IPSWICH
BOROUGH COUNCIL

2019 Air Quality Annual Status Report (ASR)

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

June, 2019

Local Authority Officer	Andrew Coleman
Department	Environmental Protection
Address	Grafton House, 15-17 Russell Road, Ipswich, IP1 2DE
Telephone	01473 433115
E-mail	environmental.health@ipswich.gov.uk
Report Reference number	AC/ASR/19
Date	June 2019

Executive Summary: Air Quality in Our Area

Air Quality in Ipswich Borough

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].

In order to comply with its duty to review the air quality within its area, Ipswich Borough Council monitors nitrogen dioxide (NO_2) levels within the town using both an automatic monitor located on Chevallier Street and a total of 85 diffusion tubes positioned at carefully selected locations across the borough. Changed and analysed on a monthly basis, the data from the tubes provides a measure of how nitrogen dioxide levels vary over time and is used to calculate an annual mean concentration at each monitoring location. Once corrected for experimental bias and adjusted to take into account the location of the tubes relative to any likely human exposure, these annual values should not exceed the national air quality objective level of 40µg/m^3. In the event that this level is, or is likely, to be exceeded on a consistent basis Local Authorities have a legal duty to declare an Air Quality Management Area (AQMA) encompassing the relevant locations. Both nationally and locally the main source of high levels of nitrogen dioxide is road transport.

To date, Ipswich Borough Council has declared a total of five AQMAs, all due to continued exceedance of the annual mean NO_2 objective level:

- *Ipswich AQMA No.1* - Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, extending along Chevallier

[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

Street to beyond the junction with Waterloo Road (declared 2006; amended 2017);

- *Ipswich AQMA No. 2* - From the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street. (declared 2006; amended 2017);
- *Ipswich AQMA No. 3* - Following the route of the Star Lane / Key Street / College Street gyratory clockwise from the junction with Lower Orwell Street, extending along Star Lane, Grimwade Street, Fore Street, Salthouse Street, Key Street and College Street, terminating at the junction with Bridge Street (declared 2006; amended 2017);
- *Ipswich AQMA No. 4* - Incorporating the Bramford Road / Yarmouth Road / Chevallier Street junction and part of Chevallier Street (declared 2010);
- *Ipswich AQMA No*. 5 - Incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road (declared 2017).

Further information on the above AQMAs (including maps showing their location and boundaries) is available on Ipswich Borough Council's AQMA webpage on the DEFRA website – https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=133.

Following the amendment of AQMA Nos. 1 to 3 and the declaration of AQMA No. 5 in September 2017, Ipswich Borough Council has been working closely with local Highway Authority, Suffolk County Council and other stakeholders, including Public Health, to develop a new Air Quality Action Plan (AQAP) to address the challenge of poor air quality within the Borough. The AQAP was recently published in February 2019.

Ipswich Borough Council is also a member of the Suffolk Air Quality Management Group which includes all of the Suffolk Local Authorities.

As illustrated by the trend line plots in Figure A.1 of mean NO_2 concentrations in the vicinity of each of the AQMAs over the last 6 years, levels appear to have remained

essentially static with a very marginal downward trajectory. No exceedances were noted in AQMA 4 following both bias and distance correction in 2018.

Actions to Improve Air Quality

Installation of second continuous Air Quality Monitoring Station

Over the last year, the Council have successfully obtained another complete years' worth of automatic monitoring data from the existing air quality analyser on Chevallier Street. In light of this, the Council have begun to arrange the installation of a second air quality analyser on St Matthews Street, just outside Ipswich AQMA No.5. It is anticipated that the analyser should be installed and collecting data from Q3, 2019.

Zero Emission Fleet Vehicles

At the time of writing this report, the Council have also procured eleven electric pool car vehicles which will replace the older diesel fleet. Works are ongoing at the Councils headquarters to install new EV charging infrastructure to support the delivery of the new fleet. The Council are committed to a 3 year programme of upgrading all of the small vehicle fleet to electric vehicles. Larger vehicles will be Euroclass VI standard.

Launch of air quality campaign in schools

The Council have launched an air quality campaign targeting schools as part of this year's Clean Air Day on 20th June 2019. Workshops are being delivered in schools across Ipswich to help raise awareness of the importance of improved air quality and the small steps we all can take to reduce air pollution.

During the workshops, children will learn about the sources of air pollution around schools, how air pollution affects them and what they can do to improve local air quality and protect themselves from pollution. Particularly interested schools have also been working with officers to conduct an educational anti-idling campaign outside the school gates at peak times.

Every school the Council visited got the opportunity to participate in a five-day walking challenge between 17th – 21st June, that saw each pupil who walked to school every day get a free 10-day pass at one of the Council's sports facilities.

Preparation of Suffolk wide Anti-Idling Campaign

Officers across the Suffolk Local Authorities have been working together to prepare materials for a Suffolk wide anti-idling campaign. It is anticipated that the campaign will be fully launched during the second half of 2019.

Commissioning of an air quality report

The Council have commissioned an air quality modelling study for the Ipswich urban area 2018/2019. It is hoped this report will indicate future predicated air quality levels across the town, thereby enabling the Council to work with its partners to devise measures to maintain and improve air quality.

Development of a Low Emissions Supplementary Planning Document (SPD)

Officers are currently developing a low emissions SPD for developers. A first draft has been produced and is being reviewed.

Conclusions and Priorities

As discussed later in the report, the Council opted to analyse this year's data using the locally derived bias adjustment factor. Once bias adjusted using the local factor and distance corrected, the nitrogen dioxide diffusion tube data for 2018 shows that the national air quality objective for mean annual NO2 concentrations was exceeded at 14 of Ipswich Borough Council's 76 monitoring locations; 2 of which fall outside of the current AQMA boundaries. No exceedances were noted in AQMA 4 following bias adjustment and distance correction.

Despite using the Local Bias adjustment factor, the Council also analysed this year's data using the nationally derived bias adjustment factor for comparison. When analysing the results using the national bias adjustment factor and distance correction, the national air quality objective for mean annual NO2 concentrations is exceeded at 8 of Ipswich Borough Council's 76 monitoring locations;1 of which falls outside of the current AQMA boundaries. No exceedances were noted in AQMA 4 following bias adjustment and distance correction.

Over the coming year, Ipswich Borough Council's principal air quality priority is to continue to work towards implementing the measures in the recently developed and adopted AQAP.

The continued growth in housing development and business activity will be a major challenge when addressing air quality in the Borough. Ensuring all developments have suitable measures in place to mitigate against their impacts will be essential in ensuring air quality is maintained and improved in Ipswich.

The Council will continue to monitor air quality across Ipswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.

Local Engagement and How to get Involved

The Council recently consulted with members of the public as part of the development of the new AQAP. A summary of the comments and responses can be found in the AQAP on the Council's website.

The main source of air pollution in Ipswich is road traffic. We are working to meet the challenge set by the Government for NO2, PM10 and PM2.5 targets but it will also require a concerted public effort with each person doing their bit in order to try and increase active travel and reduce the use of the motor vehicle where possible. Below are a few suggestions on how to get involved:

- Try to use your car less. Walking and cycling are much cleaner, cheaper and healthier forms of travel. A map showing cycle routes across Ipswich is available on the Green Suffolk Website: https://tinyurl.com/y4y9sr6u.

- Use public transport, such as the bus and train.
- If you have to use your car, you can reduce emissions by not idling when parked. You can also reduce emissions from your car by ensuring it is regularly serviced and by driving efficiently.
- Consider purchasing an electric vehicle. The Council is working to improve the local charging infrastructure across Ipswich. Electric vehicles are reducing in cost and technology is improving to make this technology more viable. If you opt to purchase a traditionally fuelled vehicle, consider the most fuel efficient petrol vehicle rather than buying a diesel vehicle. See the Zap Map website for locations of charging points: https://www.zap-map.com/
- Consider car sharing to reduce emissions and save money. See the Suffolk car share website for details: www.suffolkcarshare.com

More information on air quality within Ipswich is available on the Ipswich Borough Council Air Quality Management website (https://tinyurl.com/mzjsurv).

If you have any specific questions or concerns, or if you would like to make suggestions on possible improvements and/or supply additional air quality information, please contact Environmental Health at Ipswich Borough Council on 01473 433115 or environmental.health@ipswich.gov.uk.

Table of Contents

List of Tables

List of Figures

1 Local Air Quality Management

This report provides an overview of air quality in Ipswich Borough 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 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 Ipswich Borough Council 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 E.1 in Appendix E

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 compliance with the objectives.

A summary of AQMAs declared by Ipswich Borough Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=133 – see full list at https://uk-air.defra.gov.uk/aqma/list. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMA(s).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Ipswich AQMA No.1	Declared 11/04/2006 Amended 12/09/2017	NO_2 Annual Mean	Ipswich	An area encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, extending along Chevallier Street to beyond the junction with Waterloo Road.	NO	50	µg/m^3	44	µg/m^3	Ipswich Borough Council Air Quality Action Plan 2019-2024	2019	https://tinyurl.com/y2ozjoqx
Ipswich AQMA No.2	Declared 11/04/2006 Amended 12/09/2017	NO_2 Annual Mean	Ipswich	An area from the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street.	NO	45	µg/m^3	48	µg/m^3	Ipswich Borough Council Air Quality Action Plan 2019-2024	2019	https://tinyurl.com/y2ozjoqx

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Ipswich AQMA No.3	Declared 11/04/2006 Amended 12/09/2017	NO_2 Annual Mean	Ipswich	An area following the route of the Star Lane / Key Street / College Street gyratory clockwise from the junction with Lower Orwell Street, extending along Star Lane, Grimwade Street, Fore Street, Salthouse Street, Key Street and College Street, terminating at the junction with Bridge Street.	NO	50	µg/m^3	43	µg/m^3	Ipswich Borough Council Air Quality Action Plan 2019-2024	2019	https://tinyurl.com/y2ozjoqx
Ipswich AQMA No.4	Declared 14/12/2010	NO_2 Annual Mean	Ipswich	Incorporating the Bramford Road/Yarmouth Road/Chevallier Street junction and part of Chevallier Street.	NO	55	µg/m^3	38	µg/m^3	Ipswich Borough Council Air Quality Action Plan 2019-2024	2019	https://tinyurl.com/y2ozjoqx

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Ipswich AQMA No.5	Declared 12/09/2017	NO_2 Annual Mean	Ipswich	An area incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road.	NO	49	µg/m^3	53	µg/m^3	Ipswich Borough Council Air Quality Action Plan 2019-2024	2019	https://tinyurl.com/y2ozjoqx

☒ **Ipswich Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

2.2 Progress and Impact of Measures to address Air Quality in Ipswich Borough

Defra's appraisal of last year's ASR concluded that:

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

The next step for Ipswich Borough Council is to consider the outcome of the source apportionment and transport intervention study in the development of the new AQAP."

Specific points were raised as follows:

- *'The development of the next Action Plan, alongside the developing Low Emission Strategy are key initiatives in the process of developing further measures to address areas of poor air quality in Ipswich. The Council should ensure close liaison with the Transport Authority through the operation of the Action Plan steering group to ensure transport based interventions can be given due consideration in the developing plan'.*
  The AQAP has been developed with input from the Ipswich Air Quality Steering Group, which includes members from Transport Authority, Suffolk County Council. The AQAP was published in February 2019 and includes transport related measures such as supporting Suffolk County Council's development of a local Ipswich Cycling and Walking Infrastructure Plan. The Low Emissions Strategy is continuing to be developed with the intention of a finalised version being adopted in 2020.
- *'The locations of further exceedances falling outside of current AQMA boundaries should be investigated'.*
  Two additional monitoring locations have been installed following on from the exceedances noted (SP5 and SP25) during the special project in 2017. The additional monitoring will be reported on in next year's ASR. When re-examining the 2017 data, it was noted that site 61 should have been distance corrected when it had not been. Upon distance correction, the data for site 61 showed that the annual average was below the air quality objective level at 25.2µg/m^3. The bias adjusted and distance corrected data for this site in 2018 was again below the annual objective level, at 25.2 µg/m^3 (using the local bias

correction factor). Site 30, which is just outside AQMA 3 will be continued to be monitored for an exceedance of the annual objective level.

- *'It will be important to link the knowledge of pollution hotspot locations to areas where transport interventions are feasible. We assume the outcome of the source apportionment and transport intervention study will usefully inform this process'.*

  The results of the source apportionment and traffic intervention study were used to inform the development of the new AQAP.

- *'We note the discussion in relation to the choice of bias factor, and agree that for the first year of co-location it may be prudent to remain using a nationally derived factor. However we suggest this should be reconsidered when another year's co-location measurements become available. Locally derived bias factors are likely to be more appropriate for use in relation to the monitoring sites exhibiting the highest pollution levels'.*

  As this is the second year running where the Council has been able to obtain a high data capture rate (99%) of continuous analyser data to benchmark this year's data against, the locally derived bias adjustment factor has been used. For clarity and greater trend analysis, the nationally derived factor has also been applied to this year's data.

Ipswich Borough Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the Ipswich Borough Council Air Quality Action Plan 2019 - 2024. As the action plan has only recently been developed and published, the measures are being worked on and progressed. Work is ongoing on a number of key measures:

- EV charge points have been installed in the Councils Crown and Elm Street Car Parks. Assessing the use of these charge points to inform future provision is ongoing.

- The Council have procured eleven new pool cars to replace the aging diesel fleet. At the time of writing this report, EV charging infrastructure is being installed at the Councils headquarters to support the delivery of the new fleet.

- Launch of air quality campaign in schools. To date, seven primary schools have signed up to workshops where children will learn about the sources of air pollution around schools, how air pollution affects them and what they can do to improve local air quality and protect themselves from pollution. Two schools will also be working with officers to conduct an educational anti-idling campaign outside the school gates at peak times.
- Development of the Suffolk wide anti-idling campaign. It is anticipated that the campaign will be fully launched during the second half of 2019.
- Officers are currently developing a low emissions SPD for developers. A first draft has been produced and is being reviewed.

Ipswich Borough Council expects the following measures to be completed over the course of the next reporting year:

- Introduction of Taxi Emissions Standard Policy.
- Undertake an anti-idling campaign to raise awareness of air quality issues.

Ipswich Borough Council's priorities for the coming year are:

- To continue to work towards implementing the measures in the recently developed and adopted AQAP.
- To continue to monitor air quality across Ipswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.
- To finalise a Low Emissions Supplementary Planning Document, with adoption by the Council in Q1, 2020.
- To examine the findings of the air quality modelling study for the Ipswich urban area 2018/2019. The Council have commissioned the study and the findings are due in the third quarter of 2019. The findings are likely to lead to additional/amended measures within the AQAP.

- To continue to assess and comment on planning applications and major developments in relation to air quality. This is essential in order to ensure future emission reductions within the district, and to reduce the likelihood of additional AQMAs being declared and further deterioration of air quality in existing AQMAs.

The principal challenges and barriers to implementation that Ipswich Borough Council anticipates facing are:

- Limitations on the level of dedicated resource available for air quality management activities; and
- Difficulty in obtaining sufficient support to include potentially more intrusive and/or costly interventions to secure significant and necessary improvements in air quality throughout the AQMAs.
- Officers have tried to engage with Primary Schools with the air quality campaign being rolled out across Ipswich, particularly those nearest to our AQMAs. Unfortunately, to date, only one school near to an AQMA has expressed an interest in participating. Officers will continue to attempt to engage with schools, but it is anticipated that uptake will be low.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Ipswich Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of all current AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Low Emissions Strategy SPD	Policy Guidance and Development Control	Low Emissions Strategy	Ipswich Borough Council	Q2, 2019	Q4, 2019	-	Medium	Ongoing - a draft SPD is being prepared	Q1, 2020	It will need to mesh with the Councils Local Plan and Suffolk County Councils Transport Plan and the development of the Cycling& Walking Infrastructure Plan
2	Support the Local Transport Plan to create a more efficient use of the highway network in and around the town, and across Suffolk	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Suffolk County Council	2019	Unknown	-	Medium	Works ongoing by SCC on this measure	-	
3	Embed air quality considerations in the Councils Local Plan.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ipswich Borough Council	Q1, 2019	2020	-	Medium	Development of Local Plan ongoing. At preferred options stage. Going to Executive in September.	2020	Adopted Local Plan (February 2017) currently implemented
4	Support Suffolk County's development of Local Ipswich Cycling and Walking Infrastructure Plans, and work to improve existing cycle routes	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Suffolk County Council	2019	Unknown	-	-	Works ongoing by SCC on this measure	-	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
5	Comment on best practice measures in relation to air quality in planning applications and major developments. Support alternatives to single occupancy car use arising from new developments, through the use of robust travel plans secured through the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ipswich Borough Council	2019	Q1, 2019	100% of relevant planning applications assessed	Medium	Ongoing	Ongoing	Air Quality Assessments asked for in line with EPUK/IAQM guidance. Low emissions SPD should support this measure.
6	Introduction of taxi emissions standards policy	Promoting Low Emission Transport	Taxi Licensing conditions	Ipswich Borough Council	Q2, 2018	Q4, 2019 / Q1, 2025	Reduction in non-Euro 6 Diesel	Low	Consultation ongoing. Public consultation ongoing until 31st July 2019. Policy being amended and going back to Licencing and Regulatory committee following public consultation.	Ongoing - on track	Concerns from industry over emissions standards required. Policy likely to be amended as a result, lowering the standards required.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
7	Work with Ipswich Buses bus fleet to encourage the renewal of their fleet to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes	Vehicle Fleet Efficiency	Other	Ipswich Borough Council	2020	2020 (and 2026)	8 Euro III/IV's buses to be replaced in 2019/2020 with Euro V or VI. 18 buses to be replaced in 2026 with buses at least Euro V or better. Reduced fleet emissions	Low	Ongoing	2020 (and 2026)	Still to investigate IBC funding towards improvements of bus fleet.
8	Work with other Bus Operators in the town (i.e. First, Norse, Beestons) to encourage the renewal of their fleets to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes	Vehicle Fleet Efficiency	Other	Ipswich Borough Council	2019	TBC	Reduced fleet emissions	Low	Ongoing	TBC	
9	Procurement of low emission vehicles in Ipswich Borough Council Fleet	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	Ipswich Borough Council	2019	2019 onwards	Provision of new vehicles	Low	11 pool cars replaced with electric vehicles in June 2019	2022	3 year replacement plan for small vehicle fleet to zero emission. Larger vehicles to be euro VI standard

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
10	Provision of EV charging points across IBC offices, Crown Street and Elm Street public car parks and investigate the feasibility of additional charging points across IBC car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Ipswich Borough Council	2019	2019	Provision of 4 charging stations (8 points) at Grafton House. Usage of EV charging points by the public.	Low	Charging points installed at Crown Street and Elm Street Car Parks. 4 charging stations installed at Grafton House in May 2019.	2019 but ongoing in additional IBC car parks	Provision of additional charging points depends on success of usage of current charging points
11	Development and implementation of an anti-idling campaign, including where appropriate an enforcement regime	Public Information	Other	Ipswich Borough Council	2019	2019 onwards	-	Low	Suffolk Air Quality Working Group have met and campaign materials are being produced. Anti-idling work is planned outside a Primary School in June 2019.	2019 - for campaign materials. 2020- for IBC to investigate/ implement enforcement regime	
12	Campaign to raise awareness of air quality issues in schools near AQMAs to subsequently influence behavioural change and improve air quality near schools	Public Information	Other	Ipswich Borough Council	2019	2019 onwards	Present information to schools near AQMAs and within the borough.	Low	All schools nearest to the AQMAs have been contacted. A presentation has been finalised and will be delivered in seven primary schools. One school is near to AQMA 2.	2019 but ongoing awareness campaign in schools willing to engage with the campaign	Unfortunately, only one school near to an AQMA has engaged with the Council and shown an interest in participating in the campaign.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
13	Active participation in annual Clean Air Days	Public Information	Other	Ipswich Borough Council	Completed for 2019 but annual event so planning ongoing	Q2, 2019	Participation in Clean Air Day on 20th June 2019.	Low	Campaign launched at time of writing this report.	Ongoing annual participation	
14	Promote the Councils Green Travel Plan to employees, including use of agile working.	Promoting Travel Alternatives	Workplace Travel Planning	Ipswich Borough Council	2019	2019 onwards	Annual promotion of travel plan. Increase in the number of employees walking, cycling or using public transport in the Councils Travel Plan survey	Low	Travel Plan was promoted in a staff newsletter April 2019. Travel Plan questionnaire will be rolled out to staff in May 2019 to establish baseline levels of walking, cycling and public transport.	Ongoing promotion	SCC were contacted about including a question in the travel plan questionnaire to establish whether employees travel through AQMAs during their commute but this was left out due to complexity. Will be speaking to SCC again following survey to see if useful information can be still be extracted/inferred on travel routes.
15	Investigate the feasibility of promoting air quality messages on non-IBC owned variable message signs around Ipswich (e.g. Bury Road)	Public Information	Other	Suffolk County Council	2019	2019 onwards	-	Low	Conversations ongoing with SCC	Ongoing use	Agreed with SCC that signs could be used to promote annual Clean Air Day event. Unfortunately, SCC decided against this near the campaign launch. Officers to try to establish whether use of the signs is possible.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
16	Investigate the feasibility of promoting air quality messages on IBC procured variable message signs around Ipswich	Public Information	Other	Ipswich Borough Council	2019	2019 onwards	Promote anti-idling messages quarterly	Low	Agreed internally that signs can be used to promote messages.	Ongoing use	Signs purchased and to be installed Q3, 2019
17	Explore opportunities to increase Ipswich's Park and Ride scheme, including consideration given to re-opening the Bury Road Park and Ride, and promote current schemes to incentivise people coming into Ipswich town centre to use public transport over private cars	Alternatives to private vehicle use	Bus based Park & Ride	Ipswich Borough Council	2019	2019 onwards	Increase in Park and Ride uptake	Low	None	TBC	Progress has stalled with this measure. IBC are keen to progress with reopening Bury Road Park and Ride, but SCC do not feel this is viable at present. Need to reopen conversations with existing park and ride provider to promote exisitng services.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
18	Review (in conjunction with other IBC/ SCC work streams), the traffic management arrangements in the St Matthews St/ Norwich Rd corridor. Maintaining delivery facilities, whilst minimising disruption to traffic flows.	Freight and Delivery Management	Quiet & out of hours delivery	Suffolk County Council	Q1,2019	Q4, 2019	Reduction in congestion along Norwich Road & St Matthews Street	Low	None	TBC	Early discussions have taken place between IBC and SCC but progress has stalled on this measure. Need to reopen discussions between IBC and SCC to determine feasibility of a clearway order. £10k plus signage for a clearway order
19	Promote the use of South Street (to be renamed Norwich Road Car Park), short term parking bays behind businesses on Norwich Road. Incentivising use of allocated parking and enforcement against unauthorised on street loading/ parking.	Traffic Management	Other	Ipswich Borough Council	2019	Q3, 2019	Reduction in congestion along Norwich Road. St Matthews Street. Number of penalty notices served	Low	Destination Norwich Road website produced	Ongoing promotion	Website does not promote free short term car parking spaces. Need to discuss this with project team. Project on track.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
20	Review opportunities for alterations to traffic management to reduce congestion in AQMAs (including opportunities on Berners Street while still providing a convenient facility for pedestrians)	Traffic Management	Other	Suffolk County Council	Ongoing	2019 onwards	Reduction in congestion on Civic Drive/ St Matthews Street roundabout	AQMA No.5 approx. 2% reduction in NO_x	Ipswich Strategic Partnership Area report commissioned on air quality. This will look at existing AQMAs and possible mitigation. Results of screening should be available July 2019 and results of detailed modelling should be available August 2019. Concerns over whether a puffin crossing on Berners Street would lessen congestion as indicated in source apportionment report published June 2018.	TBC. Results of IPSA report will likely impact on measures and timescales.	Possible mitigation dependant on funding and appropriate support from stakeholders.
21	Consider and explore the feasibility of further measures that would improve air quality within both AQMAs and across the borough, including emissions testing within AQMAs, clean air zones, low emission zones and congestion charging	Promoting Low Emission Transport, Promoting Travel Alternatives & Public Information	Other	Ipswich Borough Council	2019	2019 onwards	-	High (if LEZ/ congestion charging introduced)	Ipswich Strategic Partnership Area report commissioned on air quality. This will look at existing AQMAs and possible mitigation. Results of screening should be available July 2019 and results of detailed modelling should be available August 2019	TBC. Results of IPSA report will likely impact on measures and timescales.	Possible mitigation dependant on funding and appropriate support from stakeholders.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
22	Provision of A rated boilers in IBC owned housing stock	Promoting low Emission plant	Other	Ipswich Borough Council	Completed	Ongoing	All larger properties are to have low NOx boilers, defined as boilers that meet a dry NOx emission rating of 40mg/kWh	Low	Ongoing installation	2022	
23	Work with the Private Sector Housing team to improve their renovation grant criteria and include air quality considerations	Policy Guidance and Development Control	Other policy	Ipswich Borough Council	2019	2019 onwards	100% of all grants with air quality implications	Low	None to date	Ongoing rollout of renovation grants	Private Sector Housing has encountered staffing changes. New principal EHO to be appointed, Discussions will take place once in post.
24	Development and implementation of campaign to provide information about the impacts of domestic burning and good practice, including wood burners and burning of garden waste	Public Information	Other	Ipswich Borough Council	2019	2019 onwards	Reduction in number of domestic burning complaints received	Low	None to date	Ongoing promotion once campaign launched	Planning Suffolk Wide Campaign. IBC website requires updating to include further detail on domestic burning.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
25	Investigate what other organisations in the town are doing with regards to fleet renewal (e.g. other Local Authorities and large businesses) and whether there are opportunities (and funding) for an accelerated take up of ULEVs in the town.	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	2019	2020	2020	-	Low	None to date	Unknown at this point. Likely to be ongoing engagement with organisations	
26	Assist the Councils Car Parking Services in the development of their policies and strategies to promote clean travel and improved air quality. Review use of short and long stay car parks	Promoting Low Emission Transport	Other	Ipswich Borough Council	2019	2019	-	Low	None to date	Unknown at this point	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
27	Continue to explore the possibility and apply to DEFRA for grant funding under Air Quality Grant Schemes and any other appropriate funding	Promoting Low Emission Transport, Promoting Travel Alternatives & Public Information	Other	Ipswich Borough Council	2019	TBC – dependant on grant availability and successful bid for funding	-	-	Discussions taking place with stakeholders about submitting a joint application	TBC – dependant on grant availability and successful bid for funding	Dependant on grant availability and successful bid for funding

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

As detailed in Policy Guidance LAQM.PG16[4] (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.

The Suffolk Air Quality Group, of which Ipswich Borough Council is a member, has engaged with Suffolk County Council (SCC) Public Health and Protection to pursue a unified approach to tackling $PM_{2.5.}$ This is focused on promoting modal shift away from motor vehicle use towards active means of travel such as walking and cycling. Further details on this approach can be found in the Healthy Suffolk Joint Strategic Needs Assessment (JSNA) Topic Report on Air Quality[5].

The Public Health Outcomes Framework (PHOF) is a Department of Health data tool, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The PHOF includes an indicator, based on the effect of particulate matter ($PM_{2.5}$) on mortality. According to the public health outcomes framework, the fraction of mortality in those aged over 30 years, attributable to particulate air pollution (measured as $PM_{2.5}$) in 2017 in Ipswich is 5.72%, above the average for England (5.06%), and similar to that of the East of England Region (5.49%). This would suggest that $PM_{2.5}$ concentrations in Ipswich are comparable to other areas in the UK[6].

Ipswich Borough Council anticipates that the measures within the Action Plan, whilst primarily targeted at NO_2, will also contribute toward a reduction in $PM_{2.5}$. Proposals focussing on measures such as supporting the development of the local transport plan, promoting public transport and the staff travel plan will also help to reduce overall vehicle trips, reducing $PM_{2.5}$ emissions both through reductions in fuel usage and brake and tyre wear. However, sources of $PM_{2.5}$ extend beyond transport.

[4] https://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf
[5] https://www.healthysuffolk.org.uk/jsna/jsna-topic-reports/air-quality
[6] https://fingertips.phe.org.uk/static-reports/public-health-outcomes-framework/at-a-glance/e07000202.html

Ipswich Borough Council continues to enforce statutory controls on combustion emissions from both industrial and domestic sources, which both contribute to $PM_{2.5}$ concentrations.

We will continue to consult with Suffolk County Council Public Health colleagues and be advised by them, and national guidance, on any relevant measures that will reduce exposure.

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

This section sets out what monitoring has taken place and how it compares with objectives.

Ipswich Borough Council undertook automatic (continuous) monitoring at one site during 2018. Table A.1 in Appendix A shows the details of the site.

A map showing the location of this monitoring site is provided in Appendix D. Further details on how the monitor is calibrated and how the data has been adjusted are included in Appendix C.

At the time of writing this report, the Council is arranging the installation of a second automatic monitor for NO_2. The monitor is due to be positioned just outside the boundary of AQMA No.5. on St Matthews Street. It is anticipated that the monitor will be commissioned late June/ early July 2019.

National monitoring results are available at https://uk-air.defra.gov.uk/.

3.1.2 Non-Automatic Monitoring Sites

As part of its normal monitoring programme, Ipswich Borough Council undertook non- automatic (passive) monitoring of NO_2 at 76 sites during 2018. Table A.2 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) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. distance correction), are included in Appendix C.

Due to some minor changes to street furniture and road layouts across the Borough over previous years, the locations of non-automatic sites were re-examined during late 2018. This will help to ensure that the Council continues to report using accurate, up-to-date, monitoring data. The updated locations will be reported on in future ASR's.

In order to further understand pollution levels around key junctions in the town, four additional non-automatic monitoring locations have been installed in 2019. The locations are at:

- Crown Street (in AQMA.No.2)
- Grove Lane (just outside AQMA. No.2 near to the Junction with Spring Road and St Helens Street)
- Fore Hamlet. This was located on a relevant receptor in proximity to where an exceedance of the annual average air quality objective was found during the special project conducted in 2017 (site ID: SP25). The special project was reported on in last year's ASR. For ease of reference, the annual mean NO_2 monitoring results from the special project are included at the bottom of Table A.3 of this year's ASR.
- Vernon Street. This was located on a relevant receptor in proximity to where an exceedance of the annual average air quality objective was found during the special project conducted in 2017 (site ID: SP5). The special project was reported on in last year's ASR. For ease of reference, the annual mean NO2 monitoring results from the special project are included at the bottom of Table A.3 of this year's ASR.

The findings of the additional monitoring will be reported on in the 2020 ASR.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, "annualisation" and distance correction. Bias adjustment on the data obtained during 2018 has been carried out using both the local and national correction factors. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

When analysing the data, a discrepancy was noted with the 2017 August data contained in the 2018 ASR. Furthermore, Site 61, required distance correction when it had not been. The data has been amended, with the results being suitably distance corrected and bias adjusted using the national factor (0.77) as used in 2018's ASR. The amended results are shown in Appendix F and incorporated into Table A.3. Essentially, in 2017, for the normal monitoring locations, exceedances were noted in

11 unique locations: 9 exceedances were located within AQMAs, and 2 were located outside the AQMAs. The 2 exceedances noted outside the AQMAs were both located on the periphery of AQMAs (AQMAs 2 & 3). Looking at the 2017 special project data shown in 2018's ASR, the same exceedances were noted: SP5 & SP25.

Table A.3 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 are provided in Appendix B.

The results from the continuous analyser, located within AQMA 1, measured a slight decrease in the annual mean NO_2 concentration at 28µg/m^3 from 29µg/m^3 in 2017. This is the second year running where the Council has been able to obtain a high data capture rate (99%) of continuous analyser data and where levels are within the objective (40 µg/m^3).

Table A.4 in Appendix A compares the ratified continuous monitored NO2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year – during 2018 no exceedances were recorded.

Looking at the locally bias adjusted and distance corrected data for the non-automatic monitoring locations, exceedances of the annual mean NO_2 concentration were found at 14 unique locations, 12 of which are located within current AQMA boundaries. Of the 12 exceedances within AQMAs;

- 1 located in AQMA 1 (site 14)
- 5 located in AQMA 2 (sites 11,12&19 – triplicate, 24, 27, 66, 68)
- 2 located in AQMA 3 (sites 5, 39)
- 4 located in AQMA 5 (sites 49, 52, 53, 64&65 – duplicate)

No exceedances were noted in AQMA 4, although site 2 was close to the objective level at 38.4 µg/m^3. Given the influence of meteorological conditions on pollutant concentrations, further monitoring will be carried out over future years to confirm

levels remain below the objective. If levels remain below the objective, the Council will conduct a detailed assessment with a view to revoke this AQMA.

The remaining 2 exceedances are:

- Site 17, which has an annual mean NO_2 concentration of 41.2 µg/m^3 and is located on the periphery of AQMA 2
- Site 30, which has an annual mean NO_2 concentration of 45.5 µg/m^3 and is located on the periphery of AQMA 3.

If future NO_2 concentrations are high at these sites, the Council will review whether to amend the boundarys of the AQMAs.

Site 31 is shown as an exceedance in the tables and maps below but there is no relevant receptor near to this site so the annual mean objective level does not apply. In light of this, site 31 has not been included in the number of exceedances listed above.

The number of exeedances appears higher to those observed last year. However, this is due to the difference in bias adjustment factors used (local factor used for 2018's results rather than national factor used for 2017's results). The local adjustment factor (0.83) is a more conservative figure than the national adjustment factor (0.76) in this instance.

Despite using the Local Bias adjustment factor for this years ASR, the data was also analysed using the nationally derived bias adjustment factor for comparison against data collected in 2017 (which was analysed using the national factor). Looking at the data corrected via the national factor and subsequent distance correction, exceedances of the annual mean NO_2 concentration were found at 8 sites, 7 of which are located within current AQMA boundaries. No exceedances were noted in AQMAs 3 or 4. When comparing this years data to last years data using the national factor, 3 less exceedances are noted: 2 less in AQMA 3 and 1 less outside the AQMAs (Tube 30 – located outside the periphery of AQMA 3).

Figure A.1 shows bias and distance corrected trendline plots for clusters of passive monitoring locations in and around each of the 5 AQMAs. All would appear to indicate that annual mean NO2 levels remain essentially unchanged.

There are no annual averages greater than 60µg/m^3 that would indicate an exceedance of the 1-hour mean objective.

3.2.2 Particulate Matter (PM_{10})

Ipswich Borough Council does not monitor for particulate matter (PM_{10}) – historical studies / monitoring have not identified any exceedance of the objective levels.

3.2.3 Particulate Matter ($PM_{2.5}$)

Ipswich Borough Council does not monitor for particulate matter ($PM_{2.5}$).

3.2.4 Sulphur Dioxide (SO_2)

Ipswich Borough Council does not monitor for Sulphur Dioxide (SO_2) – previous screening work has not suggested that there will be any exceedance of the objective levels.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
IPS3	Chevallier Street	Roadside	615261	245350	NO2	YES	Chemiluminescent	2.5	2.5	1.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – 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)
1	Civic Drive	Kerbside	615992	244412	NO2	NO	18.8	6	NO	2.63
2	Chevallier Street	Kerbside	615144	245245	NO2	YES	1.55	1.95	NO	2.43
3	Coprolite Street / Duke Street	Kerbside	617070	244039	NO2	NO	N/A	0.8	NO	2.55
4	Berners Street	Kerbside	615929	244927	NO2	NO	6.1	1.55	NO	2.46
5	Fore Street	Kerbside	616887	244128	NO2	YES	0.9	3.3	NO	2.44
6	Kings Avenue	Background	617286	244420	NO2	NO	N/A	3.8	NO	2.45
7	Bramford Road	Kerbside	615007	245239	NO2	NO	0	5.6	NO	2.3
8	Bramford Road	Kerbside	615125	245209	NO2	NO	4.25	2.2	NO	2.45
9	Bramford Road	Kerbside	615125	245209	NO2	NO	4.25	2.2	NO	2.45
10	Bramford Road	Kerbside	615125	245209	NO2	NO	4.25	2.2	NO	2.45
11	St Margaret's Street / Piper's Court	Kerbside	616593	244753	NO2	YES	0	2.45	NO	2.27
12	St Margaret's Street / Piper's Court	Kerbside	616593	244753	NO2	YES	0	2.45	NO	2.27

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)
13	Bramford Lane	Kerbside	615117	245305	NO2	NO	3.3	1.2	NO	2.52
14	Chevallier Street	Kerbside	615285	245393	NO2	YES	0.35	2.5	NO	2.2
15	Tavern Street	Background	616282	244643	NO2	NO	N/A	N/A	NO	2.62
16	Valley Road / Westwood Court	Kerbside	615362	245437	NO2	NO	2.6	3.1	NO	2.48
17	Woodbridge Road	Kerbside	616993	244659	NO2	NO	2.1	1.78	NO	2.49
18	Yarmouth Road	Kerbside	615095	245175	NO2	NO	0	7.5	NO	2.3
19	St Margaret's Street / Piper's Court	Kerbside	616593	244753	NO2	YES	0	2.45	NO	2.27
20	Fonnereau Road	Kerbside	6164589	244829	NO2	NO	1.8	2.22	NO	2.6
21	St Margaret's Plain	Kerbside	616494	244807	NO2	YES	N/A	2	NO	2.42
22	St Margaret's Plain / Northgate Street	Kerbside	616489	244785	NO2	YES	N/A	2.29	NO	2.59
23	St Margaret's Green	Kerbside	616645	244784	NO2	NO	0	3.25	NO	2.49

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)
24	St Margaret's Street	Kerbside	616663	244692	NO2	YES	N/A	3.3	NO	2.38
25	St Helen's Street	Kerbside	616753	244582	NO2	YES	1.05	2.95	NO	2.54
26	St Helen's Street / Grimwade Street	Kerbside	616971	244511	NO2	NO	0	3.6	NO	2.29
27	Argyle Street	Kerbside	616965	244546	NO2	YES	0.3	1.2	NO	2.32
28	Chevallier Street	Kerbside	615194	245292	NO2	YES	2.62	1.9	NO	2.48
29	Fore Hamlet	Kerbside	617118	244074	NO2	NO	0	2.2	NO	2.65
30	Fore Street	Kerbside	616939	244114	NO2	NO	1.4	2.65	NO	2.46
31	Star Lane	Kerbside	616332	244149	NO2	NO	N/A	2.4	NO	2.3
32	Spring Road	Kerbside	617398	244573	NO2	NO	2.9	2	NO	2.5
33	Key Street	Kerbside	616666	244114	NO2	YES	0	2	NO	2.47
34	College Street	Kerbside	616467	244072	NO2	YES	N/A	1.75	NO	2.52
35	Cobden Place	Kerbside	616746	244696	NO2	NO	0	1.12	NO	2.37
36	Valley Road	Kerbside	616820	246158	NO2	NO	15	2.2	NO	2.45
37	Lower Brook Street	Kerbside	616483	244165	NO2	NO	N/A	2.9	NO	2.26
38	Civic Drive	Kerbside	615904	244805	NO2	NO	6.3	0.85	NO	2.47

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)
39	Star Lane / Fore Star	Kerbside	616731	244245	NO2	YES	N/A	1.4	NO	2.5
40	Norwich Road	Kerbside	615460	245148	NO2	NO	5.7	2.75	NO	2.4
41	Bramford Road / Norwich Road	Kerbside	615564	245010	NO2	NO	0.5	1.3	NO	2.52
42	Norwich Road	Kerbside	615744	244901	NO2	YES	0	2.3	NO	2.54
43	Bramford Road / Yarmouth Road	Kerbside	615109	245200	NO2	YES	0.55	3.6	NO	2.4
44	Bramford Road	Kerbside	615052	245237	NO2	NO	4.8	1.6	NO	2.4
45	Chevallier Street	Kerbside	615261	245350	NO2	YES	2.5	4.15	YES	1.2
46	Chevallier Street	Kerbside	615261	245350	NO2	YES	2.5	4.15	YES	1.2
47	Chevallier Street	Kerbside	615261	245350	NO2	YES	2.5	4.15	YES	1.2
48	Valley Road	Kerbside	615425	245486	NO2	NO	7.35	2.55	NO	2.73
49	St Matthew's Street	Kerbside	615792	244876	NO2	YES	0	1.85	NO	2.58
50	Barrack Lane	Kerbside	615773	244890	NO2	YES	1.52	1.4	NO	2.44
51	St Matthew's Street	Kerbside	615769	244866	NO2	YES	4.53	0.85	NO	2.58

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)
52	St Matthew's Street	Kerbside	615826	244871	NO2	YES	0	2.15	NO	2.52
53	St Matthew's Street	Kerbside	615820	244858	NO2	YES	0	2.15	NO	2.33
54	St Matthew's Street Roundabout	Kerbside	615893	244855	NO2	NO	10.4	1.3	NO	2.48
55	Berners Street	Kerbside	615917	244898	NO2	NO	0	2.28	NO	2.52
56	Berners Street	Kerbside	615931	244911	NO2	NO	0	1.5	NO	2.52
57	Berners Street	Kerbside	615941	244981	NO2	NO	0	8.12	NO	2.54
58	Berners Street	Kerbside	615978	245042	NO2	NO	7.65	0.5	NO	2.46
59	St Matthew's Street Roundabout	Kerbside	615926	244837	NO2	NO	N/A	2.85	NO	2.46
60	Colchester Road	Kerbside	617438	246168	NO2	NO	14.5	3.1	NO	2.43
61	Valley Road	Kerbside	616099	246105	NO2	NO	19.5	2.35	NO	2.52
62	St Matthew's Street	Kerbside	615935	244803	NO2	NO	2.9	1.83	NO	2.63
63	St Matthew's Street	Kerbside	615950	244790	NO2	NO	0	3.3	NO	2.44

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)
64	Norwich Road	Kerbside	615688	244939	NO2	YES	0.35	1.3	NO	2.38
65	Norwich Road	Kerbside	615688	244939	NO2	YES	0.35	1.3	NO	2.38
66	Woodbridge Road	Kerbside	616807	244669	NO2	YES	0	3.35	NO	2.37
67	Blanche Street	Kerbside	616890	244676	NO2	NO	6.3	1.35	NO	2.57
68	Woodbridge Road	Kerbside	616905	244657	NO2	YES	0	3.35	NO	2.5
69	Argyle Street	Kerbside	616978	244590	NO2	NO	0	4.75	NO	2.48
70	Argyle Street	Kerbside	616965	244583	NO2	NO	N/A	1.57	NO	2.27
71	St Helen's Street	Kerbside	617032	244537	NO2	NO	0	14.5	NO	2.46
72	St Helen's Street	Kerbside	617123	244535	NO2	YES	0	1.9	NO	2.6
73	Regent Street	Kerbside	617124	244517	NO2	NO	0	0.95	NO	2.59
74	Grimwade Street	Kerbside	616953	244443	NO2	NO	N/A	2.12	NO	2.53
75	Grimwade Street	Kerbside	616932	244362	NO2	NO	0	5.2	NO	2.5
76	St Helen's Street	Kerbside	616951	244521	NO2	YES	0	2.95	NO	2.46
77	St Helen's Street	Kerbside	616902	244542	NO2	NO	0	4.7	NO	2.49
78	Orchard Street	Kerbside	616870	244586	NO2	NO	1.5	1.4	NO	2.59

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)
79	Woodbridge Road	Kerbside	617052	244677	NO2	NO	2.31	5.45	NO	2.43
80	St Helen's Street	Kerbside	616821	244546	NO2	YES	N/A	1	NO	2.4
81	St Helen's Street	Kerbside	616821	244546	NO2	YES	N/A	1	NO	2.4
82	St Helen's Street	Kerbside	616821	244546	NO2	YES	N/A	1	NO	2.4
83	Bond Street	Kerbside	616792	244498	NO2	NO	1.58	1.6	NO	2.24
84	Carr Street / Major's Corner	Kerbside	616702	244601	NO2	NO	N/A	4.35	NO	2.47
85	Old Foundry Road	Kerbside	616681	244623	NO2	NO	0.17	1.32	NO	2.51

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – 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 ($\mu g/m^3$) (3)					
					2014	2015	2016	2017	2018 (Local Factor)	2018 (National Factor)
IPS3	Roadside	Automatic	99	99	29	N/A	N/A	29	28	28
1	Kerbside	Diffusion Tube	100	100	28	26	24	27	26	24
2	Kerbside	Diffusion Tube	100	100	**43**	**41**	**39**	**40**	**42**	39
3	Kerbside	Diffusion Tube	100	100	29	27	27	26	27	25
4	Kerbside	Diffusion Tube	100	100	33	34	32	36	33	30
5	Kerbside	Diffusion Tube	92	92	**40**	**42**	**41**	**44**	**42**	39
6	Urban Background	Diffusion Tube	92	92	16	16	17	18	17	16
7	Kerbside	Diffusion Tube	100	100	32	33	30	32	31	29
8	Kerbside	Diffusion Tube	100	100	33	34	35	35	34	31
9	Kerbside	Diffusion Tube	100	100	33	34	35	35	34	31
10	Kerbside	Diffusion Tube	100	100	33	34	34	35	34	31
11	Kerbside	Diffusion Tube	100	100	**44**	**47**	**45**	**50**	**48**	**44**
12	Kerbside	Diffusion Tube	100	100	**43**	**49**	**47**	**50**	**48**	**44**
13	Kerbside	Diffusion Tube	100	100	35	22	24	25	24	22
14	Kerbside	Diffusion Tube	100	100	**47**	**48**	**47**	**45**	**45**	**41**

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 (Local Factor)	2018 (National Factor)
15	Urban Background	Diffusion Tube	100	100	25	24	23	24	26	24
16	Kerbside	Diffusion Tube	100	100	33	36	35	37	35	32
17	Kerbside	Diffusion Tube	100	100	**47**	**43**	**42**	**46**	**46**	**42**
18	Kerbside	Diffusion Tube	100	100	30	29	28	27	28	26
19	Kerbside	Diffusion Tube	100	100	**41**	**48**	**45**	**50**	**48**	**44**
20	Kerbside	Diffusion Tube	100	100	33	33	29	34	33	30
21	Kerbside	Diffusion Tube	100	100	36	37	36	37	38	34
22	Kerbside	Diffusion Tube	92	92	38	38	36	36	39	35
23	Kerbside	Diffusion Tube	100	100	23	23	21	23	21	20
24	Kerbside	Diffusion Tube	100	100	**42**	**40**	38	37	**40**	37
25	Kerbside	Diffusion Tube	100	100	**41**	**40**	36	38	39	36
26	Kerbside	Diffusion Tube	92	92	32	31	30	32	36	33
27	Kerbside	Diffusion Tube	100	100	37	35	39	**42**	**43**	39
28	Kerbside	Diffusion Tube	100	100	35	37	36	36	38	35
29	Kerbside	Diffusion Tube	100	100	30	31	32	33	32	29

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 (Local Factor)	2018 (National Factor)
30	Kerbside	Diffusion Tube	100	100	29	**47**	**46**	**51**	**49**	**45**
31	Kerbside	Diffusion Tube	92	92	32	34	36	**43**	**45**	**42**
32	Kerbside	Diffusion Tube	100	100	31	32	30	34	31	29
33	Kerbside	Diffusion Tube	100	100	33	33	33	33	34	31
34	Kerbside	Diffusion Tube	100	100	**42**	38	37	**40**	39	35
35	Kerbside	Diffusion Tube	92	92	28	27	24	27	27	25
36	Kerbside	Diffusion Tube	100	100	28	30	30	33	31	29
37	Kerbside	Diffusion Tube	100	100	24	25	24	25	25	23
38	Kerbside	Diffusion Tube	100	100	35	33	33	34	35	32
39	Kerbside	Diffusion Tube	100	100	39	**42**	**41**	**43**	**43**	39
40	Kerbside	Diffusion Tube	100	100	27	27	27	31	30	27
41	Kerbside	Diffusion Tube	100	100	37	37	34	35	37	34
42	Kerbside	Diffusion Tube	100	100	34	34	**41**	33	38	35
43	Kerbside	Diffusion Tube	100	100	37	**40**	37	39	38	35
44	Kerbside	Diffusion Tube	100	100	37	37	37	38	38	34

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 (Local Factor)	2018 (National Factor)
45	Kerbside	Diffusion Tube	100	100	30	29	27	27	28	25
46	Kerbside	Diffusion Tube	100	100	29	28	27	27	28	25
47	Kerbside	Diffusion Tube	100	100	29	28	28	27	28	25
48	Kerbside	Diffusion Tube	100	100	27	27	27	29	27	24
49	Kerbside	Diffusion Tube	92	92	**42**	**42**	**41**	**41**	**46**	**42**
50	Kerbside	Diffusion Tube	92	92	25	28	26	28	27	25
51	Kerbside	Diffusion Tube	83	83	36	38	38	37	**42**	38
52	Kerbside	Diffusion Tube	100	100	**45**	**47**	**47**	**47**	**46**	**43**
53	Kerbside	Diffusion Tube	92	92	**49**	**46**	**45**	**42**	**46**	**42**
54	Kerbside	Diffusion Tube	100	100	31	31	31	36	37	34
55	Kerbside	Diffusion Tube	100	100	30	31	29	28	29	26
56	Kerbside	Diffusion Tube	100	100	27	28	29	29	29	27
57	Kerbside	Diffusion Tube	100	100	25	26	25	27	25	23
58	Kerbside	Diffusion Tube	100	100	25	27	23	25	25	23
59	Kerbside	Diffusion Tube	100	100	32	34	32	33	32	29

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 (Local Factor)	2018 (National Factor)
60	Kerbside	Diffusion Tube	83	83	36	34	36	31	29	27
61	Kerbside	Diffusion Tube	83	83	33	34	36	**42**	**40**	37
62	Kerbside	Diffusion Tube	100	100	38	38	33	37	36	33
63	Kerbside	Diffusion Tube	100	100	37	38	35	37	36	33
64	Kerbside	Diffusion Tube	92	92	**52**	**55**	**50**	**56**	**55**	**49**
65	Kerbside	Diffusion Tube	83	83	**51**	**51**	**51**	**56**	**55**	**49**
66	Kerbside	Diffusion Tube	100	100	38	38	35	**40**	**42**	38
67	Kerbside	Diffusion Tube	100	100	30	27	26	26	28	26
68	Kerbside	Diffusion Tube	100	100	**46**	**43**	**41**	**45**	**44**	**41**
69	Kerbside	Diffusion Tube	100	100	27	26	26	26	27	25
70	Kerbside	Diffusion Tube	83	83	33	33	33	36	38	35
71	Kerbside	Diffusion Tube	100	100	24	27	24	24	25	23
72	Kerbside	Diffusion Tube	100	100	38	36	36	38	38	35
73	Kerbside	Diffusion Tube	100	100	22	23	23	23	23	21
74	Kerbside	Diffusion Tube	100	100	26	27	26	27	27	24

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 (Local Factor)	2018 (National Factor)
75	Kerbside	Diffusion Tube	100	100	23	25	25	25	26	24
76	Kerbside	Diffusion Tube	100	100	37	37	34	36	37	33
77	Kerbside	Diffusion Tube	100	100	27	28	28	28	29	26
78	Kerbside	Diffusion Tube	92	92	23	24	25	25	24	22
79	Kerbside	Diffusion Tube	75	75	23	30	37	36	36	33
80	Kerbside	Diffusion Tube	92	92	34	35	32	36	38	34
81	Kerbside	Diffusion Tube	92	92	35	35	33	36	38	34
82	Kerbside	Diffusion Tube	83	83	36	35	33	36	38	34
83	Kerbside	Diffusion Tube	100	100	31	30	27	29	31	29
84	Kerbside	Diffusion Tube	100	100	27	26	24	25	26	24
85	Kerbside	Diffusion Tube	92	92	32	32	29	31	32	29
SP1	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	36	N/A	N/A
SP2	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	38	N/A	N/A
SP3	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A
SP4	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	31	N/A	N/A

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 (Local Factor)	2018 (National Factor)
SP5	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	**45**	N/A	N/A
SP6	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A
SP7	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A
SP8	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	28	N/A	N/A
SP9	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	27	N/A	N/A
SP10	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	30	N/A	N/A
SP11	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	32	N/A	N/A
SP12	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A
SP13	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	33	N/A	N/A
SP14	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A
SP15	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	29	N/A	N/A
SP16	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	22	N/A	N/A
SP17	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	21	N/A	N/A
SP18	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	26	N/A	N/A
SP19	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	29	N/A	N/A

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 (Local Factor)	2018 (National Factor)
SP20	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	31	N/A	N/A
SP21	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	29	N/A	N/A
SP22	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	27	N/A	N/A
SP23	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	24	N/A	N/A
SP24	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	36	N/A	N/A
SP25	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	**44**	N/A	N/A
SP26	Kerbside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	23	N/A	N/A

☒ Diffusion tube data has been bias corrected (Using the National Bias Adjustment Factor for years 2014, 2015, 2016, 2017. The Local Bias Adjustment Factor was used for 2018 but the data has also been adjusted using the National Bias Adjustment Factor for further trend analysis)

It is expected that developers submitting air quality assessments in support of a planning application should give primary regard to the 2018 results generated via using the Local Bias Adjustment Factor.

☒ Annualisation has been conducted where data capture is <75%

Notes:

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

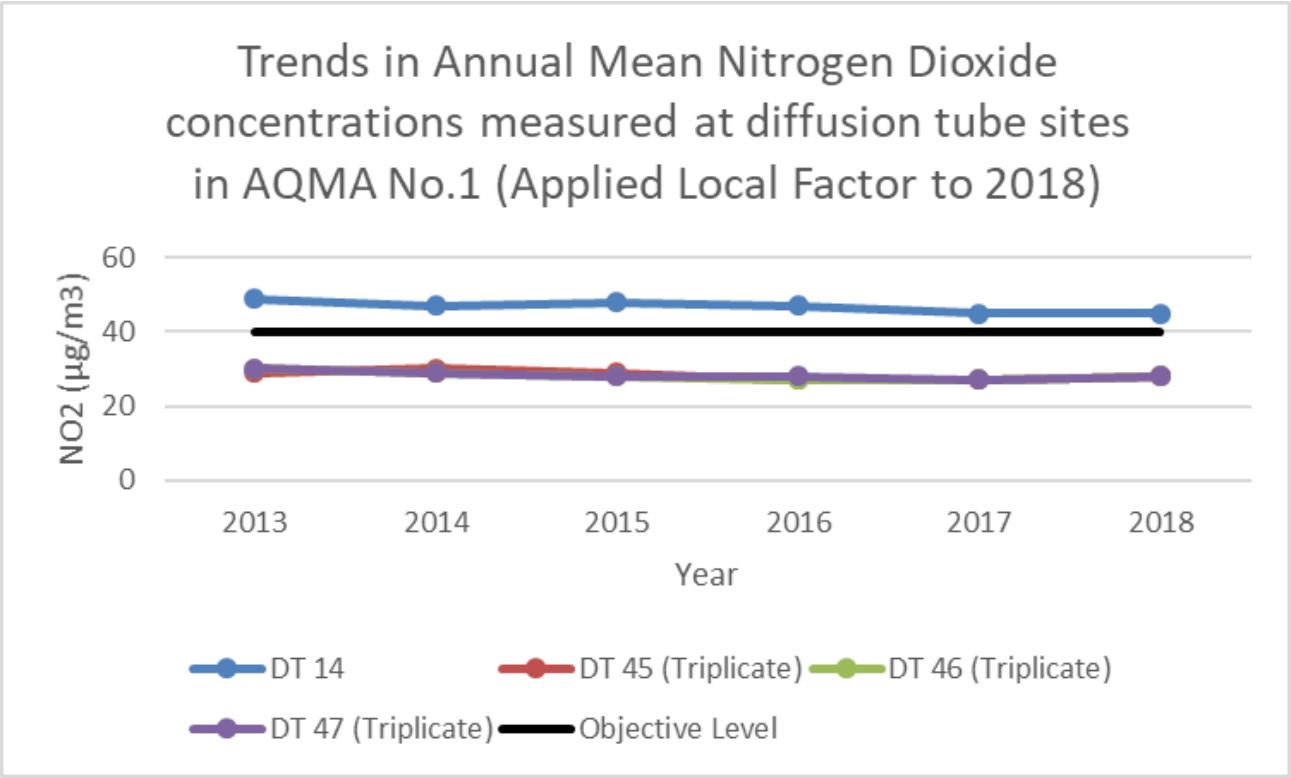
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

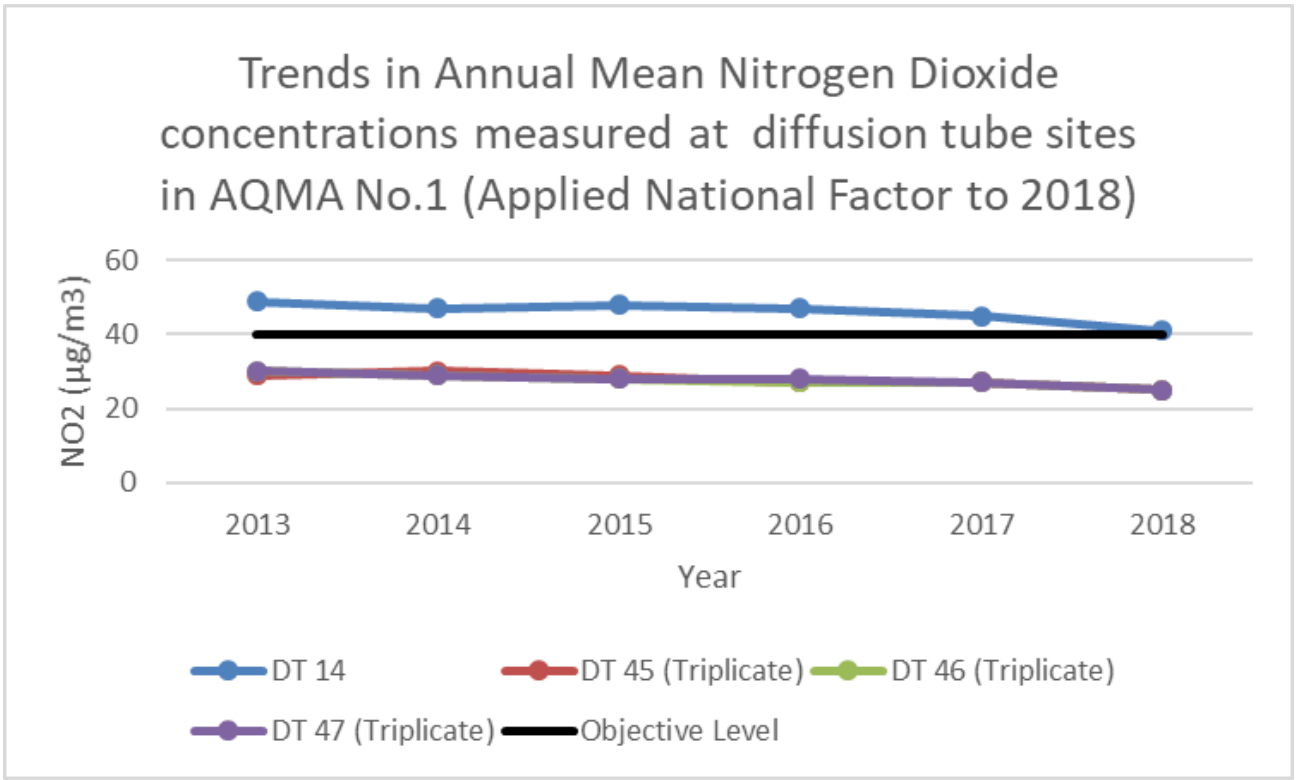
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

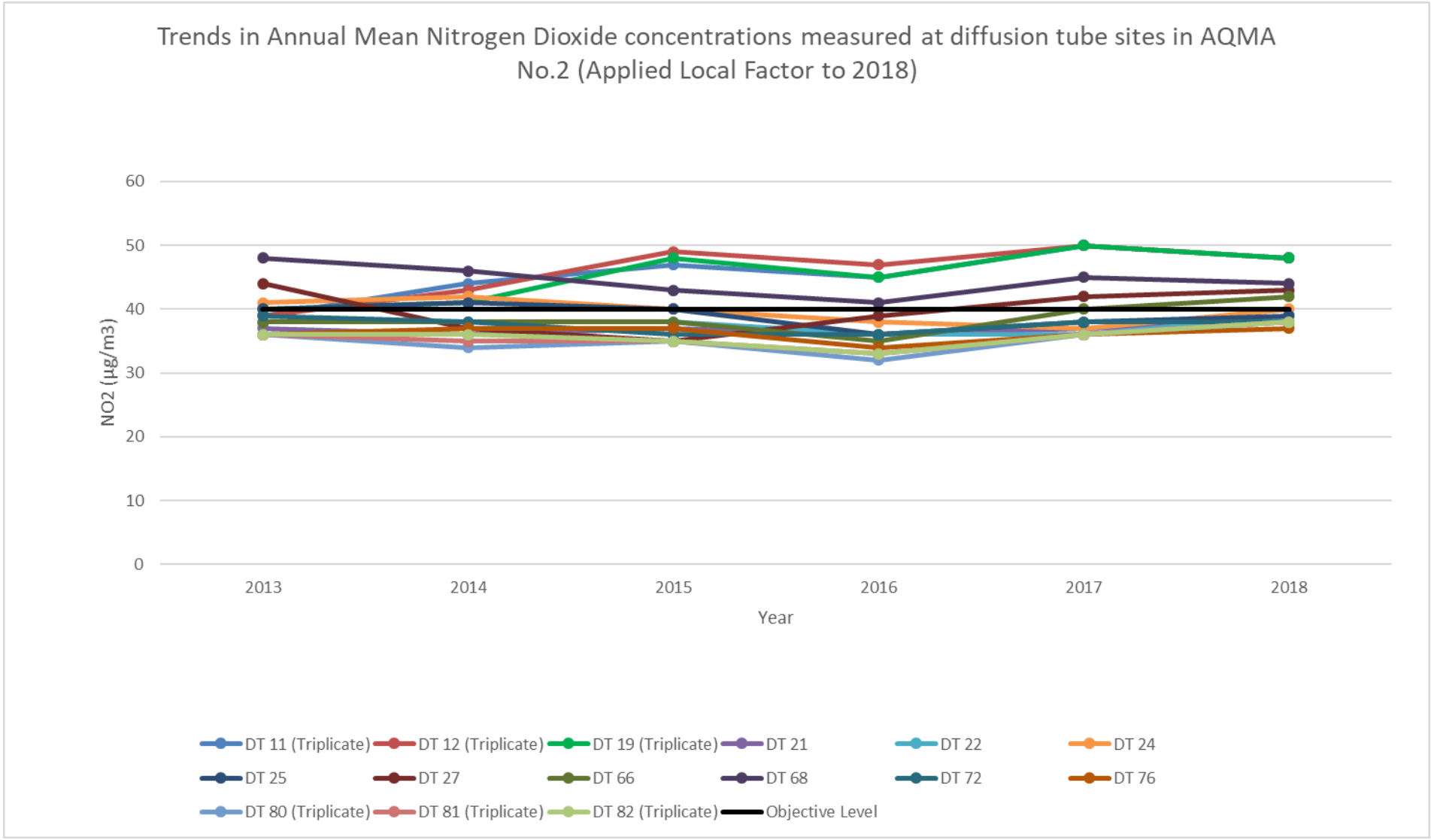
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

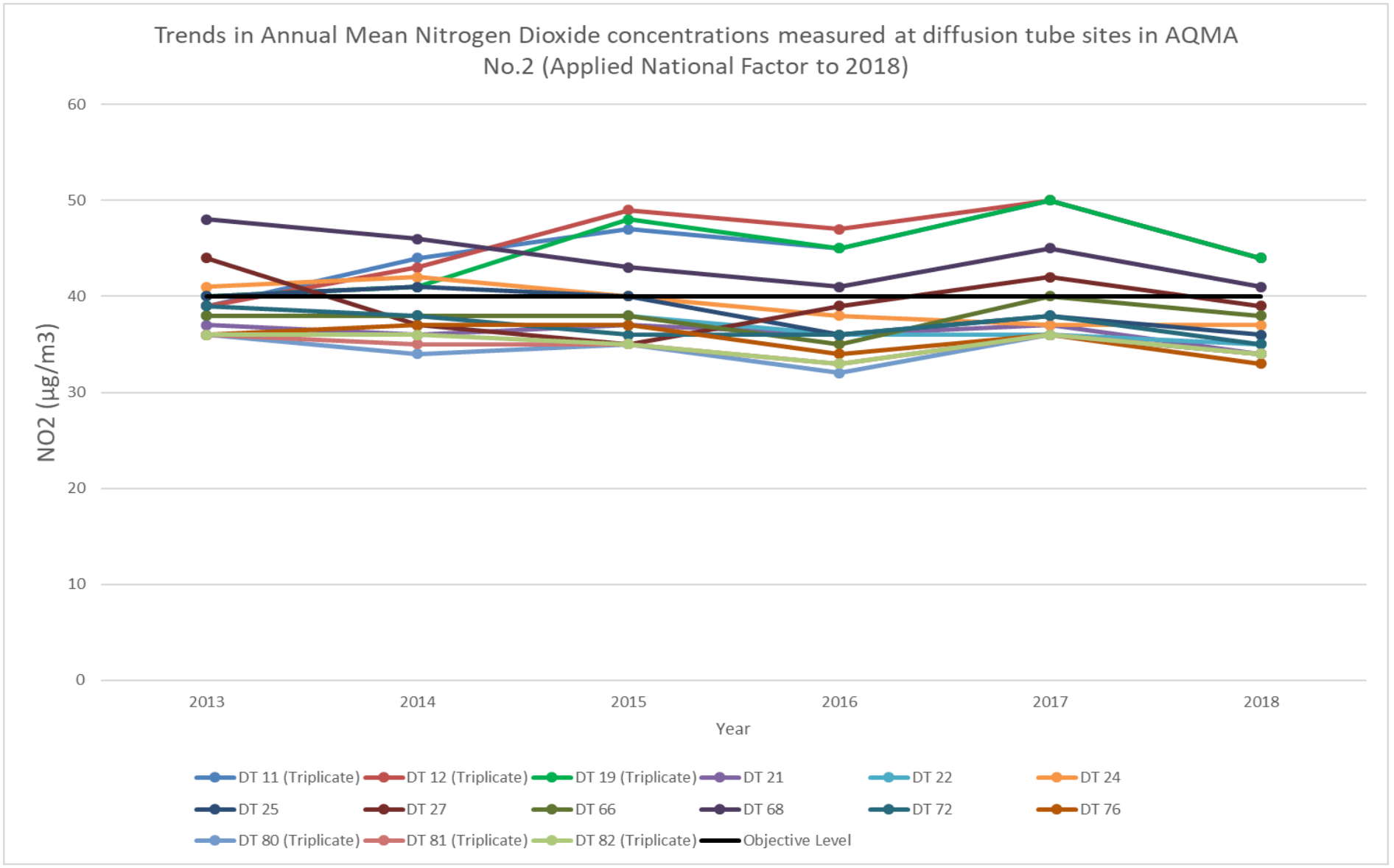
(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

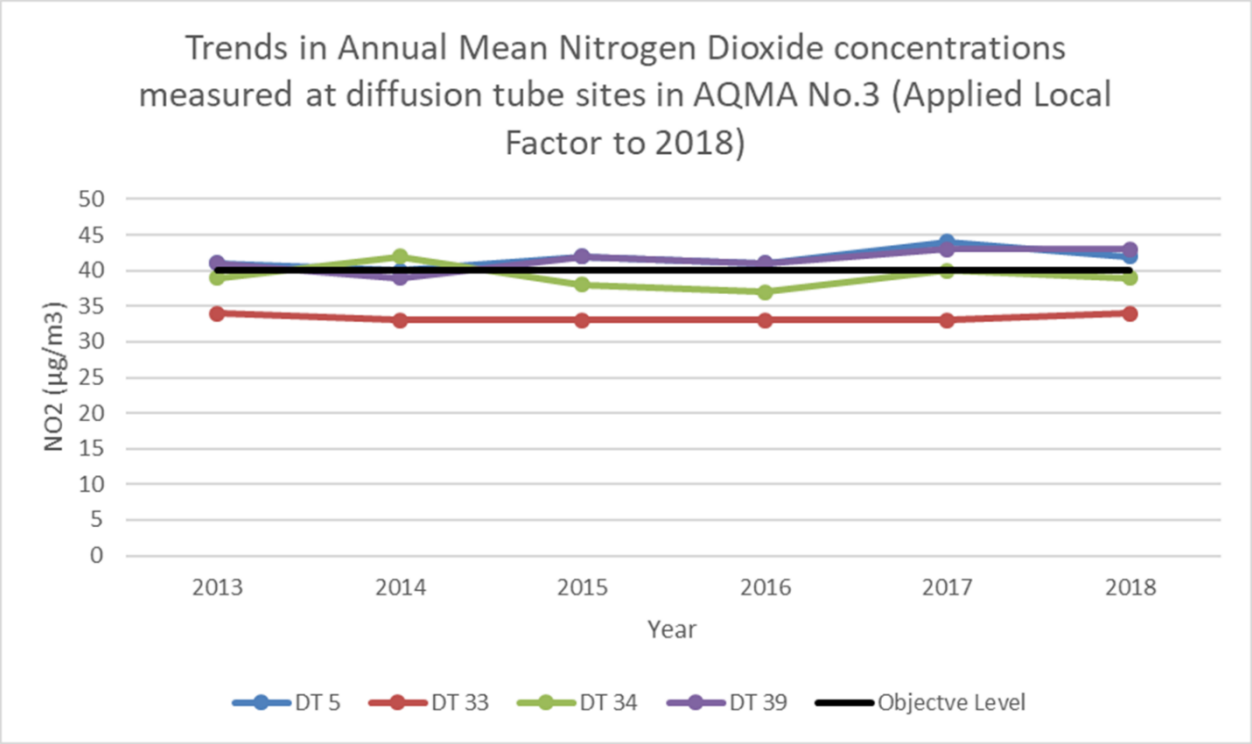
Figure A.1 – Trends in Annual Mean NO_2 Concentrations (not distance corrected)

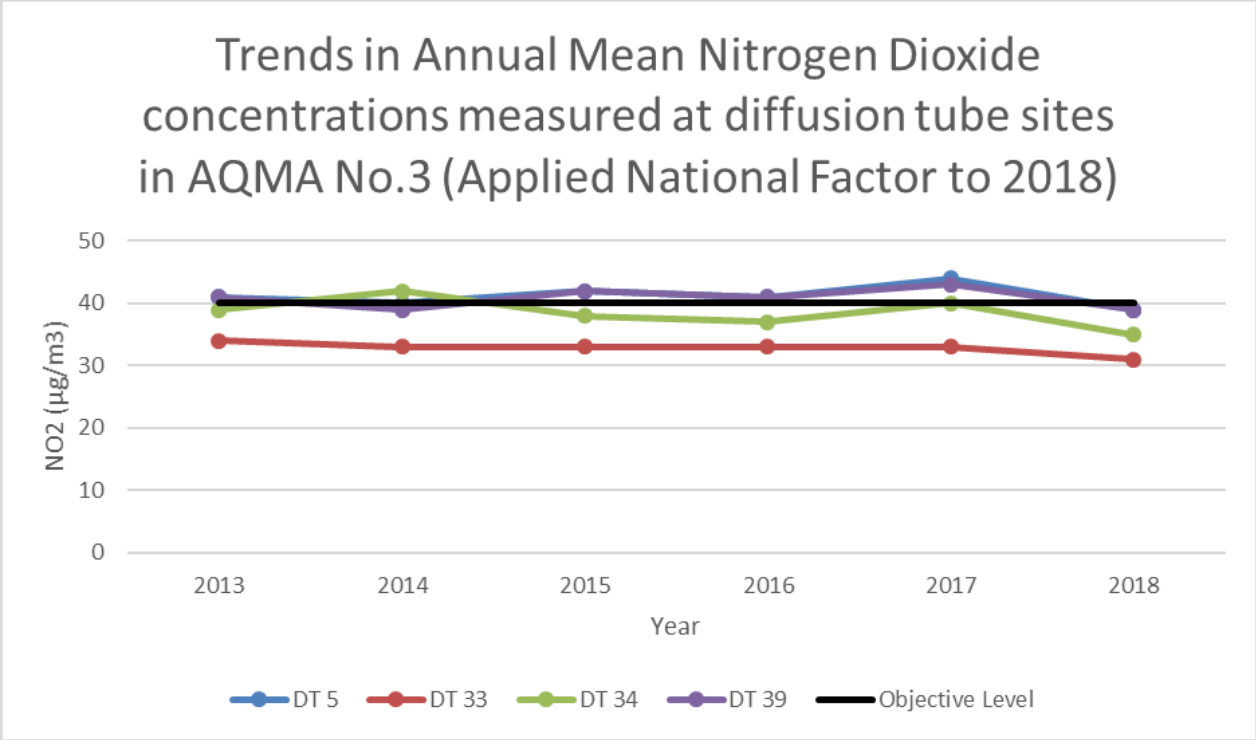


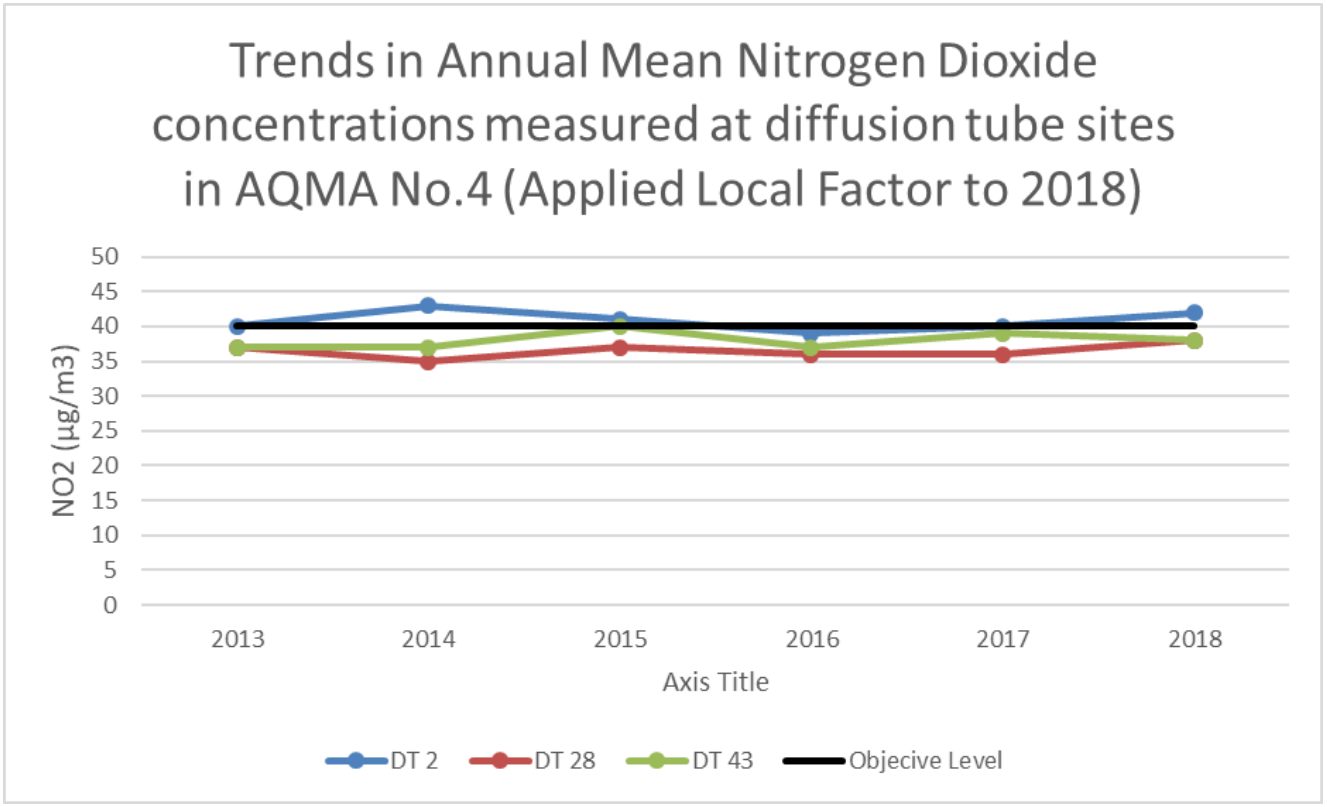


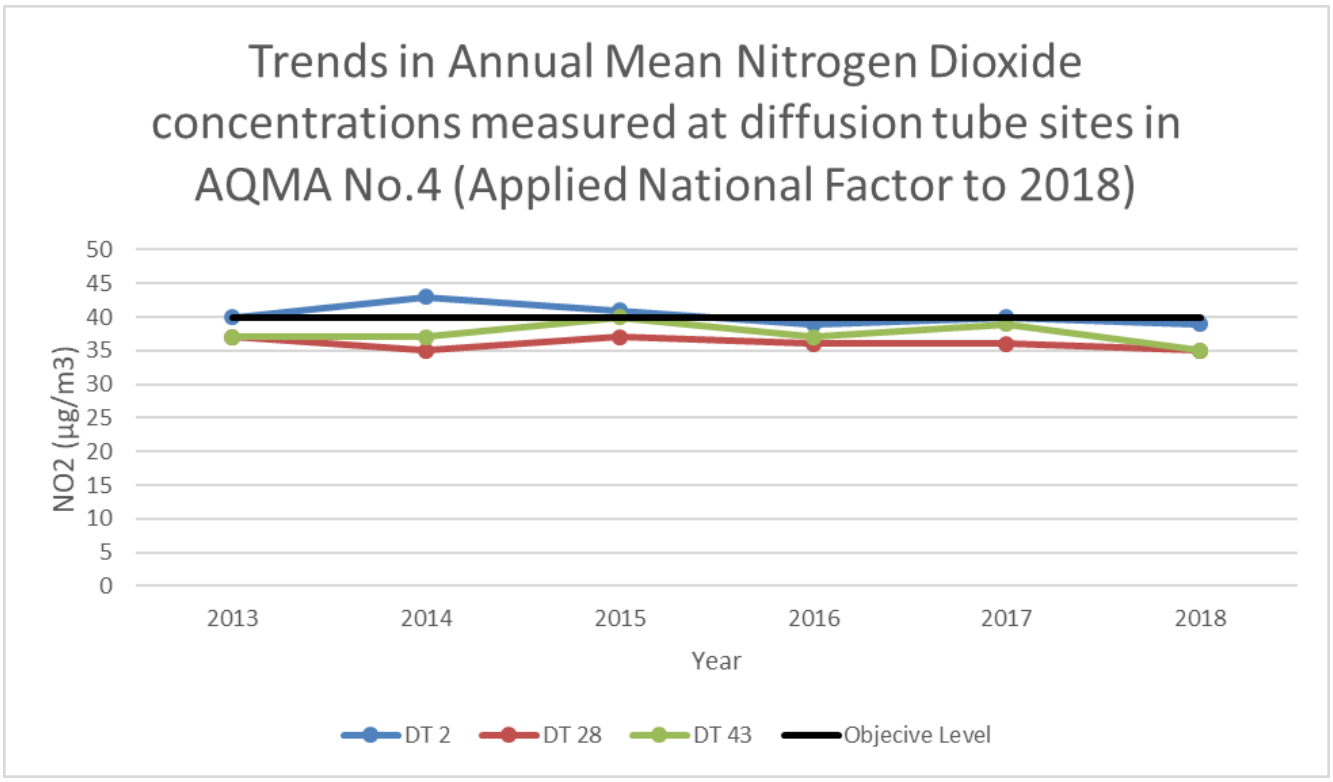

Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.2 (Applied Local Factor to 2018)
NO2 (µg/m3)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 11 (Triplicate)
DT 12 (Triplicate)
DT 19 (Triplicate)
DT 21
DT 22
DT 24
DT 25
DT 27
DT 66
DT 68
DT 72
DT 76
DT 80 (Triplicate)
DT 81 (Triplicate)
DT 82 (Triplicate)
Objective Level

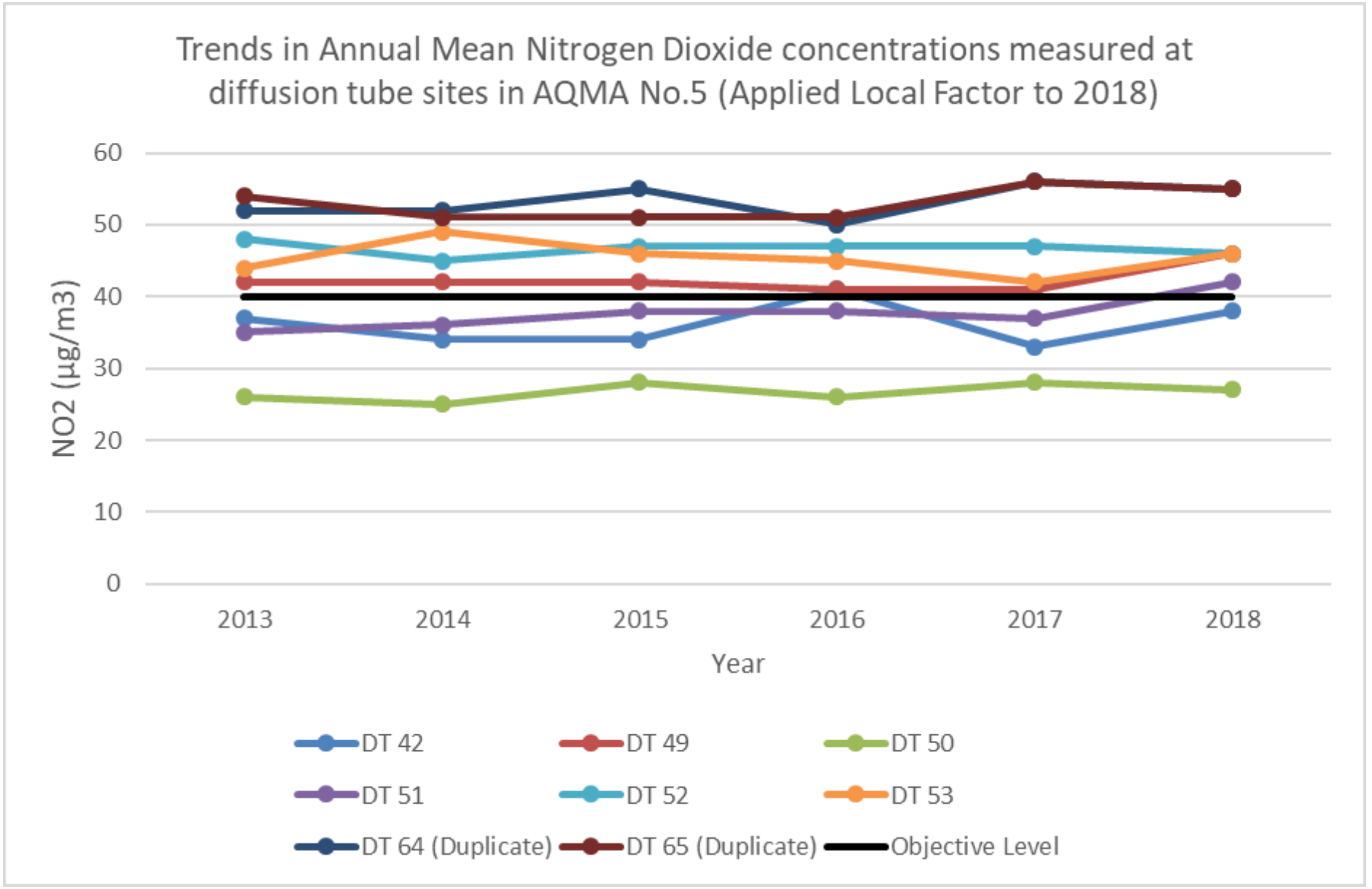

Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.2 (Applied National Factor to 2018)
NO2 (µg/m3)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 11 (Triplicate)
DT 12 (Triplicate)
DT 19 (Triplicate)
DT 21
DT 22
DT 24
DT 25
DT 27
DT 66
DT 68
DT 72
DT 76
DT 80 (Triplicate)
DT 81 (Triplicate)
DT 82 (Triplicate)
Objective Level

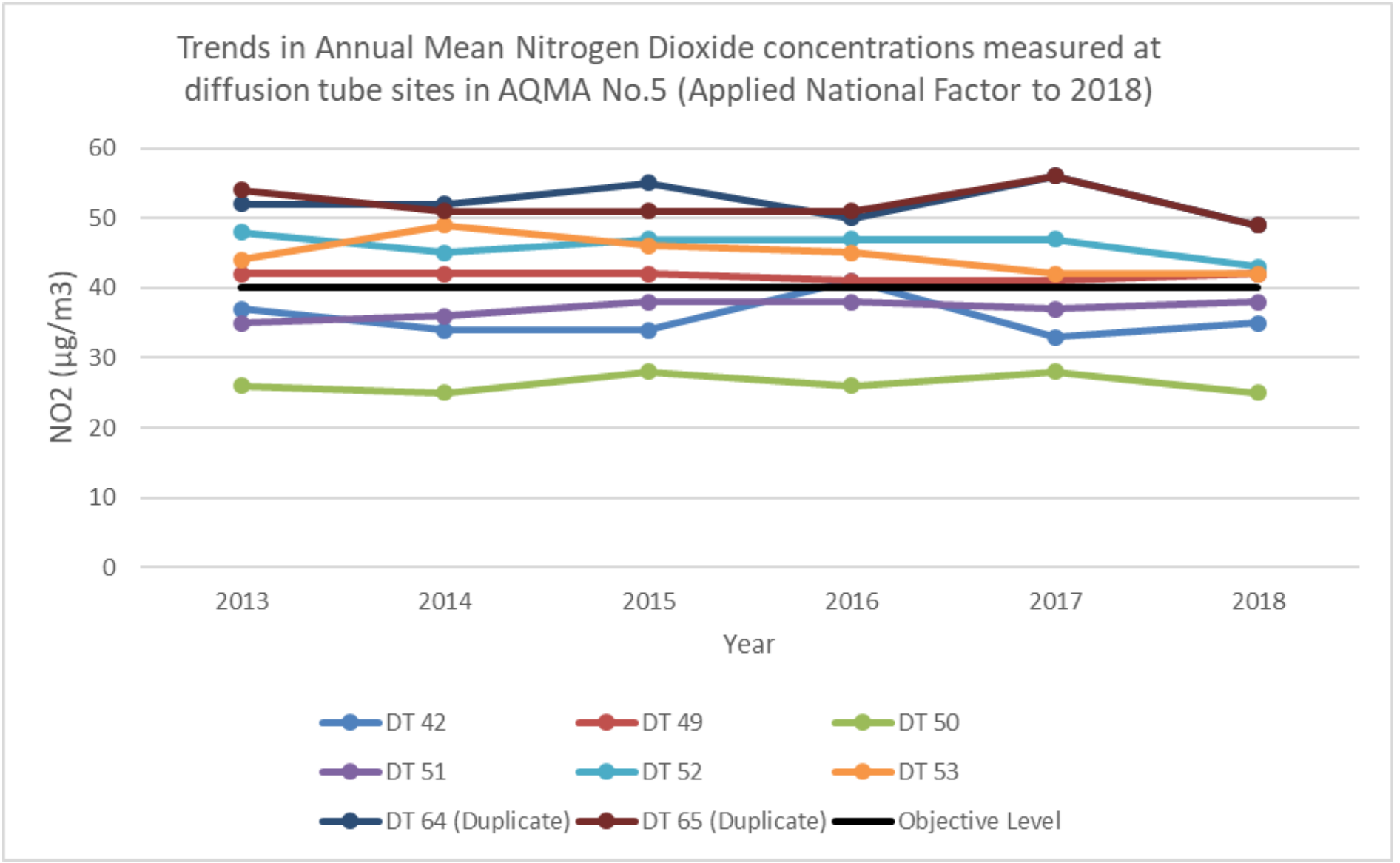

Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.3 (Applied Local Factor to 2018)
NO2 (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
2018
Year
DT 5
DT 33
DT 34
DT 39
Objectve Level

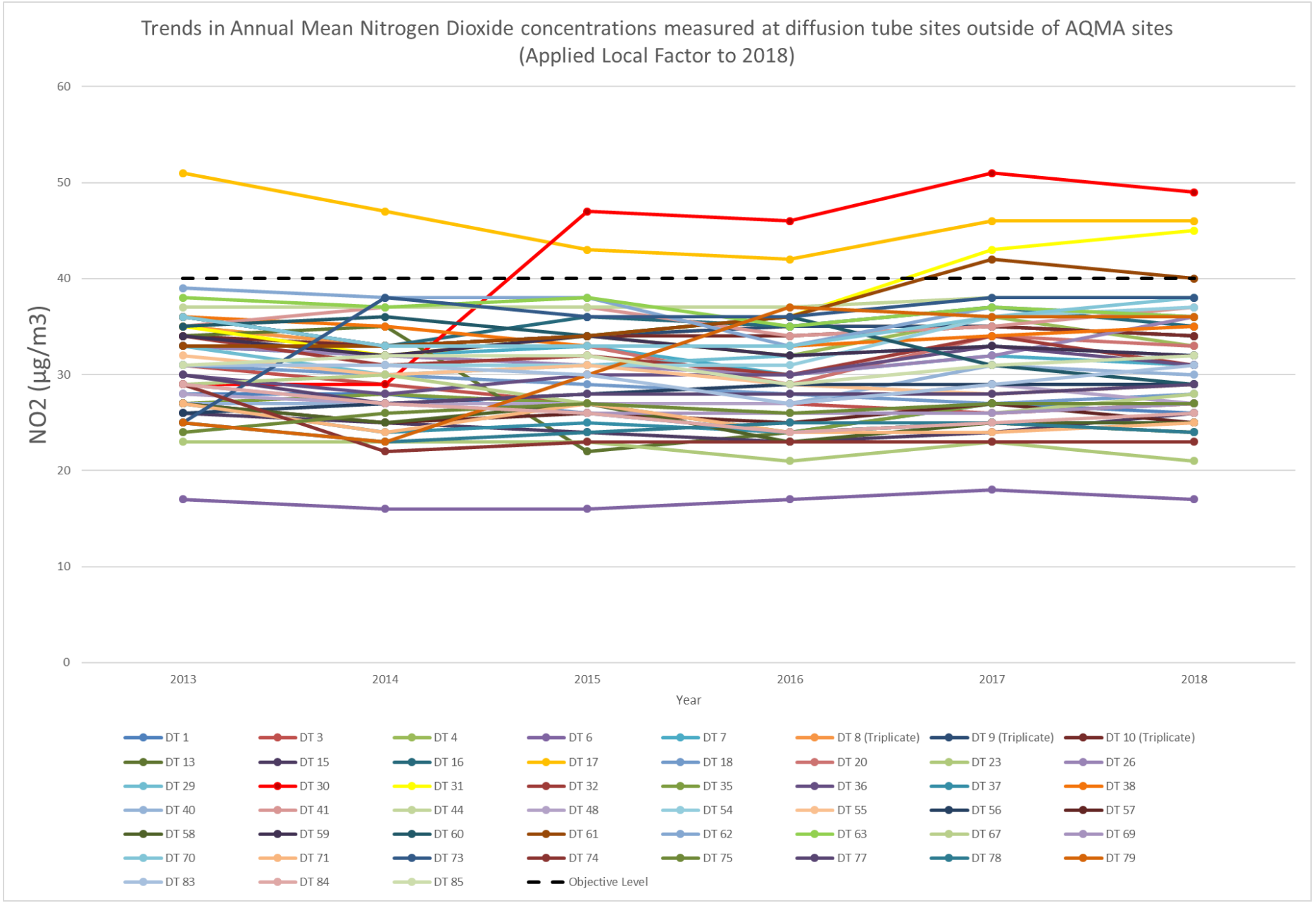

Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.3 (Applied National Factor to 2018)
NO2 (µg/m3)
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 5
DT 33
DT 34
DT 39
Objective Level


Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.4 (Applied Local Factor to 2018)
NO2 (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
2018
Axis Title
DT 2
DT 28
DT 43
Objecive Level


Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.4 (Applied National Factor to 2018)
NO2 (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
2018
Year
DT 2
DT 28
DT 43
Objecive Level


Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.5 (Applied Local Factor to 2018)
NO2 (µg/m3)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 42
DT 49
DT 50
DT 51
DT 52
DT 53
DT 64 (Duplicate)
DT 65 (Duplicate)
Objective Level


Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites in AQMA No.5 (Applied National Factor to 2018)
NO2 (µg/m3)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 42
DT 49
DT 50
DT 51
DT 52
DT 53
DT 64 (Duplicate)
DT 65 (Duplicate)
Objective Level


Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites outside of AQMA sites
(Applied Local Factor to 2018)
NO2 (µg/m3)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 1
DT 3
DT 4
DT 6
DT 7
DT 8 (Triplicate)
DT 9 (Triplicate)
DT 10 (Triplicate)
DT 13
DT 15
DT 16
DT 17
DT 18
DT 20
DT 23
DT 26
DT 29
DT 30
DT 31
DT 32
DT 35
DT 36
DT 37
DT 38
DT 40
DT 41
DT 44
DT 48
DT 54
DT 55
DT 56
DT 57
DT 58
DT 59
DT 60
DT 61
DT 62
DT 63
DT 67
DT 69
DT 70
DT 71
DT 73
DT 74
DT 75
DT 77
DT 78
DT 79
DT 83
DT 84
DT 85
Objective Level

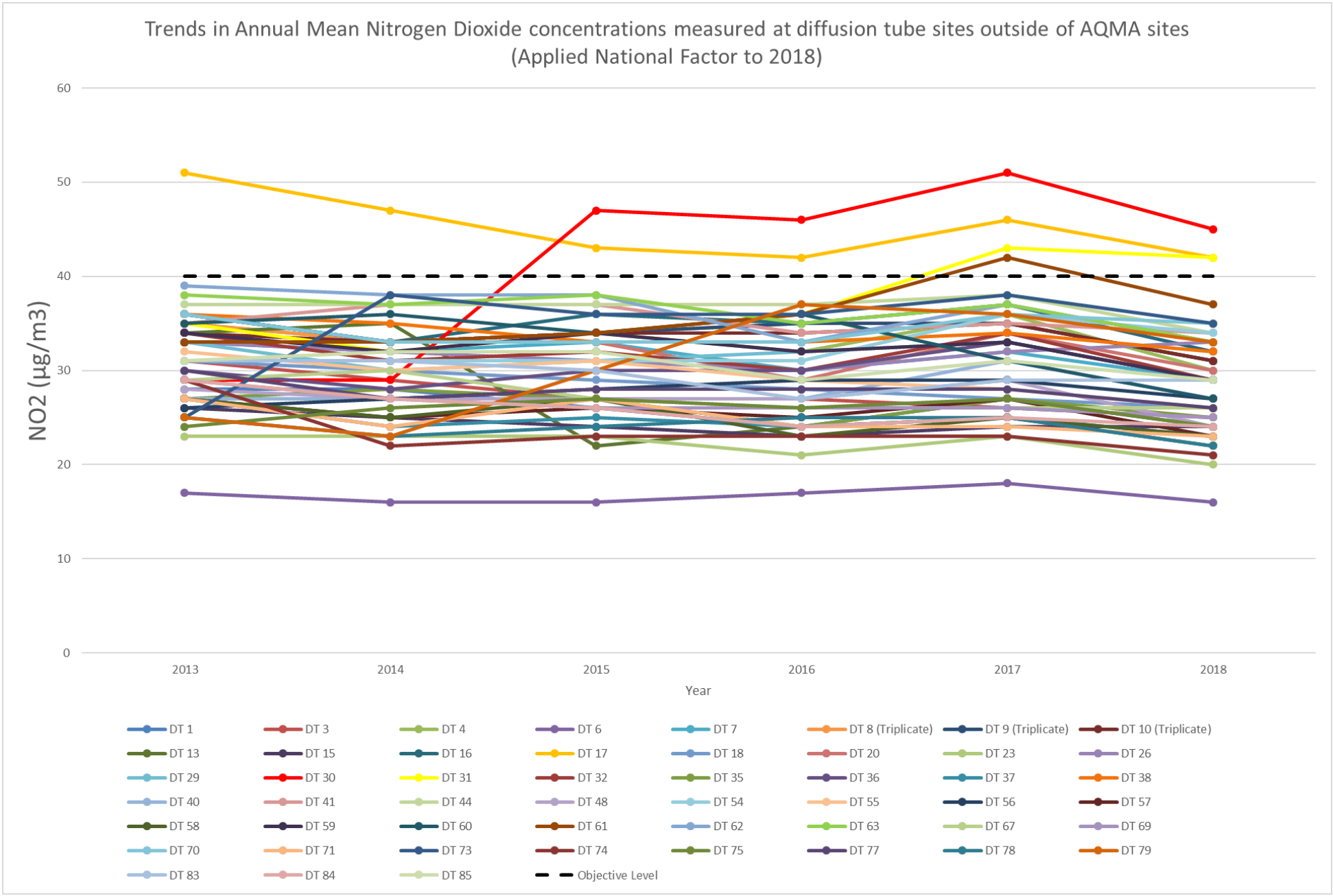

Trends in Annual Mean Nitrogen Dioxide concentrations measured at diffusion tube sites outside of AQMA sites
(Applied National Factor to 2018)
NO2 (µg/m3)
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
Year
DT 1
DT 3
DT 4
DT 6
DT 7
DT 8 (Triplicate)
DT 9 (Triplicate)
DT 10 (Triplicate)
DT 13
DT 15
DT 16
DT 17
DT 18
DT 20
DT 23
DT 26
DT 29
DT 30
DT 31
DT 32
DT 35
DT 36
DT 37
DT 38
DT 40
DT 41
DT 44
DT 48
DT 54
DT 55
DT 56
DT 57
DT 58
DT 59
DT 60
DT 61
DT 62
DT 63
DT 67
DT 69
DT 70
DT 71
DT 73
DT 74
DT 75
DT 77
DT 78
DT 79
DT 83
DT 84
DT 85
Objective Level

Table A.4 – 1-Hour 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 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
IPS3	Roadside	Automatic	99	99	0	N/A	N/A	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

(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) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results – 2018 (distance corrected using Local Bias Adjustment Factor)

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 (0.83) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1	39.9	36.6	36.3	33.9	23.4	20.5	28.1	28.1	26.4	31.4	36.2	32.8	31.1	25.8	21.3
2	56.0	50.9	54.1	51.7	44.1	38.5	61.1	51.0	42.0	46.7	57.4	55.5	50.8	**42.1**	38.4
3	37	36.1	35.4	33.7	29.1	24	29.9	32.6	29.5	34.8	34.2	33.3	32.5	26.9	26.9
4	47.1	46.3	46.3	39.2	29.4	31	35.3	34.3	40	46.8	43.4	40.5	40.0	33.2	27.0
5	43.8	50	46.4	59	46.3	37.5	59.6	53.9	44.5	63.6		53.5	50.7	**42.1**	**40.6**
6		23.9	28.9	22.7	16.2	13	16.4	17.4	16.4	23.3	23.2	25.6	20.6	17.1	17.1
7	44.8	34.8	41.4	38.5	31.1	25.1	37.5	38.3	31.2	38.8	42.4	46.1	37.5	31.1	31.1
8	40.9	39	44.7	40.1	40.6	36.8	40.8	37.1	36.2	46.8	37.2	40.8	40.5	33.6	28.7
9	27.3	43.2	46.3	42.9	43.8	36.4	39.1	37	37.5	35.9	41.9	41.9	40.5	33.6	28.7
10	42.5	45.1	46.4	42.5	44.5	36.3	42.4	40.2	36.3	39.7	42.8	43.7	40.5	33.6	28.7
11	66.2	53.7	51.6	68.1	50.6	40.4	66.7	64.5	57.7	61.3	52.1	65.9	58.0	**48.1**	**48.1**
12	62.5	56.2	58.1	62.4	43.3	35.7	57.1	64.8	59	60.2	64.4	66.1	58.0	**48.1**	**48.1**
13	38	29.9	32.1	29.5	23.9	19.7	24.5	26.8	24.4	32.1	32.6	35.7	29.1	24.2	21.6
14	57.6	58.8	37.6	53.1	59.7	51.4	53.9	54.5	55.2	55.4	48.2	58.1	53.6	**44.5**	**43.5**
15	35.5	30.6	32.9	31.2	22.6	17.4	22.9	51.5	29.6	35.3	35.5	37.1	31.8	26.4	26.4
16	53.4	41.5	41.3	45.6	32.7	32.8	43	47.1	41.6	42.1	44.8	44.7	42.6	35.3	32.0

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 (0.83) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
17	65.6	59.8	56	52.4	47.7	39.5	59.1	51.5	46.3	60.9	60.2	68.1	55.6	**46.1**	**41.2**
18	33.1	32.7	37.6	35.7	38.6	33.9	28.7	31.5	29.9	38.5	31.6	35.1	33.9	28.1	28.1
19	58.3	47.9	51.4	65.1	52.2	38.2	69.1	63.8	57.6	58.2	63.7	73.8	58.0	**48.1**	**48.1**
20	45.9	38.5	42.3	39.5	33.3	30.3	38.6	38.8	38.1	37.6	41.6	45.7	39.2	32.5	30.5
21	53.1	50.8	46.9	45.1	48.2	42.6	44.6	40.3	40.2	38.2	45.9	47.2	45.3	37.6	37.6
22	48	47.9	49.3	50.9	43.9		53.7	45.7	33.6	44.2	45.8	47.5	46.4	38.5	38.5
23	29.8	27.7	31.5	27.3	21.6	18.9	13	25.6	22.4	28	31.5	30.2	25.6	21.3	21.3
24	57.5	50.8	49.5	49.5	41.3	34.7	45	47.7	48.1	53.5	53.5	51.7	48.6	**40.3**	**40.3**
25	50.8	50.3	50	53.1	44.6	40.1	50.6	27	43.7	50.3	50.5	55.8	47.2	39.2	37.6
26	44.6	46.4	46.6	48.3	42.8	37.1	45.2	40.4	36.8		34	47.7	42.7	35.5	35.5
27	60.8	55.9	54.4	52.9	46.4	41.1	49.3	38.5	47.1	56.3	54.8	56.3	51.2	**42.5**	**41.4**
28	54.6	39.2	50.8	51.4	35.1	33.8	45.7	42	38.7	43.2	72.4	46.4	46.1	38.3	33.6
29	39.7	39.5	40.5	39.6	40.6	36.9	39.4	34.9	32.6	43.5	35.1	41.2	38.6	32.1	32.1
30	67.6	60.7	55.2	64.2	50.9	43.7	70	60.7	49.4	59.5	59.7	62.3	58.7	**48.7**	**45.5**
31	59.7	48.9	50.6	60.7		43.6	48.2	58	52.4	61	55.7	61.4	54.6	**45.3**	**45.3**
32	52.2	37.5	42.2	38.8	27.9	24	34	37.5	34	39.1	44.1	42.1	37.8	31.4	28.1
33	45.4	47.2	43.9	40.7	41.2	35.3	36.4	40.8	35.8	46.2	36.2	42.2	40.9	34.0	34.0
34	53.5	50.5	50.5	50.4	41.2	36.9	48.5	48.8	40.3	44.6	44.9	48.6	46.6	38.6	38.6
35	34.5	35.6	36.7	31.9		26.1	28.6	30	28.5	30.8	37.9	34.8	32.3	26.8	26.8
36	40.9	34.3	48	39.7	21.5	26.4	35.8	35.5	36.2	35.6	47.8	50.6	37.7	31.3	22.1

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 (0.83) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
37	34.4	35	33.5	31.6	27.1	25.3	28.3	31.3	25.1	30.3	31.4	28.5	30.2	25.0	25.0
38	42.7	44.2	42.8	46.4	40.2	30.7	47.5	42.4	34.2	45.6	49.2	42.4	42.4	35.2	27.1
39	58.5	53.8	53.8	53.9	47.1	38.6	51	51.1	42.7	56.6	53.5	55.5	51.3	**42.6**	**42.6**
40	44.1	43.3	41	34.8	30.5	29	29.7	30.5	28.4	40.6	37.5	42.3	36.0	29.9	25.6
41	35.4	44	44.7	53.2	38.8	32.7	53.6	49.5	37.5	47.9	45.7	52.1	44.6	37.0	35.5
42	42.5	45.6	49.4	46	53	41	48.8	38.4	33.8	54.4	52.1	46.9	46.0	38.2	38.2
43	48	52.6	50.8	51.4	45	36	50.8	44.1	38.8	46.9	43	45.1	46.0	38.2	37.3
44	43.5	50	44.1	46.6	48.3	35.8	45.5	43.6	38.5	53.3	45.2	48.5	45.2	37.6	30.6
45	39.7	35.7	37.8	36.6	33.8	30.5	31.3	30.7	30.1	37.1	37.3	35.7	34.7	28.3	26.5
46	38	36.8	37.1	33.1	29.2	29.7	31.3	29.1	28	36.6	38.3	36.6	33.7	28.3	26.5
47	38.3	38.7	35.5	35.7	32.4	29.4	27.2	29.5	27.1	15.2	35.1	32.6	31.4	28.3	26.5
48	39.2	32.8	35.2	33.6	24.4	22.8	24.8	30.4	30.6	34.8	34.8	40.2	32.0	26.5	22.5
49	49.8	57.4	57.4	60.2	61.1	54.4	63.6	48.3	40.7		58.6	53.1	55.0	**45.6**	**45.6**
50	35.9	37.7	41.3	35.7	20.6	18.9	26.1	31.9	25.9		36.4	44.7	32.3	26.8	25.1
51	49.3	50.7	62.9	57.4	45.4	34.6			33.3	54.5	65.6	48.9	50.3	**41.7**	32.4
52	56.4	59.4	58.9	52.8	54.2	50.9	59.1	55	52.2	56.1	52.4	64	56.0	**46.4**	**46.4**
53	52.3	57.4	57.5	63.4	46.1	36.8	56.6		49.5	57.7	63.9	62.3	54.9	**45.5**	**45.5**
54	47.2	44.5	48.2	43.5	37.4	31.5	40.3	41.5	38.2	50.6	57.5	54.6	44.6	37.0	27.1
55	34.5	35	36.1	35.9	33.8	29.1	28.7	33.2	34.3	42	33.8	37.5	34.5	28.6	28.6
56	40.2	41.8	41.7	32.5	31.9	26.8	31.8	33.7	31.3	39.2	34.8	39.3	35.4	29.4	29.4

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 (0.83) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
57	37.5	34.5	27.5	31.9	24.5	20.2	18.5	27.7	29.3	34.7	32.3	37.7	29.7	24.6	24.6
58	38.1	30.5	36.8	31.8	22.4	21.4	24.8	27.9	22	31.8	40.3	38.8	30.6	25.4	20.2
59	41.4	43.4	40.9	37.5	32.5	30.3	34.6	35.1	36.2	40.6	41.3	49.8	38.6	32.1	32.1
60	43.1			37.1	28.4	22.9	29	33.5	32.3	40.8	38.1	43.4	34.9	28.9	21.3
61	51.8			48.6	47.2	39.4	47.4	47.9	45.4	49.9	48.2	55.8	48.2	**40.0**	25.2
62	50.9	44.4	46.7	45.7	36	31.9	42.6	42.4	42.1	45.9	46.8	46.3	43.5	36.1	31.7
63	49.8	49	40.3	47.2	35.8	29.8	43.8	45	39.2	47.6	43.6	51.1	43.5	36.1	36.1
64	58.8	55.5	57.6	71.6	52.9		61.7	71.3	57.4	65.1	53.5	74.9	61.8	**54.6**	**52.6**
65	71.3	64.8	67.8	73.4	57.8			62.8	62.1	70.1	66.6	68.1	66.5	**54.6**	**52.6**
66	55.6	50	47.8	56.8	46.4	37.7	53.9	52.8	44.3	49	54.1	54	50.2	**41.7**	**41.7**
67	44	41.6	38.9	36.8	27.1	22	33.6	29.1	26.4	34.6	34.1	41.4	34.1	28.3	24.6
68	51.7	43.2	57.3	62.1	50.9	47	60.3	41.2	44.5	58.8	58.3	63.7	53.3	**44.2**	**44.2**
69	40.6	40.6	40.4	29.7	28.7	25.5	28	27.9	27.5	36.4	31.2	32.6	32.4	26.9	26.9
70	53.2	49.3		45	37.8	32.3		41.3	46.2	54.4	47.9	48.9	45.6	37.9	37.9
71	31.7	30.9	32.7	29.4	25.8	21.6	26.2	28	30	36.2	31.2	33.8	29.8	24.7	24.7
72	48.1	55.1	45.1	44.5	45.6	41.8	38.4	41.6	40.8	54.3	46.5	47.9	45.8	38.0	38.0
73	33.7	35.5	33.4	19.6	23.2	21.4	20.8	24.4	23.8	30.1	32.6	32.5	27.6	22.9	22.9
74	36.6	37.2	38.8	32.9	27.2	22.7	29.7	27.7	26.8	33.5	36.6	33.2	31.9	26.5	26.5
75	37	35.2	35.3	32.7	25.8	20.9	28.4	29.2	28.7	35.1	27.4	35.2	30.9	25.7	25.7
76	51.5	37.3	49.9	43.2	39	33.1	43.9	43.9	36.3	42.7	51.4	55.2	44.0	36.5	36.5

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 (0.83) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
77	36.2	38.6	40.9	31.9	34.4	29.7	32.9	27.6	27.7	38.7	36.2	37.1	34.3	28.5	28.5
78	32.8	38.6	34.5	25.9	22	18.8	21.2	24.2		29.2	35.9	38.9	29.3	24.3	23.4
79	48	50.2	46.7	35.8	38.2	34	39.2			46.5		49.6	43.1	35.8	33.6
80	47.7	48.8	50.8	51.5		35.3	45	45	42.7	49.4	50.2	46.3	46.6	38.3	38.3
81	45.8	48.5	50.3	49.9		33.6	45.8	45.2	39	47.9	51.9	48.3	46.0	38.3	38.3
82	32.7	47	46.2	43.5		32.5	43	43.8	40.8		49.9	44.4	42.4	38.3	38.3
83	40.3	43.7	44.1	34.7	32.1	30.9	33.4	33	30.3	39.7	43.6	45.2	37.6	31.2	29.2
84	35.7	37.9	37.9	32.9	27.5	23.2	28.7	28.3	25.3	31.1	36	35.4	31.7	26.3	26.3
85	42.9	34.8	41.2	38.9	29.4	24.5	37.1		37	43.9	42.9	49.3	38.4	31.8	31.4

☒ **Local bias adjustment factor used for 2018 data.**

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

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

Table B.2 – NO_2 Monthly Diffusion Tube Results – 2018 (distance corrected using National Bias Adjustment Factor)

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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1	39.9	36.6	36.3	33.9	23.4	20.5	28.1	28.1	26.4	31.4	36.2	32.8	31.1	23.7	20.1
2	56.0	50.9	54.1	51.7	44.1	38.5	61.1	51.0	42.0	46.7	57.4	55.5	50.8	38.6	35.4
3	37	36.1	35.4	33.7	29.1	24	29.9	32.6	29.5	34.8	34.2	33.3	32.5	24.7	24.7
4	47.1	46.3	46.3	39.2	29.4	31	35.3	34.3	40	46.8	43.4	40.5	40.0	30.4	25.2
5	43.8	50	46.4	59	46.3	37.5	59.6	53.9	44.5	63.6		53.5	50.7	38.6	37.3
6		23.9	28.9	22.7	16.2	13	16.4	17.4	16.4	23.3	23.2	25.6	20.6	15.7	15.7
7	44.8	34.8	41.4	38.5	31.1	25.1	37.5	38.3	31.2	38.8	42.4	46.1	37.5	28.5	28.5
8	40.9	39	44.7	40.1	40.6	36.8	40.8	37.1	36.2	46.8	37.2	40.8	40.5	30.8	26.7
9	27.3	43.2	46.3	42.9	43.8	36.4	39.1	37	37.5	35.9	41.9	41.9	40.5	30.8	26.7
10	42.5	45.1	46.4	42.5	44.5	36.3	42.4	40.2	36.3	39.7	42.8	43.7	40.5	30.8	26.7
11	66.2	53.7	51.6	68.1	50.6	40.4	66.7	64.5	57.7	61.3	52.1	65.9	58.0	**44.1**	**44.1**
12	62.5	56.2	58.1	62.4	43.3	35.7	57.1	64.8	59	60.2	64.4	66.1	58.0	**44.1**	**44.1**
13	38	29.9	32.1	29.5	23.9	19.7	24.5	26.8	24.4	32.1	32.6	35.7	29.1	22.1	20.1
14	57.6	58.8	37.6	53.1	59.7	51.4	53.9	54.5	55.2	55.4	48.2	58.1	53.6	**40.8**	**40.0**
15	35.5	30.6	32.9	31.2	22.6	17.4	22.9	51.5	29.6	35.3	35.5	37.1	31.8	24.2	24.2
16	53.4	41.5	41.3	45.6	32.7	32.8	43	47.1	41.6	42.1	44.8	44.7	42.6	32.3	29.5
17	65.6	59.8	56	52.4	47.7	39.5	59.1	51.5	46.3	60.9	60.2	68.1	55.6	**42.2**	38.0
18	33.1	32.7	37.6	35.7	38.6	33.9	28.7	31.5	29.9	38.5	31.6	35.1	33.9	25.8	25.8

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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
19	58.3	47.9	51.4	65.1	52.2	38.2	69.1	63.8	57.6	58.2	63.7	73.8	58.0	**44.1**	**44.1**
20	45.9	38.5	42.3	39.5	33.3	30.3	38.6	38.8	38.1	37.6	41.6	45.7	39.2	29.8	28.2
21	53.1	50.8	46.9	45.1	48.2	42.6	44.6	40.3	40.2	38.2	45.9	47.2	45.3	34.4	34.4
22	48	47.9	49.3	50.9	43.9		53.7	45.7	33.6	44.2	45.8	47.5	46.4	35.3	35.3
23	29.8	27.7	31.5	27.3	21.6	18.9	13	25.6	22.4	28	31.5	30.2	25.6	19.5	19.5
24	57.5	50.8	49.5	49.5	41.3	34.7	45	47.7	48.1	53.5	53.5	51.7	48.6	36.9	36.9
25	50.8	50.3	50	53.1	44.6	40.1	50.6	27	43.7	50.3	50.5	55.8	47.2	35.9	34.5
26	44.6	46.4	46.6	48.3	42.8	37.1	45.2	40.4	36.8		34	47.7	42.7	32.5	32.5
27	60.8	55.9	54.4	52.9	46.4	41.1	49.3	38.5	47.1	56.3	54.8	56.3	51.2	38.9	37.9
28	54.6	39.2	50.8	51.4	35.1	33.8	45.7	42	38.7	43.2	72.4	46.4	46.1	35.0	30.8
29	39.7	39.5	40.5	39.6	40.6	36.9	39.4	34.9	32.6	43.5	35.1	41.2	38.6	29.4	29.4
30	67.6	60.7	55.2	64.2	50.9	43.7	70	60.7	49.4	59.5	59.7	62.3	58.7	**44.6**	**41.8**
31	59.7	48.9	50.6	60.7		43.6	48.2	58	52.4	61	55.7	61.4	54.6	**41.5**	**41.5**
32	52.2	37.5	42.2	38.8	27.9	24	34	37.5	34	39.1	44.1	42.1	37.8	28.7	26.0
33	45.4	47.2	43.9	40.7	41.2	35.3	36.4	40.8	35.8	46.2	36.2	42.2	40.9	31.1	31.1
34	53.5	50.5	50.5	50.4	41.2	36.9	48.5	48.8	40.3	44.6	44.9	48.6	46.6	35.4	35.4
35	34.5	35.6	36.7	31.9		26.1	28.6	30	28.5	30.8	37.9	34.8	32.3	24.6	24.6
36	40.9	34.3	48	39.7	21.5	26.4	35.8	35.5	36.2	35.6	47.8	50.6	37.7	28.6	20.8
37	34.4	35	33.5	31.6	27.1	25.3	28.3	31.3	25.1	30.3	31.4	28.5	30.2	22.9	22.9
38	42.7	44.2	42.8	46.4	40.2	30.7	47.5	42.4	34.2	45.6	49.2	42.4	42.4	32.2	25.4

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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
39	58.5	53.8	53.8	53.9	47.1	38.6	51	51.1	42.7	56.6	53.5	55.5	51.3	39.0	39.0
40	44.1	43.3	41	34.8	30.5	29	29.7	30.5	28.4	40.6	37.5	42.3	36.0	27.3	23.7
41	35.4	44	44.7	53.2	38.8	32.7	53.6	49.5	37.5	47.9	45.7	52.1	44.6	33.9	32.6
42	42.5	45.6	49.4	46	53	41	48.8	38.4	33.8	54.4	52.1	46.9	46.0	35.0	35.0
43	48	52.6	50.8	51.4	45	36	50.8	44.1	38.8	46.9	43	45.1	46.0	35.0	34.2
44	43.5	50	44.1	46.6	48.3	35.8	45.5	43.6	38.5	53.3	45.2	48.5	45.2	34.4	28.3
45	39.7	35.7	37.8	36.6	33.8	30.5	31.3	30.7	30.1	37.1	37.3	35.7	34.7	25.3	23.9
46	38	36.8	37.1	33.1	29.2	29.7	31.3	29.1	28	36.6	38.3	36.6	33.7	25.3	23.9
47	38.3	38.7	35.5	35.7	32.4	29.4	27.2	29.5	27.1	15.2	35.1	32.6	31.4	25.3	23.9
48	39.2	32.8	35.2	33.6	24.4	22.8	24.8	30.4	30.6	34.8	34.8	40.2	32.0	24.3	21.1
49	49.8	57.4	57.4	60.2	61.1	54.4	63.6	48.3	40.7		58.6	53.1	55.0	**41.8**	**41.8**
50	35.9	37.7	41.3	35.7	20.6	18.9	26.1	31.9	25.9		36.4	44.7	32.3	24.5	23.1
51	49.3	50.7	62.9	57.4	45.4	34.6			33.3	54.5	65.6	48.9	50.3	38.2	30.1
52	56.4	59.4	58.9	52.8	54.2	50.9	59.1	55	52.2	56.1	52.4	64	56.0	**42.5**	**42.5**
53	52.3	57.4	57.5	63.4	46.1	36.8	56.6		49.5	57.7	63.9	62.3	54.9	**41.7**	**41.7**
54	47.2	44.5	48.2	43.5	37.4	31.5	40.3	41.5	38.2	50.6	57.5	54.6	44.6	33.9	25.4
55	34.5	35	36.1	35.9	33.8	29.1	28.7	33.2	34.3	42	33.8	37.5	34.5	26.2	26.2
56	40.2	41.8	41.7	32.5	31.9	26.8	31.8	33.7	31.3	39.2	34.8	39.3	35.4	26.9	26.9
57	37.5	34.5	27.5	31.9	24.5	20.2	18.5	27.7	29.3	34.7	32.3	37.7	29.7	22.6	22.6
58	38.1	30.5	36.8	31.8	22.4	21.4	24.8	27.9	22	31.8	40.3	38.8	30.6	23.2	19.0

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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
59	41.4	43.4	40.9	37.5	32.5	30.3	34.6	35.1	36.2	40.6	41.3	49.8	38.6	29.4	29.4
60	43.1			37.1	28.4	22.9	29	33.5	32.3	40.8	38.1	43.4	34.9	26.5	19.9
61	51.8			48.6	47.2	39.4	47.4	47.9	45.4	49.9	48.2	55.8	48.2	36.6	23.7
62	50.9	44.4	46.7	45.7	36	31.9	42.6	42.4	42.1	45.9	46.8	46.3	43.5	33.0	29.2
63	49.8	49	40.3	47.2	35.8	29.8	43.8	45	39.2	47.6	43.6	51.1	43.5	33.1	33.1
64	58.8	55.5	57.6	71.6	52.9		61.7	71.3	57.4	65.1	53.5	74.9	61.8	**48.8**	**47.1**
65	71.3	64.8	67.8	73.4	57.8			62.8	62.1	70.1	66.6	68.1	66.5	**48.8**	**47.1**
66	55.6	50	47.8	56.8	46.4	37.7	53.9	52.8	44.3	49	54.1	54	50.2	38.2	38.2
67	44	41.6	38.9	36.8	27.1	22	33.6	29.1	26.4	34.6	34.1	41.4	34.1	25.9	23.1
68	51.7	43.2	57.3	62.1	50.9	47	60.3	41.2	44.5	58.8	58.3	63.7	53.3	**40.5**	**40.5**
69	40.6	40.6	40.4	29.7	28.7	25.5	28	27.9	27.5	36.4	31.2	32.6	32.4	24.6	24.6
70	53.2	49.3		45	37.8	32.3		41.3	46.2	54.4	47.9	48.9	45.6	34.7	34.7
71	31.7	30.9	32.7	29.4	25.8	21.6	26.2	28	30	36.2	31.2	33.8	29.8	22.6	22.6
72	48.1	55.1	45.1	44.5	45.6	41.8	38.4	41.6	40.8	54.3	46.5	47.9	45.8	34.8	34.8
73	33.7	35.5	33.4	19.6	23.2	21.4	20.8	24.4	23.8	30.1	32.6	32.5	27.6	21.0	21.0
74	36.6	37.2	38.8	32.9	27.2	22.7	29.7	27.7	26.8	33.5	36.6	33.2	31.9	24.3	24.3
75	37	35.2	35.3	32.7	25.8	20.9	28.4	29.2	28.7	35.1	27.4	35.2	30.9	23.5	23.5
76	51.5	37.3	49.9	43.2	39	33.1	43.9	43.9	36.3	42.7	51.4	55.2	44.0	33.4	33.4
77	36.2	38.6	40.9	31.9	34.4	29.7	32.9	27.6	27.7	38.7	36.2	37.1	34.3	26.1	26.1
78	32.8	38.6	34.5	25.9	22	18.8	21.2	24.2		29.2	35.9	38.9	29.3	22.2	21.6

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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
79	48	50.2	46.7	35.8	38.2	34	39.2			46.5		49.6	43.1	32.8	30.9
80	47.7	48.8	50.8	51.5		35.3	45	45	42.7	49.4	50.2	46.3	46.6	34.2	34.2
81	45.8	48.5	50.3	49.9		33.6	45.8	45.2	39	47.9	51.9	48.3	46.0	34.2	34.2
82	32.7	47	46.2	43.5		32.5	43	43.8	40.8		49.9	44.4	42.4	34.2	34.2
83	40.3	43.7	44.1	34.7	32.1	30.9	33.4	33	30.3	39.7	43.6	45.2	37.6	28.6	27.0
84	35.7	37.9	37.9	32.9	27.5	23.2	28.7	28.3	25.3	31.1	36	35.4	31.7	24.1	24.1
85	42.9	34.8	41.2	38.9	29.4	24.5	37.1		37	43.9	42.9	49.3	38.4	29.1	28.8

☒ **National bias adjustment factor used**

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

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

Automatic Monitoring

The automatic monitor located on Chevallier Street (IPS3) is subject to fortnightly routine calibration by an Ipswich Borough Council Environmental Health Officer or Technical Officer. The analyser is also serviced and the monitoring site audited biannually by WeCare4Air and Ricardo Energy & Environment respectively. A copy of the Certificate of Calibration issued following the most recent site audit (February 2019) is displayed below (Figure C.1).

All automatic monitoring data collected at the Chevallier Street site is managed by Ricardo Energy & Environment using the same quality control procedures utilised by Defra's national air quality network stations. These procedures represent best practice and fully meet the requirements set out in LAQM.TG(16). Ricardo Energy & Environment currently provide UKAS accredited quality control audits and data management services to all Defra national network (AURN) air quality monitoring stations.

All collected data is screened and scaled (based on site calibrations) and the final data set presented within this report (Figure C.2) has benefitted from a full process of data ratification, including thorough additional data quality checks that include site audits and a ratification process that corrects data for instrument sensitivity drift between routine calibrations.

Figure C.1 – Certificate of Calibration for IPS3

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,

Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	D Hector	☐	S Stratton
☑	N Rand	☐	S Telfer
☐	E Marshall-Padkin	☐	S Gray
☐	B Davies	☐	D Lane

Signed:

Date of issue: 29 Mar 19

Certificate Number: 04453

Customer Name and Address:

Ipswich Borough Council
Grafton House
15-17 Russell Road
Ipswich
IP1 2DE

Description: Calibration factors for the air monitoring station at Ipswich Chevallier Street

Ricardo Energy & Environment ID: ED62657218/February 2019

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

Ricardo Energy & Environment
Head Office
Gemini Building,
Fermi Avenue,
Harwell,
Oxon
OX11 0QR

Tel: +44 (0)1235 753 000

Registered office
Shoreham Technical Centre
Shoreham-by-Sea
West Sussex
BN43 5FG

Registered in England No.
08229264

VAT Registration No.
GB 212 8365 24

ee.ricardo.com

0401

CERTIFICATE OF CALIBRATION

Date of issue: 29 Mar 19

Certificate Number: 04453

Ricardo Energy & Environment ID: ED62657218/February 2019

Ipswich Chevallier Street
Date of audit: 14 Feb 2019

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty ppb	Calibration Factor[2]	Factor uncertainty %	Converter eff. (%)[3]
NOx	606215582	-1.4	2.5	0.8770	3.5	98.1
NO	606215582	-2.2	2.5	0.8652	3.5	n/a

CERTIFICATE OF CALIBRATION

0401

Date of issue: 29 Mar 19

Certificate Number: 04453

Ricardo Energy & Environment ID: ED62657218/February 2019

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and k_0(where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NOx, SO_2, O_3 and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Figure C.2 – 2018 Air Pollution Report – Ipswich Chevallier Street (Site ID: IPS3)

Air Pollution Report

Air Quality England

1st January to 31st December 2018

Ipswich Chevallier Street (Site ID: IPS3)

These data have been fully ratified

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	365	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	170	74	336
Annual Max	482	138	853
Annual Mean	20	28	58
99.8th Percentile of hourly mean	-	96	-
98th Percentile of hourly mean	108	71	231
95th Percentile of hourly mean	61	59	147
50th Percentile of hourly mean	12	25	44
% Annual data capture	**99.34%**	**99.32%**	**99.32%**

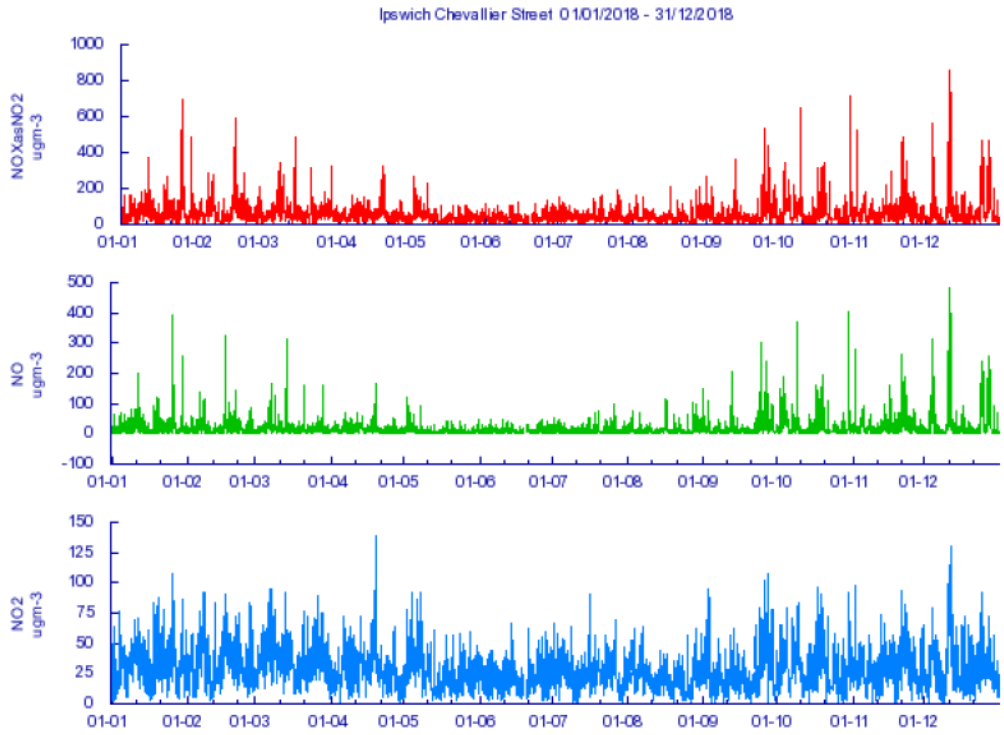
All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Standards regulations 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-

1 / 2

Report produced by Ricardo Energy & Environment

Annual Graph



Diffusion Tube Analysis

Nitrogen dioxide diffusion tubes are supplied by SOCOTEC, Didcot.

The exposed tubes are analysed in accordance with SOCOTEC's standard operating procedure which complies with the guidelines set out in DEFRA's *'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance'*. The analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tubes is within the scope of their UKAS schedule. SOCOTEC participates in the AIR NO_2 PT scheme, the results of which indicate that during 2018 100% of QC samples were analysed satisfactorily.

Using the *AEA_DifTPAB_v04.xls* spreadsheet published on the DEFRA LAQM Support website to check the precision of collocated tubes, the results for all collocated monitoring sites within Ipswich were shown to demonstrate "*Good precision"* (see Figure C.3).

A control tube (travel blank) is sent with each month's tubes.

Figure C.3 – Precision and Accuracy of Collocated Diffusion Tubes

a) Bramford Road (Site ID: 8, 9 & 10)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2018	29/01/2018	40.9	27.3	42.5	37	8.4	23	20.7			Poor Precision	
2	29/01/2018	26/02/2018	39.0	43.2	45.1	42	3.1	7	7.8			Good	
3	26/02/2018	26/03/2018	44.7	46.3	46.4	46	1.0	2	2.4			Good	
4	26/03/2018	04/05/2018	40.1	42.9	42.5	42	1.5	4	3.8			Good	
5	04/05/2018	06/06/2018	40.6	43.8	44.5	43	2.1	5	5.2			Good	
6	06/06/2018	03/07/2018	36.8	36.4	36.3	37	0.3	1	0.7			Good	
7	03/07/2018	30/07/2018	40.8	39.1	42.4	41	1.7	4	4.1			Good	
8	30/07/2018	04/09/2018	37.1	37.0	40.2	38	1.8	5	4.5			Good	
9	04/09/2018	03/10/2018	36.2	37.5	36.3	37	0.7	2	1.8			Good	
10	03/10/2018	31/10/2018	46.8	35.9	39.7	41	5.5	14	13.7			Good	
11	31/10/2018	04/12/2018	37.2	41.9	42.8	41	3.0	7	7.5			Good	
12	04/12/2018	02/01/2019	40.8	41.9	43.7	42	1.5	3	3.6			Good	
13													
											Overall survey -->	Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

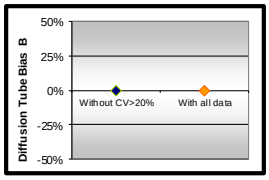
Site Name/ ID:	Bramford Road o/s No 122

Precision: 11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

b) Piper's Court (Site ID: 11, 12 & 19)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	05/01/2018	30/01/2018	66.2	62.5	58.3	62	4.0	6	9.8			Good	
2	30/01/2018	27/02/2018	53.7	56.2	47.9	53	4.3	8	10.6			Good	
3	27/02/2018	26/03/2018	51.6	58.1	51.4	54	3.8	7	9.5			Good	
4	26/03/2018	01/05/2018	68.1	62.4	65.1	65	2.9	4	7.1			Good	
5	01/05/2018	06/06/2018	50.6	43.3	52.2	49	4.7	10	11.8			Good	
6	06/06/2018	05/07/2018	40.4	35.7	38.2	38	2.4	6	5.8			Good	
7	05/07/2018	30/07/2018	66.7	57.1	69.1	64	6.3	10	15.8			Good	
8	30/07/2018	04/09/2018	64.5	64.8	63.8	64	0.5	1	1.3			Good	
9	04/09/2018	03/10/2018	57.7	59.0	57.6	58	0.8	1	1.9			Good	
10	03/10/2018	31/10/2018	61.3	60.2	58.2	60	1.6	3	3.9			Good	
11	31/10/2018	04/12/2018	52.1	64.4	63.7	60	6.9	12	17.2			Good	
12	04/12/2018	02/01/2019	65.9	66.1	73.8	69	4.5	7	11.2			Good	
13													
										Overall survey -->		Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	Pipers Court

Precision: 12 out of 12 periods have a CV smaller than 20%

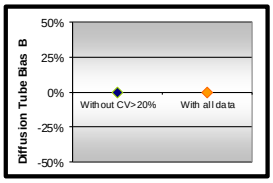
(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

c) Chevallier Street (Site ID: 45, 46 & 47 co-located with IPS3)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2018	29/01/2018	39.7	38.0	38.3	39	0.9	2	2.3	32.46	100	Good	Good
2	29/01/2018	26/02/2018	35.7	36.8	38.7	37	1.5	4	3.8	33.41	100	Good	Good
3	26/02/2018	26/03/2018	37.8	37.1	35.5	37	1.2	3	2.9	35.37	100	Good	Good
4	26/03/2018	04/05/2018	36.6	33.1	35.7	35	1.8	5	4.5	29.81	99.89	Good	Good
5	04/05/2018	06/06/2018	33.8	29.2	32.4	32	2.4	7	5.9	25	100	Good	Good
6	06/06/2018	03/07/2018	30.5	29.7	29.4	30	0.6	2	1.4	22	95.99	Good	Good
7	03/07/2018	30/07/2018	31.3	31.3	27.2	30	2.4	8	5.9	24	100	Good	Good
8	30/07/2018	04/09/2018	30.7	29.1	29.5	30	0.8	3	2.1	23	99.65	Good	Good
9	04/09/2018	03/10/2018	30.1	28.0	27.1	28	1.5	5	3.8	23	99.71	Good	Good
10	03/10/2018	31/10/2018	37.1	36.6		37	0.4	1	3.2	30	95.84	Good	Good
11	31/10/2018	04/12/2018	37.3	38.3	35.1	37	1.6	4	4.1	29.25	100	Good	Good
12	04/12/2018	02/01/2019	35.7	36.6	32.6	35	2.1	6	5.2	30.18	100	Good	Good
13													
										Overall survey -->		Good precision	Good Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	Chevallier Street

Precision: 12 out of 12 periods have a CV smaller than 20%

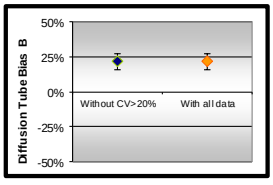
(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 12 periods of data
Bias factor A 0.83 (0.79 - 0.87)
Bias B 20% (15% - 26%)
Diffusion Tubes Mean: 34 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 28 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 28 (27 - 29) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 12 periods of data
Bias factor A 0.83 (0.79 - 0.87)
Bias B 20% (15% - 26%)
Diffusion Tubes Mean: 34 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 28 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 28 (27 - 29) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

d) Norwich Road (Site ID: 64 & 65)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2018	29/01/2018	58.8	71.3		65	8.8	14	79.4			Good	
2	29/01/2018	26/02/2018	55.5	64.8		60	6.6	11	59.1			Good	
3	26/02/2018	26/03/2018	57.6	67.8		63	7.2	12	64.8			Good	
4	26/03/2018	01/05/2018	71.6	73.4		73	1.3	2	11.4			Good	
5	01/05/2018	06/06/2018	52.9	57.8		55	3.5	6	31.1			Good	
6	06/06/2018												
7	03/07/2018	30/07/2018	61.7										
8	30/07/2018	04/09/2018	71.3	62.8		67	6.0	9	54.0			Good	
9	04/09/2018	03/10/2018	57.4	62.1		60	3.3	6	29.9			Good	
10	03/10/2018	31/10/2018	65.1	70.1		68	3.5	5	31.8			Good	
11	31/10/2018	04/12/2018	53.5	66.6		60	9.3	15	83.2			Good	
12	04/12/2018	02/01/2019	74.9	68.1		72	4.8	7	43.2			Good	
13													
											Overall survey -->	Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

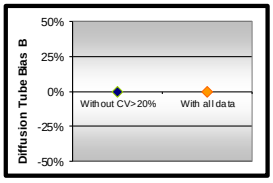
Site Name/ ID:	Norwich Road between Nos. 13&15

Precision: 10 out of 10 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

e) St. Helens Street (Site ID: 80, 81 & 82)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	05/01/2018	30/01/2018	47.7	45.8	32.7	42	8.2	19	20.3			Good	
2	30/01/2018	27/02/2018	48.8	48.5	47.0	48	1.0	2	2.4			Good	
3	27/02/2018	26/03/2018	50.8	50.3	46.2	49	2.5	5	6.3			Good	
4	26/03/2018	01/05/2018	51.5	49.9	43.5	48	4.2	9	10.5			Good	
5	01/05/2018												
6	06/06/2018	05/07/2018	35.3	33.6	32.5	34	1.4	4	3.5			Good	
7	05/07/2018	30/07/2018	45.0	45.8	43.0	45	1.4	3	3.6			Good	
8	30/07/2018	04/09/2018	45.0	45.2	43.8	45	0.8	2	1.9			Good	
9	04/09/2018	03/10/2018	42.7	39.0	40.8	41	1.9	5	4.6			Good	
10	03/10/2018	31/10/2018	49.4	47.9		49	1.1	2	9.5			Good	
11	31/10/2018	04/12/2018	50.2	51.9	49.9	51	1.1	2	2.7			Good	
12	04/12/2018	02/01/2019	46.3	48.3	44.4	46	2.0	4	4.8			Good	
13													
											Overall survey -->	Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

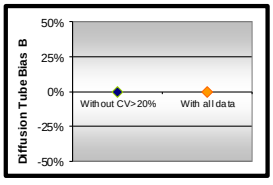
Site Name/ ID:	St Helens Street - County Hall

Precision: 11 out of 11 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Diffusion Tube Bias Adjustment

Following the resumption of automatic air quality monitoring at the Chevallier Street site (IPS3) in December 2016, for the second consecutive year it has been possible to compare mean collocated diffusion tube values with data captured by the cheminescence analyser using the AEA_DifPAB_v04.xls spreadsheet to obtain a local bias adjustment factor of 0.83 (see Figure C.3c).

Consulting the *National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 03/19* published on the DEFRA LAQM Support website, for the SOCOTEC, Didcot laboratory; preparation method 50% TEA in acetone; for the year 2018, a bias adjustment figure of 0.76 was obtained based on 21 studies.

With approximately 8% difference between the two values, the choice of the bias correction factor to be applied will have a notable effect on the diffusion tube monitoring output. Having given due consideration to the guidance given in Box 7.11 of LAQM.TG16, a decision was made to apply the relevant local bias adjustment factor: a choice different from the last six annual reports submitted by Ipswich Borough Council. The reasons for this decision were:

- This is the second year running where the Council has been able to obtain a high data capture rate (99%) of continuous analyser data to benchmark this year's data against.
- The co-located site has good precision for the diffusion tubes and high quality chemiluminescence results.

Diffusion Tube Annualisation

Annualisation was not required this year as all diffusion tube monitoring sites returned 9 months or more worth of data.

Diffusion Tube Distance Correction

Wherever possible diffusion tube monitoring locations are selected to be representative of exposure. However, where this is not practicable measurements should be adjusted to estimate the nitrogen dioxide concentration at the nearest location relevant for exposure.

Where necessary, this correction has been undertaken using the *NO2 Fall-Off with Distance Calculator Version 4.2* available on the Defra LAQM Support website.

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Overview of Ipswich AQMA boundaries and Monitoring Locations (1)

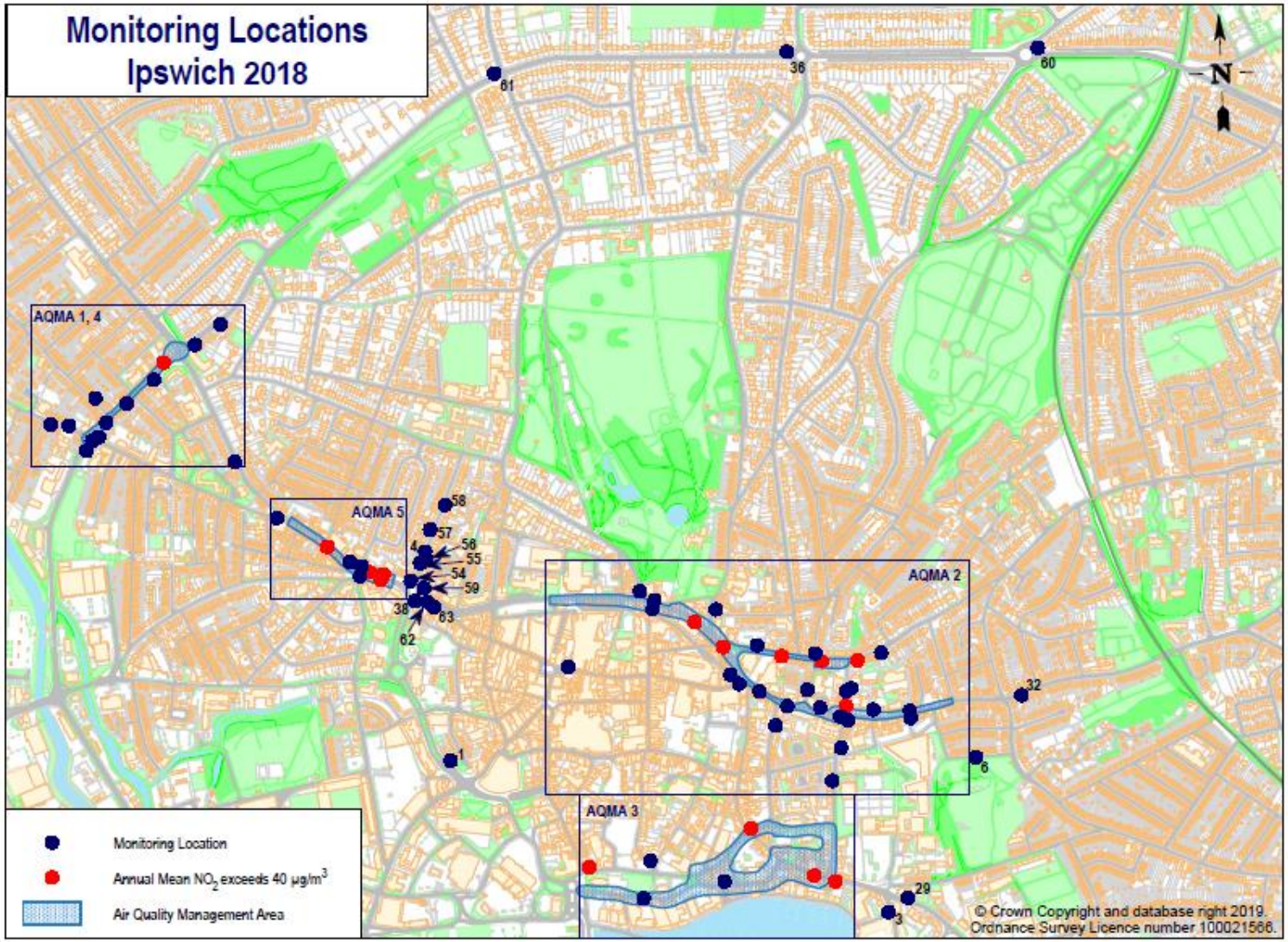


Figure D.2 – Ipswich Air Quality Management Areas 1 and 4 (1)

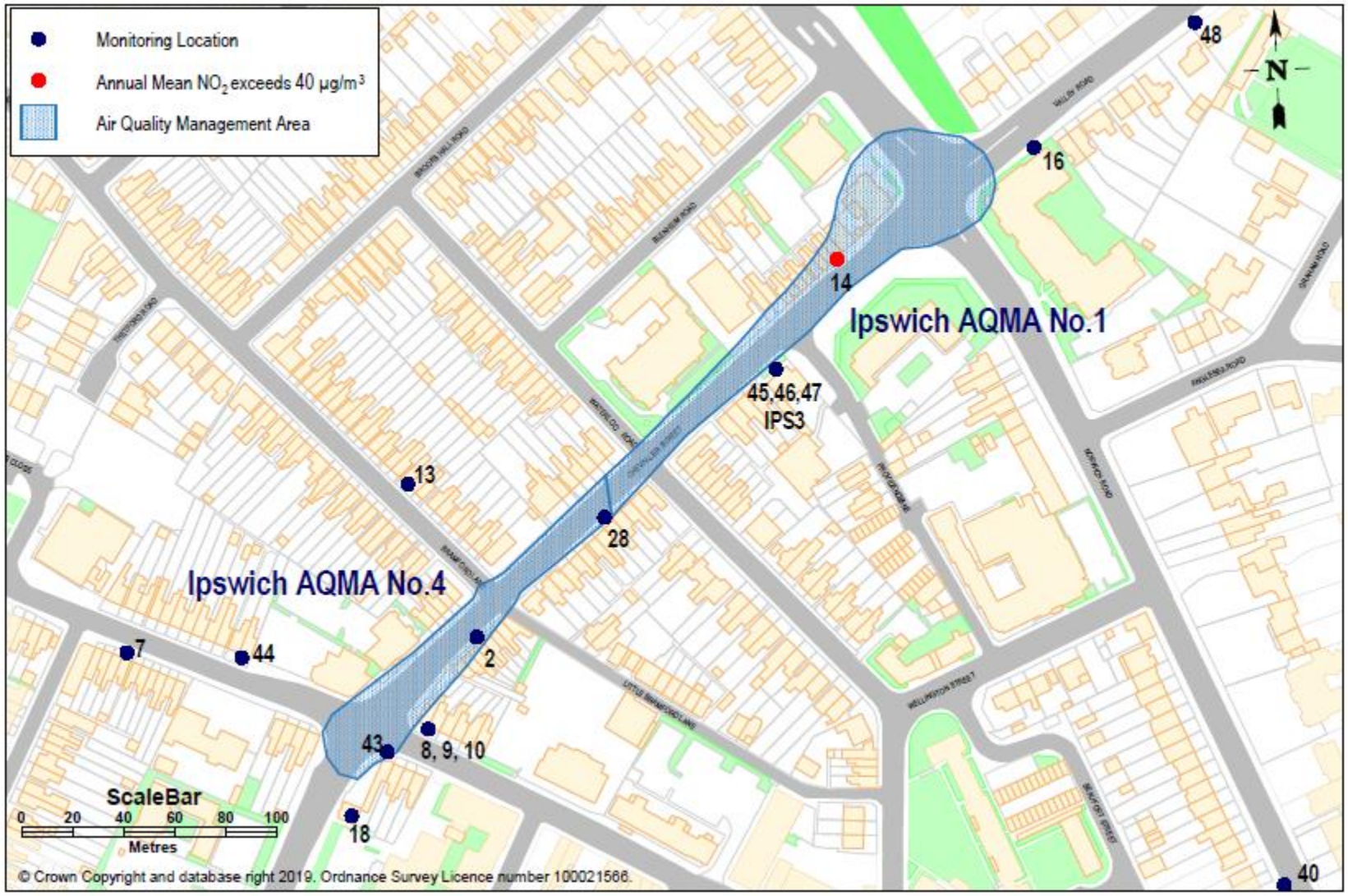


Figure D.3 – Ipswich Air Quality Management Area 2 (1&2)

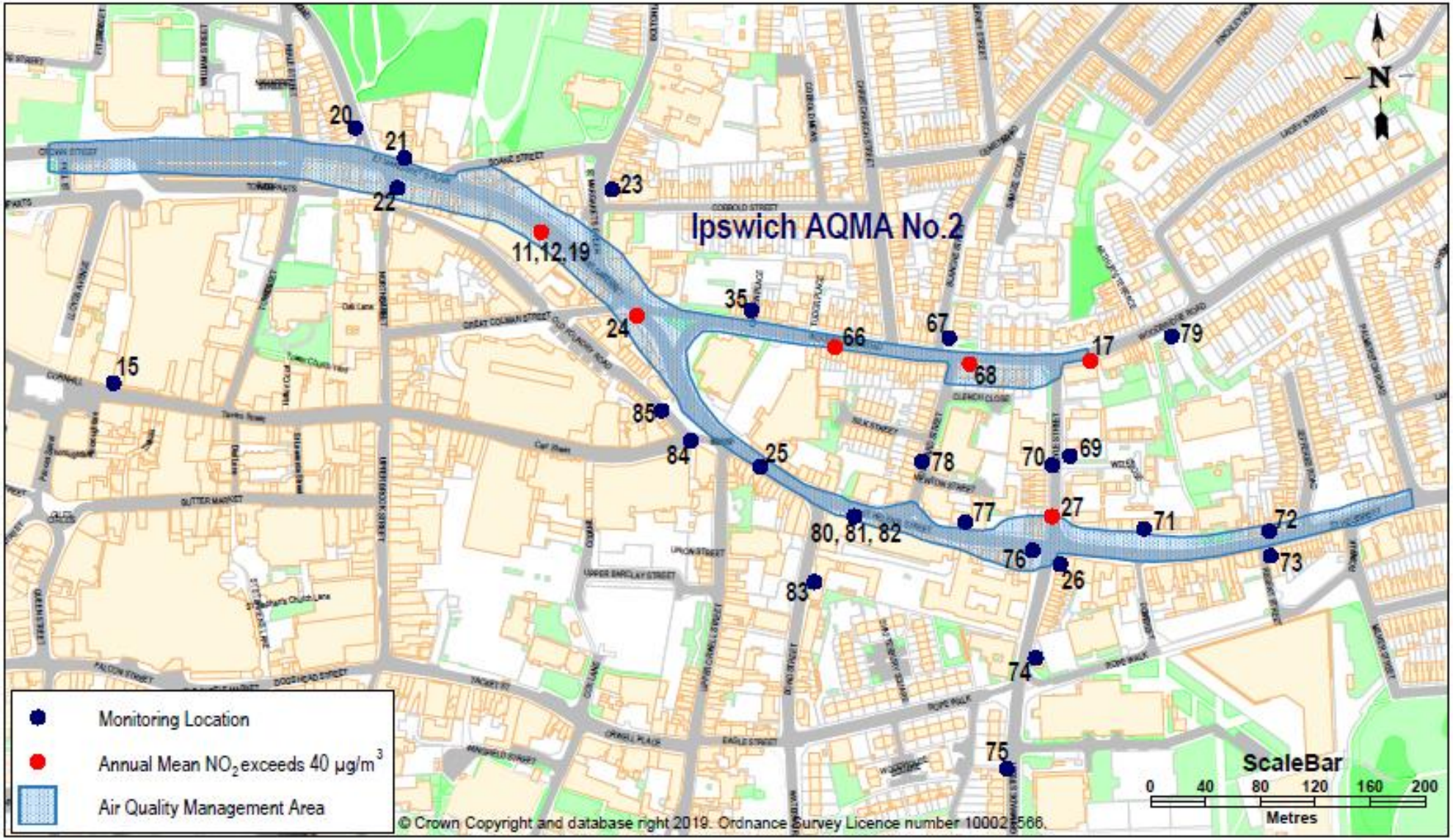


Figure D.4 – Ipswich Air Quality Management Area 3 (1)

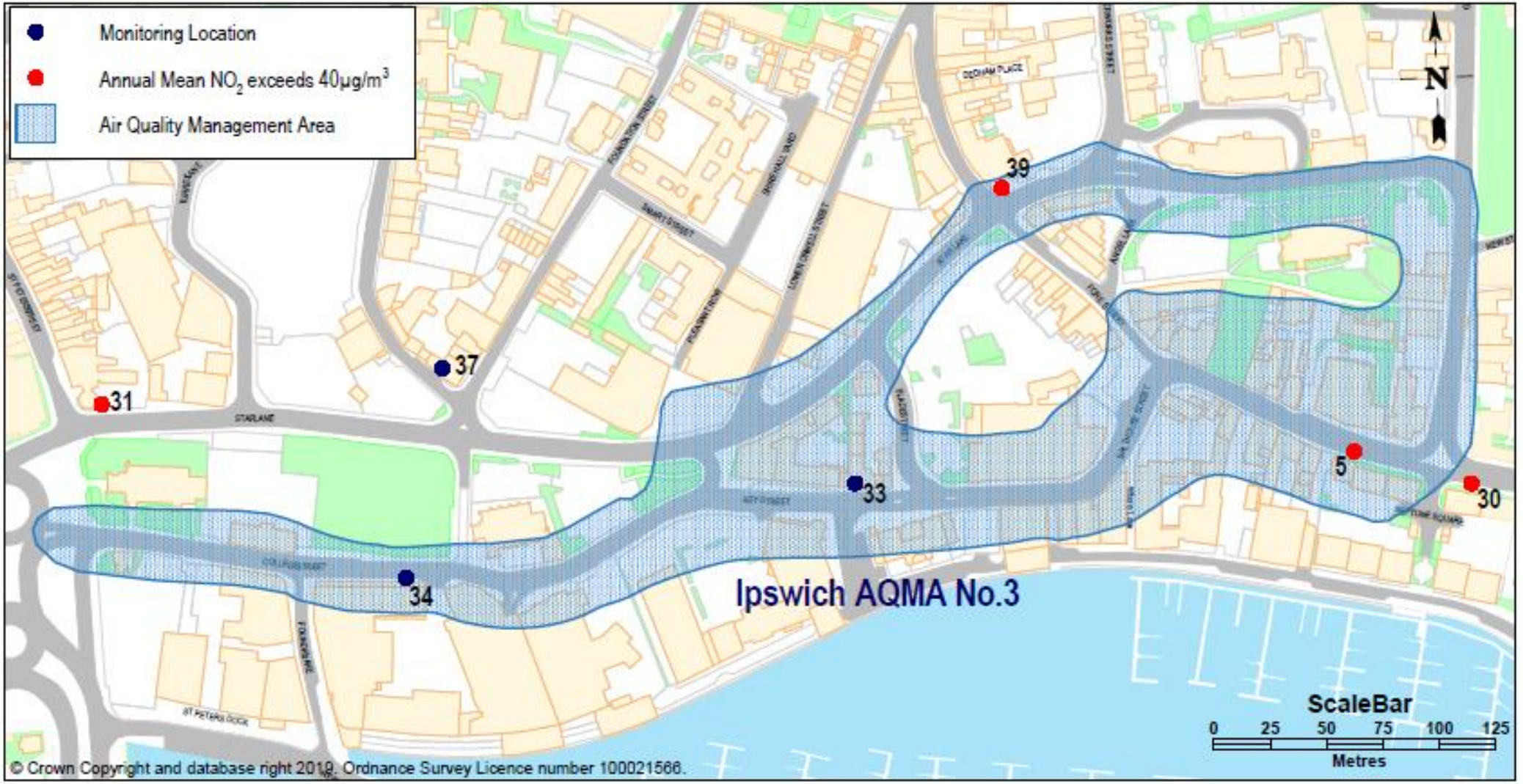
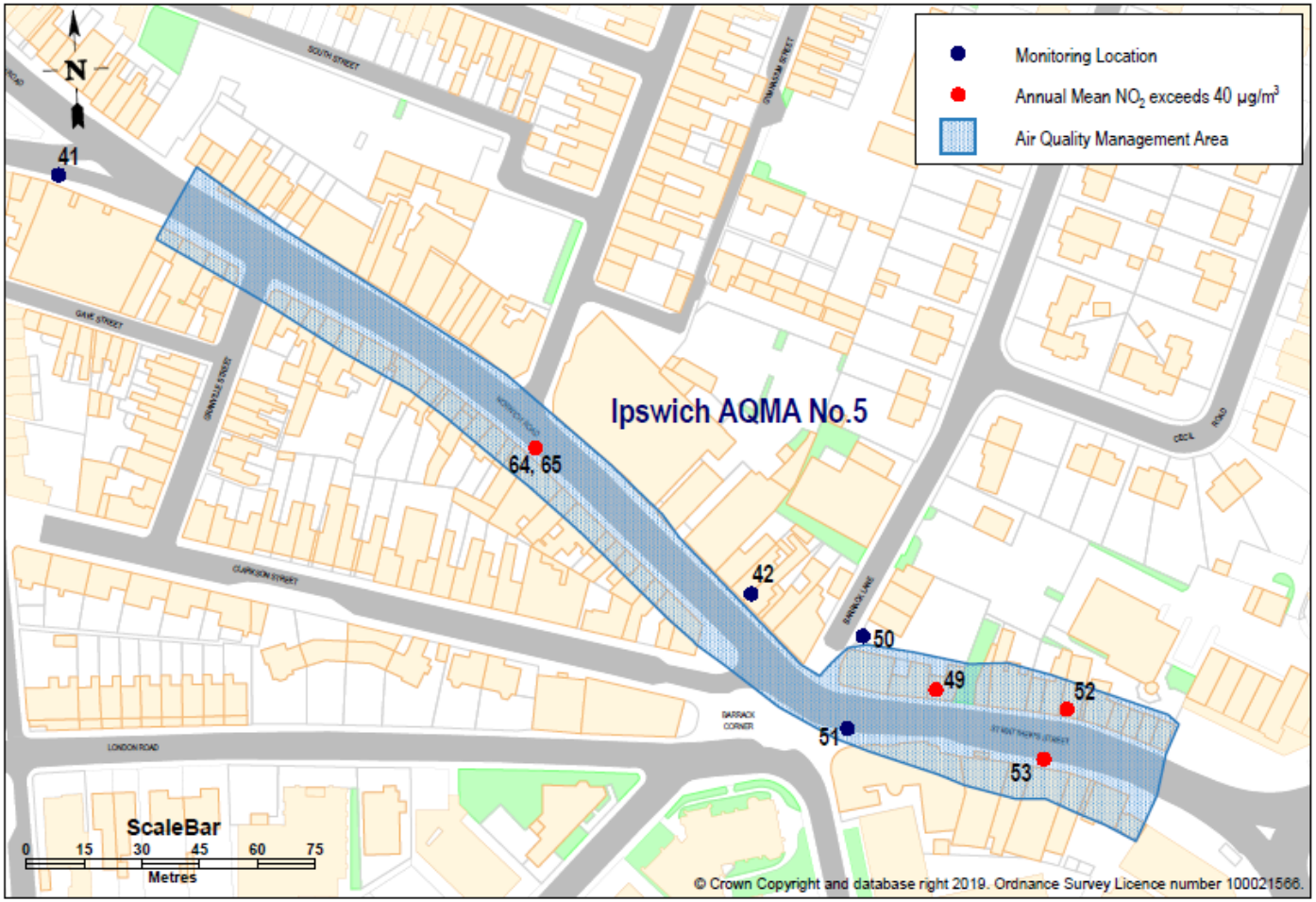


Figure D.5 – Ipswich Air Quality Management Area 5 (1&2)



Notes:

(1) Monitoring locations at which the distance corrected annual mean NO_2 level, bias corrected using the local factor, exceeds the objective of 40µg/m_3 are shown
in red.

(2) Monitoring locations at which the annual mean NO_2 level, bias corrected using the local factor, exceeds the objective of 40µg/m_3 are shown in red.

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[7]	
	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

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

Appendix F: Amended Full Monthly Diffusion Tube Results for 2017

Table F.2 – Amended NO_2 Monthly Diffusion Tube Results – 2017

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1	44.7	40.1	38.5	30.7	27.1	24.8	26.1	31.4	32.2	37.4	44.8	39.9	34.8	26.8	26.8
2	71.2	55.8	54.8	46.8	49.2	42.7	47.7	50.7	47.0	49.5	58.1	52.3	52.2	**40.2**	37.3
3	35.7	40.2	35.1	30.3	28.2	30.7	24.5	33	32.1	37.1	43.9	34.7	33.8	26.0	21.1
4	67.4	50.5	52.4	41.7	28.5	38.6	38.6	35.2	48.5	48.7	60.9	52.9	47.0	36.2	29.7
5	72.4	54.6	61.6	58.8	53.0	54.7	51.2	55.6	53.9	53	65	55.5	57.4	**44.2**	**42.0**
6	36.1	28.3	25.5	20.3	17.7	14.3	15.3	17.4	19.6	24	33.9	24.5	23.1	17.8	17.8
7	48.9	42.8	46.4	39.9	33.3	36.0	37.1	41.3	39.9	41.6	44.2	42.1	41.1	31.7	31.7
8	58.8	46.2	51.6	45.5	41.3	37.2	36.8	38.8	41.1	40.3	50.9	42.8	44.3	35.2	30.1
9	45.7	48.9	52.6	45.3	45.1	40.5	36.6	38.8	44.7	39.9	49.9	45.7	44.5	35.2	30.1
10	66.5	51.5	55.7	48.8	43.7	41.9	37.0	45.2	45.2	46.4	57	43.4	48.5	35.2	30.1
11	75.6	61.7	63.5	61.8	51.4	58.8	58.6	63.5	59.2		71.6	69.3	63.2	**49.7**	**49.7**
12	88.3	62.4	68.3	67.1	61.8	60.2	60.1	65.4	65.6	66.8	78	54.1	66.5	**49.7**	**49.7**
13	52.4	39.3	36.6	28.5	26.4	19.4	23.6	26.8	27.7	28.9	38.2	35.8	32.0	24.6	22.3
14	76.7	57.3	63.5	59.5	55.3	48.9	46.9	52.5	56.5	59.5	62.6	63	58.5	**45.1**	**43.7**
15	52.2	36.3	26.9	28.4	24.4	20.9	21.8	25.7	29.0	32.5	42.3	34.2	31.2	24.0	24.0
16	54.8	49.1	46.3	42.8	36.2	42.4	43.9	44.1	48.6	54.1	54.7	54.2	47.6	36.7	33.6

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
17	76.7	64.6	63.4	55.2	52.4	47.2	47.8	53	59.8	55.4	71.5	64.2	59.3	**45.6**	**40.5**
18	46.2	38.1	41.5	33.5	1.6	34.5	30.3	40	36.8	37.4	48.1	32.4	35.0	27.0	27.0
19	75.5	66.0	64.4	66.9	56.8	56.3	59.0	63.9	65.5		65.7	62.5	63.9	**49.7**	**49.7**
20	57.0	44.8	42.2	39.9	37.6	40.7	37.8	41.9	40.0	45.8	53.2	49	44.2	34.0	32.2
21	56.2	55.7	50.2	47.7	45.5	45.7	41.9	41	46.5	46.9	60.4	43.5	48.4	37.3	37.3
22	53.4	54.5	51.8	46.5	45.8	39.4	42.8	42.8	44.6	45.4	53.6	45.7	47.2	36.3	36.3
23	41.1	35.7	32.2	26.0	23.7	23.5	23.4	24.4	23.6	30.7	37.8	32.4	29.5	22.7	22.7
24	67.9	54.9	52.5	11.5	44.7	42.4	42.2	47.8	44.5	49.5	63.7	53.9	48.0	36.9	36.9
25	51.0	56.5	50.5	47.9	47.1	42.2	43.3	46	55.5	51.7	49.6	52	49.4	38.1	34.0
26	47.4	45.4	46.3	39.5	39.9	33.2	33.0	37.6	30.6	42.7	55.5	39.6	40.9	31.5	28.7
27	63.1				54.2	46.5	49.1	53.1	53.7	49.6	60.6	58.5	54.3	**41.8**	33.9
28	55.7	49.9	53.9	42.0	41.8	38.9	43.5	35	46.9	51	51.8	50.3	46.7	36.0	32.2
29	60.5	43.1	44.4	43.1	42.7	34.7	34.3	39	40.3	39.6	53.2	41.6	43.0	33.1	33.1
30	82.1	69.4	69.5	65.9	59.5	59.3	58.0	64.1	70.2	68.7	67.4	61	66.3	**51.0**	**46.3**
31	69.4	55.7	55.7	53.3	45.4	40.6	47.2	57.4	50.1	57.4	70.8	60.5	55.3	**42.6**	37.4
32	60.7	51.7	45.4	40.2	31.9	33.5	33.7	38.1	43.9	49.5	55.6	50.7	44.6	34.3	30.7
33	45.5	44.3	42.1	44.7	42.5	32.7	37.2	44.9	42.0	44.1	56.6	44.2	43.4	33.4	30.8
34	67.0	49.0	58.1	54.4	42.2	45.4	43.8	54.3	46.9	49.5	58.2	51.7	51.7	39.8	39.8
35	48.4	39.6	36.7	33.1	28.5	29.6	27.4	31.5	33.7	37.9	40.6	40.2	35.6	27.4	27.4
36	50.3	50.9	41.5	39.4	33.8	36.0	35.3	34.1	43.5	49	56.7	49.4	43.3	33.4	24.2

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
37	46.4	35.3	36.0	28.0	27.3	23.9	24.9	31.9	27.5	32.7	39.2	31.4	32.0	24.7	24.7
38	57.8	45.9	45.5	39.9	40.0	40.0	41.9	36.6	48.8	44.8	52.7	41.5	44.6	34.4	26.7
39	70.6	57.2	61.4	54.7	45.9	44.2	46.0	57	48.4	52.7	72.1	55.6	55.5	**42.7**	**42.7**
40	59.0	48.4	44.6	37.9	32.5	26.1	27.8	31	34.0	39.3	50.7	52.4	40.3	31.0	26.6
41	58.7	51.8	51.3	45.7	48.1	42.0	43.2	48.9	49.8	44.1	45.9	21.2	45.9	35.3	35.3
42		46.3	49.0	47.9	47.5	34.9	38.5	39.9	41.3	38.7	51.7	39	43.2	33.2	33.2
43	61.9	54.9	56.0	50.1	48.6	44.8	45.7	42.9	48.5	47.3	57.4	50.6	50.7	39.1	38.7
44	68.5	53.2	53.2	48.4		36.8	48.2	39	48.6	37.4	58.4	45.6	48.8	37.6	30.7
45	49.5	40.1	42.3	31.4	31.4	25.9	27.3	29.4	31.5	36.5	42.2	38.2	35.5	26.5	25.0
46	50.3	37.6	26.3	31.5	32.0	27.4	27.3		33.5	35.2	40	37.5	34.4	26.5	25.0
47	49.5	38.9	37.7	32.6	28.5	24.9	27.0	32.5	32.5	36.5	33.8	26.3	33.4	26.5	25.0
48	48.2	41.5	43.8	34.0	30.8	28.5	28.8	33.1	36.5	30.3	50.2	42.7	37.4	28.8	24.4
49		57.9	57.0	57.0	57.4	42.3	47.5	48.8	53.2	50	62.6	52.1	53.3	**41.0**	**41.0**
50	48.9	38.1	42.5	30.3	31.0	26.9	27.8	29	34.1	36.8	49.1	38.1	36.1	27.8	26.1
51	69.7	54.7	58.1	45.1	44.8	41.6	43.2	45.9	44.3	44.9	50.9	40.4	48.6	37.4	30.6
52	73.5	66.4	66.1	65.2	60.9	38.5	55.4	56	66.7	59.9	72.8	55.6	61.4	**47.3**	**47.3**
53	71.1	65.1	68.3		0.9	55.5	53.0	57.6	59.4	58.7	54	61.6	55.0	**42.4**	**42.4**
54	70.4	56.8	51.4	43.8	40.2	30.1	37.1	40.6	45.1	49.9	53	44.8	46.9	36.1	36.1
55	51.5	47.7	41.4	36.1	37.1	23.8	2.9	31.5	36.6	39.1	47.4	42.5	36.5	28.1	28.1
56	55.6	39.9	44.4	35.0	31.4	32.0	30.9	32.2	37.6	36.8	47.4	29.3	37.7	29.0	27.6

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
57	50.2	44.9	39.0	29.7	26.8	24.4	26.2	25.8	32.9	35.4	41.3	37.5	34.5	26.6	26.0
58	51.7	39.6	41.1	27.7	26.2	24.1	25.8	25	27.9	32.3	32.2		32.1	24.8	20.0
59	59.6	42.7	49.5	39.6	35.7	34.5	34.5	39.8	43.4	44.4	48.6	46.7	43.3	33.3	33.3
60	60.1	48.0	47.1	36.6	30.7	24.6	31.7	38.5	36.7	41.7	48.5	38.3	40.2	31.0	23.0
61	73.5	56.8	60.2	46.8	45.1	41.9	47.1	52.3	53.7	51.8	69.3	57.8	54.7	**42.1**	25.2
62	60.2	49.7	51.7	38.5	41.2	50.3	41.4	45.4	49.4	47.4	48.1	48.8	47.7	36.7	31.7
63	61.8	47.9	52.7	45.5	43.3	42.2	40.8	40.4	48.6	50	53.5	51.8	48.2	37.1	34.6
64	84.3	72.1	73.7	72.9	57.7	64.8	58.7	65.9	68.6	71.6	66.5	77	69.5	**55.6**	**53.9**
65	93.1	68.3	77.0	78.5	62.4	60.0	64.5	67	81.8	78.3	89.2	79.5	75.0	**55.6**	**53.9**
66	64.4	55.7	53.1	48.4	45.0	49.7	48.8	53	39.0	50.2	59.5	55.1	51.8	39.9	39.9
67	50.9	37.4	35.2	31.7	30.2	30.3	28.5	30.2	32.0		37.9	30.3	34.1	26.2	23.4
68	78.1	58.7	59.5	60.3	51.8	51.0	49.2	53.6	53.9	55.6	68.5	56.2	58.0	**44.7**	**44.7**
69	49.9	42.7	39.0	31.0	30.2	26.9	25.2	24.8	30.5	35.2	42.1	32.7	34.2	26.3	26.3
70	63.8	52.8	51.2	48.5	40.2	36.5	36.2	42.2	48.9	46.7			46.7	36.0	30.8
71	46.4	39.1		28.8		22.5	23.6	23.7	27.4	29.3	34.8	32.9	30.9	23.8	23.8
72	62.3	54.4	54.0	48.9	44.3	42.0	38.7	44	49.5	50.5	58.2	52.2	49.9	38.4	36.8
73	41.1	36.7	35.4	25.7	25.2	20.0	20.8	24.5	28.6	29.8	31.5	35	29.5	22.7	21.7
74	46.6	41.0	40.9		28.7	23.6	25.2	27.9	31.8	37	40.3	35.4	34.4	26.5	26.5
75	49.5	37.7	39.7	27.1	27.2	21.5	22.8	28.6	31.3	37.9	39.2	33.9	33.0	25.4	25.4
76	60.3	45.8	54.0	41.7	41.6	39.4	40.2	43.8	45.4	44.4	50.6	49.1	46.4	35.7	35.7

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
77	51.6	43.3	40.5	35.9	35.0	28.6	29.3	33.2	35.9	32.2	32.6	35.5	36.1	27.8	27.8
78	52.9	43.3	39.4	29.5	21.9	22.8	25.1	26.4	26.5	32.7	35.1	35.2	32.6	25.1	24.2
79	64.6	55.2	41.6	38.0	39.4	37.4	37.5	44.8	47.8	45.4	63.3	50.6	47.1	36.3	30.8
80	53.6	49.8	48.3	40.3	40.7	42.0	39.9		45.1	48.9	51.6	47.5	46.2	35.7	35.7
81	55.2	48.9	50.9	45.5	38.0	43.6	40.7		44.7	42.3	52.5	41.6	45.8	35.7	35.7
82	55.7	49.2	52.6	45.6	40.4	41.5			43.6	47.1	54.3	41.8	47.2	35.7	35.7
83	57.0	43.2	40.8	33.5		27.6	26.9	32.4	33.0	33.8	41.9	39.6	37.2	28.7	27.3
84	48.5	37.9	34.3	29.5	28.3	20.1	23.6	28.2	24.7	32.2	50	31	32.4	24.9	24.9
85	54.1	44.6	42.9	39.2	34.0	32.6	31.0	38	36.0	41.8	50.3	43.4	40.7	31.3	31.3
SP1	55.4	45.7	49.7	41.2	51.6	38.3	51.6	49	36.5				46.6	35.8	-
SP2	72.4	56.0	68.1	62.3	34.0	31.4	32.7	39.8	44.8				49.1	37.8	-
SP3	57.0	38.3	35.7	34.9		28.0	22.9	29.1	31.1				34.6	27.5	-
SP4	52.5	45.2	47.2	42.3	35.5	31.1	32.1	36.4	40.5				40.3	31.0	-
SP5	73.7	60.6	64.9	60.0	56.8	50.0	46.2	56.4	53.7				58.0	**44.7**	-
SP6	56.3	41.5	41.2	33.1	32.7	28.5	23.8	34.9	34.8				36.3	28.0	-
SP7	48.9	41.1	44.9	39.9	37.1	28.7	26.8	32.8	32.7				37.0	28.5	-
SP8	46.1	38.8	47.9	37.8	29.9	28.1	26.0	34.9	33.9				35.9	27.7	-
SP9	48.6	37.8	42.3	30.6	32.4	30.2	26.0	34.2	34.8				35.2	27.1	-
SP10	46.1	43.7	46.4	38.5	36.2	33.9	30.1	37.5	42.6				39.4	30.4	-
SP11	67.4	49.1	50.7	38.7	41.3	28.8	29.2	37.6	36.1				42.1	32.4	-

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SP12	46.2	35.9	39.7	27.0	28.4	25.9	20.7	26.4	28.2				30.9	23.8	-
SP13	54.2	47.2	47.6	43.2	36.7	36.8	33.7	44.8	45.2				43.3	33.3	-
SP14	45.6	35.1	36.7	28.9	28.3	22.3	23.0	28.3	30.0				30.9	23.8	-
SP15	50.9	41.1	43.5	37.9	37.5	27.5	25.6	35	36.9				37.3	28.7	-
SP16	42.8	30.0	34.1	29.3	24.3	21.4	18.3	27	29.0				28.5	21.9	-
SP17	35.2	28.3	33.3	30.1	24.5	21.6	18.8	23.5	28.2				27.1	20.8	-
SP18	51.5	37.2	38.3	31.4	26.9	24.9	24.1	34.1	34.8				33.7	25.9	-
SP19	47.6	40.4	46.6	37.3	34.3	27.7	28.1	36.9	37.8				37.4	28.8	-
SP20	52.6	46.4	36.7	45.2	40.0	33.8	30.7	35.4	43.9				40.5	31.2	-
SP21	54.2	40.3	41.0	38.2	34.0	28.9	28.1	34.5	35.0				37.1	28.6	-
SP22	41.6		54.8	33.0	27.9	24.6	22.2	28.6	29.2				32.7	27.2	-
SP23	51.1	34.3	35.7	31.1	24.8	20.8	21.9	28.9	30.7				31.0	23.9	-
SP24	53.9	54.8	53.7	48.0	43.0	37.9	33.4	50.6	49.7				47.2	36.4	-
SP25	71.4	57.4	58.5	57.7	57.6	50.8	44.6	55.1	57.6				56.7	**43.7**	-
SP26	43.9	36.6	35.2	25.9	24.3	21.1	20.8	28.1	27.5				29.3	22.5	-

☒ **National bias adjustment factor used**

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

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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
LAQM.PG16	Local Air Quality Management Policy Guidance (PG16) [April 2016]
LAQM.TG16	Local Air Quality Management Technical Guidance (TG16) [February 2018]
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
SCC	Suffolk County Council
SO_2	Sulphur Dioxide
SPD	Supplementary Planning Document