Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title: RSA for Receive-Only Earth Stations in bands 1690-1710 MHz, 3600-4200 MHz and 7750-7850 MHz

To (Ofcom contact): RSAconsult@ofcom.org.uk

Name of respondent: Mr A.G. Reed
Representing (self or organisation/s): INTELSAT

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing [√]

Whole response [ ]

Part of the response [ ]

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If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. [ ]

Name Signed (if hard copy)

Intelsat response to Ofcom consultation document on RSA for receive-only earth stations in the bands 1690-1710, 3600-4200 and 7750-7850 MHz

Intelsat is a Fixed Satellite Service (FSS) operator that currently has 54 satellites in orbit, many of them providing coverage in the C-band. Any modifications to the regulatory conditions for the provision of service in the 3600-4200 MHz are of grave concern and will directly impact our operations. It is our view that Ofcom should conduct further consultations with stakeholders on this matter, and we respectfully request that Ofcom make further efforts to better understand the view of industry and, in particular, mechanisms other than the Recognized Spectrum Access ("RSA").

While there is a need to protect receive-only earth stations in the C-band, Intelsat believes that RSA is not a proportionate mechanism to achieve this purpose. Specifically, the conversion to licences and tradability aspects of RSA are not appropriate for the purpose of protection of FSS earth stations from harmful interference. Rather, Intelsat believes that a straightforward registration approach of earth stations would be a more appropriate tool.

Intelsat is a member of both the European Satellite Operator Association ("ESOA") and the Satellite Action Plan Regulatory Working Group ("SAP REG") and has contributed to, and supports, the joint comments of these two organizations. In this response we would like to provide additional comments on specific sections of the consultation document.

General

3.8 "*In each of the bands that are covered by this consultation, receive-only earth station operators have asked us to introduce RSA.***"**

Ofcom is requested to let responders know the number of receive-only earth station operators who made the request in respect of the band 3600-4200 MHz, and whether the requests were specifically for RSA or simply for a mechanism that would ensure interference protection for their stations. We request that Ofcom clarify the basis for the initiation of this consultation process.

4.3 "*RSA cannot be mandatory, even in bands in which it has been made available. It will remain perfectly lawful to operate receive-only earth stations without RSA*"

We ask that Ofcom clarify how it would proceed if the operator of an existing receive-only earth station has made Ofcom aware of its location and parameters, but has **not** applied for RSA, and Ofcom receives a licence application for a new terrestrial station nearby likely to cause harmful interference to the existing receive-only station. In our view it would be unreasonable for Ofcom to issue the licence without requiring action to be taken to limit the interference to an acceptable level.

4.54 "*Although the use of spectrum by receive only earth stations is passive, their use of the spectrum is as legitimate as the active use of the same frequencies by fixed link and BWA transmitters*"

In the light of this true statement, it is considered that the licences of incoming terrestrial stations should require them to deploy those stations in such a manner that they do not cause interference exceeding the protection criteria of existing receive-only earth stations.

4.58 "*Broadband Wireless Access (BWA) has also been introduced with a BWA operator holding a national licence for 2x84 MHz of the band and the BWA base stations required to co-ordinate with existing licensed FSS and FS receivers in the band*."

It is assumed that a similar requirement will be included in the licences of any other BWA operators issued in the future, and that it is by requiring operators of terrestrial station to coordinate with

receive-only earth stations that Ofcom intends to ensure the protection of such earth stations. Confirmation by Ofcom is requested.

Consultation questions

The Case for Introducing RSA

Question 6: Do you agree that RSA for receive-only earth stations could provide greater security against interference and help promote optimal use of the 1690 - 1710, 3600 - 4200 and 7750 - 7850 MHz bands? If not, please explain why and describe any alternative mechanism that you consider to be necessary.

2.22 "*Typical uses for FSS services are:*
- *broadband access and data connectivity in remote locations*"

It is considered that this should be worded "... connectivity especially in remote locations." FSS spacecraft cover heavily populated areas as well as remote locations.

2.26 "*We are required to exempt receive-only earth stations from individual licensing and so have no information about their geographical location or the frequencies on which they operate*."

Intelsat believes that Ofcom can get access to this information through a registration scheme without the tradability and convertibility aspects of RSA.

4.27 "*The impact area on 4 GHz fixed links derived for a typical 4 GHz receive earth station was 2,320 km*^{2}"

As an example (detailed in Figure 1 of the Annex to these comments), using typical BWA base station transmit parameters, a 90m terrain data-base, and modelling propagation on ITU-R Rec. P.452, the area around a hypothetical receive-only earth station in London within which interference from a BWA base station would exceed the long-term criterion (I/N not to exceed -10 dB for more than 20% of the time) was found to span around 80 km E/W and 50 km N/S. Similarly Figures 2, 3 and 4 show that the corresponding contours would span around 60 km E/W & 80 km N/S for an earth station in Coventry, 70 km E/W & 50 km N/S for an earth station in Glasgow, and 60 km E/W & 70 km N/S in Belfast. These results suggest that the area of 2320 km^2, which corresponds to E/W & N/S spans of only about 48 km, would be too small for use as the basis for Ofcom to ensure protection in typical actual cases. The corresponding contours within which the short-term protection criterion would be exceeded would be considerably larger. There is a need for Ofcom to spell-out the basis and procedure it will use to ensure the actual protection of an existing receive-only earth station from interference by an incoming terrestrial station.

4.56 "*...the introduction of RSAs has the potential to reduce the remaining pool of spectrum / locations available for new fixed link licenses and, in the 3600 – 4200 MHZ band, for new BWA deployments*"

Under current regulations the band 3800-4200 MHz is not available for BWA deployments serving mobile users. We ask that Ofcom clarify this in any further published documents.

4.59 "*...the introduction of mobility to the existing BWA licence in the band has led some FSS stakeholders to express concern that their services may be impacted*."

In order to serve mobile users in all parts of their cells, BWA base stations need to transmit in all directions in and near the horizontal plane. This makes it considerably more difficult to protect an earth station in the vicinity from interference by BWA base stations serving mobiles, than to protect it from interference by terrestrial point-to-point links. See Annex for examples.

4.68 "*The alternative to granting RSA would be to create a registration scheme. ... ‧ ‧ ‧ ‧ ‧ if we were to create a registration scheme, we would still have to do the same work to implement a registration scheme*"

These words imply that, in the case of a registration scheme, Ofcom would take similar action to ensure the protection of registered receive-only earth stations to that which it would take in the case of stations granted RSA. This would meet the main requirement of the satellite community. It is further assumed that registration would not include the tradability and convertibility features proposed for RSA. For us, registration along these lines would be substantially preferable to RSA.

Short answer to Question 6

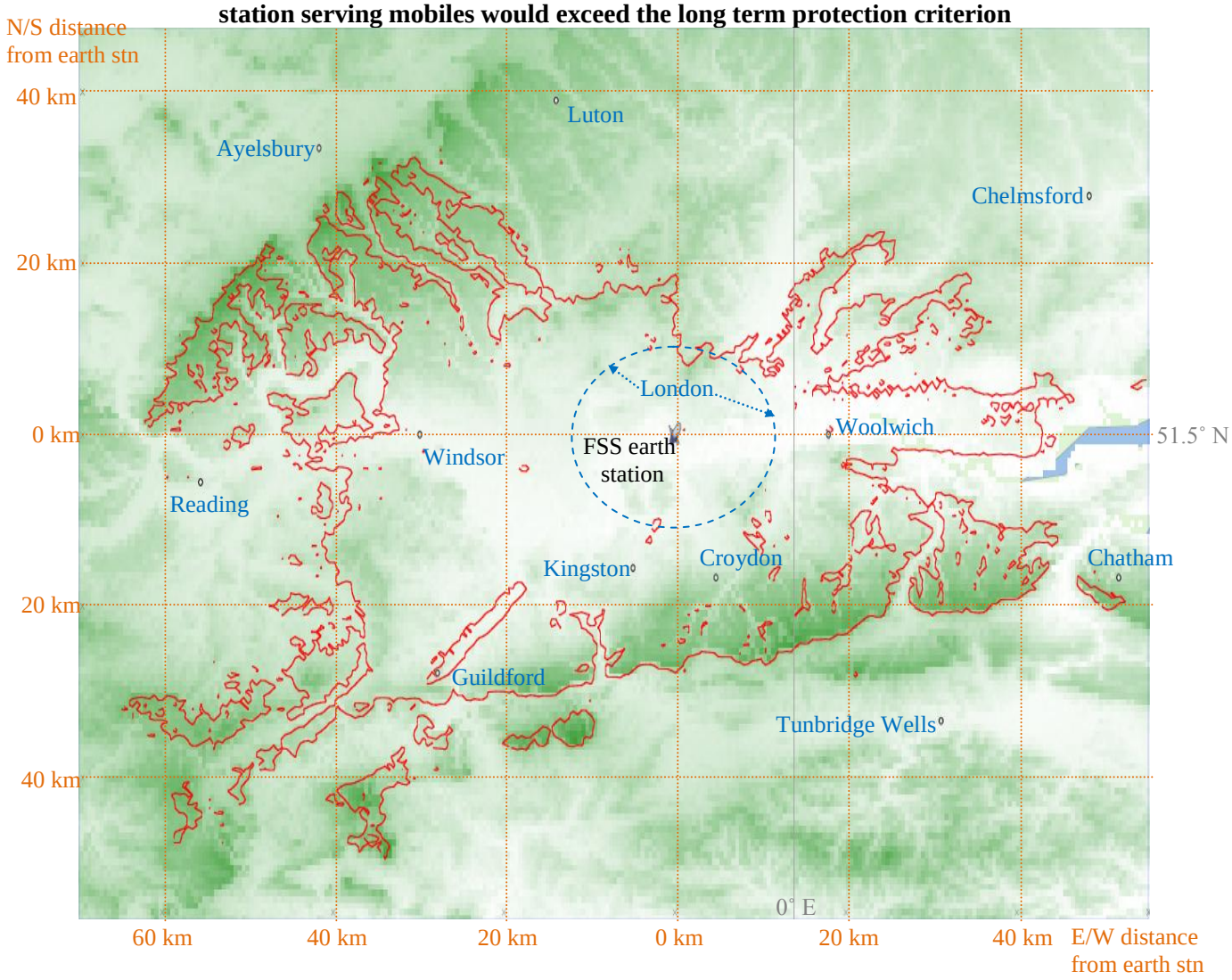
RSA as proposed in the consultation document would not improve security against interference from any terrestrial station in operation prior to the grant of RSA. With respect to such a terrestrial station a receive-only earth station originally brought into service (on a licence-exempt basis) before the deployment of the terrestrial station would still not be protected even if it had been granted RSA. Intelsat ask that Ofcom clarify their approach in such a circumstance.

The document implies that a Registration scheme would provide a receive-only earth station with the same level of security against interference as RSA, but would not include the tradability and conversion-to-licence ability proposed for RSA. If this is so, then Intelsat would consider registration to be a much better option than RSA. In our view Ofcom should issue a consultation document on such a Registration scheme and invite responses to it, before taking a decision on RSA in respect of the band 3600-4200 MHz.

Annex *See next page*

ANNEX

Figure 1
Contour around FSS earth station in London within which interference from a BWA base station serving mobiles would exceed the long term protection criterion



Frequency – 3700 MHz

Earth station location – 51.5˚N/0.2˚W

Earth station antenna diameter – 9 m, and height above ground – 5 m

Satellite longitude – 38.33˚W (so earth station antenna elevation angle is approximately 20˚)

Earth station receive system noise temperature – 93˚K

Earth station antenna receive gain pattern – as defined by ITU-R Recommendation S.465-5

Earth station protection criterion – I/N not to exceed -10 dB for more than 20% of the time

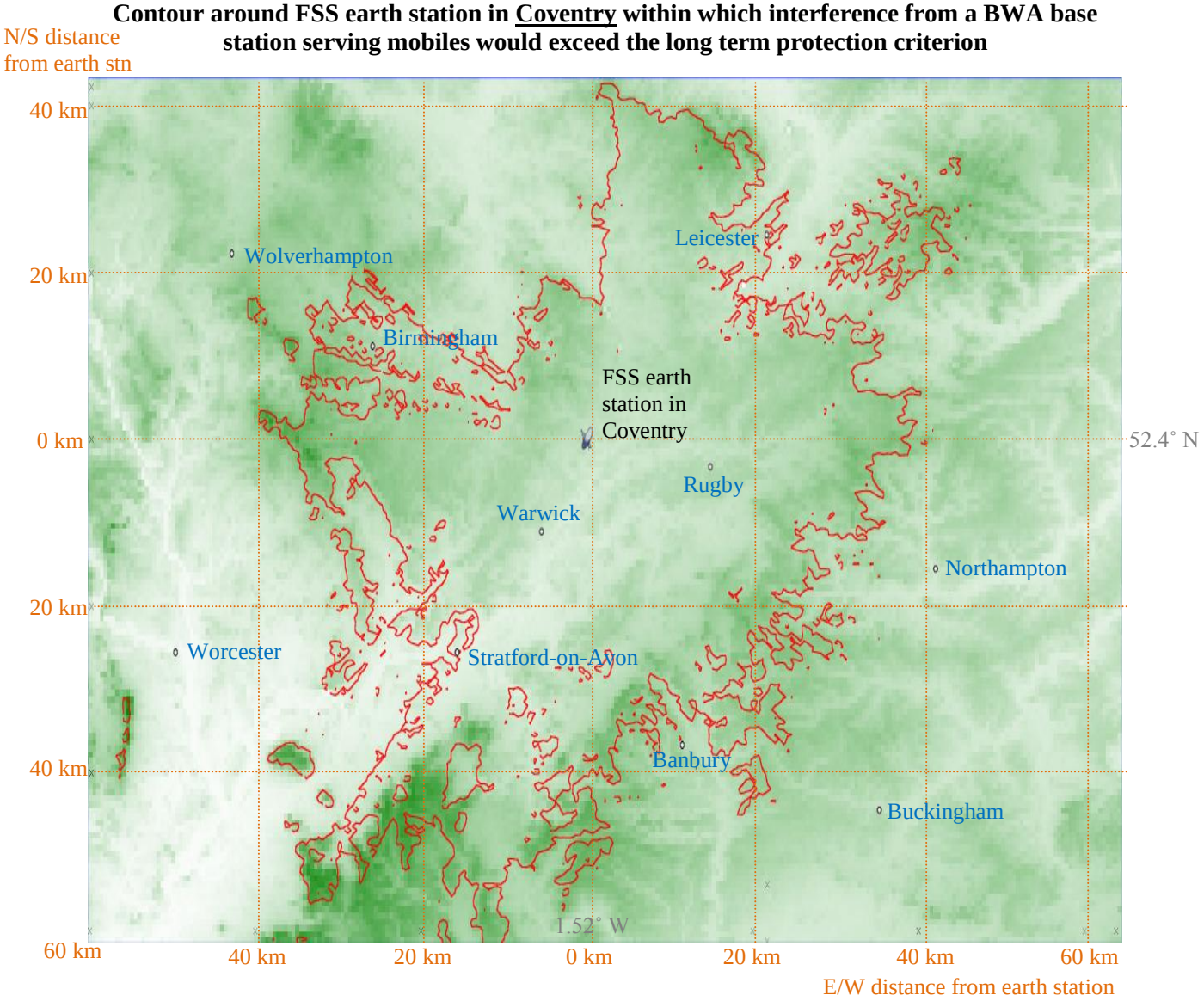
BWA base station peak e.i.r.p. density – 24 dBW/MHz

BWA base station antenna gain pattern – as defined by ITU-R Rec. F.1336 for 120° sector antennas

BWA base station antenna down-tilt – 2˚ (so e.i.r.p. density in horizontal directions is 16 dBW/MHz)

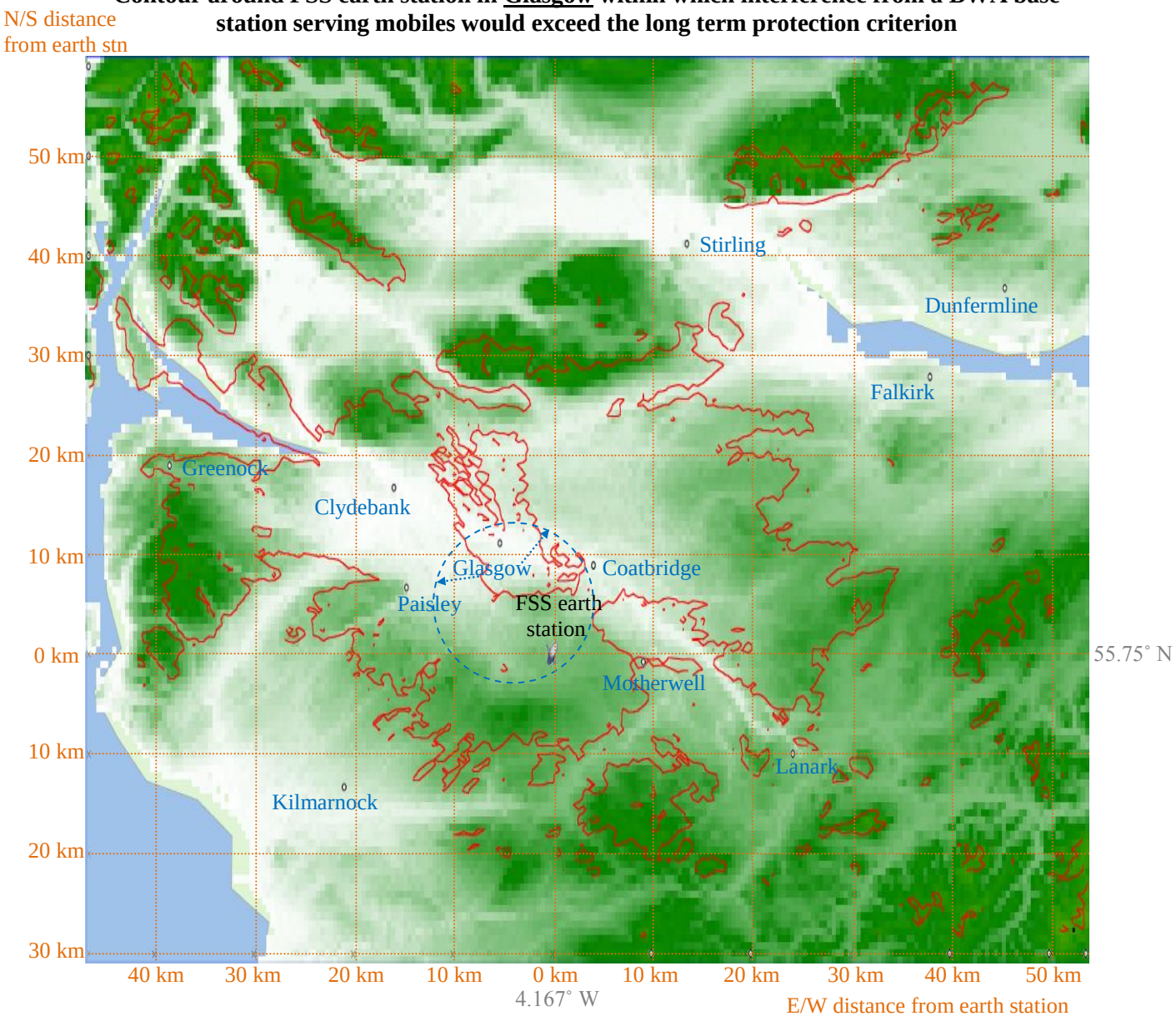
Propagation loss on interference paths – computed using the algorithms in ITU-R Rec. P.452-14 and a 90 m terrain data-base.

Figure 2
Contour around FSS earth station in Coventry within which interference from a BWA base station serving mobiles would exceed the long term protection criterion



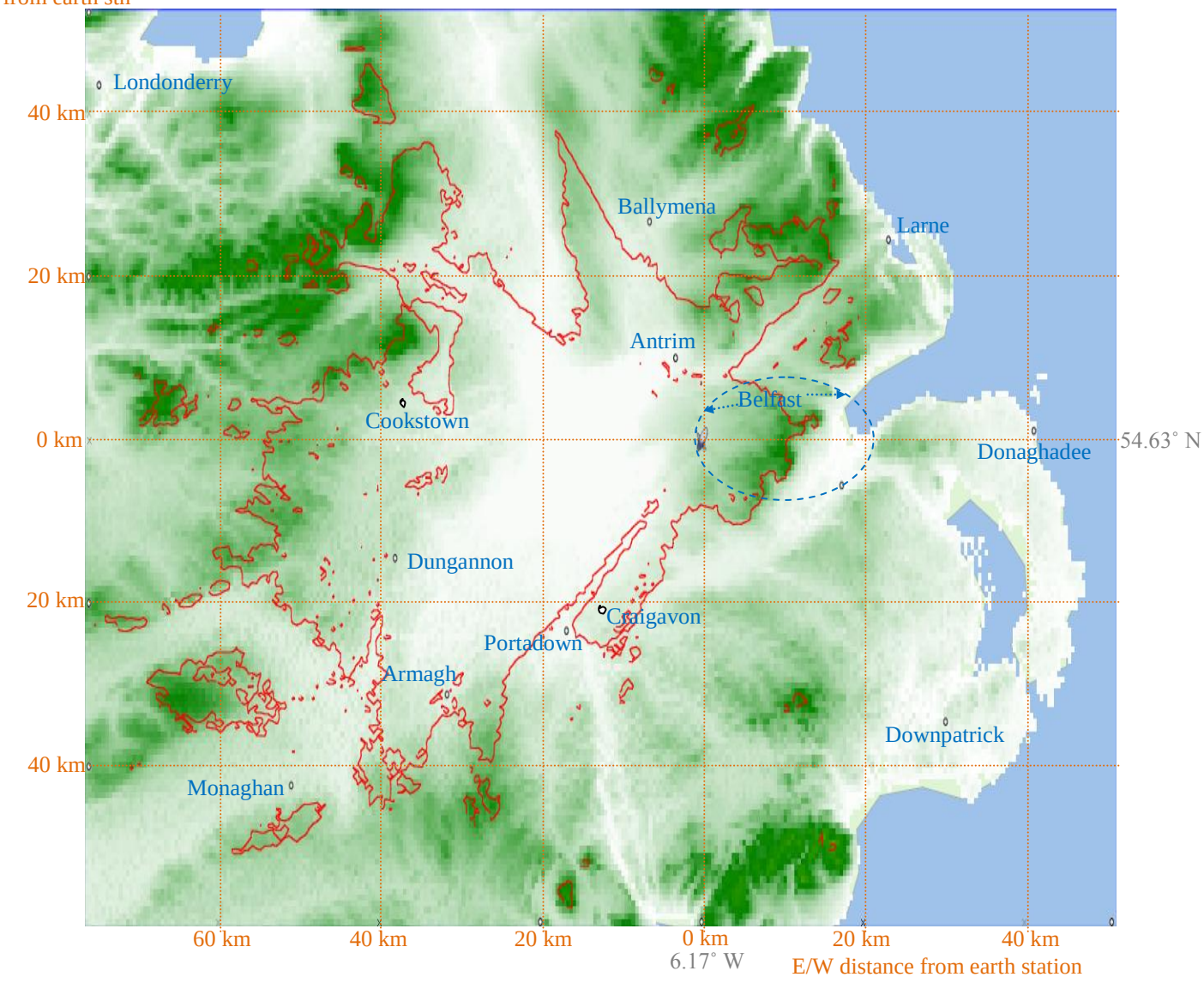
Basis as for Figure 1 except that Earth station location – 52.4˚N/1.52˚W.

Figure 3
Contour around FSS earth station in Glasgow within which interference from a BWA base station serving mobiles would exceed the long term protection criterion



Basis as for Figure 1 except that Earth station location – 55.75˚N/4.167˚W.

Figure 4
Contour around FSS earth station in Belfast within which interference from a BWA base station serving mobiles would exceed the long term protection criterion



Basis as for Figure 1 except that Earth station location – 54.63˚N/6.17˚W.

end