

Part IV Environment Act 1995

Review and Assessment of Air Quality Round 2

Updating and Screening Assessment (July 2003)

November 2003

Air Quality

UPDATING AND SCREENING ASSESSMENT (JULY 2003)

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SUMMARY

This document has been produced in response to the requirements of the Welsh Assembly Government for a second round of the review and assessment of air quality. This review under part IV of the Environment Act 1995 consists of two stages. The first stage is an updating and screening assessment of all seven pollutants designated for the purposes of local air quality management. The second stage is a detailed assessment of individual pollutants if the first stage screening assessment indicates that it is needed.

The updating and screening assessments are set out on the following pages and these relate to:

- Carbon monoxide
- Benzene
- 1,3-Butadiene
- Lead
- Nitrogen dioxide
- Sulphur dioxide
- Fine particulate matter (PM₁₀)

The updating and screening assessment in relation to five of the seven pollutants identified that there was no need to proceed to a detailed assessment. There were also no new or modified sources producing any significant affect to air quality in this Authorities area from outside the area. Diffusion tube monitoring has shown however that at one site, Victoria Gardens, Neath, nitrogen dioxide measurements increased sufficiently during 2002, so as to appear to exceed the annual average (objective level) for this substance (40 µg/m³). Additional work will therefore be undertaken using a continuous analyser to investigate this matter further. This will also be the case in relation to the seventh pollutant PM₁₀ as indicated below and therefore the authority will be carrying out a detailed assessment for the pollutants nitrogen dioxide and PM₁₀.

In relation to the seventh pollutant, PM₁₀, the assessment coincided with a period of time when one of the confirmed significant local sources of PM₁₀ was out of commission. Since this time this source, blast furnace no. 5 at the Corus Port Talbot steelworks, has undergone rebuilding and upgrading (including the provision of cast-house fume arrestment) following an explosion at the works in November 2001. Further monitoring is therefore required within the existing Taibach/Margam air quality management area to assess if the improvements carried out have been effective in abating low level fugitive emissions and also to identify whether the objective level for PM₁₀ is likely to be met by 31st December 2004. The air quality management area will remain in force until such time that the achievement of the air quality objective can be confidently predicted.

Review and assessment of carbon monoxide

Introduction

The Welsh Assembly Government had adopted an 8-hour running mean concentration of 11.6 mg/m³ as the air quality standard for carbon monoxide. The new objective however has been set at a slightly tighter level of 10 mg/m³ as a maximum daily running 8-hour mean concentration, to be achieved by the end of 2003, bringing it into line with the second Air Quality Daughter Directive limit value.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of two main parts:

Box 1: Summary of the Updating and Screening checklist for carbon monoxide

Reference No.	Source, location or data that need to be assessed
A	Monitoring data
B	Very busy roads

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

Carbon monoxide is continuously measured at Groeswen Hospital, Margam. The instrument used is a model M300 manufactured by Advanced Pollution Instruments. Data for the calendar year 2002 is considered for the purposes of the Updating and Screening Assessment.

2. *Ratification of monitoring data*

The analyser does not provide data to the Advanced Urban Network as the other analysers do in the monitoring station. Consequently, the data does not benefit from the quality assurance benefits that derive from membership of this network. However, the instrument is subject to regular servicing according to an annual contract with Enviro Technology Services. Calibrations are carried out at approximately fortnightly intervals using a cylinder of gas sourced from Messer UK. Calibration responses are input to the Monnet database application, which handles acquisition and quality assurance of the collected data. Data is retrieved on an hourly basis and is subject to automatic scaling. Subsequently data is subject to a final scaling and ratification before use in reports.

3. Identify the maximum daily running 8-hour concentrations

The maximum daily running 8-hour concentration was 1.9 mg/m³ and the top ten concentrations and their corresponding dates are shown in the table below:

Review and assessment of carbon monoxide

Table 1. Top ten rolling 8-hour carbon monoxide concentrations.

Date	CO mg/m ³
20/12/02	1.9
16/08/02	1.6
19/02/02	1.5
14/07/02	1.4
25/06/02	1.2
29/05/02	1.2
08/06/02	1.2
30/05/02	1.2
26/07/02	1.1
22/07/02	1.1

The data capture rate for 2002, at 89% was 1% below the minimum ideally required for demonstration of compliance with the objective. However, since the highest single 8-hour rolling average amounted to less than 20% of the objective limit value, the authority is of the view that the data collected was sufficient to demonstrate compliance. Monitoring data does not suggest that carbon monoxide objective is likely to be breached.

Section B - Very busy roads or junctions in built up areas

1. *Identify "very busy" roads and junctions in areas where the 2003 background is expected to be above 1 mg/m³.*

The average concentration measured at the Groeswen Hospital monitoring site during 2002, was less than 0.1 mg/m³. This site, which is also close to the M4 motorway would therefore expected to be exposed to some of the higher carbon monoxide concentrations in the County Borough.

There are no single carriageway roads with daily average traffic flows that exceed 80,000 vehicles per day.

There are no dual carriageway (2 or 3-lane) roads with daily average traffic flows that exceed 120,000 vehicles per day.

There are no motorways with daily average traffic flows that exceed 140,000 vehicles per day.

There are no criteria that indicate that the carbon monoxide objective will be exceeded at very busy roads.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for carbon monoxide.

Introduction

The Government and Devolved Administrations have adopted a running annual mean concentration of $16.25 \mu\text{g}/\text{m}^3$ as the air quality standard for benzene with an objective for the standard to be achieved by the end of 2003. However, in the light of other health advice the government has resolved to reduce benzene levels in air to as low as possible and additional tighter objectives have been set. The additional objective is for an annual mean of $5 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2010 in England and Wales.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 2: Summary of the Updating and Screening checklist for benzene

Reference No.	Source, location or data that need to be assessed
A	Monitoring data
B	Road traffic
C	Industrial sources

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

Benzene is continuously measured at Baglan Primary School, Baglan. The instrument used is a Perkin Elmer Ozone Precursor Monitoring System. Benzene is one of several compounds that are first concentrated, then separated and measured using gas chromatography. Data for the calendar year 2002 is considered for the purposes of the Updating and Screening Assessment.

2. *Ratification of monitoring data*

The analyser does not provide data to the national hydrocarbon network. Consequently, the data does not benefit from the quality assurance benefits that derive from membership of this network. However, the instrument is subject to regular servicing according to an annual contract with Perkin Elmer. Calibrations are carried out at approximately monthly intervals using a cylinder of gas sourced from the National Physical Laboratory. Calibration responses are input to the Monnet database application, which handles acquisition and quality assurance of the collected data. Data is retrieved on an hourly basis and is subject to automatic scaling. Subsequently data is subject to a final scaling and ratification before use in reports.

3. *Calculate annual means from the data and identify highest values*

The maximum running annual mean concentration was $0.9 \mu\text{g}/\text{m}^3$ and the top ten concentrations and their corresponding dates are shown in the table below:

Table 2. Top ten running annual mean concentrations.

Date	Benzene($\mu\text{g}/\text{m}^3$)
17/04/02	0.9
25/04/02	0.9
18/04/02	0.9
19/04/02	0.9
16/04/02	0.9
23/04/02	0.9
13/04/02	0.9
12/04/02	0.9
21/04/02	0.9
24/04/02	0.9

There are no running annual means greater than $16.25 \mu\text{g}/\text{m}^3$ and none greater than $5 \mu\text{g}/\text{m}^3$.

Section B - Very busy roads

1. *Identify "very busy" roads in areas where the 2003 background is expected to be above $2 \mu\text{g}/\text{m}^3$.*

The average concentration measured at the Baglan Primary School monitoring site during 2002, was approximately $0.6 \mu\text{g}/\text{m}^3$. It is estimated that the "true background" will be less than this figure.

There are no single carriageway roads with daily average traffic flows that exceed 80,000 vehicles per day.

There are no dual carriageway (2 or 3-lane) roads with daily average traffic flows that exceed 120,000 vehicles per day.

There are no motorways with daily average traffic flows that exceed 140,000 vehicles per day.

Therefore there are no criteria that indicate that the benzene objective will be exceeded at very busy roads.

Section C - Industrial Sources

1. *Use the checklist in Appendix E of Annex 2 of LAQM. TG(O3) to determine whether there are any industrial processes that merit further consideration.*

Environment Agency Authorisation reference AF8661 relates to a carbonisation process at Port Talbot steelworks.

2. *Identify the annual emission of benzene and the height of the emission.*

The process was responsible for the emission of 2.087 tonnes of benzene in 2001. The emission was confirmed by the Environment Agency as being fugitive and arising at low-level. The nearest residential property is at some 2km distance.

Review and assessment of benzene

3. Use the nomogram, Figure 3.3 of LAQM. TG(O3) on page 3-23 to assess the ground-level concentration of benzene at the nearest property.

It was clear from the nomogram that the concentration at ~2km distance would be substantially less than the 16.25 $\mu\text{g}/\text{m}^3$ (or the 0.22 $\mu\text{g}/\text{m}^3$) objective, irrespective of the height of the stack in the 0 - 9m range. This result is also in agreement with the large benzene diffusion tube survey that was carried out by the Authority in 1997 as part of the First Phase Review.

There are no other Part A or B industrial processes in the area that are liable to emit significant amounts of benzene.

Section D - Other Sources

1. Identify petrol stations on busy roads

There are only two petrol stations in the County Borough on busy roads i.e. roads having more than 30,000 vehicles per day. These are a) Skewen Service Station, on A465 trunk road at Neath and b) Shell Swansea Bay Service Station, Fabian Way, Crymlyn Burrows. Both petrol stations have an annual throughput of more than 2 million litres of petrol per annum.

2. Determine whether there is relevant exposure

Neither petrol station has residences or other relevant exposure within 10m of the pumps. These petrol stations do not therefore require further consideration.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for benzene.

Review and assessment of 1,3-butadiene

Introduction

The Government and Devolved Administrations have adopted a running annual mean concentration of $2.25 \mu\text{g}/\text{m}^3$ as the air quality standard for 1,3-butadiene with an objective for the standard to be achieved by the end of 2003.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 3: Summary of the Updating and Screening checklist for 1,3-butadiene

Reference No.	Source, location or data that need to be assessed
A	Monitoring data
B	New industrial sources
C	Existing industrial sources with significantly increased emissions

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

1,3-butadiene is continuously measured at Baglan Primary School, Baglan. The instrument used is a Perkin Elmer Ozone Precursor Monitoring System. 1,3-butadiene is one of several compounds that are first concentrated, then separated and measured using gas chromatography. Data for the calendar year 2002 is considered for the purposes of the Updating and Screening Assessment.

2. *Ratification of monitoring data*

The analyser does not provide data to the national hydrocarbon network. Consequently, the data does not benefit from the quality assurance benefits that derive from membership of this network. However, the instrument is subject to regular servicing according to an annual contract with Perkin Elmer. Calibrations are carried out at approximately monthly intervals using a cylinder of gas sourced from the National Physical Laboratory. Calibration responses are input to the Monnet database application, which handles acquisition and quality assurance of the collected data. Data is retrieved on an hourly basis and is subject to automatic scaling. Subsequently data is subject to a final scaling and ratification before use in reports.

3. *Calculate annual means from the data and identify highest values*

The maximum running annual mean concentration was $0.09 \mu\text{g}/\text{m}^3$ which was measured in January 2002. This concentration is around the limit of detection of this substance for this instrument. The top ten concentrations have not been listed since they are all around this very low figure.

The results show that there are no running annual means greater than $2.25 \mu\text{g}/\text{m}^3$.

Review and assessment of 1,3-butadiene

Section B - New industrial sources

1. *Identify any new industrial sources liable to emit significant quantities of 1,3-butadiene.*

There have been no new industrial sources of 1,3-butadiene since the first review and assessment has been carried out.

Section C - Industrial sources with substantially increased emissions

No industrial sources of 1,3-butadiene were identified during the first review and assessment and none have changed so as to emit this substance in the interim period.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for 1,3-butadiene.

Introduction

The Government and Devolved Administrations have adopted a running annual mean concentration of $0.5 \mu\text{g}/\text{m}^3$ as the air quality standard for lead with an objective for the standard to be achieved by the end of 2004. In addition, a lower air quality objective of $0.25 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2008 has also been set.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 4: Summary of the Updating and Screening checklist for lead

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	New industrial sources
C	Existing industrial sources with significantly increased emissions

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

Lead is monitored at Pontardawe Leisure Centre as part of a study of 13 airborne metals that has continued since 1972. Metered air is continuously pumped through cellulose filters, which are subsequently analysed by Netcen.

2. *Ratification of monitoring data*

The analysis of the prepared samples is effected using either inductively-coupled plasma mass spectrometry (ICP-MS) or inductively-coupled plasma atomic emission spectrometry (ICP-AES).

3. *Calculate annual means from the data and identify highest values*

The concentration of lead found at Pontardawe during 2002 was $7.7 \text{ ng}/\text{m}^3$. This concentration represents approximately 1.5% of the 2005 objective and ~3% of the 2008 objective.

Section B - New industrial sources

1. *Identify any new industrial sources liable to emit significant quantities of lead.*

There have been no new industrial sources of lead since the first review and assessment has been carried out.

Review and assessment of lead

Section C - Industrial sources with substantially increased emissions

No industrial sources of lead were identified during the first review and assessment and none have changed so as to emit this substance in the interim period.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for lead.

Review and assessment of nitrogen dioxide

Introduction

The Government and Devolved Administrations have adopted two Air Quality Objectives for nitrogen dioxide. An annual mean concentration of $40 \mu\text{g}/\text{m}^3$ and a 1-hour mean concentration of $200 \mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times per year. Both objectives are to be achieved by the end of 2005.

In addition, the first Air Quality Daughter Directive also sets limit values for nitrogen dioxide, which have been translated into UK legislation. A 1-hour limit of $200 \mu\text{g}/\text{m}^3$ applies, not to be exceeded by more than 18 times per year. An annual mean limit value of $40 \mu\text{g}/\text{m}^3$ also applies, both to be achieved by the 1st January 2010.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 5: Summary of the Updating and Screening checklist for nitrogen dioxide

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data within an AQMA
C	Narrow congested streets with residential properties close to the kerb
D	Junctions
E	Busy streets where people may spend 1-hour or more close to the traffic
F	Roads with high flow of buses and/or HGVs
G	New roads constructed or proposed since first round of review and assessment
H	Roads close to the objective during the first round of review and assessment
I	Roads with significantly changed traffic flows
J	Bus stations
K	New industrial sources
L	Industrial sources with significantly increased emissions
M	Aircraft

The detailed checklist is shown below:

Section A - Monitoring data outside and AQMA

1. *Collation of monitoring data*

Nitrogen dioxide is continuously measured at Groeswen Hospital, Margam. The instrument used is a model M200 manufactured by Advanced Pollution Instruments. Data for the calendar year 2002 is considered for the purposes of the Updating and Screening Assessment.

The authority has seven nitrogen dioxide monitoring tubes, which form part of the UK nitrogen dioxide network, which is controlled by AEA Technology.

Review and assessment of nitrogen dioxide

2. Ratification of monitoring data

The continuous nitrogen dioxide analyser is part of the Advanced Urban Network (AUN) and is subject to the calibration and quality assurance to the standards of that network. The data used for 2002 was downloaded from the AEA Technology website.

The diffusion tubes are provided by Harwell Scientifics Limited. The tubes are prepared using 20% TEA in Water and are subject to a WASP quality assurance scheme. Harwell have been carrying out a co-location study with a chemiluminescence analyser since the start of 2003. Harwell Scientifics are currently quoting a bias correction of 0.72 for these tubes.

3. Calculate annual means from the data and identify highest values

The annual mean concentration of nitrogen dioxide in 2002 at the Groeswen Hospital continuous monitoring station was $19 \mu\text{g}/\text{m}^3$.

The annual average concentrations for the seven diffusion tube sites are shown in the table below:

Table 1. Bias corrected nitrogen dioxide tube data for 2002

Site Id	NO ₂ $\mu\text{g}/\text{m}^3$	Tube Count	Site Type	Site Address
E2/10/10	28.7	12	Urban background	Civic Centre, Neath.
E2/10/12	13.6	11	Urban background	Cwmnedd Primary School, Glynneath.
E2/10/3	37.4	10	Kerbside	Groeswen Hospital, Port Talbot.
E2/10/4	23.4	12	Urban background	21 Rice Street, Port Talbot.
E2/10/6	20.1	11	Urban background	11 College Green, Port Talbot
E2/10/7	36.5	9	Kerbside	11 High Street, Pontardawe.
E2/10/9	45.3	10	Kerbside	6 Victoria Gardens, Neath.

The bias corrected values were obtained by multiplying the reported values by the bias correction factor.

4. Estimate the annual mean concentrations in 2005.

The concentrations of the kerbside sites for 2005 is calculated using the following equation:

$$\text{Conc}(2005) = \text{Conc}(2004) * 0.892/0.915$$

The calculated values for kerbside sites are shown below:

Site Id	NO ₂ $\mu\text{g}/\text{m}^3$
E2/10/3	36.5
E2/10/7	35.6
E2/10/9	44.2

5. Calculate the number of 1-hour exceedences of $200 \mu\text{g}/\text{m}^3$ in a full year, or the 99.8th percentile of hourly means.

The maximum 1-hour average during 2002 at the Groeswen Hospital site was $88 \mu\text{g}/\text{m}^3$, well below the $200 \mu\text{g}/\text{m}^3$ limit.

Review and assessment of nitrogen dioxide

6. Calculate exceedences.

Items 3 and 4 above show that there could be an exceedence of the 40 $\mu\text{g}/\text{m}^3$ limit at Victoria Gardens (44.2 $\mu\text{g}/\text{m}^3$).

Item 5 above shows that there are currently no exceedences of the 200 $\mu\text{g}/\text{m}^3$ limit and there are not likely to be any at the continuous monitoring site.

Section B - Monitoring within an AQMA

There is currently no AQMA for nitrogen dioxide, and no further consideration of this section is required.

Section C - Narrow congested streets with residential properties close to the kerb

There are no additional locations that were not fully considered during the first round of review and assessment. The identification of these sites was based upon local experience rather than measurements of vehicle speed. There are a few sites around the Authority where speed is measured, but it is not known how speeds vary between these sites. Speed limits are known on all roads, but this is not quite the same thing as knowing the actual vehicle speeds. On the basis of local judgement, it is considered that no further consideration is required for this section.

Section D - Junctions

1. Identify 'busy' junctions

The following junctions have been identified as having a flow of vehicles of more than 10,000 per day.

The junction with the highest flow is located at the intersection of Eastland Road (north and south), Bilton Road and Geoffrey Street. The flows and percentages of heavy vehicles are shown below:

Table 2. Vehicle flows at Eastland Road Roundabout

Road ID	Road	Location 1	Vehicle Flow (AADT)	HV %age
1	B4434	Eastland Rd.N.(NB)	13374	1.7%
2	B4434	Eastland Rd.S.(NB)	15227	1.6%
3	U/C	Bilton Rd (EB)	2149	0.6%
4	U/C	Geoffrey St (EB)	431	0.2%

2. Determine whether there is relevant exposure within 10m of the kerb.

There are residences within 10 metres of the kerb.

Review and assessment of nitrogen dioxide

3. Obtain detailed information on traffic flows, speeds and the proportion of different vehicle types.

This information is shown in the table 2 above.

4. Use the DMRB screening model to predict the annual mean concentration in 2005.

The background concentrations of NO_x and NO₂ were obtained from the airquality.co.uk website. Values of 28 and 19 µg/m³ were derived for NO_x and NO₂ respectively for the nearest relevant location i.e. 275500, 197500. The two Eastland Road sections were regarded as one link, given the similarity of flows. A run of the model for a receptor at 5m produced an annual mean concentration of 23.9 µg/m³, substantially less than the 40 µg/m³ limit.

Section E - Busy Streets where people may spend 1 hour or more close to the traffic

1. Identify 'busy' streets

There are 55 roads within the County Borough that have been identified as having a flow in excess of 10,000 vehicles per day. The top 20 of these roads are shown below:

Table 3. Busy Streets

Road ID	Road	Location 1	Location 2	Vehicle Flow (AADT)
1	M4	J42 - 43 (EB)	.	61800
2	M4	J43 - 44 (EB)	.	58751
3	M4	J41 - 42 (EB)	.	57745
4	M4	J39 - 40 (EB)		57332
5	M4	J40 - 41 (EB)		57200
6	M4	J 38 - 39 (EB)		54752
7	M4	J44 - 45 (EB)	.	53121
8	M4	J37 - 38		53000
9	M4	J45 - 46 (EB)	.	52158
10	M4	J46 - 47 (EB)	.	50867
11	M4	J47 - 48 (EB)	.	42950
12	A465	S.of saltings (EB)	.	38250
13	M4	J48 - 49 (EB)	.	33500
14	A483	Elba Cres.(just W of it)	.	31101
15	A483	Fabian Way E. (EB)	Jersey Marine Rbt.	31000
16	A474	Milland Link (EB)	E.of A465 Saltings	27000
17	A474	Southern Link (NB)	S.Link/Skewen junc	24824
18	A465	N.of saltings (EB)		23340
19	A48	Baglan (EB)	W.of Sunnycroft	21000
20	A474	Cadoxton Rd. W. (EB)	A474/A4230 junc	20500

Review and assessment of nitrogen dioxide

2. *Identify streets where members of the public may be exposed within 5m of the kerb for 1 hour or more.*

Members of the public are only likely to be exposed for a period of 1 hour or more at the road with Id 20 i.e. the A474 at Cadoxton Road.

3. *Obtain detailed information about traffic flows, speeds and the proportion of different vehicle types.*

The section of road is relatively short and lies between two roundabouts. The vehicle speeds are not known, but are estimated to be about 25mph (40.2 kph). It is known that the proportion of heavy goods vehicles on this road is 4.4%. The annual daily flow of all vehicles is 20,500.

4. *Use the DMRB screening model to predict the annual mean in 2005.*

The background concentrations of NO_x and NO₂ were obtained from the airquality.co.uk website. Values of 27.7 and 19 µg/m³ were derived for NO_x and NO₂ respectively for the nearest relevant location i.e. 274500, 198500. A run of the model for a receptor at 5m produced an annual mean concentration of 26.4 µg/m³, substantially less than the 40 µg/m³ limit.

This street represents a "worst case" scenario since it is the busiest road with the possibility of public exposure within 5m. No further detailed assessment is required since the calculated mean at concentration is only 66% of the annual limit.

Section F - Roads with high flows of buses and/or HGV's

1. *Check whether such locations were assessed during the first round of review and assessment*

These types of location were not specifically considered during the first round.

2. *Identify all roads with an unusually high proportion of heavy-duty vehicles.*

There are no roads in the County Borough with a proportion of heavy-duty vehicles that is greater than 25%. The worst-case is 17%, which is west of the Ynys-y-gerwn highways depot on the B4242.

There is no need to proceed further as there are no roads that exceed the criteria for having an unusually high proportion of heavy-duty vehicles.

Section G - New roads constructed or proposed since first round of review and assessment

There have been no new roads constructed since the first round of review and assessment that have had a traffic flow of 10,000 vehicles per day or have resulted in significantly increased flow on existing roads. No further consideration is therefore required for this section.

Review and assessment of nitrogen dioxide

Section H - Roads close to the objective during the first round of review and assessment

There were no roads predicted to be above $36 \mu\text{g}/\text{m}^3$ but below $40 \mu\text{g}/\text{m}^3$ during the first review and assessment. As stated in Section A, the Victoria Gardens site is currently the highest with a value of $44.2 \mu\text{g}/\text{m}^3$.

Section I - Roads with significantly changed traffic flows

There are no roads having a traffic flow of 10,000 vehicles per day, which have experienced an increase in traffic flow of more than 25%. The largest single increase in traffic over a 2-year period was 5%, this was at the A474 between the A465 and Cwrt Herbert roundabout.

Section J - Bus stations

It is considered highly unlikely that there any bus stations in the County Borough with a flow anywhere approaching 1000 buses per day.

Section H - New industrial sources

1. *Check whether an air quality assessment has already been carried out for the new industrial source.*

The Combined Cycle Gas Turbine (CCGT) at Baglan was taken into account at the last review and assessment. A full environmental impact assessment was carried out and this did not predict any breaches of objectives. Furthermore, the Authority has carried out monitoring on behalf of the operator since March 2001. No breaches of the air quality objectives have been observed.

No other new industrial sources that are likely to give rise to substantial nitrogen dioxide emissions have arisen. Therefore no further consideration of this section is required.

Section L - Industrial sources with substantially increased emissions

There are no industrial sources in the area for which emissions of nitrogen dioxide have increased by more than 30%.

Section M - Aircraft

There are no airports within the area bounded by the County Borough.

Conclusion

The updating and screening checklist shows that there is a need to proceed to a detailed assessment for nitrogen dioxide at the Victoria Gardens site only.

Review and assessment of sulphur dioxide

Introduction

The Government and Devolved Administrations have adopted a 15-minute mean of $266 \mu\text{g}/\text{m}^3$ as an air quality standard for sulphur dioxide, with an objective for the standard not to be exceeded more than 35 times per year by the end of 2005. Additional objectives have also been set which are equivalent to the EU limit values specified in the First Air Quality Daughter Directive. These are for a 1-hour mean objective of $350 \mu\text{g}/\text{m}^3$, to be exceeded no more than 24 times per year, and a 24-hour objective of $125 \mu\text{g}/\text{m}^3$, to be exceeded no more than 3 times per year, to be achieved by the end of 2004.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 6: Summary of the Updating and Screening checklist for sulphur dioxide

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data within an AQMA
C	New industrial sources
D	Industrial sources with substantially increased emissions
E	Areas of domestic coal burning
F	Small boilers ($>5\text{MW}_{(\text{thermal})}$) burning coal or oil
G	Shipping
H	Railway locomotives

The detailed checklist is shown below:

Section A - Monitoring data outside an AQMA

1. Collation of monitoring data

Sulphur dioxide is continuously measured at Groeswen Hospital, Margam. The instrument used is a model M400 manufactured by Advanced Pollution Instruments. Data for the calendar year 2002 is considered for the purposes of the Updating and Screening Assessment.

The authority no longer operates any 8-port bubblers as the measured concentrations were consistently low.

2. Ratification of monitoring data

The continuous sulphur dioxide analyser is part of the Advanced Urban Network (AUN) and is subject to the calibration and quality assurance to the standards of that network. The data used for 2002 was downloaded from the AEA Technology website.

3. Calculate exceedences.

The annual mean concentration of sulphur dioxide in 2002 at the Groeswen Hospital continuous monitoring station was $2 \mu\text{g}/\text{m}^3$, whilst the maximum concentration was $44 \mu\text{g}/\text{m}^3$. There were no breaches of any of the air quality standards or Objectives.

Review and assessment of sulphur dioxide

Section B - Monitoring within an AQMA

There is currently no AQMA for sulphur dioxide, and no further consideration of this section is required.

Section C New industrial sources

There are no new industrial sources that utilise sulphur-bearing fuels that have arisen since the first review and assessment.

Section D - Industrial sources with substantially increased emissions

There are no industrial sources with increased sulphur dioxide emissions that amount to 30% or more.

Section E - Areas of domestic coal burning

There are no areas in the Authority having 100 or more houses in a 0.5km square that utilise coal as their main fuel for domestic heating.

Section F - Small boilers >5 MW_(thermal)

1. *Identify all boiler plant >5 MW_(thermal) that burn coal or fuel oil.*

The authority is not aware of any such boilers that are not part of Part A processes that have been subject to monitoring elsewhere as part of the review and assessment process.

Section G - Shipping

The Corus steelworks does have deliveries of iron ore and minerals using large ships. However, the number of ships is typically of the order of 80 to 100 per year, significantly less than the 5000 required for a detailed assessment.

Section H - Railway locomotives

There are a number of locations in the County Borough where railway locomotives may be at a standstill for 15 minutes or more. Examples include Corus steelworks at Port Talbot, Onllwyn Washery, Cwmgwrach Railhead. However, it is not considered likely that there will be any regular exposure to members of the public within 15m of the stationary locomotives. A detailed assessment is therefore not required.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for sulphur dioxide.

Introduction

The Government and Devolved Administrations have adopted two Air Quality Objectives for PM₁₀. An annual mean concentration of 40 µg/m³ and 50 µg/m³ as a fixed 24-hour mean not to be exceeded more than 35 times per year. Both objectives are to be achieved by the end of 2004. The objectives are based upon measurement carried out using the European gravimetric transfer reference sampler method.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of thirteen main parts:

Box 7: Summary of the Updating and Screening checklist for PM₁₀

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data within an AQMA
C	Busy roads and junctions in Scotland
D	Junctions
E	Roads with high flow of buses and/or HGVs
F	New roads constructed or proposed since first round of review and assessment
G	Roads close to the objective during the first round of review and assessment
H	Roads with significantly changed traffic flows
I	New industrial sources
J	Industrial sources with significantly increased emissions
K	Areas with domestic solid fuel burning
L	Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc
M	Aircraft

The detailed checklist is shown below:

Section A - Monitoring data outside and AQMA

1. *Collation of monitoring data*

PM₁₀ was measured at a private residence in Onllwyn. The monitoring was continuous between May 2001 to April 2002. The instrument used was Tapered Element Oscillating Microbalance (TEOM), manufactured by Rupprecht and Pattaschnick. The location was chosen as the houses are next to a large coal washery where complaints are regularly received about dust emissions.

2. *Ratification of monitoring data*

The TEOM is subject to a maintenance contract by the UK distributor of the equipment. The Monnet database application handles acquisition and quality assurance of the collected data. Data was retrieved on an hourly

was checked prior to acceptance in the database. Filter changes and instrument cleaning were handled by Authority staff. The gravimetric conversion factor of 1.3 was applied on raw TEOM data in order to interpret compliance with the Objectives.

3. *Calculate annual means and the number of 24-hour exceedences*

The annual mean gravimetric concentration of at Onllwyn during the period concerned was 15 µg/m³. There were 8 gravimetric exceedences of the 24-hour 50 µg/m³ limit.

4. *Calculate the number of 24-hour exceedences of 50 µg/m³ in 2004.*

The data clearly shows that it is highly unlikely that there will be more than 35 exceedences of the 50 µg/m³ standard in 2004. Monitoring was discontinued at this site because of the perceived low risk.

Monitoring was not carried out at other sites during the calendar year of 2002.

Section B - Monitoring within an AQMA

1. *Collation of monitoring data*

PM₁₀ is continuously measured at Groeswen Hospital, Margam. The instrument used is Tapered Element Oscillating Microbalance (TEOM), manufactured by Rupprecht and Pattaschnick. Data for the calendar year 2002 is considered for the purposes of the Updating and Screening Assessment.

2. *Ratification of monitoring data*

The continuous PM₁₀ analyser is part of the Advanced Urban Network (AUN) and is subject to the calibration and quality assurance to the standards of that network. The data used for 2002 was downloaded from the AEA Technology website.

3. *Calculate annual means and the number of 24-hour exceedences*

The annual mean gravimetric concentration of PM₁₀ in 2002 at the Groeswen Hospital continuous monitoring station was 28.6 µg/m³. There were 24 gravimetric exceedences of the 24-hour 50 µg/m³ limit.

4. *Calculate the number of 24-hour exceedences of 50 µg/m³ in 2004.*

It is not possible to estimate the concentration in 2005 because the PM₁₀ problems in Port Talbot are judged to be linked with the operation of the Corus steelworks and Blast Furnace No. 5 in particular. This furnace was out of order during the whole of 2002 following the explosion in November 2001. Whilst it is hoped that the new blast furnace will give rise to much lower emissions than its predecessor, this will only be proved by monitoring.

Section C - Busy roads and junctions in Scotland

This section does not apply to Wales.

Section D - Junctions

1. *Identify 'busy' junctions*

The junction with the highest flow is located at the intersection of Eastland Road (north and south), Bilton Road and Geoffrey Street. The flows and percentages of heavy vehicles are shown below:

Table 4. Vehicle flows at Eastland Road Roundabout

Road ID	Road	Location 1	Vehicle Flow (AADT)	HV %age
1	B4434	Eastland Rd.N.(NB)	13374	1.7%
2	B4434	Eastland Rd.S.(NB)	15227	1.6%
3	U/C	Bilton Rd (EB)	2149	0.6%
4	U/C	Geoffrey St (EB)	431	0.2%

2. *Determine whether there is relevant exposure within 10m of the kerb.*

There are residences within 10 metres of the kerb.

3. *Obtain detailed information on traffic flows, speeds and the proportion of different vehicle types.*

This information is shown in the table 4 above.

4. *Use the DMRB screening model to predict the annual mean concentration in 2005.*

The background concentration of PM₁₀ was obtained from the airquality.co.uk website. The value of 18.1 µg/m³ was derived PM₁₀ for the nearest relevant location i.e. 275500, 197500. The two Eastland Road sections were regarded as one link, given the similarity of flows. A run of the model for a receptor at 5m produced an annual mean concentration of 20.5 µg/m³, with 4 exceedences of the 50 µg/m³ limit.

Section E - Roads with high flow of buses and/or HGV's

1. *Check whether such locations were assessed during the first round of review and assessment*

These types of location were not specifically considered during the first round.

2. *Identify all roads with an unusually high proportion of heavy-duty vehicles.*

There are no roads in the County Borough with a proportion of heavy-duty vehicles that is greater than 25%. The worst-case is 17%, which is west of the Ynys-y-gerwn highways depot on the B4242.

There is no need to proceed further as there are no roads that exceed the criteria for having an unusually high proportion of heavy-duty vehicles.

Section F - New roads constructed or proposed since first round of review and assessment

There have been no new roads constructed since the first round of review and assessment that have had a traffic flow of 10,000 vehicles per day or have resulted in significantly increased flow on existing roads. No further consideration is therefore required for this section.

Section G - Roads close to the objective during the first round of review and assessment

There were no roads predicted to have more than 30 24-hour exceedences of 50 µg/m³ during the first review and assessment.

Section H - Roads with significantly changed traffic flows

There are no roads having a traffic flow of 10,000 vehicles per day, which have experienced an increase in traffic flow of more than 25%. The largest single increase in traffic over a 2-year period was 5%, this was at the A474 between the A465 and Cwrt Herbert roundabout.

Section I - New industrial sources

1. *Check whether an air quality assessment has already been carried out for the new industrial source.*

The Combined Cycle Gas Turbine (CCGT) at Baglan was taken into account at the last review and assessment. A full environmental impact assessment was carried out and this did not predict any breaches of objectives.

No other new industrial sources that are likely to give rise to substantial PM₁₀ emissions have arisen. Therefore no further consideration of this section is required.

Section J - Industrial sources with substantially increased emissions

There are no industrial sources in the area for which emissions of PM₁₀ have increased by more than 30%.

Section K - Areas of domestic solid fuel burning

1. *Identify areas where significant solid fuel burning still takes place.*

The Authority has no firm data from Census or other sources on this issue. However, local knowledge indicates that it is now unlikely that there are any areas where the number of houses that rely primarily on coal for domestic heating exceeds 50 in a half kilometre square. Some towns which previously relied heavily upon coal, such as Glynneath, have now had access to gas for some years.

Section L - Quarries/landfill sites/opencast coal/handling of dusty cargoes at ports etc

1. *Establish if there is relevant exposure 'near' to the sources of dust emission.*

The only site that has exposure within the 200m specified for background concentrations of less than 26 µg/m³ is Onllwyn washery.

2. *Establish whether there are dust concerns associated with the facility.*

There are regular dust complaints about this site, but the process has been the subject of dust measurements using a TEOM as described in section A above and has been shown to be not at risk of exceeding the objectives.

Section M - Aircraft

There are no airports within the area bounded by the County Borough.

Conclusion

The results do not show that there is sufficient cause to revoke the Air Quality Management Area that was declared in respect of PM₁₀. The Blast Furnace NO.5 at the Corus steelworks was being re-constructed during 2002 and further monitoring is required in order to assess compliance with the objectives.