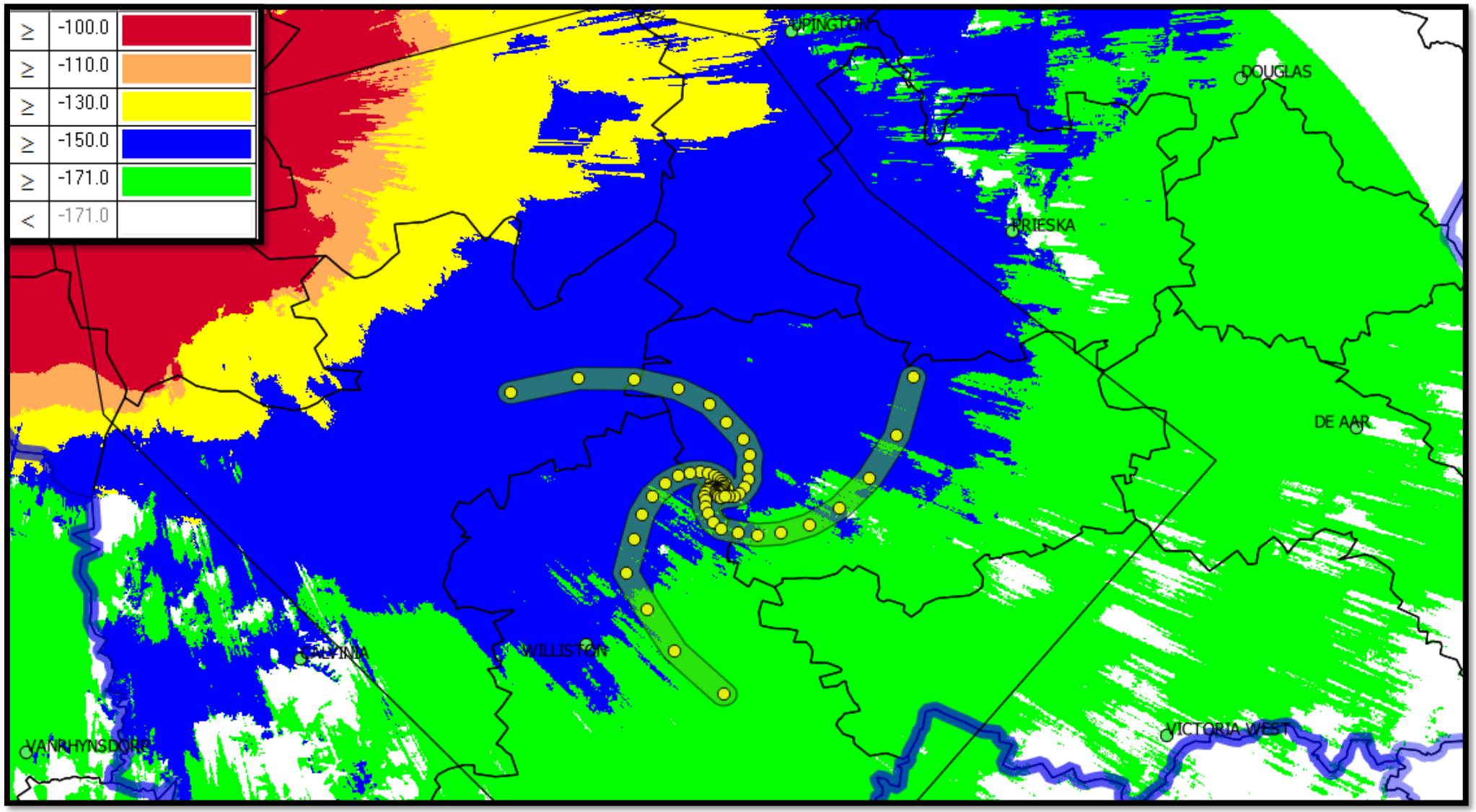

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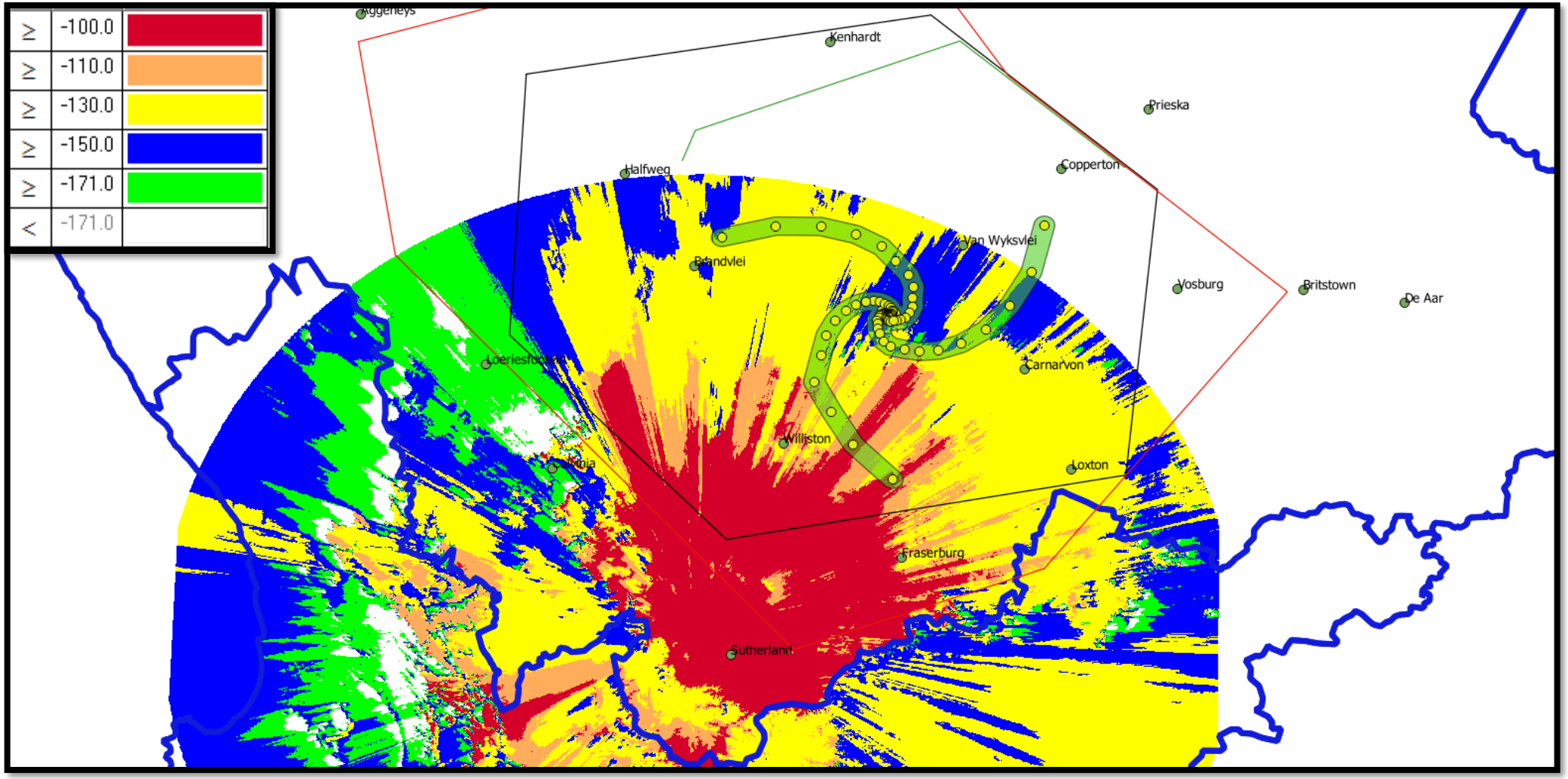

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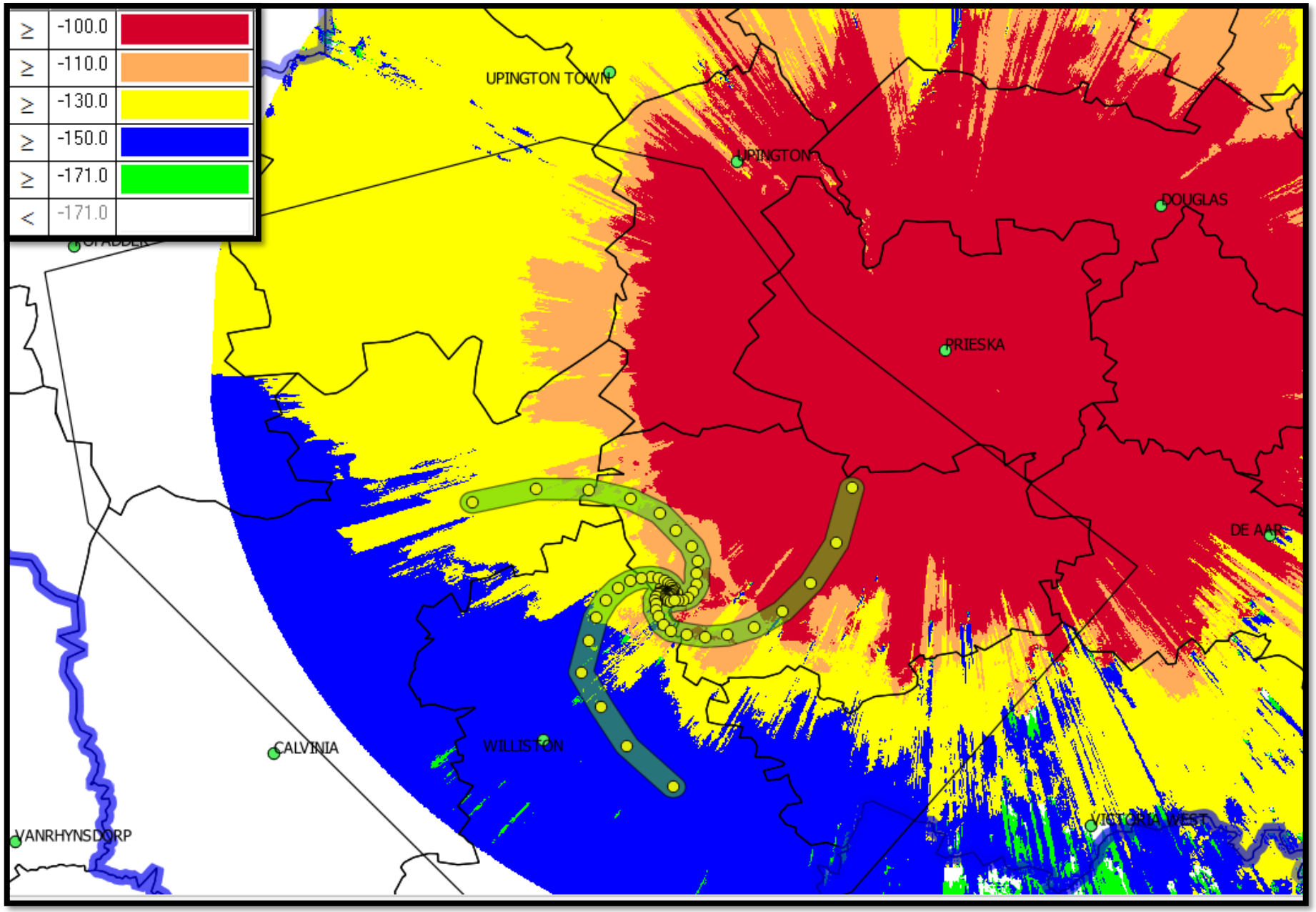
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UPINGTON
DOUGLAS
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DE AAR
CALVINIA
WILLISTON
VANRHYNSDORP
VICTORIA WEST

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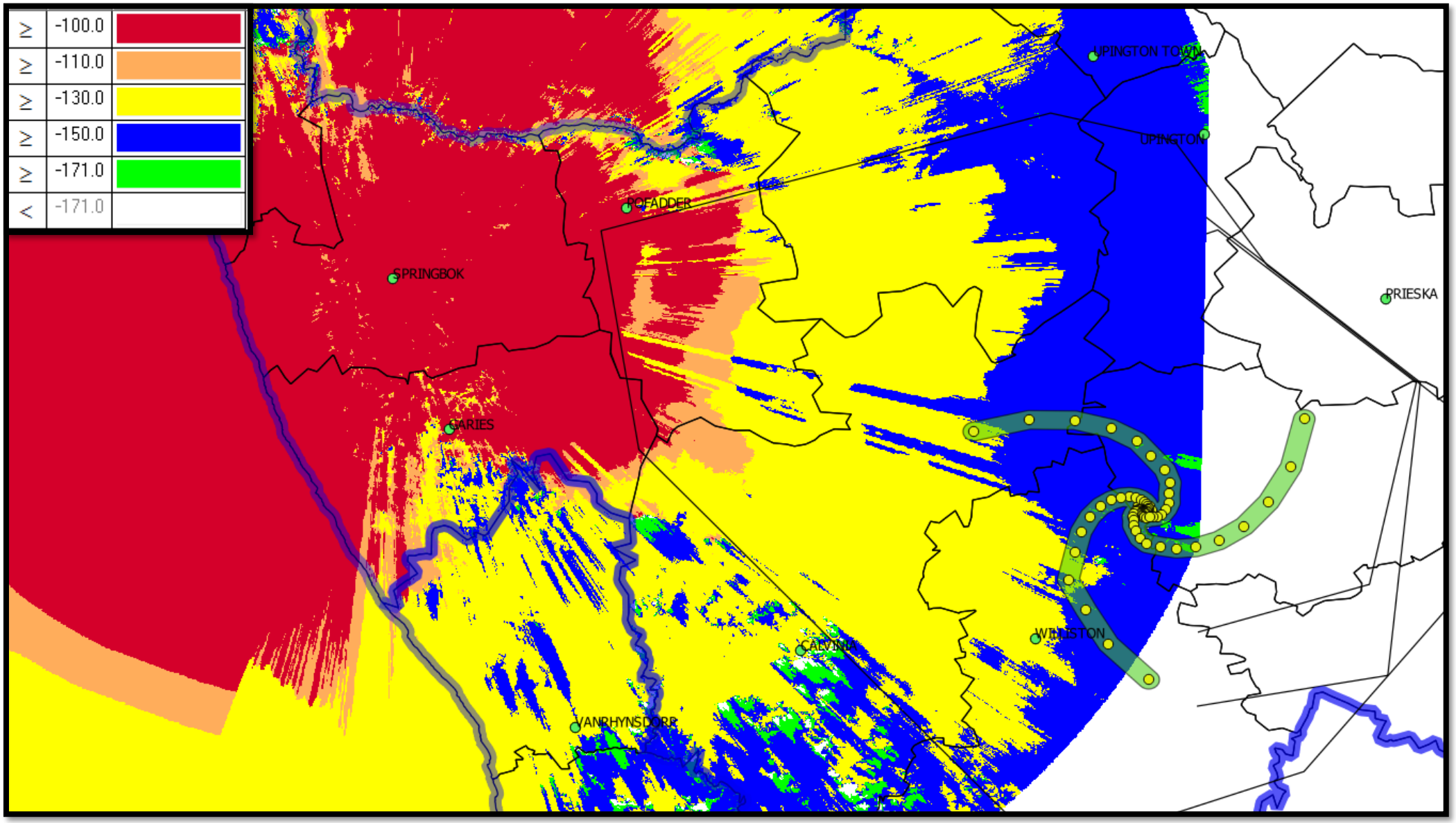

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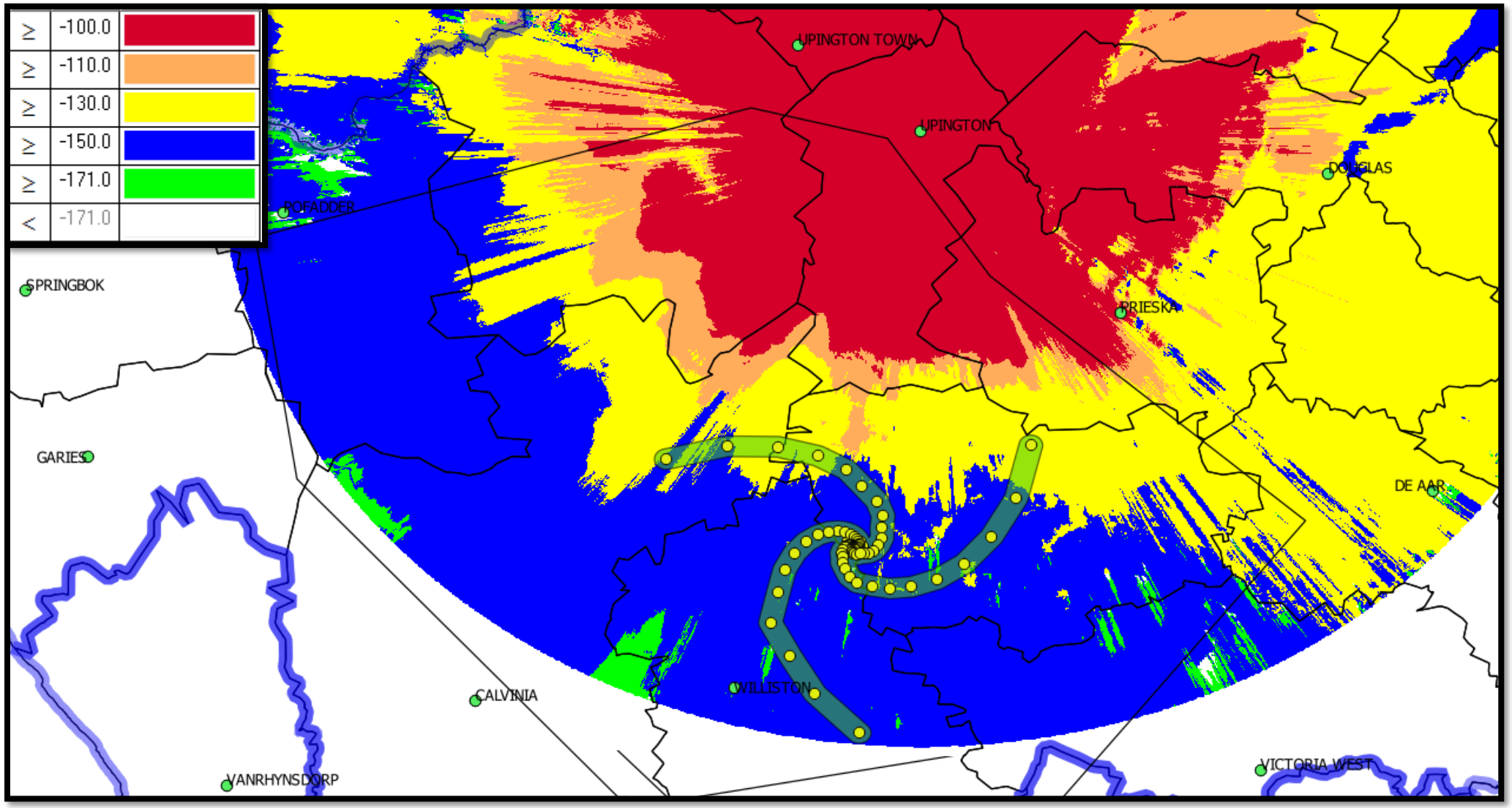
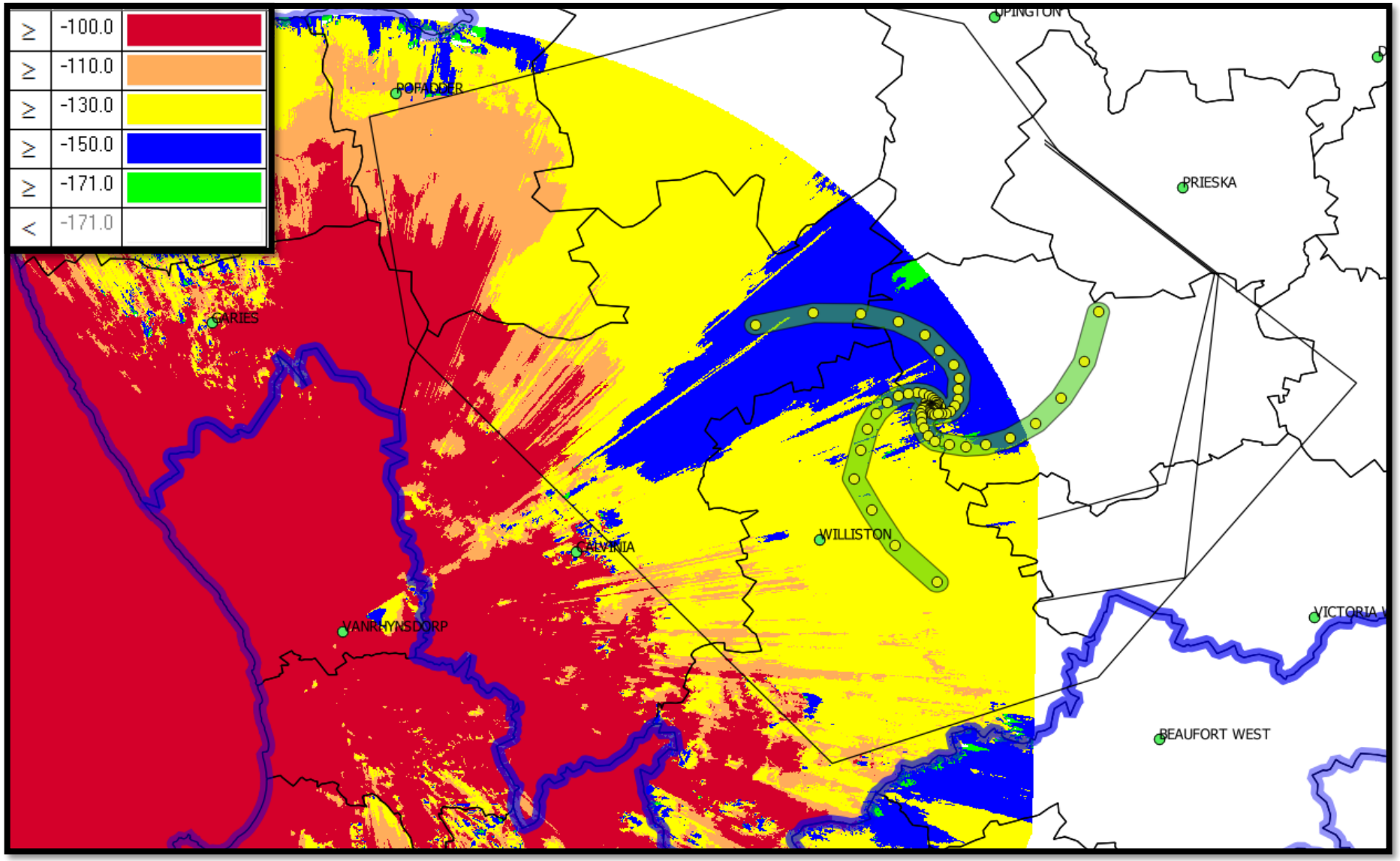


VAN RHYANSDORP (dBm)



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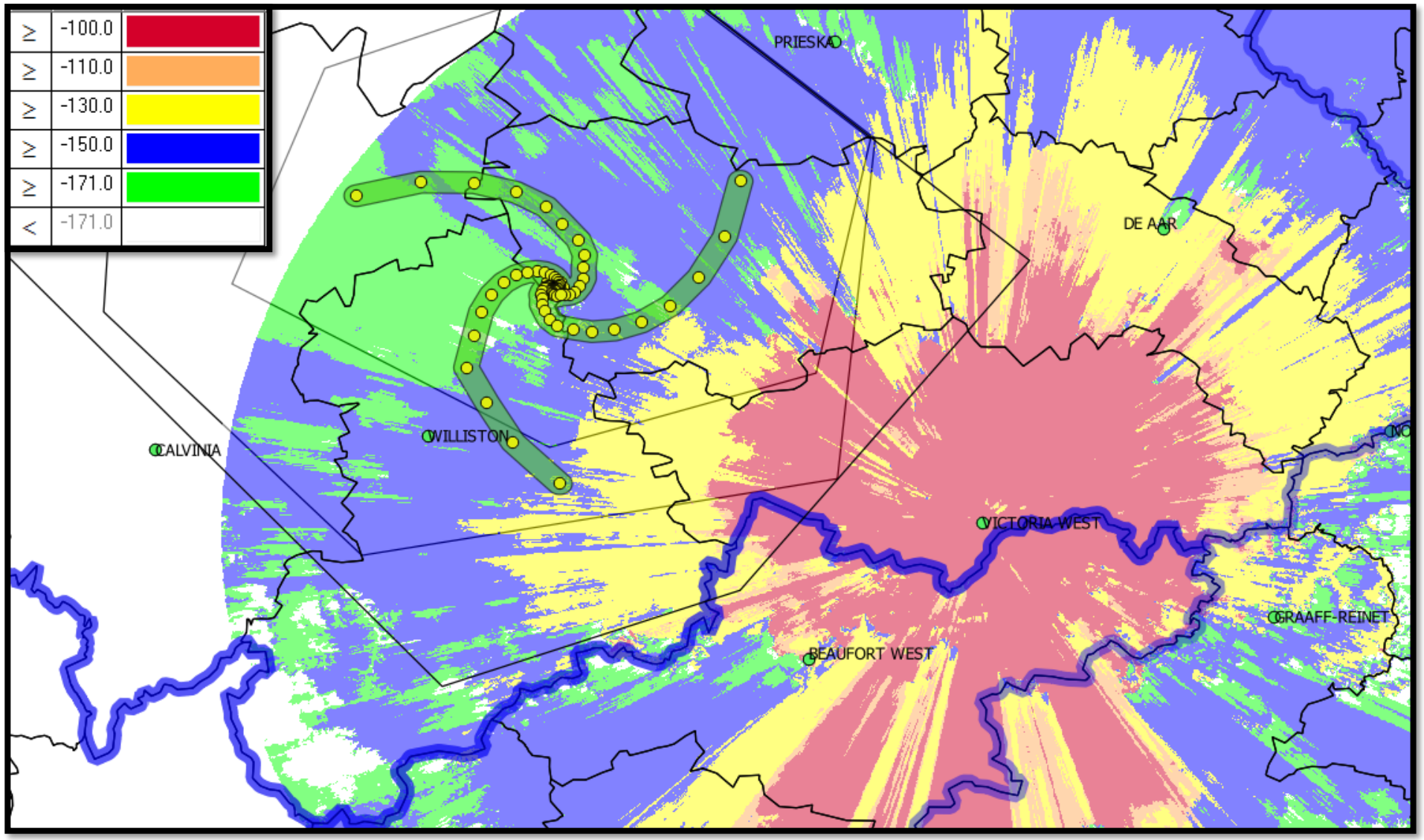

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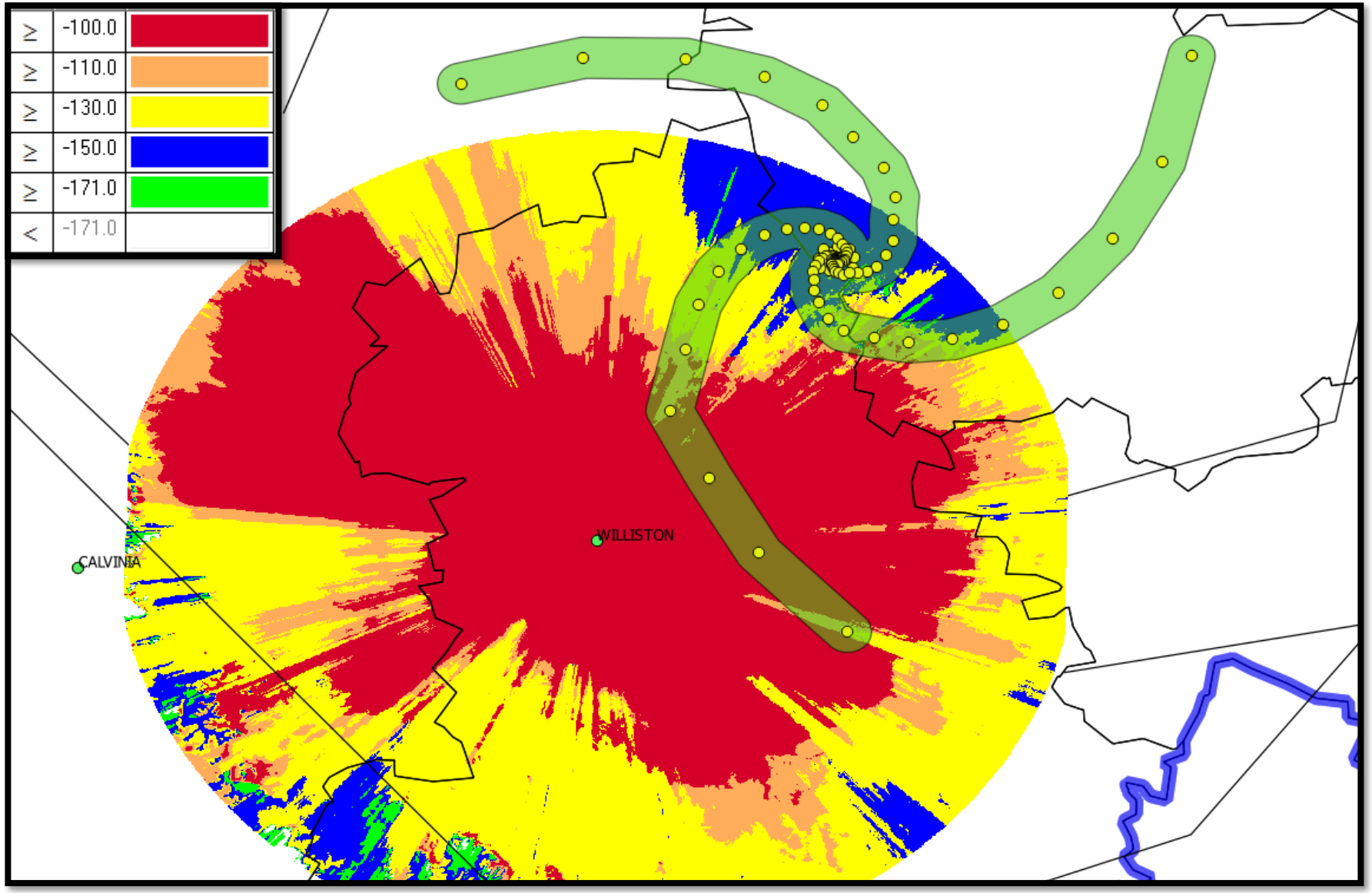

CALVINIA (dBm)