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Ashfield
DISTRICT COUNCIL

2019 Air Quality Annual Status Report (ASR)

For Ashfield District Council
In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management
30th June 2019

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Report Reference Number	**ADC/ASR (1) 2019**
Date	**30th June 2019**

Executive Summary - Air Quality in Our Area

Air Quality in Ashfield

Air Quality is an issue that is becoming one of increasing concern for the 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 in relation to Local Air Quality Management.

In February 2018 the Authority received a Ministerial Direction following an exceedance of an Air Quality Objective along a stretch of the A38 for roadside nitrogen dioxide concentration as identified by the governments Climate Pollution Mapping Model. The Authority employed Bureau Veritas to model and validate the air quality and traffic data and to submit the final feasibility study to JAQU. The

[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

feedback from DEFRA indicated that the road link identified in the feasibility study became compliant with legal limits in 2017 and they approved this conclusion.

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, Public 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 2018 and again the District of Ashfield continues to meet the air quality objectives set by National Government in relation to Local Air Quality Management. However, this is not the case nationally and now local authorities are 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, the new draft Nottinghamshire Air Quality Strategy has been reviewed and amended by the public health team at Nottinghamshire County Council. It is now waiting final review by the public health team at Nottingham City Council and Environmental Health Chief Officers.

- As an Authority Ashfield District Council has promoted the use of more sustainable forms of transport within its operational fleet, as a means of reducing the effects of detrimental Air Quality. The Council started to use electric bin lifts, fitted to its refuse collection vehicles in 2011 and now operates 14 vehicles, 70% of its refuse collection vehicles. The Council obtained its first full electric van in 2015 and continues to evaluate the opportunity to convert further vehicles to hybrid or full electric as they become widely available from the vehicle manufactures. There have been no changes to the transport fleet during 2018 whilst the service has been undergoing a comprehensive review. Transport fleet renewals are now being looked at providing an opportunity to increase the electric or hybrid fleet. All new van renewals are to the Euro 6 Standard for engines.

- The Council encourages the bike to work scheme for all employees and provide facilities to encourage employees to cycle to work.

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

Conclusions and Priorities

During 2018, 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 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 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 air 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 promoting electric and hybrid vehicles, the government is also 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 particulates 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 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 2018. 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 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. For reference, a map of Ashfield District Council's monitoring locations is available in Appendix D

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

The report sets out the Annual Status Report, which forms part of the Review & Assessment process required under the Environment Act 1995 and subsequent Regulations.

Defra's appraisal of last years ASR concluded 'The Local Authority monitors for nitrogen dioxide at 17 diffusion tube sites. There are no measured exceedances of the annual mean objective and therefore no requirement to declare an Air Quality Management Area. The majority of sites have seen decreases in nitrogen dioxide annual mean concentrations between 2016 and 2017.

The Local Authority outlined a number of measures that they are implementing alone or with Nottingham City or the County Council to improve air quality including the Nottinghamshire Air Quality Strategy, which was still waiting to be approved by Nottinghamshire

County Council. Several of the measures relate to promoting low emission transport and education. The local authority as strong links with Public Health and is working with regional groups to develop air quality strategies.

The Local Authority had been requested to submit a feasibility study to Defra after receiving a Ministerial direction following a projected exceedance of an Air Quality Objective for roadside Nitrogen Dioxide concentration, which had been identified by the governments Climate Pollution Mapping Model.

Ashfield District Council has taken forward a number of measures during the current reporting Year of 2018 in pursuit of improving air quality. Details of the measures completed, in progress or planned are set out in Table 2.1.

Progress on measure one, which was the development of an Air Quality Planning Guidance Document, has not moved forwards over the last year. The Development of an Air Quality Planning Guidance Document remains an option and Table 2.1 has been updated with a more realistic timescale. The adoption of the Local Plan is currently a priority for the forward planning team. As a result of undertaking a feasibility study for DEFRA following the submission of a targeted feasibility study an informal agreement has been developed regarding the promotion and installation of electric charging points

Ashfield District Council can confirm that measure two, which was the development of an updated Nottinghamshire Air Quality Strategy, is still ongoing but made, some progress. The Public Health Team at Nottinghamshire County Council amended the Strategy document before being presented to the Nottinghamshire Environmental Protection Working Group in January 2019. The Strategy document as now been circulated to the Public Health Team at Nottingham City Council and to the Chief Environmental Health Officers group for their review and approval.

Measure three is ongoing and through the work of the Nottinghamshire Environmental Protection Working Group, the Environmental Protection Team at Ashfield have developed closer working links with the Public Health Team at Nottinghamshire County Council.

Measure four is an ongoing measure, 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. Ashfield District Council participated in an event lead by the public health team at Nottinghamshire County Council and focussed on some of the learning outcomes around the completion and submission of a feasibility study to Defra as a response to a Ministerial direction in February 2018 due to an exceedance of an Air Quality Objective.

Measure Severn is the promotion of electric vehicle technologies by the development of EV recharging infrastructure across the Ashfield District. This is an ongoing measure but progress has been made. By working with the development control team a new petrol station on the A38 has installed the basic infrastructure for a charging point although they fell short of installing the actual charging unit. In addition, the Designer Outlet plans to install charging points as part of their carpark extension plans. The Environmental Protection Team will continue to use the development control process to develop the EV infrastructure. In addition, the Council is in the process of using grant money to install ten charging units in Council Car parks at four different locations across the district, this includes the installation of two rapid chargers.

No progress has been made on measures five and six, which is the promotion of low emission transport through specific licensing conditions. Currently there are no specific conditions promoting Euro 5 petrol, Euro 6 diesel and electric vehicles although the operator licence uses surcharges to promote low emission vehicles and prohibits the use of older vehicles.

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	2018 - 2019	2019-2021	N/A	Not Known	None	2021	
2	Development of a Nottinghamshire Air Quality Strategy	Working with Regional Groups to develop Area Wide Strategies	Control	Nottingham City	Started	Started September 2016 following a second workshop with Development Control and Lead Councillors from each Nottinghamshire Authority	N/A	Not Known	Draft copy amended and approved by NCC Public Health Team.	2019	Draft copy waiting approval from Nottingham City Public Health and Environmental Health Chief Officers Group
3	Working with Public Health England to promote public involvement.	Working with Regional Groups to develop Area Wide Strategies	Control	Nottinghamshire County Council Transport and Public Health England	Started	Ongoing	N/A	Not Known	Started	Ongoing	
4	Undertake a promotional event around Clean Air Day 2019	Public Information	Control & Promoting Low Emission Transport	ADC	Sept - Dec 2018	Spring 2019	N/A	Not Known	None	Ongoing	
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	Not Known	Euro 5 for Petrol Euro 6 for Diesel
6	New Taxi Licencing Policy to include low emission vehicles	Taxi Licencing Conditions	Promoting Low Emission Transport	Newark and Sherwood	Started	2018-2019?	N/A	Yes in some Nottinghamshire Authorities	None	Not Known	Electric Vehicles
7	Developing the EV Charging infra structure within Ashfield	Promoting Low Emission Transport	EV Recharging	ADC	Discussions Started	2018 onwards	N/A	Not Known	Started	Ongoing	

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 2018 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 areas located within Ashfield for $PM_{2.5}$ particulate matter.

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

- 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. $PM_{2.5}$ particulate matter was considered when developing the new strategy. Working with Public Healh England through the East Midland Air Quality Network provided the opportunity to ensure that any guidance, measures and targets are based on up to date knowledge and provided the opportunity to link the Nottinghamshire Air Quality Strategy with the latest public health outcomes.

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

3.1 Summary of Monitoring Undertaken

During 2018, the District of Ashfield continued to meet the air quality objectives set by National Government based on monitoring data.

There have been a number of changes to the monitoring strategy during 2018. Diffusion tube monitoring at Lowmoor Road Kirkby and Chapel Street Kirkby was stopped. The monitoring at the Chapel Street site had taken place for four years and the recorded levels of nitrogen dioxide were consistently below 30 µg/m^3. The monitoring at the Lowmoor Road site had taken place for four years and the recorded levels of nitrogen dioxide were consistently below 30 µg/m^3.

During 2018, the Council started monitoring nitrogen dioxide using single diffusion tubes at three new locations Kingsway in Kirkby in Ashfield, Alfreton Road in Sutton in Ashfield and on Stoneyford Road in Stanton Hill. The Kingsway site was chosen following concern regarding queuing traffic in a partial street canyon adjacent to upper floor flats. The Alfreton Road site was selected because of the Ministerial direction in February 2018 due to an exceedance of an Air Quality Objective along a stretch of the A38. The site was selected to understand the levels of traffic using Alfreton Road to access the A38. The new location in Stanton Hill was selected as a result of a number of new planning applications for both commercial and housing developments and concerns that increases in road traffic could result in higher levels of detrimental air quality.

The Council also undertook monitoring nitrogen dioxide using triplicate diffusion tubes at two locations on the A38 as a consequence of the Ministerial direction. These locations were selected to monitor roadside emissions and were not strictly part of the Councils LAQM monitoring regime but the results have been recorded in the report.

3.1.1 Automatic Monitoring Sites

Ashfield District Council undertook no automatic (continuous) monitoring during 2018.

3.1.2 Non-Automatic Monitoring Sites

Ashfield District Council undertook non- automatic (passive) monitoring of NO_2 at 19 locations during 2018. 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 C.

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 2018 dataset of monthly mean values is provided in Appendix B.

During 2018, 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 2018.

3.2.3 Particulate Matter ($PM_{2.5}$)

No monitoring of Particulate Matter ($PM_{2.5}$) was carried out within the district during 2018.

3.2.4 Sulphur Dioxide (SO_2)

No monitoring of Sulphur Dioxide was carried out within the district during 2018.

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	No	3	1.5	No	2
Tube 5	Dalestorth Street Sutton	Roadside	450062	359653	NO_2	No	1.7	1	No	2
Tubs 7	A38 Sutton	Other	448987	357610	NO_2	No	10	2.5	No	2
Tube 10/11/12	Church Hill Kirkby	Kerbside	448968	355816	NO_2	No	1.5	0.5	No	2
Tube 14	M1 Pinxton	Other	446492	355266	NO_2	No	28	22	No	2
Tubes 41,42,43	Ashgate Road Hucknall	Roadside	454057	348989	NO_2	No	2.8	3.5	No	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 22	Station Road Sutton	Other	450259	358512	NO_2	No	12.7	2.4	No	2
Tube 23	Common Road Huthwaite	Roadside	446827	358508	NO_2	No	2.4	2.4	No	2
Tube 27/28/ 29	Badger Box Annesly	Roadside	450844	353799	NO_2	No	9	2	No	2
Tube 31	Sutton Croft Primary	Kerbside	449850	358779	NO_2	No	4.5	2.5	No	2
Tube 35	Sutton Stoneyford Court	Roadside	449812	359577	NO_2	No	6	3.5	No	2
Tube 37/38/ 39	Kirkby Cross	Roadside	449017	356204	NO_2	No	0.5	0.5	No	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 40	Mansfield Road Selston	Roadside	447037	353573	NO_2	No	2.8	1.5	No	2
Tube 44	Mansfield Road Sutton in Ashfield	Roadside	449923	359563	NO_2	No	1.6	0.5	No	2
Tubes 45/46/47	Fulwood Cutting A38	Roadside	446696	357325	NO_2	No	4.8	12.0	No	2
Tube 48	Alfreton Road Sutton In Ashfield	Roadside	447831	357752	NO_2	No	2.6	1.5	No	2
Tubes 49/50/51	A38 Snipe	Roadside	447726	357505	NO_2	No	67	1.7	No	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 52	Kingsway Kirkby In Ashfield	Kerbside	450698	355953	NO_2	No	2	1	No	2
Tubes 53/54/55	A38 Snipe	Roadside	447726	357505	NO_2	No	12	2	No	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 2018 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2014	2015	2016	2017	2018
Tube 4 Outram Street Sutton	Urban Centre	Diffusion Tube		92%	29.0	27.8	31.2	29.6	29.0
Tube 5 Dalestorth Street Sutton	Roadside	Diffusion Tube		92%	33.3	31.9	33.8	30.4	31.5
Tube 7 A38 Sutton	Other	Diffusion Tube		100%	26.6	25.7	28.3	24.0	25.2
Tube 10/11/12 Church Hill Kirkby	Kerbside	Diffusion Tube		100%	39.0	37.1	**40.6**	35.3	35.2
Tube 14 M1 Pinxton	Other	Diffusion Tube		100%	28.7	27.6	28.0	29.3	28.9
Tubes 41,42,43 Ashgate Road Huchnall	Roadside	Diffusion Tube		92%	24.8	24.3	24.5	26.3	23.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
Tube 22 Station Road Sutton	Other	Diffusion Tube		100%	33.7	32.9	32.3	33.4	31.8
Tube 23 Common Road Huthwaite	Roadside	Diffusion Tube		100%	34.8	33.2	34.1	33.5	32.7
Tube 27/28/29 Badger Box Annesley	Roadside	Diffusion Tube		100%	33.6	32.9	34.9	34.7	33.0
Tube 31 Croft Primary Sutton	Kerbside	Diffusion Tube		100%	26.5	27.8	28.8	27.0	27.4
Tube 35 Stoneyford Court Sutton	Roadside	Diffusion Tube		100%	29.4	28.8	30.9	28.6	30.9
Tube 37/38/39 Kirkby Cross	Roadside	Diffusion Tube		100%	–	31.6	34.6	33.1	31.2
Tube 40	Roadside	Diffusion Tube		100%	–	–	29.0	24.7	27.0

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
Mansfield Road Selston									
Tube 44 Mansfield Road Sutton In Ashfield	Roadside	Diffusion Tube		100%	–	–	–	31.1	31.6
Tubes 45/46/47 Fullwood Cutting A38	Roadside	Diffusion Tube	92%		-	-	-	-	39.1
Tube 48 Alfreton Road	Roadside	Diffusion Tube	67%		-	-	-	-	26.6
Tubes 49/50/51 Snipe Loc1	Roadside	Diffusion Tube	50%		-	-	-	-	**57.1**
Tube 52 Kingsway Kirkby In Ashfield	Roadside	Diffusion Tube	58%		-	-	-	-	33.9
Tubes 53/54/55 Snipe Loc2	Roadside	Diffusion Tubes	16%		-	-	-	-	36.7

☑ **Diffusion tube data has been bias corrected**

☑ **Annualisation has been conducted where data capture is <75%**

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results – 2017

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 (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Tube 4		35.9	28.8	29.0	31.5	24.4	29.3	28.0	28.9	33.6	33.1	**40.6**	31.2	29.0	27.0
Tube 5	39.0	36.0	33.2	29.2	33.4		30.6	29.8	28.7	32.1	**41.4**	39.2	33.9	31.5	29.8
Tube 7	28.9	31.6	28.3	24.4	30.2	28.1	23.2	19.3	24.4	29.8	28.2	28.8	27.1	25.2	21.9
Tubes 10/11/12	37.3	39.4	35.2	34.9	**42.5**	38.9	23.3	38.0	**41.1**	**41.9**	**42.5**	39.0	37.8	35.2	31.0
Tube 14	34.4	35.2	28.3	31.7	23.5	21.5	28.8	31.1	33.3	34.0	36.8	34.4	31.1	28.9	27.6
Tubes 41,42,43	35.1	33.2	24.9	24.2	19.1	14.1	20.4	21.3	24.9	28.8		33.5	24.8	23.1	23.6
Tube 22	**42.9**	41.8	33.7	24.8	32.1	24.5	34.4	32.4	34.0	37.2	37.2	35.4	34.2	31.8	26.1
Tube 23	39.1	38.5	34.2	34.0	28.7	28.8	37.1	31.3	37.8	37.6	**44.1**	31.1	35.2	32.7	N/A
Tubes 27/28/29	**43.6**	39.5	32.8	33.7	30.5	25.7	34.5	36.3	**40.4**	38.8	34.6	36.3	35.5	33.0	27.4
Tube 31	37.7	34.4	27.1	26.6	24.0	19.3	26.4	23.6	29.0	33.1	35.0	37.5	29.5	27.4	25.7
Tube 35	37.9	37.1	30.4	29.3	30.1	24.8	**51.8**	27.9	28.7	30.2	35.6	34.2	33.2	30.9	28.6
Tubes 37/38/39	35.5	39.0	35.2	30.0	37.0	31.2	32.9	23.6	28.7	33.9	**40.8**	35.4	33.6	31.2	N/A
Tube 40	36.9	35.1	29.7	26.6	31.2	32.0	23.2	20.3	23.8	28.1	28.5	32.1	29.0	27.0	25.2

Tube 44	36.4	**40.6**	33.9	32.5	35.6	24.4	29.7	30.5	35.7	35.1	33.0	**40.8**	34.0	31.6	28.4
Tubes 45/46/47		**44.7**	44.3	39.8	36.2	32.8	**44.0**	39.7	**44.6**	**43.1**	**42.9**	**49.4**	**42.0**	39.1	32.9
Tube 48					25.35	17.94	21.95	22.88	27.55	31.42	33.55	31.98	26.6	26.6	25.3
Tubes 49/50/51					**52.7**	**42.9**	**50.5**	**51.9**	**55.7**	**54.4**			**51.4**	**57.1**	25.4
Tube 52						27.2	36.2	32.1	34.6	37.8	36.3	**40.2**	34.9	33.9	31.1
Tubes 53/54/55											**48.1**	**57.2**	**52.7**	36.7	27.8

✓ **National bias adjustment factor used**

✓**Annualisation has been conducted where data capture is <75%**

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.

Ashfield District Council implementing the Quality Assurance procedures, in the deployment, exposure and collection of the tubes, has reduced such factors as much as possible. 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 0.93**

Table C.1 Diffusion Tube Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet											Spreadsheet Version Number: 03/19
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 2019 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:	**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	**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 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[2]	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 undo your selection, choose (All) from the pop-up list	**Year[5]** To undo your selection, choose (All)	**Site Type**	**Local Authority**	**Length of Study (months)**	**Diffusion Tube Mean Conc. (Dm) (µg/m^3)**	**Automatic Monitor Mean Conc. (Cm) (µg/m^3)**	**Bias (B)**	**Tube Precision[6]**	**Bias Adjustment Factor (A) (Cm/Dm)**	
Gradko	20% TEA in water	2018		**Overall Factor[3] (30 studies)**				**Use**		**0.93**	

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)**		**15.7**	**µg/m^3**
Step 4		**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**29.0**	**µg/m^3**
Result		**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	**(Note 3)**		**27.0**	**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 µg/m^3)?**	**(Note 2)**		**15.4**	**µg/m^3**
Step 4		**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**31.5**	**µg/m^3**
Result		**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	**(Note 3)**		**29.8**	**µg/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)		15.6	$\mu g/m^3$
Step 4		What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		25.2	$\mu g/m^3$
Result		The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)		21.9	$\mu g/m^3$

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)		13.6	$\mu g/m^3$
Step 4		What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		35.2	$\mu g/m^3$
Result		The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)		31.0	$\mu g/m^3$

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)**		**19.0**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**28.9**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**27.6**	**$\mu g/m^3$**

Hucknall Ashgate Road (tube 19)

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)**		**2.8**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**14.0**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**23.1**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**23.6**	**$\mu g/m^3$**

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 µg/m^3)?**	**(Note 2)**		**17.9**	**µg/m^3**
Step 4		**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**31.8**	**µg/m^3**
Result		**The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor**	**(Note 3)**		**26.1**	**µg/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 µg/m^3)?**	**(Note 2)**		**17.1**	**µg/m^3**
Step 4		**What is your measured annual mean NO_2 concentration (in µg/m^3)?**	**(Note 2)**		**33.0**	**µg/m^3**

Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**27.4**	**$\mu g/m^3$**

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)**		**15.7**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**27.4**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**25.7**	**$\mu g/m^3$**

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 $\mu g/m^3$)?**	**(Note 2)**		**14.9**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**30.9**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**28.6**	**$\mu g/m^3$**

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)**		**14.2**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**27.2**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**25.2**	**$\mu g/m^3$**

Mansfield Road Sutton in Ashfield (Tube 44)

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)		1.6	metres
Step 3		What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		15.0	$\mu g/m^3$
Step 4		What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		31.6	$\mu g/m^3$
Result		The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)		28.4	$\mu g/m^3$

Fullwood Cutting A38 (Tube 45/46/47)

Step 1		How far from the KERB was your measurement made (in metres).	(Note 1)		4.8	metres
Step 2		How far from the KERB, is your receptor (in metres)?	(Note 1)		12.0	metres
Step 3		What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		16.2	$\mu g/m^3$
Step 4		What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)		39.1	$\mu g/m^3$
Result		The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)		32.9	$\mu g/m^3$

Alfreton Road Sutton in Ashfield (Tube 48)

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)**		**2.6**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**15.6**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**26.6**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**25.3**	**$\mu g/m^3$**

Kingsway Kirkby in Ashfield (Tube 52)

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)**		**2**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**13.7**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**33.9**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**31.1**	**$\mu g/m^3$**

Snipe Location 1(Tube 49/50/51)

Step 1		**How far from the KERB was your measurement made (in metres).**	**(Note 1)**		**1.7**	**metres**
Step 2		**How far from the KERB, is your receptor (in metres)?**	**(Note 1)**		**50**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**15.6**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**57.1**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**25.4**	**$\mu g/m^3$**

Snipe Location 2 (Tube 53/54/55)

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)**		**12**	**metres**
Step 3		**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**15.6**	**$\mu g/m^3$**
Step 4		**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	**(Note 2)**		**36.7**	**$\mu g/m^3$**
Result		**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	**(Note 3)**		**27.8**	**$\mu g/m^3$**

Short-term to Long-term Data Adjustment

The diffusion tube results for High Street Hucknall and Mansfield Road Sutton in Ashfield were annualised as Box 7.8 of TG 2016.

Alfreton Road Sutton In Ashfield

Long term site	Annual mean	Period mean	Ratio (Am/Pm)
Chesterfield Road Side	39.44	36.62	1.077
Nottingham Centre	42.84	39.81	1.076
Average (Ra)			1.077

Kingsway Kirkby in Ashfield

Long term site	Annual mean	Period mean	Ratio (Am/Pm)
Chesterfield Road side	39.44	38.12	1.035
Nottingham Centre	42.84	40.72	1.052
Average (Ra)			1.044

Snipe Location 1 Sutton in Ashfield

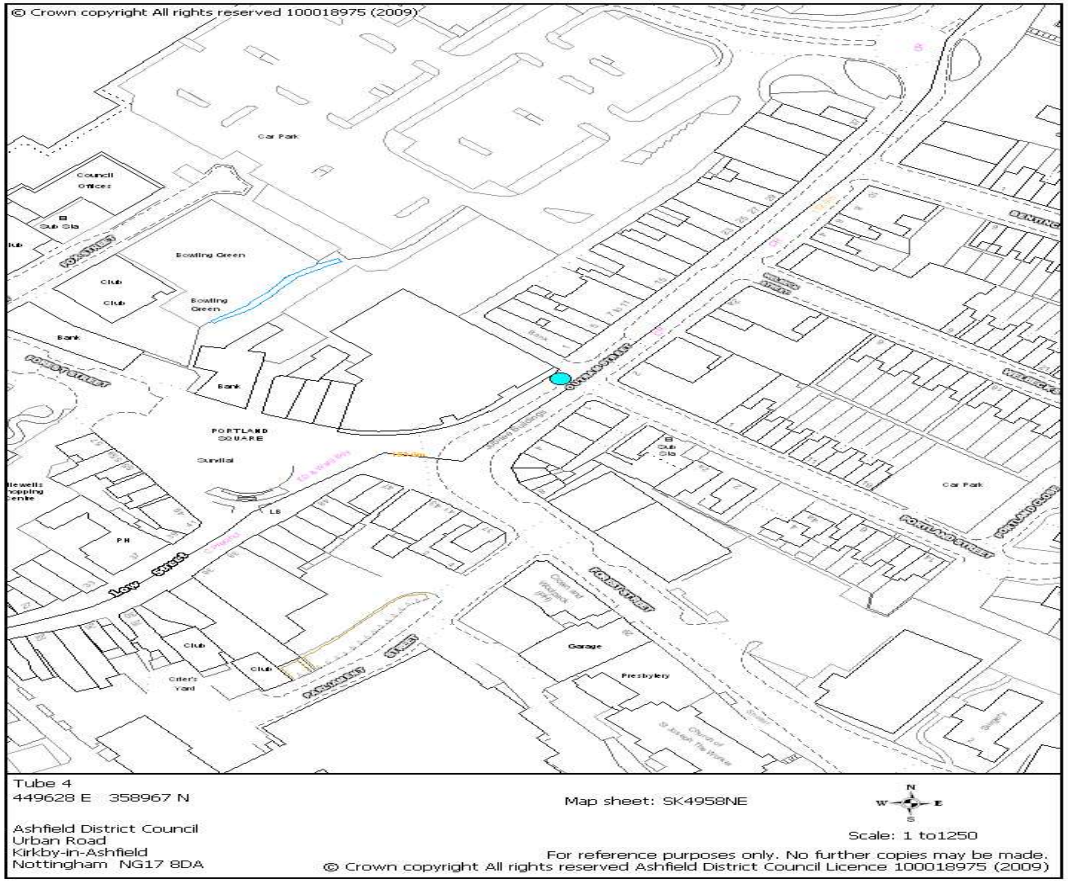
Long term site	Annual mean	Period mean	Ratio (Am/Pm)
Chesterfield Road side	39.44	36.40	1.084
Nottingham Centre	42.84	32.83	1.305
Average (Ra)			1.195

Snipe Location 2 Sutton in Ashfield

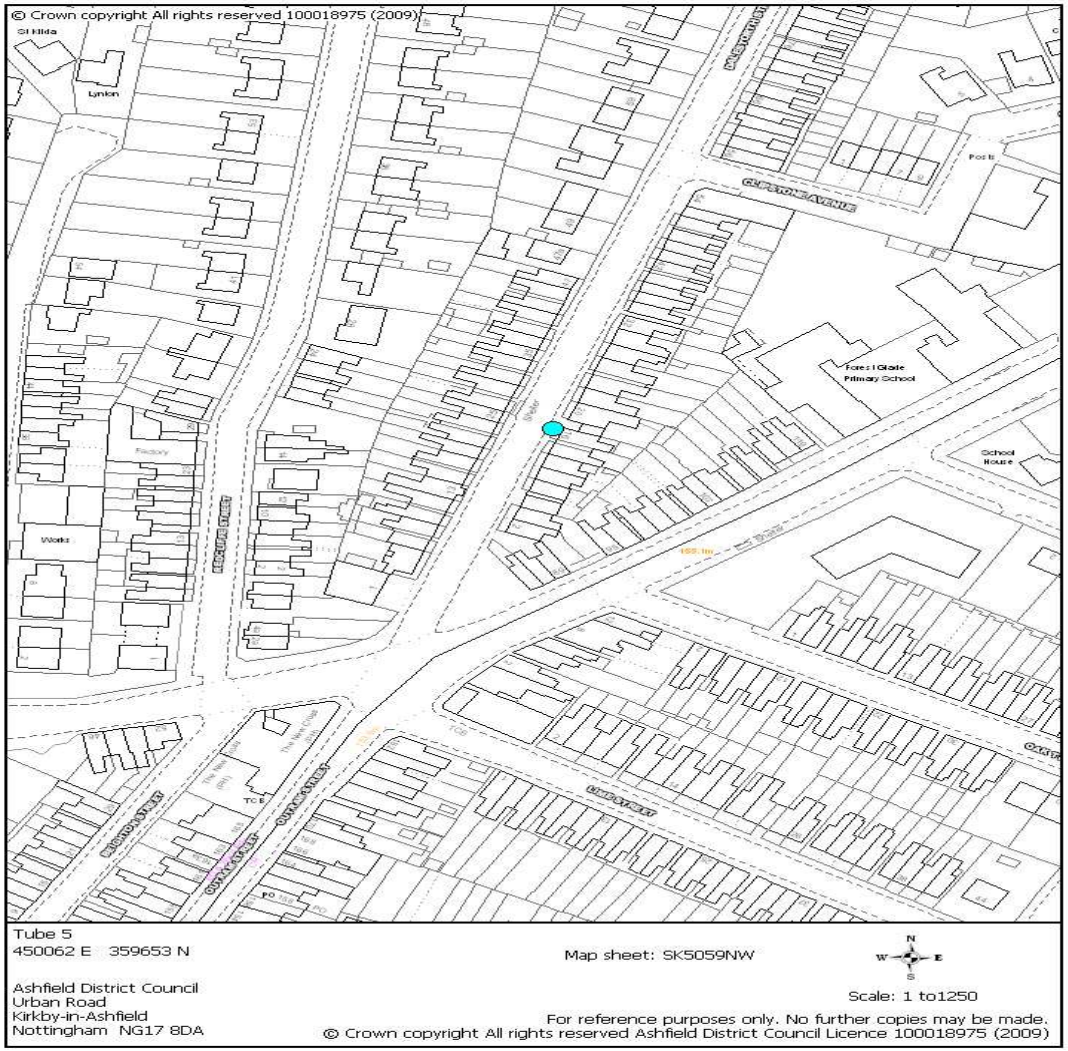
Long term site	Annual mean	Period mean	Ratio (Am/Pm)
Chesterfield Road side	39.44	53.54	0.737
Nottingham Centre	42.84	56.30	0.761
Average (Ra)			0.749

Appendix D: Maps of Monitoring Locations

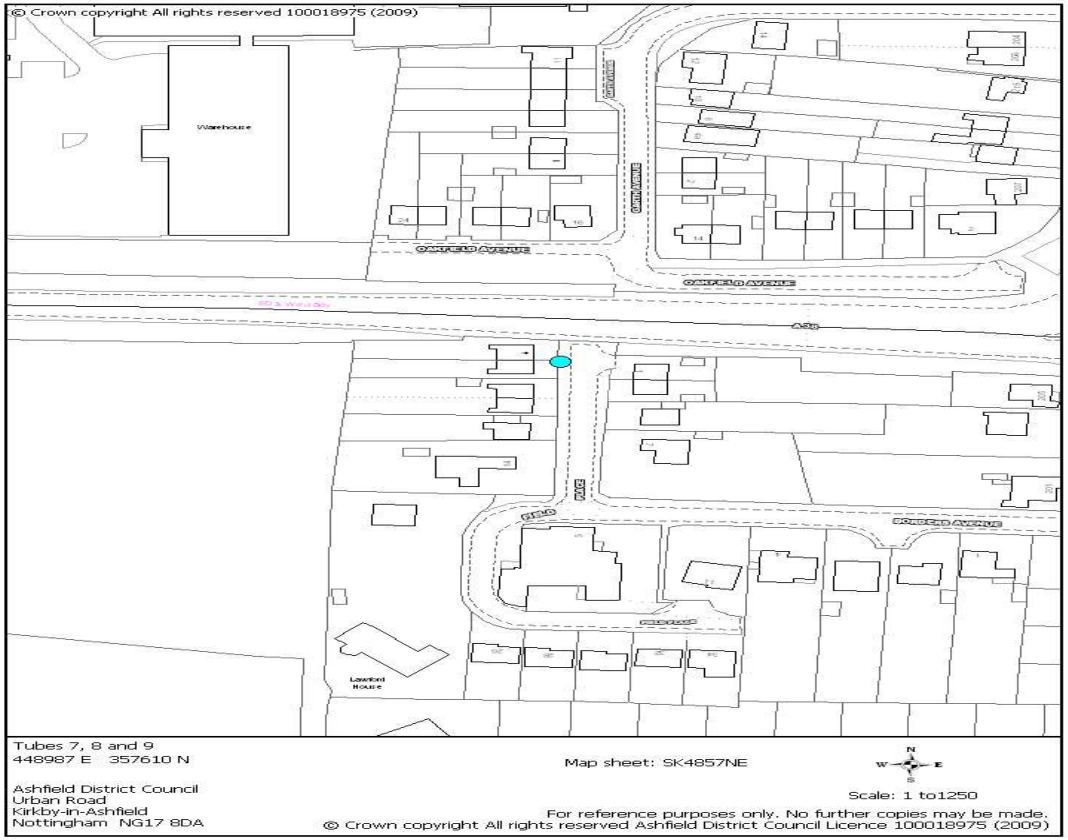
Location of Nitrogen Dioxide Diffusion Tube at Outram Street, Sutton



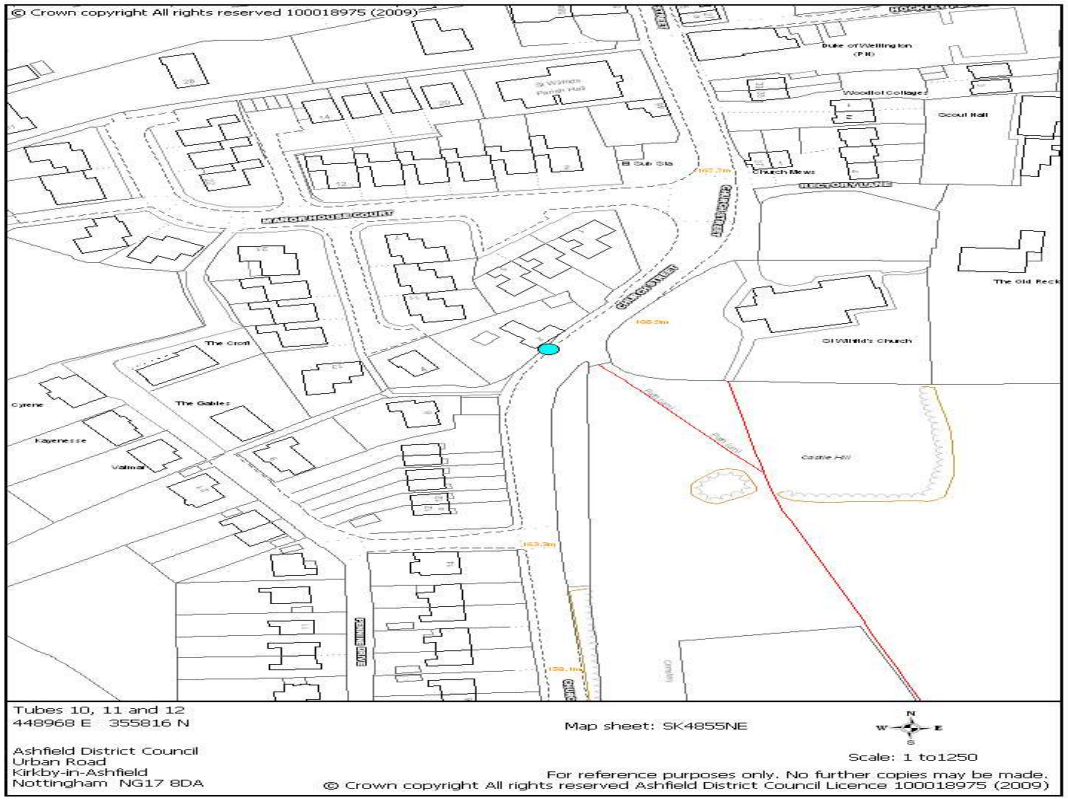
Location of Diffusion Tube at Dalestorth Street, Sutton



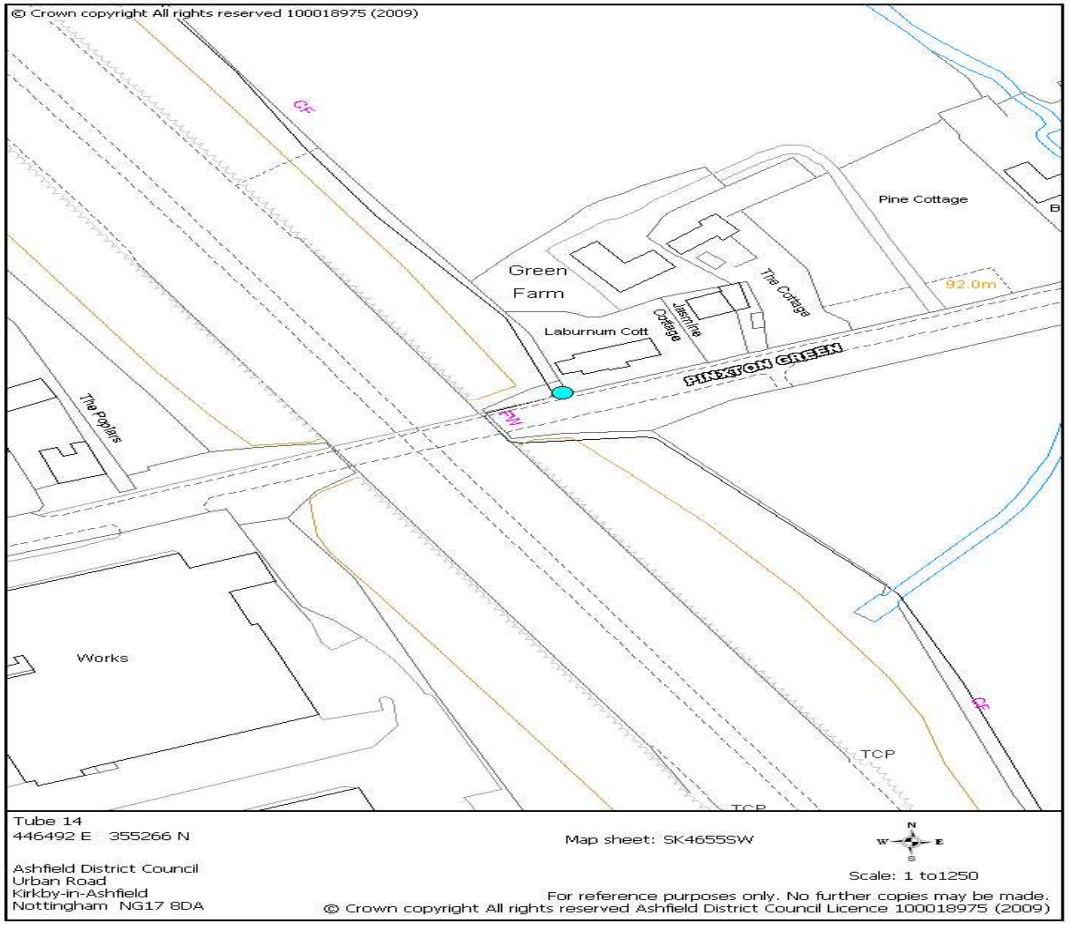
Location of Nitrogen Dioxide Diffusion Tubes at A38 Fire Station, Sutton



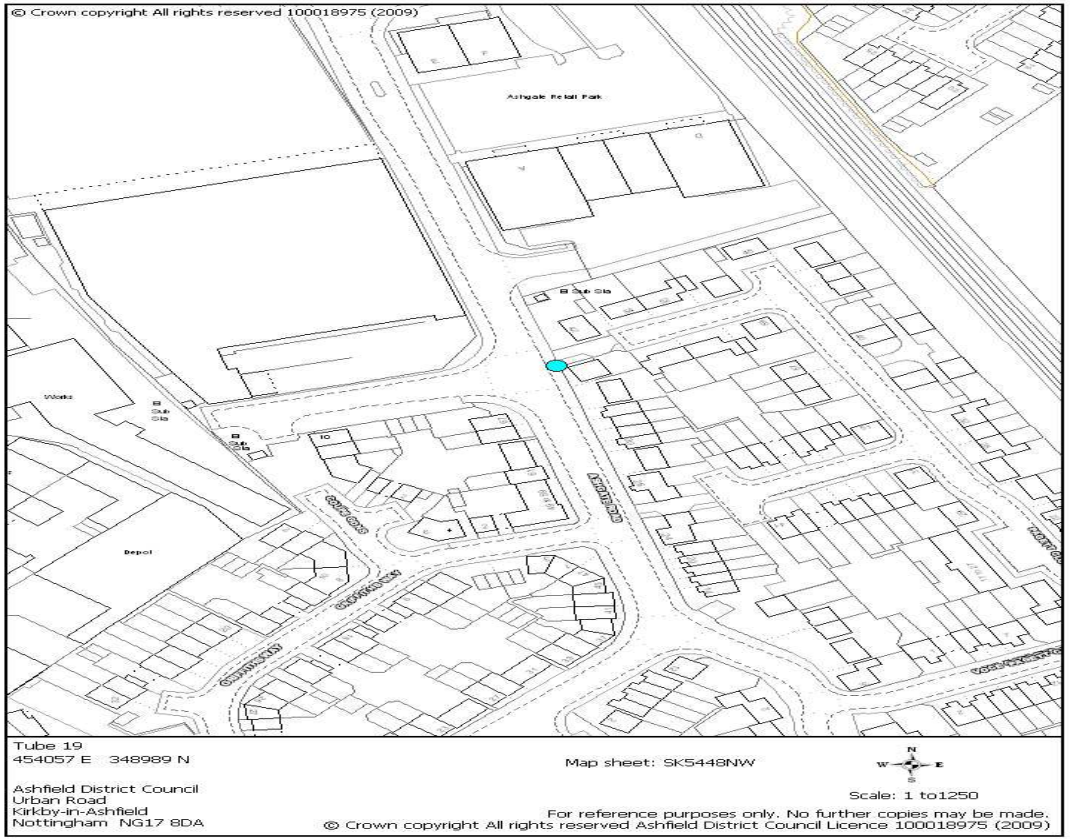
Location of Nitrogen Dioxide Diffusion Tubes at Church Hill, Kirkby



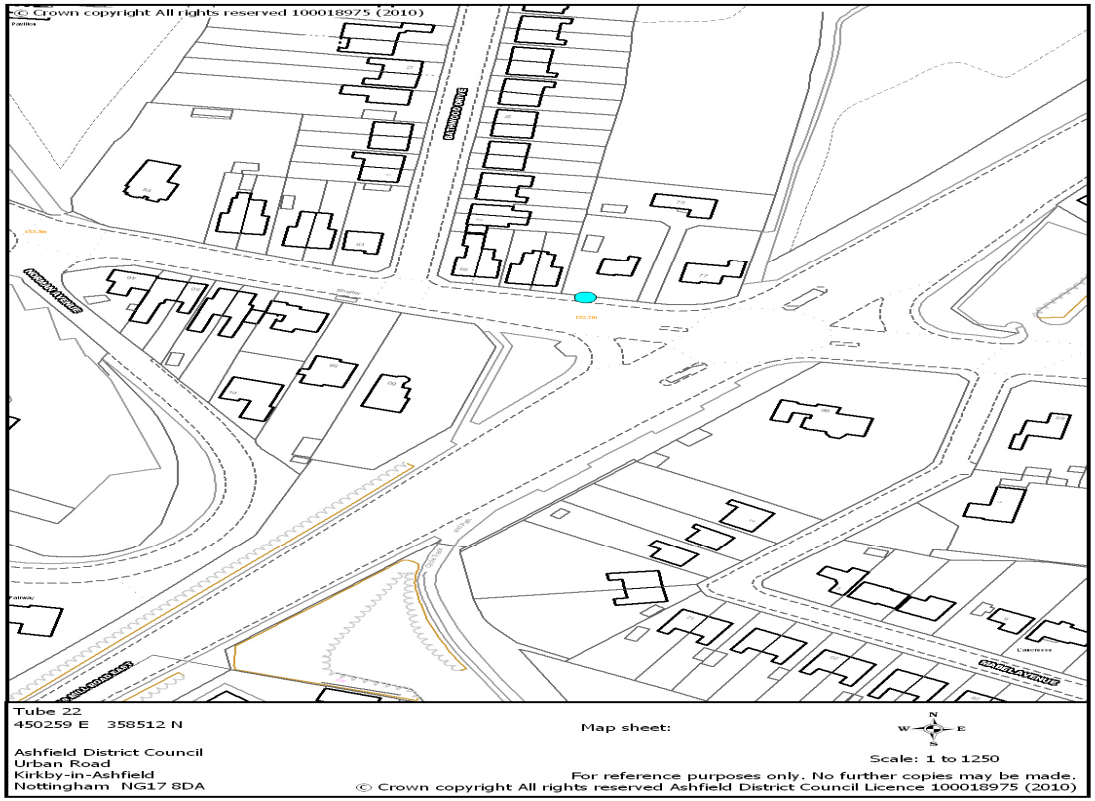
Location of Nitrogen Dioxide Diffusion Tube at M1 Pinxton



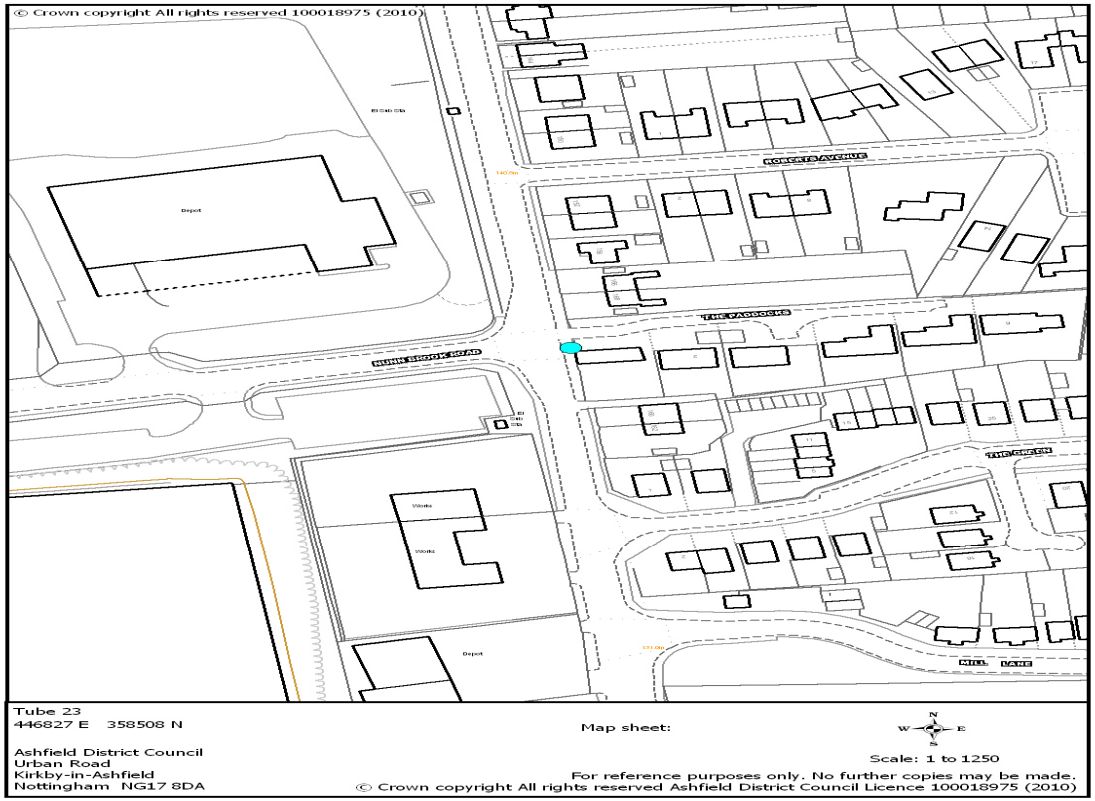
Location of Nitrogen Dioxide Diffusion Tube at Hucknall Ashgate Road



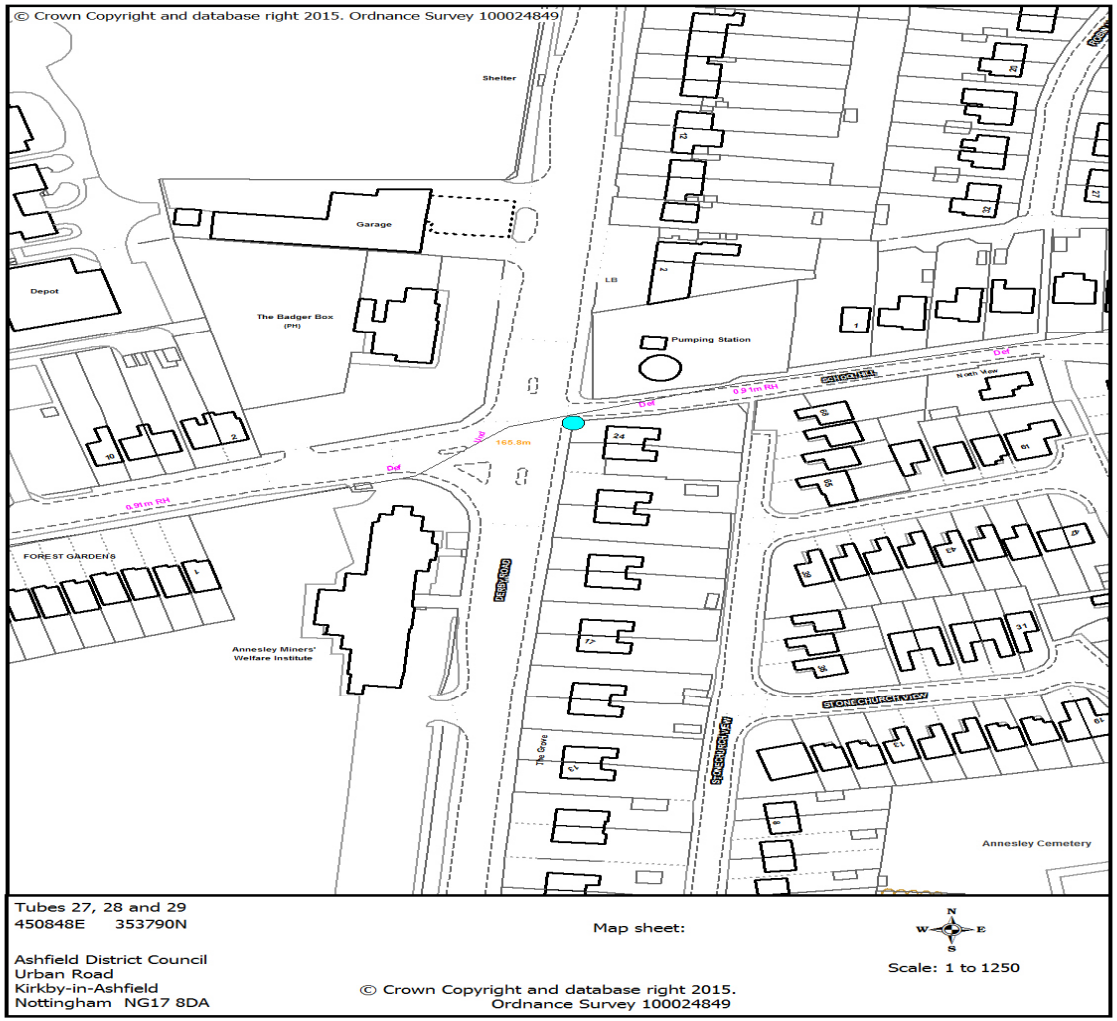
Location of Nitrogen Dioxide Diffusion Tube at Station Road, Sutton



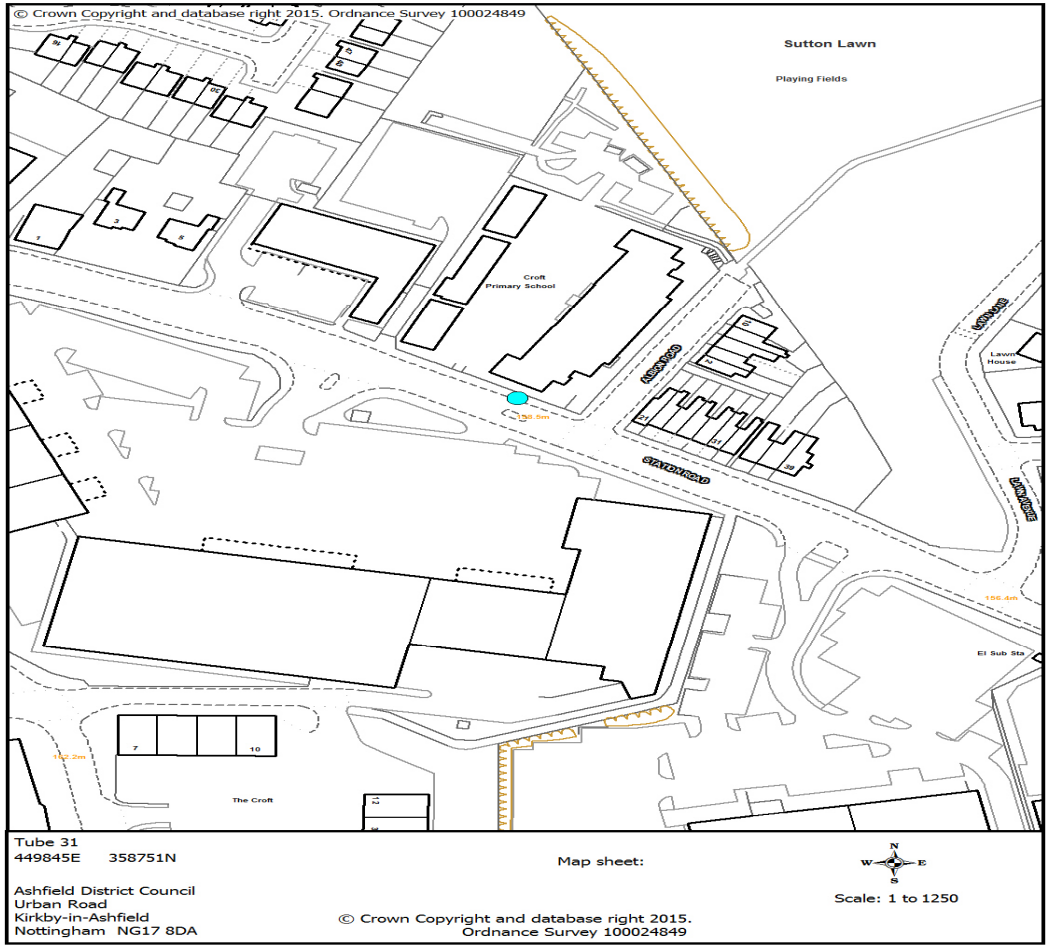
Location of Nitrogen Dioxide Diffusion Tube at Common Road, Huthwaite



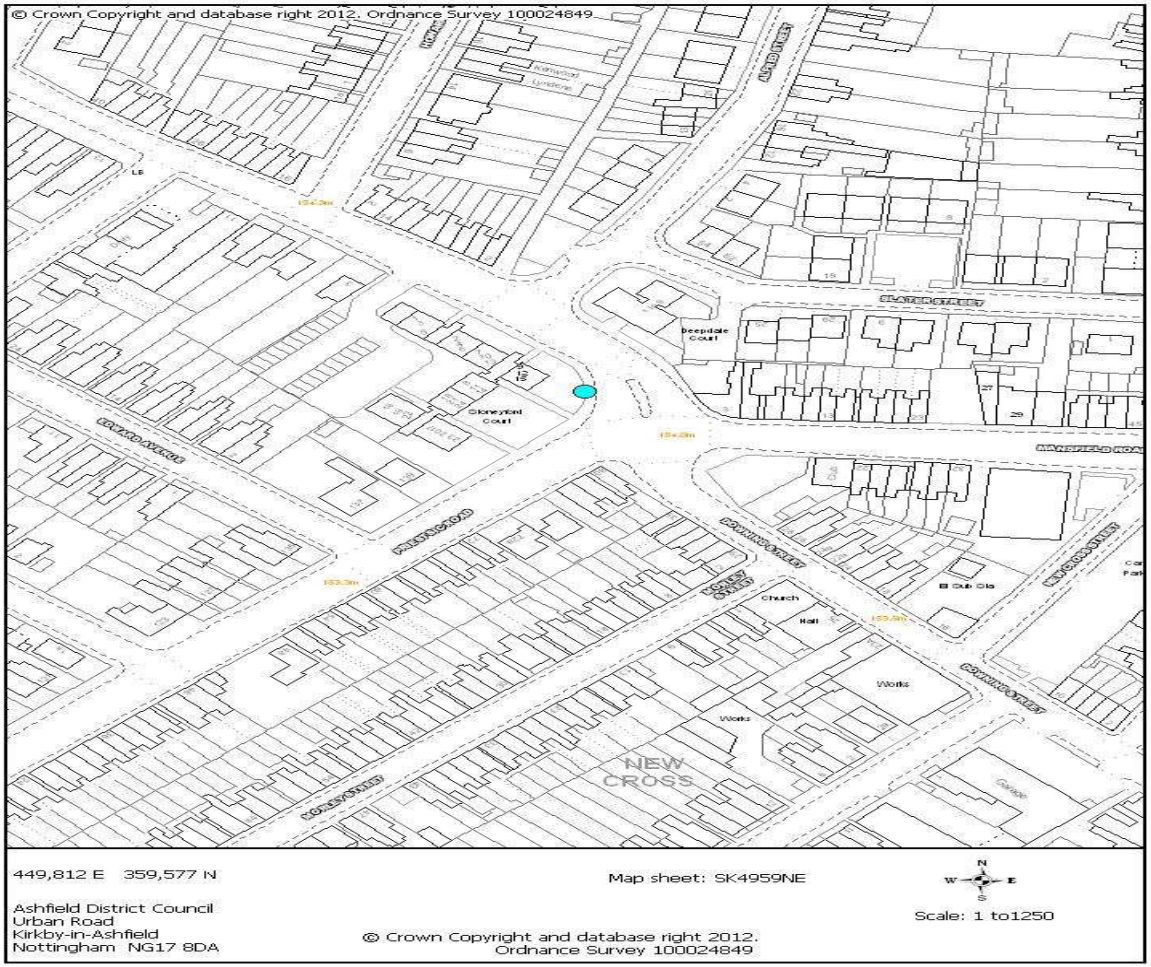
Location of Nitrogen Dioxide Diffusion Tube at the Badger Box, Annesley



Location of Nitrogen Dioxide Diffusion Tube at Croft Primary School Sutton

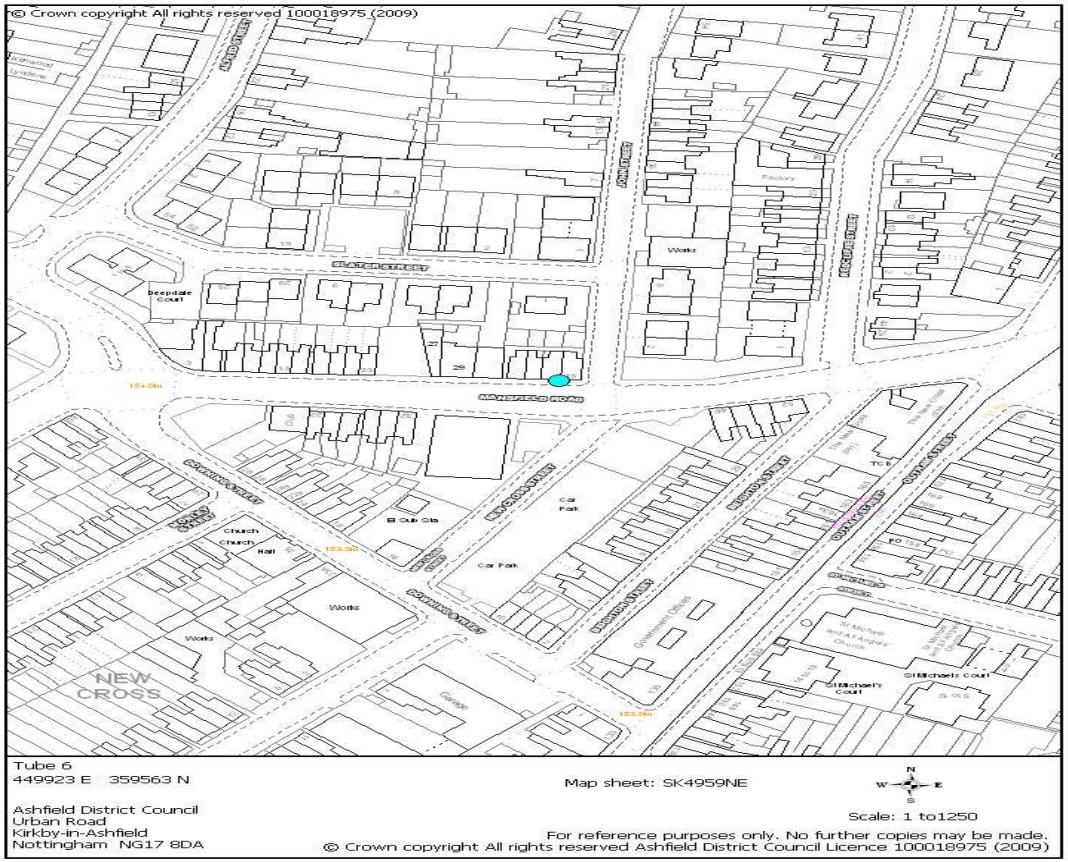


Location of Nitrogen Dioxide Diffusion Tube at Stoneyford Court Sutton

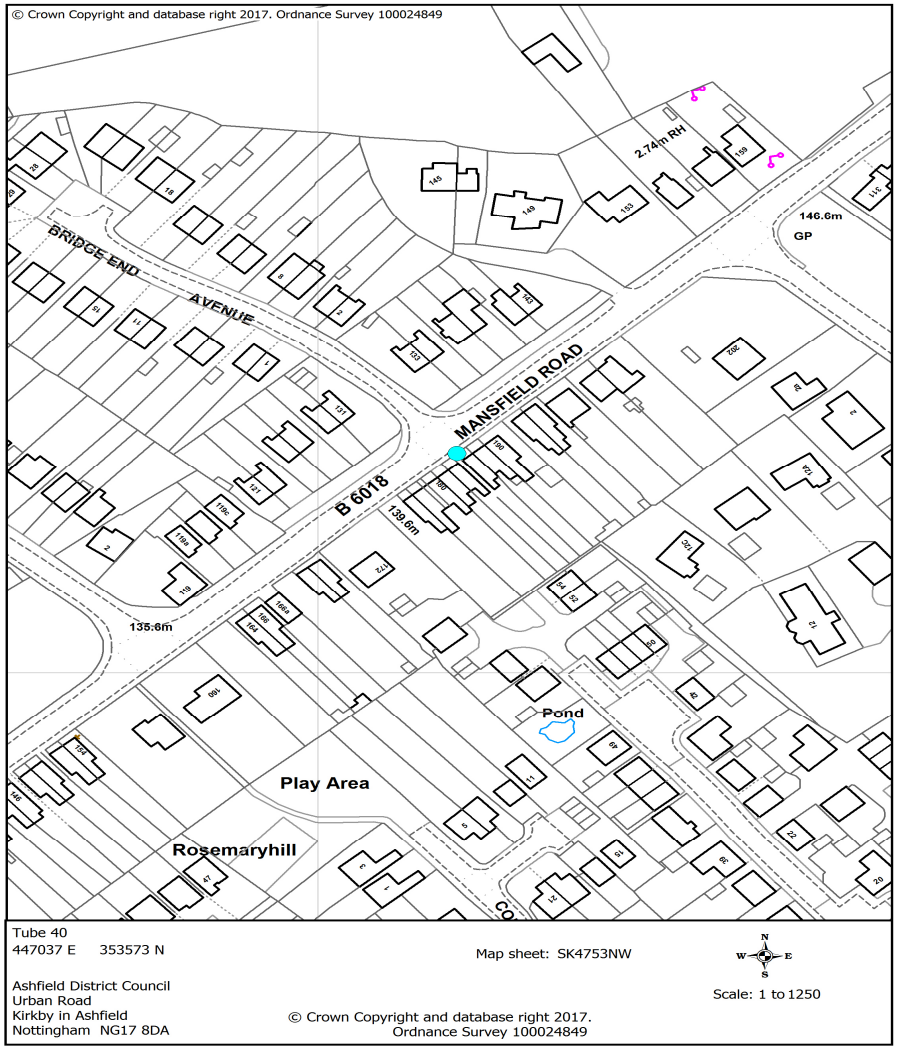


Location of Nitrogen Dioxide Diffusion Tube at Kirkby Cross

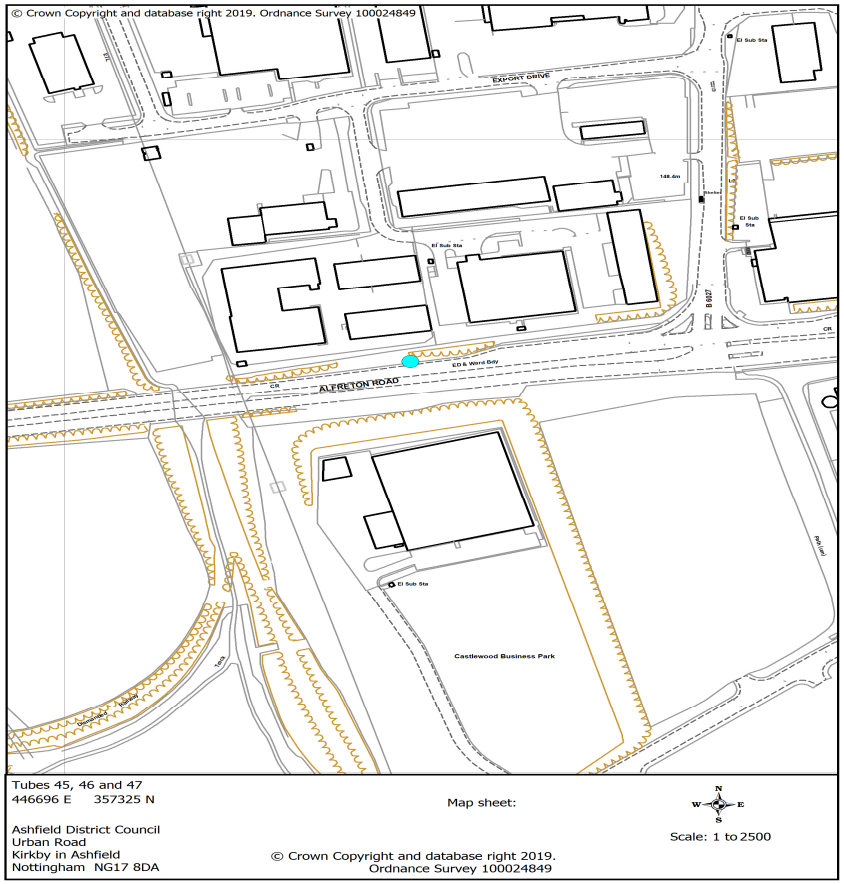
Location of Nitrogen Dioxide Diffusion Tube at Mansfield Road Sutton in Ashfield



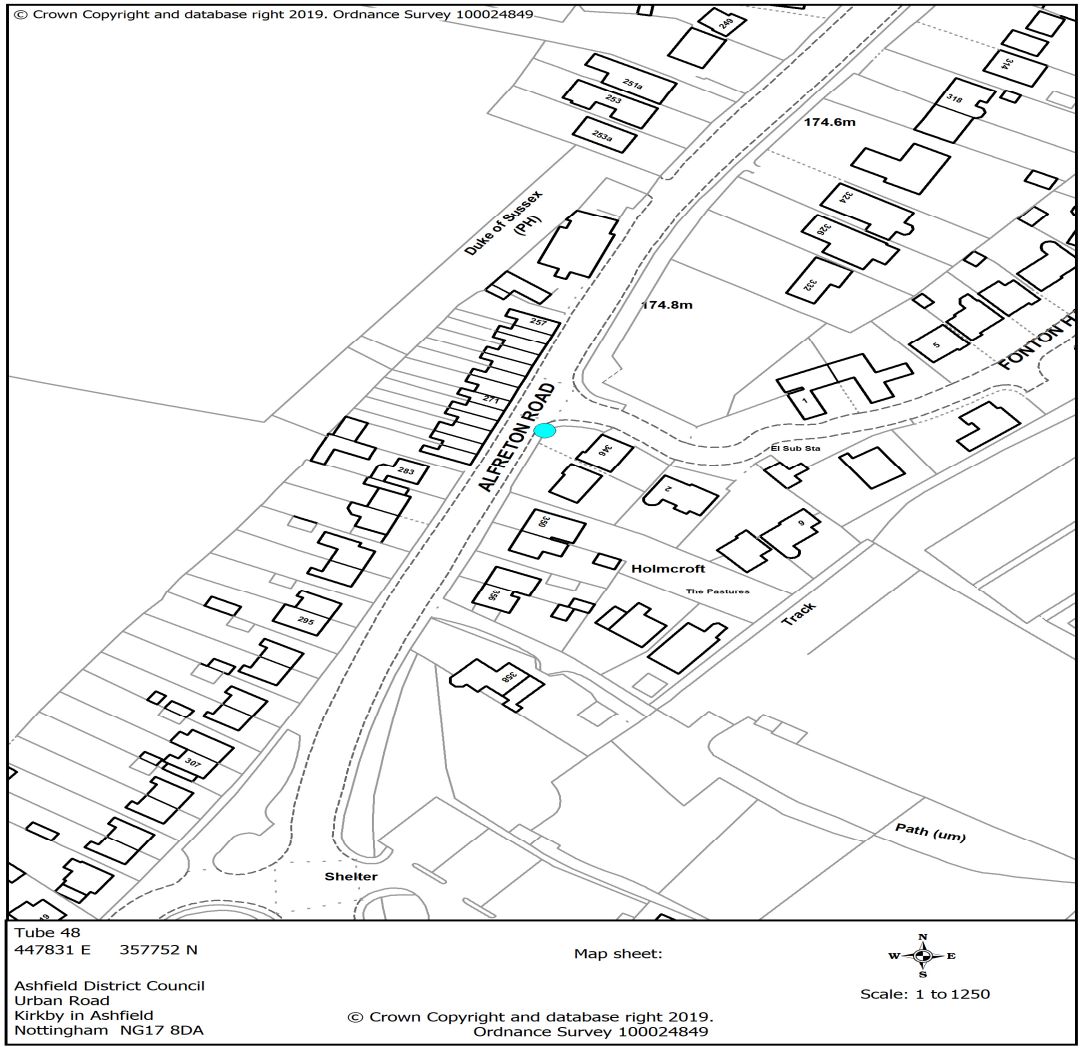
Location of Nitrogen Dioxide Diffusion Tube at Mansfield Road Selston



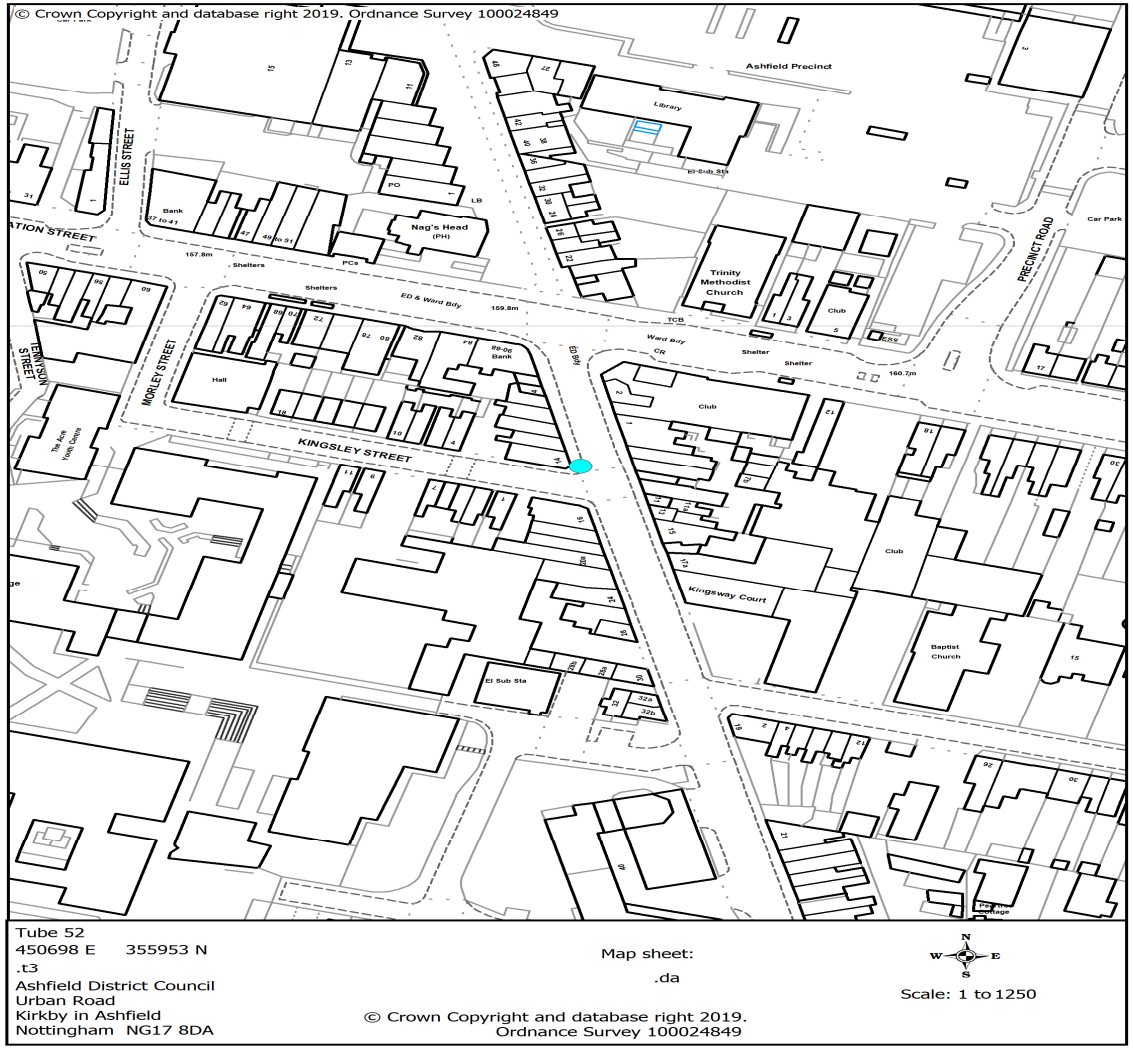
Location of Nitrogen Dioxide Diffusion Tube at Fullwood Cutting, A38 Sutton



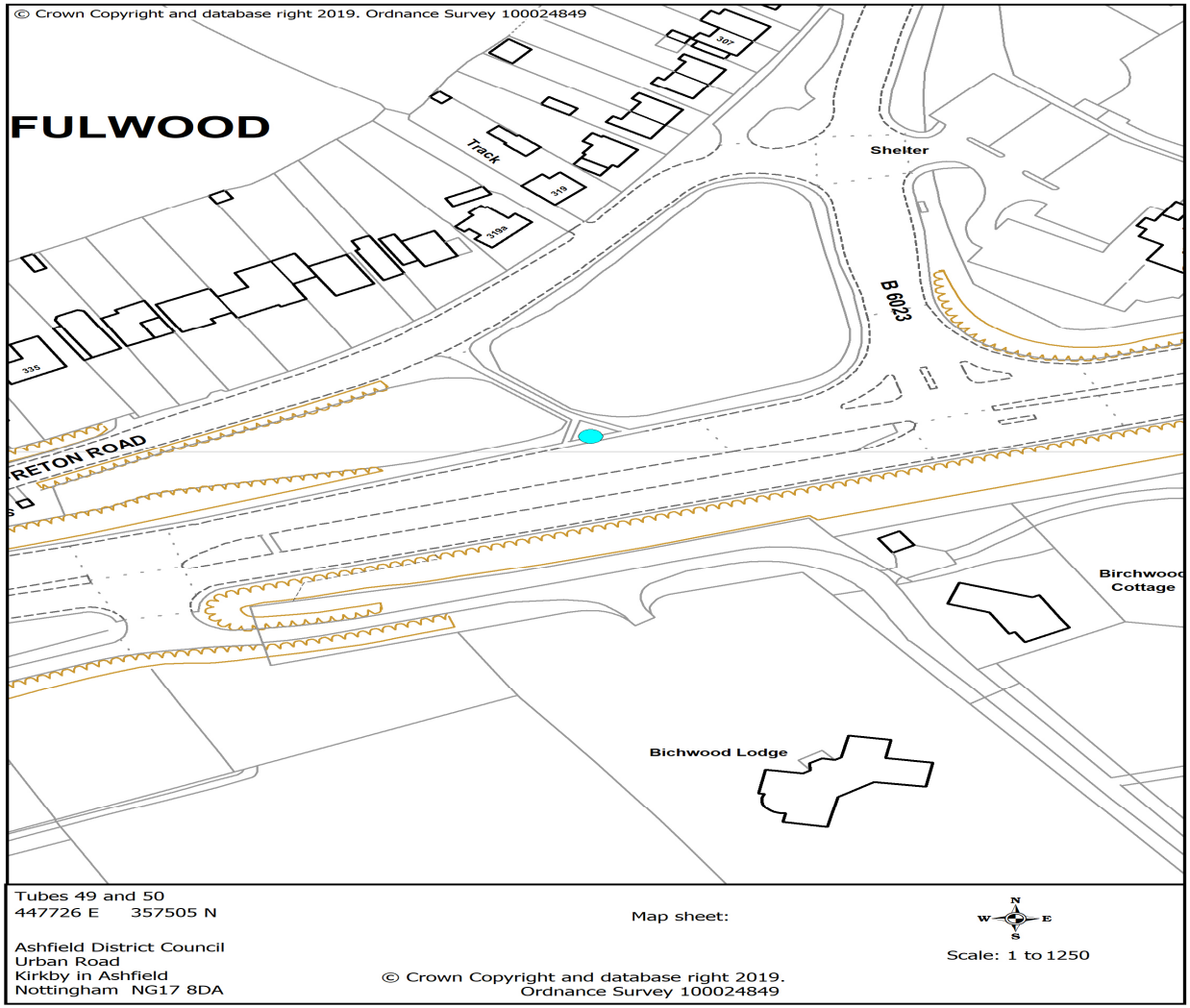
Location of Nitrogen Dioxide Diffusion Tube at Alfreton Road Sutton in Ashfield



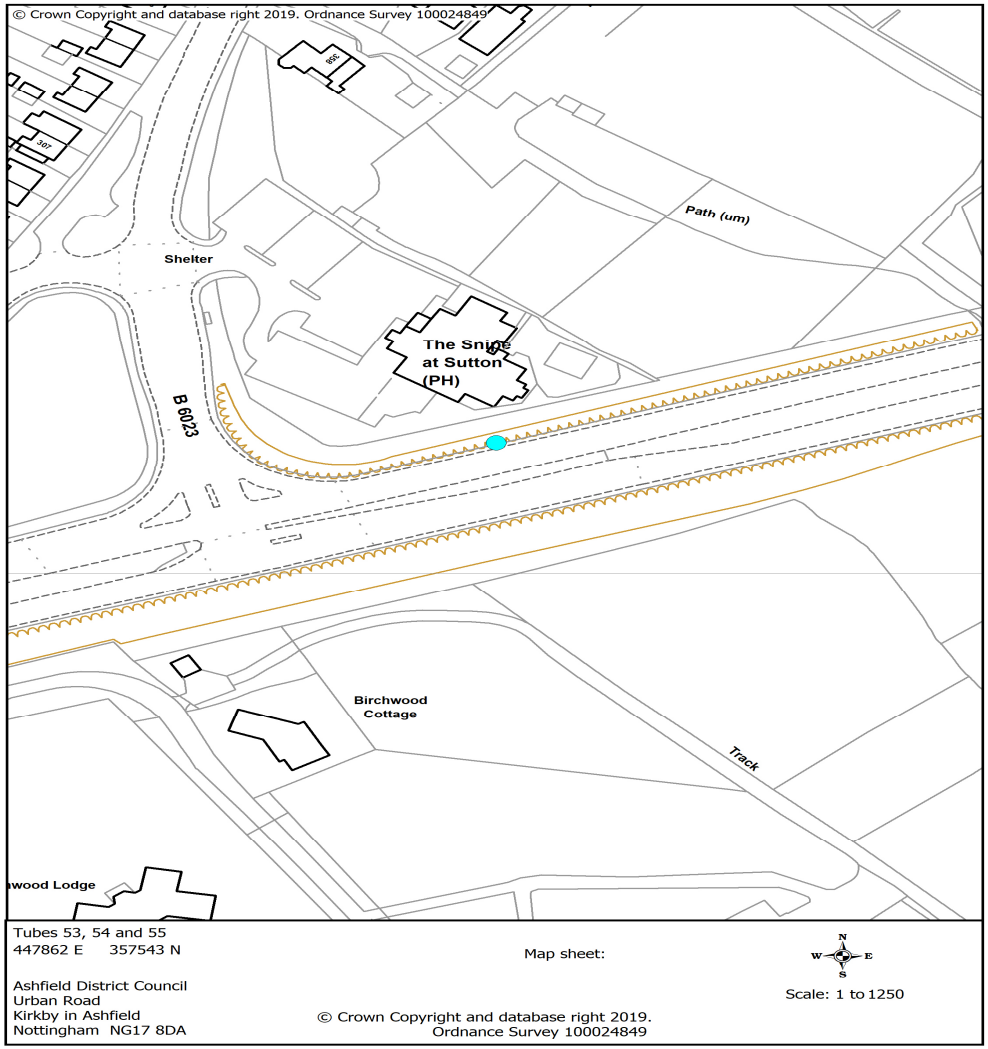
Location of Nitrogen Dioxide Diffusion Tube at Kingsway Kirkby in Ashfield



Location of Nitrogen Dioxide Diffusion Tube at Snipe Location 1



Location of Nitrogen Dioxide Diffusion Tube at Snipe Location 2



Appendix E: Diffusion Tube Results Trend Analysis

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

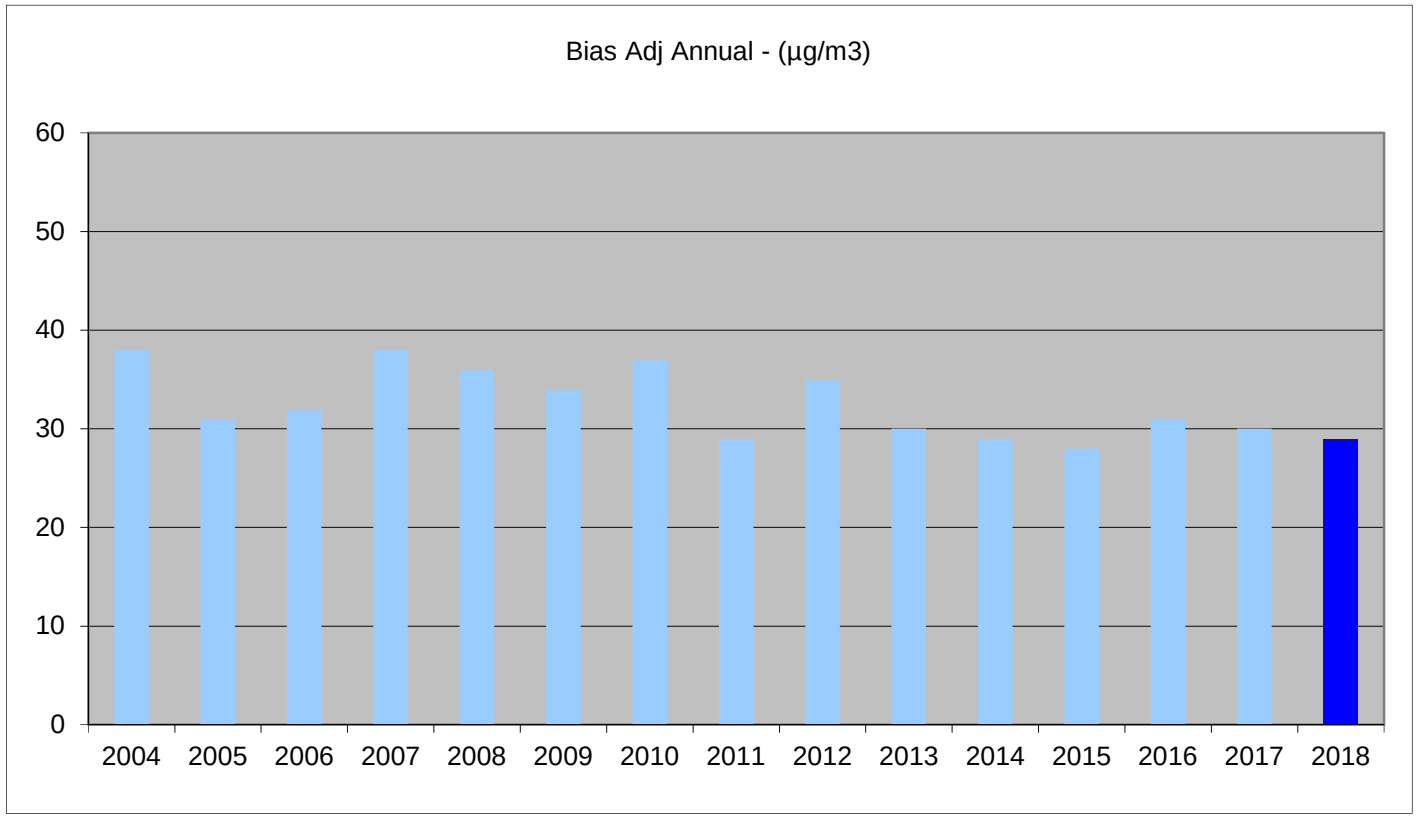


Figure E.2 Trend Analysis for Nitrogen Dioxide Diffusion Tube at Dalestorth Street, Sutton in Ashfield

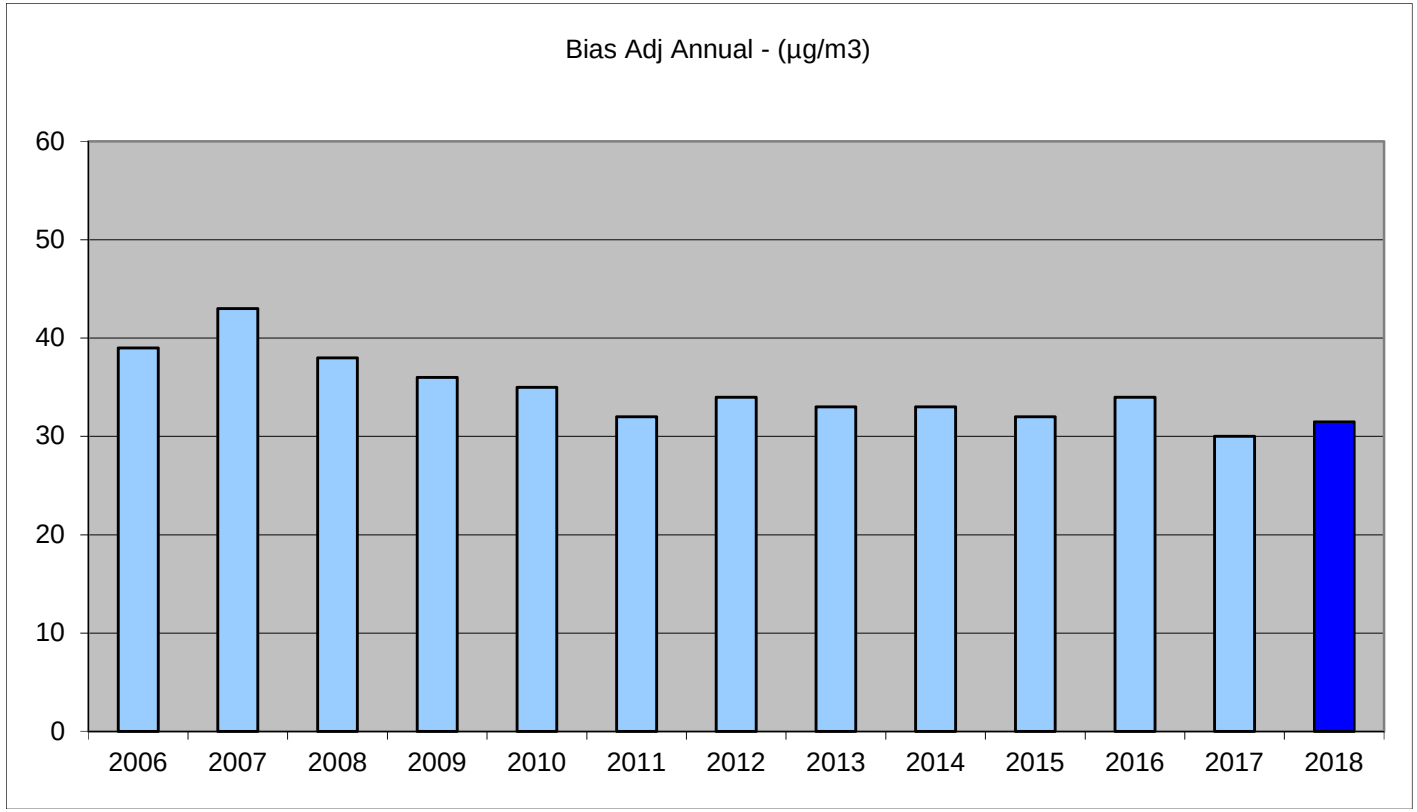


Figure E.3 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at A38, Sutton in Ashfield

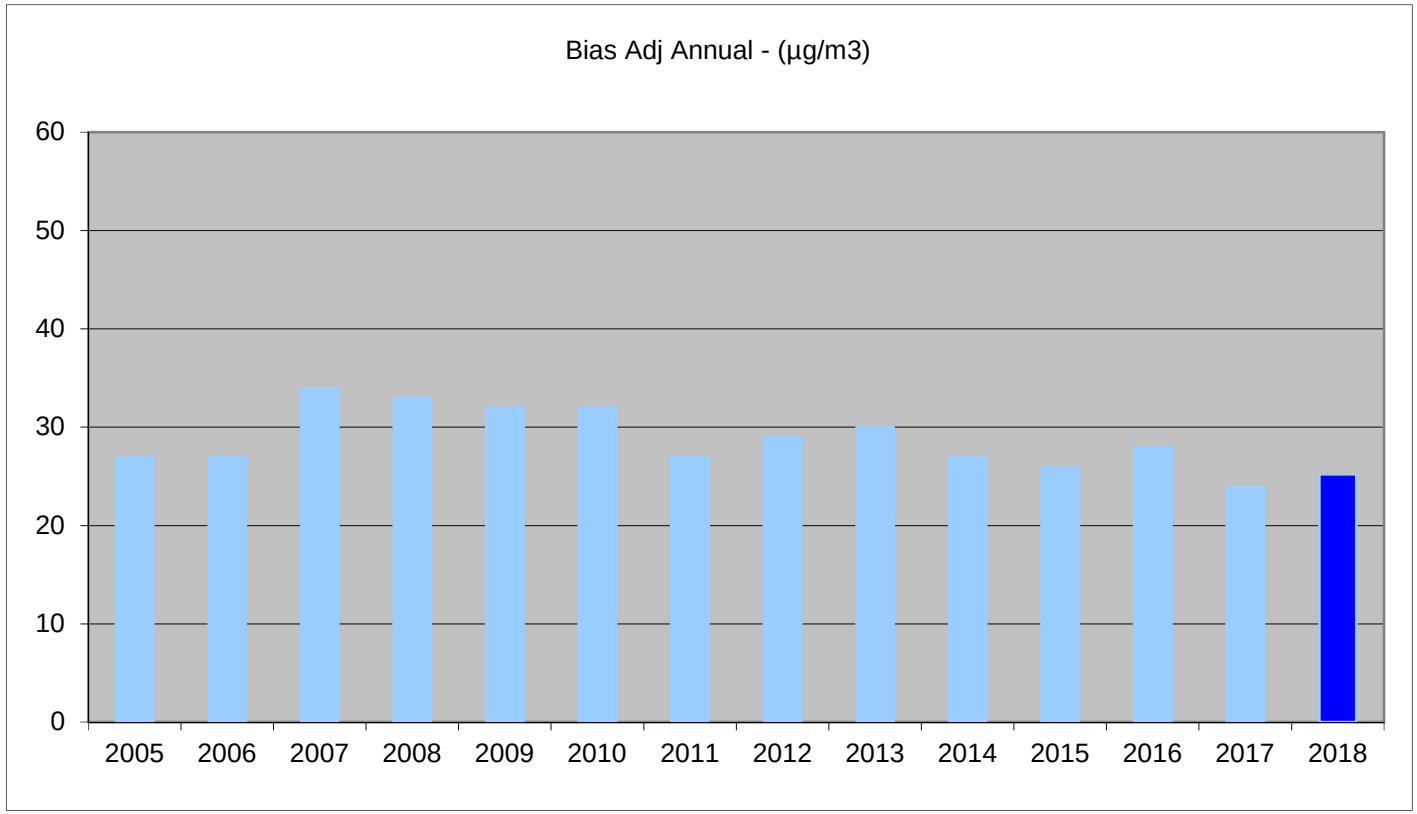


Figure E.4 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Church Hill, Kirkby

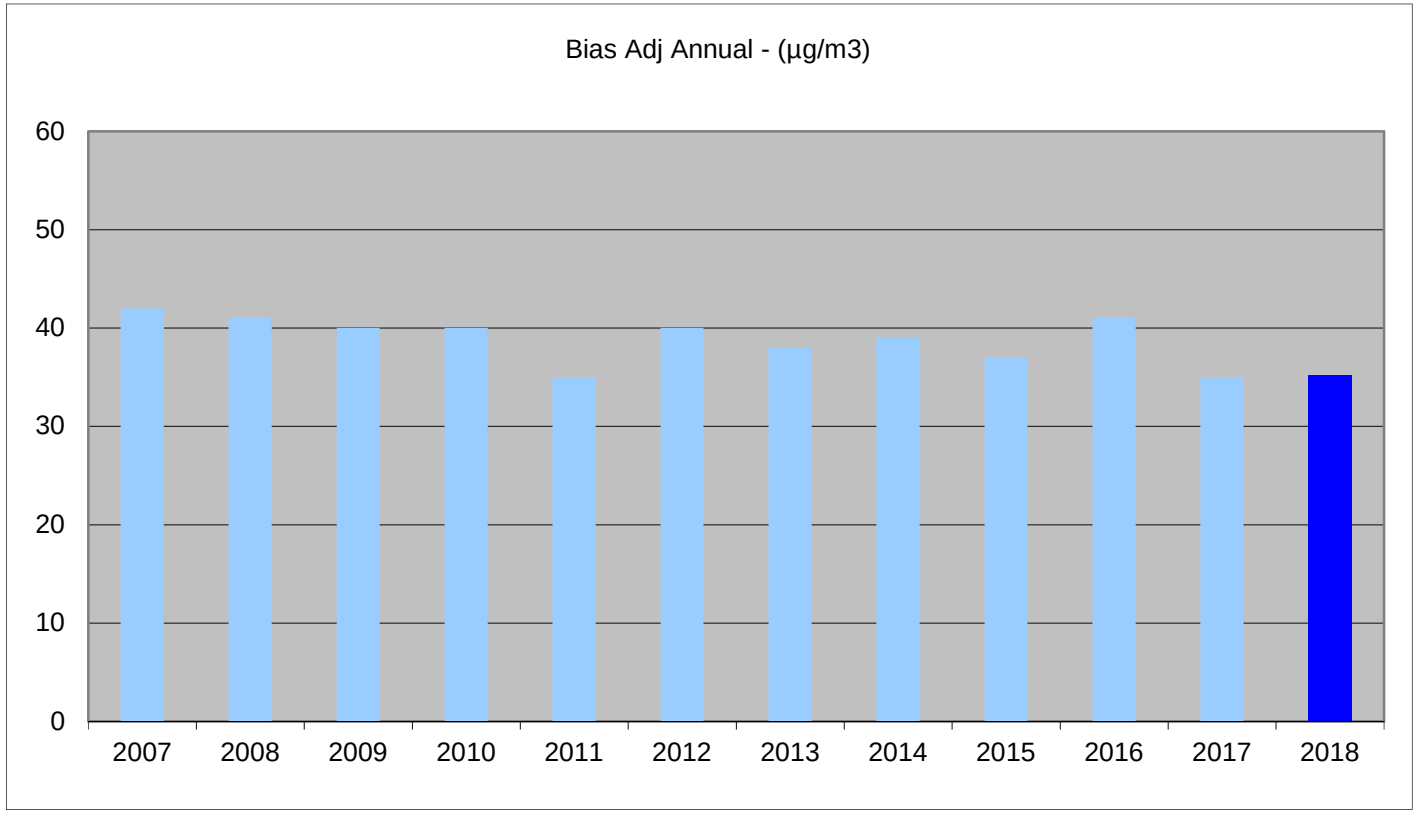


Figure E.5 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Pinxton

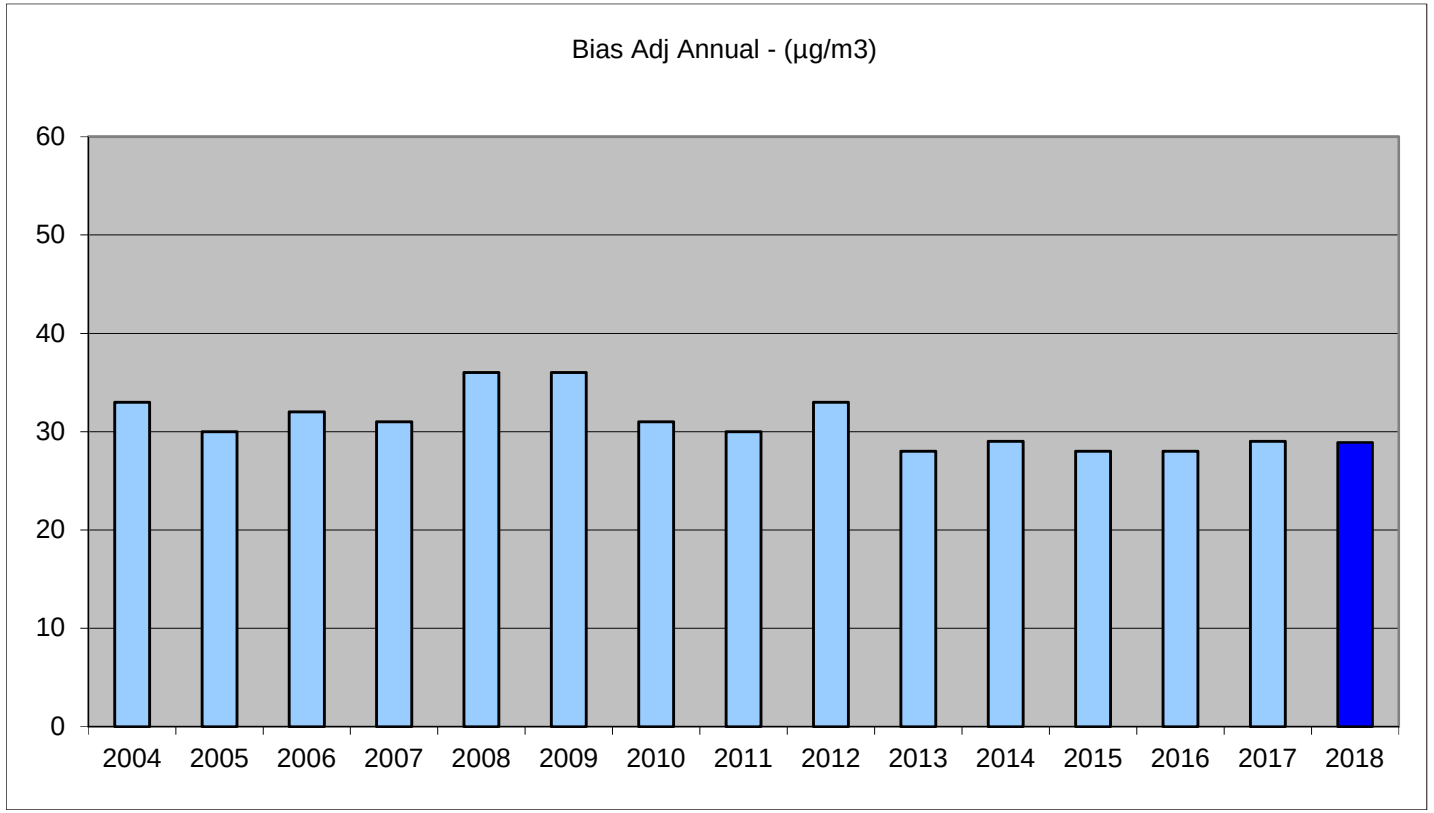


Figure E.6 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Ashgate, Hucknall

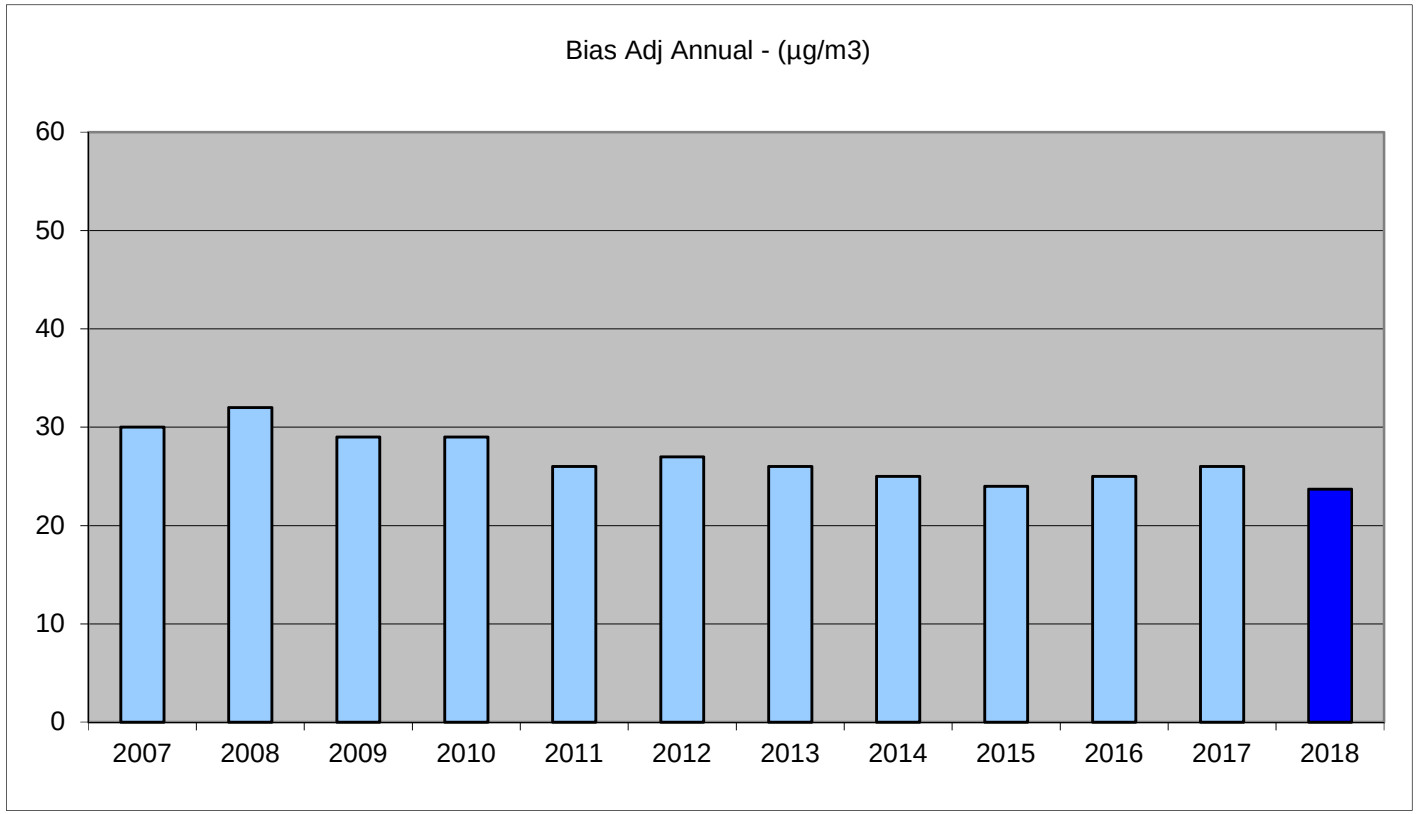


Figure E.7 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Station Road, Sutton in Ashfield

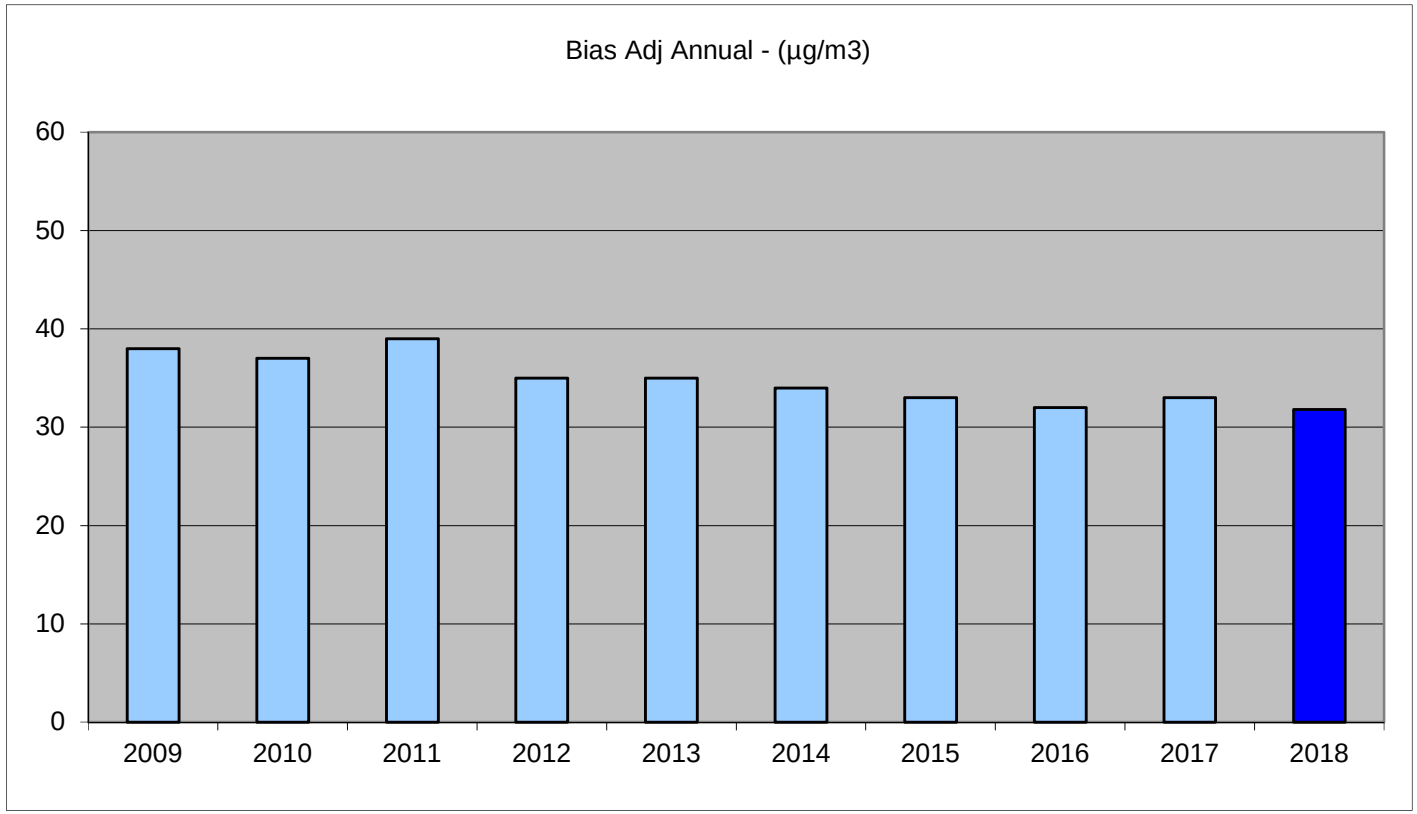


Figure E.8 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Common Road, Huthwaite

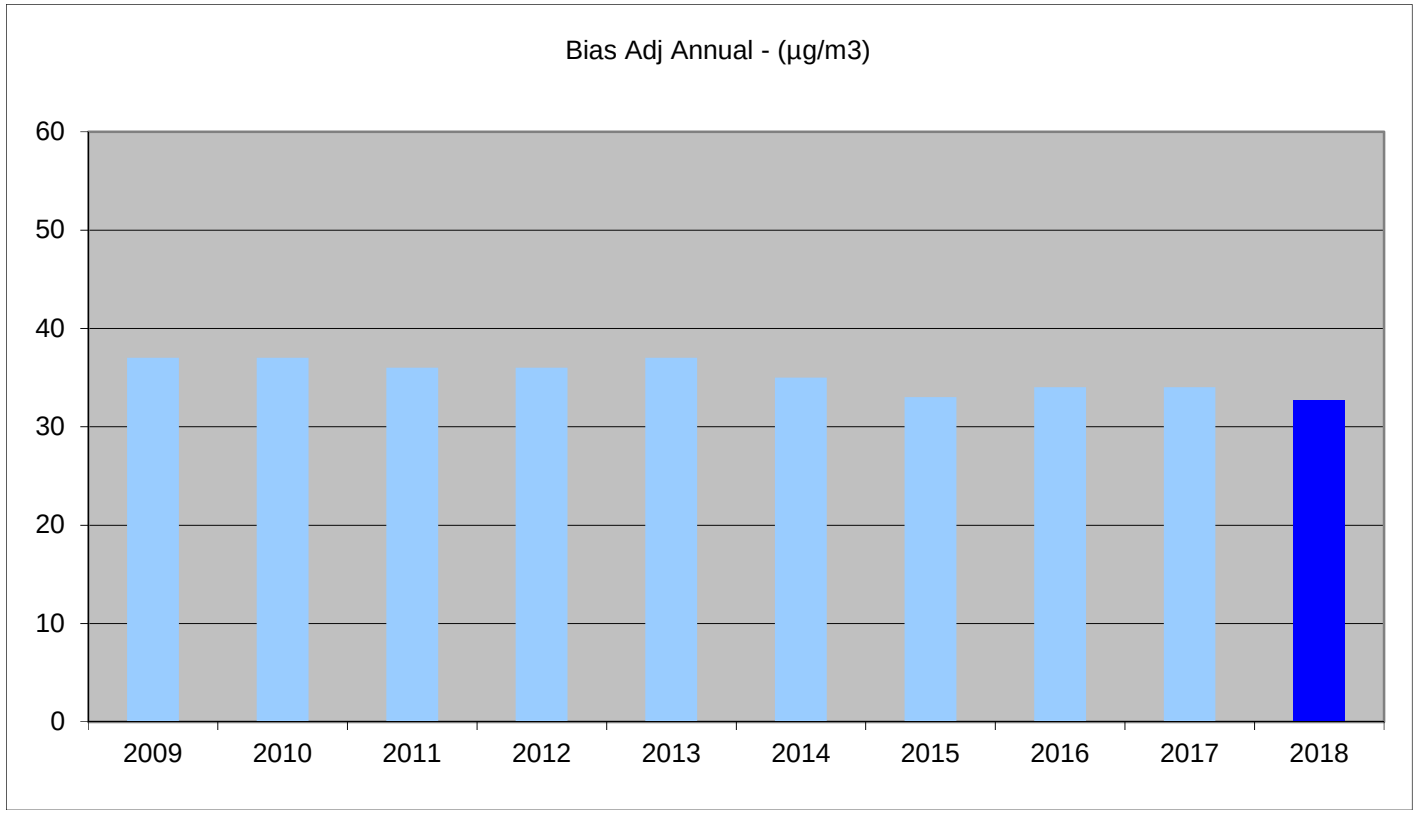


Figure E.9 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Badger Box, Annesley

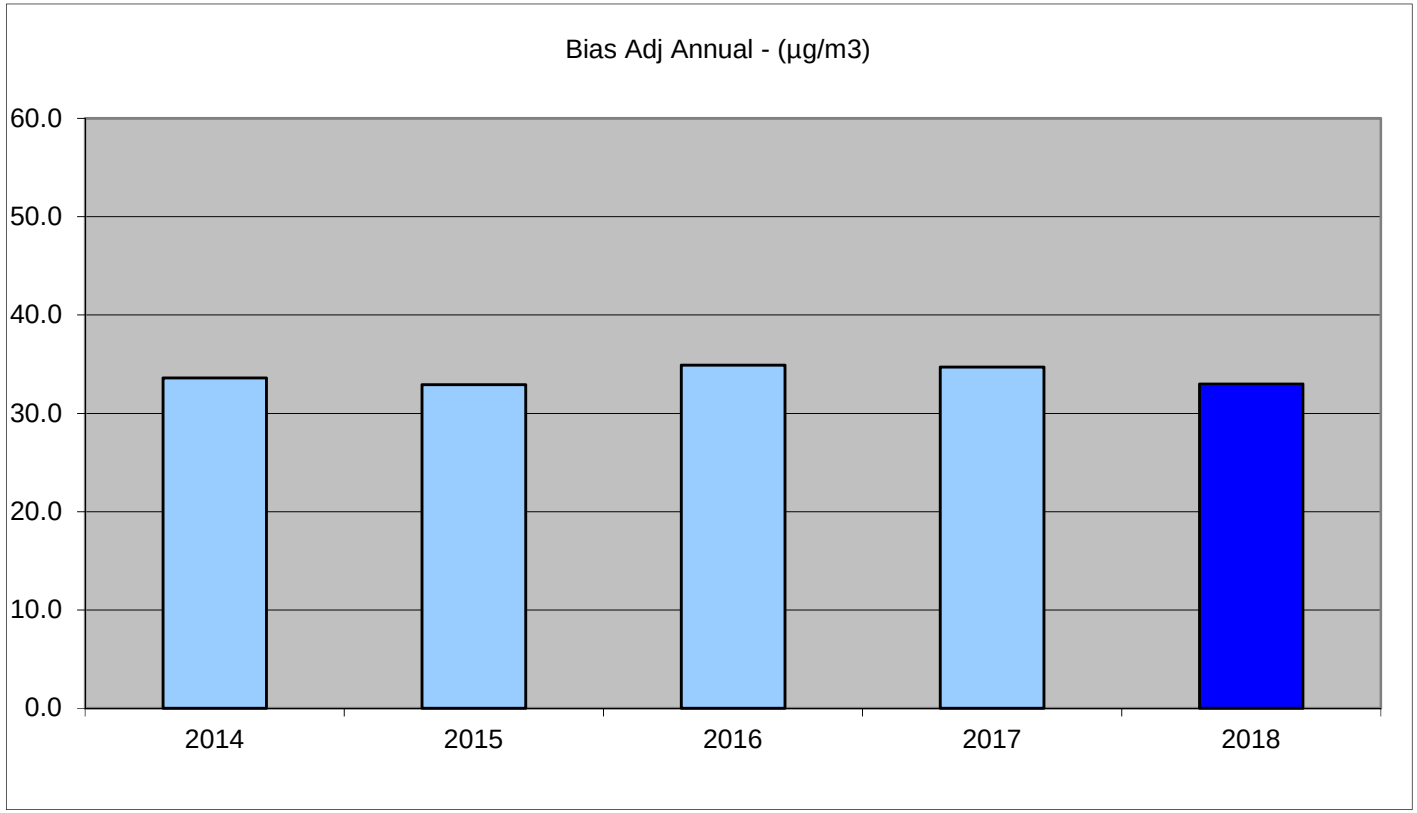


Figure E.10 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Croft Primary, Sutton in Ashfield

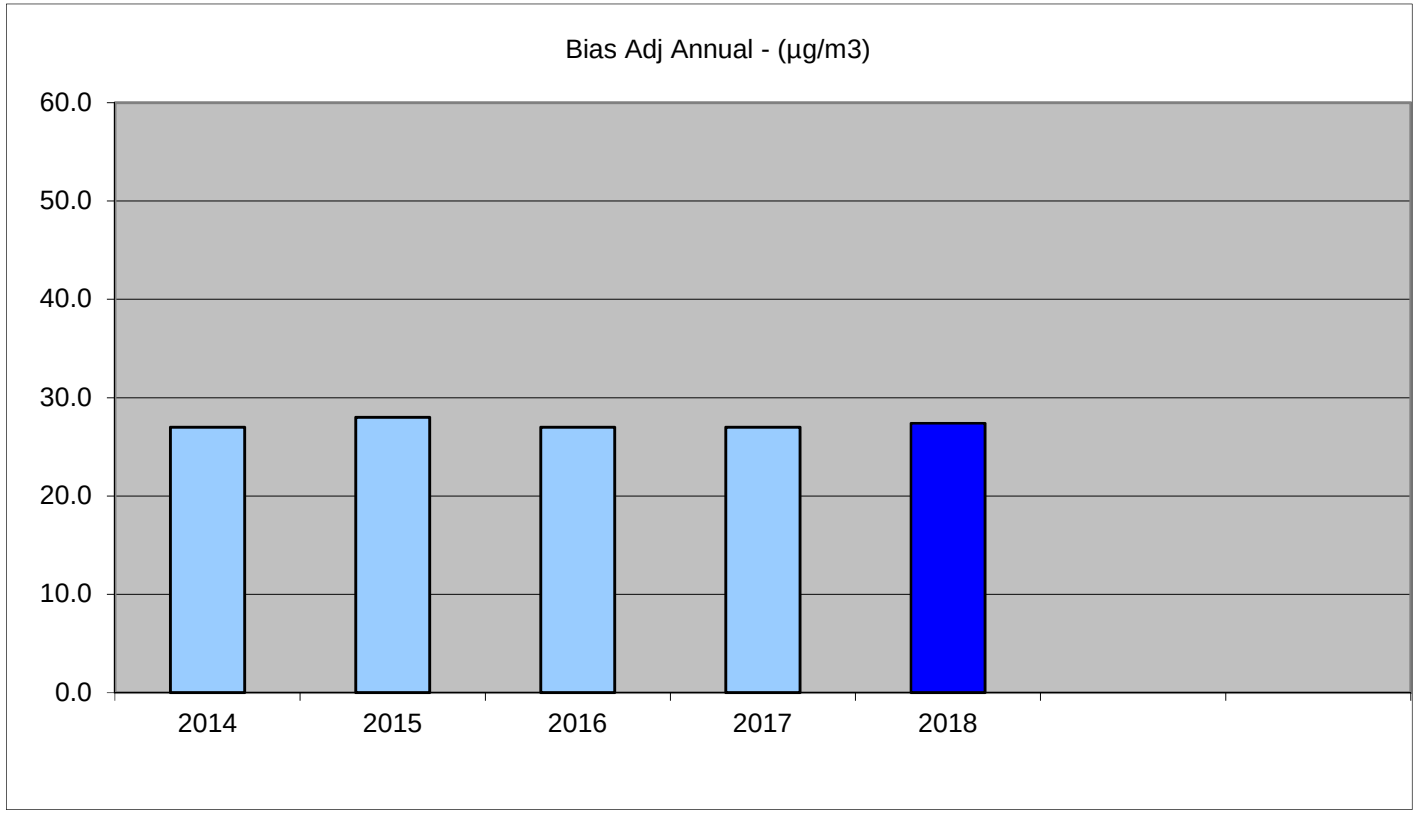


Figure E.11 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Stoneyford Court, Sutton in Ashfield

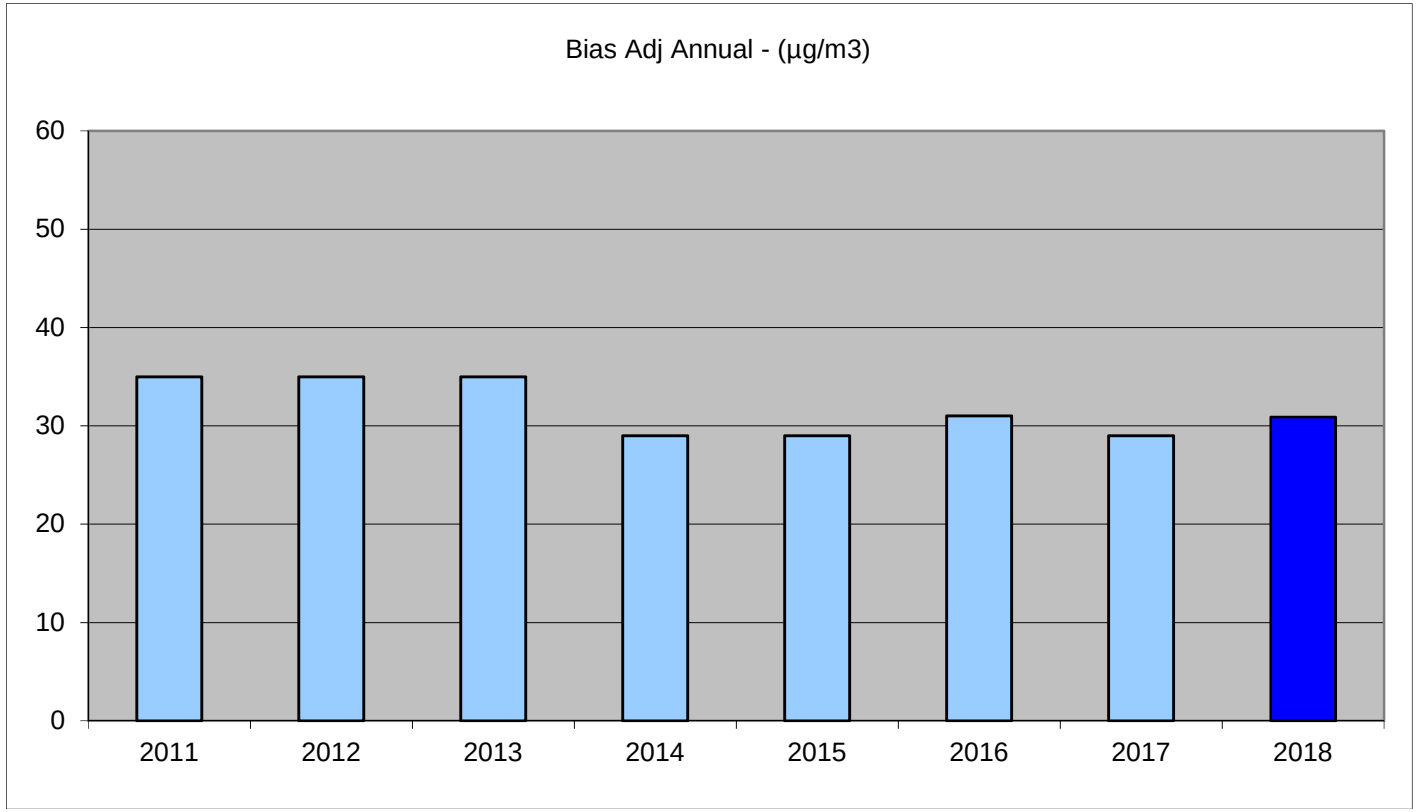


Figure E.12 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Kirkby Cross Kirkby

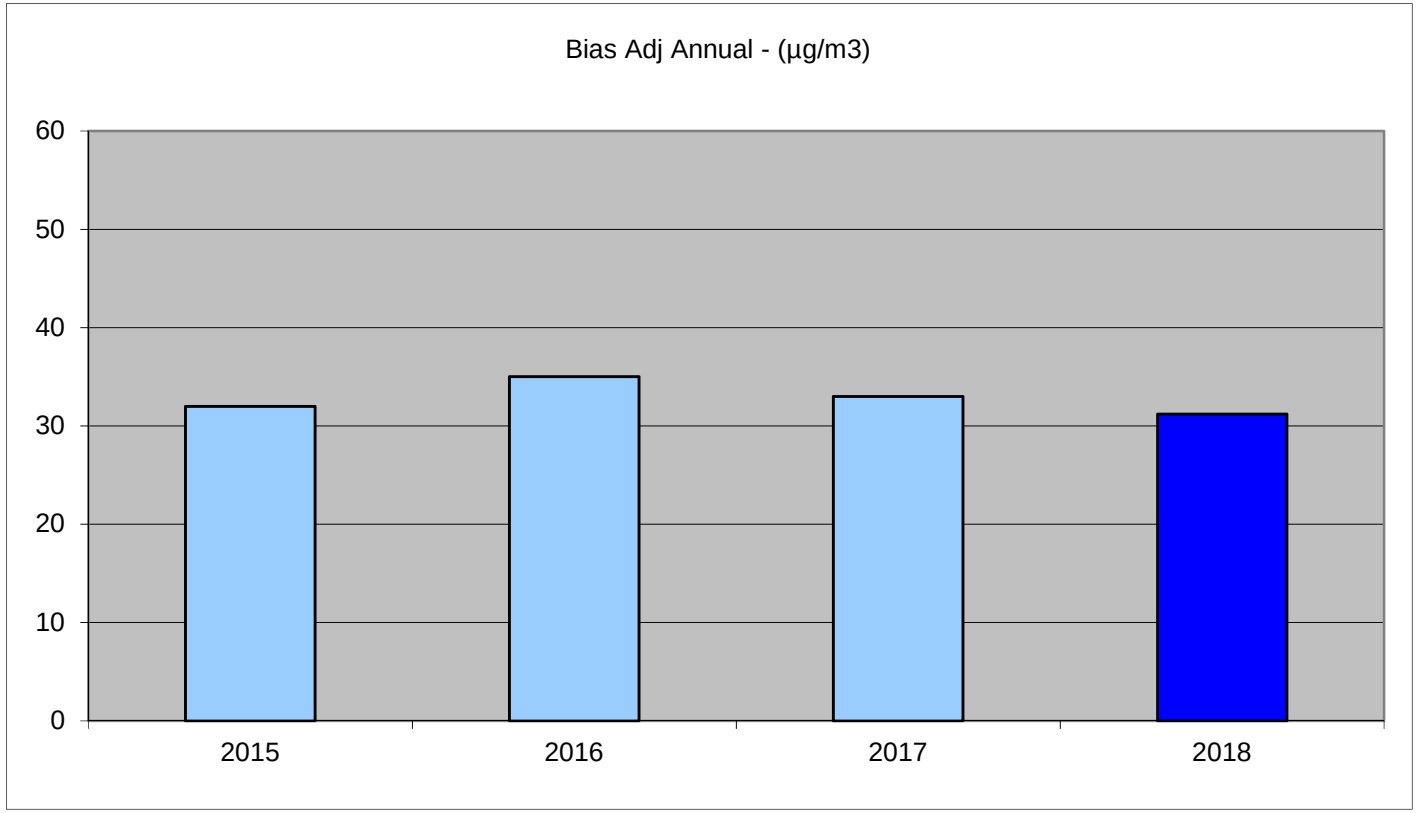


Figure E.13 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Mansfield Road Selston

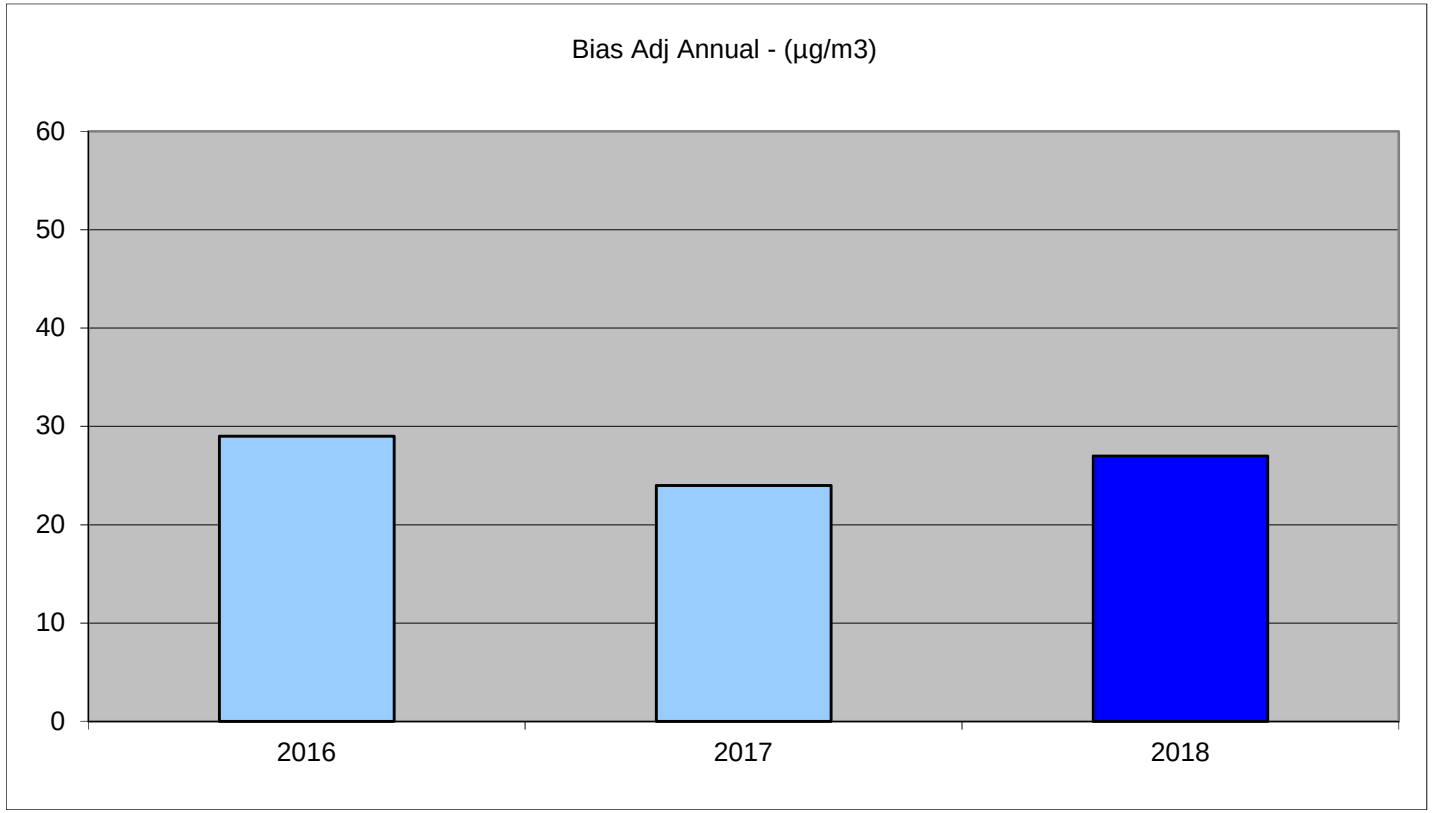
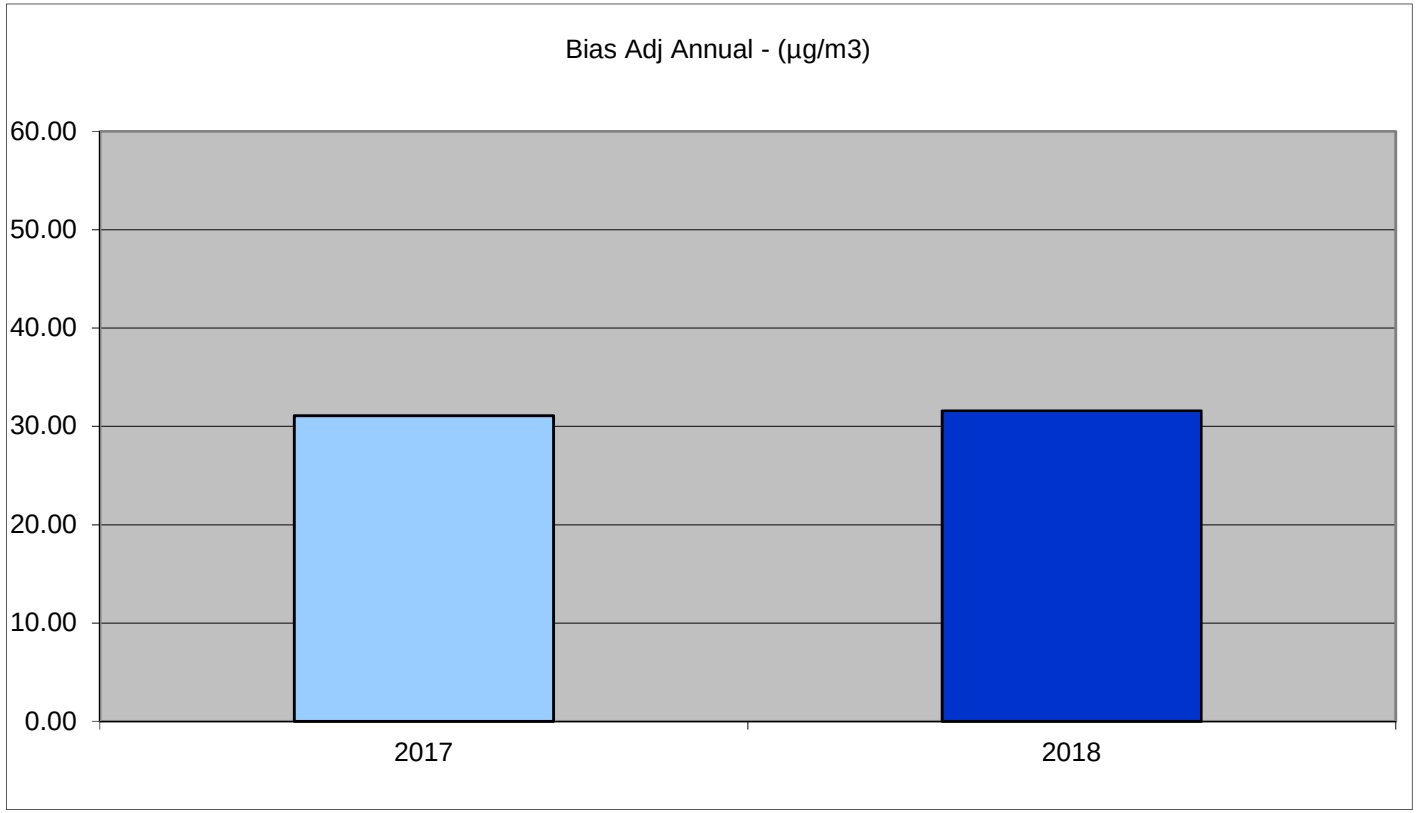


Figure E.14 Trend Analysis for Nitrogen Dioxide Diffusion Tubes at Mansfield Road Sutton



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 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