



Department  
for Environment  
Food & Rural Affairs

[www.gov.uk/defra](http://www.gov.uk/defra)

## Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide (NO<sub>2</sub>) in Swansea Urban Area (UK0027)

December 2015

This information is out of date.



Llywodraeth Cymru  
Welsh Government



**DOE**

Department of  
the Environment  
[www.doeni.gov.uk](http://www.doeni.gov.uk)



**The Scottish  
Government**  
Riaghaltas na h-Alba



© Crown copyright 2015

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v.3. To view this licence visit [www.nationalarchives.gov.uk/doc/open-government-licence/version/3/](http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/) or email [PSI@nationalarchives.gsi.gov.uk](mailto:PSI@nationalarchives.gsi.gov.uk)

Any enquiries regarding this publication should be sent to us at:

[air.quality@defra.gsi.gov.uk](mailto:air.quality@defra.gsi.gov.uk)

This information is out of date.

## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	This document . . . . .	3
1.2	Context . . . . .	3
1.3	Zone status . . . . .	3
1.4	Plan structure . . . . .	4
<b>2</b>	<b>General Information About the Zone</b>	<b>4</b>
2.1	Administrative information . . . . .	4
2.2	Assessment details . . . . .	6
2.3	Reporting under European Directives . . . . .	8
<b>3</b>	<b>Overall Picture for 2013 Reference Year</b>	<b>8</b>
3.1	Introduction . . . . .	8
3.2	Reference year: NO <sub>2</sub> _UK0027_Annual_1 . . . . .	8
<b>4</b>	<b>Measures</b>	<b>13</b>
4.1	Introduction . . . . .	13
4.2	Source apportionment . . . . .	13
4.3	Measures . . . . .	13
4.4	Measures timescales . . . . .	14
<b>5</b>	<b>Baseline Model Projections</b>	<b>14</b>
5.1	Overview of model projections . . . . .	14
5.2	Baseline projections: NO <sub>2</sub> _UK0027_Annual_1 . . . . .	15
	<b>Annexes</b>	<b>19</b>
A	References . . . . .	19
B	Source apportionment graphs . . . . .	20
C	Tables of measures . . . . .	22

# 1 Introduction

## 1.1 This document

This document is the Swansea Urban Area agglomeration zone (UK0027) updated air quality plan for the achievement of the EU air quality limit values for nitrogen dioxide (NO<sub>2</sub>). This is an update to the air quality plan published in September 2011 (<http://uk-air.defra.gov.uk/library/no2ten/>).

This plan presents the following information:

- General information regarding the Swansea Urban Area agglomeration zone
- Details of the NO<sub>2</sub> exceedance situation within the Swansea Urban Area agglomeration zone
- Details of local air quality measures that have been implemented, will be implemented or are being considered for implementation in this agglomeration zone

This air quality plan for the Swansea Urban Area agglomeration zone should be read in conjunction with the separate UK overview document and the list of UK and national measures. The UK overview document sets out, amongst other things, the authorities responsible for delivering air quality improvements and the list of UK and national measures that are applied in some or all UK zones. The measures presented in this zone plan, the accompanying UK overview document and the list of UK and national measures show how the UK will ensure that compliance with the NO<sub>2</sub> limit values is achieved in the shortest possible time.

This plan should also be read in conjunction with the supporting UK Technical Report which presents information on assessment methods, input data and emissions inventories used in the analysis presented in this plan.

## 1.2 Context

Two NO<sub>2</sub> limit values for the protection of human health have been set in the Air Quality Directive (2008/50/EC). These are:

- The annual mean limit value: an annual mean concentration of no more than 40  $\mu\text{g m}^{-3}$
- The hourly limit value: no more than 18 exceedances of 200  $\mu\text{g m}^{-3}$  in a calendar year

The Air Quality Directive stipulates that compliance with the NO<sub>2</sub> limit values will be achieved by 01/01/2010. However, where the limit values cannot be achieved by then, the Directive also allowed Member States to postpone this attainment date until 01/01/2015 at the latest provided air quality plans were established demonstrating how the limit values would be met by this extended deadline. Postponement of compliance until 01/01/2014 was granted by the European Commission for Swansea Urban Area agglomeration zone.

## 1.3 Zone status

The assessment undertaken for the Swansea Urban Area agglomeration zone indicates that the annual limit value was exceeded in 2013 but is likely to be achieved before 2020 through the introduction of measures included in the baseline.

## 1.4 Plan structure

General administrative information regarding this agglomeration zone is presented in section 2.

Section 3 then presents the overall picture with respect to NO<sub>2</sub> levels in this agglomeration zone for the 2013 reference year of this air quality plan. This includes a declaration of exceedance situations within the agglomeration zone and presentation of a detailed source apportionment for each exceedance situation.

An overview of the measures already taken and to be taken within the agglomeration zone both before and after 2013 is given in section 4.

Baseline modelled projections for 2020, 2025 and 2030 for each exceedance situation are presented in section 5. The baseline projections presented here include, where possible, the impact of measures that have already been taken and measures for which the relevant authority has made a firm commitment to implement. However, it has not been possible to quantify the impact of all the measures. This section therefore also explains which measures have been quantified, and hence included in the model projections, and which measures have not been quantified.

## 2 General Information About the Zone

### 2.1 Administrative information

Zone name: Swansea Urban Area

Zone code: UK0027

Type of zone: agglomeration zone

Reference year: 2013

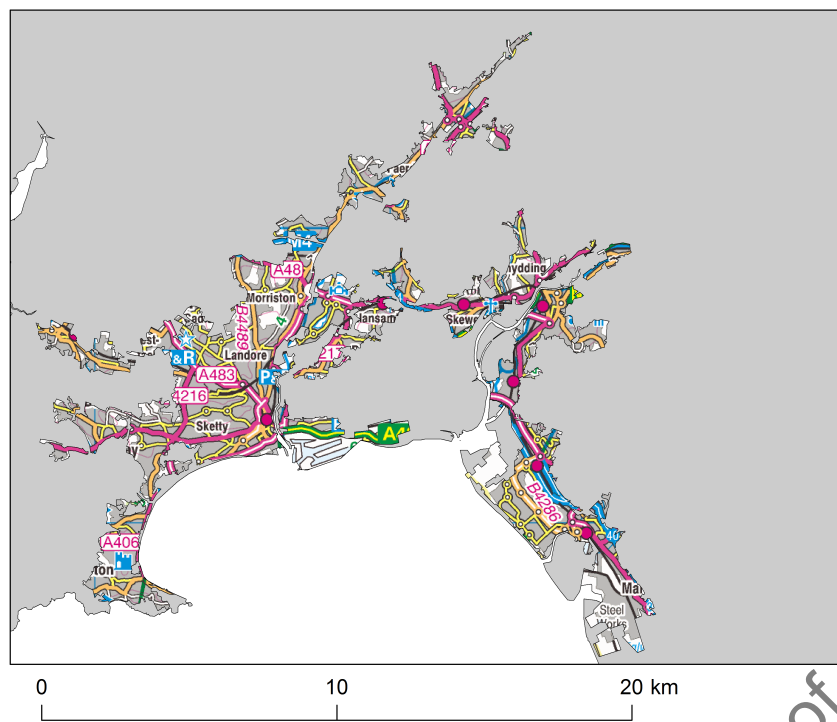
Extent of zone: Figure 1 shows the area covered by the Swansea Urban Area agglomeration zone.

Local Authorities within the zone: Figure 2 shows the location of Local Authorities within the agglomeration zone. A list of these Local Authorities is also given below. The numbers in the list correspond to the numbers in Figure 2.

1. City and County of Swansea
2. Neath & Port Talbot County Borough Council

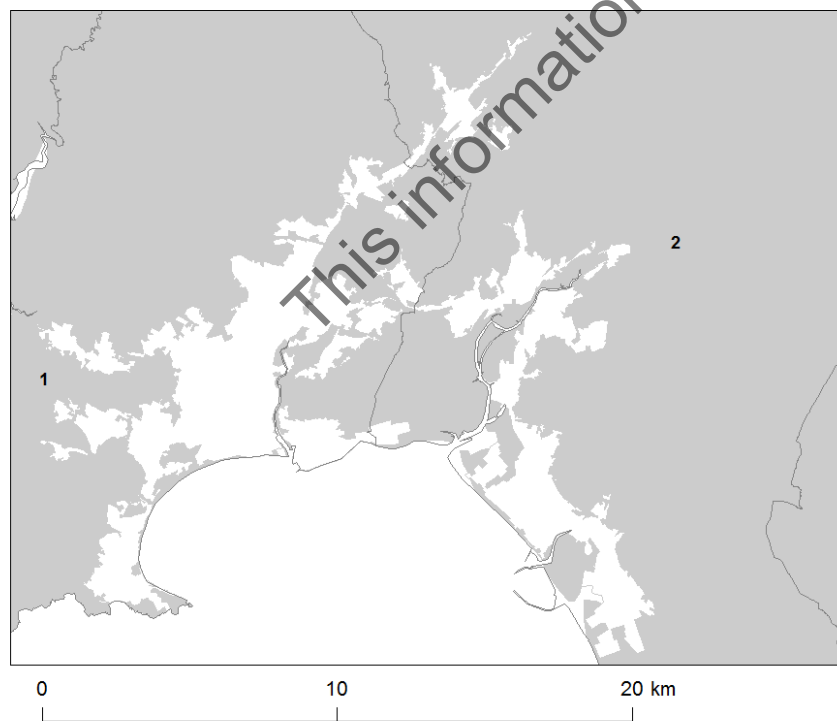
(Note: Local Authority boundaries do not necessarily coincide with zone boundaries. Hence Local Authorities may be listed within more than one zone plan.)

**Figure 1: Map showing the extent of the Swansea Urban Area agglomeration zone (UK0027).**



© Crown copyright. All rights reserved Defra, License number 100022861 [2015]

**Figure 2: Map showing Local Authorities within the Swansea Urban Area agglomeration zone (UK0027).**



© Crown copyright. All rights reserved Defra, License number 100022861 [2015]

## 2.2 Assessment details

### Measurements

NO<sub>2</sub> measurements in this zone were available in 2013 from the following national network monitoring stations (NO<sub>2</sub> data capture for each station in 2013 shown in brackets):

1. Port Talbot Margam GB0906A (95%)
2. Swansea Roadside GB0896A (99%)

Full details of monitoring stations within the Swansea Urban Area agglomeration zone are available from <http://uk-air.defra.gov.uk/networks/network-info?view=aurn>.

### Modelling

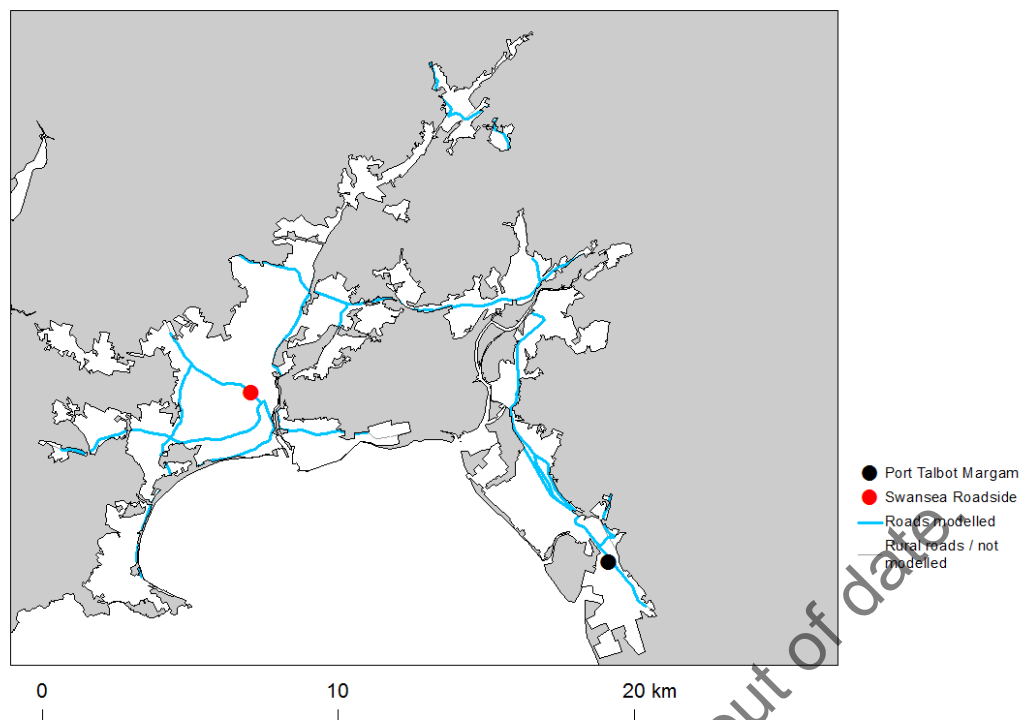
Modelling for the 2013 reference year has been carried out for the whole of the UK. This modelling covers the following extent within this zone:

- Total background area within zone (approx): 83 km<sup>2</sup>
- Total population within zone (approx): 210,269 people
- Total road length where an assessment of NO<sub>2</sub> concentrations has been made: 63 km in 2013 (and similar lengths in previous years)

### Zone maps

Figure 3 presents the location of the NO<sub>2</sub> monitoring stations within this zone for 2013 and the roads for which NO<sub>2</sub> concentrations have been modelled. NO<sub>2</sub> concentrations at background locations have been modelled across the entire zone at a 1 km x 1 km resolution.

**Figure 3: Map showing the location of the NO<sub>2</sub> monitoring stations with valid data in 2013 and roads where concentrations have been modelled within the Swansea Urban Area (UK0027) agglomeration zone.**



© Crown copyright. All rights reserved Defra, License number 100022861 [2015]



## 2.3 Reporting under European Directives

From 2001 to 2012 the UK has reported annually on air quality concentrations using a standard Excel questionnaire (Decision 2004/461/EC). These questionnaires are available online from <http://cdr.eionet.europa.eu/gb/eu/annualair>. Since 2013 reporting has been via an e-reporting system (Decision 2011/850/EU) <http://cdr.eionet.europa.eu/gb/eu/>.

In addition, the UK has reported on air quality plans and programmes (Decision 2004/224/EC) since 2003. Historic plans and programmes are available on <http://cdr.eionet.europa.eu/gb/eu/aqpp>.

# 3 Overall Picture for 2013 Reference Year

## 3.1 Introduction

There are two limit values for the protection of health for NO<sub>2</sub>. These are:

- The annual limit value (annual mean concentration of no more than 40  $\mu\text{g m}^{-3}$ )
- The hourly limit value (no more than 18 hourly exceedances of 200  $\mu\text{g m}^{-3}$  in a calendar year)

Within the Swansea Urban Area agglomeration zone the annual limit value was exceeded in 2013. Hence, one exceedance situation for this zone has been defined, NO<sub>2</sub>\_UK0027\_Annual\_1, which covers exceedances of the annual limit value. This exceedance situation is described below.

Swansea Urban Area agglomeration zone had a time extension in place until 01/01/2014. While a location has a time extension in place, a margin of tolerance has been defined by the Air Quality Directive (2008/50/EC) which applies to the annual mean NO<sub>2</sub> limit value until the time extension expires. In this agglomeration zone the annual mean concentration of NO<sub>2</sub> did not exceed the limit value plus the maximum margin of tolerance (60  $\mu\text{g m}^{-3}$ ) in 2013, thus the agglomeration zone was reported to the European Commission as compliant for this year. For the purpose of this Air Quality Plan the exceedance situation is defined with respect to the NO<sub>2</sub> limit value, irrespective of the compliance status submitted for 2013.

## 3.2 Reference year: NO<sub>2</sub>\_UK0027\_Annual\_1

The NO<sub>2</sub>\_UK0027\_Annual\_1 exceedance situation covers all exceedances of the annual mean limit value in the Swansea Urban Area agglomeration zone in 2013.

Compliance with the annual limit value in this exceedance situation has been assessed using a combination of air quality measurements and modelling. Table 1 presents measured annual concentrations at national network stations in this exceedance situation since the 1st Daughter Directive (1999/30/EC) came into force in 2001. This shows that there were no measured exceedances of the annual limit value in this zone in 2013. Table 2 summarises modelled annual mean NO<sub>2</sub> concentrations in this exceedance situation for the same time period. This table shows that, in 2013, 2.7 km of road length was modelled to exceed the annual limit value. There were no modelled background exceedances of the annual limit value. Maps showing the modelled annual mean NO<sub>2</sub> concentrations for 2013 at background and at roadside locations are presented in Figures 4 and 5 respectively. All modelled exceedances of the annual limit value are coloured orange or red in the maps.

The maximum measured concentration in the zone varies due to changes in emissions and varying meteorology in different years. However, the models are also updated each year to take into account the most up-to-date science, so the modelled results for different years may not be directly comparable.

The modelling carried out for this exceedance situation has also been used to determine the annual mean NOx source apportionment for all modelled locations. Emissions to air are regulated in terms of oxides of nitrogen (NOx), which is the term used to describe the sum of nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO). Ambient NO<sub>2</sub> concentrations include contributions from both directly emitted primary NO<sub>2</sub> and secondary NO<sub>2</sub> formed in the atmosphere by the oxidation of NO. As such, it is not possible to calculate an unambiguous source apportionment specifically for NO<sub>2</sub> concentrations; therefore the source apportionment in this plan is presented for NOx, rather than for NO<sub>2</sub> (for further details please see the UK Technical Report). Table 3 summarises the modelled NOx source apportionment for the section of road with the highest modelled NO<sub>2</sub> concentration in this exceedance situation in 2013. This is important information because it shows which sources need to be tackled at the location with the largest compliance gap in the exceedance situation.

Figure B.1 in Annex B presents the annual mean NOx source apportionment for each section of road within the NO<sub>2</sub>\_UK0027\_Annual\_1 exceedance situation (i.e. the source apportionment for all exceeding roads only) in 2013. In this figure roads have been grouped into motorways, primary roads (major roads managed by local authorities) and trunk roads (major roads managed by highways authorities).

This information is out of date.

**Table 1: Measured annual mean NO<sub>2</sub> concentrations at national network stations in NO<sub>2</sub>\_UK0027\_Annual\_1 for 2001 onwards,  $\mu\text{gm}^{-3}$  (a). Data capture shown in brackets.**

Site name (EOI code)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Port Talbot (GB0651A)	22 (96)	19 (97)	22 (97)	21 (84)	19 (97)	18 (97)	18 (55)						
Port Talbot Margam (GB0906A)							19 (42)	18 (95)	17 (95)	19 (96)	18 (99)	18 (99)	17 (95)
Swansea (GB0609A)	36 (95)	31 (98)	34 (98)	37 (91)	34 (95)	31 (54)							
Swansea Roadside (GB0896A)						36 (28)	31 (98)	32 (99)	33 (99)	36 (99)	32 (99)	31 (99)	31 (99)

(a) Annual Mean Limit Value =  $40 \mu\text{gm}^{-3}$

**Table 2: Annual mean NO<sub>2</sub> model results in NO<sub>2</sub>\_UK0027\_Annual\_1 for 2001 onwards.**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Road length exceeding (km)	0.0	3.4	11.3	0.0	0.0	0.0	2.5	2.5	5.4	5.4	5.4	2.7	2.7
Background exceeding (km <sup>2</sup> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum modelled concentration ( $\mu\text{gm}^{-3}$ ) (a)	38.4	49.9	72.6	39.5	37.2	38.5	41.8	44.1	56.5	58.6	47	46	48

(a) Annual Mean Limit Value =  $40 \mu\text{gm}^{-3}$

**Table 3: Modelled annual mean NOx source apportionment at the traffic count point with the highest modelled concentration in 2013 in NO2\_UK0027\_Annual\_1 ( $\mu\text{gm}^{-3}$ ) (traffic count point 77075 on the M4; OS grid (m): 274670, 192300).**

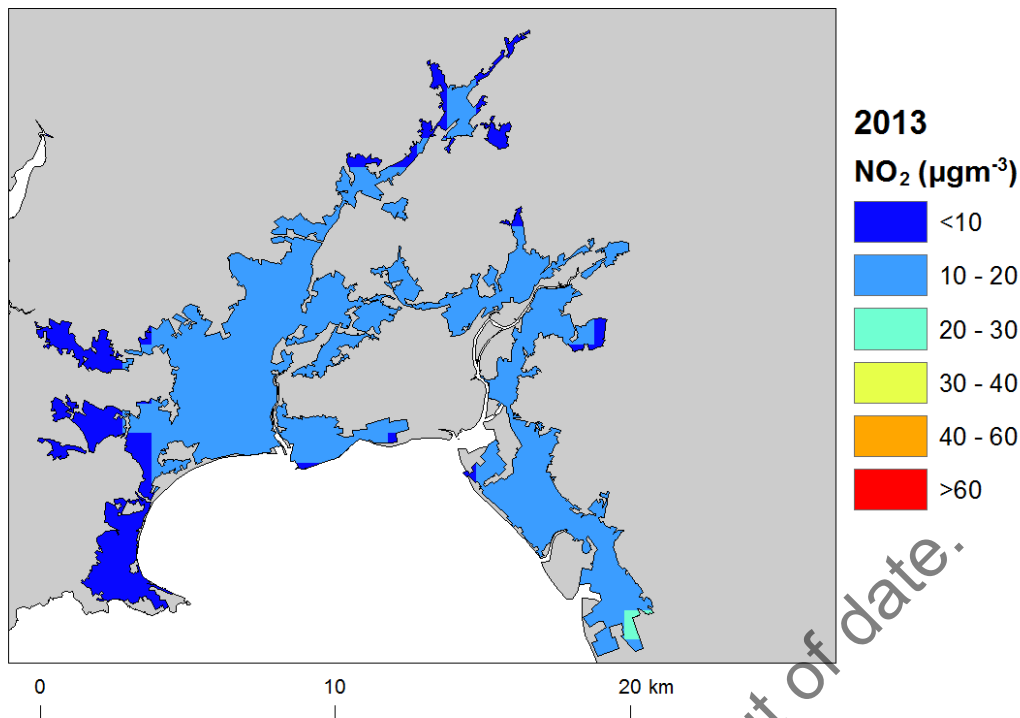
Spatial scale	Component	Concentration at highest road link (a)
Regional background sources NOx (i.e. contributions from distant sources of > 30 km from the receptor).	Total	6.2
	From within the UK	2.5
	From transboundary sources (includes shipping and other EU member states)	3.7
Urban background sources NOx (i.e. sources located within 0.3 - 30 km from the receptor).	Total	20.1
	From road traffic sources	12.0
	From industry (including heat and power generation)	2.6
	From agriculture	NA
	From commercial/residential sources	0.7
	From shipping	0.5
	From off road mobile machinery	0.9
	From natural sources	NA
	From transboundary sources	NA
	From other urban background sources	3.4
Local sources NOx (i.e. contributions from sources < 0.3 km from the receptor).	Total	88.5
	From petrol cars	4.6
	From diesel cars	40.4
	From HGV rigid (b)	11.2
	From HGV articulated (b)	12.0
	From buses	1.9
	From petrol LGVs (c)	0.4
	From diesel LGVs (c)	17.8
	From motorcycles	0.2
	From London taxis	0.0
Total NOx (i.e. regional background + urban background + local components)		114.8
Total NO <sub>2</sub> (i.e. regional background + urban background + local components)		48

(a) Components are listed with NOx concentration of NA when there is no source from this sector.

(b) HGV = heavy goods vehicle

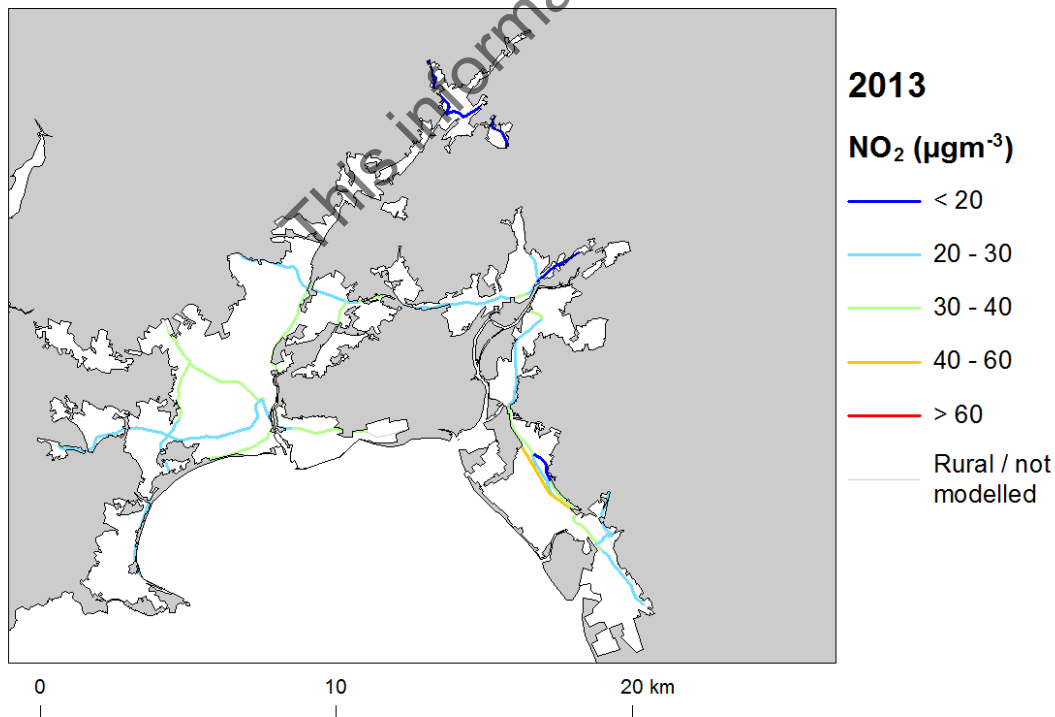
(c) LGV = light goods vehicle

**Figure 4: Map of modelled background annual mean NO<sub>2</sub> concentrations 2013. Modelled exceedances of the annual limit value are shown in orange and red.**



© Crown copyright. All rights reserved Defra, License number 100022861 [2015]

**Figure 5: Map of modelled roadside annual mean NO<sub>2</sub> concentrations 2013. Modelled exceedances of the annual limit value are shown in orange and red.**



© Crown copyright. All rights reserved Defra, License number 100022861 [2015]

## 4 Measures

### 4.1 Introduction

This section gives details of measures that address exceedances of the NO<sub>2</sub> limit values within Swansea Urban Area agglomeration zone. This includes both measures that have already been taken and measures for which there is a firm commitment that they will be taken.

Section 5 then explains the extent to which it has been possible to incorporate the impacts of these measures into the baseline modelling carried out for this assessment.

### 4.2 Source apportionment

It is important to understand which sources are responsible for causing the exceedance in order to most effectively tailor measures to address the NO<sub>2</sub> exceedance situation described in section 3 above. This can be achieved by considering the source apportionment for the exceedance situation, also presented in section 3. A summary of what the source apportionment shows and the implications for which measures would therefore be appropriate is given here.

Local road traffic was the dominant source in this exceedance location in the reference year. The largest contribution was from cars at the location of maximum exceedance with a contribution of 45  $\mu\text{gm}^{-3}$  of NO<sub>x</sub> out of a total of 114.8  $\mu\text{gm}^{-3}$  of NO<sub>x</sub>. Cars, LGVs, articulated HGVs and rigid HGVs were important sources on the motorway roads with the highest concentrations in this exceedance situation. For all road links concentrations of NO<sub>x</sub> from diesel cars were approximately four times greater than NO<sub>x</sub> emissions from petrol cars. NO<sub>x</sub> concentrations from petrol LGVs are a small component of total NO<sub>x</sub> concentrations and less than 2% of total NO<sub>x</sub> from LGVs.

This indicates that appropriate measures should impact on local road traffic sources in this zone. Other measures to address the urban background sources may also be beneficial.

### 4.3 Measures

Measures potentially affecting NO<sub>2</sub> in this agglomeration zone have been taken and/or are planned at a range of administrative levels. These are:

- European Union
- National (i.e. England, Scotland, Wales, Northern Ireland or whole UK)
- Local (i.e. UK Local Authorities)

Details of European Union measures (e.g. Euro Standards, Fuel Quality Directives, Integrated Pollution Prevention and Control) can be found on the European Commission's website ([http://ec.europa.eu/environment/air/index\\_en.htm](http://ec.europa.eu/environment/air/index_en.htm)). Details of national measures are given in the UK overview document and the list of UK and national measures.

Relevant Local Authority measures within this exceedance situation are listed in Table C.1 (see Annex C). Table C.1 lists measures which a local authority has carried out or is in the process of carrying out, plus additional measures which the local authority is committed to carrying out or is investigating with the expectation of carrying out in the future. Additional local measures which will deliver air quality improvements in Swansea Urban Area agglomeration zone have been provided by the Welsh Government and these are listed in Table C.2.

The area's recent Local Transport Plan promotes a number of initiatives that will help improve air quality. The plan is expected to deliver better public transport links to employment sites, new cycle network, walking and cycling links to national cycle network routes and walking links to schools. It is also intended to deliver electric vehicle charging, strategic bus corridors, park and share and park and ride sites.

Traffic management initiatives have begun that will reduce traffic congestion. A park and ride scheme is in operation that will give effect to modal shift along with dedicated express bus routes. These routes will continue to be made up to 2030. There are also ongoing bus corridor enhancements that will encourage modal shifts.

Safe routes to schools have also been set up and will reduce car usage around schools.

The electrification of the South Wales MainLine to Swansea will also enhance sustainable travel choices for transport users and should reduce private vehicle use to and from the area.

## 4.4 Measures timescales

Timescales for national measures are given in the UK overview document and list of UK and national measures.

Local Authorities report on progress with the implementation of their action plans annually and review action plan measures regularly. Information on local measures was collected in February/March 2015. Hence, any Local Authority action plans and measures adopted by Local Authorities after this time have not been included in this air quality plan, unless additional information was provided during the consultation process.

The reference year for this air quality plan is 2013. Where measures started and finished before 2013, then the improvement in air quality resulting from these measures will have already taken place before the reference year and the impact of these measures will have been included in the assessment where the measure has had an impact on the statistics used to compile the emission inventory. Many measures started before the reference year and will continue to have a beneficial impact on air quality well beyond the reference year. Measures with a start date before 2013 and an end date after 2013 may have an impact on concentrations in the reference year and a further impact in subsequent years. Where the Status column in Annex C is 'Implementation', this shows that this measure is already underway or that there is a commitment for this measure to go ahead. Where the Status is 'Planning', 'Preparation' or 'Other' the level of commitment is less clear and it is possible some of these measures may not go ahead.

# 5 Baseline Model Projections

## 5.1 Overview of model projections

Model projections for 2020, 2025 and 2030, starting from the 2013 reference year described in section 3, have been calculated in order to determine when compliance with the NO<sub>2</sub> limit values is likely to be achieved on the basis of EU, regional and local measures currently planned. Details of the methods used for the baseline emissions and projections modelling are provided in the UK technical report.

For national measures, it has not been possible to quantify the impact of all measures on emissions and ambient concentrations. The impact for all quantifiable measures has been included in the baseline projections.

The impacts of the individual Local Authority measures have not been explicitly included in the baseline model projections. However, measures may have been included implicitly if they have influenced the traffic counts for 2012 (used as a basis for the compilation of the emission inventory) or in the traffic activity projections to 2020 and beyond (used to calculate the emissions projections). It should be recognised that these measures will have a beneficial impact on air quality, even if it has not been possible to quantify this impact here.

## 5.2 Baseline projections: NO<sub>2</sub>\_UK0027\_Annual\_1

Table 4 presents summary results for the baseline model projections for 2020, 2025 and 2030 for the NO<sub>2</sub>\_UK0027\_Annual\_1 exceedance situation. This shows that the maximum modelled annual mean NO<sub>2</sub> concentration predicted for 2020 in this exceedance situation is 33  $\mu\text{gm}^{-3}$ . Hence, the model results suggest that compliance with the NO<sub>2</sub> annual limit value is likely to be achieved before 2020 under baseline conditions in this exceedance situation.

Figures 6 and 7 show maps of projected annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030 for background and roadside locations respectively. Maps for 2013 are also presented here for reference.

It should be noted that the baseline projections presented here include the impacts of some measures, where they can be quantified, that have already been or will be implemented.

This information is out of date.



**Table 4: Annual mean NO<sub>2</sub> model results in NO<sub>2</sub>\_UK0027\_Annual\_1.**

	2013	2020	2025	2030
Road length exceeding (km)	2.7	0.0	0.0	0.0
Background exceeding (km <sup>2</sup> )	0	0	0	0
Maximum modelled concentration NO <sub>2</sub> (μgm <sup>-3</sup> ) (a)	48	33	27	25
Corresponding modelled concentration NOx (μgm <sup>-3</sup> ) (b)	115	69	55	51

(a) Annual Mean Limit Value = 40 μgm<sup>-3</sup>

(b) NOx is recorded here for comparison with the NOx source apportionment graphs for 2013 presented in Annex B of this plan. Limit values for EU directive purposes are based on NO<sub>2</sub>.

This information is out of date.

Figure 6: Background baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030. 2013 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.

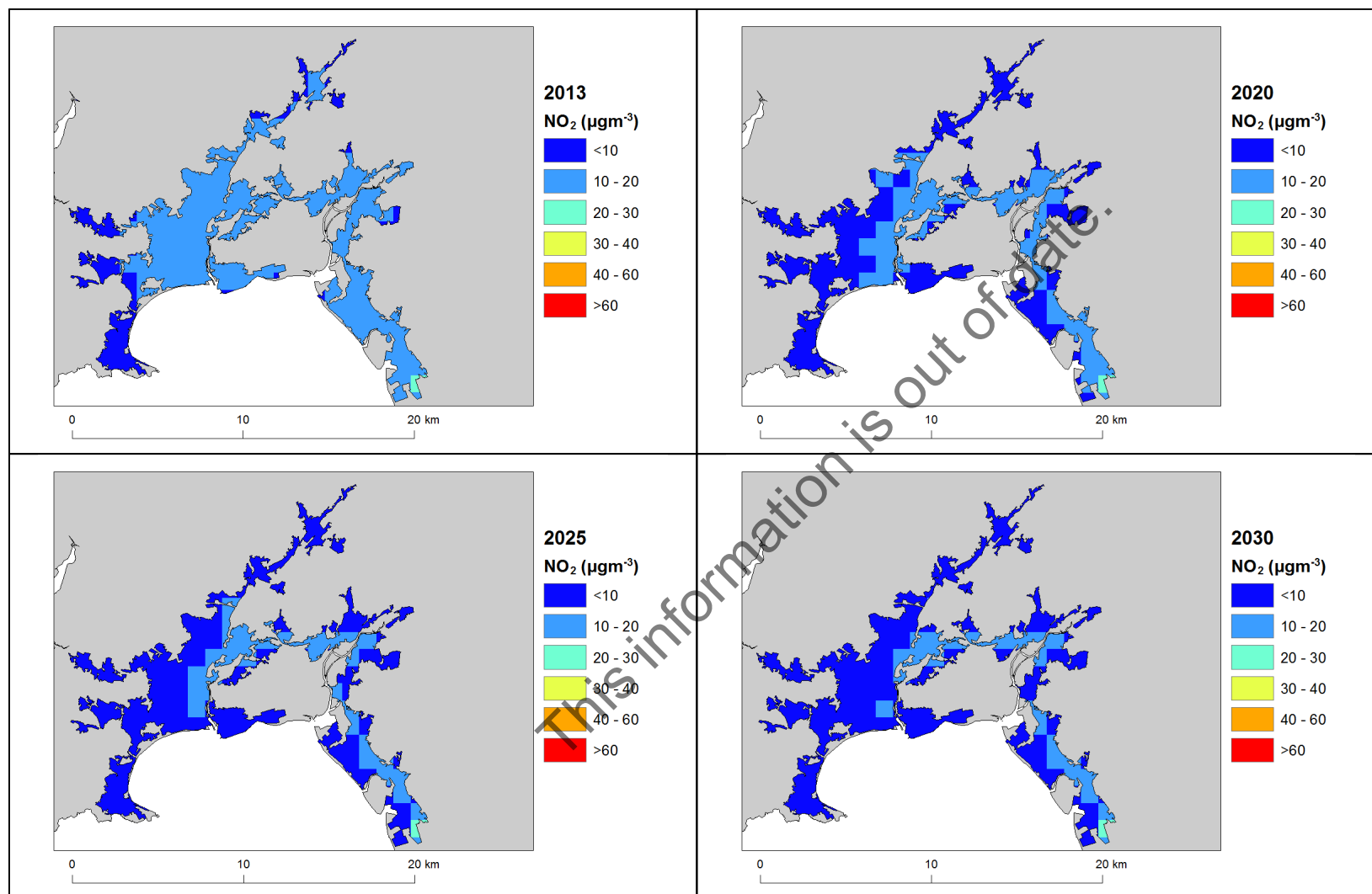
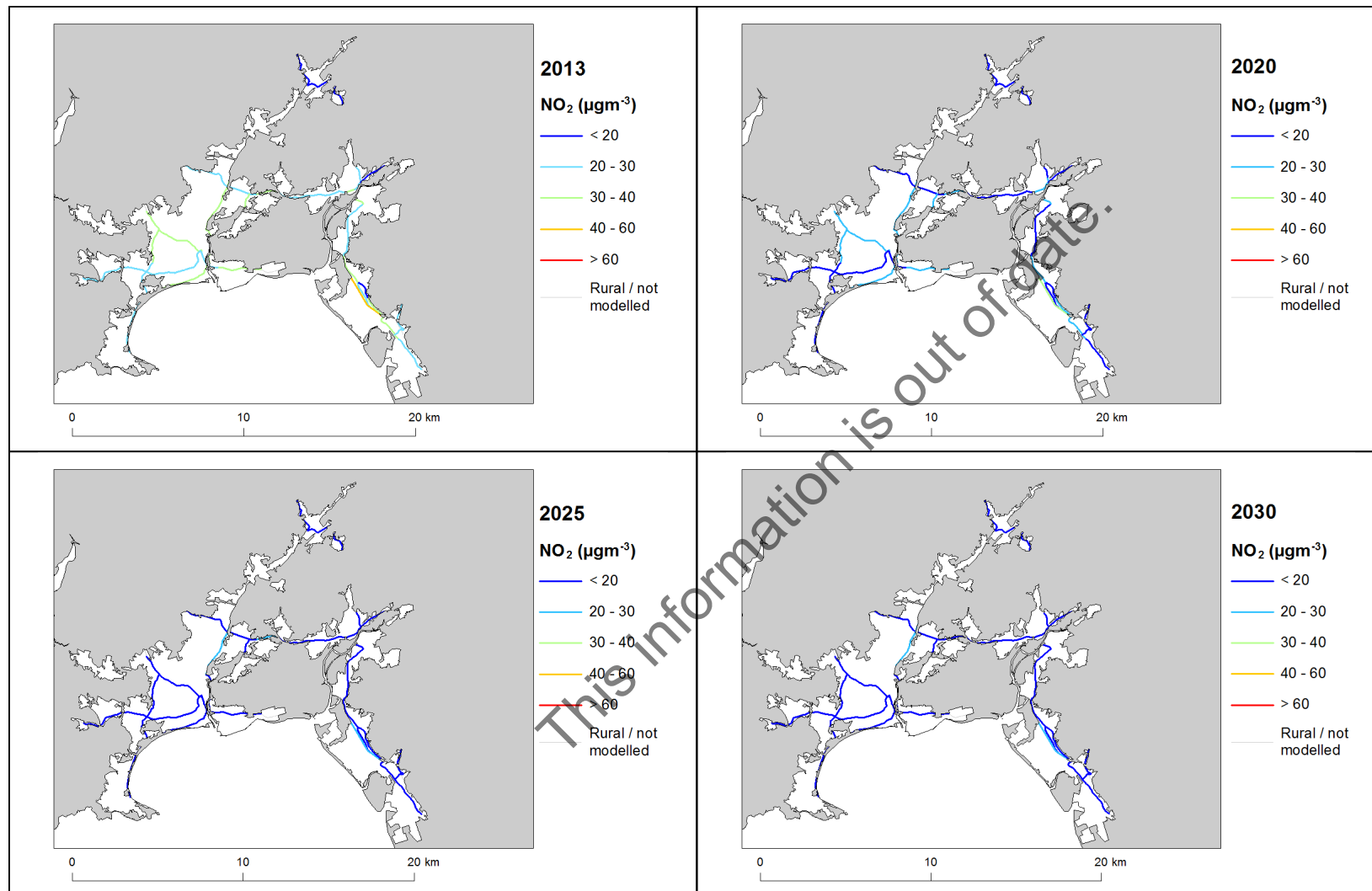


Figure 7: Roadside baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030. 2013 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.



# Annexes

## A References

Air Quality Expert Group (AQEG, 2004). Nitrogen Dioxide in the United Kingdom. <http://uk-air.defra.gov.uk/library/aqeg/publications>

Decision 2004/224/EC. Commission Decision of 20 February 2004 laying down arrangements for the submission of information on plans or programmes required under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air. From the Official Journal of the European Union, 6.3.2004, En series, L68/27

Decision 2004/461/EC. Commission Decision of 29 April 2004 laying down a questionnaire to be used for annual reporting on ambient air quality assessment under Council Directives 96/62/EC and 1999/30/EC and under Directives 2000/69/EC and 2002/3/EC of the European Parliament and of the Council. From the Official Journal of the European Union, 30.4.2004, En series, L156/78

Decision 2011/850/EU Commission Implementing Decision of 12 December 2011 laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality. From the Official Journal of the European Union, 17.12.2011, En series, L335/86

CDR Central Data Repository. <http://cdr.eionet.europa.eu/>

Air Quality Directive 2008/50/EC. Council Directive 2008/50/EC, of 21 May 2008. On ambient air quality and cleaner air for Europe. From the Official Journal of the European Union, 11.6.2008, En series, L152/1

1st Daughter Directive 1999/30/EC. Council Directive 1999/30/EC, of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (The First Daughter Directive). From the Official Journal of the European Communities, 29.6.1999, En Series, L163/41.

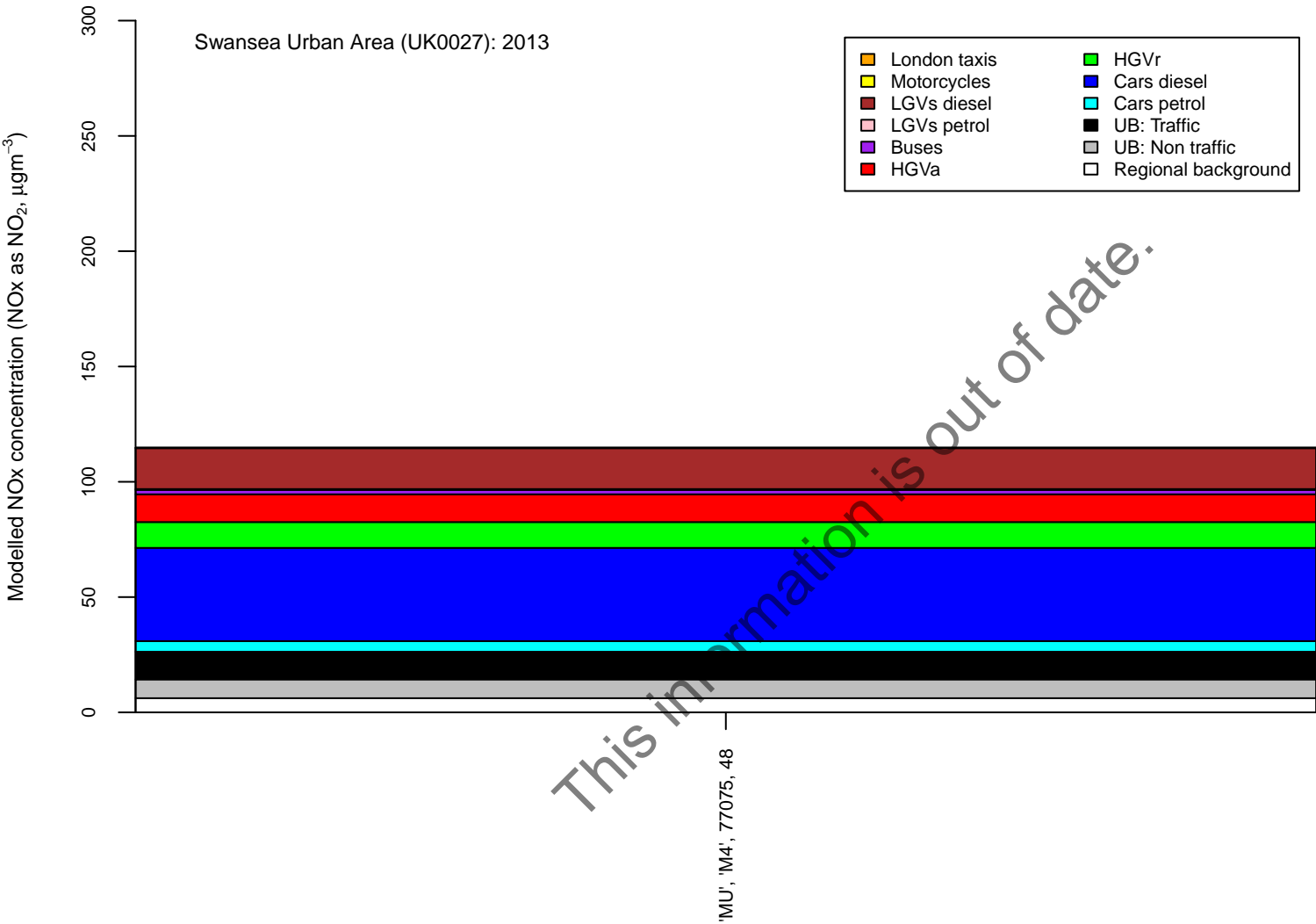
UK overview document, List of UK and National Measures and the UK technical report are available at: <http://www.gov.uk/defra>.

## B Source apportionment graphs

*Page left blank.*

This information is out of date.

Figure B.1: Annual mean roadside NO<sub>x</sub> source apportionment plots for all roads exceeding the annual mean NO<sub>2</sub> limit value in 2013.



Road class (MU = motorway, PU = primary road, TU = trunk road), road number, census id 12 and modelled NO<sub>2</sub> concentration (µgm<sup>-3</sup>)

**C   Tables of measures**

*Page left blank.*

This information is out of date.

**Table C.1 Relevant Local Authority measures within Swansea Urban Area (UK0027)**

Measure code	Description	Focus	Classification	Status	Other information
Swansea City and County Council_1	Traffic management on Neath Road	Improve safety, environment and facilities for pedestrians, cyclists and bus users	Traffic planning and management: Other measure	Implementation	Start date: 2005 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Swansea City and County Council_2	Park & Ride Provision	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Increased uptake in Park & Ride Target emissions reduction: N/A
Swansea City and County Council_3	Improved Bus Provision	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Increased patronage figures Target emissions reduction: N/A
Swansea City and County Council_4	Bus Corridor Enhancements	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2009 Spatial scale: Local Source affected: Transport Indicator: Increased patronage figures Target emissions reduction: N/A
Swansea City and County Council_5	Enhancement of Bus and Rail Stations	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: Increased patronage figures Target emissions reduction: N/A
Swansea City and County Council_6	Safe Routes to School	Reduce car usage around school sites	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2004 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Reduce car usage around school sites Target emissions reduction: N/A



Measure code	Description	Focus	Classification	Status	Other information
Swansea City and County Council_7	Vehicle Emissions testing	Reduce number of polluting vehicles	Other measure: Other measure	Other	Start date: 2005 Expected end date: 2005 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Swansea City and County Council_8	Quay Parade Bridges Improvements	To make more effective use of the existing highway network by improving traffic flows/reduction in congestion around bridges/junctions	Traffic planning and management: Other measure	Implementation	Start date: 2005 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Reduced congestion Target emissions reduction: N/A
Swansea City and County Council_9	Traffic Management Systems with Air Quality Monitoring Feedback	Development of computer modelling/forecast system that will aid management of traffic flows before/during/after forecasted pollution episodes	Traffic planning and management: Other measure	Implementation	Start date: 2004 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Reduced Congestion/Modal shift/Improved air quality within areas Target emissions reduction: N/A

**Table C.2 Additional measures provided by the Welsh Government which will deliver air quality improvements within Swansea Urban Area (UK0027)**

Measure code	Description	Focus	Classification	Status	Other information
Welsh Government Transport 1	Electrification and gauge enhancement of the South Wales Main Railway Line.	Reducing emissions compared to diesel. Faster and more regular services and gauge enhancement to encourage a modal shift from road for both passengers and freight.	Traffic Planning and Management: Improvement of Public Transport	Planning	Start date: To be confirmed Expected end date: To be confirmed Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: Not yet quantified

This information is out of date.