Hub for London

High Level Qualitative Assessment of Air Quality Compliance Risks for a Hub Airport at Stansted: Technical Note

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Executive Summary

A high level qualitative local air quality assessment of the Hub airport proposal at Stansted in 2034 and 2050 has been provided. The main purpose has been to highlight locations with potential air quality standard compliance risks - based on a current understanding of local air quality conditions and relevant locations at risk using publically accessible sources. Compliance risks have been considered in relation to public health and at Designated Sites.

Looking at baseline conditions, for public health, current baseline air quality conditions at the proposed site are relatively good. There are a number of notable point sources of air pollutants though none that would significantly influence local air quality under normal circumstances. Air quality problem areas are highlighted by AQMAs away from the site along busy roads due to near road exceedances of the standard for annual mean NO_2. Road transport routes with AQMAs include the M11 (where it joins A14) and M25. For Designated Sites, current baseline air quality conditions are generally poor, with exceedance of the Critical Load for NO_x and Critical Levels for N-dep at all sites.

Using a high level qualitative risk assessment, high risks for public health standard compliance are anticipated in 2034 along existing roads with proposed widening to accommodate Hub airport traffic; these locations are within 200 m (often closer) of the M25 centreline. By 2050 it is anticipated that no high risks remain on the basis that substantial reductions in vehicle emissions are achieved by advances in and take up of cleaner vehicle technologies. In both 2034 and 2050 the vast majority of the medium risks (in total square metres) are associated with the airport footprint (within 1km of the airport boundary excluding new/widened roads), rather than the surface access to it. This is a very different position to the proposed sites in the area of the Thames Estuary.

High risks in relation to the Critical Level for annual mean NO_x in 2034 and 2050 are not indicated for any Designated Site.

The high level qualitative nature of the risk assessment means it does not explicitly include any reflection of mitigation, however all other things being equal, high risks are synonymous with situations that would be difficult to mitigate against, and moderate risks are indications of issues that may be potentially mitigate-able (such as by design – which would be a clear option for an entirely new Hub location). On this basis, for Stansted in 2050 there is some potential for mitigation to address compliance risks.

1. Introduction

This technical note provides a high level qualitative local air quality assessment of the four runway 180 million passengers per annum (mppa) Hub airport at the Stansted in 2034 (Hub airport first phase of operation) and 2050 (Hub airport at full capacity). The assessment is not part of the Environmental Impact Assessment (EIA) process but is to help decision makers in selection of the most suitable site for a London Hub Airport. In meeting the July 2013 deadline for TfL's submission to the Airports Commission it was not practicable to undertake air quality modelling. At this stage the required data to allow for air quality modelling has not been generated.

The following assessment considers the potential future risks in compliance against current standards for ambient air quality to protect public health and sensitive ecological resources. Risk of non-compliance in terms of future baseline conditions has been considered within 200 metres (m) of all road surface access routes that are new or widened with the Hub airport, and for airport sources within 1 kilometre (km) of the Hub airport site boundary.

The main purpose of the assessment is to highlight locations with potential air quality standard compliance risks based on current understanding of local air quality conditions and relevant locations at risk, with reference to publically accessible information. Compliance risks have been considered for locations where there may be relevant exposure in terms of public health, and 'Designated Sites' with statutory designation as Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Special Area of Conservation (SAC) and under the Convention on Wetlands of International Importance ('Ramsar Convention' or 'Ramsar' sites) due to resources of national and/or international ecological importance.

The pollutants considered in terms of annual mean baseline conditions are limited to those currently of most concern to local authorities, the Department for Environment, Food and Rural Affairs (Defra) and European Union (EU) in-terms of compliance risks:

- Nitrogen dioxide (NO_2) – relevant to public health
- Particulates smaller than 10 micrometres (µm) in size (PM_{10}) – relevant to public health
- Concentrations of particulates smaller than 2.5 micrometres in size ($PM_{2.5}$) – relevant to public health
- Oxides of nitrogen (NO_x) – annual mean concentrations are relevant at potentially sensitive Designated Sites
- Nitrogen deposition rate (N-dep) – annual mean rates are relevant at potentially sensitive Designated Sites

The following sections of this note present:

- A brief overview of relevant standards for ambient air quality
- Methodology, including assumptions and limitations
- Commentary on existing baseline conditions in the vicinity of the proposed Hub airport and along main surface access routes to/from the Hub (including the M25 motorway)
- Qualitative assessment of potential compliance risks in terms of future baseline conditions in the vicinity of the proposed Hub airport and along main surface access routes to/from the airport (including the M25 motorway) that are new or widened with the Hub airport in place. The qualitative risk assessment is based on annual mean NO_2 conditions.

2. Standards

2.1. Public Health

Mandatory legislative air quality criteria are set in EU Directives that are implemented nationally by the Air Quality Standards Regulations and are assessed at national level by Defra. In 2008, the European Commission adopted Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This Directive

merged the 1996 European Air Quality Framework Directive and three of the Daughter Directives[1] (with the exception of the fourth daughter directive) and introduced new criteria for $PM_{2.5}$. The Directive was transposed into UK legislation in June 2010 through the Air Quality Standards Regulations 2010 (SI 2010/1001).

Air quality is regulated at the local level by the Air Quality (England) Regulations 2000 (SI 2000/928) and the Air Quality (England) (Amendment) Regulations 2002 (SI 2002/3043), which implement the objectives of the Government's Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS). Air quality standards are set by expert organisations on the basis of scientific and medical evidence on the effects of the particular pollutant on health, and define the level of pollution below which health effects are expected to be minimal or low risk even to the most sensitive members of the population. Air quality objectives are targets for air pollution levels which should be achieved within a specified timescale, which take account of the costs and benefits of achieving the standard, either without exception or with a permitted number of exceedances.

Where the European criteria are not met, Member States are legally required to take action to comply with the limit values, and where possible to attain long-term objectives. Statutory responsibility for achieving EU limit values rests with the Secretary of State for Environment. Local authorities have no direct responsibility for achieving the European limit values, but do have a responsibility (under the Environment Act 1995) to review and assess local pollution levels against the national air quality strategy objectives and to implement action plans to reduce pollution levels in Air Quality Management Areas (AQMAs). Under the UK Government's current Localism Bill provisions, an infraction fine for failure to achieve an EU limit value could technically be passed on in part or in full to any local authority that is deemed to have caused or contributed to that sanction. EU limit values only apply in the outdoor environment at locations where the public has access.

The AQS objectives only apply in locations likely to have 'relevant exposure' i.e. where members of the public are exposed for periods equal to or exceeding the averaging periods set for the standards. Locations of relevant exposure for the annual mean include building façades of residential premises, schools, public buildings and medical facilities. Places of work where the general public do not have access are excluded as these objectives do not apply to occupational exposure. For 24-hour mean PM_{10}, facades of hotels are also included. For 1-hour mean NO_2, a large number of locations are included such as parks and playing fields, shopping centres and cafes, i.e. any outdoor location where a member of the public could reasonably be expected to spend an hour of their time. Note that for the purposes of the risk assessment methodology (further detail in section 3.2), relevant locations are based on readily available building footprint data, as population datasets were not available for the study.

Relevant public health standards for local air pollutants are presented in Table 2.1. Public health standard compliance risks have been determined for annual mean NO_2 as the pollutant with the highest current compliance risk – the one most associated with declaration of AQMAs.

Table 2.1 – Current Public Health Standards

Pollutant	Criteria (see note 1.)	Date to be achieved by and maintained thereafter	
		AQS Objective (by end)	EU Limit Value (from beginning)
NO_2	Annual mean concentration should not exceed 40 µg/m^3	2005	2010
	Hourly average concentration should not exceed 200 µg/m^3 more than 18 times a year	2005	2010

[1] The new Directive merged the Framework Directive 96/62/EC; the first, second and third daughter Directives 1999/30/EC, 2000/69/EC, 2002/3/EC; and the Decision on Exchange of Information 97/101/EC.

Pollutant	Criteria (see note 1.)	Date to be achieved by and maintained thereafter	
		AQS Objective (by end)	EU Limit Value (from beginning)
PM_{10}	Annual mean concentration should not exceed 40 µg/m^3	2004	2005
	24-hour mean concentration should not exceed 50 µg/m^3 more than 35 times a year	2004	2005
$PM_{2.5}$	Annual mean concentrations target value of 25 µg/m^3	2020	2010
	Annual mean of 25 µg/m^3	2020	2015
	Exposure concentration obligation (ECO) of 20 µg/m^3 as 3-year running annual mean as Average Exposure Indicator (AEI)	-	2015
	Exposure Reduction Target based on three-year average concentration	2020 (see note 2.)	2020 (see note 3.)

Notes:

1. Pollutant concentrations are expressed in micrograms per cubic metre (µg/m^3)
2. AQS objective is 15% reduction in concentrations in urban background locations between 2010 and 2020
3. EU target is 0, 10, 15 or 20 % reduction depending on value of AEI in 2010 + all measures to reach 18 µg/m^3 AEI

2.2. Designated Sites

Criteria have been set for the protection of vegetation based on the work of the United Nations Economic Commission for Europe (UNECE) and World Health Organisation (WHO); these criteria are incorporated into the Air Quality Limit Value Regulations (SI 2010/1001). These values are referred to as "critical levels", defined by the UNECE as: *"concentration of pollutants in the atmosphere above which direct adverse effects on receptors, plants, ecosystems or materials, may occur according to present knowledge"*. The critical level for annual mean NO_x is 30 µg/m^3.

In addition to critical levels for the concentration of NO_x in the atmosphere, critical loads for nitrogen deposition have been set by UNECE that represent (according to current knowledge) *"the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem"*. These have been established for a variety of habitat types that are dependent on low nitrogen levels. Critical loads are expressed in deposition units of kilograms of nitrogen per hectare per year (kg N/ha/yr), and are given as a range of upper and lower values to reflect the range of sensitivities across Europe.

3. Methodology

This technical note provides a high level qualitative local air quality assessment, based on baseline conditions and a simple qualitative risk assessment. In meeting the July 2013 deadline for TfL's submission to the Airports Commission it was not practicable to undertake air quality modelling. At this stage the required data to allow for any air quality modelling has not been generated.

3.1. Existing Baseline

Existing baseline conditions have been defined with reference to publically accessible information published by Defra, Ordnance Survey, Natural England and local authorities. The existing baseline conditions have been determined using MapInfo Professional® Geographical Information System (GIS) software to analyse the data and present the information to the reader graphically in-terms of background pollutant concentrations, AQMAs for NO_2 (generally annual mean based) and PM_{10}, major roads and areas with residential population, and Designated Sites.

3.1.1. Public Health

3.1.1.1. Data Sources and Assumptions

- Defra background mapping[2] for annual mean pollutant concentrations of NO_2, PM_{10} and $PM_{2.5}$ in 2010
- Defra GIS AQMA boundaries for 2011[3] (latest available dataset)
- Ordnance Survey Meridian™ 2 vector data showing motorways, A roads and B roads[4]
- Ordnance Survey Boundary-Line™ vector data showing local authority boundaries

3.1.1.2. Limitations

The information presented relates to existing/recent conditions at large scale only and may not reflect more localised circumstances at specific locations either in the present or in the future.

3.1.2. Designated Sites

3.1.2.1. Data Sources and Assumptions

The same assumptions apply as for Public Health plus:

- Defra background mapping for annual mean pollutant concentrations of NO_x in 2010
- Natural England GIS digital boundary datasets for Designated Sites[5]
- UK Air Pollution Information System (APIS) data for critical levels (NO_x) and critical loads (N-dep) at Designated Sites[6]

3.1.2.2. Limitations

The same limitations apply as for Public Health.

[2] http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

[3] http://aqma.defra.gov.uk/aqma/contact.html

[4] www.ordnancesurvey.co.uk/oswebsite/products/os-opendata.html

[5] http://www.naturalengland.org.uk/publications/data/

[6] http://www.apis.ac.uk/

3.2. Potential Compliance Risks

Potential compliance risks in 2034 and 2050 in relation to future baseline air quality conditions have been identified with reference to publically accessible information published by Defra, Ordnance Survey, Natural England and local authorities.

Public health standard compliance risks have been determined for annual mean NO_2 as the pollutant with the highest current compliance risk. For Designated Sites the compliance risks have been determined in relation to the critical level for annual mean NO_x and critical load for N-dep.

Risk of non-compliance in terms of future baseline conditions has been considered within 200 m of all road surface access routes that are new or widened with the Hub airport (not just local surface access links as referred to in Airports Commission guidance), and within 1 km of the Hub airport site boundary. At this early stage it has not been possible to realistically consider or quantify the impacts of the Hub airport itself on local air quality as suitable detail and data have not yet been generated.

The assessment of risks has relied upon the available information some of which only relates to the existing baseline conditions, and some of which is based on air quality background data forecasts published by Defra as well as assumptions made by the Atkins/TfL team relating to surface access and Hub infrastructure provisions.

The available data have been examined in GIS by overlaying mapped data layers (see data sources and assumptions below) on an Ordnance Survey base map so that areas with potential public health and Designated Site exposure risks can be captured.

Compliance risks have been coded as ‘green’ (=low), ‘yellow’ (=moderate) and ‘red’ (=high). A green risk indicates a relatively low probability of baseline air quality conditions being a constraint on Hub airport development. A yellow risk indicates a moderate probability of there being a problem (i.e. the possibility of a problem canot be ruled out). A red risk indicates a relatively high probability that baseline air quality conditions may be a constraint on Hub airport development. All other things being equal, high risks are synonymous with situations that would be difficult to mitigate against, and moderate risks are indications of issues that may be potentially mitigate-able (such as by design), although given the high level qualitative nature of the risk assessment it does not explicitly include any reflection of mitigation.

- Red criteria:
  - new major road surface access route is within an AQMA with buildings (presumed residential) within 200 m of the route, or within 200 m of a Designated Site where the background NO_x and/or N-dep is within 90% of or above the critical level and/or lower critical load respectively
  - the Hub Airport boundary is within 1,000 m of an AQMA, or a Designated Site where the background NO_x and/or N-dep is within 90% of or above the critical level and/or lower critical load respectively
  - widening of existing major road to accommodate Hub Airport surface access traffic is within an AQMA with buildings (presumed residential) within 200 m of the route, or within 200 m of a Designated Site where the background NO_x and/or N-dep is within 90% of or above the critical level and/or lower critical load respectively
- Yellow criteria:
  - new major road surface access route is within 50 m of buildings (presumed residential) not in an AQMA, or within 200 m of a Designated Site where background NO_x and/or N-dep is within 75 - 90% of the critical level and/or lower critical load respectively
  - the Hub Airport boundary is within 1,000 m of buildings (presumed residential) not in an AQMA, or a Designated Site where background NO_x and/or N-dep are within 75 - 90% of the critical level and/or critical load respectively
  - widening of existing major road to accommodate Hub Airport surface access traffic is within 50 m of buildings (presumed residential) not in an AQMA, or within 200 m of a Designated Site where

background NO_x and/or N-dep are within 75 - 90% of the critical level and/or lower critical load respectively

- Green criteria:
  - new major road surface access route or a widened existing major road is not within 50 m of buildings (presumed residential) not in an AQMA, or within 200 m of a Designated Site where background NO_x and/or N-dep is less than 75% of the critical level and/or critical load respectively
  - there are Designated Sites within 1,000 m of the Hub Airport boundary where background NO_x and/or N-dep is less than 75% of the critical level and/or critical load respectively

Using the GIS it has been possible to calculate the approximate area of potential public exposure (i.e. building footprint) and Designated Sites lying within these red, yellow and green 'zones'. The mapped data layers used in this analysis are illustrated in Appendix A - Figure 1.

On the basis that current legislation still applies and measures to reduce emissions from transport sources continue into the future it has been assumed that the public health risk in 2050 will be substantially lower than in 2034; it is assumed that all AQMA's will have been revoked by 2050. Only low risk (green) and moderate risk (yellow) areas are therefore anticipated in 2050.

3.2.1. Public Health

AQS objectives only apply at locations with relevant exposure. Where there is non-compliance with one or more AQS objective the relevant local authority declares an AQMA and puts in place an action plan to stabilise and improve air quality. AQMAs can cover whole local authority areas where there is whole authority area non-compliance or if whole authority area designation assists with improving conditions in smaller hotspot areas, or specific areas of non-compliance only (e.g. a section of road with adjacent residential property). AQMA information compiled by Defra has been used to identify potential at risk areas in 2030. Most current AQMAs relate to exceedance of the AQS objective for annual mean NO_2 caused by emissions of NO_x and primary NO_2 from road traffic in locations with traffic congestion and/or high traffic volumes. Relatively few AQMAs have been declared either solely or jointly (with NO_2) for PM_{10}; AQMA for PM_{10} generally relate to non-compliance with the AQS objective for 24-hour mean concentrations.

Compliance with EU limit values relates to concentrations at designated monitoring sites and modelling undertaken by Defra for zones (comprising one or more local authority area but excluding agglomerations) and agglomerations (urban areas with more than 250,000 head of population). The UK has been divided up into 43 zones for reporting compliance to the EU. The latest Defra report on compliance[7], published in 2012 reporting the situation in 2011, 40 zones with exceedances of limit value for annual mean NO_2 , three zones with exceedances of the limit value for one-hour mean NO_2 (London, Glasgow and South East) and one zone with exceedance of the 24-hour limit value for PM_{10} (London). All zones met the limit value for annual mean PM_{10} and target value for $PM_{2.5}$. Where there is non-compliance, Defra is required to take action to achieve compliance or face EU infraction proceedings. As with AQS objective non-compliance, problems are generally in relation to excessive annual mean NO_2 concentrations due to high road traffic emissions of NO_x and primary NO_2.

Compliance risks in relation to air quality standards to protect public health (Table 2.1) have been reported in terms of area of building footprint where the public may be exposed on a regular basis (see Limitations).

3.2.1.1. Data Sources and Assumptions

- Major point source emissions locations from 2010 National Atmospheric Emissions Inventory (NAEI) emissions mapping (latest available dataset)[8]
- Defra background mapping[9] for annual mean pollutant concentrations of NO_2, PM_{10} and $PM_{2.5}$ in 2030 (the furthest forecast year available) as a proxy for conditions in 2034

[7] http://uk-air.defra.gov.uk/library/annualreport/index

[8] http://naei.defra.gov.uk/

[9] http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

- Defra GIS AQMA boundaries for 2011[10] (latest available dataset). It is assumed that AQMA indicate areas that are potentially non-compliant with current AQS objectives in 2034 and 2050
- Ordnance Survey Meridian™ 2 vector data showing motorways, A roads, B roads. It is assumed that existing roads are still in place in 2050
- Proposed new road routes with Hub airport in 2034 and 2050 (new rail routes are assumed to have overhead electrification) as shown in Appendix A - Figure 2
- Proposed widened existing road routes with Hub airport in 2034 and 2050 as shown in Appendix A - Figure 2
- Ordnance Survey VectorMap® District data showing building footprints. It is assumed that existing buildings are still in place in 2050
- Ordnance Survey Boundary-Line™ vector data showing local authority boundaries. It is assumed that local authority boundaries do not change between now and 2050

3.2.1.2. Limitations

The information presented relates to current understanding at large scale only. The information concerning potential compliance risks is based on current publically available information and legislation; it is indicative only and cannot at this stage be taken to accurately define circumstances in the future.

In reporting risk in terms of area of building footprint it has not been possible at this stage without the necessary Ordnance Survey MasterMap® Address Layer 2 data to differentiate between buildings with no routine public access and those where public access is routinely prohibited. Compliance risk is thus considered for all buildings regardless of whether the air quality standards to protect public health apply or not.

3.2.2. Designated Sites

3.2.2.1. Data Sources and Assumptions

The same assumptions apply as for Public Health plus:

- Defra background mapping[11] for annual mean pollutant concentrations of NO_x in 2030 (the furthest forecast year available) as a proxy for conditions in 2034
- Natural England GIS digital boundary datasets for Designated Sites. It is assumed that designations are the same as in 2010
- APIS data for Critical Level (NO_x) and Critical Loads (N-dep in kg N/ha/year) at Designated Sites. It is assumed that a non-compounded 2% annual reduction in background N-dep applies up to 2030[12]

3.2.2.2. Limitations

The same limitations apply as for Public Health.

4. Existing Baseline

Baseline situation in 2010/2011 at Stansted and in the surrounding area are illustrated in Appendix A - Figure 3 with commentary below.

[10] http://aqma.defra.gov.uk/aqma/contact.html

[11] http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

[12] Design Manual for Roads and Bridges - Volume 11 Section 3 Part 1 (Air Quality) Annex F, HA 207/07 (http://www.dft.gov.uk/ha/standards/dmrb/)

4.1. Sensitive Locations

4.1.1. Public Health

Area around the proposed Hub airport site at Stansted comprises a mixture of rural, small urban and airport land uses.

Major areas of population in the surrounding area include:

- Great Dunmow and Braintree to the east
- Takeley, Sawbridgworth, Hatfield Heath and Harlow to the south
- Bishop's Stortford, Stansted Mountfitchet, Stevenage, Ware, Hertford and Letchworth to the west
- Saffron Walden to the north

4.1.2. Designated Sites

Designated sites in the vicinity of the proposed Hub airport with ecology sensitive to NO_x and N-dep include:

- Elsenham Woods SSSI within Hub airport footprint
- High Wood, Dunmow SSSI within Hub airport footprint
- Hatfield Forest SSSI to the south

4.2. Existing Emission Sources

Using Environment Agency datasets, the most notable air pollutant sources in the vicinity of the Hub airport site are:

- Stansted airport
- M11 motorway
- Crumps Farm Landfill gas combustion to the south
- Thames Water sewage gas combustion to the south west near Bishops Stortford
- Elsenham Landfill gas combustion to the north west
- Ugley Gas to Energy landfill gas combustion to the north west

These are notable sources of NO_x and particulates (as well as other substances). Emissions from landfill/sewage gas sources are regulated by the Environment Agency.

4.3. Existing Ambient Air Quality

In relation to public health, air quality in the vicinity of the Hub airport site at Stansted is considered to be relatively good, as evidenced by low background annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ and no AQMA (see Appendix A - Figures 4 to 6 respectively). The concentrations are reasonably typical of a rural setting.

Ambient air quality in the wider area varies from relatively good, in the more rural areas away from the road transport network, to relatively poor in the urban centres with a high density of roads and along major roads including the M25. Poor air quality is indicated by AQMAs, which are mostly in relation to annual mean NO_2 concentrations in exceedance of the 40 µg/m^3 standard (Table 2.1).

At Designated Sites, ambient annual mean concentrations of NO_x are generally in excess of the Critical Level (30 µg/m^3) and N-dep Critical Loads are generally exceeded (see Appendix A - Figure 7 for an illustration of background NO_x concentrations).

5. Potential Compliance Risks

Future background annual mean concentrations of NO_2, PM_{10}, $PM_{2.5}$ and NO_x assumed for 2034 over the study area are illustrated in Appendix A - Figures 8, 8, 10 and 11 respectively. The illustrated concentrations are noticeably lower than those in 2010; this is due to progressive reductions in emissions from various source sectors, in-particular road transport, as anticipated by Defra.

Potential air quality compliance risks are tabulated below separately for public health (Table 5.1) and Designated Sites (Table 5.2, Table 5.3, Table 5.4 and Table 5.5).

5.1. Public Health

In relation to public health, it is assumed that only moderate (yellow) compliance risks would exist in 2050 assuming that current legislation still applies and measures to reduce emissions from transport sources continue into the future. The compliance risks shown are for annual mean NO_2 as the pollutant with highest current compliance risk. Risks associated with PM_{10} and $PM_{2.5}$ are likely to be lower in most locations.

Table 5.1 – Air Quality Compliance Risks for Public Health

Area of building footprint (m^2) adjacent to ...	2034 risk			2050 risk		
	RED	YELLOW	GREEN	RED	YELLOW	GREEN
Within 1km of Hub airport boundary (excluding new/widened roads)	0	997270	0	0	997270	0
Main access – new	0	0	0	0	0	0
M11 J8-14 - widened	0	340	108840	0	340	108840
M11 J6-8 - widened	0	820	77460	0	820	77460
M25 J27 to Dartford Crossing - widened	27870	2380	153830	0	2380	181700
M25 Dartford Crossing to J3 - widened	5310	970	25280	0	970	30600
M25 J3-5 - widened	12570	0	39360	0	1080	50860
M25 J5-7 - widened	5320	3590	31490	0	3590	36820
M25 J7-9 – all lane running	390	710	98580	0	1100	98580
Total	51460	1006080	534840	0	1007550	584860

5.2. Designated Sites

Notes on the following tables for Designated Sites:

- Annual mean NO_x concentrations ($\mu g/m^3$) shown in **bold** are in excess of the Critical Level of 30 $\mu g/m^3$
- Background N-dep values for woodland are generally greater than for lower growing vegetation. Where the main habitat includes woodland and lower growing vegetation (e.g. grassland) then the lowest background N-dep is shown

Table 5.2 – Air Quality Compliance Risks at SSSI

Site name	Main habitat	Area affected (m^2)	2010 NOx	2030 NOx	2034 / 2050 risk of exceeding Critical Level	Lower Critical Load	Upper Critical Load	2010 background N-dep	2030 background N-dep	2034 / 2050 risk of exceeding lower Critical Load
Westerham Wood	Broadleaved, mixed and yew woodland - lowland	112883	**35**	15	Green	10	20	39	24	Red
Lullingstone Park	Broadleaved, mixed and yew woodland - lowland	193	**34**	16	Green	10	20	37	22	Red
Epping Forest	Broadleaved, mixed and yew woodland - lowland; Acid grassland - lowland	111937	**35**	16	Green	5	25	17	10	Red
Hatfield Forest	Broadleaved, mixed and yew woodland - lowland	1318128	**36**	20	Green	10	20	36	22	Red
Woldingham & Oxted Downs	Calcareous grassland - lowland; Broadleaved, mixed and yew woodland - lowland	1207	**34**	15	Green	5	25	20	12	Red
Titsey Woods	Broadleaved, mixed and yew woodland - lowland	151230	**34**	14	Green	10	20	37	22	Red
Curtismill Green	Neutral grassland - lowland; Broadleaved, mixed and yew woodland - lowland	10098	**40**	15	Green	10	30	20	12	Red
Whittlesford-Thriplow Hummocky Fields	Arable and horticulture – not sensitive	28554	#N/A	#N/A	Green	#N/A	#N/A	#N/A	#N/A	#N/A
Mole Gap to Reigate Escarpment	Broadleaved, mixed and yew woodland - lowland; Calcareous grassland - lowland; Earth heritage;	53268	**37**	16	Green	5	25	18	11	Red

Table 5.3 – Air Quality Compliance Risks at Ramsar

---- No Ramsar sites affected ----

Table 5.4 – Air Quality Compliance Risks at SPA

---- No SPA sites affected ----

Table 5.5 – Air Quality Compliance Risks at SAC

Site name	Main habitat	Area affected (m^2)	2010 NOx	2030 NOx	2034 / 2050 risk of exceeding Critical Level	Lower Critical Load	Upper Critical Load	2010 background N-dep	2030 background N-dep	2034 / 2050 risk of exceeding lower Critical Load
Mole Gap to Reigate Escarpment	Broadleaved, mixed and yew woodland - lowland; Calcareous grassland - lowland; Earth heritage;	39456	**36**	16	GREEN	5	25	18	11	RED

6. Summary

A high level qualitative local air quality assessment of the Hub airport proposal at Stansted in 2034 and 2050 has been provided. The assessment is not part of the EIA process but is to help decision makers in selection of the most suitable site for a London Hub Airport.

The main purpose of the assessment has been to highlight locations with potential air quality standard compliance risks based on a current understanding of local air quality conditions and relevant locations at risk, based on current publically accessible sources. Compliance risks have been considered in relation to public health and at Designated Sites.

For public health, current baseline air quality conditions at the proposed site are relatively good. There are a number of notable point sources of air pollutants though none that would significantly influence local air quality under normal circumstances. Air quality problem areas are highlighted by AQMAs away from the site along busy roads due to near road exceedances of the standard for annual mean NO_2. Road transport routes with AQMAs include the M11 (where it joins A14) and M25.

For Designated Sites, current baseline air quality conditions are generally poor, with exceedance of the Critical Load for NO_x and Critical Levels for N-dep at all sites.

High risks for public health standard compliance are anticipated in 2034 along existing roads with proposed widening to accommodate Hub airport traffic; these locations are within 200 m (often closer) of the M25 centreline. By 2050 it is anticipated that no high risks remain on the basis that substantial reductions in vehicle emissions are achieved by advances in and take up of cleaner vehicle technologies. In both 2034 and 2050 the vast majority of the medium risks (in total square metres) are associated with the airport footprint (within 1km of the airport boundary excluding new/widened roads), rather than the surface access to it. This is a very different position to the proposed sites in the area of the Thames Estuary.

High risks in relation to the Critical Level for annual mean NO_x in 2034 and 2050 are not indicated for any Designated Site. Critical Loads are at risk of being exceeded at all sites.

Appendices

Appendix A. A3 Figures

Figure 1 – Illustration of layering in GIS analysis

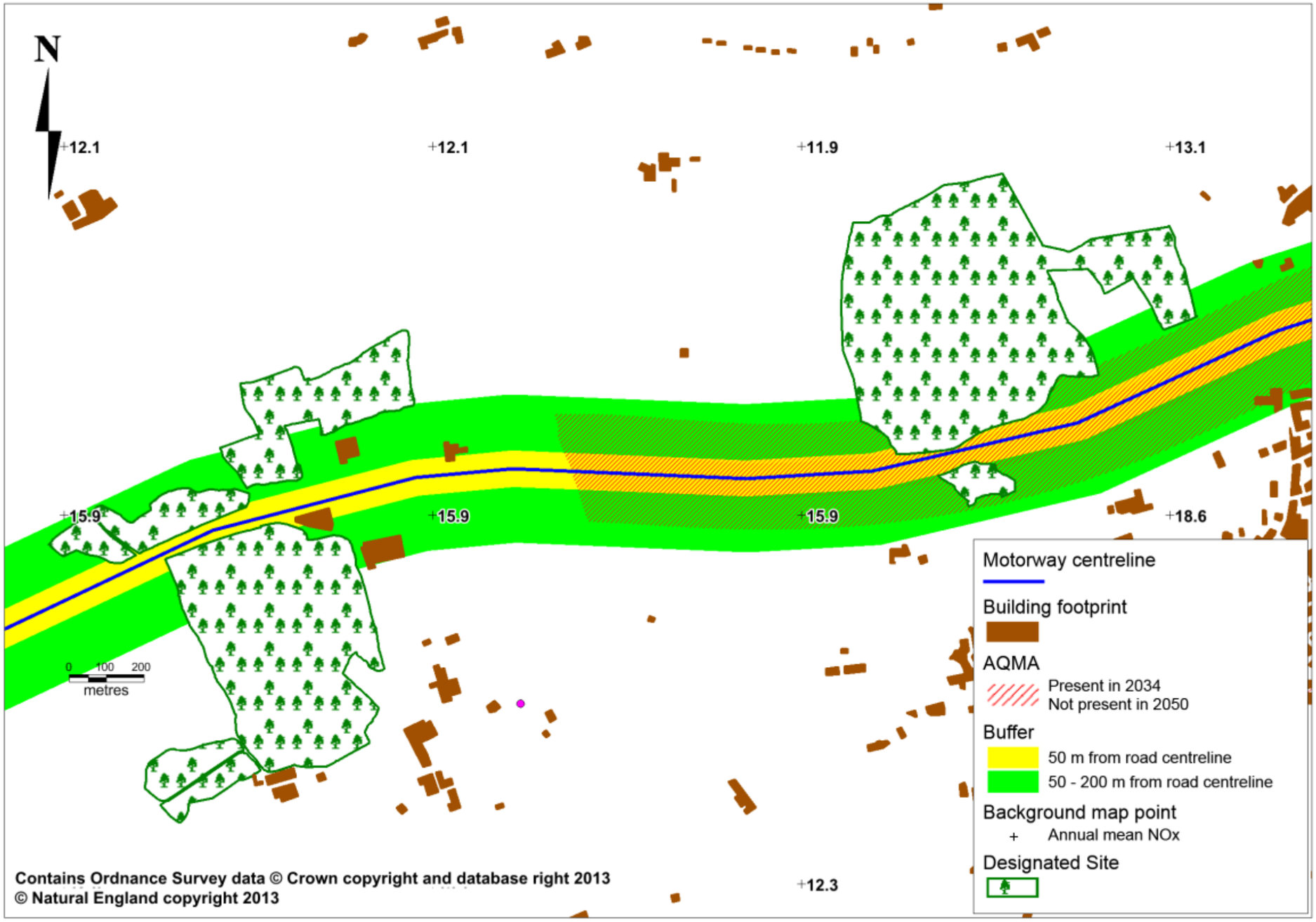

Figure 2 – New and widened existing road routes

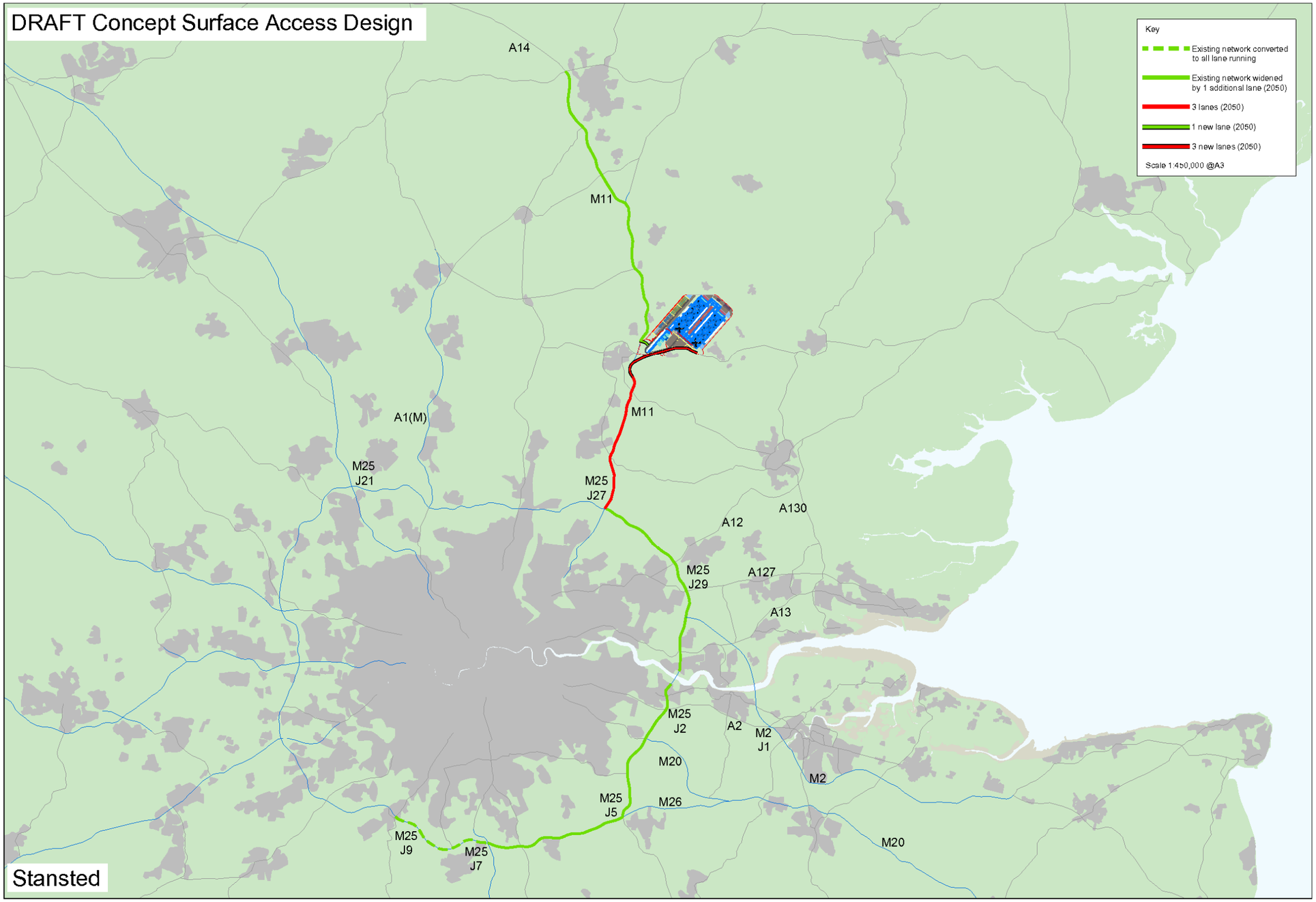

Figure 3 – Baseline situation in 2010/2011

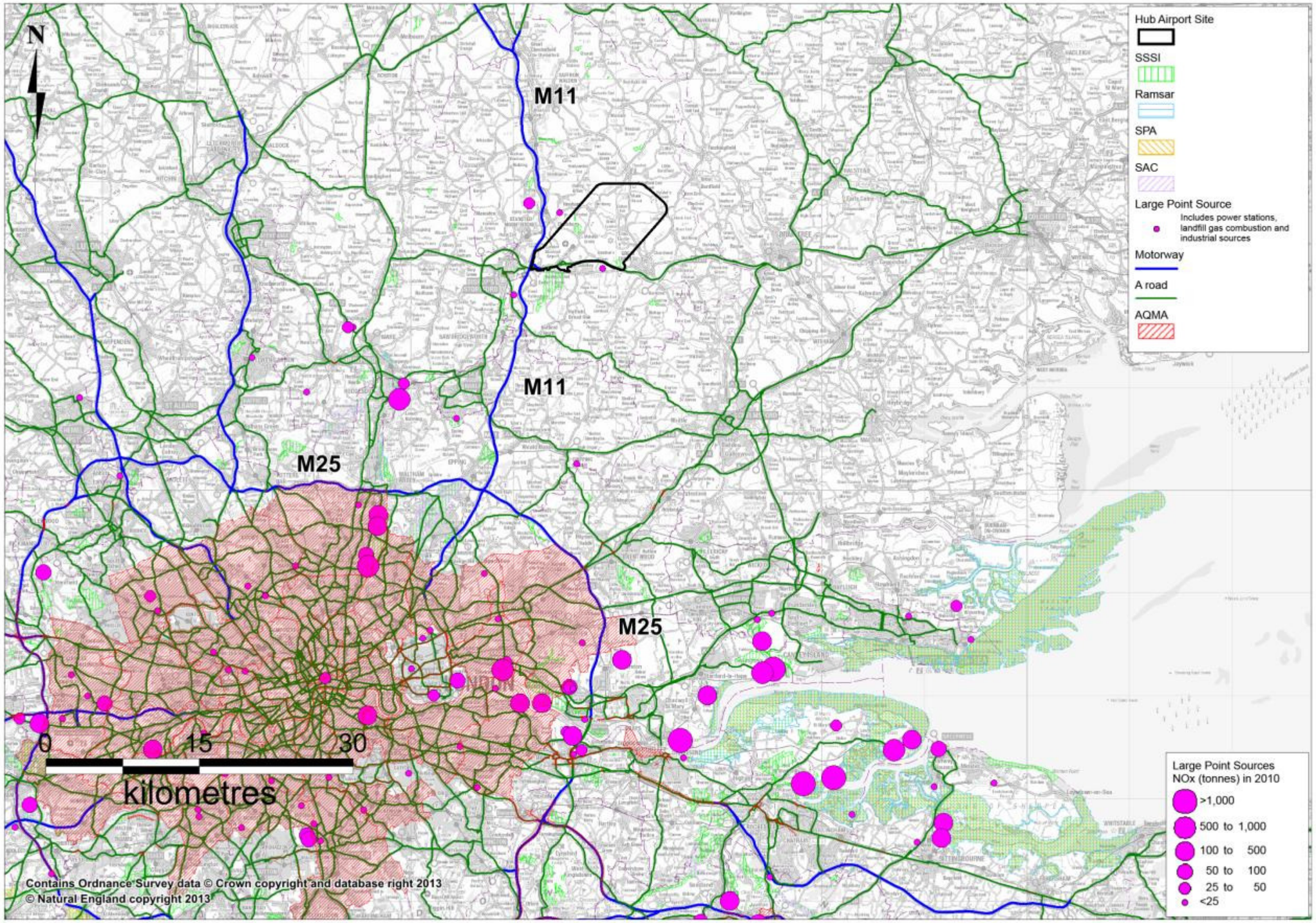

Figure 4 – Background annual mean NO_2 concentrations (µg/m^3) in 2010

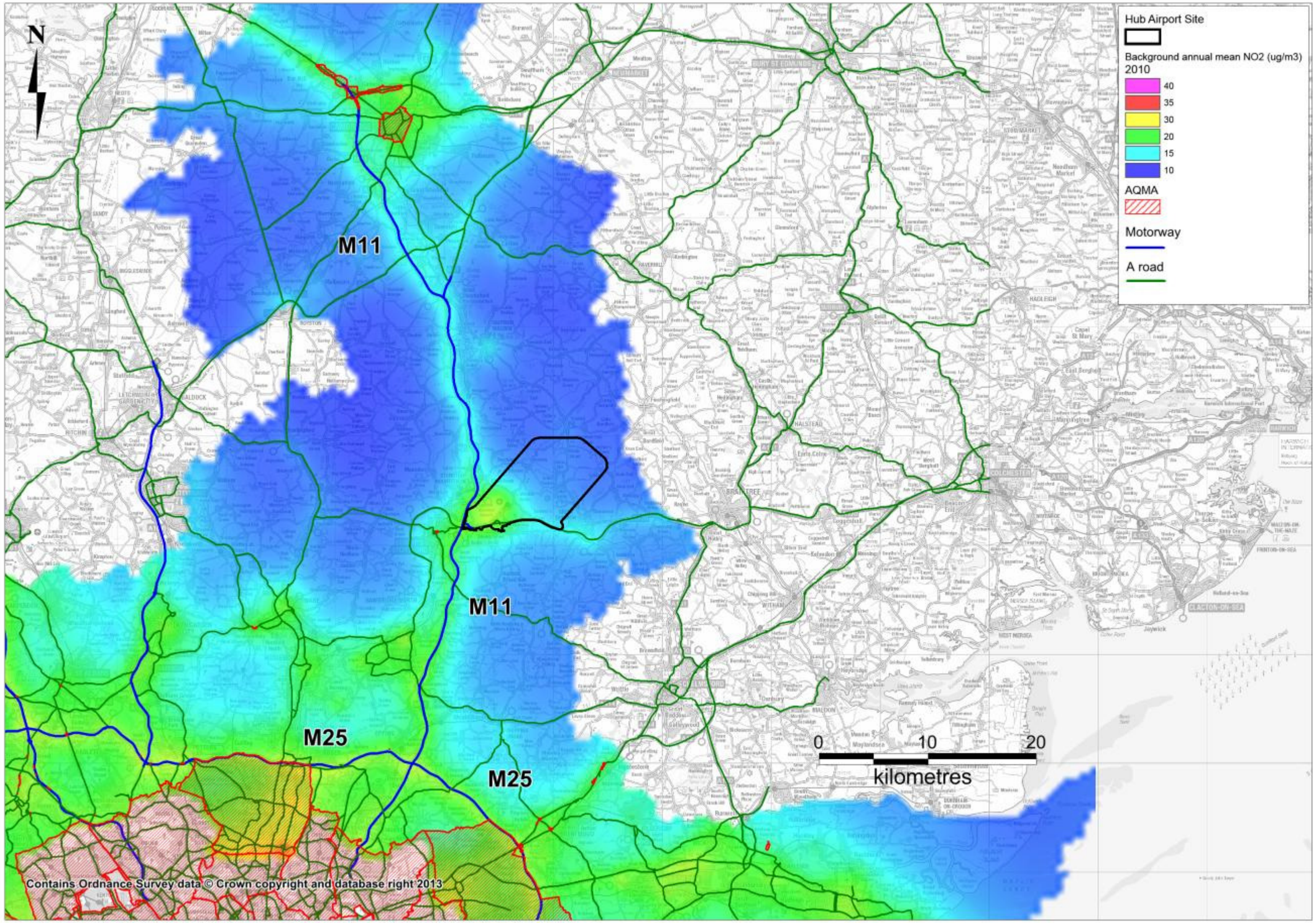

Figure 5 – Background annual mean PM_{10} concentrations (µg/m^3) in 2010

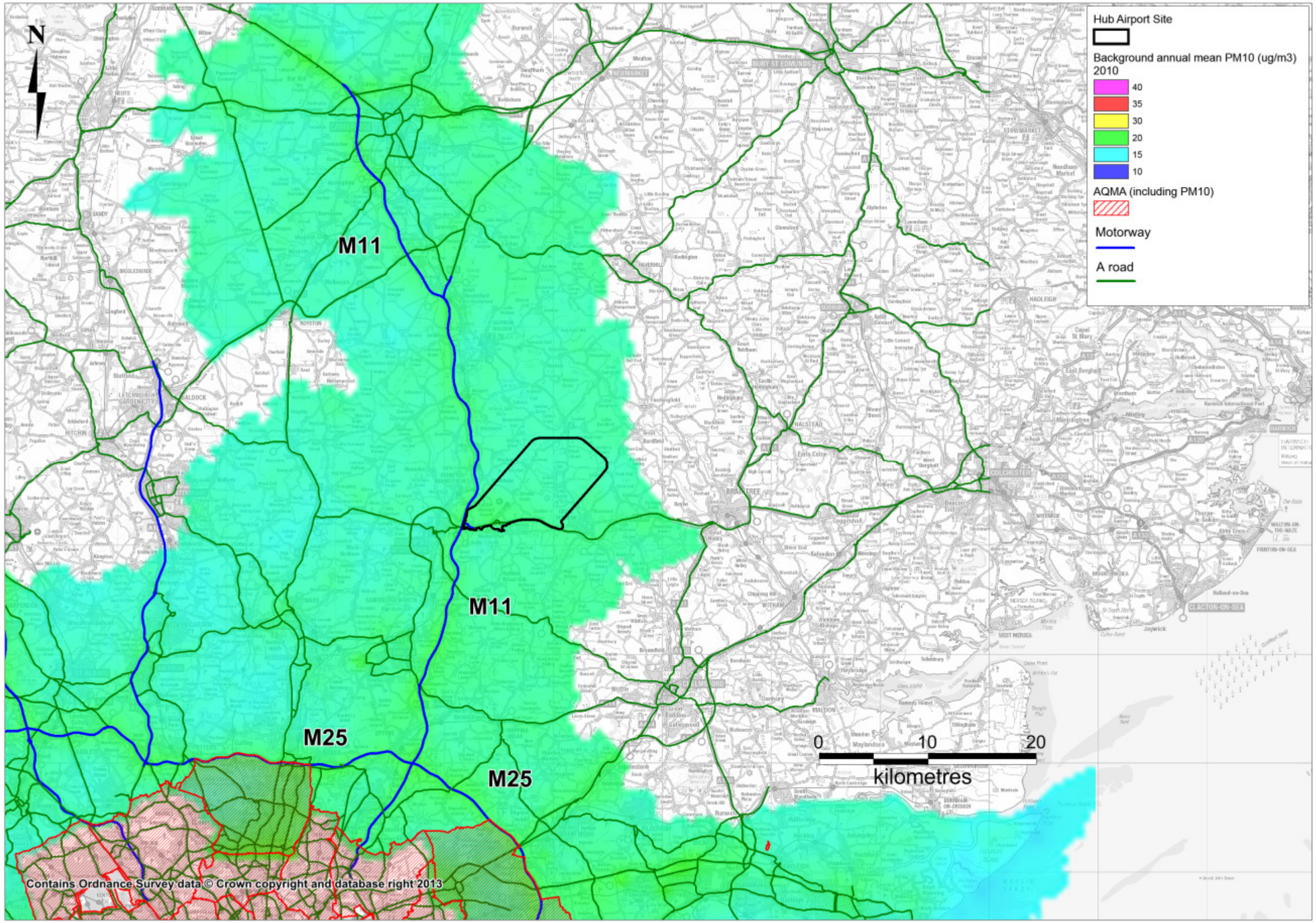

Figure 6 – Background annual mean $PM_{2.5}$ concentrations (µg/m^3) in 2010

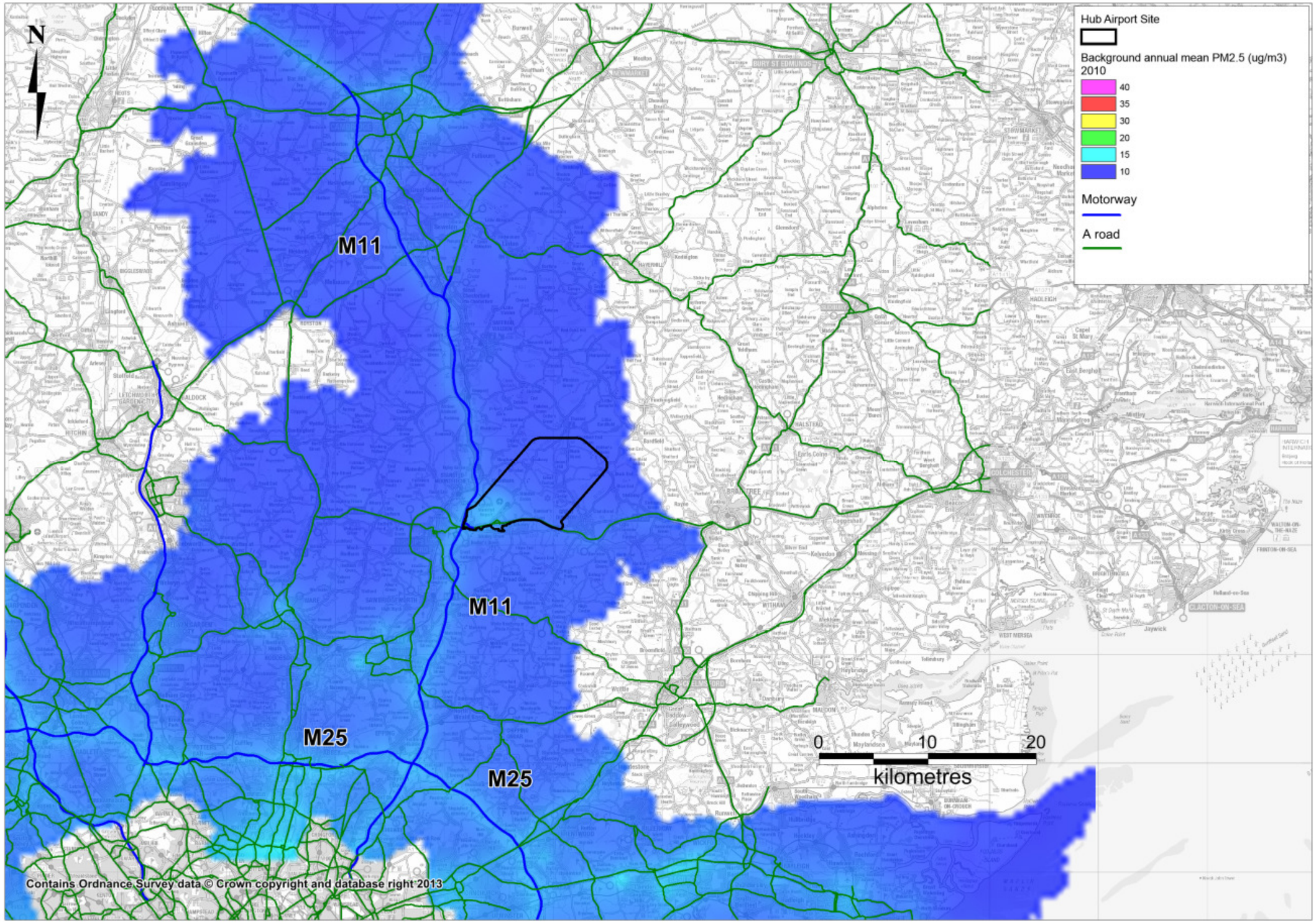

Figure 7 – Background annual mean NO_x concentrations ($\mu g/m^3$) in 2010

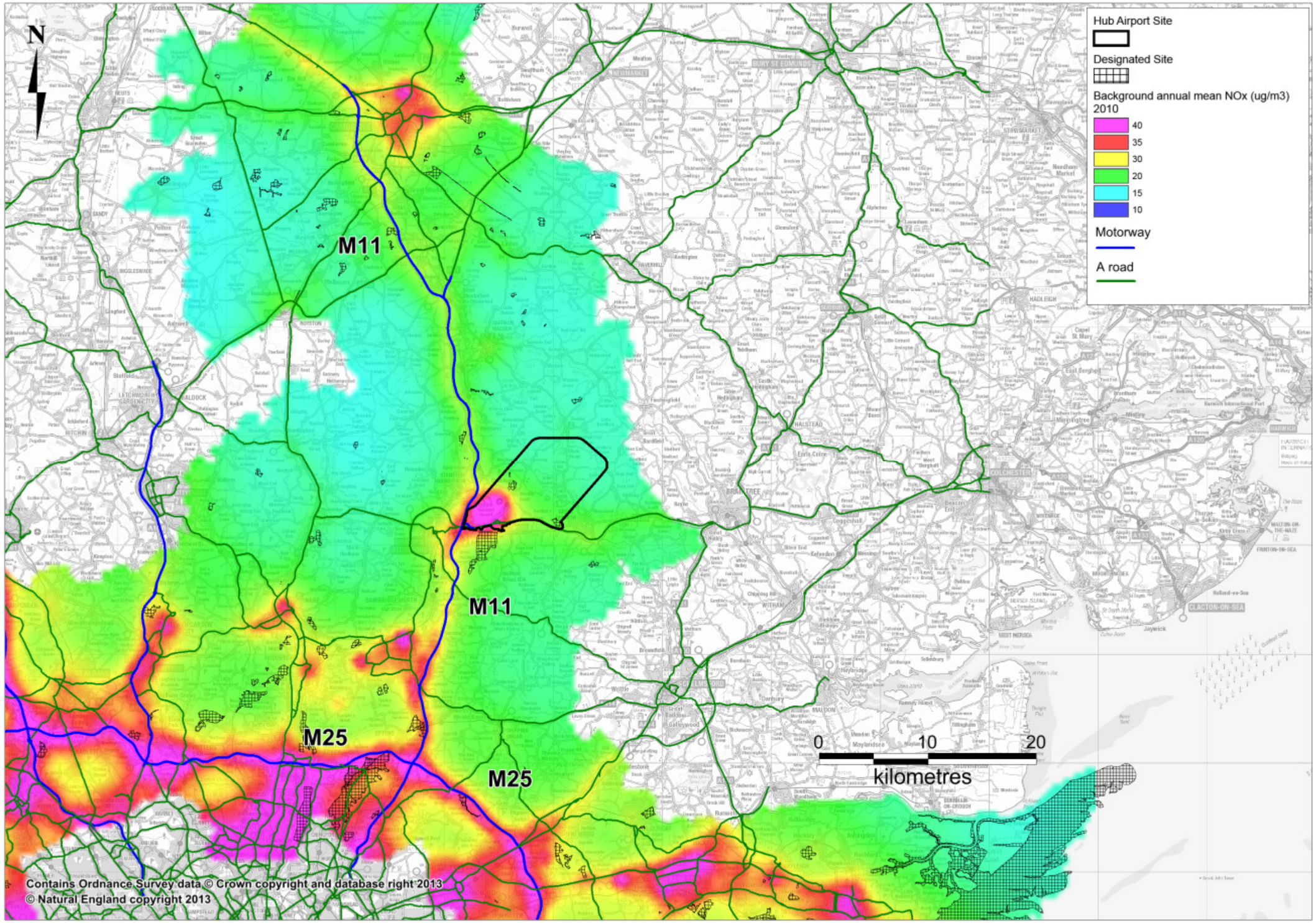

Figure 8 – Background annual mean NO_2 concentrations (µg/m^3) in 2034

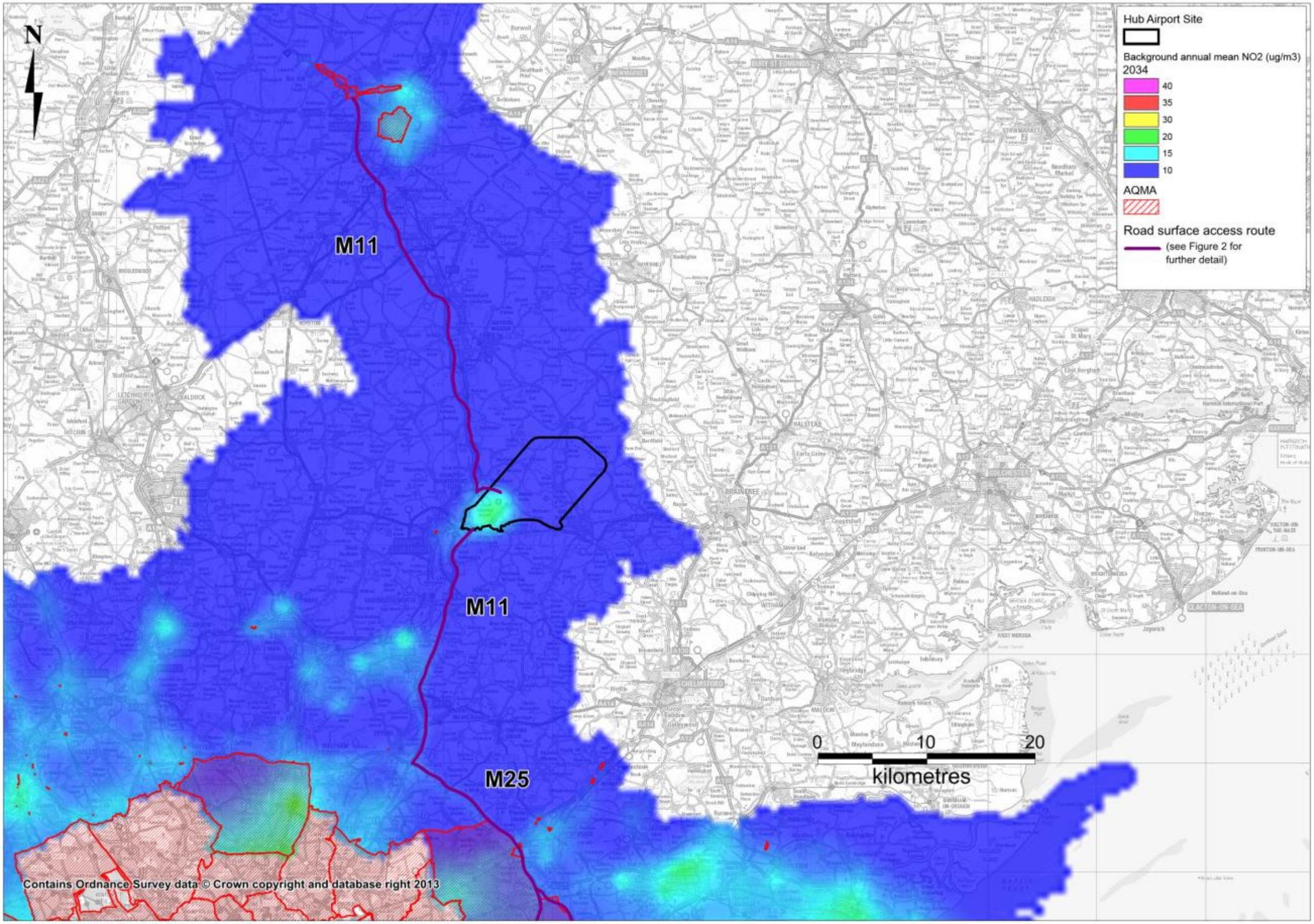

Figure 9 – Background annual mean PM_{10} concentrations (µg/m^3) in 2034

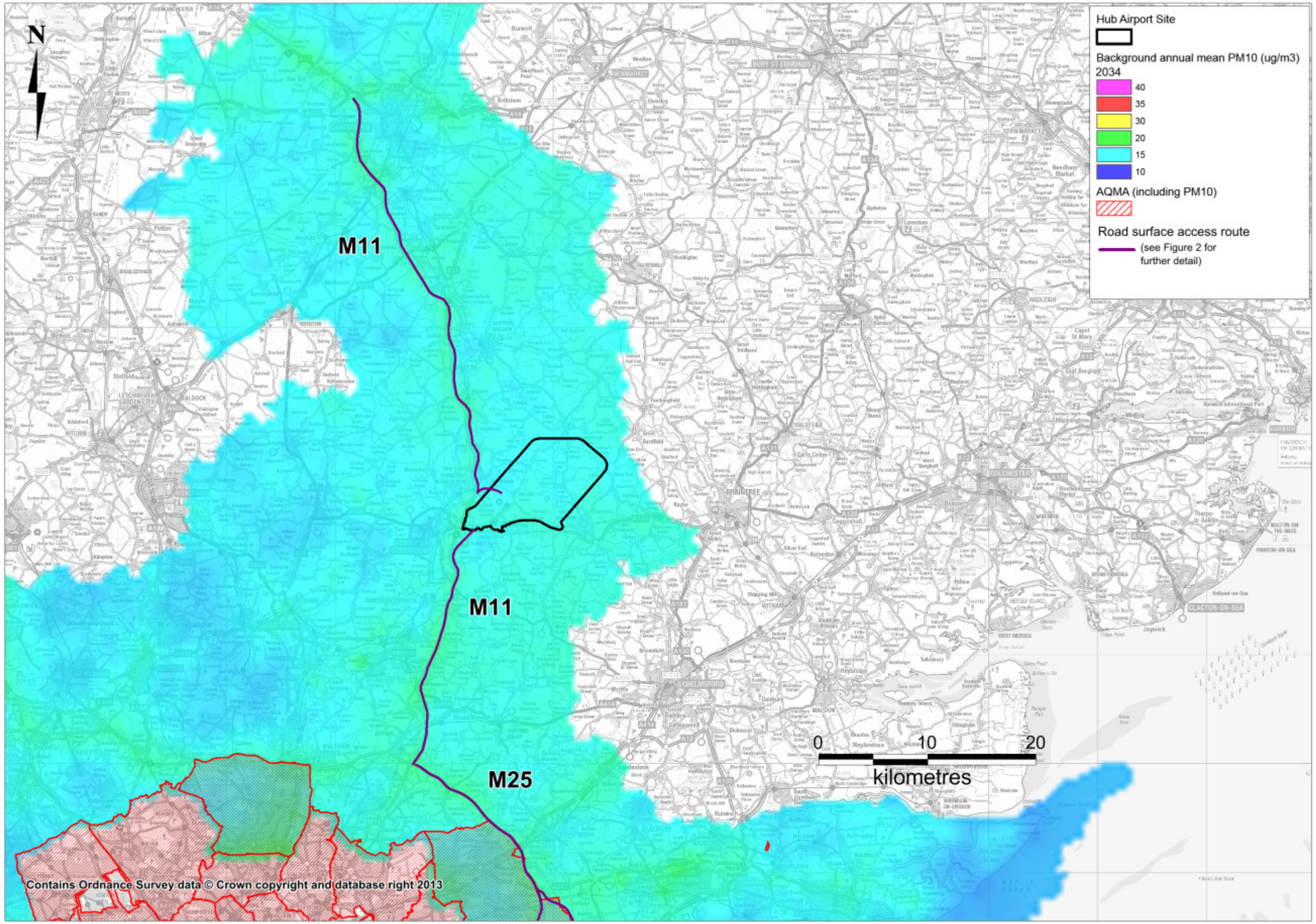

Figure 10 – Background annual mean $PM_{2.5}$ concentrations (µg/m^3) in 2034

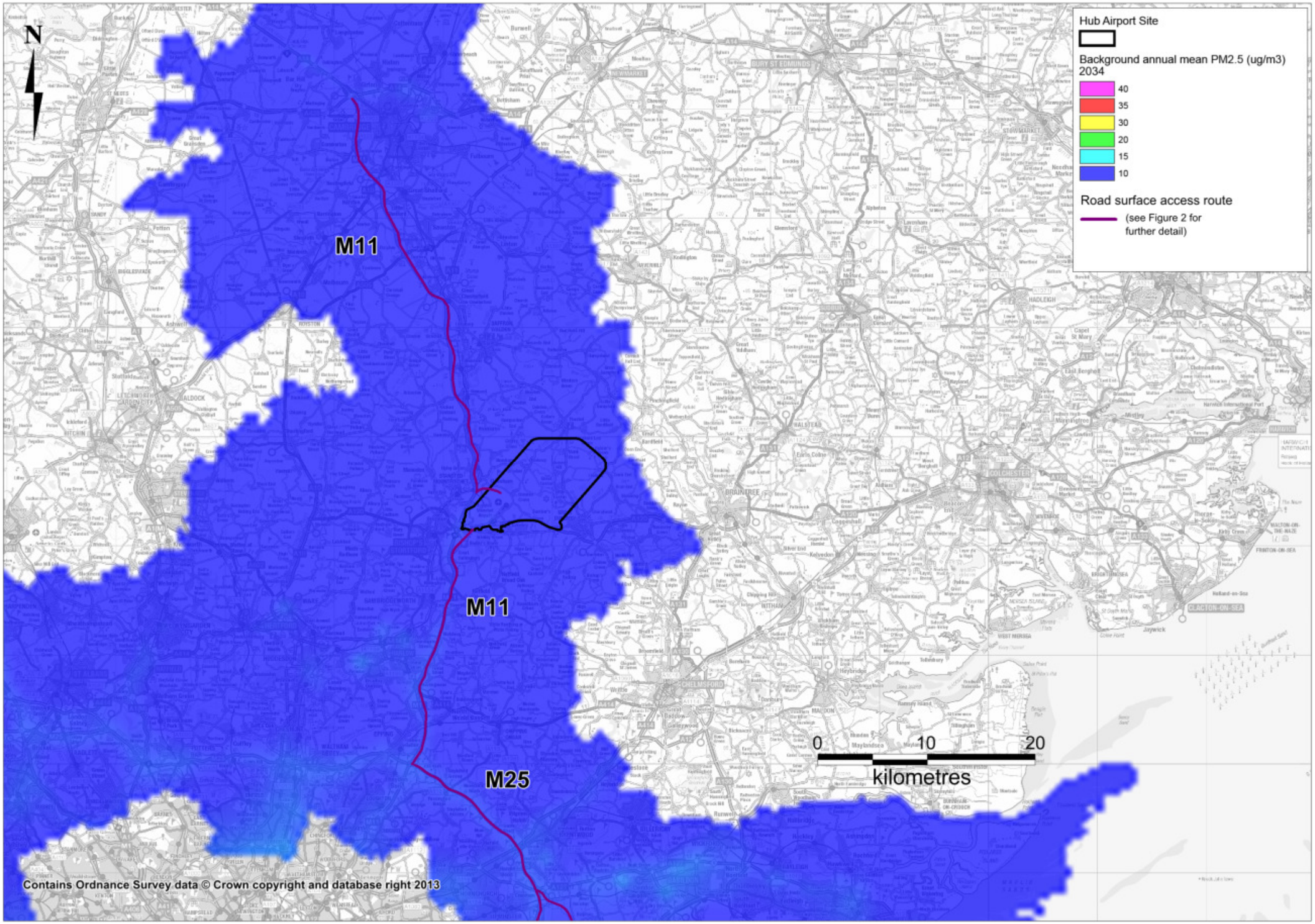

Figure 11 – Background annual mean NO_x concentrations (µg/m^3) in 2034