

SUPPLEMENTARY INFORMATION

1. Site Details

Site Name:	Bogaire	Site Address:	Land off Water of Nevis, Mamore Estate, Kinlochleven, Highlands PH33 6TE
National Grid Reference:	E: 223751 N: 769419		
Site Ref Number:	30731101	Site Type: ¹	Macro

2. Pre Application Check List

Site Selection

Was an LPA mast register used to check for suitable sites by the operator or the LPA?	Yes	No
If no explain why: None held		
Was the industry site database checked for suitable sites by the operator:	Yes	No
If no explain why:		

Annual rollout consultation with LPA

Date of last annual rollout information/submission:	Ongoing
Name of Contact:	Dafydd Jones
Summary of outcome/main issues raised:	There have been a number of meetings facilitated by DMSL outlining the SRN project and the TNS part within – this contact is ongoing. Highland Council are receiving by far the largest proportion of the SRN PNS applications, and it is understood that there are resource implication not least

¹ Macro or Micro

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	due to the increased activity caused by the SRN project overall.
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Pre-application consultation with LPA

Date of written offer of pre-application consultation:	04/08/2023	
Was there pre-application contact:	Yes	No
Date of pre-application contact:	17/10/2023	
Name of contact:	Helen Stevenson	
Summary of outcome/main issues raised:		
<p>23/03786/PREAPP – An extract from the response is set out below and a full copy is supplied with the application.</p> <p><u>“Conclusion</u> <i>In conclusion, the Planning Authority has very significant concerns regarding the proposed location within the SAC, NSA and WLA, and it likely that the proposal would be recommended for refusal. If you wish to progress with the proposal however, the surveys and further supporting information referred to above are required to be undertaken to enable the Authority to properly assess the potential impact of the proposed development.”</i></p> <p>The studies requested in the pre-app response have been conducted and accompany the application. These are discussed below.</p>		


Ten Commitments Consultation

Rating of Site under Traffic Light Model:	Green	Amber	Red
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Outline of consultation carried out:

Consultation letters and plans sent to:

- Ward Councillors (Fanet, MacDonald, MacLennan and Willis)
- MP – Ian Blackford
- MSP – Kate Forbes
- Spean Bridge, Roy Bridge and Achnacarry Community Council
- Kinlochleven Community Council
- Fort William, Inverlochy and Torlundy Community Council

Plans and details of the proposal have also been shared with Naturescot.

Summary of outcome/main issues raised:

Patricia Jordan, Secretary of Fort William, Inverlochy & Torlundy Community Council replied on 10/08/2023 to say that the consultation letters had been forwarded to the chair and members and that she had also forwarded copies to the Nevis Landscape Partnership and the John Muir Trust. A further response was sent by Ms. Jordan on 29/11/23 to say that the FWIT Community Council would not comment on the application as they deferred to the John Muir Trust and Cllr. Willis who are more knowledgeable on the subject of siting.

Cllr Willis replied on 22/8/23 to ask for an explanation as to why a mast is being proposed at this location given that the site is located in a remote glen, with no habitation nearby and no decent access. Cllr Willis has also expressed concerns over new masts in very rural areas across a number of proposed SRN sites. A reply was sent to Cllr. Willis on 5/12/23 that outlined the objectives of the DMSL SRN TNS project and some of the potential benefits that improved coverage could bring even in remote and sparsely populated areas.


Current standing advice from Naturescot is that national designations should be avoided if possible and, if not, then any application should be fully supported by appropriate studies. Since the publication of the NPF4, this may now include Wild Land Impact Assessments and Peat Surveys and management strategies. In addition, there is an overall concern around the impact of new access tracks and as such these should be avoided where possible – meaning locations for masts close to, or as close as possible to, existing tracks.

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School/College

Location of site in relation to school/college: Application site is not close to any schools/colleges
Outline of consultation carried out with school/college: N/A
Summary of outcome/main issues raised: N/A

Civil Aviation Authority/Secretary of State for Defence/Aerodrome Operator consultation (only required for an application for prior approval)

Will the structure be within 3km of an aerodrome or airfield?	Yes	No
Has the Civil Aviation Authority/Secretary of State for Defence/Aerodrome Operator been notified?	Yes	No
Details of response: N/A		

Developer's Notice

Copy of Developer's Notice enclosed?	Yes	No
Date served:	N/A	


3. Proposed Development

The proposed site: The application site can be seen on the enclosed drawings. It is located on land adjacent to the Water of Nevis.
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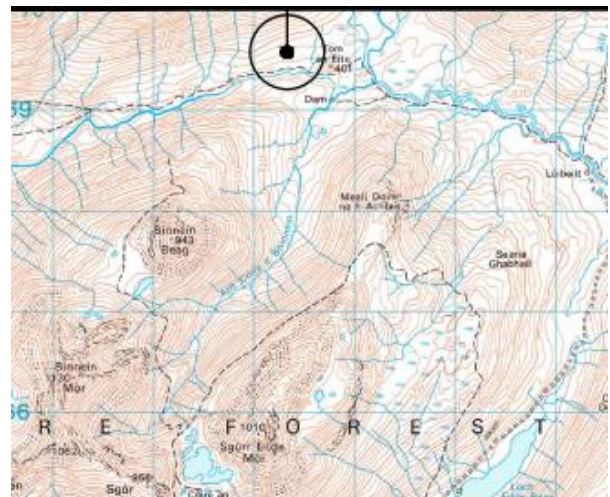
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Location Plan



Site Location Plan



It comprises a 20m lattice tower, shared SRN antennas, transmission dishes, ground-based apparatus and accompanying generators. The proposals also include a renewables power solution – solar panels. The location allows for the use of an existing right of way (forming part of Scottish Hill Track 158) to access the site. The location can be seen with the proposed apparatus superimposed on the landscape in the image below:




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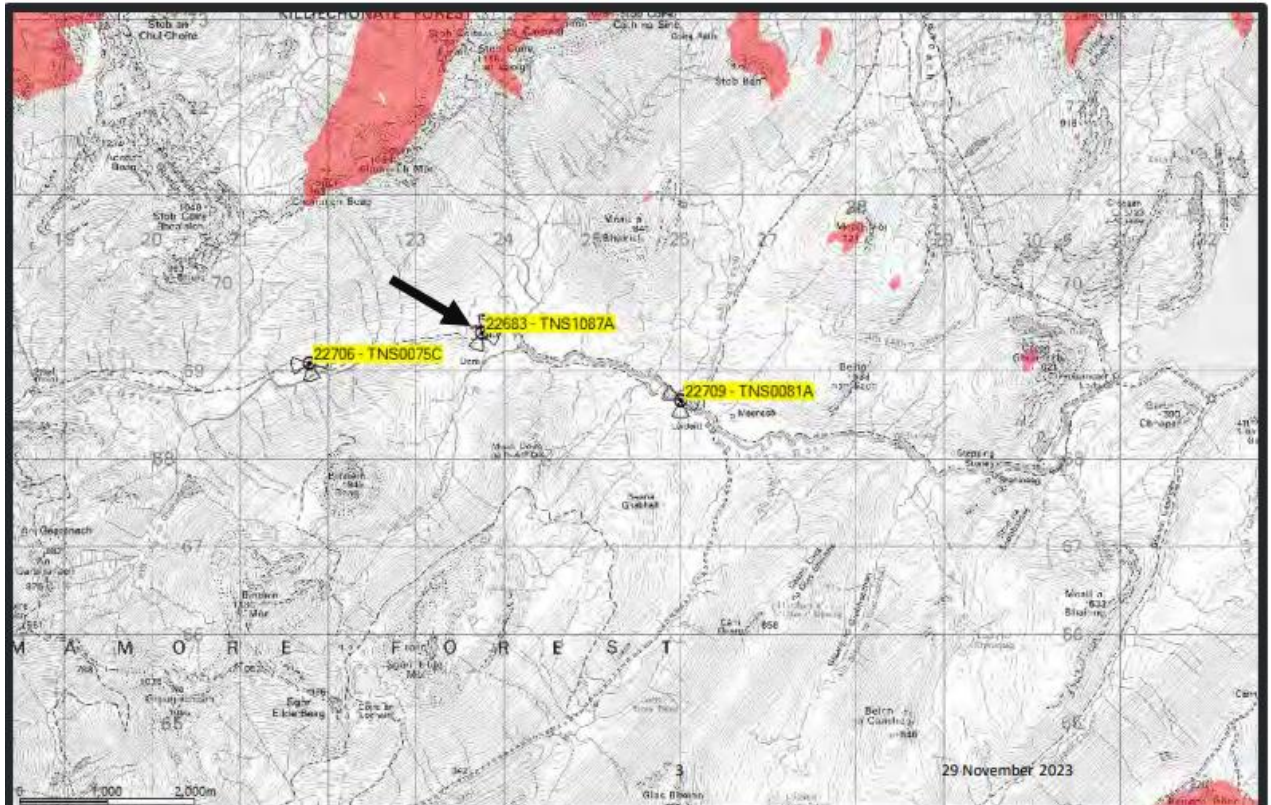
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Enclose map showing the cell centre and adjoining cells:

The proposed site and surrounding sites can be seen on the slide below along with the existing 4G coverage from Vodafone – 4G coverage being the red shaded areas

22683 – TNS1087 – Existing VF Live 4G Coverage




A set of radio coverage plots which show the proposed coverage accompany the application however an extract of planned 4G coverage is set out below. This coverage would be for all 4x MNOs (Vodafone, VMO2, Three and EE).

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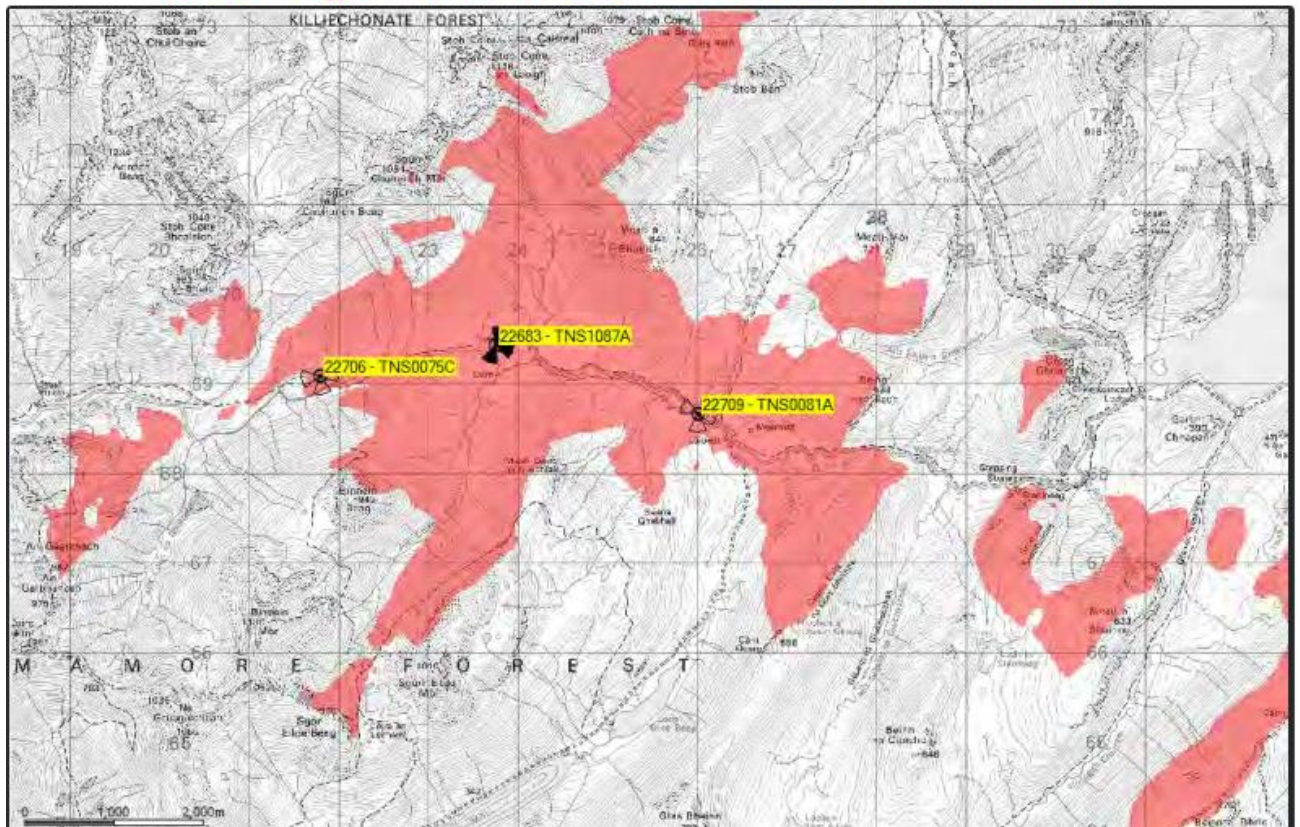
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Coverage from 22683 – TNS1087 in Isolation



Type of Structure:

Description:

The proposed site comprises of the installation of a 20m high lattice tower, supporting 3 no. antennas, 2 no. transmission dish, 7 no. equipment cabinets, 2 no. meter cabinets and ancillary development thereto, including Remote radio units (RRUs), 1 no. generators, 1.9m high stockproof fence. It will also include 4 x solar arrays.


Below is an extract from the planning drawings and an image of a Swann tower built previously as part of a separate rural project.

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Drawing Extract

Image of similar tower - Image © Swann

Overall Height: 20m	
Height of existing building:	N/A
Equipment Housing:	
Length:	See schedule below
Width:	See schedule below
Height:	See schedule below



ENCLOSURE SCHEDULE			
MODEL	DIMENSIONS (WxDxH)	LOCATION	COLOUR/ FINISH
POWER/BBU PSC CABINET	823x640x1721	TOWER FOUNDATION	RAL 7034
ERS CABINET	650x600x1900	TOWER FOUNDATION	RAL 7034
RBS 6130 CABINET	650x700x1100	TOWER FOUNDATION	RAL 7034
FOUL WEATHER ENCLOSURE	2200x2600x2500	TOWER FOUNDATION	RAL 7034
BBU RADIO CABINET	750x600x2100	FOUL WEATHER ENCLOSURE	RAL 7034
TX CABINET	600x600x1750	FOUL WEATHER ENCLOSURE	RAL 7034
POWER CABINET	730x750x1800	FOUL WEATHER ENCLOSURE	RAL 7034
MULTI MINO METER CABINET	1500x490x1200	TOWER FOUNDATION	RAL 7034

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Materials:	
Tower/mast etc – type of material and external colour:	<p>Steel RAL7034</p>  <p>RAL 7034 Yellow Grey</p>
Equipment housing – type of material and external colour:	<p>Steel (RAL7034)</p>  <p>RAL 7034 Yellow Grey</p>


Reasons for choice of design:

For SRN, the operators have carefully considered the design of the proposed masts across the programme. The structure has to be able to support the equipment for 4x operators. A lattice tower is the most suitable design from a technical viewpoint, given the windloading in the exposed rural locations where the SRN masts will be located. Such a design is also able to facilitate greater coverage (as they give better scope for antenna orientation) and provide the structural capability required to be able to support the weight and size of all the operators' telecommunications equipment. Due to the slim line nature of the supporting struts of the lattice frame,

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light is able to continue to pass through the structure. If the lattice tower were to be any slimmer in width, then it would not be structurally capable of supporting all the operators' equipment or meet the windloading requirements in this location. The colour of the tower is proposed to be RAL7034 as this sits well within this type of landscape. However, it could any other colour that the authority considers appropriate.

The antennas are proposed to be located on the legs of the tower and therefore there will not be a bulky headframe at the top of the mast. Remote Radio Units (RRUs) are proposed underneath the antennas. These are small, approximately the size of a shoe box. They are designed to make the antennas more efficient and reduce the amount of ground based equipment cabinets, thus minimising the visual impact on the surrounding area. Given their height above ground level located underneath the antennas, at centre line heights of 16.5m and 15.3m AGL, and their small size, they will not be prominent in the landscape.

The transmission dish is essential to link the installation back into the MNO's wider network and relay the data. The dish antennas used by mobile phone networks are relatively small, in this case they are proposed to be 300mm and 600mm in diameter. They are used to link individual radio base stations to each other and, through a series of links, into the wider mobile phone and fixed line networks. In order to communicate with each other, dish antennas must have a clear line of sight, sometimes known as point-to-point communications. They must be in clear view of each other without any physical obstructions such as trees or buildings which would reduce or disrupt the low-powered signal. For this reason, dish antennas are always mounted high on rooftops or tall structures. In this instance, in order to obtain a clear line of sight over the undulating topography in the wider surrounds, the dish antenna needs to be located at a centre line height of 20.5m above ground level.

A streetworks style column/pole cannot be utilised as they are not able to structurally support the weight and size of 4 separate MNO's equipment to enable the operators to share the same structure. A number of masts would be needed, throughout this rural landscape. This would lead to proliferation and would have a greater impact on the surrounding area. Such designs are also restrictive on the coverage that can be provided due to limitations in respect of the heights and bearings and therefore will not be able to provide the necessary coverage to this large rural area.


The more compromises on design, the less coverage and service provision that can be provided and the less benefits will be obtained. Monopoles are unable to support as much equipment and are less able to be future proofed. They also come in one long section whereas lattice masts come in several smaller sections and can be assembled on site. This is an important consideration given the rural and remote location of this site.

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The proposed height at 20m is essential in order for all the operators' equipment to reach the target coverage area. The proposed height has had to take into account the landscape, topography and area of proposed coverage. If the mast were to be any lower in height, it would only be able to provide coverage to a smaller part of the larger target area. This would fail the operator's design brief to provide high quality 4G coverage across this area of the Highlands.

The submitted coverage plots supporting this application demonstrates the significant coverage which will be achieved through the delivery of this important infrastructure.

The equipment cabinets are designed to appear like other statutory undertakers' equipment cabinets. The equipment cabinet and electric meter cabinet are relatively small. Given their location within a fenced compound, their maximum height of 2.50m and their proposed colouring to blend with the landscape, they should not be prominent. The colour of the apparatus can be discussed during the course of the application taking on board consultee comments

The site will be located within a fenced compound for health and safety reasons. The proposed fencing will be 1.9metre high fence to help minimise ground-based impacts.

The scheme also proposes a small access track and hardstanding 'access space' area, which will provide a safe set down area. It will extend from the existing access track/right of way to the north and allow safer access into the compound's gates.

The proposed mast and apparatus will be predominantly powered by renewables. This will be achieved through 4x solar arrays which are shown on the drawings and will be located within the compound.

Each solar array (4No) is 3kW nominal (full sun); but will deliver in the region of 400-600W per array average throughout the year. May – Sept will basically operate 100% on solar, but between Oct - Apr will need more generator input.


However, there is also battery storage, and it is quite central to the solution (it is a 'hybrid' solution). It fulfils the load until emptied at which point it needs to pull power from a generator. The generator will use HVO and is more of a backup than a primary source. HVO, or Hydrotreated Vegetable Oil is a 'cleaner' solution than traditional diesel by using non fossil fuel and reducing the carbon footprint from the site. Importantly, this generator is a back-up and will only be used when either the solar arrays are not providing power and/or when the battery needs topping up.

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The noise from the generator is generally attenuated as it is housed within the container. The generator produces 66dB(A) at 7m. Sound also attenuates over distance as per the equation below:

$SPL2 = SPL1 - 20 \log (R2/R1)$; SPL1 is Sound at point 1 (66 dB(A) at 7 metres) SPL2 is sound at point 2 (calculated), R1 is 7 metres. If R2 is 300m, the perceived sound would be about 33dB(A), which is quite low (even in a remote and rural area).

It is therefore considered that the proposal before you strikes the best balance between landscape, environmental impact and operational considerations. The proposed height and design represent the best compromise between the visual impact of the proposal on the surrounding area and meeting the technical requirements for the site. Taking all matters into account it is considered that this proposal, to provide Shared Rural Network 4G coverage and to fill this total not spot with high quality 4G mobile service provision for the four telecommunications network operators, utilising the same structure, would be acceptable within the landscape.

4. Technical Information

<p>ICNIRP Declaration attached</p> <p>ICNIRP public compliance is determined by mathematical calculation and implemented by careful location of antennas, access restrictions and/or barriers and signage as necessary. Members of the public cannot unknowingly enter areas close to the antennas where exposure may exceed the relevant guidelines.</p> <p>When determining compliance, the emissions from all mobile phone network operators on the site are taken into account.</p>	Yes	No
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Frequency:	See below
Modulation characteristics ²	See below

² The modulation method employed in 2G (GSM) is GMSK (Gaussian Minimum Shift Keying) which is a form of Phase modulation
 The modulation method employed in 3G (UMTS) is QPSK (Quad Phase Shift Keying) which is another form of Phase Modulation

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Power output (expressed in EIRP in dBW per carrier)					See below
Mobile Network Operator(MNO)	Technology	Frequency (MHZ)	Modulation	EIRP dBW	
VF	L8	801-811	QAM	34	
	GSM 900	925 – 960	QPSK	32	
VMO2	L8	811-821	QAM	34	
	GSM 900	925 – 960	QPSK	32	
EE	L8	796 - 801	QAM	34	
	GSM 1800	1831.7 – 1876.7	QPSK	32	
3UK	L8	791-796	QAM	34	

In order to minimise interference within its own networks and with other radio networks, the MNOs operate their networks in such a way the radio frequency power outputs are kept to the lowest levels commensurate with effective service provision

As part of the MNO's networks, the radio base station that is the subject of this application will be configured to operate in this way.


All operators of radio transmitters are under a legal obligation to operate those transmitters in accordance with the conditions of their licence. Operation of the transmitter in accordance with the conditions of the licence fulfils the legal obligations in respect of interference to other radio systems, other electrical equipment, instrumentation, or air traffic systems. The conditions of the licence are mandated by Ofcom, an agency of national government, who are responsible for the regulation of the civilian radio spectrum. The remit of Ofcom also includes investigation and remedy of any reported significant interference.

The modulation method employed in 4G (LTE) is 64 QAM (Quadrature Amplitude Modulation) which is another form of Phase Modulation
The modulation method employed in 5G is 256 QAM (Quadrature Amplitude Modulation) which is another form of Phase Modulation

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<p>The telecommunications infrastructure the subject of this application accords with all relevant legislation and as such will not cause significant and irremediable interference with other electrical equipment, air traffic services or instrumentation operated in the national interest.</p>	
<p>Height of antenna (m above ground level)</p>	<p>C/L of 18.6m</p>

5. Technical Justification


<p>Reason(s) why site required e.g. coverage, upgrade, capacity (map attached if required):</p>
<p>The proposed mast near Water of Nevis is part of the Shared Rural Network (SRN) Total Not Spot (TNS) programme. This is a £500m Government funded programme to ensure that as much of the UK as possible can obtain 4G mobile connectivity from all 4 mobile operators – Vodafone, EE, VM02 and Three. The area around Water of Nevis currently has no coverage from any operator and as such falls within the scope of the TNS programme.</p>

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Department for
Digital, Culture,
Media & Sport

Shared Rural Network Coverage Forecast Improvements in Scotland




SHARED
RURAL
NETWORK

Pre-SRN



Post-SRN



Key

- Total not-spots, areas with no 4G coverage from any operator
- Partial not-spots, areas with 4G coverage from at least one, but not all four operators
- 4G coverage from all four operators

Notes
Forecast improvements subject to availability of EAS sites. Coverage improvements subject to finding suitable sites, obtaining power supply and backhaul and securing the necessary permissions through the planning system.

Electoral Region	4G Coverage from all MNOs		4G Coverage from at least one MNO	
	Pre-SRN	Forecast post-SRN	Pre-SRN	Forecast post-SRN
Central Scotland	87%	92%	99%	99%
Highlands and Islands	26%	68%	73%	91%
Lothian	88%	94%	99%	99%
Mid Scotland and Fife	53%	78%	80%	93%
North East Scotland	59%	79%	86%	94%
South Scotland	55%	81%	88%	97%
West Scotland	59%	82%	91%	98%

In Scotland, coverage from all four operators will rise to a minimum of 74%, up from 44%. Coverage from at least one operator will increase from 81% to 91% by the end of the programme.

In the interests of brevity, the information around SRN and its benefits will only be summarised within this document however fuller details of the SRN programme can be found on the links below:

<https://srn.org.uk/>

<https://www.mobileuk.org/shared-rural-network>


In addition, we have included in the application documents a paper titled "Programme Summary" published by DMSL which both explains SRN and sets out the main benefits of the coverage and why it is required in TNS areas. It also sets out the

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practical challenges of building a mast in a rural area such as the application site. It states:

“What is the Shared Rural Network?”

The Shared Rural Network (SRN) is a telecommunications programme which sees the UK Government working in partnership with the four UK mobile network operators - EE, O2, Three and Vodafone - to increase mobile connectivity in rural parts of the UK.

The programme will make 4G available to 95% of the UK, offering significant improvements to mobile coverage in rural communities. The mobile network operators (MNOs) expect this will extend mobile coverage to an additional 280,000 premises and create an additional 16,000km of the UK's roads, boosting productivity and investment in rural areas.

Why create the Shared Rural Network?

The Shared Rural Network was developed to improve digital infrastructure across the UK, ensuring that people and businesses have access to a reliable 4G mobile connection, regardless of their location. Good coverage and high-speed mobile connectivity are essential to a modern way of life, whether it's running a business, communicating with friends and family, working remotely, or accessing news and information instantly, there is a need for reliable, good quality coverage.

What are the benefits of the Shared Rural Network?

The benefits of reliable 4G mobile connectivity are far reaching and have positive impacts on many aspects of day-to-day life. There are many personal and commercial benefits, as well as positive impacts on healthcare, education, tourism, remote working, and accessing online services, to name a few. The Shared Rural Network will help those who live and work in rural communities to achieve their full potential through improved mobile connectivity.”

In April 2023 the UK Government also published its UK Wireless Infrastructure Strategy. Whilst this Strategy focuses on 5G connectivity, it also recognises that there is a disparity in the quality of coverage across the UK and between urban and rural areas. As part of the Strategy's 10-point plan for rural connectivity, point 3 confirms that:


“3. We are already investing £1 billion in the Shared Rural Network to deliver 4G coverage to 95% of the UK landmass, with the biggest coverage improvements in rural parts of Scotland, Northern Ireland and Wales

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- *this will also deliver 4G coverage on a further 16,000 km of roads, with further indirect improvements over time, including a boost to 'in-car' coverage on around 45,000 km of roads.*
- *and we improve geographic coverage to 79% of Areas of Natural Beauty, benefitting millions of visitors every year"*

Whilst the telecommunications industrial sector is a UK competency and the sector is regulated by OFCOM, the planning system, on which the roll-out of new wireless infrastructure depends, is devolved and therefore falls under the jurisdiction of the Scottish Government.

However, the Scottish Government is also actively involved in seeking to improve mobile connectivity across Scotland and has a number of initiatives of its own – especially in rural areas. They have their own 'Mobile Action Plan' they have also had their own infrastructure roll-out programme funded by the Scottish Government themselves. Scottish Government policy and strategy support for this type of proposal is set out in the section below.

The above demonstrates the overall need and the requirement for coverage in rural areas and areas where there is currently no mobile coverage across Scotland.

The overall Total Not Spot element to SRN will see an indicative 320 new sites proposed across Scotland and these have been divided between the 4 MNOs, with each being tasked with delivering around 80 sites each.

The remote nature of these sites has led to the MNOs adopting a 'cluster' approach which allows, specifically transmission links, to be obtained and ensure that the radio coverage can be linked to the MNOs networks.


The details of this specific site are set out below. It is understood that other MNOs may be taking forward their own TNS sites in or around this area and this site, whilst part of Vodafone's TNS site delivery, will form part of the overall TNS project in the area. The application site can be seen within the transmission cluster map shown below:

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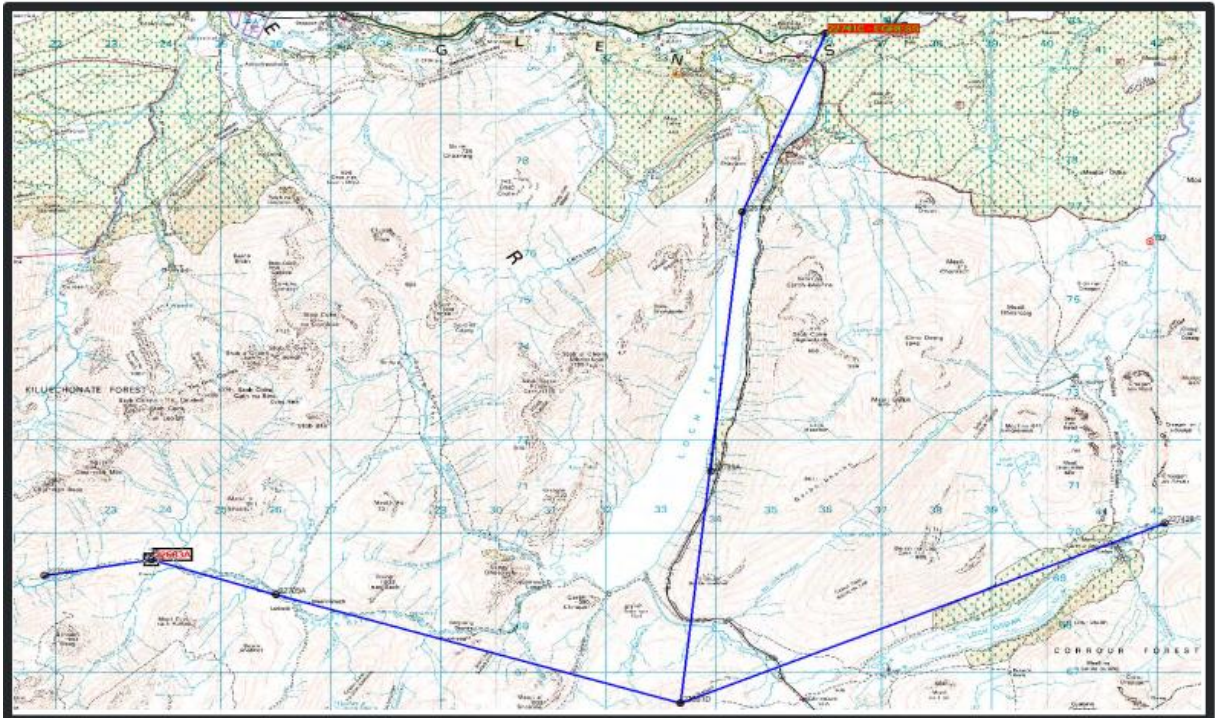
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Transmission Cluster Connectivity Plan



As can be seen from the above cluster plan, there are eight Vodafone sites within this specific cluster, each being dependent on the neighbouring site for connectivity into the wider network. The application site can be seen as the third most westerly site on the above map/plan.

A full set of radio plots has been submitted with the application and which includes this transmission connectivity plan.

6. Site Selection Process – alternative sites considered and not chosen (Enclose map highlighting all alternatives that have been considered by the operator)


The rationale for SRN is set out above and OFCOM provided the MNO with the TNS areas where coverage is required. They are also provided with nominal locations which radio software has determined will provide coverage across the area to the required level.


For this site the Total Not Spot (TNS) area can be seen in red below with the blue area representing a Partial Not Spot (PNS) area. Due to the funding model of state intervention (the TNS element of SRN being funded by Government), the MNOs are

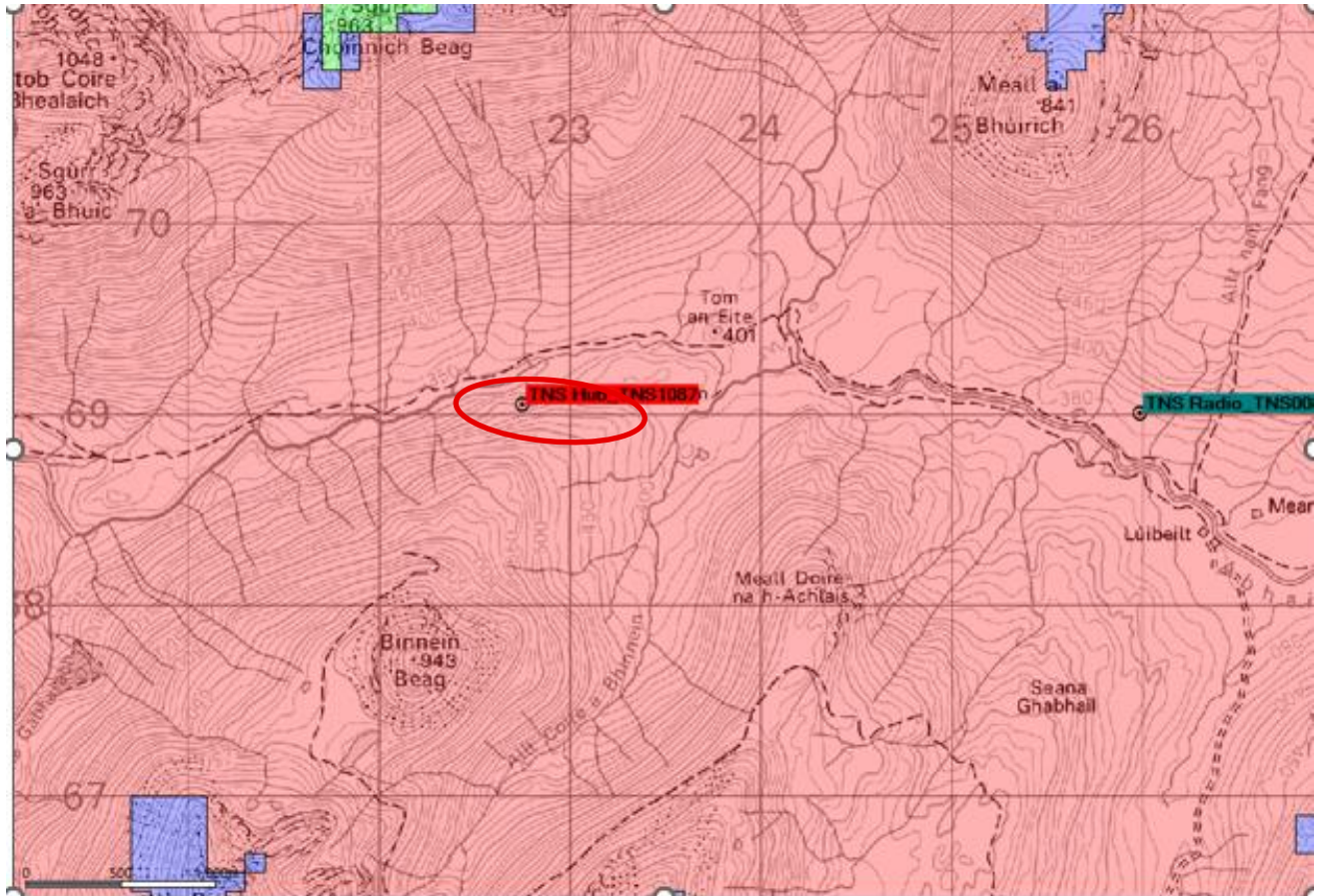
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unable to locate any new mast within a blue (PNS) area. This means that the area of search needs to concentrate on the red areas. This search areas can be seen annotated by the red ellipse – 




The above mapping is taken from the original OFCOM search information and includes the indicative search area. Fundamentally the driver for the site location in this case is the local topography, the transmission link back to the network and trying to minimise impacts by locating as close to the existing access track as possible.

The landscape designations, landscape character, environmental conditions and designations have also all been taken into account in proposing potential sites. In addition the localised topography is also important as on steep land additional works are required to either dig-out and level a site or to build up a site. This involves more material, a bigger footprint and additional construction work. This is avoided where possible not least due to the new policy requirements in the NPF4 (discussed below).

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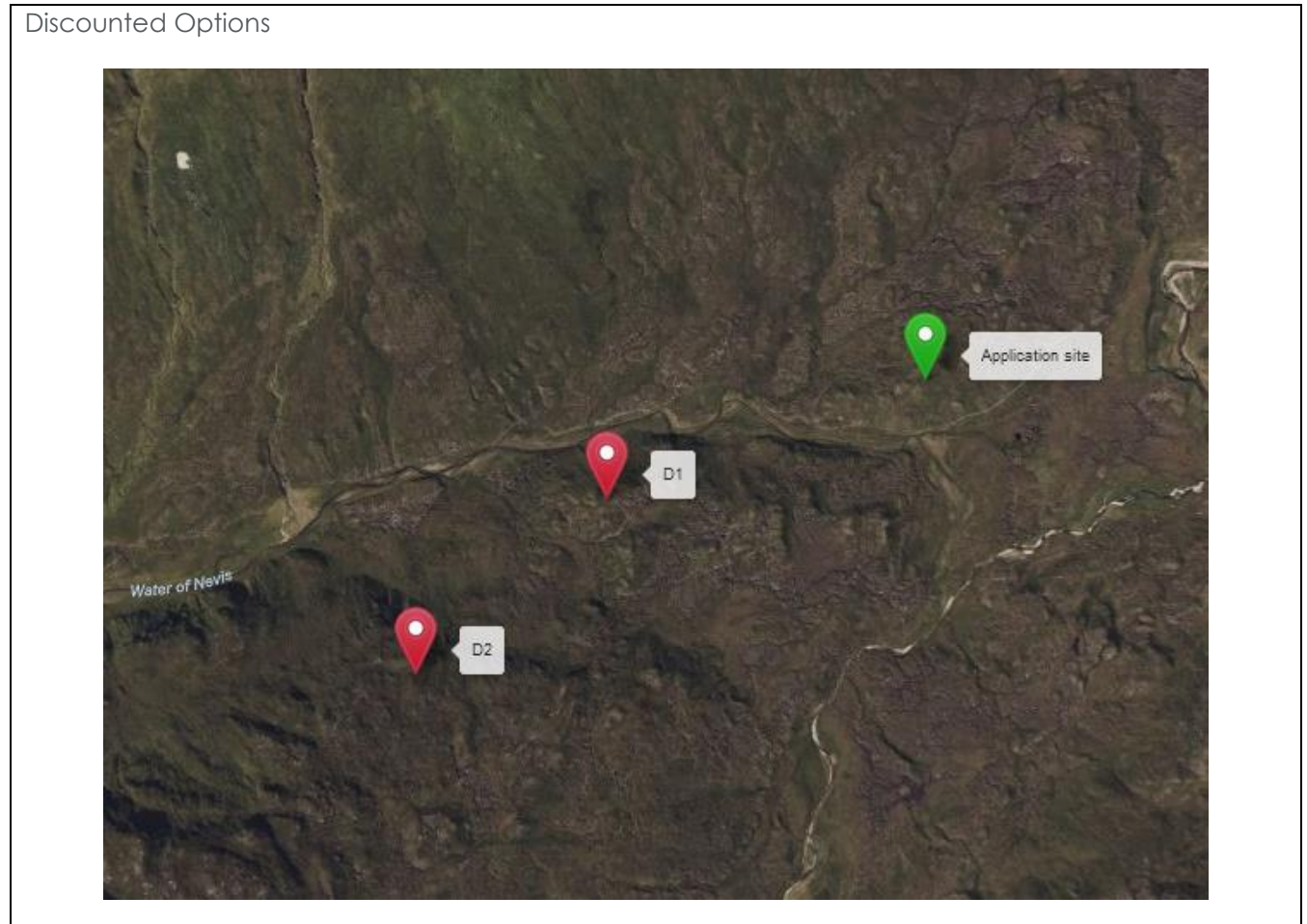
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As can also be seen, no existing infrastructure exists which would provide the required level of coverage required by the TNS project. This is set out below alongside information on discounted options.




The above mapped options are set out in the table below.

Site	Location	Comments
Application Site	Bogaire	Application Site
D1	Land off Water of Nevis #1, Bogaire, Mamore Estate (E223259 N769258)	Option was discounted as it was not as favourable for either radio coverage or ensuring a transmission link to secure network connection. In landscape impact or ecological terms, it offered no advantages over the proposed site. This is mainly due to there being no access to the land and hence the impact of construction would be far greater than the application site and would also involve cross the Water of Nevis

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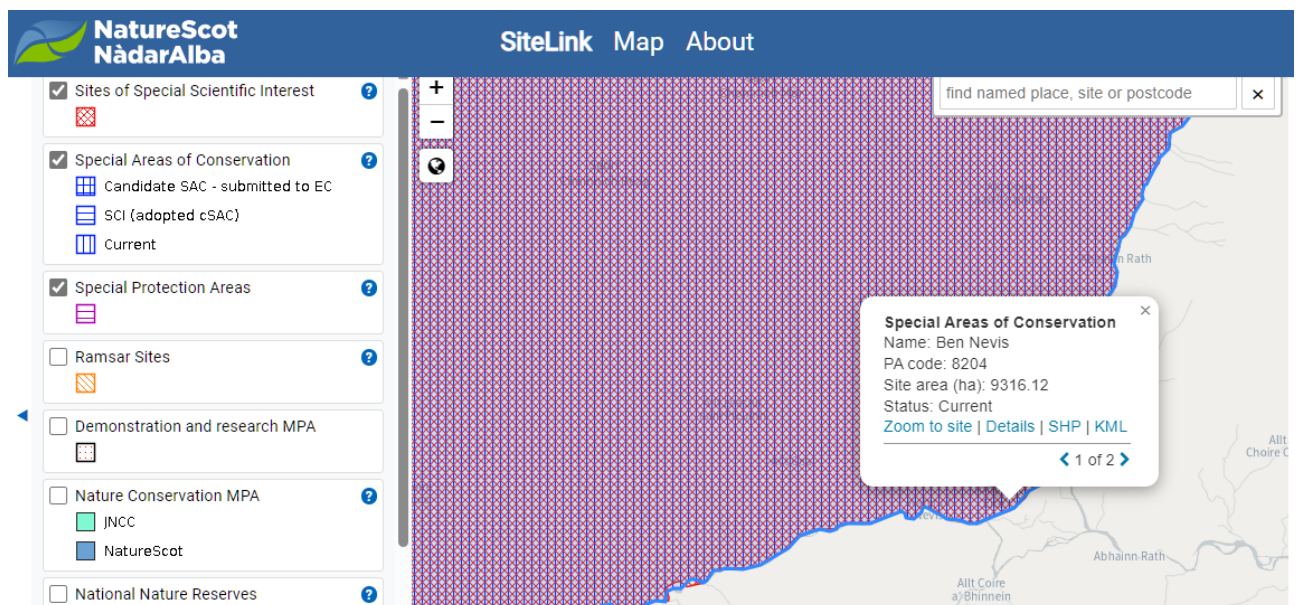
D2	Land off Water of Nevis #2, Bogaire, Mamore Estate (E222956 N769005)	Option was discounted as it was not as favourable for either radio coverage or ensuring a transmission link to secure network connection. In landscape impact or ecological terms, it offered no advantages over the proposed site. This is mainly due to there being no access to the land and hence the impact of construction would be far greater than the application site and would also involve crossing the Water of Nevis
----	--	--

If no alternative site options have been investigated, please explain why:

N/A

Environmental information

The Naturescot online mapping can be seen below:




As can be seen above, the application site lies just inside the environmental designations Ben Nevis SSSI and Ben Nevis SAC. The submitted PEA and CEMP address any issues surrounding access, construction and maintenance and any impacts on the local environment.

To quantify any potential impacts and provide potential mitigation we have provided a Preliminary Ecological Assessment (PEA) with the application. Its summary and conclusions state:

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5. CONCLUSIONS


- 5.1.1. The PEA was carried out in accordance with the scope set out in **Section 1.2** with no substantial limitations.
- 5.1.2. The HRSA (**Appendix B**) concludes Likely Significant Effect on Ben Nevis SAC; therefore, Appropriate Assessment is required.
- 5.1.3. Further surveys or assessments to inform decision-making:
- An NVC survey should be carried out to characterise the plant communities and inform the mitigation strategy. NVC survey will also be required to inform SSSI consent.
 - Peat surveys are recommended to supplement the application.
- 5.1.4. Pre-Construction and Construction Phase Mitigation Measures:
- Suitable habitat and/or presence of the following protected or priority species was recorded: terrestrial invertebrates; aquatic invertebrates and vertebrates; amphibians; reptiles; birds (winter and breeding); badger, water vole and otter.
 - General Environmental Protection Measures set out in **Section 4.2**, along with Additional Mitigation Measures set out in **Table 4.1** will ensure compliance with legislation and planning policy.
- 5.1.5. **Section 4.7** sets out opportunities for enhancement to be considered, to comply with planning policy.

Highland Council will need to undertake an appropriate assessment before coming to any decision. In addition, in support of the application, also submitted alongside is an NVC (as suggested in the PEA), a Peat Survey and a Construction and Environmental Management Plan (CEMP). This will demonstrate how the mast and associated works can be built whilst maintaining the integrity of the surrounding area and environmental assets.

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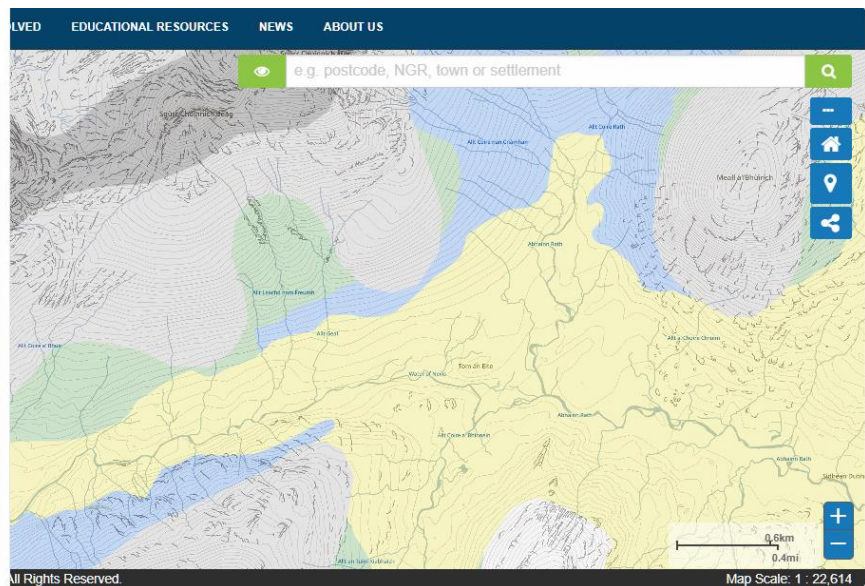
Carbon and Peatland

Map contents

About Map data Legend Base map

Carbon and Peatland 2016

- Non-soil
- Unknown soil
- Mieral soil
- Class 1
- Class 2
- Class 3
- Class 4
- Class 5



An NVC Survey and a Peat Survey accompany the application and consider the implications for Carbon and Peatland. Should the application be approved it would be expected that a condition requiring a peat management plan would be imposed

Land use planning designations:


In terms of other land use designations, the application site does not lie within any heritage designations, nor are any affected. The mapping below (HES) highlights heritage assets (as per the Layers key) with no assets showing within kilometres of the application site.

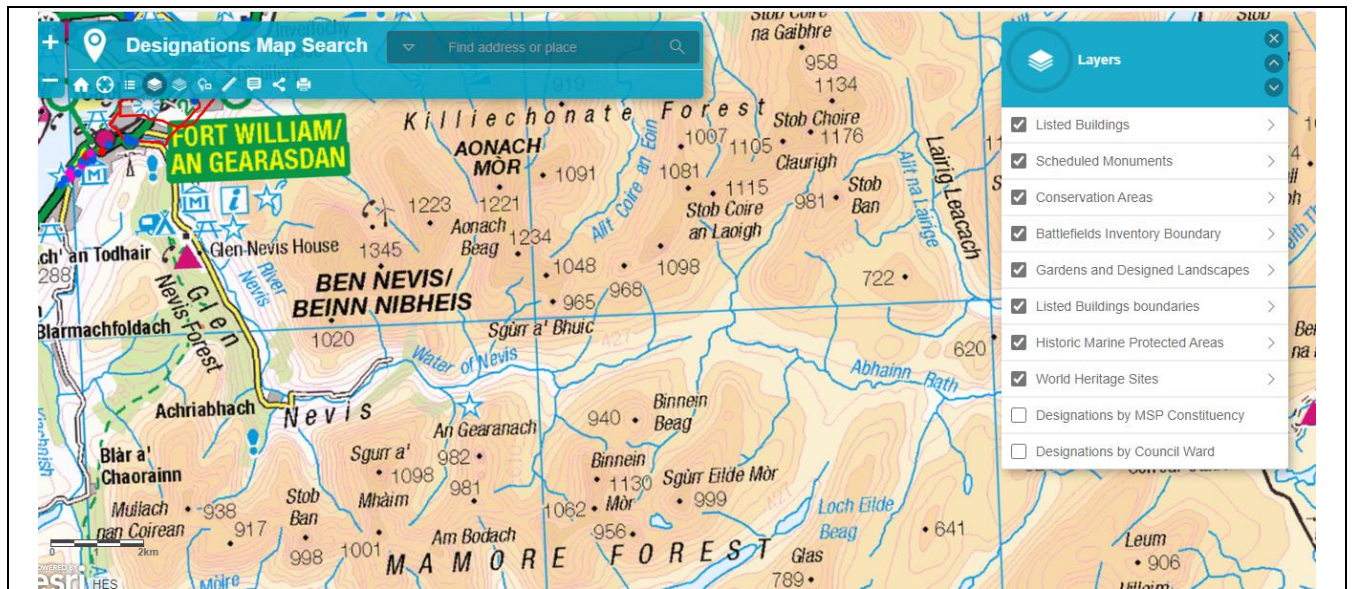
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Turning to the landscape impacts, It also lies within the northern part of the Ben Nevis and Glen Coe National Scenic Area (NSA) and north-western part of the Wild Land Area (WLA) 14: Rannoch – Nevis – Mamores – Alder. An LVA and WLA have been submitted which assesses impacts on the landscape.


Looking at the LVIA in the first instance, its conclusions state:

Conclusion	
	<p>The Proposed Development comprises a new radio base station encompassing a 20.5m high lattice tower, associated telecoms infrastructure and four solar arrays located to the west of To an Eite, a small hill summit comprising mainly marshy grassland, approximately 280m north of confluence of the Allt Coire a' Bhinnein and the Water of Nevis and approximately 2.8km northwest of Luibeilt in the central part of upper Glen Nevis.</p> <p>Although located on a slightly elevated small mound, the Proposed Development would benefit from a degree of intervening screening as a result of localised features of the predominant vegetation cover on the glen floor, marshy grassland and modified bog. Despite this, the Proposed Development would introduce a new land-use to upper Glen Nevis comprising a vertical, man-made feature, four solar arrays, associated ground-based infrastructure and a new construction and access track. The greatest visual effects would be experienced in the upper glen within ~2km of the Proposed Development, however, the lattice tower would not be visible against skyline and is fully backdropped by topography in close and mid-range views.</p> <p>The specification of a locally appropriate and visually recessive finish for post the lattice tower and cabinets/ generators assists the visual integration of the Proposed Development, particularly within more distant views from elevated mountain summits. From these locations, the Proposed Development is experienced as a minor component in a landscape of vast vertical and horizontal expanse and as a congruent addition to the existing pattern of human influence at Luibeilt, Meanach to the east and Steall to the west.</p>

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The Proposed Development has considered the general principles set out by adopted guidance such as PAN 62⁵ and Policies 28, 46 and 61 of the HWLDP in relation to the landscape resource and visual amenity. It is deemed to be as discrete and visually integrated as possible whilst maintaining the Scottish Governments agenda to service the rural economies with better telecoms.

The applicant agrees with this assessment. Bearing in mind the coverage requirements it is not possible to locate the proposed mast outside the Wild Land area or outwith the NSA.

The WLA, in its conclusion's states:

Table 1.3 Summary of Rannoch - Nevis - Mamores - Alder Wild Land Area Assessment

Wild Land Quality 1	Sensitivity	Magnitude	Level of Effect
<i>"Mountain ranges and glens of varying landform, but all arresting, with towering, steep and rugged slopes and striking physical features."</i>	High	High to Medium (within 2km) Very Low (beyond 2km)	Substantial to Major (within 2km) Minor (beyond 2km)
Wild Land Quality 2	Sensitivity	Magnitude	Level of Effect
<i>"A strong contrast of wide-open peatland, lochs and steep-sided mountains that highlight the visibility and awe-inspiring qualities of each"</i>	High to Medium	Medium (within 2km) Very Low (beyond 2km)	Major to Moderate (within 2km) Minor (beyond 2km)
Wild Land Quality 3	Sensitivity	Magnitude	Level of Effect
<i>"An extensive and remote mountain and peatland interior with a strong sense of sanctuary, appearing even larger due to distant views to surrounding wild land areas."</i>	High	High to Medium (within 2km) Very Low (beyond 2km)	Substantial to Major (within 2km) Minor (beyond 2km)
Wild Land Quality 4	Sensitivity	Magnitude	Level of Effect
<i>"A large area which is visited by many people to experience wild land qualities in different ways, whilst maintaining a sense of remoteness, sanctuary, challenge and risk."</i>	High to Medium	High to Medium (within 2km) Very Low (beyond 2km)	Substantial to Major (within 2km) Minor (beyond 2km)


Again, the applicant agrees that there will be impacts in short range views, however in more distant views (over 2km) these effects will be minor at worst.

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Additional relevant information (include planning policy and material considerations):

Supplied with the application, to help the planning authority with their assessment against planning policy and also discussed above, are the following studies:

- Landscape and Visual Appraisal (inc. appendices)
- Wild Land Assessment (inc. appendices)
- NVC Survey
- Visualisations (from various viewpoints)
- Preliminary Ecological Appraisal
- Construction and Environmental Management Plan
- Peat Survey
- Radio Coverage Plots

Below are the various policies in place to assess, promote and manage telecommunications connectivity and development. Introduced above this includes both UK-wide policies and strategies, Scotland specific policies and strategies and local policies and strategies. This includes Highland's Local Development Plan.

Firstly, it is worth highlighting and emphasising the support for better connectivity from UK and Scottish Governments. This has come in three main areas:


- Reform of Electronic Communications Code – the purpose of which is to support the installation, maintenance and upgrading/sharing of apparatus, alongside facilitating faster and more collaborative negotiations between operators and site providers, while balancing the public interest in having improved digital connectivity with private property rights.
- Reform of planning legislation – Relaxation of Class 67 of the GPDO – the purpose of which was to allow taller masts and more apparatus to be classed as permitted development to support the upgrade and expansion of communications infrastructure which in turn supports connectivity.
- Formation of supportive policy and strategy to help guide decision-makers – the NPF4 has communications and connectivity pervading the substance of the new document. It emphasises that connectivity cuts across land use, land type and both social and economic activity. The Scottish Government also has in place its longer standing Mobile Action Plan and now sitting behind both documents is the UK Wireless Infrastructure Strategy published in April 2023. In addition to this, the main planning guidance for the siting of telecommunications apparatus in Scotland has just been published – This replaces Planning Advice Note 62 (PAN62).

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We have also appended three documents which provide a backdrop to SRN and help to demonstrate how important it is to achieve as large a geographic coverage footprint as possible. This is not only for the benefits 4G brings but also to allow the new 5G radio networks to be deployed efficiently. These are:

- House of Commons Briefing Paper on rural mobile coverage and the SRN programme
- Digital Scotland – how Scotland will thrive in a digital World
- Scottish Government – How Scotland will thrive in a 5G world.

These documents should be read in conjunction with the other application documents.

Therefore, it is important to understand that both UK and Scottish Government have highlighted better connectivity as an essential part of the nation's social and economic well-being.

As we move forward, this connectivity will be increasingly important in rural areas if they are not to fall behind the more populated areas in any digital divide and also to ensure that automated services and machine-to-machine (IoT) connectivity is available in a nation-wide basis.

Planning Policy

Planning policy, and those parts of it which deals with the siting and appearance of communications infrastructure will carry the most weight when dealing with this application.

National Planning Framework 4 (NPF4)

Looking first at the NPF, as alluded to above, the importance of connectivity can be seen throughout the document. This is manifested in the Digital Communications Policy (Policy 24) and supporting text – this is reproduced below.

Firstly

“Policy Intent:

To encourage, promote and facilitate the roll-out of digital infrastructure across Scotland to unlock the potential of all our places and the economy.

Policy Outcomes:


- *Appropriate, universal and future proofed digital infrastructure across the country.*
- *Local living is supported and the need to travel is reduced.”*

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Of note is the NPF4 seeks the roll-out of infrastructure across the country and this includes areas such as the Blackwater Dam where there is currently either no or very limited communications infrastructure. Discussed more below, the outcome, should this application be approved, would be 'appropriate' infrastructure in this area of the Highlands.

Whilst there will be a lag from the NPF4's publication earlier this year and the rolling adoption of Local Development Plans (LDPs) across Scotland, NPF4 sets out how LDFs should deal with communications infrastructure, stating:

"LDPs should support the delivery of digital infrastructure, including fixed line and mobile connectivity, particularly in areas with gaps in connectivity and barriers to digital access."

Of note is that it supports an approach where not spots, such as that being addressed by this application ('where there are gaps in connectivity') are specifically supported.

Looking at the policy itself, it states:

"Policy 24

- a) Development proposals that incorporate appropriate, universal, and future-proofed digital infrastructure will be supported.*
- b) Development proposals that deliver new digital services or provide technological improvements, particularly in areas with no or low connectivity capacity, will be supported.*
- c) Development proposals that are aligned with and support the delivery of local or national programmes for the roll-out of digital infrastructure will be supported.*
- d) Development proposals that deliver new connectivity will be supported where there are benefits of this connectivity for communities and the local economy.*
- e) Development proposals for digital infrastructure will only be supported where:
 - i. the visual and amenity impacts of the proposed development have been minimised through careful siting, design, height, materials and, landscaping, taking into account cumulative impacts and relevant technical constraints;*
 - ii. it has been demonstrated that, before erecting a new ground based mast, the possibility of erecting antennas on an existing building, mast or other structure, replacing an existing mast and/or site sharing has been explored; and*
 - iii. there is no physical obstruction to aerodrome operations, technical sites, or existing transmitter/receiver facilities."**


An assessment of the siting and appearance of the infrastructure against this policy is set out below, criterion-by-criterion:

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- a) The proposals are appropriate for their location (see 'reasons for choice of design' above). They will provide coverage for all 4 MNOs and so will be universal and, as a shareable lattice structure, the proposals will be future-proofed. On this basis, the application should be supported as directed by the policy criterion.
- b) The area around the application site currently has no connectivity at all from any MNO. Therefore the provision of new 4G connectivity for all MNOs means across a wide area of this TNS means that the proposals should be supported under this criterion.
- c) The proposals for part of the larger and wider 'Shared Rural Network' (SRN) a nation-wide programme for the roll-out of digital infrastructure. It also forms a part of the Scottish Government's Mobile Action Plan (MAP). On this basis, the application should be supported as directed by the policy criterion.
- d) This is a remote area where people visit and where devices used by visitors, walkers, cyclists would benefit from connectivity. It would also support any M2M connectivity (IoT) and would be important for the building of national networks where geographic coverage is vital to allow seamless communications between devices (with or without human interaction). The extent of geographic coverage can be seen in the accompanying coverage plots.
- e) Looking at the specific sub-criteria (i) – (iii) we would comment:
 - i. There will be impacts from the proposals. This is chiefly due to the location within Wild Land and the NSA. However, the technical constraints of radio technology are such that, if the current lack of connectivity is to be addressed, then a new mast will be required in this area. This is confirmed by its status as an OFCOM Total Not Spot. Its visual impacts in both amenity and landscape terms is addressed within the Landscape and Visual Appraisal and Wild Land Assessment both of which accompany the application. These assessments are in line with NPF4 requirements (see more below). Importantly we would note that the overall siting is predicated on the TNS area, and its micro-siting is based on reducing overall impacts. The height and design are discussed above, however in summary the height is the minimum required to achieve radio coverage across the area and a transmission link back into the radio network and the design allows for the range of antennas, dishes and ancillary development to be supported in the mast. Its lightweight open structure also helps those parts which are visible in its assimilation within the landscape when seen against the sky.

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- ii. As will be seen on any site visit and can be gleaned from the submitted LVA, there are no existing masts or tall structures in the local area. By definition this means a new ground-based mast will be required if coverage is to be provided. An analysis of existing masts/infrastructure is also set out above.
- iii. There are no facilities close-by where there could be any physical obstruction.

Taken together, there is NPF4 policy support for the proposals when the most pertinent policy is considered. Communications policies are the policies which should have the most weight in any assessment.

However, the NPF4 is very clear on how better connectivity should not be seen as a stand-alone policy as connectivity permeates so many our social and economic activities and with the emergence of the IoT, even activities that don't need any human interaction. Indeed the NPF4 makes linkages explicit throughout the document and after each policy lists its policy impact and connections (across other policies) – these are reproduced below and we have highlighted those specifically pertinent for this application **in bold**:

“Policy impact:

Just Transition

Conserving and recycling assets

Local living

Compact urban growth

Rebalanced development

Rural revitalisation

Key policy connections:

Tackling the climate and nature crises

Natural places

Green belts

Zero waste

Design, quality and place

Local Living and 20 minute neighbourhoods

Infrastructure first

Health and safety

Community wealth building

Business and industry

City, town, local and commercial centres


Rural development”

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Better connectivity underpins moves to reduce emissions as it reduces the need to travel and allows non-physical communications (for example transfer of electronic files vs delivery of documents by traditional post). This shift which reduces overall demand on the grid works in tandem with the shift to renewables to help Scotland to move closer to its climate change targets. Better connectivity allows rural areas, be those rural businesses, residents, visitors, or those simply travelling through the area to participate in the online world, irrespective of how rural or remote that area is. Through policy 4 of the NPF4, the application has been supported by a Landscape and Visual Assessment (LVA). That document should be read in conjunction with this document as well as the summary of the LVA reproduced above.

Confirmed above, due to coverage requirements and the TNS area, a location outwith the Wild land and the NSA could not be found.

Additional benefits of the mast will not only increase mobile connectivity but also it has a focus on overall mobile broadband. There are significant IoT applications that will benefit from the connectivity that the proposed mast would provide. There will be new opportunity for new connectivity, with environmental measures that were not possibly able to be measured in real time, will be able to have this advantage. Air quality sensors, sensors monitoring ecology and protected species will be able to be utilised on a real time basis, giving better accuracy on data. The increased benefits are in line with both the NPF4 and the connectivity aspirations of Highland Council and the Scottish Government.

The below (taken from an American source³) demonstrates the benefits of remote sensing for the sorts of environmental assets found across rural Scotland and how connectivity (the biggest cost barrier) is crucial in this. This Government investment reduces any up-front costs from agencies looking to set out sensing for environmental assets (air/water/wildlife).

Environmental monitoring is more critical than ever to the protection of our health and the health of the environment. As the human population continues to increase and industrial development continues to expand, energy use is surging and pollution is posing a major threat to the environment. Both world and community leaders and scientists are increasingly turning to advanced technology and data science to help quantify and mitigate the impact of human activity on the environment.

Despite advances in pollution control in recent years, the Intergovernmental Panel on Climate Change's 2021 climate change report served as a stark warning to leaders that policy changes must be enforced expeditiously to mitigate the unprecedented environmental changes already set in motion. As each new year ushers in a slew of record-


³ <https://www.heavy.ai/blog/how-real-time-environmental-monitoring-systems-are-improving-our-relationship-with-the-planet>

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breaking floods, wildfires, hurricanes, and global temperatures, it is all the more urgent to employ environmental monitoring methods and data science to gain full visibility of our activities on the environment.

Innovations in technology, in combination with data science, have introduced real-time environmental monitoring systems, which incorporate modern real-time sensor networks, the Sensor Observation Service (SOS), Geographic Information Systems (GIS), telemetry systems, machine learning techniques, the Internet of Things, predictive analytics, and other technologies to gather and statistically analyze environmental data in real-time. This real-time data is used to make predictions and inform time-critical decisions related to environmental conditions.

Real-time environmental monitoring and assessment technologies are more sophisticated than ever

The technologies used in real-time environmental monitoring systems include a wide variety of hardware, software, and methodologies. Some of the most common technologies include:

Real-Time Sensor Networks

A dispersed group of environmental sensors monitor and record the conditions of an environment, and stream data in real-time over the Internet via their own API or bespoke connection. Once data is transmitted to a data center, it is subject to anomaly detection, which identifies potentially inaccurate data produced from compromised monitoring devices. Typically a stream-based importer is used to ingest data into a database.

Analytics Platforms

Provides a centralized location where massive GIS datasets can be ingested, queried, visualized on a granular level, and analyzed at scale in real-time. An accelerated analytics platform features interactive data visualizations, and allows analysts to cross-filter billions of geospatial data records and polygons alongside other features in milliseconds.

Sensor Observation Service

A web service to query real-time sensor network data and sensor data time series, and applicable to use cases in which real-time sensor data streams need to be managed in an interoperable way. SOS allows querying observations, real-time sensor metadata, as well as representations of observed features. Standards are defined by the Open Geospatial Consortium.

Geographic Information Systems

GIS are computer and software tools for gathering and analyzing data connected to geographic locations and their relation to human or natural activity on Earth. GIS mapping software uses spatial data to create maps and 3D models out of layers of visual information, revealing patterns and relationships in the GIS data. Remote sensing data is pulled from sources like USGS Earth Explorer and the Socioeconomic Data and Applications Center.

Telemetry Systems

Telemetry is the automatic in situ recording of measurements or other data at remote points and their transmission to receiving IT equipment at a different location. Common options include cellular, radio, or satellite. Telemetry platforms are appropriate for a variety of remote, real-time monitoring applications.

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The Internet of Things

IoT based environmental monitoring enable us to visualize, monitor, and control crucial phenomena in the environment with the use of devices that can sense, process, and wirelessly transmit data to remote storage such as the cloud, where data can be stored, analyzed, and presented in a valuable way.

Machine Learning

Data history is recorded with data science tools like Pandas inside a Notebook environment. Machine Learning models can then be implemented as a way of infilling or back painting missing data. Deep learning algorithms have revolutionized the ability to detect complex objects in imagery, such as wisps of clouds. A human element is still necessary, a role filled by an environmental monitoring technician.

The benefits and advantages of environmental monitoring in real-time are enormous

The objectives of environmental monitoring are simple: minimize the impact an our activities have on an environment. Real-time environmental monitoring systems are helping humans develop a proactive relationship with the Earth, and advancing Earth analytics can even help mitigate catastrophic events. Continuous environmental monitoring with real-time technologies helps provide data that is used to identify trends, make predictions, and establish parameters and trigger levels, which is essential for early warning strategies.

A major benefit of the proliferation of real-time environmental monitoring is accountability. Our ability to conduct environmental monitoring and impact assessments in some of the most remote corners of the world ensures corporate compliance and adherence to government regulations. Real-time monitoring helps agencies and enterprises set environmental performance goals and emission reduction targets, and create environmental monitoring reports to track their progress.

Another major benefit is the improvement of disaster response and preparedness. Disaster management data collection and emergency management software facilitate innovative emergency management endeavors such as crisis mapping, social media mining, and event simulations, which use enormous volumes of real-time and historical data to assist emergency management directors and their teams in developing proactive, protective strategies, such as flood warning systems.

Real-time environmental monitoring applications are all around us every day

The practical applications of real-time environmental monitoring are vast and varied. Wildfires, landslides, flooding, biodiversity, and waste and pollution are all issues of increasing concern as the climate crisis is predicted to worsen in coming years. Wildfire monitoring systems have been particularly useful in 2020, which saw a record-setting number of wildfires ravage California.

Real-time sensor data combined with data science and advanced analytics tools facilitate high visibility and granular analysis of environmental phenomena. The most common environmental monitoring types include air, soil, and water:

Air Monitoring


Wireless sensor networks for real time air pollution monitoring is performed with the use of specialized observation tools, such as sensor networks and Geographic Information System (GIS) models, from multiple different environmental networks and institutes is integrated into

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air dispersion models, which combine emissions, meteorological, and topographic data to detect and predict concentration of air pollutants and measure temperature humidity.

Soil Contamination Monitoring

Grab sampling (individual samples) and composite sampling (multiple samples) are used to monitor soil, set baselines, and detect threats such as acidification, biodiversity loss, compaction, contamination, erosion, organic material loss, salinization, water leak detection, and slope instability. Salinity monitoring, contamination monitoring, and erosion monitoring help identify imbalances, toxins, and behavior that can impact everything from crop yield to diseases.

Water Quality Monitoring

Water quality monitoring and sampling equipment and techniques include judgmental, simple random, stratified, systematic and grid, adaptive cluster, grab, and passive; semi-continuous and continuous environmental condition monitoring; remote sensing, and biosensors for water quality monitoring, are used to measure and monitor ranges for biological, chemical, radiological, microbiological, and population parameters.

Environmental monitoring solutions feature tools and capabilities that are tremendously useful to data analysts

Whether you're measuring air quality or analyzing soil samples, most real-time environmental monitoring solutions tend to feature the same general capabilities and features:

IoT visualization

Automated data collection tools for quantitative and qualitative data

Built-in notifications for tracking environmental samples

Validation and auditing tools

Regulatory exports and reports

Multi-tiered security

Local Language Support

Built-in GIS mapping

Mobile integrations

Advanced query tools

Pre-built calculations for analytical data

Data science is quickly becoming one of the most valuable tools for protecting the environment

Data science and Artificial Intelligence are helping drive technological innovations for some major environmental initiatives and projects. Some compelling examples include:

Simulation Modeling of the Earth

Scientists are creating a digital twin of our planet that will capture continuous, real-time environmental data to help improve climate forecasts. Scientists and policymakers will be able to evaluate different scenarios that would support sustainable development and influence environmental policies.

Accelerating Research at NASA


NASA Center for Climate Simulation (NCCS) is combining AI and machine learning with high-performance computing to manage and gain insight from its increasingly massive data stores. Projects include landslide detection, surface water monitoring, and habitat suitability prediction.

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Environmental Protection Using AI

Microsoft's "AI for Earth" initiative provides scientists and researchers access to AI and machine learning technology, awarding grants to support projects related to agriculture, biodiversity, climate and water. One such project is Ocean Cleanup, which uses machine learning to identify plastic pollution in rivers and simulate how it moves in the ocean.

There are still major challenges in implementing real-time environmental monitoring systems. As is the case with many advanced technologies, the greatest barrier of entry for real-time environmental monitoring systems is upfront cost. While real-time monitoring systems are not cheap, billions of dollars are spent every year on asset management, and a significant percentage of those funds are wasted on inefficiencies. Real-time monitoring systems combine preventive risk analysis and logistics to help teams make smarter, data-driven decisions.

Managing the sheer volume of existing environmental assets is growing impractical without advanced environmental monitoring tools, so while the upfront cost may cause sticker shock, the long-term benefits and savings from real-time monitoring outweighs the initial cost.

Therefore, whilst for a number of TNS locations there is either limited or no local population, connectivity and the ability to gather real-time information from very remote areas will allow data to be gathered without the need for costly visits and the associated travel and other costs.

Policy 4 of NPF4 also seeks to ensure that there are no adverse impacts to European Sites. The PEA highlights that there could be impacts on the nearest site (2.3km away) and that the Council will need to undertake an appropriate assessment.

It is the applicant's view that, with appropriately worded conditions, and bearing in mind the existing access track/road, permanent power source and very limited development footprint, there will be no adverse impacts on the European site.

Highland Local Development Plan

The development plan for the application is the Highland-wide Local Development Plan (HwLDP). This was adopted in 2012 and is currently under review. It has two specific policies which would apply to telecommunications proposals – these policies are:

Policy 45 Communications


The Council will support proposals which lead to the expansion of the electronic communications network in Highland. This includes delivery of core infrastructure for telecommunications, broadband and other digital infrastructure.

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Policy 46 Siting and Design of Communications Infrastructure

The Council will support proposals for the provision of new communications infrastructure, where:

- *equipment and any associated access are sited and designed sensitively to avoid adverse impacts on natural, built and cultural heritage, including landscape character and views;*
 - *existing masts or other structures cannot be shared;*
 - *existing services are not interfered with; and*
 - *redundant masts and equipment are removed (without prejudice to their possible re-use elsewhere).*
- The cumulative visual effect of equipment will also be taken into account when assessing proposals.*

The first policy (45) sets out the positive nature within which development proposals will be assessed and this is welcomed by the applicant. The second policy (46) is a criteria-based policy which should be used to assess individual applications. In terms of these criteria and the application in front of the Council we would note the following:

- The siting and design are led by the function of the proposed mast. It is located in an area which has no mobile connectivity at all (TNS). The proposed radio coverage is designed to provide as much as possible across as wide an area whilst minimising impacts as much as possible. It is located within an area nationally designated for landscape value (National Scenic Area) and is also within a Wild Land area. To support the application and to quantify impacts on the landscape an LVIA and a WLA have been submitted alongside and these are discussed above and should be read in conjunction with this document. Impacts on the environment, heritage assets and landscape are discussed further below and have been explored above.
- There are no existing masts in the area which would allow the required radio coverage for all the MNOs.
- No existing services will be interfered with.
- Redundant apparatus will be removed.

The above demonstrates that there is policy compliance with the specific policy which would attract the greatest weight within the LDP.

The studies which support the application discuss other planning policies as they relate to landscape and environmental assets.


For the reasons set out above and the policy analysis immediately above, it is hoped that the Council can support this application to approve connectivity across this rural part of the Highlands.

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Scottish Government Mobile Action Plan

The SG has also been very supportive of connectivity. Indeed it has previously set up its own publicly-funded 4G mobile connectivity programme (Scottish 4G Infill - <https://www.gov.scot/publications/scottish-4g-infill-programme-progress-update/>). The SG has understood for some time that in order to get mobile connectivity into areas where there is no commercial rationale, but there is a public benefit, is unlikely to be met without public intervention.

In terms of the overall ambition for mobile connectivity, the SG has its own Mobile Action Plan (MAP) 2016 and a 5G Strategy (2019). These set ambitions for the nation in terms of connectivity. Bearing in mind the pace of change in the mobile market and technological innovation the MAP is now somewhat dated. The Mobile infill project is now nearly complete and the ESN network likewise. It predates SRN. However the Introduction sets out the SG ambition for mobile connectivity and this hasn't changed. It states:

Ensuring high quality digital connectivity across all of Scotland is a priority for the Scottish Government (SG). We have set out an ambition for the availability of world class digital connectivity across Scotland, and we recognise that improved mobile connectivity is an integral part of delivering that ambition. SG has been working with the Scottish Futures Trust (SFT) to determine how we can most effectively support industry to deliver a 5G-ready infrastructure across all of Scotland.

The UK mobile network operators (MNOs) have demonstrated a clear commitment to maximise coverage, not least by investing substantial sums in rolling out 4G networks across the country. Significant progress is being made towards meeting 4G coverage obligations and the 90% geographic coverage agreement. Nevertheless, we collectively recognise that once commercial deployment is complete, coverage gaps will still remain in some of the most rural and remote areas.

SG also recognises that the costs of deploying new infrastructure to address mobile hotspots is often prohibitively high, particularly when set against the limited revenues that can be generated where there are relatively few users.


The MAP therefore sets the ambition that all of Scotland should have high quality connectivity and that there will be areas which are hard to reach and which the MNOs would not go to on a commercial basis - the SRN fits squarely within this ambition.

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Scottish Government Planning Guidance: Digital Telecommunications

The Scottish Government replaced the longstanding Planning Advice Note 62 (PAN62) in late December 2023. This now forms the Scottish Government's formal guidance in the siting and the appearance of communications apparatus across Scotland. It will be a strong material consideration in the assessment of applications for both planning applications and prior approval applications.

The guidance is clear that the planning system can help in areas where there is no current connectivity stating:

1.6 The planning system can assist in addressing the gaps in connectivity and barriers to digital access by supporting the delivery of new digital services and technological improvements, particularly in areas with no or low connectivity capacity. These factors are critical to NPF4 aspirations which seek to:

- tackle climate change and protect local environments from its damaging impacts by reducing the need to travel and to contribute to a net zero society.
- unlock opportunities for businesses, employment and remote working.
- support investment and population growth in rural areas.
- create better places by influencing the pattern and location of development and ensure connectivity is where it is needed.
- build 'smart' communities to facilitate more sustainable ways of living.

Importantly on rural Scotland, it also states:

1.9 At the time of writing, despite significant progress large parts of rural Scotland still have little or no mobile connectivity. These are often challenging areas in which to deploy mobile infrastructure because of areas of natural and cultural significance, topography and the economics of developing installations that might only serve small populations and low numbers of passing customers. To address the digital divide that has emerged in these areas, the Scottish Government, the UK Government and the Mobile Network Operators (MNO) are working together to transform mobile coverage countrywide in the Scottish 4G Infill (S4GI) and Shared Rural Network (SRN) programmes. To gain maximum coverage, it is likely that some of the SRN infrastructure will be tall, but that should reduce the overall number of sites that may otherwise be required in some sensitive landscapes.

Specifically on SRN it states:


4.36 'Not spots' (both total and partial) can, and are more likely to, occur in remote locations. Historically, the operators have provided coverage to population centres, as this made more commercial sense. This has left large areas and dispersed communities with little in the way of mobile coverage. There are also large unpopulated areas where there

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may be no population but there are visitors and those travelling through on road or rail. Furthermore, the Scottish and UK Governments both aspire to have ubiquitous coverage because mobile broadband is a facilitator technology, and it is needed in these areas for interconnections via the internet of computing devices embedded in everyday objects. This enables technology to send and receive data to serve various applications (for example for agriculture, tourism, emergency services, monitoring protected species, air quality, applications for drone guidance etc). The Shared Rural Network (SRN) has been instigated to deal with both these total and partial not spots.

4.37 The often rugged and mountainous topography of rural Scotland adds to this challenge and signals can be blocked by hills and forests. Adding to the problem of receiving coverage from base stations is how the data is linked back into the network (backhaul). A lot of rural areas have no existing fibre infrastructure and the lack of existing masts, combined with topography, can make LOS between masts difficult to achieve. Likewise, easily accessible power also introduces complexity and expense in the provision of coverage in rural areas. This will have implications for the siting and appearance of new masts, where taller masts are expected but that should reduce the overall number of sites that may otherwise be required in some sensitive landscapes.

Whilst the guidance also seeks to ensure the minimisation of impacts, the understanding that coverage is required is explicit in the document. To support the application and to address concerns over impacts, the various studies outlined above accompany the application.

Site and mast sharing is encouraged through the new guidance. This is clear from the extract below:

4.8 The Electronic Communications Code (Conditions and Restrictions) Regulations 2003, as amended, ("the Code Regulations") require an operator to share the use of electronic communications apparatus, where practicable. Site sharing minimises the number of sites required and reduces proliferation. In the light of this, operators have site sharing arrangements with each other and with the wholesale infrastructure providers. They also have similar arrangements with the utilities and some large landlords.


4.9 When operators are seeking to deploy new sites, they will therefore look first at maximising site sharing opportunities and facilitating prompt delivery without the need to search for new parcels of land and to have to enter into potentially lengthy negotiations and legal agreements on an individual basis. These potential sites may offer additional benefits, such as having existing or ready access to a power supply, access to fibre or an existing vehicular access. Sharing will often enable quicker and more economic installation and, subject to requirements, additional equipment may be undertaken under PDR.

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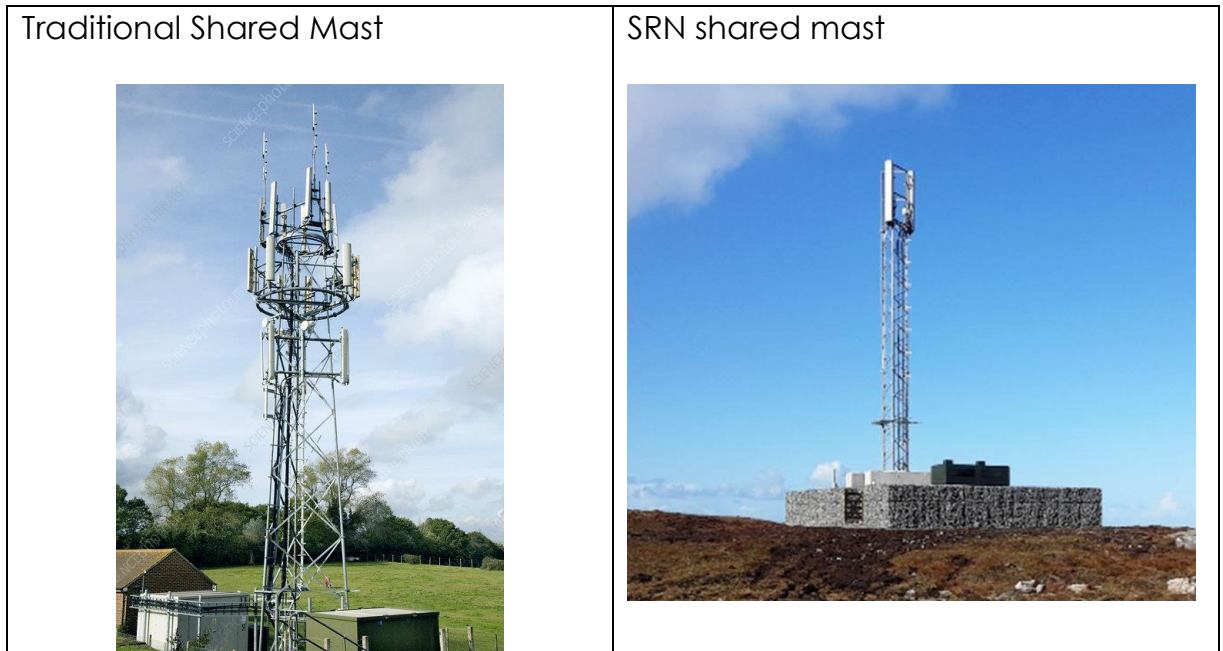
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Whilst the proposed development in front of the Council is for a new mast, it is for a shared new mast. All the MNO will be present on the mast. Not only this, for the first time the antennas will be shared by the MNOs. This means only one set of radio antennas is required i.e. 3 antennas. This means that a less robust mast can be used and that the apparatus location on the mast is less cumbersome and has a lower visual impact. This can be seen from the two example mast below:



The accompanying LVIA and WLA with the various visualisations help to demonstrate how the proposed mast can be assimilated into the landscape with minimal impacts and hence how it will accord with the new guidance.

Importantly, and also picked up in the new guidance, are issues surrounding power and access tracks. In this case power will be supplied predominantly through renewables (solar) and the application site will be located as close to an existing access track as is possible and practicable. This reduces the overall impacts from the proposed development in line with the guidance.

Naturescot: Standing advice for planning consultations – Telecommunication masts in National Scenic Areas, National Parks and Wild Land Areas - 2023


Naturescot developed standing guidance on proposed communications infrastructure in designated areas in Autumn 2023

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This seeks to ensure the correct level of supporting information is provided with each application to allow it to be assessed properly and seeks to limit impacts from infrastructure through good siting and design. This includes pointing to the principles set out in PAN62 – although it is noted that this guidance is dated⁴. It then goes on to provide guidance on 5 key areas, these being:

- Site selection – for this proposal, this is set out above. Bearing in mind the TNS area, a site close to the existing access track was chosen.
- Access tracks – as described, the site location just off an existing well established access road reduces impacts in this regard.
- Equipment Housing and Compound – this is the minimum required.
- Mitigation and reinstatement – there are limited options in such an open landscape however the applicant could look at such matters in discussion with the Council/Naturescot.
- Cumulative Impacts – these are considered as part of the WLA and LVA.

UK Wireless Infrastructure Strategy 2023

We have included the Strategy within the application documents however it is worth noting the more pertinent parts within this document.

That the Strategy focuses on 5G tells its own story. The rest of the UK and the more populated urban areas are now moving to look at 5G coverage rather than 4G. This highlights the current geographical divide on mobile connectivity

The Strategy was issued by the Government in April 2023, and sets out how the Government will deliver world-class digital infrastructure to all Britons over the next decade.

In the foreword by the Secretary of State for Science, Innovation and Technology, Michelle Donelan, it is stated:

"...wireless technology has transformed our world almost beyond recognition. Today, radio waves connect communities across the country not just with one another, but with the world thousands of miles beyond our shores, and the satellites hundreds of miles above our skies.

Connectivity has brought benefits for British household and British business, boosting growth, productivity, and opportunity for all. And change shows no sign of stopping...


⁴ PAN62 is due to be replaced in late 2023

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...It is my personal mission as the Department's first Secretary of State to put Britain right at the forefront of scientific and technological progress. By bringing together world-class research and a dynamic business ecosystem, we can harness enterprise and innovation to grow the economy, driving forward the delivery of one of the Prime Minister's five priorities.

To do all this, we need world-class digital infrastructure... we have redoubled our efforts to build gigabit broadband in remote regions like Cornwall or Cumbria, together with our work to extend 4G coverage across the country through the £1 billion Shared Rural Network.

...Government will lead by example, putting wireless connectivity right at the heart of new and existing infrastructure to ensure that we do build infrastructure fit for the digital age...

...We will strengthen the infrastructure that underpins these markets, too, by managing the spectrum for the benefit of all, driving forward the rapid deployment of mobile networks..."

The Minister for State for Digital Infrastructure, Julia Lopez, also highlights the importance of connectivity in her foreword to the UK Wireless Infrastructure Strategy:

"The more our lives are conducted online, the more access to the internet becomes critical for social and economic opportunity.

This is why delivering world-class digital infrastructure to all Britons is a fundamental mission of this government – and our efforts to build it the modern equivalent in scale and ambition to the Victorian's construction of the railways. Our plan is for every corner of our country to get lightning fast connectivity, not only to give people real choices about where to live and work today but so they will not be left out of future technological revolutions because of poor infrastructure.

...the time is right to turn our sights to mobile connectivity, where the same sense of mission is needed to deliver the kind of wireless infrastructure that will transform how we live our lives and run our economy. This is not simply a matter of improving download speeds as people browse the internet on their phones or dial into work calls. It is far more transformative than that.


...Falling behind in coverage will mean falling behind in international competitiveness when it comes to the technologies of tomorrow, and failing

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to provide British people with innovative, life-enhancing services on secure, resilient networks.”

The Executive Summary sets out the prime minister's five priorities for this Government:

“...to build a better, more secure, more prosperous future for the UK, including growing the economy, and creating better-paid jobs and opportunity right across the country, which this strategy is focused on delivering.

We can only deliver on that priority with world-class digital infrastructure. Advanced wireless connectivity will be the foundation on which we build industries, jobs, skills and services for the future, and this strategy sets out our plan to harness its potential for our economy and our society.

The next decade will see seismic changes both in terms of what wireless connectivity can deliver and how we can use it. The economic and social benefits from these changes promise to be vast, from supercharging growth to accelerating our transition to net zero. But we can only realise these benefits with concerted action from government, industry, and others. This strategy sets out our plan to do just that...”

The Executive Summary goes on to highlight that the UK Government is supporting the rural areas of the UK ‘through our £1bn deal with the mobile network operators, we are supporting rural communities by ensuring that 95% of the UK landmass have 4G coverage by 2025. This currently stands at 92%’.

The Strategy indicates why the Government that already has a high bar of digital connectivity, aspires to set it even higher. It notes that 2G and 3G mobile networks opened up a new realm of connectivity and mobile communication, but these legacy technologies are being phased out over the course of the next decade to free up spectrum for next generation networks and remove barriers to new companies entering the telecoms supply chain.

The Strategy goes on to acknowledge that:

“4G revolutionised the way people use their mobile phones, supporting access to bandwidth hungry content on platforms like YouTube. Today, a 4G mobile phone can process data four times as fast as a 2G equivalent at the turn of the millennium.


By building world-class, secure digital infrastructure networks, we can realise the vision we set out in our Digital Strategy for a competitive and innovative

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digital economy, support our vision for new technologies like that set out in the AI Regulation White Paper and deliver on our commitment to grow the economy.

...By ensuring that everyone can access the technology they need, including through specific support for rural economies by enabling applications such as agritech, we can make it as easy to start and scale up a digital business in rural Yorkshire as it is in central London."

The strategy sets out how the UK will maximise the potential of advanced wireless networks over the next decade, securing international competitiveness for the future and driving economic growth across the UK. This includes:

"Ensuring good connectivity for all – 4G will continue to play an important role over the next decade in providing mobile connectivity across the UK. Through the Government's £1 billion Shared Rural Network programme it is moving further and faster to push 4G coverage to 95% of the UK's landmass."

To drive good connectivity for all the Government is taking action on reporting. It has asked Ofcom to continue to hold the mobile network operators to account through on-the-ground signal testing and to improve the accuracy of its coverage reporting through increased use of crowdsourced data. It has also asked Ofcom to consider how it can improve the accuracy of reporting of network performance levels in rural areas and for indoor coverage, to help policy makers and industry understand where coverage improvements are needed.

The Government wants rural economies to benefit from the huge benefits connectivity offers. As a result, the Government will be appointing a Rural Connectivity Champion to report to DSIT and DEFRA Secretaries of State to remove local barriers for deployment and promote digitally based innovation in rural areas.

Chapter 2 of the UK Wireless Infrastructure Strategy relates to ensuring good connectivity across rural and urban areas. It states that:


"The government's priority to build a better, more secure, more prosperous future for the UK includes a clear commitment to grow the economy, and create better paid jobs and opportunity right across the country. To do this, it is vital that people who live and work in all parts of the UK, including in rural areas, have access to good quality mobile and broadband coverage."

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The Government seeks to support rural communities by ensuring that 95% of the UK landmass has 4G coverage by 2025. Currently 92% of the UK landmass is covered by a good 4G signal from at least one Mobile Network Operator, while 70% of the country is covered by all four operators. Ensuring good mobile connectivity will support the delivery of the Emergency Services Network that will replace the current Airwave service used by the emergency services in Great Britain and transform the way they operate."

The Government has a plan for rural connectivity which includes investing £1 bn in the SRN programme to deliver 4G coverage to 95% of the UK landmass. *"This will also deliver 4G coverage on a further 16,000km of roads, with further indirect improvements over time, including a boost to 'in-car' coverage on around 45,000km of roads and we improve geographic coverage to 79% of Areas of Natural Beauty, benefitting millions of visitors every year".* The Government has also asked Ofcom to improve mobile coverage reporting, including in rural areas.

The strategy acknowledges that wireless connectivity can play a crucial role in delivering fixed broadband to the hardest to reach areas of the country. It goes on to note that worldclass digital infrastructure underpins the digital economy and was worth £143 billion in 2021, accounting for 5% of the national workforce. This infrastructure provides the backbone of the UK economy and society with ever more jobs, public services and societal interactions built upon its foundations. As growth in the digital sector is nearly six times faster than across the economy as a whole, its importance will only continue to increase as the Prime Minister's priority to grow the economy is delivered. 4G technology revolutionised the way people use their mobile devices. According to Ofcom's Communications Market Report, there are already close to 100 million mobile subscriptions in the UK, and a significant and growing number of machine-to-machine subscriptions.

This is the yearly report produced by OFCOM and as well as the UK-wide Report, a nation specific report is produced for Scotland where it can be seen the importance placed on SRN by the Regulator in helping to achieve greater geographical coverage. It states:

Improving geographic coverage

Both the Scottish Government and UK Government have introduced initiatives which should see significant investment in networks and therefore improved geographic coverage over the coming years.

Shared Rural Network


The Shared Rural Network (SRN) was agreed between the UK Government and the mobile operators in March 2020. Work has continued throughout 2022 towards the delivery of the SRN, with operators' licence obligations to achieve good quality coverage across 88% of the landmass falling due in

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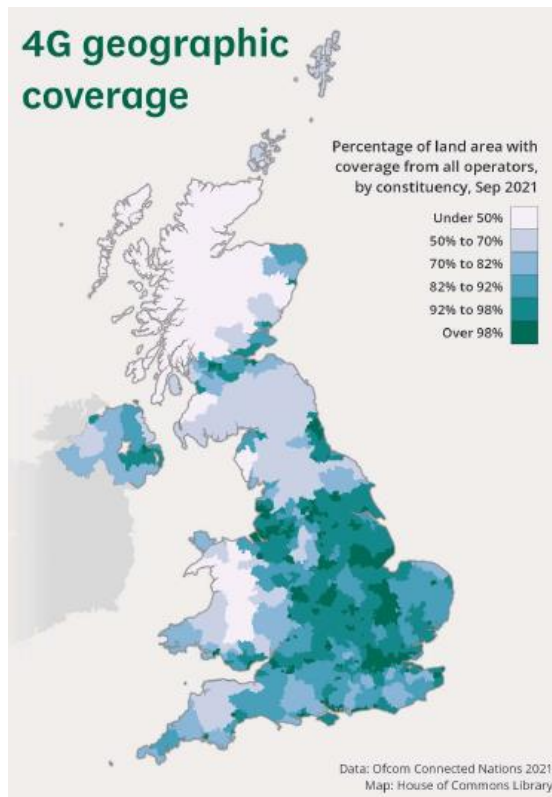
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June 2024, and 90% of the landmass to be covered by January 2027. The UK Government also expects that as a result of this activity there will be good 4G coverage available across 95% of the UK landmass by the end of 2025 (from at least one mobile operator). Coverage in Scotland is expected to rise to 91% from at least one operator and reach 74% from all four operators.

Set out previously, rural connectivity is an issue which is receiving political attention and the various documents and strategies we have included with the application demonstrate this. The is includes:

House of Commons Briefing Paper

This is a very useful background and reference document and provides a stock-take of where the UK is currently at in terms of mobile coverage (as of the publication date – April 2022). Taken from the document, the map below shows the current poor quality of geographic coverage in rural Scotland and emphasises the challenge of the SRN programme.




Digital Scotland: A Changing Nation

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This document is wide ranging and covers a lot of ground. However, with specific reference to SRN we would highlight the following extract:

No One Left Behind

- Improve rural 4G mobile coverage and set the right conditions to encourage investment:** We will continue to invest in future-proofed infrastructure through the Scottish 4G infill programme and work collaboratively with the UK Government to ensure maximum impact from the up to £1bn Shared Rural Network (SRN) investment in Scotland – the UK government has said this scheme will provide 91% geographic coverage by at least one mobile network operator.⁹ We will simplify the planning process to make it easier for telecoms operators to deploy infrastructure that meets community needs, and through Scotland 5G centre's Infralink project offer support and guidance to improve rental access to publicly owned assets and ensure that the siting and design of masts helps to protect the natural environment.

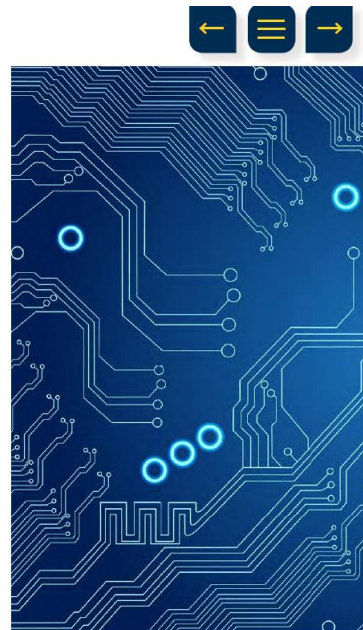


Technology Enabled

- Ensure that all newly publicly-funded infrastructure is future-proofed for data requirements,** and all our communities – including our rural and islands communities – are resilient and sustainable so they have a strong economic future and can transition to a net zero society. Making robust, high quality data open and available to our communities will enable smarter investment, allow better use of assets and innovation in our public services and economy.



Data-Driven



31 | Digital Scotland | A Changing Nation: How Scotland will Thrive in a Digital World

Scottish Government - Forging our Digital Future

Whilst a 5G document, it acknowledges that new infrastructure is required especially in rural area

“HOW 5G CAN BE SUPPORTED

While the UK's reserved 5G policy is expected to evolve, the continued availability of UK-wide funding streams for 5G is also crucial. The Scottish Government welcomes the UK Government's investment in 5G to date, but it is clear that there has been insufficient investment in Scotland. The UK Government must make further funding available to Scotland – and future funding allocations must fully take into account the challenges to widespread rollout which exist in Scotland due to our country's geography. We would expect to be fully consulted on future funding priorities.

The FTIR contains the phrase 'outside in' as regards the UK Government's aim of supporting deployment to the most rural and remote areas as well as urban areas, but it is not clear how this will manifest itself. A key component must be the rural dimension and we would welcome the opportunity to work with the UK Government and Ofcom to consider how investment can be best targeted at areas of Scotland where the private sector will not deploy to on a commercial basis.

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For example, the Scottish Government is keen to explore models which could help reduce the industry's deployment and operational costs – to facilitate network deployment in rural and remote areas. This could potentially use existing public sector assets and/or deployments arising from the Scottish Government's Scottish 4G Infill programme¹⁹ as a testbed in which to target public investment in rural areas to reduce the 5G “notspots” in the future. In parallel, proof of concept 5G projects need to be supported by collaboratively working with industry and academia to attract early-stage investment in 5G networks and infrastructure in Scotland.”

Summary

The application site is within the Highland Council area. Impacts thereon have been assessed in the submitted supporting documents – Landscape and Visual Assessment, Wild Land Assessment, Construction and Environmental Management Plan, Preliminary Ecological Assessment, NVC Survey and Peat Survey. These studies demonstrate that the mast could be absorbed within the landscape and the environment in an acceptable manner.

Alternatives have been considered however bearing in mind the radio coverage constraints, the local topography there were no other options which would have less impacts than the application proposals.

The socio-economic benefits of the mast have been outlined and compared to the environmental impact of the mast. The mast will have increased socio-economic benefits to an area where there is currently no connectivity. The additional supporting documentation has outlined and contrasted the environmental impact and deemed the mast to be acceptable, especially when considered against the socio-economic benefits.

For this reason it is hoped that the Council can find the siting and appearance acceptable when weighed against the benefits of improved connectivity and approve the application.


Confirmation that submitted drawings have been checked for accuracy

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Position:	Planning Consultant	(on behalf of Cornerstone)	

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