Office of Communications (Ofcom)
Wireless Telegraphy Act 2006

PUBLIC WIRELESS NETWORK LICENCE

This licence document replaces the version of the Licence issued by Ofcom on 27 February 2024 to Telefónica UK Limited.

Licence no. **0249663**

Date of issue: **01 June 2024**

Fee payment date: **31 October** (annually)

1. The Office of Communications (Ofcom) grants this wireless telegraphy licence ("the Licence") to

Telefónica UK Limited
(Company registration number 1743099)
("the Licensee")
500 Brook Drive
Reading
RG2 6UU

to establish, install and use wireless telegraphy stations and/or wireless telegraphy apparatus as described in the schedules to this Licence (together "the Radio Equipment") subject to the terms set out below.

Licence Term

2. This Licence shall continue in force until revoked by Ofcom or surrendered by the Licensee.

Licence Variation and Revocation

3. Pursuant to schedule 1 paragraph 8 of the Wireless Telegraphy Act 2006 ("the Act"), Ofcom may not revoke this Licence under schedule 1 paragraph 6 of the Act except:

(a) at the request, or with the consent, of the Licensee;

(b) if there has been a breach of any of the terms of this Licence;

(c) in accordance with schedule 1 paragraph 8(5) of the Act;

(d) if it appears to Ofcom to be necessary or expedient to revoke or vary the licence for the purpose of complying with a direction by the Secretary of State given to Ofcom under Section 5 of the Act or Section 5 of the Communications Act 2003;

(e) if, in connection with the transfer or proposed transfer of rights and obligations arising by virtue of the Licence, there has been a breach of any provision of regulations made by Ofcom under the powers conferred by section 30of the Act[1];

[1] These are regulations on spectrum trading.

(f) for reasons related to the management of the radio spectrum, provided that in such a case the power to revoke may only be exercised after at least five years' notice is given in writing.

4. Ofcom may only revoke or vary this Licence by notification in writing to the Licensee and in accordance with schedule 1 paragraphs 6, 6A and 7 of the Act.

Transfer

5. This Licence may not be transferred. The transfer of rights and obligations arising by virtue of this Licence may however be authorised in accordance with regulations made by Ofcom under powers conferred by section 30 of the Act.[2]

Changes to Licensee details

6. The Licensee must give prior notice to Ofcom in writing of any change in the details of the name and/or address recorded in paragraph 1 of this Licence.

Fees

7. The Licensee shall each year pay to Ofcom the relevant fee(s) as provided in section 12 of the Act and the regulations made thereunder on or before the fee payment date shown above, or on or before such dates as shall be notified in writing to the Licensee.

Radio Equipment Use

8. The Licensee shall ensure that the Radio Equipment is established, installed and used only in accordance with the provisions specified in the schedules to this Licence. Any proposal to amend any detail specified in the schedules to this Licence must be agreed with Ofcom in advance and implemented only after this Licence has been varied or reissued accordingly.

9. The Licensee must ensure that the Radio Equipment is operated in compliance with the terms of this Licence and is used only by persons who have been authorised in writing by the Licensee to do so and that such persons are made aware of, and of the requirement to comply with, the terms of this Licence.

10. The Licensee must ensure that all Radio Equipment is established, installed, modified and used only in accordance with the provisions specified in schedule 3 (EMF Licence Condition) of this Licence.

Access and Inspection

11. The Licensee shall permit a person authorised by Ofcom:

(a) to have access to the Radio Equipment; and

(b) to inspect this Licence and to inspect, examine and test the Radio Equipment,

at any and all reasonable times or, when in the opinion of that person an urgent situation exists, at any time to ensure the Radio Equipment is being used in accordance with the terms of this Licence.

[2] See Ofcom's website for the latest position on spectrum trading and the types of trade which are permitted.

Modification, Restriction and Closedown

12. A person authorised by Ofcom may require the Radio Equipment, or any part thereof, to be modified or restricted in use, or temporarily or permanently closed down immediately if in the opinion of the person authorised by Ofcom:

(a) a breach of this Licence has occurred; and/or

(b) the use of the Radio Equipment is causing or contributing to undue interference to the use of other authorised radio equipment.

13. Ofcom may require the Radio Equipment to be modified or restricted in use, or temporarily or permanently closed down either immediately or on the expiry of such period as may be specified in the event of a national or local state of emergency being declared. Ofcom may exercise this power by a written notice served on the Licensee or by a general notice applicable to holders of this class of Licence.

Geographical Boundaries

14. Subject to the requirements of any coordination procedures notified to the Licensee under the schedules to this Licence, the Licensee is authorised to establish, install and use the Radio Equipment in the United Kingdom. For the avoidance of doubt, the United Kingdom includes the United Kingdom's territorial sea (measured in accordance with section 1 of the Territorial Sea Act 1987) and does not include the Channel Islands or the Isle of Man.

Interpretation

15. In this Licence:

(a) the establishment, installation and use of the Radio Equipment shall be interpreted as establishment and use of wireless telegraphy stations and installation and use of wireless telegraphy apparatus for wireless telegraphy as specified in section 8(1) of the Act;

(b) the expression " interference" shall have the meaning given by section 115 of the Act;

(c) the expressions "wireless telegraphy station" and "wireless telegraphy apparatus" shall have the meanings given by section 117 of the Act;

(d) the schedules form part of this Licence together with any subsequent schedule(s) which Ofcom may issue as a variation to this Licence; and

(e) the Interpretation Act 1978 shall apply to the Licence as it applies to an Act of Parliament.

Issued by Ofcom

Office of Communications

SCHEDULE 1 TO LICENCE NUMBER: 0249663

Licence Category: **Public Wireless Network 900 MHz**

Description of Radio Equipment Licensed

1. References in this schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this schedule.

Interface Requirements for the Radio Equipment

2. Use of the Radio Equipment shall be in accordance with the following Interface Requirements:

IR 2014 – Public Wireless Networks; and/or
IR 2109 – Terrestrial systems capable of providing electronic communications services in the 900 MHz and 1800 MHz bands;

or for equipment placed on the market before 8 April 2000, is required to be type approved in accordance with a recognised technical performance standard relating to the service licensed.

Special Conditions relating to the Operation of the Radio Equipment

3.

(a) Subject to paragraph 3(b) of this schedule, during the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of the following details relating to the Radio Equipment:

i) postal address (including post code);

ii) National Grid Reference, to at least 10 metre resolution;

iii) antenna height (above ground level) and type, and boresight east of true north (if applicable); and

iv) radio frequencies which the Radio Equipment uses;

v) Transmitted power expressed in dBm / 200 kHz EIRP for GSM base stations;

vi) Transmitted power expressed in dBm / 200 kHz EIRP per antenna for base stations for narrowband terrestrial ECS; and

vii) Transmitted power expressed in dBm / 5 MHz EIRP per antenna for base stations for broadband terrestrial ECS;

and the Licensee must produce these above records if requested by a person authorised by Ofcom;

(b) The conditions relating to the keeping of records contained in sub-paragraphs 3(a)i), 3(a)ii) and 3(a)iii), shall not apply in respect of femtocell equipment and smart/intelligent low power repeater equipment;

(c) The Licensee shall submit to Ofcom copies of the records detailed in sub-paragraph (a) above at such intervals as Ofcom shall notify to the Licensee.

Co-ordination at Frequency and Geographical Boundaries and Compliance with Other Procedures Relating to Interference

4. The Licensee shall ensure that the Radio Equipment is operated in compliance with such co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

International Cross-Border Coordination

5. The Licensee shall ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

Voice Coverage Obligation

6. The Licensee shall maintain an electronic communications network that is capable of providing mobile voice telecommunications services to an area covering at least 90% of the geographic landmass of the United Kingdom at at least one of the minimum signal strengths set out in Table 1 of this condition. For the avoidance of doubt the Licensee shall be permitted to meet the obligation set out in this condition using any frequencies and technologies available to the Licensee.

Table 1

Technology and Band	Minimum Signal Threshold
GSM 900	-93 dBm
GSM 1800	-93 dBm
UMTS 2100	-103 dBm
LTE 800	-115 dBm

Assessment of compliance with the Voice Coverage Obligation

7. Ofcom will assess the Licensee's compliance with the Voice Coverage Obligation by reference to the document "*Voice Coverage Obligation Notice of Compliance Methodology*" published by Ofcom.

2020 Coverage Obligations

8.

Definitions

(1) For the purposes of interpreting conditions 8.(2)-(8) below, these terms shall have the following meaning:

(a) "**2019 Baseline Coverage Level**" means the Licensee's coverage footprint of the Required Service as measured by the Licensee's predictive model on the basis of their September 2019 data as submitted to Ofcom in October 2019;

(b) "**2020 Baseline Coverage Footprint**" means the Licensee's coverage footprint of the Required Service as submitted to Ofcom in January 2020 on the basis of: (i) the data submitted to Ofcom in September 2019 for the Connected Nations 2019 report and (ii) the Licensee's forward-looking predictions for any additional site which is expected to be on-air by 30 June 2020, excluding any site which is not on-air by 30 June 2021;

(c) **"Available"**, for the purposes of condition 8.(4)(a), has the meaning given in the Grant Agreement;

(d) "**EAS Site**" means: (i) any of the 292 extended area service sites that the Home Office is intending to build to improve coverage in remote areas and (ii) any alternative or additional extended area service site which is publicly funded in the same way whose location is specified by Government by 31 March 2024, excluding any such site the deployment of which would materially duplicate the coverage from any site in Total Not Spots for which land has already been acquired by the Licensee;

(e) "**Full Coverage Area**" means a geographical area within the UK falling within all the MNOs' 2020 Baseline Coverage Footprints;

(f) "**Grant Agreement**" means the funding agreement entered into by Government and the SRN Entity in March 2020 as amended on 1 March 2021, in 2022 and again in 2024;

(g) "**Initial Coverage Deadline**" means 30 June 2024;

(h) "**MNO**" (Mobile Network Operator) means each of EE Limited,[3] Hutchison 3G UK Limited,[4] Telefónica UK Limited[5] and Vodafone Limited[6] (collectively, the "**MNOs**");

(i) **"Partial Not Spot"** means a geographical area within the UK falling within at least one, but not all, the MNOs' 2020 Baseline Coverage Footprints;

(j) "**Required Service**" means an electronic communications network that provides with a confidence level of more than 95% a mobile telecommunications service to users (i) with a sustained downlink speed of not less than 2 megabits per second, and (ii) on which 90 second voice calls can be made without interruption. This is equivalent to providing an outdoor LTE telecommunications service at a predicted mean signal strength of at least -105dBm;

(k) "**Road**" means all motorway, A-road, B-road, minor (non-numbered) roads and local roads excluding restricted access, private roads and cul-de-sacs;

(l) "**Subsequent Coverage Deadline**" means, in relation to each obligation that falls due on such deadline, 31 January 2027, unless Government suspends funding in response to a "Suspension Event" (as defined in the Grant Agreement), in which case the deadline shall be extended by the number of days included within such suspension;

(m) **"SRN Entity"** means the joint venture set up by the MNOs to run the SRN Programme;

(n) "**SRN Programme**" means the programme agreed between the MNOs and Government in March 2020 to improve mobile coverage in rural areas;

(o) "**Total Not Spot**" means geographical areas within the UK falling outside all the MNOs' 2020 Baseline Coverage Footprints.

[3] **EE Limited**, registered in England under company number 02382161. Registered office address: Trident Place, Mosquito Way, Hatfield, Hertfordshire, AL10 9BW.

[4] **Hutchison 3G UK Limited**, registered in England under company number 03885486. Registered office address: Star House, 20 Grenfell Road, Maidenhead, Berkshire, SL6 1EH.

[5] **Telefónica UK Limited**, registered in England under company number 01743099. Registered office address: 260 Bath Road, Slough, Berkshire, SL1 4DX.

[6] **Vodafone Limited**, registered in England under company number 01471587. Registered office address: Vodafone House, The Connection, Newbury, Berkshire, RG14 2FN.

88% coverage

(2) By the Initial Coverage Deadline the Licensee shall provide, and thereafter maintain, the Required Service to an area covering at least:

(a) 88% of the geographic landmass of the United Kingdom;

(b) 92% of the geographic landmass of England;

(c) 91% of the geographic landmass of Northern Ireland;

(d) 75% of the geographic landmass of Scotland; and

(e) 82% of the geographic landmass of Wales.

In meeting these obligations, the Licensee shall ensure that:

(i) any additional coverage relative to the 2020 Baseline Coverage Footprint is either:

(A) provided in Partial Not Spots;
(B) gained by deploying on sites located in Partial Not Spots; or
(C) gained by deploying on sites located in a Full Coverage Area, provided that any such coverage which is added in Total Not Spots does not exceed 0.3% of the geographic landmass of the United Kingdom;

(ii) any additional coverage which is provided in Total Not Spots does not limit the Licensee's ability to meet condition 8.(4)(b)(ii) below; and

(iii) any additional coverage is not gained by deploying on any site for which the Licensee is publicly funded (either in part or in whole) under the Grant Agreement.

90% coverage

(3) By the Subsequent Coverage Deadline the Licensee shall provide, and thereafter maintain, the Required Service to an area covering at least:

(a) 90% of the geographic landmass of the United Kingdom;

(b) 93% of the geographic landmass of England;

(c) 92% of the geographic landmass of Northern Ireland;

(d) 85% of the geographic landmass of Scotland;

(e) 86% of the geographic landmass of Wales;

(f) 90,000 premises in the United Kingdom which do not fall within the Licensee's 2019 Baseline Coverage Level. Premises which are built after September 2019 will not count towards satisfaction of this requirement; and

(g) 10,000 kilometres of Roads in the United Kingdom which do not fall within the Licensee's 2019 Baseline Coverage Level. Roads which are built after September 2019 will not count towards satisfaction of this requirement.

Coverage from the Extended Area Service Sites and in Total Not Spots

(4) In meeting the obligations set out in condition 8.(3)(a), the Licensee shall ensure that any coverage required to meet such condition which is incremental to the 88% geographic coverage to be met under condition 8.(2)(a):

(a) includes, as far as possible, coverage from the EAS Sites in so far as these sites are made Available by the Home Office no later than one year before the Subsequent Coverage Deadline and continue to be made Available to the Licensee for the duration of this condition; and

(b) the remaining additional coverage:

(i) is provided in areas that are Total Not Spots and are not provided with the Required Service from the EAS Sites, by deploying as far as possible on sites which are publicly funded (either in part or in whole) under the Grant Agreement; and

(ii) includes, in any case, at least 1 percentage point in such areas.

Proportionate reduction

(5) The obligations set out in conditions 8.(3)(a)-(e) and 8.(4) will be removed or proportionately reduced if the conditions described in the document "*2020 Coverage Obligations - Notice of compliance verification methodology*" published by Ofcom in March 2020 (and updated in July 2021 and again in 2024) are met.

Duration

(6) The obligations set out in conditions 8.(3) and 8.(4) will remain in force for 14 years from the Subsequent Coverage Deadline.

Technology neutrality

(7) For the avoidance of doubt, the Licensee is permitted to meet the obligations set out in this Licence using any frequencies and technologies available to the Licensee.

Assessment of compliance with the 2020 coverage obligations

(8) Ofcom will assess the Licensee's compliance with the obligations set out in conditions 8.(2) to 8.(4) after the date at which each obligation is due to have been met by reference to the document "*2020 Coverage obligations - Notice of compliance verification methodology*" notified by Ofcom to the Licensee in March 2020 (and updated in July 2021 and again in 2024). In addition to verifying compliance when these obligations fall due, Ofcom may repeat this assessment from time to time to ensure continued compliance.

Permitted Frequency Blocks

9. Subject to any emission requirements in this schedule, the Radio Equipment may only transmit within the following frequency bands (the Permitted Frequency Blocks):

Downlink frequencies	Uplink frequencies
947.5 – 959.9 MHz	**902.5 – 914.9** MHz

and, from 15 October 2024

Downlink frequencies	Uplink frequencies
942.5 – 947.5 MHz	**897.5 – 902.5** MHz

Radio Frequency Carrier Spacing

10. In the absence of bilateral or multilateral agreements which have been notified to Ofcom specifying alternative arrangements between the licensee and the licensee(s) of neighbouring networks the licensee must ensure that in respect of the frequencies set out at paragraph 9 of this schedule:

(a) the centre frequency of any of their GSM carriers is 100 kHz or more inside any edge of their Permitted Frequency Blocks;

(b) the channel edge of any of their narrowband terrestrial ECS carriers is 200 kHz or more inside any edge of their permitted frequency blocks;

(c) the channel edge of any of their wideband terrestrial ECS carriers is 200 kHz or more inside any edge of their permitted frequency blocks where a neighbouring licensee has deployed a GSM carrier or carriers (including GSM-R) in the immediately adjacent spectrum; and

(d) the channel edge of any of their wideband terrestrial ECS carriers does not extend beyond their permitted frequency blocks.

ITU Class of Emission

11. For GSM: 271KG7W

Maximum Permissible Downlink Transmit Power

12. Subject to any more restrictive limitations imposed by the coordination requirements notified by Ofcom in accordance with paragraphs 4 and 5 of this schedule, the power transmitted in any direction in the Permitted Frequency Blocks by the Radio Equipment shall not exceed:

(a) Downlink Frequencies

Radio Equipment	Maximum mean power
GSM base station	62 dBm EIRP per carrier
non-AAS base station[a] – narrowband terrestrial ECS	62 dBm / 200 kHz EIRP per antenna
non-AAS base station[a] – broadband terrestrial ECS	65 dBm / 5 MHz EIRP per antenna

[a] For femtocell base stations, power control must be applied to minimise interference to adjacent channels.

(b) Uplink Frequencies[7]

Radio Equipment	**Maximum mean power**
GSM terminal station	33 dBm TRP
Terrestrial ECS mobile or nomadic terminal station[b][c]	25 dBm TRP
Terrestrial ECS fixed or installed terminal station[b][c]	25 dBm TRP

[b] The maximum mean power relates to the EIRP or TRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

[c] It is recognised that a possible tolerance of up to +2 dB is included in this value, to take account of operation under extreme environmental conditions and production spread. This value does not include test tolerance.

Maximum power outside the Permitted Frequency Blocks

13. For transmissions on the downlink frequencies, the EIRP emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks, but within 915-970 MHz, shall not exceed the higher (least stringent) of (a) the baseline requirements and (b) the block specific requirements for that frequency.

(a) Baseline Requirements

Frequency Range	**Non-AAS mean EIRP limit per antenna**
915-970 MHz	3 dBm / MHz

(b) Block-specific requirements

Frequency range	**Non-AAS mean EIRP limit per antenna**
-10 to -5 MHz from lower block edge	12 dBm / 5 MHz
-5 to -1 MHz from lower block edge	5 dBm / MHz
-1 to -0.2 MHz from lower block edge	13.8 dBm / 0.8 MHz
-0.2 to 0 MHz from lower block edge	32.4 dBm / 0.2 MHz
0 to +0.2 MHz from upper block edge	32.4 dBm / 0.2 MHz
+0.2 to +1 MHz from upper block edge	13.8 dBm / 0.8 MHz
+1 to +5 MHz from upper block edge	5 dBm / MHz
+5 to +10 MHz from upper block edge	12 dBm / 5 MHz

[7] Consumer user equipment will be authorised by means of a licence exemption under section 8 of the Wireless Telegraphy Act 2006

Interpretation

14. In this schedule:

(a) "AAS" means active antenna system. An AAS is a base station and antenna system where the amplitude and / or phase between antenna elements is continually adjusted resulting in an antenna pattern that varies in response to short term changes in the radio environment. This is not intended to include long term beam shaping such as fixed electrical down tilt. In AAS base stations the antenna system is integrated as part of the base station system or product;

(b) "Broadband terrestrial ECS" means a system that operates in channel bandwidths greater than 200 kHz;

(c) "dBm" means the power level in decibels (logarithmic scale) referenced against 1 miliwatt (i.e. a value of 0 dBm is 1 milliwatt);

(d) "Downlink" means transmissions from a base station or repeater to a terminal station (handset);

(e) "ECS" means Electronics Communication System;

(f) "EIRP" means the effective isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

(g) "A femtocell" means Radio Equipment transmitting on the downlink frequencies, which operates at a power not exceeding 24 dBmEIRP per carrier which may be established by customers of the Network but which is or will be used only by and under the control of the Network, following the establishment of a telecommunications link between the femtocell and the Network;

(h) "Fixed or installed" means used or installed at specific fixed points;

(i) "GSM system" means an electronic communications network that complies with GSM standards, as published by ETSI, in particular EN 301 502, EN 301 511 and EN 301 908-18 and "GSM" means pertaining to such a network or its Radio Equipment;

(j) "GSM-R" means the variant of GSM for railways as specified in IR 2064;

(k) "IR" means a United Kingdom Radio Interface Requirement published by Ofcom in accordance with the Radio Equipment Regulations 2017, as amended by the Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019;

(l) "ITU" means the International Telecommunication Union, and "Class of Emission" shall have the meaning as defined in the ITU Radio Regulations Appendix 1;

(m) "Lower block edge" means, in relation to the Permitted Frequency Block, the lowest frequency in that Permitted Frequency Block;

(n) "LTE system" means an electronic communications network that complies with the LTE standards as published by ETSI, in particular EN 301 908-1, EN 301 908-13, EN 301 908-14, EN 301 908-15 and EN 301 908-11 and "LTE" means pertaining to such a network or its Radio Equipment;

(o) "Mobile or nomadic" means intended to be used while in motion or during halts at unspecified points;

(p) "Narrowband terrestrial ECS" means a system that operates in channel bandwidths of 200 kHz, excluding GSM;

(q) "non-AAS" means a piece of Radio Equipment which is not an AAS;

(r) "per antenna" means per radiating unit/component (irrespective of the number of radiating elements that make up that unit/component);

(s) "per cell" means per specific piece of Radio Equipment. For a multi-sector base station, per cell refers to each one of the individual sectors irrespective of the number of transmit antennas;

(t) "Permitted Frequency Blocks" has the same meaning given to it in paragraph 8 of this schedule;

(u) A "smart/intelligent low power repeater" means a repeater which operates with power not exceeding 24 dBm EIRP per carrier, which may be established by customers of the Licensee who have written agreements with the Licensee and:

- The Licensee has ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensee;
- The repeater operates only on the Licensee's frequencies and with their valid Public Land Mobile Network Identifier;
- Must not cause undue interference to other spectrum users; and
- The repeater only transmits on the Licensee's Base Receive frequencies when actively carrying a call (voice, video or data) or signalling from serviced handsets;

(v) "TRP" means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere;

(w) "UMTS system" means an electronic communications network that complies with the UMTS standards as published by ETSI, in particular EN 301 908-2, EN 301 908-3 and EN 301 908-11 and "UMTS" means pertaining to such a network or its Radio Equipment;

(x) "Uplink" means transmissions from a terminal station (handset) or repeater to a base station;

(y) "Upper block edge" means, in relation to the Permitted Frequency Block, the highest frequency in that Permitted Frequency Block.

SCHEDULE 2 TO LICENCE NUMBER: 0249663

Licence Category: **Public Wireless Network 1800 MHz**

Description of Radio Equipment Licensed

1. References in this schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this schedule.

Interface Requirements for the Radio Equipment

2. Use of the Radio Equipment shall be in accordance with the following Interface Requirements:

IR 2014 – Public Wireless Networks; and/or
IR 2109 – Terrestrial systems capable of providing electronic communications services in the 900 MHz and 1800 MHz;

or for equipment placed on the market before 8 April 2000, is required to be type approved in accordance with a recognised technical performance standard relating to the service licensed.

Special Conditions relating to the Operation of the Radio Equipment

3.

(a) Subject to paragraph 3(b) of this schedule, during the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of the following details relating to the Radio Equipment:

i) postal address (including post code);

ii) National Grid Reference, to at least 10 metre resolution;

iii) antenna height (above ground level) and type, and boresight east of true north (if applicable); and

iv) radio frequencies which the Radio Equipment uses;

v) Transmitted power expressed in dBm / 200 kHz EIRP for GSM base stations;

vi) Transmitted power expressed in dBm / 200 kHz EIRP per antenna for non-AAS base stations for narrowband terrestrial ECS;

vii) Transmitted power expressed in dBm / 5 MHz EIRP per antenna for AAS base stations for broadband terrestrial ECS; and

viii) Transmitted power expressed in dBm / 5 MHz TRP per cell for AAS base stations,

and the Licensee must produce these above records if requested by a person authorised by Ofcom;

(b) The conditions relating to the keeping of records contained in sub-paragraphs 3(a)i), 3(a)ii) and 3(a)iii), shall not apply in respect of femtocell equipment and smart/intelligent low power repeater equipment;

(c) The Licensee shall submit to Ofcom copies of the records detailed in sub-paragraph (a) above at such intervals as Ofcom shall notify to the Licensee.

Co-ordination at Frequency and Geographical Boundaries and Compliance with Other Procedures Relating to Interference

4. The Licensee shall ensure that the Radio Equipment is operated in compliance with such co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

International Cross-Border Coordination

5. The Licensee shall ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom from time to time.

Permitted Frequency Blocks

6. Subject to any emission requirements in this schedule, the Radio Equipment may only transmit within the following frequency bands (the Permitted Frequency Blocks):

Downlink frequencies	Uplink frequencies
1805.1 – 1810.9 MHz	**1710.1 – 1715.9** MHz

Radio Frequency Carrier Spacing

7. In the absence of bilateral or multilateral agreements which have been notified to Ofcom specifying alternative arrangements between the licensee and the licensee(s) of neighbouring networks the licensee must ensure that in respect of the frequencies set out at paragraph 6 of this schedule:

(a) the centre frequency of any of their GSM carriers is 100 kHz or more inside any edge of their permitted frequency blocks;

(b) the channel edge of any of their narrowband terrestrial ECS carriers is 200 kHz or more inside any edge of their permitted frequency blocks;

(c) the channel edge of any of their wideband terrestrial ECS carriers is 200 kHz or more inside any edge of their permitted frequency blocks where a neighbouring licensee has deployed a GSM carrier or carriers in the immediately adjacent spectrum; and

(d) the channel edge of any of their wideband terrestrial ECS carriers does not extend beyond their permitted frequency blocks.

ITU Class of Emission

8. For GSM: 271KG7W

Maximum Permissible Downlink Transmit Power

9. Subject to any more restrictive limitations imposed by the coordination requirements notified by Ofcom in accordance with paragraphs 4 and 5 of this schedule, the power transmitted in any direction in the Permitted Frequency Blocks by the Radio Equipment shall not exceed:

(a) Downlink Frequencies

Radio Equipment	**Maximum mean power**
GSM base station	62 dBm EIRP per carrier
non-AAS base station[a] – narrowband terrestrial ECS	62 dBm / 200 kHz EIRP per antenna
non-AAS base station[a] – broadband terrestrial ECS	65 dBm / 5 MHz EIRP per antenna
AAS base station[a] – broadband terrestrial ECS	50 dBm / 5 MHz TRP per cell

[a] For femtocell base stations, power control must be applied to minimise interference to adjacent channels.

(b) Uplink Frequencies[8]

Radio Equipment	**Maximum mean power**
GSM terminal station	30 dBm TRP
Terrestrial ECS mobile or nomadic terminal station[b][c]	25 dBm TRP
Terrestrial ECS fixed or installed terminal station[b][c]	25 dBm TRP

[b] The maximum mean power relates to the EIRP or TRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

[c] It is recognised that a possible tolerance of up to +2 dB is included in this value, to take account of operation under extreme environmental conditions and production spread. This value does not include test tolerance.

[8] Consumer user equipment will be authorised by means of a licence exemption under section 8 of the Wireless Telegraphy Act 2006

Maximum power outside the Permitted Frequency Blocks

10. For transmissions on the downlink frequencies, the EIRP emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks, but within 1795-1890 MHz, shall not exceed the higher (least stringent) of (a) the baseline requirements and (b) the block specific requirements for that frequency.

(b) Baseline Requirements

Frequency Range	**Non-AAS mean EIRP limit per antenna**	**AAS mean TRP limit per cell**
1795-1890 MHz	3 dBm / MHz	−6 dBm / MHz

(c) Block-specific requirements

Frequency range	**Non-AAS mean EIRP limit per antenna**	**AAS mean TRP limit per cell**
-10 to -5 MHz from lower block edge	12 dBm / 5 MHz	3 dBm / 5 MHz
-5 to -1 MHz from lower block edge	5 dBm / MHz	−4 dBm / MHz
-1 to -0.2 MHz from lower block edge	13.8 dBm / 0.8 MHz	4.7 dBm / 0.8 MHz
-0.2 to 0 MHz from lower block edge	32.4 dBm / 0.2 MHz	17.4 dBm / 0.2 MHz
0 to +0.2 MHz from upper block edge	32.4 dBm / 0.2 MHz	17.4 dBm / 0.2 MHz
+0.2 to +1 MHz from upper block edge	13.8 dBm / 0.8 MHz	4.7 dBm / 0.8 MHz
+1 to +5 MHz from upper block edge	5 dBm / MHz	−4 dBm / MHz
+5 to +10 MHz from upper block edge	12 dBm / 5 MHz	3 dBm / 5 MHz

Interpretation

11. In this schedule:

(a) "AAS" means active antenna system. An AAS is a base station and antenna system where the amplitude and / or phase between antenna elements is continually adjusted resulting in an antenna pattern that varies in response to short term changes in the radio environment. This is not intended to include long term beam shaping such as fixed electrical down tilt. In AAS base stations the antenna system is integrated as part of the base station system or product;

(b) "Broadband terrestrial ECS" means a system that operates in channel bandwidths greater than 200 kHz;

(c) "dBm" means the power level in decibels (logarithmic scale) referenced against 1 miliwatt (i.e. a value of 0 dBm is 1 milliwatt);

(d) "Downlink" means transmissions from a base station or repeater to a terminal station (handset);

(e) "ECS" means Electronics Communication System;

(f) "EIRP" means the effective isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

(g) "A femtocell" means Radio Equipment transmitting on the downlink frequencies, which operates at a power not exceeding 24 dBm EIRP per carrier which may be established by customers of the Network but which is or will be used only by and under the control of the Network, following the establishment of a telecommunications link between the femtocell and the Network;

(h) "Fixed or installed" means used or installed at specific fixed points;

(i) "GSM system" means an electronic communications network that complies with GSM standards, as published by ETSI, in particular EN 301 502 and EN 301 511 and "GSM" means pertaining to such a network or its Radio Equipment;

(j) "IR" means a United Kingdom Radio Interface Requirement published by Ofcom in accordance with the Radio Equipment Regulations 2017, as amended by the Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019;

(k) "ITU" means the International Telecommunication Union, and "Class of Emission" shall have the meaning as defined in the ITU Radio Regulations Appendix 1;

(l) "Lower block edge" means, in relation to the Permitted Frequency Block, the lowest frequency in that Permitted Frequency Block;

(m) "LTE system" means an electronic communications network that complies with the LTE standards as published by ETSI, in particular EN 301 908-1, EN 301 908-13, EN 301 908-14, EN 301 908-15 and EN 301 908-11 and "LTE" means pertaining to such a network or its Radio Equipment;

(n) "Mobile or nomadic" means intended to be used while in motion or during halts at unspecified points;

(o) "Narrowband terrestrial ECS" means a system that operates in channel bandwidths of 200 kHz, excluding GSM;

(p) "non-AAS" means a piece of Radio Equipment which is not an AAS;

(q) "per antenna" means per radiating unit/component (irrespective of the number of radiating elements that make up that unit/component);

(r) "per cell" means per specific piece of Radio Equipment. For a multi-sector base station, per cell refers to each one of the individual sectors irrespective of the number of transmit antennas;

(s) "Permitted Frequency Blocks" has the same meaning given to it in paragraph 6 of this schedule;

(t) A "smart/intelligent low power repeater" means a repeater which operates with power not exceeding 24 dBm EIRP per carrier, which may be established by customers of the Licensee who have written agreements with the Licensee and:

- The Licensee has ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensee;
- The repeater operates only on the Licensee's frequencies and with their valid Public Land Mobile Network Identifier;
- Must not cause undue interference to other spectrum users; and
- The repeater only transmits on the Licensee's Base Receive frequencies when actively carrying a call (voice, video or data) or signalling from serviced handsets;

(u) "TRP" means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere;

(v) "UMTS system" means an electronic communications network that complies with the UMTS standards as published by ETSI, in particular EN 301 908-2, EN 301 908-3 and EN 301 908-11 and "UMTS" means pertaining to such a network or its Radio Equipment; and

(w) "Uplink" means transmissions from a terminal station (handset) or repeater to a base station;

(x) "Upper block edge" means, in relation to the Permitted Frequency Block, the highest frequency in that Permitted Frequency Block.

SCHEDULE 3 TO LICENCE NUMBER: 0249663

EMF Licence Condition

Licence category: **Public Wireless Network**

Sites which are not shared with another licensee

1. The Licensee shall only establish, install, modify or use Relevant Radio Equipment if the total electromagnetic field exposure levels produced by the Licensee's On-Site Radio Equipment do not exceed the basic restrictions[9] in the relevant tables for general public exposure identified in the ICNIRP Guidelines[10] in any area where a member of the general public is or can be expected to be present when transmissions are taking place.

Sites which are shared with another licensee

2. In the case of a shared site where the Shared Site Exemption applies to the Licensee, the Licensee shall comply with paragraph 1 above.

3. In the case of a shared site where the Shared Site Exemption does not apply to the Licensee, the Licensee shall only establish, install, modify or use the Relevant Radio Equipment if:

   (a) the total electromagnetic field exposure levels produced by the Licensee's On-Site Radio Equipment, together with

   (b) the total electromagnetic field exposure levels produced by all other wireless telegraphy stations and wireless telegraphy apparatus operated by another licensee on the same site for which the Licensee can reasonably assume that a Shared Site Exemption does not apply,

   do not exceed the basic restrictions[11] in the relevant tables for general public exposure identified in the ICNIRP Guidelines[12] in any area where a member of the general public is or can be expected to be present when transmissions are taking place.

[9] Compliance with the reference levels for general public exposure identified in the ICNIRP Guidelines will ensure compliance with the basic restrictions.
[10] The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".
[11] Compliance with the reference levels for general public exposure identified in the ICNIRP Guidelines will ensure compliance with the basic restrictions.
[12] The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".

Emergency Situations

4. The obligations in paragraphs 1, 2 and 3 above will not apply if the Relevant Radio Equipment is being used for the purpose of seeking emergency assistance or reporting and responding to an emergency situation (in the vicinity of that situation) including for search and rescue activities and maritime emergency communications[13].

Relationship with authorised transmission levels

5. The Licensee shall comply with paragraphs 1, 2 and 3 above notwithstanding the maximum transmission levels authorised in the Licence.

Records

6. The Licensee shall keep, or shall procure that a third party shall keep, and shall make available to Ofcom on request, records (including the type of records identified in Ofcom's "Guidance on EMF Compliance and Enforcement") that demonstrate how it has complied with paragraphs 1, 2 and 3 above when Relevant Radio Equipment is established, installed, modified or used.

Ofcom's "Guidance on EMF Compliance and Enforcement"

7. When evaluating its compliance with paragraphs 1, 2 and 3 above, the Licensee shall take into account Ofcom's "Guidance on EMF Compliance and Enforcement" that is in force at the relevant time.

[13] Further information on emergency situations in set out in Ofcom's "Guidance on EMF Compliance and Enforcement".

Interpretation

8. In this schedule:

(a) **"dBi"** means the ratio in dB (decibel) when comparing the gain of the antenna to the gain of an isotropic antenna. An isotropic antenna is a theoretical antenna which radiates power uniformly in all directions;

(b) **"EIRP"** means equivalent isotropically radiated power which is the product of the power supplied to an antenna and the absolute or isotropic antenna gain in a given direction relative to an isotropic antenna;

(c) **"ERP"** means effective radiated power which is the product of the power supplied to an antenna and its gain in a given direction relative to a half-wave dipole;

(d) "**general public**" means any person who is not: (a) the Licensee, owner, operator or installer of the Relevant Radio Equipment; or (b) acting under a contract of employment or otherwise acting for purposes connected with their trade, business or profession or the performance by them of a public function;[14]

(e) **"ICNIRP Guidelines"** means the version of the Guidelines published by the International Commission on Non-Ionizing Radiation Protection for limiting exposure to electromagnetic fields which are identified in Ofcom's "Guidance on EMF Compliance and Enforcement" that is in force at the relevant time.[15]

(f) **"Licensee's On-Site Radio Equipment"** means the Relevant Radio Equipment and any other wireless telegraphy station(s) and wireless telegraphy apparatus on the same site which transmits at powers higher than 10 Watts EIRP or 6.1 Watts ERP.[16]

[14] There is pre-existing health and safety legislation which already requires employers to protect workers from exposure to electromagnetic fields ("EMF") including the following legislation specifically relating to EMF (as amended from time to time): The Control of Electromagnetic Fields at Work Regulations 2016, The Control of Electromagnetic Fields at Work Regulations (Northern Ireland) 2016 and The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Electromagnetic Fields) Regulations 2016.

[15] Ofcom's "Guidance on EMF Compliance and Enforcement" will initially require the Licensee to comply with the ICNIRP Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz), published in: Health Physics 74(4):494-522, dated April 1998 and available at: https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf ("1998 Guidelines") or the ICNIRP Guidelines for limiting exposure to electromagnetic fields (100 KHz to 300 GHz), published in: Health Physics 118(5): 483–524; 2020 and available at: https://www.icnirp.org/cms/upload/publications/ICNIRPrfgdl2020.pdf ("2020 Guidelines"). However, once work on the relevant standards explaining the methodology for assessing compliance with the 2020 Guidelines has progressed sufficiently, Ofcom will publish a public consultation on updating its "Guidance on EMF Compliance and Enforcement" to explain that going forward Ofcom will be requiring the Licensee to comply with the 2020 Guidelines only. Following this public consultation, Ofcom will publish an updated version of Ofcom's "Guidance on EMF Compliance and Enforcement" on its website. Ofcom will follow the same process for any subsequent versions of the ICNIRP Guidelines.

[16] 10 Watts EIRP is equivalent to 6.1 Watts ERP. In linear units EIRP (W) = 1.64 x ERP (W); in decibels EIRP (dB) = ERP (dB) + 2.15. Ofcom's "Guidance on EMF Compliance and Enforcement" explains how the Licensee can determine if wireless telegraphy station(s) or wireless telegraphy apparatus "transmits at powers higher than 10 Watts EIRP or 6.1 Watts ERP".

(g) **"Relevant Radio Equipment"** means all the Radio Equipment that is authorised by this Licence to transmit at powers higher than 10 Watts EIRP or 6.1 Watts ERP.

(h) **"Shared Site Exemption"** means any of the following three situations apply on a shared site in relation to the Licensee's or another licensee's wireless telegraphy station(s) or wireless telegraphy apparatus that is authorised to transmit at powers higher than 10 Watts EIRP or 6.1 Watts ERP:

- The first situation is that all of the licensee's wireless telegraphy station(s) or wireless telegraphy apparatus on a shared site do not transmit at a combined total radiated power in any particular direction[17] that is higher than 100 Watts EIRP or 61 Watts ERP;[18]
- The second situation is that the total electromagnetic field exposure levels produced by the licensee's wireless telegraphy station(s) or wireless telegraphy apparatus in any area where a member of the general public is or can be expected to be present when transmissions are taking place is no more than 5% of the basic restrictions or 5% of the reference levels in the relevant tables for general public exposure identified in the ICNIRP Guidelines;[19]
- The third situation is where the licensee's wireless telegraphy station or wireless telegraphy apparatus has an antenna gain that is equal to or higher than 29 dBi and has a fixed beam;

(i) **"shared site"** means a site that is shared by the Licensee and at least one other licensee for the purposes of establishing, installing, modifying or using wireless telegraphy stations or wireless telegraphy apparatus;

(j) **"site"** means a physical structure, building, vehicle or moving platform;

(k) **"wireless telegraphy apparatus"** has the meaning given to it in section 117 of the Wireless Telegraphy Act 2006; and

(l) **"wireless telegraphy station"** has the meaning given to it in section 117 of the Wireless Telegraphy Act 2006.

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[17] For the purpose of this situation, the combined total radiated power is a simple sum of the radiated powers (in EIRP or ERP) of all of the licensee's wireless telegraphy station(s) or wireless telegraphy apparatus on the shared site that transmits signals covering the same or overlapping areas.
[18] 100 Watts EIRP is equivalent to 61 Watts ERP.
[19] The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".