



2012 Air Quality Updating and Screening Assessment for South Derbyshire District Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

August 2012

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Executive Summary

This Updating and Screening Assessment has been undertaken in accordance with statutory guidance^(3,4). It is based on a review of the most recent full calendar year of air quality monitoring results from monitoring locations operated by South Derbyshire District Council. It is also based on a review of potential sources of emissions and their likely impact on receptor locations sensitive to air pollution based on current knowledge and experience obtained over the past 10 years of air quality assessments.

South Derbyshire only monitors nitrogen dioxide levels within the District. All monitoring locations demonstrated that nitrogen dioxide levels in 2011 were below the annual average Air Quality Objective of 40 µg/m³. There is no evidence to suggest that any other air pollutants are at or near the short or long term Air Quality Objectives and therefore we do not propose to extend the monitoring network to include other pollutant species.

An assessment of potential sources of air pollution has indicated that there is a possible risk that air quality along High Street in Repton may exceed the annual average Air Quality Objective. The reason for the possible exceedence is because traffic flows in excess of 5000 vehicles per day pass through the relatively narrow street and due to the close proximity of the houses to the kerb. An air quality survey along the High Street is proposed during 2012/13. This will provide empirical evidence to enable a Detailed Assessment of the air quality in Repton to be undertaken.

The Updating and Screening Assessment demonstrates that across the rest of South Derbyshire air quality meets all health based statutory Objectives.

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1 Introduction

1.1 Description of Local Authority Area

The District of South Derbyshire, as the name implies, comprises most of Derbyshire South of the City of Derby, and is bordered on the western side by the Borough of East Staffordshire, to the north by the District of Derbyshire Dales, Derby City and Erewash Borough, and by Leicestershire to the east.

The district covers an area of more than 130 sq. miles, and has a population of around 94,000. Large areas of the river valleys of the Dove and the Trent are dedicated to dairy farming, whilst some arable farming is found on higher ground around Melbourne, and to the south of Swadlincote. In the Trent Valley continuing gravel extraction and previous power generation at Drakelow and Willington power stations provide important landmarks.

Although rich coal and clay seams run together along the Leicestershire border, there are no longer any deep coal mines in operation in the area. The twin industries of coal and clay once formed the backbone of the district's industrial base, but these traditional mining industries have now been substantially replaced by more modern industrial developments.

SOURCES OF POLLUTION

The district is traversed by two major trunk roads, the A38 and the A50, and is contiguous with the large conurbations of Derby City and Burton on Trent. Consequently, the main potential sources of pollution affecting the area are:-

- i) Emissions from industrial processes prescribed under the Environmental Permitting Regulations;
- ii) Emissions from other industrial processes and domestic chimneys;
- iii) Traffic;

- iv) Imported emissions from similar sources outside the district boundary.

Environmental Permits

According to the Environment Agencies online public register there are currently 11 installations permitted as A(1) regulated sites under the Environmental Permitting Regulations within South Derbyshire. The District Council currently regulates a further 38 Part B processes and one A(2) installation.

Traffic Pollution

The main significant sources of traffic related pollution occurs on busy and congested roads.

For South Derbyshire, the roads which have been identified as creating the most pollution are sections of the A38, A50, A511, A444 and the A516.

Other Industrial Sources

General industry as a whole contributes to air pollution levels within South Derbyshire. Where any significant sources are identified, they will also be considered within the review and assessment procedures.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives (AQO) are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment (USA) is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report provides an update of any outstanding information requested previously in Review and Assessment reports.

Section 2 of the report analyses recent air quality monitoring data to determine if there is empirical evidence of any exceedences of the Air Quality Objectives at monitoring locations.

Sections 3 to 7 of the report uses a checklist approach detailed in Local Air Quality Management Technical Guidance TG(09) to identify if there is any risk of the Air Quality Objectives being exceeded at locations where monitoring has not previously been undertaken.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

All previous air quality reports have been summarised below, with any identified/predicted exceedences of air quality objective highlighted.

Report type	Exceedences identified/predicted	Area affected	AQMA declared	Action taken
2003 (Updating And Screening Assessment)	None	NA	No	None required
2004 (Progress Report)	None	NA	No	None required
2005 (Progress Report)	NO ₂ exceedence predicted.	Overseal	No	DRMB Predictions for following year showed compliance with 2005 objective, therefore no action required.
2006 (Updating And Screening Assessment)	None	N/A	No	None required
2007 (Progress Report)	None	N/A	No	None required
2008 (Progress Report)	NO ₂ exceedence predicted.	Overseal	No	Marginal exceedence, site to be monitored closely, if repeated in 2009 USA then detailed assessment to follow.
2009 (Updating and Screening Assessment)	NO ₂ exceedence predicted.	Overseal	No	Marginal exceedence repeated in 2009. Detailed Assessment required.
2010 (Detailed Assessment)	No NO ₂ exceedence identified from additional monitoring.	Overseal	No	Commitment to continue with enhanced monitoring in Overseal
2010 (Progress Report)	None	N/A	No	None required
2011 (Progress Report)	None	N/A	No	None required

Historically air quality assessments and monitoring in South Derbyshire has demonstrated that all of the National Air Quality Objectives are being met. Investigations into apparent breaches of the Objectives (in 2010) resulted in

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improvements in the monitoring methodologies which subsequently demonstrated that Objectives were being attained.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

South Derbyshire District Council does not undertake any automatic monitoring within the district.

2.1.2 Non-Automatic Monitoring Sites

South Derbyshire District Council monitors NO₂ in the district with Palmes type diffusion tubes. Diffusion tubes are small plastic tubes containing a media, which upon exposure to pollutants passively absorbs them. Once returned to a laboratory for analysis, a calculation can be made of the mean pollutant concentration in the location of the tube from the duration of exposure and amount of pollutants absorbed. The laboratory uses a 50% TEA in water preparation method, and follows the procedures set out in the Harmonisation Practical Guidance as required by DEFRA and the Devolved Administrations. The tubes are located at 11 points around the district and are analysed monthly by ESG Laboratory.

The results from the laboratory need to be 'bias adjusted' to correct for the inherent uncertainties that occur using this method. This can be done by comparing the results to those obtained from a local real-time NO₂ monitor that was located at the same site as one of the tubes, or from figures derived by the laboratory supplying and analysing the tubes. As South Derbyshire has no real-time analysers we have taken the average bias adjustment value from all ESG 50% TEA diffusion tube surveys across the UK for 2011.

The Workplace Analysis Scheme for Proficiency (WASP) laboratory survey tests the proficiency of laboratories undertaking analysis of chemical pollutants in workplace and ambient air. The most recently published proficiency testing results (rounds 108-115) covering the period January 2010 to December 2011 rated all ESG analysis as 'satisfactory'.

The national bias correction factor for ESG 50% TEA for 2011 was **0.84**.

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An illustration of each of the diffusion tube monitoring locations is provided in the following figures.

Figure 2.2a Map of Non-Automatic Monitoring Sites in Church Gresley



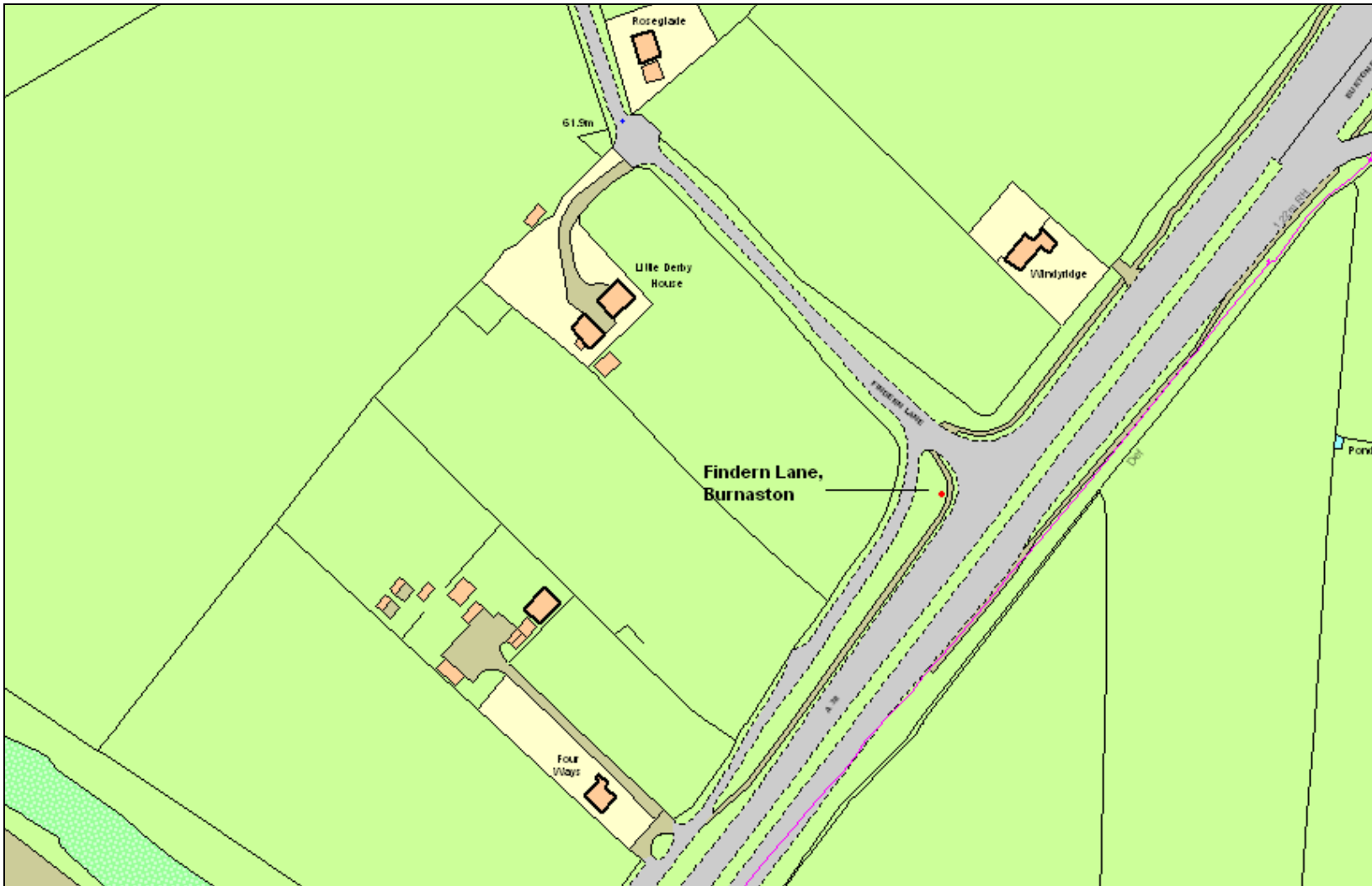
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Figure 2.2b Map of Non-Automatic Monitoring Sites in Woodville



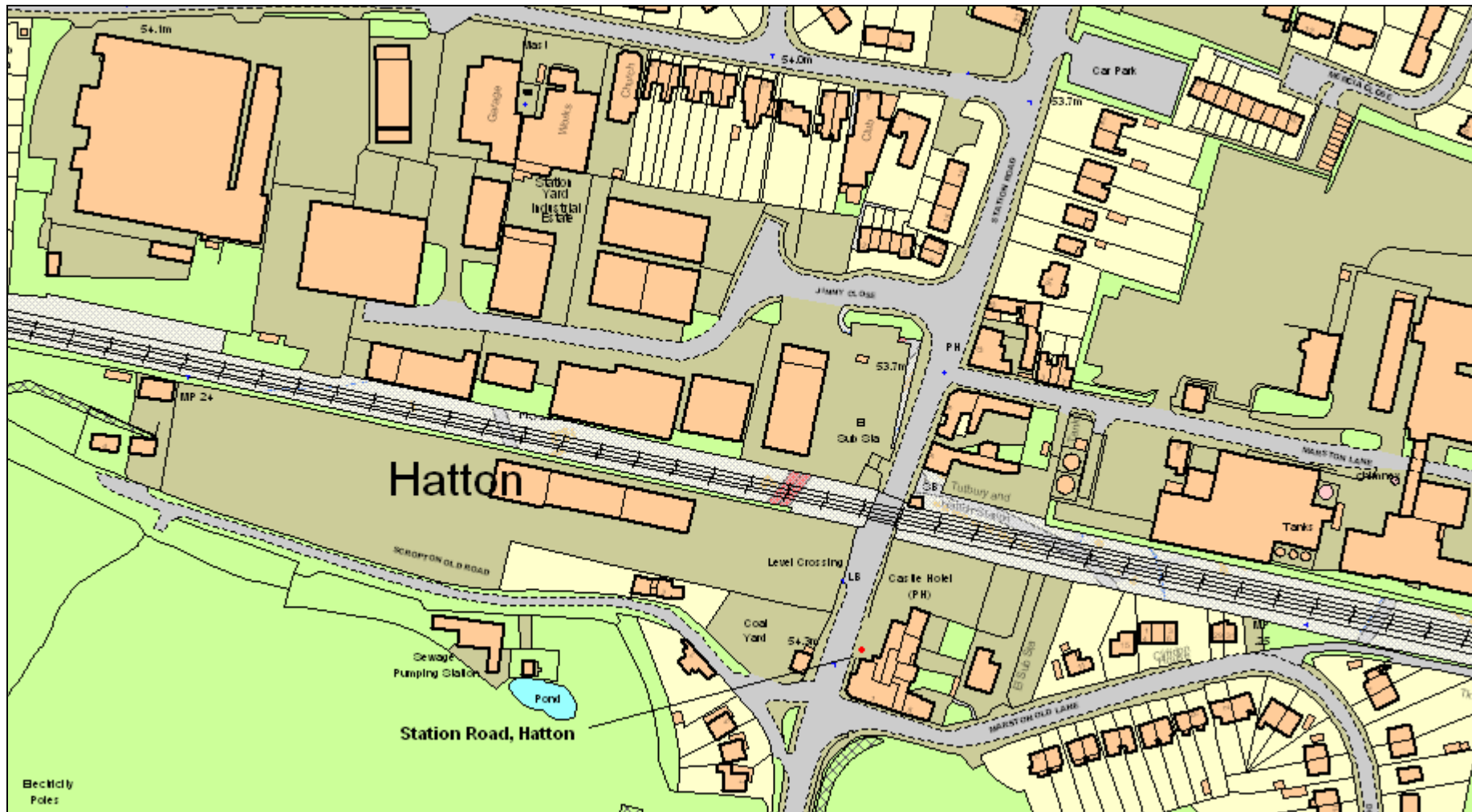
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Figure 2.2c Map of Non-Automatic Monitoring Site in Burnaston



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Figure 2.2d Map of Non-Automatic Monitoring Site in Hatton



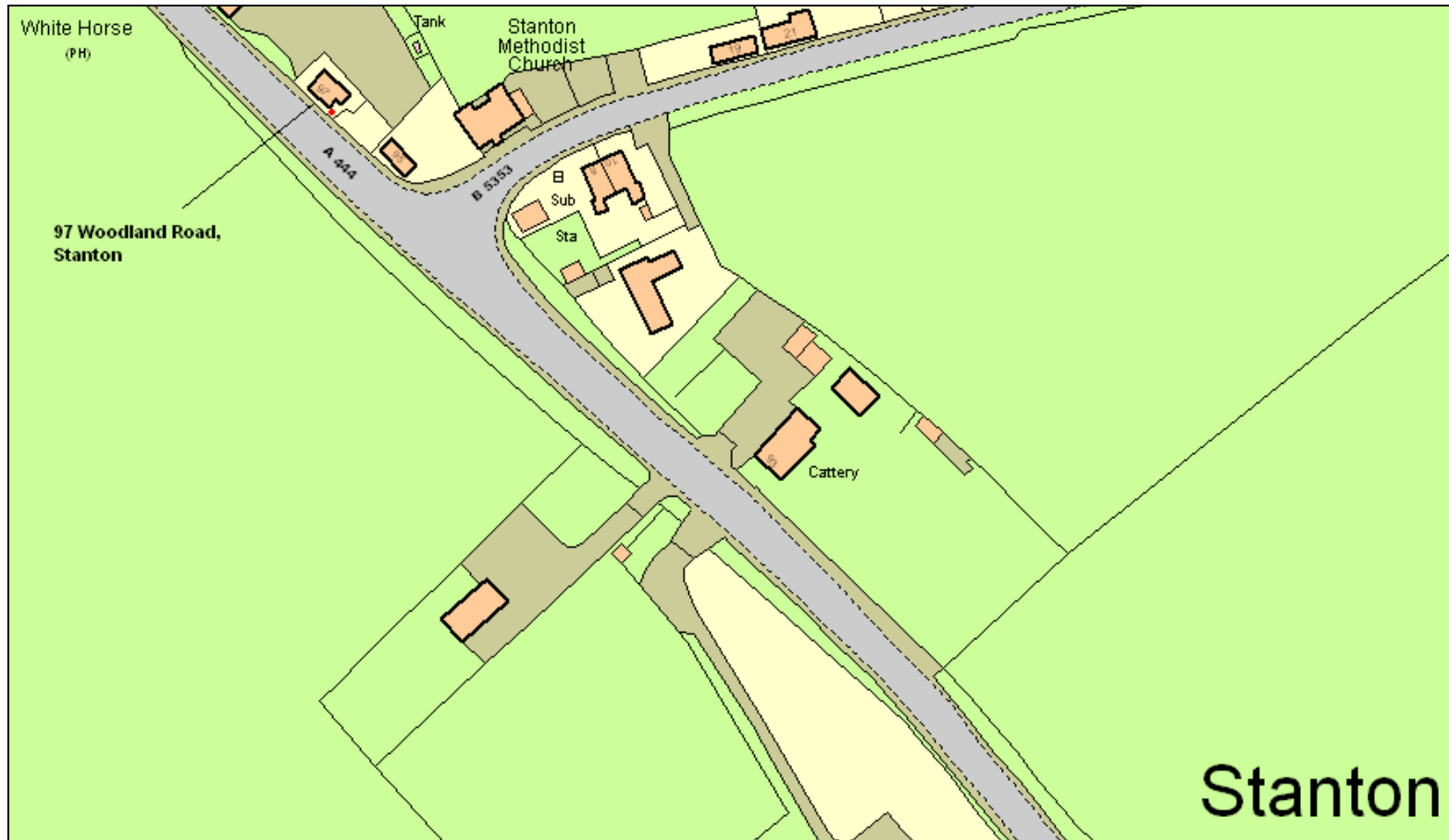
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Figure 2.2e Map of Non-Automatic Monitoring Site in Overseal



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Figure 2.2g Map of Non-Automatic Monitoring Site in Stanton



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Table 2.1 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Road sign, Findern Lane, Burnaston	Roadside	430056	331100	NO ₂	No	No	N	<1m	Y
27 High Street, Woodville	Roadside	431567	319138	NO ₂	No	No	Y 0.5m	4m	Y
Community Centre Hall Street, Church Gresley	Urban background	429302	318628	NO ₂	No	No	Y 0m	20m	Y
Castle Hotel, Station Road, Hatton	Roadside	421480	329623	NO ₂	No	No	Y 10m	4m	Y
The Nelson, High Street, Woodville	Kerbside	431588	319085	NO ₂	No	No	Y 1.5m	1m	Y
8 High Street, Woodville	Roadside	431538	319150	NO ₂	No	No	Y <1m	4m	Y
Road sign adjacent to Robin Hood PH, Lullington Road	Roadside	429454	315403	NO ₂	No	No	Y <1m	2m	N
Road sign next to 1 Lullington Road Overseal	Roadside	429463	315389	NO ₂	No	No	Y <1m	30m	N
97 Woodland Road, Stanton	Roadside	427002	319850	NO ₂	No	No	Y <1m	3m	Y
Lamppost near 160 Burton Road, Castle Gresley	Kerbside	427618	318884	NO ₂	No	No	Y 5 m	1 m	Y
Library, 1 Hartshorne Road, Woodville	Roadside	431501	319259	NO ₂	No	No	N	15m	N

2.2 Comparison of Monitoring Results with AQ Objectives

Only nitrogen dioxide is monitored within South Derbyshire

2.2.1 Nitrogen Dioxide

The 2011 annual monitoring results for each of the non-continuous monitoring locations are summarised in Table 2.2. Exceedences of the annual average Air Quality Objective for NO₂ are highlighted in the shaded cells.

All monitoring locations complied with the AQO in 2011.

The five year arithmetic mean for the eight long term monitoring location shows that overall there has been a downward trend in annual average NO₂ levels in South Derbyshire. Seven of the monitoring locations showed a linear trend decrease of 1.64 to 24.69%.

Table 2.2 Results of Non-Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site Name	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %	Valid Data Capture 2011 %	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2007*	2008*	2009*	2010*	2011
Road sign, Findern Lane, Burnaston	Roadside	No	N/A	100.0	31.2	29.2	32.7	29.3	28.2
27 High Street, Woodville	Roadside	No	N/A	100.0	33.2	35.0	39.2	52.1	29.6
Community Centre Hall Street, Church Gresley	Urban background	No	N/A	45.5	18.2	17.7	17.7	21.0	18.3
Castle Hotel, Station Road, Hatton	Roadside	No	N/A	90.9	29.5	27.3	30.6	29.3	25.5
Robin Hood PH, Burton Road, Overseal	Roadside	No	N/A	90.9	40.5	41.4	43.5	41.3	32.1
8 High Street, Woodville	Roadside	No	N/A	90.9	Not monitored	Not monitored	32.3 ^a	48.8	35.8
Road sign adjacent to Robin Hood PH, Lullington Road	Roadside	No	N/A	81.8	Not monitored	Not monitored	20.8 ^a	33.6	24.7
Road sign next to 1 Lullington Road Overseal	Roadside	No	N/A	54.5	Not monitored	Not monitored	19.2 ^a	32.4	32.2
97 Woodland Road, Stanton	Roadside	No	N/A	100.0	34.4	32.6	31.6	31.0	24.5
Lamppost near 160 Burton Road, Castle	Kerbside	No	N/A	100.0	38.7	37.7	38.3	36.7	30.8

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Site Name	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %	Valid Data Capture 2011 %	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2007*	2008*	2009*	2010*	2011
Gresley									
Library, 1 Hartshorne Road, Woodville	Roadside	No	N/A	90.9	30.7	27.8	33.4	28.9	26.2
84 Burton Road, Findern	Suburban	No	N/A	N/A	22.4	23.9	Not monitored	Not monitored	Not monitored
Village Hall, Main Street, Smisby	Rural background	No	N/A	N/A	18.5	15.6	Not monitored	Not monitored	Not monitored
Scout hut, Packhorse Road, Kings Newton, Melbourne	Suburban	No	N/A	N/A	16.1	17.2	Not monitored	Not monitored	Not monitored

All data reported is based on a full calendar year of monitoring data other than;

^a based on a 5 month monitoring period. The results have been annualised in accordance with TG(09) Box 3.2.

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.84)
								2011 ($\mu\text{g}/\text{m}^3$)
SDDC1	Road sign, Findern Lane, Burnaston	Kerbside	No	No	100.0	Not required	No	28.2
SDDC2	27 High Street, Woodville	Roadside	No	No	100.0	Not required	No	29.6
SDDC3	Community Centre Hall Street, Church Gresley	Urban background	No	No	45.5	Yes	No	18.3
SDDC4	Castle Hotel, Station Road, Hatton	Roadside	No	No	90.9	Not required	No	25.5
SDDC5	Robin Hood PH, Burton Road, Overseal	Roadside	No	No	90.9	Not required	No	32.1
SDDC6	8 High Street, Woodville	Roadside	No	No	90.9	Not required	No	35.8
SDDC7	Road sign adjacent to Robin Hood PH, Lullington Road	Roadside	No	No	81.8	Not required	No	24.7
SDDC8	Road sign next to 1 Lullington Road Overseal	Roadside	No	No	54.5	Yes	No	32.2
SDDC9	97 Woodland Road, Stanton	Roadside	No	No	100.0	Not required	No	24.5
SDDC10	Lamppost near 160 Burton Road, Castle Gresley	Kerbside	No	No	100.0	Not required	No	30.8
SDDC11	Library, 1 Hartshorne Road, Woodville	Roadside	No	No	90.9	Not required	No	26.2

All data reported is based on a full calendar year of monitoring data.

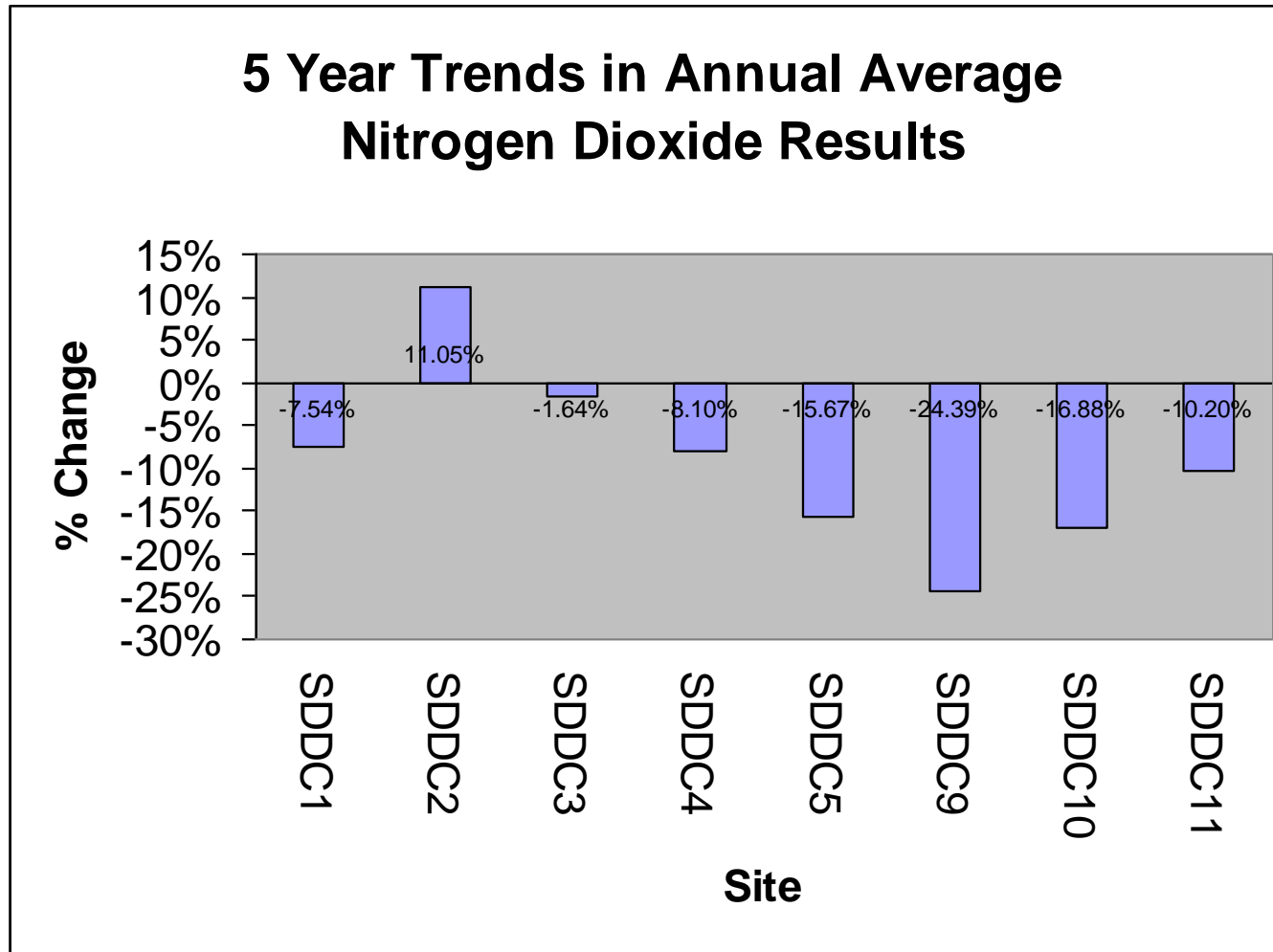
Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2007* (Bias Adjustment Factor = 0.88)	2008* (Bias Adjustment Factor = 0.82)	2009* (Bias Adjustment Factor = 0.81)	2010* (Bias Adjustment Factor = 0.75)	2011 (Bias Adjustment Factor = 0.84)
SDDC1	Kerbside	No	31.2	29.2	32.7	29.3	28.2
SDDC2	Roadside	No	33.2	35.0	39.2	52.1	29.6
SDDC3	Urban background	No	18.2	17.7	17.7	21.0	16.2
SDDC4	Roadside	No	29.5	27.3	30.6	29.3	25.5
SDDC5	Roadside	No	40.5	41.4	43.5	41.3	32.1
SDDC6	Roadside	No	Not monitored	Not monitored	32.3 ^a	48.8	35.8
SDDC7	Roadside	No	Not monitored	Not monitored	20.8 ^a	33.6	24.7
SDDC8	Roadside	No	Not monitored	Not monitored	19.2 ^a	32.4	31.5
SDDC9	Roadside	No	34.4	32.6	31.6	31.0	24.5
SDDC10	Kerbside	No	38.7	37.7	38.3	36.7	30.8
SDDC11	Roadside	No	30.7	27.8	33.4	28.9	26.2
84 Burton Road, Findern	Suburban	No	22.4	23.9	Not monitored	Not monitored	Not monitored
Village Hall, Main Street, Smisby	Rural background	No	18.5	15.6	Not monitored	Not monitored	Not monitored
Scout hut, Packhorse Road, Kings Newton, Melbourne	Suburban	No	16.1	17.2	Not monitored	Not monitored	Not monitored

All data reported is based on a full calendar year of monitoring data other than;

^a based on a 5 month monitoring period. The results have been annualised in accordance with TG(09) Box 3.2.

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



2.2.2 PM₁₀

No monitoring of respirable particulate is undertaken in South Derbyshire

2.2.3 Sulphur Dioxide

No monitoring of sulphur dioxide is undertaken in South Derbyshire

2.2.4 Benzene

No monitoring of benzene is undertaken in South Derbyshire

2.2.5 Summary of Compliance with AQS Objectives

South Derbyshire District Council has examined the results from monitoring in the District during the year 2011 and has referred to historical monitoring data going back to 2007.

Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

The following sections use the framework of statutory guidance to assess the potential for road traffic emissions within South Derbyshire to result in an exceedence of one of the Air Quality Objectives.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when narrow congested streets with residential properties close to the kerb may be at risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide.

In summary, the Guidance concludes that streets relevant to this part of the assessment are those which;

- i. Experience traffic flows greater than 5,000 as an annual average daily traffic flow (AADT), and;
- ii. Are occupied by slow moving traffic which frequently stops and starts due to pedestrian crossings, parked vehicles, etc for much of the day (and not just rush hours) and in which the average speed is less than about 15mph, and
- iii. Have buildings on either side of the road and residential buildings within 2 meters of the kerb.

The table in Appendix A provides estimated traffic flows (in AADT) for all of the key roads in South Derbyshire.

The only street which is deemed to potentially meet criteria i, ii and iii is Main Street Repton, which, based on latest road traffic data estimates, is estimated to have an AADT of 6,142 (count point ref cp97002).

South Derbyshire District Council has identified one street with a flow above 5,000 vehicles per day and residential properties close to the kerb, which has not been considered in previous rounds of Review and Assessment. **An assessment of air quality on Main Street, Repton will need to proceed to a Detailed Assessment.**

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when busy streets where people may spend 1 hour or more close to traffic may be at risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide.

Relevant streets are those where there are many shops and outdoor cafes and bars in close proximity to high volumes of traffic movements. The Guidance suggests that streets relevant to this part of the assessment are;

- i. Where people may be within 5 meters of the kerbside for periods of more than 1 hour, and;
- ii. Where the traffic flows on the road is greater than 10,000 as an annual average daily traffic flow (AADT).

There are not deemed to be any streets in South Derbyshire which meet these criteria.

South Derbyshire confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when roads with a high flow of buses and / or HGVs may be at risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide.

The Guidance advises that there may be some roads where the traffic flows are not necessarily high, but that due to an unusually high proportion of buses or HGVs there is a risk of the Objective being exceeded. The Guidance advises that roads relevant to this part of the assessment;

- i. Have flows of buses / HGVs more than 20% of the AADT, and;
- ii. Have relevant receptors within 10 meters of the kerbside, and;
- iii. Have total bus and HGV flows greater than 2,500 AADT.

The data in Appendix A demonstrates that there are no roads in South Derbyshire with a flow of buses / HGVs greater than 20% of the overall AADT.

South Derbyshire District Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when traffic emissions at busy junctions may be at risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide.

The Guidance advises that due to the cumulative effects of emissions from two or more roads and the effects of congestion, there may be some junctions where there is a risk of the Objective being exceeded.

The Guidance advises that junctions relevant to this part of the assessment;

- i. Have vehicle flows of more than 10,000 AADT, and;
- ii. Have relevant receptors within 10 meters of the kerbside.

The following junctions meet these criteria;

A444 (Burton Road) / A514 (Cadley Hill Road), Swadlincote;

A514 (Swadlincote Road) / A511 (Burton Road) / Moira Road, Swadlincote;

Air quality monitoring has been undertaken for some years at relevant locations representative of receptors on both of these junctions. Annual average levels of nitrogen dioxide have been shown to be consistently below the Air Quality Objective and therefore no further assessments are necessary.

South Derbyshire District Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when traffic emissions at busy junctions may be at risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide and respirable particulates.

The Guidance advises that a new road may present a risk of causing an exceedence of the Air Quality Objectives where;

- i. The AADT on the new road is greater than 10,000, or
- ii. The new road has increased traffic flow along an existing road on which the annual average NO₂ has already been established to be above 36µg/m³, or
- iii. The new road has increased traffic flow along an existing road on which more than 30 exceedences of the 24 hour Objective for PM₁₀ (50µg/m³) has been predicted.

There have been no new roads in South Derbyshire since the last Updating and Screening Assessment.

South Derbyshire District Council confirms that there are no new/proposed roads likely to result in an exceedence of the Air Quality Objectives.

3.6 Roads with Significantly Changed Traffic Flows

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when traffic emissions at busy junctions may be at risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide and respirable particulates.

The Guidance suggests that a road with significantly changed traffic flows is;

- i. A road where traffic flows have increased by more than 10,000 AADT or by more than 25% since the last USA, and;
- ii. A road where the annual average NO₂ has already been established to be above 36µg/m³

No roads in South Derbyshire meet these criteria.

South Derbyshire District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Local Air Quality Management Technical Guidance Note TG(09) provides guidance on conditions when traffic emissions at bus and coach stations may cause a risk of causing an exceedence of the Air Quality Objective for nitrogen dioxide and respirable particulates.

The Guidance suggests that a bus or coach station which may create a risk of a potential exceedence of the Air Quality Objective is where;

- i. There is relevant exposure within 10m of any part of the bus station where buses are present, and;
- ii. There are predicted to be more than 2,500 bus movements per day through the station.

No bus stations in South Derbyshire meet either of these criteria.

South Derbyshire District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There are no airports within South Derbyshire.

The nearest major airport to South Derbyshire is the East Midland airport which is situated approximately 1,600m east of the nearest point of the boundary with South Derbyshire. North West Leicestershire District Council has previously undertaken a Detailed Assessment of emissions from the East Midlands Airport and its associated activities. This Assessment determined that there are no exceedences of the Air Quality Objective in South Derbyshire.

South Derbyshire District Council confirms that there are no airports in the Local Authority area and no airports which significantly influence air quality within the Local Authority Area.

4.2 Railways (Diesel and Steam Trains)

Stationary locomotives, both diesel and coal fired can give rise to high levels of sulphur dioxide close to the point of emission. Recent evidence also suggests that moving diesel locomotives in sufficient numbers can cause high levels of NO₂ close to the track.

4.2.1 Stationary Trains

TG(09) provides guidance on circumstances when stationary railway emissions cause a risk of an Air Quality Objective exceedence. The guidance recommends that the following circumstances create a potential risk;

- i. Relevant locations exist where diesel or steam locomotives are regularly stationary for periods of more than 15 minutes, and;
- ii. Relevant outdoor exposure may occur within 15m of the stationary locomotives.

South Derbyshire District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

TG(09) provides guidance on circumstances when moving railway emissions cause a risk of an Air Quality Objective exceedence. The guidance recommends that the following circumstances create a potential risk;

- i. Where a section of track described in Table 5.1 of TG(09) passes through the District, and;
- ii. Where background NO₂ levels are estimated to be above 25µg/m³, and;
- iii. Where a relevant receptor is located within 30m of trackside.

South Derbyshire District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Large ships generally burn oils with high sulphur contents and if there sufficient movements of such ships there can be a risk of exceedences of the 15 minute Air Quality Objective for SO₂.

Shipping is considered to create a potential risk of an Objective exceedence where;

- i. There is relevant exposure within 1km of berths and main areas of manoeuvring, and more than 15,000 ship movements per year or;
- ii. There is relevant exposure within 250m of berths and main areas of manoeuvring, and more than 5,000 ship movements per year.

South Derbyshire District Council confirms that there are no ports or shipping that meets the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

Industrial installations have the potential to generate emissions which may cause exceedences of the Air Quality Objectives.

Assessments of existing industrial installations have been undertaken in support of previous Review and Assessments. All of these Assessments concluded that there was no risk of any exceedences of the Air Quality Objectives.

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out

South Derbyshire District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority which will adversely affect air quality.

5.1.2 Existing Installations where Emissions have increased substantially or New Relevant Exposure has been introduced

South Derbyshire District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

South Derbyshire District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There is some evidence that major fuel petrol depots could emit benzene in such quantities that there may be a risk of emissions causing an exceedence of the benzene Air Quality Objective.

South Derbyshire District Council can confirm that there are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

There is some evidence that petrol stations could emit benzene in such quantities that there may be a risk of emissions causing an exceedence of the benzene Air Quality Objective.

TG (09) identifies that there may be a risk of the Air Quality Objective being exceeded where the following criteria apply;

- i. A petrol station carries an annual throughput of more than 2000m³ of petrol, and;
- ii. The relevant station is located near to a busy road with an AADT of more than 30,000, and;
- iii. There are relevant receptors located within 10m of the pumps.

All petrol filling stations with a throughput of greater than 500m³ per annum of petrol are required to hold an environmental permit which is regulated by South Derbyshire District Council. There are currently 13 petrol filling stations holding an environmental permit. None of the petrol filling stations within South Derbyshire meet all of the above criteria.

South Derbyshire District Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Evidence of exceedences of the Air Quality Objective for PM₁₀ has been identified from emissions from poultry farms.

TG(09) recommends that there may be a potential risk of the PM₁₀ Objective being exceeded where the following criteria apply;

- i. Where the poultry unit houses
 - a. 400,000 birds if mechanically ventilated, or
 - b. 200,000 birds if naturally ventilated, or
 - c. 100,000 birds for any turkey unit, and
- ii. There is relevant exposure within 100m of the poultry units.

There are two poultry units regulated by the Environment Agency within South Derbyshire, namely;

- Overbrook Farms Ltd, Woodlands Farm, Woodyard Lane, Foston, Derbyshire.
- Cherry Tree Farm Poultry Unit, Dalbury Lees, Derbyshire

The existing stocking levels at the poultry unit do not meet the criteria above.

South Derbyshire District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Biomass burning can lead to an increase in PM₁₀ emissions and compared to conventional gas burning, biomass burning can result in an increase in the overall NO_x emissions.

TG(09) sets out criteria where biomass emissions may create a risk of an exceedence of an Air Quality Objective. Only biomass facilities in excess of 50kW are deemed likely to create a risk of an Objective exceedence.

There is one known biomass installation in South Derbyshire located at the Rosliston Forestry Centre. The net rated thermal capacity of this installation is below 50kW and therefore the installation is below the level considered to pose any risk of exceeding the Air Quality Objectives

South Derbyshire District Council confirms that there are no biomass combustion plant in the Local Authority area which exceed the screening assessment criteria.

6.2 Biomass Combustion – Combined Impacts

There is the potential that many small biomass combustion installations (including domestic solid fuel burning), could in combination lead to unacceptably high PM₁₀ concentrations.

TG(09) provides a process for determining the risk of a potential exceedence of the Air Quality Objective from cumulative domestic and service sector emissions.

The take-up of biomass has been relatively limited across the district and the nature of appliances and fuels used in the main urban area of Swadlincote is still controlled through a Smoke Control Order. There is not deemed to be a significant risk from cumulative combustion sources within the District.

South Derbyshire District Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Significant amounts of domestic solid fuel burning can give rise to exceedences of the Objective for SO₂.

TG(09) provides a process for determining the risk of a potential exceedence of the Air Quality Objective for SO₂ from domestic solid fuel burning.

Domestic solid fuel emissions are only considered likely to be significant where the density of coal burning premises exceeds 100 per 500 by 500m square.

A review and assessment of air quality in 2003 concluded that the maximum number of solid fuel appliances in the main urban cores of Swadlincote per 500 by 500m area were;

Swadlincote	-	22
Church Gresley	-	18
Newhall	-	65
Midway	-	42

There is no evidence to suggest that these numbers have altered significantly since the original assessment and therefore they have been taken for the purposes of this updating and screening assessment.

South Derbyshire District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Dust emissions from a range of fugitive and uncontrolled sources can give rise to elevated PM₁₀ concentrations. Generally sources are associated with the passage of vehicles over unpaved ground, from the passage of vehicles over public roads onto which dust and dirt has been 'tracked out', from the handling of dusty materials and windblown dust from stockpiles or dusty surfaces.

Relevant sources of fugitive or uncontrolled dust are defined within TG(09) (p.5-52) as;

- Quarrying and mineral extraction site;
- Landfill sites;
- Coal and mineral stockyards, or materials handling;
- Major construction works, and;
- Waste management sites

TG(09) recommends that an assessment of the risk of an exceedence of the Objective for PM₁₀ consider the proximity of a receptor to a relevant source, the existing predicted background PM₁₀ concentration and evidence from either complaints or observations of significant fugitive dust emissions.

A review has been undertaken of all complaints made about dust to South Derbyshire District Council over the period 1st January 2009 to 31st December 2011. Where any of the alleged sources of dust have fallen into the categories of sources above then a further screening assessment has been undertaken to determine the potential risk of an exceedence of the AQO for PM₁₀.

Table 7.1 below summarises the relevant sites which have been the subject of a dust complaint during the period 1st January 2009 to 31st December 2011;

Table 7.1 Assessment of Fugitive Sources

Source	Nature of Source	Number of Complaints	Distance to Nearest Receptor	Evidence of dust emissions or track out
Development on Station Road, Melbourne	Construction	3	30m (Properties on Stations Road)	No – development now complete
Bison, William Nadin Way, Swadlincote	Mineral processing	3	230m (The Long House, Cadley Lane)	No
Development off Swadlincote Lane, Church Gresley	Construction	13	20m (all newly developed properties)	Development now largely complete
Wards Recycling, Moira Road, Woodville	Waste management	2	10m (Properties on Moira Road and Swadlincote Road)	No
Development off William Nadin Way, Swadlincote	Construction	8	150m (Woodview Road & Meadowview Road)	No current development activity
Quarry off Repton Road, Willington	Mineral extraction	1	210m (15 Tailby Drive, Willington)	No

South Derbyshire District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

New monitoring data showed a sharp decline in annual average NO₂ levels between 2010 and 2011 and the five year long term trends are generally demonstrating that NO₂ levels are reducing. This is bucking the trend in much of the rest of the country where long term improvements in air quality due to predicted improvements in vehicle technology have not materialised. The long term reductions are particularly noteworthy as the population base of the District has increased by approximately 5% in this period and thus traffic volumes will have increased above the national trend.

No exceedences of AQOs were identified at any of the monitoring locations.

8.2 Conclusions from Assessment of Sources

None of the existing sources of atmospheric emissions in South Derbyshire are predicted to be causing a risk of an exceedence of any of the AQOs.

A review of the most recent traffic data has identified a small potential risk that canyon conditions on High Street Repton may restrict the dispersion of traffic emissions to the possible detriment of the air quality in this single street.

8.3 Proposed Actions

The Updating and Screening Assessment has identified the need to progress to a Detailed Assessment of air quality on High Street, Repton.

No air quality monitoring data exists from Repton to support or refute the assumption that buildings along the High Street are acting as a possible canyon and preventing the dispersion of traffic emissions. We propose to undertake a 6-12 month survey of air quality at three residential receptor locations to determine if the annual average AQO for nitrogen dioxide is being exceeded at receptor facades.

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In the event that the monitoring results demonstrate an exceedence of the AQO, further dispersion modelling will be undertaken using an appropriate validated model in order to predict the spatial extents of the AQO exceedence.

The only other changes proposed to be made to the Council's existing air quality service are some minor adjustments to existing diffusion tube monitoring locations in order to reduce the frequency of the theft of the monitoring tubes.

9 References

1. The Environment Act 1995
2. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1), DEFRA, 2007
3. Local Air Quality Management Technical Guidance LAQM.TG(09), DEFRA 2009
4. Design Manual For Roads and Bridges, Volume 11 Section 3 Part 1, HA207/07, Air Quality
5. Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users, Air Quality Consultants Ltd, 2008
6. Diffusion Tube Environmental Monitors Instruction Manual For Exposure and Location, Gradko International Ltd, undated

Appendices

Appendix A: QA/QC Data

Appendix B: Traffic Data

Appendix A: QA:QC Data

Factor from Local Co-location Studies (if available)

No co-location study was involved in the derivation of the Councils bias adjustment.

Diffusion Tube Bias Adjustment Factors

The bias adjustment factor for 2011 is based on the equivalent national studies reported on the DEFRA website for ESG 50% TEA diffusion tube surveys across the UK for 2011. These are summarised below;

Authority and location type		Duration (mths)		% variance	Good / Poor	Bias Correction	
R	Dover District Council	12	42	37	14.0%	G	0.88
UB	Medway Council	12	22	26	-15.6%	G	1.19
R	North East Lincolnshire Council	10	52	48	8.9%	G	0.92
R	North East Lincolnshire Council	9	38	35	7.5%	G	0.93
R	North East Lincolnshire Council	12	41	31	32.8%	G	0.75
UB	North East Lincolnshire Council	12	22	21	7.5%	P	0.93
B	Medway Council	9	32	20	55.3%	G	0.64
R	Wrexham County Borough Council	12	22	19	11.8%	G	0.89
R	Medway Council	9	36	30	19.0%	G	0.84
K	Marylebone Road Intercomparison	11	121	99	21.5%	G	0.82
R	Castlereagh Borough Council	11	48	40	20.9%	G	0.83
R	Down District Council	12	51	36	39.0%	G	0.72
R	Lisburn City Council	12	30	20	49.6%	G	0.67
R	North Down Borough Council	11	45	27	66.7%	G	0.60
K	Suffolk Coastal District Council	12	51	43	18.7%	G	0.84
R	Dumfries and Galloway Council	12	38	32	20.0%	G	0.83
R	Rugby Borough Council	10	34	34	-0.3%	G	1.00
R	Wycombe District Council	10	43	39	11.5%	G	0.90
R	Tunbridge Wells Borough Council	12	59	43	38.5%	P	0.72
R	LB Newham	12	40	47	-14.3%	G	1.17
UB	Canterbury City Council	11	17	15	17.8%	G	0.85
R	Canterbury City Council	12	39	34	15.5%	G	0.87
Overall Factor³ (22 studies)						Use	0.84

Appendix B: Traffic Data

Summary of traffic data from relevant traffic count points in 2010.

Count Point Ref	Road	Easting	Northing	AADT	% HGV	Location
26391	A38	427448	327708	28206	10.12%	Willington
46395	A38	430138	331161	36307	7.26%	Burnaston
73363	A38	430820	332586	12135	7.66%	Littleover
99569	A38	428260	328724	20318	10.72%	Willington
cp16362	A38	431094	333377	38923	9.58%	Findern
cp26391	A38	427448	327708	48058	11.13%	Egginton
cp99569	A38	428257	328724	44047	12.62%	Willington
7148	A444	427300	319500	8034	4.31%	Stanton
37203	A444	429011	316175	13068	6.86%	Linton
80680	A444	429800	314100	4644	6.85%	Donisthorpe
cp1916	A444	429309	315657	10631	7.84%	Overseal
cp7148	A444	426652	320084	15046	4.92%	Swadlincote
26534	A50	416415	332020	18921	13.68%	Sudbury
99122	A50	424536	331320	49687	13.62%	Aston
99123	A50	418697	331798	37132	14.85%	Foston
99542	A50	414402	333285	48194	13.63%	Doveridge
99566	A50	426926	330723	37672	14.31%	Etwall
99567	A50	430708	329983	87087	11.57%	Findern
99568	A50	439754	329854	31576	11.05%	Aston
99756	A50	442752	330100	36344	10.82%	Shardlow
cp75306	A50	440600	330450	40795	12.49%	Aston
cp99123	A50	418697	331798	38351	15.96%	Foston
cp99542	A50	414402	333285	36750	14.82%	Sudbury
cp99566	A50	428000	330360	37744	14.40%	na
cp99567	A50	430708	329983	39047	13.02%	Findern
cp99568	A50	439754	329854	41993	12.22%	Chellaston
cp99756	A50	442752	330100	47285	12.44%	Shardlow
26535	A511	430037	321174	11318	3.14%	Swadlincote, Springfield Road junction
77500	A511	433000	318970	9295	6.83%	Swadlincote, Butt Lane
77502	A511	428250	322260	6933	4.08%	Swadlincote, Burton Road
cp1114	A511	421528	329777	10406	4.44%	Hatton
cp38688	A511	421600	330000	8170	4.79%	Hatton
7710	A5132	430000	328500	4784	1.82%	
27777	A5132	429051	328447	2051	2.19%	
37821	A5132	435000	328600	3667	5.15%	
47780	A5132	425882	329938	3697	2.49%	
cp27777	A5132	429051	328447	7089	2.57%	Willington
cp75305	A5132	428250	328590	4073	5.65%	Willington
cp7710	A5132	430000	328500	5531	2.33%	Willington
17188	A514	436500	325000	5326	1.67%	
37283	A514	437560	329000	5080	1.44%	
47262	A514	434922	323959	9146	1.47%	
80211	A514	430158	319719	7607	2.80%	
99729	A514	428000	319100	6841	4.58%	

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cp2385	A514	427761	318962	11423	5.50%	Swadlincote
cp37283	A514	437560	329000	15614	1.67%	Swarkestone
cp99729	A514	428000	319100	11387	5.37%	Swadlincote
47266	A516	428157	332934	22833	7.58%	
cp47266	A516	428157	332934	15252	7.40%	Burnaston
cp2907	B586	430381	320269	7871	0.85%	Swadlincote
cp97002	C29	430690	326510	6142	1.10%	Repton
cp931390	C366	423735	330677	5311	1.11%	Hilton
cp931389	C47	423967	319440	4648	1.20%	Drakelow