

**AIR QUALITY UPDATING AND
SCREENING ASSESSMENT 2006**

BROXTOWE BOROUGH COUNCIL



THE ENVIRONMENT ACT 1995

**AIR QUALITY REVIEW AND
ASSESSMENT**

Executive Summary

This report presents the findings of the third statutory review and assessment for air quality undertaken within the borough of Broxtowe. Local authorities have already carried out their first and second rounds of reviews and assessments to determine whether there is a need to designate any Air Quality Management Areas (AQMA's) in their area. It is therefore envisaged that these former assessments should act as benchmarks against which local authorities can measure their future progress in making improvements to their local air quality.

Part IV of the Environment Act 1995 requires local authorities to review and assess the current and future air quality in their areas against objectives set out for eight key pollutants, under the provisions of the Air Quality Regulations 2000 and the Air Quality (Amendment) Regulations 2002 (see Table 1.0.)

A review and assessment of air quality is the first step in the Local Air Quality Management (LAQM) process. Part IV of the Act requires each local authority to review air quality 'from time to time'. The National Air Quality Regulations 2000 and the Air Quality (Amendment) Regulations 2002 prescribe air quality objectives and the dates for meeting them. For each objective, local authorities have to consider present and future air quality and assess whether the objectives are likely to be achieved by the prescribed date.

Review and assessment is undertaken using a phased approach, initially conducting an 'Updating and Screening Assessment' principally based on a checklist to identify those matters that have changed since the previous round of review and assessment was completed and which now require further assessment. Following this a 'Detailed Assessment' is undertaken if the Updating and Screening Assessment indicates that an air quality objective may be compromised.

Where objectives set for air quality are unlikely to be met, local authorities must issue orders designating these areas as AQMA's. In these areas local authorities are required to draw up plans to ensure air quality objectives are met. Plans may include action to be taken both within and outside an AQMA and could extend beyond a single Council's area involving several Councils working together.

In addition to the objectives set out in the Air Quality Regulations 2000, and the Air Quality (Amendment) Regulations 2002, the EU has set limit values in respect of nitrogen dioxide (NO₂) and benzene(C₆H₆), to be achieved by 1 January 2010, as well as indicative limit values for PM₁₀ also to be achieved by 2010. In addition, there are separate limit values for carbon monoxide (CO), sulphur dioxide (SO₂) and lead (Pb), to be achieved by 2005.

The new particles objectives for England, Wales, Northern Ireland and Greater London are not currently included in Regulations for the purpose of Local Air Quality Management (LAQM). Local authorities have no statutory obligation to assess air quality against these limits. However, informal guidance has been provided to enable them to do so. Review and assessment within Broxtowe has taken consideration of these limits.

Summary

A review of local ambient air quality between 2003-06 has demonstrated that the air quality objectives for benzene, 1,3-butadiene, carbon monoxide, lead, PM₁₀ and sulphur dioxide will be met within the district. The Council declared 4 AQMA's within the borough due to an exceedence of the annual mean objective for nitrogen dioxide and whilst it is anticipated that this will fall below the national objective prior to 2010, there is not adequate information to necessitate a detailed assessment with a view to revoking the AQMA's at this moment in time.

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1.0. Introduction

This is the third round of Review and Assessment for air quality. The aim of this report is to collate and detail the progress on implementing local air quality management across Broxtowe by presenting a comprehensive Updating and Screening Assessment (USA) of local air quality including new monitoring data and any new developments which might affect local air quality.

It is recommended that this report is read in conjunction with the preceding reports, Air Quality Review and Assessment 2001, Updating and Screening Assessment 2003, Broxtowe Air Quality Review Detailed Assessment 2005, and Progress Report 2005.

A principal approach to the third round of review and assessment established by the Government and Devolved Administrations is the intention that local authorities undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded. The review and assessment process is divided into two steps (i.e. two levels of assessment) these being an 'Updating and Screening Assessment' (USA) and a 'Detailed Assessment' (DA).

The USA uses a checklist approach to identify those matters that have changed since the previous round of review and assessment, and which now require further assessment. To assist local authorities to maximise the lessons learnt through previous review and assessments DEFRA have published a revised checklist to be used when making assessment against each pollutant. The USA will address new monitoring data, new objectives, new sources of emissions or significant changes to existing sources, either locally or within neighbouring authorities, which might affect air quality. Where such changes are identified, simple screening tools have been made available to determine whether the exceedence of an air quality objective may occur.

Where the USA identifies a risk that an air quality objective will be exceeded at a location with relevant public exposure, the authority is then required to undertake a DA. The aim of the DA is to identify with reasonable certainty whether or not a likely exceedence will occur. The assumptions within a DA are therefore considered in greater detail than in the screening process and use data quality assured to a high standard. This is to ensure that the authority is confident in the decisions it reaches. Where a likely exceedence of a pollutant is identified, the assessment is required to be sufficiently detailed to determine both its magnitude and geographical extent. Local authorities are restricted from declaring an Air Quality Management Area (AQMA) unless a DA has been completed.

1.1. Public Exposure

The Regulations make clear that likely exceedences of the objectives should be assessed in relation to *'the quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present'*. Review and assessments should thus be focussed on those locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Authorities are advised not to consider exceedences of the objectives at any location where public exposure would not be realistic.

1.2. Consultation

DEFRA advise that local authorities will not need to consult widely on the updating and screening assessment. However they have advised that results from this process should be made available to the public.

This report and associated appendices will be made available to the public via libraries in the borough, at the Council Offices and on the Council's Web Site. The Nottinghamshire Air Quality Steering group, established during the first round of review and assessment to co-ordinate consultation across Nottinghamshire authorities, will continue to be involved in Local Air Quality Management. A copy of this report will be put before this group for consultation.

Table 1.0 shows objectives included in the Air Quality Regulations (England) (Wales) 2000 and in Air Quality (England) (Wales) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured As	
Benzene ¹	16.25 µg/m ³	Running annual mean	31.12.2003
	5 µg/m ³	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide ¹	10.0 mg/m ³	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5µg/m ³	Annual mean	31.12.2004
	0.25µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide ²	200 µg/m ³ not to be exceeded more than 18 times a year.	1-hour mean	31.12.2005
	40 µg/m ³	annual mean	31.12.2005
Particles (PM₁₀) (gravimetric) ³	50 µg/m ³ not to be exceeded more than 35 times a year.	24-hour mean	31.12.2004
	40 µg/m ³	annual mean	31.12.2004
Sulphur dioxide	350µg/m ³ not to be exceeded more than 24 times a year.	1-hour mean	31.12.2004
	125µg/m ³ not to be exceeded more than 3 times a year.	24-hour mean	31.12.2004
	266µg/m ³ not to be exceeded more than 35 times a year.	15-minute mean	31.12.2005

¹. The Air Quality Objective of 5 µg/m³ for benzene and the objective of 10µg/m³ for carbon monoxide came into force in separate Air Quality (Amendment) Regulations for England and Wales on 11 December 2002 and 31 December 2002 respectively.

² The objectives for nitrogen dioxide are provisional.

³. Measured using the European gravimetric transfer sampler or equivalent

2.0. Benzene

2.1. The National Perspective

The main sources of benzene emissions in the UK are petrol-engine vehicles, petrol refining, storage and the distribution and uncontrolled emissions from petrol station forecourts without vapour recovery systems. A number of policy measures already in place, or planned for future years, will continue to reduce emissions of benzene. Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1% from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions from cars and light-duty vehicles, and emissions of benzene from the storage and distribution of petrol are controlled by vapour recovery systems.

2.2. National Objectives

16.25 $\mu\text{g}/\text{m}^3$ running annual mean (31st December 2003)
5 $\mu\text{g}/\text{m}^3$ annual mean (31st December 2010)

2.3. Standards and Objectives for Benzene

The Government and Devolved Administrations have adopted a running annual mean 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 31st December 2003. However, in light of the health advice from the Expert Panel on Air Quality Standards (EPAQS) and the Department of Health's Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC), additional tighter objectives have been set. The Second Air Quality Daughter Directive for benzene, which has been transposed into UK legislation, sets a limit value, annual mean of 5 $\mu\text{g}/\text{m}^3$ to be achieved by 1 January 2010.

2.4. Screening Assessment

No local monitoring for benzene has been undertaken in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the running annual mean of 16.25 $\mu\text{g}/\text{m}^3$ (2003) and the annual mean of 5 $\mu\text{g}/\text{m}^3$ (2010) would be met across Broxtowe.

2.5. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003, and LAQM.TG(03) Update, published January 2006, requires assessment of benzene to consider the following sources, data or locations:

- Monitoring Data outside an AQMA
- Monitoring Data within an AQMA
- Very Busy Roads or Junctions in Built-up Areas
- New Industrial Sources

- Industrial sources with substantially increased emissions, or new relevant exposure
- Petrol Stations
- Major Fuel Storage Depots (Petroleum only)

These are described in the following sections.

2.6. Monitoring Data outside an AQMA

No monitoring for benzene has been undertaken in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the running annual mean objective of $16.25\mu\text{g}/\text{m}^3$ (2003) and annual mean of $5\mu\text{g}/\text{m}^3$ (2010) would be met across Broxtowe.

2.7. Monitoring data within an AQMA

This assessment for this section is only applicable to authorities that have declared Air Quality Management Areas (AQMA's). Broxtowe has declared 4 AQMA's within the district for an exceedence of Nitrogen Dioxide (NO_2). No monitoring has been undertaken for benzene.

2.8. Screening assessment of very busy roads

Local authorities are only required to undertake a review and assessment for road traffic sources of benzene in respect of the 2003 objective, where there are 'very busy' roads with daily average traffic (AADT) flows that exceed the following criteria:

- i. Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day
- ii. Dual carriageway (2 or 3 lanes) roads with daily average traffic flows which exceed 120,000 vehicles per day
- iii. Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

There are no roads in Broxtowe that have been identified as 'very busy' and therefore no further assessment has been undertaken for this section.

2.9. New Industrial Sources

There have been no new industrial sources of benzene identified within Broxtowe since the last Updating and Screening Assessment (2003) and there are no sources within neighbouring authorities close to the district boundary as determined against the checklist in Annex 2 of the LAQM.TG(03). Therefore no further assessment has been undertaken for this section.

2.10. Industrial Sources with substantially increased emissions, or new relevant exposure

There have been no new industrial sources with substantially increased emissions identified within Broxtowe and therefore no further assessment has been undertaken for this section.

2.11. Petrol Stations

None of the petrol stations within Broxtowe meet the required criteria for assessment stipulated in LAQM.TG (03) and therefore no further assessment has been undertaken for this section.

2.12. Major fuel storage depots (Petrol only)

There are no major fuel storage depots located within Broxtowe or within adjacent authorities close to the district boundary and therefore no further assessment has been undertaken for this section.

Conclusion

The assessment for benzene has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the annual objective concentrations of $16.25\mu\text{g}/\text{m}^3$ (2003) and $5\mu\text{g}/\text{m}^3$ (2010) will be met across Broxtowe.

3.0. 1,3-Butadiene

3.1. The National Perspective

The main source of 1,3-butadiene in the UK is emissions from motor vehicle exhausts. 1,3-butadiene is also an important industrial chemical and is handled in bulk at a small number of industrial premises. Maximum running annual mean concentrations of 1,3-butadiene measured at all urban background/centre and roadside locations in the national network are already well below the 2003 objective of $2.25\mu\text{g}/\text{m}^3$. The increasing numbers of vehicles equipped with three way catalysts will significantly reduce emissions of 1,3-butadiene in future years.

3.2. National Objective

$2.25\mu\text{g}/\text{m}^3$ running annual mean (31 December 2003)

3.3. Standards and Objectives for 1,3-butadiene

The Government and the Devolved Administrations have adopted a maximum running annual mean concentration of $2.25\mu\text{g}/\text{m}^3$ as an air quality standard for 1,3-butadiene. The objective is for the standard to be achieved by 31st December 2003.

3.4. Screening Assessment

No local monitoring has been undertaken for 1,3-butadiene in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the running annual mean of $2.25\mu\text{g}/\text{m}^3$ (2003) would be met across Broxtowe.

3.5. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003, and LAQM.TG(03) Update, published January 2006, requires assessment of 1,3-butadiene to consider the following sources, data or locations:

- Monitoring Data
- New Industrial Sources
- Industrial Sources with Significantly Increased Emissions, or new relevant exposure

These are described in the following sections.

3.6. Monitoring Data

No monitoring for 1,3-butadiene has been undertaken in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the running annual mean of $2.25\mu\text{g}/\text{m}^3$ (2003) would be met across the district. There has been no significant increase in 1,3-butadiene sources identified within Broxtowe.

3.7. New Industrial Sources

There have been no new industrial sources of 1,3-butadiene identified within Broxtowe since the last Updating and Screening Assessment (2003) and there are no sources within neighbouring authorities close to the district boundary as determined against the checklist in Annex 2 of the LAQM.TG(03). Therefore no further assessment has been undertaken for this section.

3.8. Industrial Sources with Substantially increased emissions, or new relevant exposure

There has been no substantial increase of 1,3-butadiene emissions identified in Broxtowe since the last Updating and Screening Assessment (2003) likely to give rise to exceedences of the running average mean objective for 1,3-butadiene. Therefore, no further assessment has been undertaken for this section.

Conclusion

The assessment for 1,3-butadiene has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the running annual mean of $2.25\mu\text{g}/\text{m}^3$ (2003) will be met across Broxtowe.

4.0. Carbon Monoxide

4.1. The National Perspective

The main source of carbon monoxide in the UK is road transport. Annual emissions of carbon monoxide have been falling steadily since the 1970's, and are expected to continue to do so. Current projections indicate that road transport emissions will decline by a further 42% between 2000 and 2005. Existing policies will be sufficient to reduce maximum daily 8-hour mean concentrations of carbon monoxide below $10\text{mg}/\text{m}^3$ by 2003.

4.2. National Objective

$10\text{mg}/\text{m}^3$ maximum daily running eight-hour mean (31 December 2003)

4.3. Standards and Objectives for Carbon Monoxide

The Government and the Devolved Administrations have adopted an 8-hour running mean concentration of $11.6\text{mg}/\text{m}^3$ as the air quality standard for carbon monoxide. The new objective has been set at a slightly tighter level of $10\text{mg}/\text{m}^3$ as a running 8-hour mean concentration, to be achieved by 31 December 2003, bringing it into line with the second Air Quality Daughter Directive limit value.

4.4. Screening Assessment

No local monitoring has been undertaken for carbon monoxide in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the 8-hour mean concentration $10\text{mg}/\text{m}^3$ (2003) would be met across Broxtowe.

4.5. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003, and LAQM.TG(03) Update, published January 2006, require assessment of carbon monoxide to consider the following sources, data or locations:

- Monitoring Data
- Very Busy Roads or Junctions in built-up Areas

These are described in the following sections.

4.6. Monitoring Data

No monitoring for carbon monoxide has been undertaken in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the 8-hour mean objective concentration of $8\text{mg}/\text{m}^3$ (2003) would be met across the borough. There has been no significant increase in carbon monoxide sources identified within Broxtowe.

4.7. Very Busy Roads or Junctions in built-up Areas

Local authorities are only required to undertake a review and assessment for road traffic sources of carbon monoxide in respect of the 2003 objective, where there are 'very busy' roads with daily average traffic (AADT) flows that exceed the following criteria:

- i. Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day
- ii. Dual carriageway (2 or 3 lanes) roads with daily average traffic flows which exceed 120,000 vehicles per day
- iii. Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

Traffic flow on the borough's busies roads have been checked using updated traffic flow data for 2004 with the following roads highlighted as the busiest within the borough.

Table 4.7.1. Traffic Flow on the major roads within Broxtowe

Road Name	Type	Traffic flow	Criteria	Exceeds
M1 (Junction 25–26)	Motorway	121,550	>140,000	No
M1 (Junction 26–27)	Motorway	116,750	>140,000	No
A610	Dual	51,500	>120,000	No
A52	Dual	49,000	>120,000	No

There are no roads that have been identified as 'very busy' and therefore no further assessment has been undertaken for this section.

4.8. Junctions in built-up Areas

Nuthall Roundabout is the busiest junction within the district where roads such as the A610, the A6002 and the B600 converge. Using guidance in LAQM.TG(06) and traffic flow data for 2004 shows that this junction has 64,034 vehicles. However, there is no relevant exposure within 10m of the junction and therefore no further assessment has been undertaken for this section.

Conclusion

Although there is no monitoring data for carbon monoxide within the Borough, it is unlikely that ambient concentrations are above the objective. There are no roads within the borough, which can be classified as 'very busy' according to the criteria in the guidance. Consequently, Broxtowe Borough Council is not required to carry out a Detailed Review and Assessment for carbon monoxide.

5.0. Lead

5.1. The National Perspective

The agreement reached between the European Parliament and the Environment Council on the Directive on the Quality of Petrol and Diesel Fuels (part of the Auto-Oil Programme) has led to the ban on sales of leaded petrol in the UK with effect from 1 January 2000. Emissions of lead are now restricted to a variety of industrial activities, such as battery manufacture, pigments in paints and glazes, alloys, radiation shielding, tank linking and piping.

Detailed assessments of the potential impact of lead emissions from industrial processes have been undertaken by the Government and the Devolved Administrations, based upon both monitoring and sector analysis studies. The former has included a 12-month monitoring survey in the vicinity of 30 key industrial sites in the UK, which has been used to supplement information already provided from the non-automatic monitoring networks. These monitoring data have generally indicated no exceedences of the 2004 and 2008 objectives, although locations in proximity to non-ferrous metal productions and foundry processes were deemed to be at risk.

5.2. National Objective

0.5µg/m³ annual mean (31 December 2004)
0.25µg/m³ annual mean (31 December 2008)

5.3. Standard and Objective for Lead

The Government and the Devolved Administrations have adopted an annual mean concentration of 0.5µg/m³ as the air quality standard for lead, with an objective for the standard to be achieved by 31 December 2004. In addition, a lower air quality objective of 0.25µg/m³ has also been set to be achieved by 31 December 2008.

5.4. Screening Assessment

No local monitoring has been undertaken for lead in Broxtowe since the last Updating and Screening Assessment (2003), which concluded that the annual objective concentrations of 0.5µg/m³ (2004) and 0.25µg/m³ (2008) would be met across Broxtowe.

5.5. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003 and LAQM.TG(03) Update, published January 2006 requires assessment of lead to consider the following sources, data or locations:

- Monitoring Data
- New Industrial Sources
- Existing Industrial Sources with Significantly Increased Emissions, or new relevant exposure

These are described in the following sections.

5.6. Monitoring Data

No monitoring for lead has been undertaken in Broxtowe since the last Updating and Screening Assessment in 2003, which concluded that the annual objective concentration of $0.5\mu\text{g}/\text{m}^3$ (2004) and $0.25\mu\text{g}/\text{m}^3$ (2008) would be met across the borough. There has been no significant increase in lead sources identified within Broxtowe.

5.7. New Industrial Sources

There have been no new industrial sources of lead identified within Broxtowe since the last Updating and Screening Assessment (2003) and there are no sources within neighbouring authorities close to the district boundary as determined against the checklist in Annex 2 of the LAQM.TG(03). Therefore, no further assessment has been undertaken for this section.

Industrial Sources with substantially increased emissions, or new relevant exposure

There has been no substantial increase of lead emissions identified in Broxtowe since the last Updating and Screening Assessment (2003) likely to give rise to exceedences of the running average mean objective for lead.

Conclusion

The assessment for lead has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the annual objective concentrations of $0.5\mu\text{g}/\text{m}^3$ (2004) and $0.25\mu\text{g}/\text{m}^3$ (2008) will be met across Broxtowe.

6.0. Nitrogen Dioxide (NO₂)

6.1. The National Perspective

The principal source of NO_x emissions is road transport, which accounted for approximately 49% of total UK emissions in 2000. Major roads carrying large volumes of high-speed traffic (such as motorways and other primary routes) are a predominant source, as are conurbations and city centres with congested traffic. Within most urban areas, the contribution of road transport to local emissions will be much greater than for the national picture.

Meeting the annual mean objective in 2005, and the limit value in 2010, is expected to be considerably more demanding than achieving the 1-hour objective. National studies have indicated that the annual mean objective is likely to be achieved at all urban background locations outside of London by 2005, but that the objective may be exceeded more widely at roadside sites throughout the UK in close proximity to busy road links. Projections for 2010 indicate that the EU limit value may still be exceeded at urban background sites in London, and at roadside locations in other cities.

6.2. National Objective

200µg/m³ 1 hour mean (no more than 18 exceedences) (31 December 2005)

40µg/m³ annual mean (31 December 2005)

6.3. Standards and Objectives

The Government and the Devolved Administrations have adopted two Air Quality Objectives for NO₂, as an annual mean concentration of 40µg/m³, and a 1-hour mean concentration of 200µg/m³ not to be exceeded more than 18 times per year. The objectives are to be achieved by 31 December 2005.

The first Air Quality Daughter Directive also sets limit values for nitrogen dioxide, which has been transposed into UK legislation. The directive includes a 1-hour limit value of 200µg/m³ not to be exceeded more than 18 times per year and an annual mean limit value of 40µg/m³ both to be achieved by 1 January 2010.

6.4. Screening Assessment

The last Review and Assessment (2003) carried out by independent consultants Netcen concluded that further monitoring was required for the pollutant NO₂. Broxtowe Borough Council employed the same consultants to carry out 12 months real-time monitoring for NO₂, following which a Detailed Assessment of Air Quality was published in May 2005. This recommended the Council declare Air Quality Management Areas (AQMA's) along the M1 corridor due to an exceedence of the annual mean limit value of 40µg/m³.

A summary of these reports is given below. The reader is referred to Broxtowe Borough Council's Updating and Screening Assessment (July 2003), Detailed and Assessment (May 2005) and Progress Report 2005 for more comprehensive information, all of which have been submitted to and approved by DEFRA.

6.4.1. Updating and Screening Assessment (2003)

There are no significant industrial sources of nitrogen dioxide in Broxtowe. The DMRB screening tool and review of the Stage 3 assessment indicated that the annual average objective was likely to be exceeded in 2005 at locations close to the M1, the Nuthall roundabout and near crossings of the M1. The identified locations are:

- Iona Drive, Trowell
- Trowell Services
- Nuthall roundabout
- Crossing of M1 by A609, A6007 and B600.

Diffusion tube data indicated that the predicted 2005 annual mean concentrations at the monitoring sites would be below the objective. Nonetheless, a detailed assessment of the locations was recommended.

Netcen considered that further NO₂ modelling was required to characterise exposure at the receptors in Broxtowe. Further modelling of receptor areas to assess control strategies was unlikely to be helpful without monitoring data.

6.4.2. Detailed Assessment (2005)

This detailed assessment identified a significant (>50%) risk of exceedence of the UK annual average objective for NO₂ in 2005 in the following areas:

- M1/A6007 Closest houses to east of M1 in Iona Drive and Tiree Close
- M1/A609 Houses on the Nottingham Road and Derbyshire Avenue closest to the M1
- M1/B600 Houses on the Nottingham Road and Watnall Road closest to the M1

It recommended that consideration be given to declaring air quality management areas in the above locations.

M1 Trowell Services buildings closest to the motorway. Since the hourly average objective was not predicted to be exceeded in 2005 there was no requirement to declare an air quality management area in this location unless there are any permanent residents in the buildings.

6.4.3. Progress Report 2005

Following the external consultant's report, Broxtowe Borough Council declared 4 Air Quality Management Areas (AQMA's) encompassing a total of 37 properties along the M1 corridor. These orders came into effect on 1 February 2006. Following formal declaration, an Action Plan will be devised within 12 months designed to allow the local authority to manage the air quality within the AQMA's.

The dominant source of the pollution is from motorway traffic, the control of which is outside the Council's remit and lies with the Highways Agency.

The Council will therefore be lobbying the Highways Agency, Nottinghamshire County Council and Derbyshire County Council to try and disperse traffic from the M1 motorway between Junction 25 and Junction 26.

6.5. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003, and LAQM.TG(03) Update, published January 2006, requires assessment of NO₂ to consider the following sources, data or locations:

- Monitoring Data outside an AQMA
- Monitoring Data within an AQMA
- Narrow congested streets with residential properties close to the kerb
- Junctions
- Busy Streets where people may spend 1-hour or more close to traffic
- Roads with high flow of buses and/or HGV's
- New roads constructed or proposed since the previous round of review and assessment
- Roads with significantly changed traffic flows, or new relevant exposure
- Bus Stations
- New Industrial Sources
- Industrial Sources with substantially increased emissions, or new relevant exposure
- Aircraft

These are described in the following sections.

6.6. Monitoring Data outside an AQMA

No automatic monitoring stations are located in the borough. Diffusion tube monitoring of NO₂ is undertaken in the borough at four sites operated as part of the UK national survey and at an additional site operated by Broxtowe Borough Council. Further sites are operated as part of the M1 corridor survey. Table 6.6.1. shows the location of monitoring sites within Broxtowe.

Table 6.6.1. Location of diffusion tube sites in Broxtowe Borough

ID	Address	X	Y
National Network Sites			
BX01 – Nuthall	19 Nottingham Road, (Kerbside)	451600	344500
BX03 – Chilwell	Chilwell Olympia, Bypass Rd. (Suburban)	451800	335300
BX04 – Trowell	St. Helen's Church (Kerbside)	448300	339700
BX09 – Nuthall*	Nuthall Methodist Church, Nottingham Road	451900	344300
M1 Corridor Survey			
BX07 – Trowell	7 Colonsay Close, Trowell Park Estate	448700	339100
BX08 – Trowell	23 Stapleford Road, Trowell	448500	339600
BX09 – Nuthall*	Nuthall Methodist Church, Nottingham Road	451900	344300
BX10 – Nuthall	The Old Rectory, Nuthall	451500	344500
BX12 – Trowell	71 Nottingham Road, Nuthall	448800	340100
BX14 – Sandiacre	Cottons Farm, Bostocks Lane, (J.25/M1 Northbound)	447100	335100
BX15 – Sandiacre	Cottons Farm, Bostocks Lane, (J.25/M1 Southbound)	447100	335100
BX16 – Trowell	18 Roehampton Drive, Trowell Park Estate	448600	338600
BX17 – Trowell Services	Granada Services M1 Northbound	449200	340700
BX18 – Trowell Services	Granada Services M1 Southbound	449300	340700
BX20 - Bramcote	Opp. Sherwin Arms, Derby Road	450400	337900
BX22 - Nuthall	A610 / B600 Island	452200	344000

* NO_x site is duplicated

During the last detailed assessment (2005), Broxtowe Borough Council co-located 3 diffusion tubes with a continuous monitor in Trowell. The diffusion tubes exposed at this site recorded an average of 44.8µg/m³ in 2004/5 whereas the continuous monitor recorded an average concentration of 40.3µg/m³ over the same time period. This provided a bias adjustment factor of 0.9. The diffusion tube results have been multiplied by this adjustment factor, the results of which can be seen in Table 6.6.2.

Table 6.6.2. Estimated annual mean NO₂ concentrations 2005 objective

ID	Measured Annual Mean for 2005 based on 12 month data (µg/m³)	Measured Annual Mean for 2005 based on 12 month data (µg/m³) (Corrected with 0.0 bias factor)
National Network Sites		
BX01 – Nuthall	39.4	35.46
BX03 – Chilwell	29.17	26.25
BX04 – Trowell	35.6	32.04
BX09 – Nuthall*	35.03	31.77
M1 Corridor Survey		
BX07 – Trowell	33.63	30.27
BX08 – Trowell	29.40	26.46
BX09 – Nuthall*	35.03	31.77
BX10 – Nuthall	31.33	28.20
BX12 – Trowell	30.91	27.82
BX14 – Sandiacre	33.67	30.30
BX15 – Sandiacre	71.45	64.31
BX16 – Trowell	31.21	28.01
BX17 – Trowell Services	57.99	52.19
BX18 – Trowell Services	60.60	54.54
BX20 - Bramcote	43.37	39.03
BX22 - Nuthall	54.60	49.14

* NO_x site is duplicated

BX15 - Sandiacre

The diffusion tube was collocated with a diffusion tube within Erewash Borough Council's area. As the tube is not within the borough, no further consideration for this result is made.

BX17 and BX18 – Trowell Services

No relevant exposure exists at Trowell Services and therefore no further consideration for this result is made.

BX22 - Nuthall

Detailed monitoring was carried out at Nuthall roundabout during the last detailed assessment (2005), which predicted that the NO₂ objective would be met at the closest receptor for 2005 and 2010. No further consideration is taken for this result as no relevant exposure exists.

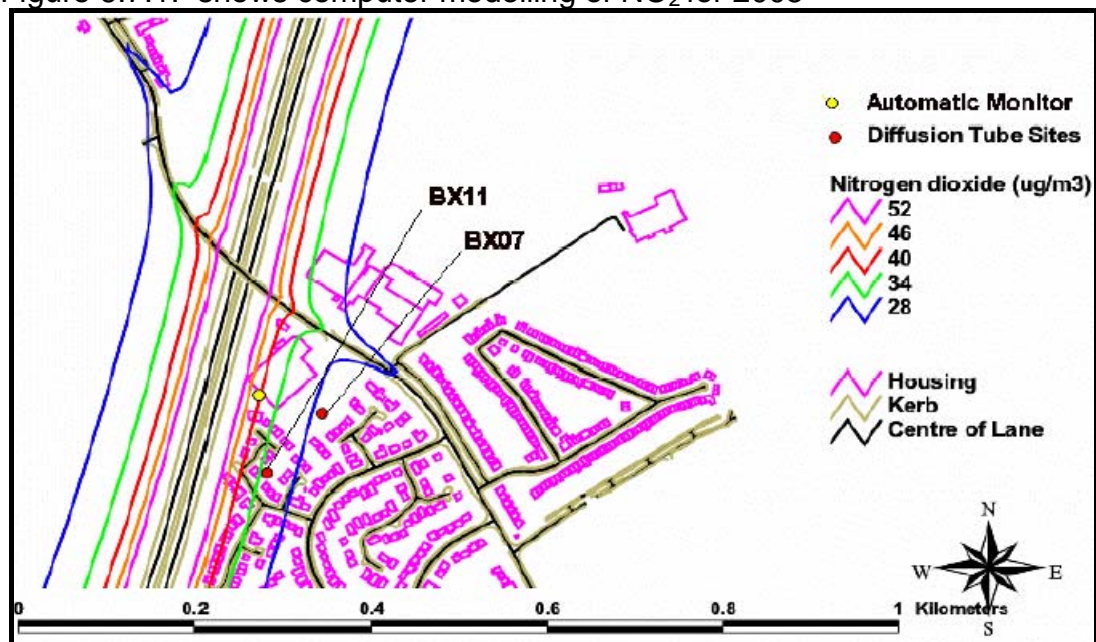
There is therefore no requirement to proceed to a detailed assessment for this section.

6.7. Monitoring Data within an AQMA

The last Updating and Screening Assessment (2003) identified potential exceedences of the annual objective for NO₂. A Detailed Assessment (2005) was carried out which recommended that the Council declare AQMA's in the borough where relevant exposure existed. Four AQMA's came into force on 1 February 2006 encompassing a total of 37 properties along the M1 corridor. Modelling has been carried out to show the predicted annual mean for NO₂ in 2005 and 2010.

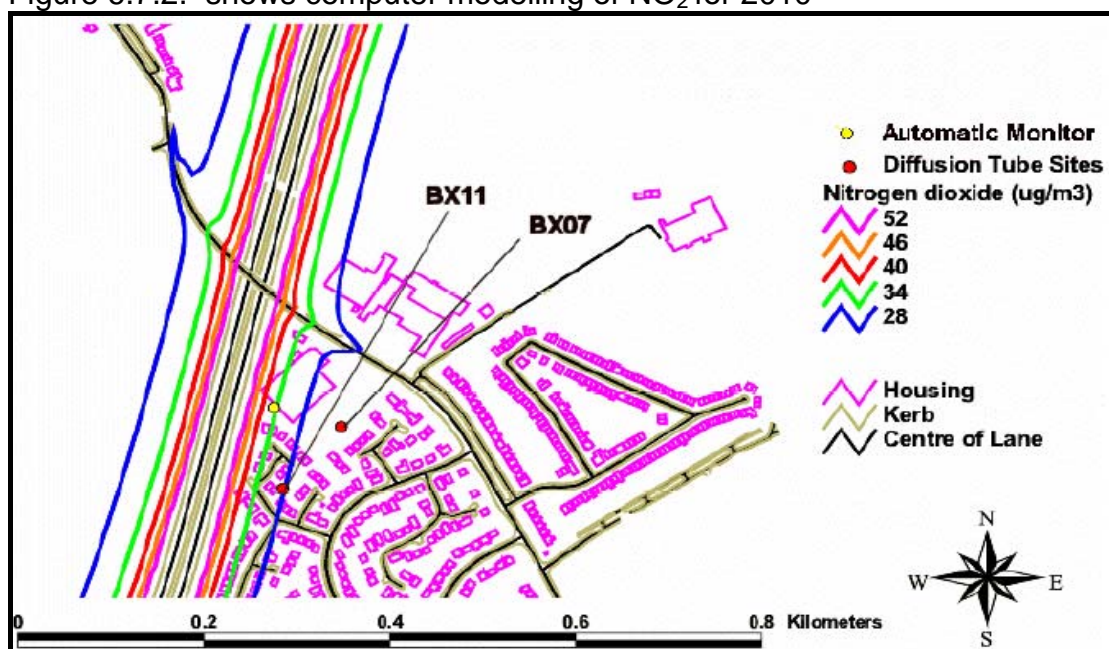
Air Quality Management Area 1

Figure 6.7.1. shows computer modelling of NO₂ for 2005



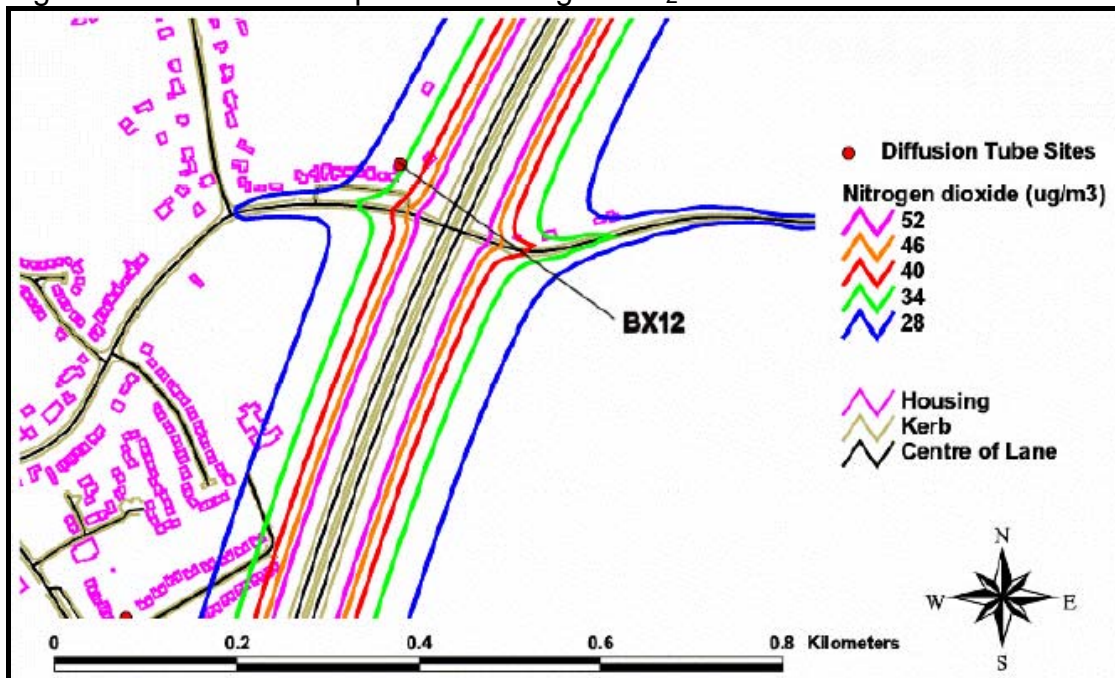
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 6.7.2. shows computer modelling of NO₂ for 2010



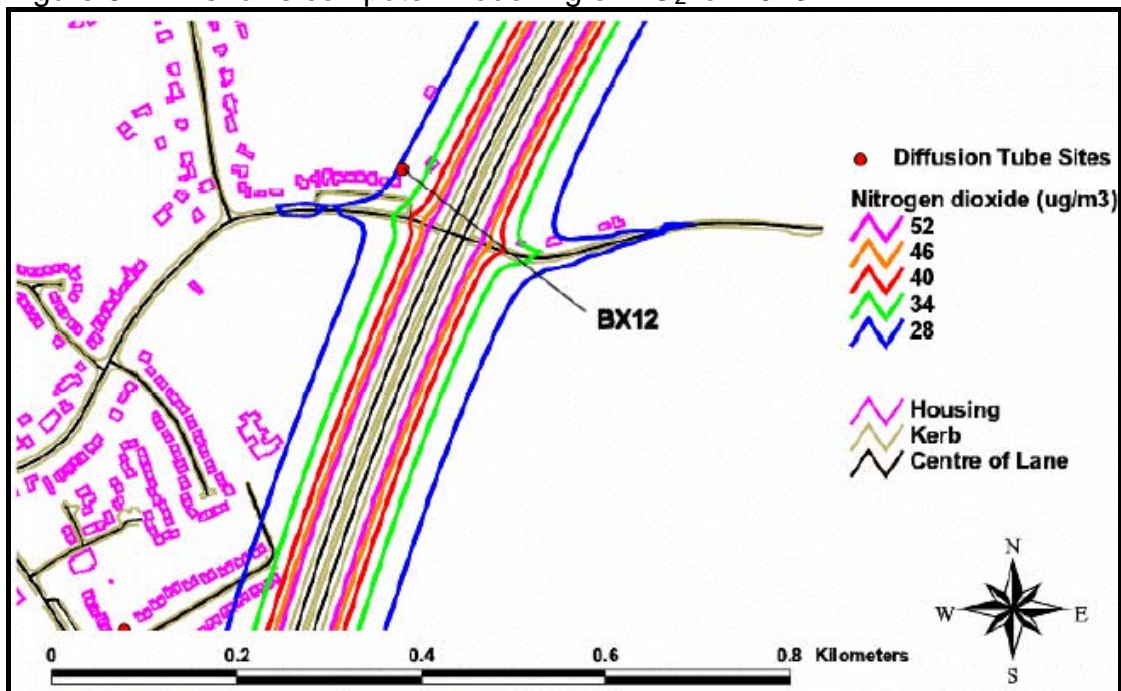
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Air Quality Management Area 2 and Air Quality Management Area 3
 Figure 6.7.3. shows computer modelling of NO₂ for 2005



Source: Broxtowe Air Quality Review Detailed Assessment May 2005

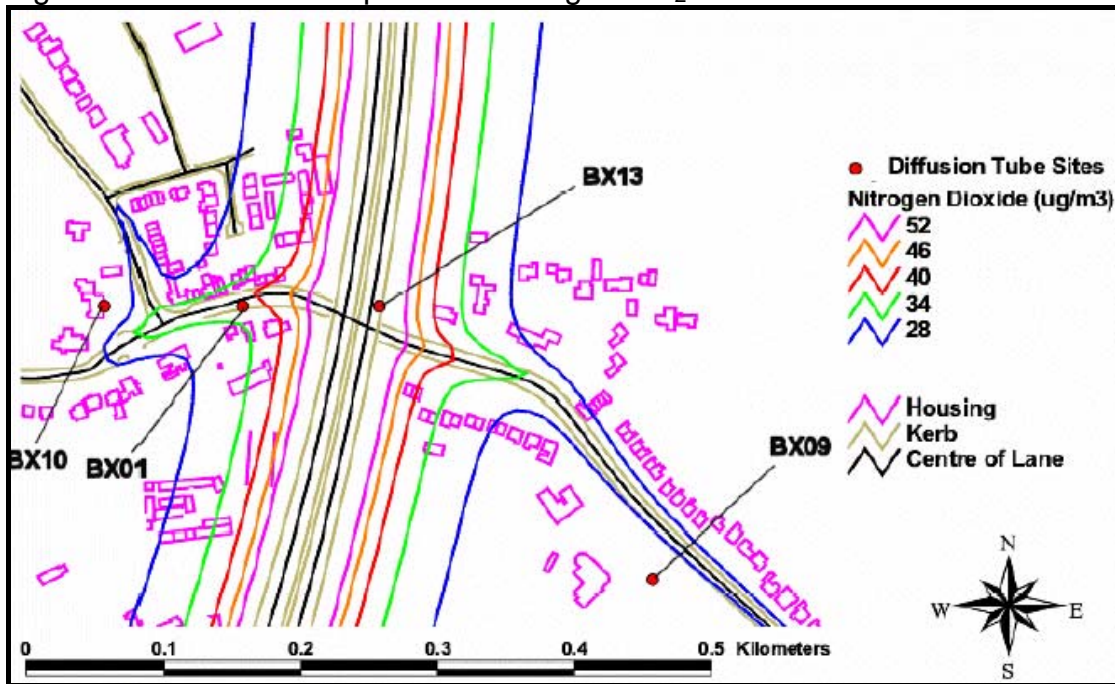
Figure 6.7.4. shows computer modelling of NO₂ for 2010



Source: Broxtowe Air Quality Review Detailed Assessment May 2005

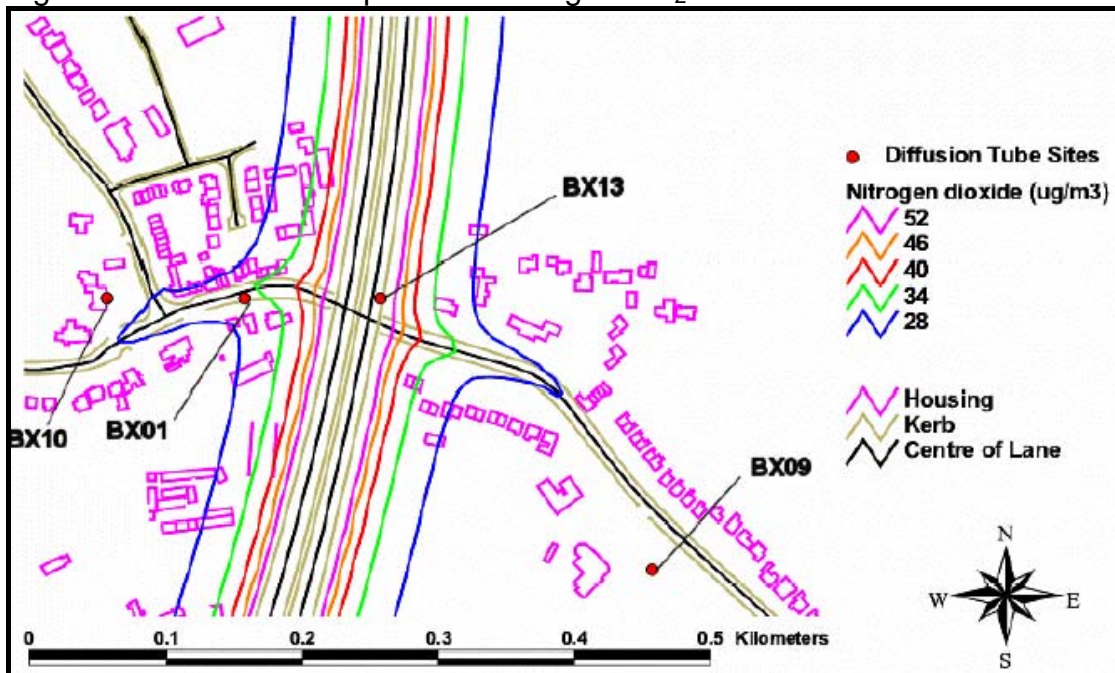
Air Quality Management Area 4

Figure 6.7.5. shows computer modelling of NO₂ for 2005



Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 6.7.6. shows computer modelling of NO₂ for 2010



Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Since formal declaration of the AQMA's, further monitoring using NO_x tubes has taken place. However, DEFRA guidance suggests that a 12 month period should be used or a minimum of 6 months if from January to July or July to December to account for a variety of metrological conditions. The NO_x tubes have not been established for a significant period of time and therefore this data has not been included in this report. Monitoring will continue to take

place within the AQMA's to ensure the standard will be met prior to 2010. Currently there is insufficient evidence to proceed to a detailed assessment at this time to revoke the AQMA's and no further consideration has been made for this section.

6.8. Narrow congested streets with residential properties close to the kerb

Local authorities are only required to undertake assessments of roads where there are narrow congested streets with residential properties within 5 metres of the kerb and which have traffic flows greater than 10,000 per day. This criterion has been reassessed against roads which have seen an increase above 10,000 AADT since the last Updating and Screening Assessment (2003).

No locations were identified to warrant the use of the DMRB screening model for narrow congested streets in any location within Broxtowe and therefore no further assessment has been undertaken for this section.

6.9. Junctions

Local authorities are required to undertake assessment of busy junctions within their districts. LAQM.TG(03) interprets a 'busy' junction as '*one with more than 10,000 vehicles per day*'. Additionally, there should be a relevant exposure within 10 metres of the kerb. A comprehensive assessment of busy junctions was undertaken during the 2nd Round USA utilising GIS software and local knowledge.

A Detailed Assessment on these junctions was carried out in May 2005 which identified no exceedences of the $40\mu\text{g}/\text{m}^3$ objective for 2005.

Modelling was also carried out at these junctions for 2010 which predicted that there would be no exceedences where relevant exposure exists. No further assessment will be taken for junctions within the borough.

6.10. Busy Streets where people may spend 1-hour or more close to traffic

Local authorities are only required to undertake review and assessment against this section where there are busy street locations identified where members of the public might regularly spend 1-hour or more, e.g. streets with many shops, streets with outdoor cafes/bars. The guidance interprets 'busy' as those streets with more than 10,000 vehicles per day. This criterion has been reassessed against roads which have seen an increase above 10,000 ADDT since the last Updating and Screening Assessment (2003).

There are no streets within Broxtowe which meet all the criteria of this section and therefore no further assessment has been undertaken.

6.11. Roads with high flow of buses and/or HGV's

Authorities are only required to undertake further assessment for this section where roads are identified as having an unusually high proportion of buses or HGV's. An 'unusually high proportion of buses or HGV's is taken to be greater than 20% of the AADT, LAQM.TG(03).

This was evaluated during the last updating and screening assessment (2003) where no roads were determined as having an unusually high proportion of buses or HGV's. There has been no change in this position.

6.12. New roads constructed or proposed since the previous round of review and assessment

No new roads have been constructed or proposed since the last updating and screening assessment (2003) and therefore no further assessment has been undertaken for this section.

6.13. Roads with significantly changed traffic flows, or new relevant exposure

Authorities are only required to undertake the assessment of roads with traffic flows greater than 10,000 vehicles per day that have experienced a large increase in traffic. LAQM.TG(03) has interpreted 'large increase' as *'more than a 25% increase in traffic'*. The aim of the assessment is to establish whether there is a risk of exceedences along the existing roads with a significant change in flows.

Improved AADT traffic data for 2004 was compared with 2001 AADT data to identify roads which had experienced an increase in traffic flow above 25%. Table 6.13.1. shows an evaluation of roads with significantly changed traffic flows.

Table 6.13.1. Roads with significantly changed traffic flows between 2001 and 2004

Road	Traffic Flow Link No.	Description	ADDT 2001	ADDT 2004	% Increase
A6005	317	Nottingham Road: Attenborough Lane, Attenborough – B6464 Bye Pass Road, Chilwell	21,350	27,750	29.97
B6003	554	A52 Stapleford Bypass – A6005 Nottingham Road, Toton	11,750	17,200	46.38

A6005

(Nottingham Road: Attenborough Lane, Attenborough – B6464 Bye Pass Road, Chilwell)

GIS evaluation has determined that there are no relevant receptors within 10m of the road and therefore no further assessment has been undertaken.

B6003

(A52 Stapleford Bypass – A6005 Nottingham Road, Toton)

GIS evaluation has determined that there are no relevant receptors within 10m of the road and therefore no further assessment has been undertaken.

6.14. Bus Stations

The guidance only requires the updating and screening process to be undertaken if bus movements exceed 1,000 movements a day, and if there is a relevant receptor within 10m, assessed against the 1-hour objective. An evaluation of the bus station has determined that there are well below 1,000 bus movements per day. It is also very unlikely that any members of the public would remain in this location for over an hour. No further assessment will be undertaken for this section.

6.15. New Industrial Sources

There have been no new industrial sources of nitrogen dioxide identified within Broxtowe since the last updating and screening assessment (2003) and therefore no further assessment has been undertaken for this section.

6.16. Industrial Sources with Substantially increased emissions

There has been no substantial increase of nitrogen dioxide emissions identified in Broxtowe since the previous Updating and Screening Assessment (2003).

6.17. Aircraft

There are no relevant air quality issues relating to aircraft within Broxtowe and therefore no further assessment has been undertaken for this section.

Conclusion

The assessment for nitrogen dioxide has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the 1-hour mean of $200\mu\text{g}/\text{m}^3$ (no more than 18 exceedences (2005) will be met. It has also been predicted that the annual mean objective of $40\mu\text{g}/\text{m}^3$ (2005) will be met prior to 2010, however, as monitoring data is not currently available, the Council is unable to assess whether or not it should proceed to a Detailed Assessment at this time with a view to revoking the AQMA. Adopting a cautionary approach, the Council will not proceed to a detailed assessment for nitrogen dioxide.

7.0. PARTICLES (PM₁₀)

7.1. The National Perspective

National UK emissions of primary PM₁₀ have been estimated as totalling 184,000 tonnes in 1997. Of this total, around 25% was derived from road transport sources. It should be noted that, in general, the emissions estimates for PM₁₀ are less accurate than those for the other pollutants with prescribed objectives, especially for sources other than road transport.

The Government established the Airborne Particles Expert Group (APEG) to advise on sources of PM₁₀ in the UK and current and further ambient concentrations. Their conclusions were published in January 1999. APEG concluded that a significant proportion of the current annual average PM₁₀ is due to the secondary formation of particulate sulphates and nitrates, resulting from the oxidation of sulphur and nitrogen oxides. These are regional scale pollutants and the annual concentrations do not vary greatly over a scale of tens of kilometres. There are also natural or semi-natural sources such as wind-blown dust and sea salt particles. The impact of local urban sources is superimposed on this regional background. Such local sources are generally responsible of winter episodes of hourly mean concentrations of PM₁₀ above 100µg/m³ associated with poor dispersion. However, it is clear that many of the sources of PM₁₀ are outside the control of individual local authorities and the estimation of future concentrations of PM₁₀ are in part dependent on predictions of the secondary particle component.

7.2. National Objective

50µg/m³ (35 exceedences) 24 hour mean (31 December 2004)

40µg/m³ annual mean (31 December 2004)

7.3. Standards and Objectives

The Government and the Devolved Administrations have adopted two Air Quality Objectives for fine particles (PM₁₀), which are equivalent to the EU Stage 1 limit values in the first Air Quality Daughter Directive. The objectives are 40µg/m³ as the annual mean, and 50µg/m³ as the fixed 24-hour mean to be exceeded on no more than 35 days per year, to be achieved by 31 December 2004.

The Government has also announced new objectives for PM₁₀. These supplement and strengthen substantially the current objectives set in the Air Quality Strategy. These European Union Stage 2 limit values are 20µg/m³ as the annual mean and 50µg/m³ as the new 24-hour mean to be exceeded on no more than 7 days per year. The new particulate objectives for England, Wales, Northern Ireland and Greater London are not currently included in Regulations for the purpose of Local Air Quality Management. Local authorities have no statutory obligation to assess air quality against these

limits. However, informal guidance has been provided to enable them to do so. Review and Assessment within Broxtowe has taken consideration of these potential new limits.

7.4. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003 and LAQM.TG(03) Update, published January 2006 requires assessment of PM₁₀ to consider the following sources, data or locations:

- Monitoring Data outside an AQMA
- Monitoring Data within an AQMA
- Junctions
- Roads with high flow of buses and/or HGV's
- New roads constructed or proposed since the previous round of review and assessment
- Roads with significantly changed traffic flows, or new relevant exposure
- Roads close to the objective during the second round of Review and Assessment
- New Industrial Sources
- Industrial Sources with substantially increased emissions, or new relevant exposure
- Areas of domestic solid fuel burning
- Quarries / landfill sites / opencast coal / handling of dusty cargoes at ports, etc.
- Aircraft

7.5. Monitoring Data outside an AQMA

No monitoring for PM₁₀ has been undertaken in Broxtowe since the Detailed Assessment in May 2005, which concluded that the 24 hour mean objective (not to be exceeded more than 35 times per year) of 50µg/m³ (2004) and annual mean of 50µg/m³ (2004) would be met across the district.

7.6. Monitoring Data within an AQMA

This assessment for this section is only applicable to authorities that have declared Air Quality Management Areas (AQMA's). Broxtowe has declared 4 AQMA's within the district for an exceedence of Nitrogen Dioxide (NO₂). No monitoring has been undertaken for PM₁₀ since the Detailed Assessment (2005) which concluded that Broxtowe Borough Council was not required to declare any AQMA's for PM₁₀ as no relevant exposure existed.

7.7. Junctions

Local authorities are required to undertake assessment of busy junctions within their districts. LAQM.TG(03) interprets a 'busy' junction as '*one with more than 10,000 vehicles per day*'. Additionally, there should be a relevant exposure within 10 metres of the kerb. A comprehensive assessment of busy

junctions was undertaken during the 2nd Round USA utilising GIS software and local knowledge.

A Detailed Assessment on these junctions was carried out in May 2005 which identified no exceedences of the PM₁₀ objectives.

Modelling was also carried out at these junctions for 2010 which predicted that there would be no exceedences where relevant exposure exists. No further assessment will be taken for junctions within the borough.

7.8. Roads with high flow of buses and/or HGV's

Authorities are only required to undertake an updating and screening assessment for this section where roads have been identified as having an unusually high proportion of buses or HGV's. An unusually high proportion of buses or HGV's is taken to be greater than 20% of the AADT, LAQM.TG(03).

This was evaluated during the last review and assessment where no roads were determined as having an unusually high proportion of buses or HGV's. There has been no change in this position.

7.9. New roads constructed or proposed since last review and assessment

No new roads have been constructed or proposed since the last updating and screening assessment (2003) and therefore no further assessment has been undertaken for this section.

7.10. Roads with significantly changed traffic flows, or new relevant exposure

Authorities are only required to undertake the assessment of roads with traffic flows greater than 10,000 vehicles per day that have experienced a large increase in traffic. LAQM.TG(03) has interpreted 'large increase' as *'more than a 25% increase in traffic'*. The aim of the assessment is to establish whether there is a risk of exceedences along the existing roads with a significant change in flows.

Improved AADT traffic data for 2004 was compared with 2001 AADT data to identify roads which had experienced an increase in traffic flow above 25%. Table 7.10.1. shows an evaluation of roads with significantly changed traffic flows.

Table 7.10.1. Roads with significantly changed traffic flows between 2001 and 2004

Road	Traffic Flow Link No.	Description	ADDT 2001	ADDT 2004	% Increase
A6005	317	Nottingham Road: Attenborough Lane, Attenborough – B6464 Bye Pass Road, Chilwell	21,350	27,750	29.97
B6003	554	A52 Stapleford Bypass – A6005 Nottingham Road, Toton	11,750	17,200	46.38

A6005

(Nottingham Road: Attenborough Lane, Attenborough – B6464 Bye Pass Road, Chilwell)

GIS evaluation has determined that there are no relevant receptors within 10m of the road and therefore no further assessment has been undertaken.

B6003

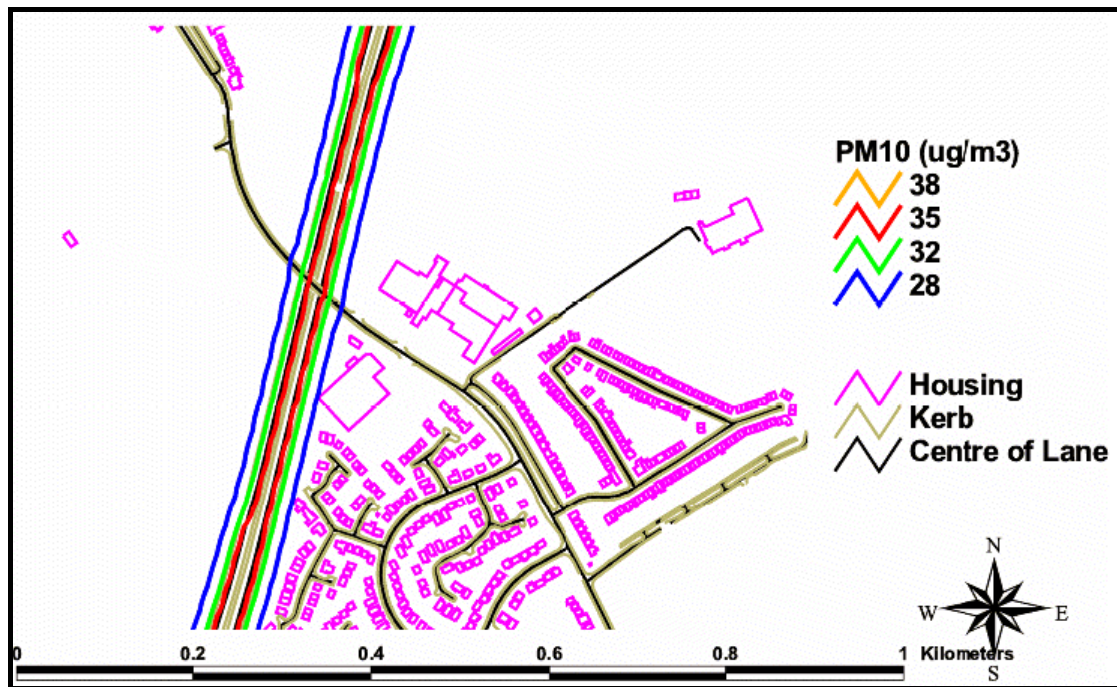
(A52 Stapleford Bypass – A6005 Nottingham Road, Toton)

GIS evaluation has determined that there are no relevant receptors within 10m of the road and therefore no further assessment has been undertaken.

7.11. Roads close to the objective during the second round of Review and Assessment

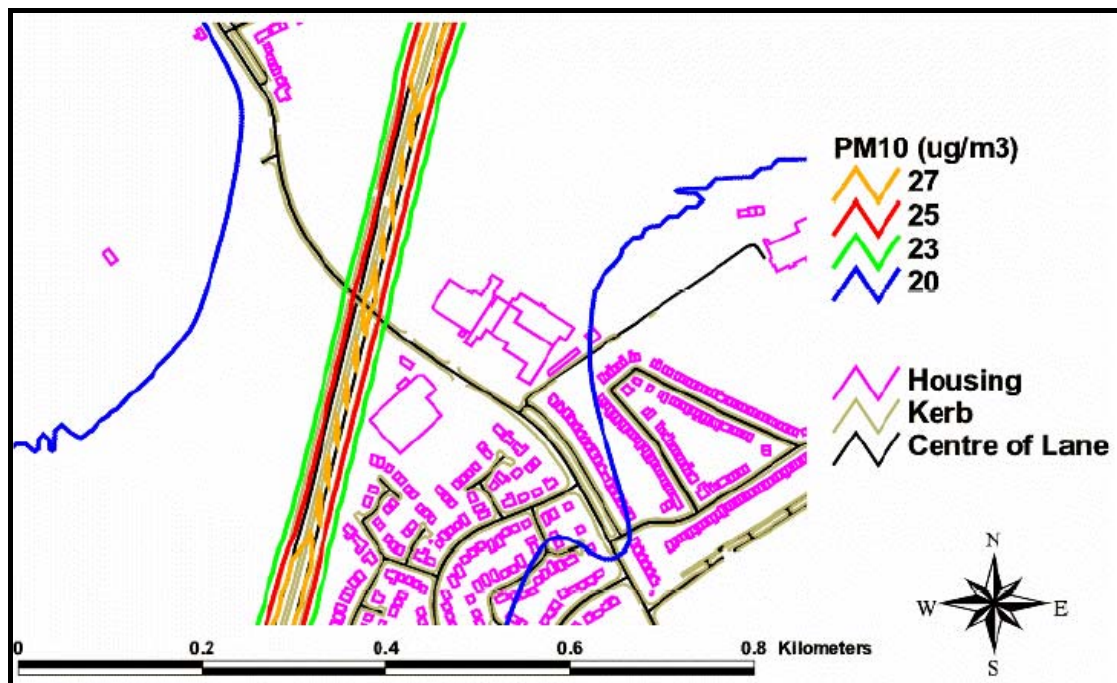
The last Review and Assessment (2003) recommended that Broxtowe Borough Council carry out a Detailed Assessment on roads where there was a potential risk of exceedence in the air quality objective for PM₁₀. Computer modelling was carried out following 12 months of real time monitoring at locations which were considered to be close to the objective for PM₁₀. Modelling has been carried out for 2004 and 2010.

Figure 7.11.1. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at M1 / A6007 (2004)



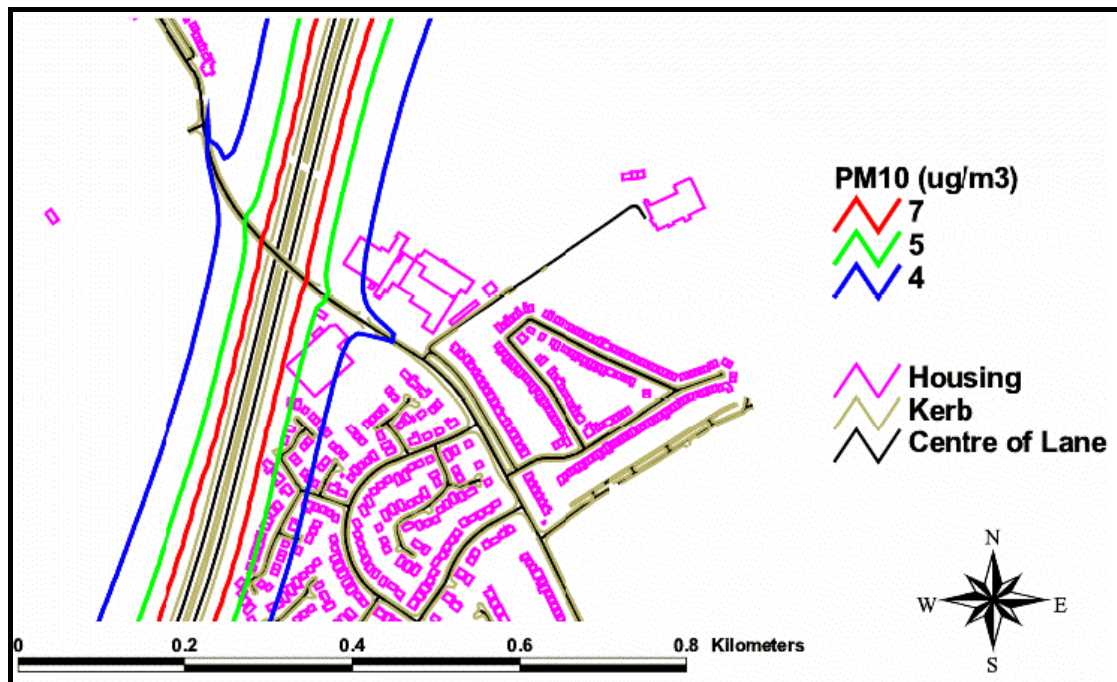
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.2. shows predicted concentrations of PM_{10} at M1 / A6007 (2010)



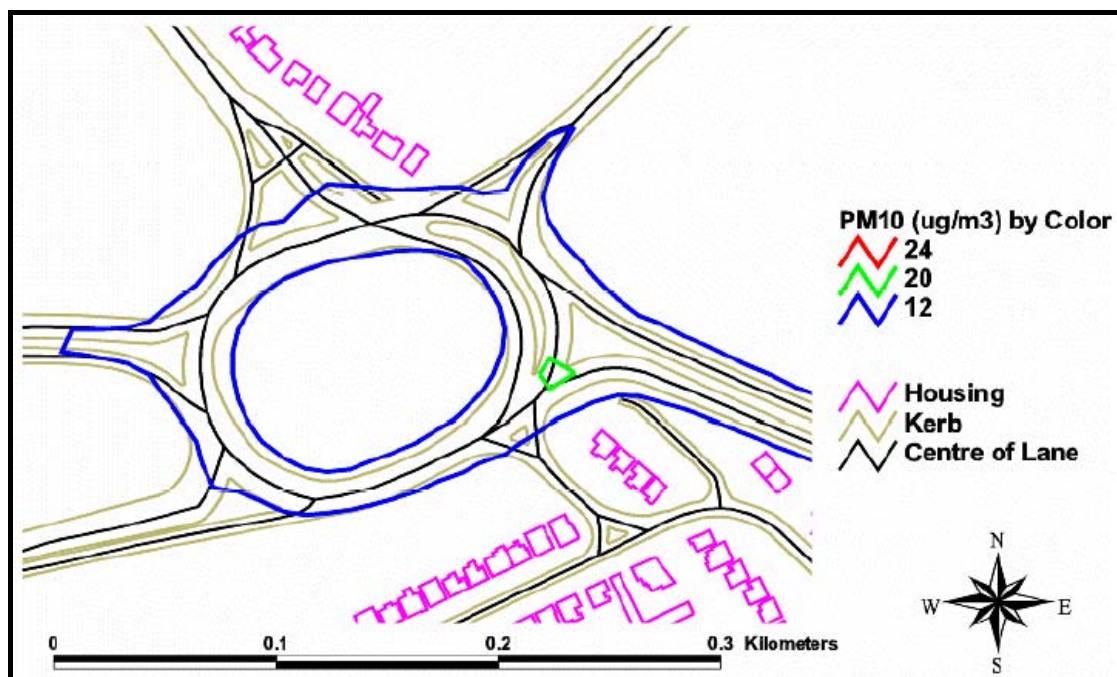
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.3. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at M1 / A6007 (2010)



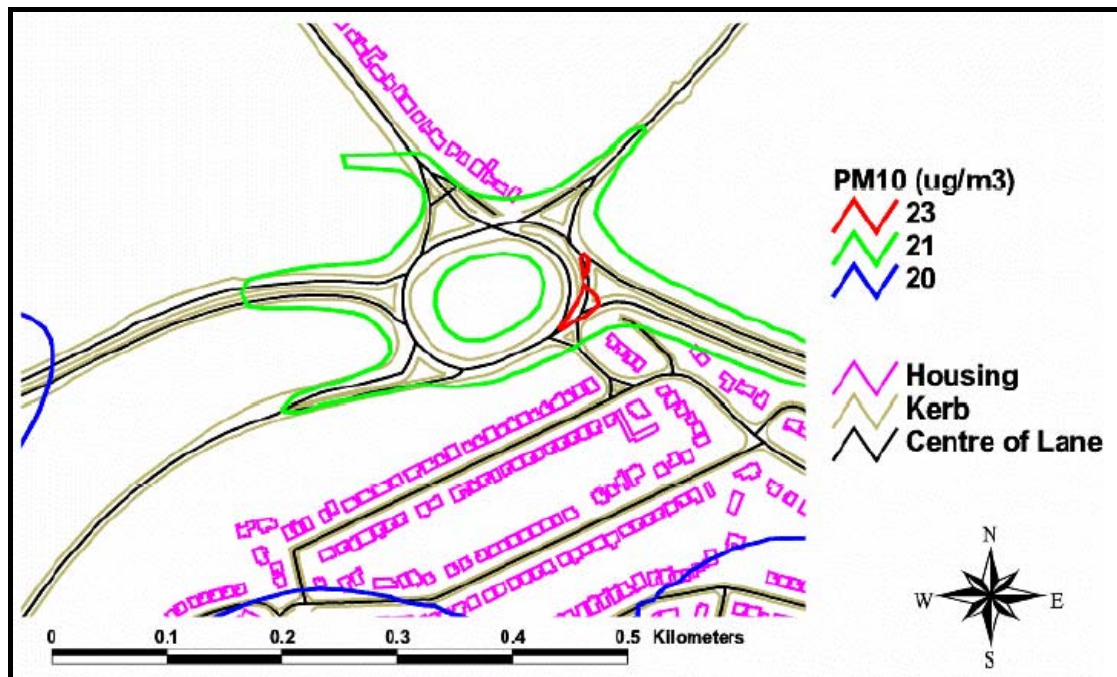
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.4. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at Nuthall Roundabout (2004)



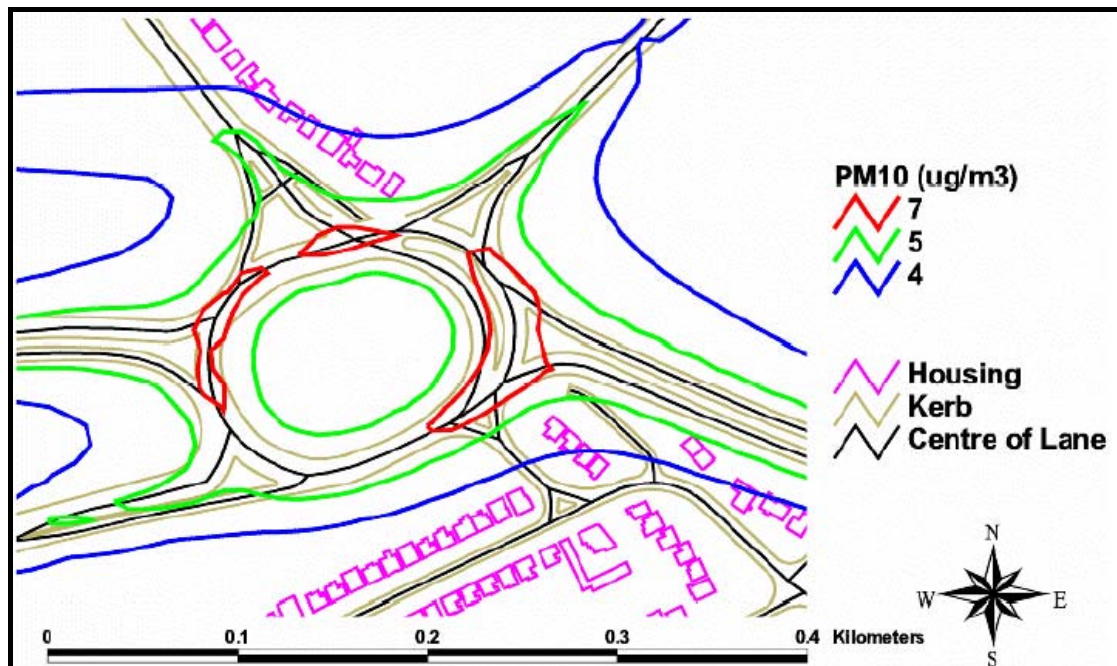
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.5. shows predicted concentrations of PM₁₀ at Nuthall Roundabout (2010)



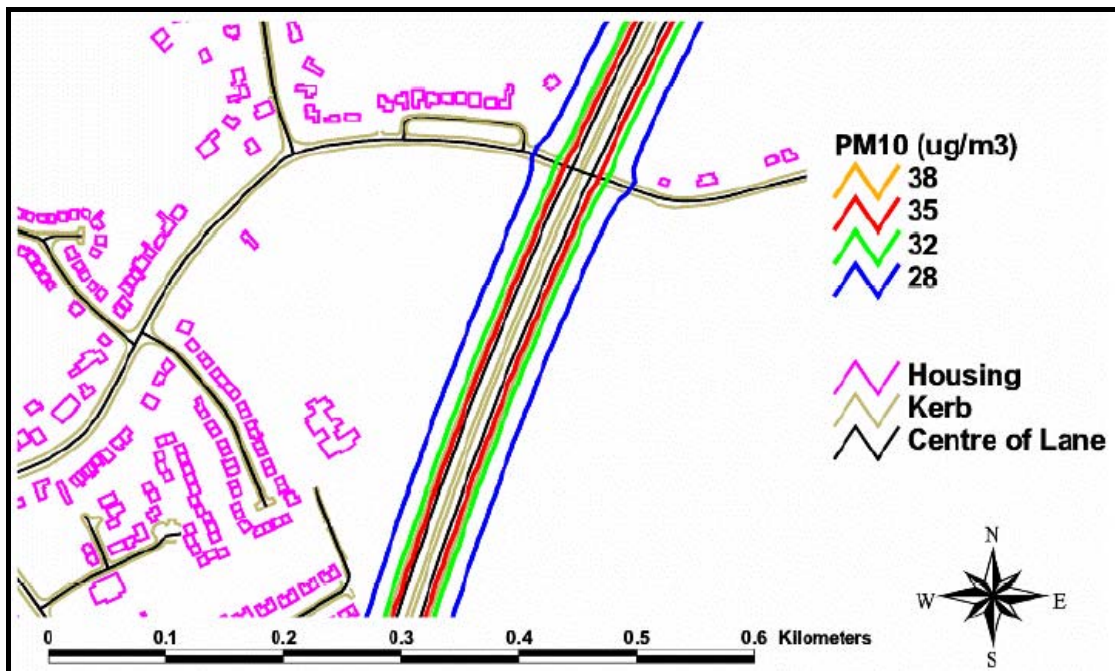
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.6. shows predicted number of days above 50µg/m³ PM₁₀ at Nuthall Roundabout (2010)



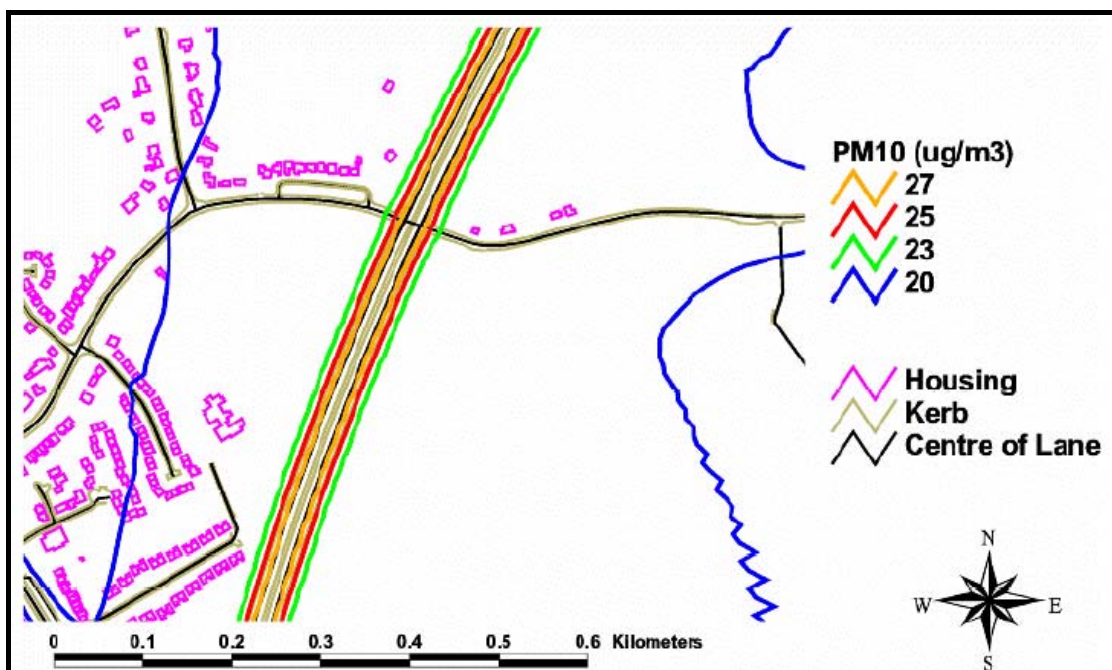
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.7. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at M1 / A609 (2004)



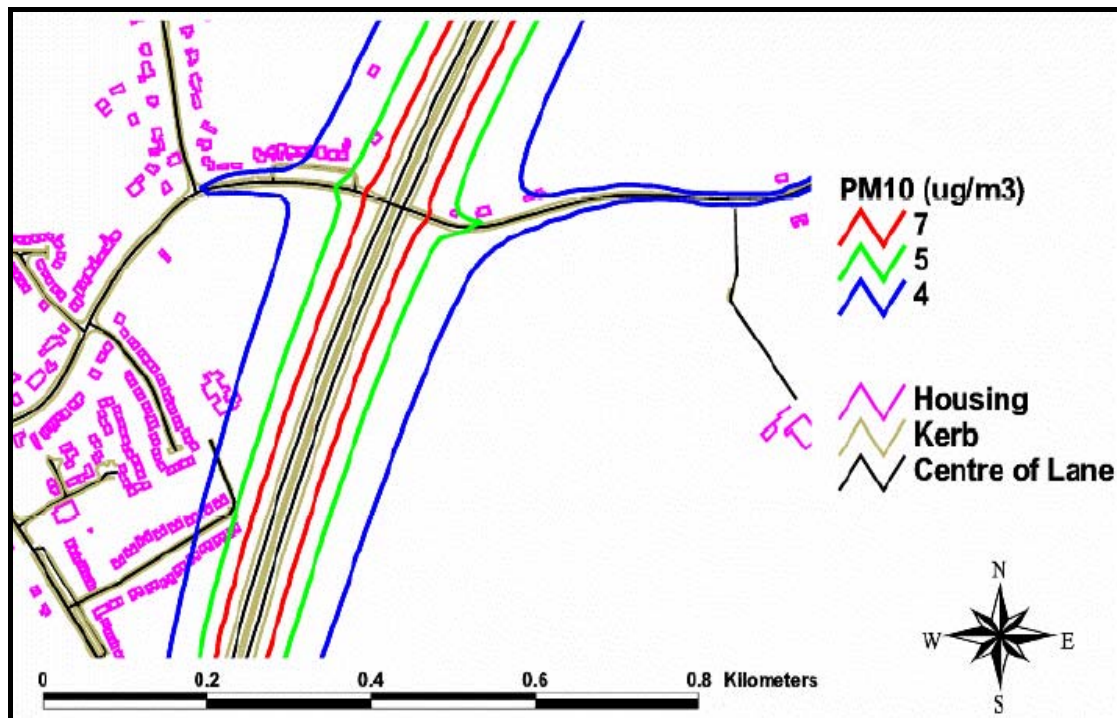
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.8. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at M1 / A609 (2004)



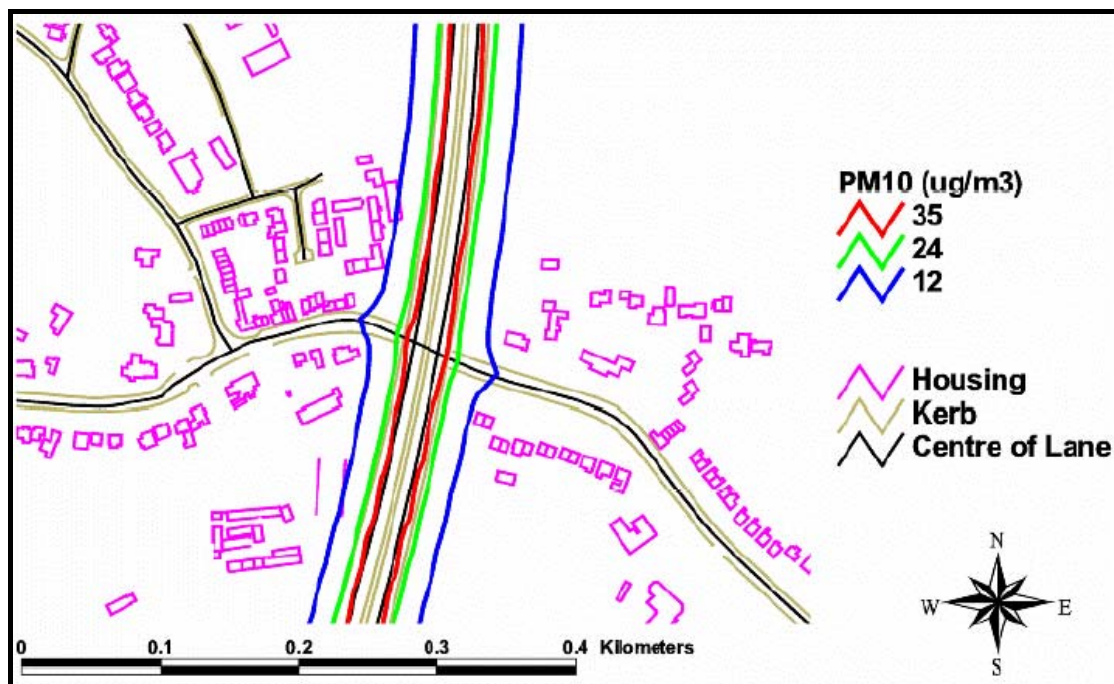
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.9. shows predicted number of days above 50 $\mu\text{g}/\text{m}^3$ PM₁₀ at M1 / A609 (2010)



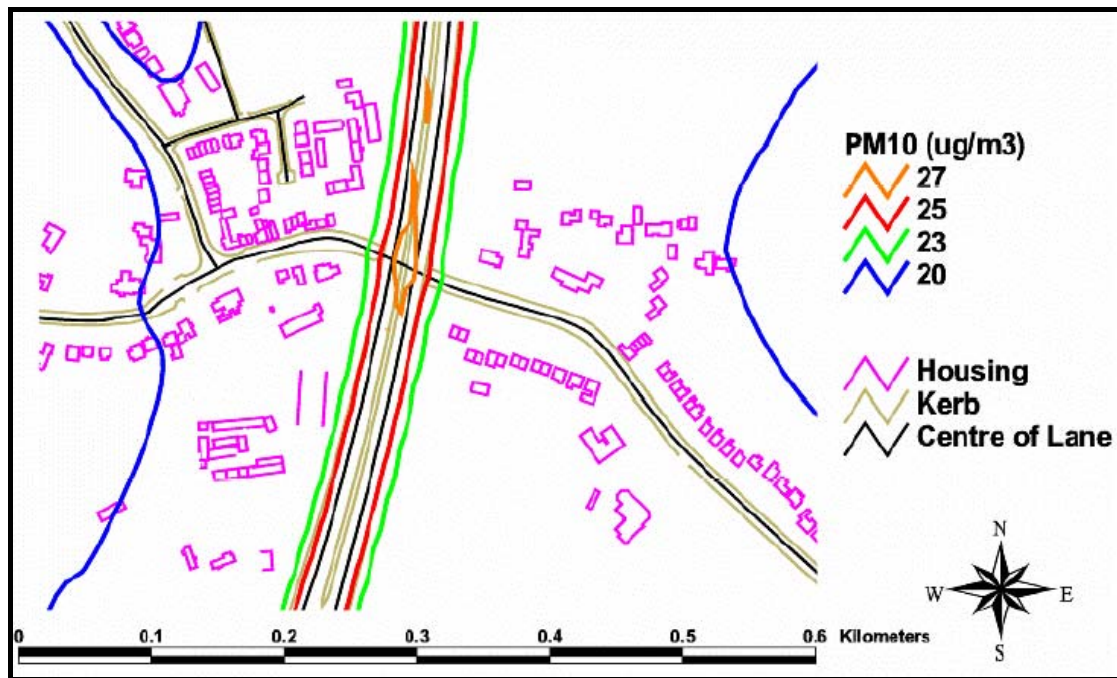
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.10. shows predicted concentrations of PM₁₀ at M1 / B600 (2010)



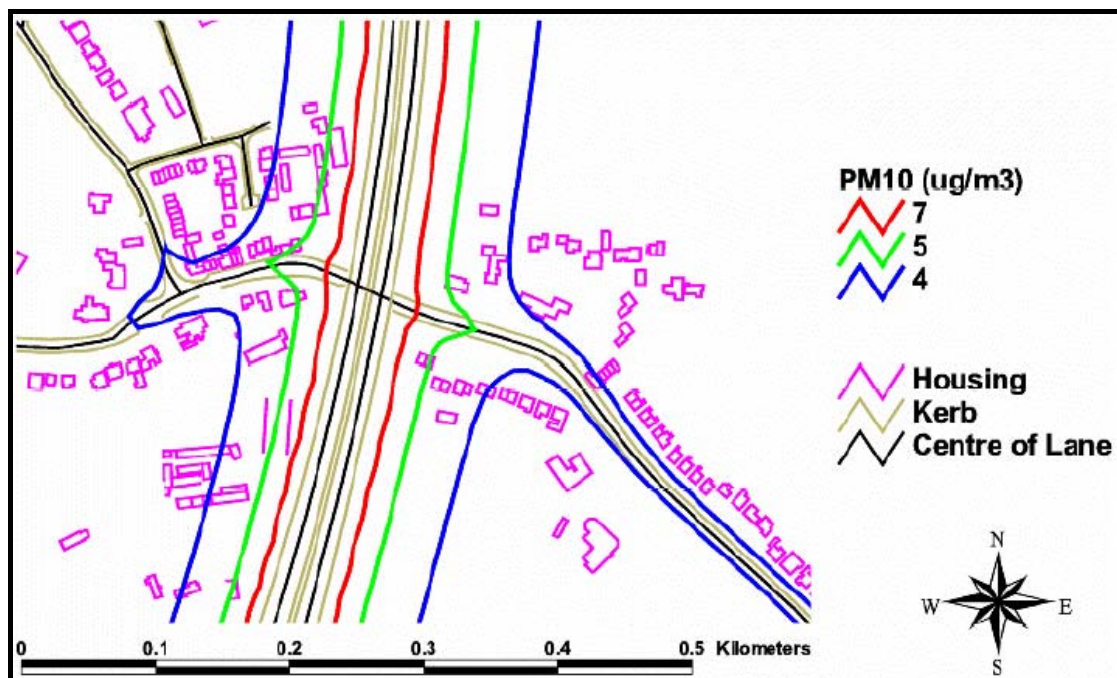
Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.11. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at M1 / B600 (2004)



Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Figure 7.11.12. shows predicted number of days above $50\mu\text{g}/\text{m}^3$ PM_{10} at M1 / B600 (2010)



Source: Broxtowe Air Quality Review Detailed Assessment May 2005

Modelling has predicted that the 2004 objective for PM₁₀ will not be compromised and no further assessment has been undertaken for this section.

7.12. New Industrial Sources

There have been no new industrial sources of PM₁₀ identified within Broxtowe since the last updating and screening assessment (2003) and therefore no further assessment has been undertaken for this section.

7.13. Industrial Sources with Substantially increased emissions, or new relevant exposure

There have been no substantial increase of PM₁₀ emissions or new relevant exposure identified in Broxtowe since the previous Updating and Screening Assessment (2003) and therefore no further assessment has been undertaken for this section.

7.14. Areas of domestic solid fuel burning

The last updating and screening assessment (2003) considered it was unlikely that there are any areas with 50 houses using solid fuel in a 500 metres square. No further assessment has since taken place. It is envisaged that solid fuel burning will continue to decrease throughout all areas within the district.

7.15. Quarries / landfill sites / opencast coal / handling of dusty cargoes at ports, etc.

Local Authorities are only expected to undertake a detailed assessment for PM₁₀ in regard to this section where locations with relevant exposure and substantiated problems associated with dust have been determined.

There are no areas with substantiated problems and a detailed assessment is not required for this section.

7.16. Aircraft

There are no relevant air quality issues relating to aircraft within Broxtowe and therefore no further assessment has been undertaken for this section.

Conclusion

The assessment for PM₁₀ has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the 1-hour mean objective of 350µg/m³ not to be exceeded more than 24 times per year(2004) and a 24-hour objective of 125µg/m³ (2004) will be met across Broxtowe and therefore there is no requirement to proceed to a detailed assessment.

8.0. Sulphur Dioxide

8.1. The National Perspective

The main source of sulphur dioxide in the UK is power stations, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be locally much more significant. Road transport currently accounts for less than 1% of emissions.

Local exceedences of the objectives (principally the 15-minute mean objective) may occur in the vicinity of small combustion plant (less than 20MW) which burn coal or oil, in areas where solid fuels are the predominant form of domestic heating and in the vicinity of major ports.

8.2. National Objectives

266 $\mu\text{g}/\text{m}^3$ 15 minute mean (35 exceedences) (31 December 2005)

350 $\mu\text{g}/\text{m}^3$ 1-hour mean (24 exceedences) (31 December 2004)

125 $\mu\text{g}/\text{m}^3$ 24-hour mean (3 exceedences) (31 December 2004)

8.3. Standards and Objectives

The Government and the 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 in a year by 31 December 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 31 December 2004.

8.4. Source Checklist

The Technical Guidance LAQM.TG (03), published January 2003 and LAQM.TG(03) Update, published January 2006 requires assessment of sulphur dioxide to consider the following sources, data or locations:

- Monitoring data outside an AQMA
- Monitoring data within an AQMA
- New Industrial Sources
- Industrial Sources with substantially increased emissions, or new relevant exposure
- Areas of domestic coal burning
- Small Boilers 5MW (thermal)
- Shipping

- Railway Locomotives

8.5. Monitoring data outside an AQMA

No monitoring for sulphur dioxide has been undertaken in Broxtowe since the last updating and screening assessment (2003), which concluded that the objectives will be met across the district. There has been no significant increase in sulphur dioxide sources identified within Broxtowe.

8.6. Monitoring data within an AQMA

This assessment for this section is only applicable to authorities that have declared Air Quality Management Areas (AQMA's). Broxtowe has declared 4 AQMA's within the district for an exceedance of Nitrogen Dioxide (NO₂). No monitoring has been undertaken for sulphur dioxide.

8.7. New Industrial Sources

There has been no new industrial sources of sulphur dioxide identified since the last updating and screening assessment (2003), likely to give rise to exceedances of the running average mean objective for 1,3-butadiene.

8.8. Industrial Sources with substantially increased emissions, or new relevant exposure

There has been no substantial increase of sulphur dioxide emissions identified in Broxtowe since the last updating and screening assessment (2003) likely to give rise to exceedances of objectives for sulphur dioxide.

8.9. Areas of domestic coal burning

The last updating and screening assessment (2003) considered it was unlikely that there are any areas with 50 houses using solid fuel in a 500 metres square. No further assessment has since taken place. It is envisaged that solid fuel burning will continue to decrease throughout all areas within the district.

8.10. Small Boilers 5MW (thermal)

There are no boilers within the district identified as being greater than 5MW (thermal) and therefore no further assessment has been undertaken for this section.

8.11. Shipping

There are no relevant air quality issues relating to shipping within Broxtowe and therefore no further assessment has been undertaken for this section.

8.12. Railway Locomotives

Authorities are only required to undertake assessment at locations where there is relevant exposure to diesel or coal fired locomotives, which are regularly stationary for periods of 15-minutes or more. There are no locations identified within Broxtowe which meet these criteria, and therefore no further assessment has been undertaken.

Conclusion

The assessment for sulphur dioxide has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the 1-hour mean objective of $350\mu\text{g}/\text{m}^3$ not to be exceeded more than 24 times per year(2004) and a 24-hour objective of $125\mu\text{g}/\text{m}^3$ (2004) will be met across Broxtowe and there is no requirement to proceed to a detailed assessment.

9.0. Conclusion

9.1. Benzene

The assessment for benzene has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the annual objective concentrations of $16.25\mu\text{g}/\text{m}^3$ (2003) and $5\mu\text{g}/\text{m}^3$ (2010) will be met across Broxtowe. Therefore, Broxtowe Borough Council is not required to carry out a Detailed Assessment for benzene.

9.2. 1,3-butadiene

The assessment for 1,3-butadiene has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the running annual mean of $2.25\mu\text{g}/\text{m}^3$ (2003) will be met across Broxtowe. Therefore, Broxtowe Borough Council is not required to carry out a Detailed Assessment for 1,3-butadiene.

9.3. Carbon Monoxide

Although there is no monitoring data for carbon monoxide within the Borough, it is unlikely that ambient concentrations are above the objective. There are no roads within the borough, which can be classified as 'very busy' according to the criteria in the guidance. Consequently, Broxtowe Borough Council is not required to carry out a Detailed Assessment for carbon monoxide.

9.4. Lead

The assessment for lead has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the annual objective concentrations of $0.5\mu\text{g}/\text{m}^3$ (2004) and $0.25\mu\text{g}/\text{m}^3$ (2008) will be met across Broxtowe. Therefore, Broxtowe Borough Council is not required to carry out a Detailed Assessment for Lead.

9.5. Nitrogen Dioxide (NO₂)

The assessment for nitrogen dioxide has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the 1-hour mean of $200\mu\text{g}/\text{m}^3$ (no more than 18 exceedences (2005) will be met. It has also been predicted that the annual mean objective of $40\mu\text{g}/\text{m}^3$ (2005) will be met prior to 2010, however, as monitoring data is not currently available, the Council is unable to assess whether or not it should proceed to a Detailed Assessment at this time with a view to revoking the AQMA. Adopting a cautionary approach, the Council will not proceed to a Detailed Assessment for nitrogen dioxide.

9.6. Particulates (PM₁₀)

The assessment for PM₁₀ has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the 1-hour mean objective of 350µg/m³ not to be exceeded more than 24 times per year (2004) and a 24-hour objective of 125µg/m³ (2004) will be met across Broxtowe and therefore there is no requirement to proceed to a Detailed Assessment.

9.7. Sulphur Dioxide

The assessment for sulphur dioxide has been completed against the 2006 revised criteria checklist contained in LAQM.TG (03). It is expected that the 1-hour mean objective of 350µg/m³ not to be exceeded more than 24 times per year (2004) and a 24-hour objective of 125µg/m³ (2004) will be met across Broxtowe and therefore there is no requirement to proceed to a Detailed Assessment.