BEFORE THE INDEPENDENT HEARINGS COMMISSIONER APPOINTED BY THE INVERCARGILL CITY COUNCIL

UNDER	the Resource Management Act 1991
IN THE MATTER	of Part 8 of the Act
BY	**SPACE OPERATIONS NEW ZEALAND LIMITED** Requestor

SUPPLEMENTARY STATEMENT OF EVIDENCE OF ROBIN MCNEILL

Dated: 2 November 2026

Todd Walker

Solicitor acting
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Supplementary statement of evidence of Robin McNeill

Introduction

[1] My name is Robin Gustav McNeill. I am the CEO of Space Operations New Zealand Limited (**SpaceOps NZ**). My qualifications and experience are as set out in my evidence in chief dated 14 September 2026.

[2] The purpose of this supplementary statement of evidence is to address the electromagnetic interference (**EMI**) issue that arose during the hearing.

RSM protection zone

[3] as explained in the course of the hearing, Radio Spectrum Management (**RSM**) has removed the protection zone around Awarua, Warkworth from PIB 38. SpaceOps was not aware of this occurring until it was discovered after the hearing had commenced. The *Public Information Bulletin PIB 38* which details the RSM decision on this matter can be found at:

https://www.rsm.govt.nz/assets/Uploads/documents/pibs/radio-licence-certification-rules-pib-38.pdf

[4] The most relevant are sections 5.7, 5.9 and 5.10.

[5] Nevertheless, based upon calculations below and in the email from RSM attached as **Appendix 1**, it shows that the new RSM determination arrives at the same EMI limitation condition that SpaceOps NZ initially asked for in condition 3 of the notified NoR being (-154 dBW/MHz).

[6] While the RSM decision removes the special protection previously accorded to Warkworth, Mahia, and Awarua in S-Band, the new *PIB 38* part 5.7 means that someone with knowledge of SpaceOps NZ's receiving antennas' "system noise temperatures" and the gain of those antennas would arrive at values close, or identical, to the initial sought restriction of -154 dBW/MHz. The attached email from RSM also further demonstrates this.

[7] In addition, the new *PIB 38*:

(a) Includes out-of-band transmissions (for example, a transmitter nominally transmitting at 1100 MHz could quite possibly have a second harmonic at 2200 MHz inadvertently also being transmitted). Out-of-band transmissions are normally unintentional or designed to be sufficiently low that they are considered acceptable.

(b) Means that signals are cumulative (for example, if there was one transmitter transmitting with power arriving at Awarua at -155 dBW/MHz (which would be acceptable under the rule) and then a second transmitter transmitted at almost identical frequency and at the same power, the -154 dBW/MHz limit would be exceeded as the cumulative signal power would be increased by 3dB (the same as doubling), i.e. a resultant cumulative power of -152 dBW/MHz, which would be unacceptable under the rule.

Consequence of RSM decision on proposed EMI conditions

[8] Given there are so many radio receiving protection licences at Awarua SGS, it would be difficult for someone unfamiliar with SpaceOps NZ's existence or operation to easily ascertain that any transmission from their proposed radiator would have to ensure that they had to meet the more stringent -10 dB noise/signal limit set out in the new *PIB 38*.

[9] For this reason, SpaceOps NZ considers it reasonably necessary and appropriate to continue with the initially requested NoR condition 3, based on -154 dBW/MHz so that any other party considering obtaining a licence would be aware of the need to proceed with caution.

[10] In effect this means that the RSM decision is now more protective than the previous method of protection zones, and condition 3 as sought in the NoR, is less restrictive than what could be enforced under the *Radiocommunications Act*.

[11] In order to provide more clarity on the EMI condition as proposed in the hearing, the following wording would be suitably applied:

Condition 1:

a. Electromagnetic Interference Limitation Area: all land and airspace within a 2 km radius measured from any point of the boundary of Designation 97 – Awarua Satellite Ground Station and Ancillary Operations, being Lot 1 DP 483454, Lot 1 DP 524692 and Lot 2 DP 524692, as it relates to electromagnetic interference from terrestrial radiocommunication services covered by either individual radio or spectrum licences, or General Use Radio Licences (GURL).

Condition 3

Within the Electromagnetic Interference Limitation Area shown on the Designation Plan, no new individual terrestrial radiocommunication service established after [date of confirmation of designation] shall cause interference to Space Operations New Zealand Limited within the 2200–2290 MHz frequency range that exceeds -154 dBW/MHz at the input of a Space Operations receiver. This includes any out-of-band or spurious emissions as defined in *ITU Radio Regulations* (Article 1, Section VI), namely:

"1.144 out-of-band emission*: Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

1.145 spurious emission*: Emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions."

Dated: 2 November 2026



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Robin McNeill

Appendix 1: Email from RSM

From: Lucy King
Sent: Thursday, 15 October 2026 3:24 pm
To: Lucy King
Subject: FW: Space Ops supplementary evidence

From: Michal Falatas <Michal.Falatas@mbie.govt.nz>
Sent: Monday, 28 September 2026 10:42 am
To: Graham Hulston <graham@rhwtelecommunications.co.nz>
Cc: Craig Scott <Craig.Scott2@mbie.govt.nz>; Robin McNeill <robin.mcneill@spaceops.nz>
Subject: RE: PIB 38: Removal of S Band protection areas for Awarua SES, Warkworth SES and Rocket Lab Mahia Peninsula UNCLASSIFIED

NOTICE: This email has been sent to you from outside the organisation

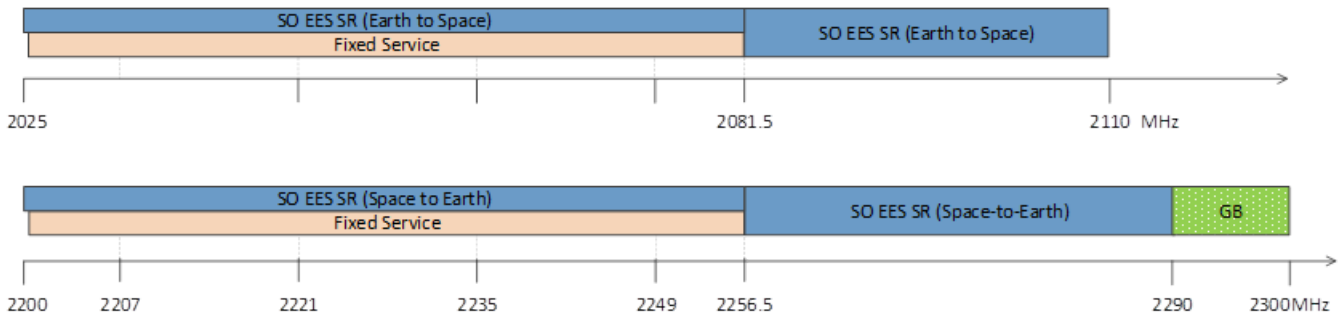
Hello Graham,

Thanks for your enquiry.

This material was removed as it conflicts (or is confused with) the protection criteria / co-channel interference criteria of '10 dB below the receiver noise floor for Earth station receivers.'(-10 dB I/N) in section 5.7 of PIB 38. The now removed 'Earth station receive-protection zone' did not provide useful protection measures for stations of the Space Operations Service and in many cases provided less protection than section 5.7. If Approved persons applied the Earth station receive-protection zone alone this could be problematic. The following considerations apply:

1. The Earth station receive-protection zone was specific to 2200–2290 MHz (space to Earth) and co-frequency fixed link stations only
2. The 2 km protection area radius, is insufficient to provide protection (i.e. potential interference from fixed link stations can come from >10s of km away depending on propagation characteristics etc)
3. The figure of -154 dBW/MHz figure does not have receive system associated with it (no antenna type / gain, feeder loss etc) and is anywhere within the protection area. The assumption here is that it is to a receive system with an isotopic antenna and no feeder loss (0dBi antenna gain and 0dB feeder loss)
4. If we take one of the licences you have engineered (LIC ID 404221), this has a minimum elevation of 5 degrees, a 3.7 m parabolic, 35.5 dBi on boresight gain, S.580 antenna pattern and a system noise temperature of 290K. This results in a calculated Receiver noise floor of ~ -144 dBW / MHz, applying the protection criteria of -10 dB I/N this would result in ~-154 dBW / MHz
5. If we applied the Earth station receive-protection zone area figure of -154 dBW/MHz (with 0dBi antenna gain and 0dB feeder loss) and applied the characteristics from LIC ID 404221, the resulting power at the receiver would be ~ -139 dBW / MHz (-154 dBW/MHz + 15 dBi – approximate antenna gain towards the horizon at 5 degrees elevation) which provides ~15 dB less protection than section 5.7

For reference we have included the band plan diagram.



2025 – 2081.5 MHz and 2200 – 2256.5 MHz is on a sharing use between terrestrial and non-terrestrial service
2081.5 – 2110 MHz and 2256.5 – 2290 MHz is exclusivity allocated to non-terrestrial service

With regards,

Michal Falatas
Principal Engineer- Licensing
Radio Spectrum Management
Market Integrity - Te Whakatairanga Service Delivery Branch
Ministry of Business, Innovation & Employment

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RADIO SPECTRUM MANAGEMENT

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

New Zealand Government

From: graham@rhwtelecommunications.co.nz <graham@rhwtelecommunications.co.nz>
Sent: Monday, 31 August 2026 11:40 am
To: Michal Falatas <Michal.Falatas@mbie.govt.nz>
Cc: Craig Scott <Craig.Scott2@mbie.govt.nz>; 'Robin McNeill' <robin.mcneill@spaceops.nz>
Subject: PIB 38: Removal of S Band protection areas for Awarua SES, Warkworth SES and Rocket Lab Mahia Peninsula

Hi Michal

In the attached update to PIB 38 in 2021 it added the use of S band for SES services and the following protection areas:

6.6.3 Earth Station receive coordination zone

There are a number of coordination zones allocated for space services with the following paramet

1. Each coordination zone is centred on a point location, as shown in Table 19;**Error! Refere source not found.**
2. Each coordination zone has a radius of 2 km from that point location; and
3. The coordination frequency range is 2 200 – 2 290 MHz.

The permissible interference level from terrestrial services in 2 200 – 2 290 within the coordinatio shall be less than -154 dBW/MHz[13].

Table 19 Satellite Earth Station receive protection zones

Location Name	Geo-reference (NZGD2000/WGS84)	Protection area radius (km)
Warkworth Earth Station	-36.43235 174.66834	2
Awarua Earth Station	-46.52864 168.37913	2
Mahia Peninsula	-39.24054 177.87585	2

I note in the July 2025 update to PIB 38 (attached) that this section has been removed from the section given as "Space service coordination with terrestrial service"

What is the reason for this removal? This of particular concern to Space Operations New Zealand Limited and will be to Rocket Lab who I do radio licensing work for also.

Regards
Graham Hulston

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