2013 Air Quality Progress Report for Rushcliffe Borough Council

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

July 2013

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Executive Summary

This report provides an update with respect to air quality issues within the borough of Rushcliffe over the year 2012 and the progress of implementation of the measures outlined in the Air Quality Action Plan (AQAP), published initially in May 2007 (updated 2009) as required by the Environment Act 1995. Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work.

The AQAP contains a set of measures aimed at working toward ensuring the air quality in Rushcliffe meets the Air Quality Objectives set out in the National Air Quality Strategy due to excessive levels of Nitrogen Dioxide in air quality management areas (AQMA's) within the Borough.

Rushcliffe has three active air quality management areas all of which have been declared due to traffic pollution and in particular due to excessive levels of the annual Nitrogen Dioxide above the air quality objective (AQO) level in certain areas. The areas covered by the AQMA's are the Trent Bridge/Radcliffe Road/Wilford lane areas, part of the A52 ring road up to the Nottingham Knight traffic island and the A5 junction with Stragglethorpe Road, Radcliffe on Trent. These areas are major traffic routes into/out of and around the Nottingham area and are controlled by partner organisations to Rushcliffe; namely, the Highways Agency and Nottinghamshire County Council.

This report includes consideration of new monitoring data and emissions sources assessed by Rushcliffe Borough Council over the 2010 period.

Rushcliffe has undertaken atmospheric pollution monitoring of particulate matter (PM10), NO2/NOx (chemi-luminescent monitoring) and NO2 diffusion tube monitoring at 37 monitoring locations in 2012. The progress report's review of new monitoring data has shown that exceedences of Nitrogen Dioxide annual mean objective continue to occur within Rushcliffe's Air Quality Management Area 1 at certain locations that are relevant locations close to busy roads. In AQMA 2, all sites

have been shown to be below the AQO for a further year but only marginally below the annual objective of 40 micrograms. In the newly declared AQMA 4 at Stragglethorpe Road/A52 levels are significantly above the annually mean objective at façade but below the hourly objective. There are no plans at this stage to revoke any AQMA.

Levels of non-aqma sites have shown a slight increase in 2012

The excedences in the AQMA1 relate to two sites that are consistently above the AQO for the annual mean. These two sites being the Trent House Flats and the Radcliffe Road site; both are on facades of residential premises. These two sites are only marginally above the AQO in 2012 but roadside levels are higher particularly around the Trent Bridge junction highlighted by the TBI tube. It is therefore important to ensure no new receptors are not allowed to develop in this situation which may make achieving the AQO in the future more difficult or impossible without major re-design of road layouts.

The development of the new AQAP for AQMA4 has stalled at consultation stage with the Highways Agency. It is the intention over 2013 to pursue this and finalise the AQAP.

The monitor that was purchased to undertake monitoring at AQMA4 has not been able to be installed at his site due to various issues that the Highways Agency has with doing this. As such the monitor is temporarily sited in AQMA 1 at Trent House Flats.

The PM10 levels at AQMA 4 have been assessed with the Sven Leckel . There were no exceedences in 2012 of the annual mean objective for PM10 (50 µg/m3) (Table 2.7) and there were 21 exceedences of the 24-hour mean objective (Table 2.8). A graph showing the full dataset is shown in Appendix B, Figure 13.2. The siting was on land with permission of the occupier. He has now removed permission for installing a new monitor.

Monitoring in Bingham area has continued. No exceedances have been established depite previous concerns. Monitoring will continue to see how the expansion affects air quality NO2 levels.

The report concludes there is no requirement to proceed to detailed assessment for NO2.

The progress report concludes that no Detailed Assessment is required for benzene, 1, 3-butadiene, carbon monoxide, lead, particulates (PM10), and sulphur dioxide.

The NET phase 2 is now being constructed which is expected to have a positive effect on air quality once operational by reducing commuter traffic coming through routes used to access Trent Bridge within the Rushcliffe area. These benefits will however be a number of years away.

A comprehensive list of interventions undertaken to date and progress since the last R&A report by the Nottinghamshire County Council through The Local Transport Plan is shown in, Chapter 8.

All of the AQMA areas in Rushcliffe are major traffic routes into/out of and around the Nottingham area and are controlled by partner organisations to Rushcliffe; namely, the Highways Agency and Nottinghamshire County Council. The measures that are in place across the county in the Local Transport Plan (LTP), national policies and the Highways Agencies policies on air quality will help toward better air quality in these areas.

The AQAP, through the LTP programmes of work, continues to implement a number of measures with the aim of reducing single occupancy car usage and reducing the impact of road vehicles in and around the AQMA1 area. The majority of the measures are, however, aimed at the commuters as a whole and not just in and around the AQMA. The LTP indicators used to monitor performance against the delivery of the LTP strategy and therefore the AQAP are generally meeting their targets, although there is room for improvement on two indicators.

A comprehensive list of interventions undertaken to date and progress since the last R&A report by the Nottinghamshire County Council through the LTP is shown in, Chapter 8.

The conclusion from the County Council states that funding for local transport improvements, such as addressing congestion or air quality, is called the integrated transport block and is calculated by the Department for Transport (DfT) through

needs based formulas. The integrated transport block for Nottinghamshire in 2012/13 represented a reduction of £5.39m or 50% in comparison with 2010/11 proposed funding levels. These reductions in funding will have a serious impact on the delivery of transport improvements within AQMA1, as detailed within the AQAP.

Rushcliffe BC recognises that it has a role to play to ensure that AQO's are met in the borough. We continue to work toward reducing our impacts on air quality by introducing a number of measures such as remote working, good fleet management, energy efficiency measures and working toward the introduction of a travel plan for employees. The travel survey was undertaken in 2012 but to date a travel plan has not been developed. Rushcliffe has joined a the ECO-stars fleet project and been rated through this process.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Rushcliffe lies to the south of Nottingham City and the river Trent in Nottinghamshire and covers 157 square miles (around 400 sq km) and has a population of 111,100. It stretches from the River Trent to the Leicestershire borders and eastwards along the Trent Valley, to within a few miles of Newark.

The largest town is West Bridgford, with a population of about 36,000. This is part of the Nottingham urban area, being separated from the city of Nottingham by the River Trent. The other major settlements within the borough are Bingham, Cotgrave, East Leake, Keyworth, Ruddington and Radcliffe-on-Trent. A plan of the borough area is shown in Map 1.1

Several major roads cross the borough, linking the borough with both the M1 and the A1. Principally this is the A52 and the recently upgraded to dual carriageway A46. There are also high daily traffic flows in West Bridgford, from the major arterial routes into Nottingham City centre. Although the borough is predominantly rural in nature, it also contains some significant industrial processes. These include Ratcliffe-on-Soar power station and the British Gypsum plasterboard factory at East Leake.

East Midlands Airport (EMA) lies immediately to the south west of Rushcliffe, within the district of North West Leicestershire District Council. Although the flight paths for both approaching and departing aircraft pass directly over the borough, the air quality impacts of the airport itself do not affect Rushcliffe residents.

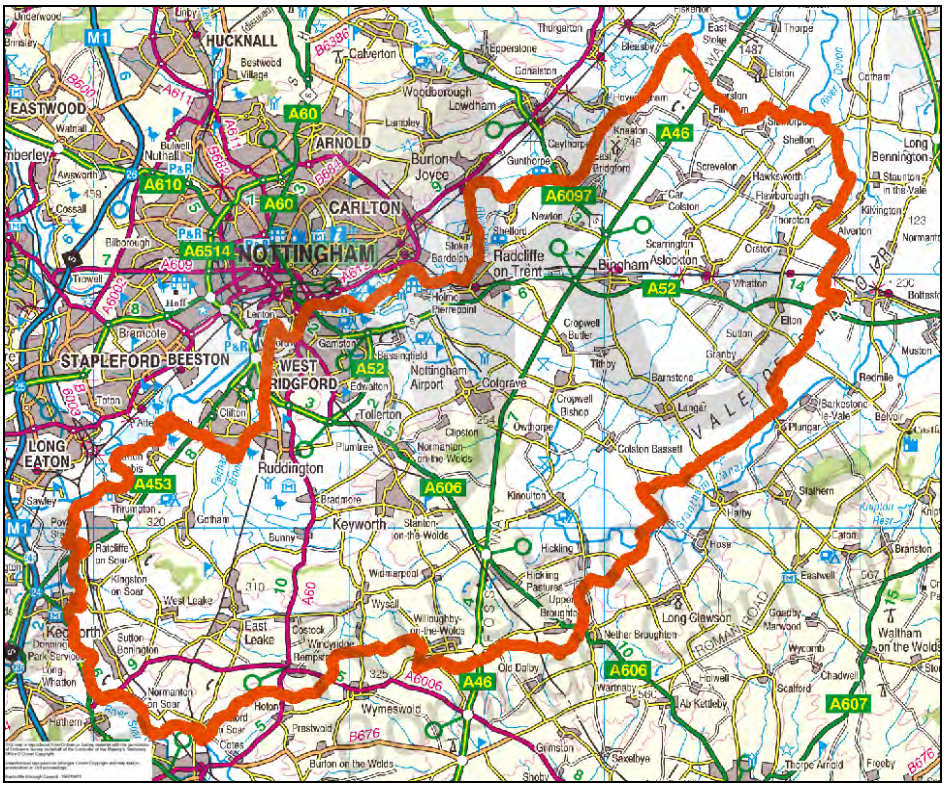
The major sources of pollution of concern are derived from commuter traffic moving in and out of Nottingham.

The locations of the AQMAs in the borough are shown in Map 1.2 to Map 1.5

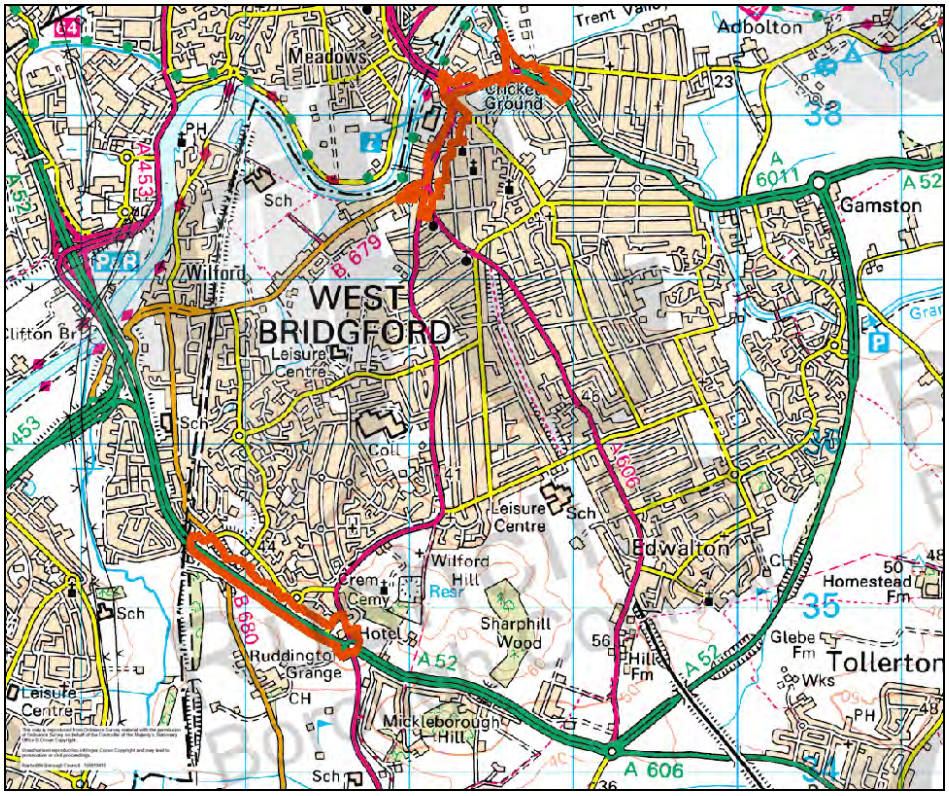
Much of Rushcliffe is rural and agricultural. The western half of the Borough is characterised by the Wolds, with higher undulating land in the south. The remainder of the Borough is flatter and lower with the rivers Trent, Soar and Smite forming shallow valleys running through the Borough. There are mixed areas of woodland,

except for the north-eastern part and the area west of Ruddington which are characterised by an open, flat landscape where many trees and hedgerows have been removed. Other prominent features are Gotham Hill, Hickling Standard, Wilford Hill, Barton Gap and Cropwell Bishop Gap.

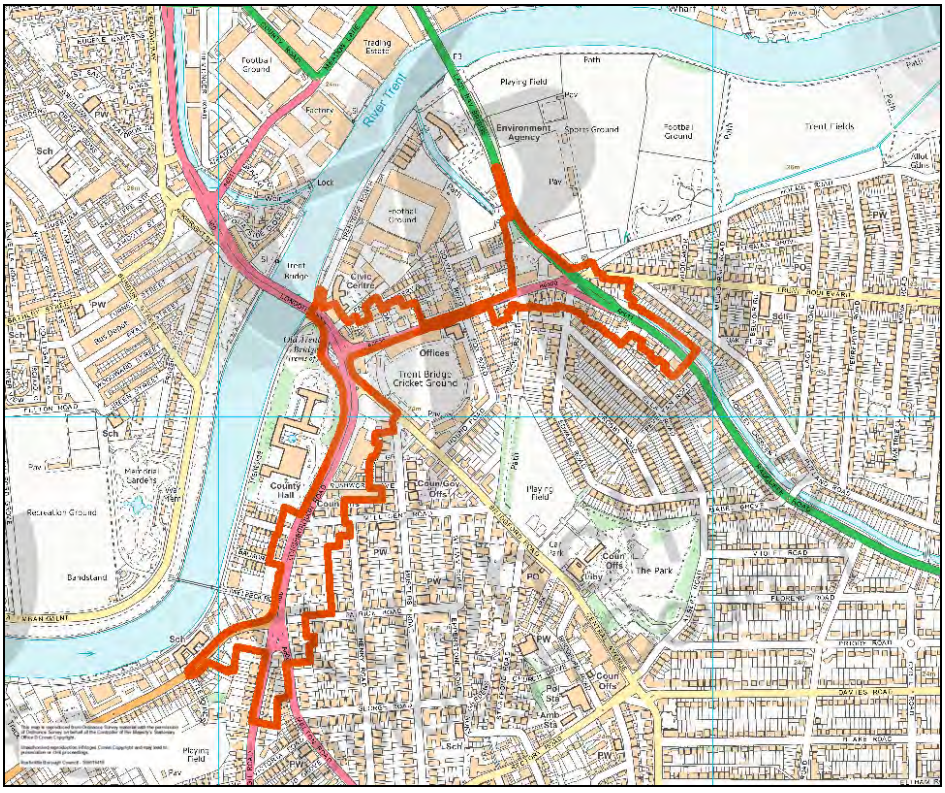
Map 1.1 Map of borough boundaries



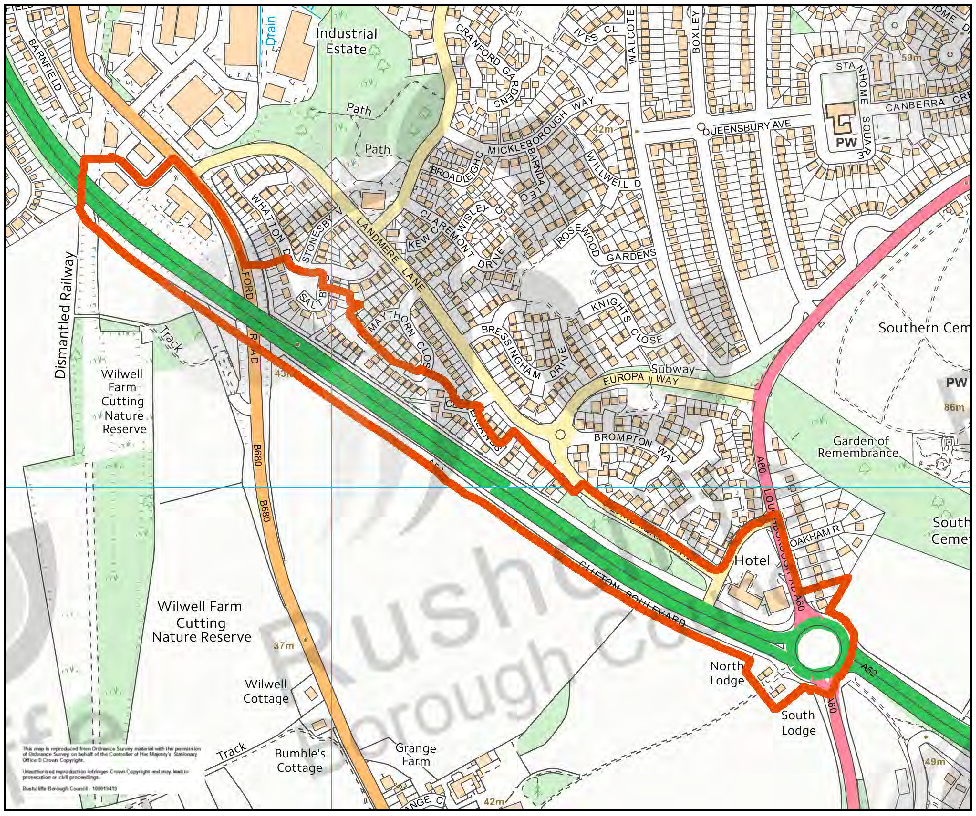
Map 1.2 Map of AQMA 1 & AQMA 2 boundaries



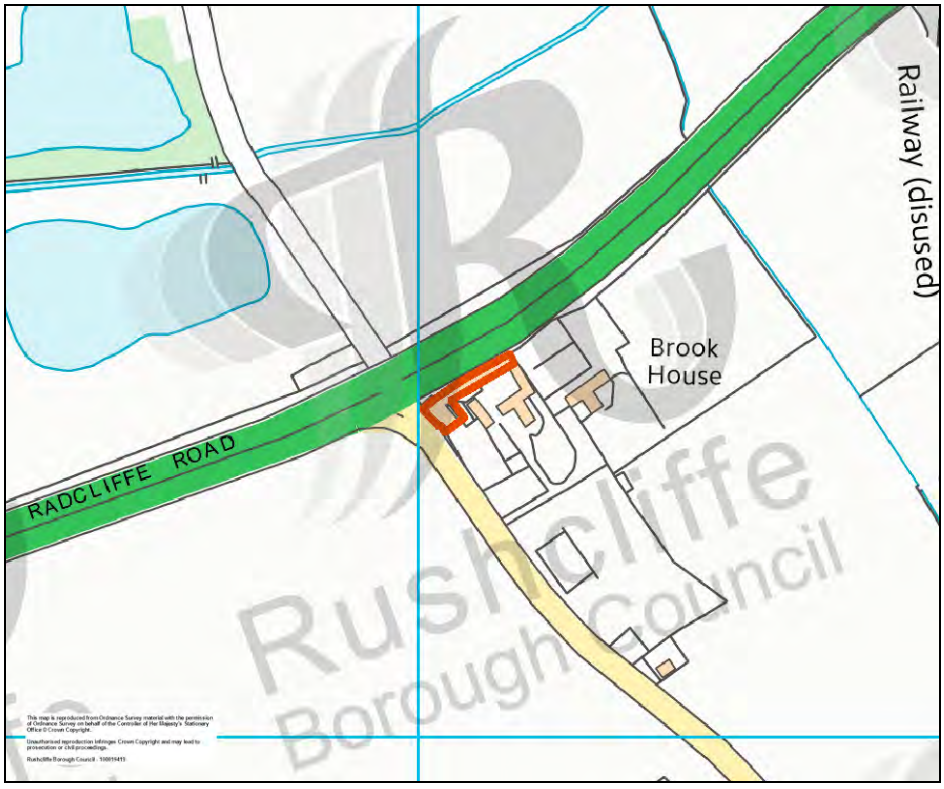
Map 1.3 Detailed Map of AQMA 1 Boundaries



Map 1.4 Detailed Map of AQMA 2 Boundaries



Map 1.5 Map of AQMA Boundaries (AQMA4, Stragglethorpe Junction, A52 Radcliffe on Trent)



1.2 Purpose of Progress 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 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.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

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 micrograms per cubic metre (μg/m^3) (note; 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 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	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
Particulate Matter (PM_{10}) (gravimetric)	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	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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

Rushcliffe has declared AQMAs in previous review and assessment rounds in several areas in the district. These areas are principally associated with NO_2 exceedences of the annual mean associated with traffic but have in the past been for SO_2 exceedance of the AQS at an industry process in Barnstone.

The detailed assessment undertaken in 2005 concluded that the annual mean objective for NO_2 would be exceeded. As a result, two AQMAs were declared on 1st September 2005 and remain in force today AQMA1 included the areas around Wilford Lane, Trent Bridge and Lady Bay; AQMA2 included the area around A52/Botany Close (Map 1.2 to Map 1.4)

The AQS objectives were also found to have been exceeded in respect of SO_2 in the vicinity of Lafarge UK Ltd. cement plant at Barnstone and as a result, AQMA 3 was declared on 1st September 2005. Following the closure of the kiln, which was the source of the exceedence, the AQMA 3 was revoked on 27th April 2007.

The 2010 Progress Report concluded that within AQMA 2 receptor sites have all been below the AQS but recommended further monitoring prior to any decision to remove the AQMA. The 2010 report also recommended the completion of a Detailed Assessment at the A52 Junction with Stragglethorpe Road as a result of elevated levels of NO_2 when compared to the annual mean objective. Levels in AQMA 1 continued to be above the AQS at relevant receptors.

Monitoring along roadside sites outside of AQMA‘s indicates exceedances of annual mean for NO_2, however when adjusted for distance to receptors previous reports have indicated AQS are not being exceeded.

The progress report 2011 recommended the creation of further AQMA for the exceedance of the annual mean NO_2 level following the completion of the detailed assessment for the Stragglethorpe Junction area.

Consequently on 1st October 2011 a forth AQMA area was declared in Rushcliffe. This area is refered to as AQMA 4 although the official order names the site as "AQMA1 order 2011' (Map 1.5)

A further assessment was carried out in 2012 and work is being undertaken to develop and AQAP for AQMA 4 which is in the early stages at this point. With the A52 being the cause of the exceedance it is anticipated that the Highways Agency will have a significant input into the measures that can be adopted. An initial options appraisal has been carried out by the LA and this has been submitted to the HA in order to facilitate further discussions about how to progress with appropirate measures within AQMA 4.

An updating and screening assessment was carried out in 2012. The main findings of this report relate to:

- the changes in a major road improvement scheme, A46
- Increase the number of diffusion tibe sites due to future residential developments
- Review of the reduction in NOx levels in AQMA 1 and AQMA 2
- Further monitoring data for AQMA 4 indicating the correct decision was made to declare the AQMA.

Table 1.2 Showing previous review and assessment reports

Report title	Date Produced
Further Assessment Stragglethorpe 2012	September 2012
Updating and Screening Assessment Review and Assessment of Local Air Quality 2012	April 2012
2011 Air Quality Progress Report	May 2011
Detailed assessment of NO2 at A52/Stragglethorpe Road	May 2011 (concluded AQMA to be declared)
Air quality & Air quality action plan Progress report 2010	March 2010
Air Quality Action Plan 2009 Progress Report	July 2009
Updating and Screening Assessment Review and Assessment of Local Air Quality (2009)	July 2009
Air Quality Progress Report 2008	June 2008
Air Quality Review: Assessment Progress Report June 2007	June 2007
Air Quality Action Plan: May 2007	May 2007
Air Quality Management No 3 Order Revocation order (2007)	April 2007
Updating and Screening Assessment, Review and Assessment of Local Air Quality 2006	April 2006
Progress report 2005	April 2005
Detailed assessment of Sulphur dioxide and nitrogen dioxide	February 2005
Updating and Screening Assessment Review and Assessment of Local Air Quality (May 2003)	May 2003
Annual Report on Air Quality (2002)	2002
Air Quality Review and Assessment (2000)	December 2000

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Rushcliffe undertook automatic monitoring for NO_2/NOx at Loughborough Road/Millicent Road AQMA 1 and PM_{10} in the A52 Stragglethorpe AQMA 4 during 2012.

The locations of the two operational monitors in the district covering the 2012 period are shown in Table 2.1, Map 2.1 and shown in Map 2.2.

Table 2.1 below confirms the grid references for the automatic monitoring locations in the borough.

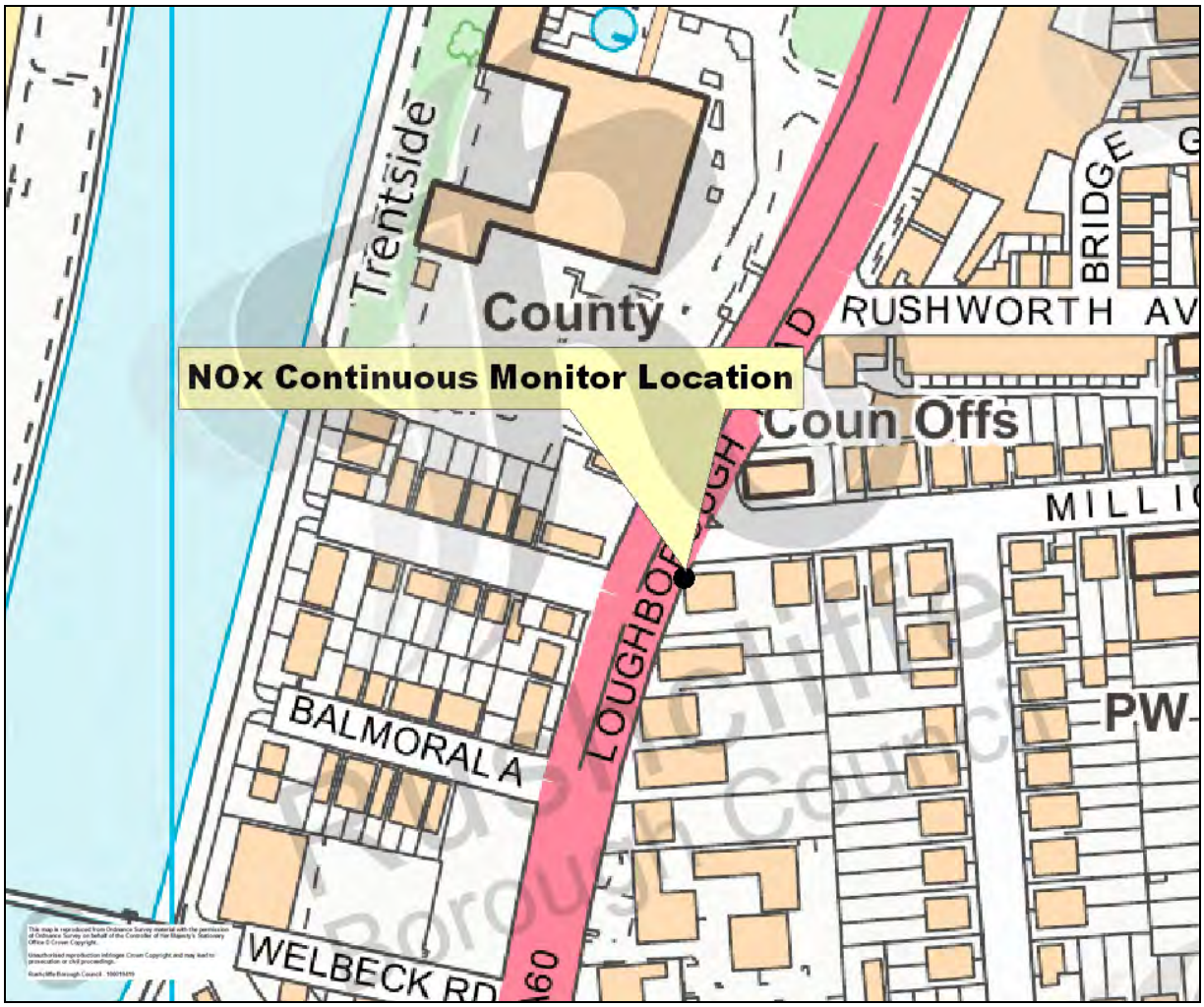
Full details of the monitors can be found in the QA/QC section of Appendix A.

As recommended by Defra from comments made by Defra regarding last year‘s progress report a new NOx monitor was purchased and was to be installed adjacent to Holme House in the Stragglethorpe AQMA 4; but technical and safety issues with the proposed location of the monitor means this has been delayed, pending further discussions with the Highways Agency. To utilise this resource the new monitor was installed in AQMA1 in May 2013 at the Trent Bridge Flats, which is a site that currently exceeds AQS for NO2 annual mean and so real time monitoring can be carried out to back up the current diffusion tube data until the relocation to Stragglethorpe can be done. It must be stressed that getting a suitable site in AQMA 4 is proving to be very difficult with the HA; it is possible that any site will prove to be not ideal or it may not be possible to locate a monitor in this location. Work is on going in 2013 to resolve this.
The findings from the newly installed monitor will be published in next year‘s report.

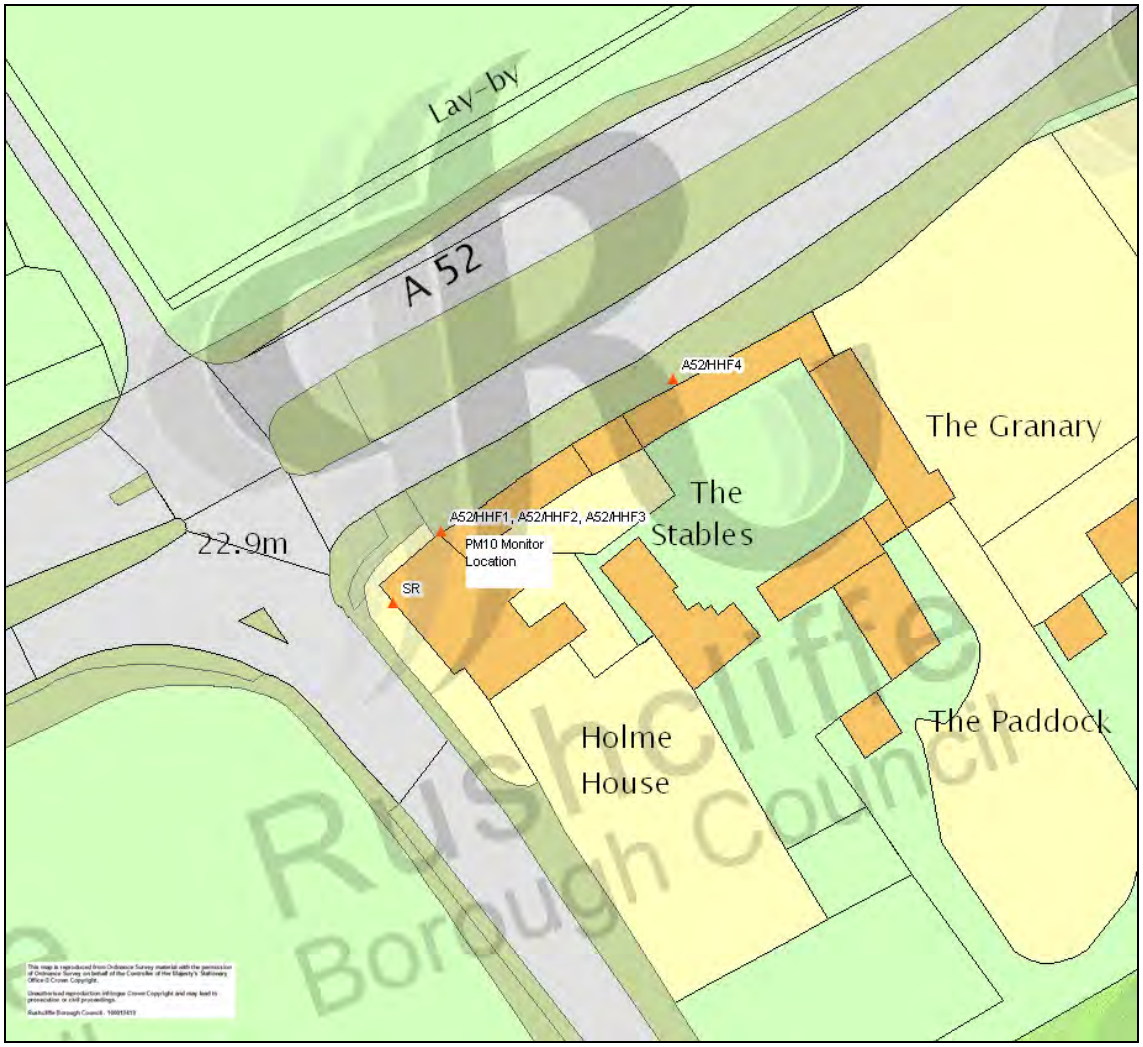
Table 2.1 Details of Automatic Monitoring Sites

Site Name	**Site Type**	**X OS Grid Reference**	**Y OS Grid Reference**	**Inlet Height (m)**	**Pollutants Monitored**	**In AQMA?**	**Monitoring Technique**	**Relevant Exposure?** (Y/N with distance (m) from monitoring site to relevant exposure)	**Distance to Kerb of Nearest Road (m)** (N/A if not applicable)	**Does this Location Represent Worst-Case Exposure?**
Loughborough Road/Millicent Road, West Bridgford	Roadside	458174	337772	1.9	NO_2	Y	Chemiluminescence	Y (0m)	5m	Y
A52 Holme House, Stragglethorpe Junction, Radcliffe on Trent	Roadside	463011	338213	1.5	PM_{10}	Y	Gravimetric	Y (0.5)	5.5	Y

Map 2.1 Location of Automatic Monitoring Sites (NO_2 monitor)



Map 2.2 Location of Automatic Monitoring Site (PM_{10} monitor) and Diffusion Tube Locations at Holme House, Stragglethorpe



2.1.2 Non-Automatic Monitoring Sites

Nitrogen Dioxide

Rushcliffe Borough Council undertook nitrogen dioxide monitoring using diffusion tubes at 37 monitoring points in 2012; some sites have duplicate tubes and there are two sites with triplicate tubes, including colocation with the NOx analyser at Loughborough Road/Millicent Road.

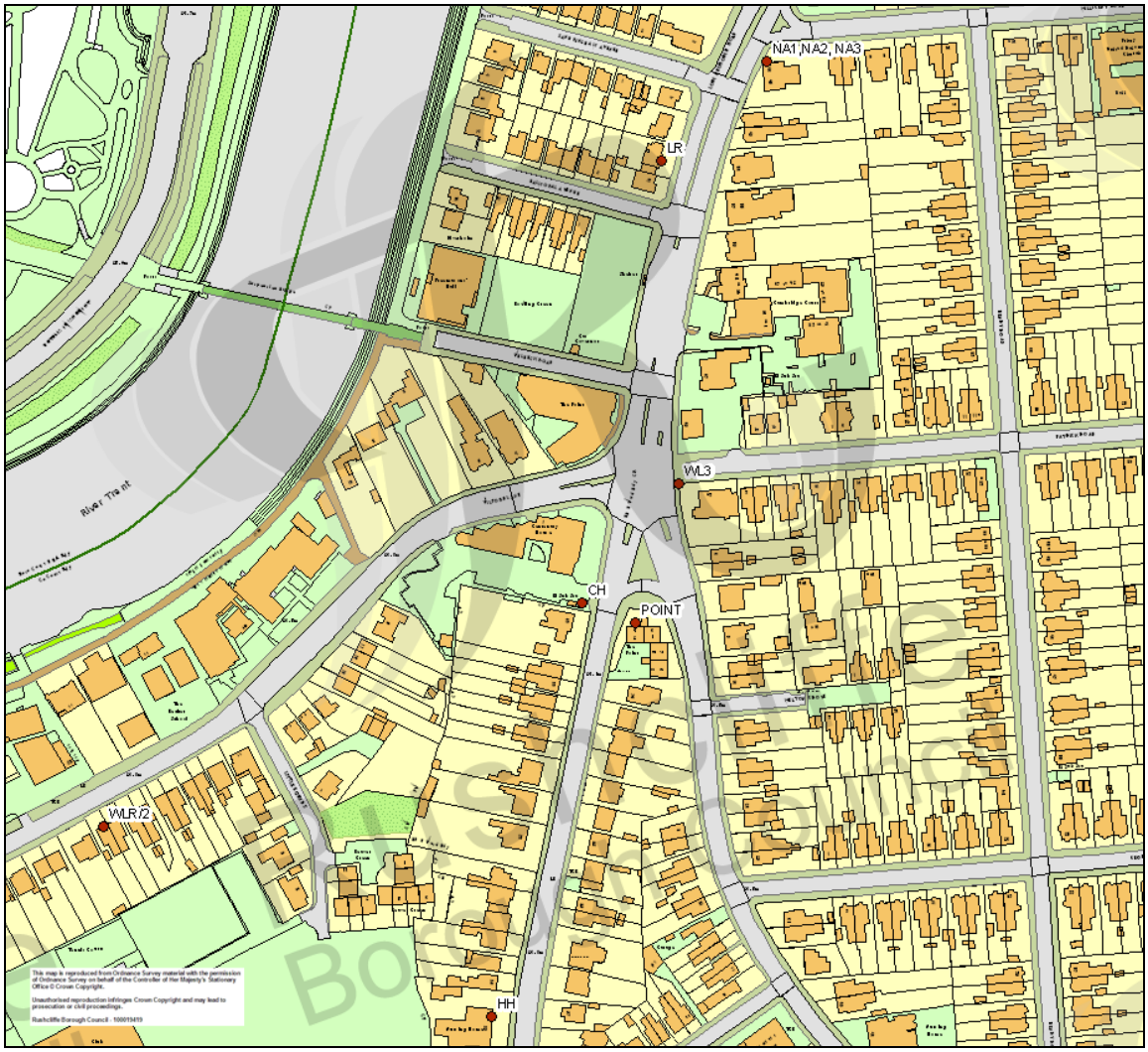
12 sites are in AQMA 1, 4 in AQMA 2, 4 in AQMA 3, and the rest are located at various roadside, urban background and façade sites throughout the borough.

The maps and the specific details of the locations of the diffusion tube monitoring sites are shown in Map 2.1 to Map 2.14.

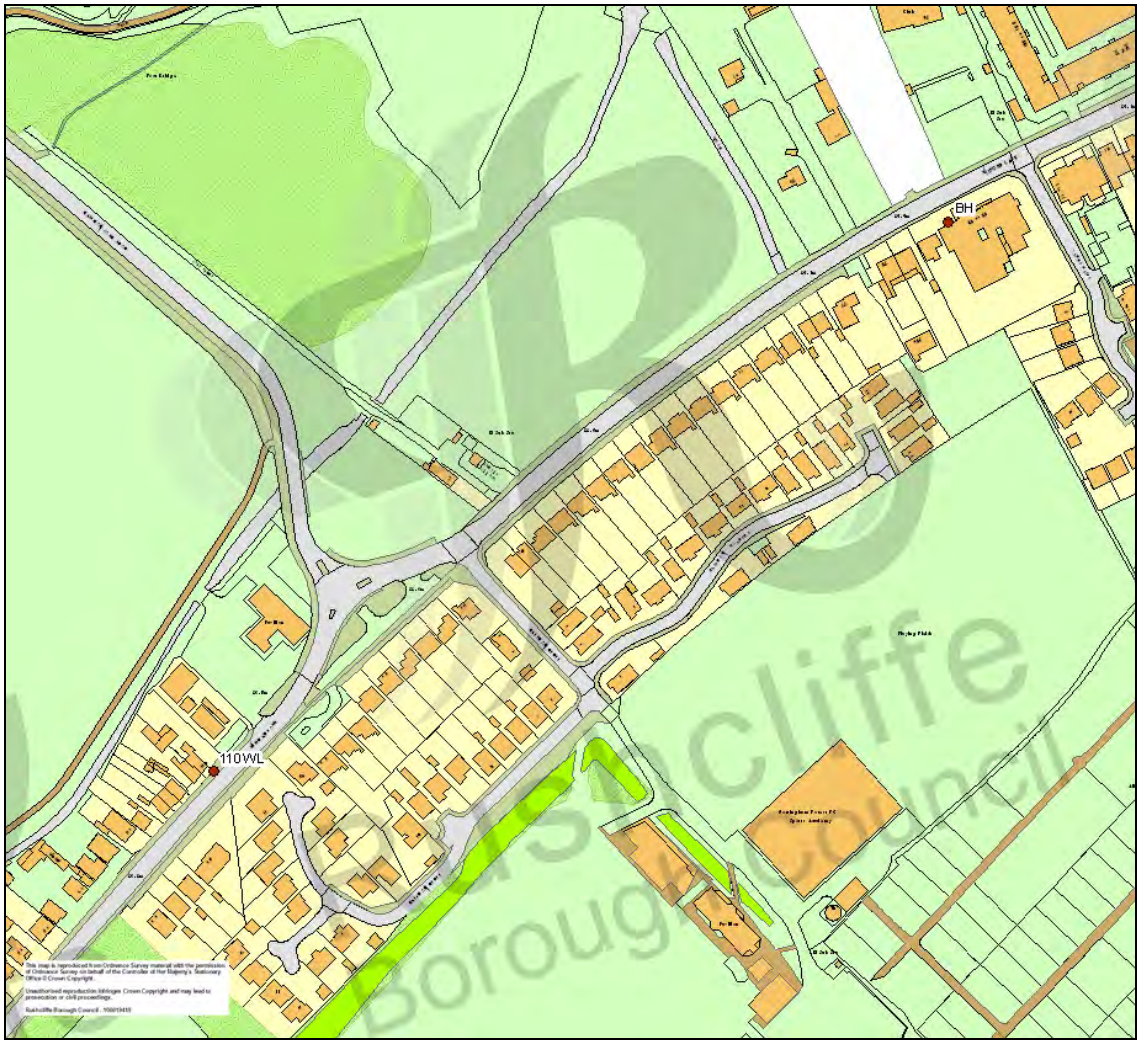
No other non-automatic monitoring took place in the Borough during the year.

Map 2.3 to Map 2.14 Map(s) of Non-Automatic Monitoring Sites

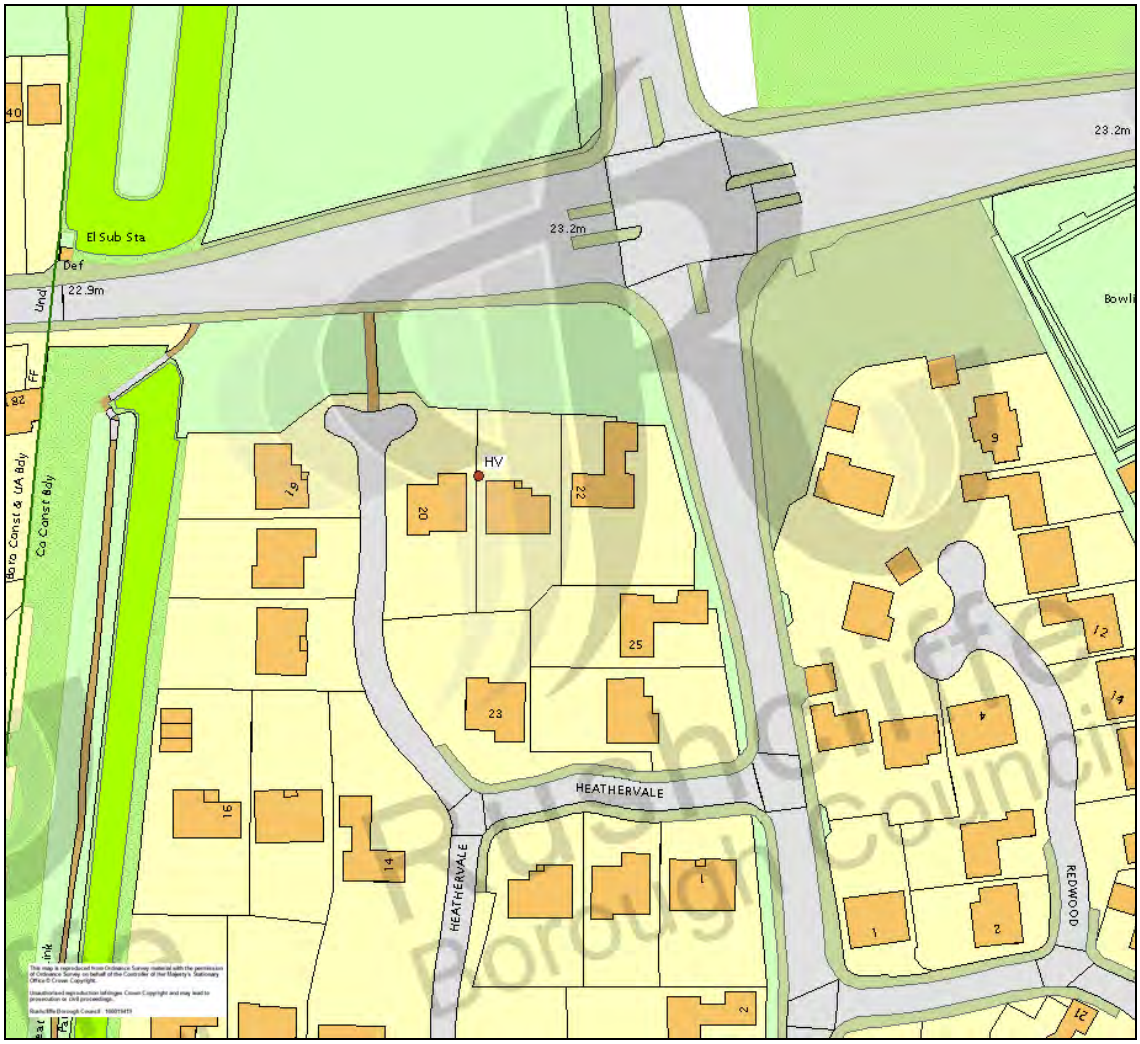
Map 2.3 AQMA1 Diffusion Tube locations Loughborough Road West Bridgford



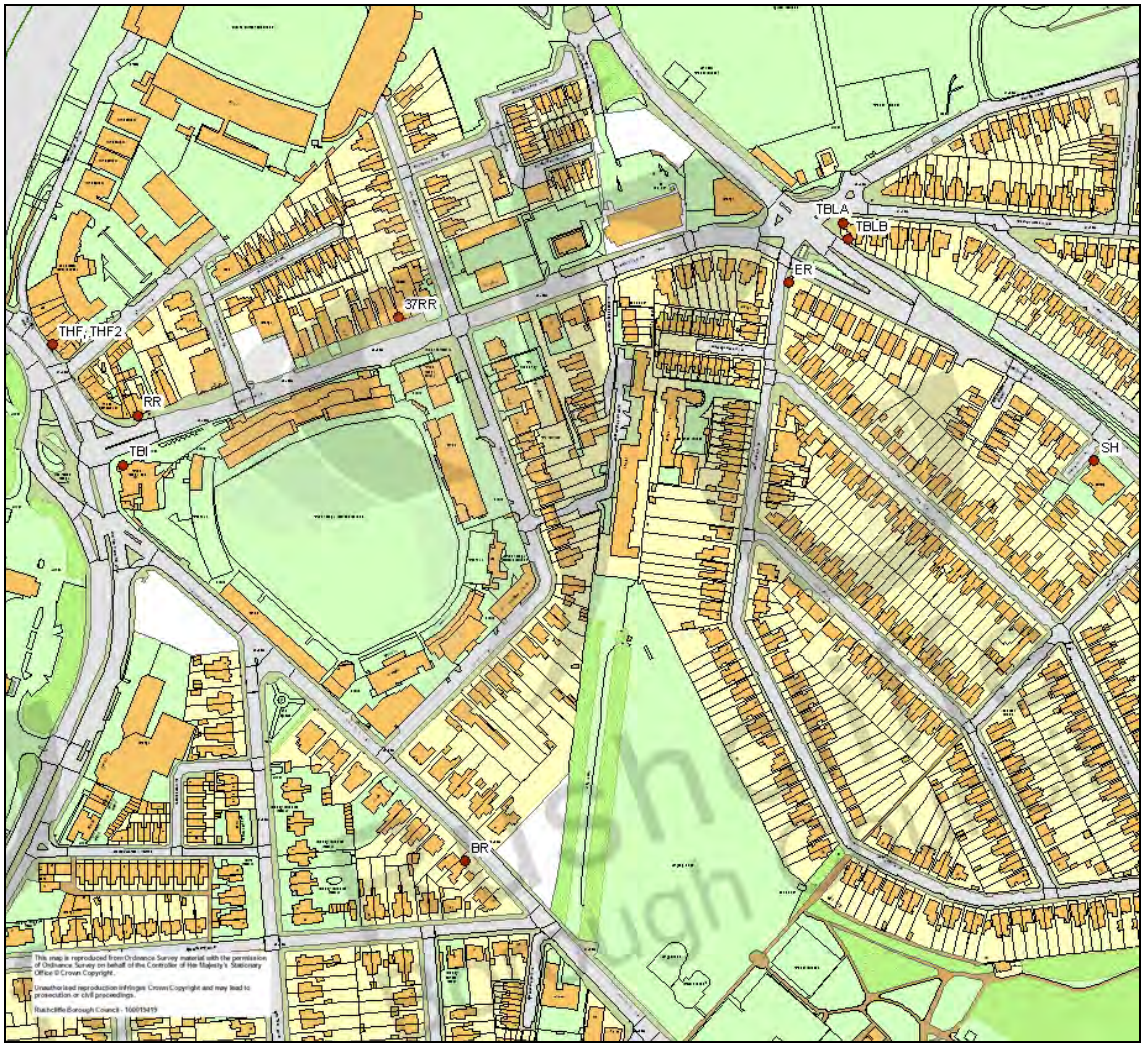
Map 2.4 Diffusion Tube Locations Wilford Lane West Bridgford



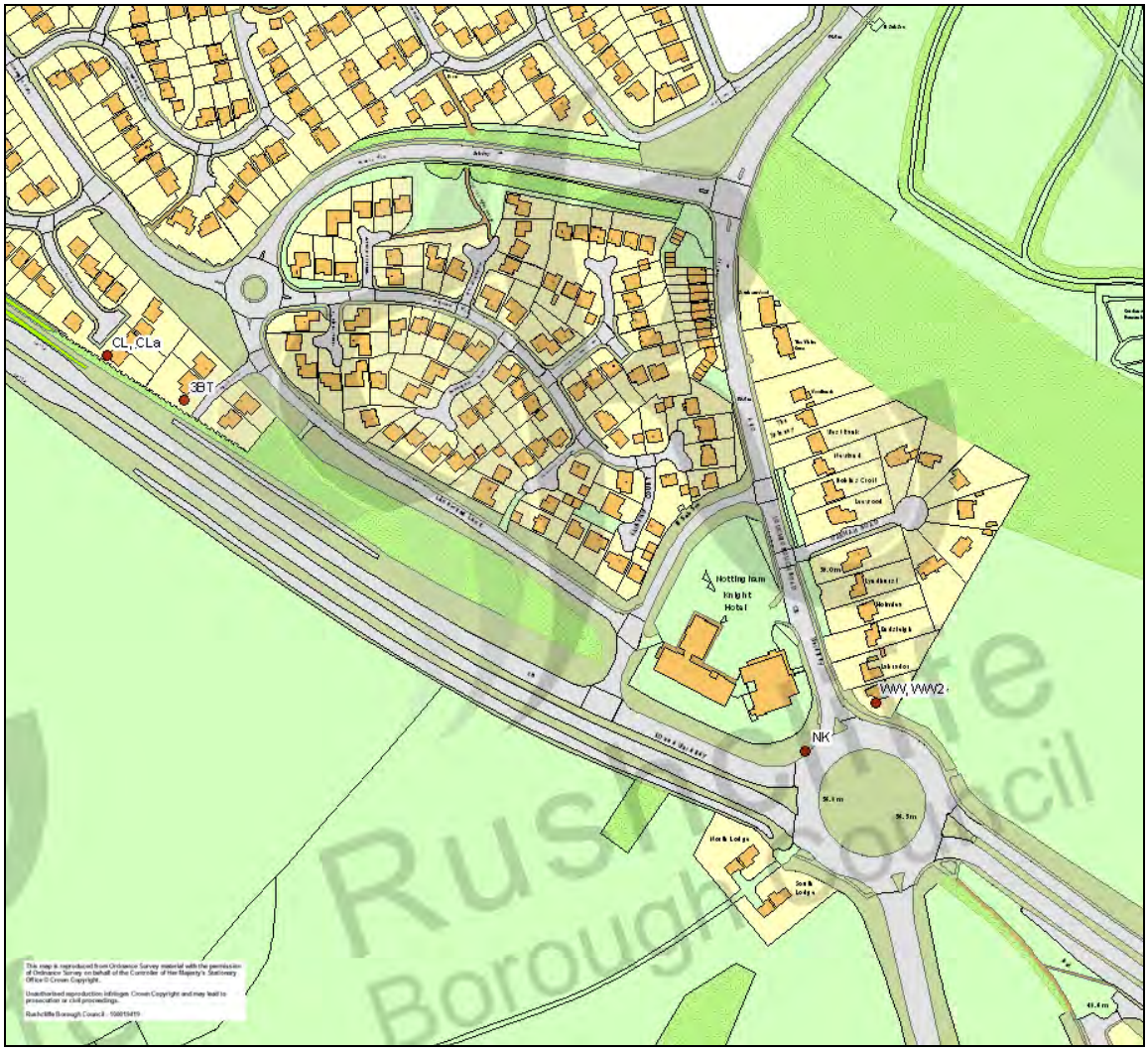
Map 2.5 Diffusion Tube Location Heathervale West Bridgford



Map 2.6 Diffusion Tube location AQMA1 Radcliffe Road West Bridgford

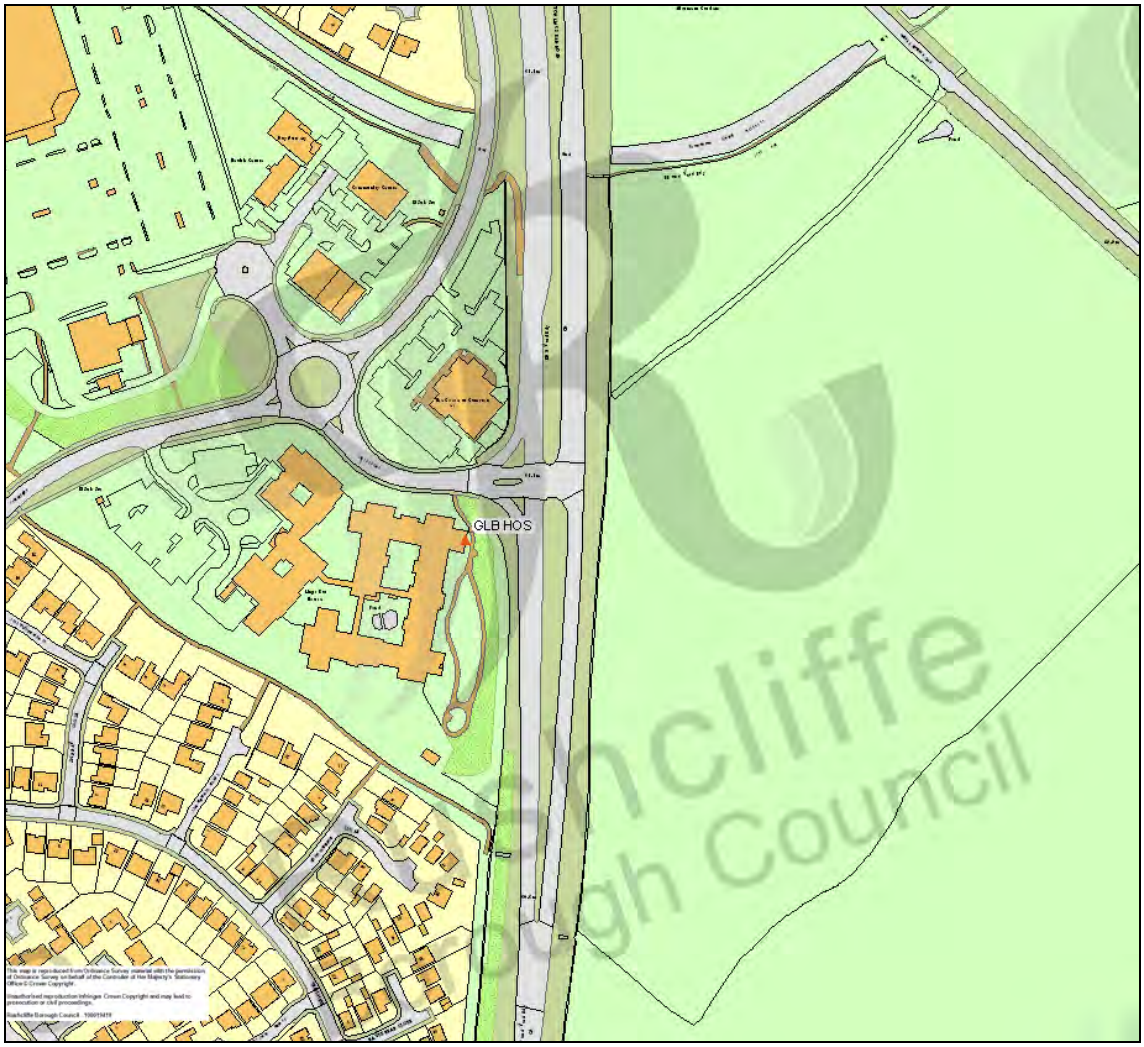


Map 2.7 Diffusion Tube Location AQMA 2

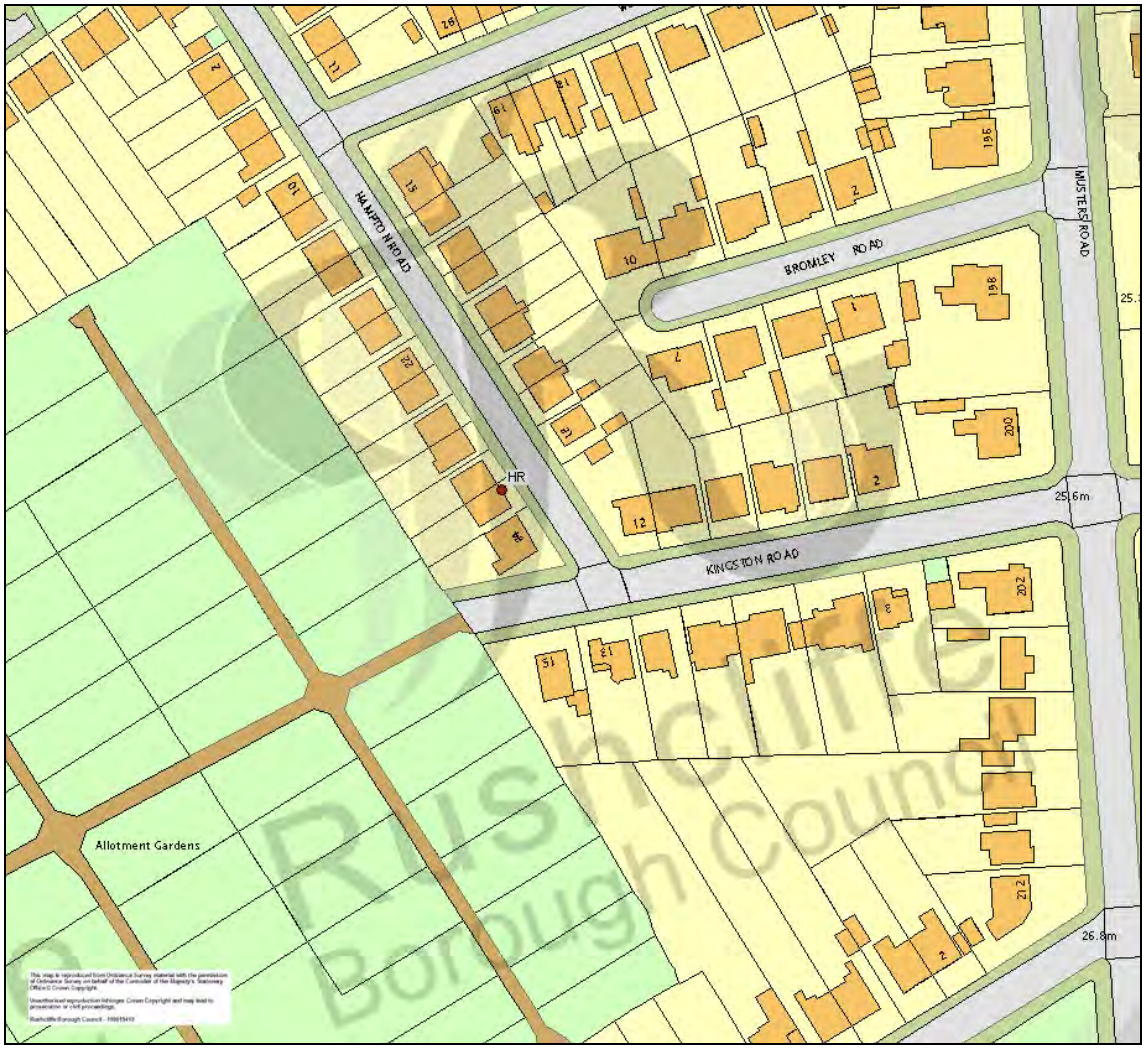


Map 2.8 Diffusion Tube Location Peveril court

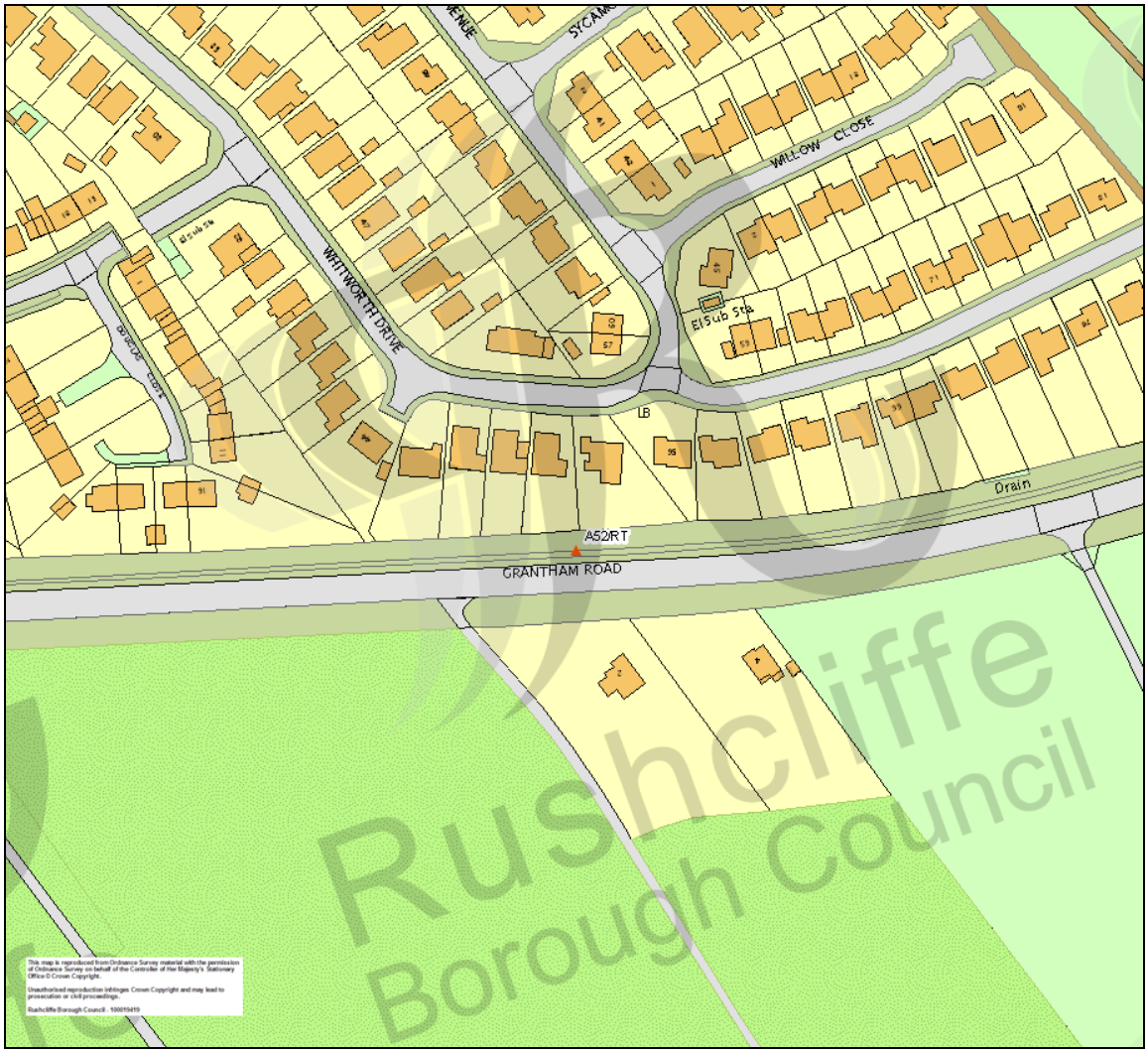
Map 2.9 Diffusion Tube Location Lings Bar Gamston



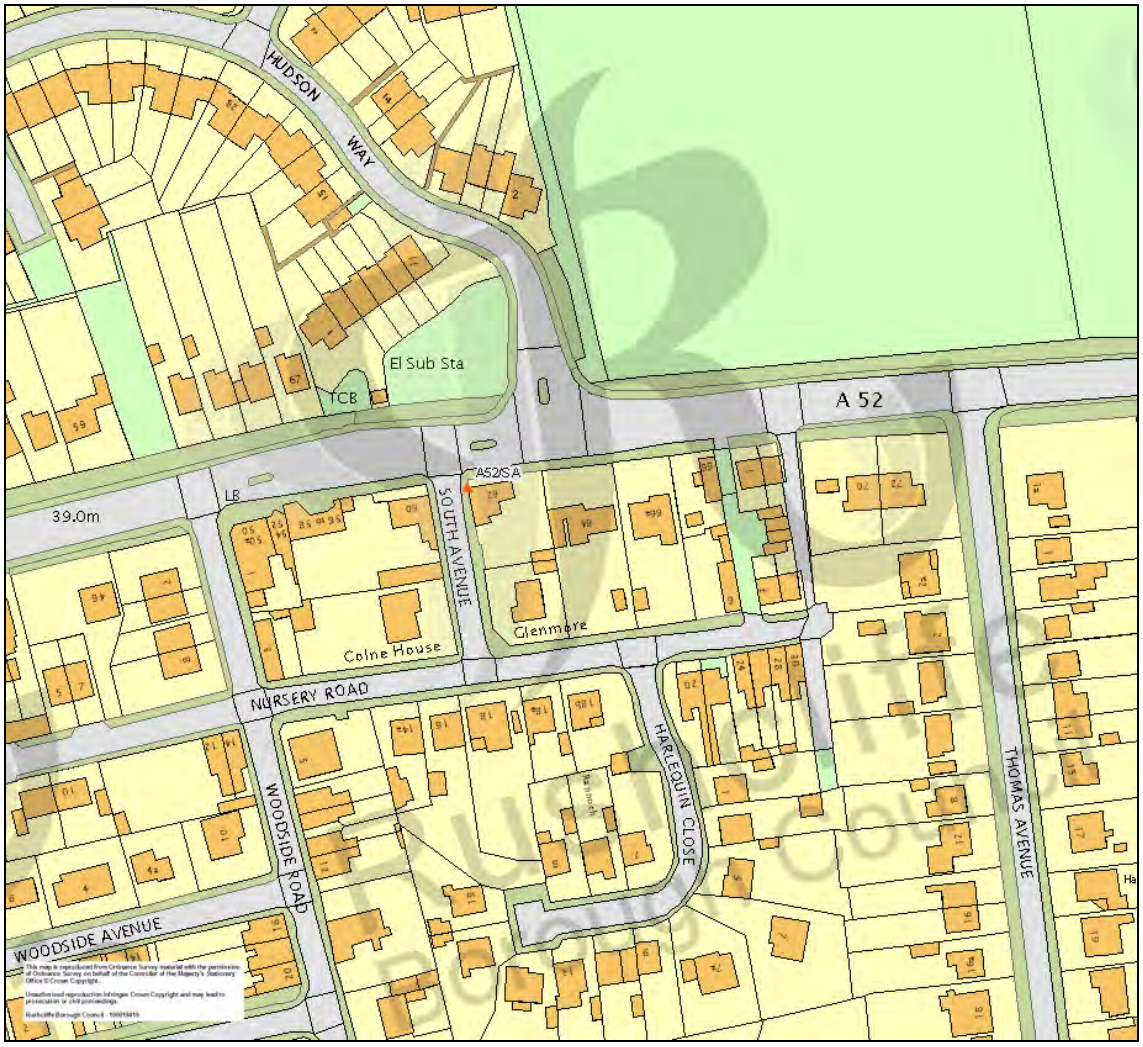
Map 2.10 Diffusion Tube Location Hampton Road West Bridgford



Map 2.11 Diffusion Tube Location A52 Radcliffe on Trent



Map 2.12 Diffusion Tube Location A52 South Avenue Radcliffe on Trent



Map 2.13 Diffusion Tube location Kirkhill Bingham

Map 2.14 Diffusion Tube Location A453 Thrumpton

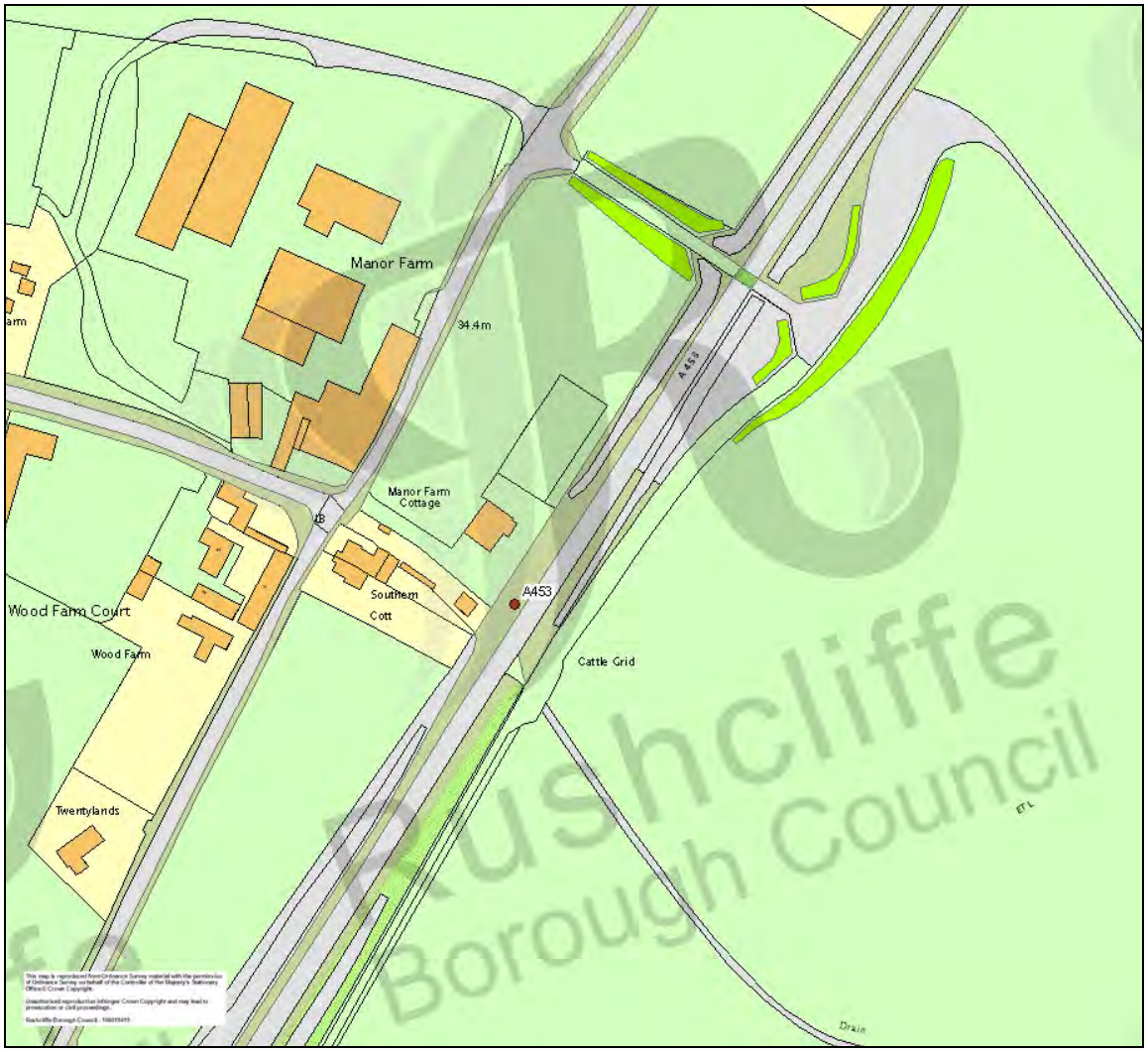


Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Short Name (Tube descriptor)	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)			Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
							For annual limit	For 1 hr limit	distance		
1 LOUGHB'H RD W/B	NA1,NA2, NA3	Façade	458174	337772	NO2	1	Y	Y	0	5	Y
EDWARD ROAD, LADY BAY	ER	RS	458716	338238	NO2	1	Y	Y	0	10.5 from main road(2 from ER)	Y
LOUGHBOROUGH ROAD (RES)	LR	Façade	458126	337727	NO2	1	Y	Y	0	8.9	Y
CENTENARY HOUSE	CH	Façade	458090	337527	NO2	1	Y	Y	6.4	7.3	Y
RADCLIFFE ROAD	RR	Façade	458284	338150	NO2	1	N	Y	0	4	Y
SWANS HOTEL	SH	Façade	458919	338120	NO2	1	Y	Y	0	10	Y
THE POINT	POINT	Façade	458114	337518	NO2	1	Y	Y	0	7.4	Y
TRENT BOULEVARD A	TBLA	Façade	458752	338278	NO2	1	Y	Y	0	7.1	Y
TRENT BOULEVARD B	TBLB	Façade	458756	338267	NO2	1	Y	Y	0	3.4	Y
TRENT BRIDGE INN	TBI	Façade	458274	338117	NO2	1	N	Y	0	6.6	Y
TRENT HOUSE	THF, THF2	Façade	458227	338197	NO2	1	Y	Y	0	3.2	Y
WILFORD LANE 3	WL3	RS	458134	337581	NO2	1	Y	Y	5.2	2.1	Y
A60/A52 JUNCTION (Nott Knight)	NK	RS	457612	334813	NO2	2	N	N	n/a	1.8	Y

3 BOTANY CLOSE	3BT	Façade	457266	335008	NO2	2	Y	Y	0	21	Y
CLOVERLANDS(Façade)	CL, CLa	Façade	457223	335033	NO2	2	Y	Y	0	16.3(from A52)	Y
WINDYWAYS	WW, WW2	Façade	457651	334840	NO2	2	Y	Y	0	12	Y
A453	A453	RS	451697	330925	NO2	no	Y	Y	23.8	3.2	Y
A52 LINGS BAR Hospital	GLB HOS	Façade	460663	336514	NO2	no	Y	Y	0	26	Y
A52 SOUTH AVE, RADCLIFFE	A52/SA	RS	465929	335543	NO2	no	Y	Y	0	4.2	Y
RADCLIFFE A52	A52/RT	RS	464644	338730	NO2	no	Y	Y	5.2	3.3	Y
A52 HOME HOUSE(façade) STRAGGLETHORPE	A52/HHF1, A52/HHF2, A52/HHF3	Façade	463011	338213	NO2	4	Y	Y	0	6.4	Y
A52 HOME HOUSE(Garden) STRAGGLETHORPE	A52/HHG	Garden	463022	338210	NO2	4	Y	Y	0	15	N
A52 HOMEHOUSE (Façade away from junction on A52)	A52/HHF4	Façade	463040	338232	NO2	4	Y	Y	0	6.4	Y
STRAGGLETHORPE ROAD	SR	Façade	463005	338204	NO2	4	Y	Y	0	5.5	Y
21 HEATHERVALE	HV	Façade	456893	336768	NO2	no	Y	Y	0	36	N
34 BRIDGFORD ROAD	BR	Façade	458501	337854	NO2	no	Y	Y	0	10	Y
39/41 WILFORD LANE	WLR/2	Façade	457873	337426	NO2	no	Y	Y	0	9	Y
HAMPTON ROAD	HR	UB	458326	336714	NO2	no	Y	Y	0	5.4	Y
HICKORY HOUSE	HH	Façade	458049	337340	NO2	no	Y	Y	0	10.5	Y
110 WILFORD LANE	110 WL	RS	457366	337091	NO2	no	Y	Y	3	1.8	Y
37 RADCLIFFE ROAD	37RR	Façade	458457	338215	NO2	no	Y	Y	0	13.8	Y
PEVERIL COURT	PC, PC2	Façade	458399	337172	NO2	no	Y	Y	0	8	Y
THE BEECHES HOTEL	BH	Façade	457701	337342	NO2	no	Y	Y	0	9.7	Y
1 KIRKHILL	1KH, 1KH2	Façade	470210	340010	NO2	no	Y	Y	0	1.37	Y

4 KIRKHILL	4KH	RS	470219	340051	NO2	no	Y	Y	0	2	Y
15 KIRKHILL	15KHG	RS	470202	340092	NO2	no	Y	Y	0	2	Y
19 NEWTHORPE STREET	19NS	Façade	470266	339996	NO2	no	Y	Y	0	2	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

The results for 2012 collected from the chemiluminescence analyser sited at Loughborough Road, West Bridgford are shown in Table 2.3 and Table 2.4 below, with the previous four years data included for comparison.

The 2012 annual mean was 41.1µg/m^3 marginally above the AQO of 40µg/m^3 however the data capture for 2012 was only 81%, due to power failures and breakdowns. Therefore the 99.8th percentile of the data was calculated at 136.3µg/m^3 showing that there were no exceedences of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year).

Figure 2.1 shows the trend in annual means from 2008 to 2012 and there has been a slight overall increase in nitrogen dioxide concentrations measured at the monitoring site (as shown by the graph trend line). This may correspond to the slight increase in traffic flows along this particular stretch of road from 2006 to 2011.

Table 2.4 shows there have been no exceedences of the hourly mean since 2008.

A graph showing the 2012 hourly means is shown in Appendix B, Figure 13.1 1Hour average NO2 real time monitor chart

Table 2.3 Results of Automatic Monitoring NO_2 2012: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Annual Mean Concentration (µg/m^3)				
					2008	2009	2010	2011	2012
NOx monitor	Loughborough Road/ Millicent Road	Y	N/A	81	38.4	34.10	39.24	37.8	**41.1**

In bold, exceedence of the NO2 annual mean AQS objective of 40µg/m^3

Figure 2.1 Trends in Annual Mean NO_2 Concentrations Measured at the Loughborough Road/Millicent Road Automatic Monitoring Site

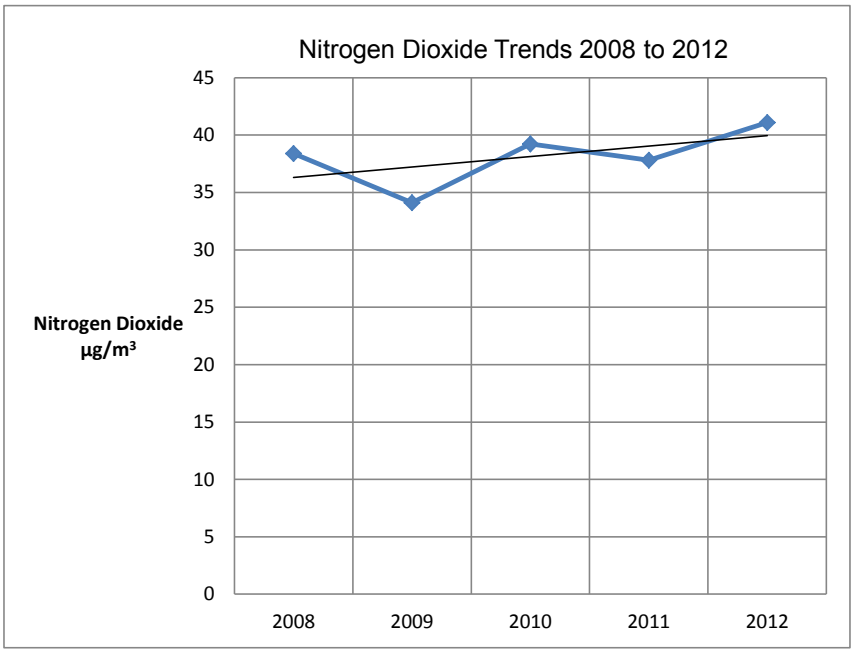


Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 % [b]	Number of Hourly Means > 200µg/m^3				
					2008	2009	2010	2011	2012
NOx monitor	Loughborough Road/ Millicent Road	Y	N/A	81	2	0	0	0	0
						99.8th Percentile 119.8 µgm^{-3} (revised 2010)	99.8th Percentile 131.6µgm^{-3}	99.8th Percentile 126.8 µgm^{-3}	99.8th Percentile 136.3µg m^{-3}

[b] The data capture for 2012 was 81% therefore the 99.8th percentile of the data was calculated at 136.3µg/m^3 and thus there were no exceedences of the NO2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

Non-Automatic Monitoring

Diffusion Tube Monitoring Data

The diffusion tubes are supplied and analysed by Gradko International Ltd utilising the 20% Triethanolamine (TEA) in water preparation method. Gradko is a WASP listed and UKAS accredited laboratory. Gradko International Laboratory utilises a Laboratory Quality Management System with the analysis being carried out with a documented in-house laboratory method GLM7

With regard to the application of a bias adjustment factor for the diffusion tubes, the LAQM.TG (09) and Review and Assessment Helpdesk recommends use of a local bias adjustment factor where available and relevant to diffusion tube sites. Rushcliffe Borough Council operates a triplicate diffusion tube co-location with a continuous NO_2 analyser on Loughborough Road/Millicent Road (AKA 1 Loughborough Rd) in West Bridgford. However, due to data capture issues and instrument faults in 2012, a local bias factor was not considered to be robust enough to calculate a local factor. As such a national bias factor of 0.94 has been used derived from the DEFRA website at: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Where diffusion tube sites are not directly positioned on the façade of a relevant receptor due to practicalities a prediction was made using the fall off with distance tool available from http://www.airquality.co.uk/laqm/tools.php.

The monitoring site details are contained in Table 2.2 and the 2012 results in Table 2.5 with maps of site locations shown in Map 2.3 to Map 2.14. Details of the bias calculation and the adjustment of the reported NO_2 annual mean are shown in Table 13.1 2012 NO2 Diffusion Tubes monthly results and the chosen bias factor is discussed in Appendix A: Quality Control (QA/QC)

The full monthly mean dataset is shown in Appendix B, Table 13.1 2012 NO2 Diffusion Tubes monthly results

It should be noted that due to a failure in the Gradko laboratory QA/QC procedures, the July 2012 diffusion tube results were declared void and removed from the database.

Summary of diffusion tube results in AQMA 1

In AQMA1, 12 monitoring locations for diffusion tubes were assessed in 2012 with three sites indicating results above the 40 $\mu g/m^3$ annual mean and none above the 60 $\mu g/m^3$ indicating no breech of the hourly limit. Unless otherwise stated results for diffusion tubes are bias adjusted. Those exceeding the annual mean are highlighted in black in Table 2.5 below. These sites are discussed below with particular reference

to those still indicating high levels and any changes that have taken place in the last year.

The **TBI** site is located at the entrance to a public house. The site is not a relevant receptor for the annual mean but would be for the hourly limit. The result is thus compliant with AQO for NO_2 with an annual bias adjusted mean of 48.9µg/m^3 being significantly below the 60 µg/m^3.

The **Radcliffe Road** tube (RR) is sited on the façade of a shop approximately 2.1-2.2 metres from ground level. There are no relevant exposures to the annual mean at ground floor level in this area as the frontage is populated by shops, although seating area does exist for a café (2-3 seats) which is used infrequently. However, at first floor level several buildings above shops have permission to be residential, although it is unclear at the moment as to whether some are in occupation or not. Given that at first floor level it is expected that NO_2 levels will be slightly lower than at ground level it is hypothesized that first floor levels in the area are likely to be less than the 40µg/m^3 AQO, although there does not exist a tool for assessing this more accurately (current level is 37.9 µg/m^3). As such the site is in compliance for the 1 hour objective and remains marginal for the annual mean at first floor level. There are no plans to move the tube to a higher level as there is no access to this façade to make it practicable to change on a regular basis.

Trent House Flats (THF) site is on the façade of an upper storey residential flat and is representative of residential exposure on the façade. Duplicate diffusion tubes results of 42.0µg/m^3 show that the site is above the AQO for the annual mean but below the 1 hour surrogate value and is therefore still non-compliant with the AQO for the annual mean.

This site is currently the highest NO_2 site at the façade by either measurement or calculation. As such a fall in levels at this site to below the AQO will indicate compliance with the objective to the annual mean within the AQMA 1.

Projections based on Box 2.1 of TG(09) indicates that the predicted levels for 2013 and 2014 are:

2013 42.0µg/m^3 x 0.879/0.920 = 40.1µg/m^3

2014 42.0µg/m^3 x 0.839/0.920 = 38.3µg/m^3

The site is also currently being monitored (commenced mid 2013) on a short term basis using a chemiluminescence analyser as a further check on the NO_2 levels and the results will reported in a future report.

Trent Boulevard A and B. The Trent Boulevard site is a property that has two diffusion tubes, one mounted on the Trent Boulevard façade and one on the Radcliffe Road façade. The Radcliffe Road tube has shown a slight increase from 38.8µg/m^3 in 2011 to 40.4µg/m^3 in 2012 and the Trent Boulevard façade is marginal at 37.2µg/m^3.

Wilford Lane 3 (WL3). This tube is mounted on a lamppost and is on the side of the junction where relevant receptors for the annual mean are present, albeit they are set

back from the road. Utilising the distance correction tool available from http://www.airquality.co.uk/laqm/tools/NO2withDistancefromRoadsCalculatorIssue2.xls to estimate the exposure at the nearest receptor a corrected value of 38.6µg/m^3 from 42.0µg/m^3 is estimated. The background value selected is the 2012 value from the published background maps. The calculation is available in Figure 13.6. This is below the AQO and as such the site is not breaching the AQO for the annual hourly objectives.

All other sites in AQMA 1 are below the AQO for the annual mean without any fall off with distance correction being applied. One site, Loughborough Road (residential), is marginal, being above 36µg/m^3, but below the AQO.

Summary of NO_2 diffusion tube results in AQMA 2

4 diffusion tubes sites were located within AQMA 2 in 2012.

The **A52 Ring Road NK (Nottingham Knight)** site continues to be high at roadside. However this site does not have any relevant receptors nearby for the annual mean at this point around the traffic island. The nearby public house has an outside seating area that is used in the summer months but is approximately 20m from the roadside The tube is 1.8m from the roadside and the 2012 annual mean for the site is 44.3µg/m^3, and is compliant with the AQO (i.e. significantly below the 60 µg/m^3). The site has been in place for a number of years and it is proposed to keep the site active to enable roadside trends at this junction to be monitored.

Windy Ways (WW) has seen a slight reduction in NO_2 in the last few years and in 2012 the annual mean was marginally below the AQO at 39.1µg/m^3.

The 3BT (3 Botany Close) shows an increase from 28.8µg/m^3 in 2011 to the current 32.6µg/m^3 but still well below the AQO.

The Cloverland (CL) site is located on the closest property to the A52 and is near to the 3BT site. This site has 2 tubes located in close proximity to improve the accuracy at the site. The 2012 levels of 34.3µg/m^3 indicate a slight increase at this site from 32.5µg/m^3 in 2011.

Summary of diffusion tube results in AQMA 4

Holme House (A52HH) is situated on the A52 trunk road into Nottingham and is positioned on the corner of the junction with Stragglethorpe Road and in 2012, 4 locations were used for diffusion tube studies including one triplicate site.

The tubes located on the A52 façade show consistently high results with annual means of 49.3µg/m^3 (A52/HH/F4, 2012 annualised data) and 51.9µg/m^3 (A52/HH/F1 to F3) showing an increase from the 2011 levels of 42.0µg/m^3 and 49.4µg/m^3 respectively.

The Stragglethorpe Road façade tube gave an annual mean of 34.6µg/m^3 marginally lower than the 2011 mean of 36.8µg/m^3.

A diffusion tube located in the garden of one of the properties gave an annual mean of 25.4µg/m^3 compared with 24.8µg/m^3 measured in 2011. The use of the garden

location was discontinued at the end of 2012 because of the consistently low levels of NO_2 at that location.

Summary of diffusion tubes not in AQMA's

17 sites outside of existing AQMA's were monitored in 2012 with diffusion tubes.

The **A453 Thrumpton site** is located on the grass verge of the A453 and as such is expected to be high (41.1µg/m^3 for 2012). The site has relevant receptors some distance from the location (23.8m) and as such there is significant fall off with distance which leads the site to be compliant with the AQO and the predicted level at the relevant receptor is 29.2µg/$m^{3.}$ The calculation is available in appendix B, Figure 13.5

It should be noted that work on the A453 widening project commenced on January 2013 and the monitoring location maybe compromised during the work.

37RR (37 Radcliffe Road) The property is adjacent to AQMA 1 and the tube is located back from the façade of the building by 3.3 metres. As such a distance correction to the 2012 bias adjusted mean is required. This results in a facade level of 34.5µg/m^3 well below the AQO. The calculation is available in appendix B, Figure 13.3

A52/RT is a roadside site and the distance corrected concentration is 38.9µg/m^3 for the nearest residential property and the NO_2 level has increased from 36.6µg/m^3 in 2011. Further consideration will be given to this site if future concentrations are elevated above the AQO. The calculation is available in appendix B, Figure 13.4

Kirkhill, Bingham. In 2011, two diffusion tube monitoring sites were established at Kirkhill, Bingham, due to concerns regarding possible future increases in traffic and congestion resulting from significant proposed developments in the area.

In 2012, the number of diffusion tube sites was increased to 4 (1KH – duplicate tube, 4KH, 15KH and 19NS) because the 2011 NO_2 levels were above the AQO.

The 2012 levels however were below the AQO at 27.5, 35.9, 31.8 and 31.0µg/m^3 respectively. The duplicate 1KH and 19NS diffusion tubes were discontinued at the end of 2012.

The A52 South Avenue site at Radcliffe on Trent is marginal with an annual mean of 36.1µg/m^3. All other locations which are non AQMA sites are below the AQO.

None of the diffusion tube annual means were found to be above 60µg/m^3 indicating that exceedences of the NO_2 hourly mean AQS objective are unlikely.

Rushcliffe confirms that no further sites have been identified as exceeding the AQO for relevant receptors. Consequently the diffusion tube monitoring does not indicate that any further detailed assessments need to be undertaken in 2013.

Table 2.5 Results of NO2 Diffusion Tubes 2012

Site Name	Site ID	Site Type	In AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) [a]	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.94
1 LOUGHB'H RD W/B	NA1,NA2, NA3	Façade	Y	Triplicate Co-located Tube	75 – 92%	33.9
EDWARD ROAD, LADY BAY	ER	RS	Y	N	83	32.7
LOUGHBOROUGH ROAD (RES)	LR	Façade	Y	N	92	37.6
CENTENARY HOUSE	CH	Façade	Y	N	92	30.8
RADCLIFFE ROAD	RR	Façade	Y	N	92	37.9
SWANS HOTEL	SH	Façade	Y	N	92	33.0
THE POINT	POINT	Façade	Y	N	92	30.1
TRENT BOULEVARD A	TBLA	Façade	Y	N	83	37.2
TRENT BOULEVARD B	TBLB	Façade	Y	N	92	**40.4**
TRENT BRIDGE INN	TBI	Façade	Y	N	83	**48.9**
TRENT HOUSE	THF, THF2	Façade	Y	Duplicate	92	**42.0**
WILFORD LANE 3	WL3	RS	Y	N	92	42.3 (38.6) [b]
A60/A52 JUNCTION (Nott Knight)	NK	RS	Y	N	92	**44.3**
3 BOTANY CLOSE	3BT	Façade	Y	N	92	32.6
CLOVERLANDS(Façade)	CL, CLa	Façade	Y	Duplicate	92	34.3
WINDYWAYS	WW, WW2	Façade	Y	Duplicate	92	39.1
A453	A453	RS	N	N	92	**41.1** (29.2) [b]
A52 LINGS BAR Hospital	GLB HOS	Façade	N	N	83	21.8

A52 SOUTH AVE, RADCLIFFE	A52/SA	RS	N	N	92	36.1
RADCLIFFE A52	A52/RT	RS	N	N	92	**41.8** (**38.9**) [b]
A52 HOME HOUSE(façade) STRAGGLETHORPE	A52/HHF1, A52/HHF2, A52/HHF3	Façade	Y	Triplicate	92	**51.9**
A52 HOME HOUSE(Garden) STRAGGLETHORPE	A52/HHG	Garden	Y	N	92	25.4
A52 HOMEHOUSE (Façade away from junction on A52)	A52/HHF4	Façade	Y	N	67 [a]	**45.6 (49.3)** [a]
STRAGGLETHORPE ROAD	SR	Façade	Y	N	92	34.6
21 HEATHERVALE	HV	Façade	N	N	75	23.1
34 BRIDGFORD ROAD	BR	Façade	N	N	92	27.4
39/41 WILFORD LANE	WLR/2	Façade	N	N	92	28.9
HAMPTON ROAD	HR	UB	N	N	92	21.8
HICKORY HOUSE	HH	Façade	N	N	92	29.1
110 WILFORD LANE	110 WL	RS	N	N	83	33.4
37 RADCLIFFE ROAD	37RR	Façade	N	N	83	34.2 (34.5) [b]
PEVERIL COURT	PC, PC2	Façade	N	Duplicate	92	29.0
THE BEECHES HOTEL	BH	Façade	N	N	92	30.7
1 KIRKHILL	1KH, 1KH2	Façade	N	Duplicate	83- 92	27.5
4 KIRKHILL	4KH	RS	N	N	92	35.9
15 KIRKHILL	15KHG	RS	N	N	83	31.8
19 NEWTHORPE STREET	19NS	Façade	N	N	92	31.0

Data in bold, shows exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

[a] Means "annualised" as in Box 3.2 of TG(09)(http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), because full calendar year data capture was less than 75%

[b] exceedence was measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure was estimated based on the "NO2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/NO2-falloff.html). The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30).

Table 2.6 Results of NO_2 Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.91/0.92)	2009 (Bias Adjustment Factor = 0.95)	2010 (Bias Adjustment Factor = 0.92)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.94)
1 LOUGHB'H RD W/B	Façade	Y	35.7	34.2	34.5	30.5	33.9
EDWARD ROAD, LADY BAY	RS	Y	n/a	34.5	35.7	29.6	32.7
LOUGHBOROUGH ROAD (RES)	Façade	Y	**40.0**	35.3	37.6	34.5	37.6
CENTENARY HOUSE	Façade	Y	32.1	33.9	35.0	27.1	30.8
RADCLIFFE ROAD	Façade	Y	38.6	40.1	40.8	36.5	37.9
SWANS HOTEL	Façade	Y	31.2	32.8	32.2	29.9	33.0
THE POINT	Façade	Y	29.5	29.1	28.5	26.7	30.1
TRENT BOULEVARD A	Façade	Y	38.5	37.0	34.6	34.9	37.2
TRENT BOULEVARD B	Façade	Y	38.0	**40.3**	38.8	37.2	**40.4**
TRENT BRIDGE INN	Façade	Y	n/a	**54.0**	**48.8**	**47.6**	**48.9**
TRENT HOUSE	Façade	Y	39.6	**43.0**	**42.0**	38.9	**42.0**
WILFORD LANE 3	RS	Y	n/a	**44.0**	**40.3**	**41.1**	**42.3 (38.6)** [b]
A60/A52 JUNCTION (Nott Knight)	RS	Y	**48.2**	**49.3**	**44.3**	**49.7**	**44.3**
3 BOTANY CLOSE	Façade	Y	n/a	36.5	31.0	28.1	32.6
CLOVERLANDS(Façade)	Façade	Y	**44.2**	38.5	36.0	32.5	34.3
WINDYWAYS	Façade	Y	39.3	38.8	35.0	37.9	39.1
A453	RS	N	**44.9**	**44.2**	**41.1**	**40.8**	**41.1** (29.2) [b]
A52 LINGS BAR Hospital	Façade	N	n/a	22.5	23.9	19.6	21.8
A52 SOUTH AVE, RADCLIFFE	RS	N	n/a	34.8	35.9	31.2	36.1
RADCLIFFE A52	RS	N	**42.6**	39.1	38.7	36.6	**41.8** (38.9) [b]
A52 HOME HOUSE(façade) STRAGGLETHORPE	Façade	Y	n/a	n/a	**52.0**	**49.4**	**51.9**

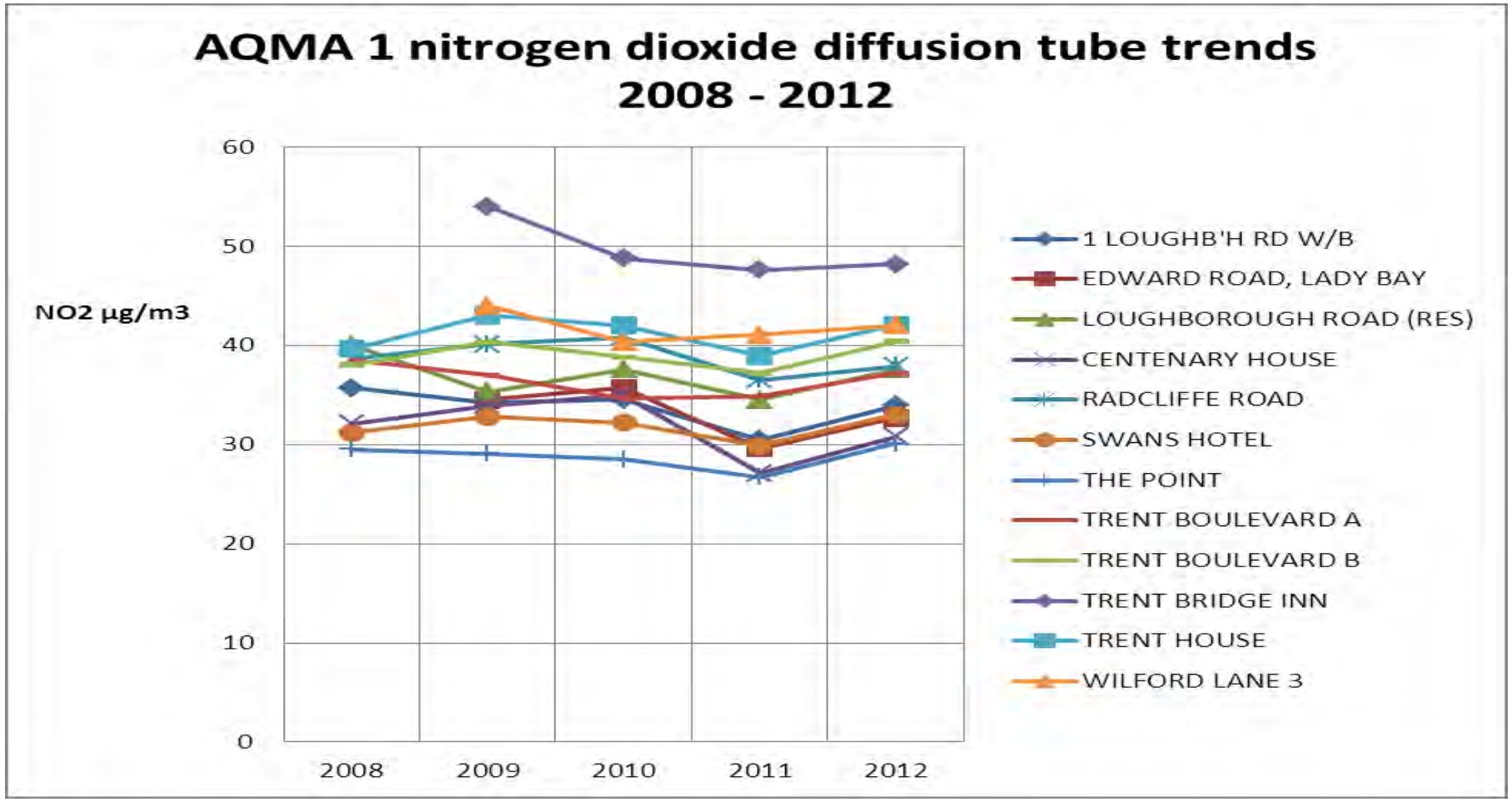
Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.91/0.92)	2009 (Bias Adjustment Factor = 0.95)	2010 (Bias Adjustment Factor = 0.92)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.94)
A52 HOME HOUSE(Garden) STRAGGLETHORPE	Garden	Y	n/a	n/a	n/a	n/a	25.4
A52 HOMEHOUSE (Façade away from junction on A52)	Façade	Y	n/a	n/a	**41.0**	**42.0**	**45.6 (49.3)** [a]
STRAGGLETHORPE ROAD	Façade	Y	n/a	36.3	37.7	36.8	34.6
21 HEATHERVALE	Façade	N	29.4	29.5	25.9	21.7	23.1
34 BRIDGFORD ROAD	Façade	N	27.1	27.6	26.1	25.1	27.4
39/41 WILFORD LANE	Façade	N	30.4	30.1	29.6	26.5	28.9
HAMPTON ROAD	UB	N	21.7	21.8	22.0	18.8	21.8
HICKORY HOUSE	Façade	N	28.9	29.8	28.2	27.0	29.1
110 WILFORD LANE	RS	N	n/a	n/a	36.5	33.0	33.4
37 RADCLIFFE ROAD	Façade	N	n/a	35.2	33.3	30.0	34.2 (34.6) [b]
PEVERIL COURT	Façade	N	30.3	30.1	30.8	26.5	29.0
THE BEECHES HOTEL	Façade	N	33.1	29.9	30.7	26.8	30.7
1 KIRKHILL	Façade	N	n/a	n/a	n/a	**40.6**	27.5
4 KIRKHILL	RS	N	n/a	n/a	n/a	34.1	35.9
15 KIRKHILL	RS	N	n/a	n/a	n/a	n/a	31.8
19 NEWTHORPE STREET	Façade	N	n/a	n/a	n/a	n/a	31.0

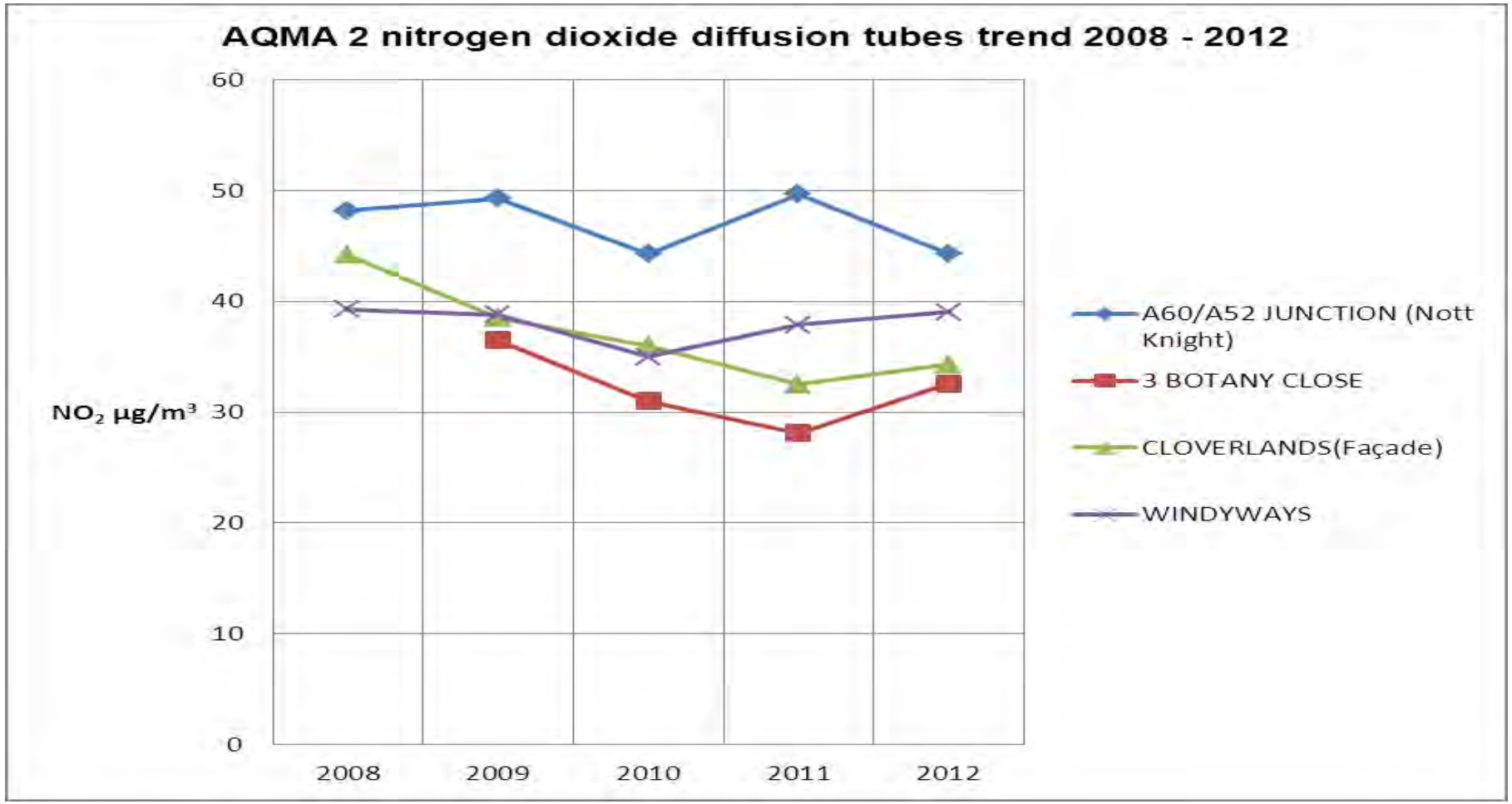
Data in bold, shows exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

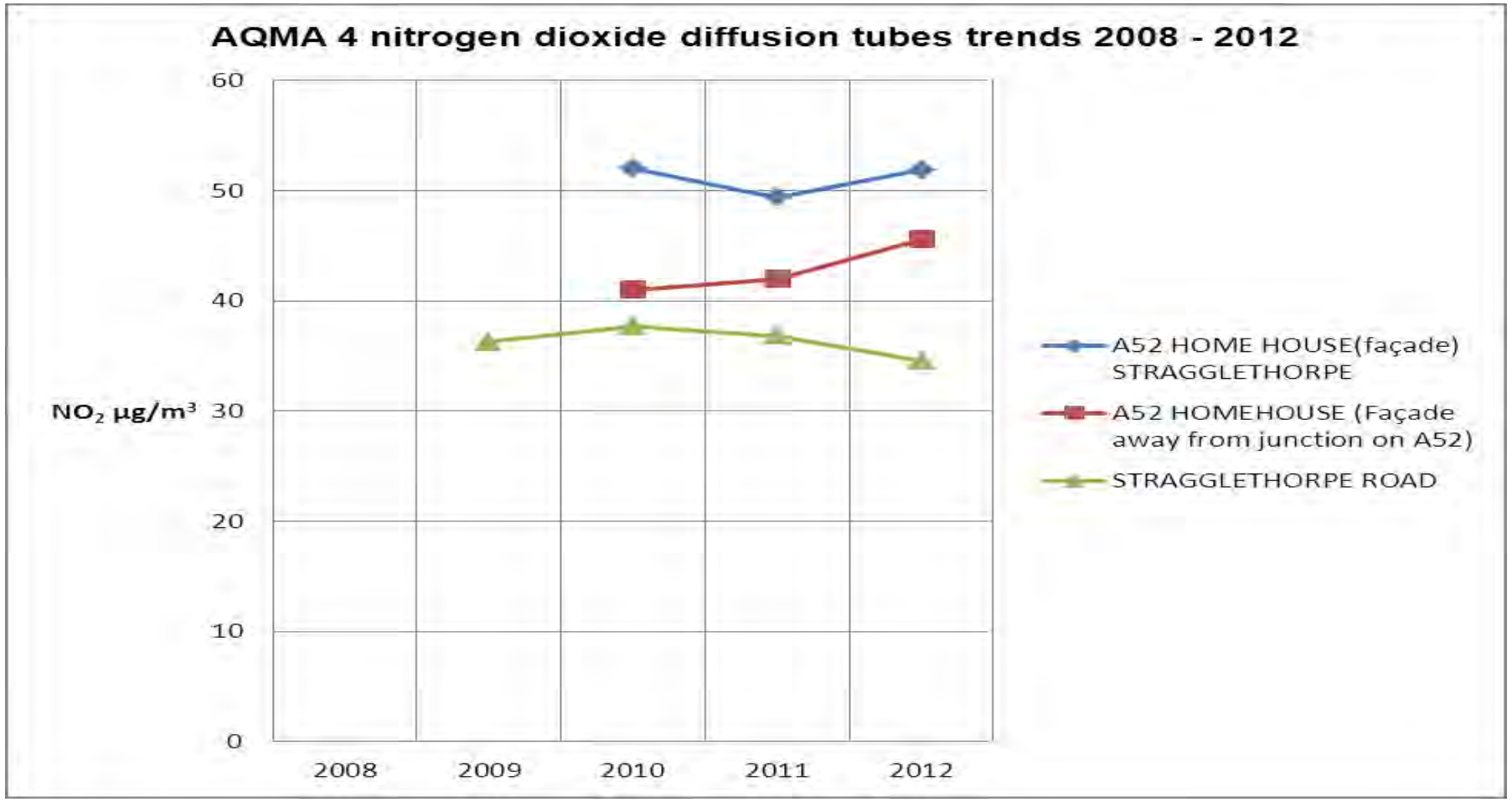
[a] Means "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), as full calendar year data capture was less than 75%' The corrected concentration is in brackets.

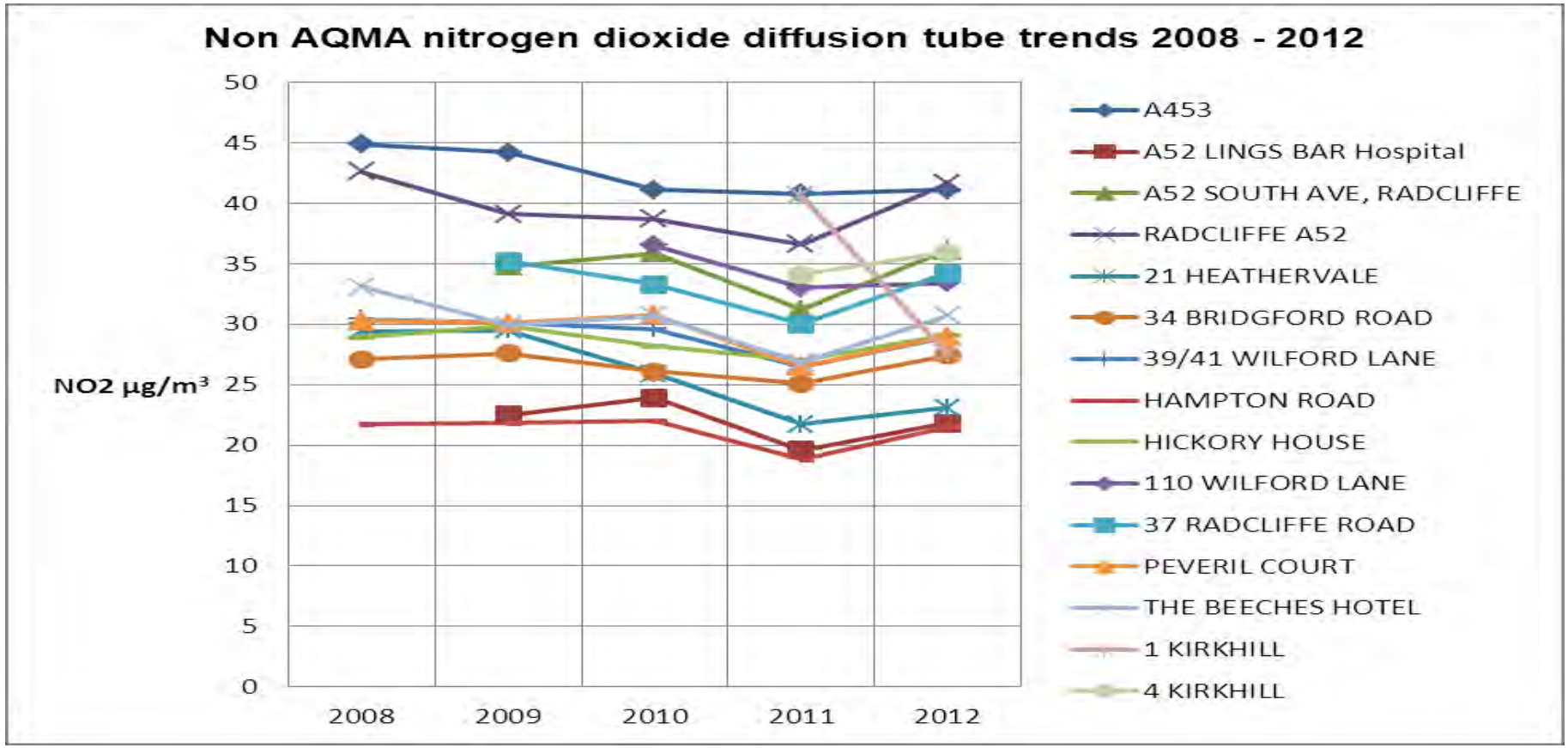
[b] Means distance corrected with the final concentration in brackets

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




AQMA 2 nitrogen dioxide diffusion tubes trend 2008 - 2012
60
50
40
30
20
10
0
NO2 µg/m3
2008
2009
2010
2011
2012
A60/A52 JUNCTION (Nott Knight)
3 BOTANY CLOSE
CLOVERLANDS(Façade)
WINDYWAYS


AQMA 4 nitrogen dioxide diffusion tubes trends 2008 - 2012
60
50
40
30
20
10
0
NO2 µg/m3
2008
2009
2010
2011
2012
A52 HOME HOUSE(façade) STRAGGLETHORPE
A52 HOMEHOUSE (Façade away from junction on A52)
STRAGGLETHORPE ROAD


Non AQMA nitrogen dioxide diffusion tube trends 2008 - 2012
NO2 µg/m³
50
45
40
35
30
25
20
15
10
5
0
2008
2009
2010
2011
2012
A453
A52 LINGS BAR Hospital
A52 SOUTH AVE, RADCLIFFE
RADCLIFFE A52
21 HEATHERVALE
34 BRIDGFORD ROAD
39/41 WILFORD LANE
HAMPTON ROAD
HICKORY HOUSE
110 WILFORD LANE
37 RADCLIFFE ROAD
PEVERIL COURT
THE BEECHES HOTEL
1 KIRKHILL
4 KIRKHILL

Discussion of the trends in nitrogen dioxide levels from 2008 to 2012.

AQMA 1 nitrogen dioxide levels

The Trent Bridge Inn diffusion tube results over the 2008 to 2012 period show a decrease of 5.1µg/m^3, whilst all the other diffusion tube sites in AQMA 1 show relatively consistent levels of nitrogen dioxide.

AQMA 2 nitrogen dioxide levels

The Windy Ways (façade) and Nottingham Knight (roadside) diffusion tubes have shown stable levels of nitrogen dioxide over the past five years. Both sites are adjacent to the A52 and A60 roundabout.

Botany Close shows a slight decrease in levels whereas Cloverlands shows a marked decrease, being further away from the A52/A60 roundabout.

AQMA 4 nitrogen dioxide levels 2010 to 2012

The diffusion tube mounted on the Stragglethorpe Road façade of Holme House show consistent levels below the nitrogen dioxide AQO, whilst the A52 façade tubes are well above the AQO. The A52/HH/F4 location shows a significant increase over the 2010 to 2012 period.

Non AQMA nitrogen dioxide levels

The majority of the diffusion tube sites show consistent or slight decreases in nitrogen dioxide levels.

The A453 roadside site has shown a slight decrease in levels over the past five years. It should be noted that work has commenced to improve the section of this road from the M1 to Clifton has commenced and monitoring at this site may be compromised during the work.

The above trends seem to reflect the current national view that the ambient trends in the concentrations of NO_2 are not decreasing as predicted by using the current emission factors.

2.2.2 Particulate Matter (PM_{10})

In 2012 Rushcliffe undertook automatic monitoring for PM_{10} at the AQMA 4 A52/Stragglethorpe Road junction site. The particulate monitor was relocated from the Centenary House site in AQMA 1 in October 2010 following the 2010 Progress Report which concluded that the site was unlikely to have PM_{10} exceedences at this site due to a falling trend over a number of years. The monitor was moved to the AQMA 4 site and commenced monitoring in April 2011, following difficulties getting power to the site. This site was chosen due to the high traffic flows, the proximity of receptors to the road and the high NO_2 levels observed from diffusion tube sampling undertaken by Rushcliffe BC.

Monitoring for PM_{10} was undertaken with a Sven Leckel particulate sampler with a 10 micron selective head fitted. This monitoring technique is a gravimetric method and therefore the results did not require any bias adjustment. Daily mean values were validated and ratified for comparison against the 24-hour mean objective for PM_{10}. Full details of the monitor and the QA/QC procedures are contained in Appendix A.

There were no exceedences in 2012 of the annual mean objective for PM_{10} (40 $\mu g/m^3$) (Table 2.7) and there were 21 exceedences of the 24-hour mean objective (Table 2.8). A graph showing the full dataset is shown in Appendix B, Figure 13.2

Although traffic on the A52 is the main source contribution of PM_{10}, it was considered unlikely that will be any exceedences of the annual or 24 hour mean objectives (35 exceedences) in the future and there are no significant PM_{10} contribution from industrial sources in the area. The trend over the limited period of monitoring shows a slight increase from 2011 to 2012, but the decision was made to discontinue monitoring for PM_{10}, and after obtaining advice from Bureau Veritas (acting on behalf of the LAQM Helpdesk), the monitor was removed from the site and mothballed.

Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2008	2009	2010	2011	2012
Holme House	Roadside	Y	NA	98.0	Y	NA	NA	NA	21.8 [c]	24.8

[c] Means "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), for data capture less than 75%

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2008	2009	2010	2011 [c]	2012
Holme House	Roadside	Y	NA	98	Y	NA	NA	NA	11 [c] (90th %tile= 43.3)	21

[c] data capture for full calendar year was less than 90%, therefore the 90.4th percentile of 24-hour means in is shown in brackets

2.2.3 Sulphur Dioxide (SO_2)

No monitoring was carried out for sulphur dioxide in 2012.

2.2.4 Benzene

No monitoring was carried out for benzene in 2012.

2.2.5 Other Pollutants Monitored

No other pollutants were monitored for in 2012.

2.2.6 Summary of Compliance with AQS Objectives

Rushcliffe Borough Council has examined the results from the NO_2 and PM_{10} monitoring in the Rushcliffe Borough during 2012 and compared the concentrations against the AQO for those pollutants.

The nitrogen dioxide concentrations at some of the relevant locations within the AQMAs are still exceeding the 40µg/m^3 for NO_2 at Holme House location (AQMA 4), Trent House Flats and Trent Boulevard (both in AQMA 1), and marginally below the AQO at Windyways (AQMQ 2). It is therefore considered that all the AQMA's should remain.

The AQAP for AQMA 4 has not progressed as quickly as hoped being held up awaiting response from the Highways Agency on consultation on proposed measures. Meetings have taken place but until a formal response is received the Borough Council cannot progress this AQAP. The development of the AQAP for AQMA4 will be followed up in 2013, consulted on and submitted to Defra when completed. It is hoped this can be before the next reporting date.

Nitrogen dioxide concentrations outside of the AQMAs are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment for any of those locations.

The PM_{10} concentrations measured at Holme House in AQMA4 are well below the AQO and therefore the monitoring at this site was discontinued at the end of 2012.

3 New Local Developments

Land at Sharphill To East And West Of Melton Road Edwalton Nottinghamshire
Proposal: Mixed use development of up to 1200 dwellings; primary school; business innovation centre; further education centre; 100 bed hotel; local centre with retail units, community building and health centre, sports facilities and community park; associated road
Decision: **Refused**
Appeal status: **Allowed**
Application number: 08/00664/OUT Melton Road, Edwalton (Sharphill)

No construction has begun on this site in 2012. An application for reserved matters is expected in 2011 in order to prevent the permission from lapsing. At the time of writing an application for reserved matters for just 3 properties has been received.

RAF Newton.
The site though has received permission for development in several parts and will continue to achieve applications in the future.
In 2007 outline permission was given for mixed use scheme including use of hangars 1, 3 and 5 for B8 use; demolition of former officer's accommodation and construction of 165 dwellings with community facility, access and open space (revised proposals).
The demolition on the site has now been completed and various sections of the site have either been developed, or are being developed by a number of housing construction firms

3.1 Road Traffic Sources

A46 dueling
The A46, linking Widmerpool to Newark A46 was completed in 2012. Following the completion of this road, the traffic flow has been moved away from a number of receptors. At the time of writing this report, we are awaiting a comparative report from the HA which will discuss the impact this new road has had on traffic flow, congestion etc. however this will depend on traffic surveys being undertaken by them and the date of which is unknown at this time.

A453 improvement scheme
Following a new funding announcement in 2012, the duelling of the A453 from J24/M1 to Nottingham was approved. Whilst the road is not currently a new source, it is likely to impact on our ability to continue a monitoring site at Thrumpton.

3.2 Other Transport Sources

Rushcliffe Borough Council confirms that there are no new _other transport sources' since the last Review and assessment report in their local authority area meeting the specified criteria.

3.3 Industrial Sources

Lafarge Aggregates

In 2011, permission was granted for a new bagging plant at the site (planning ref: **11/00510/CMA)** The site operator submitted associated documentation, which at the time of this report, is being considered for determining the need to alter their current permit.

Bunny brick works

Application was received for the storage and processing of Bottom Ash (**12/01028/CMA).** No objections were raised to this application subsequent to a dust management plan being in place. This was placed as a condition on their planning approval

Cemex East Leake - Mineral Extraction

An application was approved in March 2011 for an extension to the existing site. Conditions were placed on this approval to ensure that dust from the site was logged and reported to the LA.

3.4 Commercial and Domestic Sources

John Brooks Saw Mills Biomass Boilers

Report submitted in 2012 indicated that there would not be an impact on the closest AQMA 1. Site was not operating the Biomass for the period of this report.

Smart Wood recycling

Application for the above was granted in 2012. This LA has investigated a number of dust complaints regarding their current site. At the time of writing this report, the site is not in operation and the plant removed.

3.5 New Developments with Fugitive or Uncontrolled Sources

Rushcliffe Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

4 Local / Regional Air Quality Strategy

Rushcliffe Borough Council have adopted a regional Air Quality Strategy, this is available at the following website:

http://cms.nottinghamshire.gov.uk/home/traffic_and_travel/strategy-policy/airquality.htm

This strategy has been prepared by a partnership of Nottinghamshire Local Authorities, the Environment Agency, The Health Protection Agency and the Highways Agency. The work has been led by the Nottinghamshire Environmental Protection Working Group. This framework identifies and agrees an effective strategy to improve air quality in the next decade throughout the whole of Nottinghamshire and also reduce greenhouse gas emissions particularly CO_2. The strategy is entitled ‗A breath of fresh air for Nottinghamshire, An Air Quality Improvement strategy for the next Decade' and was launched in 2008.

The Framework for Action seeks to fulfil the following main objectives:

- Minimise air pollution and the impact of global warming and climate change.
- Encourage sustainable development in Nottinghamshire to protect the health and wellbeing of the population.
- To work with businesses, stakeholders and the residents of Nottinghamshire to encourage sustainable improvements in air quality.
- Support and maintain the work of the Nottinghamshire Air Quality Steering Group.
- Complement other county wide groups and strategies adopted and supported by Local Authorities and the County Council and other organisations such as the Environment Agency, Primary Care Trusts, Highways Agency and the Health Protection Agency.
- Ensure that the strategy to improve air quality in Nottinghamshire is reviewed by 2011.

The Council is a member of the Nottinghamshire Environmental Protection Working Group (NEPWG) formed in partnership with Nottinghamshire County Council,

Ashfield District Council, Bassetlaw District Council, Broxtowe Borough Council, Gedling Borough Council, Mansfield District Council, Newark and Sherwood District Council Nottingham City Council, Environment Agency, Health Protection Agency and the Highways Agency.

The NEPWG works under the direction of the Nottinghamshire Chief Environmental Health Officers Group. The NEPWG enables the authorities to work collaboratively on the full range of pollution issues, demonstrating that liaison on a technical level is already well established.

NPWG in process of updating the strategy but due to district re-organisations, workloads, and other Corporate priorities (across the County), this not been done. The Nottinghamshire Chief Officers Group will ensure that work is taken forward to complete and update this strategy in 2013

5 Planning Applications

Housing sites			
Planning ref	Site name	No. of dwellings	Other
11/01582/FUL	39-41 Loughborough Rd, West Bridgford	14 Apartments	Within AQMA1. Objections raised due to no AQ Assessment.
12/01029/FUL	34 Wilford Lane, West Bridgford	9 Dwellings	Not within AQMQ.
Employment sites			
Planning ref	Site name	Proposal	Other
12/00103/CMA	Smart Wood Recycling, Langar	COU Wood recycling	Conditions relate to control of dust from site
12/00564/FUL	Sainsburys, Wilford Lane, West Bridgford	New Superstore	Monies obtained from s106 agreement for additional diffusion tube monitoring
12/01028/CMA	Johnsons Aggregates, Bunny	Bottom Ash	See separate comment in this report
12/01488/CMA	Cemex, East Leake	Increase site	See separate comment in this report

6 Air Quality Planning Policies

Rushcliffe Borough Council currently has no local planning policies dedicated solely to air quality; Policy G1 of the Rushcliffe Borough Non-Statutory Local Plan does cover issues in relation to pollution. Above this, the National Planning Policy Framework (NPPF), introduced in March 2012, states that *"the planning system should contribute to and enhance the natural and local environment by… preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability*". The NPPF states specifically that *"planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan*". Wherever possible, the wording contained within the NPPF is used when responding to Air Quality matters to give any consultation responses greater impact within the planning decision making process

Whilst the East Midlands Regional Plan has been abolished it is intended that the Council's Local Development Framework (LDF) will, in time, set out new policies that contribute to reducing air pollution. In particular, a Supplementary Planning Document (SPD) relating to air quality is likely to be prepared. However, work on it cannot be undertaken until the main elements of the LDF, specifically the LDF's Core Strategy, have been progressed further. At present, it is envisaged it will be around 18 months to 2 years before the SPD can be completed.

Local Transport Plans and Strategies

The Nottinghamshire Local Transport Plan (LTP) is produced by the County Council and sets out the long-term transport strategy for the whole of Nottinghamshire. It was developed in consultation with a range of stakeholders and the public to identify existing and potential challenges and how to address these challenges.

The LTP consists of two separate documents:

- A strategy document detailing how transport improvements will be delivered in the county, and

- An implementation plan which sets out where investment will be prioritised to deliver the local transport strategy.

The local transport strategy element of the LTP covers the fifteen year period 1 April 2011 to 31 March 2026 and will be reviewed at least every five years; whilst the implementation plan mirrors central government's Comprehensive Spending Review periods and will be reviewed annually to ensure:

- Consideration of changes in transport conditions
- Consideration of the effectiveness of the strategy to deliver transport improvements in Nottinghamshire
- The priorities and focus are still relevant and address the transport issues in Nottinghamshire, as well as national and regional priorities, and
- Consideration of changes in corporate priorities such as those detailed within the sustainable community strategy 2010-2020
- The effectiveness of the measures used to deliver the strategy.

The main functions of the LTP are to:

- Draw links with wider land-use planning, economic, social, health, and sustainability agendas
- Detail how the national and local priorities for transport will be delivered in Nottinghamshire
- Detail local objectives and indicators that will form the basis of the County Council's investment in transport, and
- Demonstrate best value solutions to transport issues in the county.

One of the strategic transport goals in the LTP is to minimise the impacts of transport on people's lives, maximise opportunities to improve the environment and help tackle carbon emissions. This will focus on:

- Adapting to climate change
- CO_2 emissions
- Congestion management
- Air quality
- Noise, and Biodiversity, the natural, historic and physical environment.

The County Council's adaptation responses to the predicted impacts of climate change are detailed in section 7.1 of the LTP.

Addressing CO_2 emissions from ground transport (which is detailed in section 7.2 of the LTP) will involve:

- Effective spatial planning
- Supporting change to new vehicle technologies and lower carbon fuels
- Promoting lower carbon transport choices
- Encouraging A transfer to lower carbon vehicles, and
- Education on lower carbon transport issues.

Whilst congestion management will play a major role in minimising the impacts of transport on people's lives, maximising opportunities to improve the environment and helping tackle carbon emissions, the measures to be undertaken to manage congestion is detailed within Section 4.1 – Making best use of our existing transport networks, of the LTP.

Addressing transport related air quality issues, particularly within air quality management areas (which is detailed in section 7.4 of the LTP) will involve working with district councils to:

- Assess and monitor air quality, and
- Develop action plans to improve air quality where necessary.

- On-going assessment will continue to be undertaken across the county to monitor levels of pollutants to help identify existing or potential exceedences in the future. If issues arise there are existing mechanisms whereby they can be raised and tackled through a partnership approach.

- Given the close links between air quality and congestion, the measures detailed within Section 4.1 – Making the best use of our existing transport networks, of the LTP, are used to manage congestion and therefore help maintain air quality and will form the basis for air quality action plans. Where assessments identify existing or likely future exceedences additional resources will, however, be prioritised to address such exceedences.

- The LTP can be viewed or downloaded from:

http://www.nottinghamshire.gov.uk/travelling/travel/plansstrategiesandtenders/local-transport-plan/ltp3/

- Rushcliffe Council regularly meets with Nottinghamshire County Council's local transport plan manager to discuss the progress of the measures set out in the AQAP and supported through the LTP. The aim of the meeting is to monitor delivery of the key objectives set out in the action plan, including looking at such matters as improving traffic flows, park and ride systems, improvements to public transport and considering air quality impacts from major developments. The meetings enable this Authority to improve air quality by working in partnership with the County Council on transport planning issues within the borough that may be directly outside of its control. A target has been set to meet with the LTP on three occasions annually.

7 Climate Change Strategies

The council‘s climate change strategy was published in July 2010 and the associated climate action plan for the period 2009 – 2020 was developed and completed.
At the time of writing, of the 81 actions in the action plan, 42 have been completed, 8 have been cancelled, 9 have not yet started and 22 are ongoing.

The Climate Change Strategy and The Climate Change Action Plan are available at:
http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/Climate_change_july_10.pdf,
and
http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/rushcliffe_climate_change_action_plan_09d.pdf

As part of the Climate Change Strategy and Action Plan, a five year Carbon Management Plan was produced for its own estates and operations up to 2020, as measured against emissions in 2009/10.
The emissions reduction target is to reduce the total direct GHG significant emissions by 15% by 2015 and a further 15% by 2020. To date the council has achieved 9.7% reductions in emissions.

The Carbon Management Plan is available at:
http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/Carbon%20Management%20Plan%202011.pdf

8 Implementation of Action Plans

The air quality action plan was drawn up to outline the actions to be undertaken by the County Council, Rushcliffe BC and other partner organisations to work toward reducing nitrogen dioxide levels within the declared AQMA1 to below the National Air Quality Objectives at relevant receptor locations. The main action plan measures are derived from the LTP.

The third Local Transport Plan (LTP) for Nottinghamshire came into effect on 1 April 2011 and was drawn up in consultation with the public, stakeholders and County Council elected members. The strategic goals of the LTP are to:

- provide a reliable, resilient transport system which supports a thriving economy and growth whilst encouraging sustainable and healthy travel
- improve access to key services, particularly enabling employment and training opportunities, and
- Minimise the impacts of transport on people‘s lives, maximise opportunities to improve the environment and help tackle carbon emissions.

The consultation identified twelve local transport objectives that will be addressed to help deliver the LTP strategic goals. Delivery of the local transport objectives will also help deliver air quality improvements as nine of the twelve objectives will help lead to improved air quality and the table below details the impact that delivery of each of the objectives will have on the air quality improvements within the AQMAs.

The LTP commits to working in partnership with the district councils to deliver air quality improvements generally; but particularly within AQMAs as a result of road traffic on the road network for which the County Council is responsible. The LTP also recognises the role of the Air Quality Action Plan (AQAP) to help provide a systematic way of joining up air quality management and transport planning.

Major positive Impact	Positive Impact	Minor positive impact	No impact	Minor negative Impact	Negative Impact	Major negative impact

Local Transport Plan objectives	
Tackle congestion and make journey times more reliable	
Improve connectivity to inter-urban, regional and international networks, primarily by public transport	
Address the transport impacts of planned housing and employment growth	
Encourage people to walk, cycle and use public transport through promotion and the provision of facilities	
Support regeneration	
Reduce transport's impact on the environment	
Adapt to climate change and the development of a low-carbon transport system	
Improve levels of health and activity by encouraging active travel instead of short car journeys	
Address and improve personal safety when walking, cycling or using public transport	
Improve access to employment and other key services, particularly from rural areas	
Provision of an affordable, reliable, and convenient public transport network	
Maintain the existing transport infrastructure	

Table 8.1 NCC Action Plan ProgressTable 8.1details progress of the measures implemented by the County Council to help reduce exceedences within AQMA1 in 2011/12 as well as those that are ongoing. Whilst it should be recognised that these activities could potentially have an impact on AQMAs 2 and 4, the County Council is not responsible for the highway network which has caused the exceedences within AQMAs 2 and 4 as this is the responsibility of the Highways Agency and not the County Council. Rushcliffe Borough Council therefore also liaises with the Highway Agency to address the exceedences within AQMAs 2 and 4.

Table 8.2 details the indicators used to evaluate the individual measures. A colour coding scheme is used to easily identify which targets are being met and which are behind schedule. Given that several of the indicators are reported on a financial year basis, data/analysis is still outstanding for several indicators. Indicators where data is not yet available are marked N/A.

Funding

The Comprehensive Spending Review, announced on 20 October 2010, detailed several changes in local transport funding. The DfT announced reductions in overall transport funding by 15% in real terms over the period 2011/12 to 2014/15, making savings of 21% from the revenue budget and an 11% reduction in capital spending. The funding for local transport improvements, such as addressing congestion or air quality, is called the integrated transport block and is calculated by DfT through needs based formulas.

As a result of announced funding reductions, central government integrated transport funding in 2012/13 represented a reduction of £5.39m or 50% in comparison with 2010/11 proposed funding levels (pre in-year cuts). Recognising the importance of local transport improvements to help develop the economy and reduce harmful emissions, the County Council determined to support the integrated transport funding with additional County Council capital funds of over £1.5m in 2012/13 to minimise the overall reductions.

The reductions in central government funding will, however, have a serious impact on the delivery of transport improvements within AQMA1, as detailed within the AQAP.

The County Council submitted a successful joint Local Sustainable Transport Fund (LSTF) bid with Nottingham City Council and Derbyshire County Council. The LSTF bid contains several elements that will help improve journey times, and reduce emissions from transport which will have a positive impact on the AQMA and these schemes have been included within the table where appropriate.

Table 8.1 NCC Action Plan Progress

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
Parking	Park & Ride facilities	Pilot 'pocket' park and ride schemes have been implemented along the A46 and A52 corridor and are monitored to determine their effectiveness. The development of LTP3 included a review of transport schemes that currently have land safeguarded along their proposed route, or would require the County Council to safeguard a route. The review recognised the need for a Park & Ride site to the east of Nottingham and therefore further investigations will be undertaken to identify a site (potentially linked to new housing/employment development).	Monitoring of the two site indicates that approximately 6 vehicles use the A46 corridor site daily as a park and ride facility (which has remained static over the last 12 months); and approximately 6 vehicles use the A52 corridor site daily as a park and ride facility (which has increased over the last 12 months). No progress has been made on the development of an eastern park and ride site due to resource constraints but primarily as any scheme is potentially dependent upon future development which has not come forward yet.	LTP1 LTP2 LTP4 LTP5 NI177 LTP20
Smarter Choices	NCC travel plan 1996 and on-going	The NCC travel plan has been in operation for the past 10 years and has been incorporated into the climate change action plan for the County Council. In 2007 NCC employees based at campuses in West Bridgford travelled to work by the following means - 12% cycled; 7% walked; 9% by public transport; and 9% car share.	The Council intends to continue monitoring the mode split of travel to work bi-annually. The surveys undertaken during the 2011/12 financial year indicated that of the staff working at the West Bridgford campus 10% cycled; 8% walked; 14% travelled by public transport; and 9% car share. These figures are much better than the mode of travel to work for all people in Nottinghamshire detailed in the 2011 census (3% cycled; 8% walked; 9% by public transport; and 5% car share) and show an overall increase in sustainable travel since the surveys undertaken in 2007. Surveys will be undertaken again during 2013. A variety of measures have been undertaken to promote alternatives to the car, including involvement in 'walk week', 'bike week', car sharing, personalised travel planning etc.	LTP1 LTP2 NI176 LTP4 LTP5 LTP7 NI177 LTP13 LTP19 LTP20 LTP21
	Car parking Investigate staff car park charging and its implications	A car park focus group has been established for NCC staff to ensure equality of any implications. A decision on any 'on-site' charging regime has been delayed, however, due to an impending change in Chief Executive in 2008. Staff car park charging has been introduced for NCC employees at 'off-site' nearby previously free parking facilities.	Charging at 'off-site' car parks was introduced in April 2008. There has been a significant reduction in the numbers of observed vehicles parking in the car parks but there is no evidence to demonstrate that this parking has not just been displaced on-street. It is proposed that there will be a review of car parking arrangements at specific County Council sites as part of the 'new ways of working' being introduced at the County Council, although this work will not be complete until 2015.	LTP1 LTP2 LTP4 LTP5 NI177 LTP13 LTP21
	Cycling Undertake measures to maintain cycling levels at 2010 levels - on-going	All of the work undertaken by the NCC travel plan co-ordinator (e.g., publicity campaigns, personalised travel planning etc.) aim to deliver increases in cycle mode share. In July 2007 (7% of all NCC employees currently cycling to work).	The Council intends to continue monitoring the mode split of travel to work bi-annually. The surveys undertaken during the 2011/12 financial year indicated that of the staff working at the West Bridgford campus 10% cycled. These figures are much better than the mode of travel to work for all Nottinghamshire residents (3%) and Rushcliffe residents (3%) as detailed in the 2011 census travel to work data; as well as all NCC employees (7% cycled). Surveys will be undertaken again during 2013.	LTP1 LTP2 LTP4 LTP5 LTP13 LTP20 LTP24

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
			Despite the very poor weather in 2012, in the Nottingham built-up area part of the county cycling has increased by 5% between 2010 and 2012; and in Rushcliffe district there has been a 1% increase in cycling between 2010 and 2012. It is not possible to analyse these figures at a more local level.	
	Business mileage Undertake measures to deliver 1% per year reduction in business mileage - on-going	Various measures are underway to help deliver the reductions in business mileage including new terms and conditions which affect business mileage rates and driver training to help motorists drive more sustainably.	Across the Nottingham built-up area the area wide road traffic mileage has reduced by 8% between 2005 and 2011. HGVs areawide road traffic mileage across the Nottingham built-up area has decreased by 22% during the same period. Correspondingly there has also been a 6% reduction in CO_2 emissions. It is not possible to analyse these figures at a more local level. Eco-driver training was carried out with staff across the County Council in March 2012.	LTP1 LTP2 LTP4 LTP5 NI177 LTP13 LTP20
	Workplace travel plans Develop workplace travel plans with businesses in the vicinity of the AQMA - on-going	Nottingham Forest has developed an approved travel plan which covers not only its employees but also supporters. Match day smarter choices promotion has been undertaken and discussions are now underway on hard measures to support the travel plan.	A further eight travel plans have been developed in Rushcliffe Borough during 2012/13. Between 2004 and 2009 the A52 saw traffic flow decreases of 3%. During the same period traffic flows on the A46 increased by 6%. No valid traffic flow data is available along the A46 and A52 during 2010 or 2011 due to construction work being undertaken on A46; and data for 2012 has not been released by DfT yet.	LTP1 LTP2 NI176 LTP4 LTP5 LTP7 NI177 LTP13 LTP19 LTP20 LTP21
	Marketing campaigns Investment in marketing public transport as well as the benefits of walking and cycling - on-going	NCC has committed to a funding contribution to the ‗Big Wheel' and had a service level agreement between the two parties is in place for the period 2011/12. ‗Big Wheel' has undertaken various marketing campaigns throughout the year to encourage cycling, walking and passenger transport use.	Despite the very poor weather in 2012, in the Nottingham built-up area part of the county cycling has increased by 5% between 2010 and 2012; and in Rushcliffe district there has been a 1% increase in cycling between 2010 and 2012. It is not possible to analyse these figures at a more local level. Public transport patronage in the county has increased by 2% between 2005/06 and 2011/12. This information is supplied by public transport operators and is not currently available on a ‗corridor by corridor' basis. Smarter choices marketing campaigns have been undertaken during 2012/13 at all of the major sporting venues which could impact on the AQMA (Nottinghamshire County Cricket Club, Nottingham Forest Football Club and Nottingham Rugby Club) at matches during the 2010/11, 2011/12 and 2012/13 seasons.	LTP1 LTP2 NI176 LTP4 LTP5 NI177 LTP8 LTP13 LTP14 NI198 LTP15 LTP16 LTP17 LTP18 LTP19 LTP20 LTP22 LTP23

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
				LTP25 LTP30
	Car sharing The promotion and facilitation of car sharing schemes at NCC and throughout the county - on-going	nottinghamshare.com was launched in April 2006 and continues to be marketed across the county.	The number of current registered users on the website has increased from 2,044 to 2,234 between 2012 and 2013. The number of NCC staff registered on the website has increased to 407. NCC staff have made estimated savings of 388,219miles; 127.8kg of CO_2; and 14.4kg nitrogen oxides as a result of car sharing through the website.	LTP1 LTP2 LTP4 LTP5 LTP20 LTP21
	Car club Establishment of Greater Nottingham Car Club	A feasibility study was undertaken by consultants on the merits of introducing such a scheme. The study concluded that the greatest benefits would be seen by a scheme evolving out of the car share club introduced in the City. A feasibility study was undertaken on the merits of introducing such a scheme and it is still intended that this will be delivered as part of the Nottingham built up area Local Sustainable Transport Fund bid..	Delivery of this measure has been delayed. No outcome from the scheme will be measurable until at least one year after scheme completion.	LTP1 LTP2 LTP4 LTP5 LTP20 LTP21
	Personalised travel planning A pilot ‗travel smart' scheme was undertaken in the Meadows and Lady Bay areas adjoining the AQMA in 2003/04, a further travel smart scheme is due to be undertaken - 2008/09	Due to revenue resource constraints this measure was not undertaken in 2011/12 and will not be undertaken during 2012/13. The Local Sustainable Transport Fund (LSTF) funding must be spent by the end of the 2014/15 financial year.	A successful LSTF bid developed jointly with Nottingham City Council was submitted to DfT in December 2011. The bid includes an element for personalised travel planning which will be prioritised in areas within the county that could impact on congestion and AQMAs. If it is determined that personalised travel planning will be delivered in Rushcliffe it will be undertaken before the end of the 2014/15 financial year.	LTP1 LTP2 NI176 LTP4 LTP5 NI177 LTP13 NI198 LTP14 LTP15 LTP16 LTP17 LTP18 LTP19 LTP20 LTP21 LTP22 LTP23 LTP25 LTP30
Planning	Development control	Co-ordination of land use planning and transport infrastructure through the Local Development Framework	Work continues on the development of the Local Development Frameworks. An Aligned Core Strategy involving all of the district councils in the Core Nottingham Housing Market Area was planned but Rushcliffe may withdraw from this process due to the timescales currently being followed by other planning authorities.	LTP1 LTP2 NI176 LTP4 LTP5 LTP7 NI177 LTP13 LTP14

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
				NI198 LTP15 LTP16 LTP17 LTP18 LTP19 LTP20
	Development control contributions Use of collected development control contributions to provide cycling, walking and public transport improvements within the AQMA - on-going	Two posts have been created within the County Council improve the s106 process and consistency with the districts.	No funding was released by Rushcliffe Borough Council during 2012/13 for improvements that will help provide benefits across the AQMA.	LTP1 LTP2 NI176 LTP4 LTP5 LTP8 NI177 NI178 LTP13 LTP14 NI198 LTP15 LTP16 LTP17 LTP18 LTP19 LTP20 LTP27 LTP28 LTP29
	Promotion and marketing Involvement and promotion of walk week and walk to work day -on-going	Involvement in Walk Week during May includes guided walks, a chance to try out activities.	In addition to the walking events that are held throughout the year, a number of events were held during walk week included: a celebration event in the Market Square to promote health; and walk to work events. National walk to school week was also promoted by the County Council in all schools across the county. It is hoped that the events in Walk Week will encourage people to continue walking and lead healthier lifestyles.	LTP1 LTP2 LTP4 LTP5 LTP14 NI198 LTP20
Cycling	Promotion and marketing Develop and distribute cycle maps of Rushcliffe area (and the rest of the county) - on-going	Maps continue to be distributed throughout the county, and are available as a hard copy and on-line.	In the Nottingham built-up area part of the county cycling has increased by 5% between 2010 and 2012 despite the very poor weather in 2012; and in Rushcliffe district there has been a 1% increase in cycling between 2010 and 2012. It is not possible to analyse these figures at a more local level.	LTP1 LTP2 LTP4 LTP5 LTP13 NI198 LTP20 LTP25 LTP26

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
	Cycle training Deliver adult and child cycle training - On-going	The County Council offers nationally accredited cycle training to people of all ages and abilities. 12 additional trainers were trained to accredited standards in 2008 to meet the national guidelines.	Cycle training continues to be offered free of charge to children in the county. Adult training is also available free to members of the public, whilst training is offered at workplaces at a cost to employers. In 2011/12 4,900 children received cycle training.	LTP1 LTP2 LTP4 LTP5 LTP13 NI198 LTP20 LTP25 LTP26
	Lady Bay Bridge cycle lane To be implemented as part of Eastside Regeneration scheme - 2010/11	This scheme has been delayed as it is part of a wider Eastside Regeneration scheme.	The measure is part of a larger Nottingham City Council Eastside Regeneration scheme. The County Council cannot implement the scheme until works have been undertaken by Nottingham City Council. No progress has been made by the City Council as their scheme is potentially dependent upon future developer contributions.	LTP1 LTP2 NI176 LTP4 LTP5 LTP13 NI198 LTP20
	Cycle parking facilities To be implemented as part of the Local Sustainable Transport Fund (LSTF) – 2014/15	It is proposed to introduce additional secure cycle parking in West Bridgford to provide better integration for cyclists to make longer distance journeys by bus. These facilities will be accessible by bus smartcard.	This is a new measure and therefore there is no progress to report.	LTP1 LTP2 LTP4 LTP5 NI177 LTP8 LTP13 LTP14 LTP15 LTP16 LTP17
Public transport	SkyLink bus service Provision of SkyLink direct 24 hour bus service to the airport - on-going	The service began operating in May 2004 and in February 2006, the Skylink service became 24-hour, operating every 30minutes and was re-routed via Trent Bridge. Between 2005 and 2009 patronage on the Nottingham Skylink service has increased by 168%. The numbers of people travelling to the airport by car have decreased by almost 7%.	The franchise for the Skylink service was re-tendered during 2011 and the new operator revised the route which no longer operates through the AQMA. Another operator took up the vacated route but unfortunately ceased trading during 2012. It is intended that this route will be funded through the LSTF and that it will be operational by May 2013.	LTP1 LTP2 NI176 LTP4 LTP5 NI177 LTP8 LTP15 LTP19 LTP20

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
	Ticketing Introduction of ITSO smartcard ticketing - 2007/08 and on-going	It was planned to introduce ITSO smartcards in replacement of the NCC legacy concessions smartcard in March/April 2007 and this was carried out in the Bassetlaw District. When government announced the introduction of the English National Concessions Scheme (ENCTS) commencing 1st April 2008 it was decided, however, that, rather than carrying out two complete card re-issues, the ITSO and ENCTS cards would be introduced together. Scholars' cards were issued in ITSO format starting July 2007.	130,000 concessions cards (including 21,000 in Rushcliffe) were produced and distributed to pass holders during 2008. Further enhancements to smartcard ticketing in the county will be determined as part of the emerging Integrated Passenger Transport Strategy which will be completed during 2013/14. Any enhancements to the smartcard 'offer' will therefore be developed after 2013/14.	LTP1 LTP2 NI176 LTP4 LTP5 NI177 NI178 LTP8 LTP20 LTP30
	Concessionary fare schemes for the over 60s and disabled Free countywide off-peak concessionary fare schemes for the over 60s and disabled to be introduced - 2006/07 and on-going	A free countywide off-peak concessionary fare scheme for the over 60s and disabled was introduced on 1 April 2006.	95% of older people living in Rushcliffe had taken up their entitlement to a concessionary pass.	LTP1 LTP2 NI176 LTP4 LTP5 NI177 NI178 LTP8 LTP20 LTP16 LTP17 LTP18 LTP30
	Information Investigate and publicise web based journey planners - on-going	Nottinghamshire is now part of the national, multi-modal Traveline journey planner. Web links to the Traveline site are publicised and available from the County Council's website. In addition to this, links to all of the area's public transport operators' journey planner information are also available from NCC's website.	This action has been completed. Links to the Traveline journey planner and operators' journey planner information continue to be available from NCC's website. Further enhancements to web based journey planners in the county will be determined as part of the emerging Integrated Passenger Transport Strategy which will be completed during 2013/14. Any enhancements to web based journey planners will therefore be developed after 2013/14.	LTP1 LTP2 NI176 LTP4 LTP5 NI177 NI178 LTP8 NI198 LTP15 LTP16 LTP17 LTP18 LTP19 LTP20 LTP22

Intervention	Measure/ timescales	Progress with measure	Progress since last review	Related targets
	Construction of the East Midlands Parkway station on the A453 with adjoining park and ride site Scheme completion - 2008/09	Construction started at the site in December 2007.	Parkway station opened in January 2009. The numbers of passengers continues to increase and approximately 5,000 passengers used the station each week during 2011/12.	LTP1 LTP2 NI176 LTP4 LTP5 LTP15 LTP16 LTP17 LTP18 LTP19 LTP20
	Encourage operators to take-up cleaner vehicles through partnership working Cleaner fleet vehicles - 2010/11 and on-going	Operators are encouraged to take-up cleaner vehicles through partnership working. Due to the sustained high level of investment by the two main operators the average age of the bus fleet operating in the AQMA is already less than six years old and by the end of 2007 all of the two main operators fleet were low-emission Euro2, 3 or 4 standards.	Partnerships with all of the major bus operators are on-going including the transport development group which is held every two months. The group helps determine future service and public transport scheme improvements.	LTP1 LTP2 LTP4 LTP5 LTP8 LTP20 LTP27 LTP30
	Introduce increasing proportion of bio-fuels to NCC's fleet		The measure is not due to commence yet and therefore there is no progress or outcomes to report.	LTP1 LTP2 LTP4 LTP5 LTP20
Network management	Traffic control and information Jointly fund the traffic control centre that monitors traffic movement and provides real time traffic control over many traffic signal installations - On-going	The County and City Councils jointly fund the traffic control centre that monitors traffic movement and provides real time traffic control over many traffic signal installations. Real time information is conveyed onto the local media and disseminated via NCC's web site. A review of the Travelwise Centre was undertaken in early 2007 which resulted in a complete restructuring of Travelwise in May 2007. The review included how the traffic and travel information is conveyed to the public, taking into account advances in communication systems, the internet, mobile phones, satellite navigation and radio broadcasting. The existing Travelwise web site was completely rebuilt and developed to become the central real time information hub for reporting road conditions, congestion, road works, events, incidents, travel information and useful advice for the travelling public.	The Travelwise centre remains in operation 24hrs a day, every day.	LTP1 LTP2 LTP4 LTP5 NI178 LTP8 LTP20
	Introduction of SCOOT/MOVA SCOOT/MOVA - On-going Introduction of MOVA at junction of Radcliffe Road/ Ambleside - 2006/07	SCOOT/MOVA and other traffic signal efficiency improvements, including CCTV at junctions within AQMA. MOVA was installed at the junction of Radcliffe Road/Ambleside during 2007/08.	This action was completed during 2012/13. Upgrades to the traffic signals on Bridgford Road/A60 junction in August 2012 enabled some alterations to the phasing of the signals at A60/Radcliffe Road junction where traffic queues outside Trent House flats. The County Council was able to make significant improvements to the operation of the junction during the peak traffic period and off peak	LTP1 LTP2 LTP4 LTP5 NI178 LTP8 LTP20

<table>
<tr><th>Intervention</th><th>Measure/ timescales</th><th>Progress with measure</th><th>Progress since last review</th><th>Related targets</th></tr>
<tr><td></td><td></td><td></td><td>times. The most significant improvement has been to allow the left turn manoeuvre from A60 London Road over Trent Bridge onto A6011 Radcliffe Road to go green earlier than before. This has the potential to significantly reduce the amount of time traffic is standing outside the Trent House flats on the A60 London Road (although it is dependent upon the length of queues through the junction.</td><td></td></tr>
<tr><td></td><td>Co-ordination of streetworks - Effective co-ordination of streetworks to minimise traffic disruption and unnecessary congestion as part of NCC's network management duty

County Council's network management duty - On-going</td><td>Systems for notice management and coordination have been upgraded to enhance noticing handling, monitoring of works proposals, coordination of works and directing timing of works. Staff awareness and training has been undertaken to ensure that powers are used effectively. Promoters of highway works have been made aware of the requirement to manage works to minimise the impact on traffic to reduce disruption. A review of street designations and network hierarchy has commenced to improve data quality for works promoters and network managers and to prioritise works management. Regular coordination meetings have been held between all works promoters in conjunction with the City Council and HA and also additional regular meetings between the HA and the local authorities of Nottinghamshire, Nottingham, Derbyshire and Derby to create a composite framework programme of planned works affecting major routes in the region. In addition, workshops have been held with major works promoters including utility companies to promote good practice and to encourage alternative working methods with a review to reducing peak period working and thereby address the most disruptive aspect of working on the highway.</td><td>Detailed journey time monitoring of key corridors (including the A60, A6011 and A6520 which lie within the AQMA) has been undertaken annually since 2005/06.

Between 2005 and 2011 there has been a decrease in journey times per mile on each of the routes monitored in the AQMA (as well as those leading to the AQMA) as shown in the table below. Data for 2012 is not available yet.

<table>
<tr><th></th><th colspan="7">Journey time per mile in the morning peak</th></tr>
<tr><td>Route</td><td>2011</td><td>2010</td><td>2009</td><td>2008</td><td>2007</td><td>2006</td><td>2005</td></tr>
<tr><td>A6011 Lady Bay Bridge</td><td>4.1</td><td>4.2</td><td>3.7</td><td>4.0</td><td>4.3</td><td>3.9</td><td>4.7</td></tr>
<tr><td>A6520 & A60 Trent Bridge</td><td>2.7</td><td>3.1</td><td>3.2</td><td>4.1</td><td>3.3</td><td>3.2</td><td>3.9</td></tr>
<tr><td>A60 South</td><td>2.8</td><td>3.1</td><td>2.9</td><td>2.8</td><td>2.7</td><td>3.1</td><td>3.2</td></tr>
<tr><td>A606</td><td>3.2</td><td>3.2</td><td>3.1</td><td>3.3</td><td>2.9</td><td>3.2</td><td>3.0</td></tr>
<tr><td>All Routes</td><td>3.3</td><td>3.4</td><td>3.3</td><td>3.6</td><td>3.4</td><td>3.4</td><td>3.8</td></tr>
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NI178
LTP8
LTP20</td></tr>
<tr><td></td><td>Incident management - Effective management of incidents to minimise traffic disruption and unnecessary congestion as part of NCC's network management duty

County Council's network management duty - On-going</td><td>As indicated under Traffic Control and Information, the joint County/City control centre and travelwise web site have been comprehensively revised. This has improved the manner in which incident information can be dealt with to ensure that communication about the incident is passed effectively to those who need to deal with the matter and also to the road user. The local operating agreement between the authority and the HA has been comprehensively reviewed to identify the relevant parts of the network which have interaction on each authority and to put in place appropriate communication channels for management of incident information.</td><td>Detailed journey time monitoring of key corridors (including the A60, A6011 and A6520 which lie within the AQMA) has been undertaken annually since 2005/06.

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<tr><td></td><td>Contingency planning - Effective contingency planning to minimise traffic disruption and unnecessary congestion as part of NCC‘s network management duty

County Council‘s network management duty - On-going</td><td>Working in close collaboration with the City and HA, tactical diversion routes have been developed for the emergency diversion of traffic from any part of the trunk road network, to reduce the delay in implementation of alternative routes and to ease congestion at the time of incidents. Key locations on the local network are being identified and associated diversion routes investigated in line with the developing network hierarchy.</td><td>Detailed journey time monitoring of key corridors (including the A60, A6011 and A6520 which lie within the AQMA) has been undertaken annually since 2005/06.

Between 2005 and 2011 there has been a decrease in journey times per mile on each of the routes monitored in the AQMA (as well as those leading to the AQMA) as shown in the table below. Data for 2012 is not available yet.
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Major transport schemes (costing over £5m)

Over £1.5bn is to be provided for local authority major schemes during the 2011/12-2014/15 Spending Review period. Schemes that are already under construction will continue to receive funding. The level of funding required for schemes already under construction means that it is unlikely that any further schemes will be able to begin construction before 2012/13. To maximise the number of schemes that can go ahead, DfT challenged scheme promoters to review options for cost reductions (including scope changes); take opportunity of the existing market conditions; and increase local contributions. In order to do this DfT reviewed all of the schemes with programme entry or valid programme entry bids and have categorised them in three pools:

- Supported pool with approved funding – which consists of schemes that are likely to be funded subject to DfT Full Approval of statutory powers and tender prices.
- Approved development pool – which consists of schemes that are likely to be funded subject to DfT Full Approval of statutory powers and tender prices but which local authorities need to undertake further detailed work on.
- Pre-qualification pool – schemes awaiting promotion to the development pool pending further investigations.

Any schemes which were not included in the ‗supported pool with approved funding' or the ‗approved development pool' (including new schemes) will not receive funding before 1 April 2015.

Future prioritisation of major transport schemes

Following the dismantling of the regional bodies, DfT have been looking to develop new arrangements to provide advice on the prioritisation of major transport schemes. Consultation undertaken by the DfT on this issue has been undertaken (closing in April 2012) and the results of the consultation led to the establishment of the Local Transport Bodies which will oversee the prioritisation of such schemes. A Local Transport Body (LTB) covering a similar geographic location as the D2N2 Local Enterprise Partnership (Derby city, Derbyshire county, Nottingham city and Nottinghamshire county – although some funding will be allocated to the Sheffield

City Region where districts overlap) is in the process of being established. The LTB will oversee the prioritisation of larger transport schemes across its geographical coverage from April 2015 and work is currently underway to determine the schemes that will be promoted by each of the transport authorities.

Major schemes	A52 ring road upgrade	A business case was submitted to DfT by the City Council but no decision had been made on its success or progression before the major scheme review.	In December 2011, the City Council was awarded 'Programme Entry' to progress the Nottingham Ring Road transport scheme. The scheme was one of 21 major transport schemes to have received the go-ahead from Government. The scheme proposes a package of measures aimed at directly addressing the key problems affecting the Ring Road. These are based upon making the best use of the existing road network and minimising public expenditure.
	NET phase 2 - timescales subject to all feasibility, funding and approvals	Department for Transport granted ‗programme entry approval' for Phase 2 of the Nottingham Express Transit (NET) in October 2006. This decision has allowed progress of the extension of the tram system to incorporate two new lines to the south and west of Nottingham city centre totalling 17km in length. A public inquiry into the proposals closed on 16 January 2008. The Inspector presented his findings on the NET Public Inquiry to the Secretary of State for Transport whom approved the Transport and Works Act Order (TWAO) for the NET Phase 2 proposals on 30 March 2009.	In March 2011 the Government confirmed that funding is to be made available to enable the construction of NET Phase Two after cost savings were identified to make the project more affordable. A preferred bidder has been selected to build the two new tram lines and construction began in early 2012. It is expected that the extended network will be fully operational by late 2014.
	A453 widening	The first Regional Funding Allocation (RFA) in January 2006 identified the A453 widening as a medium priority but the February 2009 RFA review made the scheme a high priority. The proposed scheme aims to improve the A453 trunk road between the M1 junction 24 and the A52 in Nottingham, to ease existing highway congestion and improve road safety. The Highways Agency (HA) has published draft legal Orders and an Environmental Statement, which is part of the Statutory process for delivering this scheme. Following public exhibitions and consultation on the proposals a Public Inquiry was held in November 2009. The findings of the Inquiry have been passed to the Secretary of State and their decision to proceed with the scheme has been announced.	DfT announced approval of the A453 widening scheme in March 2012. Advanced works on the scheme have started and the scheme is due for completion in 2014.
	A46 duelling	The first Regional Funding Allocation in January 2006 allocated funding for only a quarter of the scheme which was due to be built by 2019. During the recent Regional Funding Allocation review (RFA2), Government, as part of its response to the national economic situation, offered additional funding to the Region to pay 50% (£174m) of the cost of the A46 scheme to facilitate a start to be made in 2009/10 as a single phase construction with completion in 2011/12. Although the offer meant that the Region would need to fund the remaining 50% of the scheme costs from the RFA2 budget, it provides the only affordable means for the Region to secure the A46 improvement at the earliest opportunity and avoids the need to phase construction over a lengthy period. The Region's financial commitment to the A46 has now been brought forward and it will now be possible to deliver the full scheme within three years. The	As part of the October 2010 Spending Review the coalition Government announced that ‗schemes already under construction will proceed on their original terms'' and hence the A46 scheme continued apace. The A46 road improvement is now fully completed.

		main construction contract commenced in June 2009 and the construction is currently slightly ahead of the original schedule with the A46 road improvement due to be completed in Spring 2012. A supplementary Orders Public Inquiry was held in January/February 2010. The findings of the Inquiry have been passed to the Secretary of State and their decision is still pending. This Inquiry will not delay the on-going construction of the remainder of the scheme.	
	New River Trent crossing	The AQMA encompasses two of the three road bridges crossing the River Trent within the Nottingham built-up area LTP area. A fourth road bridge crossing is not planned until after the ‗dualling' of the A52 between Clifton Bridge and Saxondale island, including grade separated junctions between these two locations. The work on the A52 does not, however, feature as a Highways Agency priority.	The new River Trent Crossing was not considered as a scheme and therefore is not a DfT supported scheme up to 2015. Priorities beyond this date will be considered at a later date but it is unlikely they will be made earlier than 2014. Given the very high cost of such a scheme it is unlikely that it will be included as a priority in the near future.
	Road user charging	The Three Cities Partnership which includes Derbyshire, Leicestershire and Nottinghamshire County Councils and the respective City Councils and other regional partners received Government pump priming funding as part of the second round of the Transport Innovation Fund programme. The funding was allocated to the partnership for an in-depth investigation into the possible options for tackling congestion problems and improving roads and public transport across the sub-region. The funds were used to consider the potential for road pricing schemes and other transport options to reduce congestion and support economic growth over the next 15 years. The effectiveness of the alternative options in tackling congestion was assessed primarily through transport models. These models were developed and validated and the outputs considered alongside other key issues such as estimates of implementation costs and initial views from a programme of key stakeholder engagement.	The feasibility study was completed in the spring of 2008. At that point, the six local authorities considered all of the evidence collected. For further investigations on a potential road user charging scheme to progress all of the partners needed to approve. Some of the six authorities did not, however, wish to proceed with further investigations at this time.
	Workplace parking levy - timescales subject to all feasibility, funding and approvals	The public consultation on the proposals for a Workplace Parking Levy (WPL) in Nottingham closed on 12 October 2007 following a 12 week consultation period. As part of the consultation there was a five day Public Examination of the WPL proposals by an independent chairman. An independent report of the findings, together with responses from the consultation, was presented to Nottingham City Council in December 2007. Councillors considered the conclusions of the public consultation and the Public Examination of the WPL proposals at the Nottingham City Council's Executive Board on 18 December 2007 and decided to proceed, in principle, with developing the details of the scheme.	The scheme was ratified by Nottingham City Full Council in May 2008, and a revised Business Case was subsequently submitted to the Department for Transport (DfT). DfT granted conditional approval for the scheme in July 2009 along with confirmation of the Orders. The scheme was introduced without charge in October 2011; and became fully operational (including charges) in April 2012. The WPL will provide funding for NET Phase 2; the redevelopment of Nottingham Railway Station (the Hub project); and is also intended to support the popular Link Bus network.

Table 8.2 Nottinghamshire County Council Indicator Table

Progress against trajectory legend:	
	Going strongly in the right direction
	No clear trend/slowly going in the right direction, perhaps not fast enough to meet agreed targets
	Going in wrong direction
N/A	Data not available at time of writing

Indicator no.	Indicator	Performance	Year								
					2008	2009	2010	2011	2012	2013	2014
LTP1	**Average journey time per mile during the morning peak on the urban centre networks in the county**	Trend data			3mins 26secs	3mins 19secs	3mins 24secs				
		Targets						3mins 26secs	3mins 27secs	3mins 29secs	3mins 30secs
		Actual						3mins 16secs	N/A	N/A	
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP2	**Changes in area wide traffic mileage (vehicle kilometres travelled)**	Trend data	100	102	99	100					
		Targets					101	102	103	104	105
		Actual					99	98	N/A		
					2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
NI176	**Working age people with access to employment by public transport (and other specified means)**	Trend data		79.5%	80.8%	80.9%					
		Targets					80.9%	80.9%	80.9%	80.9%	80.9%
		Actual					81.2%	81.9%	N/A		
				2007	2008	2009	2010	2011	2012	2013	2014
LTP4	**Number of AQMAs on County Council managed roads**	Trend data		1	1	1	2				
		Targets						2	2	2	2
		Actual						2	2		
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP5	**CO2 emissions from transport on County Council managed roads**	Trend data	105	106	103	100					
		Targets					101	102	103	104	105
		Actual					100	98	N/A		

Indicator no.	Indicator	Performance	Year								
			2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
LTP7	Organisations with a travel plan	Trend data							N/A		
		Targets							N/A		
		Actual							N/A		
			2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
NI177	No. of local bus and light rail passenger journeys originating in the authority	Trend data	32.6m	34.0m	35.1m	35.4m	35.1m				
		Targets						35.4m	35.8m	36.1m	36.5m
		Actual						34m	33.2m	N/A	
			2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
NI178	Bus services running on time (Percentage of buses on time)	Trend data									
		Targets									
		Actual							85%	85%	
	Bus services running on time (waiting time on frequent services)	Trend data									
		Targets									
		Actual							0.89mins	0.93mins	
							2009/10	2010/11	2011/12	2012/13	2013/14
LTP8	Public satisfaction with local bus services	Trend data					90%				
		Targets						90%	90%	90%	90%
		Actual						71%	71.5%	87%	
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP13	Cycling levels	Trend data	103	104	99	100	100				
		Targets						100	100	100	100
		Actual						109	105		

Indicator no.	Indicator	Performance	Year								
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP14	Footfall in towns and district centres	Trend data							N/A		
		Targets									
		Actual									
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP15	Percentage of 16-19 year olds with access to further education colleges within 40mins travel time by public transport	Trend data					92%				
		Targets						92%	92%	92%	92%
		Actual						94%	92%		
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP16	Percentage of households with access to GP surgeries within 20mins travel time by public transport	Trend data					94%				
		Targets						94%	94%	94%	94%
		Actual						94%	93%		
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP17	Percentage of households with access to hospital within 40mins travel time by public transport	Trend data					86%				
		Targets						86%	86%	86%	86%
		Actual						86%	90%		
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP18	Percentage of households with access to a supermarket or local convenience store within 40mins travel time by public transport	Trend data					99%				
		Targets						99%	99%	99%	99%
		Actual						99%	99%		
			2006	2007	2008	2009	2010	2011	2012	2013	2014
LTP19	Percentage of households within 800m of a bus stop with an hourly or better bus service Monday–Saturday (0600-1800)	Trend data					96%				
		Targets						96%	96%	96%	96%
		Actual						95%	94%		

Contributory output indicators (no targets have been set for such indicators but it is anticipated that year on year growth will be seen)

Indicator no.	Indicator	Performance	Year						
LTP21	Number of registered car sharers on nottinghamshare		2006	2007	2008	2009	2010	2011	2012
		Actual	790	994	1,326	1,760	1,891	2,044	2,234
LTP22	Public satisfaction with passenger transport information		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
		Actual		59%	80%	82%	89.3%	91.5%	75%
LTP23	Public satisfaction with bus driver behaviour		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
		Actual				61%	59.5%	63.5%	79%
LTP25	Number of children undertaking cycle training		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
		Actual					4,800	4,900	N/A
LTP28	Provision of information at bus stops		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
		Actual	74%	76%	80%	80%	95%		
LTP29	Provision of real-time information		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
		Actual				80	80	111	
LTP30	Take up of concessionary fare passes		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
		Actual	74	76	80	80	86%	N/A	89.3%

Table 8.3 Rushcliffe Borough Council Measures

measure	Focus	Responsibility	Air Quality Impact	Time scale	Indicator	Progress
RBC Travel Plan	Reduce impact of RBCs business and staff travel.	P Philips	L	M	Implementation of travel plan.	2009: RBC Travel Plan - No progress has been made on the update for the RBC Travel Plan and there is no timescale for this work. A review is currently underway by the Senior Management Team for the Lease Car Scheme, this will consider environmental measures in the consideration of any changes. 2010: RBC Travel Plan - No progress has been made on the update for the RBC Travel Plan and there is no timescale for this work. 2011 - No progress has been made on the update for the RBC

						Travel Plan and there is no timescale for this work. **2012: A staff travel survey has been carried out in November 2012 and Feb 2013. A travel awareness campaign was also run alongside the survey. The results of the survey will be used to develop a new staff travel plan.**
Remote home working	Expand to other Service areas as appropriate	Corporate (J Waterston has access to remote worker list)	L	S	AQ3	2009: Environmental Health staff currently undertake a significant proportion of work from home negating the need to travel through the AQMA areas. This measure has been adopted in 2009 as the ‗fit for purpose review' with the potential to increase remote working where appropriate throughout the Council. FY 2010/11 we paid 46 staff remote working allowance. FY 2011/12 we paid 42 staff remote working allowance. FY 2012/13 we paid 36 staff remote working allowance.
Energy efficiency	Reduce emissions of greenhouse gases and nitrogen dioxide from RBC premises and domestic premises and establish targets	P Philips (Sheila Hood)	L	2009/ 2010	NI185 NI187	An energy strategy is in place for the period 2000-2010 with the aim or reducing energy usage in general. This measure is now part of the Climate Change Action Group remit NI 187 Progress – we are feeding our action plan into the county action plan under the LAA. At the moment RBC are continuing with actions from 2008/9. The county NI 187 group have secured money to fund further initiatives into 2011. **2010**: NI187 is reported below. Various projects on-going. Some feedback from Sheila : 157 referrals received, £589,622 spent on energy efficiency measures of which 128 were boiler replacements, there were no CO" savings recorded. EST data is from April 2010 - Jan 2011 as follows: 84 CWI —-> 51,240 kg CO2 110 LI —-> 25,300 kg CO2 Much of my work with communities does not lend itself to be measured in CO2 savings but the Kinoulton Greening

						campaign did result in a saving of 106 tonnes of CO2. Events throughout the year with the Fantastic Homes vehicle in tow resulted in estimated savings (by Marches Energy Agency) CO2 saved (lifetime) = 101,401kg + 44,280 kg + 72,888 kg 2011 Energy efficiency NI 187 was abandoned by Gov't but members asked for repeat surveys, the results show: SAP <35 — SAP 65 and over 2010 — 8.9% — 29.1% 2011 — 7.1% — 29.8% Greening Campaign Sutton Bonington Phase 1 results 35% of your community was engaged TOTAL CO2 SAVINGS: 122,564 kg Fantastic Homes events resulted in Lifetime Savings of: 293,754kg CO2 Warmstreets Insulation scheme Carbon savings July '11- Jan '12 = 131 tonnes **2012** **A Home Energy Conservation Act (HECA) report and plan is in preparation, this will set future objectives for domestic premises.** **For RBC premises please see the Greenhouse Emissions Report 2011/2012 online at: http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/climatechange/Rushcliffe%20GHG%20Report%202011_12.pdf The 2012/13 report is due July 2013.**
A52 Traffic Study	Determine traffic levels and air quality impacts along A52 from Widmerpool to Clifton and associated junctions.	Highways Agency	H	By end of 2010	Production of final report	2009 study on-going at this time 2010: contact has been made with route manager for the A52. The study data has not been forwarded as yet. Expected in 2011. 2011: Awaiting comment from HA 2012: Update is required as HA have provided pervious commitment that this will be done
VOSA vehicle emissions testing	Liaise with NCC and evaluate feasibility of enforcement of emission standards within AQMA's	E&WMS (M Hickey)	L	2009/2010	Under take monitoring	The action was raised at the AQSG. 2 LA's agreed to part take in a joint scheme. This — Item will remain open but no further progress has been made. 2009 no progress 2010 no progress made 2011 no progress made 2012 no progress made

						was insufficient to fund the project.	
Local Plans. Development Control Strategies.	Develop Supplementary Planning Documents. Ensure air quality is a material consideration for key developments in the Borough. Prevention of a worsening of air quality through inappropriate development in or around the AQMA's	Development control (Richard Mappletoft) Neighbourhoods (M Hickey)	M	2009 On-going on-going	Draft has been produced and published on web in 2009 AQ4 AQ5 AQ6	Draft guidance produced. Planners have policy in place to refer applications with air quality impacts	Air quality is a material consideration in planning matters and specific conditions relating to land use and traffic impacts are being commented on and attached as planning conditions currently. A draft informal SPD has been drafted by EH&WM but requires further revision prior to consultation. An un adopted guide for developers is likely to be published this year but formal adoption by development control is yet to be discussed: **2009**: non statutory guide has been produced and published. Planners have suggested SPD will be 2012/13 before published **2010** Consider some parts have been implemented and will continue to monitor and report changes and impacts. The SPD has not progressed due to change in Government policy toward the LDF. This delay has a knock on effect to the development of any proposed SPD's which is similarly delayed. **2011:** Looking at a joint grant bid with Gedling Borough Council. Alternatively, no progress will be expected until the RBC planning policy has been completed with the LDF process and can programme in the time required. Expected 2 years+ in in-house **2012:** Use of NPPF wording to influence planning decisions
RBC fleet and fuel policy	Use good vehicle management. Evaluate cleaner fuels/vehicles	(Neighbourhoods Robert Yarnall)	L	M	NI194 Review of fuel policy	Fleet operated on bio diesel mix. Currently have 1 Euro V vehicle with 2 more to be delivered in June 08. Older vehicles on 8 year rolling programme of change. Has 1 electric allterrain vehicles for country park. To review fuel policy again in 2009. Driver awareness training in place Progress on fleet composition to be update annually by	

						RBC Fleet Manager 2009. Fleet manager has not provided and update for this measure in time for report publication. No progress to report 2010. (1) The fleet currently operates on a blend of Bio / diesel mix approximately 5%/95% (2) Currently we have 5 x Euro V vehicles on the fleet (3) There are another 6 Euro V vehicles due on the fleet before the end of this financial year. (4) We currently have one electric vehicle.(Rushcliffe Country Park) (5) Awareness training is being given to drivers during their annual CPC courses for fuel efficient driving. (6) Fleet composition reviewed annually for continuity of design and any other environmental and fuel saving developments. (7) Progress is being made to introduce our refuse vehicles with Electric Bin lifters in a phased approach with the possibility of two of these units being in service by March 2012 2011 Driver CPC training continues with year 3 now completed Highlighting the drivers roll in the quest for fuel efficient vehicle operation and driving. Annual overall fleet MPG figures suggests that there is no marked improvement in fuel efficiency, the average for the R2go fleet 3.5 MPG for each vehicle. It is hoped with the introduction of the two new 32 ton refuse freighter (from the 01/04/12) with electric bin lifts fitted, it will show an improved % in fuel consumption. Manufactures claim a 6/7% improvement in fuel use. This is yet to be proved as the vehicles have run less than twenty day each and are currently being monitored. Our one electric vehicle has now been moved from Ruddington Country Park to Bridgford Park, West Bridgford as it was felt it was unsuitable for operations in the Country Park suited better to the flat terrain of West Bridgford. We will a have further (6) Euro V HGV vehicles being ordered during 2012/13 as direct replacements for older life expired , with an additional 5 light vehicle under 3.5 ton also being ordered..

						During 2011/12 there has been a reduction in the overall fleet size with a reduction of 2 Refuse freighters being taken out of service due to round re-balancing and the loss of ***Trade Waste Services***. 2012: The Council's own fleet has committed to undergo and assessment for the ECO Stars Scheme. A further report will be included in 2012-13 PR.
Completed Actions – moved to end of action plan following completion.						
Nottinghamshire Air Quality Strategy	Review the strategy through the Nottinghamshire Air Quality Steering Group	Neighbourhoods (M Hickey)	L	n/a	Adoption of strategy	Strategy was adopted in 2008 Strategy was adopted by RBC in 2008. NFA required. COMPLETED IN 2008
Climate change action group	Air quality – % reduction in NOx and primary PM10 emissions through local authority's estate and operations.	P Philips	L	2009/ 2010	NI 194 NI 185 NI 186	**2008**: Commenced Sept 2008. Steering group set up which meets periodically. Energy Saving Trust questionnaire completed by all departments- action plan developed with targets incorporated to lower Co2 and Pm10. Progress report discussed at group – regular agenda item for future. Contributions made to the Air Quality Action Plan. **2009**: Climate Change - A climate change strategy and action plan is in development, supported by the EST and based on their preparatory questionnaires. The strategy and action plan will be adopted in 2010, with implementation over the following years. **2011:** NI185 – this has been replaced by the ***Greenhouse Gas Emissions Report available online at*** http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/climatechange/Rushcliffe%20GHG%20Report%202010_11.pdf
RBC procurement	Implement a green corporate procurement strategy to reduce pollution	Procurement officer (David Hayes)	L	S		The Council published Green purchasing guidelines' in Jan 2004. The Council requires pre-qualification of suppliers to ensure that they practice equal opportunities and environmental policies. A procurement strategy is in place covering 2006-2009. Currently RBC is working toward a regional Sustainable Procurement with Improved environmental performance across the range of goods purchased being a key aim. **2008**: No further progress to report

						2009:No further progress to report **2010**: Procurement Strategy updated for 2009/2012 and still recognises broad impacts on sustainability. Link here: http://www.rushcliffe.gov.uk/upload/public/attachments/266/procurement_strategy_20092012final.pdf No measurable air quality outputs from this strategy. **COMPLETED 2010**	
Control of industrial emissions	Liaise with Environment Agency to ensure that air quality is considered as part of the IPPC regime/ enforcement of ppc controls to air	Neighbourhoods (M Hickey)	L	on-going	LIEWM20	Incorporated into existing procedures. Measure implemented. **2010:** Policies and procedures in place and therefore action is **COMPLETE**. Will continue to monitor number of complaints and report to demonstrate on-going commitment On-going as RBC have decided to carry over this Local Indicator for 2011/12	
Bonfires	Encourage composting recycling and enforce bonfire controls on demolition sites	Neighbourhoods, (P Scotney)	L	on-going	AQ2	Policies are already in place to investigate complaints within 5 days **2010**: Policies and procedures in place and therefore action is **COMPLETE**. Will continue to monitor number of complaints and report to demonstrate on-going commitment.	
Smoke control	Enforce the requirements of the Smoke Control Areas In West Bridgford	Neighbourhoods (P Scotney)	L	on-going	AQ1	Policies are already in place to investigate complaints within 5 days **2010**: Policies and procedures in place and therefore action is **COMPLETE**. Will continue to monitor number of complaints and report to demonstrate on-going commitment.	
AQ monitoring/ information	Continued monitoring throughout the borough. Development of County wide AQ website and develop consistent monitoring procedures. Air quality monitoring data and reports published on Rushcliffe.gov.uk web site	Neighbourhoods (M Hickey)	L	Implemented Updates in 2009 Annually June July 2009	Web site going live. Updates to web site design Published on web	Envitec & Casella employed by AQSG to install	Further training on the use of the software has been undertaken in 2008/09. Further web development needs to take place though the AQSG to further enhance the service. Initial meetings arranged to discuss updates made for July 2009 Web site went live in 2008. RBC real time data is now published on the web for Loughborough Road NO2. Previous data and reports are on RBC website. Meetings have continued in 2009 and further development is expected in 2010 and publicity given to the new site.

							2009. This measure is now accessible to the public and is completed albeit amendments to the website will take place and new additions as time allows 2010 monitoring has continued through 2010. website has been accessible over the year also. **2011 website continues to be accessible. Discussion at the NEPWG about enhancing this AQ measure. Grant application bid to be undertaken in 2012 for additional NOx monitor at Stragglethorpe (AQMA4)**
Local Strategic Partnership	Develop key actions on air quality improvement within the Environmental Issues Group	P Scotney/ P Philips	L	M	NI85 N194	Rushcliffe Community Partnership have developed an Action Plan ‗A Better Future for Rushcliffe – Protecting and Improving Our Environment' Key actions with the aim of reducing Rushcliffe's Eco footprint and air quality being one aspect of the action plan. To be implemented over 08/09 **2009** Local Strategic Partnership - The environmental action plan is being updated and will include specific actions on climate change, these are likely to concentrate on green travel and sustainable food issues. The LSP has supported the development of a green streets initiative (encouraging green travel) in the West Bridgford area. A role out of the "Greening Campaign" to parishes and neighbourhoods across Rushcliffe, encouraging communities to take first steps to reduce their impact, has been carried out with 10 communities so far signed up. 2010: Rushcliffe Environmental Partnership on-going. Various community projects in place. Climate change action plan has been completed: http://www.rushcliffe.gov.uk/upload/public/attachments/271/rushcliffe_climate_change_action_plan_09d.pdf Measures of interest are, travel plan, energy advice, Planning policy. An Eco Houses group has been set up in West Bridgford, this has held open days PV demonstration day and evening seminars Rushcliffe Solar project has been established - providing advice on fitting solar PV - A survey of potential properties that could install solar PV has identified about 4500 in	

						West Bridgford as suitable. Awareness raising through delivery of a letter to potential properties, a website and Saturday surgeries has led to 225 detailed reports being produced for home owners. The greening campaign phase 1 has been completed in Kinoulton, Ruddington and West Bridgford. Radcliffe and Sutton Bonington are beginning stage 1. Seven other communities considering involvement. Kinoulton started a phase 2 project in Dec 2010. Transition WB have established a number of food schemes - Garden Share; Food Co-op; Community Supported Agriculture scheme (Great Green Garden); Transition Allotment; Lembas buyers' group; Fruit tree planting; Abundance project. Melton Road market to be established, promoting local produce. A community food grant scheme is in development by the Rushcliffe Environmental Partnership. **2011 The Rushcliffe Environmental Partnership is no longer meeting and the following recommendations were produced:** **To close the Environment Partnership and transfer responsibilities within the community strategy to Rushcliffe Borough Council, including production of a 6 monthly e-newsletter and maintain a database of environmental / sustainability organisations** **Hold an annual Forum event** **Establish partnership task and finish groups to deliver specific partnership related environmental projects.** **The Environmental partnership to continue to be represented at Strategic Board level to champion environmental issues.**

Liaison with the Highways Agency	Develop further actions for the improvement of air quality within the AQMA's	Neighbourhoods (M Hickey / Sarah Cairns)	L	2009/2010	Meet with HA at least annually. Forward any Air quality reports to the HA as a consultee Contact the Route manager in 2009 if necessary	**2009.** The HA have attended one meeting of the AQSG in early 2009 and provided an update on air quality from their perspective to the group as a whole. Regarding RBC the HA are of the opinion that the levels of NO2 along the A52 in AQMA2 are expected to fall below the AQS objectives before projects such as the A453 become live. This is based on an Air Quality assessment undertaken by consultants on their behalf for the A453 widening project. HA are to undertake study in 2009/2010 as indicated in the following measure. Reports are forwarded to the HA annually from Rushcliffe. Sites in AQMA 2 have gone below AQO in 2009 therefore further action with HA not high priority for AQMA2 Rushcliffe has liaised with the route manager for the A52 to consult on moving the PM10 to Holme House and the exceedences for NO2 at the site. **2010** levels in AQMA 2 are all showing below the AQO. As such this item has not been pursued as a priority and consideration is being given to revoking this AQMA. Contact has been maintained over 2010 with the route manager for the A52 with regards to the Stragglethorpe junction and support has been provided by the HA to install power and a base for the pm10 monitor at this site. 2011 Rushcliffe have met with the HA regarding the Stragglethorpe AQMA. Discussions also took place regarding AQMA2. It was agreed that AQMA 2 at present requires no additional measures as all sites are under or very close to being under the annual mean in this AQMA. Opportunities will continue to raise this area in contact with the HA.
LTP integration	Reduction/prevention of traffic increase in AQMA 1 through the LTP	LTP transport Planners (Sean Parks)	H	April 2010 During 2009	Production of indicators and targets for each LTP measure annually AQ7	LTP table reported in 2008 Met with LTP on 2 occasions in 2008. New table supplied by LTP with targets and indicators added for 2009 see attached table. **2009:** progress and indicators table produced by LTP Meeting continuing on target to progress measures and highlight areas for improvements/development **2010**: targets are mostly in the green with only 4 measures showing no overall direction.

						2011. AQ is integrated into the LTP3, **this measure is therefore complete.** Indicators introduced to show impacts. From actions.
Reduction in NO2 in AQMA's	Measure NO2 concentrations at key receptor locations in AQMA's	Neighbourhoods (M Hickey)	H	on-going	AQ8 full details of NO2 results reported annually to DEFRA through R&A	Generally levels increased in 2007. Levels have reduced in 2008 such that a number of key sites are now at or below the annual AQS objectives. **2009** has seen levels fall again. Noted exceptions are the THF. Predictions using the DEFRA future year's tool suggest that all sites will be compliant in 2011 if traffic growth does not occur. 2010: AQMA 2 has again remained below the AQO for all monitored sites. AQMA1 two sites remain above the AQO and the NOX monitor is below the objective for this year again but did rise from the previous year. 2011 Since the declaration AQMA1 and AQMA2 have been assessed as _compliant'
Reduction in NO2 in AQMA's	Renew NO2 and PM10 monitors in AQMA 1	Neighbourhoods (M Hickey)	H	April 2010	Implemented in 2009 and Jan 2010	New Romon enclosure and new NO2 analyser purchased from Casella through a joint procurement with Nottingham City to reduce costs. A grant toward the monitor was applied for and £1500 received from DEFRA **2010**: monitor installed and now operational PM10, Sven Leckel EU monitor was renewed in 2009, purchased from Eti the current supplier. Measure **completed** in 2009. In 2011 this monitor was moved to AQMA4. It was acknowledge PM10 in AQMA is unlikely to be a concern. 2011 a local performance measure has been introduced to look at the NO2 reduction across the AQMA areas

Table 8.4 Rushcliffe BC Air Quality Action Plan indicators

Indicator	2006		2007		2008		2009		2010	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
N185: Percentage CO2 reduction from LA operations This has been replaced by the Green House Gas Emissions Report	N/A	N/A	N/A	N/A	N/A	Base line established 2008/09 was 4,740,475 kg.	5% reduction	CO2 output for 2009/10 was 4,461,611 kg 6% reduction achieved	Measure replaced by GHGER	Measure replaced by GHGER
Green House Gas Emissions Report (GHGER)*1*2					Target is to reduce our total direct GHG emissions, scopes 1, 2 and scope 3 significant emissions by 15% by 2015 and a further 15% by 2020.	48.4Kg CO2e per resident To 31st March 2009		46.6Kg CO2e per resident To 31st March 2010		47.4Kg CO2e per resident To 31st March 2011

Indicator	2006-2010	2011		2012	
		target	result	target	result
N186: Per capita reduction in CO2 emissions in the LA area	For data see previous reports	Abolished target, see comments in table 6.3		Abolished target, see comments in table 6.3	
N187: Tackling fuel poverty - % of people receiving income based benefits living in homes with a low and high energy efficiency rating	For data see previous reports	2011/12 SAP<35 7.1% SAP 65 and over 29.8% # No target due to abolition of NI		No target due to abolition of NI	
N194: Air quality – % reduction in NOx and primary PM10 emissions through local authority's estate and operations	For data see previous reports	NI abolished		NI abolished	
LIEWM20: % of risk based inspections undertaken as part of the annual programme PPC	For data see previous reports	98%	100%	98%	100%
AQ1: Number of smoke control complaints investigated	For data see previous reports	n/a	n/a	n/a	16

Indicator	2006-2010	2011		2012	
		target	result	target	result
AQ2: Number of bonfire complaints investigated	For data see previous reports	n/a	58 bonfires +12 producing dark smoke	n/a	37
AQ3: Number of RBC staff remote working	For data see previous reports	increase	42 received home working allowance	increase	36 received remote working allowance

Indicator		2008	2009	2010	2011	2012
AQ4: Air quality assessments reviewed through the planning process	No of Assessments	6	4	4	2	3
AQ4 continued	No of properties affected covered by assessments and details	Approx. 2125 units & 28,400m2 business park	09/01025/OUT 5,500 dwellings up to 30 hectares employment	Crown Estates Bingham 1000 residential dwellings (C3); 15.6 hectares of employment development	Cemex quarry planning application contained AQ assessment. ES/2135 County Application still pending	Crown Estate development within Bingham - submitted
			A453 duelling consultation effects 13,304 properties	10/01853/FUL Bingham Tescos, potential impacts on residents in Bingham area particularly Kirkhilll	RAF Newton Development 0/02105/OUT housing and industrial/commercial	Tesco Superstore to be built within Bingham
			09/01119/FUL 295m2 office use in AQMA	Cotgrave colliery: Redevelopment of site for up to 470 dwellings; employment uses (B1, B2 and B8); open space; landscaping; footbridge crossing the canal; associated works including roads, cycleways, footpaths and car parking (revised scheme)		
			08/00567/OUT 470-500 dwellings & business use (33.4Ha)	2 properties affected by John Brookes saw mills 3 MW wood fuelled renewable energy biomass plant (resubmission due to change in technology)		

Indicator		2007		2008		2009		2010		2011	2012
AQ5:	Number of pre application discussions			n/a	4	n/a	3	n/a	2	2 Sainsbury Wilford lane Proposed pharmacy Wilford lane	2 5 Min car wash AQADV from SR's
	Number of applications commented on for air quality			n/a	9	n/a	9	n/a	10	8 Bridgford road Crown estates, Bingham Cemex quarry, Rempstone Smart recycling x 2 John Brookes Saw mills West Bridgford library	39-41 Loughborough Rd – AQMA 11/01582/FUL See above comments
AQ6: Number of Travel plans conditioned through the planning process				n/a	1	n/a	0	n/a	1 7-9 Radcliffe Road 09/01540/ FUL	4 Tollerton airport 11/00965/OUT 5/12/2011 Three storey offices 11/00050/FUL 12/8/2011 Cotgrave Colliery 30/3/2011 10/00559/out 10/00757/EXT extension to existing permission 1-27 Loughborough Road West Bridgford	4 Cotgrave colliery Tollerton airport Medical centre Sainsburys
AQ7: Number of meetings with LTP				3	2	3	3	3	3	2	2
AQ7/2: Number of meetings with HA		1	0	1	1	1	1	1	0	1	2

Definitions

SAP below 35 = % of people receiving income based benefits living on homes with a low energy efficiency rating.

SAP above 65 = % of people receiving income based benefits living on homes with a high energy efficiency rating.

*1 Please note for 2010/11 the method of calculation will change, these figures will be re-worked to give figures for 09/10 and 10/11. Data for 2010/11 is not available yet..

2 Greenhouse Gas Emissions Report available online at
http://www.rushcliffe.gov.uk/media/rushcliffe/media/documents/pdf/environmentandwaste/climatechange/Rushcliffe%20GHG%20Report%202010_11.pdf

Rushcliffe BC Air Quality Action Plan Indicators – continued

Indicator		2006		2007		2008		2009		2010		2011		2012	
		Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
			µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3
AQ8: NO2 air quality in AQMA's at receptor locations	Key sites in AQMA														
NO2 Monitor annual mean, Loughborough Road, West Bridgford			N/A for 2006 2005 was 39.93	No increase	43.2	Reduction by 3.5 µg/m^3	38.4	No increase <40	34.1	No increase <40	39.24	<40	37.82	<40	41.05
Loughborough Road residential			36.14	No increase	45.8	Reduction by 6 µg/m^3	40	No increase <40	35.3	No increase <40	37.6	<40	34.5	<40	37.6
Radcliffe Road, West Bridgford			43.6		51.4		38.6	No increase <40	40.1	No increase <40	40.8	<40	36.5	<40	37.9

37 Radcliffe Road (formerly Midlands Communications on Radcliffe Road, West Bridgford		40.72	Reduction by 1 µg/m^3	48.2	Reduction by 8.5 µg/m^3	40.6	Reduction by 0-1 µg/m^3 <40 *1	(tube 40.6) assessed at receptor as 39.9	Reduction by 0-1 µg/m^3 <40	(new location 33.3) assessed at receptor as 34.2	<40	30 (31.4 at receptor)	<40	34.9
Trent House Flats, Trent Bridge		44.67	Reduction by 5 µg/m^3	52.5	Reduction by 12.5 µg/m^3	39.6	No increase <40	43.3	No increase <40	**42.0**	Reduction by 2.5 µg/m3	38.8	Reduction by 2.5 µg/m3	42.0
Trent Boulevard B, Lady bay area		43.62	Reduction by 4 µg/m^3	50.6	Reduction by 11 µg/m^3	38.0 (revised)	<40	40.3	<40	38.8	<40	37.2	<40	40.4
Clover lands A52		39.84	No increase	48	Reduction by 8 µg/m^3	44.2	Reduction by 4.5 µg/m^3 <40	38.5	Reduction by 4.5 µg/m^3 <40	36	<40	32.5	<40	34.3
Windy Ways A52 (Nottingham Knight Island)		41.24	Reduction by 2 µg/m^3	44	Reduction by 4 µg/m^3	39.3	<40	38.8	<40	35	<40	**37.9**	<40	39.1

Red above AQO
Orange below AQO but increase on previous year
Green below AQO and fall on previous year

*1 this site was on a business premise (Not a relevant receptor). This tube was moved to the nearest first floor receptor for the later part of 2009 and on as recommend in the USA 2009.

Table 8.5 2011 Traffic flows in AQMA's (and main roads into AQMA's)

(THIS DATA IS COMMERCIALLY CONFIDENTIAL AND MAY NOT BE USED OR REPRODUCED WITHOUT THE PERMISSION OF THE TRANSPORT PLANNING TEAM AT NOTTINGHAMSHIRE COUNTY COUNCIL. ENQUIRIES SHOULD BE MADE TO ANDREI CRUDGINGTON IN THE TRANSPORT PLANNING TEAM (0115) 977 2393)

ROAD NO.	LINK NO.	AQMA	LOCATION (FROM - TO)	AADT 2006	AADT 2007	change from 2006-2007	AADT 2008	change from 2007-2008	AADT 2009	change from 2008-2009	AADT 2010	change from 2009-2010	AADT 2011	change from 2010-2011
A 52	54	2	Clifton Boulevard: A 453 Clifton Lane - A 60 (Nottingham Knight roundabout)	50,550	51,600	1,050	50,050	-1,550	50,200	150	49900	-300	49450	-450
A 52	55	2	Clifton Boulevard: A 60 (Nottingham Knight roundabout) - A 606 (Wheatcroft roundabout)	34,150	36,700	2,550	35,650	-1,050	35,700	50	36600	900	34050	-2,550
A 52	56		Gamston Lings Bar Road: A 606 (Wheatcroft roundabout) - Ambleside	25,550	24,950	-600	24,650	-300	24,950	300	24750	-200	24050	-700
A 52	57		Gamston Lings Bar Road: Ambleside - A 6011 (Gamston roundabout)	25,650	26,200	550	24,950	-1,250	25,250	300	25000	-250	24850	-150
A 52	58		Radcliffe Road: A 6011 (Gamston roundabout) - Sandy Lane (Holme House)	41,750	42,400	650	40,250	-2,150	40,900	650	40600	-300	40350	-250
A 60	122	1	Trent Bridge, Nottingham: B 685 Meadow Lane - A 6520 Radcliffe Road	46,700	43,100	-3,600	42,850	-250	43,000	150	40550	-2,450	40300	-250
A 60	123	1	Loughborough Road, West Bridgford: A 6520 Radcliffe Road - A 606 Melton Road	33,200	33,600	400	31,200	-2,400	30,800	-400	32150	1,350	34900	2,750
A 60	124	1	Loughborough Road, West Bridgford: A 606 Melton Road - Rugby Road	13,050	13,200	150	13,250	50	14,300	1,050	14,150	-150	14050	-100
A 60	125		Loughborough Road, West Bridgford: Rugby Road - Boundary Road	13,500	13,650	150	13,550	-100	13,500	-50	13400	-100	13300	-100

A 60	126	2	Loughborough Road, West Bridgford: Boundary Road - A 52 (Nottingham Knight roundabout)	18,450	17,650	-800	17,550	-100	17,750	200	17600	-150	17500	-100
A 606	139	1	Melton Road, West Bridgford: A60 Loughborough Road - Musters Road	14,200	14,350	150	12,600	-1,750	12,550	-50	11650	-900	16000	4,350
A 606	140		Melton Road, West Bridgford: Musters Road - Boundary Road	12,600	12,750	150	12,650	-100	12,600	-50	12000	-600	11950	-50
A 606	141		Melton Road, West Bridgford: Boundary Road - A52 (Lings Bar roundabout)	12,600	12,100	-500	12,050	-50	11,800	-250	11550	-250	11500	-50
A 6011	308	1	Lady Bay Bridge, Nottingham: Meadow Lane - A6520 Radcliffe Road	22,400	21,250	-1,150	21,100	-150	21,650	550	21250	-400	21500	250
A 6011	309	1	Radcliffe Road, West Bridgford: Lady Bay Bridge - Davies Road	26,650	26,950	300	26,800	-150	26,650	-150	26400	-250	26250	-150
A 6011	310	1	Radcliffe Road, West Bridgford: Davies Road - Regatta Way	27,850	27,250	-600	27,100	-150	26,950	-150	26700	-250	26850	150
A 6011	311	1	Radcliffe Road, West Bridgford: Regatta Way - A52 (Gamston roundabout)	26,000	26,300	300	25,900	-400	25,750	-150	25500	-250	25350	-150
A 6520	369	1	Radcliffe Road, West Bridgford: A60 Loughborough Road - A6011 Lady Bay Bridge	18,650	18,850	200	18,750	-100	n/a	n/a	n/a	n/a	18400	n/a
A 6520	368	1	Radcliffe Road, West Bridgford: A60 Loughborough Road - Fox Road	n/a	n/a	n/a	n/a	n/a	17,050	-1,700	18,200	1,150	18100	-100
A 6520	369	1	Radcliffe Road, West Bridgford: Fox Road - A6011 Lady Bay Bridge	n/a	n/a	n/a	n/a	n/a	18,650	-100	18500	-150	18400	-100
B 679	409	1	Wilford Lane: B 680 Ruddington Lane, Wilford - A 60 Loughborough Road, West Bridgford	17,050	17,250	200	15,550	-1,700	16,550	1,000	16,700	150	17250	550
				Overall change on all roads listed		-450		-13,650		1350		-3,400		2,800
				change in AQMA1		-3,650		-7,000		50		-2,150		7,200
				change in AQMA2		2,800		-2,700		400		450		-3,100

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

The annual monitoring data indicates that there are no new exceedences for which a detailed assessment would be necessary. In addition, the results from the AQMA's indicate that there are still exceedences in all the AQMAs and therefore it is not appropriate at this time to revoke any.

9.2 Conclusions relating to New Local Developments

There have been a number of proposed new developments that may have an impact on the AQMA's and as such the Council have made a funding bid as part of the —Section 106 agreement" procedure to obtain funds to carry out non-automatic monitoring in the development locations.

Both Sainsbury Superstore and the combined Medical Centre are two particular sites where an increase in vehicular pollution source may impact on AQMA 2. Both of the submitted AQ reports for these developments did not indicate that there would be an increase in NO_2. However, in order to more accurately record current NO_2 levels, this funding was obtained for the purposes of current level recording.

Similarly, two developments in the East of the Borough, Bingham Crown Estates and Tesco Superstore have also given us a need to begin NO_2 level monitoring, again due to the likely increase in traffic source pollution.

Smart recycling facility is a new site which has created some local nuisance problems; however, the nearest receptor is some distances away. At the time of writing however this site is not operation and has ceased operating.

9.3 Other Conclusions

The County Council have provided an update in the above tables and have fully integrated measures to improve on air quality into the LTP which influences transport measures over the entire county. Their progress is linked to continued funding for the projects and Rushcliffe continue to monitor progress and influence these policies

where possible. A number of the measures have now been completed or are on-going with monitoring in place. E.g. public transport infrastructure has been upgraded and journey times are being recorded within the AQMA1.

However, the greatest positive impact is expected to be from national policy on transport which will see NO_2 reductions take place as new EURO vehicles replace older models, and through the implementation of the NCC LTP measures. This is due to the vast majority of transport related pollution being from commuter traffic outside of Rushcliffe's direct control. It is welcome to note that air quality has been recognised within the LTP and therefore commitments have been worked into County Council strategy.

Rushcliffe is aware that the fall in NO_2 as expected in previous years has not happened as dramatically as expected and is most likely due to national emissions factors over-predicting the fall. The measures being currently worked on by the County Council are shown in Table 8.1 and aim to manage traffic growth in and around the Nottingham area in general.

The transport data in Table 8.5 is based on growth factors from the previous year. This is due to the fact that the requirement to produce an air quality progress report in April does not account for the provision and analysis of traffic (and other) data from elsewhere. Therefore much of the reported data is over a year old. For example, DfT does not supply the previous calendar year's traffic data until the following summer and therefore this information will not be available to report in any AQ progress report published in April (i.e. traffic data for 2012 will not be available until summer 2013). The conclusions reached are therefore based on 2011 data. This indicates that there has been a decrease in traffic through the AQMA 1 and AQMA2 last year. The growth factors are based on UTC traffic figures generated by the County Council. Overall since 2006 the table indicates traffic has reduced in the areas measured or remained stable. Given that over this time the vehicle fleet will have modernised, (and will continue to modernise) if the trend in traffic levels continues downward then NO_2 should continue to fall.

The planning process will be used to seek to introduce mitigation measures both for climate change and air quality impacts wherever possible to negate any future development impacts that may put pressure on transport. This is evident as a

number of travel plans have been conditioned through the planning process. Also air quality assessments have been required for development that may cause increases in NO_2 or may bring in new receptors into AQMA areas or into places that make the assessment of air quality worse. When reviewing AQ assessments there will be a requirement to ensure sensitivity analysis takes place in view of the uncertainty of national emission factors being achieved in light of recent cases. Rushcliffe will ensure this is incorporated into an assessment of such reports.

Overall the assessment of new development may be a challenge as the LDF has identified areas around the district for growth points. Whilst developers will be required to deliver mitigation against traffic growth for such developments traffic growth above those that are forecast without the development may occur in these areas. In such circumstances objection to such growth may be difficult and section 38, 278 and 106 planning obligations will be used to mitigate any effects as far as is possible and seek to ensure sustainable development takes place.

Funding for the tram system extension known as NET2 has been secured, the contract has been awarded and construction work on the new lines has begun. This could potentially see reductions in congestion when operational and hopefully a reduction in NO_2 in congested hotspots in Rushcliffe as one of the routes crosses the Trent and terminates in the Clifton area near the A453. Rushcliffe will therefore expect to see some reductions in commuter traffic once the line to Clifton is operational. Details of the impacts of the tram are not known at this time but this will be discussed with the City Council in due course. Prerequisite to the NET2 was the implementation of the Workplace Parking Levy (WPL) which aims to reduce commuter traffic. WPL is part of an overall transport package to tackle congestion, in line with local and national transport policy. Its aim is to promote realistic alternatives to the use of private cars by encouraging less car trips into Nottingham, as well as providing funding to help deliver high quality sustainable public transport; such as NET2, the redevelopment of Nottingham Railway Station (the Hub project) and by supporting the popular Link bus network. All money raised from the WPL will be invested into improving local transport for Nottingham. As a consequence this levy may also deter parking in the city when linked to parking policies by the City Council and other neighbouring LAs.

The two new tram lines to Chilwell and Clifton will connect to the existing Line One at the redeveloped Hub interchange at Nottingham railway station. The Chilwell line will serve key locations such as the Meadows, Queens Medical Centre, Nottingham University, Nottingham Science Park, Beeston, Chilwell and a new 1300 space Park and Ride site near to the A52 'Bardills' roundabout. The Clifton line will serve key locations including the Meadows, Wilford, Compton Acres, Clifton and a new 1000 space Park and Ride site adjacent to the A453. Passenger services across the extended tram network could be fully operational by the end of 2014.

Rushcliffe‘s AQAP is linked to the County Council‘s LTP as the traffic that is/has been the cause of the exceedence in AQMA1 is commuter traffic, originating from within and outside of Rushcliffe, making its way into and out of Nottingham over the River Trent crossings. The County Council are best placed to influence the behaviour of commuters and as such Rushcliffe are not in direct control of implementing the measures that may have the greatest impact on levels of traffic in the area. NCC has provided an update on the transport measures which are indicating they are on target (with minor exceptions) across the county. The nature of these locations makes it difficult to remedy the problems with infrastructure and therefore smarter choices measures (such as travel planning, marketing and promotions of alternatives to the car) are more likely to provide the solution. Unfortunately, the types of such measures do not always make it possible to calculate the effects of the measures specifically in the AQMA1 area. Rushcliffe is aware of the suggested reporting format to quantify the impacts on the AQMAs on NO_2, these impacts, however, are not always available but where possible these have been included within the report. Area wide traffic mileage within the county has decreased. Correspondingly, cycling levels have increased within Rushcliffe.

NCC has noted that due to finance pressures, the capacity to impact on air quality may be reduced in future years. This is apparent in the reduction in funding from Central Government. Smarter choices as detailed above are predominantly funded through revenue funding which historically has been difficult for the County Council to fund. A successful Local Sustainable Transport Fund bid was, however, submitted jointly with the City Council and will offer opportunities to increase the level of such measures in the 2013/14 and 2014/15 financial years.

9.4 Proposed Actions

Considering the contents of this report and the data obtained from the automatic and non-automatic locations, our proposed actions are as follows:

- Maintain current AQMA's. The results of the monitoring in all AQMA's have shown that NO_2 remains an issue.
    - AQMA 2 has shown a slight increase at one location, pushing the value above the 40µg/$m^{3.}$
    - A number of locations within AQMQ 1 still remain above the limit.
    - Diffusion tube results from AQMA 4 indicate exceedences of NO_2.
- Whilst an on-going issue with locating the continuous NOx monitor at AQMA 4 exists, locate this monitor within AQMA 1 in order to verify the results of the diffusion tube data.
- Install new NOx monitor at AQMA 4, following approval of its location by the Highways Agency
- Development of the outstanding actions of the AQAP.
- Submit 2014 Air Quality Progress Report

10 References

Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 Air Quality, May 2007, and accompanying spreadsheet DMRB Screening Method V1,03.xls. July 2007

Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

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Local Air Quality Management Updating and Screening Assessment Report 2009 Rushcliffe Borough Council

Local Air Quality Management, Progress with AQAP Report 2009 Rushcliffe Borough Council

Local Air Quality Management, Annual Progress Report 2007 Rushcliffe Borough Council

Rushcliffe Borough Council 2007, Local Air Quality Management Air Quality Action Plan 2007

Rushcliffe Borough Council 2010, Local Air Quality Management update of Air Quality Action Plan 2007,

Local Transport Plan for Nottingham, 2011 to 2026, Nottinghamshire County Council

Congestion Delivery Plan, Nottinghamshire County Council 2007

Air Quality Considerations for Developers, Rushcliffe Borough Council, 2010

GLM7, Gradko Laboratories NO2 Laboratory Method

BSEN 123412, EC reference Method, British Standard

MDHS 14/2, General methods for the sampling and gravimetric analysis of respirable and total inhalable dust, HSE

Policy G1, Non statutory Local Plan, Rushcliffe Borough Council

PPG 13, planning policy guidance 13, transport, Communities and Local Government (formerly OPDM)

PPS 23, Planning policy statement 23, Planning and pollution control, Communities and Local Government (formerly OPDM)

Policy 36 East Midlands Regional Plan, East Midlands Regional Assembly, 2006

LDF, Local Development Framework, Rushcliffe Development Framework - Core Strategy Option for Consultation. (Consultation document)

Rushcliffe Borough Council published documents are available from www.Rushcliffe.gov.uk. Air quality reports are available on the webpage:

http://www.rushcliffe.gov.uk/environmentalhealth/pollution/airquality/airqualityreports/

11 Glossary of terms

Air Quality Standard – these standards represent minimal/no risk health based standards, for ambient concentrations of pollutants. They are based purely on medical evidence, taking no account of costs, benefits or technical feasibility.

Air Quality Objective – these objectives take account of both costs and benefits, forming benchmarks in time, against which —Air Quality Standards" can be achieved.

Annual mean – The average of the concentrations measured or calculated for each pollutant for one calendar year.

AQMA – Air Quality Management Area

AQAP – Air Quality Action Plan

Assessment – The consideration of whether estimated levels for the relevant future period are likely to exceed the levels set in the objectives.

AURN – Automated Urban and Rural Network of air quality monitoring stations

Background concentration – Concentration of a particular pollutant thought to be present in an area, which cannot be accounted for by dispersion modelling from local emissions. It is generally caused by transportation of pollutants over long distances.

CHG – Greenhouse gases

CO – Carbon Monoxide

Data Capture – The percentage of all the possible measurements for a given period that were validly measured

DEFRA – Department for Environment, Food and Rural Affairs

DETR – Department for the Environment and the Regions (Now DEFRA)

DfT – Department for Transport

Emissions Inventory – A full list of sources that emit pollutants into the atmosphere over a sustained period of time.

Exceedences – A period of time where the concentration of a pollutant is greater than, or equal to, the appropriate air quality objective.

IPPC – Integrated Pollution, Prevention and Control Act 2000

LDF – Local Development Framework

LEZ – Low emission zone

Maximum hourly average – The highest hourly reading of air pollution obtained during the time period under study.

NETCEN – National Environmental Technology Centre

NO_2 – Nitrogen Dioxide

NO_x – Nitrogen Oxides

Part A installations – Large emitters of pollution, which are regulated by either the Environment Agency (A1) or Local Authorities (A2)

Part B installations - Smaller emitters of pollution, which are regulated by local authorities

Percentile – A value found by listing a set of numbers in order and calculating the number below which a certain percent of the data set lies. For example, the 99th percentile of values in a data set, is the value below which 99% of the data falls.

PM_{10} – Particulate Matter with a diameter of 10µm or less

PPB – Parts per Billion

QA/QC – Quality Assurance/Quality Control.

Running Mean – A mean or series of means, calculated for overlapping time periods. For example, a daily running 8 hour mean equals any 8 hour period within that day.

SO_2 – Sulphur Dioxide.

µg/m^3 – Microgrammes per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m^3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

12 Appendix A: Quality Control (QA/QC)

It is essential to ensure that all data collected is accurate, reliable and comparable and have high data capture rates. It is therefore important to apply consistent quality control and assurance procedures. The aim of this Appendix is to outline the main quality assessment and quality control procedures used in Rushcliffe BC to determine air quality data for use in the local air quality management process.

Air quality operators

All monitoring and data management is undertaken by fully trained in house employees who have several years experience in air quality monitoring and data management. Any new personnel will undertake appropriate supervised training in line with the service‘s competency scheme prior to any unsupervised monitoring, calibration or data management. Currently two personnel are trained and competent to undertake such work this includes, Martin Hickey EHO and John Pemblington Technical Officer.

Nitrogen Dioxide Diffusion Tube Monitoring

Rushcliffe BC use Gradko diffusion tubes prepared using 20%Triethanolamine (TEA) in water to measure nitrogen dioxide at a number of sites in the borough. The diffusion tubes are stored in an airtight bag in a refrigerator upon receipt in the post and are used within 6 weeks of the preparation date displayed on the label.

Tube batches are exposed at selected sites to the atmosphere for approximately 4 weeks with the changeover date aiming to be +/- 1 day of the publicised diffusion tube change over date for the month to allow comparison with other Local Authority studies if necessary. The locations are reviewed periodically and all tubes are mounted using spacer brackets and grommets supplied through Gradko.

Each tube is labelled with a bar code and unique identification number. Each batch is supplied with a data collection form to record the location, date and time each tube is exposed in that period. The exposure period is calculated using an Excel spreadsheet and in addition Gradko recheck the calculated exposure period for each tube on receipt at the laboratory.

On the day of collection, the tubes are sent in an airtight bag to Gradko International Limited for analysis, together with a control blank that is stored unexposed in the sample fridge. The diffusion tubes are analysed within the scope of Gradko International Ltd Laboratory Quality Control Procedures utilising in-house method GLM7. Gradko is a UKAS accredited laboratory and undertakes diffusion tube monitoring on the same basis for a number of other local authorities and Environmental Consultants and now undertakes the monitoring for all local authorities in the Nottinghamshire Pollution Working Group.

Nitrogen dioxide absorbed as nitrite by triethanolamine (TEA) is determined by spectrophotometric measurement at 540 nanometers. Nitrite reacts with an added

reagent to form a reddish purple azo dye and the optical density of this complex is measured using a Camspec UV/Visible Spectrophotometer. The concentrations of nitrogen dioxide are then calculated from a pre-calibrated response factor and exposure times. The values are not blank corrected using the blank —control" diffusion tube provided by Rushcliffe Borough Council.

The accuracy of the measurements made by Gradko are also monitored by participation in an external laboratory measurement proficiency scheme, the ‗Workplace Analysis Scheme for Proficiency' (WASP), implemented by the Health and Safety Laboratory, Sheffield. The results of the WASP analysis are shown below.

Table 12.1 WASP rating

WASP Round	**WASP R113**	**WASP R114**	**WASP R115**	**WASP R116**	**WASP R117**	**WASP R118**	**WASP R119**
Round conducted in the period	April - June 2011	July - September 2011	October - December 2011	January – March 2012	April – June 2012	July – September 2012	October – December 2012
Gradko International *	100 %	100 %	37.5 %	100 %	100 %	100 %	100 %

* Gradko International subscribes to two sets of test samples (2 x 4 test samples) in each WASP PT round.

Data ratification

All diffusion tube data is checked on a monthly basis to identify any spurious data and compared with other local monitoring sites to further identify any suspect data.

Diffusion tube monitoring data reported in this document have been ratified and bias adjusted using the correction factor as stated which is either derived from the most up to date national bias factor (v.06/12).

Gravimetric monitor

The gravimetric sampler is a Sven Leckel 47/50 gravimetric monitor and is compliant with BS EN 123412, as an EC reference method for PM_{10}. The data necessary to calculate the air flow and any error status is downloaded to a laptop via a cable at each filter cartridge change. The cartridge has a maximum capacity of 17 filters, although Rushcliffe use a batch process of 15 filters at a time.

The sampler operates by drawing a metered ambient air sample through a size selective inlet head by a vacuum pump, thus enabling the particles to be trapped on a filter for later weighing. Each filter is exposed for a 24-hour period and is then automatically changed at midnight each day until the inlet cartridge is empty. Exposed filters are moved to a collection cartridge after exposure.

Filter handling procedures

Filters are supplied by Environmental Scientifics Group Limited (UKAS Accredited and HSE Approved Laboratory) in individual metal containers already in the filter housing and are able to be placed in the monitor without touching the filter surface.

Each filter housing is identified by a number (e.g. Rush1) and each filter has a unique number to keep track of the pre-weighed value. The record sheets and exposed filters are returned to the laboratory for re-conditioning, re-weighing and the necessary calculations to determine the mass collected on the filter for each 24hr period. The returned form contains the date of exposure, the air flow sampled, the length of time of exposure, the filter reference number and the mass of PM_{10} in $\mu g/m^3$.

The laboratory in-house method is based on the HSE document MDHS 14/2 ―General methods for the sampling and gravimetric analysis of respirable and total inhalable dust'. The filters used are QMA 47 and are stored and weighed in an air-conditioned balance room.

All filters are conditioned for at least 12 hours prior to weighing and re-weighing in the laboratory. They remain under the influence of an ionised air source, in order to minimise the influence of static electricity, immediately prior to weighing. The filters are then weighed on ―Sartorius" micro-balances that have a readability of 1 µg. The final results are recorded and submitted on UKAS accredited test reports.

Monitor checks and maintenance

At each visit to the monitor (every 15 days) to change the filters the grease trap in the inlet is cleaned and fresh grease applied. Upon download of the parameters each filters hours of exposure and volume of air sampled is examined to determine if any unusual values have occurred. If so the operator will investigate the cause and take appropriate action.

The monitor is under a service contract with the supplier SupportingU plc and receives two service visits annually at which time preventative maintenance and cleaning takes place as well as a flow calibration.

Data handling

Reports from Environmental Scientifics Group Limited are received via email and the data is transferred manually on to an Excel spreadsheet. From the spreadsheet the annual mean, data capture rate and number of days above the AQS is determined. As the sampler is an EU approved sampler no corrections are required to be made to the reported particulate results and direct comparison with the air quality objectives can be made.

NOx Continuous Analyser

Description of Analyser

The NOx continuous analyser is located at the façade of 43 Loughborough Road, West Bridgford and is a permanent site. The site is non residential but provides a good assessment of NO_2/NOx close to the main road along the building line. It is a Monitor Europe ML9841B single chamber Chemiluminescence analyser and is approved by TUV, US EPA and NETCEN.

The analyser has a resolution of 0.001ppm and a reported lower detectable limit of <0.5ppb. The linearity error of the analyser is ± 1% of the full scale (from best line fit), and the precision is 0.5ppb or 1% of concentration reading (whichever is the greater). Data reported in this document is entirely from the new monitor. The new monitor remains a ML9841B NOx Analyser with IZS and is installed into a Romon 300 roadside enclosure with air conditioning.

Instruments Checks and Calibration of the Analyser

Daily automatic calibration

Zero air is generated by passing air through scrubbers and passed through the reaction cell. Span gas is generated by a permeation tube and passed to the reaction chamber to give the span calibration response.

The daily automatic calibrations are used as a check on the instrument performance and drift.

Analyser inspection and manual calibration

The analyser was covered by a service and maintenance contract with SupportingU. The service and maintenance contract covers calibration checks, flow and leak checks, cleaning of components, analyser diagnostic checks, replacement of faulty components and consumables and fault call out.

Manual calibration checks are carried out by RBC staff on a fortnightly basis using scrubbed zero air derived from the integrated scrubber column and a certificated NO/NOx calibration gas is supplied by BOC Gases. The BOC gas is changed when the certification expires.

The analyser is taken out of service and the inlet filter is changed prior to connecting the calibration gases. The zero air and NO/NOx gases are run through the analyser and the responses noted together with the instrument gain factor. The output of the analyser (e.g. the gain) is only reset or altered following equipment service or repair or if drift occurs necessitating a change of the gain setting. The calibration zero values, span values and gas certified values are used to rescale the raw data received from the analyser using a proprietary software package, Envista.

Data Handling and Ratification

Data handling

Raw data is downloaded via a modem connection automatically every 24hours into the Envista Arm remote server database. This data can be viewed by all the Nottinghamshire Local Authorities who are part of the network; however, only data can be manipulated in the database that belongs to the respective LA. Data is currently being maintained under contract by the software supplier Envitec – Europe and hosted by Nottingham City Council, and data integrity and security is part of this contract arrangement. In addition the data, both raw and ratified is published on the following air quality web page http://www.nottinghamaqm.net/Default.htm

Data is downloaded in PPB and μgm^{-3} and visually inspected for negative values, missing data sets and spurious results.

Initial scaling factors are determined for NO and NOx using the following formulas based on the fortnightly calibration checks.

$$\text{Scaling Factor "A"} = \frac{\text{Expected (Known) Cylinder Concentration}}{\text{Measured Concentration - Measured Zero}}$$

$$\text{Scaling Factor "B"} = \text{- Measured Zero Value}$$

To rescale the NO value the “A” scaling factor for the fortnightly period in question is multiplied to each 15 minute data set for NO in the database (on the PPB channel). Subsequently the “B” scaling factor is added to the same period of data to address any zero drift noted at the calibration check.

If any zero values, negative values are still present the data block is further rescaled to remove any zero values. Any values added to the NO channel are applied to the NOX channel. This ensures no change in the NO_2 outcome.

The same procedure is then carried out with the NOx data using calculated “A” and “B” factors for NOx over the same periods.

To calculate the rescaled NO_2 15 min values a calculation is then run on the PPB data base using the following equation:

NO_2 concentration (PPB) = NOx concentration (PPB) - NO concentration. (PPB)

These calculations are undertaken in PPB before any conversion to micrograms. NO_2 and NOx are converted to μgm^{-3} by a conversion factor of 1.91. NO is converted to μgm^{-3} by a conversion factor of 1.25.

Once data on the PPB channels is determined to be satisfactory the μgm^{-3} channels are re-calculated from the PPB channels to enable analysis in micrograms.

Data ratification

All raw data is examined for consistency and the existence of any spurious results. Negative values are examined and either removed or rescaled further and high values are interrogated to see if the readings are consistent with expectations or an equipment error may have occurred. Data, during calibration checks is automatically excluded from the database by a software service switch on the instrument panel which is used during calibration checks.

If any doubts exist as to the satisfactory status of any data the data is excluded from the data base calculations, although the Envista Arm software allows the data to remain in the database and marked as ‗not used' enabling recovery of any excluded data should that be considered necessary. Each data set that is excluded must have annotated against it a reason for the data exclusion to allow for traceability of data ratification. The most common reason for data being excluded is monitor breakdown leading to consistently low or very high readings. However, power failure can also be a cause as well as any specific events noted by officers during visits, e.g. trucks being run next to the monitor for maintenance of the building façade or similar.

Information from the other analysers on the system can also be accessed to compare any data that may be experiencing high or low readings to enable a decision to be made on the status of any data highlighted. This includes the AURN monitors operated by the Nottingham City.

Envista has built in reports that enable a number of parameters to be determined on the ratified or raw datasets as required. Three new channels were added to the data base to enable display of the results directly in μgm^{-3}. Data ratification and recalculation will take place on the ppb channels as described above with final data being calculated from these ppb channels and converted using the published conversion factors in TG (09).

Discussion of Choice of Factor to Use

Whilst we had the option to use either own Local factor derived from colocation studies with the NOx analyser or the National Bias Adjustment Factor, due to the fact that there were data quality issues with our local monitor, and that the data capture was below the 90% recommended in TG(09) Box 3.3; therefore, we had to use the National Factor to adjust our diffusion tube results.

The revised bias factor published in June 2013 for the Gradko 20% TEA in water diffusion tubes was calculated as 0.94.

PM Monitoring Adjustment

Not applicable on the gravimetric sampler.

Nitrogen dioxide diffusion tube short-term to long-term data adjustment.

The diffusion tube data for the diffusion tube ref no. A52/HH/F4 was incomplete from April to July and the annualisation calculation was carried out as outlined in Table A.1 below.

Data from four similar sites at neighbouring local authorities for the corresponding monitoring period were used.

Table 12.2 Short-Term to Long-Term Monitoring Data Adjustment

Long term site Annual mean	**Long term site Annual mean 2012**	**Period Mean 2012 (Pm)**	**Ratio (Am/Pm)**
Gedling Arnold	37.50	27.50	1.36
Gedling Carlton	37.99	34.0	1.11
Charnwood Rosebery	24.69	27.33	0.90
Newark and Sherwood The Lodge	38.66	40.58	0.95
		Average Ratio	1.08

A52 HH F4 Annualised result = 45.6 x 1.08 = 49.3

13 Appendix B: 2012 NO_2 Diffusion Tubes monthly results

Table 13.1 2012 NO2 Diffusion Tubes monthly results

Location	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Bias adjusted mean (0.94)
NA1 (triplicate and collocated)	45.65	43.96	43.97	35.38	22.58	25.15	n/a	32.32	32.77	38.86	42.61	42.49	33.9
NA2 (triplicate and collocated)	31.86	41.55	45.12	n/a	n/a	26.05	n/a	32.16	31.94	35.38	40.68	42.35	—
NA3 (triplicate and collocated)	41.69	44.63	40.93	33.08	21.30	25.03	n/a	31.07	31.61	34.07	42.07	39.74	—
HV	n/a	n/a	33.09	25.51	19.09	16.88	n/a	18.56	22.96	26.37	30.45	28.51	23.1
BR	36.65	36.08	36.29	27.31	20.21	19.26	n/a	21.60	23.03	27.19	35.14	37.98	27.4
WLR/2	36.90	36.27	38.72	29.66	24.70	21.37	n/a	24.30	21.87	33.72	33.70	36.85	28.9
A453	44.55	42.82	51.46	41.71	39.88	35.19	n/a	47.53	43.03	38.92	50.19	45.84	41.1
GLB HOS	28.00	n/a	30.31	21.59	17.82	16.08	n/a	17.91	20.54	24.41	27.10	27.69	21.8
A52/SA	45.58	50.88	48.39	38.55	33.17	26.69	n/a	29.41	31.35	36.62	37.94	44.24	36.1
NK	50.28	55.48	38.48	45.53	42.60	42.55	n/a	50.25	46.13	47.21	51.54	48.46	44.3
3BT	35.81	41.82	70.54	25.99	21.32	22.55	n/a	30.35	29.90	29.43	36.25	37.14	32.6
CL (duplicate)	46.87	44.45	41.91	32.51	19.98	25.23	n/a	31.30	30.42	29.04	39.49	39.23	34.3
CL2a (duplicate)	40.71	45.60	41.12	33.16	21.71	24.85	n/a	30.34	29.62	34.26	43.02	53.88	—
HR	31.06	32.24	29.33	20.87	15.70	12.23	n/a	16.11	19.97	22.03	25.52	26.31	21.8
HH	39.27	40.56	36.08	28.70	21.11	19.13	n/a	21.98	24.69	31.94	35.62	41.28	29.1
Location	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Bias adjusted mean

													(0.94)
LR	47.32	48.03	47.75	35.82	32.50	30.08	n/a	37.14	37.22	38.74	41.34	43.94	37.6
37RR	45.98	45.32	43.02	32.11	25.57	21.56	n/a	n/a	31.09	35.45	43.06	41.19	34.2
PM10(Centenary House)	33.31	42.05	42.04	29.48	35.13	23.70	n/a	24.77	24.09	33.99	36.60	35.53	30.8
PC	39.78	40.39	41.08	24.26	22.99	19.29	n/a	25.66	29.49	28.72	26.31	40.92	29.0
A52/RT	56.39	51.61	56.07	38.67	30.96	33.41	n/a	43.79	41.78	39.64	48.44	48.27	41.8
RR	34.38	53.35	48.90	36.51	36.64	27.50	n/a	35.69	37.15	36.07	48.78	48.84	37.9
SH	44.93	44.73	44.02	30.87	23.24	25.11	n/a	27.78	27.62	33.40	35.74	48.46	33.0
BH	40.37	38.70	40.11	29.16	24.40	22.63	n/a	28.07	28.27	32.90	37.34	37.03	30.7
POINT	39.13	36.78	38.09	30.83	25.94	21.53	n/a	24.49	26.83	32.96	36.81	39.11	31.1
TBLA	50.83	50.66	51.84	40.23	27.30	25.31	n/a	35.41	35.55	36.23	n/a	42.91	37.2
TBLB	51.11	52.54	52.69	44.20	29.96	30.94	n/a	36.62	35.87	40.47	47.23	51.11	40.4
TBI	61.24	60.27	63.98	n/a	41.88	37.13	n/a	55.47	46.38	42.72	51.79	59.60	48.9
THF(duplicate)	50.82	57.06	55.31	40.04	37.46	34.42	n/a	45.04	30.08	42.50	48.38	53.95	42.0
THF2(duplicate)	44.58	59.73	57.32	38.31	27.97	32.94	n/a	44.52	35.86	41.71	49.60	56.18	—
WL3	49.12	54.27	56.34	44.32	25.23	29.57	n/a	38.58	39.93	44.38	52.13	61.09	42.3
WW (duplicate)	41.38	46.37	46.90	36.17	24.30	38.09	n/a	48.96	42.94	39.05	50.17	44.45	39.1
WW2 (duplicate)	39.45	45.99	48.85	36.92	30.63	35.08	n/a	51.05	32.98	41.92	49.01	43.56	—
110 WL	41.96	39.19	47.57	32.90	21.93	n/a	n/a	29.34	27.88	30.99	42.41	41.07	33.4
A52/HHF1 (triplicate)	56.11	63.02	66.93	59.00	50.62	43.09	n/a	53.06	40.80	51.91	55.80	66.50	51.9
Location	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Bias adjusted mean (0.94)
A52/HHF2	46.87	62.11	66.51	53.80	57.04	49.96	n/a	54.16	49.33	47.20	56.67	57.94	—

(triplicate)													
A52/HHF3 (triplicate)	44.86	53.98	59.41	57.39	37.13	40.71	n/a	51.82	46.04	43.68	n/a	56.70	—
SR	36.67	42.76	44.39	43.10	33.15	30.32	n/a	31.83	30.77	36.29	34.54	40.63	34.6
A52/HHF4	45.41	56.34	55.73	n/a	n/a	n/a	n/a	41.47	46.50	41.44	45.80	55.32	45.6
A52/HHG	32.71	19.69	33.40	32.09	23.15	16.26	n/a	22.67	25.93	27.22	31.26	33.29	25.4
1KH	n/a	38.17	41.30	27.47	20.85	21.87	n/a	26.34	18.69	28.40	34.52	35.56	27.5
1KH2	31.28	40.90	39.77	28.65	24.14	20.27	n/a	25.65	19.49	25.83	34.03	32.02	—
4KH	44.43	43.25	48.42	39.04	29.03	30.83	n/a	35.59	27.82	35.79	39.15	47.04	35.9
15KHG	42.17	19.92	43.93	35.51	21.86	27.76	n/a	n/a	32.34	33.52	38.84	42.34	31.8
19 NS	41.83	36.87	43.00	30.41	20.51	23.78	n/a	30.88	30.22	29.35	36.14	39.22	31.0

Figure 13.1 1Hour average NO2 real time monitor chart

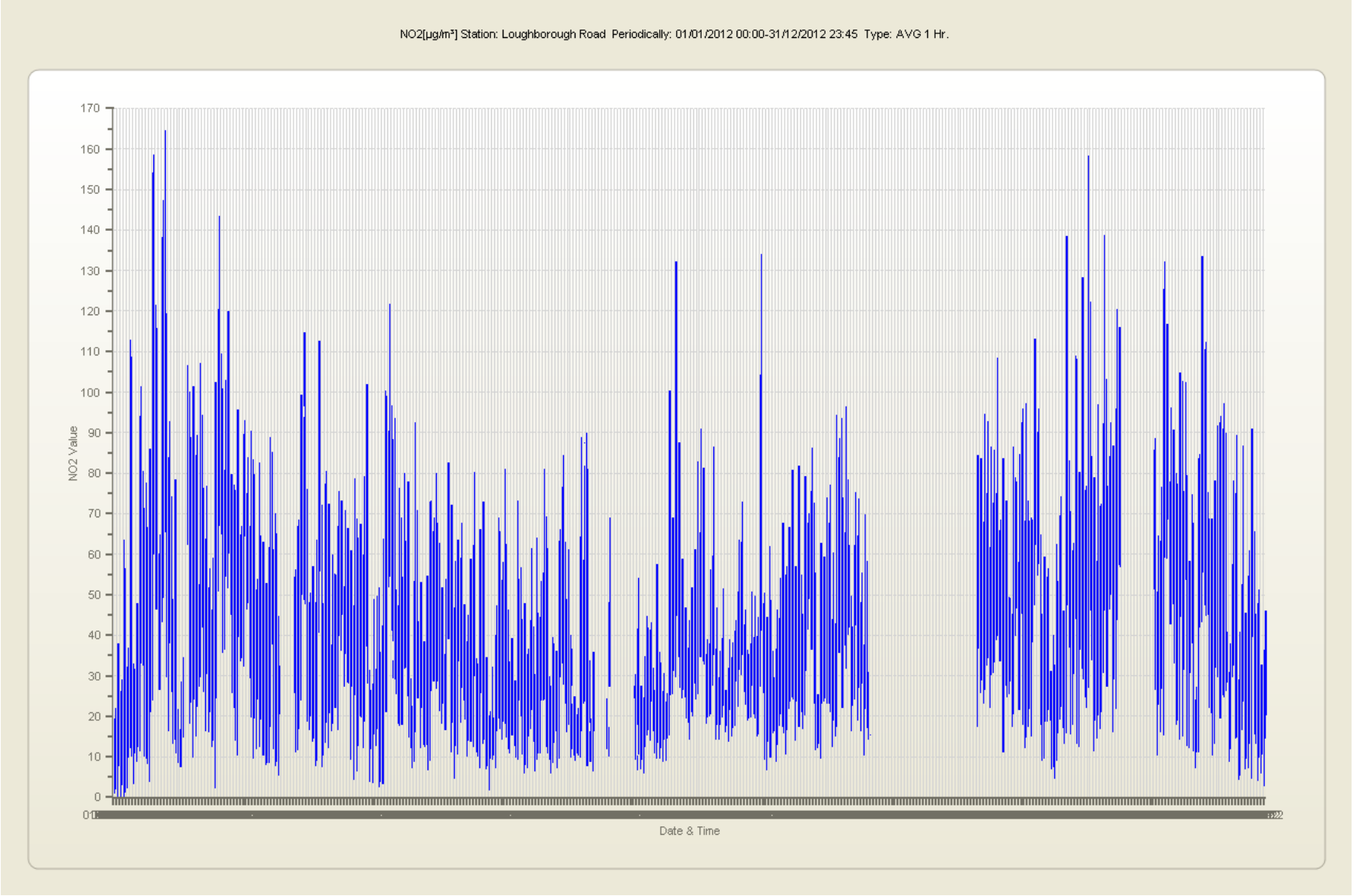

Figure 13.2 PM10 daily gravimetric results 2012

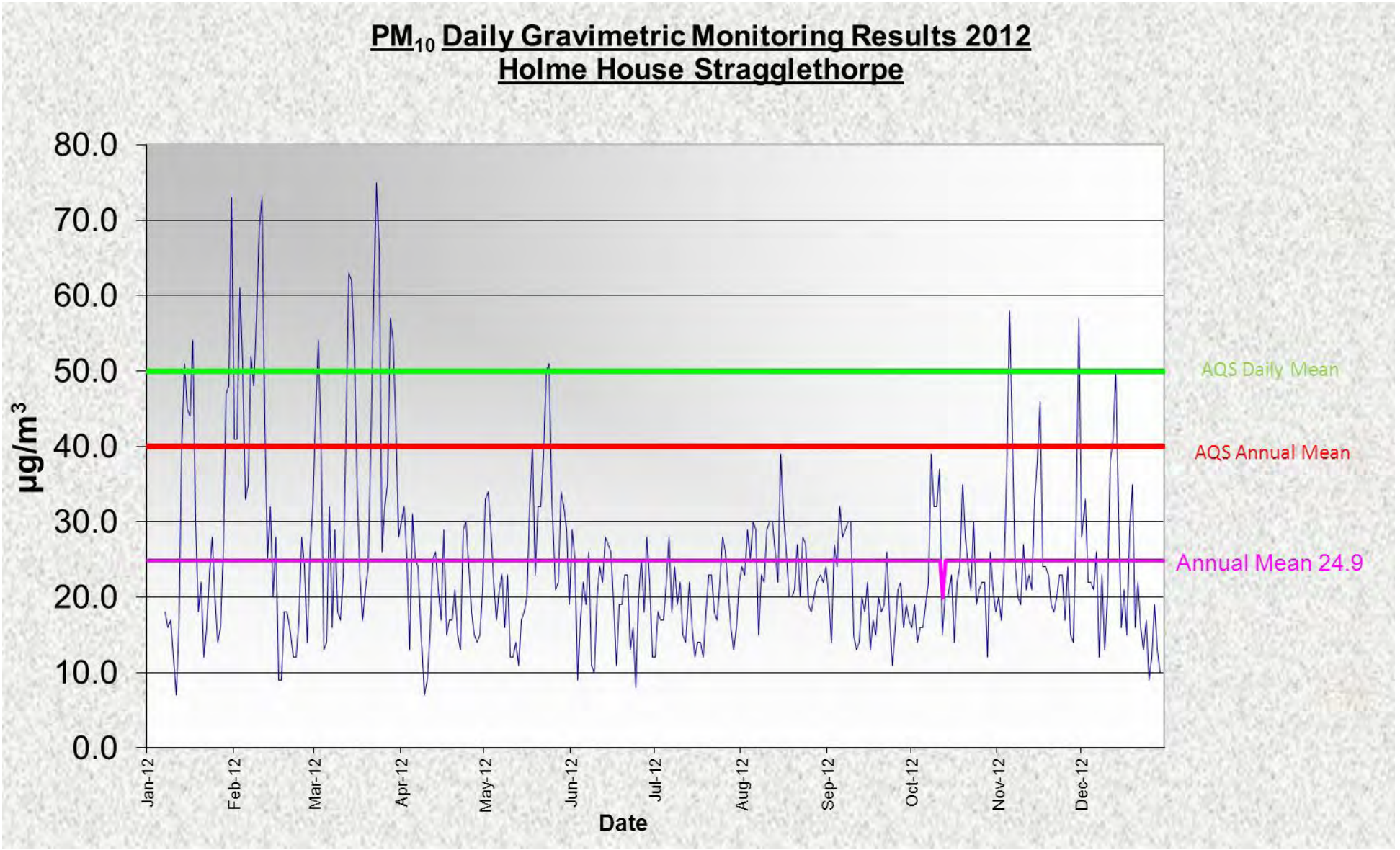

Figure 13.3 37RR NO2 distance correction of NO2

37RR

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

-

Enter data into the yellow cells

Step 1	**How far from the KERB was your measurement made (in metres)?**	(Note 1)	**11**	metres
Step 2	**How far from the KERB is your receptor (in metres)?**	(Note 1)	**9**	metres
Step 3	**What is the local annual mean background NO_2 concentration (in µg/m^3)?**	(Note 2)	**30.58**	µg/m^3
Step 4	**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	(Note 2)	**34.2**	µg/m^3
Result	**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	(Note 3)	**34.5**	µg/m^3

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Figure 13.4 A52/RT NO2 distance correction of NO2

A52/RT

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Enter data into the yellow cells

Step 1	**How far from the KERB was your measurement made (in metres)?**	(Note 1)	**3.3**	metres
Step 2	**How far from the KERB is your receptor (in metres)?**	(Note 1)	**5.2**	metres
Step 3	**What is the local annual mean background NO_2 concentration (in µg/m^3)?**	(Note 2)	**17.43**	µg/m^3
Step 4	**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	(Note 2)	**41.8**	µg/m^3
Result	**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	(Note 3)	**38.9**	µg/m^3

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Figure 13.5 A453 NO2 distance correction of NO2

A453

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Enter data into the yellow cells

Step 1	**How far from the KERB was your measurement made (in metres)?**	(Note 1)	**3.2**	metres
Step 2	**How far from the KERB is your receptor (in metres)?**	(Note 1)	**23.8**	metres
Step 3	**What is the local annual mean background NO_2 concentration (in µg/m^3)?**	(Note 2)	**18.59**	µg/m^3
Step 4	**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	(Note 2)	**41.1**	µg/m^3
Result	**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	(Note 3)	**29.2**	µg/m^3

Warning: your receptor is more than 20m further from the kerb than your monitor, treat result with caution

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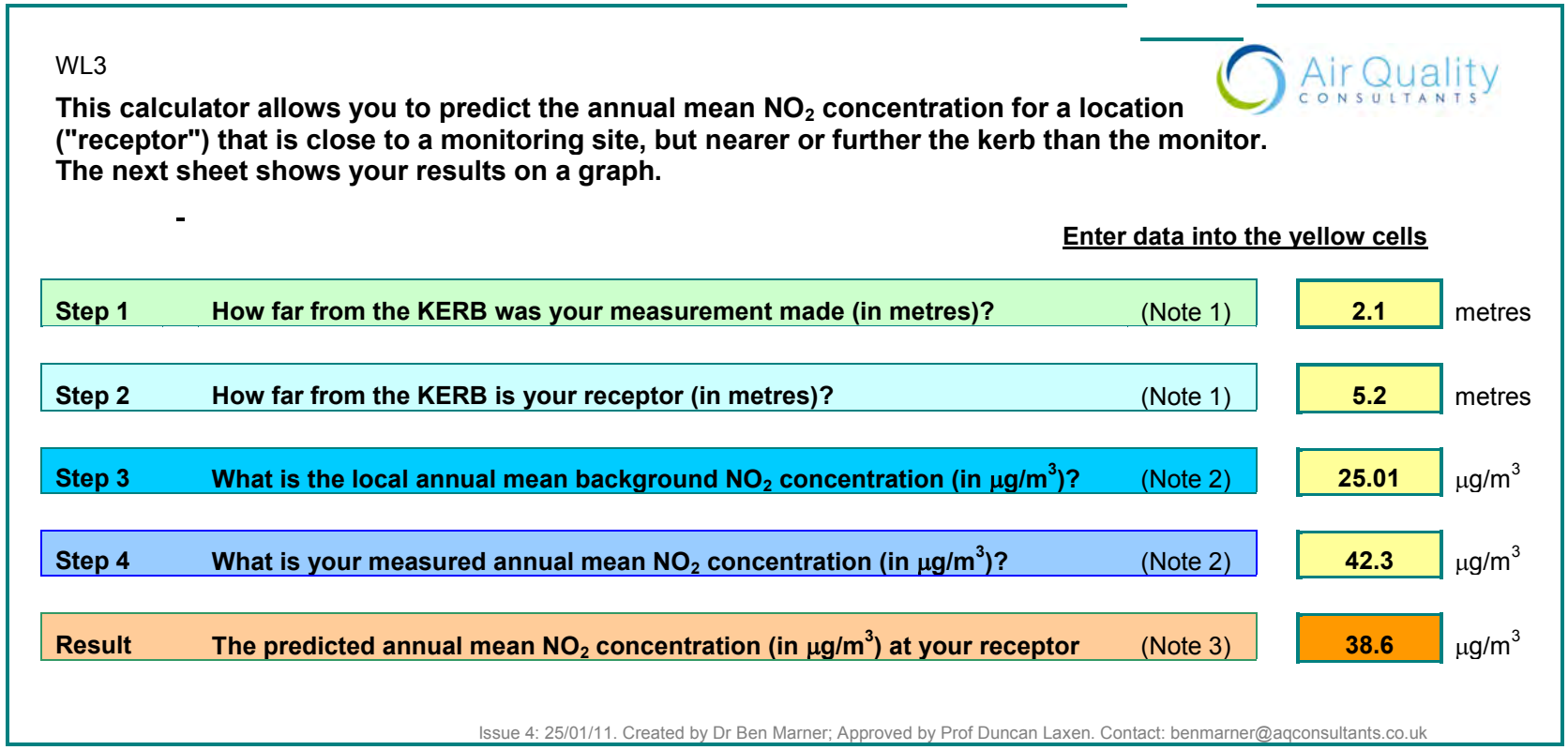
Figure 13.6 WLR3 NO2 distance correction of NO2



WL3

Air Quality CONSULTANTS

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Enter data into the yellow cells

Step 1	**How far from the KERB was your measurement made (in metres)?**	(Note 1)	**2.1**	metres
Step 2	**How far from the KERB is your receptor (in metres)?**	(Note 1)	**5.2**	metres
Step 3	**What is the local annual mean background NO_2 concentration (in µg/m^3)?**	(Note 2)	**25.01**	µg/m^3
Step 4	**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	(Note 2)	**42.3**	µg/m^3
Result	**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	(Note 3)	**38.6**	µg/m^3

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رشکلف براء کاؤنسل زبان کی سہولت کیلئے' لینگویج لائن' کے ساتھ رجسٹرڈ ہے تا کہ یقین دہانی ہو سکے کہ ہمارے تمام صارفین کو ہماری سروسز تک رسائی حاصل ہے۔