

# Re-Notification of the Air Quality Plan to meet the Annual Mean NO<sub>2</sub> Limit Value in the Swansea Agglomeration, UK (UK0027)

## Summary

Updated monitoring and modelling data underpinning the latest UK projections show that the current and planned measures set out in the existing Air Quality Plan for the Swansea Agglomeration (UK0027) will achieve compliance with the annual mean limit value for nitrogen dioxide (NO<sub>2</sub>) by 1 January 2014. We would ask that the Commission assess the new evidence presented in this Re-Notification and the accompanying Time Extension Notification (TEN) Forms<sup>1</sup> for the Swansea Agglomeration under Article 22 of the Ambient Air Quality Directive (2008/50/EC) and confirm that the conditions of a time extension until January 2014 have been met.

## Introduction

In September 2011, the UK Government submitted to the European Commission an Air Quality Plan for the Swansea Agglomeration (UK0027) setting out the measures in place or being planned to deliver compliance with the annual mean limit value for NO<sub>2</sub> (40 µg/m<sup>3</sup>). A case for postponement of the compliance deadline to 2015 was made, in accordance with Article 22 of the Ambient Air Quality Directive (2008/50/EC). The Plan projected that, as a result of current and planned measures, NO<sub>2</sub> concentrations would reduce from 37 µg/m<sup>3</sup> in 2010 to 25 µg/m<sup>3</sup> by 2015 therefore achieving compliance with the annual limit value.

In June 2012, Commission Decision C(2012)4155<sup>2</sup> was published, which set out the Commission's conclusions on the UK Air Quality Plans that were submitted in September 2011. The Decision raised objections to the postponement of the deadline for attaining the annual limit value for NO<sub>2</sub> in the Swansea Agglomeration having considered that:

**The United Kingdom authorities have provided projections which show compliance with the annual NO<sub>2</sub> limit value already in 2010. The official annual air quality report for 2010 provided by the United Kingdom however lists those zones as in exceedence of the annual NO<sub>2</sub> limit value. As the exceedence is a modelled**

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<sup>1</sup> The revised TEN Forms for the Swansea Zone are available here: <http://uk-air.defra.gov.uk/library/no2ten/index>. Only Forms that have been revised should be considered.

<sup>2</sup> [http://ec.europa.eu/environment/air/quality/legislation/pdf/uk2\\_no2\\_en.pdf](http://ec.europa.eu/environment/air/quality/legislation/pdf/uk2_no2_en.pdf).

exceedence, no indication is given about the proportion of exceedence in 2010. Considering the discrepancy between the projected 2010 NO<sub>2</sub> annual concentration levels and the information provided in the annual air quality report on 2010 and the lack of explanation thereof, the Commission finds that it cannot fully assess whether a postponement is needed and if yes whether the proposed abatement action is sufficient for achieving compliance with the annual limit value for NO<sub>2</sub> by 1 January 2015 and if it could be achieved earlier.

This Re-Notification responds to Commission Decision C(2012)4155 following a review by UK authorities of the latest compliance evidence, using more recent NO<sub>2</sub> concentration data and projections than those included in the existing Plan submitted in September 2011. This Re-Notification should be considered as an addendum to the existing Plan, which is available online<sup>3</sup>.

## Review of the latest compliance evidence

For the September 2011 Plan, 2008 was used as the reference year. In this Re-Notification, the UK authorities used 2010 concentration data as the reference year. Table 1 presents the measured annual mean concentrations at national network monitoring stations in this zone, including the data recently submitted as part of the 2011 compliance assessment. There were no measured exceedences in this zone in 2010 or 2011 or in any other year. Table 2 presents the modelled annual mean NO<sub>2</sub> results in this zone. There were no modelled background exceedences of the limit value in 2010 or any other year.

**Table 1: Measured annual mean NO<sub>2</sub> concentrations at national network stations in the Swansea Agglomeration, µgm<sup>-3</sup>. (Data capture shown in brackets)**

Zone code	Agglomeration name	Site	2007	2008	2009	2010	2011
UK0027	Swansea Urban Area	Port Talbot Margam (GB0906A)	19 (42%)	18 (95%)	17 (95%)	19 (96%)	18 (99%)
UK0027	Swansea Urban Area	Swansea Roadside (GB0896A)	31 (98%)	32 (99%)	33 (99%)	36 (99%)	32 (99%)

<sup>3</sup> <http://uk-air.defra.gov.uk/library/no2ten/documents/UK0027.pdf>

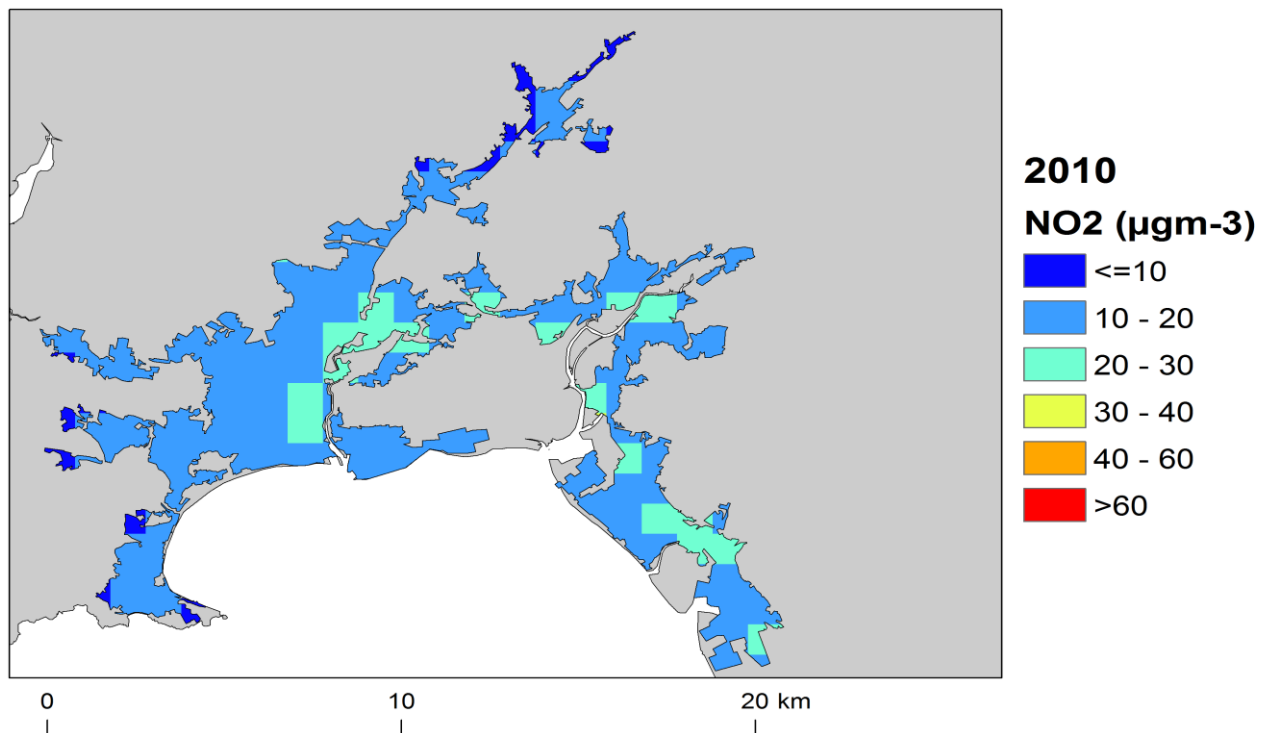
**Table 2: Annual mean NO<sub>2</sub> model results for the Swansea Agglomeration.**

	<b>Assessment Data</b>				
	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Road length Exceeding (km)	2.5	2.5	5.4	12.1	5.4
Background area exceeding (km <sup>2</sup> )	0.0	0.0	0.0	0.0	0.0
Maximum modelled concentration (µg/m <sup>3</sup> )	42	44	57	48	48

1. The location of the maximum modelled concentration for 2010 is road link M4, location 274670, 192300.
2. The data for 2010 are not those from the 2010 compliance assessment as the emissions factors have been updated after this was reported and the results recalculated.

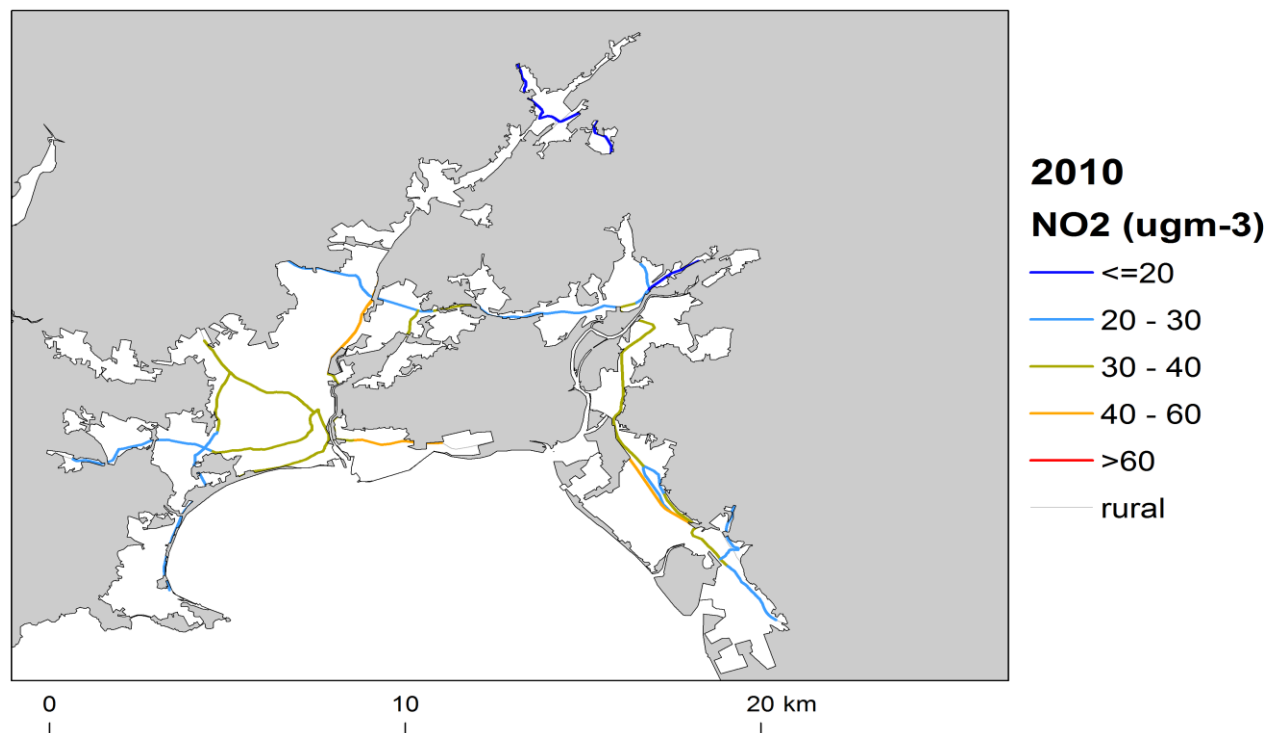
Maps showing the modelled annual mean NO<sub>2</sub> concentrations for 2010 at background and at roadside locations are presented in Figures 1 and 2 respectively.

**Figure 1: Map of modelled background annual mean NO<sub>2</sub> concentrations 2010.**



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**Figure 2: Map of modelled roadside annual mean NO<sub>2</sub> concentrations 2010.**



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### **Baseline model projections**

The modelling and projections that were used to underpin the Plan for the Swansea Agglomeration submitted in September 2011 have been significantly updated in 2012 and now show a more realistic assessment of future NO<sub>2</sub> concentrations. It is on this basis that this Re-Notification is made.

As foreshadowed in the UK Overview Document submitted in September 2011, the UK authorities have incorporated the latest COPERT vehicle emission factors (version 4.8) and updated fleet data based on ANPR (Automatic Number Plate Recognition) technology into the latest projections. Both of these changes are an improvement on the previous projections, notably the COPERT emission factors as they are based on real world emissions.

The overall (UK) impact of the new emission factors and updated fleet data is that the new projections generally predict concentrations decreasing more slowly into the future than the previous projections. However, the impact varies between locations according to the fleet mix on the individual road. In this zone the predicted rate of decline in NO<sub>2</sub> concentration at the location with the highest modelled concentration is predicted to be somewhat less steep than in the previous projections. These previous projections also predicted a decline between 2008 and 2010 but it is clear from the measured data for GB0896A presented in Table 1 that this did not happen as a result of combination of a lack

of decline in real world emissions of NO<sub>x</sub> from road traffic sources and the unusual weather conditions in 2010 (discussed below).

The trend in maximum modelled annual mean NO<sub>2</sub> concentration in this zone presented in Table 2 is complex. It is the result of several zone specific reasons in addition to the overall trends in emission and ambient concentrations across the UK. The maximum modelled concentration in 2009 was higher than the value in 2008 because of the inclusion of an additional stretch of the M4 motorway in the assessment. This road was not classified as urban in the 2008 reference year. The reduction from 2009 to 2010 was the result of incorporating the updated emission factors and fleet data. The updated fleet data showed that the heavy goods vehicles travelling on motorways were newer than previously assumed and this had a large impact on the emission inventory for motorways. The lack of decrease between 2010 and 2011 was a result of an increase of 10% in the traffic count for this specific road.

We also now know that NO<sub>x</sub> emissions and ambient concentrations in 2010 were significantly influenced by extreme cold weather spells at the start and end of the year and that in 2011, emissions and concentrations returned to the overall trend. Monitoring data from across the UK's compliance monitoring network have been compared for the years 2008, 2009, 2010 and 2011 by calculating the mean concentration for each station type for stations that have at least 75% data capture in all of these years. It is clear that concentrations in 2010 were higher on average than in other recent years for both NO<sub>x</sub> and NO<sub>2</sub>. Therefore a scaling factor (0.94) has been calculated from the difference between the measured NO<sub>2</sub> concentration in 2010 and the values interpolated between 2009 and 2011. Projections have been calculated with and without this scaling factor. The projections with the scaling factor are presented here as a sensitivity test to estimate projected concentrations for future years with the influence of the unusual weather in 2010 on emissions and ambient concentrations removed.

In the Swansea Agglomeration, this updated evidence shows that compliance will be achieved by 1 January 2014. The new baseline projections for 2014 are shown in Table 3. Projections for 2015 are also shown for information.

**Table 3: Annual mean NO<sub>2</sub> modelled baseline projections for 2014 and 2015 for the Swansea Agglomeration.**

	Baseline Projections	Baseline projections with scaling factor applied <sup>3</sup>	Baseline Projections	Baseline projections with scaling factor applied <sup>3</sup>
	Year 2014	Year 2014	Year 2015	Year 2015
Road length exceeding (km)	0.0	0.0	0.0	0.0
Background area exceeding (km <sup>2</sup> )	0.0	0.0	0.0	0.0
Maximum modelled concentration (µg/m <sup>3</sup> )	39	37	37	35

3. The projections with the scaling factor are presented here as a sensitivity test to remove the influence of the unusual weather conditions in 2010, the reference year.

## Measures Implementation

As demonstrated by the reduction in annual mean NO<sub>2</sub> concentrations and road length exceeding the annual mean NO<sub>2</sub> limit, the existing measures set out in the Plan for the Swansea Agglomeration submitted in September 2011 are reducing NO<sub>2</sub> concentrations and will deliver compliance by 1 January 2014.

Many of the measures are based on strategies which aim to encourage modal shift in transport. Measures such as developing park & ride schemes, intelligent transport systems, implementation of bus corridors, rapid transport networks, cycling and walking are included in the Plan.

It should also be noted that local authority action plans have a role to play in improving local air quality though small scale measures are very difficult to quantify and include in the new projections. For example, in 2012 the Welsh Government provided an £82,000 grant to Swansea City Council to help further expand the coverage of variable message signs – a system, that from April 2013, will disseminate information to drivers from the Nowcaster model to try and influence movements on specific routes during periods of forecast elevated concentrations of NO<sub>2</sub> and other air quality pollutants. Whilst it has not been

possible to incorporate these measures into the new projections, it is expected that they will reduce ambient concentrations of NO<sub>2</sub> in the Swansea urban area further<sup>4</sup>.

## **Conclusion**

The updated evidence presented in this document shows that compliance with the annual mean NO<sub>2</sub> limit in the Swansea Agglomeration is expected by 1 January 2014. As such, we would ask that the Commission assess this Re-Notification in accordance with the provisions set out in Article 22 of Directive 2008/50/EC with a view to confirming that the conditions for a time extension until 1 January 2014 have been met.

December 2012

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<sup>4</sup> For further information on local measures see [Action Plan - City and County of Swansea](#)