Ashfield
DISTRICT COUNCIL

2017 Air Quality Annual Status Report (ASR)

For Ashfield District Council
In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management
June 2017

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Executive Summary - Air Quality in Our Area

Air Quality in Ashfield

Air Quality is an issue that is becoming one of an increasing interest for the general public and of increasing interest to news organisations. Most of the issues raised focus on how detrimental air quality can affect human health.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Since 2003 Ashfield District Council has undertaken monitoring of the air quality within the district under the Local Air Quality Management regime and reports back to DEFRA. Fortunately Ashfield District Council has been able to consistently meet the Air Quality Objectives set by National Government.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

The District of Ashfield is a Smoke Control Area and the Environmental Protection Team at Ashfield District Council use the Clean Air Act Legislation to control the levels of air pollution from domestic, commercial and industrial combustion activities. In addition, air pollution within the district from key industrial processes is regulated by the Environmental Permitting (England and Wales) Regulations 2016.

The Trans-boundary nature of air pollution sources and episodes make it a prerequisite that Ashfield District Council works with partner organisations to control air pollution problems and develop strategies for reducing levels of detrimental air pollution. These partner organisations include the Environment Agency, Pubic Health England and the neighbouring Nottinghamshire Authorities through the work of the Nottinghamshire Environmental Protection Working Group and at the regional level through the work of the East Midlands Air Quality Network.

This report focuses on monitoring data collected during 2016 and again the District of Ashfield continues to meet the air quality objectives set by National Government. However this is not the case nationally and now local authorities are also being asked to report on actions and initiatives they are undertaking to improve local and regional air quality.

Actions to Improve Air Quality

Ashfield District Council has not had to declare an AQMA but it is still important for the Council to take steps to address air quality within the District.

- Over the last year in response to Ashfield District Council's current Air Quality Strategy becoming outdated, the Council has been working with partners such has the neighbouring Nottinghamshire Authorities through the work of the Nottinghamshire Environmental Protection Working Group, Nottinghamshire County Council and Public Health England to develop an Updated Air Quality Strategy. The Draft of the New Nottinghamshire Air Quality Strategy has now been published and put out for comments by all consultees including the Health and Wellbeing Boards.

- As an Authority Ashfield District Council is trying to promote the use of more sustainable forms of transport has a means of reducing the effects of detrimental Air Quality. The Council as obtained its first electric vehicle using grant money and it is now using a hybrid vehicle within the Grounds Maintenance Team and a hybrid vehicle within the Community Protection Team. The Council as also fitted electric lifts to five of its refuse vehicles which had led to a nine percent saving in fuel usage. The Council also operates a tax free bikes scheme for all employees to encourage cycle use for employee's to get to work but also to encourage cycle use outside of work.

- As stated earlier the Council will continue to enforce all legislation aimed at reducing air pollution and it will continue to make assessments of all new commercial, industrial and large domestic housing projects that apply for planning approval.

Conclusions and Priorities

During 2016 the District of Ashfield continued to meet the air quality objectives set by National Government based on monitoring data, however this is not the case nationally and now local authorities are also being asked to report on actions and initiatives they are undertaking to improve local and regional air quality

Despite Ashfield District Council not having any AQMA's our priority is to continue working with partners such as Public Health England to develop public engagement in light of the health issues associated with detrimental air quality and with neighbouring Nottinghamshire Authorities and Nottinghamshire County Council to implement the updated Nottinghamshire Air Quality Strategy.

Promoting public awareness of air pollution and the actions that individuals can take to reduce air pollution should help to ensure that the levels of Air Pollution within the District of Ashfield continue to the meet National Air Quality Objectives. It is important that the health effects of detrimental air quality are conveyed to the public and highlight to the public that even lower levels of air pollutants can affect public health

In Hucknall the District borders the Nottingham Clean Air Zone and our engagement with Public Health England and the work with the Nottinghamshire Environmental Protection Working Group will help to address the issue. People commuting from neighbouring District Authority areas into Nottingham City can have an impact on their air pollution problems and it again highlights the importance of engaging with the public to promote sustainable transport options.

Local Engagement and How to Get Involved

Residents living or working in Ashfield and Business's based in Ashfield can take steps to improve local air quality by electing to adjust their life style choices. These changes centre on the increased use of sustainable transport and a reduction in personal car use.

Ashfield has good links to all forms of public transport. The Robin Hood railway line (which runs from Nottingham to Worksop) has stations at Kirkby-in-Ashfield, Sutton Parkway and Hucknall. Hucknall is also a terminus for the Nottingham Express Transit (NET) tram route to Nottingham.

Walking and cycling are both good for an individual's general health but it also makes a positive contribution to resolving the problems associated with detrimental air quality in congested areas. Contact your local school and enquire whether they operate any group cycling or walking schemes.

When the time comes to replacing your existing vehicle consider purchasing an electric or low emission vehicle. The Government are providing a number of different grant schemes and tax incentives to encourage the general public and business to switch to using electric and low emission vehicles. There are grants available that promote the use of plug in electric cars and vans. Coupled with 'feed in tariffs' that enable consumers to get money for generating their own electricity these incentives could help the domestic consumer to reduce the cost of running a car whilst also making a contribution to reducing the levels of anthropogenic pollution.

There are also incentives through grants and tax incentives to encourage business to switch to electric or low emission vehicles. There is specific grant money available for public transport providers to purchase cleaner, greener buses. In addition to electric and hybrid vehicles the government is promoting the use of hydrogen fuelled fleet vehicles. For further information you can visit the GOV.UK website.

The whole of the district of Ashfield has been designated a Smoke Control Area under the Clean Air Act 1993 and whilst this places restrictions on the burning of waste by business it does not completely prohibit the burning of waste by householders who can still burn garden waste provided they do not cause nuisance to other residents. All forms of combustion including bonfires can give rise to increases in the levels of particulate both PM_{10} and $PM_{2.5}$ which leads to increases in cardiovascular and respiratory diseases especially within vulnerable groups such as the elderly, children and asthma sufferers. Local residents can contribute to reducing particulates by recycling waste rather than burning it. Ashfield District Council currently offers a free garden waste collection scheme using the fortnightly collection of brown/black lidded bins and large quantities of waste can be taken to the household waste recycling centres. They are located at Wigwam lane Hucknall, Sidings Road Kirkby in Ashfield and at Hermitage Lane Mansfield. It is important that Nottinghamshire residents register with Nottinghamshire County Council before using the household waste recycling centres.

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1 Local Air Quality Management

This report provides an overview of air quality in Ashfield during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by District of Ashfield to improve air quality and any progress that has been made.
The statutory air quality objectives applicable to LAQM in England can be found in Table G.1 in Appendix G.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

Ashfield District Council currently does not have any Air Quality Management Areas.

2.2 Progress and Impact of Measures to address in Air Quality in Ashfield

Defra's appraisal of last year's ASR concluded 'The local Authority monitors for nitrogen dioxide at a number of diffusion tube sites located close to roadsides. There are no measured exceedances of the annual mean objective and therefore no requirement to declare an Air Quality Management Area. There are some reductions in nitrogen dioxide annual mean concentrations at some of the monitoring sites but no real downward trend has been observed over the last five years.

The local authority has outlined a number of measures that they are considering alone or jointly with Nottingham City or County councils to improve air quality.

On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants.'

Ashfield District Council has taken forward a number of measures during the current reporting Year of 2016 in pursuit of improving air quality. Details of the measures completed, in progress or planned are set out in Table 2.1.

Ashfield District Council expects that measure two which is the development of an updated Nottinghamshire Air Quality Strategy and measure four which is a promotional event around National Clean Air Day and which encourages public participation by highlighting sustainable transport options and highlights the health issues associated with detrimental air quality to be completed over the course of the next year. Ashfield District Council does not anticipate any barriers to the implementation of the above mentioned measures.

Progress on measure one which was the development of an Air Quality Planning Guidance Document has been delayed by unforeseen staff changes and an internal review of development control and the wider planning department and Table 2.1 has been updated with a more realistic timescale. Measure five which was the development of a Taxi Licencing Policy which encompassed incorporation of more stringent emission limits on new taxi licences was not incorporated into the current Taxi Licencing policy. This measure was not implemented because it was thought that for the measure to be effective it would need to be implemented by all Nottinghamshire Authorities at the same time to prevent driver's going to a neighbouring authority for a Hackney Cab Licence that did not have the revised emissions limits. Table 2.1 has been updated with a more realistic timescale for the implementation of these measures.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Work With development control to produce an Air Quality Planning Guidance Document	Air Quality Planning and Policy Guidance	Policy Guidance And Development	ADC	2017/2018	2019-2020	N/A	Not Known	None	2020	
2	Development of an Nottinghamshire Air Quality Strategy	Working with Regional Groups to develop Area Wide Strategies	Control	Nottingham City	Started	Projected to Start September 2016 following a Second Workshop with Development Control and Lead Councillors from Each Nottinghamshire Authority	N/A	Not Known	Draft Copy Completed	Oct 2017	Draft Copy is out for consultation
3	Working with Public Health England to promote public involvement.	Working with Regional Groups to develop Area Wide Strategies	Control	Nottinghamshire County Council and Public Health England	Started	Ongoing	N/A	Not Known	Started	Ongoing	
4	Undertake a promotional event around Clean Air Day 2018	Public Information	Control & Promoting Low Emission Transport	ADC	Sept 2017	Oct 2017 to April 2018	N/A	Not Known	None	2018	
5	New Taxi Licencing Policy to include low emission vehicles	Taxi Licencing Conditions	Promoting Low Emission Transport	ADC	Started	2017-2018	N/A	Not Known	None	2019	Euro 5 for Petrol Euro 6 for Diesel

2.3 $PM_{2.5}$ Local Authority Approach to Reducing Emissions and or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Ashfield District Council has not undertaken any continuous monitoring of $PM_{2.5}$ particulate matter during 2016 and does not have the continuous monitoring equipement available to monitor $PM_{2.5}$ particulate matter. Having reviewed the monitoring data from published background maps it does not identify any 'hot spot area's' located within Ashfield for $PM_{2.5}$ particulate matter.

Ashfield District Council is taking the following measures to address $PM_{2.5}$ particulate:

- It is important that we continue to enforce the Clean Air Act 1993 and the Environmental Permitting (England and Wales) Regulations 2016 to control particulate emissions from industrial processes including combustion processes and to ensure that domestic combustion is controlled.

- Where planning applications are received for new industrial and commercial processes that require an air quality assessment then the modelling of $PM_{2.5}$ particulate emissions will need to be assessed. Measure one of table 2.1 highlights the development of an air quality planning and guidance policy document and this needs to address the problem of $PM_{2.5}$ particulate emissions.

- Measure two of table 2.1 highlights the importance of working with partners to update the Nottinghamshire Air Quality Strategy. It is important that $PM_{2.5}$ particulate matter is considered when developing any new strategy. Working with Public Healh England through the East Midland Air Quality Network provides the opportunity to ensure that any guidance, measures and targets are based on up to date knowledge and provides the opportunity to link the Nottinghamshire Air Quality Strategy with the latest public health outcomes.

- Ashfield District Council has now decided to replace our current air quality monitoring station infavour off an AQ Mesh system which is easy to deploy on lamposts and as the capabilty to measuring $PM_{2.5}$ particulates. It is hoped that this equipemt can be used in complaints, planning applications and to make assessments of particulate levels.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

During 2016 the District of Ashfield continued to meet the air quality objectives set by National Government based on monitoring data and therefore there is no requirement undertake any further assessment. During the 2016 monitoring period and as a result of a complaint from local resident regarding perceived increases in HGV movements a new diffusion tube location at Mansfield Road Selston was added to those sites already monitored. Based on the limited monitoring that took place during 2016 the location met the air quality objectives set by National Government but the results were at a level that it was felt that the site warranted further assessment during 2017.

3.1.1 Automatic Monitoring Sites

Ashfield District Council undertook no automatic (continuous) monitoring at during 2016.

3.1.2 Non-Automatic Monitoring Sites

Ashfield District Council undertook non- automatic (passive) monitoring of NO_2 at 17 sites during 2016. Table A1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. Further details on adjustments are provided in Appendix F.

3.2.1 Nitrogen Dioxide (NO_2)

Table A2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

During 2016 there were no exceedances of the air quality objective of 40µg/m^3 and Ashfield District Council has not had to undertake a detailed assessment or declare an Air Quality Management Area.

3.2.2 Particulate Matter (PM_{10})

No monitoring of Particulate Matter (PM_{10}) was carried out within the district during 2016.

3.2.3 Particulate Matter ($PM_{2.5}$)

No monitoring of Particulate Matter (PM2.5) was carried out within the district during 2016.

3.2.4 Sulphur Dioxide (SO_2)

No monitoring of Sulphur Dioxide was carried out within the district during 2016.

Appendix A: Monitoring Results

Table A1 – Details of Non - Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
Tube 4	Outram Street Sutton	Urban Centre	449628	358967	NO_2	N	3	1.5	N	2
Tube 5	Dalestorth Street Sutton	Roadside	450062	359653	NO_2	N	1.7	1	N	2
Tubs 7	A38 Sutton	Other	448987	357610	NO_2	N	10	2.5	N	2
Tube 10/11/ 12	Church Hill Kirkby	Kerbside	448968	355816	NO_2	N	1.5	0.5	N	2
Tube 14	M1 Pinxton	Other	446492	355266	NO_2	N	28	22	N	2
Tube 19	Ashgate Road	Roadside	454057	348989	NO_2	N	2.8	3.5	N	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
	Hucknall									
Tube 20	High Street Hucknall	Roadside	453477	349315	NO_2	N	5.3	2	N	2
Tube 21	Beardall Street Hucknall	Urban Background	453631	348972	NO_2	N	2.2	2	N	2
Tube 22	Station Road Sutton	Other	450259	358512	NO_2	N	12.7	2.4	N	2
Tube 23	Common Road Huthwaite	Roadside	446827	358508	NO_2	N	2.4	2.4	N	2
Tube 27/28/ 29	Badger Box Annessly	Roadside	450844	353799	NO_2	N	9	2	N	2
Tube 31	Sutton	Kerbside	449850	358779	NO_2	N	4.5	2.5	N	

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
	Croft Primary									2
Tube 32	Lowmoor Road Kirkby	Roadside	450636	356279	NO_2	N	2	2	N	2
Tube 33	Kirkby Chapel Street	Roadside	449211	356192	NO_2	N	5	5	N	2
Tube 34/35/ 36	Sutton Stoneyford Court	Roadside	449812	359577	NO_2	N	6	3.5	N	2
Tube 37/38/ 39	Kirkby Cross	Roadside	449017	356204	NO_2	N	0.5	0.5	N	2
Tube 40	Mansfield Road Selston	Roadside	447037	353573	NO_2	N	2.8	1.5	N	2

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
Tube 4 Outram Street Sutton	Urban Centre	Diffusion Tube		100%	34.7	29.8	29.0	27.8	31.2
Tube 5 Dalestorth Street Sutton	Roadside	Diffusion Tube		100%	34.2	33.1	33.3	31.9	33.8
Tube 7 A38 Sutton	Other	Diffusion Tube		100%	29.2	30.0	26.6	25.7	28.3
Tube 10/11/12 Church Hill Kirkby	Kerbside	Diffusion Tube		100%	**40.0**	38.3	39.0	37.1	**40.6**
Tube 14 M1 Pinxton	Other	Diffusion Tube		100%	32.5	28.2	28.7	27.6	28.0
Tube 19 Ashgate Road Huchnall	Roadside	Diffusion Tube		100%	26.6	25.7	24.8	24.3	24.5
Tube 20 High Street	Roadside	Diffusion Tube		100%	26.5	35.6	33.2	32.4	35.3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
Hucknall									
Tube 21 Beardall Street Hucknall	Urban Background	Diffusion Tube	67%		28.8	22.9	24.8	22.6	25.0
Tube 22 Station Road Sutton	Other	Diffusion Tube		92%	35.2	34.7	33.7	32.9	32.3
Tube 23 Common Road Huthwaite	Roadside	Diffusion Tube		100%	35.8	36.7	34.8	33.2	34.1
Tube 27/28/29 Badger Box Annesley	Roadside	Diffusion Tube		100%	–	–	33.6	32.9	34.9
Tube 31 Croft Primary Sutton	Kerbeside	Diffusion Tube		100%	–	–	26.5	27.8	28.8
Tube 32 Lowmoor Road Kirkby	Roadside	Diffusion Tube		100%	–	–	29.2	25.7	27.4
Tube 33	Roadside	Diffusion		100%	–	–	–	29.0	30.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
Chapel Street Kirkby		Tube							
Tube 34/35/36 Stoneyford Court Sutton	Roadside	Diffusion Tube		100%	34.5	35.0	29.4	28.8	30.9
Tube 37/38/39 Kirkby Cross	Roadside	Diffusion Tube		100%	–	–	–	31.6	34.6
Tube 40 Mansfield Road Selston	Roadside	Diffusion Tube	25%		–	–	–	–	29.0

Notes: Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO_2 Monthly Diffusion Tube Results – 2016

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.94) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Tube 4	35.7	37.7	40.0	32.4	30.4	29.1	23.9	24.3	30.4	.34.5	40.2	39.6	33.2	**31.2**	**29.5**
Tube 5	43.5	42.8	37.0	29.3	32.9	29.6	26.7	24.0	36.3	33.0	44.1	52.6	36.0	33.8	32.8
Tube 7	31.5	37.1	32.4	33.3	28.1	30.8	18.7	22.1	28.5	37.4	28.0	33.0	30.1	28.3	25.3
Tubes 10/11/12	42.7	45.7	46.6	36.8	42.1	45.9	33.5	32.5	42.7	44.6	49.6	56.2	43.2	40.6	35.9
Tube 14	37.3	34.5	29.6	27.9	24.8	24.5	27.3	23.1	30.0	27.0	34.8	36.5	29.8	28.0	26.9
Tube 19	36.9	31.2	25.3	22.4	21.2	18.0	20.2	17.5	25.9	21.9	33.9	39.4	26.1	24.5	24.1
Tube 20	45.6	44.3	51.7	36.3	35.5	34.0	28.1	27.9	33.1	38.4	43.3	32.9	37.6	35.3	31.4
Tube 21	34.1	34.4	29.3	21.5	22.0	19.1	17.8	15.8					24.3	25.0	24.9
Tube 22	45.3	41.3	35.5	29.7	32.1	27.6	29.3	28.6	34.9	33.4	40.8		34.4	32.3	27.9
Tube 23	42.9	37.0	.36.5	35.3	33.9	30.8	30.9	31.2	35.3	36.9	40.5	44.7	36.3	34.1	N/A
Tubes 27/28/29	41.8	46.9	40.1	32.3	34.3	30.3	33.2	27.5	35.0	33.1	41.8	49.4	37.1	34.9	29.9
Tube 31	38.5	33.8	34.2	27.8	26.7	23.2	23.9	23.7	29.9	28.1	34.1	43.9	30.6	28.8	27.0
Tube 32	34.8	33.7	30.0	25.9	26.2	24.9	21.9	19.5	29.3	27.0	32.4	43.0	29.1	27.4	N/A

Tube 33	37.3	24.7	32.6	32.9	29.4	28.8	24.6	23.5	32.7	32.0	37.6	41.4	32.3	30.4	N/A
Tubes 34/35/36	36.8	36.9	32.4	31.8	30.9	25.7	25.8	25.5	32.0	35.6	36.0	44.9	32.9	30.9	28.5
Tubes 37/38/39	35.8	39.8	38.0	35.8	35.1	37.1	23.5	25.5	36.1	44.4	44.5	46.2	36.8	34.6	N/A
Tube 40										36.1	38.5	40.2	38.3	29.0	28.2

☐ **Local bias adjustment factor used (confirm by selecting in box)**

✓ **National bias adjustment factor used (confirm by selecting in box)**

✓**Annualisation has been conducted where data capture is <75% (confirm by selecting in box)**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

Laboratory Used

Nottinghamshire Authorities agreed to employ a single laboratory to undertake the supply and analysis of diffusion tubes. All authorities have agreed to use Gradko Laboratories, utilising the 20% TEA in Water. This is to enable the authorities to effectively compare results over the whole of the county.

Consequently, Ashfield District Council started utilising Gradko Laboratories from April, 2008 and continues to do so.

Laboratory Performance

There can be considerable differences in diffusion tube performance due to a number of factors. One of the issues affecting diffusion tubes is the exposure procedures employed.

Such factors have been reduced as much as possible by Ashfield District Council implementing the Quality Assurance procedures, in the deployment, exposure and collection of the tubes. However, another factor in diffusion tube performance is related to the way in which the diffusion tubes are prepared and analysed. Accordingly, it is important the Council utilise the services of a Laboratory that operates its own QA/QC systems to ensure reliability and consistency of analysis results.

Ashfield District Council utilise the services of Gradko Laboratories for the supply and analysis of Nitrogen Dioxide diffusion tubes. Gradko is UKAS accredited for Nitrogen Dioxide diffusion tube analysis. Additionally, they participate in a centralised QA/QC scheme, namely the Workplace Analysis Scheme for Proficiency (WASP). WASP is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). It is recommended that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the WASP scheme. From the report *'Annual Performance Criteria for NO_2 Diffusion Tubes used in Local Air Quality Management (LAQM), 2008 onwards, and Summary of Laboratory Performance in Rounds 98-102' (February 2009)*, it is shown that Gradko's performance has been rated as **Good**.

Gradko Laboratories NO_2 diffusion tube procedures have been amended to follow the guidelines of the DEFRA document related to the preparation, extraction, analysis and calculation procedures for NO_2 passive diffusion tubes. These amendments are minimal

because they already carried out most of the procedures before the introduction of the Guidelines. Their internal analysis procedures are assessed by U.K.A.S. on an annual basis for compliance to ISO17025.

Bias Adjustment Factors

Diffusion tubes generally under or over-read when compared to a reference automatic analyser. This is referred to as bias. This bias can be corrected by applying a correction factor that is derived either from a local study or from a nationally derived database. Local Authorities are advised to report on both local and national adjustment factors and thereafter decide which to utilise, depending on a number of factors.

Ashfield District Council did not have suitable data to undertake a co-location study to calculate a local bias factor. Therefore the bias adjustment factor derived from the national database has been utilised for the purpose of this report.

This report as used a **Bias Adjustment Factor of 0.94**

Table C.1 Diffusion Tube Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/17 V2

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2017

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data [2]

Step 4:

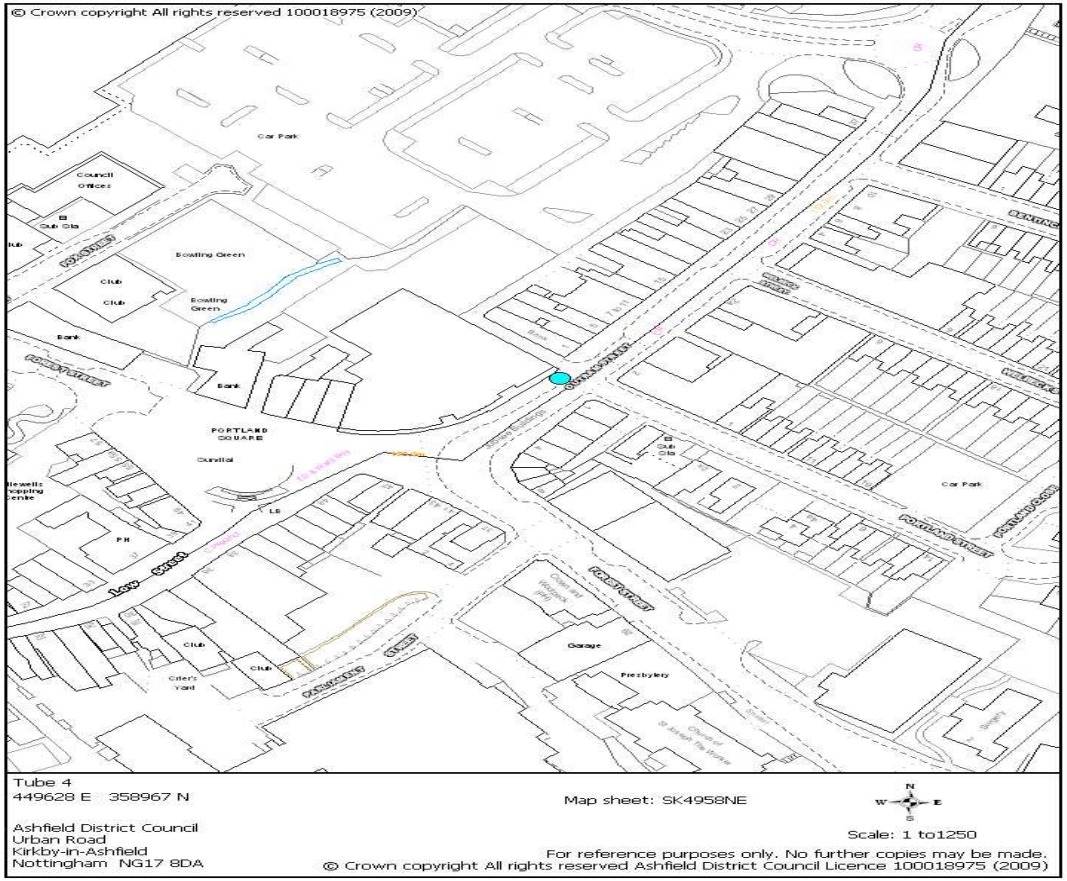
Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor [3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote [4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

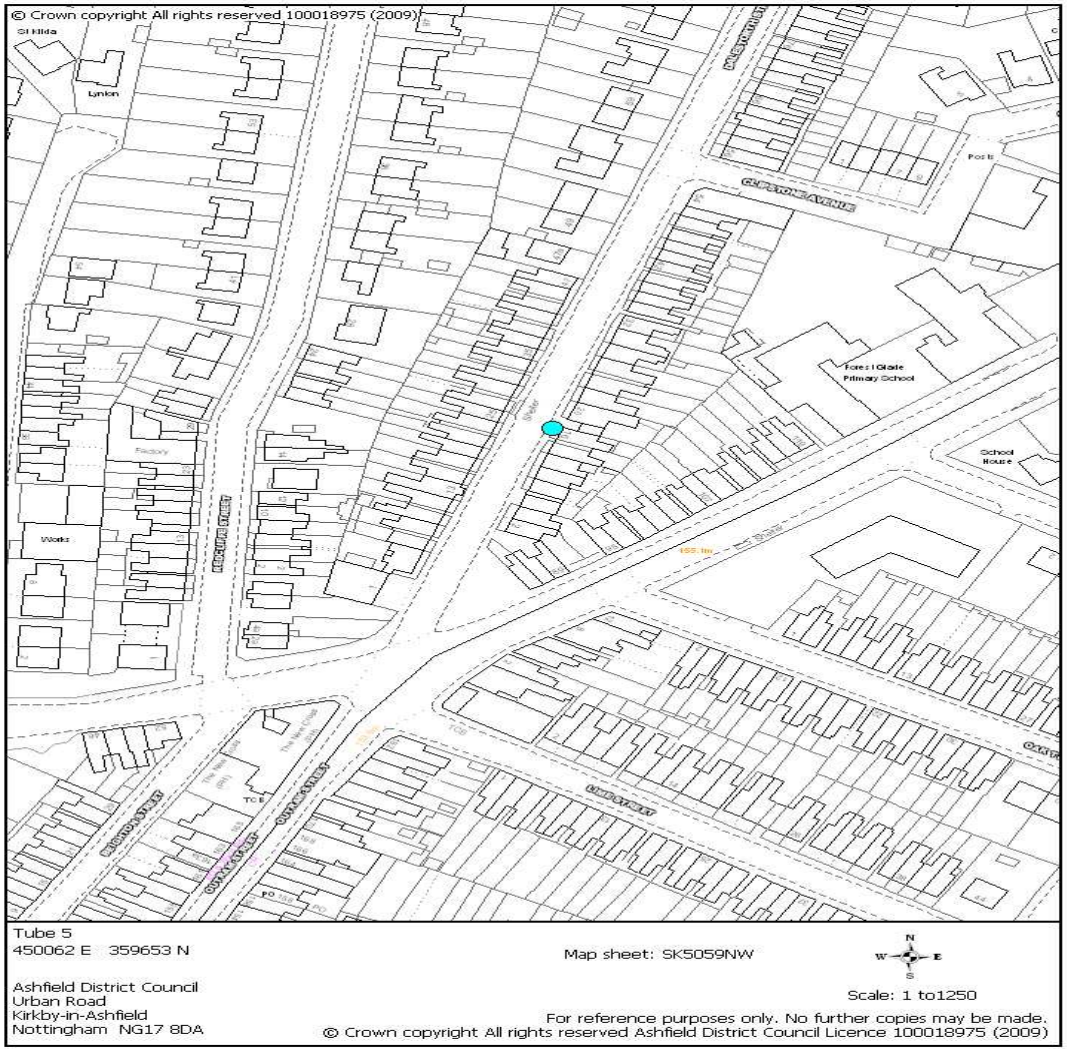
Analysed By [1]	Method To make your selection, choose (All) from the pop-up list	Year [2] To make your selection, choose (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision [4]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2016		**Overall Factor [3] (21 studies)**				**Use**		**0.94**

Appendix D: Maps of Monitoring Locations

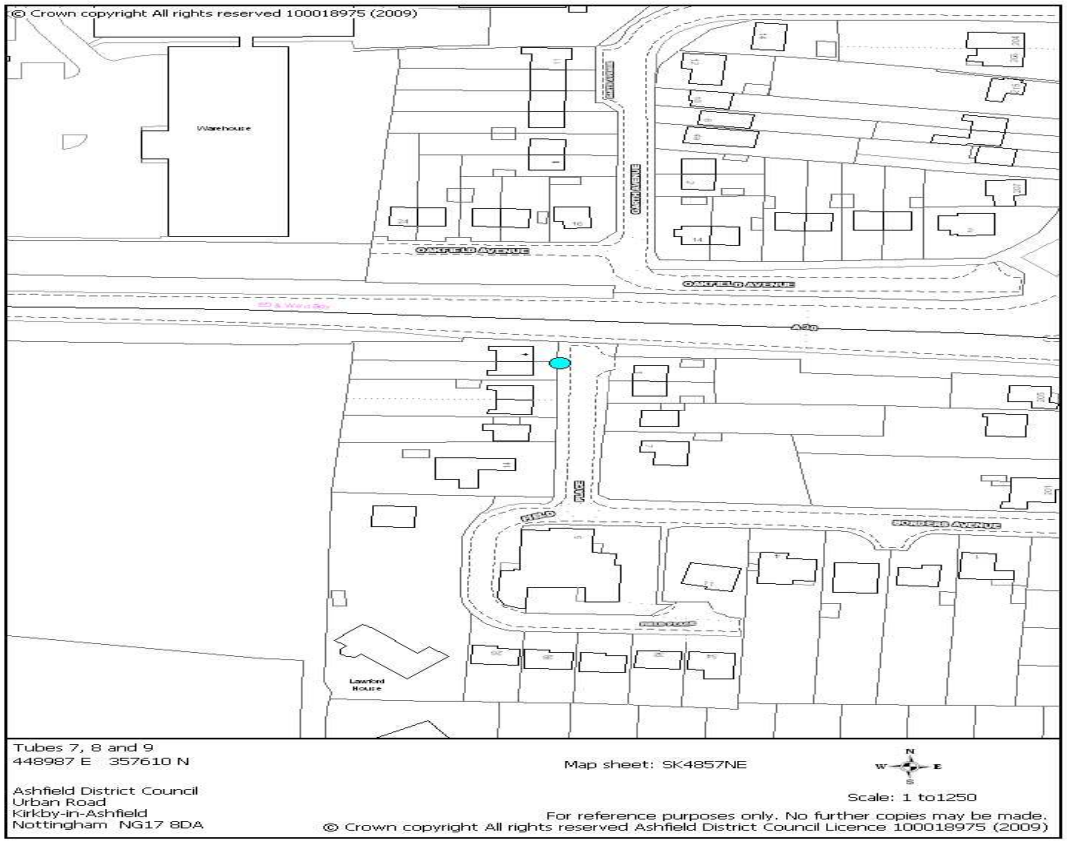
Location of Nitrogen Dioxide Diffusion Tube at Outram Street, Sutton



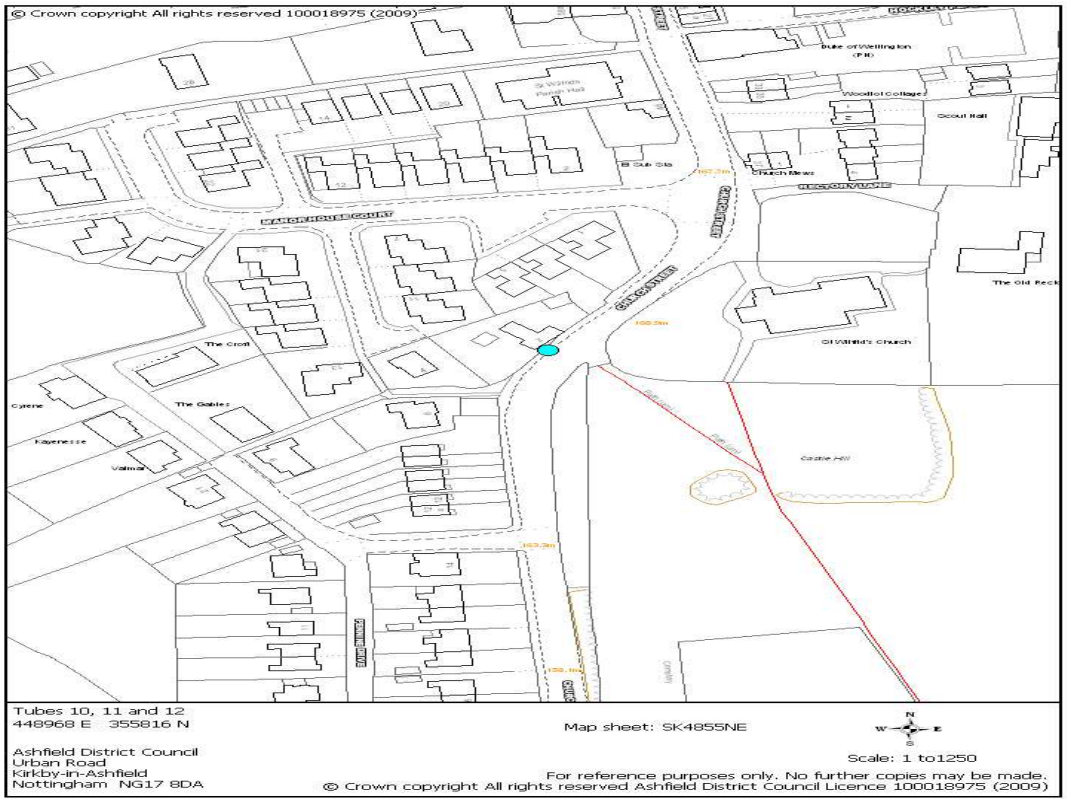
Location of Diffusion Tube at Dalestorth Street, Sutton



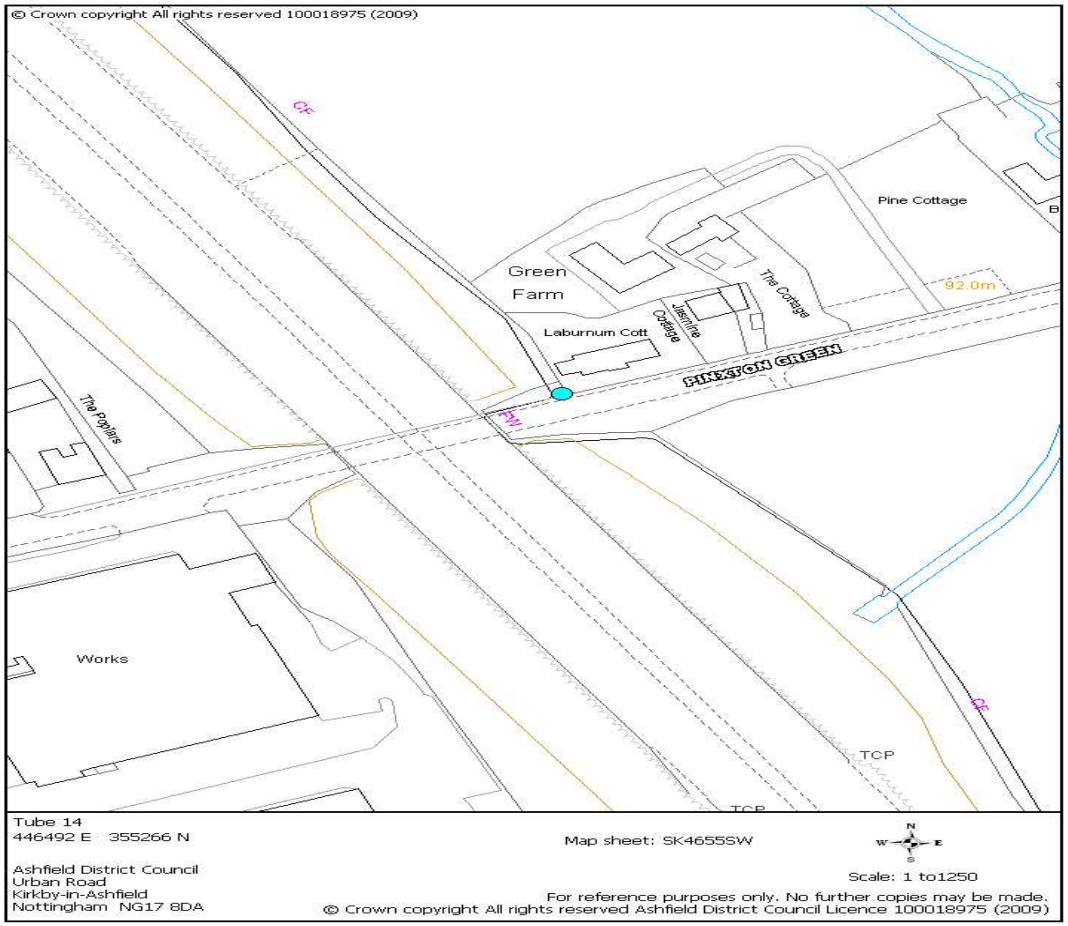
Location of Nitrogen Dioxide Diffusion Tubes At A38 Fire Station, Sutton



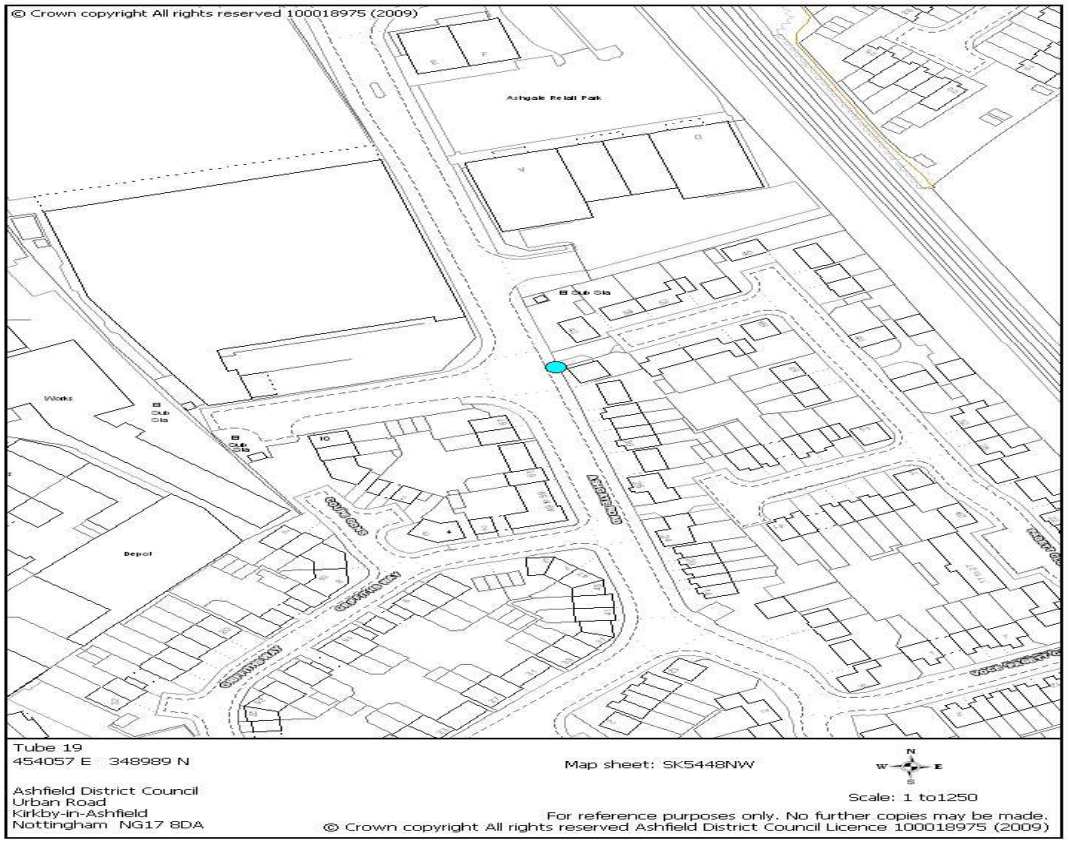
Location of Nitrogen Dioxide Diffusion Tubes At Church Hill, Kirkby



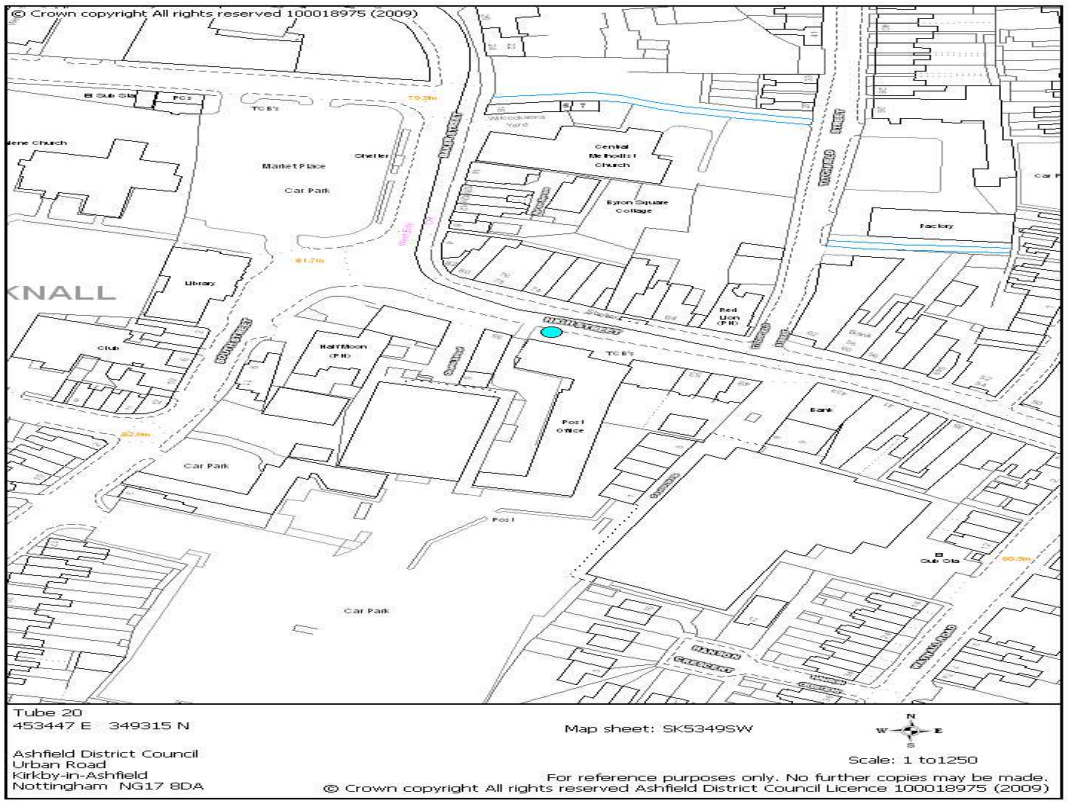
Location of Nitrogen Dioxide Diffusion Tube at M1 Pinxton



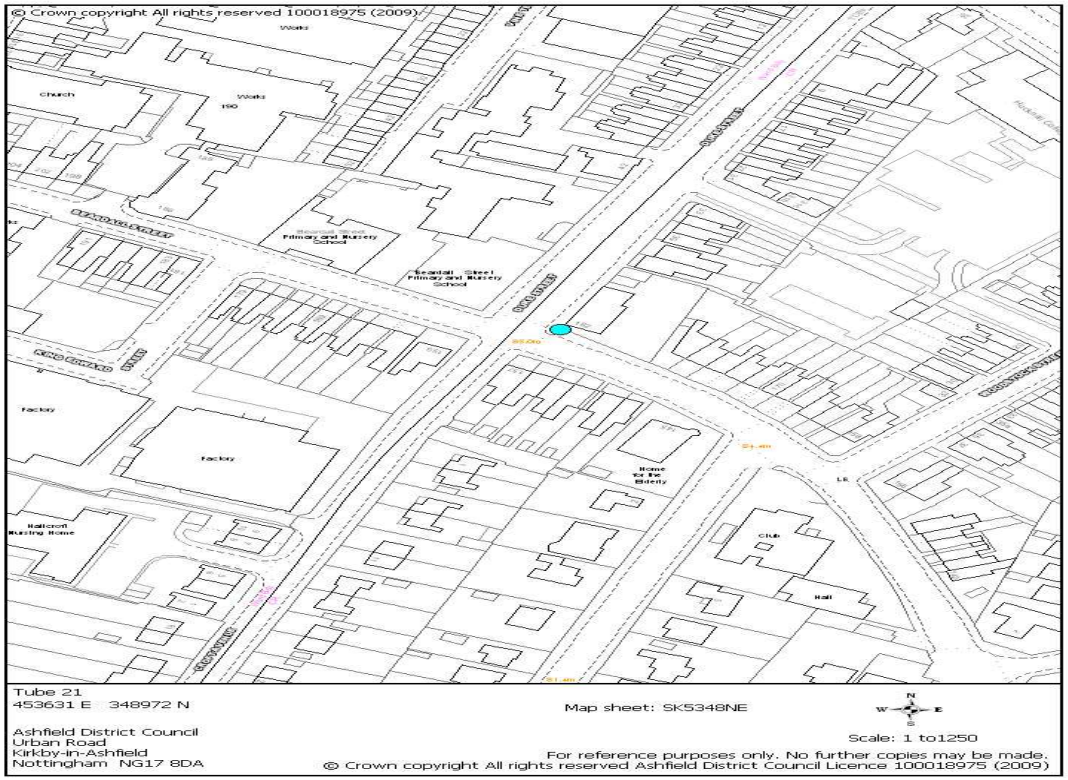
Location of Nitrogen Dioxide Diffusion Tube at Hucknall Ashgate Road



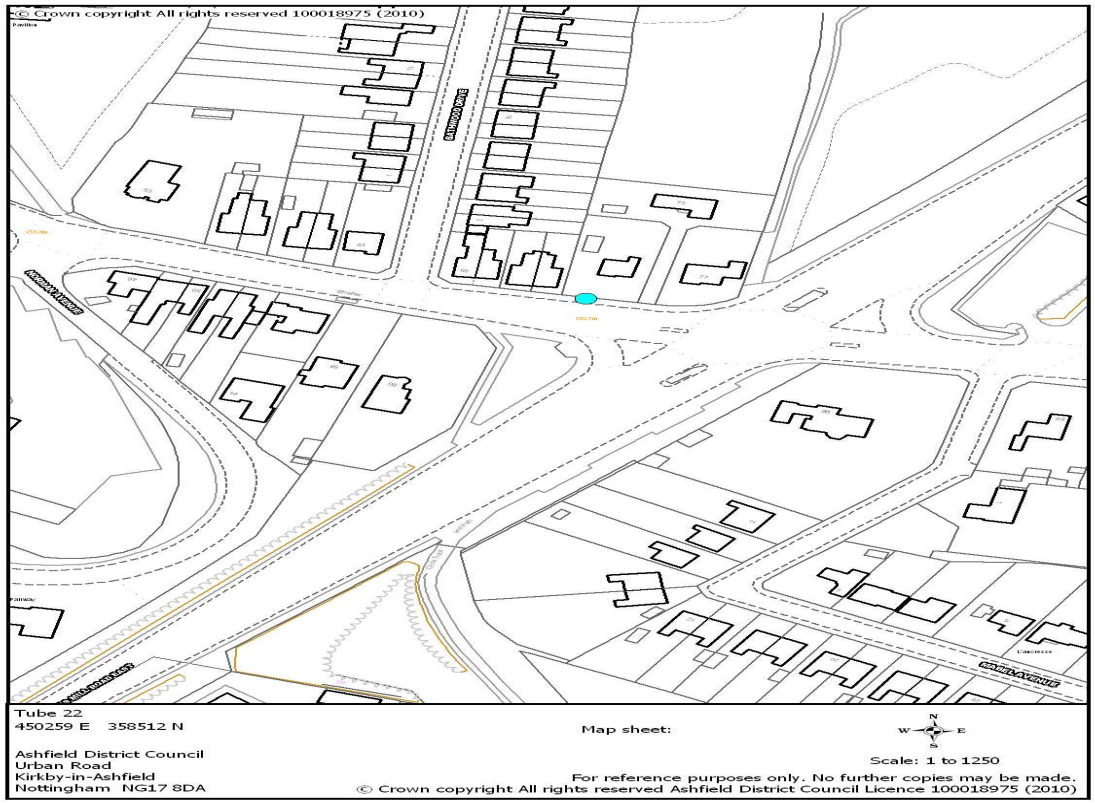
Location of Nitrogen Dioxide Diffusion Tube at Hucknall High Street



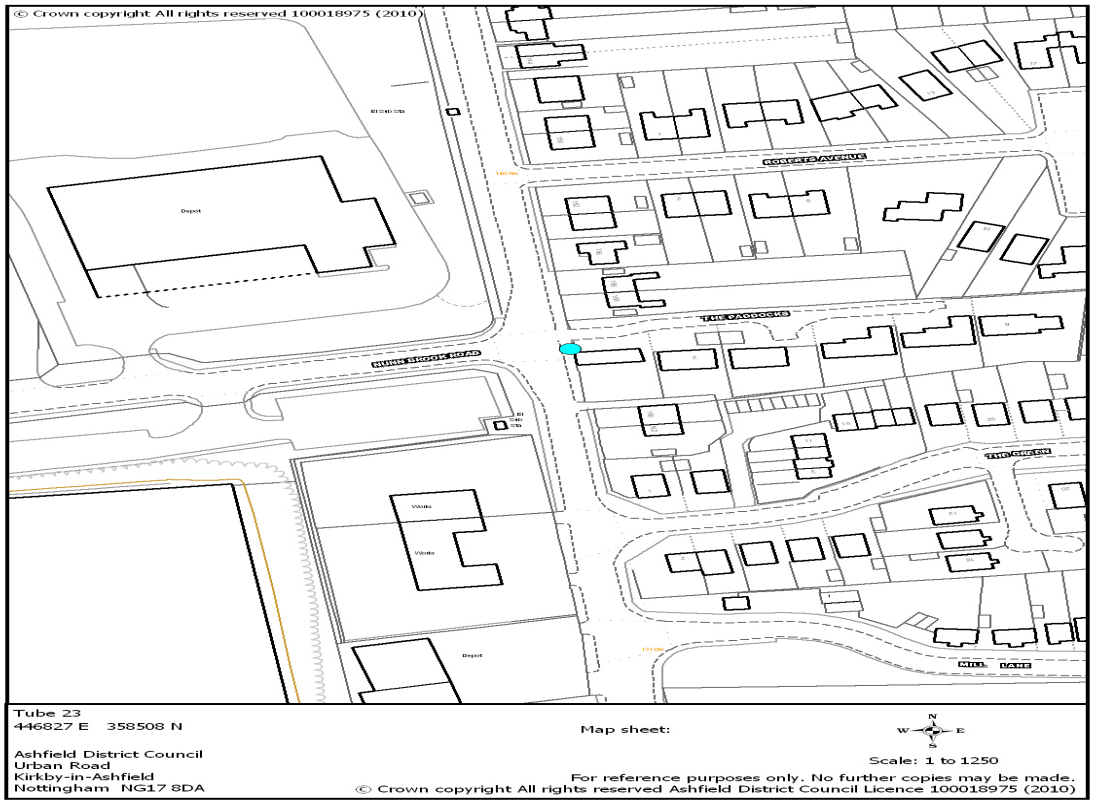
Location of Nitrogen Dioxide Diffusion Tube at Hucknall Croft/ Beardhall Street



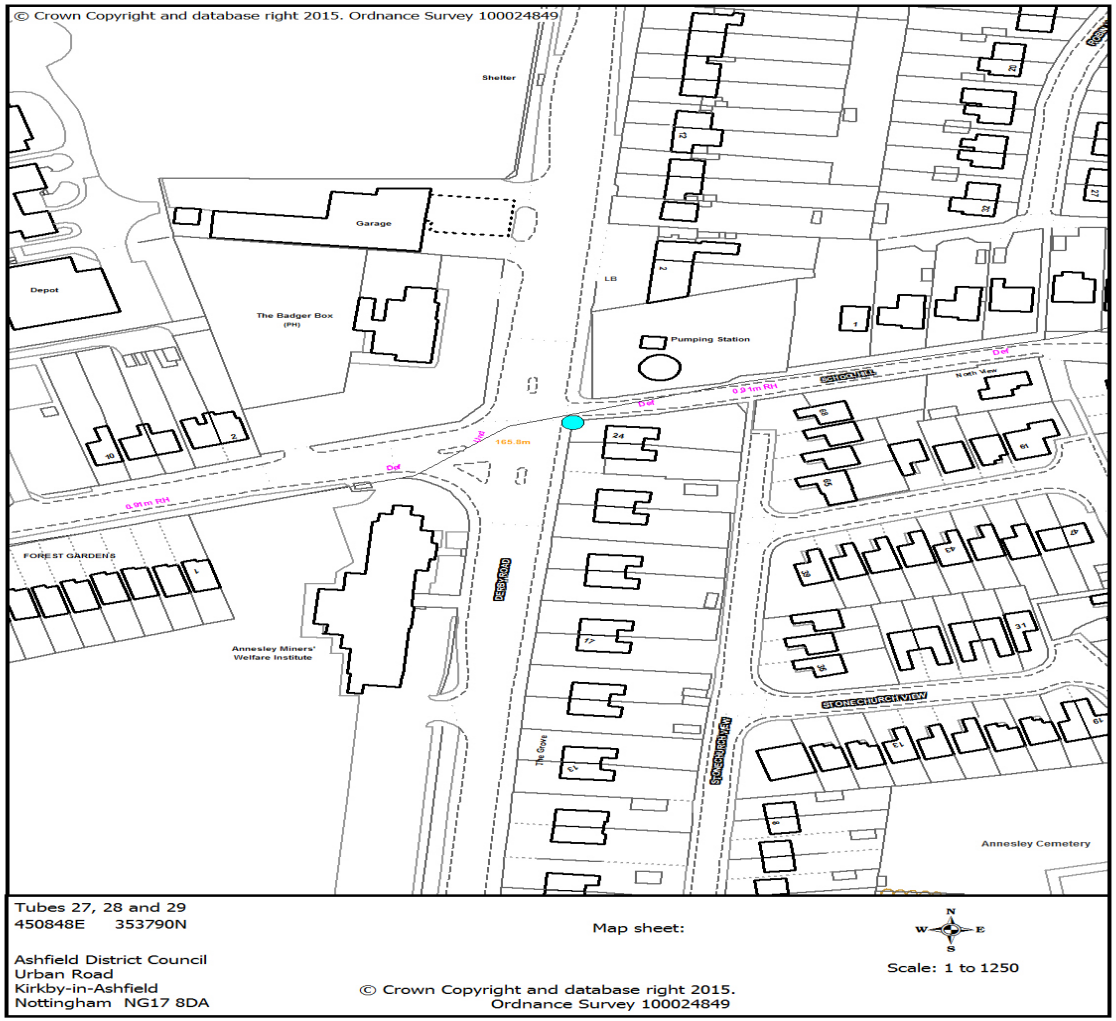
Location of Nitrogen Dioxide Diffusion Tube at Station Road, Sutton



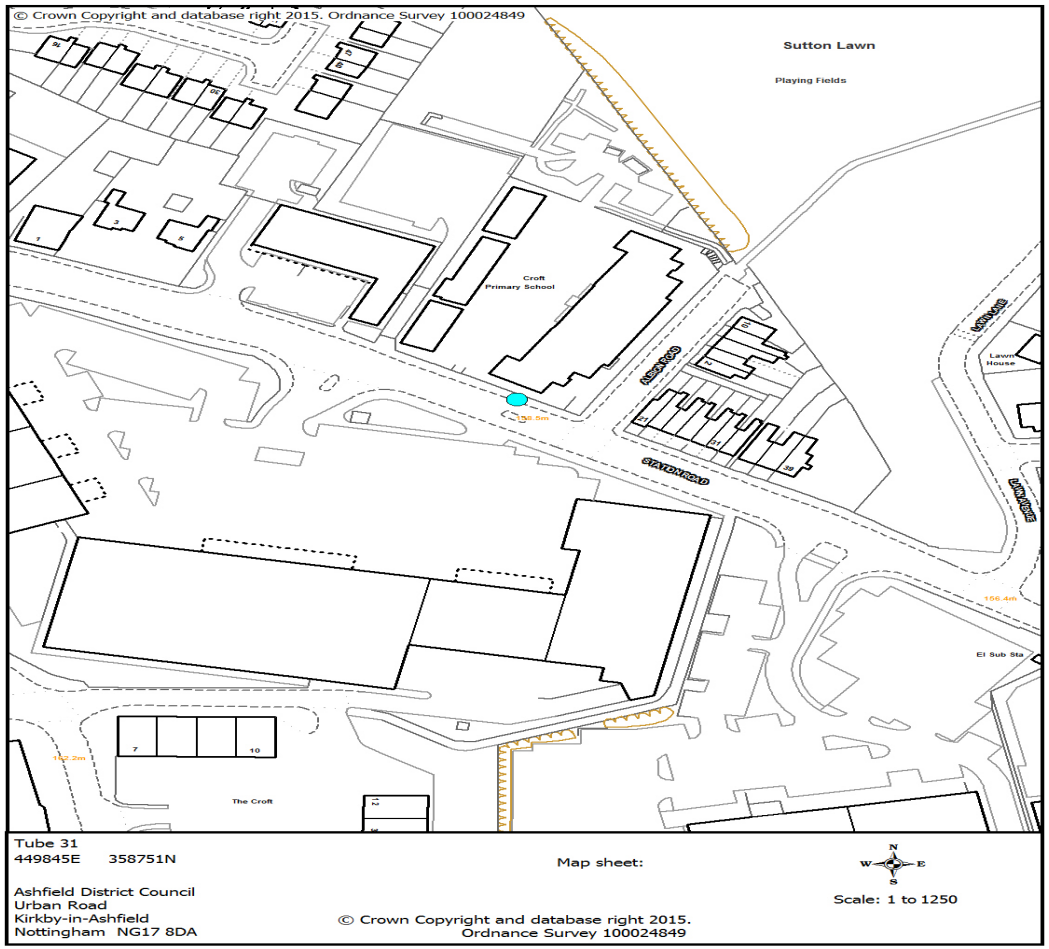
Location of Nitrogen Dioxide Diffusion Tube at Common Road, Huthwaite



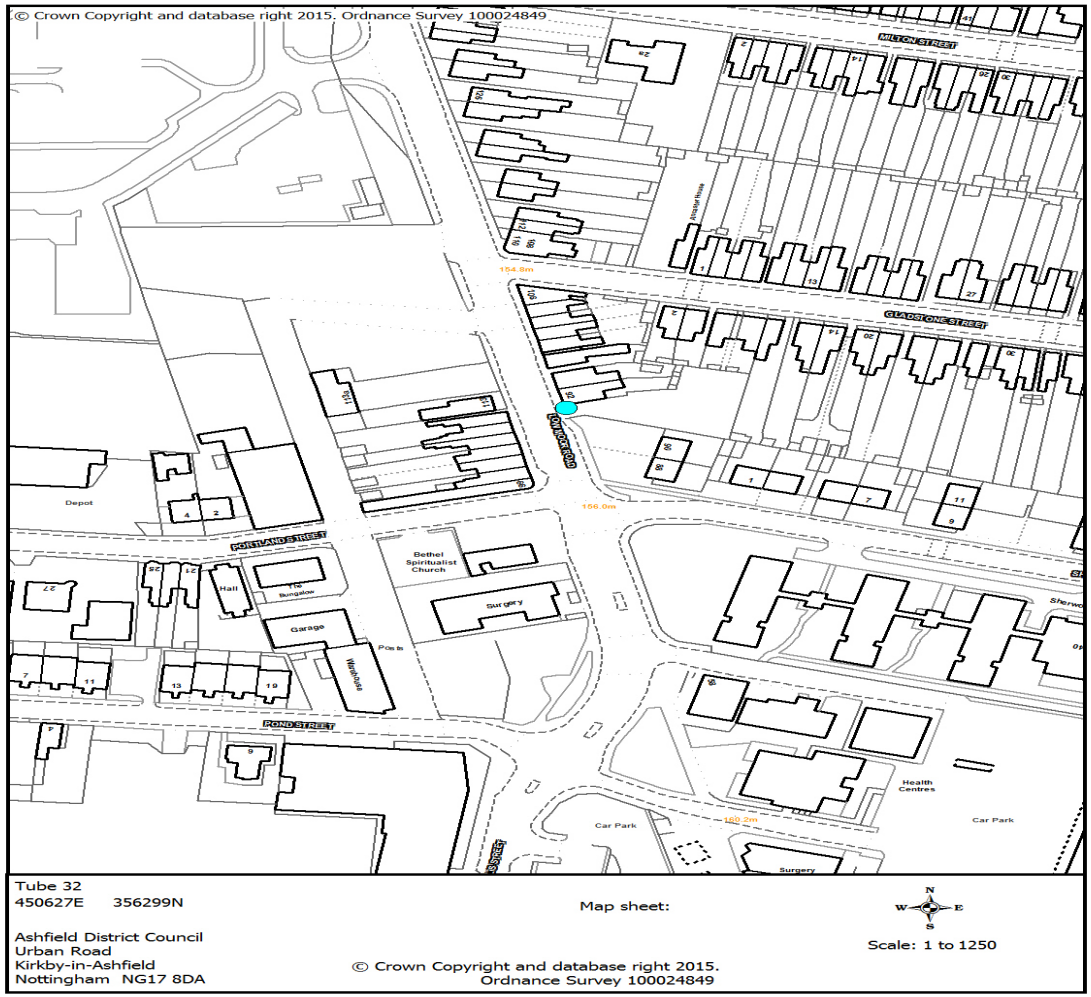
Location of Nitrogen Dioxide Diffusion Tube at the Badger Box, Annesley



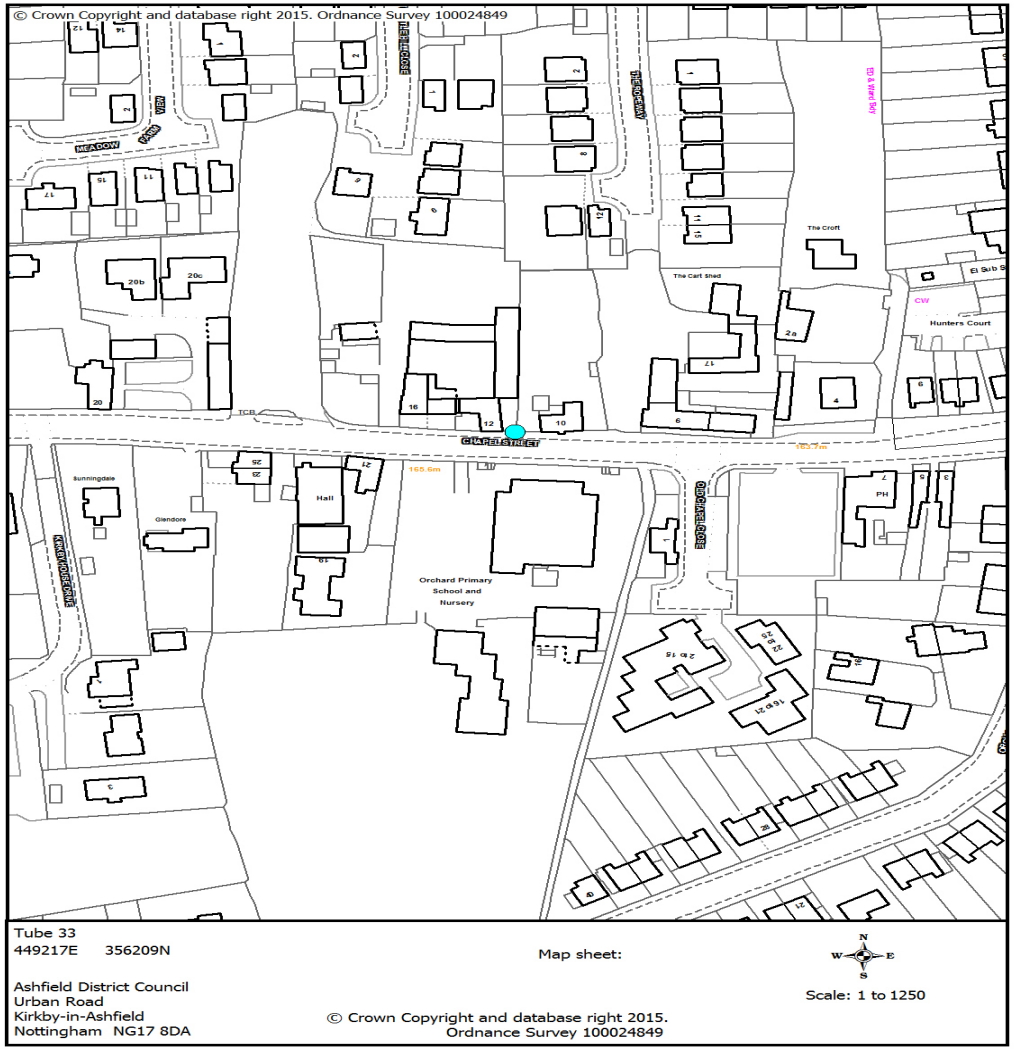
Location of Nitrogen Dioxide Diffusion Tube at Croft Primary School



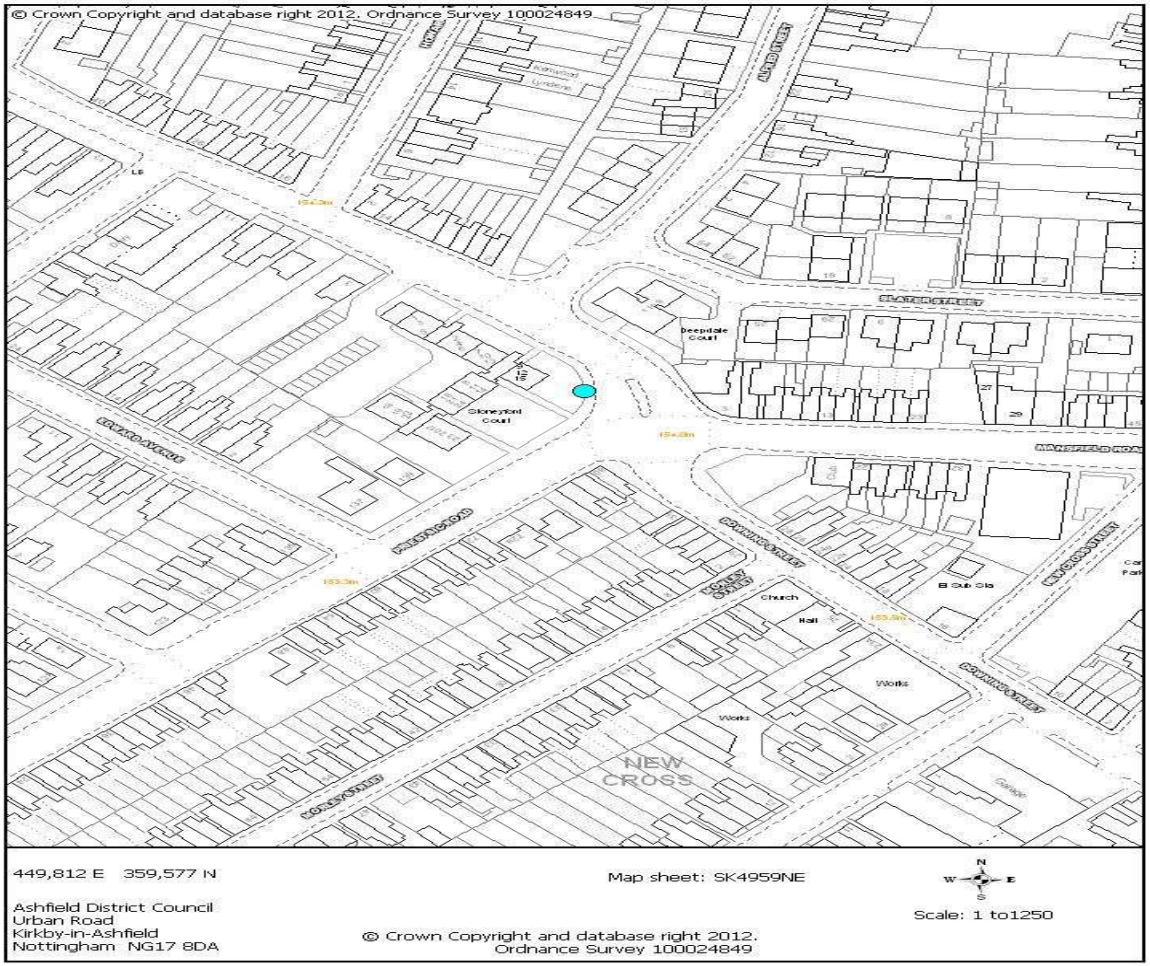
Location of Nitrogen Dioxide Diffusion Tube at Lowmoor Road Kirkby



Location of Nitrogen Dioxide Diffusion Tube at Chapel Street School

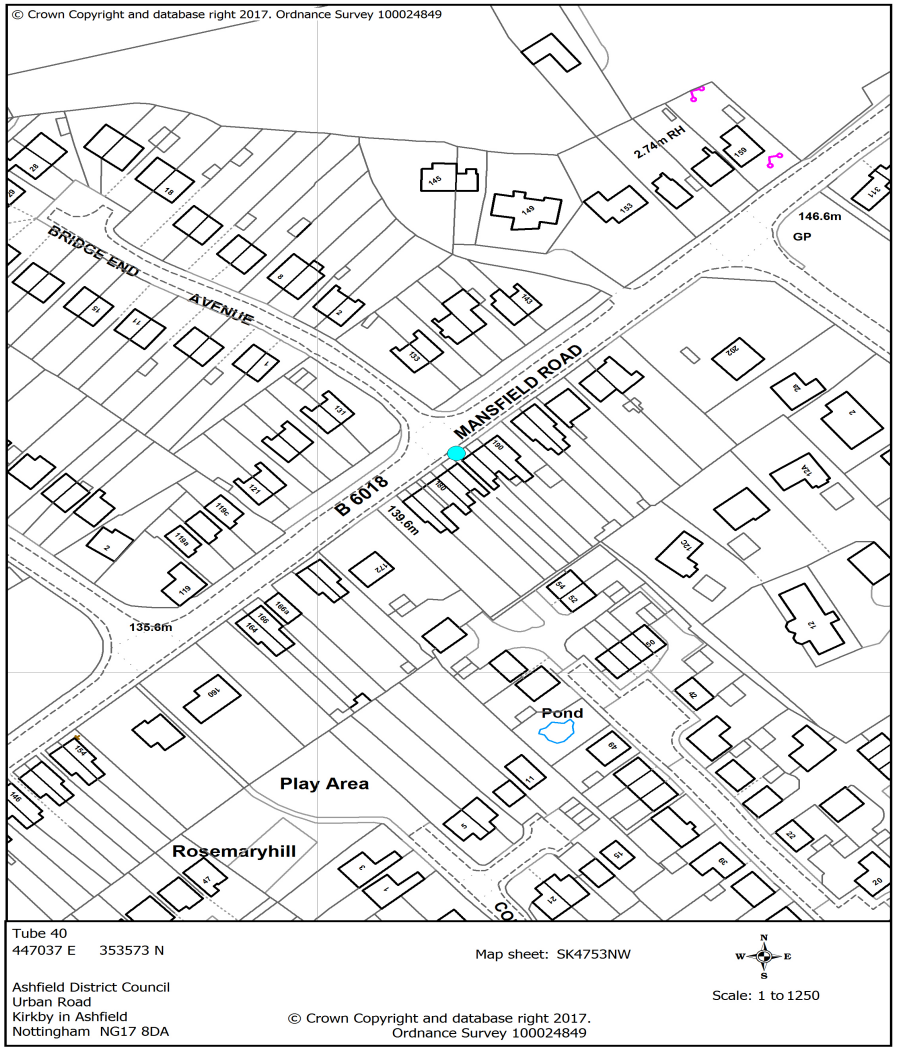


Location of Nitrogen Dioxide Diffusion Tube at Stoneyford Court Street



Location of Nitrogen Dioxide Diffusion Tube at Kirkby Cross

Location of Nitrogen Dioxide Diffusion Tube at Mansfield Road Selston



Appendix E: Diffusion Tube Results Trend Analysis

Figure E.1 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Outram Street, Sutton in Ashfield

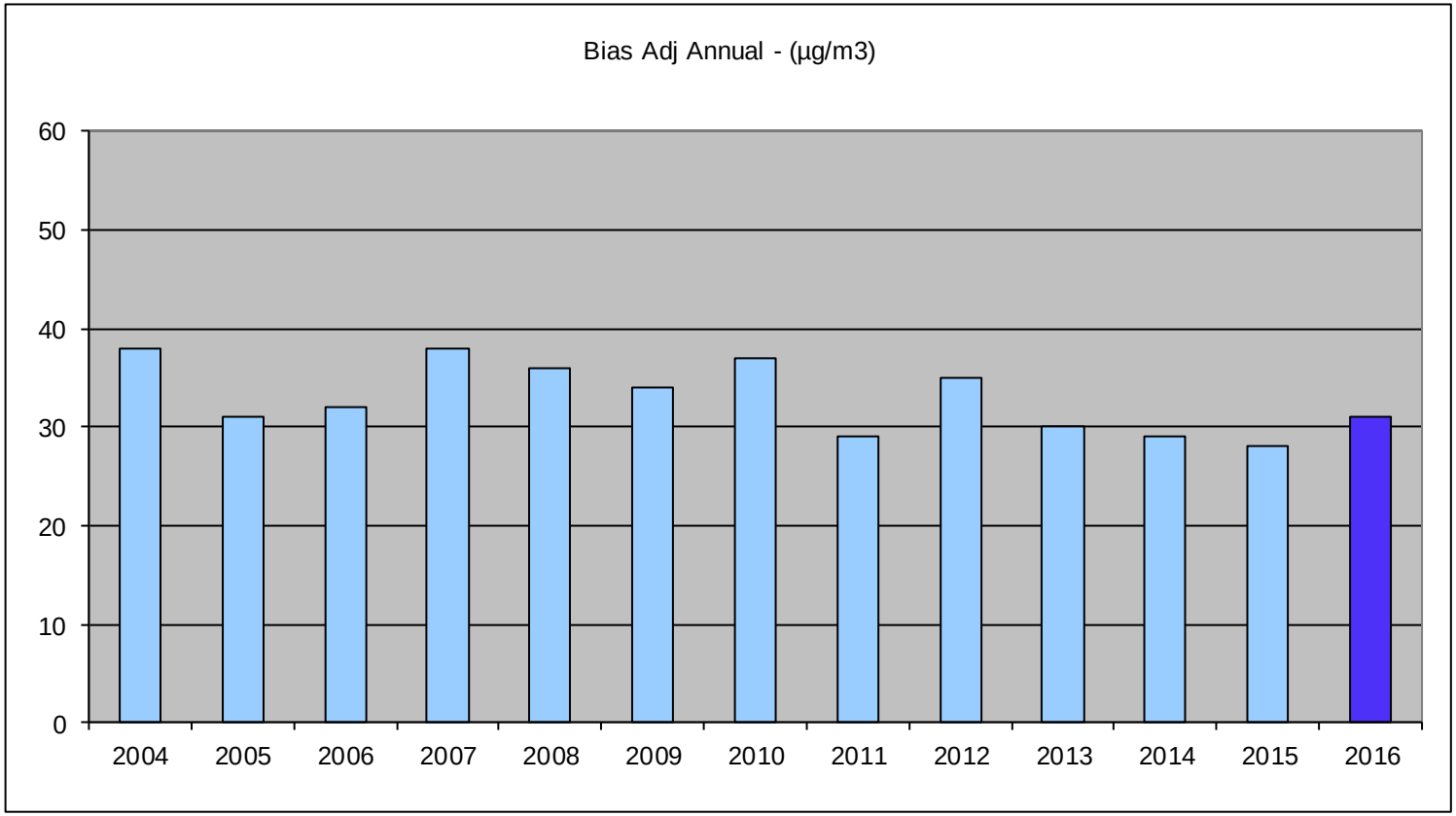


Figure E.2 Trend Analysis for Nitrogen Dioxide Diffusion Tube at Dalestorth Street, Sutton in Ashfield

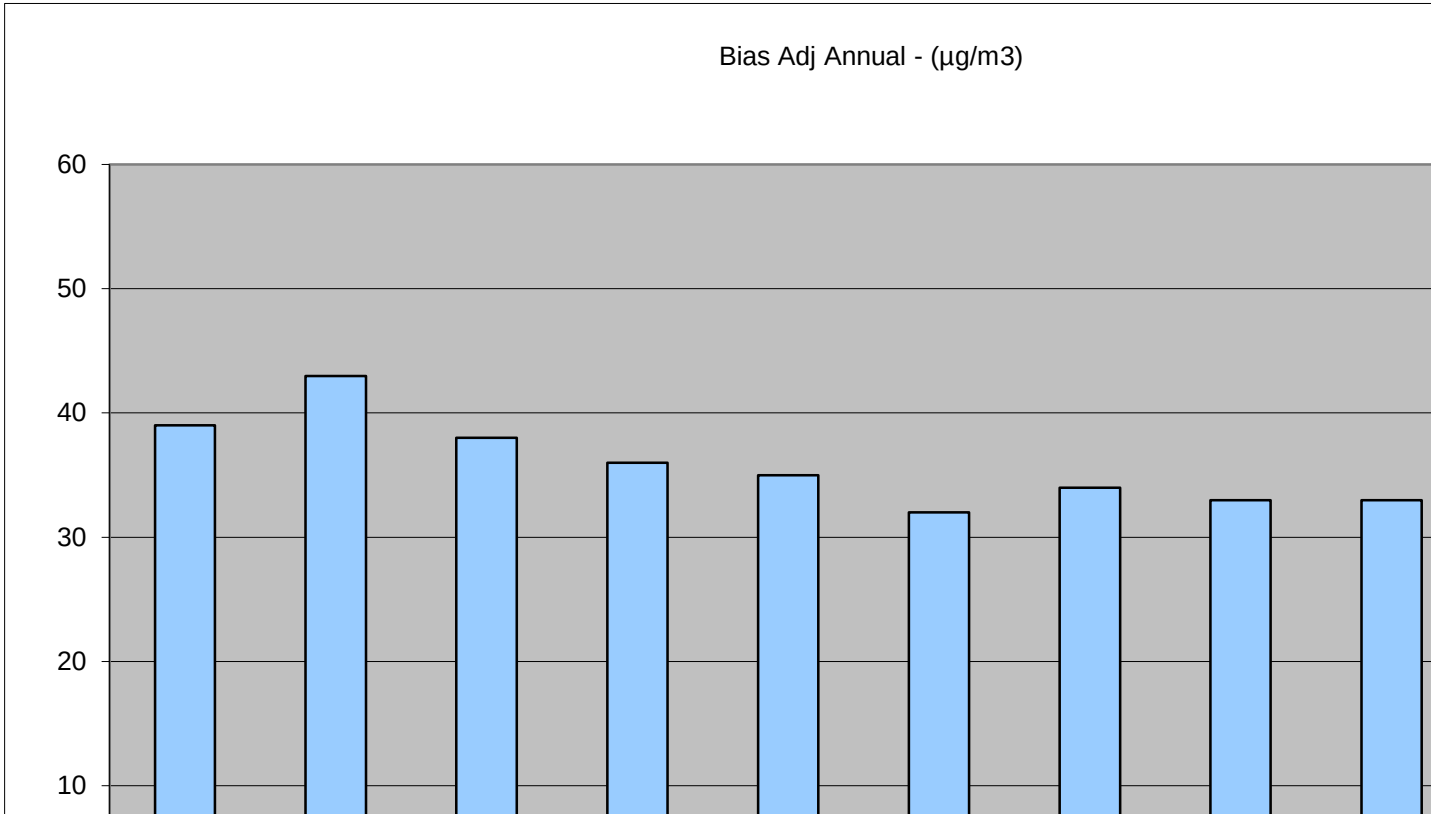


Figure E.3 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at A38, Sutton in Ashfield

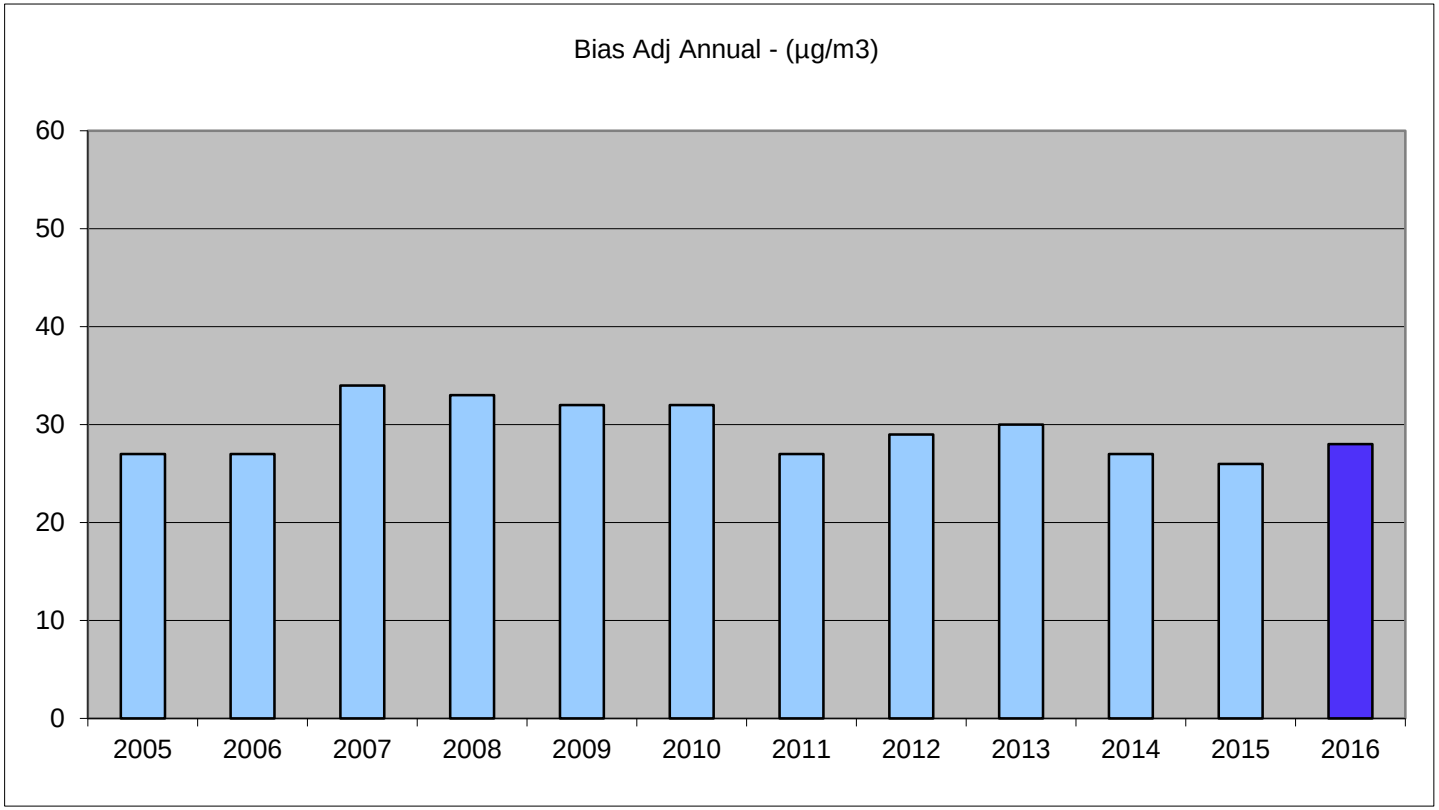


Figure E.4 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Church Hill, Kirkby

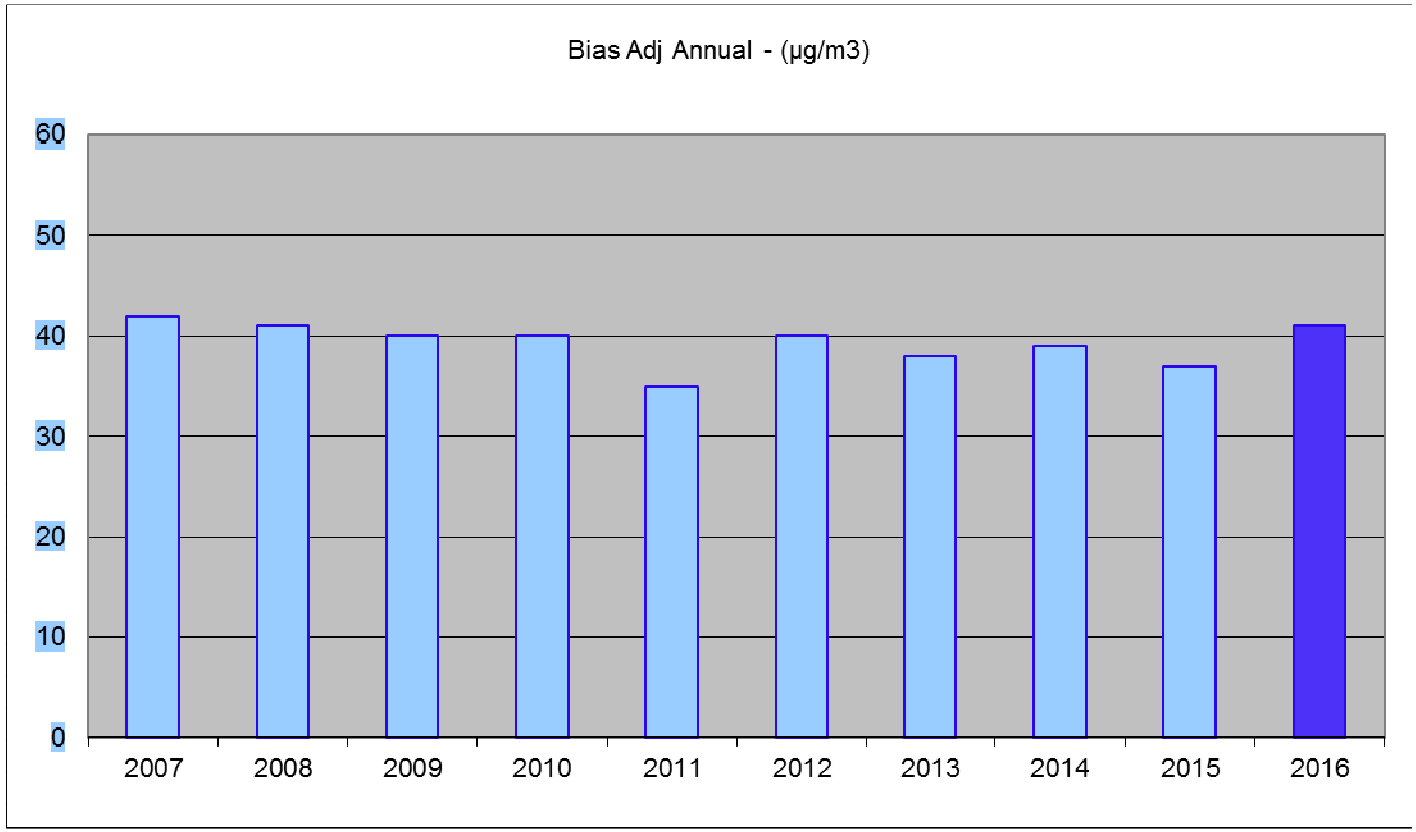


Figure E.5 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Pinxton

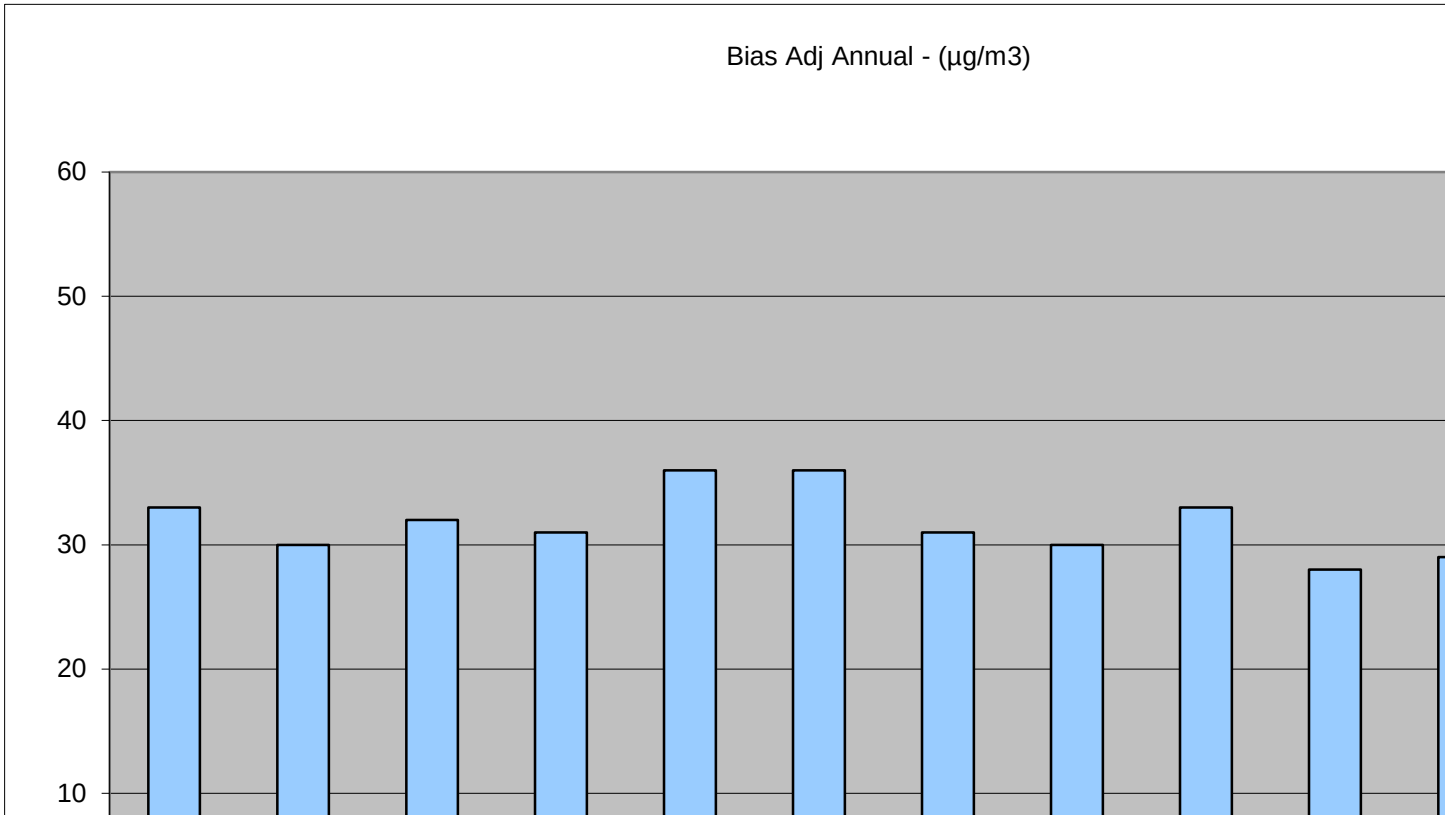


Figure E.6 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Ashgate, Hucknall

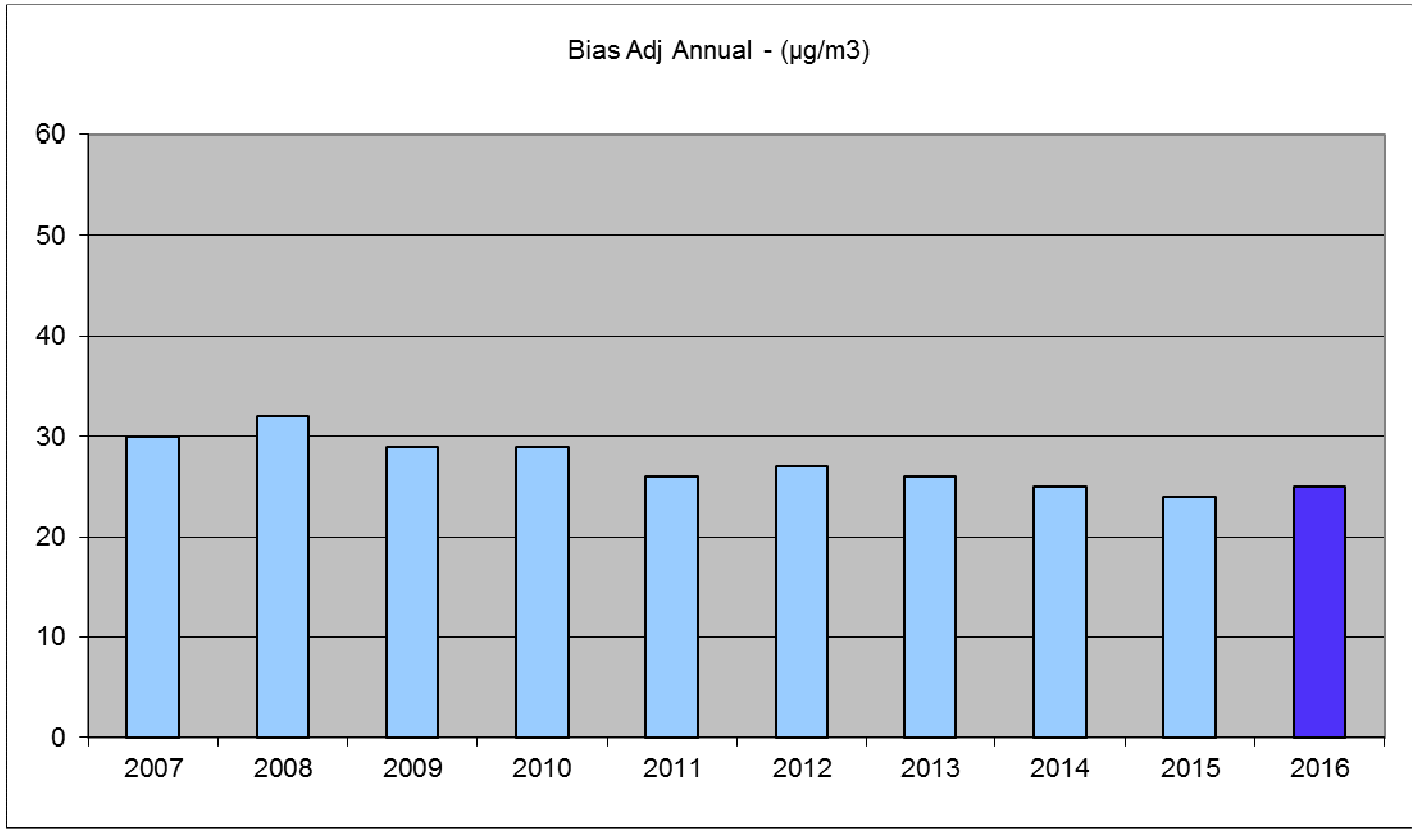


Figure E.7 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at High Street, Hucknall

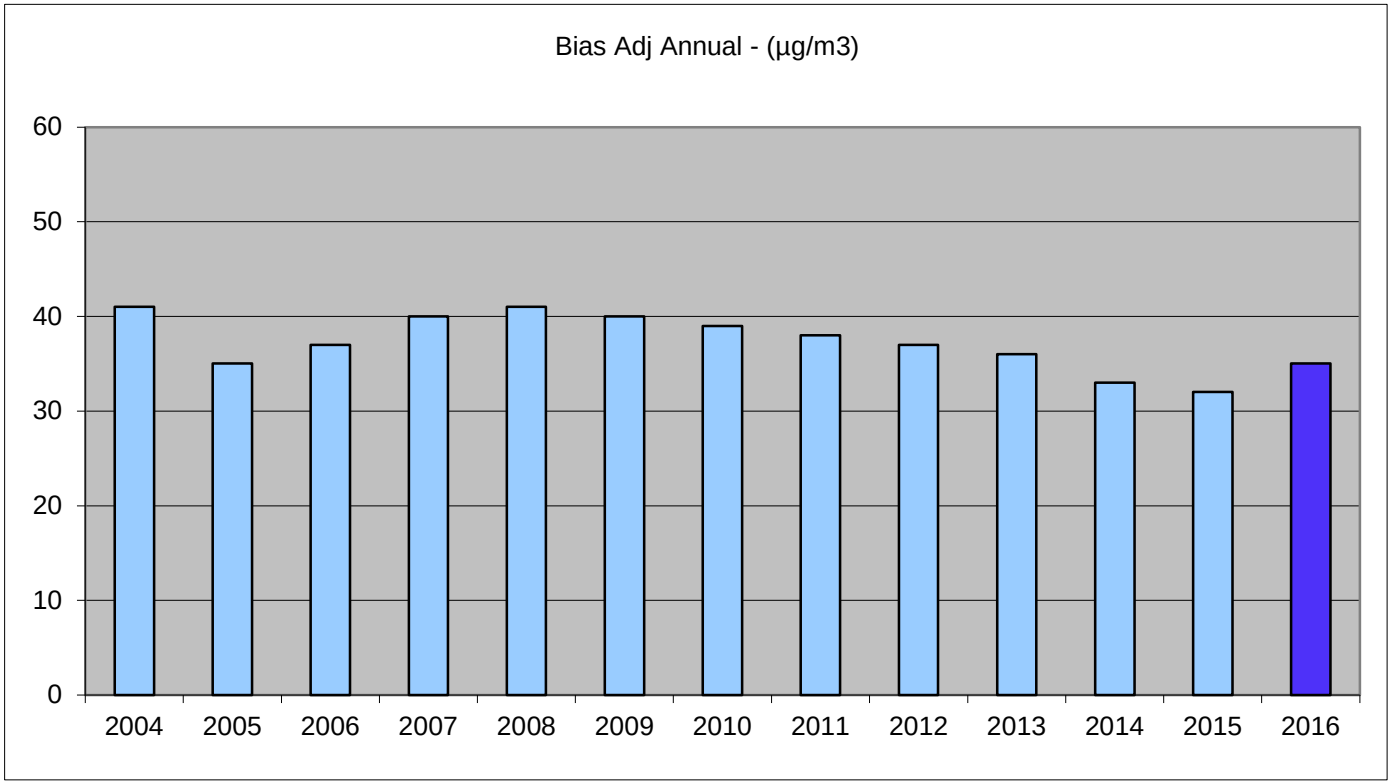


Figure E.8 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Beardall Street, Hucknall

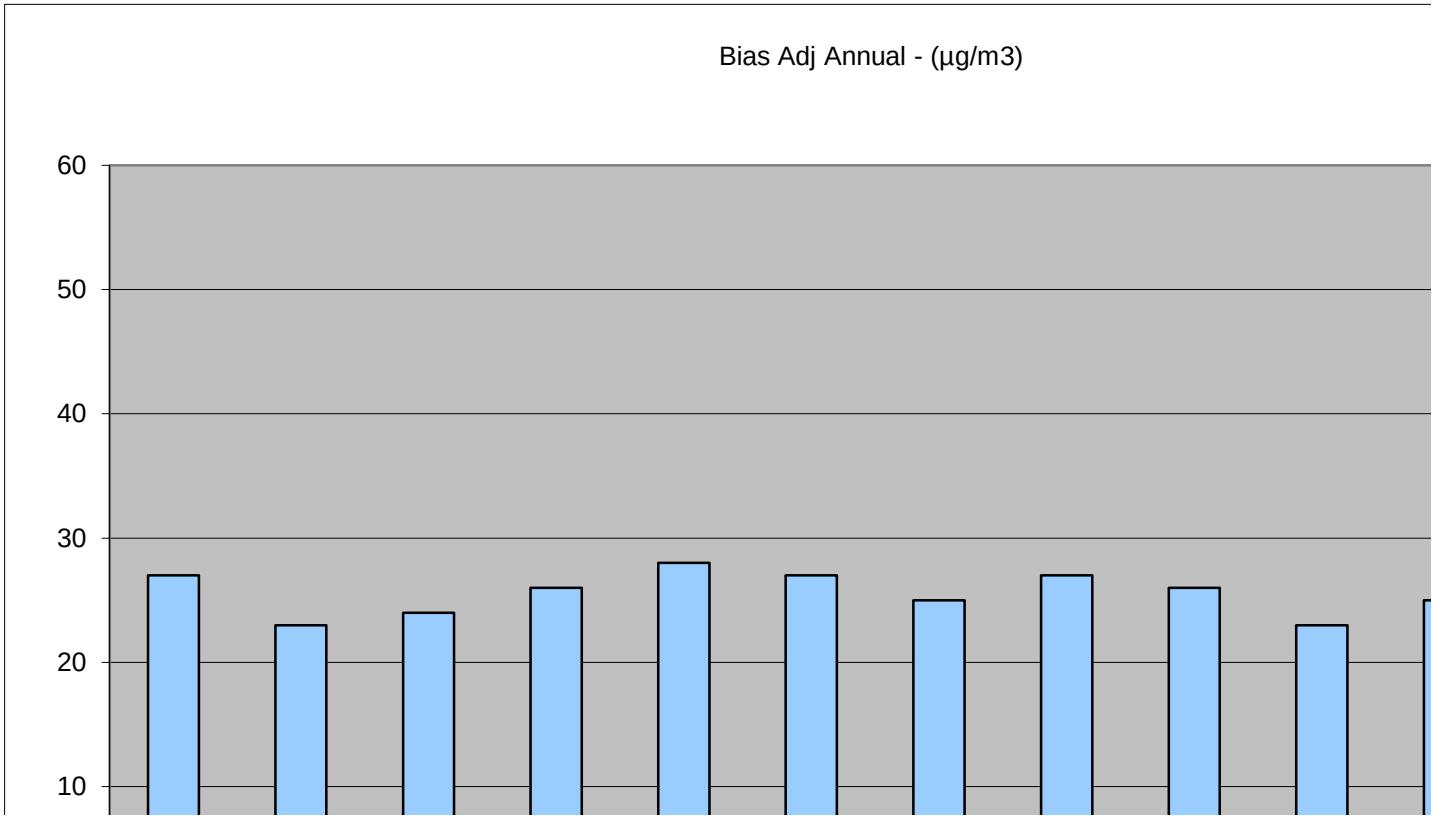


Figure E.9 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Station Road, Sutton in Ashfield

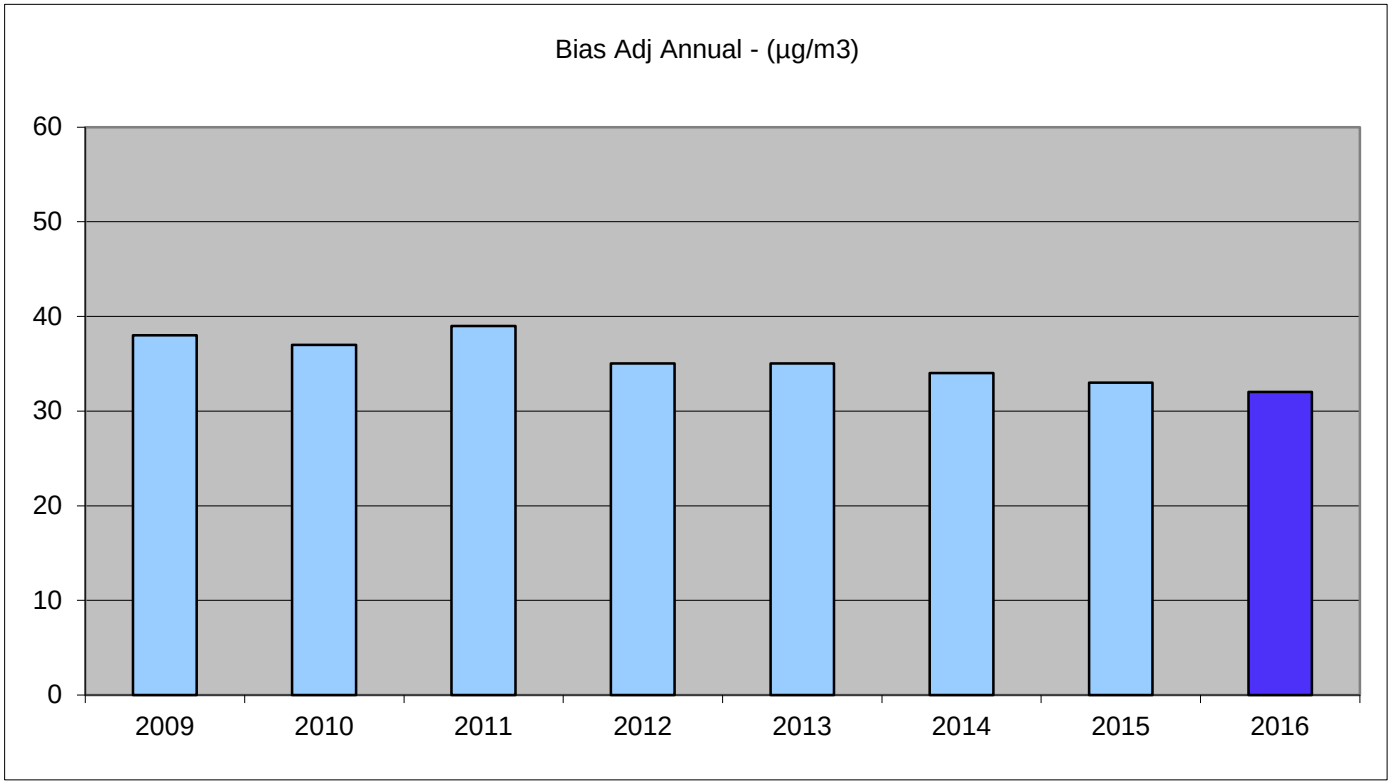


Figure E.10 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Common Road, Huthwaite

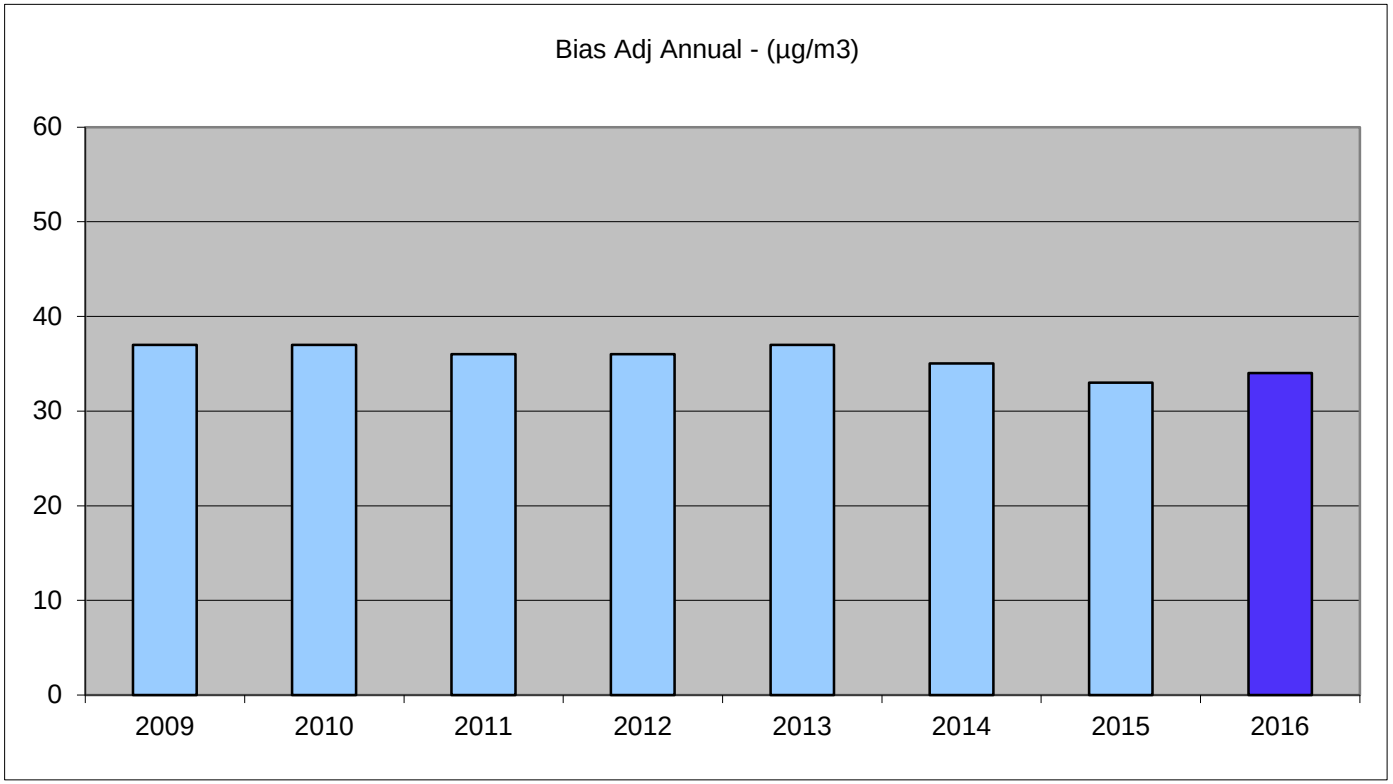


Figure E.11 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Badger Box, Annesley

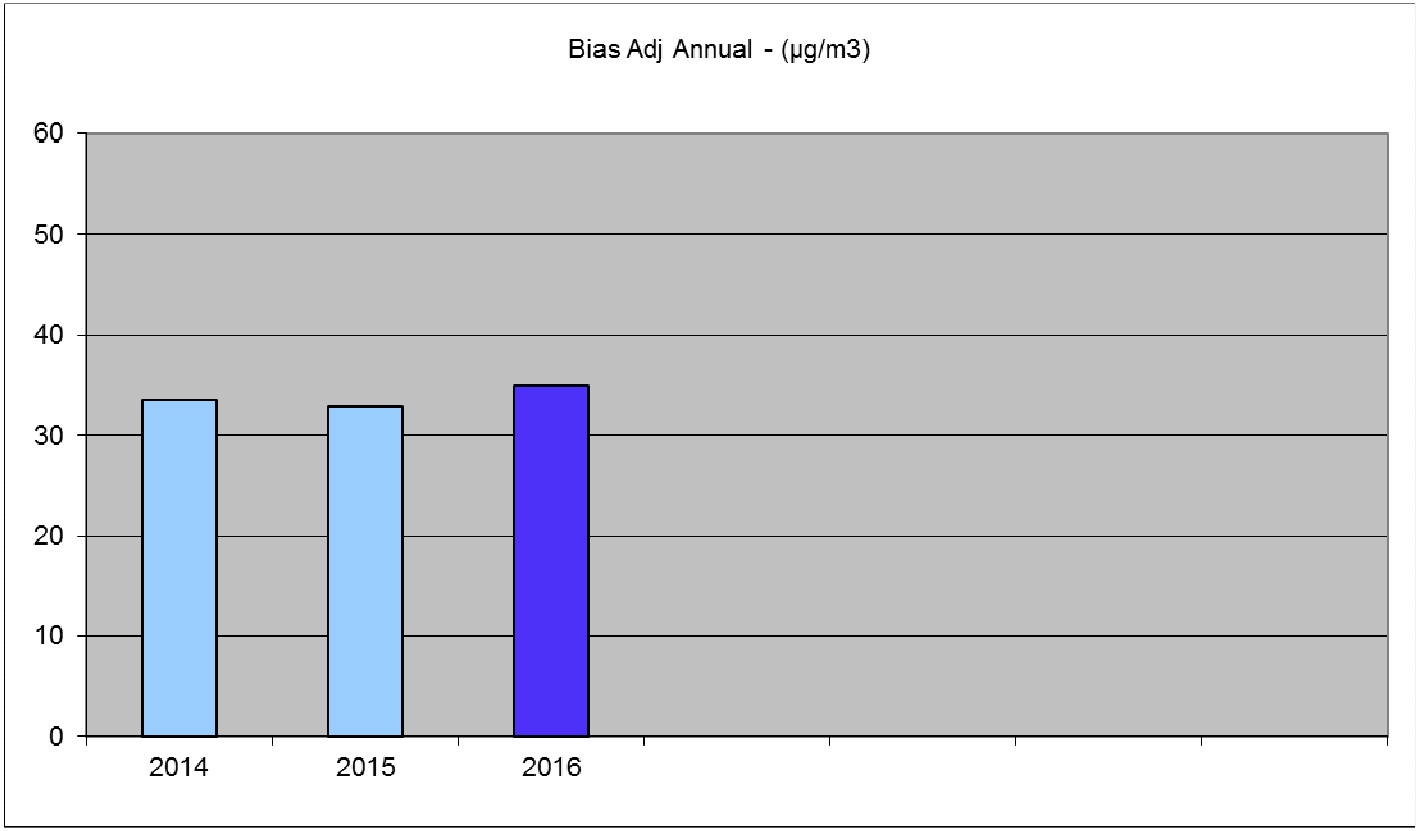


Figure E.12 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Croft Primary, Sutton in Ashfield

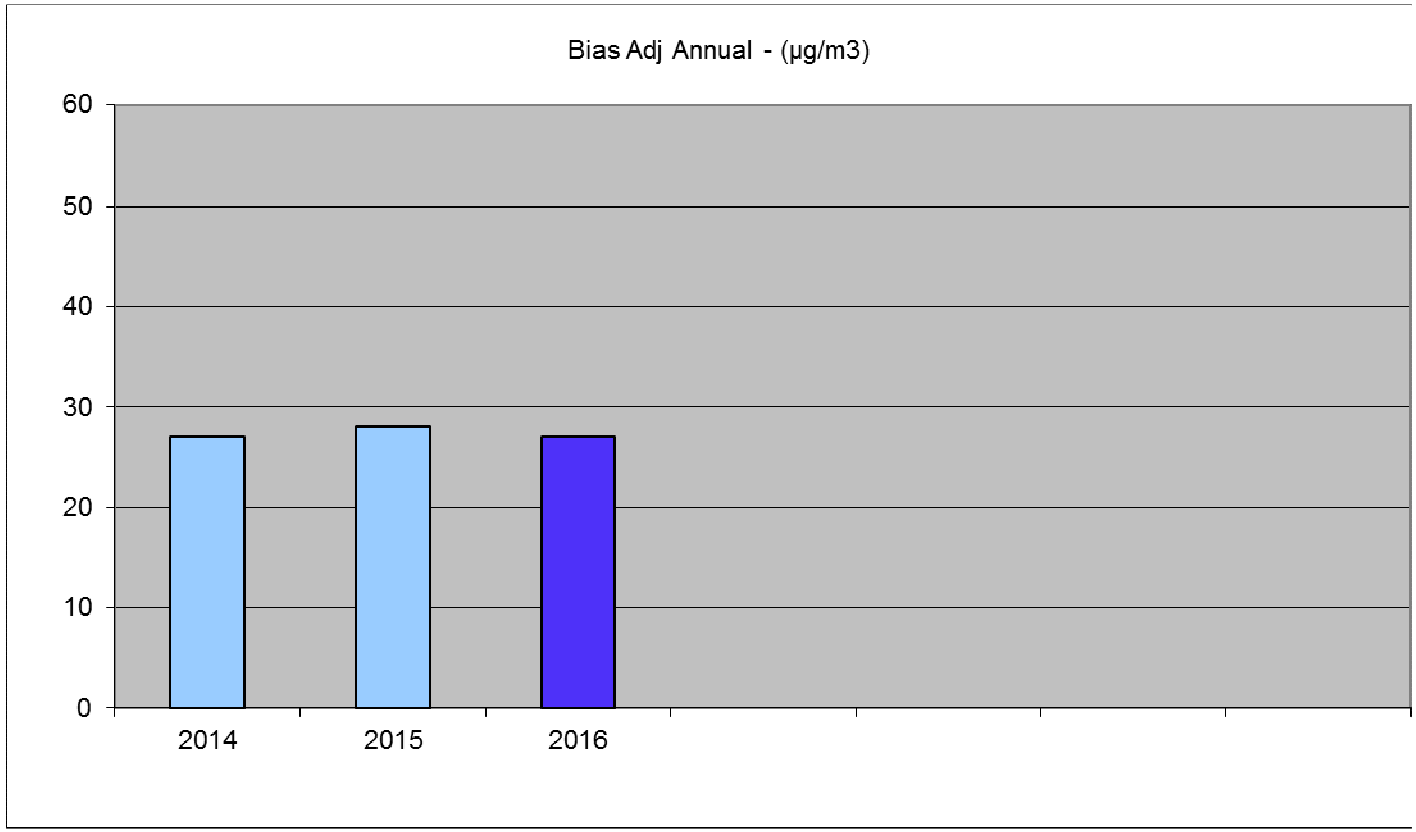


Figure E.13 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Lowmoor Road, Kirkby in Ashfield

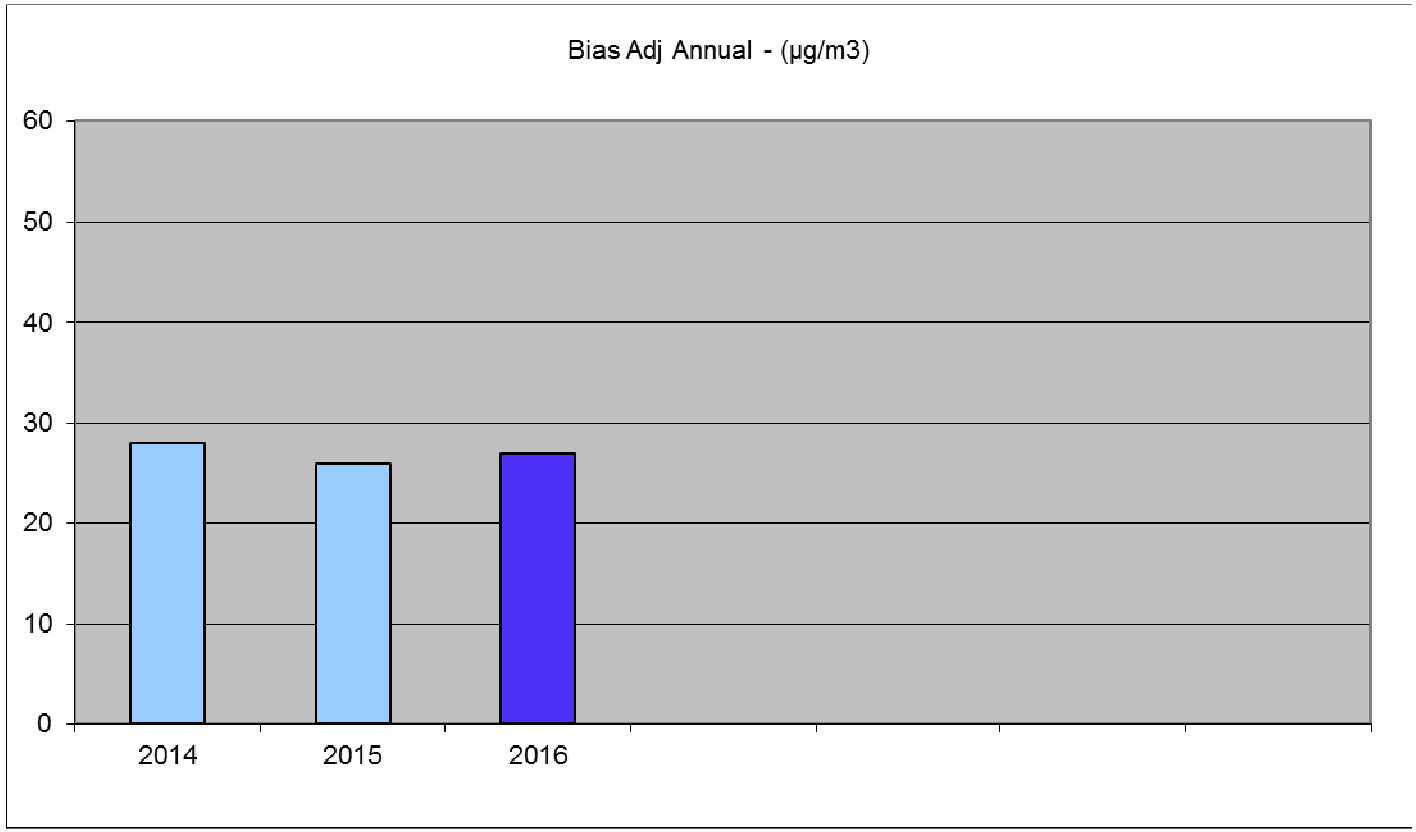


Figure E.14 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Chapel Street, Kirkby in Ashfield

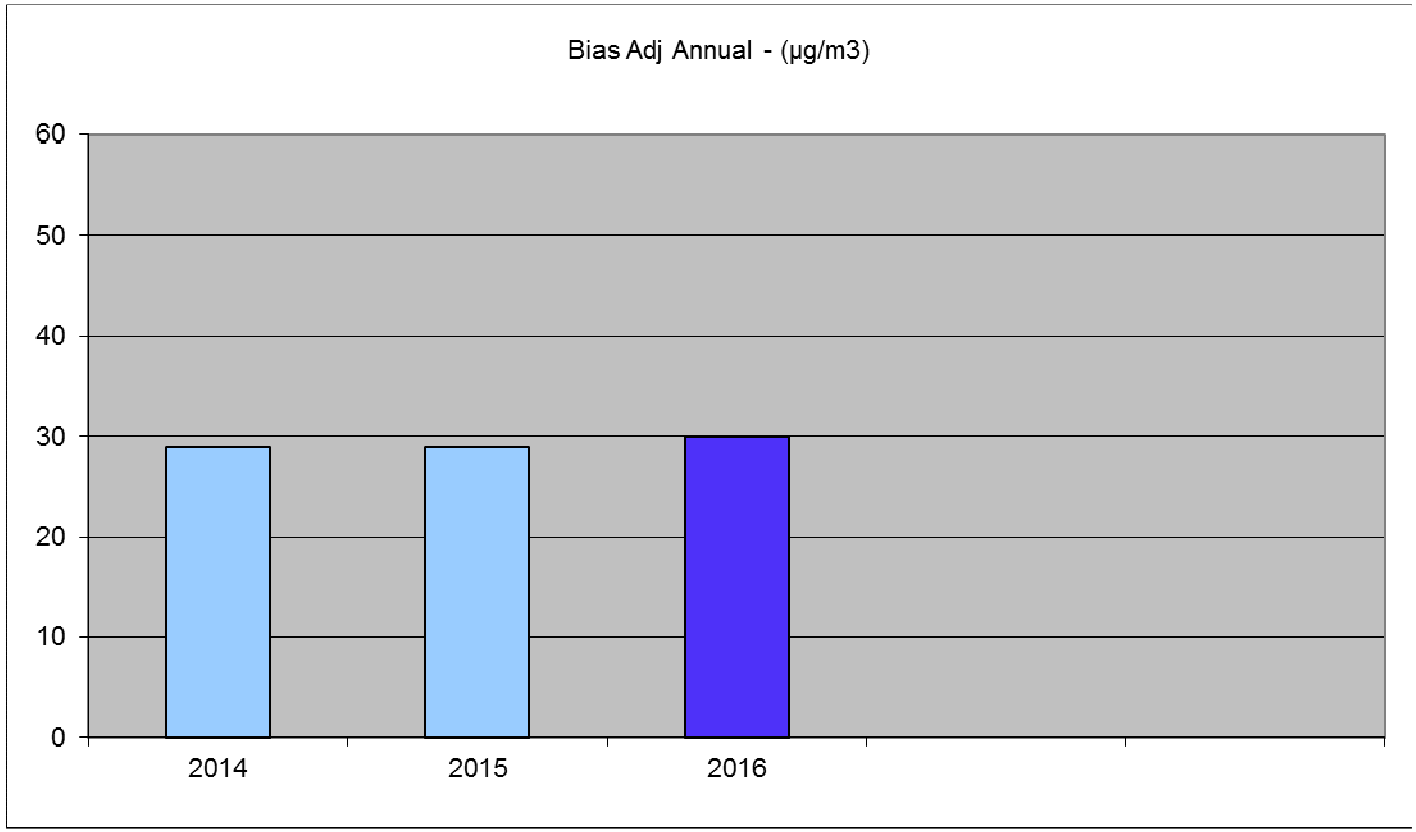


Figure E.15 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Stoneyford Court, Sutton in Ashfield

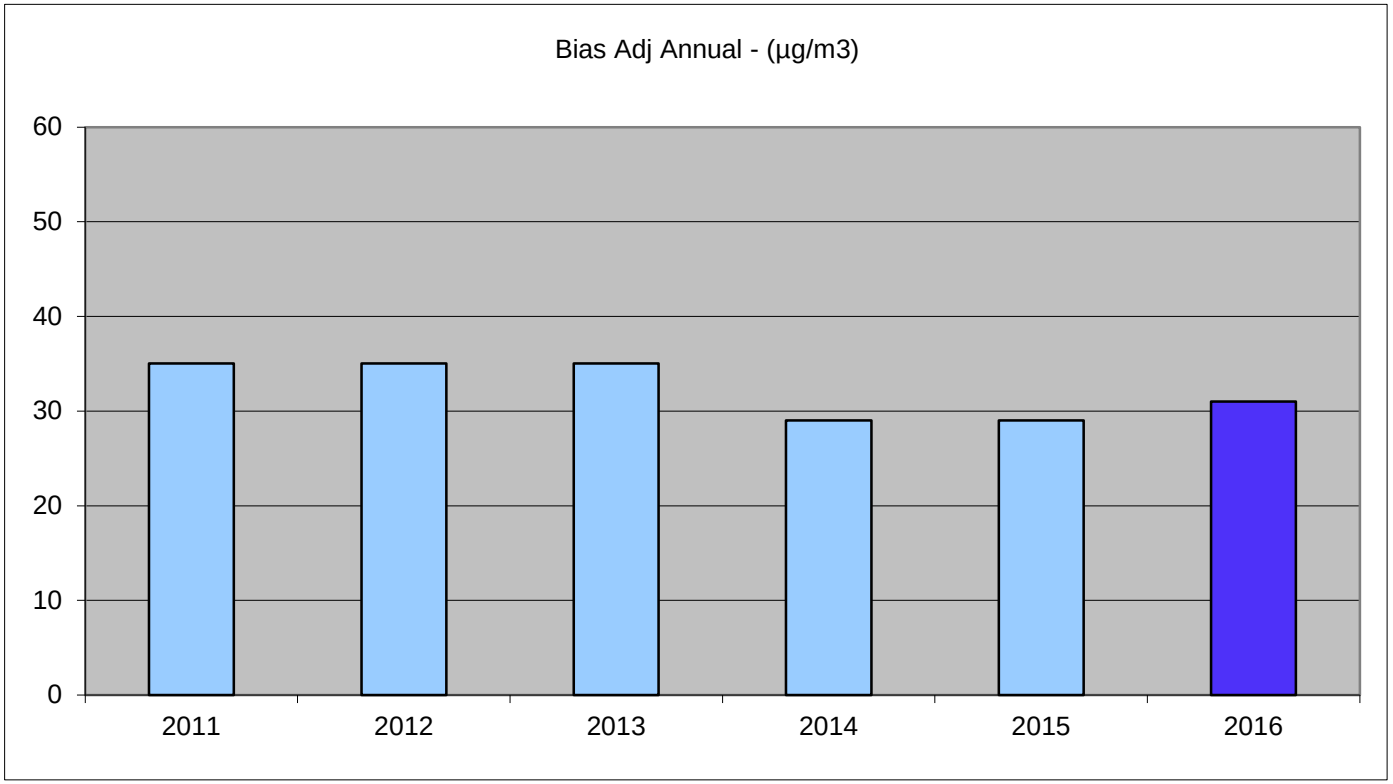
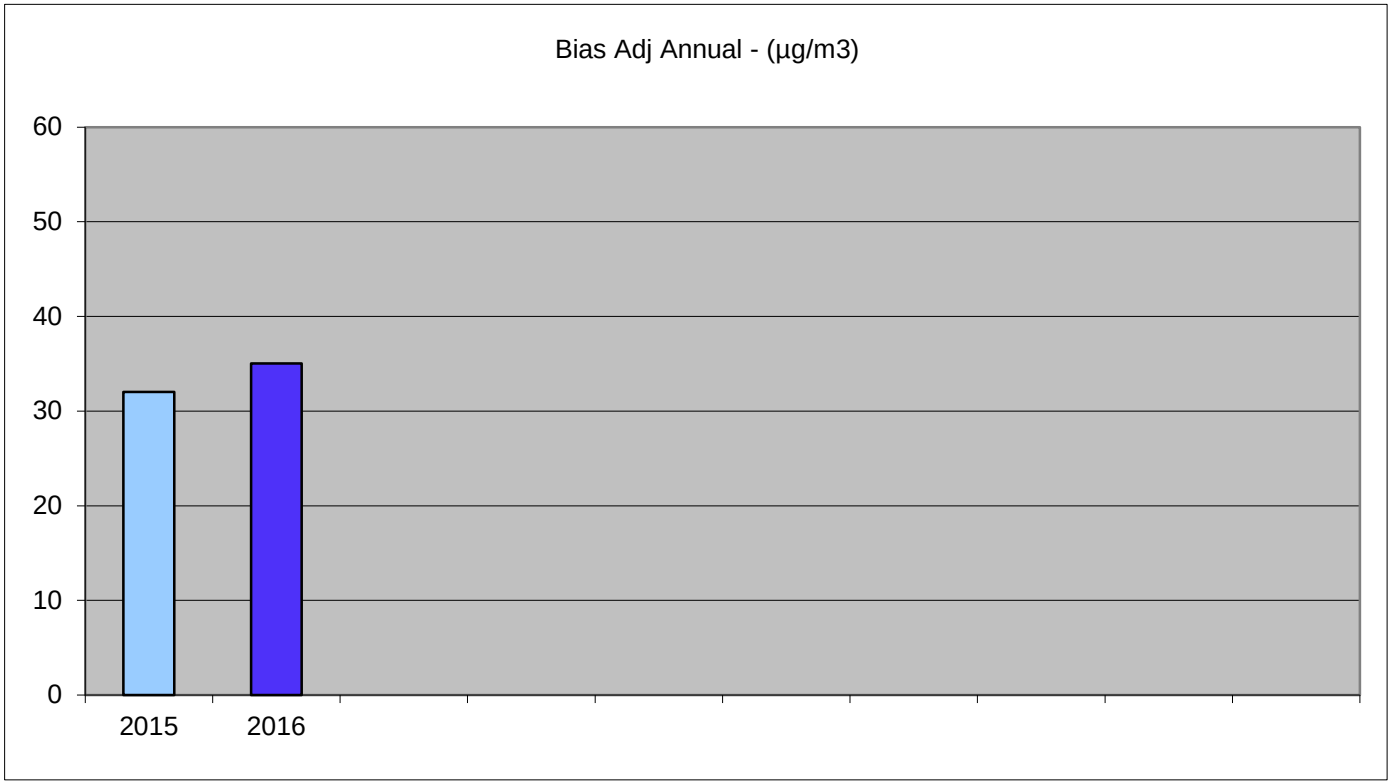


Figure E.16 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Kirkby Cross Kirkby



Appendix F: Distance Fall Off Calculations & Short Term to Long Term Data Adjustment.

Nitrogen Dioxide – Distance Fall-Off Calculations

Sutton Outram Street (Tube 4)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**1.5**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**3**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**19.7**	**µg/m^3**
Step 4		**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**31.2**	**µg/m^3**
Result		**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	**(Note 3)**		**29.5**	**µg/m^3**

Sutton Dalestorth Street (Tube 5)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**1**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**1.7**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**19.0**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**33.8**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**32.8**	**$\mu g/m^3$**

Sutton A38 Fire Station (Tube 7)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**2.5**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**10**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**19.4**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**28.3**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**25.3**	**$\mu g/m^3$**

Kirkby Church Hill (10,11and 12)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**0.5**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**1.5**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**16.4**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**40.6**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**35.9**	**$\mu g/m^3$**

M1 Pinxton (Tube14)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**22**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**28**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**19.4**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**28.0**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**26.9**	**$\mu g/m^3$**

Hucknall Ashgate Road (tube 19)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**0.5**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**1.5**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**16.4**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**24.5**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**24.1**	**$\mu g/m^3$**

High Street Hucknall (Tube 20)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**2**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**5.3**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**18.1**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**35.3**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**31.4**	**$\mu g/m^3$**

Beardall Street Hucknall (Tube 21)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**2**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**2.2**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**18.3**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**25.0**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**24.9**	**$\mu g/m^3$**

Sutton Station Road (Tube 22)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**2.4**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**12.7**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**21.4**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**32.3**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**27.9**	**$\mu g/m^3$**

Common Road Huthwaite (Tube 23)

No Distance fall off

Annesley Badger Box (Tubes 27, 28 and 29)

Step 1		How far from the KERB was your measurement made (in metres)?	(Note 1)		2	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 $\mu g/m^3$)?	(Note 2)		20.7	$\mu g/m^3$
Step 4		What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		34.9	$\mu g/m^3$
Result		The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)		28.9	$\mu g/m^3$

Sutton Croft Primary Station Road (Tube 31)

Step 1		How far from the KERB was your measurement made (in metres)?	(Note 1)		2.5	metres
Step 2		How far from the KERB is your receptor (in metres)?	(Note 1)		4.5	metres
Step 3		What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		19.7	$\mu g/m^3$
Step 4		What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		28.2	$\mu g/m^3$
Result		The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)		27.0	$\mu g/m^3$

Lowmoor Road Kirkby (Tube 32)

No Distance fall off

Chapel Street Kirkby (Tube 33)

No Distance fall off

Stoneyford Court Sutton (Tubes 34, 35 and 36)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**3.5**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**6**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**19.7**	**µg/m^3**
Step 4		**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**30.9**	**µg/m^3**
Result		**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	**(Note 3)**		**28.5**	**µg/m^3**

Kirkby Cross (Tubes 37, 38 and 39)

No Distance fall off

Mansfield Road Selston (Tube 40)

Step 1		**How far from the KERB was your measurement made (in metres)?**	**(Note 1)**		**1.5**	**metres**
Step 2		**How far from the KERB is your receptor (in metres)?**	**(Note 1)**		**2.8**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**22.8**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**29.00**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**28.2**	**$\mu g/m^3$**

Short-term to Long-term data Adjustment

The diffusion tube results for Beardall Street and Mansfield Road were annualised as Box 7.8 of TG 2016.

Beardall Street

Long term site	Annual mean	Period mean	Ratio (Am/Pm)
Chesterfield Loudsley Green	16.68	14.95	1.116
Nottingham Centre	31.20	28.95	1.078
Average (Ra)			1.097

Mansfield Road Selston

Long term site	Annual mean	Period mean	Ratio (Am/Pm)
Chesterfield Loudsley Green	16.68	20.40	0.818
Nottingham Centre	31.20	39.41	0.792
Average (Ra)			0.805

Appendix G: Summary of Air Quality Objectives in England

Table G.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[4] The units are in micrograms of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

.Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

None