South Tyneside Council

2024 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: June 2024

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Executive Summary: Air Quality in Our Area

Air Quality in South Tyneside Council

The main cause of air pollution within South Tyneside, like many other similar authorities is road traffic emissions.

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry

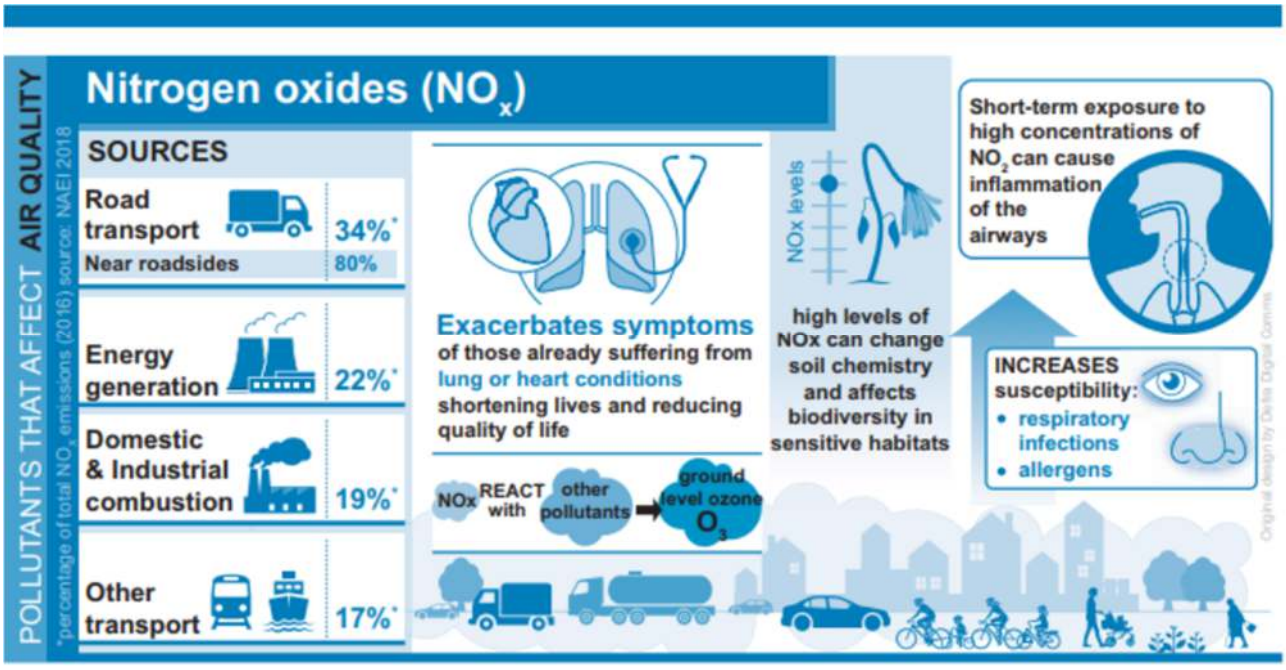
[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

$PM_{2.5}$)	and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

What is Nitrogen Dioxide and what can it do to me?

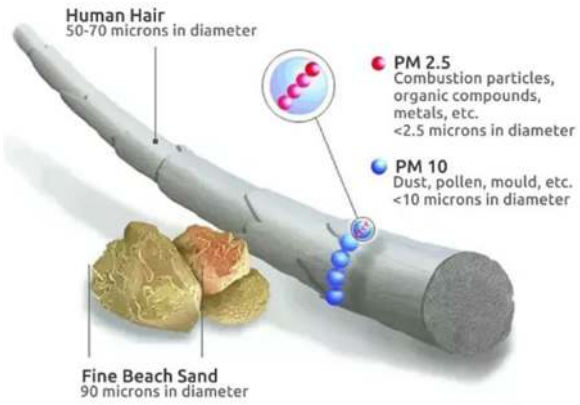
NO2 is formed from the nitrogen that is released during fuel combustion which combines with oxygen atoms to create nitric oxide (NO). This further combines with oxygen to create NO2. NO converts to NO2 very quickly and vice versa. It is usual scientific practice to refer to the two gases together as nitrogen oxides (NOX). For reporting and measurement purposes, we report NOX as NO2. NO2 is an irritant gas and is harmful to health both in the short and long-term, particularly among people with respiratory illness. High levels of exposure have been linked with increased hospital admissions due to respiratory problems, while long-term exposure may affect lung function and increase the response to allergens in sensitive people. NOx also contributes to smog formation, and acid rain, can damage vegetation, contributes to ground-level ozone formation and can react in the atmosphere to form fine particulate matter. The sources of NOx and their effects are shown below



What is Particulate Matter (PM) and what can it do to me?

Particulate matter is everything in the air that isn't a gas, a suspension of particles which are solid, liquid or somewhere in between. It can come from natural sources such as pollen, sea spray and desert dust, and human made sources such as smoke from fires,

soot from vehicle exhausts, dust from tyres and brakes, as well as emissions from industry. Particles emitted directly from these sources are called primary PM. Secondary PM is formed in the atmosphere through chemical reactions between other air pollutant gases such as nitrogen oxides (NOX), ammonia (NH3) and sulphur dioxide (SO2). Particulates are classified according to size, either as PM10 (particles of ≤10µm (micrometres) diameter) or PM2.5 (particles of ≤2.5µm diameter particles which are 200 times smaller than a grain of sand). The distinction between PM and the other air pollutants considered here is somewhat artificial. PM is not a single pollutant; it is made up from a huge variety of chemical compounds and materials. Both PM and the gases that can form it travel large distances, so impacts may occur far from the original source. PM2.5 are very small particles that are smaller than 2.5 microns in size. To give that some perspective, a PM2.5 particle is around 200 times smaller than a grain of sand.

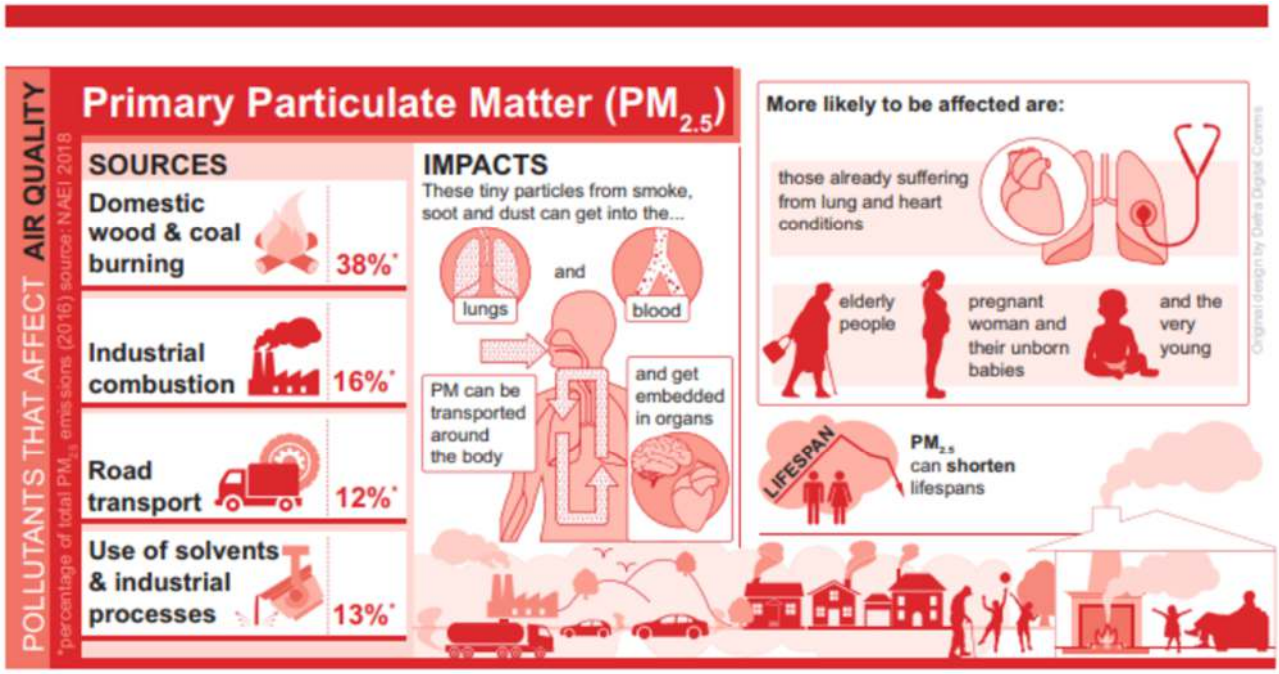


Due to the size of the particles, they are easily breathed into the lungs, reaching the gaseous exchange regions, and transferring to the blood stream. Particles are then able to lodge in organs causing illness and disease. PM2.5 is also linked to vehicle exhaust systems but is also released from braking systems and tyre wear. They have short and long-term effects on human health. The sources of Primary Particulate Matter and its effects are shown below.

Between 1970 and 2021 primary PM10 emissions fell by 79%, and primary PM2.5 emissions fell by 85%. Since the late 2000s, annual emissions of particulate matter have fluctuated year-on-year. Considerable decreases in emissions from some sectors have been largely offset by increases in emissions from wood burning in domestic settings and from solid fuel burning by industry (particularly the burning of biomass). Around 15% of UK PM comes from naturally occurring sources such as pollen and sea spray, up to a third

from other European countries and around half from UK human-made sources. PM is formed of tiny particles that can get into the lungs and blood and be transported around the body, lodging in the heart, brain and other organs. PM affects health in two ways: by being toxic or by providing a surface for transporting toxic compounds to where they can do harm. PM can have short-term health impacts over a single day when concentrations are elevated, and long-term impacts from lower-level exposure over the life course. Effects are amplified in vulnerable groups including young children, the elderly, and those suffering from breathing problems like asthma.

The recent rise in the popularity of open fires and wood burning stoves has seen a significant increase in the amount of particulate matter attributable to domestic burning and represents the greatest contribution at around 40% of UK primary PM emissions. Around12% comes from road transport (e.g., fuel related emissions and tyre and brake wear) and a further 13% comes from solvent use and industrial processes (e.g., steel making, brick making, quarries, construction).



Smoke control areas

Most of the borough of South Tyneside is classified as a Smoke Control Area with a small number of exemptions. Smoke control areas were primarily introduced to help minimise the pollution from open fires in houses and are not used to control garden bonfires (although South Tyneside Council would actively discourage this practice due to impacts on local air quality and the potential to a cause statutory nuisance). DEFRA has produced a useful Smoke Control Area map covering the UK Smoke Control Area Interactive Map **Smoke Control Area Interactive Map (defra.gov.uk).** They have also published specific guidance on open fires and wood burning stoves that should be followed **Open fires and wood-burning stoves - a practical guide (defra.gov.uk).**

Air Quality Monitoring and Reporting Arrangements

There are two different arrangements in place for monitoring and reporting on air quality in the UK. This can sometimes cause confusion to those who are not familiar with the monitoring and reporting arrangements. Firstly, there is the national monitoring arrangement whereby the UK Government must report to the European Commission. The 2008 Ambient Air Quality Directive (2008/50/EC) sets the UK legally binding limits of maximum permissible levels for roadside concentrations of pollutants that impact public health including NO2 and PM2.5. This was incorporated into UK law by the Air Quality Standards Regulations 201012. Guideline targets have been established as national air quality (NAQ) objectives and European Directive limits. The Government operates an extensive national monitoring network which is supplemented by pollution control modelling and reports to the European Commission on progress to meet the requirements of the European Directive annually.

Secondly, there are requirements placed on local authorities like South Tyneside Council under The Environment Act 1995. This is known as Local Air Quality Management (LAQM). LAQM is the statutory process by which local authorities monitor, assess and act to improve local air quality. Where a local authority identifies areas of non-compliance with the air quality objectives as set out in Table 1.1 of the LAQM Technical Guidance (TG22), and there is relevant public exposure as determined in Box 1.1 of the guidance – *Examples of Where the air quality Objectives Should Apply*, there remains a statutory need to declare the geographic extent of non-compliance as an Air Quality Management Area (AQMA) and to draw up an action plan detailing remedial measures to address the

problem. **The content of this report applies to LAQM rather than reporting on the European Directive requirements.**

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.

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[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and 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:

[3] Defra. Environmental Improvement Plan 2023, January 2023

[4] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

[5] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- 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
- 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.

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);
- 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 South Tyneside Physical Activity Strategy is due to be refreshed in the coming months. South Tyneside took part in 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.

The SLI self-assessment tool adopts a whole system approach to physical activity using international evidence on what works for physical activity. It focuses on several key areas, including active travel and active urban design thus making it very relevant to the Air Quality Annual Status report.

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 2024, there are 59 operational charging units in the Borough (46 public, 13 workplace). Of this total. Details of charging points across South Tyneside can be found: Electric car charging - South Tyneside Council
- 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. 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 across the borough.

North East Active Travel Strategy

The North East Active Travel Strategy is a collaboration between local and central government, active travel England and local people. It could transform the way we travel to work education and leisure up to 2035 and sets out ambitious targets to improve the number of journeys being completed by walking, wheeling or using public transport. Achieving the goals of this strategy would result in fewer vehicles on the road and improved air quality.

Conclusions and Priorities

South Tyneside Council is currently meeting local air quality objectives for NO_2 and PM_{10}.

No exceedances of the national objective levels have been recorded across the borough and we have not declared any new air quality management areas (AQMA's).

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_2 within both AQMA's remained below the annual objective level of 40 µg/m3 and that there is a predicted downward trend in background NO_2 concentrations at both sites from 2018 – 2030. Monitoring data from 2023 shows concentrations under 40 µg/m3 at all monitoring locations within the previous AQMA's.

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 2023 and the data collected from continuous monitoring stations has not identified any exceedance of the national objective levels for NO_2 or PM_{10} over the last eight years.

The monitoring locations show a varying picture of slight increases and decreases in emission levels when comparing against last year's data. The highest levels continue to be found at DT27 – The Arches roundabout. This is to be expected given the levels of traffic and the number of HGV's serving the Port of Tyne. However, the closest residential receptors are a significant distance away and the area does not lend itself to people spending a significant amount of time close to the monitoring location. The largest increase from last year's data is found at DT36 Chichester roundabout, where the increase is from 27.4 to 34.1 µg/m3. This increase can potentially be attributed to the significant works ongoing at the location in 2023, with plant such as diesel generators being in the location for the regeneration of the area around the Chichester Metro station.

When considering emissions levels however, it is important to be aware of the choice of adjustment factor that is applied to the annual mean. This is discussed in greater detail in the report, however, results in 2023 vary greatly depending on the choice of adjustment factor. Had a national adjustment factor been applied, all monitoring sites would show a decrease in levels from 2022 to 2023.

In last year's annual status report, we stated three priorities for 2023 –

- **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_2, PM10 and PM2.5) throughout the duration of the project.

This project is ongoing, with sensors recently having been deployed and the website to go live in the coming months.

- **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).

A technical review of all 3 monitoring stations concluded that equipment was obsolete and regularly failing, it was determined that all equipment should be replaced.

Two of the three stations have been upgraded to monitor not only NO_2 and PM10 but also PM2.5, South Tyneside Council recognise the importance of obtaining accurate measurements of PM2.5 and are committed to reducing this harmful pollutant to as low as possible.

Replacing all equipment gave us the opportunity to review the locations of our monitoring network which had been in place without review since 1999.

It was determined that given the extensive development within Hebburn it would be prudent to locate a continuous monitoring station with additional PM2.5 monitoring capability in the area to further characterise air quality. Hall Road was selected as the location of the monitoring station.

To accommodate locating a station at Hall Road, Hebburn, the Tyne dock continuous monitoring station has been decommissioned. The rationale is that we have increased the number of diffusion tubes around this site, and it was near our Boldon lane continuous monitoring station which will continue to monitor NO_2 and PM10.

The Edinburgh Road location was retained as it is on the A194 an arterial route in and out of the Borough with significant housing estates in the vicinity. The station now also has PM2.5 monitoring capabilities.

- **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.

Officers from the Environmental Health Service have carried out a number of proactive visits to all retail sellers to ensure that all are compliant with the regulations as set out in the Environment Act 2021.

Local Engagement and How to get Involved

A significant proportion of air pollution is a result of road traffic sources, the two main pollutants of concern being NO_2 and PM_{10}. Making changes to your daily life including walking short journeys, using public transport and car sharing will ultimately reduce levels of NO_2 and PM_{10}.

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 NOx (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 – Infrastructure and transport
- Christina Hardy – Public Health
- Ellie Forrester – Public Health
- Michael Vasey – Environmental Sustainability

This ASR has been approved by:

Stuart Wright – Director of Place and Communities

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

Tom Hall - Director of Public Health

If you have any comments on this ASR please send them to **Kevin Burrell** at:

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in South Tyneside Council during 2023. 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

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority 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 is in place 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

2.2

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

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

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

1. A few formatting errors or inconsistencies remained in the report.

   These formatting errors have been resolved.

2. STMBC has provided an in-depth discussion about the impact of $PM_{2.5}$ and the mortality within the Borough, as well as how specific measures from Table 2.1 will contribute to reductions of $PM_{2.5}$.

   Noted

3. Both AQMAs were still technically active in the reporting year of 2022 as they were not revoked until January 2023, therefore they should have been reported in this ASR. However, the concentrations were low throughout the Borough with no exceedances since at least 2018 so they were clearly compliant.

   Noted

4. The Council have provided a comparison between the local and national bias adjustment factors and the impact that each would have on the monitored concentrations as well as the justification for the choice of the local bias adjustment factor. This is commended.

   Noted

5. Clear graphs have been produced for the trends observed in the monitored data in different areas and the previous AQMAs. In future ASRs, these should include the AQO and the colour scheme could be consistent throughout the series of figures for clarity.

   Noted and improvements made to consistent colour scheme and AQO added

6. In the maps in Appendix D, the labels for some monitoring sites were missing and automatic sites were missing completely.

   Noted and maps updated and corrected with labels and automatic sites

South Tyneside Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. 20 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 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Key completed measures are:

- 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
- Review and subsequent upgrade of Continuous monitoring stations
- Consultation and publication of new air quality strategy.

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 the A184 corridor 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. Works have commenced on the NCN1 cycling route and are expected to be complete by late 2024.

- **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 planning application which is expected in the Summer of 2024.

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

  South Tyneside has been successful in bidding for on-street charging point funding through Central Government with £70,000 awarded in 2024 to implement 12 charging points.

  Further to this, the Council has agreed a new operational model through a concession contract which will see the network operated by Connected Kerb over a 20 year contract and will see the roll-out of 2,000 charging units.

- **School Streets**

  South Tyneside in working with Sustrans will implement a second year of delivery in terms of operating school streets to reduce private vehicle trips during the school run in favour of sustainable transport modes. Through pursuing effective parking restrictions during the school run and promoting active travel, it is considered that vehicular trips can be reduced which will alleviate congestion and improve air quality.

- **DEFRA Air Quality Grant 23/24**

  South Tyneside has been successful in bidding for DEFRA Air Quality Grant Funding which will see the implementation of an air quality sensor deployment scheme focussing on school run journeys and also on the impacts on wood burning facilities. Further to this, work will be undertaken to develop a public-facing website for reporting air quality information from our continuous / non-continuous monitoring regimes.

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

- **Continue to work with the planning team** to ensure air quality implications are considered during the planning process
- **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 (NO2, PM10 and PM2.5) throughout the duration of the project.
- **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
- **Continued assessment of local air quality**. Monitoring the Local Air Quality monitoring network to ensure new continuous monitoring stations are reporting appropriate data and assessing levels at new monitoring station in Hebburn.

South Tyneside Council worked to implement these measures in partnership with the following stakeholders during 2023:

- National Highways
- Ricardo
- Neighbouring local authorities
- North East Combined Authority (NECA)

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	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	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	Website to be developed as part of DEFRA bid
2	Set up a multi-disciplinary air quality steering	Policy Guidance and Development Control	Groups co-ordinating programmes	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
3	Ensure new developments are assessed against air quality impacts	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	Planning applications are assessed when they come into the system.
4	Formulation of 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	Strategy Development	Complete	Endorsed at Cabinet in 2022.
5	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 impacted	Ongoing	Ongoing.
6	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	2023/24	Plan is expected to be endorsed in 2024.
7	Set Up a Regional Air Quality Group	Policy Guidance and Development Control	Regional Groups co-ordinating programmes	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.	Ongoing	Regular meetings
8	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
9	STC promoting electric vehicles through an employer car lease scheme	Promoting Low Emission Transport	Company Vehicle Procurement -Prioritisin 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
10	Investment in Electric Charging Infrastructure	Promoting Low Emission Transport	Priority parking for LEV's	2010	Ongoing	STC	OZEV	n/a			Implementation	No direct improvement	Reduced emissions, Improved air quality	Ongoing	New concession contract which will install 2000 chargers over a 20 year period
11	Council Fleet to investigate options for electric fleet including Taxi's	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritisin uptake of low emission vehicles	2020	Ongoing, with STH fleet taking ownership of EV vans	STC		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.

Measure No.	Measure Title	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
12	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.
13	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.
14	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	Travel information is provided on a daily basis.
15	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.
16	Working with Bus Operators to deliver Enhanced Bus Partnership	Promoting Travel Alternatives	Public transport improvements- nterchanges stations ar services	2020	2023	STC / Nexus / Bus Operators	Clean Bus Funding	n/a	n/a	n/a	Complete	Yes	Reduced emissions, Improved air quality,	Delivered	Reduced fares and new bus services identified.
17	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	Cycling Improvements complete on Coast Road
18	School Streets Delivery	Promoting Travel Alternatives	Active Travel	2022	Ongoing	STC / Sustrans	Capability Funding		n/a		Implementation	Yes	Reduced emissions / improved air quality	Ongoing	Trial undertaken in 23/24, with further year extension in 24/25
19	Sustainable travel education and engagement	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	Road Safety Education provided.
20	Create extra capacity on Metros	Promoting travel alternatives	Other	2010	2024	STC Nexus, bus operator	Central Government	No	Funded	£300m	Ongoing	Yes	Nexus and contractor working on new delivery fleet	Ongoing	

2.4 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[6], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) 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 – 2022

	Male	Female
South Tyneside	76.6 years	80.8 years
National Average	78.8 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.

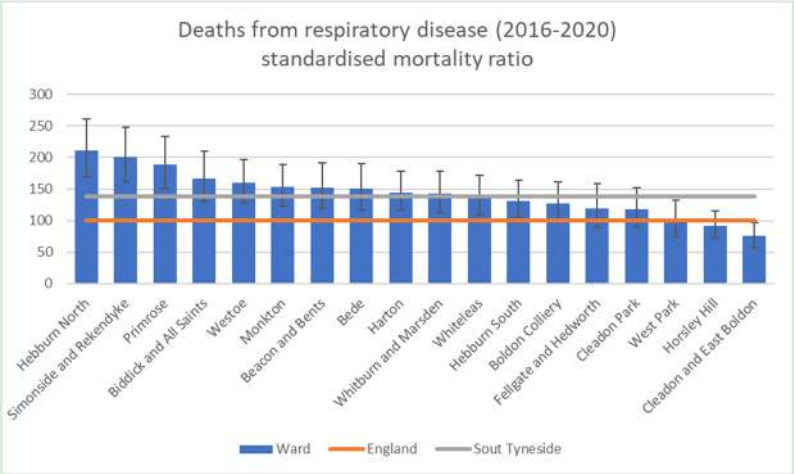
- Premature (under 75 years) mortality rates from all cardiovascular disease of 93.5 per 100,000 as compared to 76.0 per 100,000 for England; of this 40.7% per 100,000 were considered preventable. (2021)
- Premature (under 75 years) mortality rates from respiratory disease of 49.6 per 100,000 as compared to 30.7 per 100,000 for England; of this 30.3 per 100,000 were preventable. (2022)

[6] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

- Premature (under 75 years) mortality rates from cancer of 144 per 100,000 as compared to 122.4 per 100,000 for England; of this 74.6 per 100,000 were preventable. (2022)

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 2022/23 hospital admissions for asthma in children (birth to 9 years) was 153.8 per 100,000 in South Tyneside. Across the northeast were the rate was 178.1 per 100,000 as opposed to the England rate of 154.7 per 100,000.[7]

Life expectancy for local areas in England, Northern Ireland and Wales - Office for National Statistics (ons.gov.uk)

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

- 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 $PM_{2.5}$:

Undertaking all measures detailed in the executive summary and detailed in table 2.2 will have a positive effect in reducing NO_2 and PM_{10} and would have similar effect upon levels of $PM_{2.5}$.

Specifically, measure 1, **Completion of the public website** to better inform members of the public in relation to air quality within South Tyneside. 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 (NO2, PM10 and PM2.5) throughout the duration of the project. And measure 18, **School Streets Delivery project** which is managed by Sustrans aims to reduce PM2.5 exposre 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

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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

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

be extended to other suitable schools within the borough, subject to the appropriate investigations and consultations.

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 were made to 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 2023 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 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Tyneside Council undertook automatic (continuous) monitoring at 3 sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem.

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_2 at 41 sites during 2023. 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 at STC Diffusion tube locations. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, 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.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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 2023 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_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

No non-automatic or automatic monitoring sites within the South Tyneside Council network produced levels above the annual air quality objective.

As no diffusion tubes have a concentration of over 60 µg/m^3, this indicates that the hourly objective of 200 µg/m3 not to be exceeded more than 18 times a year has not been breached.

One monitoring location was removed from the network in 2023. DT35 at Imeary Street/The Glebe was removed due to persistent vandalism resulting in a lack of meaningful data. The tube has been persistently well under the Annual air quality objective.

Automatic monitoring stations CM1 has remained at a similar level to last year, CM2 shows a slight increase on last year's levels, whilst CM3 at Tyne Dock shows a significant decrease.

The levels at all monitoring locations were below air quality objectives and European Limit Values.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. There were no breaches of this objective in 2023.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

Monitoring at CM2 has shown no change to last year's levels, CM3 shows a slight decrease in levels from 2022.

The levels at all monitoring locations were below air quality objectives and European Limit Values.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

South Tyneside started to report on $PM_{2.5}$ in 2016. As detailed in Policy Guidance LAQM.PG22 $PM_{2.5}$ levels can be estimated from PM_{10} levels by using a nationally derived correction ratio of 0.7.

Monitoring at CM2 has shown no change to last year's levels, CM3 shows a slight decrease in levels from 2022.

The levels at all monitoring locations were below air quality objectives and European Limit Values.

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) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Boldon Lane, South Shields	Roadside	435949	564468	NO2	No	Chemiluminescent	15	3	1.5
CM2	Lindisfarne Roundabout, Jarrow	Roadside	434068	563695	NO2; PM10	No	Chemiluminescent TEOM	27	1	2
CM3	Tyne Dock South Shields	Roadside	435565	565040	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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	Sunderland Road Jolly Sailor - Whitburn	Roadside	440820	561821	NO2	Not in AQMA	9.3	1.7	No	2.3
DT2	Sunderland Road - Cleadon	Roadside	438542	562321	NO2	Not in AQMA	8.3	1.5	No	2.7
DT3	Front Street Cleadon - Café	Roadside	438412	562368	NO2	Not in AQMA	0.0	2.5	No	2.7
DT4	Station Road East Boldon	Roadside	437053	561418	NO2	Not in AQMA	5.0	1.5	No	2.5
DT5	Front Street / Grange Terrace	Kerbside	436528	561280	NO2	Not in AQMA	4.0	<1	No	2.3
DT6	Front Street / Boker Lane	Roadside	436021	561368	NO2	Not in AQMA	11.5	1.5	No	2.5
DT7	Arnold Street	Roadside	434623	561746	NO2	Not in AQMA	0.0	1.5	No	2.5
DT8	Holland Park Drive (A19)	Roadside	433883	562644	NO2	Not in AQMA	0.0	30.0	No	2.0
DT9	Southlands (A19)	Roadside	433739	562070	NO2	Not in AQMA	19.0	40.0	No	2.9
DT10	Mill Lane / A185 Junction	Roadside	430489	563058	NO2	Not in AQMA	3.0	28.0	No	2.5
DT11	Victoria Road	Roadside	430540	563425	NO2	Not in AQMA	1.6	20.0	No	2.0

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT12	Victoria Road West/South Street	Roadside	430582	563663	NO2	Not in AQMA	3.0	9.0	No	2.0
DT13	Station Road - Hebburn - on PJ Hairdressers	Roadside	430976	564378	NO2	Not in AQMA	0.0	3.8	No	2.6
DT14	Victoria Road East - Junction with Park Road	Kerbside	432393	564994	NO2	Not in AQMA	12.5	<1	No	2.5
DT15	Ellison Street roundabout - Pizza Addict	Roadside	432682	565456	NO2	Not in AQMA	16.2	2.2	No	2.5
DT16	Epinary Walk	Roadside	433088	565007	NO2	Not in AQMA	8.0	28.0	No	2.0
DT17	Hadrian Road	Roadside	433658	563497	NO2	Not in AQMA	2.0	5.0	No	2.5
DT18	Lindisfame Road (55)	Roadside	433698	563825	NO2	Not in AQMA	10.0	8.0	No	2.5
DT19	Hadrian Road/Finchale Terrace Junction	Roadside	433780	563692	NO2	Not in AQMA	3.0	13.5	No	3.0
DT20, DT21, DT22	Edinburgh Road Monitoring Station	Kerbside	434068	563695	NO2	Not in AQMA	30.0	<1	Yes	2.9
DT23	John Reid Road, Junction with Stirling Avenue	Kerbside	434326	563728	NO2	Not in AQMA	19.2	1.8	No	2.9
DT24	Opposite 173 Hadrian Road	Roadside	434297	563934	NO2	Not in AQMA	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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT25	Opposite 237 Newcastle Road	Kerbside	434376	563955	NO2	Not in AQMA	32.0	3.2	No	2.9
DT26	Stanhope Road/Newcastle Road	Roadside	434298	563970	NO2	Not in AQMA	18.0	22.0	No	2.4
DT27	A194 Arches Roundabout	Kerbside	435321	564843	NO2	Not in AQMA	15.0	<1	No	2.4
DT28	Commercial Road	Roadside	435605	565290	NO2	Not in AQMA	3.8	1.5	No	2.5
DT29	Corner of Bolden Lane/Stanhope Road	Kerbside	435926	564596	NO2	Not in AQMA	6.5	1.0	No	2.2
DT30	Stanhope Road	Kerbside	435987	564647	NO2	Not in AQMA	1.0	4.0	No	2.6
DT31	Boldon Lane	Kerbside	435959	564470	NO2	Not in AQMA	2.0	1.7	No	2.4
DT32	King George Road	Kerbside	437540	564355	NO2	Not in AQMA	4.0	13.0	No	2.5
DT33	Sunderland Road, next to the Cranny	Kerbside	437819	564335	NO2	Not in AQMA	7.0	2.0	No	2.3
DT34	Westoe Road	Roadside	437010	565873	NO2	Not in AQMA	7.0	2.0	No	2.5
DT36	Chichester Metro	Kerbside	436727	566374	NO2	Not in AQMA	18.9	<1	No	2.4
DT37	Western Approach (Laygate Flats)	Roadside	436216	566216	NO2	Not in AQMA	11.5	2.5	No	2.7

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT38	Alice Street (A194)	Roadside	436169	565876	NO2	Not in AQMA	<1	27.0	No	2.3
DT40	Anderson Street	Roadside	436098	565902	NO2	Not in AQMA	3.5	8.5	No	2.5
DT41	Campbell Park Road	Roadside	436597	567308	NO2	Not in AQMA	10.0	2.0	No	2.5
DT42	West Park Roundabout	Kerbside	431428	564493	NO2	Not in AQMA	25.0	6.5	No	2.5
DT43	Readhead Park	Roadside	436396	565012	NO2	Not in AQMA	5.0	1.5	No	2.5
DT44	Imeary Street	Roadside	437161	565572	NO2	Not in AQMA	10.0	2.5	No	2.5
DT45	Priory Road	Kerbside	433390	565601	NO2	Not in AQMA	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_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM1	435,949	564,456	Roadside	Automatic	65.8	23	16	19	18	18
CM2	434,068	563,695	Roadside	Automatic	96.2	23	20	20	22	23.6
CM3	435,565	565,040	Roadside	Automatic	96.4	26	20	23	27	20

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

Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/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.

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_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
DT1	440820	561821	Roadside	100	100.0	24.9	20.9	21.7	22.1	23.6
DT2	438542	562321	Roadside	100	100.0	30.6	23.8	24.4	26.8	28.2
DT3	438412	562368	Roadside	90.4	90.4	19.7	13.5	15.8	16.3	18.9
DT4	437053	561418	Roadside	100	100.0	19.8	14.7	14.5	16.3	15.9
DT5	436528	561280	Kerbside	82.7	82.7	23.7	18.1	18.3	20.2	23.4
DT6	436021	561368	Roadside	100	100.0	34.2	21.8	24.8	27.4	29.6
DT7	434623	561746	Roadside	100	100.0	23.1	17.4	21.1	20.3	20.5
DT8	433883	562644	Roadside	90.4	90.4	21.1	16.2	15.9	18.5	19.1
DT9	433739	562070	Roadside	55.8	55.8	19.4	12.7	16.1	18.8	18.6
DT10	430489	563058	Roadside	100	100.0	27.9	20.9	21.9	24.4	25.5
DT11	430540	563425	Roadside	100	100.0	23.3	15.2	18.1	20.5	20.0
DT12	430582	563663	Roadside	90.4	90.4	21.0	15.1	15.6	20.4	20.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
DT13	430976	564378	Roadside	100	100.0	25.1	18.3	22.0	23.1	25.7
DT14	432393	564994	Kerbside	100	100.0	26.3	21.8	19.8	25.9	24.9
DT15	432682	565456	Roadside	100	100.0	23.8	23.7	22.3	24.9	24.1
DT16	433088	565007	Roadside	90.4	90.4	26.2	18.2	19.8	18.7	22.6
DT17	433658	563497	Roadside	100	100.0	31.4	23.2	25.0	24.1	27.3
DT18	433698	563825	Roadside	100	100.0	24.0	19.4	21.3	22.5	23.3
DT19	433780	563692	Roadside	100	100.0	29.5	21.4	24.2	25.3	27.8
DT20, DT21, DT22	434068	563695	Kerbside	100	100.0			23.4	21.5	24.4
DT23	434326	563728	Kerbside	92.3	92.3	27.7	21.1	24.7	22.7	25.7
DT24	434297	563934	Roadside	100	100.0	32.3	24.6	25.9	28.8	30.1
DT25	434376	563955	Kerbside	100	100.0	29.3	22.4	25.0	25.4	27.0
DT26	434298	563970	Roadside	100	100.0	28.8	22.6	24.0	27.8	27.1
DT27	435321	564843	Kerbside	100	100.0	38.1	26.2	29.2	33.2	33.9
DT28	435605	565290	Roadside	100	100.0	29.0	25.0	23.9	23.7	25.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
DT29	435926	564596	Kerbside	92.3	92.3	29.8	21.3	25.9	29.1	28.9
DT30	435987	564647	Kerbside	84.6	84.6	32.6	22.1	27.8	28.1	29.8
DT31	435959	564470	Kerbside	100	100.0	30.7	22.8	26.5	28.1	30.1
DT32	437540	564355	Kerbside	92.3	92.3	24.1	19.0	19.8	23.5	22.8
DT33	437819	564335	Kerbside	100	100.0	26.9	19.5	22.8	25.0	26.4
DT34	437010	565873	Roadside	100	100.0	30.4	23.3	26.0	27.7	28.6
DT36	436727	566374	Kerbside	75	75.0	30.1	19.9	23.4	27.4	34.1
DT37	436216	566216	Roadside	100	100.0	32.6	20.8	31.9	28.9	31.1
DT38	436169	565876	Roadside	100	100.0	18.9	17.6	17.9	19.4	18.2
DT40	436098	565902	Roadside	100	100.0	22.9	19.9	22.3	23.4	23.5
DT41	436597	567308	Roadside	100	100.0	24.8	19.2	20.2	23.7	24.7
DT42	431428	564493	Kerbside	100	100.0	30.8	23.3	26.0	25.5	27.7
DT43	436396	565012	Roadside	100	100.0	26.9	20.7	22.0	22.5	24.3
DT44	437161	565572	Roadside	100	100.0	24.3	19.7	21.6	22.5	23.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
DT45	433390	565601	Kerbside	67.3	67.3				23.1	20.3

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 µg/m^3.

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

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

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 – Trends in Annual Mean NO_2 Concentrations

Figure A.1.1 Trends in Annual Mean NO_2 Concentrations – Lindisfarne/Leam Lane

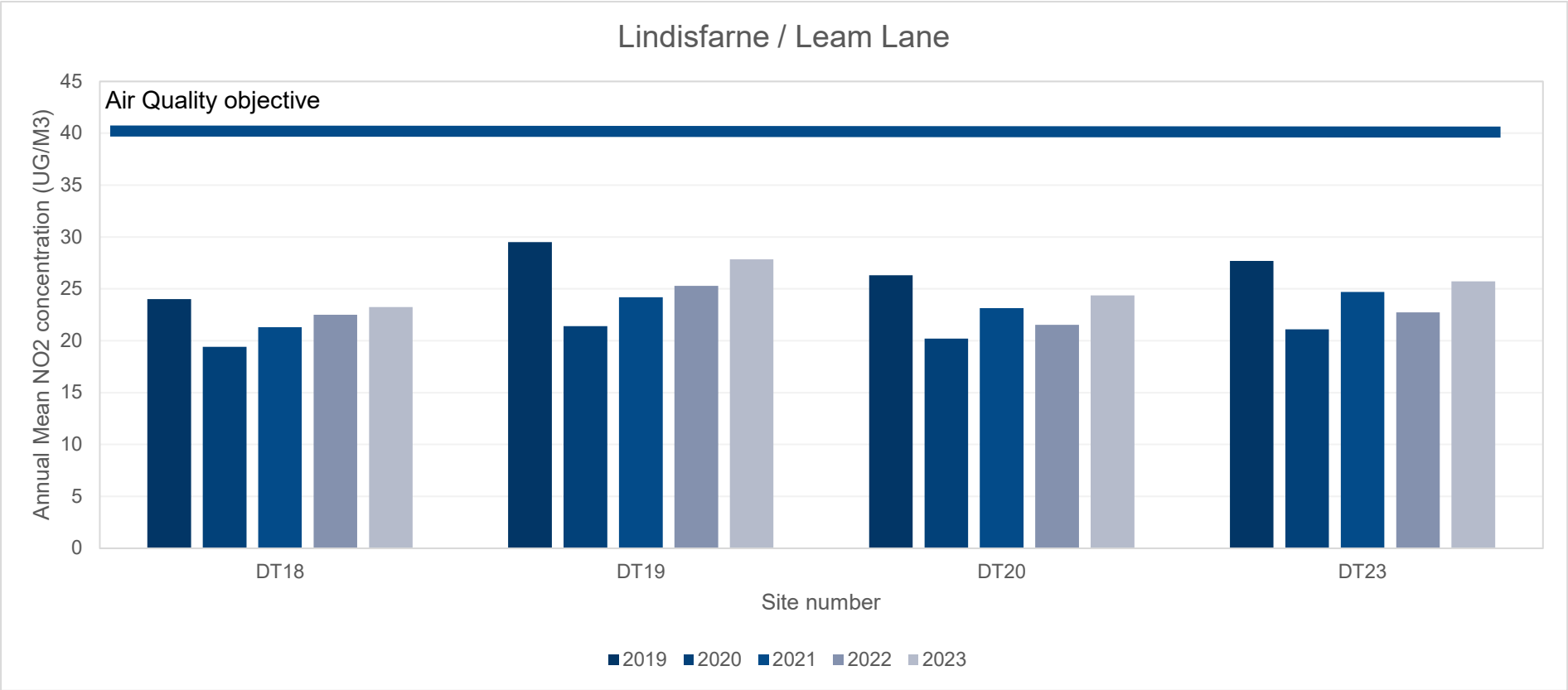


Figure A.1.2 Trends in Annual Mean NO_2 Concentrations – Boldon Lane

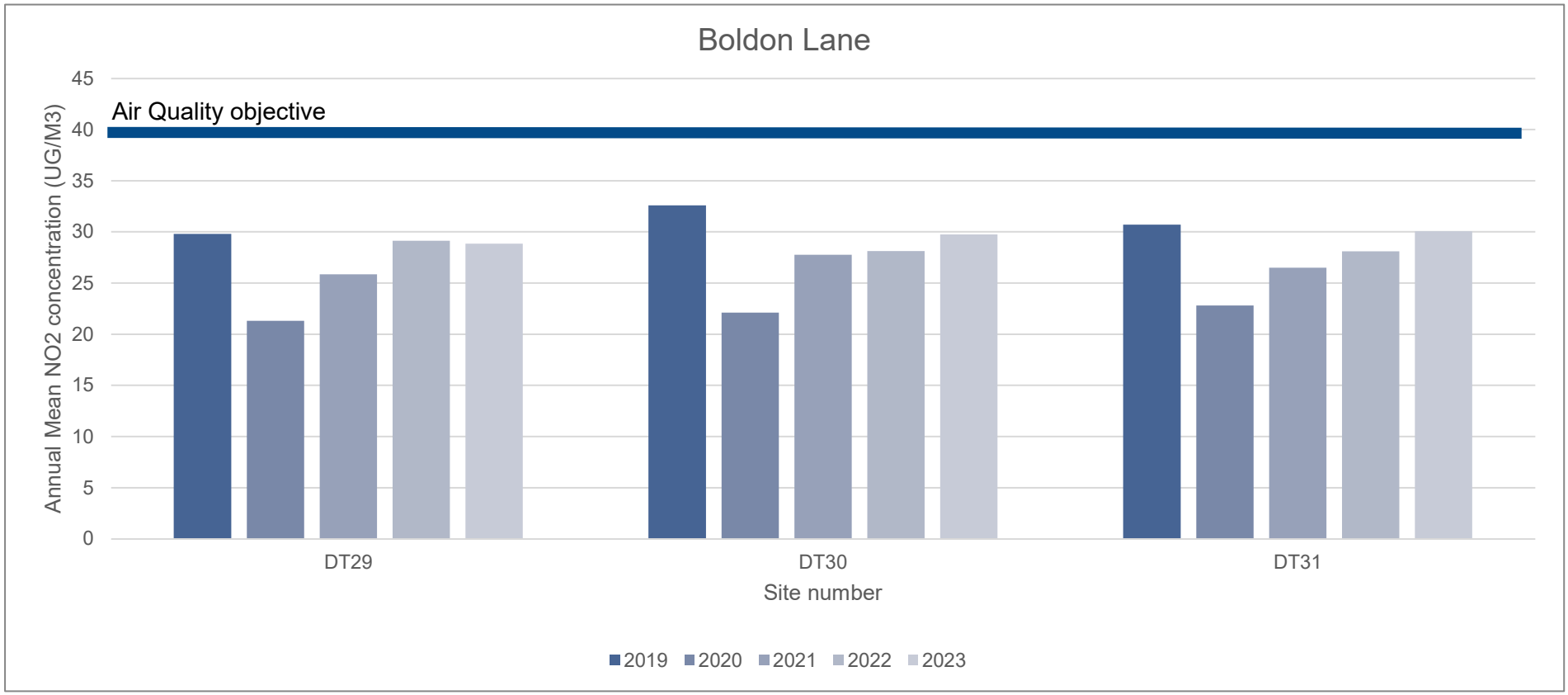


Figure A.2.3 – Trends in Annual Mean NO_2 Concentrations Whiteleas Cleadon and Boldon

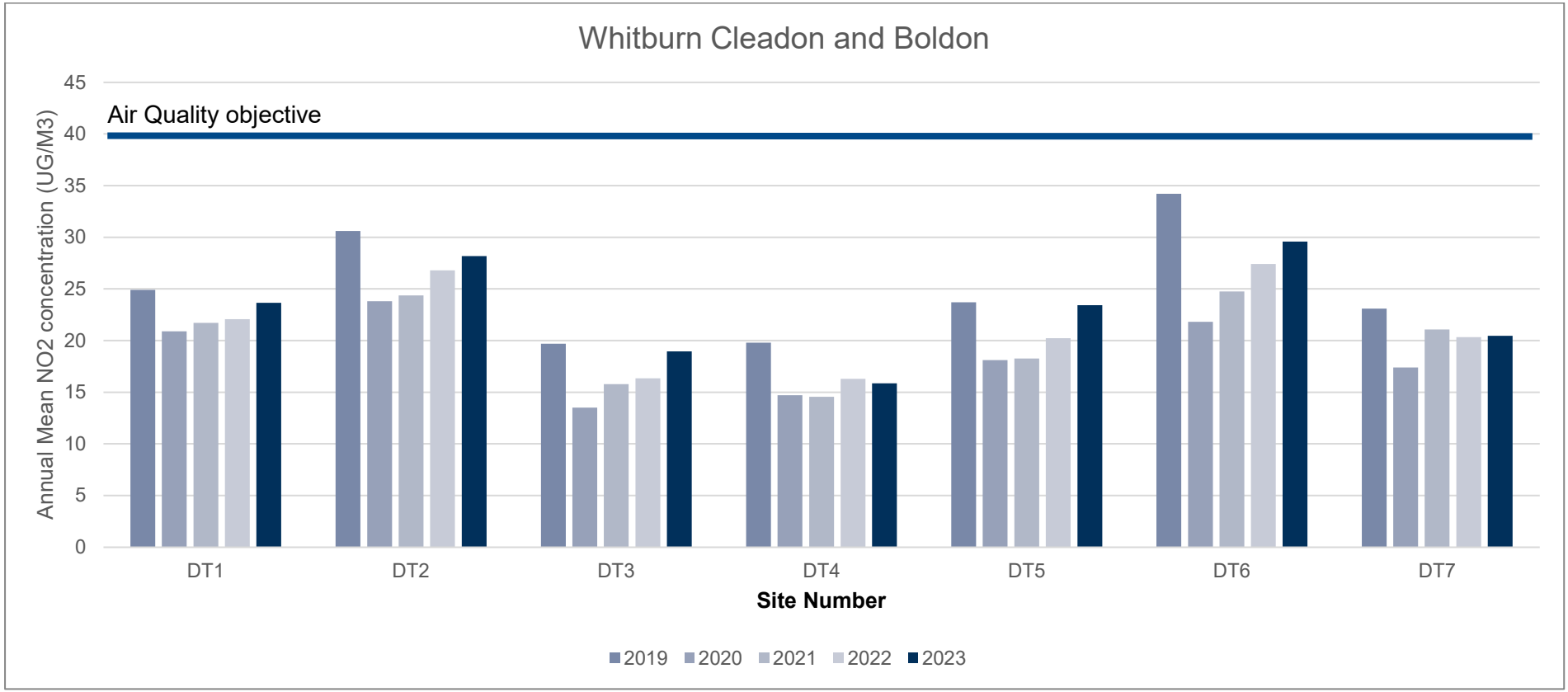


Figure A.3.4 – Trends in Annual Mean NO_2 Concentrations Fellgate for A19

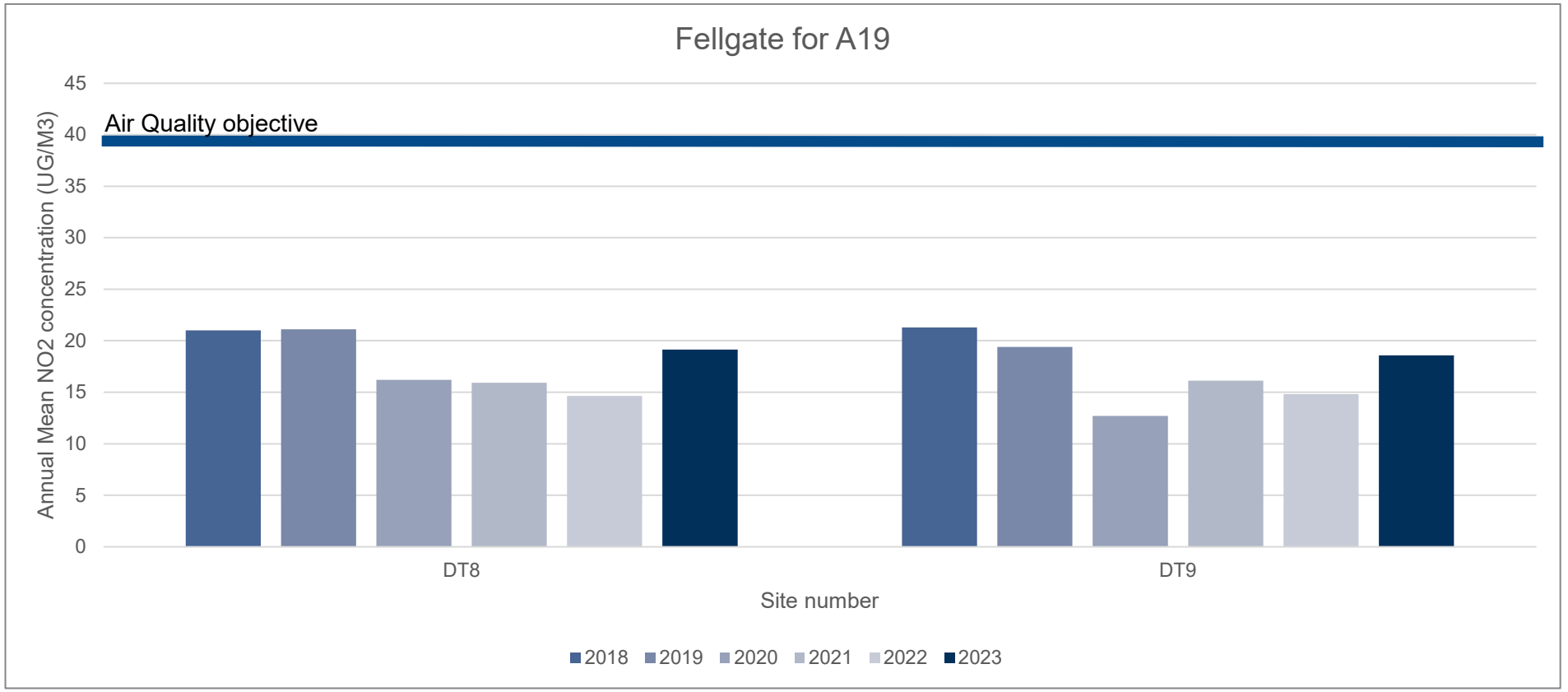


Figure A.4.5 – Trends in Annual Mean NO_2 Concentrations Hebburn and Jarrow

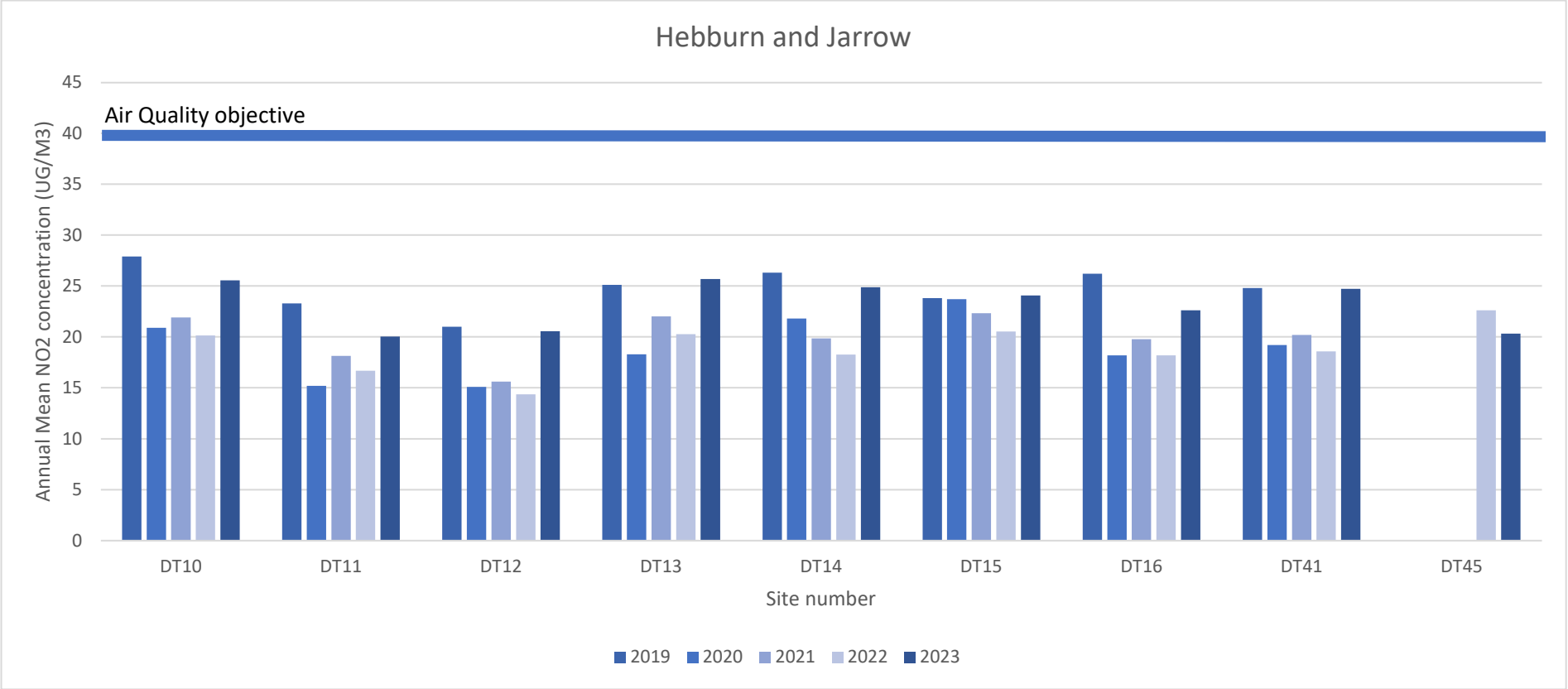


Figure A.5.6 – Trends in Annual Mean NO_2 Concentrations Hebburn and Jarrow

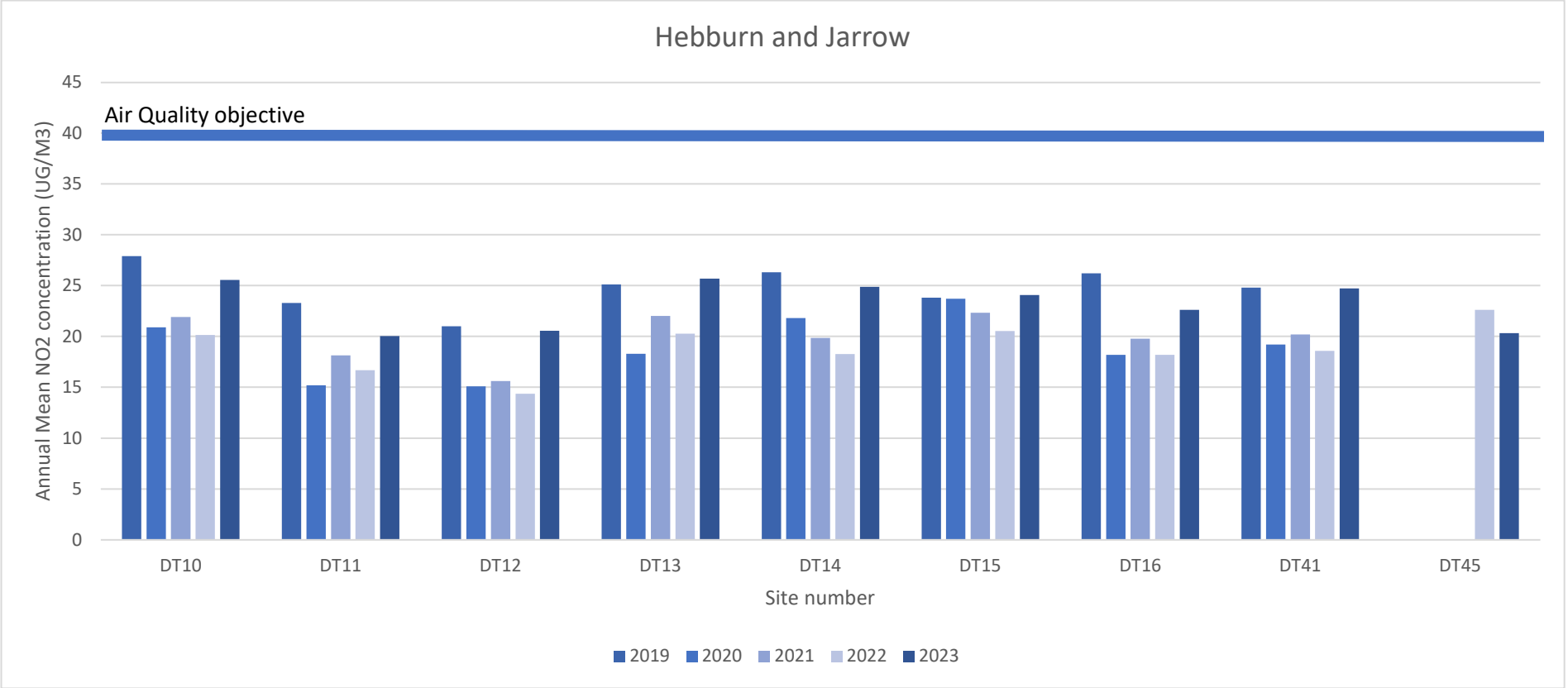


Figure A.6.7 – Trends in Annual Mean NO_2 Concentrations Tyne Dock

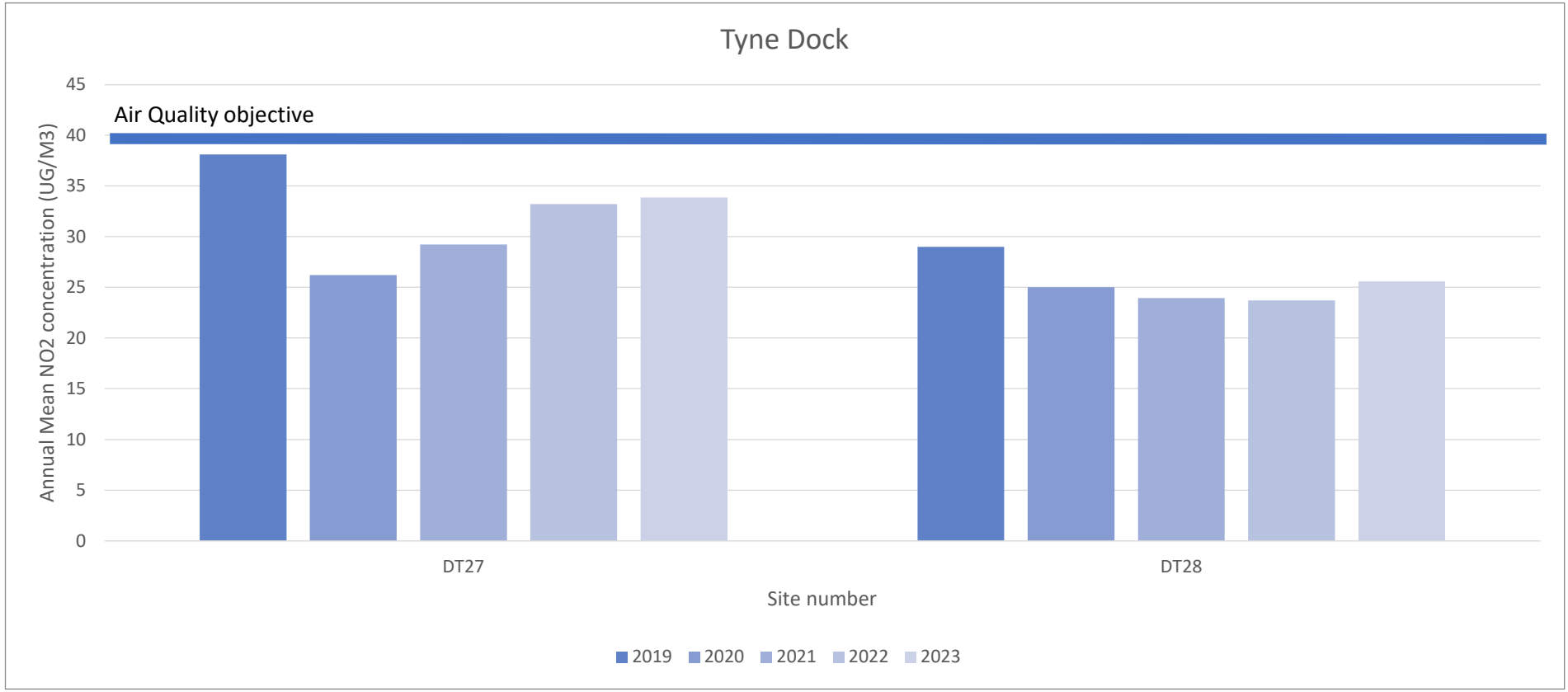


Figure A.7.8 – Trends in Annual Mean NO_2 Concentrations Westoe

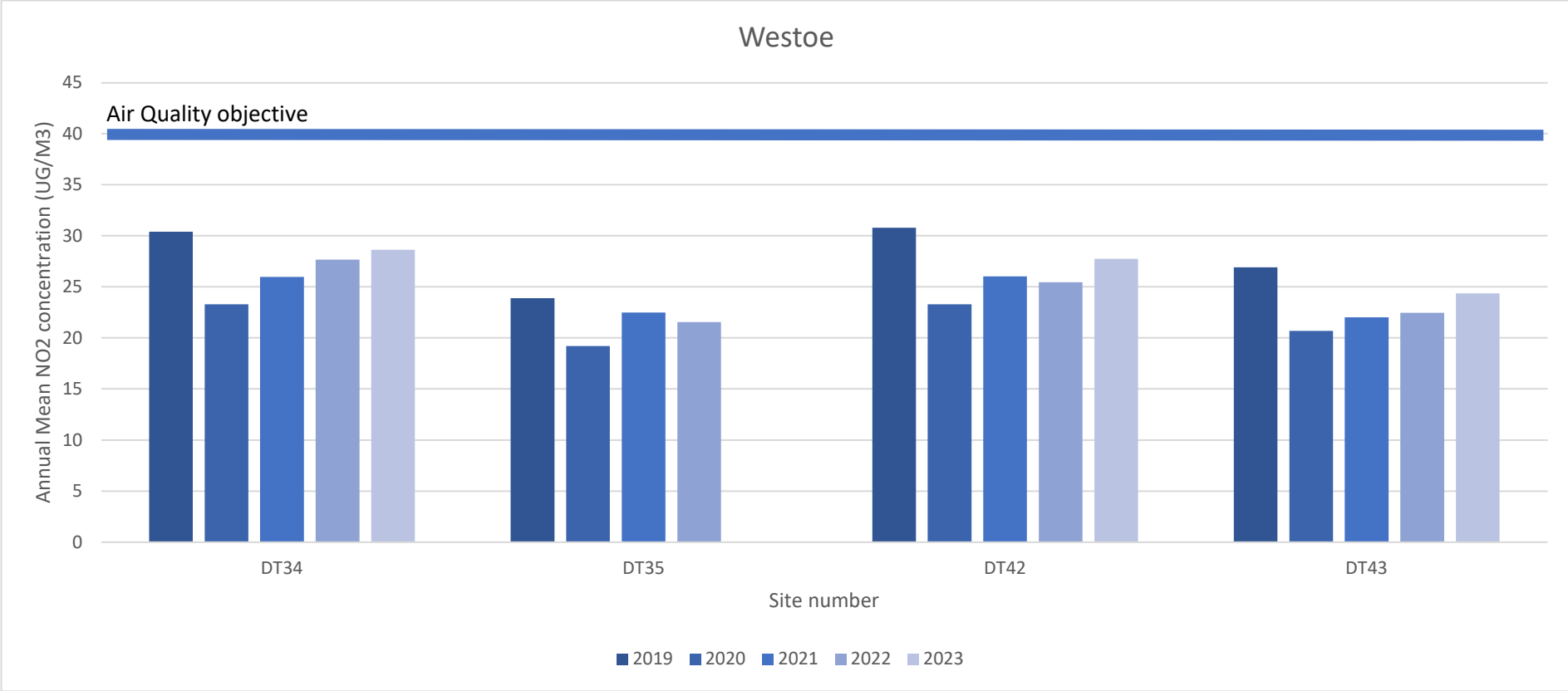


Figure A.8.9 – Trends in Annual Mean NO_2 Concentrations South Shields

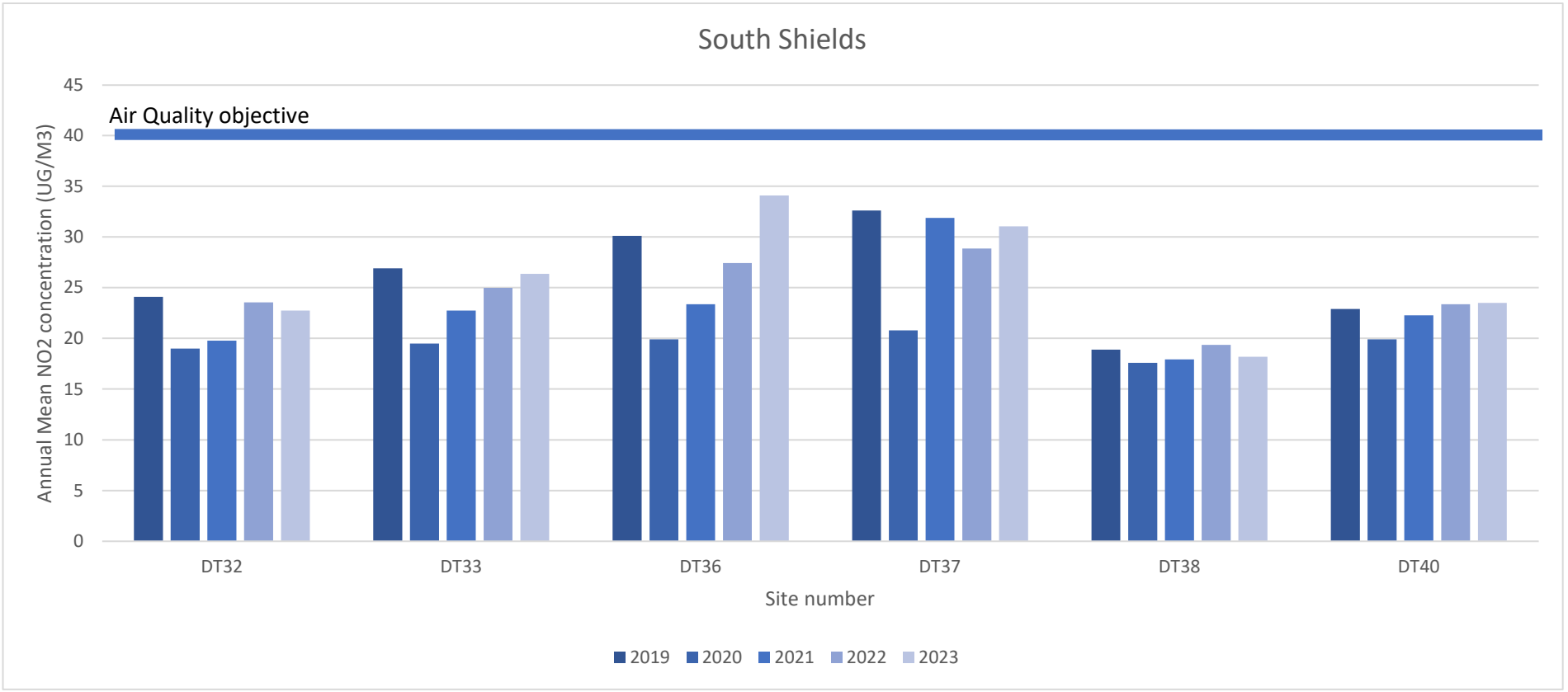


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM1	435,949	564,456	Roadside	Automatic	65.8	0	0	0	0	0
CM2	434,068	563,695	Roadside	Automatic	96.2	0	0	0	0	0
CM3	435,565	565,040	Roadside	Automatic	96.4	0	0	0	0	0

Notes:

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

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

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%).

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM2	434,068	563,695	Roadside	100	93	19	18	17	12	12
CM3	435,565	565,040	Roadside	100	94	19	14	16	18	17.2

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22x`

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the PM_{10} annual mean objective of 40µg/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_{10} Concentrations

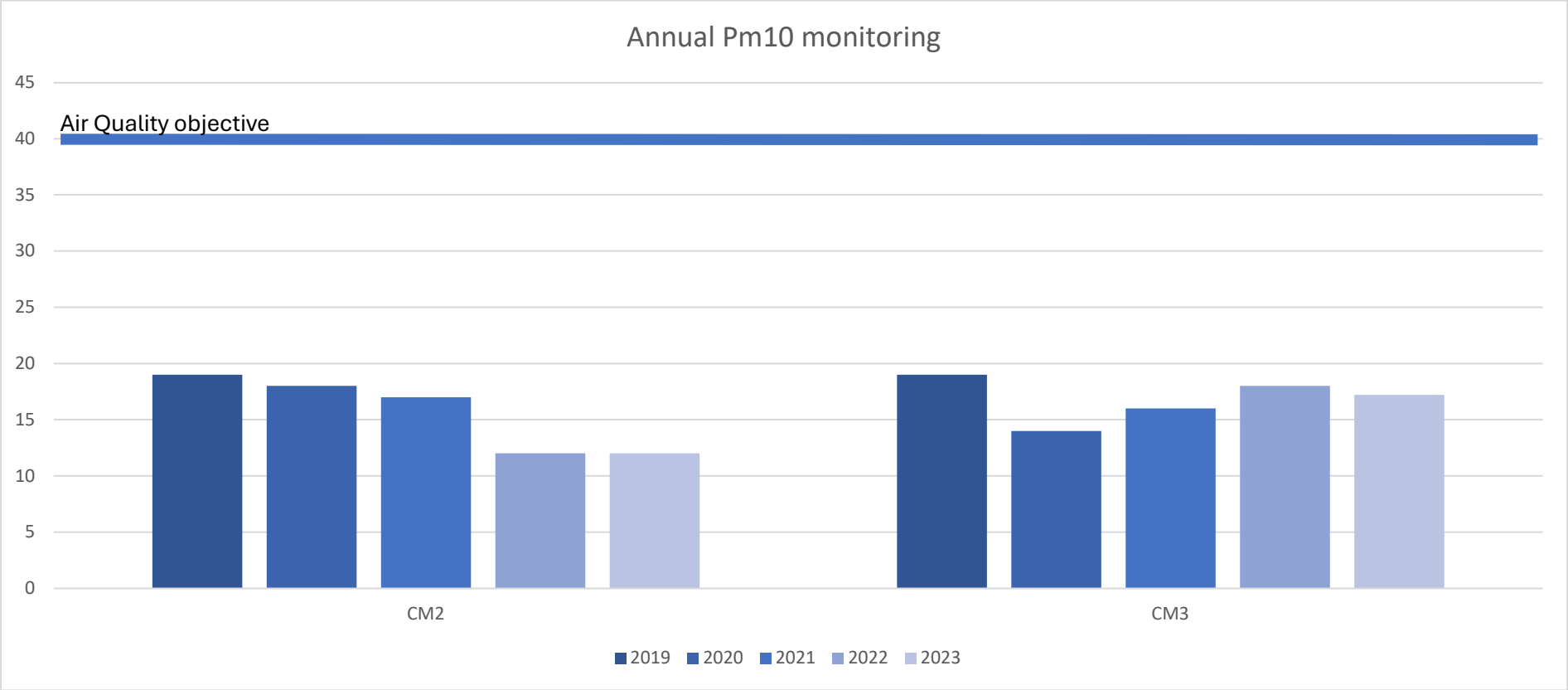


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM2	434,068	563,695	Roadside	100	93	**2(69)**	**4(67)**	**1 (56)**	**2 (55)**	0
CM3	435,565	565,040	Roadside	100	94	**4(70)**	0	0	**4 (76)**	0

Notes:

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

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

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%).

Figure A.9 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m³

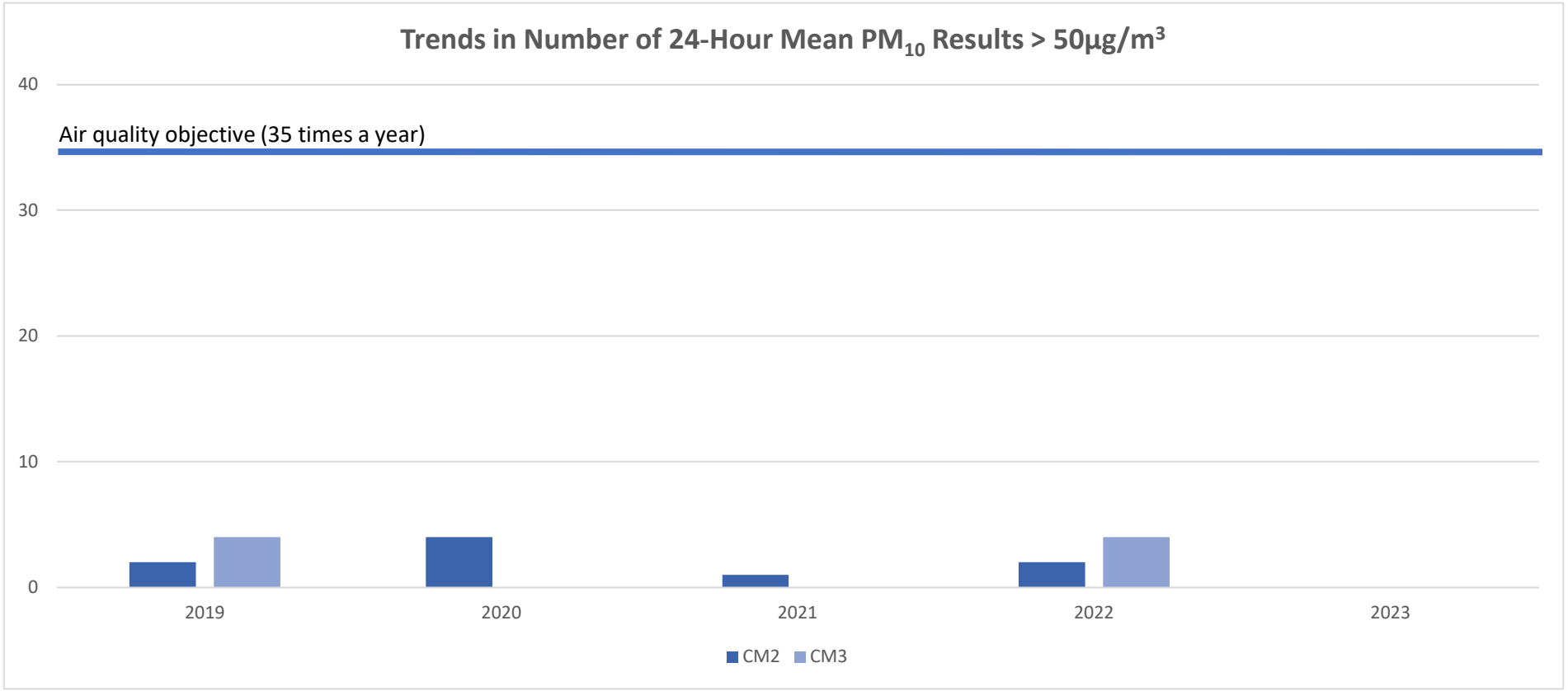


Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM2	434,068	563,695	Roadside	100	93.7	13.3	12.6	11.9	8.4	8.4
CM3	435,565	565,040	Roadside	100	88.4	13.3	9.8	11.2	12.6	12.04

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

Notes:

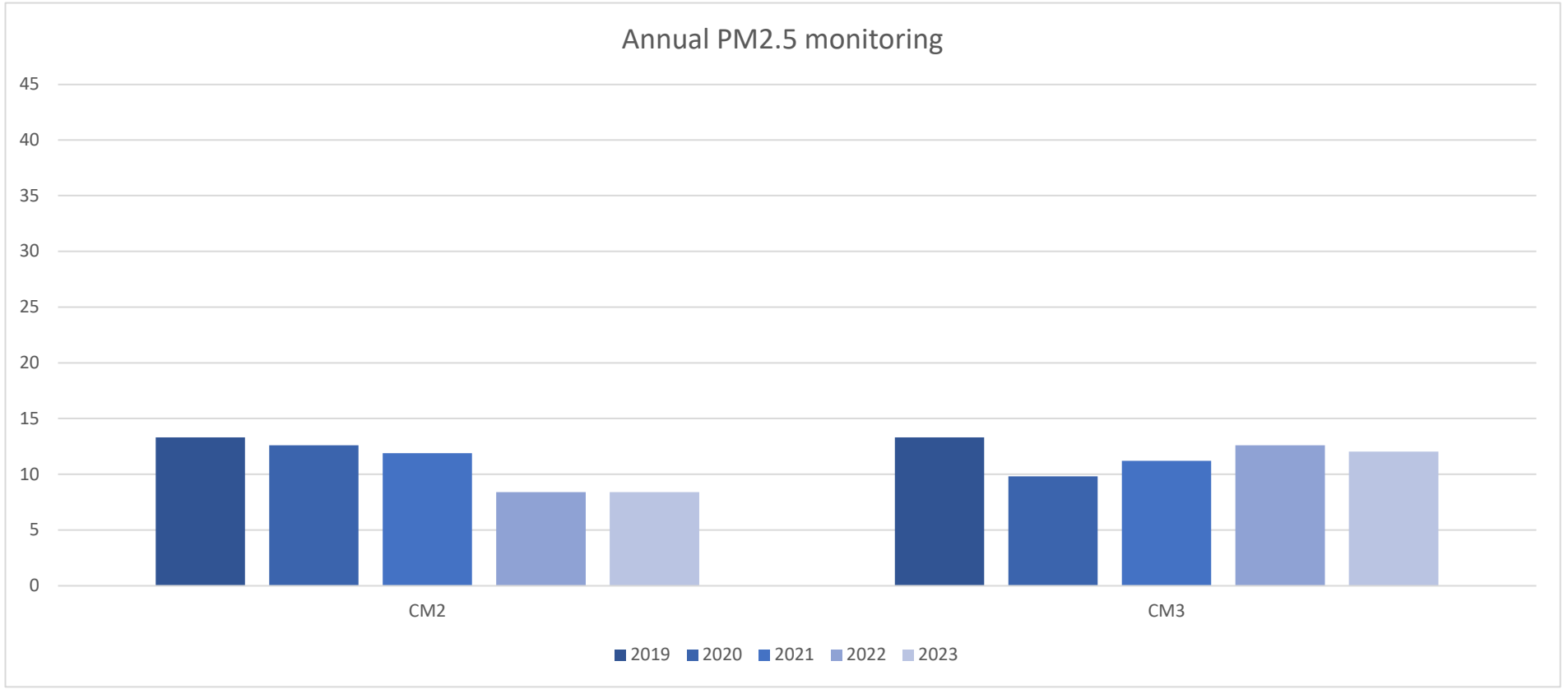
The annual mean concentrations are presented as µg/m^3.

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



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

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 <1.02>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	440820	561821	24.3	23.2	24.3	23.6	24.8	20.5	19.6	22.2	22.8	22.4	28.0	22.4	23.2	23.6	-	
DT2	438542	562321	30.4	28.2	29.5	28.8	24.2	24.1	25.8	25.1	28.3	25.8	31.9	29.5	27.6	28.2	-	
DT3	438412	562368	21.0	18.7		32.7	15.1	12.9	13.1	14.6	16.0	17.2	25.3	17.7	18.6	18.9	-	
DT4	437053	561418	19.9	17.3	16.9	14.0	12.2	10.7	11.7	12.7	14.3	15.4	23.4	18.0	15.5	15.9	-	
DT5	436528	561280	24.1	20.4	20.5	20.3	30.9			28.1	19.5	16.9	26.7	22.1	23.0	23.4	-	
DT6	436021	561368	32.1	31.5	33.3	31.4	17.6	28.4	25.3	18.1	29.8	32.2	37.1	31.2	29.0	29.6	-	
DT7	434623	561746	25.0	22.6	21.8	17.6	17.4	16.3	15.5	16.7	19.1	19.1	27.9	21.8	20.1	20.5	-	
DT8	433883	562644	19.0	20.2	21.0	18.7	16.8	15.3	14.8		17.8	18.2	24.8	19.8	18.8	19.1	-	
DT9	433739	562070	16.6	18.7		19.3	25.3	13.7			15.3			17.0	18.0	18.6	-	
DT10	430489	563058	27.3	25.2	26.8	27.0	18.0	23.4	22.7	23.5	24.9	25.3	28.8	27.5	25.0	25.5	-	
DT11	430540	563425	22.6	21.4	22.1	19.6	16.6	15.3	14.6	17.1	18.5	20.2	27.2	20.8	19.7	20.0	-	
DT12	430582	563663	20.1	20.7		20.6	28.2	15.2	15.2	16.5	17.9	18.5	26.8	21.9	20.2	20.6	-	
DT13	430976	564378	21.9	26.6	26.7	30.8	22.4	24.4	22.8	25.0	23.3	25.6	29.0	23.7	25.2	25.7	-	
DT14	432393	564994	27.2	26.8	26.1	24.0	17.9	22.4	21.7	23.8	23.5	24.5	29.5	25.3	24.4	24.9	-	
DT15	432682	565456	29.7	26.3	25.2	22.2	23.3	18.2	18.8	19.5	22.4	19.1	31.4	27.1	23.6	24.1	-	
DT16	433088	565007	21.8	17.5	19.1	22.8	27.3	21.0	17.7		19.5	25.0	29.6	22.7	22.2	22.6	-	
DT17	433658	563497	22.2	25.9	27.8	31.9	26.2	26.5	24.5	26.2	27.0	27.8	29.0	26.6	26.8	27.3	-	

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 <1.02>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT18	433698	563825	17.9	22.7	24.2	28.0	20.9	22.3	19.5	23.0	22.0	23.5	26.1	23.3	22.8	23.3	-	
DT19	433780	563692	28.7	30.3	32.6	25.7	22.0	21.7	23.2	24.6	29.6	25.2	33.4	30.6	27.3	27.8	-	
DT20	434068	563695	28.9	27.2	25.4	22.1		19.0	18.5	21.2	21.8	22.3	30.2	23.8	-	-	-	Triplicate Site with DT20, DT21 and DT22 - Annual data provided for DT22 only
DT21	434068	563695	26.5	27.2	24.6	22.1	21.8	17.7	18.3	20.0	21.0	22.2	31.3	23.5	-	-	-	Triplicate Site with DT20, DT21 and DT22 - Annual data provided for DT22 only
DT22	434068	563695	28.5	26.3	26.1	20.9	26.5	33.4	18.7	20.1	21.8	21.6	31.0	24.0	23.9	24.4	-	Triplicate Site with DT20, DT21 and DT22 - Annual data provided for DT22 only
DT23	434326	563728	26.2		25.7	26.1	26.7	23.5	20.3	22.9	22.5	25.3	33.8	24.4	25.2	25.7	-	
DT24	434297	563934	34.6	26.7	33.6	26.8	23.3	25.8	26.8	29.6	26.4	28.8	38.7	33.1	29.5	30.1	-	
DT25	434376	563955	28.9	29.1	28.4	24.0	20.4	22.9	22.4	24.5	31.2	24.7	33.1	28.3	26.5	27.0	-	
DT26	434298	563970	28.0	33.0	27.3	25.6	33.2	17.3	20.9	23.5	26.9	22.9	30.1	29.7	26.5	27.1	-	
DT27	435321	564843	32.1	33.3	35.4	39.8	25.9	30.5	29.1	32.7	33.3	33.8	37.1	35.5	33.2	33.9	-	
DT28	435605	565290	26.6	24.8	27.8	27.1	24.7	22.4	19.7	22.7	23.4	24.2	31.8	25.8	25.1	25.6	-	
DT29	435926	564596	35.5	33.0	30.0	25.2	23.9	26.6	25.9	24.0	27.4	24.4	35.3		28.3	28.9	-	
DT30	435987	564647	31.0		33.0	32.8	30.8	22.2	24.3	24.9	31.0	27.5	34.3		29.2	29.8	-	
DT31	435959	564470	28.1	32.6	32.3	33.1	18.6	27.1	28.3	27.9	26.6	34.3	34.7	30.0	29.5	30.1	-	
DT32	437540	564355	27.4	25.0	24.8	19.6	20.5	15.8	16.8	18.7	21.4		30.8	24.5	22.3	22.8	-	
DT33	437819	564335	29.6	27.9	27.3	22.7	24.7	20.9	21.9	23.1	28.4	21.8	31.7	30.0	25.8	26.4	-	
DT34	437010	565873	35.6	31.8	31.3	23.0	17.9	22.1	24.6	24.7	28.5	26.0	35.9	35.4	28.1	28.6	-	
DT36	436727	566374	28.0		32.3	29.0	35.3	27.0	25.2		59.0	28.8	36.4		33.4	34.1	-	
DT37	436216	566216	30.9	34.0	34.4	32.6	14.6	32.2	28.7	32.0	32.3	26.8	33.6	33.3	30.5	31.1	-	
DT38	436169	565876	21.6	19.5	19.3	14.2	14.0	13.0	12.9	15.4	16.8	19.3	25.0	22.9	17.8	18.2	-	
DT40	436098	565902	28.1	28.1	25.9	18.6	16.8	16.1	18.2	19.9	25.4	20.3	29.7	29.3	23.0	23.5	-	

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 <1.02>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT41	436597	567308	24.2	24.2	25.1	23.7	24.9	22.4	20.9	23.2	23.0	24.7	28.8	25.8	24.2	24.7	-	
DT42	431428	564493	33.3	31.6	29.8	25.3	27.7	24.2	21.8	23.1	25.0	25.0	36.6	23.0	27.2	27.7	-	
DT43	436396	565012	27.7	25.2	26.0	23.2	22.4	21.3	20.0	22.7	20.5	22.9	29.6	25.1	23.9	24.3	-	
DT44	437161	565572	24.6	24.0	23.9	22.9	27.6	17.5	17.3	19.4	21.3	20.0	31.4	28.3	23.2	23.6	-	
DT45	433390	565601	20.6	21.4	23.2	16.4				22.3	26.6		23.9	19.6	21.7	20.3	-	

All erroneous data has been removed from the NO_2 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 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

Notes:

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

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

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 2023

Table *.* below details the major planning applications decided in 2023 which propose the creation of significant numbers of residential units. All applications were accompanied by air quality assessments which concluded that the additional traffic trips created would not result in breaches of the air quality objectives. South Tyneside Council ensures that the cumulative effect of new developments are taken into account during the air quality assessment process.

Application ref	Address	Details
ST/0228/21/FUL	Ellison Street Hebburn NE31 1YN	Demolition of existing structures and redevelopment to provide 446 new studio, 1,2, 3, 4 & 5 bedroom homes
ST/0882/21/FUL	Land East of Lukes Lane Hebburn NE31 2BJ	Erection of 127 dwellings including a new vehicular access point from Lukes Lane, associated infrastructure and landscaping
ST/0491/23/VC	(Land South of South Shields Football Club) NE34 9PH	Demolition of existing industrial unit and construction of 69no. affordable homes
ST/0535/23/FUL	Prince Georg Square South Shields NE33 2PE	Construction of a new student accommodation block of up to 140 bed spaces with associated landscaping, highway, drainage and other works.

Additional Air Quality Works Undertaken by South Tyneside Council During 2023

South Tyneside Council has not completed any additional works within the reporting year of 2023.

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:

DT9 and DT45

Four sites classified as urban background within 50 miles of South Tyneside and 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 µg/m^3)

Diffusion Tube ID	Annualisation Factor Sunderland Silksworth	Annualisation Factor Middlesbrough	Annualisation Factor Newcastle Centre	Annualisation Factor Hartlepool St Abbs	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)

Diffusion Tube ID	Annualisation Factor Sunderland Silksworth	Annualisation Factor Middlesbrough	Annualisation Factor Newcastle Centre	Annualisation Factor Hartlepool St Abbs	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)
DT9	0.9903	1.0306	1.0106	1.0171	1.0122	18.0	18.2
DT45	0.9177	0.9312	0.9418	0.8767	0.9169	21.7	19.9
CM1	0.8832	0.8758	0.9344	0.8570	0.8876	20.9	18.5

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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 NO_x/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 1.02 to the 2023 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 very important to note, the national bias adjustment factor has been calculated at 0.81, 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
2023	Local	-	1.02
2022	Local	-	0.92

2021	National	03/22	0.84
2020	Local	-	0.85
2019	National	03/20	0.93

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1
Periods used to calculate bias	9
Bias Factor A	1.02 (0.95 - 1.11)
Bias Factor B	-2% (-10% - 5%)
Diffusion Tube Mean (µg/m^3)	24.5
Mean CV (Precision)	3.9%
Automatic Mean (µg/m^3)	25.1
Data Capture	100%
Adjusted Tube Mean (µg/m^3)	25 (23 - 27)

Notes:

A single local bias adjustment factor has been used to bias adjust the 2023 diffusion tube results.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within South Tyneside Council required distance correction during 2023

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_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM10 monitor(s) utilised within South Tyneside Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

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

CM1

Four sites classified as urban background within 50 miles of South Tyneside and are part of the national Automatic Urban and Rural monitoring network have been identified and table C.1 shows the method of annualising these automatic station concentrations.

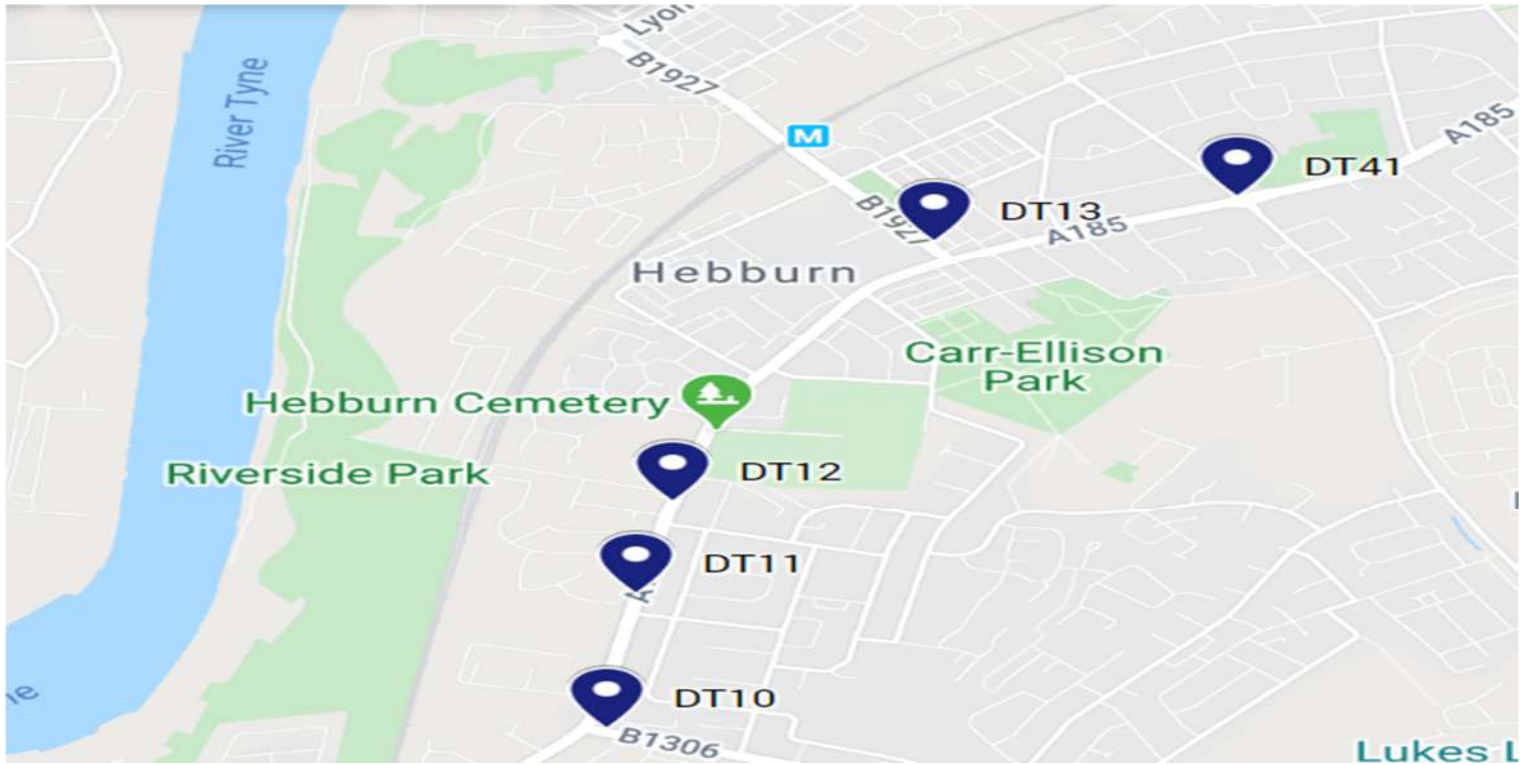
NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within South Tyneside Council required distance correction during 2023.

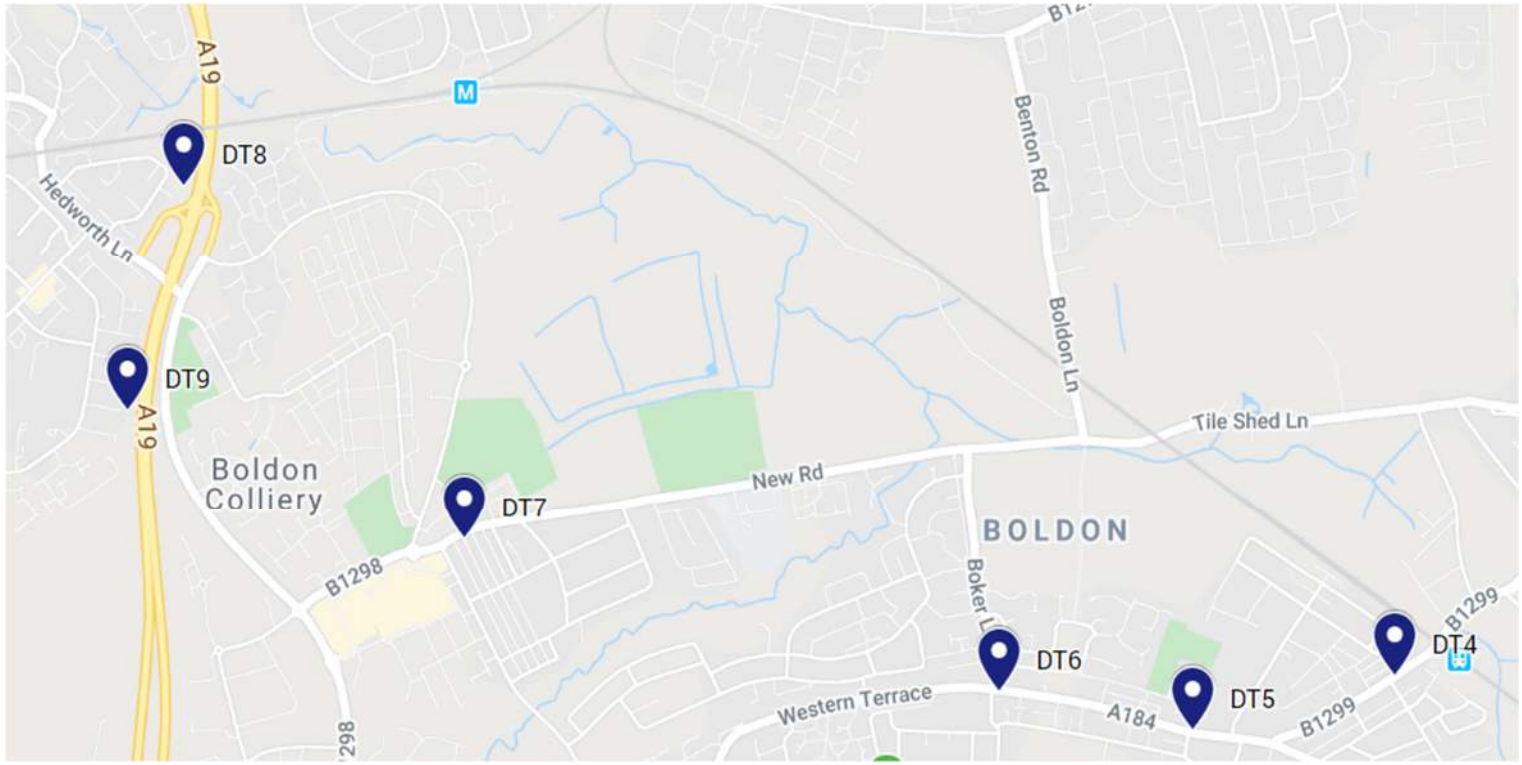
Appendix D: Map(s) of Monitoring Locations

Non-Automatic monitoring sites – Hebburn

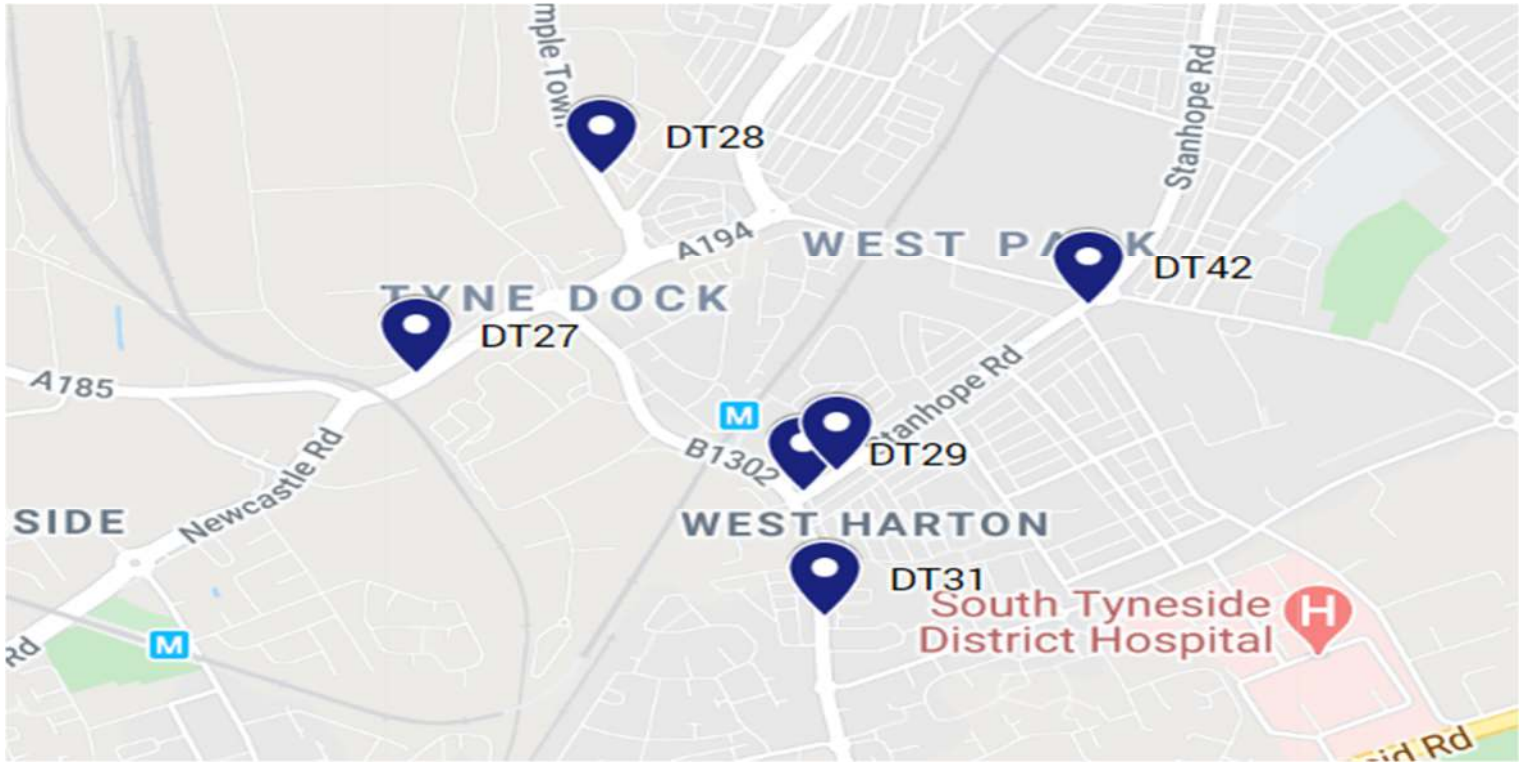


Non-Automatic monitoring sites - Jarrow

Non-Automatic monitoring sites – Boldon and A19



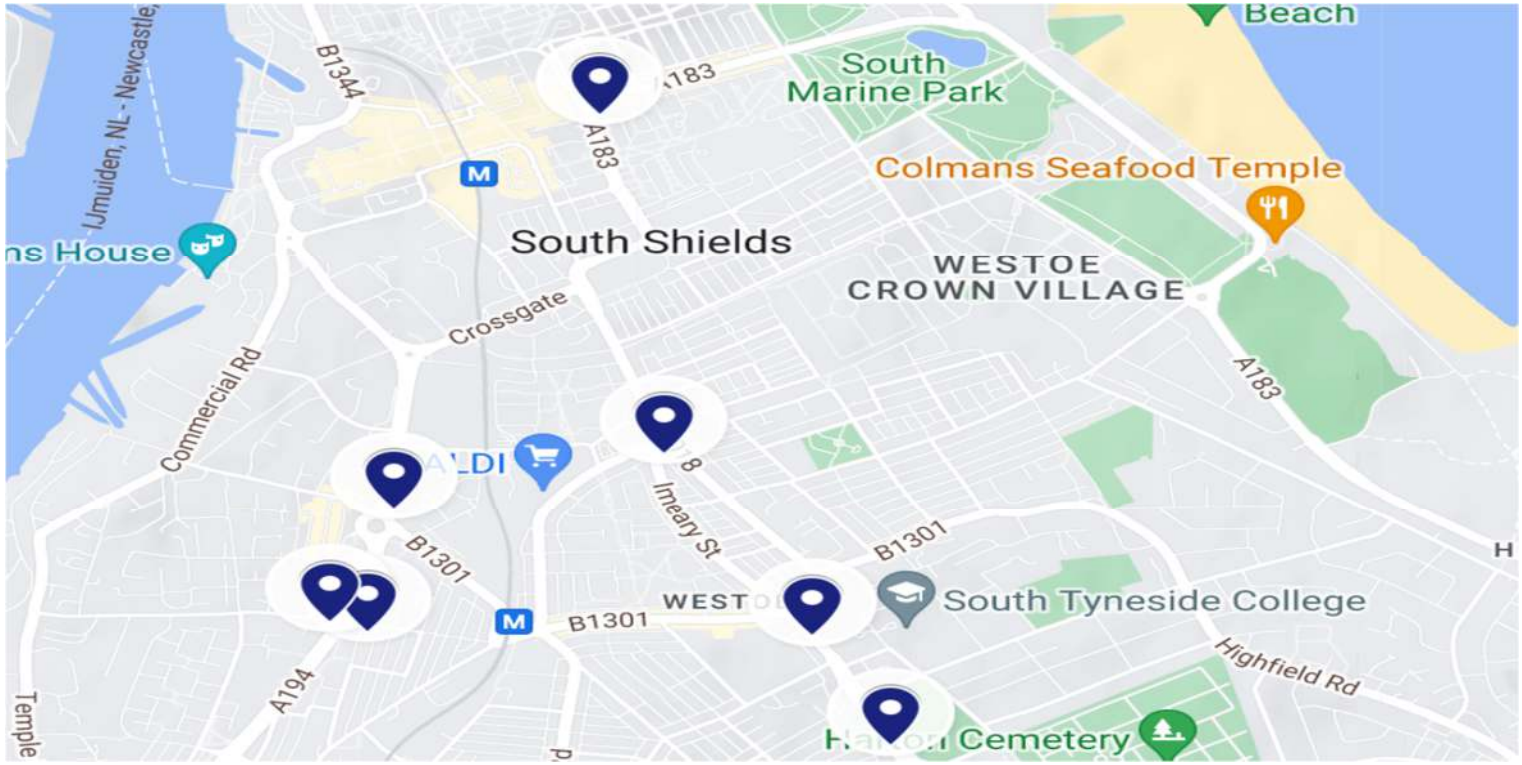
Non-Automatic monitoring sites Location Map – Tyne Dock and West Park



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[8]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	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_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- 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.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.