OADBY AND WIGSTON BOROUGH COUNCIL

UPDATING AND SCREENING ASSESSMENT

CONSULTATION DRAFT – JULY 2006

Executive Summary

Part IV of the Environment Act 1995 places a requirement on all local authorities to assess the air quality within their area, and to predict the future air quality within their area against the targets set by the National Air Quality Strategy.

This Updating and Screening Assessment (USA) has been carried out by the Environmental Health Section at Oadby And Wigston Borough Council in accordance with the technical guidance document reference LAQM. TG(03) produced by the Department for Environment, Food and Rural Affairs.

The purpose of this Updating and Screening Assessment is 'to identify the matters that have changed since the last review and assessment, which might lead to a risk of an air quality objective being exceeded.' If the USA identifies significant changes, then simple screening tools should be used to decide whether there is a sufficient risk of exceedences of the air quality objectives.

The first round of review and assessments of air quality for Oadby And Wigston Borough Council resulted in four Air Quality Management Areas (AQMA's) being declared. The AQMA's were declared because levels of nitrogen dioxide within the areas were modelled and predicted to exceed the objectives set by the National Air Quality Strategy. The nitrogen dioxide encountered which resulted in exceedences of the air quality objectives were related to road traffic in all cases. The exceedences were predicted purely as a result of carrying out modelling using Airviro modelling software. At the time, there was insufficient nitrogen dioxide diffusion tube monitoring evidence to enable any informed judgements to be made.

In summary, the findings of this USA are as follows:

Carbon Monoxide

It is not considered that there is a significant risk of the air quality objective for carbon monoxide being exceeded by 2003. A detailed assessment is therefore not required for carbon monoxide.

Benzene

It is not considered that there is a significant risk of the air quality objective for benzene being exceeded by 2003. A detailed assessment is therefore not required for benzene.

1,3-butadiene

It is not considered that there is a significant risk of the air quality objective for 1,3-butadiene being exceeded by 2003. A detailed assessment is therefore not required for 1,3-butadiene.

Lead

It is not considered that there is a significant risk of the air quality objective for lead being exceeded by 2003. A detailed assessment is therefore not required for lead.

Sulphur Dioxide

It is not considered that there is a significant risk of the air quality objective for sulphur dioxide being exceeded by 2003. A detailed assessment is therefore not required for sulphur dioxide.

PM_{10}

It is not considered that there is a significant risk of the air quality objective for PM_{10} being exceeded by 2003. A detailed assessment is therefore not required for PM_{10}.

Nitrogen Dioxide

As a result of the latest monitoring data and the applying of calculations of pollutant levels at building facades (rather than kerb-side concentrations), Oadby & Wigston Borough Council have identified that the objective figure of 40 $\mu g/m^3$ for Nitrogen Dioxide was met in all 4 AQMA's for the years 2003 2004 and 2005, and is likely to be met in subsequent years. It also identified that the objective figure was also met in all other areas of the Borough, although the annual mean for one monitoring location was close to the objective figure.

As a result of this Updating and Screening Assessment, Oadby and Wigston Borough Council are proposing to revoke all 4 of the AQMA's located in its area

Any comments or questions should be reverted to:-

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1.0 Introduction

This updating and screening assessment was undertaken in-house by the Environmental Health Department of Oadby And Wigston Borough Council.

The report has been produced in accordance with the requirements of Policy Guidance LAQM.PG(03) and Technical Guidance LAQM.TG(03) issued by the Department for Environment, Food and Rural Affairs.

1.1 National Air Quality Objectives

The Environment Act 1995 led to The National Air Quality Strategy being published in 1997, which has since been updated, the amended version being published in January 2000.

The amended strategy identified seven key pollutants and set air quality objectives for each of these pollutants, along with timescales by which the objectives should be met. A complete list of the objectives can be found in appendix 1.

1.2 Outcome From The Previous Review And Assessment

The Stage 3 Review and Assessment report released in December 2000 predicted that the air quality objectives for nitrogen dioxide would not be achieved by 2005 in 4 areas in the borough. As a result, 4 Air Quality Management Areas (AQMA's) were declared. Details of the AQMA's can be found in appendix 4.

The AQMA's were declared because levels of nitrogen dioxide within the areas were modelled and predicted to exceed the objectives set by the National Air Quality Strategy. The nitrogen dioxide encountered which resulted in exceedences of the air quality objectives were related to road traffic in all cases. The exceedences were predicted purely as a result of carrying out modelling using Airviro modelling software. At the time, there was insufficient nitrogen dioxide diffusion tube monitoring evidence to enable any informed judgements to be made.

The Stage 4 Review and Assessment published in September 2004 continued to support the above findings, as again the report was based mainly on modelling information as there were only 8 months of monitoring data to support the report.

The stage 3 report also identified that the air quality objectives for the other 6 pollutants would be achieved by their relevant target dates.

1.3 Objectives Of The Updating And Screening Assessment

The objective of the Updating and Screening Assessment (USA) is 'to identify the matters that have significantly changed since the last review and assessment, which might lead to a risk of an air quality objective being exceeded.'

If the USA identifies significant changes, then simple screening tools should be used to decide whether there is a sufficient risk of exceedences of the air quality objectives. In these cases, detailed assessments should be carried out.

1.4 Description Of Oadby And Wigston Borough Councils Area

Oadby and Wigston Borough Council is situated to the south-east of the City of Leicester and has a population of approximately 53,200. The Borough is only 9 square miles (2,372 hectares) in area, making it the smallest district in Leicestershire.

Traditional Leicestershire industries such as those making textiles, knitwear, hosiery and footwear still form a part of the Borough's industrial economy. Relative newcomers such as printing, coating, precision and electrical engineering, pattern making and the manufacture of foodstuffs and plastic components now also make up a part of the Borough's industrial base.

2.0 UPDATING AND SCREENING ASSESSMENT FOR CARBON MONOXIDE

2.1 Introduction

Carbon monoxide is a colourless, odourless gas formed mainly by the incomplete combustion of fuels containing carbon. It is toxic to the body in that it impairs the ability of the red blood cells to carry oxygen around the body. Instead, the carbon monoxide is 'picked up' and carried by the red blood cells.

Lower levels of carbon monoxide in the blood can lead to impaired mental performance and coronary stress, thus exposure can exacerbate existing heart problems.

High levels of carbon monoxide in the blood can lead to asphyxiation and death. This level of exposure is most common in domestic properties where badly maintained gas appliances emit the pollutant. This combined with poor ventilation leads to a number of deaths every year.

The main source of carbon monoxide in the United Kingdom is road transport, which accounted for approximately 67% of emissions in 2000. The concentrations of these emissions fall away rapidly with distance from roads. Emissions associated with domestic properties contributed to only 6% of total carbon monoxide emissions during the same period.

2.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for carbon monoxide is 10mg/m^3 measured as a maximum daily running 8 hour average to be achieved by 31st December 2003.

2.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objective for 2003 would not be exceeded.

2.4 Screening Assessment For Carbon Monoxide

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to carbon monoxide:

- Monitoring
- Road traffic

2.5 Monitoring

2.5.1 Monitoring Data

Monitoring for carbon monoxide is not carried out within Oadby And Wigston Borough Council.

2.5.2 Annual Mean Background Concentration

The published annual mean background concentration for 2001 has been estimated at 0.38mg/m^3. This information is summarised in appendix 3. Using published correction factors for carbon monoxide, the estimated concentration for 2003 would be approximately 0.32mg/m^3.

2.6 Road Traffic

2.6.1 Very Busy Roads Or Junctions In Built Up Areas

There are no roads within the borough that would exceed the criteria of:

- Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day
- Dual carriageway roads with daily average traffic flows which exceed 120,000 vehicles per day, or
- Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

so does not require further consideration.

The Annual Average Daily Traffic flow data can be found in appendix 2.

2.7 Conclusions

It is not considered that there is a significant risk of the air quality objective for carbon monoxide being exceeded by 2003. A detailed assessment is therefore not required for carbon monoxide for Oadby And Wigston Borough Council.

3.0 UPDATING AND SCREENING ASSESSMENT FOR BENZENE

3.1 Introduction

Benzene is a colourless aromatic hydrocarbon with a characteristic sweet smell. It is carcinogenic with the risk to human health being related to overall lifetime exposure. There is no absolute safe level for benzene.

In the United Kingdom, the main source of benzene is from the combustion of and distribution of petrol. Exhaust gases from petrol engines contain un-burnt benzene, with benzene also being formed from the combustion of other aromatic compounds of the petrol. Emissions from petrol engines accounted for 56% of total Benzene emissions in 1997. The percentage of Benzene in petrol is now limited by legislation to 1% or below

3.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for benzene is a running annual mean of 16.25µg/m^3 to be achieved by the end of 2003, with an additional objective of 5.0µg/m^3 to be achieved by the end of 2010.

3.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objective for 2003 would not be exceeded.

3.4 Screening Assessment For Benzene

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to benzene:

- Monitoring
- Road traffic
- Industrial Sources
- Other Sources

3.5 Monitoring

3.5.1 Monitoring Data

Monitoring for benzene is not carried out within Oadby And Wigston Borough Council.

3.5.2 Annual Mean Background Concentration

The published annual mean background concentration for 2003 has been estimated at approximately 0.58µg/m^3. This information is summarised in appendix 3.

3.6 Road Traffic

3.6.1 Very Busy Roads Or Junctions In Built Up Areas

There are no roads within the borough that would exceed the criteria of:

- Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day
- Dual carriageway roads with daily average traffic flows which exceed 120,000 vehicles per day, or
- Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

so does not require further consideration.

3.7 Industrial Sources

3.7.1 Industrial Sources

Oadby and Wigston Borough Council have no industrial processes (identified from Annex 2 of the guidance) within their area that have the potential to emit benzene, so does not require further consideration.

3.8 Other Sources

3.8.1 Petrol Stations

Oadby And Wigston Borough Council do not have any petrol stations within their area with an annual throughput of more than 2,000m^3 of petrol and with a road with more than 30,000 vehicles per day, so does not require further consideration.

3.8.2 Major Fuel Storage Depots

Oadby And Wigston Borough Council do not have any major fuel storage depots within their area (identified from annex 2 of the guidance), so does not require further consideration.

3.9 Conclusions

It is not considered that there is a significant risk of the air quality objective for benzene being exceeded by 2003. A detailed assessment is therefore not required for benzene for Oadby And Wigston Borough Council.

4.0 UPDATING AND SCREENING ASSESSMENT FOR 1,3-BUTADIENE

4.1 Introduction

1,3 butadiene is a colourless, flammable gas with a pungent odour, and is present in very tiny amounts in the atmosphere. This pollutant is a carcinogen and is known to have caused cancer of the bone marrow, lymphomas and leukaemia. There is no known safe level below which there is zero risk, however, the risk to human health is related to overall lifetime exposure.

The main source of 1,3-butadiene in the United Kingdom is from vehicle emissions which accounts for approximately 68% of all emissions. 1,3-butadiene is also handled in bulk at a limited number of industrial sites.

4.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for 1,3-butadiene is a running annual mean of 2.25µg/m^3 to be achieved by the end of 2003.

4.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objective for 2003 would not be exceeded.

4.4 Screening Assessment For 1,3-butadiene

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to 1,3-butadiene:

- Monitoring data
- Industrial Sources
- Other Sources

4.5 Monitoring

4.5.1 Monitoring Data

Monitoring for 1,3-butadiene is not carried out within Oadby And Wigston Borough Council.

4.5.2 Annual Mean Background Concentration

The published annual mean background concentration for 2003 has been estimated at approximately 0.21µg/m^3. This information is summarised in appendix 3.

4.6 Industrial Sources

4.6.1 New Industrial Sources

Oadby and Wigston Borough Council have no current or planned industrial processes within their area that have the potential to emit 1,3-butadiene, so does not require further consideration.

4.6.2 Industrial Sources With Substantially Increased Emissions

Oadby and Wigston Borough Council had no industrial processes within their area during the first round of review and assessments that had the potential to emit sufficient quantities of lead that would give rise to exceedences of the air quality standards. This situation has not changed, so does not require further consideration.

4.7 Conclusions

It is not considered that there is a significant risk of the air quality objective for 1,3-butadiene being exceeded by 2003. A detailed assessment is therefore not required for 1,3-butadiene for Oadby And Wigston Borough Council.

5.0 UPDATING AND SCREENING ASSESSMENT FOR LEAD

5.1 Introduction

Lead is toxic, causing damage to the nervous system, blood, gastrointestinal tract, joints and reproductive system. Lead is also bio-accumulative in that it remains in the body and becomes concentrated in body tissues once absorbed (e.g. in bones, teeth, skin and muscle). Humans come into contact with lead by inhalation of particles form the atmosphere.

In the United Kingdom, the main source of lead has historically been from petrol, however the lead content of petrol has decreased significantly since the early 1980s due to regulatory control and the increasing popularity of unleaded petrol and vehicles with catalytic converters. Leaded petrol was banned from sale from 1 January 2000. Other sources of lead include

- Manufacture of batteries;
- Pigments in paints and glazes;
- Tank lining and piping;
- Shielding of radiation sources.

The decrease and recent ban on the use of leaded petrol has lead to a significant decline in the urban background and kerbside concentrations of lead. Thus exposure to lead from vehicular sources is no longer a concern. Concentration of lead will now be highest close to industrial installations that emit Lead.

5.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for lead is a running annual mean of 0.5µg/m^3 to be achieved by the end of 2004, with a more stringent target of 0.25µg/m^3 to be achieved by the end of 2008.

5.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objective for 2004 and 2008 would not be exceeded.

5.4 Screening Assessment For Lead

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to lead:

- Monitoring
- Industrial Sources

5.5 Monitoring

5.5.1 Monitoring Data

Monitoring for lead is not carried out within Oadby And Wigston Borough Council.

5.5.2 Annual Mean Background Concentration

No annual mean background concentration data is available.

5.6 Industrial Sources

5.6.1 New Industrial Sources

Oadby and Wigston Borough Council have no new or planned industrial processes within their area that have the potential to emit sufficient quantities of lead that would be likely to give rise to exceedences of the air quality standards, so does not require further consideration.

5.6.2 Industrial Sources With Substantially Increased Emissions

Oadby and Wigston Borough Council had no industrial processes within their area during the first round of review and assessments that had the potential to emit sufficient quantities of lead that would give rise to exceedences of the air quality standards. This situation has not changed, so does not require further consideration.

5.7 Conclusions

It is not considered that there is a significant risk of the air quality objective for lead being exceeded by 2004. A detailed assessment is therefore not required for lead for Oadby And Wigston Borough Council.

6.0 UPDATING AND SCREENING ASSESSMENT FOR NITROGEN DIOXIDE

6.1 Introduction

Nitrogen dioxide (NO_2) is a toxic gas that can have both acute (short-term) and chronic (long-term) effects on health, particularly for asthma sufferers.

A high concentration of NO_2 causes inflammation of the airways. Long-term exposure may affect lung function and enhance sensitised individuals response to allergies (causing an allergic response). Effects are reversible; however ongoing exposure may lead to poorer lung function in later life.

Exposure to high concentrations for short periods is considered to be more toxic than low concentrations for long periods.

Nitrogen dioxide is reddish-brown in colour when viewed in sufficient concentrations. All combustion processes in air produce oxides of nitrogen (NO_x), emissions that consist mainly of nitric oxide and some nitrogen dioxide, however, most of the nitric oxide is converted to nitrogen dioxide when it reacts chemically with ozone in the atmosphere.

Approximately 49% of NO_x emissions are thought to originate from road transport vehicles, 24% from the electricity supply industry and 23% from the commercial sector.

6.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for nitrogen dioxide is a running annual mean of 40µg/m^3 to be achieved by the end of 2005, plus a 1 hour mean 200µg/m^3 not to be exceeded more than 18 times per year, to be achieved by the end of 2005.

6.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objectives for nitrogen dioxide would not be achieved along certain roads within the borough by 2005, resulting in 4 Air Quality Management Areas being declared. Details of these AQMA's can be found in Appendix 4.

6.4 Screening Assessment For Nitrogen Dioxide

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to nitrogen dioxide:

- Monitoring
- Road Traffic

- Industrial Sources
- Other Sources

6.5 Monitoring

6.5.1 Nitrogen Dioxide Monitoring

Oadby and Wigston Borough Council currently carry out Nitrogen Dioxide monitoring using passive diffusion tubes at 12 sites around the Borough. All tubes are placed at urban road-side sites, all of which are between 0.3 to 2m from the kerbside. A plan showing the location of all 12 diffusion tube monitoring points can be found in Appendix 10.4. The diffusion tubes have been strategically placed along busy routes and around busy junctions.

The tubes are collected and changed in line with the National Diffusion Tube Network dates and sent to an accredited laboratory (South Yorkshire Laboratory) for analysis. The laboratory uses 50% TEA in Acetone to calculate the Nitrogen Dioxide level.

Following analysis by the laboratory, the results are then adjusted for bias. The bias adjustment figure for 2003 is 0.90, the bias adjustment figure for 2004 is 0.88 and the bias adjustment figure for 2005 is 0.96, as taken from the Air Quality Review and Assessment web-site, published by UWE (University of the West of England).

We have partial diffusion tube data for 2003 (Appendix 5.1). An estimate of the annual mean has been calculated using the instructions found in the Defra guidance LAQM. TG(03) and using monitoring data supplied by a neighbouring authority, Blaby District Council. Details of the calculation can be found in Appendix 6.1 and 6.2.

We have near-complete data for 2004 (Appendix 5.2), and near-complete data for 2005 (Appendix 5.3).

In previous reports submitted by Oadby and Wigston Borough Council, the information submitted has relied upon the use of modelling results, as monitoring was not undertaken, for a variety of reasons. However, monitoring for nitrogen dioxide was resumed in September 2003 using diffusion tubes.

6.5.2 Diffusion Tube Monitoring Results – 2003

The bias adjusted calculated annual means for 2003 (Appendix 6.1 and 6.2) show that the objective of 40 $\mu g/m^3$ was achieved in all 4 of the current AQMA's (tube locations 1, 3, 5, 6, 7, 9 and 12. The only exceedences that were found was at the Canal Street / Station Road junction (tube 11), which had a calculated annual mean of 41.9 $\mu g/m^3$. It must be remembered that these concentration

figures are kerb-side figures, not building façade figures. This must be taken into account and will be reviewed later.

6.5.3 Diffusion Tube Monitoring Results – 2004

The bias adjusted monitored annual means for 2004 (Appendix 5.2) show that the objective of 40 µg/m^3 was achieved at 9 monitoring locations in the Borough. The locations that were monitored to exceed the objective figure were locations 5 – Victoria Court, 6 – Glen Road A6 and 11 – Canal Street / Station Road. Again, it must be remembered that these concentration figures are kerb-side figures, not building façade figures. This must be taken into account and will be reviewed later.

6.5.4 Diffusion Tube Monitoring Results – 2005

The bias adjusted monitored annual means for 2005 (Appendix 5.3) show that the objective of 40 µg/m^3 was achieved at 10 monitoring locations in the Borough. The locations that were monitored to exceed the objective figure were locations 5 – Victoria Court and 11 – Canal Street / Station Road. Again, it must be remembered that these concentration figures are kerb-side figures, not building façade figures. This must be taken into account and will be reviewed later.

6.5.5 Building Façade Concentration Adjustments

It is important to note that the diffusion monitoring locations are generally at the kerbside, and not at residential building facades.

Studies have shown that pollution concentrations fall significantly the further away from the kerb-sire that you get.

Volume 11 of the Design Manual for Roads and Bridges (DMRB) contains a calculation that can be used in order to predict the pollution concentration at certain distances away from road centres. The calculation formulates a factor dependant upon the distance from the road centre to the diffusion tube location, and the distance from the road centre to the building façade. The methodology of the calculation can be found in Appendix 7.1.

For ease of use, a spreadsheet (based upon the calculation discussed above) has been developed to easily calculate a building façade concentration. The spreadsheet was initially supplied by Leicestershire County Councils Local Transport Plan 2 (LTP2) team, and has been updated to take into account the pollutant background levels.

By using a GIS mapping software package, distances of diffusion tubes and building facades from the centre of roads have been measured, and have been placed into the provided calculation, giving a ‘façade factor’. This factor is then multiplied by the difference between the monitored concentration and the background concentration for that location. Building façade concentrations have then been calculated for each of the diffusion tube monitoring locations.

6.5.6 Building Façade Concentration Adjustments – 2003

The building façade concentration calculations for 2003 can be founding Appendix 7.2.

The concentrations calculated in the final column clearly indicate that when you take into account the distance of residential building façades from the location of the nitrogen dioxide diffusion tubes within the Borough, the air quality objectives are being achieved.

The highest building façade concentration found within the Borough was 38.99 µg/m^3 at monitoring point 11, Canal Street / Station Road. This is below the 40.0 µg/m^3 objective value.

The highest building façade concentration found within the 4 AQMA's was 33.43 µg/m^3 at monitoring point 5 – Victoria Court. This is well below the 40.0 µg/m^3 objective value.

6.5.7 Building Façade Concentration Adjustments – 2004

The building façade concentration calculations for 2004 can be found in Appendix 7.3.

The concentrations calculated in the final column clearly indicate that when you take into account the distance of residential building façades from the location of the nitrogen dioxide diffusion tubes within the Borough, the air quality objectives are being achieved within all 4 of the AQMA's.

The highest building façade concentration found within the 4 AQMA's was 34.44 µg/m^3 at monitoring point 5 – Victoria Court. This is well below the 40.0 µg/m^3 objective value.

However, the calculation has indicated that the objective level of 40.0 µg/m^3 at a building façade is not being achieved in one location. The highest building façade concentration found within the Borough was 41.99 µg/m^3 at monitoring point 11, Canal Street / Station Road.

6.5.8 Building Façade Concentration Adjustments – 2005

The building façade concentration calculations for 2005 can be found in Appendix 7.4.

The concentrations calculated in the final column clearly indicate that when you take into account the distance of residential building façades from the location of the nitrogen dioxide diffusion tubes within the Borough, the air quality objectives are being achieved across the whole Borough.

The highest building façade concentration found within the Borough was 39.17 µg/m^3 at monitoring point 11, Canal Street / Station Road. This is just below the 40.0 µg/m^3 objective value.

6.5.9 Pollutant Trends

Due to the fairly limited data available, accurate, reliable trends cannot be identified and studied at this stage, however the data indicates that levels of nitrogen dioxide within the Borough have reduced slightly from 2004 to 2005.

6.6 Road Traffic

6.6.1 Narrow Congested Streets With Residential Properties Close To The Kerb

Oadby And Wigston Borough Council have no new or different narrow or congested streets with residential properties close to their kerb within their area that were not fully considered during the first round of review and assessments. As the situation has not changed for this type of street, it does not require further consideration.

6.6.2 Junctions

Oadby And Wigston Borough Council have no new or different 'busy' junctions within their area that were not fully considered during the first round of review and assessments. As the situation has not changed for this type of junction, it does not require further consideration.

6.6.3 Busy Streets Where People May Spend 1 Hour Or More Close To Traffic

Oadby And Wigston Borough Council have no busy streets in their area where people may spend 1 hour or more close to traffic, so does not require further consideration.

6.6.4 Roads With High Flow Of Buses And / Or HGV's

Oadby And Wigston Borough Council have no roads in their area with an unusually high proportion (25% or more) of buses and / or HGV's, so does not require further consideration.

6.6.5 New Roads Constructed Or Proposed Since First Round Of Review And Assessment

Oadby And Wigston Borough Council have no new significant roads constructed in their area since the original review and assessment, so does not require further consideration.

6.6.6 Roads Close To The Objective During The First Round Of Review And Assessment

Oadby And Wigston Borough Council identified no roads (except those where an AQMA was declared) that had levels of nitrogen dioxide close to the objective level, so does not require further consideration,

6.6.7 Roads With Significantly Changed Traffic Flows

Oadby And Wigston Borough Council have no roads within their area that have seen a 25% or more increase in traffic flows since the last review and assessment, so does not require further consideration.

6.6.8 Bus Stations

Oadby And Wigston Borough Council have one bus depot within their area, but no bus station. Bus movements at the bus depot fall significantly short of 1000 movements per day, so does not require further consideration.

6.7 Industrial Sources

6.7.1 New Industrial Sources

Oadby and Wigston Borough Council have no new or planned industrial processes within their area that have the potential to emit sufficient quantities of nitrogen dioxide that would be likely to give rise to exceedences of the air quality standards, so does not require further consideration.

6.7.2 Industrial Sources With Substantially Increased Emissions

Oadby and Wigston Borough Council had no industrial processes within their area during the first round of review and assessments that had the potential to emit sufficient quantities of nitrogen dioxide that would give rise to exceedences of the air quality standards. This situation has not changed, so does not require further consideration.

6.8 Other Sources

6.8.1 Aircraft

Oadby And Wigston Borough Council have no airports within their area. The closest airport is East Midlands Airport which is approximately 30km away ('as the crow flies'). Due to the distance away of the nearest airport, it would be extremely rare that any aircraft would be within 200m of ground level over the borough. This will result in a negligible contribution of ground-level nitrogen dioxide concentrations, so does not require further consideration.

6.9 Conclusions

Now that we have over 2 years worth of bias adjusted monitoring data, we are now in a position to draw conclusions from actual data, rather than having to rely upon modelled data, which has proven to be unreliable in the past.

From the information gained from sections 6.5.1 to 6.5.8, results show that the objective figure of 40 $\mu g/m^3$ was achieved at relevant building facades (i.e. relative receptor points) in all areas of the Borough in 2003 and 2005, and within all 4 of the AQMA's in 2004.

The monitoring location that experienced the highest nitrogen dioxide levels at a relevant receptor point was location 11 – Canal Street / Station Road. This has been the case for all three monitoring periods. In 2003 and 2005, the levels of nitrogen dioxide calculated were 38.99 µg/m^3 and 39.17 µg/m^3 respectively, just below the 40 µg/m^3 objective level. In 2004 the level of nitrogen dioxide was calculated at 41.99 µg/m^3, just above the objective level.

7.0 UPDATING AND SCREENING ASSESSMENT FOR SULPHUR DIOXIDE

7.1 Introduction

Sulphur dioxide is a gas that readily dissolves in moisture (e.g. atmospheric moisture) to form sulphuric acid, the principal pollutant associated with global environmental effects such as acid rain.

Sulphur dioxide is acidic and acts as an irritant when inhaled. It is therefore associated with causing adverse health effects such as the stimulation of nerves in the lining of the nose, throat and airways of the lung, leading to constriction of the airways. This may be particularly serious for asthmatics and persons with chronic lung disease.

In the United Kingdom, sulphur dioxide emissions are principally as a result of burning fossil fuels, with power stations accounting for approximately 71% of total emissions. Road transport in the UK accounts for as little as 1% of emissions.

7.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for sulphur dioxide is listed below.

- 125µg/m^3 as a 24 hour mean, not to be exceeded more than 3 times per year, to be achieved by the end of 2004.
- 350µg/m^3 as a 1 hour mean, not to be exceeded more than 24 times per year, to be achieved by the end of 2004.
- 266µg/m^3 as a 15 minute mean, not to be exceeded more than 35 times per year, to be achieved by the end of 2005.

7.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objective for 2004 and 2008 would not be exceeded.

7.4 Screening Assessment For Sulphur Dioxide

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to sulphur dioxide:

- Monitoring
- Industrial Sources
- Domestic Sources
- Boilers

- Other Sources

7.5 Monitoring

7.5.1 Monitoring Data

Monitoring for sulphur dioxide is not carried out within Oadby And Wigston Borough Council.

7.5.2 Annual Mean Background Concentration

The published annual mean background concentration for 2001 has been estimated at approximately 3.0µg/m^3. Background levels for 2003 and 2005 are expected to be approximately 75% less than the 2001 figure, so will be in the region of 0.75µg/m^3. This information is summarised in appendix 3.

7.6 Industrial Sources

7.6.1 New Industrial Sources

Oadby and Wigston Borough Council have no new or planned industrial processes within their area that have the potential to emit sufficient quantities of sulphur dioxide that would be likely to give rise to exceedences of the air quality standards, so does not require further consideration.

7.6.2 Industrial Sources With Substantially Increased Emissions

Oadby and Wigston Borough Council had no industrial processes within their area during the first round of review and assessments that had the potential to emit sufficient quantities of sulphur dioxide that would give rise to exceedences of the air quality standards. This situation has not changed, so does not require further consideration.

7.7 Domestic Sources

7.7.1 Areas Of Domestic Coal Burning

Local knowledge indicates that Oadby and Wigston Borough Council have no ‘significant’ areas of approximately 500m x 500m where 100+ houses burn solid fuel as their primary source of heating, so does not require further consideration.

7.8 Boilers

7.8.1 Small Boilers >5MW$_{(thermal)}$

Oadby and Wigston Borough Council have no current or planned large boiler plant of >5MW$_{(thermal)}$ that burn either coal or fuel oil within their area. All large institutions such as schools and the hospital within the borough either use gas or electricity as their power source. Other boiler plant within the borough fall under the 5MW$_{(thermal)}$ figure, and would be unlikely emit sufficient quantities of sulphur dioxide that would be likely to give rise to exceedences of the air quality standards, so does not require further consideration.

7.9 Other Sources

7.9.1 Shipping

Oadby and Wigston Borough Council have no shipping within their area, so does not require further consideration.

7.9.2 Railway Locomotives

Oadby And Wigston Borough Council have no locations where diesel locomotives are regularly stationary for periods of 15 minutes or more, so does not require further consideration.

7.10 Conclusions

It is not considered that there is a significant risk of the air quality objective for sulphur dioxide being exceeded by 2004 / 2005. A detailed assessment is not required for sulphur dioxide for Oadby And Wigston Borough Council.

8.0 UPDATING AND SCREENING ASSESSMENT FOR PM_{10}

8.1 Introduction

Particulate matter in the atmosphere are comprised from a wide range of materials from a variety of sources. They are directly emitted from combustion sources, and also arise from other sources such as quarrying and construction, and are also re-suspended by the weather from sources such as road dust / dirt and soil.

The inhalation of PM_{10} is believed to be partly responsible for respiratory and cardiovascular ill-health, asthma and mortality. The higher the concentrations of PM_{10}, the greater the effect on health. Persons with pre-existing lung and heart disease are most at risk from this pollutant. Research into the mechanisms by which ill health occurs is ongoing, but it is becoming increasingly recognised that the finer particles ($PM_{2.5}$ etc.) are the most damaging to health.

The report only considers PM_{10} since this is the size specified in the Government's Air Quality Objectives.

8.2 Air Quality Objectives

The Government set out the air quality objectives for the United Kingdom in the Air Quality Regulations 2000 and (Amendment) Regulations 2002.

The current air quality objective for PM_{10} is 40µg/m^3 as a running annual mean and 50µg/m^3 as a 24 hour mean (not to be exceeded more than 35 times per year) to be achieved by the end of 2004.

8.3 Conclusions Of The Original Review And Assessment

The original review and assessment concluded that the air quality objective for 2004 and 2008 would not be exceeded.

8.4 Screening Assessment For PM_{10}

The Technical Guidance LAQM TG(03) requires the following sources, data or locations to be assessed with regards to PM_{10}:

- Monitoring
- Road Traffic
- Industrial Sources
- Domestic Sources
- Other Sources

8.5 Monitoring

8.5.1 Monitoring Data

Monitoring for PM_{10} is not carried out within Oadby And Wigston Borough Council.

8.5.2 Annual Mean Background Concentration

The published annual mean background concentration for 2004 has been estimated at approximately 21µg/m^3. This information is summarised in appendix 3.

8.6 Road Traffic

8.6.1 Junctions

Oadby And Wigston Borough Council have no new or different 'busy' junctions within their area that were not fully considered during the first round of review and assessments. As the situation has not changed for this type of junction, it does not require further consideration.

8.6.2 Roads With High Flow Of Buses And / Or HGV's

Oadby And Wigston Borough Council have no roads in their area with an unusually high proportion (25% or more) of buses and / or HGV's, so does not require further consideration.

8.6.3 New Roads Constructed Or Proposed Since Last Round Of Review And Assessment

Oadby And Wigston Borough Council have no new significant roads constructed in their area since the original review and assessment, so does not require further consideration.

8.6.4 Roads Close To The Objective During The First Round Of Review And Assessment

Oadby And Wigston Borough Council identified no roads (except those where an AQMA was declared) that had levels of nitrogen dioxide close to the objective level, so does not require further consideration,

8.6.5 Roads With Significantly Changed Traffic Flows

Oadby And Wigston Borough Council have no roads within their area that have seen a 25% or more increase in traffic flows since the last review and assessment, so does not require further consideration.

8.7 Industrial Sources

8.7.1 New Industrial Sources

Oadby and Wigston Borough Council have no new or planned industrial processes within their area that have the potential to emit sufficient quantities of PM_{10} that would be likely to give rise to exceedences of the air quality standards, so does not require further consideration.

8.7.2 Industrial Sources With Substantially Increased Emissions

Oadby and Wigston Borough Council had no industrial processes within their area during the first round of review and assessments that had the potential to emit sufficient quantities of PM_{10} that would give rise to exceedences of the air quality standards. This situation has not changed, so does not require further consideration.

8.8 Domestic Sources

8.8.1 Areas Of Domestic Solid Fuel Burning

Local knowledge indicates that Oadby and Wigston Borough Council have no 'significant' areas of approximately 500m x 500m where 100+ houses burn solid fuel as their primary source of heating, so does not require further consideration.

8.9 Other Sources

8.9.1 Quarries / Landfill Sites / Opencast Coal / Handling Of Dusty Cargoes At Ports Etc

Oadby And Wigston Borough Council have no quarries, landfill sites or opencast coal mines within their area that have dust concerns associated with the facility, so does not require further consideration.

8.9.2 Aircraft

Oadby And Wigston Borough Council have no airports within their area. The closest airport is East Midlands Airport which is approximately 30km away ('as the crow flies'). Due to the distance away of the nearest airport, it would be extremely rare that any aircraft would be within 200m of ground level over the borough. This will result in a negligible contribution of ground-level PM_{10}concentrations, so does not require further consideration

8.10 Conclusions

It is not considered that there is a significant risk of the air quality objective for PM_{10} being exceeded by 2004. A detailed assessment is not required for PM_{10} for Oadby And Wigston Borough Council.

9.0 Summary And Conclusions

The USA for Oadby And Wigston Borough Council predicts that the statutory objectives for the following pollutants will be met:

Benzene
1,3-butadiene
Lead
Sulphur dioxide
Carbon monoxide
Nitrogen dioxide
PM_{10}

Now that we have over 2 years worth of bias adjusted monitoring data, we are now in a position to draw conclusions from actual data, rather than having to rely upon modelled data, which has proven to be unreliable in the past.

Using the checklist approach and bias adjusted monitoring data, adjusted for relevant receptor points, it is apparent that the air quality objectives for nitrogen dioxide were met in all areas of the Borough in 2003 and 2005, and within all 4 of the AQMA's in 2004 at relevant receptor points.

The monitoring location that experienced the highest nitrogen dioxide levels at a relevant receptor point was location 11 – Canal Street / Station Road. This has been the case for all three monitoring periods. In 2003 and 2005, the levels of nitrogen dioxide calculated were 38.99 $\mu g/m^3$ and 39.17 $\mu g/m^3$ respectively, just below the 40 $\mu g/m^3$ objective level. In 2004 the level of nitrogen dioxide was calculated at 41.99 $\mu g/m^3$, just above the objective level.

For any decisions to be made regarding the extent of any air quality problem around this monitoring location, further monitoring information (more locations) is required to identify the areas of any potential future AQMA.

9.1 Proposals

As a result of this USA, Oadby and Wigston Borough Council propose the following items.

9.1.1 Revocation Of Existing AQMA's

As the objective level of 40 $\mu g/m^3$ was achieved in all 4 of the AQMA's within the Borough in 2003, 2004 and 2005 at relevant receptor points, it is proposed to revoke all 4 of the AQMA's.

9.1.2 Further Monitoring – Increasing The Monitoring Network

Further monitoring information is required around the location where nitrogen dioxide levels have been recorded as being slightly under and slightly above the objective level of 40 $\mu g/m^3$. It is

proposed to install a further 2 to 4 nitrogen dioxide passive diffusion tubes around the area in question, depending upon the suitability of location points.