



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 2016

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Executive Summary Air Quality in Our Area

Air Quality in Ashfield

Air Quality is an issue that is becoming of increasing interest to both the general public and 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 billion³.

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

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 the air pollution from key industrial processes is regulated by the Environmental Permitting (England and Wales) Regulations 2010.

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

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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, Public Health England 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 2015 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.

- Ashfield District Council's current Air Quality Strategy has become outdated and the Council has been working with partners such as 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.

- 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 hybrid vehicles 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 has led to a nine percent saving in fuel usage. The Council also operates a tax free bike scheme for all employees to encourage cycle use for employee's to get to work but also to encourage cycle use outside of work.
- In Hucknall the District borders the Nottingham Clean Air Zone and has a response to the air quality problems this is causing for the City Council in addition to more local air quality issues, Ashfield District Council are in the process of implementing a new Taxi Drivers Policy which increases the standard of vehicles used as Taxi's to Euro 5 for petrol engines and Euro 6 for diesel engines. If approved by committee this will be a higher standard than is required by Nottingham City Council.
- 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.

Local Priorities and Challenges

Despite Ashfield District Council not having any AQMA our priority is 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 develop an 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 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

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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.

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

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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 PM₁₀ and PM_{2.5} which as lead 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 2015. 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 F.1](#) in Appendix F.

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

Ashfield District Council's priorities for addressing air quality issues in the coming year are detailed in Table 2.1. Ashfield District Council's has not had to declare any AQMA and has therefore not had to develop an Air Quality Action Plan. A new Air Quality Strategy for Nottinghamshire is under development and is being coordinated by the Nottinghamshire Environmental Protection Pollution Group.

Ashfield Council Is a District Authority and it is important to note that Nottinghamshire County Council are the lead authority for measures such as Traffic Management, Transport Planning and Infrastructure.

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	2016	2017 - 2018	N/A	Not Known	None	2018	
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	Started	2017	
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	New Taxi Licencing Policy to include low emission vehicles	Taxi Licencing Conditions	Promoting Low Emission Transport	ADC	Started	2016	N/A	Not Known	Started	2016	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 2015 and does not have the continuous monitoring equipment 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 2010 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 Health 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 is currently undertaking a review of the current air quality monitoring equipment. The current air quality monitoring station has had problems with reliability but more importantly it is difficult to move to new locations and the cost of maintenance programme has risen to a level where it is hard to justify the current maintenance when currently there is no requirement to undertake continuous monitoring. The Council is currently considering replacing our current air quality monitoring station in favour of an AQ Mesh system which is easy to deploy on lampposts and has the capability to measure PM_{2.5} particulates. It is hoped that this equipment 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

3.1.1 Automatic Monitoring Sites

Ashfield District Council undertook no automatic (continuous) monitoring at during 2015.

3.1.2 Non-Automatic Monitoring Sites

Ashfield District Council undertook non- automatic (passive) monitoring of NO₂ at 16 sites during 2015. Table A2 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 C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

During 2015 there were no exceedances of the air quality objective of 40µg/m³ and Ashfield District Council has not had to undertake a detailed assessment or declare an Air Quality Management Area.

3.2.2 Particulate Matter (PM₁₀)

No monitoring of Particulate Matter (PM₁₀) was carried out within the district during 2015.

3.2.1 Particulate Matter (PM_{2.5})

No monitoring of Particulate Matter (PM_{2.5}) was carried out within the district during 2015.

3.2.1 Sulphur Dioxide (SO₂)

No monitoring of Sulphur Dioxide was carried out within the district during 2015.

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	Sutton Outram Street	Roadside/ Urban Centre	449628	358967	NO ₂	N	3	1.5	N	2
Tube 5	Sutton Dalestorth Street	Roadside	450062	359653	NO ₂	N	1.7	1	N	2
Tubs 7	Sutton A38	Near Road	448987	357610	NO ₂	N	5.6	10	N	2
Tube 10/11/12	Kirkby Church Hill	Kerbside	448968	355816	NO ₂	N	1.5	0.5	N	2
Tube 14	M1 Pinxton	Near Road	446492	355266	NO ₂	N	8.5	20	N	2
Tube 19	Hucknall 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)
Tube 20	Hucknall High Street	Roadside	453477	349315	NO ₂	N	5.3	2	N	2
Tube 21	Hucknall Beardall Street	Urban Background	453631	348972	NO ₂	N	2.2	2	N	2
Tube 22	Sutton Station Road	Near Road	450259	358512	NO ₂	N	12.7	2.4	N	2
Tube 23	Huthwaite Common Road	Roadside	446827	358508	NO ₂	N	2.4	2.4	N	2
Tube 27/28/29	Annessly Badger Box	Roadside	450844	353799	NO ₂	N	9	2	N	2
Tube 31	Sutton Croft Primary	Kerbside	449850	358779	NO ₂	N	4.5	2.5	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)
Tube 32	Kirkby Lowmoor Road	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

Table A.2 – Annual Mean NO₂ 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 (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
Tube 4 Sutton Outram Street	Roadside/ Urban Centre	Diffusion Tube		100%	29.4	34.7	29.8	29.0	27.8
Tube 5 Sutton Dalethorpe Street	Roadside	Diffusion Tube		100%	32.0	34.2	33.1	33.3	31.9
Tube 7 Sutton A38	Near Road	Diffusion Tube		100%	26.6	29.2	30.0	26.6	25.7
Tube 10/11/12 Kirkby Church Hill	Kerbside	Diffusion Tube		100%	35.4	40.0	38.3	39.0	37.1
Tube 14 M1 Pinxton	Near Road	Diffusion Tube		100%	30.2	32.5	28.2	28.7	27.6
Tube 19 Hucknall Ashgate Road	Roadside	Diffusion Tube		100%	26.2	26.6	25.7	24.8	24.3
Tube 20 Hucknall High Street	Roadside	Diffusion Tube		100%	38.0	26.5	35.6	33.2	32.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
Tube 21 Hucknall Beardall Street	Urban Background	Diffusion Tube		100%	26.7	28.8	22.9	24.8	22.6
Tube 22 Sutton Station Road	Near Road	Diffusion Tube		100%	38.7	35.2	34.7	33.7	32.9
Tube 23 Huthwaite Common Road	Roadside	Diffusion Tube		100%	33.3	35.8	36.7	34.8	33.2
Tube 27/28/29 Annesley Badger Box	Roadside	Diffusion Tube		100%	–	–	–	33.6	32.9
Tube 31 Sutton Croft Primary	Kerbeside	Diffusion Tube		100%	–	–	–	26.5	27.8
Tube 32 Kirkby Lowmoor Raod	Roadside	Diffusion Tube		100%	–	–	–	29.2	25.7
Tube 33 Kirkby	Roadside	Diffusion Tube		91%	–	–	–	–	29.0

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
Chapel Street									
Tube 34/35/36 Sutton Stoneyford Court	Roadside	Diffusion Tube		100%	34.7	34.5	35.0	29.4	28.8
Tube 37/38/39 Kirkby Cross	Roadside	Diffusion Tube	91%		–	–	–	–	31.6

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2015

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 ⁽¹⁾
Outram Street	33.41	40.05	32.22	22.19	21.81	27.25	25.51	27.53	34.03	41.39	33.08	28.00	30.5	27.8
Dalestorth	50.98	44.21	34.59	33.01	24.90	26.93	28.12	28.75	31.53	43.61	30.00	43.62	35.0	31.9
A38	31.59	35.24	34.33	28.58	21.21	24.93	22.57	22.44	32.99	39.93	22.82	21.62	28.2	25.7
Church Hill	37.33	47.33	42.26	37.74	28.34	38.66	38.34	40.50	42.82	53.91	45.60	36.56	40.8	37.1
Pinxton	37.18	41.00	35.40	25.20	22.62	25.93	27.52	28.52	24.67	29.10	30.66	36.04	30.3	27.6
Ashgate Road	35.21	37.26	29.66	22.65	15.46	20.24	21.12	24.70	21.45	26.68	32.11	30.87	26.7	24.3
High Street	39.28	41.13	36.68	35.00	27.40	32.48	31.37	31.83	33.53	45.87	35.11	37.33	35.6	32.4
Beardall Street	28.99	35.56	28.50	22.78	15.59	17.62	18.04	19.11	23.93	27.25	31.56	29.23	24.8	22.6
Station Road	35.44	45.07	41.18	32.79	26.88	32.70	34.53	21.21	34.52	43.44	43.44	41.95	36.1	32.9
Common Road	37.01	48.15	37.50	42.42	27.75	35.59	37.11	34.01	35.68	35.58	35.18	31.51	36.5	33.2
Badger Box	39.25	45.36	36.63	32.07	27.65	31.94	35.25	34.31	38.27	40.04	38.74	33.79	36.1	32.9
Croft Primary	32.48	29.74	35.98	28.86	22.52	25.40	27.44	29.10	31.27	36.68	34.98	31.12	30.5	27.8
Lowmoor Road	30.35	34.39	33.46	27.93	17.92	21.59	20.90	34.69	25.26	35.23	30.51	26.56	28.2	25.7
Chapel Street	32.23	40.81	32.95	31.18	0.00	27.22	28.05	24.36	31.67	40.97	32.20	28.94	31.9	29.0

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 ⁽¹⁾
Stoneyford Court	31.68	38.38	34.00	28.55	22.98	30.84	28.71	27.14	32.75	40.13	32.34	32.04	31.6	28.8
Kirkby Cross	0.00	42.17	40.70	36.05	23.83	30.22	26.47	29.25	37.78	47.77	35.92	31.14	34.7	31.6

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 NO₂ 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 NO₂ diffusion tube procedures have been amended to follow the guidelines of the DEFRA document related to the preparation, extraction, analysis and calculation procedures for NO₂ passive diffusion tubes. These amendments are minimal

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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.

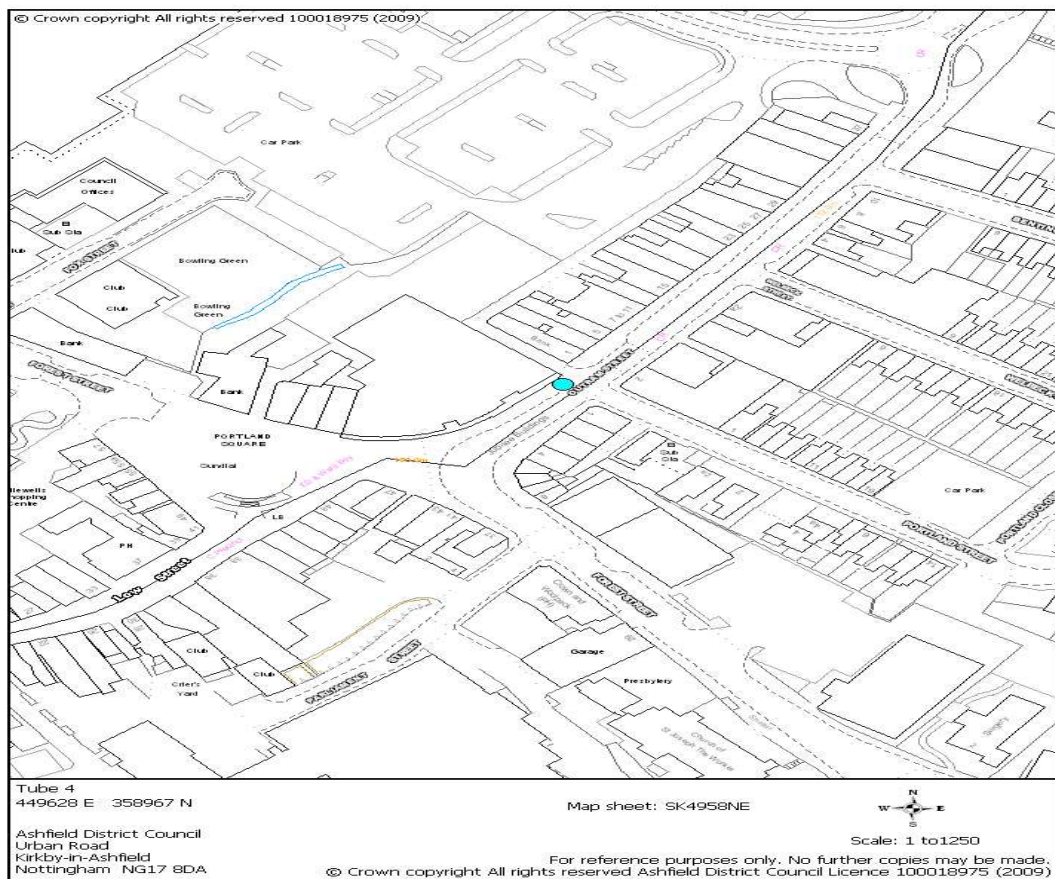
This report as used a **Bias Adjustment Factor of 0.91**

Table C.1 Diffusion Tube Bias Adjustment Factor

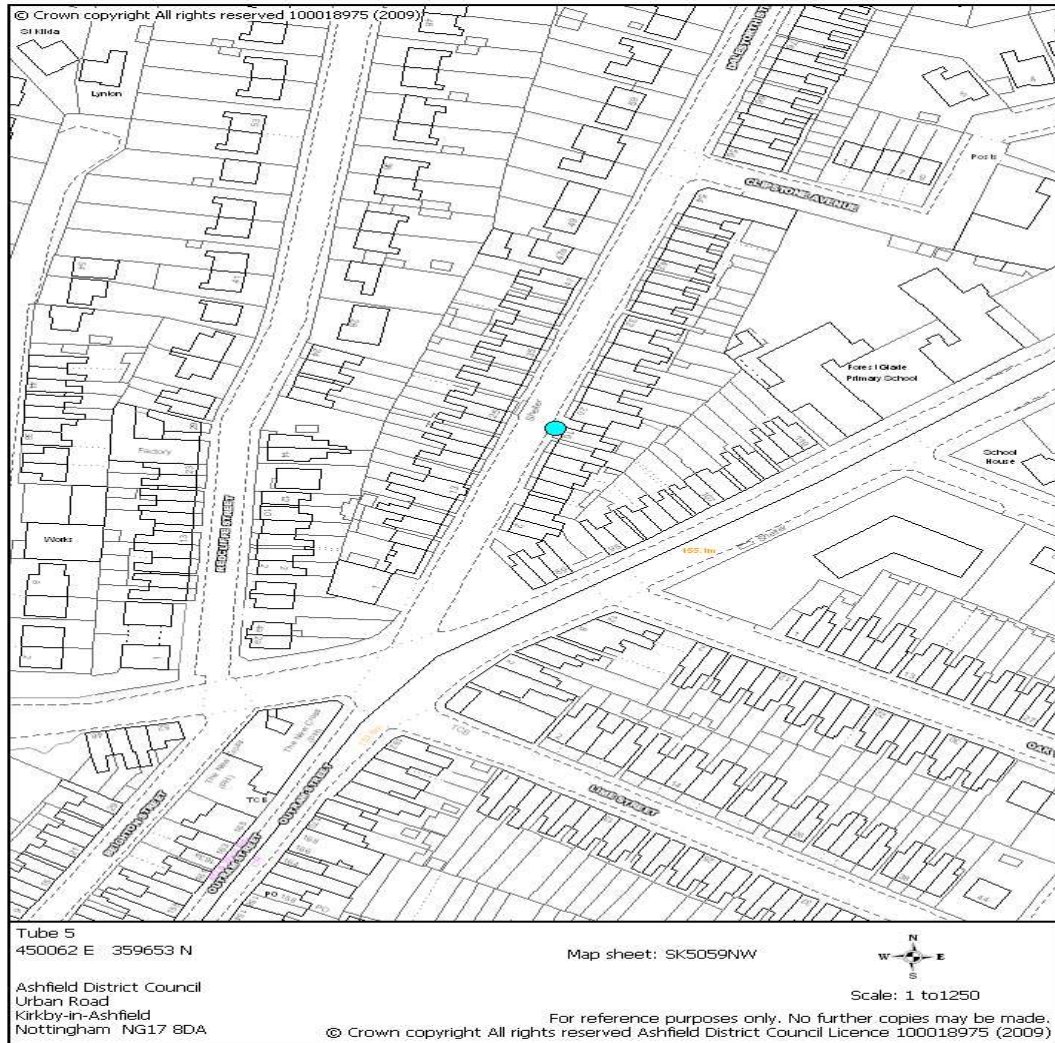
National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/16						
<p>Follow the steps below in the correct order to show the results of relevant co-location studies</p> <p>Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods</p> <p>Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet</p> <p>This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.</p>							<p>This spreadsheet will be updated at the end of June 2016</p> <p>LAQM Helpdesk Website</p>						
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:		Step 2:		Step 3:		Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		<p>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 factor² shown in blue at the foot of the final column.</p> <p>If you have your own co-location study then see footnote¹. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953</p>							
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.									
Analysed By ¹		Method		Year ²		Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) ($\mu\text{g}/\text{m}^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu\text{g}/\text{m}^3$)	Bias (B)	Tube Precision ³	Bias Adjustment Factor (A) (Cm/Dm)
▼		▼		▼									
Gradko		20% TEA in water		2015			Overall Factor² (29 studies)				Use		0.91

Appendix D: Maps of Monitoring Locations

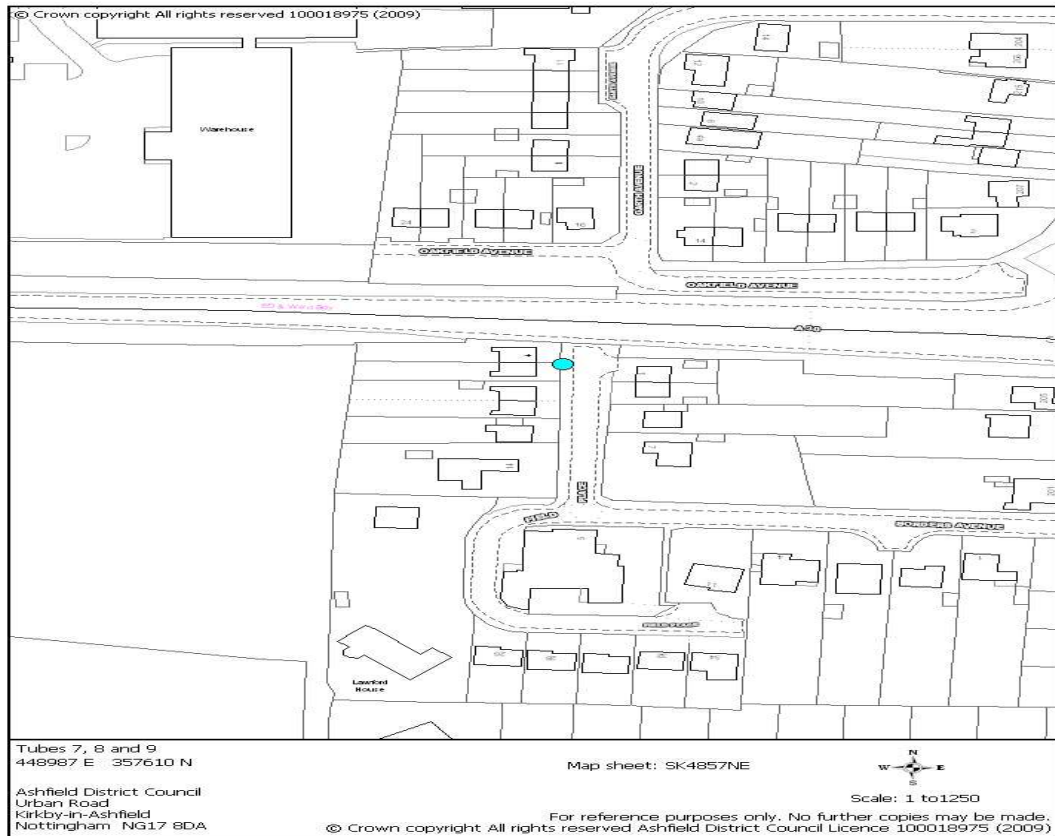
Location of Nitrogen Dioxide Diffusion Tube at Outram Street, Sutton



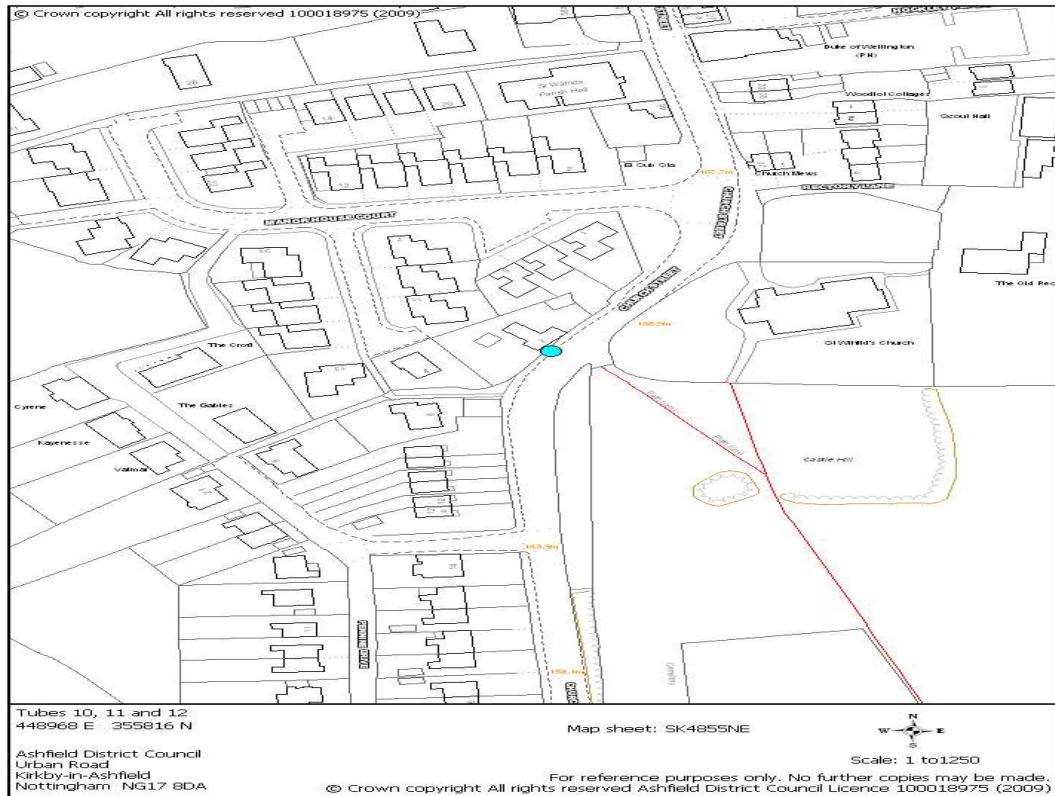
Location of Diffusion Tube at Dalestorth Street, Sutton



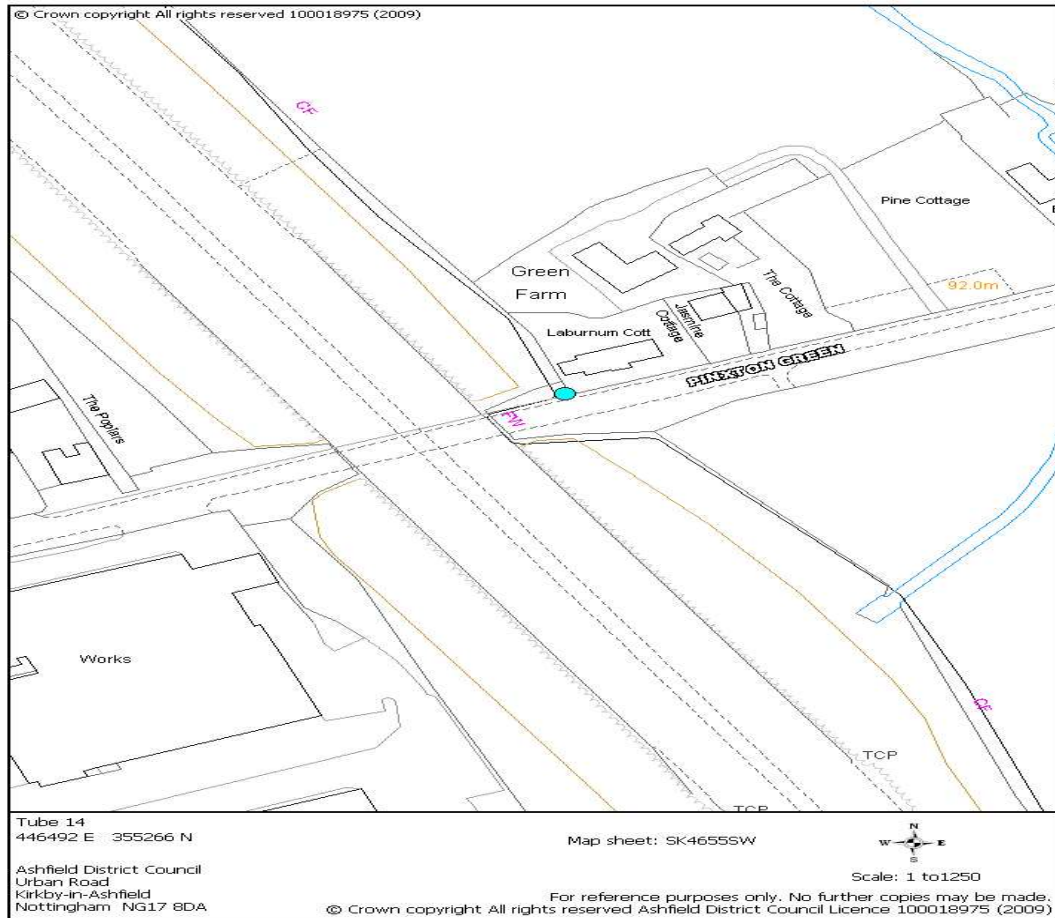
Location of Nitrogen Dioxide Diffusion Tubes At A38 Fire Station, Sutton



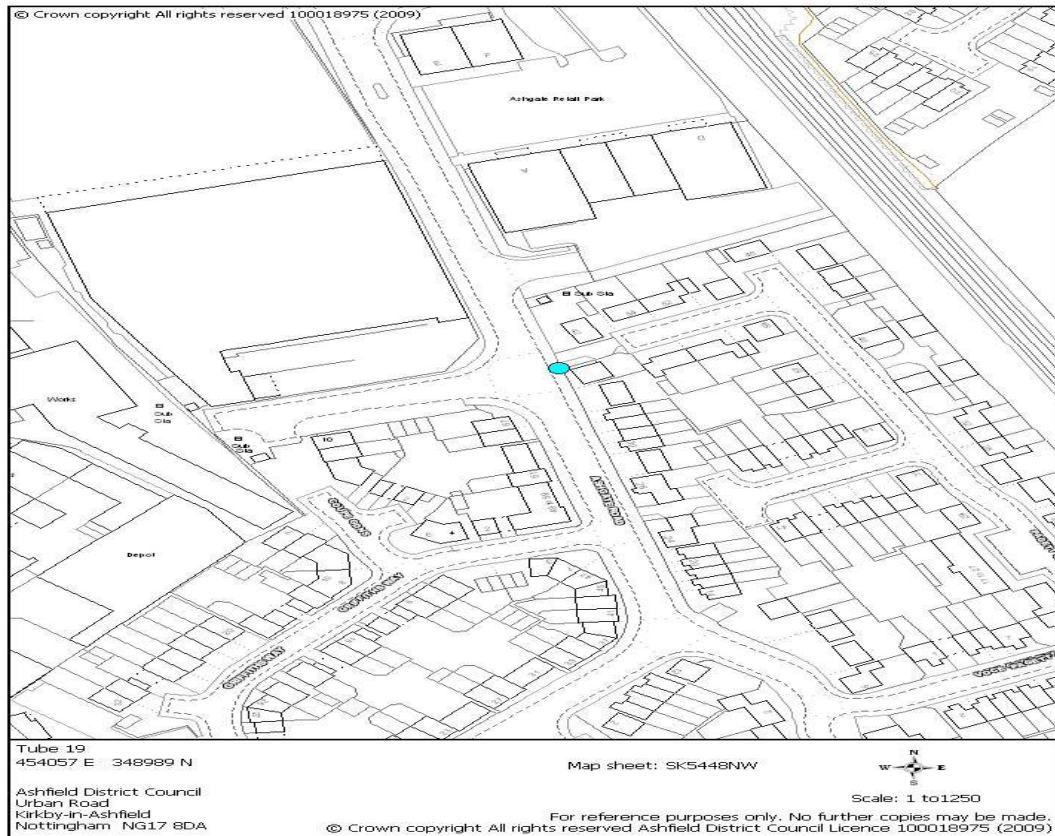
Location of Nitrogen Dioxide Diffusion Tubes At Church Hill, Kirkby



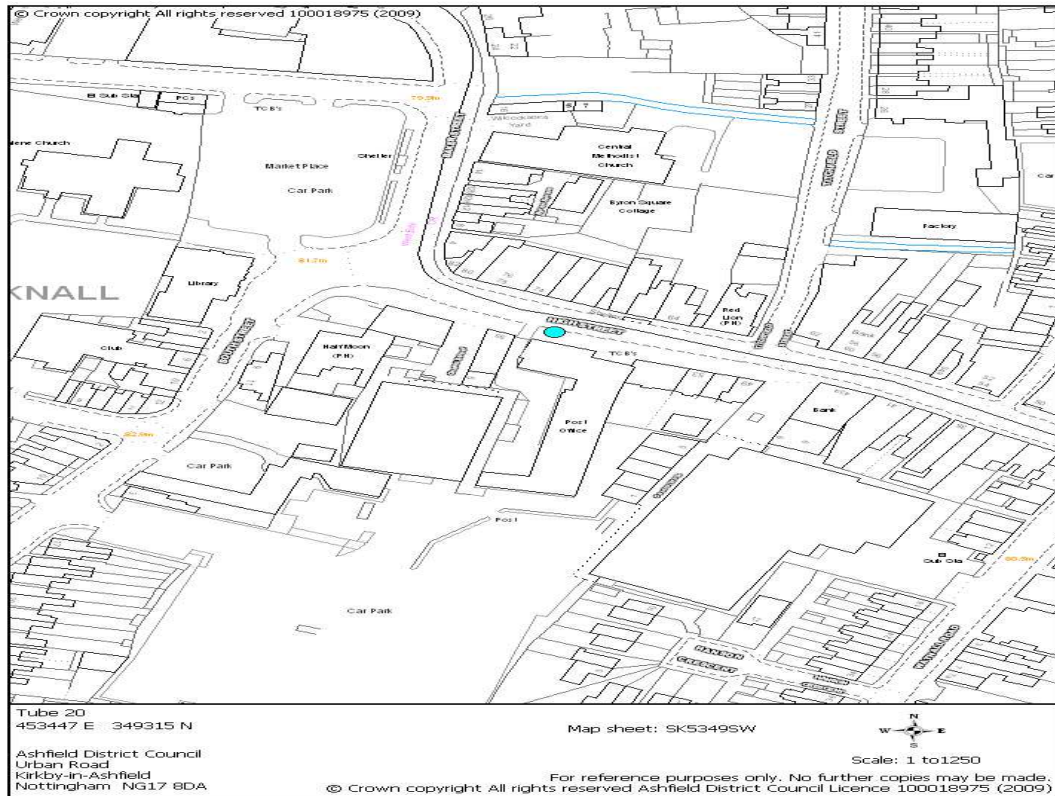
Location of Nitrogen Dioxide Diffusion Tube at M1 Pinxton



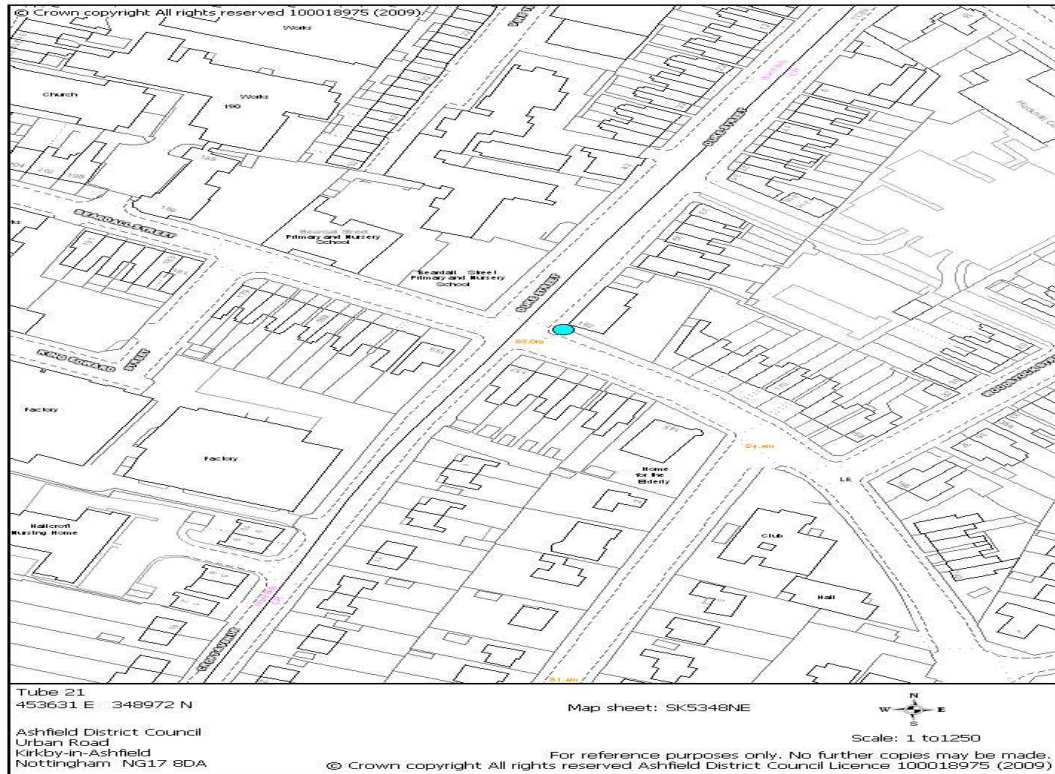
Location of Nitrogen Dioxide Diffusion Tube at Hucknall Ashgate Road



Location of Nitrogen Dioxide Diffusion Tube at Hucknall High Street

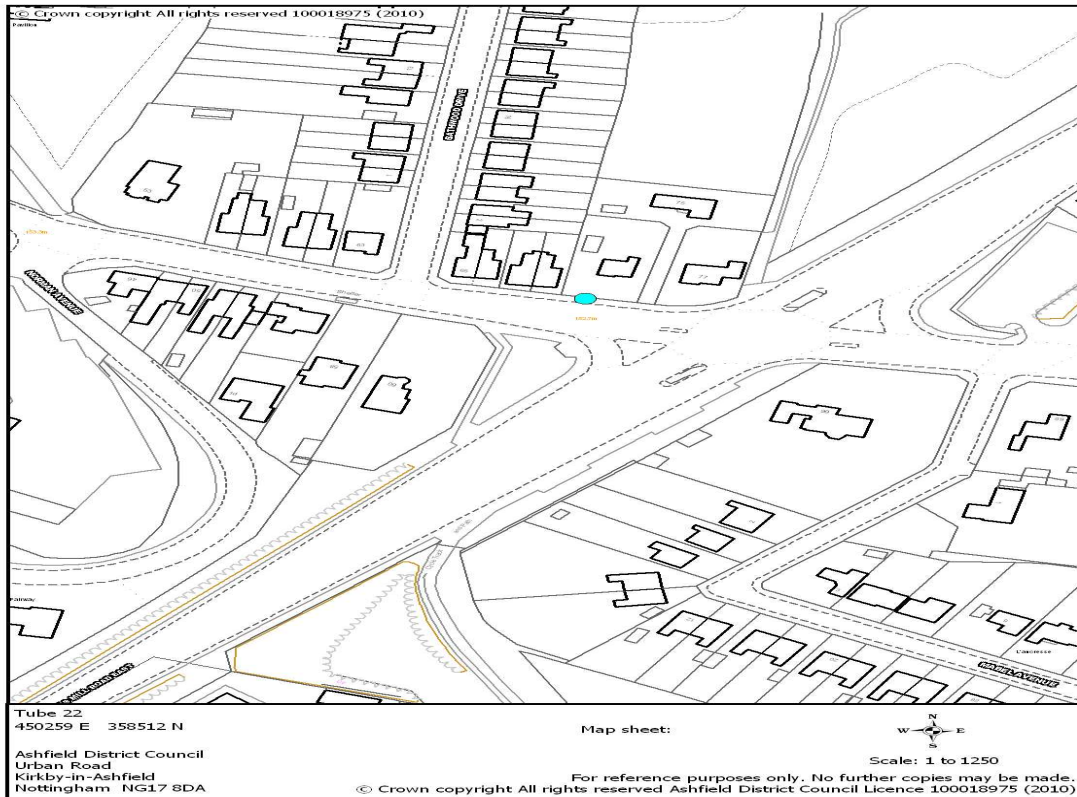


Location of Nitrogen Dioxide Diffusion Tube at Hucknall Croft/ Beardhall Street

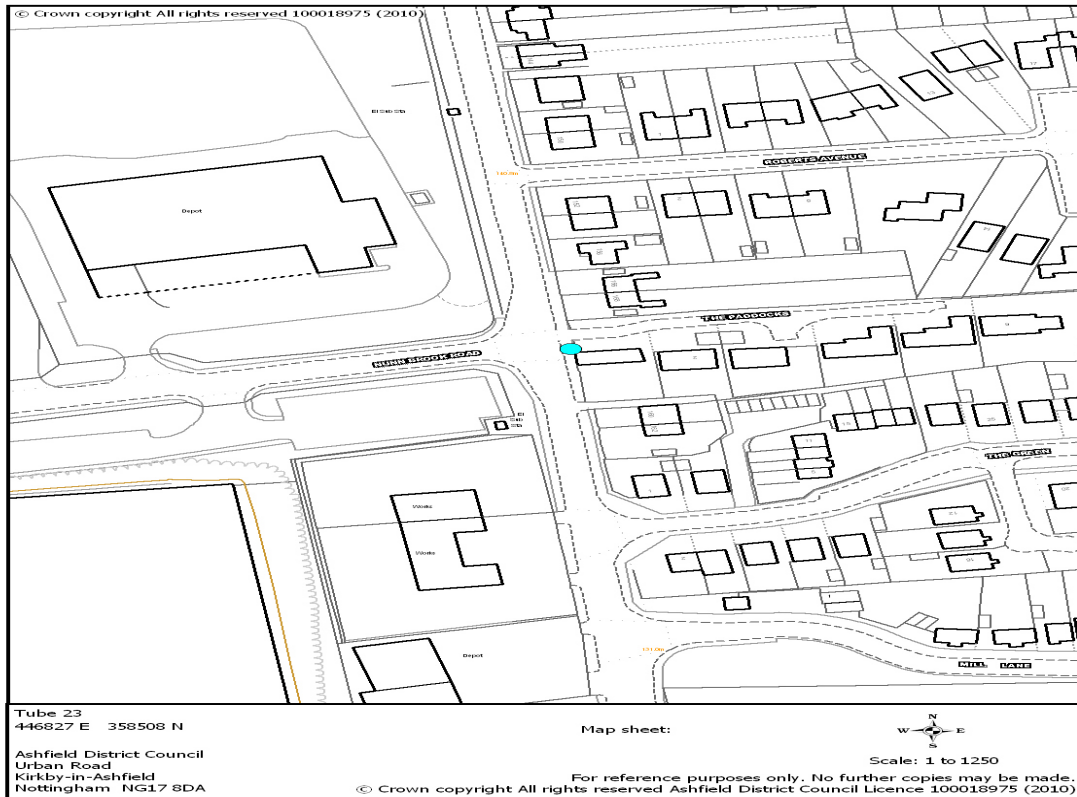


Ashfield District Council

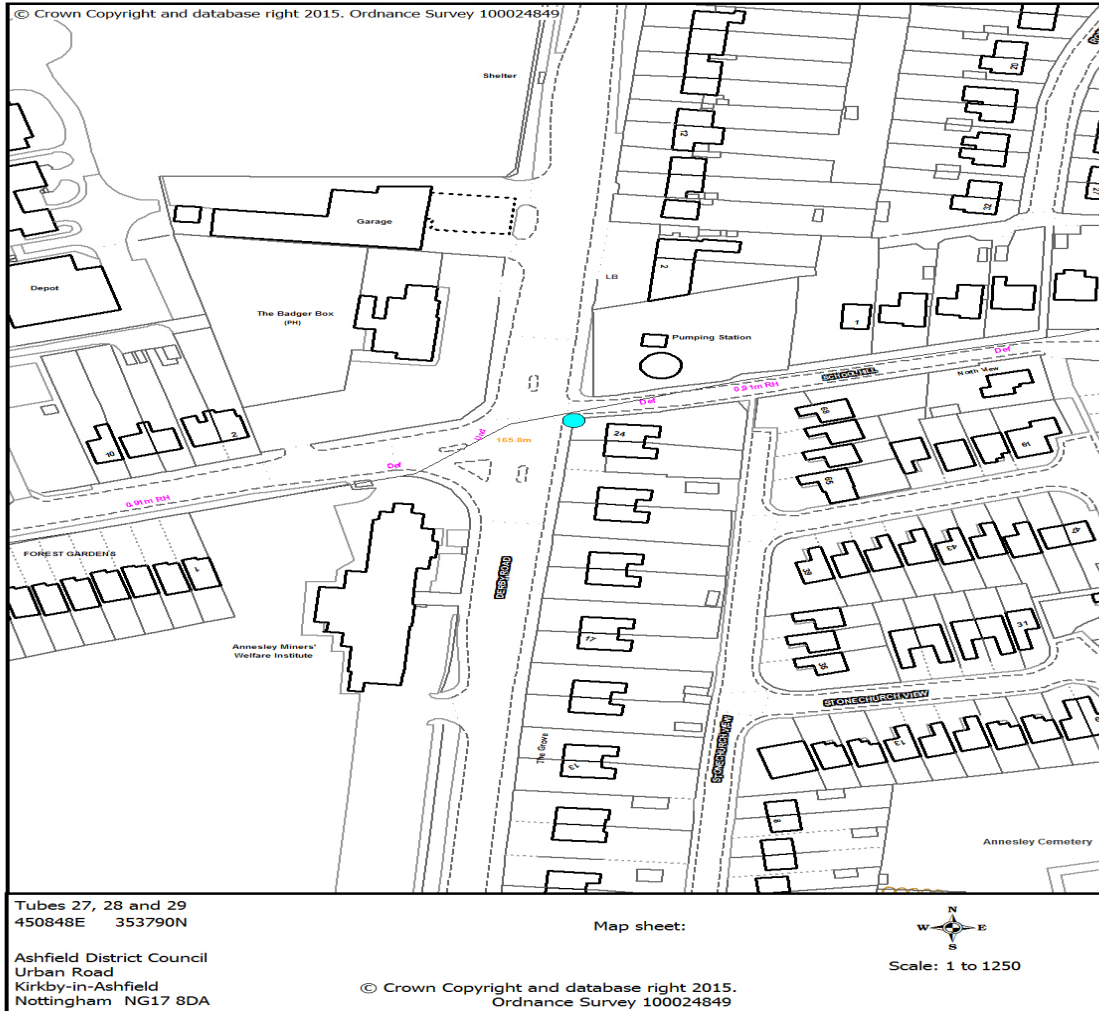
Location of Nitrogen Dioxide Diffusion Tube at Station Road, Sutton



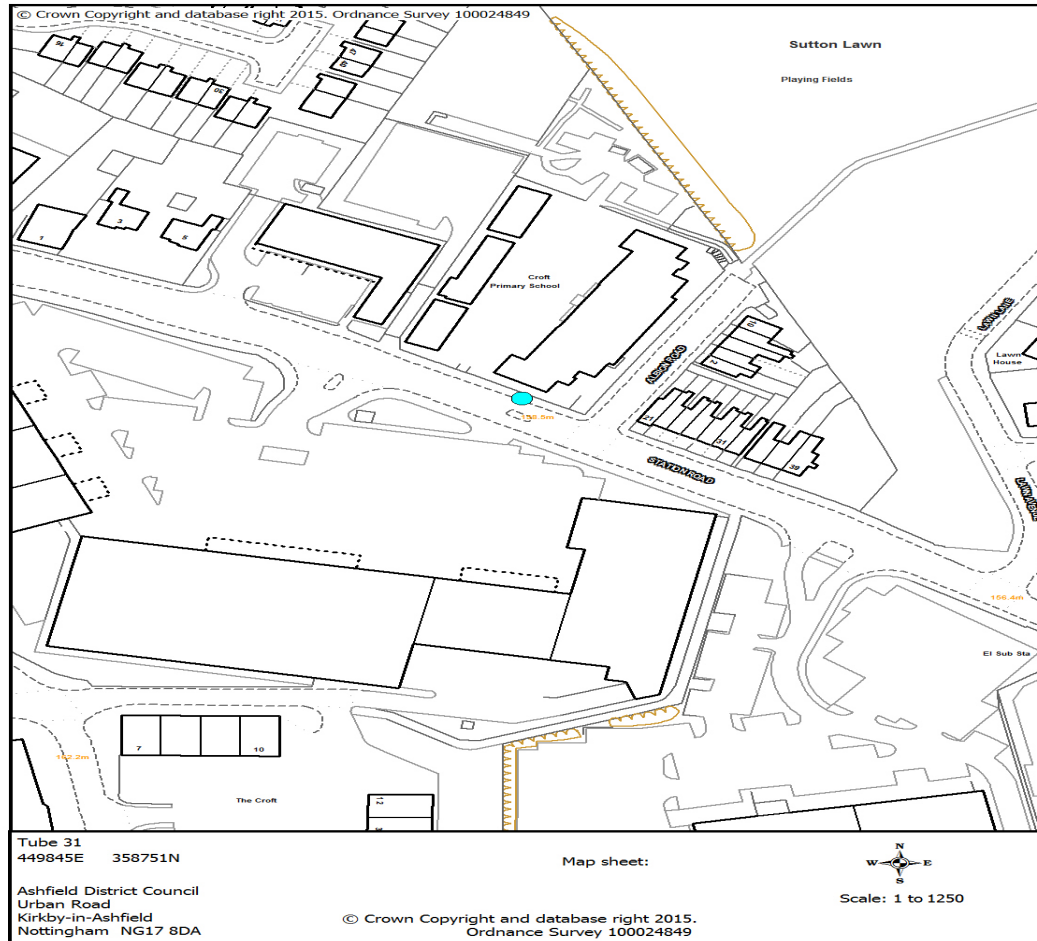
Location of Nitrogen Dioxide Diffusion Tube at Common Road, Huthwaite



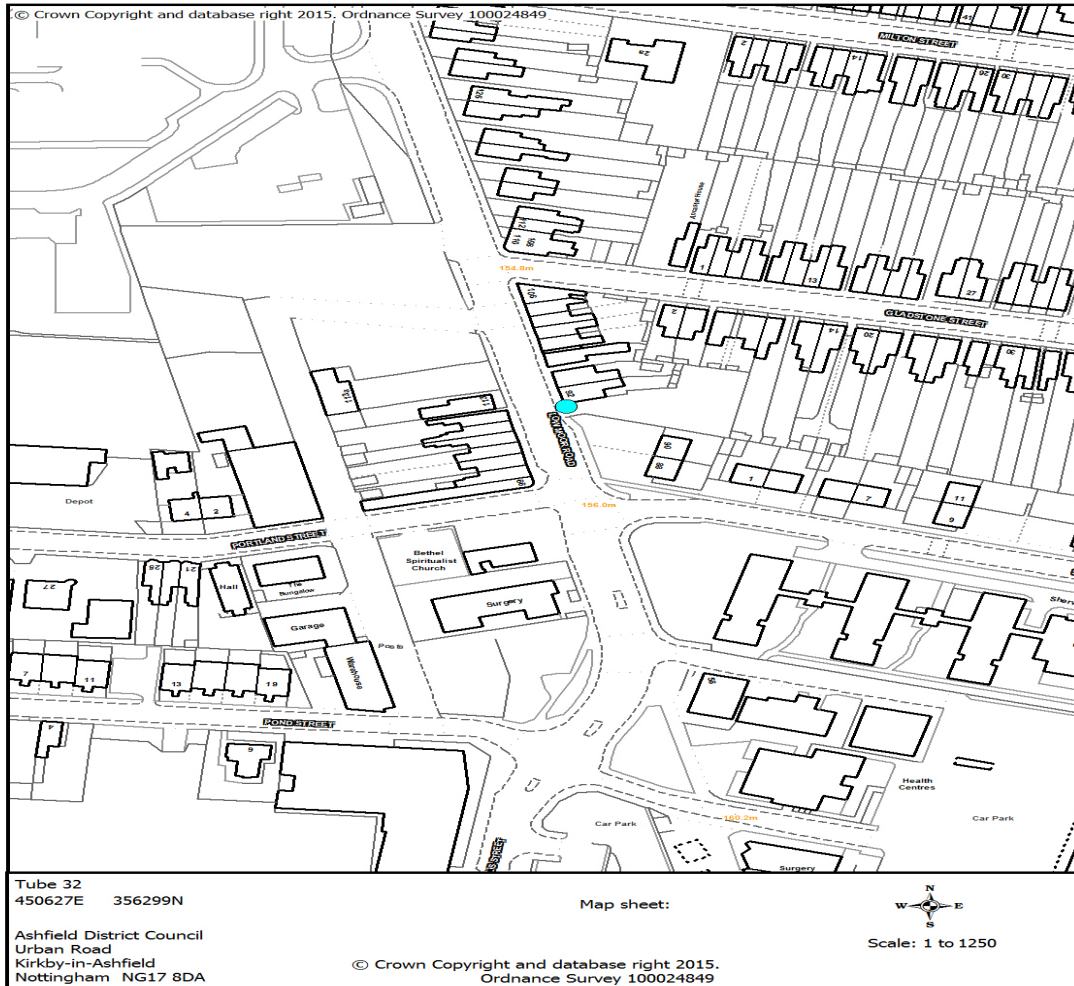
Location of Nitrogen Dioxide Diffusion Tube at the Badger Box, Annesley



Location of Nitrogen Dioxide Diffusion Tube at Croft Primary School



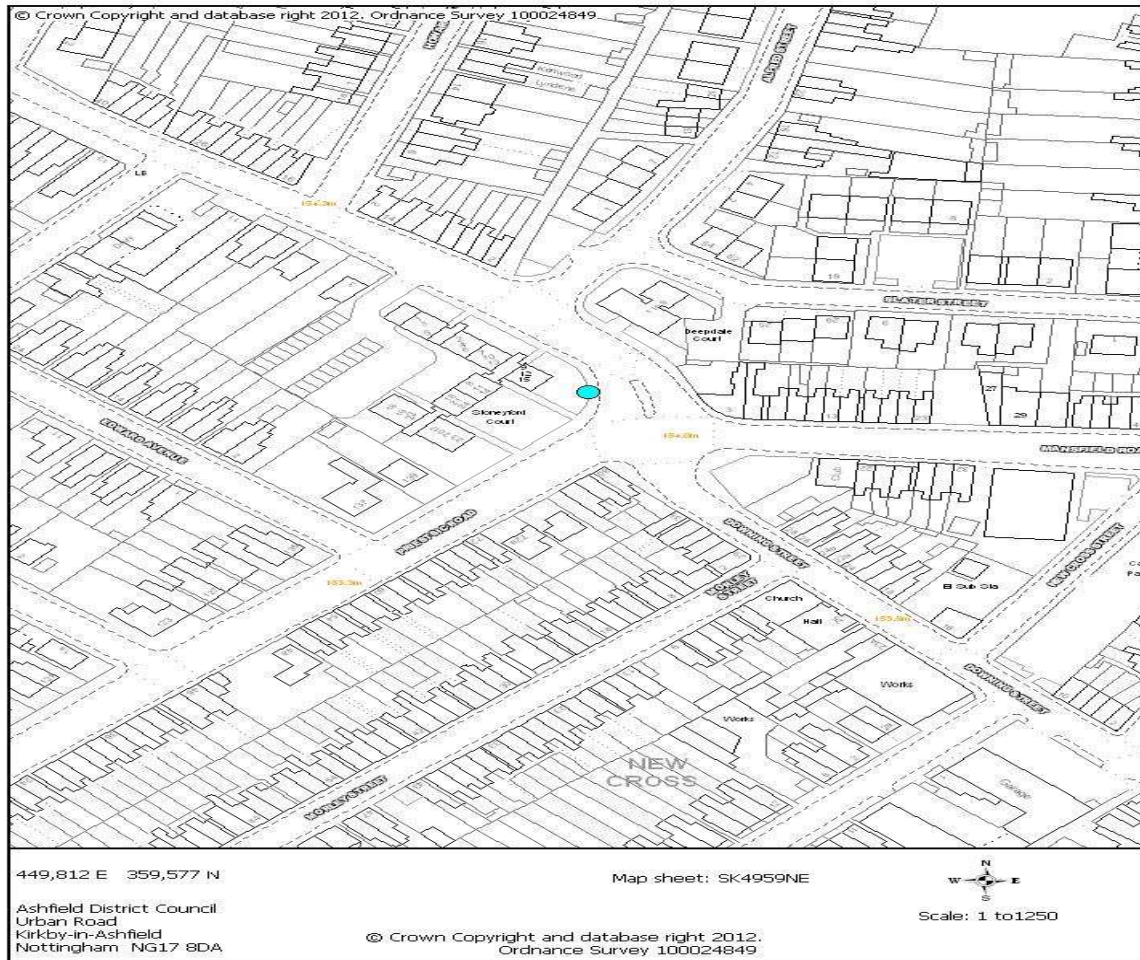
Location of Nitrogen Dioxide Diffusion Tube at Lowmoor Road Kirkby



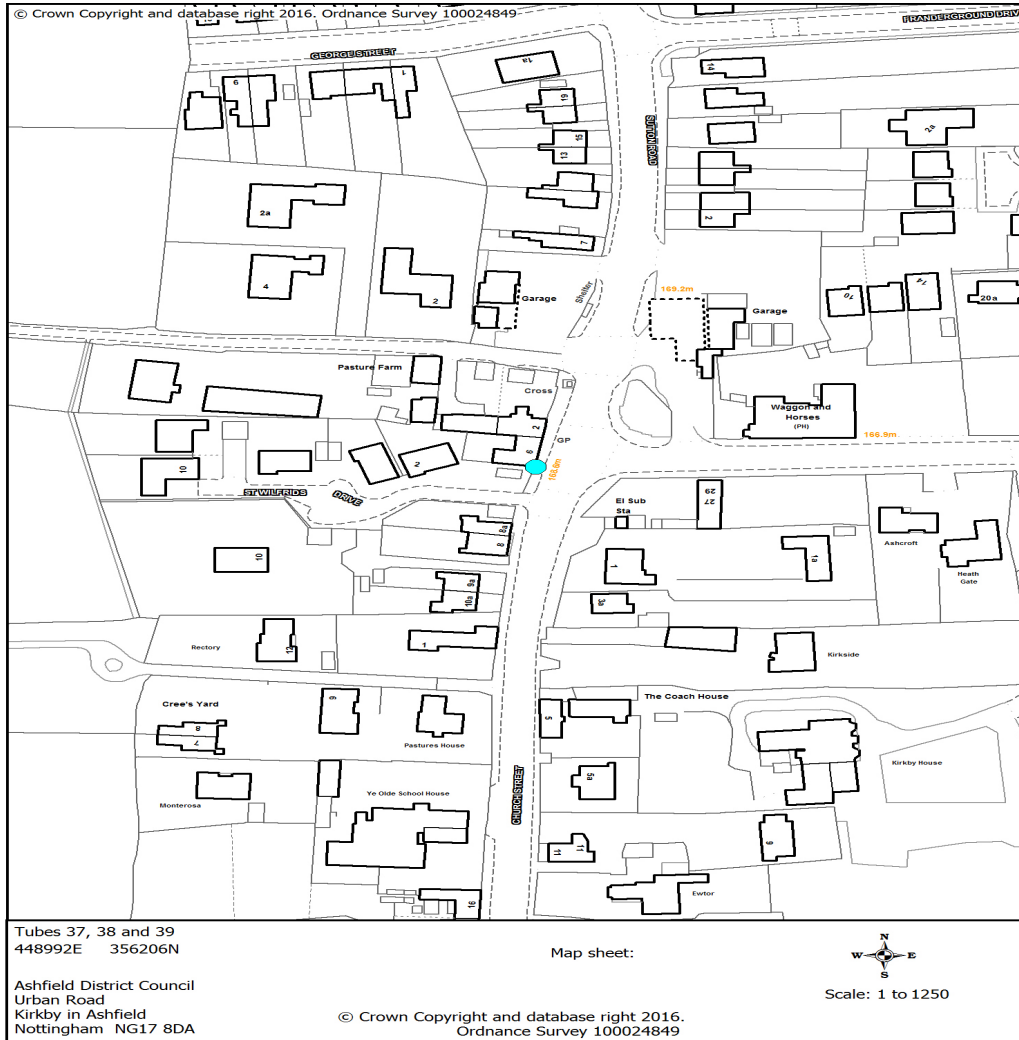
Location of Nitrogen Dioxide Diffusion Tube at Chapel Street School



Location of Nitrogen Dioxide Diffusion Tube at Stoneyford Court Street



Location of Nitrogen Dioxide Diffusion Tube at Kirkby Cross



Appendix F: Diffusion Tube Results Trend Analysis

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

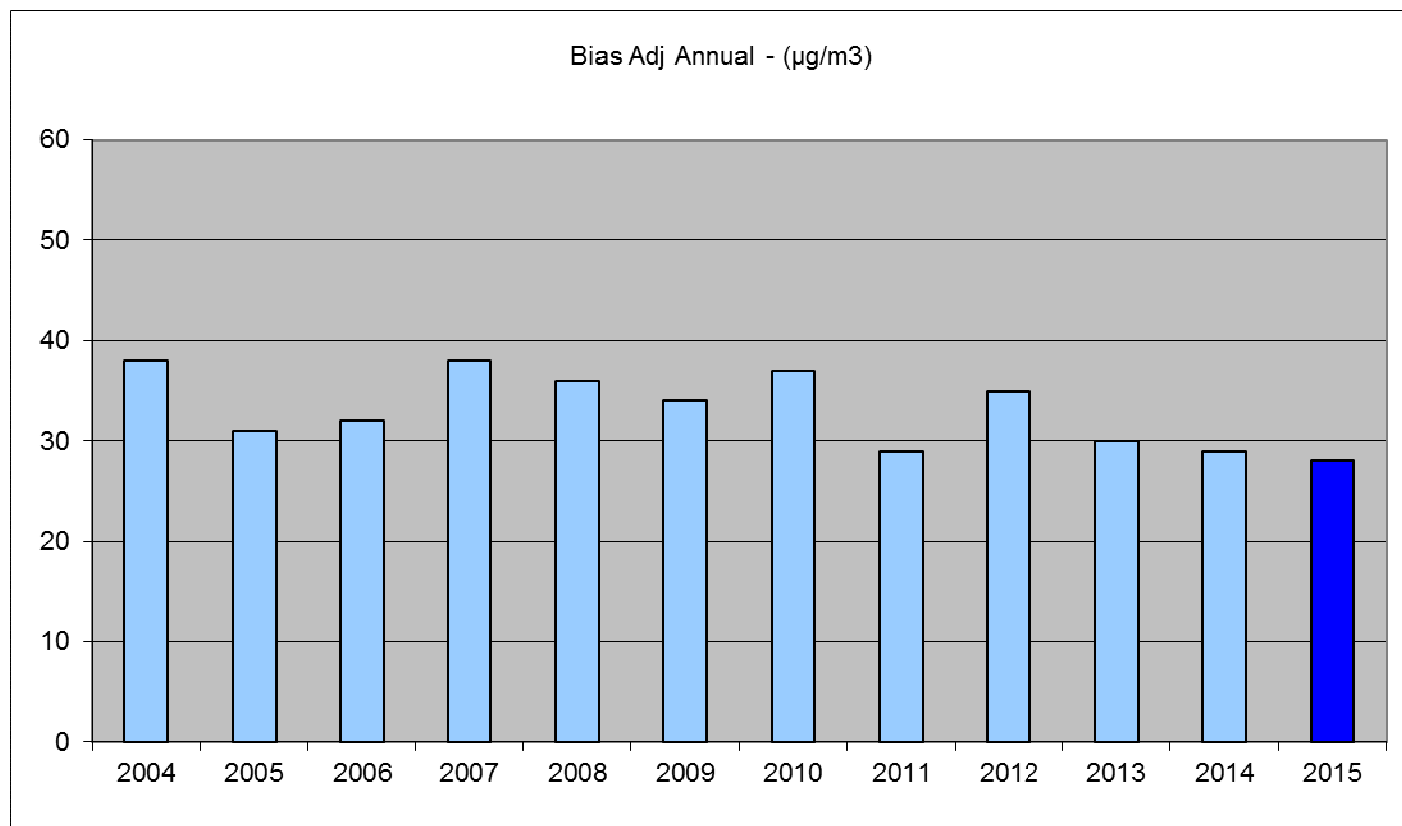


Figure E.2 Trend Analysis for Nitrogen Dioxide Diffusion Tube at Dalestorth Street, Sutton in Ashfield

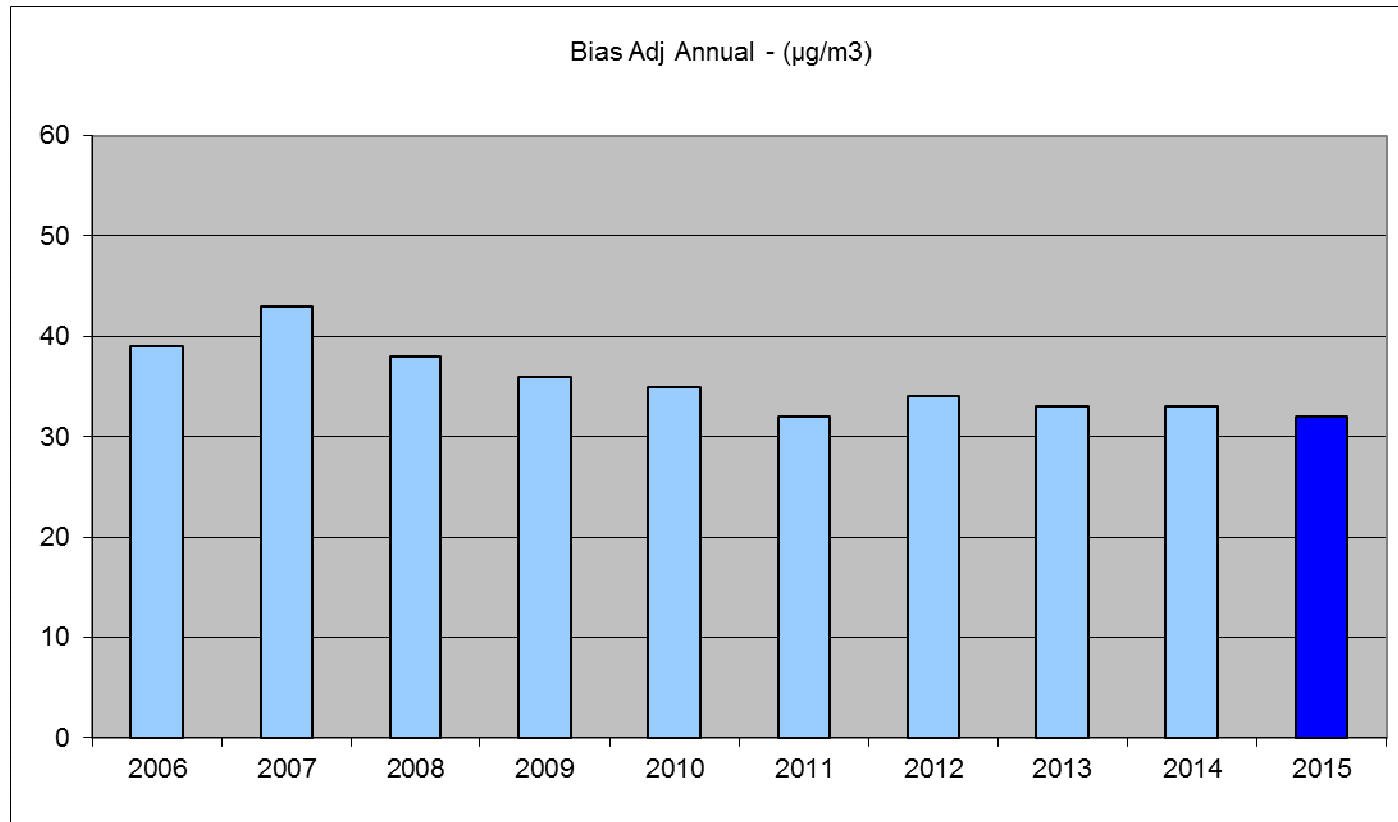


Figure E.3 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at A38, Sutton in Ashfield

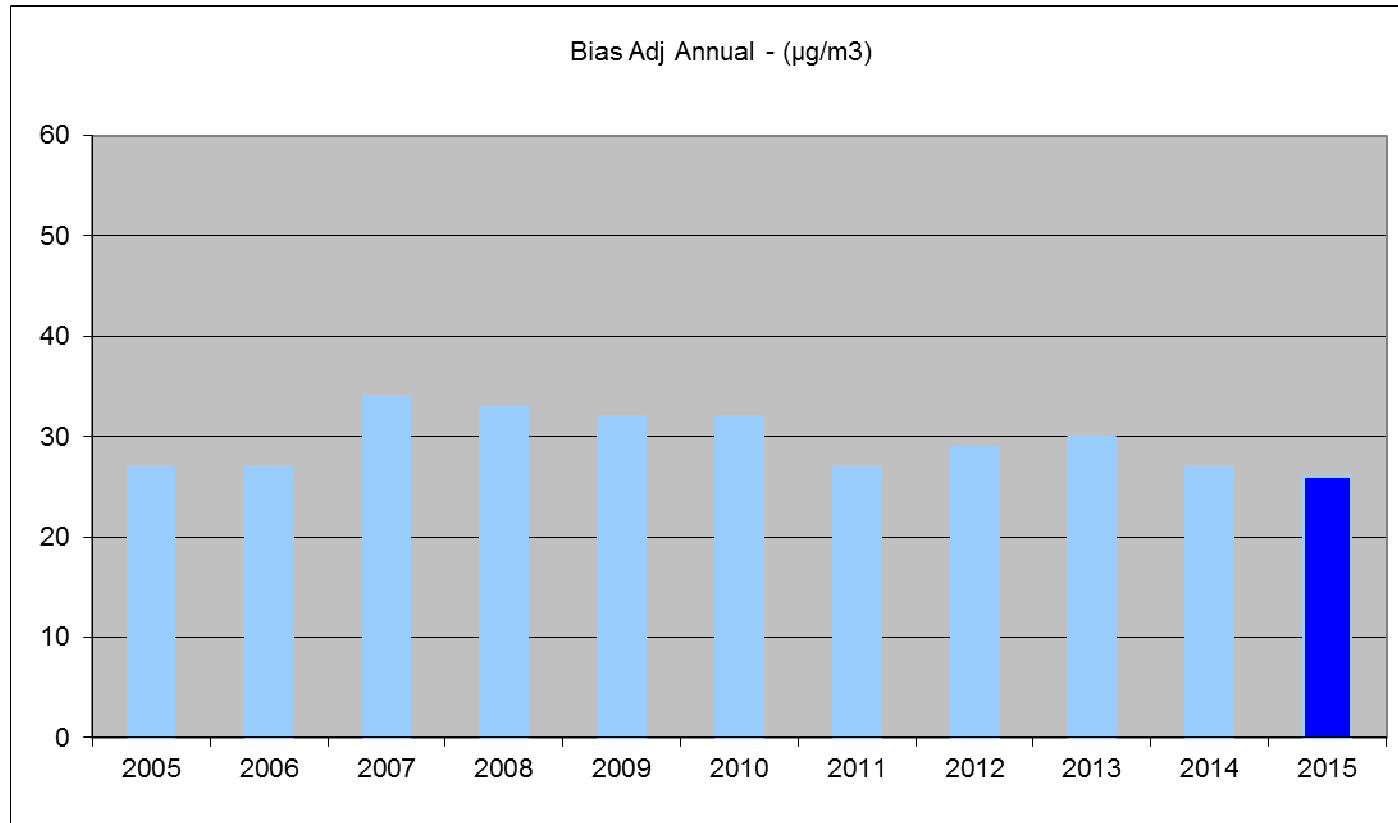


Figure E.4 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Church Hill, Kirkby

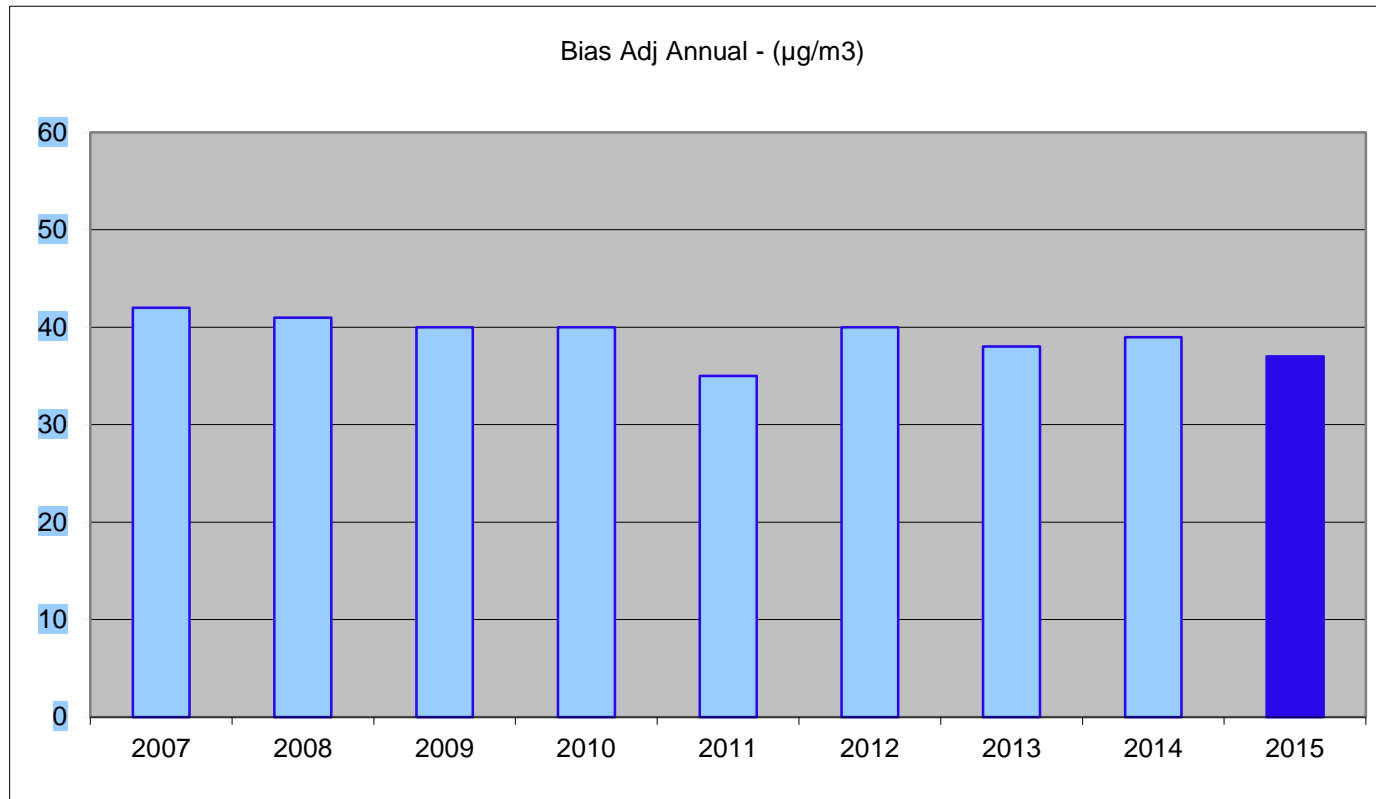


Figure E.5 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Pinxton

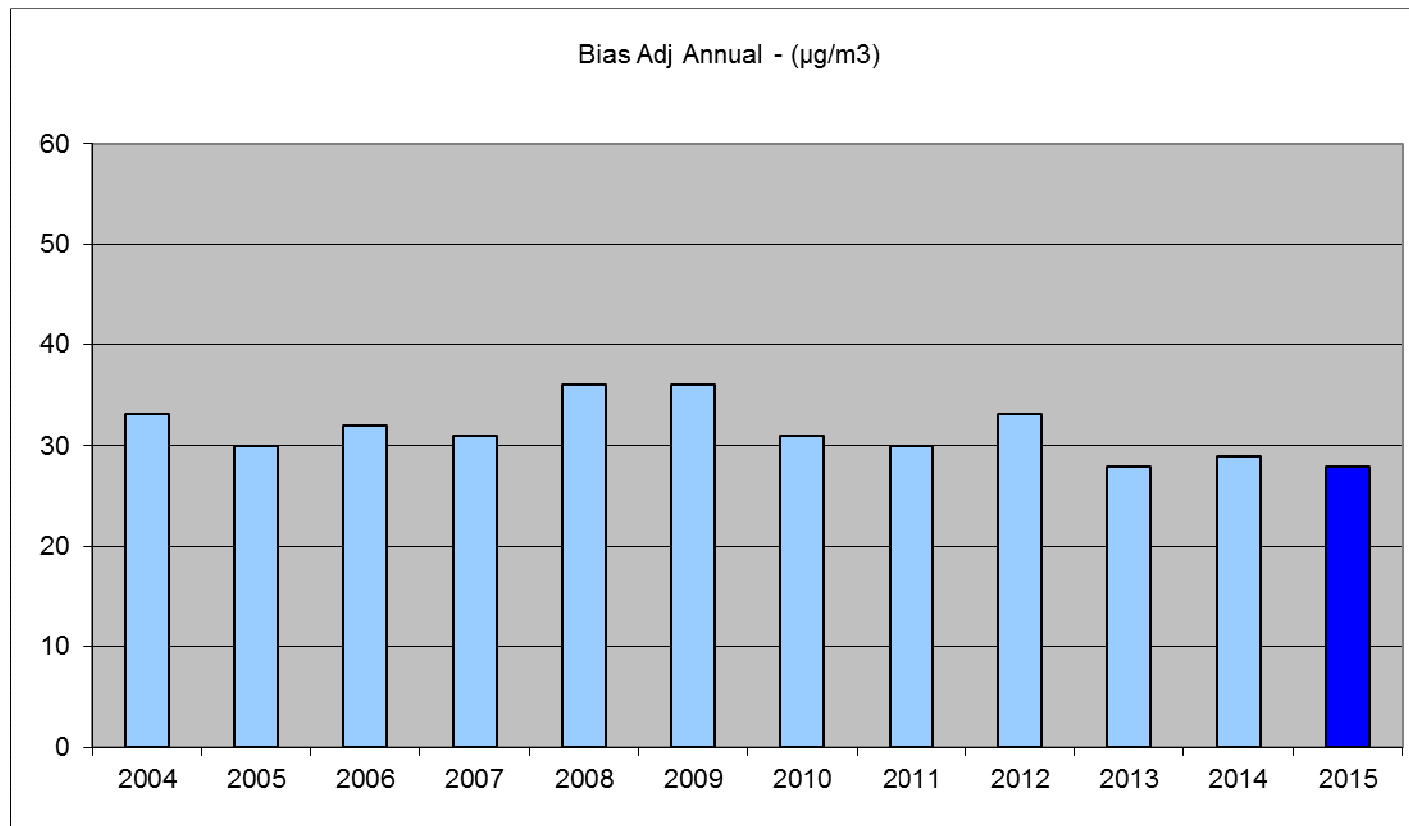


Figure E.6 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Ashgate, Hucknall

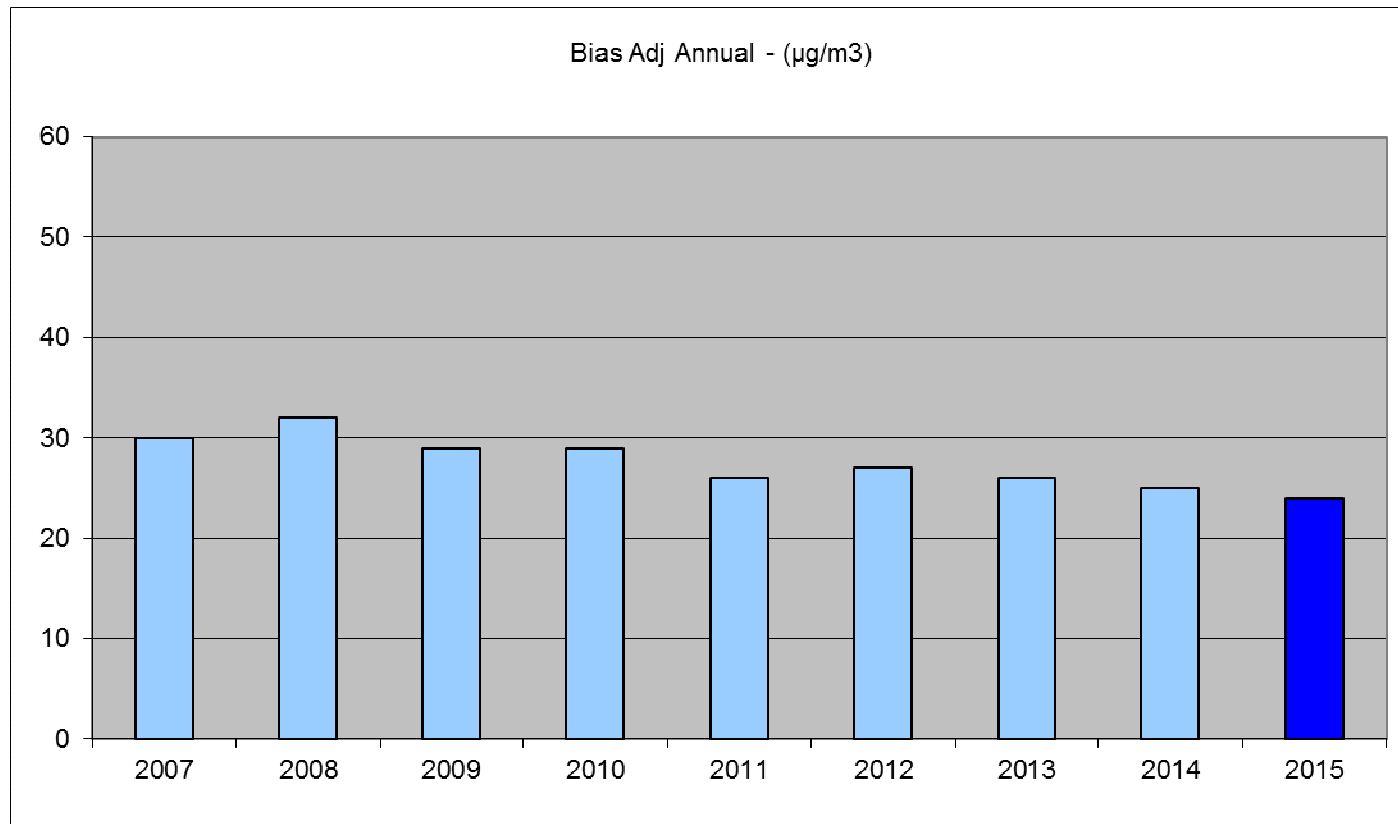


Figure E.7 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at High Street, Hucknall

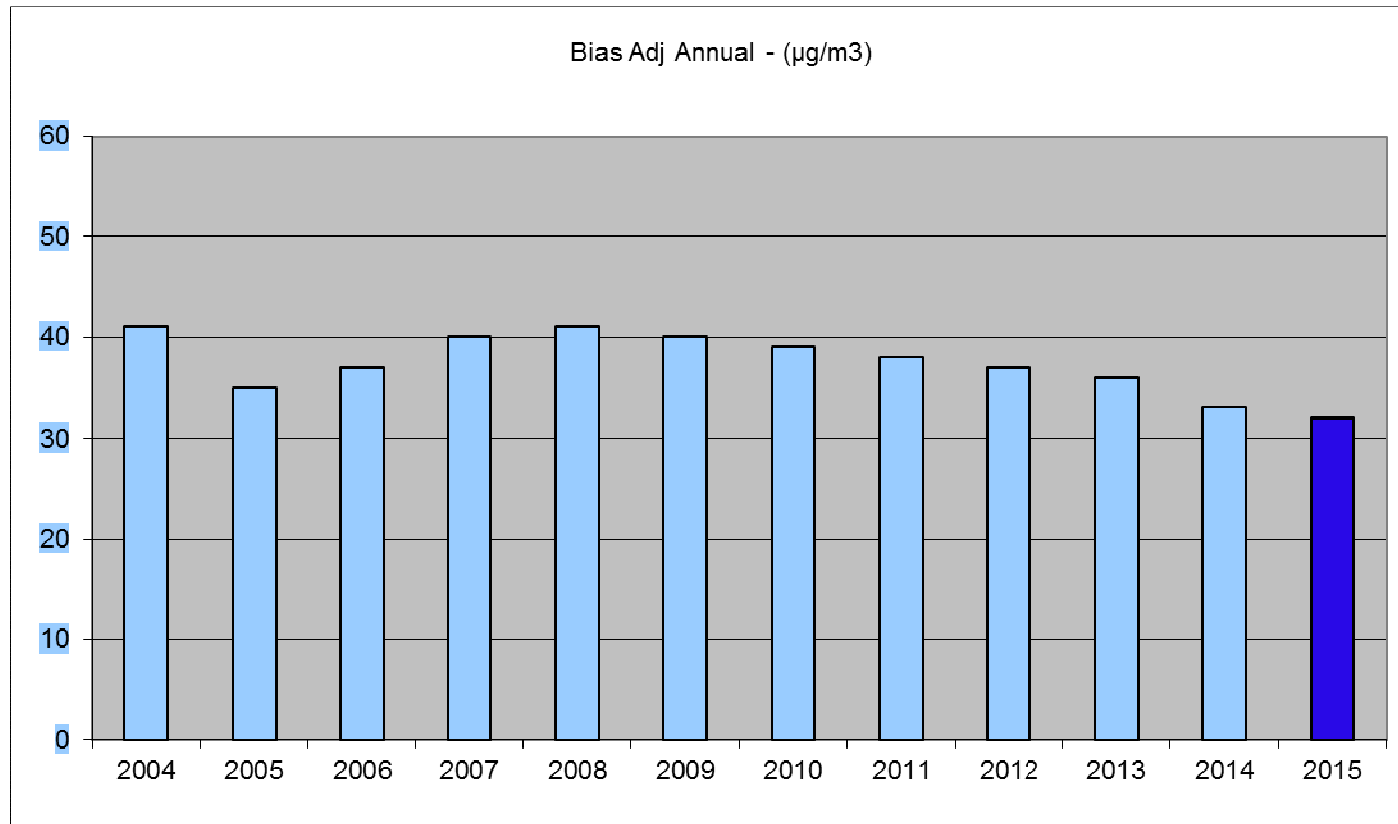


Figure E.8 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Beardall Street, Hucknall

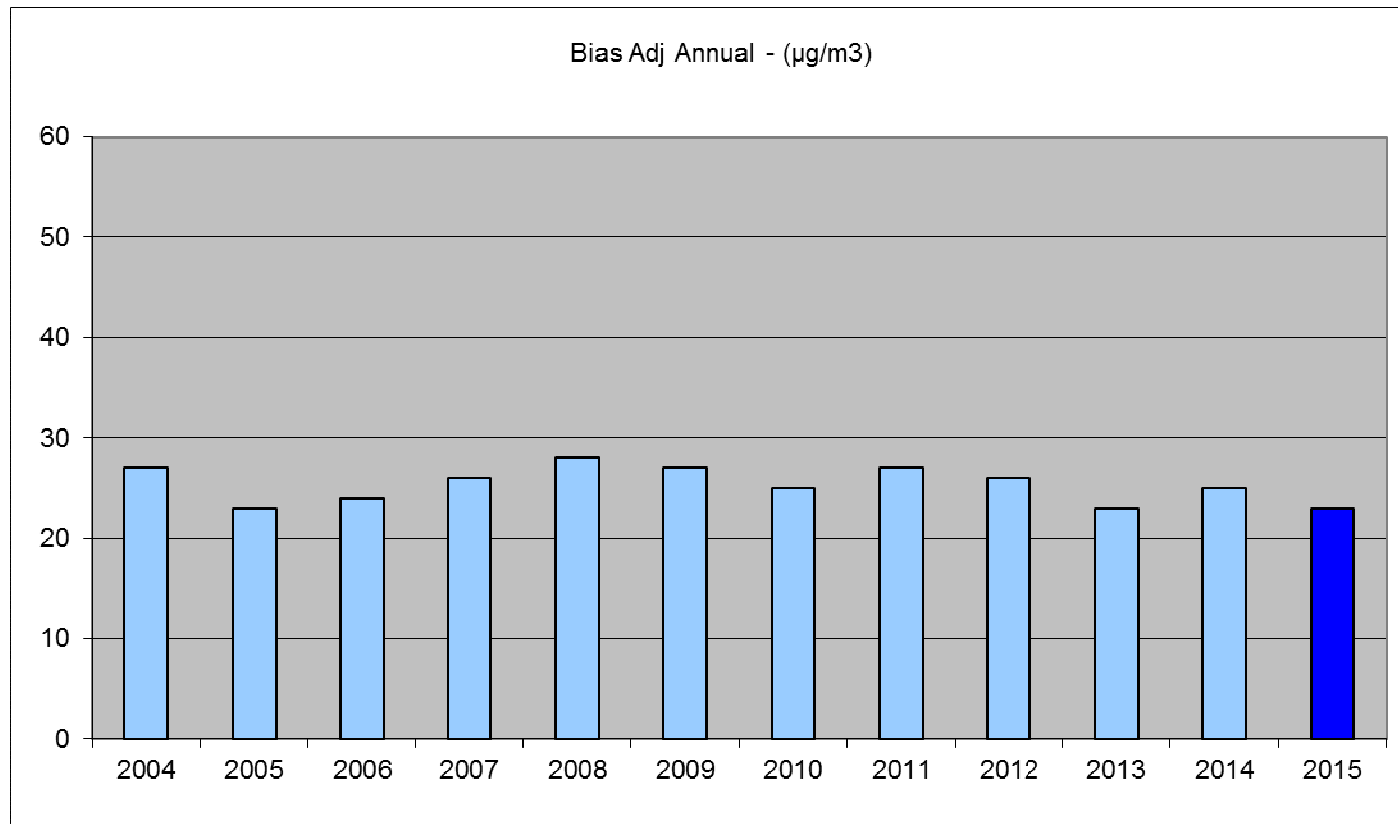


Figure E.9 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Station Road, Sutton in Ashfield

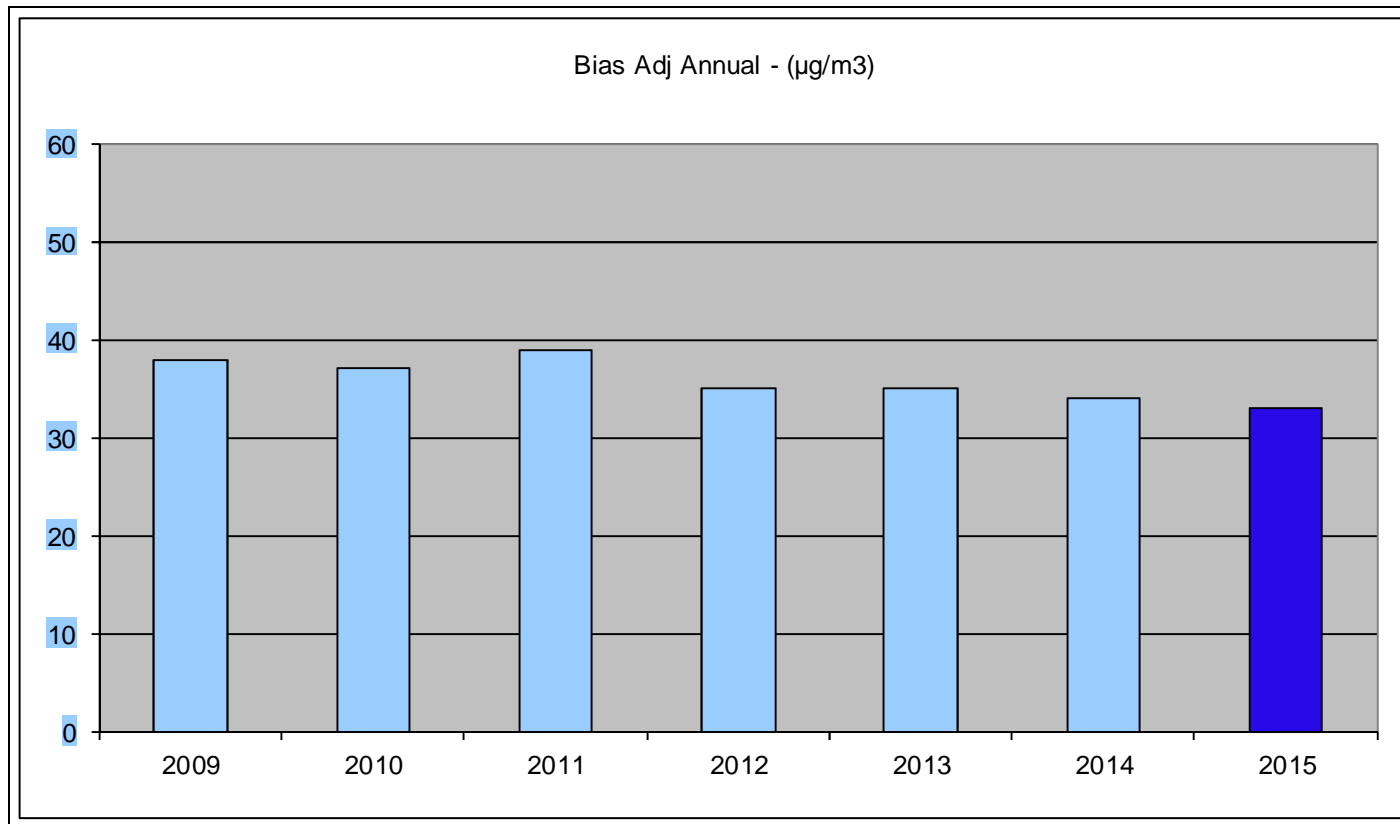


Figure E.10 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Huthwaite, Common Road

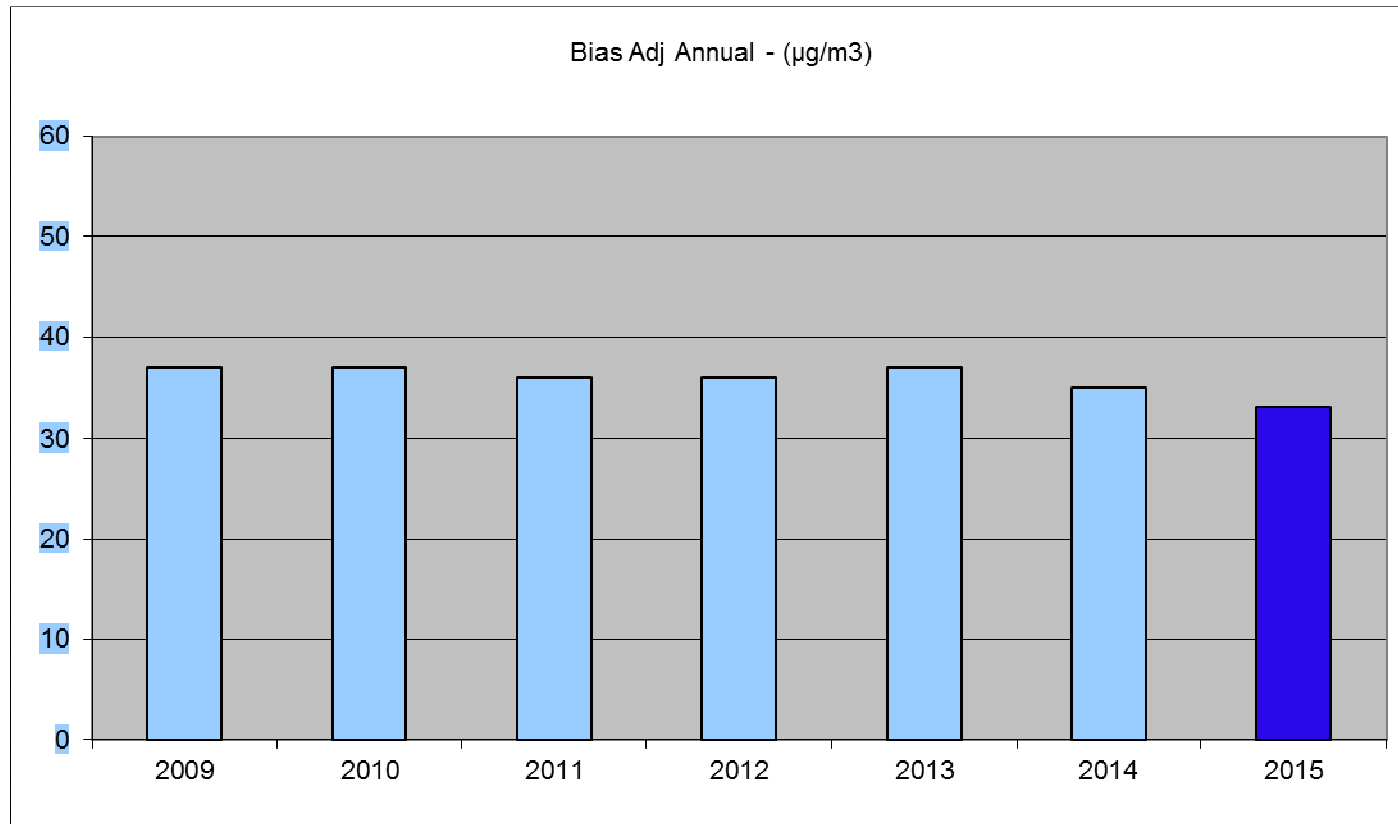


Figure E.11 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Badger Box, Annesley

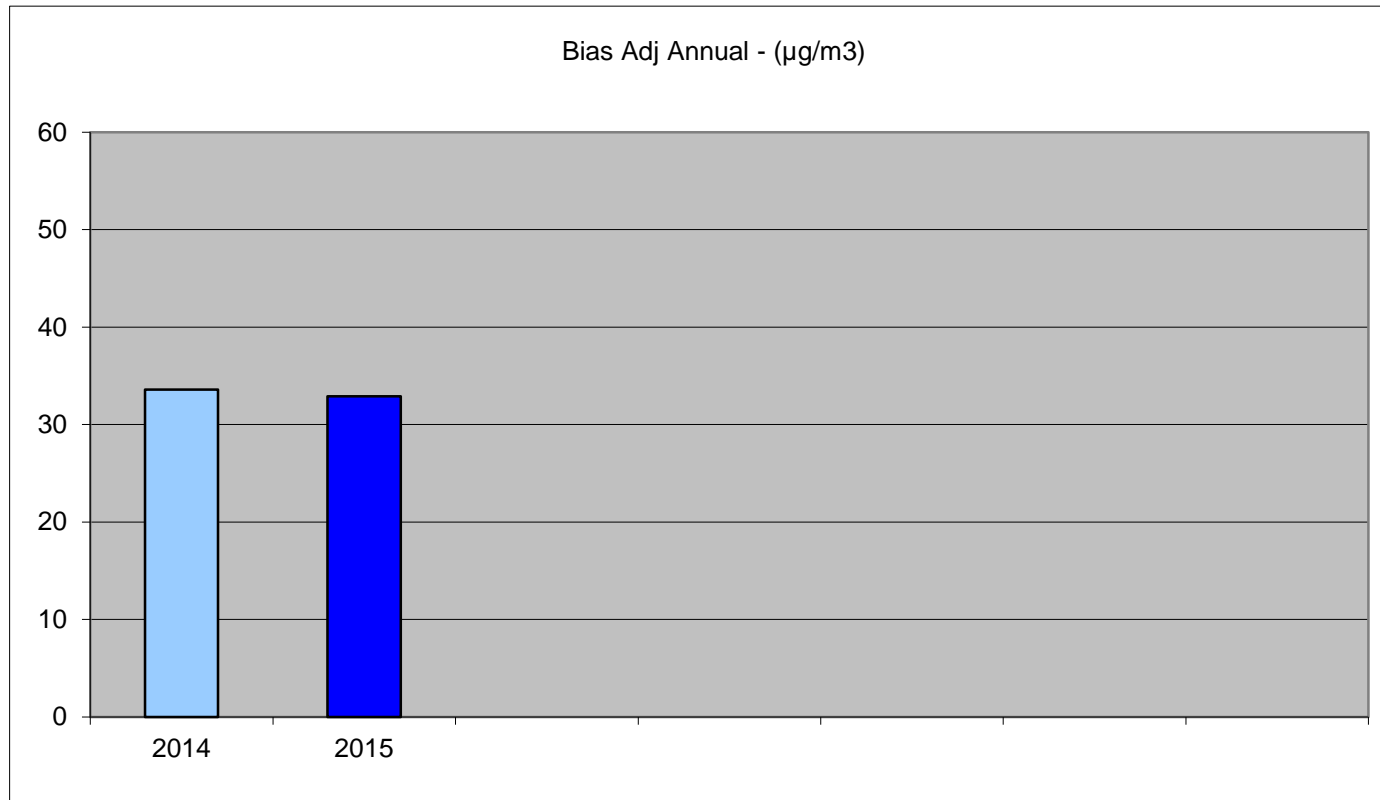


Figure E.12 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Croft Primary, Sutton in Ashfield

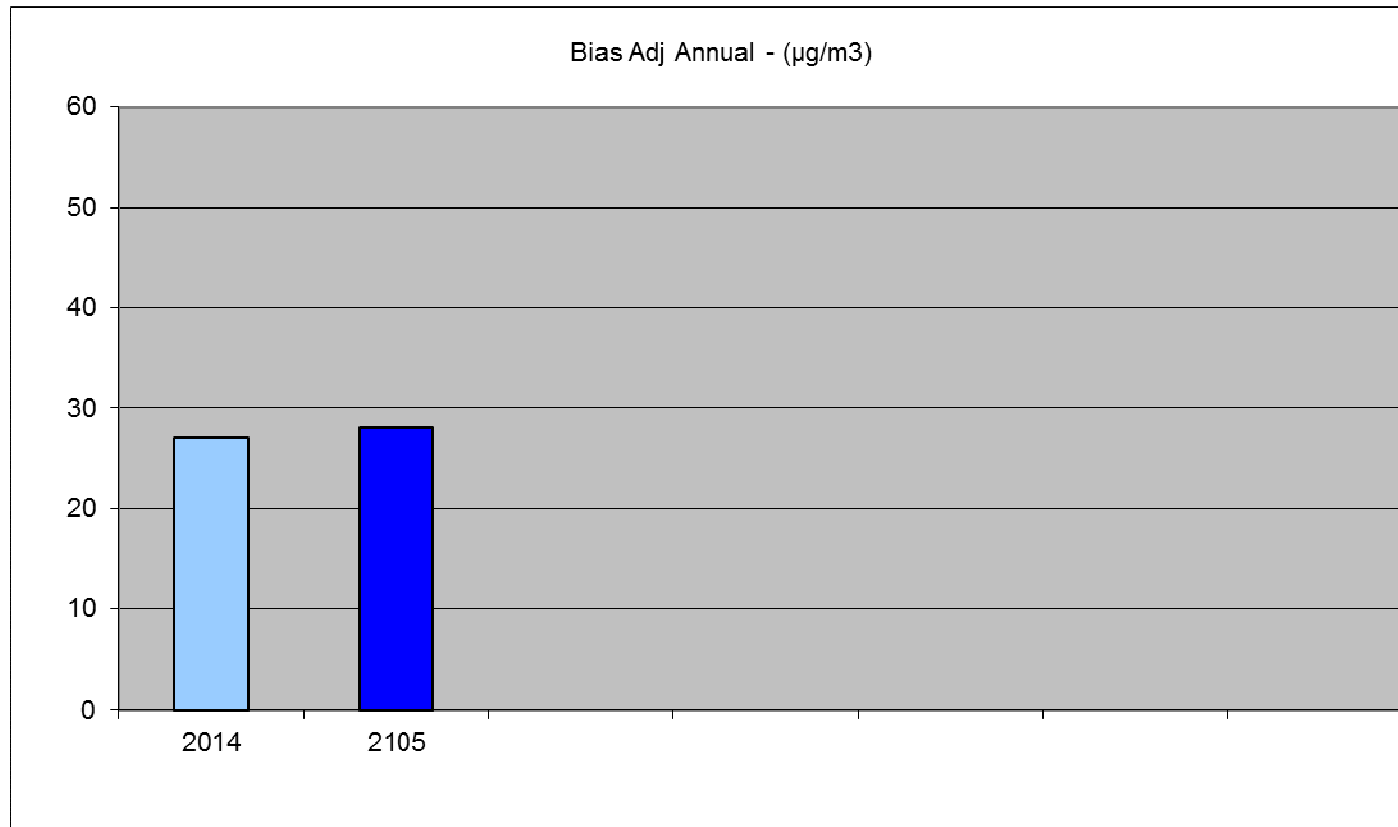


Figure E.13 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Lowmoor Road, Kirkby in Ashfield

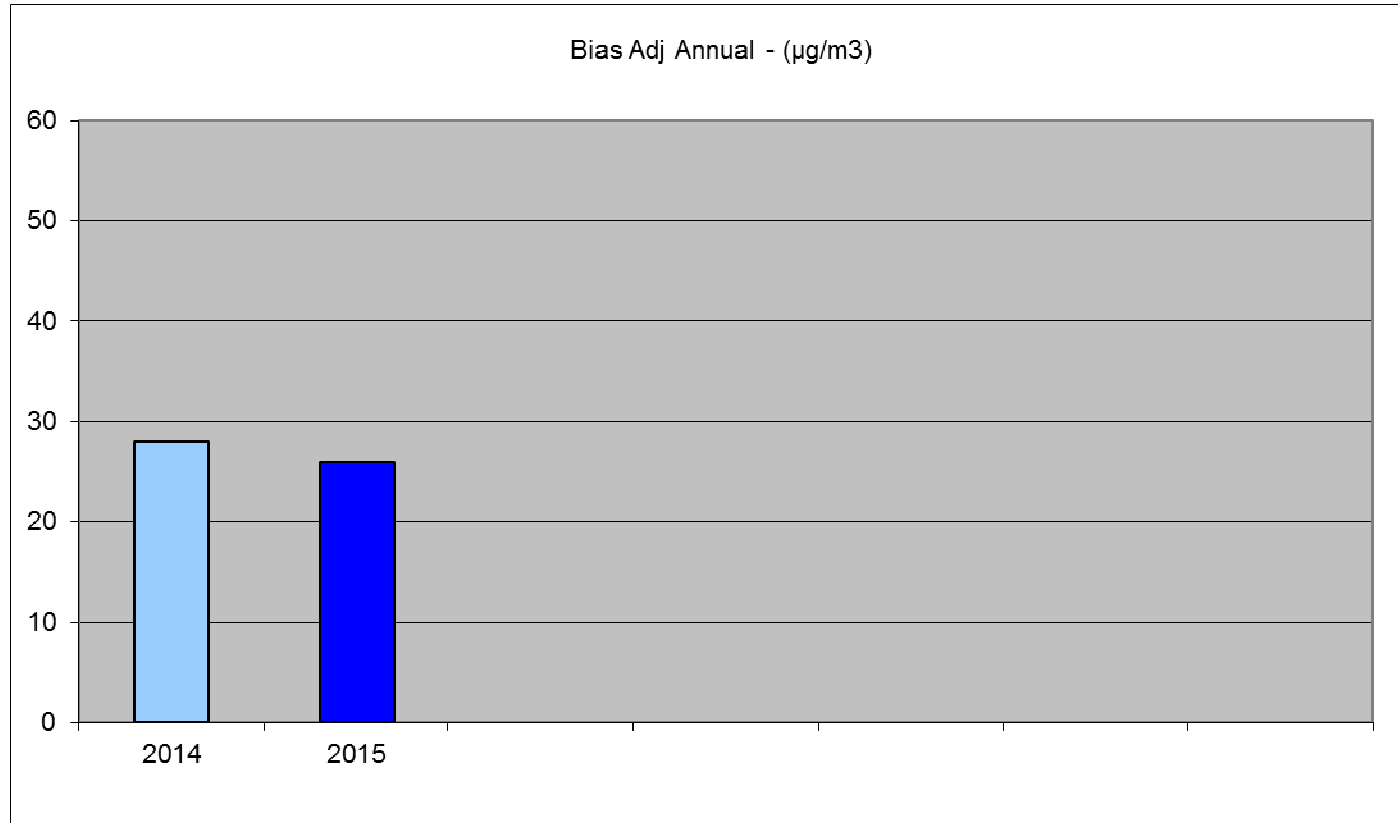


Figure E.14 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Chapel Street, Kirkby in Ashfield

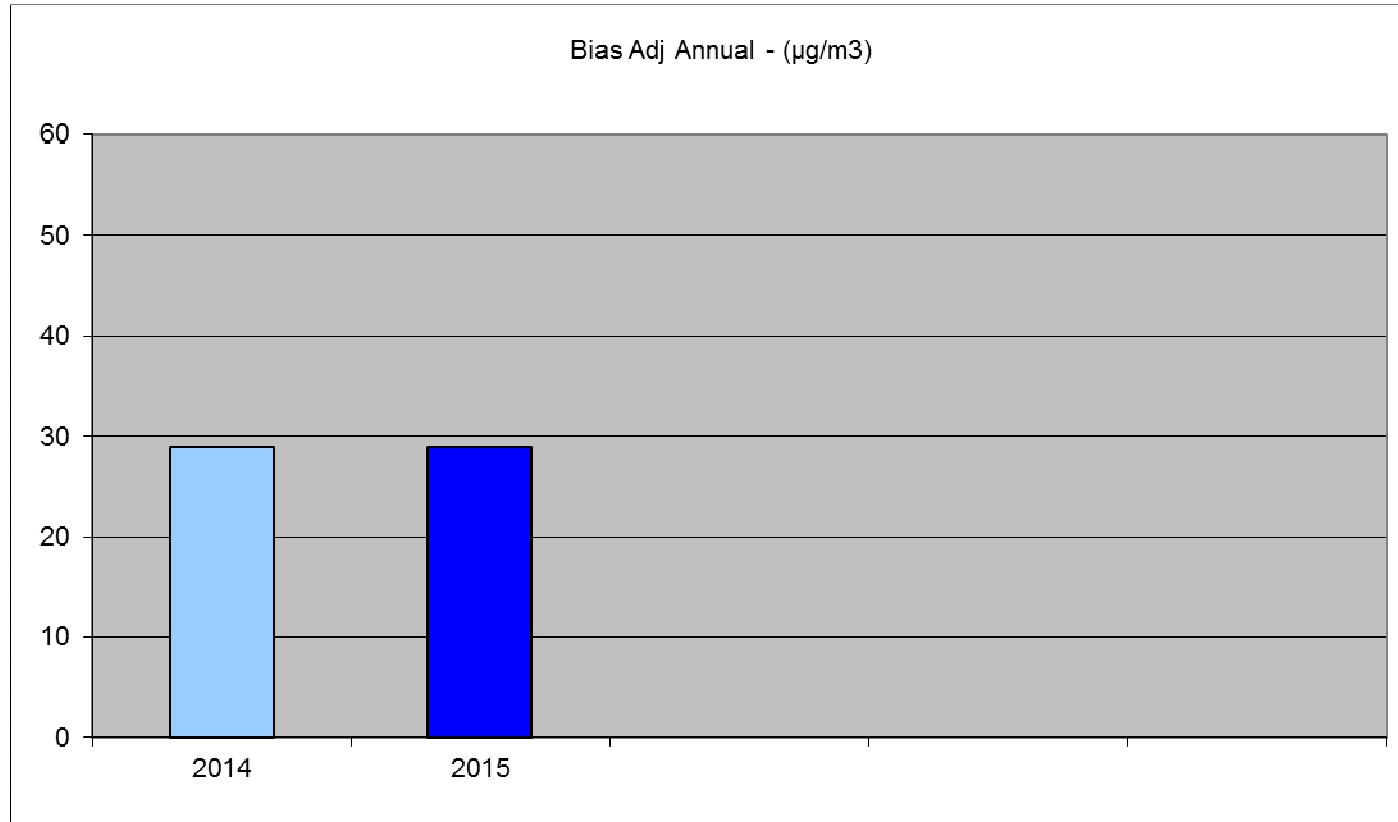
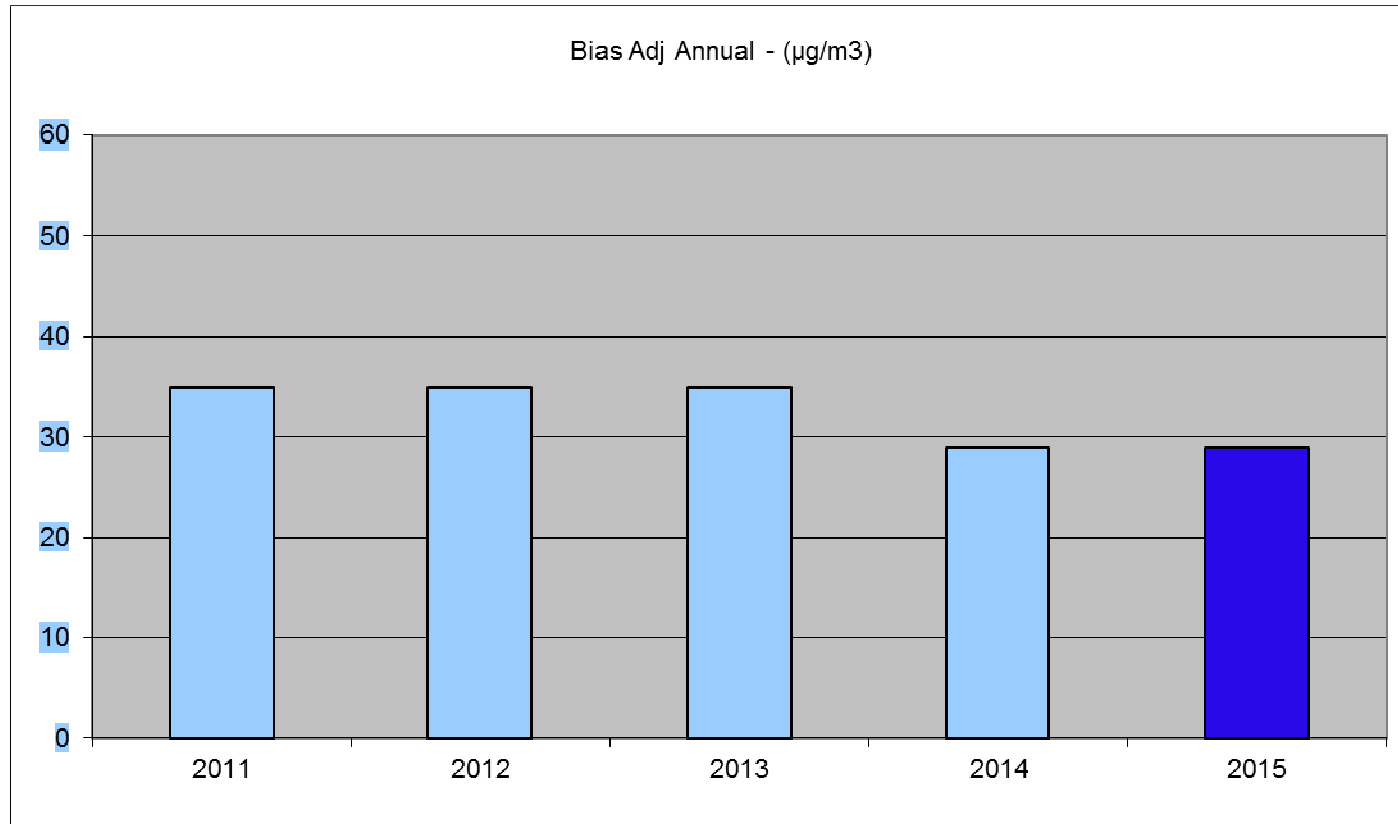


Figure E.15 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Stoneyford Court, Sutton in Ashfield



Appendix F: Summary of Air Quality Objectives in England

Table F.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 microgrammes of pollutant per cubic metre of air (µg/m³).

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