2013 Air Quality Progress Report for Chesterfield Borough Council

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

August, 2013

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Executive Summary

Chesterfield Borough Council has examined the results from monitoring in the borough. Pollutant concentrations are below the Air Quality Objectives with the exception of two properties on Church Street at Brimington, which show an exceedence of the Nitrogen Dioxide Objective.

This has been subject to a Detailed Assessment. The monitoring results at this location have fluctuated around the AQO, but the long term trend displays a reduction in the level. However, there remains an ongoing, though marginal, breach of the air quality objective in the vicinity of a single row of terraced housing. Given this we will declare an Air Quality Management Area in this immediate vicinity. Concurrent with this we will undertake a more intensive assessment of the air quality at this location. This is particularly important as the current assessment has been undertaken solely by the use of diffusion tubes. A suitable location for the siting of an automatic monitor has been agreed and works are currently being carried out to enable monitoring to begin.

The revised nitrogen dioxide diffusion tubes monitoring will continue and the results will be reported upon in the next Progress Report in 2014.

PM_{10}, and Benzene levels are within the Air Quality Objective.

Chesterfield Borough Council confirms that there are no new or newly identified local developments.

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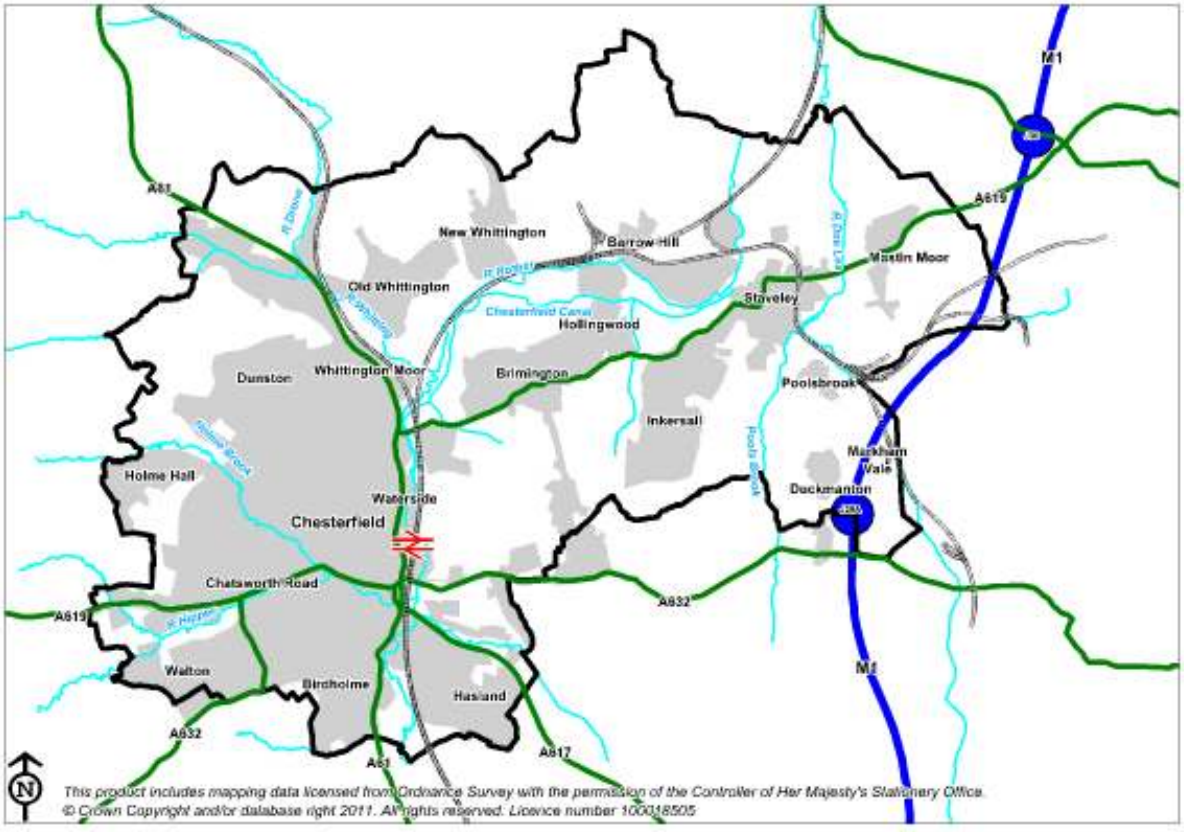
1 Introduction

1.1 Description of Local Authority Area

Chesterfield is a market town situated in North Derbyshire. The population is approximately 99,000. The borough is surrounded by the boroughs of North East Derbyshire to the north, south and west, and Bolsover District to the east. The Borough of Chesterfield consists mainly of the town centre, which has a mix of small retail and service sector activities, and immediate suburbs of Chesterfield, to the south, west, and north-west of the town centre. To the east is the small town of Staveley, with ribbon and estate housing developments connecting the two centres. Chesterfield town is surrounded by rural areas, those to the north, west, and south are outside the borough area. Part of the area between Chesterfield town and Staveley is rural farmland, but there are vacant former industrial sites in this area, a legacy of the closure of much of the heavy industry which had driven the growth of the borough. Smaller self-contained former mining villages are located in the east of the borough area. The M1 Motorway skirts the eastern fringes of the borough, and the town centre is bypassed by the A61 ring road, built on the line of one of the former railways which converged on the town. The main source of pollution in the borough comes from road transport, but there is also some remaining traditional heavy industry still located in the borough, predominantly following the railway line north of the town centre, and in an industrial estate in the north western corner of the borough.

Figure 1.1: An indicative map of Chesterfield showing the major trunk roads and areas of the borough



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 (overleaf). This table shows the objectives in units of micrograms per cubic metre μg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 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

Date	Report Title	Conclusions and recommendations
2003	Update & Screening Assessment	Nitrogen Dioxide and PM_{10} were at risk of exceeding the health-based objectives. This led to a Detailed Assessment of these pollutants being conducted in 2004
2004	Detailed Assessment	No immediate action necessary, but Nitrogen Dioxide and PM_{10} should remain under close review. Improvements in air quality monitoring across the borough was also recommended
2005	Progress Report	Monitoring data highlighted a risk of exceedence of the Air Quality Nitrogen Dioxide Objectives on Derby Road. However, the data capture was not of sufficient accuracy for immediate action to be taken. Recommendations were made to improve the air quality monitoring strategy.
2006	Update & Screening Assessment	Monitoring data highlighted three locations showing exceedence of the annual Nitrogen Dioxide Air Quality Objective. These were Chatsworth Road (A619) and Derby Road (A61 South) and Chesterfield Road, Staveley (A619). Recommendation was made to complete a Detailed Assessment for these areas
2007	Detailed Assessment	Modelled data confirmed that Chatsworth Road (A619) and Derby Road (A61 South) and Chesterfield Road, Staveley (A619). showed exceedence of the annual Nitrogen Dioxide Air Quality Objective. Proposal was made to declare a ribbon AQMA, the proposed boundary of which would be based on a contour produced by the ADMS model, and incorporated areas of the borough predicted as having average annual NO_2 levels in excess of 36 $\mu g/m^3$.
2008	Progress Report	Recommendation to improve data capture, relocation of background monitoring site and relocation of some diffusion tubes to increase accuracy of results. Better working with planning department on major developments and improving the Authority's air quality web pages.
2009	Update & Screening Assessment	Monitoring data highlighted two further areas (both lying outside of the boundary for the proposed AQMA) showing elevated levels of Nitrogen Dioxide and possible exceedence of the annual Nitrogen Dioxide Air Quality Objective. These areas were Whittington Hill and Compton Street. Recommendation to produce detailed assessments for both areas.

2010	Progress Report	None of the air quality objectives were exceeded in 2009 and it was decided to withdraw the proposals for the declaration of an AQMA. It was recommended to continue to monitor air quality at all of the hot spots previously identified. In addition, the Council is reviewing the monitoring locations to ensure that a comprehensive monitoring data set is obtained and can be used to assess air quality within the Borough with confidence.
2010	Detailed Assessment and Source apportionment	Detailed assessment based on dispersion modelling of the most heavily trafficked areas within the Borough including Whittington Hill and Compton Street. Both monitoring and modelling indicated no exceedences of any of the objectives in 2009. Elevated levels were however found at a few locations and recommendations were made to continue to monitor trends throughout the Borough and especially at these locations.
2011	Progress Report (revised)	Monitoring data highlighted four areas showing elevated levels of Nitrogen Dioxide and possible exceedence of the annual Nitrogen Dioxide Air Quality Objective. These areas were Whittington Hill; Sheffield Road; Duke Street, Staveley; and Church Street, Brimington. Recommendation to produce Detailed Assessments for these areas.
2012	Update & Screening Assessment	Monitoring Data indicates that NO_2 levels have decreased across the borough as a whole, and as a result the four areas highlighted above area revised to a single site. However, the ongoing Detailed Assessments are continuing.
2013	Detailed Assessment	Monitoring data demonstrated that the four areas identified as being at risk of breaching the AQO are all below the objective and as such there is no requirement to declare AQMAs. However, DEFRA rejected this finding and request that, if the data in the following report indicates an exceedance at the façade of a row of houses within one of the areas (for the 2012 full calendar year), an AQMA be declared in that area.
2013	Progress Report	This report

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The details of the sites and the monitoring being undertaken at each location are given below in Tables 2.1a and 2.1.b:

Table 2.1a Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique
Chatsworth Road	Urban Traffic	436349 E	370657 N	NOx PM_{10} $PM_{2.5}$ Benzene Aldehyde	Chemi-luminescent FDMS FDMS Pumped Tubes Pumped Filters
Queens Park Annex	Urban Background	437909 E	370545 N	NOx PM_{10} $PM_{2.5}$ Aldehyde	Chemi-luminescent FDMS FDMS Pumped Filters

Table 2.1b Details of Automatic Monitoring Sites

Site Name	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Chatsworth Road	N	Y (1m)	4.5m	Yes
Queens Park Annex	N	N (75m)	85m	No

The maps, below, show the locations of the two automatic monitoring stations operated by Chesterfield Borough Council.

Figure 2.1 Location of Chatsworth Road Automatic Monitoring Site

Note: For data handling and data download purposes, this site is referred to as Chesterfield Roadside, by both Bureau Veritas and DEFRA

This site, formerly classified as a Roadside site, has been reclassified as an Urban Traffic site. This site is indicative of public exposure for dwellings in urban locations.

Figure 2.2: Location of Queens Park Annex Automatic Monitoring Site

Note: For data handling and data download purposes, this site is referred to as Chesterfield, by both Bureau Veritas and DEFRA.

This site is classified as an Urban Background site, and is indicative of the diffusion tubes in locations set away from main roads (Note: Please see the section 2.1.2 below and Appendix B regarding the relocation of some tubes to facilitate the ongoing Detailed Assessments).

There is a firm plan to develop the immediate vicinity of the Queens Park Annex site, to provide a new sports centre replacing the existing facility on an adjacent site. The result of this is that the monitoring location will cease to be used, due to the impact of development leading to the site no longer being able to be classified as an Urban Background site. The long term use of this equipment is in question. The unit will either be relocated (ideally, continuing to provide data to AURN at an alternative Urban Background location) or may be decommissioned. Work is currently being carried out to identify possible sites for the unit to be moved into.

2.1.2 Non-Automatic Monitoring Sites

The locations of the NO_2 diffusion tubes across the Borough as a whole was changed in September 2011, to facilitate the undertaking of 4 Detailed Assessments. On completion of the Detailed Assessments, it was found that two of the areas which had given rise to concerns that the Air Quality Objective for Nitrogen Dioxide were well below the Objective. The additional diffusion tubes in these areas have been relocated, reinstating two of the monitoring locations which had previously been discontinued, and allowing an assessment of an existing road junction which has been altered from a roundabout to a traffic light controlled junction, as concerns have been raised that the change has lead to congestion on the roads in the area. This revised monitoring will be reported in the 2014 Progress Report.

The locations of diffusion tube monitoring across the Borough during the period covered by this report is shown in Appendix B and in Table 2.2 overleaf. As can be seen from the map, the monitoring locations now reflect the major roads and possible congestion points on those roads.

Table 2.2 Details of Diffusion Tube Monitoring Sites

Tube Number	Site Name	Site Type	O/S Grid Reference	In AQMA?	Relevant Exposure?	Distance to Kerb of Nearest Road	Worst Case Location?
1	Bradbury Club, 150 Chatsworth Rd	Façade	437222 370956	No	Yes	1m	Yes
2	Site Demolished	-	-	-	-	-	-
3	376 Sheffield Road	Façade	438291 373006	No	Yes	1m	Yes
4	390 Sheffield Road	Façade	438284 373057	No	Yes	1m	Yes
5	17, South Place	Façade	438293 370863	No	Yes	1m	Yes
6	6 Church Street, Brimington	Façade	440440 373514	No	Yes	1m	Yes
7	63/65 Duke Street	Façade	443454 374781	No	Yes	1m	Yes
8	St Augustines, 212 Derby Road	Façade	438395 369776	No	Yes	3m	Yes
9	Lincoln Street, 287 Derby Road	Façade	438385 369574	No	Yes	2m	Yes
10	7 High Street, Brimington	Façade	440531 373484	No	Yes	1m	Yes
11	42, Whittington Hill (B6052)	Façade	438307 374560	No	Yes	2m	Yes
12	460, Sheffield Road	Façade	438279 373336	No	Yes	2m	Yes
13	14a Church Street, Staveley	Façade	443450 374817	No	Yes	1m	Yes
14	348 Derby Road, Storforth Lane	Façade	438357 369410	No	Yes	2m	Yes
15	Chatsworth Road AQ. Site	Co-location	436349 370658	No	Yes	4m	Yes
16	Chatsworth Road AQ. Site	Co-location	436349 370658	No	Yes	4m	Yes
17	Chatsworth Road AQ. Site	Co-location	436349 370658	No	Yes	4m	Yes
18	Queens Park Annexe	Co-location	437909 370544	No	No	85m	No
19	Queens Park Annexe	Co-location	437909 370544	No	No	85m	No
20	Queens Park Annexe	Co-location	437909 370544	No	No	85m	No
21	39 Duke Street, Staveley	Façade	443447 374711	No	Yes	1m	Yes
22	25/27 Ringwood Road, Brimington	Façade	440669 373711	No	Yes	1m	Yes
23	78 Whittington Hill	Façade	438285 374446	No	Yes	2m	Yes
24	10, Compton Street, Saltergate	Façade	437686 371433	No	Yes	1m	Yes

Tube Number	Site Name	Site Type	O/S Grid Reference	In AQMA?	Relevant Exposure?	Distance to Kerb of Nearest Road	Worst Case Location?
25	62 Whittington Hill	Façade	438294 374497	No	Yes	3m	Yes
26	37 Whittington Hill	Façade	438323 374540	No	Yes	6m	Yes
27	Lowgates, Staveley	Façade	443897 374912	No	Yes	3m	Yes
28	Patrick Hinds House, Church St, Brimington	Façade	440323 373482	No	Yes	1m	Yes
29	Hollywell Cross R/T, Old Post Restaurant	Façade	438417 371357	No	Yes	1m	Yes
30	348, Chatsworth Rd, Brampton Mile	Façade	436702 370761	No	Yes	1m	Yes
31	386 Sheffield Road	Façade	438289 373028	No	Yes	2m	Yes
32	Warner Street, Hasland	Roadside	438976 370356	No	Yes	1m	Yes
33	55 Duke Street, Staveley	Façade	443452 374762	No	Yes	4m	Yes
34	Travel Blank	-	-	-	-	-	-
35	632, Chatsworth Road, Storrs Road	Façade	435654 370537	No	Yes	3m	Yes
36	65 Whittington Hill	Façade	438304 374457	No	Yes	2m	Yes
37	50 Church Street, Brimington	Façade	440361 373513	No	Yes	1m	Yes
38	14 Church Street, Brimington	Façade	440421 373515	No	Yes	1m	Yes
39	43 Sheffield Road	Façade	438343 371908	No	Yes	1m	Yes
40	380 Sheffield Road	Façade	438290 373014	No	Yes	1m	Yes
41	James Street / Lockoford Lane	Roadside	438407 372798	No	Yes	1m	Yes

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Nitrogen Dioxide is monitored by the use of two AURN affiliated sites, allowing the co-location of diffusion tubes to validate monthly exposed diffusion tubes which are located at appropriate sites around the borough.

Automatic Monitoring Data

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Data Capture 2012 %	Annual mean concentrations (μg/m^3)			
				2009	2010	2011	2012
Chesterfield	Urban Background	N	97.8	19.0	19.5	14.8	14.6
Chesterfield Roadside	Traffic	N	93.3	20.6	22.9	23.2	18.2

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2012 %	Number of Exceedences of hourly mean (200 μg/m^3) Where the period of valid data is less than 90% of a full year, include the 99.8th percentile of hourly means in brackets.			
				2009	2010	2011	2012
Chesterfield	Urban Background	N	97.8	0	0	0	0
Chesterfield Roadside	Traffic	N	93.3	0	0	0 (94)	0

Diffusion Tube Monitoring Data

The reorganisation of the locations of the diffusion tube monitoring has meant that all sites reflect direct public exposure to traffic either at the façade of dwellings, or at the roadside. The results of the monitoring is given below:

Table 2.4: Bias Adjusted Diffusion Tubes Results:

Tube Number	Site Name	Site Type	Data Capture	Annual Average
1	Bradbury Club, 150 Chatsworth Rd	Roadside	100	27.6
2	Site Demolished	-	-	-
3	376 Sheffield Road	Façade	67	35.7
4	390 Sheffield Road	Façade	100	27.1
5	17, South Place	Façade	83	27.0
6	6 Church Street, Brimington	Façade	100	**44.3**
7	63/65 Duke Street	Façade	92	35.0
8	St Augustines, 212 Derby Road	Façade	100	29.1
9	Lincoln Street, 287 Derby Road	Façade	92	29.2
10	7 High Street, Brimington	Façade	100	38.6
11	42, Whittington Hill (B6052)	Façade	92	34.7
12	460, Sheffield Road	Façade	100	28.7
13	14a Church Street, Staveley	Façade	100	26.0
14	348 Derby Road, Storforth Lane	Façade	100	32.8
15	Chatsworth Road AQ. Site	Co-location	100	19.1
16	Chatsworth Road AQ. Site	Co-location	100	19.7
17	Chatsworth Road AQ. Site	Co-location	100	19.5
18	Queens Park Annexe	Co-location	92	14.4
19	Queens Park Annexe	Co-location	92	14.7
20	Queens Park Annexe	Co-location	92	15.5
21	Site Removed (owner withdrew consent)	-	-	-
22	25/27 Ringwood Road, Brimington	Façade	100	35.4
23	78 Whittington Hill	Façade	92	31.8
24	10, Compton Street, Saltergate	Façade	100	33.8
25	62 Whittington Hill	Façade	92	29.5
26	37 Whittington Hill	Façade	92	23.5
27	Lowgates, Staveley	Façade	100	30.1
28	Patrick Hinds House, Church St, Brimington	Façade	92	28.7
29	Hollywell Cross R/T, Old Post Restaurant	Façade	100	30.2
30	348, Chatsworth Rd, Brampton Mile	Façade	100	26.0
31	386 Sheffield Road	Façade	83	36.4
32	Warner Street, Hasland	Roadside	92	34.1
33	55 Duke Street, Staveley	Façade	67	33.8
34	Travel Blank	-	-	-
35	632, Chatsworth Road, Storrs Road	Façade	92	30.3
36	65 Whittington Hill	Façade	75	24.9
37	50 Church Street, Brimington	Façade	92	36.6
38	14 Church Street, Brimington	Façade	100	**43.4**
39	43 Sheffield Road	Façade	92	27.8
40	380 Sheffield Road	Façade	100	39.5
41	James Street / Lockoford Lane	Roadside	100	31.2

Two monitoring locations (376 Sheffield Road, and 55 Duke Street, Staveley) have a data capture rate of less than 75 % (in each case a single extra month of data was lost giving a capture rate of 67%). However, this data has not been annualised, as there are other diffusion tubes which are located in the close vicinity which have given similar results:

376 Sheffield Rd (67% data capture) – 35.7 µg/m^3
compares favourably with:
386 Sheffield Rd (83% data capture) – 36.4 µg/m^3
380 Sheffield Rd (100% data capture) – 39.5 µg/m^3

55 Duke Street (67% data capture) – 33.8 µg/m^3
compares favourably with:
63/65 Dukes Street (92% data capture) – 35.0 µg/m^3
Lowgates (100% data capture) – 30.1 µg/m^3

Given this, we are confident that the results are valid.

Table 2.5 and Figure 2.3 (overleaf and following) shows longer term trend data, based upon the monitoring locations which have been unchanged over the past four years. The gradual reduction in overall levels of nitrogen dioxide from the peak in 2010 is continuing.

Tube 2 (Markham Road in the following table), and the elevated pink line in the associated figure) has been removed. This location reflected a historical exposure. A small row of terraced housing abutted a very busy road skirting the town centre. The houses became vacant, and have now been demolished. The site (a lamp-post) remained in use as it gathered trend data, but was ultimately removed by the local highways authority.

Tube 32 (Hasland By-pass) is showing a gradual increase in nitrogen dioxide, but is located on an isolated lamp-post at the end of a cul-de-sac. There is no adjacent housing. Once again trend data is being gathered.

Tube 6 (Church Street, Brimington) shows a fluctuation around the Air Quality Objective. This area has been subject to a Detailed Assessment. The results of this and associated monitoring will be discussed further in this report.

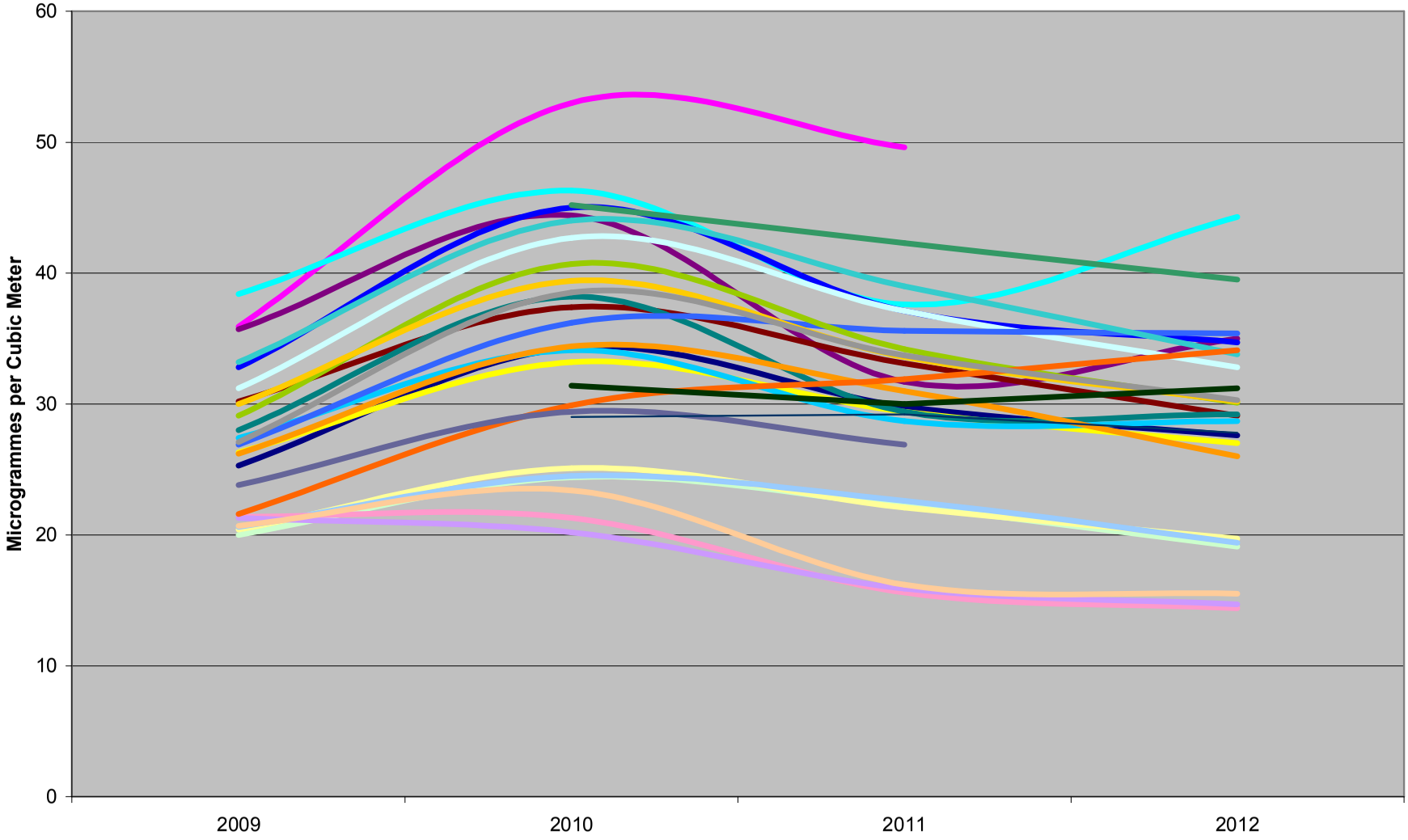
Details of QA/QC is included in Appendix A

Chesterfield Borough Council

Table 2.5 Results of NO_2 Diffusion Tubes (2009 to 2012)

Tube No	Site	Site Type	2009	2010	2011	2012
1	150 Chatsworth Rd (A619)	Façade	25.3	34.3	29.8	27.6
2	Markham Road, A619	Façade	35.9	**53**	**49.6**	-
5	17, South Place	Façade	26.3	33.2	29.4	27
6	6 Church St, Brimington	Façade	38.4	**46.3**	37.6	**44.3**
7	Duke Street, Staveley	Façade	35.7	**44.4**	31.7	35
8	St Augustines, 212 Derby Road	Façade	30.2	37.4	33.1	29.1
9	Lincoln Street, 287 Derby Road	Façade	28	38.2	29.4	29.2
11	42, Whittington Hill (B6052)	Façade	32.8	**45**	37.1	34.7
12	460, Sheffield Road	Façade	27.4	34.1	28.7	28.7
14	348 Derby Road, Storforth Lane	Façade	31.2	**42.7**	37.1	32.8
15	Chatsworth Road AQ. Site	Co-location	20	24.4	22.2	19.1
16	Chatsworth Road AQ. Site	Co-location	20.4	25.1	22.1	19.7
17	Chatsworth Road AQ. Site	Co-location	20.6	24.5	22.6	19.4
18	Queens Park Annexe	Co-location	21.4	21.3	15.6	14.4
19	Queens Park Annexe	Co-location	21.3	20.2	15.9	14.7
20	Queens Park Annexe	Co-location	20.7	23.4	16.2	15.5
22	35, Ringwood Road, Brimington	Façade	26.9	36.2	35.6	35.4
24	10, Compton Street, Saltergate	Façade	33.2	**44**	39	33.8
27	Lowgates	Façade	29.1	**40.7**	34.2	30.1
29	Holywell Cross R/T, Old Post Restaurant	Façade	30	39.4	33.6	30.2
30	348, Chatsworth Rd, Brampton Mile	Façade	26.2	34.4	31	26
32	Hasland By-Pass (A617)	Façade	21.6	29.9	31.9	34.1
34	451, Chatsworth Rd, Chapel Lane West	Façade	23.8	29.4	26.9	-
35	632, Chatsworth Road, Storrs Road	Façade	27.1	38.5	33.7	30.3
39	43 Sheffield Road	Façade	-	29	29.2	27.8
40	380 Sheffield Road	Façade	-	**45.2**	**42.3**	39.5
41	James Street / Lockoford Lane	Roadside	-	31.4	30	31.2

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



2.2.2 Particulate Matter (PM_{10})

Particulates are monitored at the two AURN sites (as detailed in section 2.1.1) Reliability of the TEOM units continues to be an issue and this reflects the general situation across the network. The results are given below:

Table 2.6a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Data Capture 2011 %	Annual mean concentrations (μg/m^3)			
				2009	2010	2011	2012
Chesterfield	Urban Background	N	51.2	19.0	19.5	21.6	11.3
Chesterfield Roadside	Traffic	N	85.8	20.6	22.9	17.8	20.2

Table 2.6b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2011 %	Number of Exceedences of daily mean objective (50 μg/m^3) Where data capture < 90%, include the 90th percentile of daily means in brackets.			
				2009	2010	2011	2012
Chesterfield	Urban Background	N	51.2	0	0	0 (38.4)	0 (18.6)
Chesterfield Roadside	Traffic	N	85.8	0	0	0 (27.6)	14 (35.7)

Monitoring indicates that there has been no breach of the Air Quality Objective.

2.2.3 Sulphur Dioxide (SO_2)

Sulphur Dioxide is not a pollutant of concern and is not monitored.

2.2.4 Benzene

Benzene is monitored at the Roadside site. Data is available from mid December 2011 to mid October 2012. The Mean level for this period is 1.16 μg/m^3. We are confident that there is no breach of the Air Quality Objective.

2.2.5 Other Pollutants Monitored

Aldehyde is monitored as part of a DEFRA/RicardoAEA joint scoping trial project. No results are available, as yet, from this exercise which is planned to continue for a further year.

2.2.6 Summary of Compliance with AQS Objectives

Chesterfield Borough Council has examined the results from monitoring in the borough. Pollutant concentrations are below the Air Quality Objectives with the exception of two properties on Church Street at Brimington, which show an exceedence of Nitrogen Dioxide.

This has been subject to a Detailed Assessment. The monitoring results at this location have fluctuated around the AQO, but the long term trend displays a reduction in the level. However, there remains an ongoing, though marginal, breach of the air quality objective in the vicinity of a single row of terraced housing. Given this we will declare an Air Quality Management Area in this immediate vicinity.

Intensive monitoring is continuing in this area, and this monitoring will be augmented by the temporary installation of automatic monitoring equipment at an adjacent site.

PM_{10}, and Benzene levels are within the Air Quality Objective.

3 New Local Developments

3.1 Road Traffic Sources

No changes have been identified with reference to Road Traffic Sources since the last report

3.2 Other Transport Sources

No additional transport sources have been identified

3.3 Industrial Sources

No newly identified industrial sources have been identified since the last report.

3.4 Commercial and Domestic Sources

No newly identified commercial and domestic sources have been identified since the last report.

3.5 New Developments with Fugitive or Uncontrolled Sources

No newly identified fugitive or uncontrolled sources have been identified since the last report.

Chesterfield Borough Council confirms that there are no new or newly identified local developments.
Chesterfield Borough Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Conclusions and Proposed Actions

4.1 Conclusions from New Monitoring Data

Monitoring throughout 2012 has confirmed that a marginal breach of the Air Quality Objective occurred at a row of terraced houses at Church Street, Brimington. This area was subject to a Detailed Assessment in 2011-12. The report on this was submitted in March 2013. The other three areas (Whittington Hill, Sheffield Road, and Dukes Street) are further confirmed to not be in breach of the AQO.

4.2 Conclusions relating to New Local Developments

No new local developments which would have any appreciable impact on air quality have been proposed.

4.3 Proposed Actions

Given that a breach of the Air Quality Objective for nitrogen dioxide, has been identified at a single location within Chesterfield, the process of declaring an Air Quality Management Area, will now begin. Concurrent with this we will undertake a more intensive assessment of the air quality at this location. This is particularly important as the current assessment has been undertaken solely by the use of diffusion tubes. A suitable location for the siting of an automatic monitor has been agreed and works are currently being carried out to enable monitoring to begin.

The revised nitrogen dioxide diffusion tubes monitoring will continue and the results will be reported upon in the next Progress Report in 2014.

5 References

Local Air Quality Management Technical Guidance – LAQM TG(09)

Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users, AEA/ENV/R/2504 – Issues 1a, Feb 2008

Trends in NOx and NO2 emissions and Ambient Measurement in the UK – draft for comment, 3 March 2011

http://laqm.defra.gov.uk/documents/Database_Diffusion_Tube_Bias_Factors-v07_13-Final.xls

http://laqm.defra.gov.uk/documents/Tube_Precision_2013_version_07_13-Final.pdf

Automatic Urban and Rural Network: Assessment of Site Classifications, AEA, 2010

NO2 Diffusion Tubes for LAQM: Guidance Notes for Local Authorities, AEA, 2006

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

NO_2 diffusion tubes are supplied by South Yorkshire Air Quality Samplers, the preparation method being 50% TEA in acetone. The laboratory follows the procedures set out in the Harmonisation Practical Guidance. The national bias factor for the tubes supplied by this source is 0.79. Data from the two sites operated by Chesterfield BC is supplied to DEFRA for input into the calculation of this factor.

Factor from Local Co-location Studies (if available)

The local bias factor for the traffic site operated by Chesterfield BC is as follows:

Chesterfield Roadside (Chatsworth Road): 0.71

Further details on the sites are given in section 2.1.1 of this report

Discussion of Choice of Factor to Use

The bias factor used in adjusting the data for this report is a local factor and, more specifically, is calculated using the traffic site, Chesterfield Roadside. This site is used as it is in a very similar location to those where the diffusion tubes are all now placed. Co-located diffusion tubes are still placed on the Urban Background site (Chesterfield Queen's Park), but they are used for trend data only, as there are no longer any diffusion tubes sited in background locations within the borough, as a result of the rationalisation of monitoring locations to best reflect traffic flows.

The local factor (0.71) varies from the national factor (0.80) but as the data is specific to this region and, more pertinently, to the roadside monitoring which is now being uniformly undertaken, it is believed that the use of the local factor is fully justified.

PM Monitoring Adjustment

Monitoring is carried out using FDMS equipment, no data adjustment is required.

Short-term to Long-term Data adjustment

No adjustment of the data is required.

QA/QC of automatic monitoring

Data validation is carried out by BureauVeritas on behalf of DEFRA. On site calibration is carried out by Chesterfield BC staff on a 14 day cycle, using standard

calibration gases, and the calibration data is sent direct to BureauVeritas, and RicardoAEA, by email.

QA/QC of diffusion tube monitoring

The diffusion tube monitoring is carried out in full compliance with the guidance contained in the document "Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users". The WASP results show the overall performance of the analysis laboratory as good.

Appendix B: Diffusion Tube Monitoring Locations