



South Tyneside Council

# 2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995  
Local Air Quality Management, as amended by the  
Environment Act 2021

Date: 30<sup>th</sup> June 2023

<b>Information</b>	<b>South Tyneside Council Details</b>
<b>Local Authority Officer</b>	Samantha Jobson
<b>Department</b>	Environmental Health
<b>Address</b>	Town Hall and Civic Offices, South Shields, Tyne and Wear, NE33 2RL
<b>Telephone</b>	0191 424 7952
<b>E-mail</b>	Samantha.jobson@southtyneside.gov.uk
<b>Report Reference Number</b>	ASR/STC/2023
<b>Date</b>	30 <sup>th</sup> June 2023

## Executive Summary: Air Quality in Our Area

### Air Quality in South Tyneside

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas<sup>1,2</sup>.

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

South Tyneside Council adopts a collaborative, corporate-wide approach to air quality led by its Environment Services Team. Within Environment Services, the Environmental Health Team 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.

There are several principal air pollutants produced by industrial, domestic and traffic sources they include: sulphur dioxide; nitrogen oxide/ nitrogen dioxide (NO<sub>2</sub>); PM<sub>10</sub> and PM<sub>2.5</sub>; ozone and volatile organic compounds; toxic organic micro pollutants; 1-3 butadiene; benzene; carbon monoxide; lead and heavy metals.

---

<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, January 2023

<sup>4</sup> Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

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<sub>2</sub>) and Nitric Oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO<sub>x</sub>). All combustion processes produce NO<sub>x</sub> emissions, largely in the form of nitric oxides, which is then converted to nitrogen dioxide (NO<sub>2</sub>). 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, Infrastructure and Transport, Sustainability 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**

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan<sup>5</sup> sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM<sub>2.5</sub> targets. The National Air Quality Strategy, due to be published in 2023, will provide more

---

<sup>5</sup> Defra. Environmental Improvement Plan 2023, January 2023

information on local authorities' responsibilities to work towards these new targets and reduce PM<sub>2.5</sub> in their areas. The Road to Zero<sup>6</sup> details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

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

- Transforming Cities Investment Tranche 2 delivering: -
- Healthier Metro's to improve connectivity at 2 metro stations as part of the light rail network that operates in the Tyne and Wear region.
- Intelligent Transport Solutions at traffic signalised junctions to reduce congestion through the borough.
- Active Travel Funding – delivery of the South Eldon Cycle Improvements.
- Implementation of electric vehicle charging points throughout the borough.

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

Over the next 5 years to support air quality and increase the uptake in active travel and public transport, the Council is set to embark on the following schemes: -

- A194 Strategic Transport Corridor – implementation of a corridor-based improvement to reduce congestion.
- Active Travel Improvements – working with Active Travel England to deliver strategic improvements on the National Cycling Network

---

<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- Electric Vehicle Charging Points expansion – working with a new operational model and support from a private sector provider to improve the reliability of the existing network, but to expand the network to meet future demands.
- Work with Ricardo as part of a successful DEFRA Air Quality Grant Funding bid to deliver a specific Air Quality Website for the Local Authority to improve communications with our local residents, businesses and visitors. In addition, this will also include the deployment of air quality sensors throughout the borough to improve our data sets and monitoring.
- Development of an Enhanced Bus Partnership for the North East region and Bus Service Improvement Plan which will improve bus services across the region.
- Delivery of School Streets as part of a pilot scheme in the borough, working with Sustrans.
- Working with National Highways to seek investment in White Mare Pool junction Improvements (dependent on external funding bids)
- Work with Nexus in terms of the delivery of the new metro fleet as part of the Metro (light rail) network that operates within Tyne and Wear.
- Assist the delivery of a successful Decarbonisation led bid to the Levelling Fund on a regional level which will see investment in Electric Buses, Park and Ride facilities and expansion of Electric Vehicle Charging Points.

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

The A19 corridor is a key regional economic corridor and a fundamental transport link into the Borough and to wider employment opportunities. National Highways has implemented significant improvements at the A19 / A184 Testo's junction and at the A19 / A1290 Downhill Lane junction. Both schemes have improved road safety, reduced congestion and improved air quality, with the schemes being completed in March 2022.

### **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 health 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; creating safe routes to schools, and providing active travel education and awareness-raising schemes. Such changes have prompted substantial shifts from car transport to walking and cycling. In total, 3.2 million more people regularly used active travel in England in the year up to November 2022 than they did in the previous 12 months, with walking and cycling as a form of transport now accounting for around 20% of all minutes of activity taken by adults in England. This is the largest increase in any activity in a given year.

The Council has a defined Local Cycling and Walking Implementation Plan (LCWIP) at Cabinet in December 2021. This provides the Council with the mechanism to attract external investment from Central Government funding opportunities for active travel improvements. This is further expanded within the physical activity strategy for the borough which can be found: <https://www.southtyneside.gov.uk/article/63722/Adult-Physical-Activity>, it is bold in its commitments in that:

- Defined cycling and walking route improvements (subject to external investment);
- 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.

The physical activity strategy is currently being refreshed. There is a regional leadership group established with representation from Office of Health Improvement and Disparities (OHID), Active Partnerships, Sport England and local authorities. Who have agreed to undertake a Sector Led Improvement (SLI) approach using International Society for Physical Activity & Health - Eight Investments That Work for Physical Activity. The SLI work will help to inform the new Physical Activity Strategy for South Tyneside and it will enable the opportunity to take a whole systems approach with the aim of making it easier for everyone to be active.

South Tyneside are adopting this approach, which includes the Global Action Plan (societies, environments, people, and systems). The SLI self-assessment tool adopts a whole system approach to physical activity and focuses on a number of key areas, including active travel and active urban design, that are all informed by international evidence on what works for physical activity.

## Environmental Sustainability

In July 2019 the Council declared a climate emergency pledging to take all necessary steps to become “carbon neutral by 2030” across its operations.

Following the declaration, the Council developed the ‘Sustainable South Tyneside’ Strategy and produced a 5-year action plan, which provides a platform of collective actions and a shared vision to support an ambition of a cleaner, greener, low carbon and resilient future. We have already taken actions to reduce Council emissions through a number of measures, including:

- The development of low-carbon heat networks
- A significant building rationalisation programme
- Building modernisation and retrofit improvements
- Purchase of new Refuse Collection Vehicles (RCV) meeting Euro 6 standards
- Route optimisation for RCVs
- Trial of electric RCV to understand feasibility and operational challenges moving forward.
- Expansion of Electric Charging infrastructure - As of April 2022, there are 59 operational charging units in the Borough (46 public, 13 workplace). Of this total, 8 units were installed during 2022/23. Details of charging points across South Tyneside can be found: <https://www.southtyneside.gov.uk/article/38159/Electric-car-charging-points>.
- Purchase of Electric vehicles (EVs)- To date, the Council has introduced a total of 18 electric vehicles to its fleet, as well as supporting the borough-wide transition to EVs by continuing to expand the charging point network.



In October 2021, the Council signed the UK100 Pledge, committing to “strive towards area-wide emission reductions by 2045”. This builds on the operational target, covering emissions from South Tyneside businesses, residents, and visitors.

To achieve this, transportation emissions must be tackled and vehicle-related land use must be reviewed. Approximately 1/3 of borough-wide greenhouse emissions come from road vehicles, not accounting for their indirect Land Use, Land Use Change and Forestry LULUCF emissions. This provides a further mandate to phase out the use of fossil-fuel powered vehicles, to reduce the overall use of motorized vehicles, and to increase journeys by public transport and active travel methods.

### Trees and Ecology

Tree planting and ecology are an integral part of the Council’s approach to sustainability, striving to plant 3,000 trees per annum and having recently declared an Ecological Emergency in March 2023. Trees and other plants provide vast and wide-ranging benefits including improving our air quality. In 2022/23, the Council planted 3,931 trees throughout the Borough (not including replacement trees), largely through the North East Community Forest.

### Awareness Raising and Community Engagement

The Sustainable South Tyneside Strategy recognises the importance of climate change education, with transport a key focus of this. Through regular engagement events and communication, the Carbon Reduction & Sustainability team promote the use of sustainable transport both internally, to Council staff and Members, and externally to schools, businesses and residents. This engagement work includes school assemblies, social media challenges and stalls at various events.

## **Conclusions and Priorities**

South Tyneside Council is currently meeting local air quality objectives for NO<sub>2</sub> and PM<sub>10</sub>.

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).

Both AQMA’s located at Boldon Lane and Lindisfarne/ Leam Lane were revoked in January 2023 by way of legal order following public consultation. A Screening Assessment relative to the Boldon Lane (AQMA 1) and Lindisfarne/ Leam Lane (AQMA 2) was completed in October 2021 and provided the evidence and justification to revoke both AQMA’s. In

summary the report demonstrated that concentrations of NO<sub>2</sub> within both AQMA's remained below the annual objective level of 40 µg/m<sup>3</sup> and that there is a predicted downward trend in background NO<sub>2</sub> concentrations at both sites from 2018 – 2030.

Defra's Local Air Quality Management technical guidance (TG22) states that from 2023, following revocation of all AQMAs in a local authority area, local authorities in England should put in place a local air quality strategy to ensure air quality remains a high-profile issue and to ensure it is able to respond quickly should there be any deterioration in condition.

Our Air Quality Strategy with action plan was adopted by cabinet in January 2023, this followed an 8-week consultation period and review of the strategy ahead of it being adopted. The strategy can be found using the following link: [South Tyneside Council | Air Quality Strategy](#). The action plan will be updated annually and updates will be shared within the Annual status report regarding progress of identified measures.

Non continuous (diffusion tube) data collected in 2022 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<sub>2</sub> or PM<sub>10</sub> over the last seven years.

The diffusion tube data for 2022 shows a slight increase of NO<sub>2</sub> concentrations at most diffusion tubes from 2021, however none of the concentrations at any of the diffusion tubes are close the statutory limit value for nitrogen dioxide. There was a slight decrease in nine of the diffusion tubes. Notably there is a reduction of NO<sub>2</sub> at diffusion tubes 17,20-22 and 23 which are allocated near to the recently revoked AQMA at Lindisfarne Roundabout/ Leam Lane.

In February 2023 the Council were notified that we were successful in receiving Defra Grant funding to encourage behaviour change to positively impact air quality. This year the Council will embark upon a four-year project in collaboration with Ricardo which will include public engagement, encouraging behaviour change, use of air quality monitors, educational tasks underpinned by air quality sensor measurements and website services to facilitate an evidence-based approach to behaviour change.

The Council is striving to improve the reliability of the Electric Vehicle Charging Point Network and is seeking to adopt a new operational model, working closely with a private sector partner with key commitments around charging point renewals and expanding the charging point network to meet expected demands.

## 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<sub>2</sub> and PM<sub>10</sub>. Making changes to your daily life including walking short journeys, using public transport and car sharing will ultimately reduce levels of NO<sub>2</sub> and PM<sub>10</sub>.

South Tyneside Council works with public health, sustainability and transport 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 the newest and most efficient gas condensing boilers with lowest NO<sub>x</sub> (and carbon) emissions.

## Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of South Tyneside Council with the support and agreement of the following officers and departments:

- **Trevor Male** (Service Lead Transport Services)
- **Jonathan Barlow** (Transport Services)
- **Chrissy Hardie** (Senior Public Health Advanced Practitioner)
- **Mary Fairfield** (Public Health Practitioner)
- **Laura Turvey** (Service Lead, Environmental Sustainability)
- **Zoe Deans** (Carbon Reduction and Sustainability Co-ordinator)
- **Deborah Lamb** (Operations Manager Spatial Planning)

This ASR has been approved by:

- **Tom Hall** (Director of Public Health) –



- **Stuart Wright** (Head of Environment)



This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Samantha Jobson at:

Town Hall and Civic Offices,

South Shields,

Tyne and Wear,

NE33 2RL

0191 424 7952

[Samantha.jobson@southtyneside.gov.uk](mailto:Samantha.jobson@southtyneside.gov.uk)

## Table of Contents

<b>Executive Summary: Air Quality in Our Area</b> .....	<b>i</b>
Air Quality in South Tyneside .....	i
Actions to Improve Air Quality .....	ii
Conclusions and Priorities .....	vii
Local Engagement and How to get Involved.....	ix
Local Responsibilities and Commitment .....	ix
<b>1 Local Air Quality Management</b> .....	<b>1</b>
<b>2 Actions to Improve Air Quality</b> .....	<b>2</b>
Air Quality Management Areas.....	2
Progress and Impact of Measures to address Air Quality in South Tyneside .....	4
PM <sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations .....	11
<b>3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance</b> .....	<b>16</b>
Summary of Monitoring Undertaken .....	16
3.1.1 Automatic Monitoring Sites .....	16
3.1.2 Non-Automatic Monitoring Sites .....	16
Individual Pollutants .....	16
3.1.3 Nitrogen Dioxide (NO <sub>2</sub> ) .....	17
3.1.4 Particulate Matter (PM <sub>10</sub> ) .....	18
3.1.5 Particulate Matter (PM <sub>2.5</sub> ).....	18
<b>Appendix A: Monitoring Results</b> .....	<b>19</b>
<b>Appendix B: Full Monthly Diffusion Tube Results for 2022</b> .....	<b>43</b>
<b>Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC</b> .....	<b>46</b>
New or Changed Sources Identified Within South Tyneside Council During 2022.....	46
Additional Air Quality Works Undertaken by South Tyneside During 2022.....	46
QA/QC of Diffusion Tube Monitoring .....	46
Diffusion Tube Annualisation .....	46
Diffusion Tube Bias Adjustment Factors .....	47
NO <sub>2</sub> Fall-off with Distance from the Road.....	48
QA/QC of Automatic Monitoring .....	49
PM <sub>10</sub> and PM <sub>2.5</sub> Monitoring Adjustment .....	49
Automatic Monitoring Annualisation .....	49
NO <sub>2</sub> Fall-off with Distance from the Road.....	49
<b>Appendix D: Map(s) of Monitoring Locations and AQMAs</b> .....	<b>51</b>
<b>Appendix E: Summary of Air Quality Objectives in England</b> .....	<b>61</b>
<b>Glossary of Terms</b> .....	<b>62</b>

**References** .....63

## Figures

Figure A.1.1 – Trends in Annual Mean NO <sub>2</sub> Concentrations Lindisfarne / Leam Lane AQMA .....	29
Figure A.1.2 – Trends in Annual Mean NO <sub>2</sub> Concentrations Boldon Lane AQMA .....	30
Figure A.1.3 – Trends in Annual Mean NO <sub>2</sub> Concentrations Whiteleas Cleadon and Boldon .....	31
Figure A.1.1 – Trends in Annual Mean NO <sub>2</sub> Concentrations Fellgate for A19 .....	32
Figure A.1.4 – Trends in Annual Mean NO <sub>2</sub> Concentrations Hebburn and Jarrow .....	33
Figure A.1.5 – Trends in Annual Mean NO <sub>2</sub> Concentrations Tyne Dock.....	34
Figure A.1.6 – Trends in Annual Mean NO <sub>2</sub> Concentrations Westoe.....	35
Figure A.1.7 – Trends in Annual Mean NO <sub>2</sub> Concentrations South Shields.....	36
Figure D.1 – Map of Non-Automatic Monitoring Site.....	<b>Error! Bookmark not defined.</b>

## Tables

Table 2.1 – Declared Air Quality Management Areas.....	<b>Error! Bookmark not defined.</b>
Table 2.2 – Progress on Measures to Improve Air Quality.....	7
Table A.1 – Details of Automatic Monitoring Sites .....	19
Table A.2 – Details of Non-Automatic Monitoring Sites .....	20
Table A.3 – Annual Mean NO <sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m <sup>3</sup> ).....	24
Table A.4 – Annual Mean NO <sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m <sup>3</sup> ) ....	25
Table A.5 – 1-Hour Mean NO <sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m <sup>3</sup> .....	37
Table A.6 – Annual Mean PM <sub>10</sub> Monitoring Results (µg/m <sup>3</sup> )	<b>Error! Bookmark not defined.</b>
Table A.7 – 24-Hour Mean PM <sub>10</sub> Monitoring Results, Number of PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup> .....	40
Table A.8 – Annual Mean PM <sub>2.5</sub> Monitoring Results (µg/m <sup>3</sup> ).....	41
Table A.9 – SO <sub>2</sub> 2022 Monitoring Results, Number of Relevant Instances .....	<b>Error! Bookmark not defined.</b>
Table B.1 – NO <sub>2</sub> 2022 Diffusion Tube Results (µg/m <sup>3</sup> ) .....	43
Table C.1 – Annualisation Summary (concentrations presented in µg/m <sup>3</sup> ).....	47
Table C.2 – Bias Adjustment Factor .....	48
Table C.3 – Local Bias Adjustment Calculation .....	48
Table C.4 – NO <sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m <sup>3</sup> ) .....	<b>Error! Bookmark not defined.</b>

Table E.1 – Air Quality Objectives in England .....61



# 1 Local Air Quality Management

This report provides an overview of air quality in South Tyneside Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. 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 are presented in Table E.1.

## 2 Actions to Improve Air Quality

### 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 should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

South Tyneside Council currently does not have any declared AQMAs. A local Air Quality Strategy was established in January 2023 to prevent and reduce polluting activities. The Local Air Quality Strategy is available at [South Tyneside Council | Air Quality Strategy](#)

South Tyneside Council has a renewed 20-year vision for the whole of the Borough. The key goal is for South Tyneside to be a place where people live healthy, happy and fulfilled lives. This vision is based on five core ambitions including that South Tyneside residents be healthy and well throughout their lives and are part of strong communities. For the shorter-term, and in direct response to the pandemic, the Council has set out five Community priorities and a delivery plan to provide a sharper focus on recovery. These priorities are:

- supporting our young people in need,
- supporting families and older or vulnerable people,
- creating the conditions for economic recovery and investment,
- supporting all our town centres, villages, high streets and hospitality, and
- Investing in our natural and built environment.

The Air Quality Strategy contributes to each of the community priorities, setting out key projects and activities for the improvement of air quality in South Tyneside for the long-term; benefitting the health of all our communities and with positive impacts for businesses and South Tyneside's natural environment.

Protection and improvement of the environment is a top priority for the Council and its partners who have pledged their commitment to tackling Climate Change in 'Sustainable South Tyneside 2020-2025'. Theme 3 of the strategy addresses transportation, including staff travel, and looks to reduce vehicle emissions, the most significant contributor to poor

air quality. Implementation of the Air Quality Action Plan will directly support Sustainable South Tyneside 2020-2025.

## Progress and Impact of Measures to address Air Quality in South Tyneside

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

1. The decision of STMBC to revoke both AQMAs following consecutive years of compliance is welcomed. The inclusion of screening assessments in as additional appendices is commended.
2. There are a few inconsistencies present in the report. On Page 15, the report states "South Tyneside Council undertook non- automatic (i.e. passive) monitoring of NO<sub>2</sub> at 43 sites during 2020". This is incorrect and should be updated to 2021. In Tables A.5 and A.7, a few of the data entries are bolded. However, during 2021 there were no exceedances so the data in these tables should not be bolded as bolded entries indicate exceedances of air quality objectives. Moreover, in Table B.1 the numerical value for the bias adjustment factor has not been included in the column heading. The Council are encouraged to correct these inconsistencies in future reports.
3. The Council are encouraged to use the same font and text style for all tables included in the report. A few tables have different font sizes and styles which makes things slightly confusing for the reader.
4. The Council have provided clear and accurate mapping of the diffusion tube network, which is commended.
5. The council is commended for their in-depth discussion of their approach to tackling PM<sub>2.5</sub> emissions with reference to the newly adopted The Environment Act 2021.
6. Extensive Trend graphs have been provided for all monitoring data, which is commended.
7. It is encouraging to see the Council considered the comments made during the previous appraisal and actively made an effort to address all of these actions for this year's ASR.
8. The Council has provided a comprehensive list of key actions which they are planning to undertake to improve air quality over the next reporting year. This is commended.

All formatting errors that were highlighted in point 2 have been addressed in this year's report.

South Tyneside Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures

completed, in progress or planned are set out in Table 2.1. 28 measures are included within Table 2.1, with the type of measure and the progress South Tyneside Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure these are also presented within Table 2.1.

More detail on these measures can be found in their respective Action Plans

Key completed measures include:

- A194 Improvements to improve traffic flow
- Testo's and Downhill Lane Junction Improvements (National Highways) that has improved traffic flow and congestion.
- South Eldon Street – Strategic Cycling Corridor expansion improving existing network.
- Intelligent Transport Solutions at traffic signalised junctions, improving traffic flow and congestion.
- Expansion of the Electric Vehicle Charging Network
- Healthier Metros scheme

South Tyneside Council worked to implement these measures in partnership with the following stakeholders during 2022:

- National Highways
- North East Combined Authority (NECA)
- Nexus

The Council expects the following progress in the next reporting year:

- **Intelligent Transport Corridors**

Delivered using Transforming Cities and Bus Service Improvement Plan funding, this will see further corridors improved, thus reducing congestion and improving air quality.

- **Active Travel Funding**

As part of a successful bid for Active Travel Funding, South Tyneside is to bring forward sustainable transport initiatives on schemes highlighted in our consultation work undertaken as part of the Local Cycling and Walking Investment Plan. Tranche

Four works will be constructed during financial year 23/24 with a clear focus on improving the National Cycling Network.

- **IAMP Highway and Accessibility Improvements**

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 a road bridge, the dualling of the A1290 carriageway along with the internal road network to facilitate the development.

The required highway infrastructure within South Tyneside will come forward as part of a separate planning application which is expected in the Summer of 2023.

- **Ultra-Low Emission Charging Points roll-out**

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 2023/2024 period and will complement a wider network review.

South Tyneside Council's priorities for the coming year are:

- **Defra grant funded Behaviour change project** - Completion of the public website to better inform members of the public in relation to air quality within South Tyneside. This will be one aspect of the Defra grant funded planned works in collaboration with Ricardo to encourage behaviour change. The projected 4 year project will aim at targeting behaviour change on the school run and also the use of wood burning stoves. Six air quality sensors will be used to assess pollutant concentrations (NO<sub>2</sub>, PM10 and PM2.5) throughout the duration of the project.
- **Reviewing the continuous monitoring network** –Review the locations of the current continuous monitoring stations to ensure that they are positioned at the most appropriate locations as per Defra's Local Air Quality Management technical guidance (TG22).
- **Implementation of statutory requirements enacted by the Environment Act 2021** – Including proactive advisory/ enforcement activity based around the sales of solid fuels, review of smoke control areas, implementation of all enforcement powers as enacted by the Environment Act 2021.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	North East Freight Quality Partnership	Freight and Delivery Management	Delivery and Service plans	2015	Ongoing	North East Combined Authority (NECA)	n/a	n/a	n/a	n/a	Completed	No direct improvement	Measures to assist freight movements including freight consolidation centres	Ongoing	<a href="http://www.northeastfreightpartnership.info/">http://www.northeastfreightpartnership.info/</a>
2	North East Freight Maps	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2015	Ongoing	NECA	n/a	n/a	n/a	n/a	Implementation	No direct improvement	Limiting freight movements to the strategic routes around the region	Ongoing	<a href="http://www.northeastfreightpartnership.info/">http://www.northeastfreightpartnership.info/</a>
3	Set up a multi-disciplinary air quality steering group to drive forward STC clean air agenda	Policy Guidance and Development Control	Groups co-ordinating programmes to develop area wide strategies to reduce emissions and improve air quality	2018	Ongoing	STC	n/a	n/a	n/a	n/a	Implementation	No direct improvement	Ensure that all external funding opportunities are considered	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	2020	Ongoing	NECA	n/a	n/a	n/a	n/a	Implementation	No direct improvement	Ensure that air quality is considered in a trans boundary manner, maximise funding opportunities for combined authority bids	Ongoing	Regular meetings
5	Local Air Quality Strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	Oct 2021	STC	n/a	n/a	n/a	n/a	Complete	No Direct Improvement		Complete	Endorsed at Cabinet in 2022
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	2015	Ongoing	STC	n/a	n/a	n/a	n/a	Implementation	No Direct Improvement	Ensure all planning applications comply with requirements to ensure air quality is not adversely affected by development	Ongoing	
7	Completion of the Local Delivery Plan and Infrastructure delivery plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	2023	STC	n/a	n/a	n/a	n/a	Implementation	No Direct Improvement	All new development will adhere to the prescribed guidance in	2023/24	The Council will undertake an air quality modelling assessment, when the final local plan is designated.

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
													the LDP and IDP to ensure that developments are compliant		
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	2010	Ongoing	STC	n/a	n/a	n/a	n/a	Implementation	No Direct Improvement	Increase the number of travel plans within the borough	Ongoing	
9	North East Air Quality Strategy	Policy Guidance and Development	Air Quality Planning and Policy Guidance	2018	2018	Transport North East / NECA	n/a	n/a	n/a	n/a	Implementation	No direct improvement	Reduced CO <sub>2</sub> emissions	2023	This has been undertaken as part of an Active Travel Strategy.
10	North East Combined Authority Sustainable Transport Group	Policy Guidance and Development	Regional Groups to develop Area wide Strategies to reduce emissions	2018	2018	Transport North East / NECA	n/a	n/a	n/a	n/a	Implementation	No direct improvement	Air Quality Improvements	Ongoing	Regular Meetings undertaken
11	STC promoting electric vehicles through an employer car lease scheme	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2018	Ongoing	STC	n/a	n/a	n/a	n/a	Implementation	No direct improvement	Reduced emissions	Ongoing	We have 2 schemes in operation for our staff
12	Investment in Electric Charging Infrastructure	Promoting Low Emission Transport	Priority parking for LEV's	2010	Ongoing	STC	OLEV	n/a			Implementation	No direct improvement	Reduced emissions, Improved air quality	Ongoing	8 additional charging points were implemented in 2023 (May onwards).
13	Council Fleet to investigate options for electric fleet including Taxi's	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2020	Ongoing, with STH fleet taking ownership of EV vans	STC	OLEV	n/a	n/a	n/a	Implementation	No direct improvement	Reduced emissions, improved air quality	Ongoing, with STH fleet taking ownership of EV vans	Trials being undertaken on EV fleet vehicles
14	Council to install EV Charging Points	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles,	2010	Ongoing	STC	OLEV	n/a	Yearly bids	£100k per annum	Implementation	No direct improvement	Reduced emissions, improved air quality	Ongoing	New operational model to commence from May 2023.
15	Taxi Licensing Incentive Scheme	Promoting Low Emissions Transport	Taxi emission incentive	2021	Ongoing	STC	n/a	n/a	n/a	20k	Implementation	No Direct Improvements	Reduced emissions, improved air quality	Ongoing	Refund of 2 years taxi license if vehicles are upgraded to hybrid/electric. 71 cleaner vehicles to date
16	Travel Planning through	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2015	Ongoing	Transport North East /	n/a	n/a	n/a	n/a	Implementation	Limited improvements	Reduced emissions,	Ongoing	



Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	Planning Process					NECA / STC							Improved air quality,		
17	A19 Testos and Downhill lane junction improvements	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2019	2022	Highways England	Highways England RIS	n/a	n/a	£125m	Complete	Improved Air Quality	Providing a safe and serviceable road network	Complete	Works complete.
18	STC Active Travel Work stream	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2020	Ongoing	Transport North East / NECA / STC	n/a	n/a	n/a	n/a	Implementation	Limited improvements	Reduced emissions, Improved air quality,	Ongoing	Behavioural change activities undertaken through road safety education team.
19	Travel Information through the UTMC centre	Traffic planning and management	UTC, Congestion management, traffic reduction	2015	Ongoing	Transport North East / NECA / STC	n/a	n/a	n/a	n/a	Implementation	Yes	Reduced emissions, Improved air quality,	Ongoing	
20	Junction Improvements within the borough	Traffic Planning and Management	UTC, Congestion management, traffic reduction	2020	Ongoing	STC	Local Growth Funding	n/a	n/a	n/a	Implementation	Yes	Reduced emissions, Improved air quality,	Ongoing	
21	Intelligent Transport Solutions at Key Junctions	Traffic Planning and Management	UTC, Congestion management, traffic reduction	2020	Ongoing	STC	n/a	n/a	n/a	n/a	Implementation	Yes	Reduced emissions, Improved air quality,	Ongoing	Improvements to traffic signalised junctions throughout the borough.
22	Working with Bus Operators to deliver against Enhanced Bus Partnership	Promoting Travel Alternatives	Public transport improvements-interchanges stations and services	2020	2023	STC / Nexus / Bus Operators	Clean Bus Funding	n/a	n/a	n/a	Complete	Yes	Reduced emissions, Improved air quality,	Delivered	Enhanced Bus Partnership was endorsed in March 2023.
23	Delivery of the Council's Strategic Transport Priorities	Traffic Planning and Management	Congestion management, traffic reduction	2010	Ongoing	STC	Various Central Government	n/a	n/a	various	Implementation	Yes	Reduced emissions, Improved air quality	Ongoing	
24	School Streets Delivery	Promoting Travel Alternatives	Active Travel	2022	Ongoing	STC / Sustrans	Capability Funding		n/a		Implementation	Yes	Reduced emissions / improved air quality	Ongoing	
25	International Advanced Manufacturing Park – Highway Infrastructure Improvements	Traffic Management	UTC, Congestion Management, traffic reduction	2018	Ongoing	STC / Sunderland	n/a		n/a	n/a	Implementation	Yes	Reduced emissions / improved air quality	Ongoing	Planning application expected Summer 2023
26	Improved Communications on Air Quality	Public Information	Via the internet	2022	Ongoing	STC / Ricardo	DEFRA Air Quality Grant	Yes	n/a	£200k	Implementation	No	Increased understanding of selecting measures to reduce air quality	Ongoing	
27	Sustainable travel education and engagement with schools	Promoting travel alternatives	School travel plans	2020	Ongoing	STC/ Sustrans/Rise	n/a	n/a	n/a	n/a	implementation	yes	No of schools engaging to promote sustainable travel	ongoing	
28	Sustainable travel education and	Promoting travel alternatives	Workplace travel planning	2020	Ongoing	STC/Sustrans /Rise	n/a	n/a	n/a	n/a	implementation	yes	Promotion of active travel		A number engagement events planned

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	engagement with residents and businesses														

## PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

### 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 at Birth – 2021

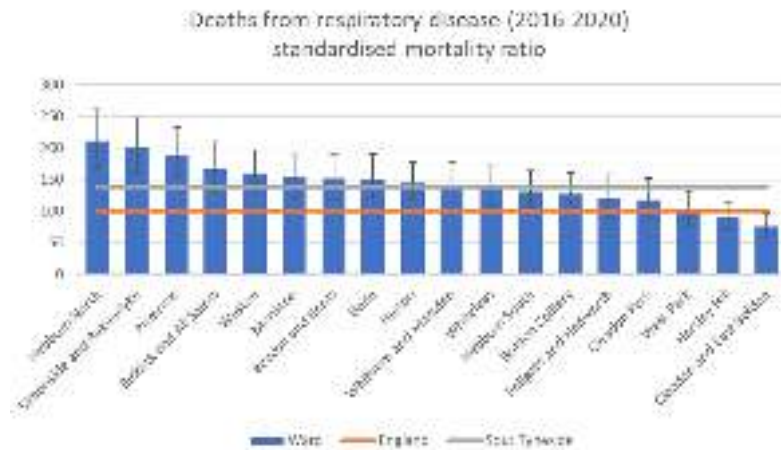
	Male	Female
South Tyneside	77.0 years	80.6 years
National Average	78.7 years	82.8 years

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.

- Premature (under 75 years) mortality rates from all cardiovascular disease of 93.5 per 100,000 as compared to 76.0 per 100,000 for England; of this 40.7% per 100,000 were considered preventable. (2021)
- Premature (under 75 years) mortality rates from respiratory disease of 39.7 per 100,000 as compared to 26.5 per 100,000 for England; of this 28.3 per 100,000 were preventable. (2021)
- Premature (under 75 years) mortality rates from cancer of 154.4 per 100,000 as compared to 121.5 per 100,000 for England; of this 74 per 100,000 were preventable. (2021)

The mortality rates for respiratory disease can be broken down further into South Tyneside Ward areas as shown in the table below (2016-2020), benchmarked against England and South Tyneside as a whole.

**Chart 2.3. Deaths from respiratory diseases, all ages, standardised mortality ratio, by Ward 2016-2020:**



Additional data shows in

- From 2016/17 – 2020/21 emergency admissions for chronic obstructive pulmonary disease is significantly worse in South Tyneside at 185 per 100,000 population in comparison to England at 100 per 100,00
- In 2021/22 hospital admissions for asthma in children (birth to 9 years) was 122.7 per 100,000 in South Tyneside. Across the northeast were the rate was 227.6 per 100,000 as opposed to the England rate of 172.7 per 100,000.<sup>7</sup>

<https://fingertips.phe.org.uk/search/life%20expectancy>

<https://fingertips.phe.org.uk/search/cardiovascular%20disease>

<https://fingertips.phe.org.uk/search/respiratory%20disease>

<https://fingertips.phe.org.uk/search/mortality%20rates%20from%20cancer>

<https://fingertips.phe.org.uk/search/Emergency%20admissions%20for%20chronic%20obstructive%20pulmonary%20disease>

<https://fingertips.phe.org.uk/search/asthma#page/1/gid/1/pat/15/ati/6/are/E12000001/iid/90810/age/220/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1>

- In 21/22 The hospital admission rates for young people with asthma aged 10 -18 is 114.5 per 100,000, significantly higher than the England rate of 87.6

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 are taking the following measures to address PM<sub>2.5</sub>:

Undertaking all measures detailed in the executive summary and detailed in table 2.2 will have a positive effect in reducing NO<sub>2</sub> and PM<sub>10</sub> and would have similar effect upon levels of PM<sub>2.5</sub>.

Measure 24 - School Streets Delivery project which is managed by Sustrans aims to reduce PM<sub>2.5</sub> exposure amongst school children by promoting active travel within schools, exploring specific measures to reduce childrens exposure to vehicle exhaust emissions during the school pick up/ drop off. The project is currently piloted within two schools within the borough, with the intention to restrict parking around the vicinity of the school entrances and to utilise air quality sensors to see if there is measured reduction. If considered a success, then the pilot will be extended to other suitable schools within the borough, subject to the appropriate investigations and consultations.

Measure 26 – Defra grant funding behaviour change project, the aim of this project is to encourage behaviour change to reduce air pollution and educate residents in relation to air quality related matters and how they can contribute to improving air quality. The Council will be working collaboratively with Ricardo on the creation of a dedicated air quality website to disseminate up to date information. The project will utilise six air quality sensors, the sensors will be used to help inform residents of PM<sub>2.5</sub> pollutant concentrations. It is the intention that the project will focus on educating the public in relation to the use of log

---

<https://fingertips.phe.org.uk/search/asthma%20admissions#page/1/gid/1/pat/15/ati/6/are/E12000001/iid/90810/age/220/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1>

burners, providing best practice advice in relation to the use of log burners as they are a significant contributor to PM2.5 levels. The project will also focus on air quality around schools, using the air quality sensors to compliment the existing school streets project.

South Tyneside Council's Public Health Team are supporting South Tyneside and Sunderland NHS Foundation Trust with their work around active travel and healthy environments as part of their Employee Wellbeing Strategy and wider businesses via the North East Better Health at Work Award. Public Health also appointed a dedicated practitioner to lead on healthy weight and physical activity, who is supporting some of this wider work including the refresh of the local Physical Activity Strategy, local work linked to the national Obesity Strategy, and our South Tyneside Cycling and Walking Investment Plan, all of which support outcomes around improving air quality through increased physical activity and green exercise, and less reliance on motorised transport.

COVID-19 made people more aware of the benefits of improving air quality especially indoors.

Allowing fresh air into indoor areas such as workplaces and schools can help remove air that contains virus particles and prevent the spread of COVID-19 and other respiratory infections such as flu. Good ventilation has also been linked to health benefits such as better concentration.

Whilst people have returned to work the importance of good ventilation as well as the need for thorough hand washing techniques continues to be promoted.

Both Public Health and Environmental Health have supported Environmental Health students at Northumbria University to provide information to go on the Local Authority website on indoor air pollution.

A major source of PM2.5 particles is from burning at home, particularly with traditional house coal or wet wood. To ensure that restrictions enacted by the Domestic Solid Fuels Regulations 2020 and the Environment Act 2021 in relation to the sale of fuel are adhered to an educational/ enforcement visit will be undertaken at all retailers providing fuels to ensure that businesses fully understand requirements and comply.

Schedule 12 amends the Clean Air Act 1993 to allow local authorities to impose financial penalties in smoke control areas. Domestic stoves/fires are known to contribute significantly to PM2.5 levels. The existing criminal offence of emitting smoke from a chimney in a smoke control area is replaced with a civil penalty regime, which should enable a quicker and simpler style of enforcement for emissions of smoke in these areas.

Schedule 12 also amends the Environmental Protection Act 1990 to remove an existing exemption, the effect of which is that smoke from a dwelling in a smoke control area could be actioned as a statutory nuisance. Smoke from chimneys in a smoke control area could therefore in future be the subject of a local authority abatement notice, breach of which is a criminal offence.

South Tyneside Council have adapted our regulatory process to include these changes.

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

This section sets out the monitoring undertaken within 2022 by South Tyneside Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

### Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

South Tyneside Council undertook automatic (continuous) monitoring at 3 sites during 2022. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

The automatic monitoring results are available through the UK-Air website .

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 (i.e. passive) monitoring of NO<sub>2</sub> at 44 sites during 2022. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D and can also be found via the following link:

<https://drive.google.com/open?id=1mRyjjoicBuFuU7S8XqtGZsfKXJUseo-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.

### Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater



than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

### 3.1.3 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data presented 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 2022 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.

Table A.5 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

There was one addition to the non-automatic monitoring network at DT45. This location was added to the monitoring network to assess air quality along Priory Road.

There are no monitored exceedances of the statutory air quality objectives.

Trend graphs for diffusion tubes are provided in Appendix A.

As no diffusion tubes have a concentration of over 60 µg/m<sup>3</sup>, this indicates that the hourly objective of 200 µg/m<sup>3</sup> not to be exceeded more than 18 times a year has not been breached.

There has been a small increase in levels at CM2 and CM3, and a small increase at CM1. Levels at CM1 and CM2 are remain below pre-covid levels of 2019, CM3 appears to have returned to pre-covid levels. It is important to note that all sites remain well under the annual air quality objective of 40 µg/m<sup>3</sup>.

As described revocation of AQMA 1 (Boldon Lane) and AQMA 2 (Lindisfarne/ Leam Lane) has been undertaken with revocation orders signed off at Cabinet in January 2023, this was following years of continued compliance. Graphs have been provided Figure A.1 and A.2 that show compliant data from the past 5 years.

### 3.1.4 Particulate Matter (PM<sub>10</sub>)

**Error! Reference source not found.** in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. There are no exceedances of the Air Quality Objective for the annual mean at the two continuous monitoring sites in South Tyneside.

Table A.6 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past five years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 35 times per year. There was 2 exceedances of the annual mean at CM2 and 4 exceedances of the annual mean at CM3.

### 3.1.5 Particulate Matter (PM<sub>2.5</sub>)

Table A.7 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past five years.

South Tyneside started to report on PM<sub>2.5</sub> in 2016. As detailed in Policy Guidance LAQM.PG22 PM<sub>2.5</sub> levels can be estimated from PM<sub>10</sub> levels by using a nationally derived correction ratio of 0.7.

The last 5 years worth of monitoring shows that the PM<sub>2.5</sub> has reduced by over 3 µg/m<sup>3</sup> at CM2 bringing it to below the average annual target value of 10 µg/m<sup>3</sup> by 2040. There is a slight increase in the concentration at CM3.

## 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? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
CM1	Boldon Lane, South Shields	Roadside	435,949	564,468	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	No	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**

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	Sunderland Road Jolly Sailor - Whitburn	Roadside	440820	561821	NO2	No	9.3	1.7		2.3
DT2	Sunderland Road - Cleadon	Roadside	438542	562321	NO2	No	8.3	1.5		2.65
DT3	Front Street Cleadon - Café	Roadside	438412	562368	NO2	No	0.0	2.5		2.7
DT4	Station Road East Boldon	Roadside	437053	561418	NO2	No	5.0	1.5		2.5
DT5	Front Street / Grange Terrace	Kerbside	436528	561280	NO2	No	4.0	<1		2.3
DT6	Front Street / Boker Lane	Roadside	436021	561368	NO2	No	11.5	1.5		2.5
DT7	Arnold Street	Roadside	434623	561746	NO2	No	0.0	1.5		2.5
DT8	Holland Park Drive (A19)	Roadside	433883	562644	NO2	No	0.0	30.0		2
DT9	Southlands (A19)	Roadside	433739	562070	NO2	No	19.0	40.0		2.9
DT10	Mill Lane / A185 Junction	Roadside	430489	563058	NO2	No	3.0	28.0		2.5
DT11	Victoria Road	Roadside	430540	563425	NO2	No	1.6	20.0		2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT12	Victoria Road West/South Street	Roadside	430582	563663	NO2	No	3.0	9.0	No	2
DT13	Station Road - Hebburn - on PJ Hairdressers	Roadside	430976	564378	NO2	No	0.0	3.8	No	2.6
DT14	Victoria Road East - Junction with Park Road	Kerbside	432393	564994	NO2	No	12.5	<1	No	2.5
DT15	Ellison Street roundabout - Pizza Addict	Roadside	432682	565456	NO2	No	16.2	2.2	No	2.5
DT16	Epinary Walk	Roadside	433088	565007	NO2	No	8.0	28.0	No	2
DT17	Hadrian Road	Roadside	433658	563497	NO2	No	2.0	5.0	No	2.5
DT18	Lindisfame Road (55)	Roadside	433698	563825	NO2	No	10.0	8.0	No	2.5
DT19	Hadrian Road/Finchale Terrace Junction	Roadside	433780	563692	NO2	No	3.0	13.5	No	3
DT20, DT21, DT22	Edinburgh Road Monitoring Station	kerbside	434068	563695	NO2	No	30.0	<1	Yes	2.9
DT23	John Reid Road, Junction with Stirling Avenue	kerbside	434326	563728	NO2	No	19.2	1.8	No	2.9
DT24	Opposite 173 Hadrian Road	Roadside	434297	563934	NO2	No	25.0	3.5	No	2.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT25	Opposite 237 Newcastle Road	kerbside	434376	563955	NO2	No	32.0	3.2	No	2.85
DT26	Stanhope Road/Newcastle Road	Roadside	434298	563970	NO2	No	18.0	22.0	No	2.35
DT27	A194 Arches Roundabout	Kerbside	435321	564843	NO2	No	15.0	<1	No	2.4
DT28	Commercial Road	Roadside	435605	565290	NO2	No	3.8	1.5	No	2.5
DT29	Corner of Bolden Lane/Stanhope Road	Kerbside	435926	564596	NO2	No	6.5	1.0	No	2.2
DT30	Stanhope Road	Kerbside	435987	564647	NO2	No	1.0	4.0	No	2.6
DT31	Boldon Lane	Kerbside	435959	564470	NO2	No	2.0	1.7	No	2.4
DT32	King George Road	Kerbside	437540	564355	NO2	No	4.0	13.0	No	2.5
DT33	Sunderland Road, next to the Cranny	Kerbside	437819	564335	NO2	No	7.0	2.0	No	2.3
DT34	Westoe Road	Roadside	437010	565873	NO2	No	7.0	2.0	No	2.5
DT35	Imeary Street/The Glebe	Roadside	436923	565967	NO2	No	14.0	4.0	No	2.3
DT36	Chichester Metro	Kerbside	436727	566374	NO2	No	18.9	<1	No	2.35

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT37	Western Approach (Laygate Flats)	Roadside	436216	566216	NO2	No	11.5	2.5	No	2.7
DT38	Alice Street (A194)	Roadside	436169	565876	NO2	No	<1	27.0	No	2.25
DT40	Anderson Street	Roadside	436098	565902	NO2	No	3.5	8.5	No	2.5
DT41	Campbell Park Road	Roadside	436597	567308	NO2	No	10.0	2.0	No	2.5
DT42	West Park Roundabout	Kerbside	431428	564493	NO2	No	25.0	6.5	No	2.5
DT43	Readhead Park	Roadside	436396	565012	NO2	No	5.0	1.5	No	2.5
DT44	Imeary Street	Roadside	437161	565572	NO2	No	10.0	2.5	No	2.5
DT45	Priory Road	Kerbside	433390	565601	NO2	No	4.0	2.0	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<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
CM1	435,949	564,456	Roadside	Automatic	92.30%	24	23	16	19	18
CM2	434,068	563,695	Roadside	Automatic	98.50%	26	23	20	20	22
CM3	435,565	565,040	Roadside	Automatic	89.10%	31	26	20	23	27

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22

Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

(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%).



**Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
DT1	440820	561821	Roadside	92.3	92.3	24.3	24.9	20.9	21.7	22.1
DT2	438542	562321	Roadside	100	100.0	28.8	30.6	23.8	24.4	26.8
DT3	438412	562368	Roadside	100	100.0	20.3	19.7	13.5	15.8	16.3
DT4	437053	561418	Roadside	100	100.0	19.5	19.8	14.7	14.5	16.3
DT5	436528	561280	Kerbside	100	100.0	23.9	23.7	18.1	18.3	20.2
DT6	436021	561368	Roadside	100	100.0	34.3	34.2	21.8	24.8	27.4
DT7	434623	561746	Roadside	92.3	92.3	24.1	23.1	17.4	21.1	20.3
DT8	433883	562644	Roadside	84.6	84.6	21.0	21.1	16.2	15.9	18.5
DT9	433739	562070	Roadside	82.6	82.7	21.3	19.4	12.7	16.1	18.8
DT10	430489	563058	Roadside	100	100.0	27.3	27.9	20.9	21.9	24.4
DT11	430540	563425	Roadside	100	100.0	29.1	23.3	15.2	18.1	20.5
DT12	430582	563663	Roadside	100	100.0	22.5	21.0	15.1	15.6	20.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
DT13	430976	564378	Roadside	92.3	92.3	24.2	25.1	18.3	22.0	23.1
DT14	432393	564994	Kerbside	82.7	82.7	26.2	26.3	21.8	19.8	25.9
DT15	432682	565456	Roadside	100	100.0	24.8	23.8	23.7	22.3	24.9
DT16	433088	565007	Roadside	100	100.0	24.6	26.2	18.2	19.8	18.7
DT17	433658	563497	Roadside	100	100.0	30.6	31.4	23.2	25.0	24.1
DT18	433698	563825	Roadside	100	100.0	25.3	24.0	19.4	21.3	22.5
DT19	433780	563692	Roadside	92.3	92.3	30.1	29.5	21.4	24.2	25.3
DT20, DT21, DT22	434068	563695	kerbside	100	100.0				23.4	21.5
DT23	434326	563728	kerbside	92.3	92.3	27.5	27.7	21.1	24.7	22.7
DT24	434297	563934	Roadside	92.3	92.3	35.3	32.3	24.6	25.9	28.8
DT25	434376	563955	kerbside	90.3	90.4	30.7	29.3	22.4	25.0	25.4
DT26	434298	563970	Roadside	67.3	67.3	29.0	28.8	22.6	24.0	27.8
DT27	435321	564843	Kerbside	92.3	92.3	38.8	38.1	26.2	29.2	33.2
DT28	435605	565290	Roadside	100	100.0	28.6	29.0	25.0	23.9	23.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
DT29	435926	564596	Kerbside	75	75.0	34.5	29.8	21.3	25.9	29.1
DT30	435987	564647	Kerbside	82.6	82.7	33.9	32.6	22.1	27.8	28.1
DT31	435959	564470	Kerbside	100	100.0	30.6	30.7	22.8	26.5	28.1
DT32	437540	564355	Kerbside	100	100.0	25.8	24.1	19.0	19.8	23.5
DT33	437819	564335	Kerbside	84.6	84.6	28.2	26.9	19.5	22.8	25.0
DT34	437010	565873	Roadside	100	100.0	32.7	30.4	23.3	26.0	27.7
DT35	436923	565967	Roadside	82.6	82.7	26.7	23.9	19.2	22.5	21.6
DT36	436727	566374	Kerbside	84.6	84.6	29.2	30.1	19.9	23.4	27.4
DT37	436216	566216	Roadside	100	100.0	34.0	32.6	20.8	31.9	28.9
DT38	436169	565876	Roadside	100	100.0	21.2	18.9	17.6	17.9	19.4
DT40	436098	565902	Roadside	100	100.0	26.7	22.9	19.9	22.3	23.4
DT41	436597	567308	Roadside	100	100.0	27.5	24.8	19.2	20.2	23.7
DT42	431428	564493	Kerbside	100	100.0	34.7	30.8	23.3	26.0	25.5
DT43	436396	565012	Roadside	92.3	92.3	28.6	26.9	20.7	22.0	22.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
DT44	437161	565572	Roadside	100	100.0	29.1	24.3	19.7	21.6	22.5
DT45	433390	565601	Kerbside	100	50.0					23.1

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22

Diffusion tube data has been bias adjusted.

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 correction.

#### Notes:

The annual mean concentrations are presented as  $\mu\text{g}/\text{m}^3$ .

Exceedances of the NO<sub>2</sub> annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

NO<sub>2</sub> annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

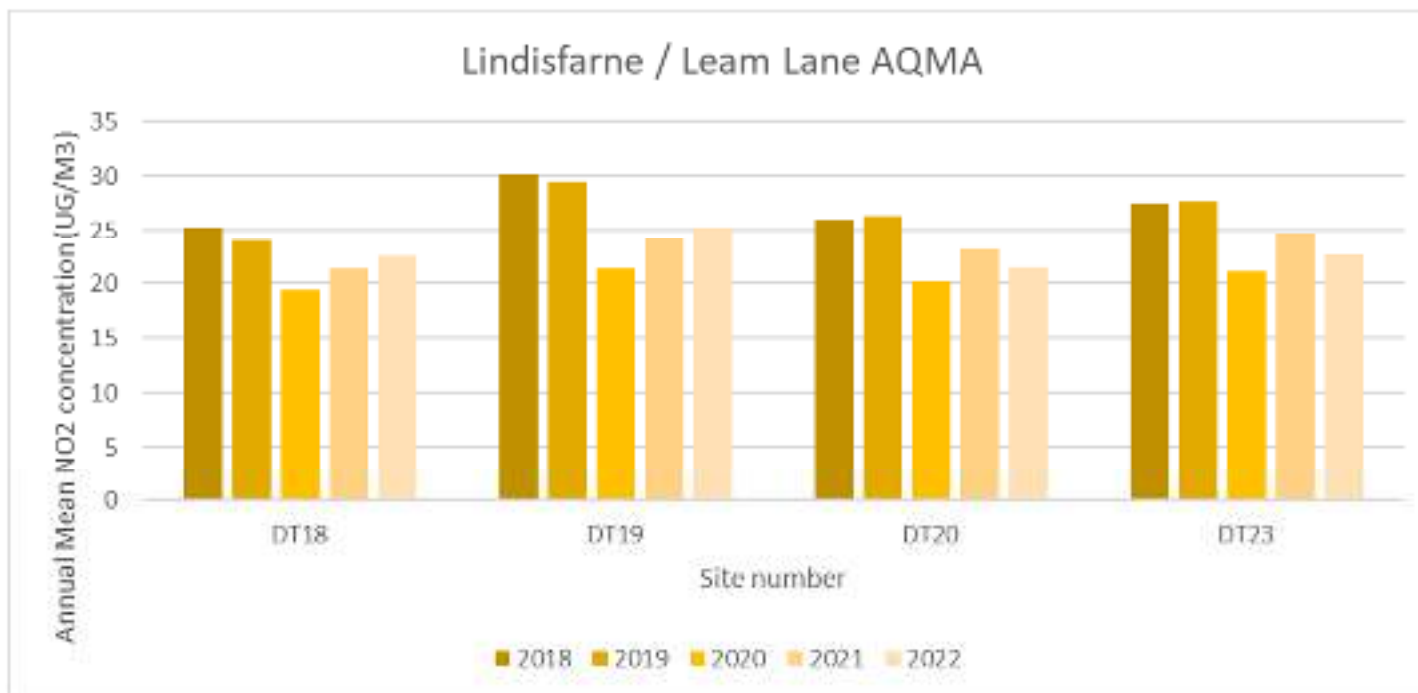
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

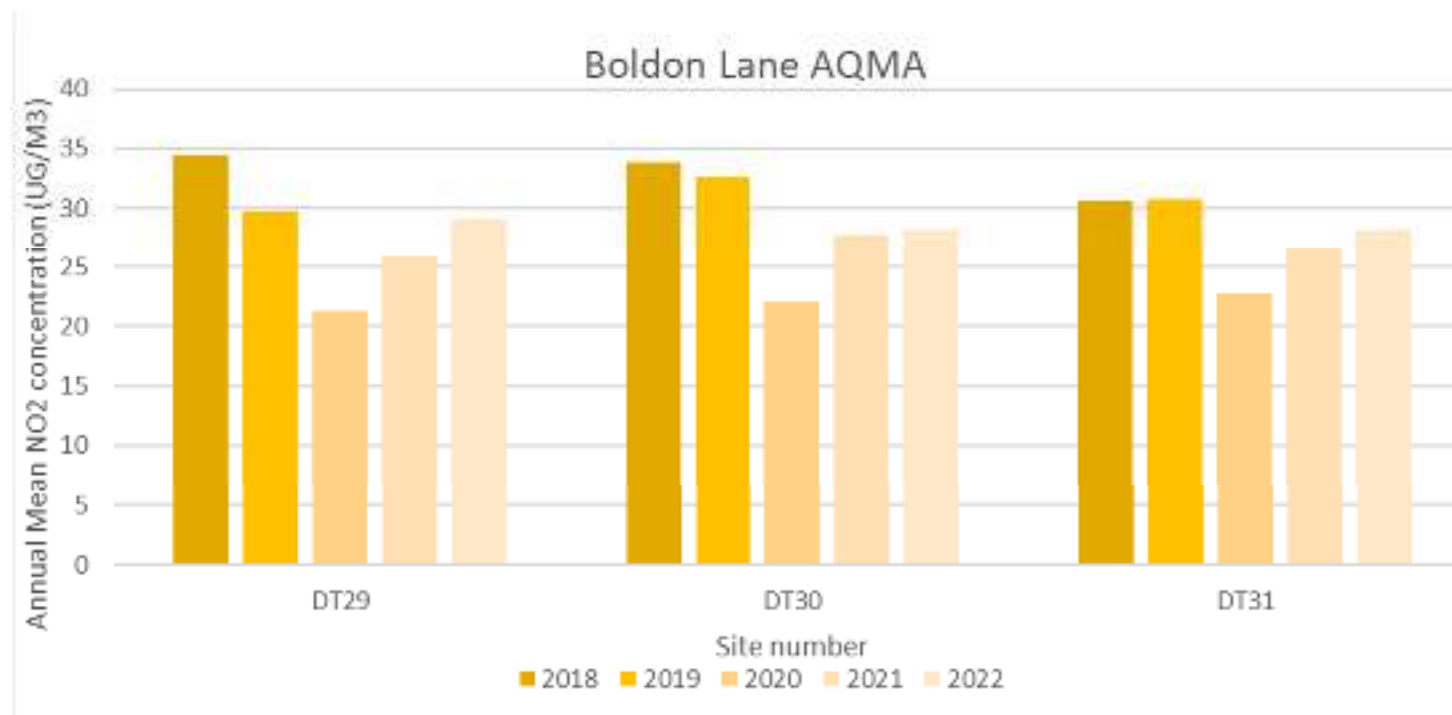
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(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%).

**Figure A.1.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations Lindisfarne / Leam Lane AQMA**



**Figure A.2.2 – Trends in Annual Mean NO<sub>2</sub> Concentrations Boldon Lane AQMA**



**Figure A.3.3 – Trends in Annual Mean NO<sub>2</sub> Concentrations Whiteleas Cleadon and Boldon**

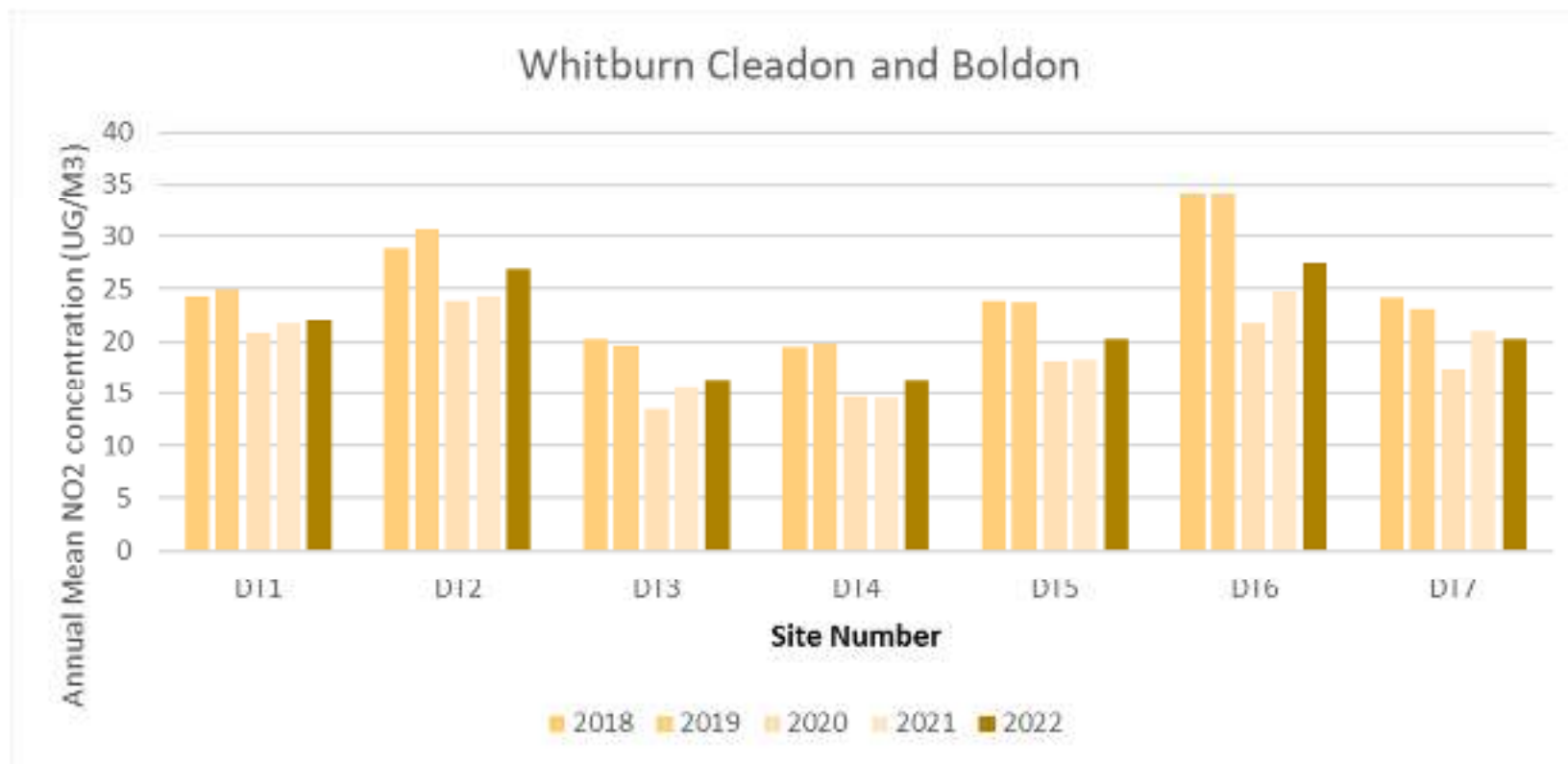


Figure A.4.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations Fellgate for A19

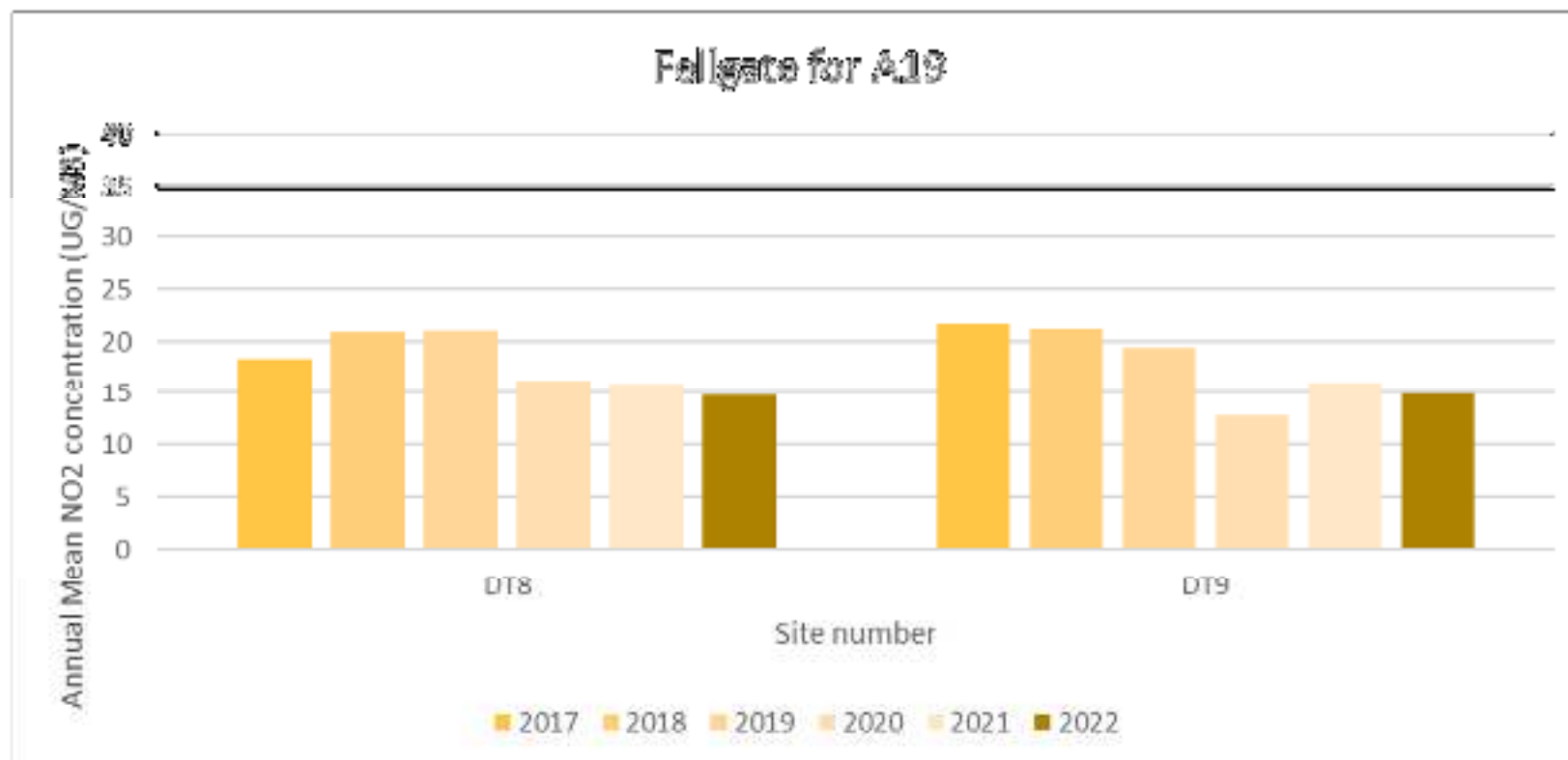




Figure A.5.4 – Trends in Annual Mean NO<sub>2</sub> Concentrations Hebburn and Jarrow

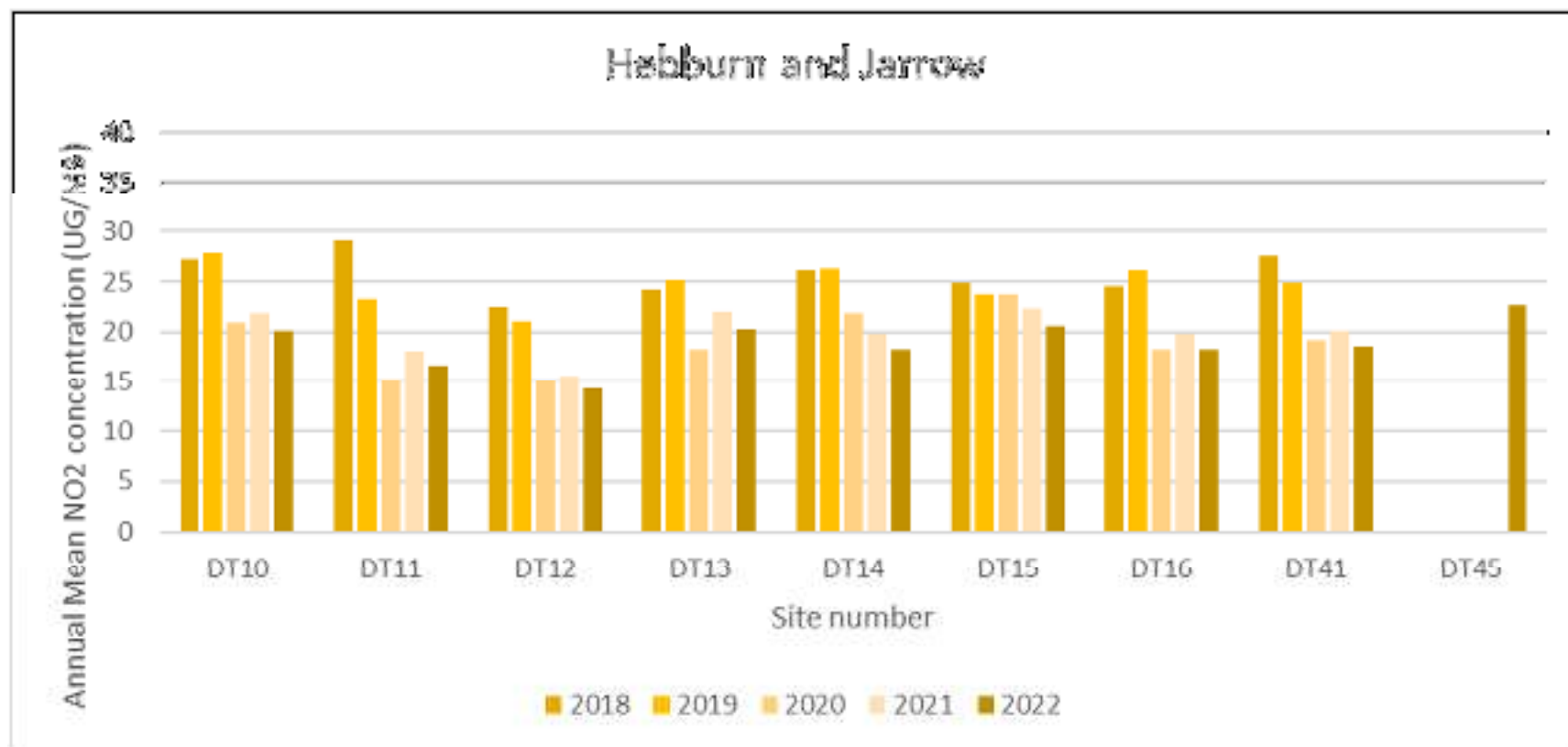


Figure A.6.5 – Trends in Annual Mean NO<sub>2</sub> Concentrations Tyne Dock

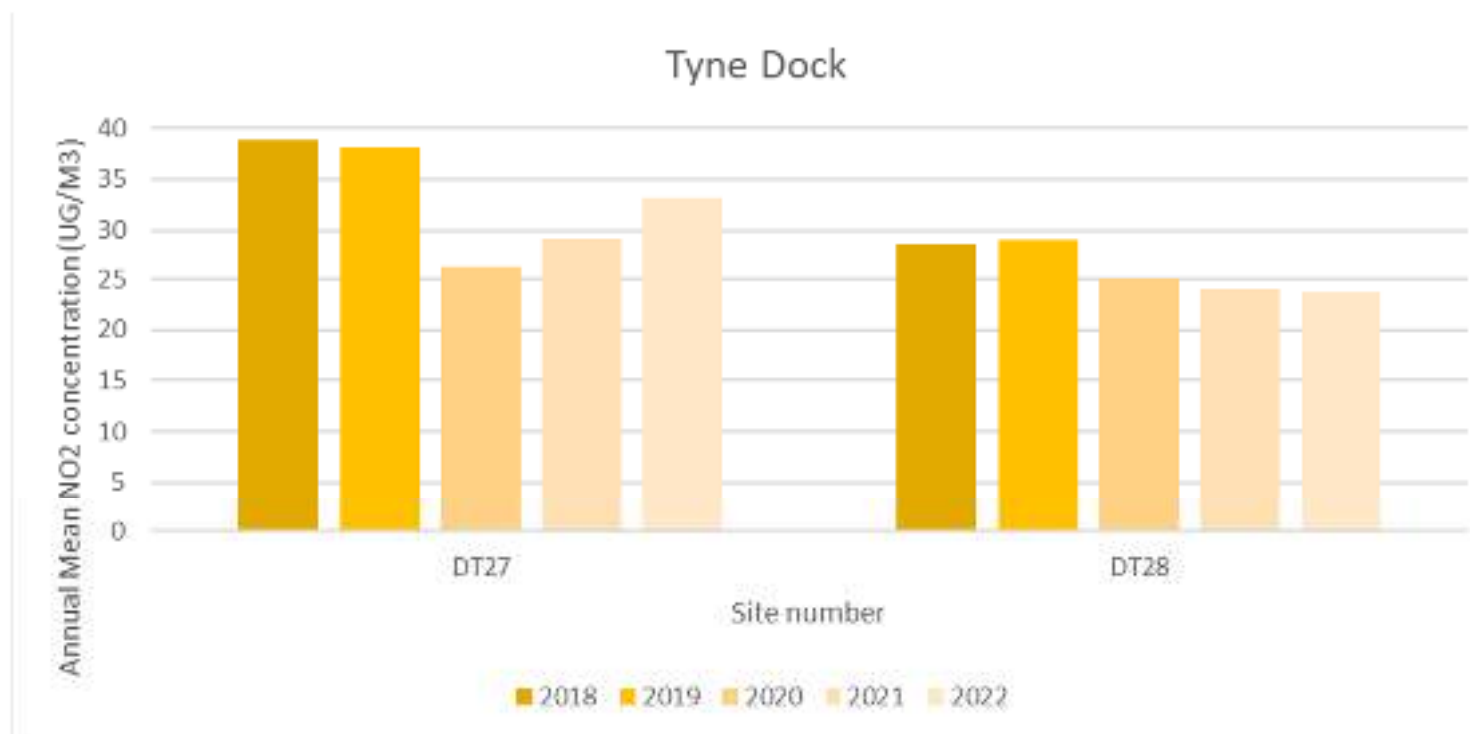


Figure A.7.6 – Trends in Annual Mean NO<sub>2</sub> Concentrations Westoe

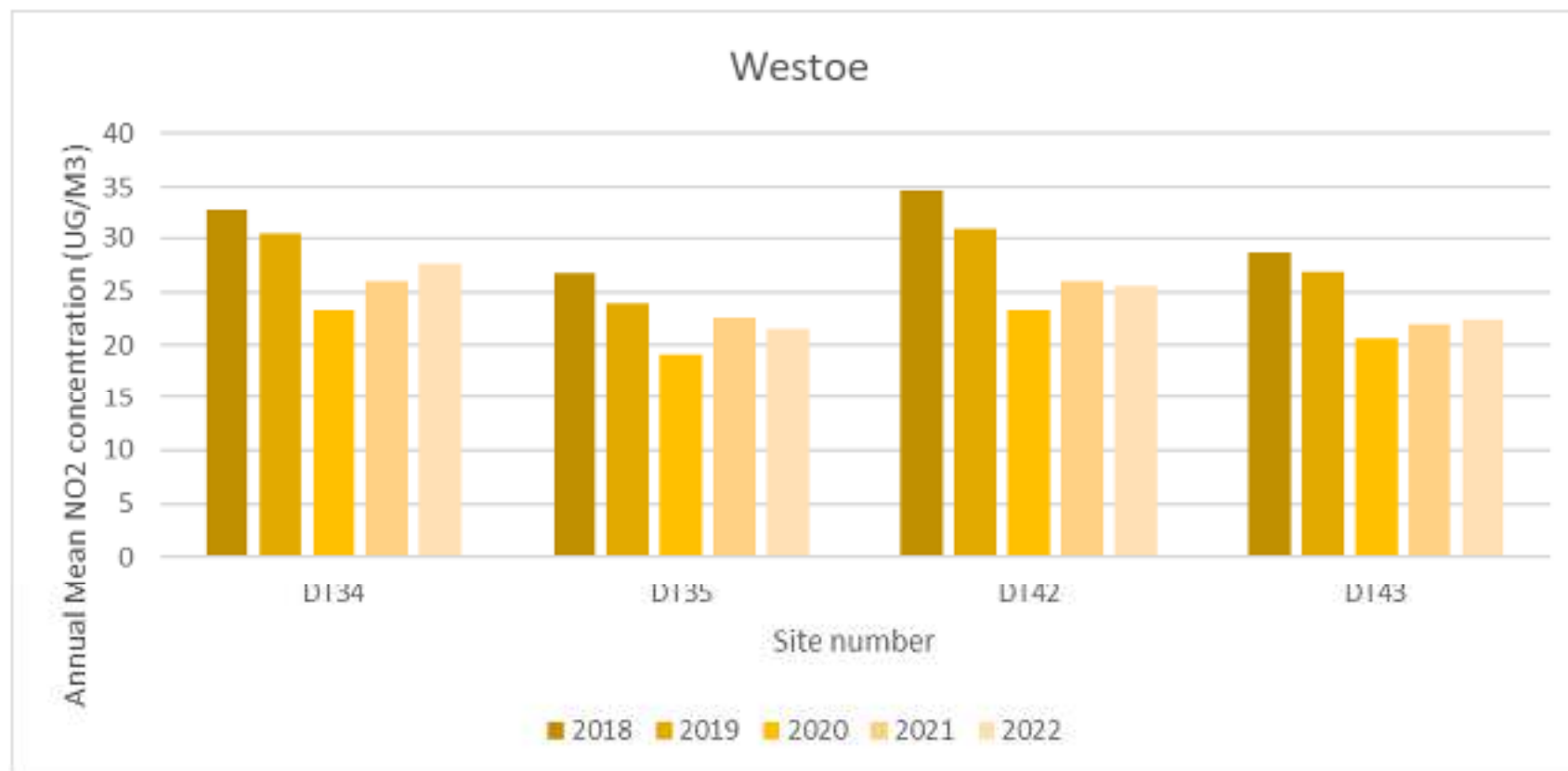
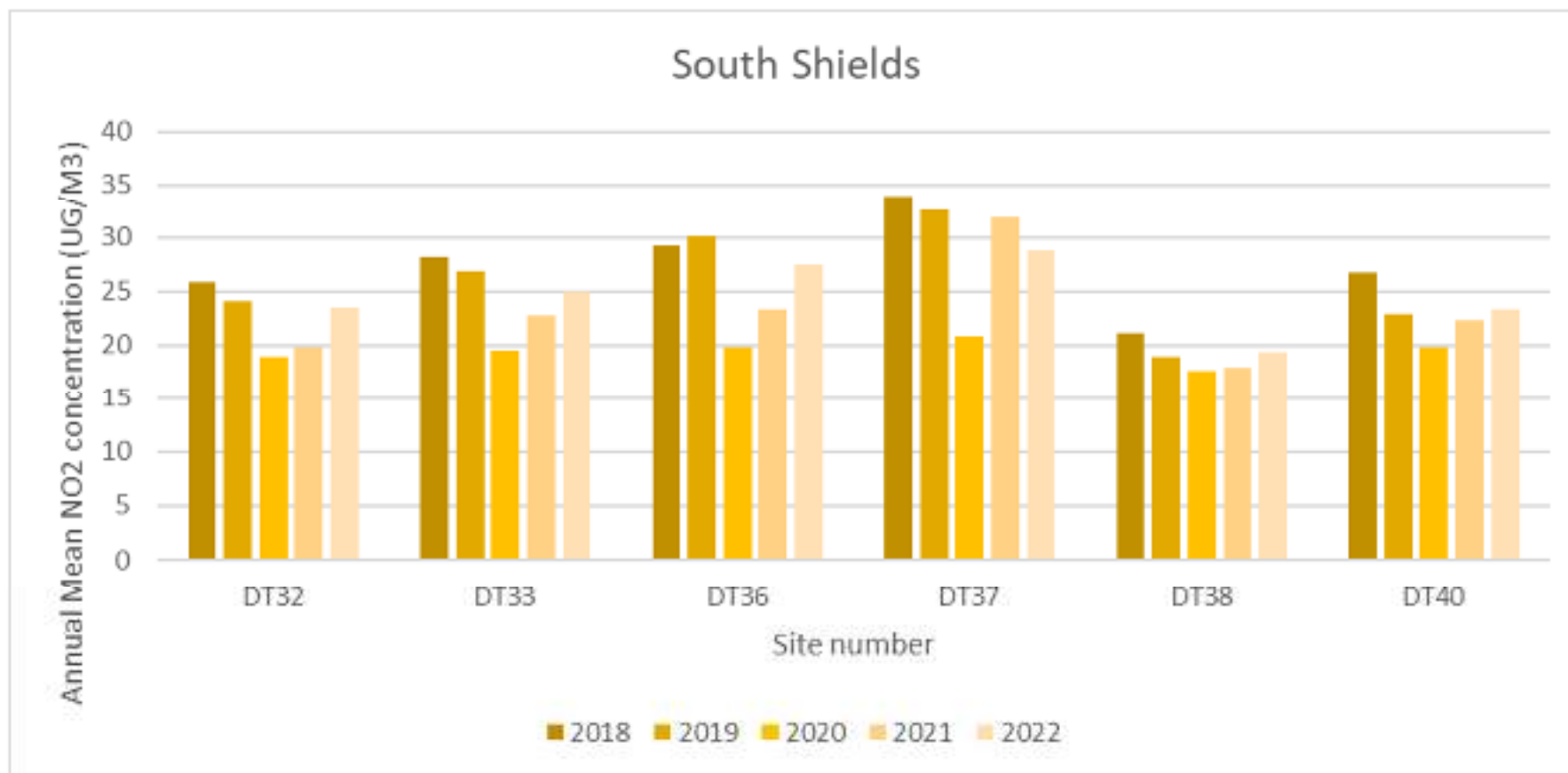


Figure A.8.7 – Trends in Annual Mean NO<sub>2</sub> Concentrations South Shields



**Table A.5 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
CM1	435,949	564,456	Roadside	Automatic	92.30%	0	0	0	0	0
CM2	434,068	563,695	Roadside	Automatic	98.50%	0	0	0	0	0
CM3	435,565	565,040	Roadside	Automatic	89.10%	0	0	0	0	0

**Notes:**

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m<sup>3</sup> have been recorded.

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

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

(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%).

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
CM2	434,068	563,695	Roadside	100	93.7	<b>18</b>	<b>19</b>	<b>18</b>	<b>17</b>	<b>12</b>
CM3	435,565	565,040	Roadside	100	88.4	19	19	14	16	18

**Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

**Notes:**

The annual mean concentrations are presented as  $\mu\text{g}/\text{m}^3$ .

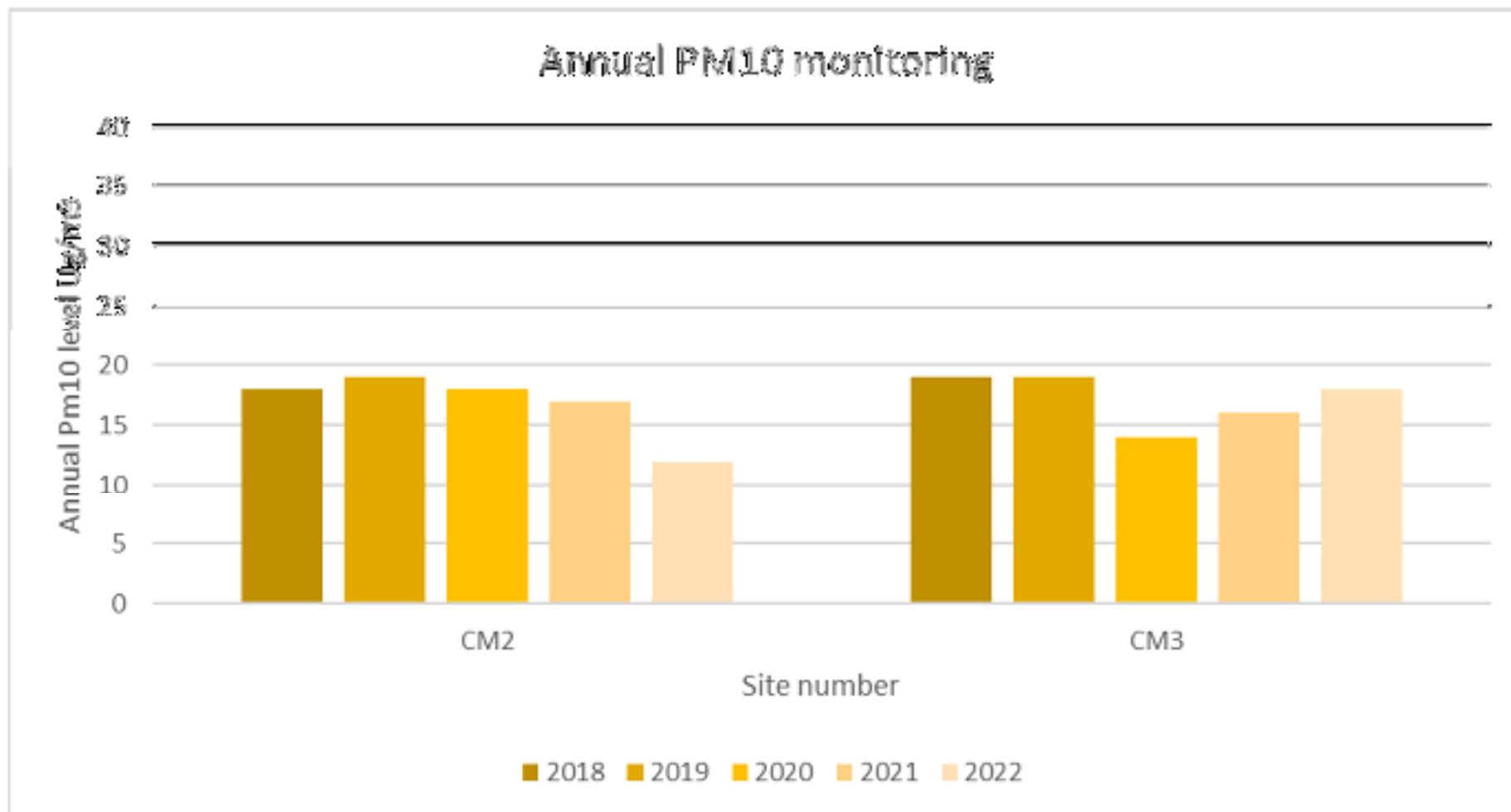
Exceedances of the PM<sub>10</sub> annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Figure A.2 – Trends in Annual Mean PM<sub>10</sub> Concentrations



**Table A.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
CM2	434,068	563,695	Roadside	100	93.7	<b>2 (67)</b>	<b>2(69)</b>	<b>4(67)</b>	<b>1 (56)</b>	<b>2 (55)</b>
CM3	435,565	565,040	Roadside	100	88.4	<b>3 (64)</b>	<b>4(70)</b>	0	0	<b>4 (76)</b>

**Notes:**

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m<sup>3</sup> have been recorded.

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).



**Table A.7 – Annual Mean PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
CM2	434,068	563,695	Roadside	100	93.7	12.6	13.3	12.6	11.9	8.4
CM3	435,565	565,040	Roadside	100	88.4	13.3	13.3	9.8	11.2	12.6

**Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

**Notes:**

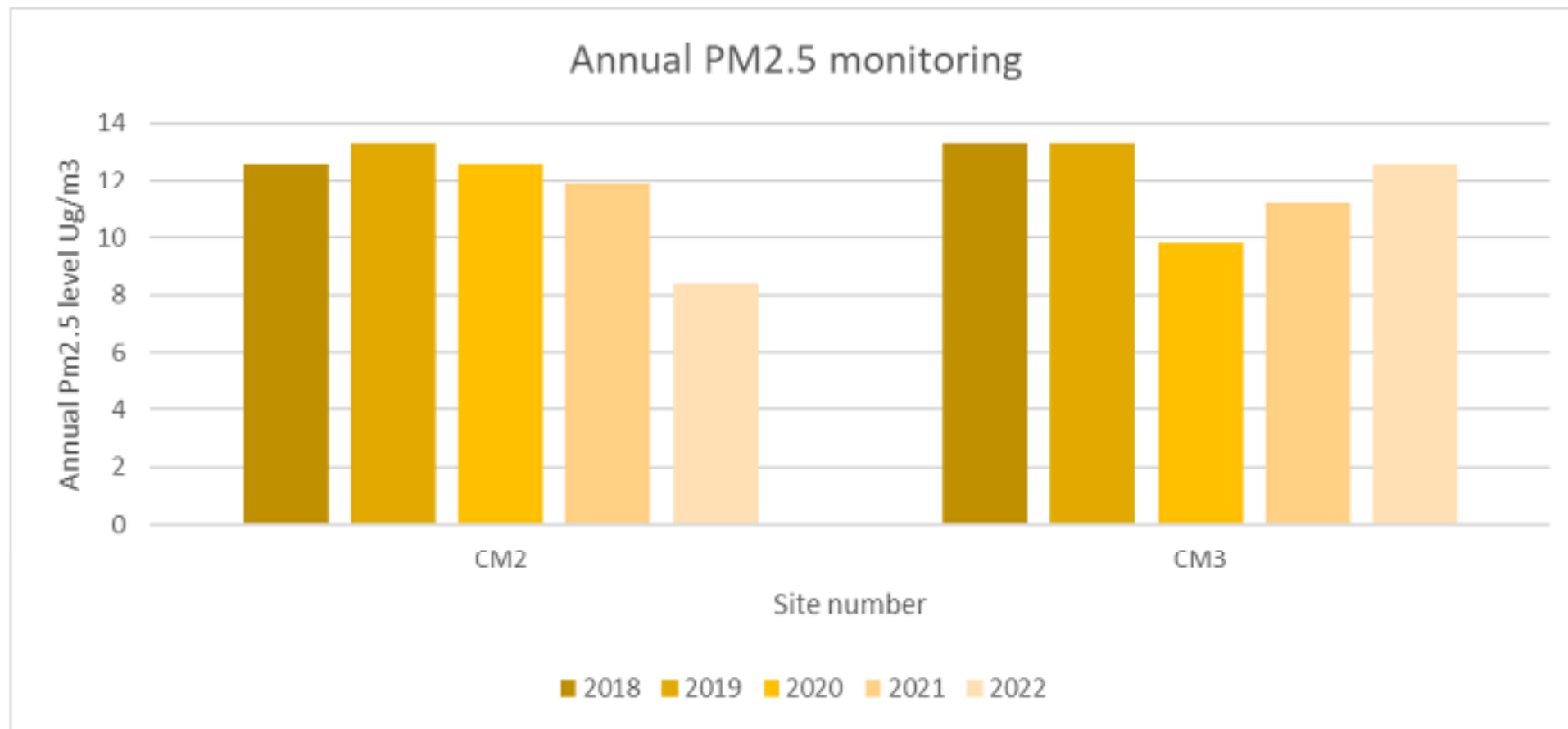
The annual mean concentrations are presented as µg/m<sup>3</sup>.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

**Figure A.3 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations**



## Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO<sub>2</sub> 2022 Diffusion Tube Results (µg/m<sup>3</sup>)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	440820	561821	27.1	22.0	30.0	22.8	18.8	16.4	21.6		25.0	22.6	29.4	28.4	24.0	22.1	-	
DT2	438542	562321	37.6	29.8	31.5	21.5	24.2	21.7	25.2	23.7	27.0	31.4	38.1	37.8	29.1	26.8	-	
DT3	438412	562368	22.4	19.4	22.3	14.9	12.8	11.0	12.7	15.9	19.3	16.8	21.5	24.4	17.8	16.3	-	
DT4	437053	561418	22.7	18.0	21.9	12.1	15.8	12.0	13.3	14.3	16.3	18.0	24.0	24.3	17.7	16.3	-	
DT5	436528	561280	26.4	20.0	23.6	17.6	24.1	17.0	18.4	17.6	19.9	23.3	28.8	27.0	22.0	20.2	-	
DT6	436021	561368	32.6	31.1	34.9	25.6	16.6	24.5	26.0	27.8	31.0	28.9	39.5	38.9	29.8	27.4	-	
DT7	434623	561746	29.8	24.6	23.4	17.7	11.2	15.4	16.3	17.1		34.0	25.6	27.8	22.1	20.3	-	
DT8	433883	562644	18.5	17.8	24.9	16.9	13.2		15.1	18.3		19.5	29.7	27.0	20.1	18.5	-	
DT9	433739	562070	18.0	16.9	24.1	17.4	11.9		13.7	16.4	19.2		45.0	21.6	20.4	18.8	-	
DT10	430489	563058	27.8	26.9	30.6	22.3	14.4	20.8	24.2	24.6	28.2	26.6	37.0	35.2	26.5	24.4	-	
DT11	430540	563425	22.2	21.7	25.0	15.6	20.6	12.8	16.0	18.0	23.2	24.8	37.1	29.9	22.3	20.5	-	
DT12	430582	563663	19.2	20.8	23.1	15.5	13.5	12.1	15.3	15.8	33.6	35.2	37.3	24.6	22.2	20.4	-	
DT13	430976	564378	21.2	23.5		23.1	20.1	16.9	22.6	26.7	26.0	26.1	38.7	31.5	25.1	23.1	-	
DT14	432393	564994	29.2	25.1		22.0		35.3	23.9	26.5	30.8	27.2	34.5	27.8	28.2	25.9	-	
DT15	432682	565456	32.0	28.0	28.7	19.0	17.9	20.2	22.1	22.6	25.2	31.9	41.4	35.8	27.1	24.9	-	
DT16	433088	565007	12.6	22.8	25.8	18.5	17.2	15.7	13.9	26.9	18.3	17.9	29.1	25.5	20.4	18.7	-	
DT17	433658	563497	23.4	24.6	34.8	25.2	23.7	14.8	26.3	17.5	27.9	28.5	39.2	29.0	26.2	24.1	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT18	433698	563825	18.7	21.2	36.0	26.6	19.3	14.8	19.5	23.7	26.0	21.6	40.7	25.3	24.4	22.5	-	
DT19	433780	563692	31.7	29.7	34.9	21.0	21.1	21.2	23.2	24.6	24.0	31.6		39.6	27.5	25.3	-	
DT20	434068	563695	30.2	25.9	28.1	20.3	19.3	16.4	18.8	23.0	25.5	21.6	28.5	28.6	-	-	-	Triplicate Site with DT20, DT21 and DT22 - Annual data provided for DT22 only
DT21	434068	563695	27.7	21.5	27.2	21.2	14.3	16.5	19.6	23.0	21.3	22.9	25.7	28.6	-	-	-	Triplicate Site with DT20, DT21 and DT22 - Annual data provided for DT22 only
DT22	434068	563695	31.2	25.7	27.6	21.6	19.5	16.5	19.8	23.3	25.5	23.1	23.1	29.8	23.4	21.5	-	Triplicate Site with DT20, DT21 and DT22 - Annual data provided for DT22 only
DT23	434326	563728		26.3	28.0	22.6	19.9	16.5	20.7	25.9	31.7	21.7	28.6	29.8	24.7	22.7	-	
DT24	434297	563934	39.0	32.6	32.9	22.3	21.7		28.6	30.7	31.3	31.9	37.5	35.4	31.3	28.8	-	
DT25	434376	563955	28.6	22.7	30.7	24.9		25.3	23.9	25.7	27.9	27.9	33.4	33.2	27.7	25.4	-	
DT26	434298	563970					26.7	19.7	22.9	23.5	23.4	31.4	40.1	36.9	28.1	27.8	-	
DT27	435321	564843		33.0	43.7	31.5	30.1	27.5	32.8	32.5	34.2	37.5	50.1	44.3	36.1	33.2	-	
DT28	435605	565290	26.6	22.8	31.7	24.4	20.6	15.8	21.9	25.7	27.3	24.4	34.2	33.5	25.8	23.7	-	
DT29	435926	564596	38.9		30.2	27.4			24.5	24.2	30.3	30.5	38.5	40.3	31.7	29.1	-	
DT30	435987	564647	30.7	29.4	35.2		25.2	22.1	27.5	28.3	34.9	33.7		38.7	30.6	28.1	-	
DT31	435959	564470	31.4	28.8	37.0	27.9	27.1	21.5	28.0	30.0	31.8	29.6	38.3	35.0	30.5	28.1	-	
DT32	437540	564355	31.1	58.5	24.3	15.9	16.2	15.3	18.4	18.0	21.6	23.4	31.4	33.0	25.6	23.5	-	
DT33	437819	564335		28.9	29.8	18.3	20.7	22.1	24.9	22.5		30.0	37.4	37.1	27.2	25.0	-	
DT34	437010	565873	41.0	32.3	29.9	20.5	23.0	26.0	27.1	25.8	22.1	33.4	38.0	41.6	30.1	27.7	-	
DT35	436923	565967	31.0	25.8	28.2	20.4	19.1	16.8	20.4	22.7	27.4	22.6			23.4	21.6	-	
DT36	436727	566374	33.1	29.4	33.3	25.4	20.8	20.9			35.6	26.5	39.2	33.8	29.8	27.4	-	
DT37	436216	566216	35.3	31.0	35.8	29.0	28.2	22.9	29.6	31.6	19.2	31.9	41.4	40.6	31.4	28.9	-	
DT38	436169	565876	28.4	19.9	20.8	15.0	11.7	12.1	15.4	16.5	20.0	20.2	25.4	47.0	21.0	19.4	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT40	436098	565902	36.6	26.6	26.3	17.5	17.7	17.3	20.5	18.6	24.7	29.0	35.9	34.2	25.4	23.4	-	
DT41	436597	567308	27.4	26.8	28.1	21.2	19.4	17.1	21.3	22.2	28.6	27.8	38.8	30.9	25.8	23.7	-	
DT42	431428	564493	34.6	30.0	30.2	22.5	22.3	18.0	20.2	25.4	29.1	27.7	35.1	37.0	27.7	25.5	-	
DT43	436396	565012	33.0	25.8	27.0	20.4	20.1	17.9	20.5	22.1		22.4	28.2	31.2	24.4	22.5	-	
DT44	437161	565572	33.1	24.9	27.7	18.5	16.8	16.6	21.5	19.3	26.1	24.5	32.5	31.7	24.4	22.5	-	
DT45	433390	565601							18.0	23.1	28.6	21.2	24.2	32.5	24.6	23.1	-	

All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22

Local bias adjustment factor used

Where applicable, data has been distance corrected for relevant exposure in the final column

South Tyneside Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

### **New or Changed Sources Identified Within South Tyneside Council During 2022**

We are currently awaiting the planning application for highways infrastructure associated with the IAMP scheme ahead of development.

### **Additional Air Quality Works Undertaken by South Tyneside During 2022**

South Tyneside Council has not completed any additional works within the reporting year of 2022.

### **QA/QC of Diffusion Tube Monitoring**

Diffusion tubes are supplied and analysed by Gradko International Ltd, Winchester, Hampshire. The preparation method used is 20% TEA and acetone.

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.)

Gradko follow the procedures set out by the DEFRA Harmonisation Practical Guidance.

Gradko participate in Air-PT analysis schemes and the most recent results are available on request.

### **Diffusion Tube Annualisation**

For those sites with a data capture of less than 75%, annualisation is required to calculate the annual mean. The sites requiring this calculation are:

DT26 and DT45

Four local sites which are part of the national Automatic Urban and Rural monitoring network have been identified and table C.1 shows the method of annualising these two diffusion tube concentrations.

**Table C.1 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )**

Site ID	Annualisation Factor <Site 1 Name>	Annualisation Factor <Site 2 Name>	Annualisation Factor <Site 3 Name>	Annualisation Factor <Site 4 Name>	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
DT26	1.0458	0.9606	1.2236		1.0767	28.1	30.2
DT45	0.9867	0.8701	1.2069		1.0212	24.6	25.1

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from  $\text{NO}_x/\text{NO}_2$  continuous analysers. Within South Tyneside, we have one such co-location at the Lindisfarne, where continuous monitoring station CM2 is co-located with DT20-22. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Tyneside Council have applied a **local** bias adjustment factor of 0.92 to the 2022 monitoring data. A summary of bias adjustment factors used by South Tyneside Council over the past five years is presented in Table C.2.

**It is important to note**, the national bias adjustment factor has been calculated at 0.84, and if this factor had been used in the calculations the concentrations at all sites would be reduced. However South Tyneside Council have taken the option of using the worst case scenario figure to arrive at our outcomes.

**Table C.2 – Bias Adjustment Factor**

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	Local	-	0.92
2021	National	03/22	0.84
2020	Local	-	0.85
2019	National	03/20	0.93
2018	National	03/19	0.93

**Table C.3 – Local Bias Adjustment Calculation**

	Local Bias Adjustment Input 1
Periods used to calculate bias	12
Bias Factor A	0.92 (0.83 - 1.02)
Bias Factor B	9% (-2% - 20%)
Diffusion Tube Mean ( $\mu\text{g}/\text{m}^3$ )	23.4
Mean CV (Precision)	5.7%
Automatic Mean ( $\mu\text{g}/\text{m}^3$ )	21.5
Data Capture	98%
Adjusted Tube Mean ( $\mu\text{g}/\text{m}^3$ )	22 (19 - 24)

**Notes:**

A single local bias adjustment factor has been used to bias adjust the 2022 diffusion tube results.

**NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.



No diffusion tube NO<sub>2</sub> monitoring locations within South Tyneside required distance correction during 2022

## QA/QC of Automatic Monitoring

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.

## PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment

The type of PM<sub>10</sub> monitor(s) utilised within South Tyneside Council do not require the application of a correction factor.

## Automatic Monitoring Annualisation

All automatic monitoring locations within South Tyneside Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

## NO<sub>2</sub> Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No automatic NO<sub>2</sub> monitoring locations within South Tyneside Council required distance correction during 2022.

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

Figure D.1 – Map of Non-Automatic Monitoring Sites – Boldon Lane AQMA

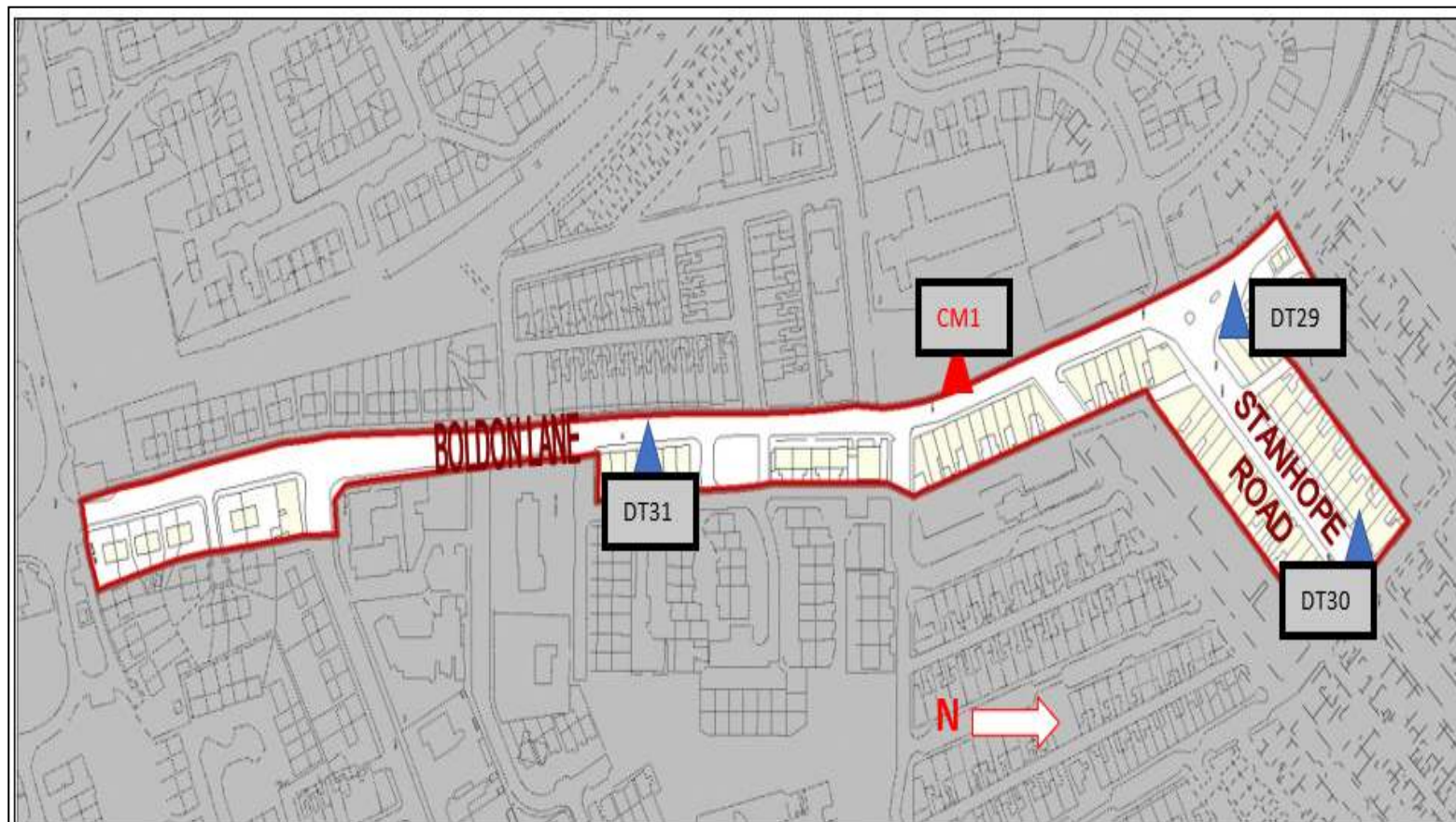
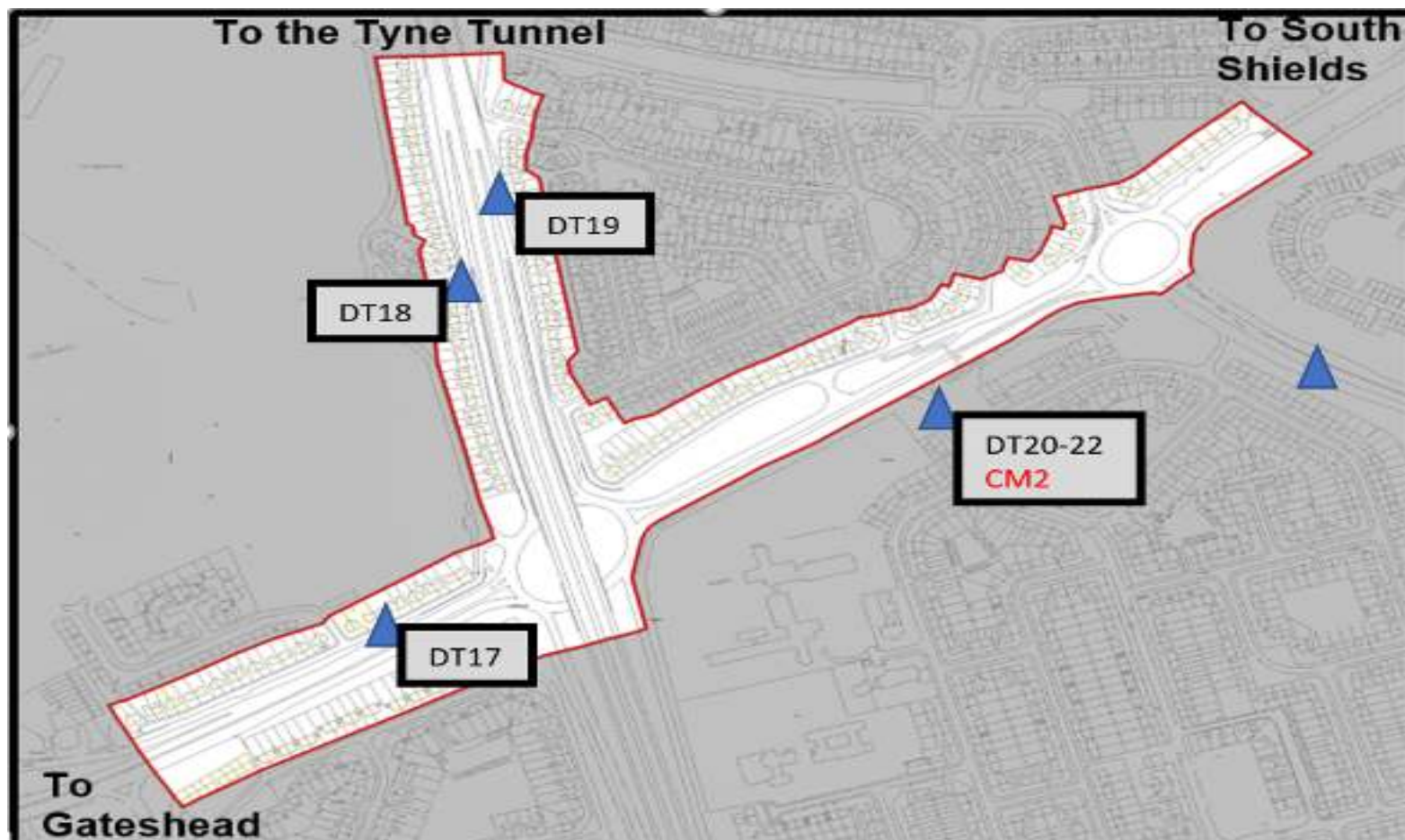


Figure D.2 – Map of Non-Automatic Monitoring Sites – Lindisfarne roundabout/Leam Lane AQMA



Non-Automatic monitoring sites - Hebburn





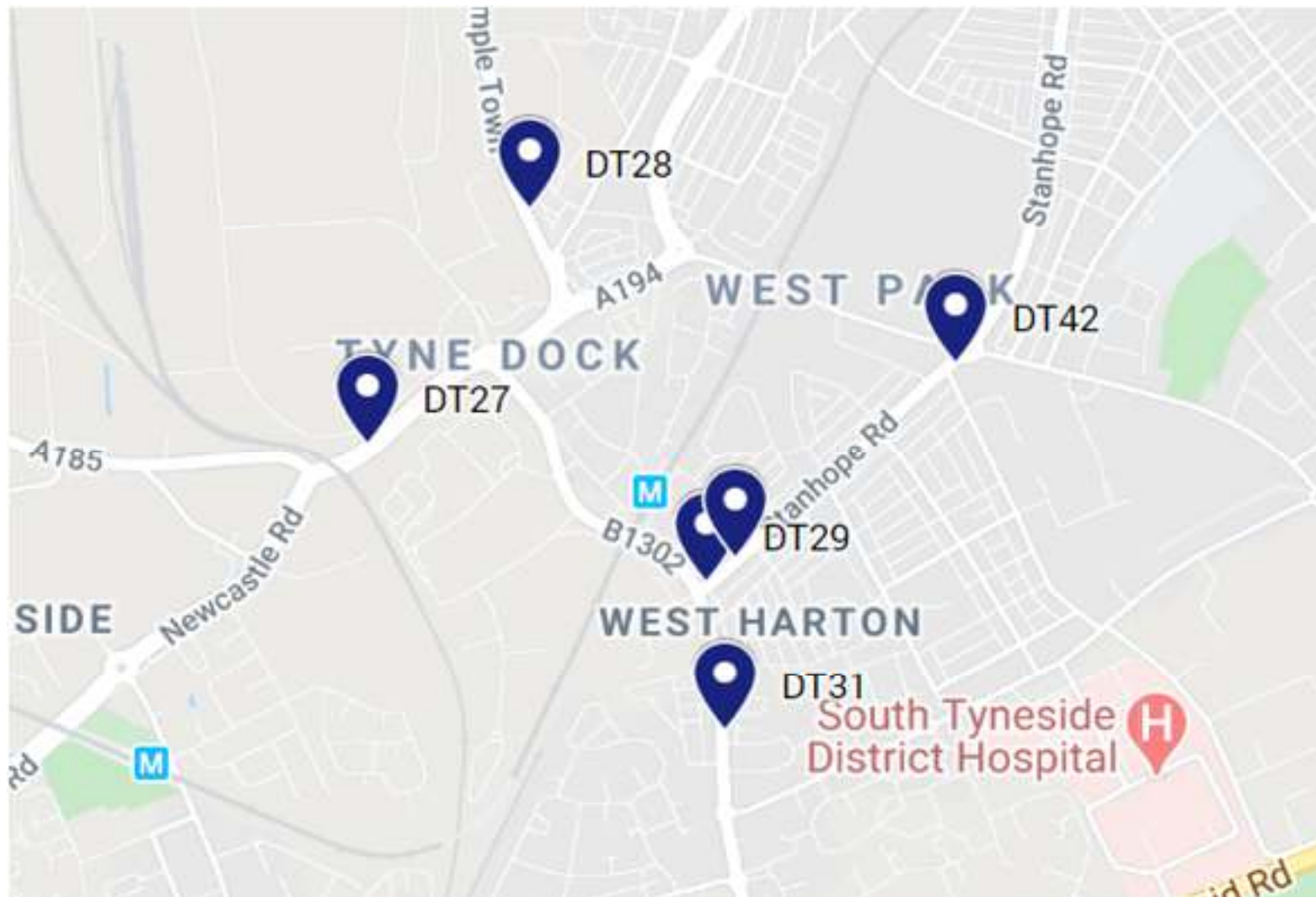
Non-Automatic monitoring sites - Jarrow



**Non-Automatic monitoring sites – Boldon and A19**



Non-Automatic monitoring sites Location Map – Tyne Dock and West Park

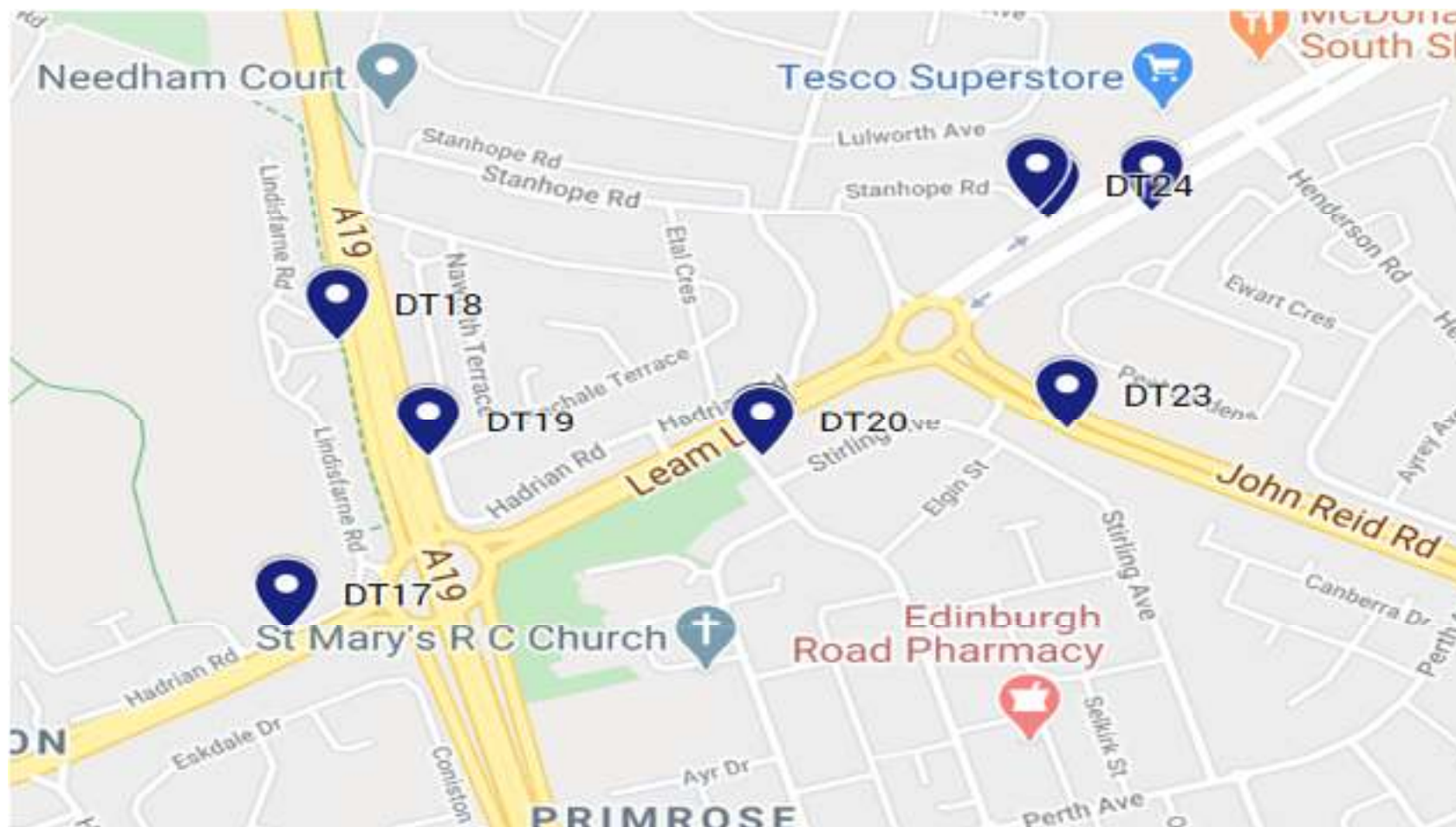




Non-Automatic monitoring sites Location Maps – Harton



Non-Automatic monitoring sites Location Map – Lindisfarne, Jarrow



### Non-Automatic monitoring sites Location Map – South Shields



Non-Automatic monitoring sites Location Map – Cleadon and Whitburn



## Appendix E: Summary of Air Quality Objectives in England

**Table E.1 – Air Quality Objectives in England<sup>8</sup>**

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO <sub>2</sub> )	40µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM <sub>10</sub> )	40µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>8</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide

## References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022.  
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022.  
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.