South Tyneside Council

HELLO TOMORROW
CHANGE IS HAPPENING

2020 Air Quality Annual Status Report (ASR)

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

(June 2020)

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Executive Summary: Air Quality in Our Area

Air Quality in South Tyneside

South Tyneside Council adopts a collaborative, corporate-wide approach to air quality led by its Development Services Team. Within Development Services, the Environmental Health Unit is responsible for overseeing local air quality management, including air quality monitoring and reporting results to the Department of Environment, Food and Rural Affairs (Defra). Close working relationships with transport, public health and spatial planning colleagues are important to improve air quality as a consequence of transport and public health initiatives and also through routine planning applications that may impact upon air quality.

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].

There are several principal air pollutants produced by industrial, domestic and traffic sources they include: sulphur dioxide; nitrogen oxide/ nitrogen dioxide (NO_2); PM_{10} and $PM_{2.5}$; ozone and volatile organic compounds; toxic organic micro pollutants; 1-3 butadiene; benzene; carbon monoxide; lead and heavy metals.

Historically, the main air pollutants have been high levels of smoke and sulphur dioxide emitted by combustion of sulphur containing fossil fuels i.e. coal, however currently the main air pollutant threat occurs from traffic emissions.

Nitrogen Dioxide (NO_2) and Nitric Oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NOx). All combustion processes produce NOx emissions, largely in the form of nitric oxides, which is then converted to

[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

nitrogen dioxide (NO_2). Nitric oxide (NO) is mainly derived from road transport emissions and other combustion processes such as the electricity supply industry.

The principal source of Nitrogen Dioxide is road transport; combustion processes such as power generation and industrial processes also provide a significant contribution. The main contribution within South Tyneside is from road traffic.

South Tyneside Council ceased monitoring Sulphur Dioxide due to continued compliance during previous rounds of review and assessment.

Together, Environmental Health, Transport and Public Health colleagues are striving to reduce pollutant levels throughout the Borough even further to improve air quality and the health and wellbeing of residents. Various initiatives are discussed within this report and further information can be found in the links provided.

We shall continue to undertake continuous and non-continuous monitoring; all monitoring results can be found within Appendix A.

Air quality is everyone's business and there are various ways that residents and businesses can improve local air quality.

Actions to Improve Air Quality

Major Schemes

The Council has completed a number of significant strategic transport improvements to improve air quality, reduce congestion and promote public transport in recent years:

- Lindisfarne Corridor (A19, A194, A1300) Improvements - £8.1m
- The Arches (A185 / A194) junction improvements) - £9m
- South Shields Public Transport Interchange - £18m
- A19 Northbound Lane Gain / Lane Drop - £3.5m
- A19 Cycle Scheme - £1m
- Follingsby Lane Carriageway Improvements - £1m
- A185 Strategic Transport Corridor - £0.9m

The delivery of these strategic transport priorities have been resultant from positive relationships with external funding providers such as the Department for Transport, Highways England, Department for the Environment, Farming, Rural Affairs and regionally through the North East Local Enterprise Partnership. Added to this, is that South Tyneside Council has a strong reputation for delivery.

Looking forward , the Council is set to embark on the construction of the following schemes in the next couple of years:-

- A194 Strategic Transport Corridor - £1.5m

  Following a successful external funding bid to the National Productivity Investment fund, the Council will deliver targeted improvements to reduce congestion, improve air quality and lead to economic growth. The designs are being finalised and will be constructed in late 2020.

- South Shields to Newcastle Bus Corridor - £15m

  The Council has been awarded Transforming Cities fund as part of a successful regional funding ask. This will enable South Tyneside to bring forward improvements for public transport and other motorists at critical junctions, thus reducing congestion and improving air quality.

  The scheme will also include the removal of 2 railway level crossings to be replaced with a road bridge and the necessary highway links. The removal of the level crossings will reduce air quality and will improve bus journey times. This will be delivered over a 3 year delivery programme from 2020-2023.

- Healthier / Safer Metro Stations - £3m

  As with the above, South Tyneside will invest in both the Chichester and Tyne Dock metro stations in terms of sustainable transport links and improved security. The funding will come from the Transforming Cities Fund, with the schemes promoting sustainable transport options in an area close to the Boldon Lane Air Quality Management Area.

- A184 / A1300 Intelligent Transport Corridors - £1.5m

  Again, as part of the successful Transforming Cities Fund bid, the Council will work with the Regional Traffic Signals team to deliver intelligent transport corridors using new technology and undertaking traffic signal upgrades.

  These upgrades will see improved traffic flows which will assist in reducing pollutants from stationary vehicles at the junctions.

- Air Quality Initiatives through working with schools - £0.5m following Air Quality Grant

  As part of the 19/20 successful air quality grant, South Tyneside is to embrace the 'school street' approach to try and influence / reduce the amount of trips undertaken by private vehicle as part of the school run. The Council will look to bring forward sustainable transport initiatives along with increased enforcement of traffic regulation orders to reduce the amount of vehicles outside of schools during pick-up and drop-off arrangements.

- IAMP Highway and Accessibility Improvements - £40m

  The International Advanced Manufacturing Park (IAMP) being constructed in land adjacent to the Nissan Manufacturing Plant in Sunderland requires a significant amount of highway infrastructure to enable the development to come forward.

  Measures include the construction of 2 road bridges, the dualling of the A1290 carriageway along with the internal road network to facilitate the development.

  The funding has been secured through the North East Local Growth Fund and will be implemented over the course of 2020-2025.

- Ultra Low Emission Charging Points roll-out - £0.25m

  South Tyneside has been successful in bidding for on-street charging point funding through Central Government. This will allow the local authority to

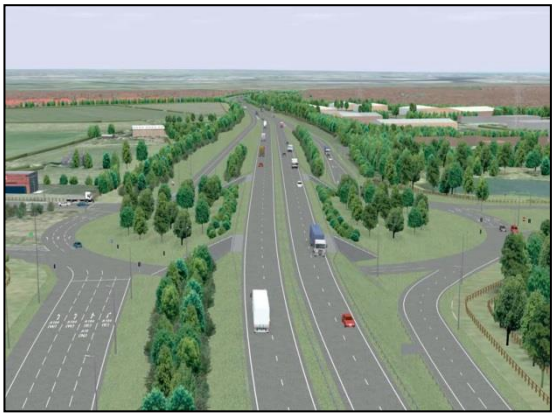
further expand the EV charging point network over the course of the 2020/21 period.

- A19 Southbound Lane Gain / Lane Drop - £3.5m

  The Council has aspirations to deliver a similar lane gain / lane drop scheme on the A19 Southbound carriageway and is working with Highways England / Regional colleagues to establish the necessary funding to deliver this scheme.

In addition to the above, South Tyneside is working closely with Highways England who are delivered specific junction improvements along the A19 corridor as part of the National Road Investment Study (RIS) process.

The A19 corridor is s key regional economic corridor and a fundamental transport link into the Borough. Highways England will construct improvements at the A19 / A184 Testo's junction and at the A19 / A1290 Downhill Lane junction. Both schemes are seen to improve road safety, reduce congestion and improve air quality, with the schemes being constructed from 2019 and completed in 2023.



Testo's and Downhill Lane Major Improvement Scheme

Active Travel and Physical Activity

We know transportation plays an important role in supporting daily activities; however we also know active travel (cycling, walking and use of public transport) can increase physical activity levels and improve physical and mental wellbeing. Prioritisation of

active travel can also reduce over reliance on motorised transport, contributing to improved air quality and a reduction in road injuries. Re-allocation of road space to support walking and cycling; restricting motor vehicle access; introducing road-user charging and traffic calming schemes; and creating create safe routes to schools. Such changes have prompted substantial shifts from car transport to walking and cycling. The Council has prepared a draft Local Cycling and Walking Implementation Plan (LCWIP) which is expected to be endorsed by the Council. On adoption, this will provide the Council with the mechanism to attract further investment from the Emergency Active Travel Fund and other Central Government Funding opportunities.

This is further expanded within the physical activity strategy for the borough, where it is bold in its commitments:

- To develop a traffic free cycle/walkway connecting South Tyneside to the IAMP and over 5000 new jobs
- All of our children will achieve the early learning goal in physical activity
- More children will travel to school by foot, bike, scoot, bus and metro than anywhere else in the region.
- We will ensure that physical activity forms part of quality GP and health professional conversations

Transport within a Post-Covid Environment

The Council recognises that Transport will have a crucial role in terms of the economic recovery in a post covid situation. The delivery of strategic transport improvements can facilitate economic growth and provide improved connectivity, but it can also act to significant improve the environment, in reducing congestion but also promoting sustainable transport modes.

South Tyneside will continue to work with Nexus (Passenger Transport Executive) and the commercial bus operators to develop an economic recovery strategy..

This will also contribute to the continued action required to reduce our high obesity rates right across the life course. The latest data for South Tyneside (2018/2019) shows:

- Prevalence rate of obesity, reception children is 10.9% against the England rate of 10.6%
- Prevalence rate of obesity for Year 6 children is 23.6% against the England rate of 19.9%
- Prevalence rate of overweight and obese for adults (aged 18 +) is 69.2.6% against the England rate of 62.3%.

Conclusions and Priorities

South Tyneside Council is currently meeting local air quality objectives for NO_2 and PM_{10}. No exceedances of the national objective levels have been recorded across the borough and we have not declared any new air quality management areas (AQMA's) or had to amend/extend our current AQMA's at Edinburgh Road/ Lindisfarne roundabout and Boldon Lane/ Stanhope Road. Non continuous (diffusion tube) data collected in 2018 has not demonstrated any exceedances of the national annual average for nitrogen dioxide the data collected from continuous monitoring stations has not identified any exceedance of the national objective levels for NO_2 or PM_{10} over the last five years.

REVOCATION OF AQMA

Defra's Local Air Quality Management technical guidance (TG16) states that an air quality management area can be revoked following a detailed assessment or if there is a robust evidence base including monitoring over a sufficient period i.e. several years to reflect national trends in emissions; Other factors such as works carried out as part of the action plan associated with the AQMA that may have had an effect on pollutant levels can also be taken into account. Based on guidance the authority are undertaking detailed assessments at both AQMA sites with a view to beginning the revocation process for both sites following review of these assessments. Revocation of the AQMA's is subject to internal review and approval via a formal corporate process which will begin after completion of the detailed assessments.

The Council will continue to liaise with Gateshead, Newcastle and North Tyneside to ensure that any plans for clean air zones within their areas do not have an adverse effect upon air quality within South Tyneside by introducing more traffic trying to avoid these clean air zones.

These Local Authorities (Newcastle, North Tyneside and Gateshead) as part of the Ministerial Direction have recently undertaken a consultation exercise on a proposed Low Emission Zone and Clean Air Zone, with South Tyneside Council formally responding to reference concerns with traffic redistribution.

One of the key priorities for the local authority in addressing air quality for the coming year includes combating the cumulative impact of major development within South Tyneside. The Tyneside planning application validation statement currently requires that an air quality assessment is undertaken for developments over a certain size. The concern is that although separately these developments may have a negligible effect on air quality, cumulatively they could have a more detrimental effect. To ensure that this issue is addressed, the Council has commenced a review of its development plan policies. The Local Plan Pre-Publication Draft (August 2019) has embedded air quality considerations into policy. This will require that the impacts that proposals might have on air quality are understood via air quality and transport requirements and where necessary, the relevant mitigation is incorporated into scheme design from the outset. Specific evidence is being prepared to model the cumulative impacts of the emerging Plan's site allocations on air quality. This will be used to inform the formal Publication Draft of the Plan which is to be published later this year for consultation.

South Tyneside Council recognises its role ensuring the health and wellbeing of everyone that lives, works and commutes to the Borough. In July 2019, the Council declared a Climate Change Emergency, taking all necessary steps to make South Tyneside Council carbon neutral by 2030, while leading by example establishing the Council as a champion for a carbon neutral future.

The Councils Climate Change Strategy and Action Plan – "Sustainable South Tyneside" provides a platform for collective actions and a shared vision for a successful and vibrant future prioritising areas for action, implementing measures to support carbon reductions, while delivering recognisable improvements to the

boroughs air quality through low carbon; renewable and alternative sustainable solutions.

The strategy commits to a wide-range of actions that will help support and deliver carbon reductions and improved air quality, which are set-out across 11 key delivery themes:-

- Reducing Emissions from Council Buildings
- Street lighting
- Transportation and Staff Travel
- Environment and Biodiversity
- Schools
- South Tyneside Homes Operations
- Procurement
- Policy
- Adaptation
- Cultural Change and Awareness
- Championing a Carbon Neutral Future

To ensure a diverse; healthy and natural environment we will implement solutions that transition away from the use of fossil fuels; diesel and petrol to more sustainable and renewable supply sources supporting the delivery of a low carbon and resilient borough with on-going improvements to air quality across South Tyneside.

South Tyneside Council continues to work with Highways England in terms of constructing the Testo's and Downhill Lane schemes which are currently being constructed and are expected to be complete from August 2022.

Finally, the Council continues to work with Sunderland City Council on the delivery of the International Advanced Manufacturing Park (IAMP). The wider Development Consent Order is expected to be submitted from late 2020, with the overall development completed by 2025.

Local Engagement and How to get involved

A significant proportion of air pollution is a result of road traffic sources, the two main pollutants of concern being NO_2 and $PM_{10.}$ Making changes to your daily life

including walking short journeys, using public transport and car sharing when you can will ultimately reduce levels of NO_2 and $PM_{10.}$

South Tyneside Council works with public health and the sustainability teams to encourage the uptake of sustainable modes of transport. South Tyneside has continued to encourage residents to cycle, walk, and use alternative methods of transport.

Other measures that residents can undertake to improve air quality include:

- Purchasing low emission electric/ and or hybrid vehicles;
- Working with schools on the importance of air quality and active travel;
- Upgrading boilers to newest and most efficient gas condensing boilers with lowest NOx (and carbon) emissions.

Table of Contents

List of Tables

List of Figures

1 Local Air Quality Management

This report provides an overview of air quality in South Tyneside Council during 2019. 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 South Tyneside 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 South Tyneside 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=251 Alternatively see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

There has been continued compliance with national air quality objective levels for nitrogen dioxide at Lindisfarne Roundabout/ Leam Lane and at the Boldon Lane/Stanhope Road AQMA's. Continued compliance has been demonstrated in the last five years of continuous monitoring data along with non-continuous monitoring data for the last 4 years. Appendix D: Maps of Monitoring locations and AQMA'S, provides a map of air quality monitoring locations in relation to the AQMA(s).

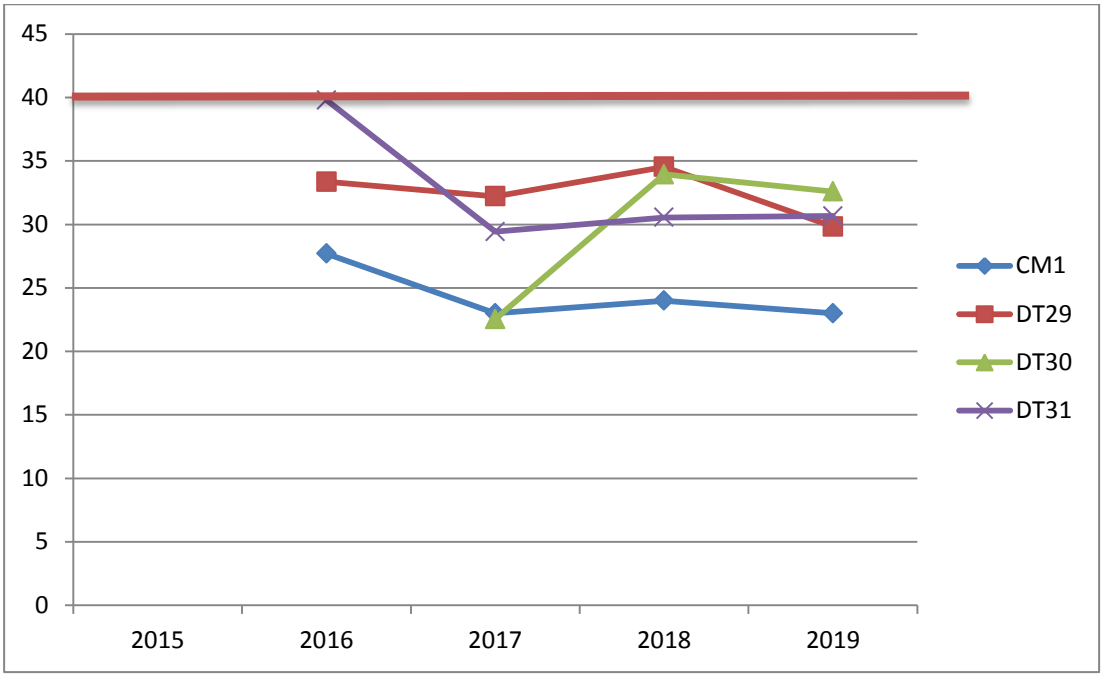
Boldon Lane/ Stanhope Road AQMA

The Council is aware that delays are experienced throughout the Boldon Lane / Stanhope Road area. As a result of this, the Council is to work collectively with the North East Urban Traffic Management Control team to bring forward intervention to improve traffic movements throughout the whole corridor.

This corridor based approach has secured external investment from the Transforming Cities Fund which will look to bring forward junction improvements as referenced below during the course of 2020-201.

There are a number of traffic signalised junctions along the corridor with additional formalised crossing facilities. The Council will coordinate the traffic lights so that journey time variability is improved and congestion reduced. The corridor is heavily used by buses, so it is important that traffic throughput is improved along the whole corridor.

Figure A.1.1 – Boldon Lane/ Stanhope Road AQMA



The figure above shows the results of continuous monitoring and non-continuous monitoring data within the Boldon Lane/ Stanhope Road AQMA. It can be seen that NO_2 levels have decreased by 1µg/m³ at CM1 from 2018 with a concentration of 23 µg/m³. DT29 has shown a fairly substantial decrease of 5 µg/m³ from 2018 data, DT30 also shows a slight decrease in concentration levels. DT31 shows a very slight increase in concentration levels. All results are below the national annual average objective level for NO_2.

Lindisfarne Roundabout/ Leam Lane AQMA

Figure A.1.2 – Lindisfarne Roundabout/ Leam Lane AQMA

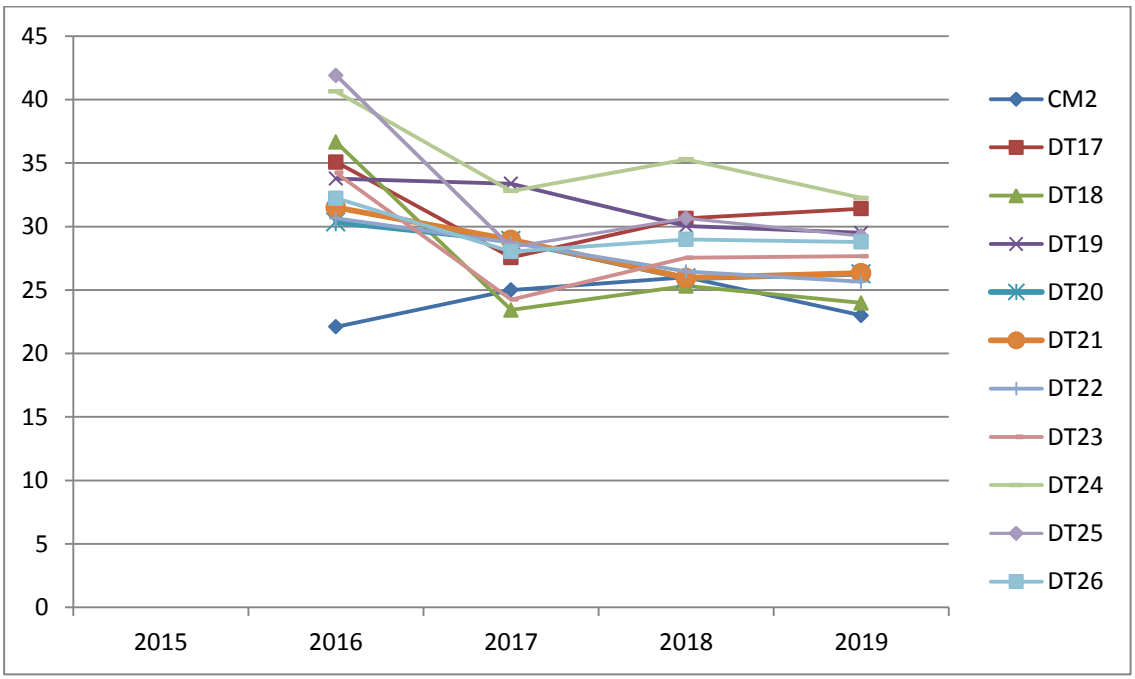


Figure A.1.2 – Lindisfarne roundabout/ Leam Lane AQMA shows all levels remain well below the national annual average objective level for NO_2. There was an decrease of 3 µg/m³ to annual mean NO_2 levels at Edinburgh Road continuous monitoring data in 2019 from 2018 concentrations. Diffusion tube data has been gathered over the past four years, concentrations have remained below the target concentration of 40 µg/m³. There is a reduction in NO_2 concentrations at DT18, DT19, DT22, DT24, DT25 and DT26. There are marginal increases in NO_2 concentrations at DT17, DT20, DT21 and DT23. The highest concentration recorded was 32.25 µg/m³ from DT24 (opposite 173 Hadrian Road.) the concentration is down 3 µg/m³ from last year.

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
Lindisfarne Roundabout/ Leam Lane	1st March 2006	NO2 Annual Mean	Jarrow	A number of properties around Lindisfarne roundabout, extending along Leam Lane and the A19	No	43	µg/m3	40	µg/m3	Action Plan for Lindisfarne Roundabout/ Leam Lane	Under review as part of the Climate Change Strategy. Refer to broad measures in table 2.2	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=251
Boldon Lane/ Stanhope Road	1st March 2006	NO2 Annual Mean	South Shields	Commercial properties with residential properties extending	No	41	µg/m3	59	µg/m3	Action Plan for Boldon Lane/ Stanhope Road	Under review as part of the Climate Change Strategy. Refer to broad	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=251

				along Boldon Lane and Stanhope Road							measures in table 2.2	

☒ **South Tyneside 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 South Tyneside Council

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

1. The report provides maps of AQMA boundaries and monitoring sites within them, but still does not include maps for monitoring sites outside of AQMAs. In future reports please ensure all sites are illustrated on maps. For further guidance please refer to LAQM Technical Guidance 16 (TG16).
    - A link to all mapped sites was included in the last report, copies of all sites illustrated in maps are included within the appendices of this report.
2. Example calculations for bias adjustments have been included which is useful and encouraged for all future reports.
3. The Council is planning to begin a detailed assessment to determine if AQMAs can be revoked. This is an appropriate next step after several years of monitoring has produced concentrations below the objective.
    - South Tyneside Council will employ a specialist consultant to undertake a detailed assessment of both AQMA's to determine that both can be revoked.
4. In general the report is well written, concise and provides a lot of detail regarding local air quality issues and the actions being taken to address them. The Council should continue to implement their air quality strategy and monitoring programme.

South Tyneside Council has taken forward a number of direct measures during the current reporting year of 2020 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 their respective action plans i.e. the integrated Transport Plan and Physical Activity Strategy. Key completed measures include:

- Lindisfarne Corridor (A19, A194, A1300) Improvements - £8.1m

- The Arches (A185 / A194) junction improvements) - £9m
- South Shields Public Transport Interchange - £18m
- A19 Northbound Lane Gain / Lane Drop - £3.5m
- A19 Cycle Scheme - £1m
- Follingsby Lane Carriageway Improvements - £1m
- A185 Strategic Transport Corridor - £0.9m

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	North East Freight Quality Partnership	Freight and Delivery Management	Delivery and Service plans	North East Combined Authority (NECA)	N/A	Complete	Measures to assist freight movements including freight consolidation centres	No direct improvement	Yearly Service Delivery plans	Ongoing	http://www.northeastfreightpartnership.info/
2	North East Freight Maps	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	NECA	N/A	Complete	Limiting freight movements to the strategic routes around the region	No direct improvement	Ongoing	Ongoing	http://www.northeastfreightpartnership.info/
3	Set up a multi-disciplinary air quality steering group to drive forward STC clean air agenda	Policy Guidance and Development Control	Regional Groups co-ordinating programmes to develop area wide strategies to reduce emissions and improve air quality	STC	N/A	Complete	Ensure that all external funding opportunities are considered	No direct improvement	Ongoing	Ongoing	Quarterly meeting undertaken
4	Set Up a Regional Air Quality Group	Policy Guidance and Development Control	Regional Groups co-ordinating programmes to develop area wide strategies to reduce emissions and improve air quality	NECA	N/A	Expected 2019	Ensure that air quality is considered in a trans boundary manner, maximise funding opportunities for combined authority bids	No direct improvement	-	Ongoing	Quarterly meetings
5	Local Air Quality Strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	STC	N/A			No Direct Improvement	Draft 1 complete	Oct 2020	
6	Ensure Air Quality is considered at pre application stage to allow effective use of planning conditions	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	STC	N/A	Updated Validation of applications document Mar 2019	Ensure all planning applications comply with requirements to ensure air quality is not adversely affected by development	No Direct Improvement	Ongoing	Ongoing	
7	Completion of the Local Delivery Plan and Infrastructure delivery plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	STC	Ongoing	2021	All new development will adhere to the prescribed guidance in the LDP and IDP to ensure that developments are compliant	No Direct Improvement	Draft of LDP and IDP due	2021	
8	Ensure new developments have adequate travel plans that are continuously reviewed and updated	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	STC	N/A	Complete	Increase the number of travel plans within the borough	No Direct Improvement	Ongoing	Ongoing	
9	North East Air Quality Strategy	Policy Guidance and Development	Air Quality Strategy	NECA	Ongoing	Expected in 2018	Reduced CO_2 emissions	No direct improvement	complete	2018	North East Combined Authority Leading on this
10	North East Combined Authority Sustainable Transport Group	Policy Guidance and Development	Regional Groups to develop Area wide Strategies to reduce emissions	NECA	Ongoing	2018	Air Quality Improvements	No direct improvement	Ongoing	2018	
11	STC promoting electric vehicles through an employer car lease scheme	Promoting Low Emission Transport	Company Vehicle Procurement -Prioritising uptake of low emission vehicles	STC	Complete	Ongoing	Reduced emissions	No direct improvement	Ongoing	Ongoing	
12	Investment in Electric Charging Infrastructure	Promoting Low Emission Transport	Priority parking for LEV's	STC	Complete	Ongoing	Reduced emissions, Improved air quality	No direct improvement	Ongoing	Ongoing	8 additional charging points will be implemented following a successful external funding bid.

13	Council Fleet to investigate options for electric fleet including Taxi's	Promoting Low Emission Transport	Prioritising uptake of low emission vehicles	STC	2019	Expected in 2019	Reduced emissions, improved air quality	No direct improvement	Ongoing	2019/2020	
14	Council have installed EV Charging Points	Promoting Low Emission Transport	Prioritising uptake of low emission vehicles,	STC	Complete	Ongoing	Reduced emissions, improved air quality	No direct improvement	Ongoing	Ongoing	
15	Travel Planning through Planning Process	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	NECA & STC	Ongoing	Ongoing	Reduced emissions, Improved air quality,	Limited improvements	Ongoing	Ongoing	
16	New South Shields Public Transport Interchange	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	NEXUS / STC	2019	Ongoing	Reduced emissions, Improved air quality,	No direct improvement	Construction started in 2018	2019	
17	A19 Testos and Downhill lane junction improvements	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Highways England	ongoing	2018	Providing a safe and serviceable road network	Improved Air Quality	Construction from 2019	2023	http://www.highways.gov.uk/roads/road-projects/a19-testos-junction-improvements/
18	STC Active Travel Work stream	Vehicle Fleet Efficiency	Driver training and ECO driving aids	NECA	Ongoing	Ongoing	Reduced emissions, Improved air quality,	Limited improvements	Ongoing	Ongoing	
19	Travel Information through the UTMC centre	Traffic planning and management	UTC, Congestion management, traffic reduction	NECA / STC	Ongoing	Ongoing	Reduced emissions, Improved air quality,	Yes	Ongoing	Ongoing	
20	Junction Improvements within the borough	Traffic Planning and Management	UTC, Congestion management, traffic reduction	STC	Ongoing	Ongoing	Reduced emissions, Improved air quality,	Yes	Ongoing	Ongoing	
21	Intelligent Transport Solutions at Key Junctions	Traffic Planning and Management	UTC, Congestion management, traffic reduction	STC	Ongoing	Ongoing	Reduced emissions, Improved air quality,	Yes	Ongoing	Ongoing	
22	Successful Clean Bus Fund Bid	Promoting Travel Alternatives	Public transport improvements- interchanges stations and services	STC	Ongoing	Ongoing	Reduced emissions, Improved air quality,	Yes	Delivered	Delivered	
23	Delivery of the Council's Strategic Transport Priorities	Traffic Planning and Management	Congestion management, traffic reduction	STC	Ongoing	Ongoing	Reduced emissions, Improved air quality	Yes	Ongoing	Ongoing	

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

As detailed in Policy Guidance LAQM-PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less).

There is now an extensive body of evidence that long-term exposure to everyday air pollutants over several years contributes to the development of cardiovascular disease (CVD), lung cancer, and respiratory disease. PM is inhaled into the lungs and ultrafine PM0.1 is thought to pass into the blood causing many adverse outcomes including systemic inflammation. Air pollution is strongly associated with all-cause mortality statistics.

In 2018 PHOF indicator D01, *Fraction of mortality attributable to particulate air pollution,* attributed 5.2% of mortality in England to particle air pollution, locally the figure was 3.8%.[4]

Impacts on Health Outcomes

The Office of National Statistics consistently reports that residents of South Tyneside have a significantly lower life expectancy than the England average.

Life Expectancy – 2016-18

	Male	Female
South Tyneside	77.0 years	81.5 years
National Average	79.6 years	83.2 years

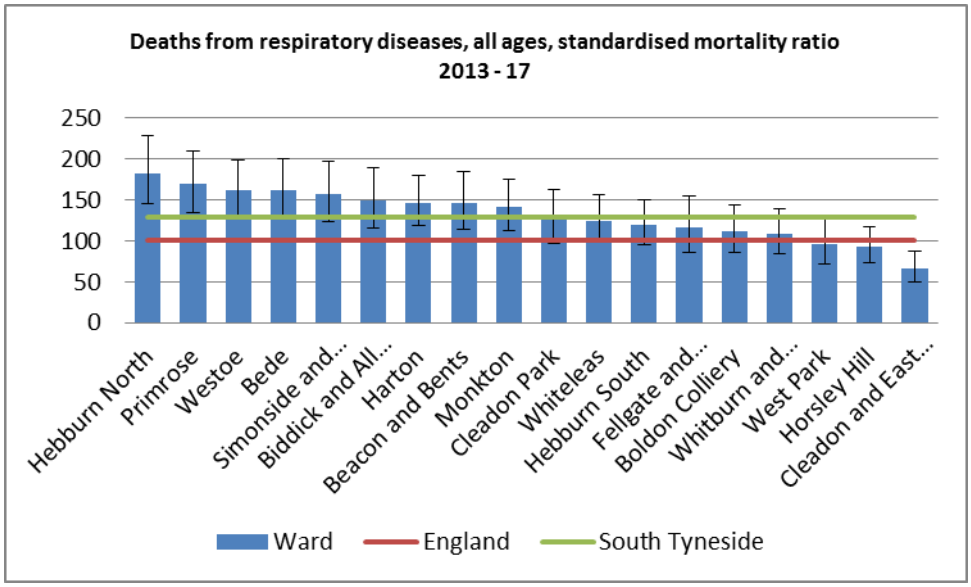
There is evidence to suggest that long term exposure to poor air quality increases the risk of premature mortality from cardiovascular and respiratory diseases. The premature mortality rates for cardiovascular, respiratory diseases and cancer are given below. It is important to note that other lifestyle factors such as smoking, etc. do influence these figures.

[4] https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/4/gid/1000043/pat/6/par/E12000001/ati/102/are/E08000023/iid/30101/age/230/sex/4/cid/4/page-options/ovw-do-0_car-do-0

- Premature (under 75 years) mortality rates from all cardiovascular disease of 83.3 per 100,000 as compared to 71.7 per 100,000 for England; of this 52.8 per 100,000 were considered preventable.
- Premature (under 75 years) mortality rates from respiratory disease of 60.9 per 100,000 as compared to 34.7 per 100,000 for England; of this 39.7 per 100,000 were preventable.
- Premature (under 75 years) mortality rates from cancer of 163.9 per 100,000 as compared to 132.3 per 100,000 for England; of this 98.8 per 100,000 were preventable.

The mortality rates for respiratory disease can be broken down further into South Tyneside Ward areas as shown in the table below, benchmarked against England and South Tyneside as a whole.

Chart 2.3. Deaths from respiratory diseases, all ages, standardised mortality ratio, by Ward 2013-2017:



To note two of these wards (Biddick & All Saints, Bede) include air quality management areas.

Additional data shows:

- Emergency admissions for chronic obstructive pulmonary disease is significantly worse in South Tyneside at 725 per 100,000 population in comparison to England at 414 per 100,000[5].
- Hospital admissions for asthma in children (birth to 9 years) are 322.4 per 100,000 as opposed to the England rate of 220.4 per 100,000.[6]
- The hospital admission rates for young people aged 10 -18 is 207.4 per 100,000, significantly higher than the England rate of 127.9. This has seen a continual increase from 2010. We should note however the numbers associated with this rate are fairly low at 30.[7]

It is worth noting that variations that are statistically significant do not in themselves establish a causal relationship and that a wide range of factors affect mortality rates and associated hospital admissions , including rates of smoking, general health, , deprivation and historic industrial exposures.

Nonetheless, diseases that can be worsened by poor air quality emphasises the importance of continued monitoring of air quality to reduce the impact of air pollution on the health of our residents.

South Tyneside Council is undertaking the measures detailed in the executive summary and detailed in table 2.2. These measures will have a positive effect in reducing NO_2 and PM_{10} and would have similar effect upon levels of $PM_{2.5}$.

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

[5] Emergency hospital admissions for COPD South Tyneside
[6] Admissions for asthma for children aged 0 to 9 South Tyneside
[7] Admissions for asthma for young people aged 10 to 18 South Tyneside

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.

South Tyneside Council undertook automatic (continuous) monitoring at 3 sites during 2019. Table A.1 in Appendix A shows the details of the sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. National monitoring results are available at https://uk-air.defra.gov.uk/

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

South Tyneside Council undertook non- automatic (passive) monitoring of NO_2 at 44 sites during 2019 Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in

https://drive.google.com/open?id=1mRyjjoiCBuFuU7S8XqtGZsfKXJUso-q3&usp=sharing

Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[8], “annualisation” (where the data capture falls below 75%), and distance correction[9]. Further details on adjustments are provided in Appendix C.

[8] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[9] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

3.2.1 Nitrogen Dioxide (NO_2)

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. Note that the concentration data presented in Table A.3 represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Figure A.1.2 – Trends of NO_2 concentration Lindisfarne Roundabout/ Leam Lane AQMA

A.1.3- Trends in Annual Mean NO_2 data

A.1.4 – Trends in annual mean NO_2 Port of Tyne concentrations

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 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 the reporting year no changes were made to diffusion tube locations.

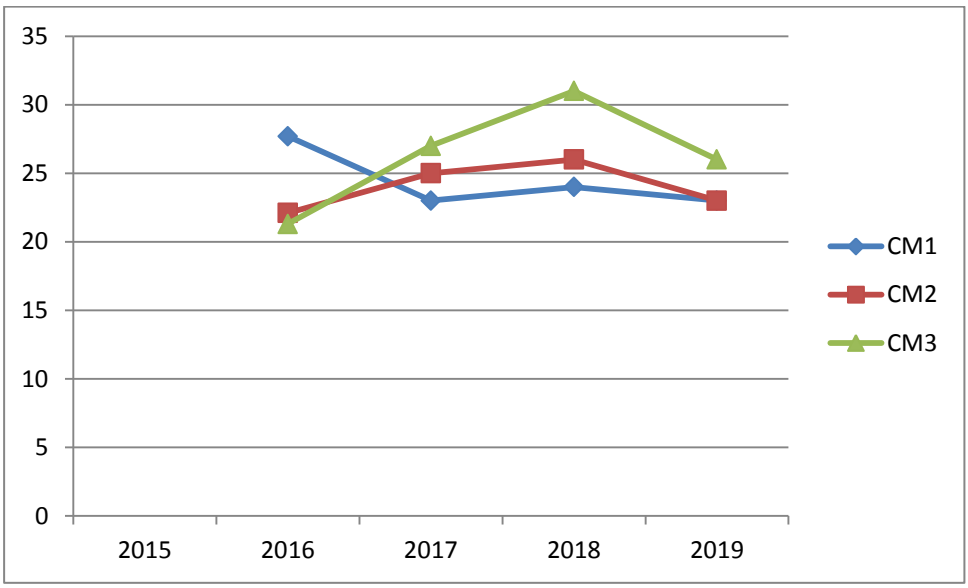
Several diffusion tube locations had less than 75% data they include:

- DT4 – Station Road East Boldon
- DT31 – Boldon Lane
- DT39 – A194 Reed Street roundabout

Annualisation of the tubes has been undertaken in accordance with LAQM (TG16) guidance using data from Newcastle City Centre and Sunderland Silksworth, these sites are within 50miles and are urban background, they form part of the AURN network.

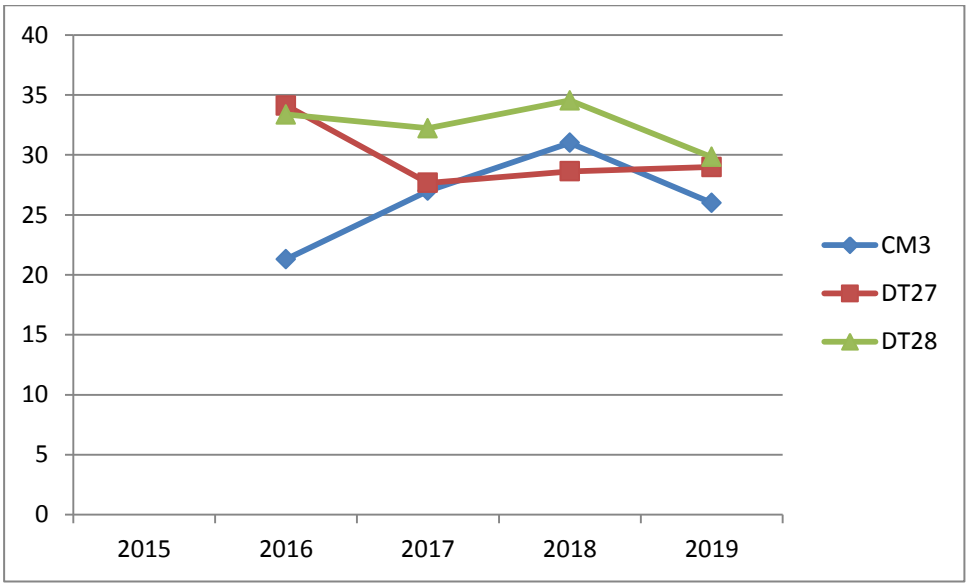
As no diffusion tubes have a concentration of over 60 µg/m³, this indicates that the hourly objective of 200 µg/m3 not to be exceeded more than 18 times a year has not been breached.

A.1.3- Continuous monitoring station data – 5 years



Continuous monitoring data is available from 2016-2019; analysis of this data shows that annual mean NO_2 levels have reduced at all sites. CM3 exhibits the larges reduction of 5 µg/m^3 NO_2, CM2 also shows a reduction of 3 µg/m^3. The decrease may be attributable to the recent works undertaken at the Arches junction improvement scheme and Lindisfarne traffic improvement scheme.

A.1.4 – Port of Tyne concentrations.



In 2016 the NO_2 concentration at the Tyne Dock continous monitoring station was at a low of 21.3 µg/m^3, this increased to 27 µg/m^3 in 2017 and the highest concentration was recorded in 2018 at 31 µg/m^3. NO_2 concentration has reduced to 26 µg/m^3. One of the nearest diffusion tubes Commercial Road (DT28) shows a reduction in concentration from 34.53µg/m^3 to 29.83µg/m^3. Diffusion tube Western Approach near

Port of Tyne (DT27) has maintained a steady NO_2 concentration since 2017 after an initial concentration reduction on 2017.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

South Tyneside Council have not recorded any exceedances of the air quality annual mean objective for PM_{10}.

At Edinburgh Road (CM2) monitoring station a maximum daily mean of 69µg/m^3 was recorded, the daily mean limit value was exceeded on 2 days.

At Tyne Dock (CM3) monitoring station a maximum daily average mean of 70 µg/m^3 was recorded, the daily mean was exceeded on 4 days.

There has been a slight increase in PM_{10} concentrations in most recent 2019 data. There has been a 1 µg/m^3 increase in PM_{10} at Edinburgh Road (CM2) PM_{10} concentrations at (CM3) have remained the same.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored PM2.5 annual mean concentrations for the past 5 years.

Local authorities are not legally obliged to monitor $PM_{2.5}$. South Tyneside started to report on $PM_{2.5}$ in 2016. As detailed in Policy Guidance LAQM.PG16 (Chapter 7) $PM_{2.5}$ levels can be estimated from PM_{10} levels by using a nationally derived correction ratio of 0.7. Table A.7 provides $PM_{2.5}$ data converted using the correction ratio with PM_{10} data collected in 2019.

The last 4 years worth of monitoring shows that the $PM_{2.5}$ has remained fairly constant and below that target value. A slight increase in PM_{10} at Edinburgh Road (CM2) means that the PM $_{2.5}$ that has been derived is slightly higher.

Appendix A: Monitoring Results

Table A.1 - Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Boldon Lane, South Shields	Roadside	435,949	564,456	NO2	YES (Boldon Lane/ Stanhope Road)	Chemiluminescent	15	3	1.5
CM2	Lindisfarne Roundabout, Jarrow	Roadside	434,068	563,695	NO2; PM10	YES (Lindisfarne Roundabout/ Leam Lane	Chemiluminescent TEOM	27	1	2
CM3	Tyne Dock South Shields	Roadside	435,565	565,040	NO2; PM10		Chemiluminescent TEOM	12	14	2

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 (Easting)	Y OS Grid Ref (Northing)	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)
DT1	Sunderland Road Jolly Sailor Whitburn	Roadside	440,820	561,821	NO2	NO	9.3	1.7	NO	2.3
DT2	Sunderland Road Cleadon	Roadside	438,542	562,321	NO2	NO	8.3	1.5	NO	2.65
DT3	Front Street Cleadon Café	Roadside	438,539	562,329	NO2	NO	0	2.5	NO	2.7
DT4	Station Road East Boldon	Roadside	437,053	561,418	NO2	NO	5	1.5	NO	2.5
DT5	Front Street / Grange Terrace	Kerbside	436,524	561,275	NO2	NO	4	<1	NO	2.3
DT6	Front Street/ Boker Lane	Roadside	436,021	561,368	NO2	NO	11.5	1.5	NO	2.5
DT7	Arnold Street	Roadside	434,623	561,746	NO2	NO	0	1.5	NO	2.5
DT8	Holland Park Drive (A19)	Roadside	433,883	562,644	NO2	NO	0	30	NO	2
DT9	Southlands (A19)	Roadside	433,739	562,070	NO2	NO	19	40	NO	2.9
DT10	Mill Lane/ A185 Junction	Roadside	430,469	563,040	NO2	NO	3	28	NO	2.5
DT11	Victoria Road	Roadside	430,538	563,420	NO2	NO	1.6	20	NO	2
DT12	Victoria Road West /South Street	Roadside	430,587	563,671	NO2	NO	3	9	NO	2
DT13	Station Road Hebburn -PJ's Hairdressers	Roadside	430,976	564,378	NO2	NO	0	3.8	NO	2.6

DT14	Victoria Road East - Junction with Park Road	Kerbside	432,169	564,962	NO2	NO	12.5	<1	NO	2.5
DT15	Ellison Street roundabout - Pizza Addict	Kerbside	432,676	565,443	NO2	NO	16.2	2.2	NO	2.5
DT16	Epinay Walk	Roadside	433,093	564,998	NO2	NO	8	28	NO	2
DT17	Hadrian Road	Roadside	433,658	563,497	NO2	NO	2	5	NO	2.5
DT18	Lindisfarne Road (55)	Roadside	433,698	563,825	NO2	NO	10	8	NO	2.5
DT19	Hadrian Road / Finchale Terrace Junction	Roadside	433,780	563,692	NO2	NO	3	13.5	NO	3
DT20	Edinburgh Road Monitoring Station	Roadside	434,068	563,695	NO2	YES	30	<1	NO	2.9
DT21	Edinburgh Road Monitoring Station	Roadside	434,068	563,695	NO2	YES	30	<1	NO	2.9
DT22	Edinburgh Road Monitoring Station	Roadside	434,068	563,695	NO2	YES	30	<1	NO	2.9
DT23	John Reid Road, Junction with Stirling Ave	Roadside	433,232	565,006	NO2	NO	19.2	1.8	NO	2.85
DT24	Opposite 173 Hadrian Road	Roadside	434,313	563,963	NO2	NO	25	3.5	NO	2.35
DT25	Opposite 237 Newcastle Road	Roadside	434,402	563,976	NO2	NO	32	3.2	NO	2.4
DT26	Stanhope Road/ Newcastle Road	Roadside	434,303	563,977	NO2	NO	18	22	NO	2.5
DT27	A194 Arches Roundabout	Kerbside	435,330	564,846	NO2	NO	15	<1	NO	2.2
DT28	Commercial Road	Roadside	435,565	565,221	NO2	NO	3.8	1.5	NO	2.6

DT29	Corner of Boldon Lane/ Stanhope Road	Kerbside	435,930	564,600	NO2	YES	6.5	1	NO	2.4
DT30	Stanhope Road/ Newcastle Road	Kerbside	435,980	564,641	NO2	YES	1	4	NO	2.5
DT31	Boldon Lane	Roadside	435,965	564,329	NO2	NO	2	1.7	NO	2.3
DT32	King George Road	Roadside	437,438	564,391	NO2	NO	4	13	NO	2.5
DT33	Sunderland Road/ next to the Cranny	Roadside	437,816	564,338	NO2	NO	7	2	NO	2.3
DT34	Westoe Road	Roadside	436,981	565,906	NO2	NO	7	2	NO	2.35
DT35	Imeary Street/ The Glebe	Roadside	436,729	566,375	NO2	NO	14	4	NO	2.7
DT36	Chichester Metro	Kerbside	436,483	565,887	NO2	NO	18.9	<1	NO	2.25
DT37	Western Approach Laygate Flats	Roadside	436,220	566,620	NO2	NO	11.5	2.5	NO	2.5
DT38	Alice Street (A194)	Kerbside	436,168	565,875	NO2	NO	<1	27	NO	2.5
DT39	A194 Reed Street roundabout	Roadside	436,102	565,894	NO2	NO	3.5	8.5	NO	2.5
DT40	Anderson Street	Roadside	436,595	567,298	NO2	NO	10	2	NO	2.5
DT41	Campbell Park Road	Kerbside	431,432	564,498	NO2	NO	25	6.5	NO	2.5
DT42	West Park Roundabout	Kerbside	436,370	565,000	NO2	NO	5	1.5	NO	2.5
DT43	Redhead Park	Kerbside	437,165	565,576	NO2	NO	10	2.5	NO	2.5
DT44	Imeary Street	Roadside	436,923	565,966	NO2	NO	<1	2	NO	2.5

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.3 – Annual Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
CM1	435,949	564,456	Roadside	Automatic	98.6	98.6	-	27.7	23	24	23
CM2	434,068	563,695	Roadside	Automatic	99.6	99.6	-	22.1	25	26	23
CM3	435,565	565,040	Roadside	Automatic	99.9	99.9	-	21.3	27	31	26
DT1	440,820	561,821	Roadside	Diffusion Tube	91.6	91.6	-	30	25.88	24.34	24.85
DT2	438,542	562,321	Roadside	Diffusion Tube	100		-	37.6	31.74	28.75	30.59
DT3	438,539	562,329	Roadside	Diffusion Tube	100		-	29.41	21.5	20.31	19.72
DT4	437,053	561,418	Roadside	Diffusion Tube	58.3	58.3	-	28.92	20.53	19.49	19.8[3]
DT5	436,524	561,275	Kerbside	Diffusion Tube	100		-	31.45	24.06	23.89	23.65
DT6	436,021	561,368	Roadside	Diffusion Tube	100		-		31.85	34.30	34.23
DT7	434,623	561,746	Roadside	Diffusion Tube	100		-	35.47	24.61	24.05	23.08
DT8	433,883	562,644	Roadside	Diffusion Tube	100		-		18.32	21.01	21.11
DT9	433,739	562,070	Roadside	Diffusion Tube	91.6		-		21.74	21.315[3]	19.38
DT10	430,469	563,040	Roadside	Diffusion Tube	100		-	38.21	27.88	27.32	27.92
DT11	430,538	563,420	Roadside	Diffusion Tube	83.3		-		24.04	29.095[3]	23.3
DT12	430,587	563,671	Roadside	Diffusion Tube	83.3		-		18.89	22.54	21

DT13	430,976	564,378	Roadside	Diffusion Tube	100		-	36.64	23.43	24.17	25.07
DT14	432,169	564,962	Kerbside	Diffusion Tube	100		-	34.9	29.95	26.18	26.34
DT15	432,676	565,443	Kerbside	Diffusion Tube	91.6		-	28.88	22.42	24.83	23.76
DT16	433,093	564,998	Roadside	Diffusion Tube	91.6		-	32.64	24.37	24.59	26.19
DT17	433,658	563,497	Roadside	Diffusion Tube	100		-	35.08	27.56	30.64	31.4
DT18	433,698	563,825	Roadside	Diffusion Tube	100		-	36.65	23.43	25.32	23.98
DT19	433,780	563,692	Roadside	Diffusion Tube	100		-	33.78	33.37	30.05	29.5
DT20	434,068	563,695	Roadside	Diffusion Tube	91.6		-	30.35	28.9	25.94	26.28
DT21	434,068	563,695	Roadside	Diffusion Tube	100		-	31.5	28.95	25.95	26.33
DT22	434,068	563,695	Roadside	Diffusion Tube	100		-	30.64	28.73	26.46	25.65
DT23	433,232	565,006	Roadside	Diffusion Tube	100		-	34.23	24.24	27.53	27.66
DT24	434,313	563,963	Roadside	Diffusion Tube	100		-	**40.63**	32.79	35.29	32.25
DT25	434,402	563,976	Roadside	Diffusion Tube	100		-	**41.9**	28.38	30.65	29.26
DT26	434,303	563,977	Roadside	Diffusion Tube	100		-	32.23	28.03	28.99	28.78
DT27	435,330	564,846	Kerbside	Diffusion Tube	75		-	**47.43**	39.03	38.82	38.09
DT28	435,565	565,221	Roadside	Diffusion Tube	100		-	34.11	27.66	28.62	28.98
DT29	435,930	564,600	Kerbside	Diffusion Tube	100		-	33.36	32.21	34.53	29.83
DT30	435,980	564,641	Kerbside	Diffusion Tube	91.6		-		22.55	33.94	32.59

DT31	435,965	564,329	Roadside	Diffusion Tube	66.6		-	39.79	29.43	30.55	30.66[3]
DT32	437,438	564,391	Roadside	Diffusion Tube	100		-	28.94	27.01	25.82	24.1
DT33	437,816	564,338	Roadside	Diffusion Tube	83.3		-	32.72	28.28	28.21	26.87
DT34	436,981	565,906	Roadside	Diffusion Tube	91.6		-	37.6	36.57	32.65	30.36
DT35	436,729	566,375	Roadside	Diffusion Tube	100		-	27.35	25.91	26.69	23.92
DT36	436,483	565,887	Kerbside	Diffusion Tube	91.6		-	29.82	29.21	29.24	30.11
DT37	436,220	566,620	Roadside	Diffusion Tube	100		-	**40.24**	32.84	34.03	32.57
DT38	436,168	565,875	Kerbside	Diffusion Tube	100		-		22.55	21.18	18.86
DT39	436,102	565,894	Roadside	Diffusion Tube	50		-		25.7	24.06	27.48[3]
DT40	436,595	567,298	Roadside	Diffusion Tube	91.6		-	29.31	27.73	26.74	22.94
DT41	431,432	564,498	Kerbside	Diffusion Tube	100		-			27.52[3]	24.84
DT42	436,370	565,000	Kerbside	Diffusion Tube	100		-			34.72[3]	30.82
DT43	437,165	565,576	Kerbside	Diffusion Tube	100		-			28.57[3]	26.88
DT44	436,923	565,966	Roadside	Diffusion Tube	100		-			29.06[3]	24.32

☒ **Diffusion tube data has been bias corrected (confirm by selecting in box)**

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

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance adjustment (confirm by selecting in box)**

Notes:

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

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

(1) 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.

(4) Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

Figure A.1.1 – Trends of NO_2 concentration Boldon Lane/ Stanhope Road AQMA

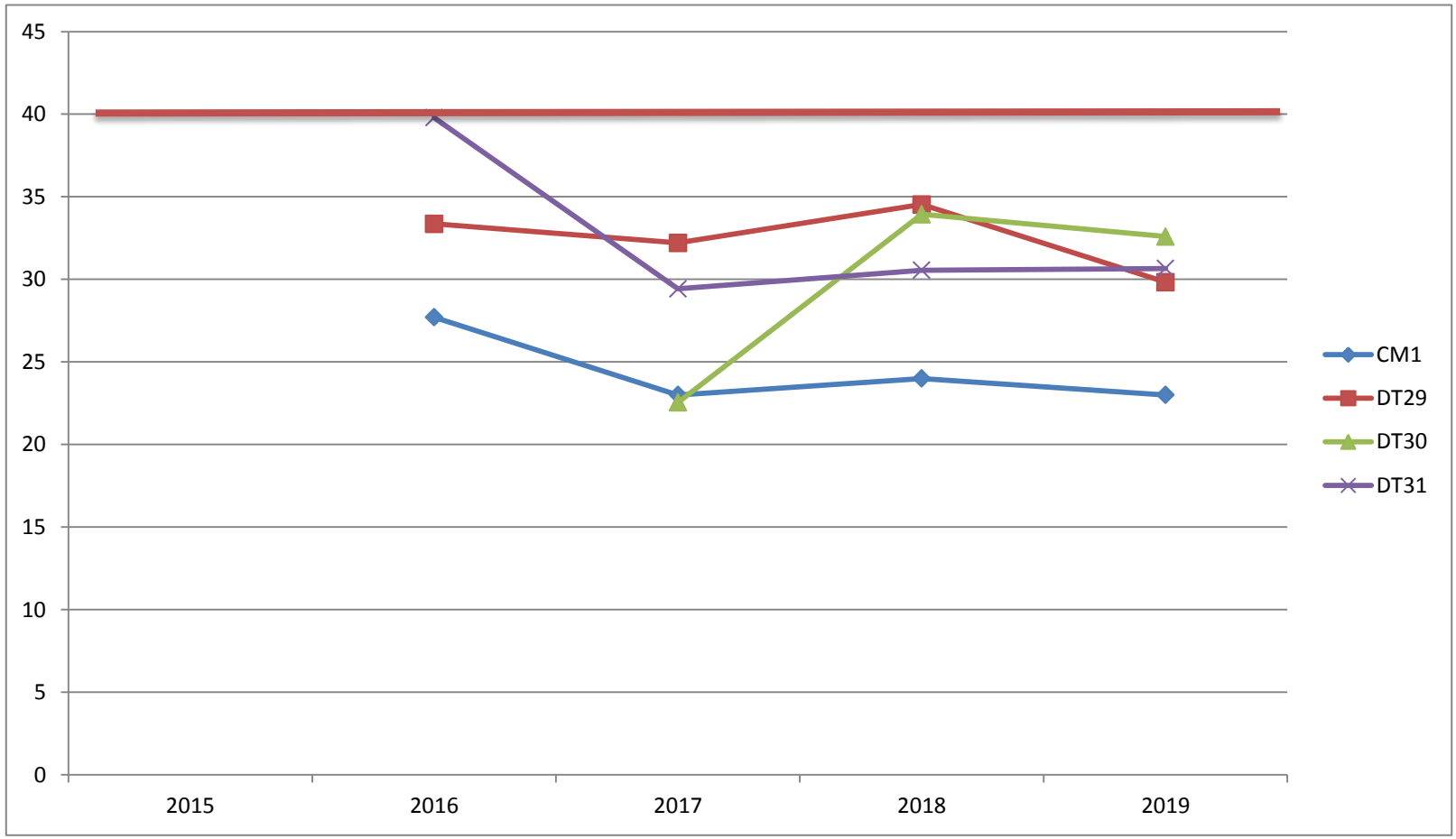
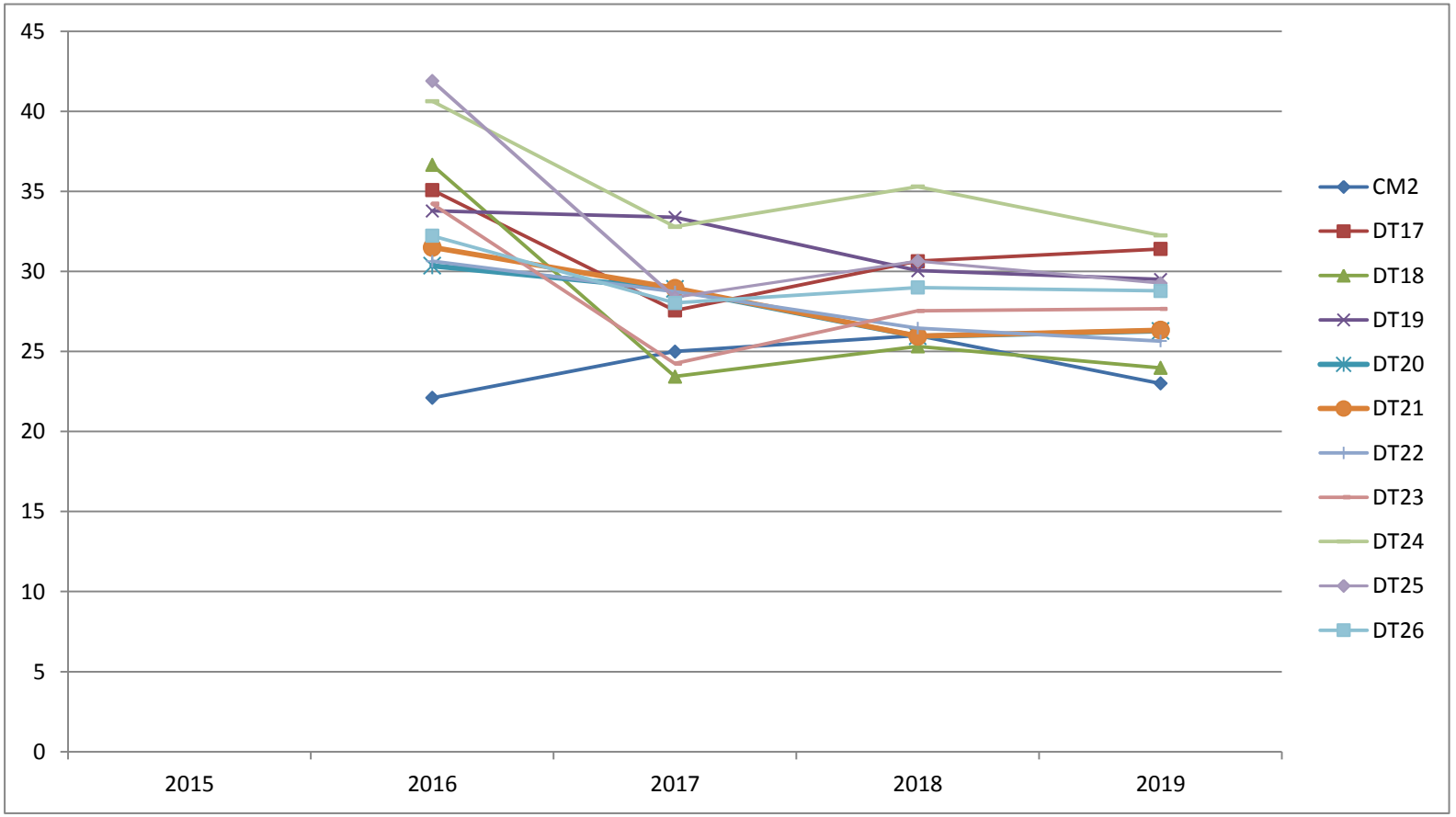
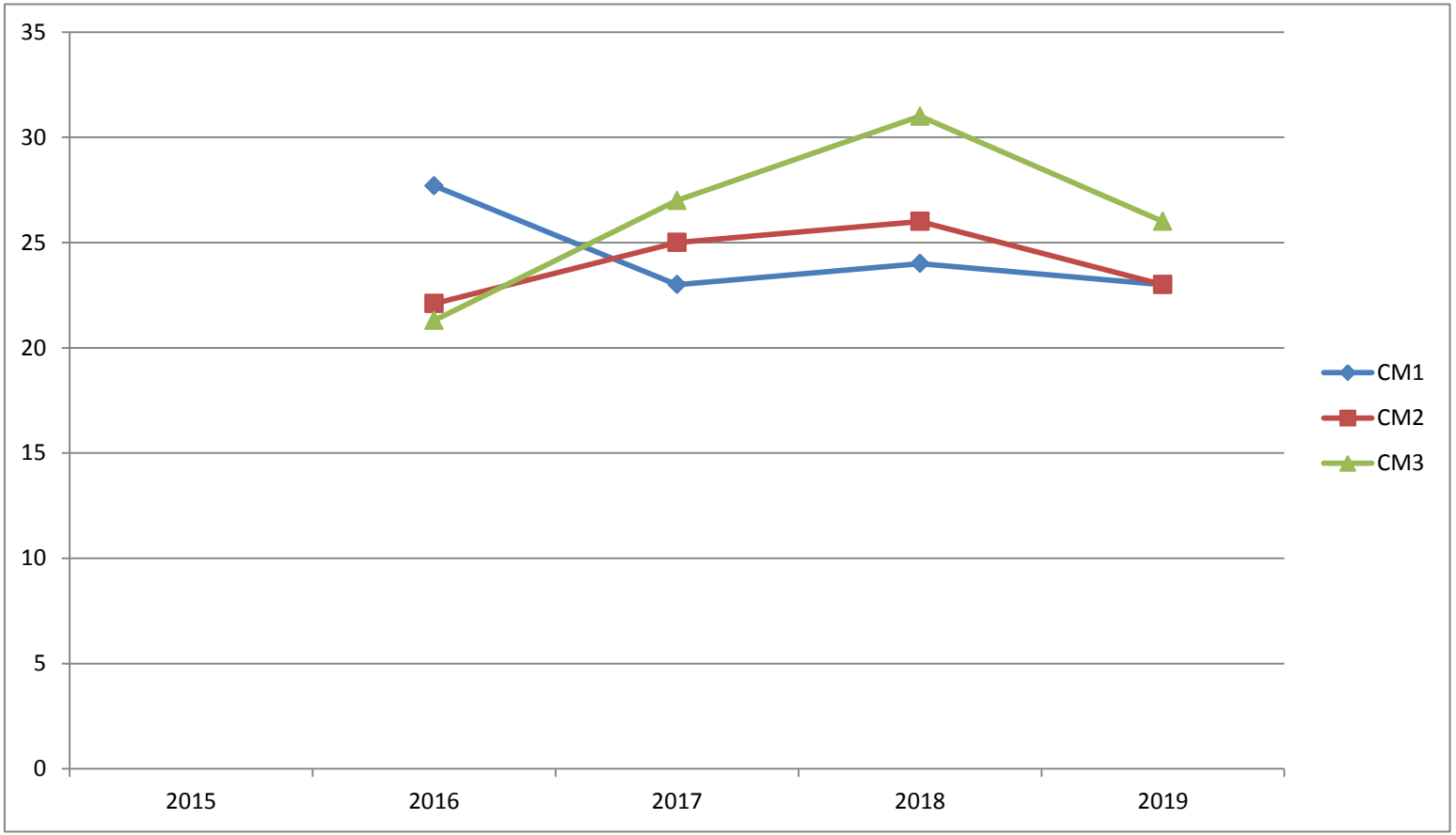


Figure A.1.2 – Trends of NO_2 concentration Lindisfarne Roundabout/ Leam Lane AQMA



A.1.3- Trends in Annual Mean NO_2 data



A.1.4 – Trends in annual mean NO_2 Port of Tyne concentrations

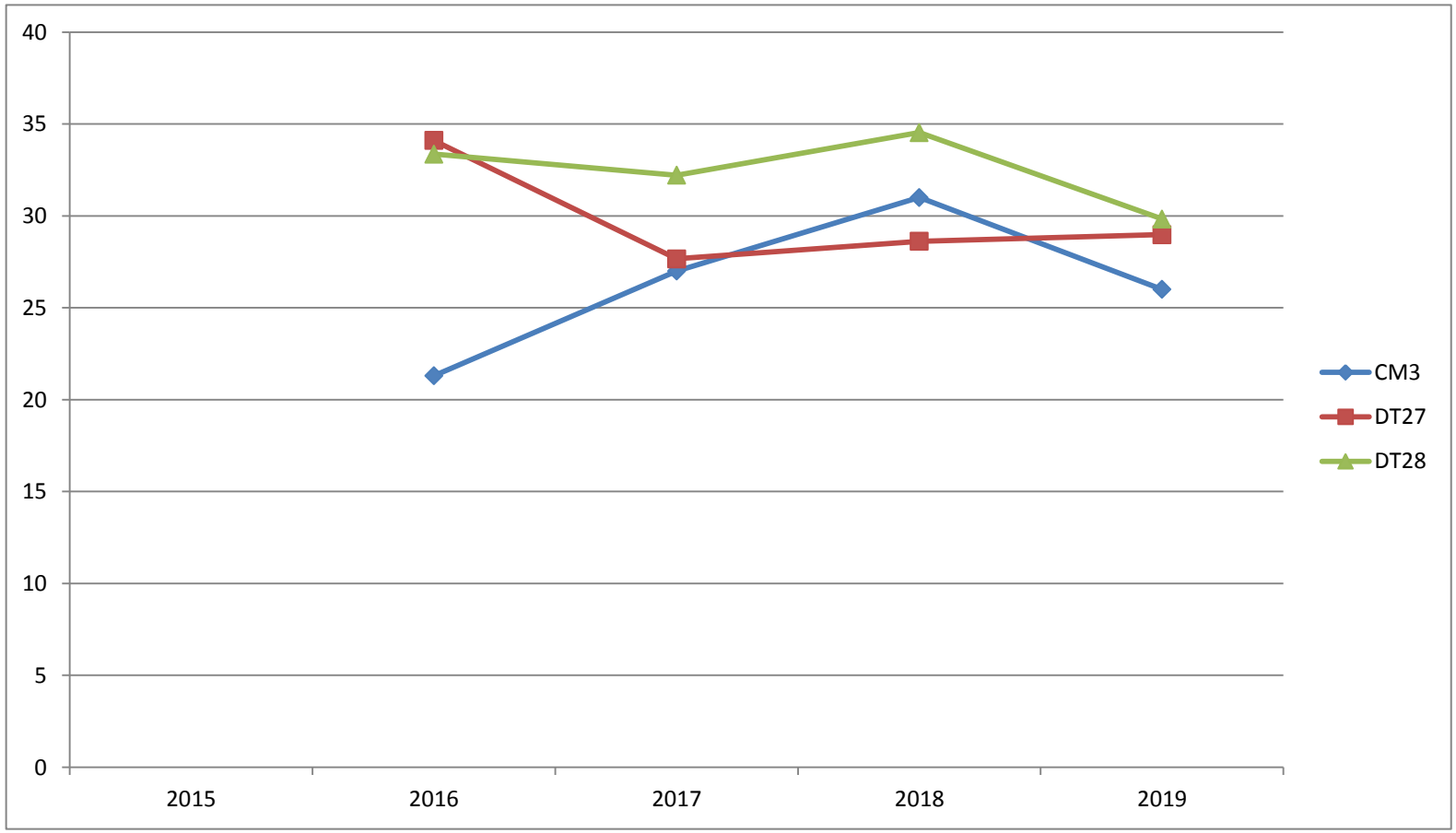


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
							2015	2016	2017	2018	2019
CM1	435,949	564,456	Roadside	Automatic	98.6	98.6		**0**	**0**	**0**	**0**
CM2	434,068	563,695	Roadside	Automatic	99.6	99.6		**0**	**0**	**0**	**0**
CM3	435,565	565,040	Roadside	Automatic	99.9	99.9		**3 (268)**	**0**	**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.

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
						2015	2016	2017	2018	2019
CM2	434,068	563,695	Roadside	99.6	99.6		14.3	15	18	19
CM3	435,565	565,040	Roadside	99.9	99.9		17.3	18	19	19

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

Notes:

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 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) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.2.5 – Trends in Annual Mean PM_{10} Concentrations

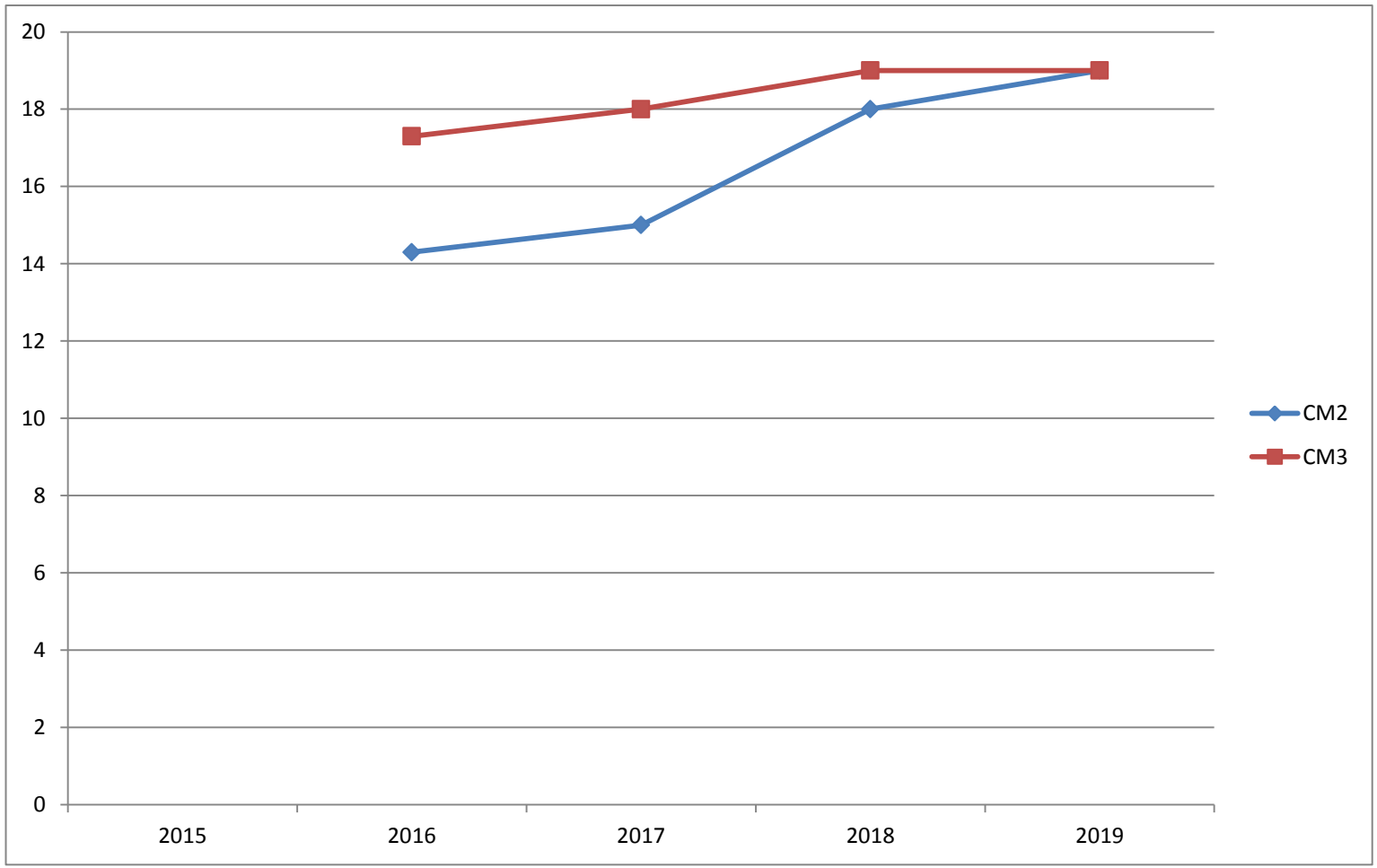


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
						2015	2016	2017	2018	2019
CM2	434,068	563,695	Roadside	99.6	99.6		**0**	**1**	**2 (67)**	2(69)
CM3	435,565	565,040	Roadside	99.9	99.9		**2**	**3**	**3 (64)**	4(70)

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 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 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	$PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3)				
						2015	2016	2017	2018	2019
CM2	434,068	563,695	Roadside	99.6	99.6		10.01	10.5	12.6	13.3
CM3	435,565	565,040	Roadside	99.9	99.9		12.11	12.6	13.3	13.3

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

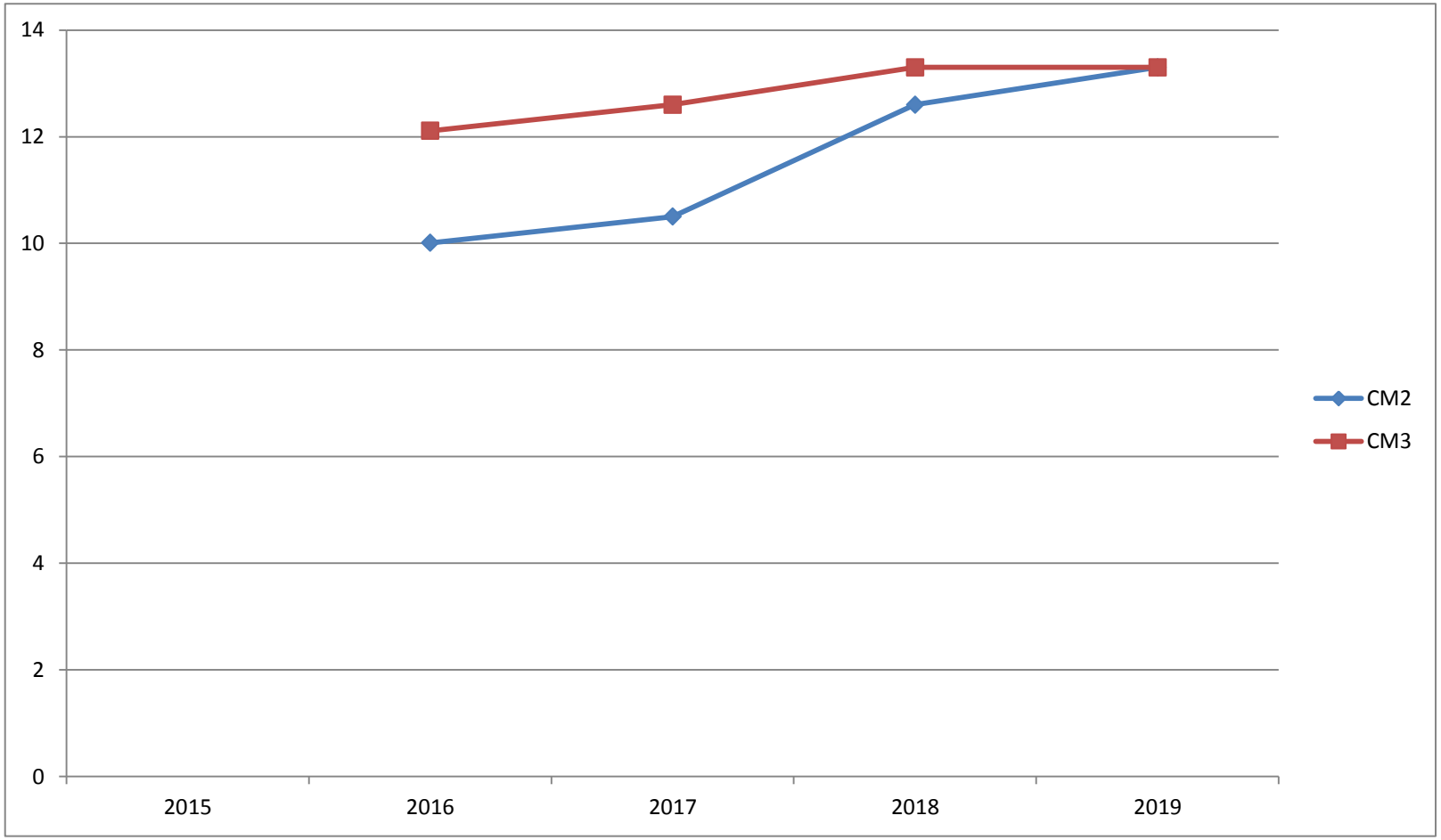
Notes:

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

Figure A.1.6 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT1	440,820	561,821	35.9	33.8	26.8	32.8	21.6	23.5	25.0	19.8	23.5	31.3		19.8	26.7	24.8496	
DT2	438,542	562,321	50.1	42.5	31.7	29.7	22.9	23.8	24.3	29.1	28.9	40.9	36.3	34.6	32.9	30.5877	
DT3	438,539	562,329	35.56	27.07	19.46	18.59	15.76	16.21	12.99	14.89	21.11	24.33	27.25	21.17	21.2	19.716	
DT4	437,053	561,418						12.46	15.4	15.05	21.04	23.74	26.94	22.57	19.6	19.8	
DT5	436,524	561,275	37.88	33.45	25.07	27.21	20.58	18.18	19.28	20.04	23.42	26.79	27.53	25.77	25.4	23.6499	
DT6	436,021	561,368	54.77	41.15	36.7	40.7	29.2	32.56	27.57	26.5	29.98	44.64	44.55	33.38	36.8	34.2333	
DT7	434,623	561,746	31.45	33.15	25.57	23.2	20.31	19.69	19.18	18.32	22.91	27.37	29.47	26.55	24.8	23.0826	
DT8	433,883	562,644	35.1	27	21.8	25.62	17.53	15.33	15.58	14.71	20.42	25.57	29	24.7	22.7	21.111	
DT9	433,739	562,070	26.75	22.73	17.51	26.23	18.61	15.63		12	17.98	23.08	27.79	20.93	20.8	19.3812	
DT10	430,469	563,040	43.14	38.38	27.28	32.13	25.54	21.97	25.47	24.44	24.6	31.15	35.78	30.32	30.0	27.9186	
DT11	430,538	563,420	37.6	38.0		23.5	18.0	18.1	20.2	17.6	23.3		28.5	25.3	25.1	23.2965	

			1	5		7	9	6	7	1	2			3			
DT12	430,587	563,671	35.12	30.19	18.8	22.68		15.78	17.74	15.93	21.54	24.35		23.69	22.6	20.9994	
DT13	430,976	564,378	34.55	28.08	23.77	34.02	25.84	20.43	23.2	17.41	24.2	32.18	34.78	25.01	27.0	25.0728	
DT14	432,169	564,962	35.53	32.94	26.51	30.71	23.86	22.85	21.75	22.21	28.44	33.09	30.33	31.61	28.3	26.3376	
DT15	432,676	565,443	41.96	31.61	23.54	20.62	15.18	16.43		18.34	23.36	33.28	27.97	28.72	25.6	23.7615	
DT16	433,093	564,998	42.02	31.53	24.44	26.8	20.06	18.8	19.3		34.86	29.77	35.89	26.31	28.2	26.1888	
DT17	433,658	563,497	33.88	39.01	28.04	48.73	29.72	28.75	31.88	28.09	29.05	37.57	37.36	33.02	33.8	31.3968	
DT18	433,698	563,825	30.48	27.84	22.43	38.54	23.52	20.14	20.1	15.35	21.13	29.59	34.37	26.05	25.8	23.9847	
DT19	433,780	563,692	49.18	43.53	35.25	33.28	15.2	23.18	24.36	25.21	25.76	35.45	36	34.28	31.7	29.4996	
DT20	434,068	563,695	47.32	32.29	25.53		19.39	21.73	22.6	20.48	27.06	31.34	38.87	24.32	28.3	26.2818	
DT21	434,068	563,695	47.65	32.12	27.67	25.46	21.68	22.68	21.7	21.48	26.14	31.18	35.74	26.23	28.3	26.3283	
DT22	434,068	563,695	47.44	31.26	27.21	25.05	20.68	22.75	22.39	19.72	21.92	31.96	36.01	24.59	27.6	25.6494	
DT23	433,232	565,006	45.37	31.65	25.26	34.31	24.47	25.76	23.42	20.23	25.34	34.07	38.49	28.5	29.7	27.6582	
DT24	434,313	563,963	52.56	45.46	31.26	29.75	28.51	28.52	30.86	29.17	30.06	41.38	38.19	30.44	34.7	32.2524	
DT25	434,402	563,976	46.07	35.51	31.02	29.21	23.93	25.82	26.17	25.19	28.7	34.01	38.44	32.78	31.5	29.2578	
DT26	434,303	563,977	46.03	45.68	28.67	28.25	25.01	23.21	22.93	25.72	26.91	32.34	33.86	32.75	31.0	28.7835	
DT27	435,330	564,846	47.24	45.88	42.17	53.77	35.74	32.82			27.31		45.41	38.35	41.0	38.0928	
DT28	435,565	565,221	41.96	36.97	28.68	39.53	25.57	21.82	25.53	21.25	31.19	33.4	36.24	31.79	31.2	28.9788	

DT29	435,930	564,600	42.08	40.3	33.23	28.05	30.98	27.63	27	19.47	28.79	33.91	38.46	35.05	32.1	29.8344	
DT30	435,980	564,641	55.29	37.69	32.84	34.62	26.34	25.52	27	26.99		39.27	44.25	35.64	35.0	32.5872	
DT31	435,965	564,329	36.8					25.8	25.69	24.46	28.67	38	44.19	31.52	31.9	30.66(1)	
DT32	437,438	564,391	40.13	35.54	26.29	22.62	19.68	18.62	19.33	26.11	25.37	14.35	30.88	32	25.9	24.0963	
DT33	437,816	564,338	40.89	37.95	28.24	24.18	25.02	22.14		27.96		17.32	29.89	35.28	28.9	26.8677	
DT34	436,981	565,906	54.12	41.58	37.19	24.61	26.44	21.8	27.52	27.81	27.76		36.2	34.05	32.6	30.3552	
DT35	436,729	566,375	42.22	27.69	26.09	23.54	21.84	20.7	21.5	19.39	26.04	14.81	35.41	29.44	25.7	23.9196	
DT36	436,483	565,887	46.45	33.66	29.73	34.78	27.12	23.99	24.89	23.35	25.39	28.38		58.42	32.4	30.1134	
DT37	436,220	566,620	50.62	39.09	36.5	38.79	33.83	32	27.66	30.02	31.99	20.34	41.85	37.49	35.0	32.5686	
DT38	436,168	565,875	35.94	27.26	22.4	16.7	14.86	12.5	14.51	16.65	19.32	12.33	26.78	24.15	20.3	18.8604	
DT39	436,102	565,894	38.01	31.61	24.13	26.48	21.28	18.58							26.7	27.48(1)	
DT40	436,595	567,298	34.6	36.64	28.53	20.57	18.25	19.19	21.92	23.99	21.93	15.26	30.49		24.7	22.9431	
DT41	431,432	564,498	31.77	32.08	21.78	27.62	23.25	21.06	22.75	18.74	25.5	33.07	34.51	28.4	26.7	24.8403	
DT42	436,370	565,000	52.44	34.06	36.18	30.35	24.5	27.26	27.64	24.63	31.35	35.16	37.39	36.09	33.1	30.8202	
DT43	437,165	565,576	45.3	31.85	30.6	25.88	26.06	25.9	27.03	24.76	28.35	16.75	34.73	29.54	28.9	26.877	
DT44	436,923	565,966	44.07	32.47	28.46	23.08	21.22	18.59	19.71	21.28	25.07	15.81	32.87	31.19	26.2	24.3195	

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

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

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

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column (confirm by selecting in box)**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

Major Development

International Advanced Manufacturing Park (IAMP)

The International Advanced Manufacturing Park (IAMP) is one the most important development sites in the North of England, with the North East seen as an exemplar in this industry. Both Sunderland and South Tyneside Councils have allocated 150 hectares of development land to the north of Nissan UK and adjacent to the A19 trunk road. The IAMP was designated a 'Nationally Significant Infrastructure Project' (NSIP) by the UK Government, with a Development Consent Order expected from 2019.

In order to facilitate the first phase of development, both Councils adopted the International Advanced Manufacturing Park Area Action Plan on 30 November 2017. A planning application for IAMP ONE was approved by Sunderland City Council in May 2018 and the construction commenced during 2018, with the first site occupiers expected in July 2020.

The second phase of the IAMP scheme 'IAMP two' is currently going through the planning process and a development consent order application will be submitted in quarter 3 of 2020, with a view to bringing forward the further development. An Environmental Impact Assessment scoping report has been appraised by both South Tyneside Council and Sunderland Council.

Diffusion Tube Bias Adjustment Factors

Diffusion tubes are supplied and analysed by Gradko International Ltd, Winchester, Hampshire. The preparation method used is 20% triethanolamine TEA and acetone. The bias adjustment factor of 0.87 was obtained from the Spread sheet version 03/18 v2.

PM Monitoring Adjustment

PM_{10} is monitored at two locations using TEOM instruments. The data has been adjusted using the volatile correction model (VCM) accessed at http://www.volatile-correction-model.info/ .

QA/QC of continuous monitoring stations

The QA/QC procedures of South Tyneside Council are based on the AUN Site Operator's manual along with training received from our original equipment suppliers, Casella Group.

Maintenance / Calibration of equipment:

- A qualified engineer services automatic analysers every 6 months under a contracted service agreement. The analysers are calibrated during service visits.
- Matt's Monitors Ltd are under contract to maintain the stations, staff visit each monitoring station at least once every 4 weeks to ensure all of the equipment is working within normal parameters and to conduct zero and span checks of the equipment. The filters at each site are changed during these visits.
- If a problem is noted with any of the stations, a call-out is initiated and a service engineer will visit the site within 2 days to correct the fault.

Data Validation

AQDM are now under contract with South Tyneside Council to validate and ratify continuous monitoring data. Monthly reports of the data are produced and e-mailed to South Tyneside Council. They review the data daily to ensure that:

- Telecommunications to the station are operational
- The air quality station is operational
- Individual analysers are operational
- Air quality exceedances are identified
- Operational information such as TEOM filter loading, does not invalidate data
- Obvious data errors are identified

Data Ratification

In addition to the initial data screening process (validation), data are further scrutinised in monthly blocks by AQDM in order to provide a final ratified data set.

Data is reviewed for erroneous data such as:

- Daily calibration spikes
- Routine or service visit errors
- Analyser faults
- Site faults, such as power outages

QA/QC Diffusion Tubes

Gradko has full U.K.A.S. accreditation for compliance with ISO-IEC 17025 for laboratory management system. The accuracy and consistency of analytical methods is regularly monitored using external proficiency schemes such as

- Workplace analysis scheme for proficiency (W.A.S.P.)
- Laboratory Environmental Analysis Proficiency (L.E.A.P.)

Distance correction for diffusion tubes

Where diffusions tubes are not located immediately next to a desired receptor, DEFRA have provided an Excel spreadsheet to help predict levels using required data.
This Excel tool has been developed to help local authorities derive the NO_2 concentration at locations relevant for exposure as it is not always possible to measure concentrations at precisely the desired location. The calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site. The monitoring can either be closer to the kerb than the receptor or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be.

The methodology consists of comparing the monitored annual mean NO_2 concentrations at a given point against known relationships between NO_2

concentrations and the distance from a road source.

Any further information with regards to the use of this tool is provided within LAQM.TG(16).

A few of the diffusion tubes within our non-continuous monitoring network had less than 9 months' worth of data therefore annualisation was necessary using the method described in LAQM (TG16) guidance. Continuous monitoring stations Newcastle City Centre and Middlesbrough were used as they were the closest Background sites within a 50 mile radius as per guidance. Included below are working for all annualisation of diffusion tubes

DT4	start date	end date	B1	D1	B1 when D1 available		Newcastle Centre	Urban Background
	09-Jan	06-Feb	40.28					
	06-Feb	06-Mar	37.18					
	06-Mar	03-Apr	31.7					
	03-Apr	01-May	29.48					
	01-May	05-Jun	28.33					
	05-Jun	03-Jul	26.96	12.46	26.96			
	03-Jul	07-Aug	24.25	15.4	24.25	ra	1.02882	
	07-Aug	04-Sep	25.22	15.05	25.22			
	04-Sep	02-Oct	30.52	21.04	30.52			
	02-Oct	06-Nov	36.33	23.74	36.33			
	06-Nov	04-Dec	40.45	26.94	40.45			
	04-Dec	08-Jan	34.89	22.57	34.89			
			32.13	19.6	31.23			

DT4	start date	end date	B1	D1	B1 when D1 available		Sunderland Silkswort	Urban Background
	09-Jan	06-Feb	18.03					
	06-Feb	06-Mar	14.15					
	06-Mar	03-Apr	9.14					
	03-Apr	01-May	11.52					
	01-May	05-Jun	10.28					
	05-Jun	03-Jul	7.59	12.46	7.59			
	03-Jul	07-Aug	7.97	15.4	7.97			
	07-Aug	04-Sep	7.85	15.05	7.85	ra	0.99762	
	04-Sep	02-Oct	12.21	21.04	12.21			
	02-Oct	06-Nov	16.17	23.74	16.71			
	06-Nov	04-Dec	18.48	26.94	18.48			
	04-Dec	08-Jan	17.25	22.57	17.25			
			12.55	19.6	12.58			
Average Ra = 1.01 x 19.6 = 19.8								

DT31	start dat	end date	B1	D1	B1 when D1 available		Newcastle Centre	Urban Background
	09-Jan	06-Feb	40.28	36.8	40.28			
	06-Feb	06-Mar	37.18					
	06-Mar	03-Apr	31.7					
	03-Apr	01-May	29.48					
	01-May	05-Jun	28.33	25.8	28.33			
	05-Jun	03-Jul	26.96	25.69	26.96			
	03-Jul	07-Aug	24.25	24.46	24.25	ra	1.00689439	
	07-Aug	04-Sep	25.22	28.67	25.22			
	04-Sep	02-Oct	30.52	44.19	30.52			
	02-Oct	06-Nov	36.33	31.52	36.33			
	06-Nov	04-Dec	40.45	31.9	40.45			
	04-Dec	08-Jan	34.89	29.66	34.89			
			32.13	30.97	31.91			

DT31	start dat	end date	B1	D1	B1 when D1 available		Sunderland Silksworth	Urban Background
	09-Jan	06-Feb	18.03	36.8	18.03			
	06-Feb	06-Mar	14.15					
	06-Mar	03-Apr	9.14					
	03-Apr	01-May	11.52					
	01-May	05-Jun	10.28	25.8	10.28			
	05-Jun	03-Jul	7.59	25.69	7.59			
	03-Jul	07-Aug	7.97	24.46	7.97			
	07-Aug	04-Sep	7.85	28.67	7.85	ra	0.975135975	
	04-Sep	02-Oct	12.21	44.19	12.21			
	02-Oct	06-Nov	16.17	31.52	16.17			
	06-Nov	04-Dec	18.48	31.9	18.48			
	04-Dec	08-Jan	17.25	29.66	17.25			
			12.55	30.97	12.87			

Average Ra = 0.99 x 30.97 = 30.66

DT39	start dat	end date	B1	D1	B1 when D1 available		Newcastle Centre	Urban Background
	09-Jan	06-Feb	40.28	38.01	40.28			
	06-Feb	06-Mar	37.18	31.61	37.18			
	06-Mar	03-Apr	31.7	24.13	31.7			
	03-Apr	01-May	29.48	26.48	29.48			
	01-May	05-Jun	28.33	21.28	28.33			
	05-Jun	03-Jul	26.96	18.58	26.96			
	03-Jul	07-Aug	24.25			ra	0.994121287	
	07-Aug	04-Sep	25.22					
	04-Sep	02-Oct	30.52					
	02-Oct	06-Nov	36.33					
	06-Nov	04-Dec	40.45					
	04-Dec	08-Jan	34.89					
			32.13	26.68	32.32			

DT39	start dat	end date	B1	D1	B1 when D1 available		Sunderland Silksworth	Urban Background
	09-Jan	06-Feb	18.03	38.01	18.03			
	06-Feb	06-Mar	14.15	31.61	14.15			
	06-Mar	03-Apr	9.14	24.13	9.14			
	03-Apr	01-May	11.52	26.48	11.52			
	01-May	05-Jun	10.28	21.28	10.28			
	05-Jun	03-Jul	7.59	18.58	7.59			
	03-Jul	07-Aug	7.97					
	07-Aug	04-Sep	7.85			ra	1.064461408	
	04-Sep	02-Oct	12.21					
	02-Oct	06-Nov	16.17					
	06-Nov	04-Dec	18.48					
	04-Dec	08-Jan	17.25					
			12.55	26.68	11.79			

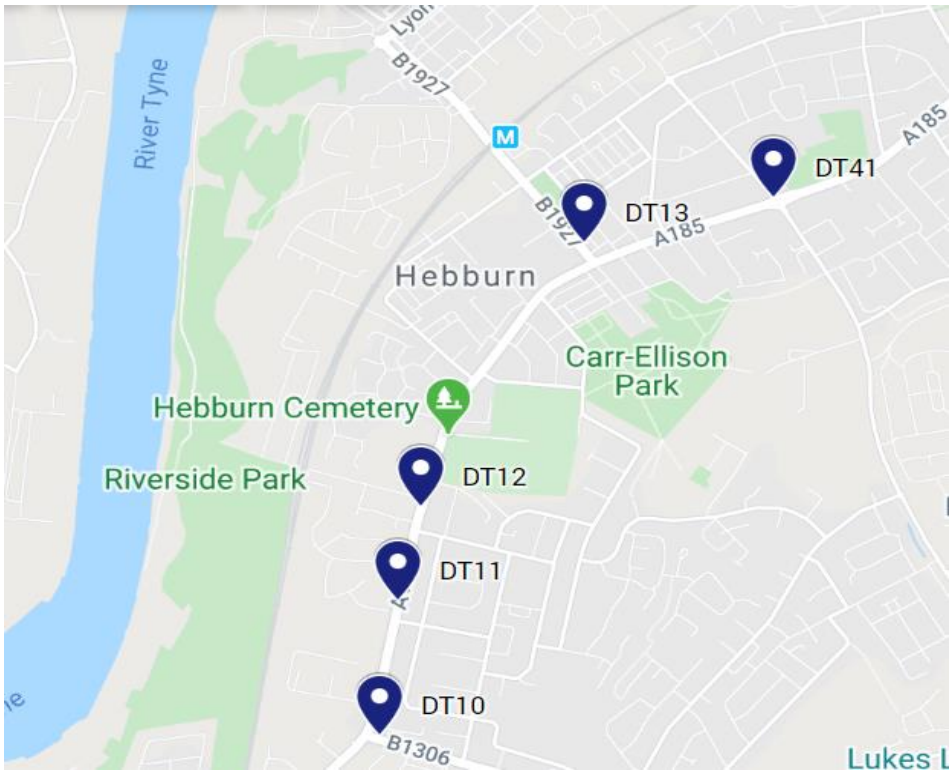
Average Ra = 1.03 x 26.68 = 27.48

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

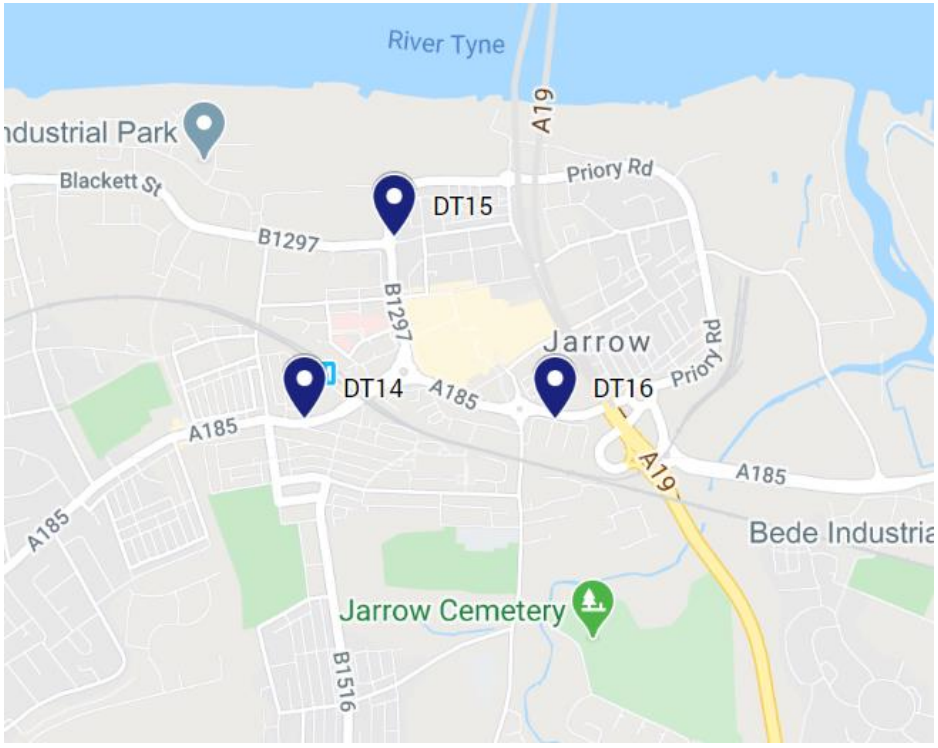
Boldon Lane AQMA

Lindisfarne AQMA

Diffusion Tube Location Map - Hebburn



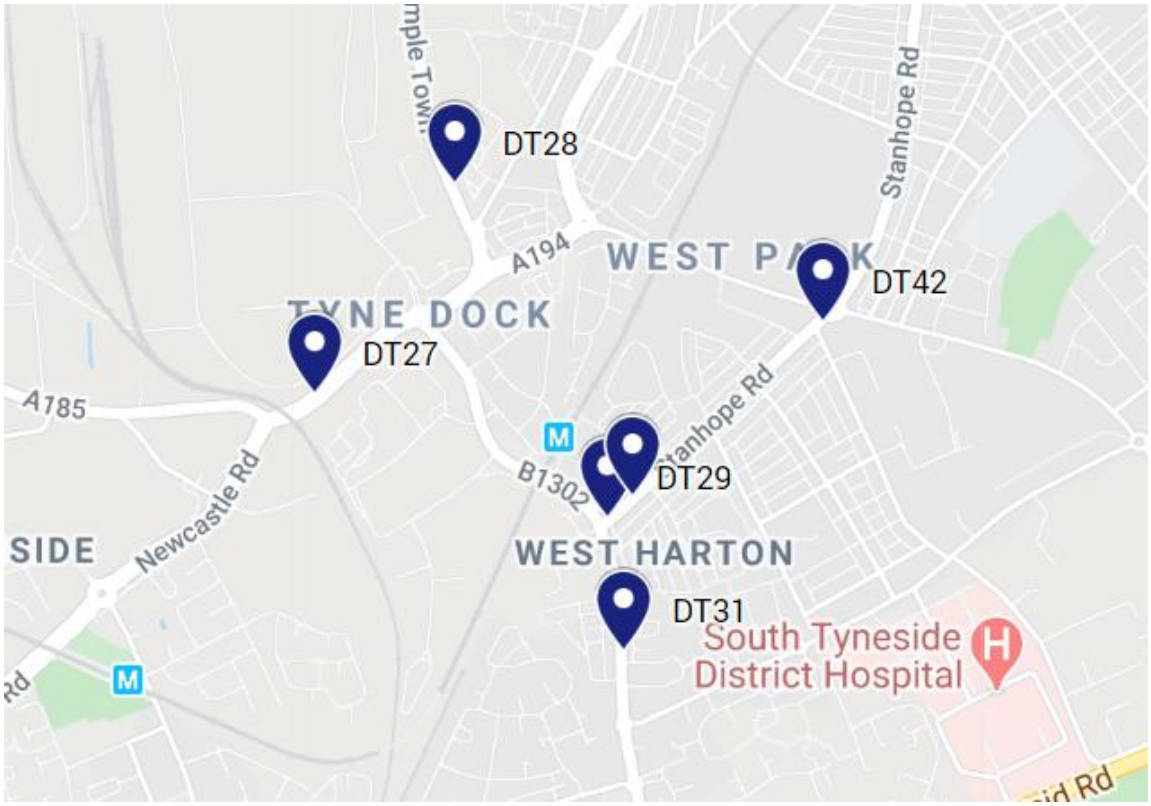
Diffusion Tube Location Map - Jarrow



Diffusion Tube Location Map – Boldon

Diffusion Tube Location Map – Cleadon and Whitburn

Diffusion Tube Location Map – Tyne Dock and West Park



Diffusion Tube Location Maps – Harton

Diffusion Tube Location Map – Lindisfarne, Jarrow

Diffusion Tube Location Map – South Shields

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[10]	
	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

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

Glossary of Terms

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

References

Add references here.