South Kesteven District Council

Annual Status Report 2024

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SOUTH KESTEVEN DISTRICT 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 Kesteven

Breathing in polluted air affects our health and costs the National Health Service (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 $PM_{2.5}$)	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 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.

[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

South Kesteven, situated in the East Midlands of England and located in the county of South Lincolnshire, is a local government District with four main towns in its jurisdiction; Grantham, Bourne, Market Deeping and Stamford. The District is one of Britain's established visitor destinations with various holiday parks and Bed and Breakfasts (B&Bs) that support increasing tourism for the area. The District is popular for historical attractions, such as Belton House and Grimsthorpe Castle, and seeks to encourage countryside tourism through its established areas of geographical interest such as Grimsthorpe Special Area of Conservation (SAC), Barnack Hills and Holes SAC, and Baston Fen SAC. The location also seeks to encourage tourism by hosting several music events and festivals, for example Granthambury, and promotes active travel through the Grantham Transport Strategy which involves various integrated walking and cycling routes that connect to the broader East Midlands region.

The area occupies a key strategic position in Eastern England, with a variety of national railway stations connecting Edinburgh to London and facilitating access to the A1 and A15 road networks, comparative to neighbouring Council jurisdictions. Thus, the District acts as a gateway for many to visit Northern and Southern England, with the A1 a key corridor for vehicles and goods transportation. South Kesteven District is also approximately 37 miles east from East Midlands Airport, offering flights for passengers to continental Europe destinations such as Spain and France, and wider United Kingdom destinations such as Ireland, Scotland and northern England for example Newcastle.

South Kesteven District is approximately 365 square miles and boasts a rich variety of charming landscape, whilst providing access to local Areas of Outstanding Natural Beauty (AONB) such as Lincolnshire Woods AONB covering 216 square miles and approximately 33 miles north-east from the District's largest settlement, Grantham. There are also over 15 Sites of Special Scientific Interest (SSSI) in South Kesteven, two designated Woodnook Valley SSSI with other examples Allington Meadows SSSI, Grimsthorpe Park SSSI and Langtoft Gravel Pits SSSI. Furthermore, there are three Special Areas of Conservation (SAC), with Grimsthorpe SAC, Barnack Hills and Holes SAC, and Baston Fen SAC, as well as one Special Protection Area (SPA) and RAMSAR site in Rutland Water SPA and RAMSAR.

The District is predominantly a rural environment, with approximately 134,000 residents. The largest urban area is the town of Grantham where approximately 45,000 people live, followed by Stamford with approximately 21,000 residents. Other population centres across the District are Bourne and Market Deeping. The District is the eighth least densely

populated of the East Midland's 35 local authority areas, and is England's 153rd most densely populated area of the 309 local authority areas, as per the Office for National Statistics (ONS).

Air pollution within the District is predominantly caused by road traffic emissions originating from major roads including the A1, A15, A52, A606, and A1175 that pass through and around the area. Additionally, car ownership in households in South Kesteven is higher than the national average, 83.3% compared to 73.2% respectively, as reported in the RAC Foundation. Vehicles as the major contributor to air pollution in South Kesteven is recognised by the South Kesteven District Council Local Plan 2011-2036 and Grantham Transport Strategy, which highlight that there is a dire need to minimise the requirement to travel by private car to employment, education and services due to the lack of provision of convenient public transport and sustainable travel modes in the District.

It is noted that major congestion often occurs in the District due to the strategic nature of the road links in connecting the area to wider England, with the majority of vehicles through-flow traffic, they do not start nor end their journeys within South Kesteven. This is reiterated by the Department for Transport (DfT) which reports that approximately 4.27 billion vehicle miles were travelled on roads in Lincolnshire (East Midlands) in 2023.

Furthermore, the A1 is recognised as a gateway to Northern and Southern England, as well as destinations in Eastern England such as the North Norfolk Coastline AONB with seasonal traffic flows in the area significantly changing with the influx of tourist-related through-flow traffic. Thus, this route has a tendency to become heavily congested on a periodic basis, resulting in the stopping and starting of vehicles, which in turns leads to elevated pollutant concentrations.

Other pollution sources including commercial, industrial, and domestic sources also contribute to pollutant concentrations within the District.

Due to South Kesteven District Council's (SKDC's) historic high reported Nitrogen Dioxide (NO_2) concentrations, with some exceedances of the NO_2 Annual Mean Air Quality Standard (AQS) of 40 µg/m^3, the 1-Hour NO_2 objective of 60 µg/m^3, PM_{10} 24-Hour Mean, and some occurrences within 10% of the annual NO_2 AQS, the District is considered to have some areas where the air quality is poor. Six air quality management areas (AQMAs) have been declared in response to these elevated pollutant concentrations, with five being revoked on 08/08/2013, as such only AQMA No.6 remains. South Kesteven District Council declared this AQMA in August 2013 for the NO_2 annual mean objective and NO_2 1-Hour objective, with its extent encompassing Manthorpe Road, Wharf Road, High Street

and London Road.

During 2023, concentrations of NO_2 were monitored passively via a diffusion tube network of 58 sites. Of the 58 passive monitoring sites, 16 were single tube locations, 15 were duplicate monitoring locations, and four were triplicate monitoring sites. Thus, 35 sites were actually monitored across South Kesteven, 14 of which are located within AQMA No.6 (SK 19-22, 27-42, 50-57). When compared to the 35 sites that made up the diffusion tube network in the previous reporting year, the NO_2 annual mean concentration decreased at 24 locations, equating to a reduction in pollutant concentration at 68.57% of sites from 2022. No single diffusion tube site recorded an NO_2 annual mean concentration above the air quality objective of 40 µg/m^3 in 2023, with the maximum concentration within and outside of the AQMA being 36.1 µg/m^3 (SK33/SK34) and 29.3 µg/m^3 (SK45/SK46), respectively. NO_2 annual mean concentrations within South Kesteven have not exceeded the objective of 40 µg/m^3 since 2019, however they have been within 10% of the annual mean AQS objective between 2021-2023. Recent monitoring evidence suggests that there is no need to extend the current boundary for which the AQMA is designated, but there is a requirement to maintain the AQMA, particularly for the annual mean NO_2 objective. It is noted that AQMA revocation is proposed for the 1-Hour NO_2 objective, and the Council have prepared an updated AQAP document that is to be issued on 8th October 2024 pending Councillor and Cabinet approval.

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.

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

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

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.

As part of the South Kesteven District Council's commitment to reduce the impacts of climate change, and specifically air pollution, the Council declared a climate emergency on 26th September 2019 and continues to progress and aim to hit 30% carbon emission reduction by 2030 for Council activities and across the District, as reported in the South Kesteven Climate Action Strategy. The Climate Action Strategy sets out various actions to reduce Carbon Dioxide (CO_2) emissions, of which also have shared benefits in improving air quality through reducing both NO_2 and Particulate Matter (PM) emissions. Examples include engagement with partners to support projects boosting biodiversity and tree planting across the District, using renewable energy sources to power buildings, ensuring a high-quality network of electric vehicle (EV) charging points are available, adopt Light Emitting Diode (LED) lighting, and further improve public transportation infrastructure and active travel provision across the District, particularly for urban journeys.

The Council have been committed to improving the District's social housing stock as well as broader accommodation in South Lincolnshire, thus making it more energy efficient. Via the Green Homes Grant (GHG) and Local Authority Delivery Phase 2 (LAD2), the Council has upgraded 164 properties with owner-occupiers and social housing tenants. These properties, with no connection to the gas supply grid, were previously heated with inefficient storage heaters or solid fuel systems, and as a result were more expensive to run with a higher-than-average carbon footprint. Works included installing energy saving measures such as solid wall insulation and renewable heating technologies Air Source Heat Pumps (ASHPs) and Solar PV, to replace the current electric heating systems. It is acknowledged that the scheme funding did not cover the cost of gas boiler replacements. Properties eligible for the grant were those with a low Energy Performance Certificate (EPC) rating of D, E, F or G, as well as households with a combined income of ≤£30,000 and savings <£16,000. The overall initiative has improved property thermal efficiency across South Kesteven with EPC ratings updated to minimum of Band C, as well as

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

reducing broader carbon footprint. More information can be found at: https://moderngov.southkesteven.gov.uk/documents/s36347/Energy%20Efficiency%20-%20Grant%20Funding.pdf

South Kesteven District Council have continued work to deliver energy efficiency upgrades to targeted homes within the District, thus improving them and the wellbeing of tenants, by securing £1.2 million in funding through the Home Upgrade Grant (HUG), currently in phase two (HUG2), and the Local Authority Delivery Phase 3 (LAD3) scheme. The Council are working in collaboration with energy experts YES Energy Solutions to deliver this incentive, with 49 properties in the District having been upgraded. The core aims of the schemes are to alleviate fuel poverty alongside reducing carbon emissions associated with energy used in domestic properties. Works include internally insulating and rendering the building, replacing kitchens, loft and floor voids insulation, installing photovoltaic panels and more energy-efficient air source heat pumps to replace the current electric heating system. Thus, improving property thermal efficiency with EPC ratings updated in most instances to Band C, as well as reducing broader carbon footprint.

South Kesteven District Council has also installed solar PV on leisure centres in Grantham, Bourne and Stamford which provide energy used on site, reduce carbon emissions and generate income.

During 2023, South Kesteven District Council commissioned a Source Apportionment Exercise to support their updated AQAP document, shown in Appendix F. The assessment involved reviewing Automatic Traffic Count (ATC) and Automatic Number Plate Recognition (ANPR) traffic data within and around the outskirts of the AQMA boundary to determine the composition of vehicles travelling in the centre of Grantham. Thus, ascertaining which vehicle types are most polluting and contributing to increased NO_2 concentrations across South Kesteven. From the exercise, the Council were able to outline key strategies to implement which seek to reduce air pollutant concentrations in the District, as detailed in the updated AQAP set for issue on 8th October 2024 post approval by Councillors and Cabinet. This project demonstrates the Council's approach to collaborative working with partner organisations to improve air quality within the area and for its residents and visitors' welfare, particularly those who are vulnerable.

The Council has been awarded a total of £540,460 in funding through The Rural Fund, integrated into the UK Shared Prosperity Fund (UKSPF), for projects delivered between 2023 and March 2025. The fund finances projects across rural areas throughout South Kesteven, with a key objective for business projects inclusive of but not limited to

productivity enhancing, energy efficient and low carbon technologies and techniques. Thus, encouraging applicants to consider the impact of their business on the environment and subsequent longevity of their proposals. More information can be found at: https://www.southkesteven.gov.uk/economic-development/south-kesteven-rural-fund

South Kesteven District Council maintains to promote the Let's Move Lincolnshire initiative who highlight free sessions for locals across various activities within South Kesteven District, such as swimming, cycling, walking. This platform encourages active transportation uptake and methods across the District whilst outlining benefits of active transport on air quality and health.

The Council, alongside Lincolnshire County Council (LCC), continue to progress with, develop and enhance the Komoot app. Komoot is an app for encouraging cycling in South Kesteven, as well as alternate locations, with users able to review a collection of road biking routes around the area. Individuals are able to utilise the 'Tours' tab to see a full breakdown of route details including elevation profiles and surface analyses, as well as browsing cycling tips and photos shared by other members of the Komoot community. The app seeks to promote an inclusive community with future collaboration between the Council, neighbouring local authorities, and people by working together to identify opportunities to improve air quality by limiting emission source(s) use whilst encouraging mortality longevity.

During 2023 the Council has maintained its positive relationship with the bicycle club Witham Wheelers in Grantham, who are part of British Cycling's GoRide development programme and were established in 1958. The club offer cycling activities such as: club rides, touring, time trials, road racing, track racing, sportives, cyclo-cross, mountain biking, and charity events. This relationship promotes the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake.

South Kesteven District Council maintains to promote the Cliff Edge Cycles innovative bike sharing and hiring services. The scheme replicates notable cycle sharing schemes found in large metropolitan areas (e.g., Santander Cycles, Mobike, Lime) and compliment the rural and urban cycling routes. Cliff Edge Cycles also offer chargeable bicycle servicing sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road. They attempt to promote alternative and accessible forms of travel between neighbouring towns and villages across the East Midlands region to help its residents lead active lifestyles and limit vehicular emissions. The business has a local base in Wyndham Park in Grantham.

Lincolnshire County Council, with support of South Kesteven District Council, have issued the Grantham Transport Strategy, with identification of three key areas in Grantham with high propensity for walking and cycling, as such there is proposed development for a cycle and pedestrian priority junction, toucan crossings and segregated cycle lanes at the following locations:

- North of Grantham town centre towards Manthorpe, via Grantham and District Hospital;
- South of Grantham town centre along A52 Somerby Hill; and
- West of Grantham town centre along A52 Barrowby Road.

Identified routes experience high commuting levels due to key destinations including the population centres. Thus, it is proposed that greater active travel infrastructure is established to support the adoption comparative to vehicle commuting to these areas, therefore reducing emissions released.

South Kesteven District Council promotes active travel, and the reduction in vehicle usage and subsequent emissions, through walking with established Core Walking Zones (CWZs) across the District. The CWZs have been assessed and audited to ensure safety and identify any required interventions along the pedestrian corridors within each CWZ. Interventions proposed include improving existing infrastructure as well as introducing new pedestrian facilities such as wayfinding, new pedestrian crossings and benches to improve the public realm.

The Council, alongside neighbouring and far-reach Councils, is host to the National Cycle Network (NCN) as well as having a Local Cycle Network (LCN) that forms the connections between the NCN and destinations such as small town centres and villages. The NCN provides a strategic network for the county with connections to key destinations, towns, villages, transport hubs, employment and housing areas with long distance trails and loops that support the visitor economy in the District. A key NCN route in South Kesteven is Route 15, which leads into Grantham centre and along the canal.

The District continued to promote the cycling initiative 'Bikeability' in 2023, led by Lincolnshire County Council. The scheme, focussed at school children and adults, involves frequent cycling proficiency courses and has educated circa 100,000 people as of May 2023 with the area named amongst the top ten local authorities for providing cycle training within 2023. The initiative has centred on three core stages, Bikeability: Level 1, Level 2 and Level 3, with individuals required to meet specific criteria to enable being

accredited the awards. There is also ‘Bikeability Balance’ and ‘Bikeability Learn to Ride’ levels which bode a suite of courses to meet needs and specifically to complement and support the core training delivered. The scheme also offers ‘Bikeability Families’ and ‘Cycle Confidence’ courses which provide parents/carers skills to cycle safely with children and allows individuals to develop cycling skills and build confidence. This programme seeks to encourage the uptake of cycling across the District, therefore, seeking to reduce pollutant concentrations imminently and through actions of longevity by also targeting future generations.

The Council promotes its established and well-connected main rail network with the branch line between Edinburgh and London via Grantham one of the area’s railway routes, a core, busy commuter line that connects South Kesteven with wider English and Scottish destinations. Highlighting the benefits of public transport on air quality comparative to private vehicle use to commute.

South Kesteven District Council actively encourages developers at the planning stage to install electric charging points or consider suitable infrastructure to allow for future cost-efficient installations, as outlined in Policy SB1 of the South Kesteven District Council Local Plan 2011-2036.

In 2023, South Kesteven District Council adopted the ‘Lincolnshire Electric Vehicle Strategy’ which recommends that in collaboration with Lincolnshire County Council, circa 1100 Electric Vehicle (EV) publicly funded charging points are to be delivered by 2030 in the District, assuming a blend of both rapid and fast chargers. There will be a particular focus on charging points on residential streets in rural and remote areas with electric grid constraints, where higher uptakes of EVs are forecast and communities without or with limited access to off-street parking. The scheme, funded by Department for Transport’s Local Electric Vehicle Infrastructure (LEVI) Fund, will significantly expand on an already growing network of on and off-street EV charging points in South Kesteven and neighbouring Councils.

South Kesteven District Council has developed a programme of charging points for Electric Vehicles (EV) across the area, resulting in 12 new EV charging points being implemented in Council owned car parks across the District since 2020. Installation of EV charging points in South Kesteven has been funded by the On-Street Residential Charge Point Scheme (OSRCPS), delivered by the Office of Zero Emission Vehicles (OZEV). The initiative seeks to support communities, aiming to provide convenient and efficient charging for residents without off-street parking as well as visitors. Furthermore, charge

points have been installed to assist residents in South Kesteven convert from internal combustion vehicles to EVs. As more residents use electric vehicles, communities will benefit from improved air quality and lower their carbon footprint. The uptake of each installed charger is monitored to understand demand and inform future installations. More information can be found at: https://www.southkesteven.gov.uk/parking-transport-and-roads/electric-vehicle-charging/skdc-electric-vehicle-charging-points

South Kesteven District Council has also encouraged Ultra Low Emission Vehicle (ULEV) adoption across the District during the 2023 monitoring year, with infrastructure to support the uptake of ULEVs being implemented as aforementioned with a wider extent planned for implementation.

The Department for Transport (DfT) awarded Lincolnshire County Council £799,900 in funding through the Active Travel Fund. Through this, the 'Grantham Active Travel Zone' has been proposed, referenced in the Lincolnshire County Council issued Grantham Transport Strategy, which aims at redeveloping the centre to improve travel choices and the transport network for people living, working, and visiting Grantham, in response to the climate emergency declared in 2019. The programme set out the Council's transport infrastructure priorities until 2036, with many schemes progressed or delivered as of 2023. The structural amendments to Grantham's pedestrian routes, cycleways, rail and road infrastructure seeks to allow easy interchange with other modes of public and active transport, promoting a green, cleaner District and broader, East Midlands region. Improvements proposed, inclusive of but not limited to, are:

- High Street – Creation of a one-way system with a 'sustainable travel corridor' allowing buses and cycles to progress southbound on High Street towards St Peter's Hill but no other traffic. Northbound traffic heading towards Watergate would continue;
- St Peter's Hill – Straight ahead lane removed from the west side including along the frontage of Munch and Prezzo, turning it into a wider footway and area for outdoor retail/hospitality;
- St Peter's Hill – Eastbound lane removed to continue the sustainable travel corridor, breaking into filter lanes opposite Belvoir Estate agents; and
- Closure of Guildhall Street at the junction of High Street, but deliveries allowed.

The Council continue to promote and engage with the Lincolnshire County Council led Clean Air Lincolnshire project which is a partnership funded by DEFRA, between public health, sustainability, and environmental health departments at the eight local authorities

in Lincolnshire, inclusive of South Kesteven District Council. There are also eight Lincolnshire schools participating in the project, using air quality monitoring to encourage action for cleaner air in their school areas, with The Kings School Grantham a participant, located within AQMA No.6. Overall, the initiative seeks to increase awareness of air pollution, the sources and impacts of it, and encourage supportive actions that will improve air quality for the District and individual's health.

Conclusions and Priorities

During 2023, the NO_2 annual mean objective was not exceeded at any monitoring location both within and outside of the AQMA boundary. This is a continuing trend that has been observed across the area since 2019, with the know exception of SK33/SK34 in 2019, as discussed in this ASR. However, concentrations have frequently been within 10% of the annual NO_2 AQS objective of 40 µg/m^3, with the exception of 2020 acknowledged as a COVID-19 year. Therefore, the monitoring data does not support the Council's revocation of AQMA No.6 for the NO_2 annual mean AQS objective. It is noted that monitoring data for the past 11 years (including 2023) supports revocation of AQMA No.6 for the NO_2 1-Hour objective.

It is acknowledged that the Council have prepared an updated AQAP document for AQMA No.6 which encompasses action for only the annual mean NO_2 AQS objective, given revocation of the AQMA for the NO_2 1-Hour objective. The updated AQAP shall be issued on 8th October 2024 pending Councillor and Cabinet approval.

The Council will continue to use the passive monitoring network to monitor air quality within the District and ensure compliance is maintained with the annual NO_2 AQS objective.

The following actions are considered to be key priorities in ensuring the air quality conditions within South Kesteven continue to comply with the AQS objectives:

- Finalising preparation of the Draft Action Plan to ensure it can be issued publicly on 8th October 2024 post Councillor and Cabinet appraisal;
- Greater progression and completion of actions within the Grantham Transport Strategy, to improve walking, cycling, rail and road infrastructure and to integrate greater public transport sources;
- Continue to review the current monitoring programme, exploring the need to deploy new monitoring locations in areas where monitoring has not previously been undertaken and where it is believed that there may be elevated concentrations of

NO_2 in areas of relevant public exposure, relocate monitoring tubes, or remove locations where necessary;

- Actively engage with developers at planning application stages to promote the installation of electric vehicle (EV) charging or alternatively, provide suitable infrastructure to allow for future cost-efficient installations as per Policy SB1 in South Kesteven District Council Local Plan 2011-2036;
- Implementation of the scheduled EV charging points on streets and in car parks across the District as per Lincolnshire Electric Vehicle Strategy;
- Continue to provide an integrated transport network to facilitate the efficient movement of pedestrian and vehicular traffic, goods, and services across the District as per Grantham Transport Strategy;
- Continue to reduce the volume of traffic on the city roads by encouraging effective active transport methods (e.g. public transport, cycling, and walking);
- Continue to improve the existing walking and cycling network by acquiring funding for development;
- Take action via the Lincolnshire County Council led Clean Air Lincolnshire project to increase awareness of air pollution, the sources and impacts of it, and encourage supportive actions that will improve air quality for the District and individual's health, with a focus on The King's School in Grantham who deploy air quality monitoring equipment in and around their grounds; and
- Implement measures within the South Kesteven Climate Action Strategy to further reduce concentrations of NO_2 and PM.

Local Engagement and How to get Involved

Given the main source of air pollution across South Kesteven is from transport sources, the public can support the reduction in air pollutant(s) release and improve air quality within the District by participating in active travel.

South Kesteven District Council have progressed additional public engagement work in 2023 through the below schemes, although the engagement schemes in 2022 are still active:

- The collaborative relationship with Lincolnshire County Council to roll out a programme of charging points for EVs across the District through the Lincolnshire Electric Vehicle Strategy, with circa 1100 EV charging points scheduled for implementation;

- Successfully implementing 12 EV charging points in Council owned car parks for public use, alongside Office of Zero Emission Vehicles (OZEV);
- Improving the use of ULEVs across the District through improving infrastructure to support the uptake with a wider extent planned for implementation;
- Acquiring funding through The Rural Fund, integrated into the UK Shared Prosperity Fund (UKSPF), for projects with a key objective of productivity enhancement, energy efficient and low carbon technologies and techniques. Thus, encouraging applicants to consider the impact of their business in South Kesteven on the environment and subsequent longevity of their proposals;
- Continue to offer active transport education to children, the future generation, and adults through cycling proficiency courses via the 'Bikeability' initiative, reducing vehicular pollutant emissions with circa 100,000 people engaging in the scheme;
- Planned investment via the Grantham Transport Strategy to further enhance adoption and utilisation of the public transport network;
- Collaboration between local businesses and clubs via Let's Move Lincolnshire initiative to host events promoting active transport and the benefits supporting people in becoming more sustainable and reducing their air pollutant contributions;
- Promotion of the National Cycle Network (NCN) and the Core Walking Zones (CWZs) post COVID-19 lockdown, encouraging active travel across the District and wider East Midlands region, with a community focus;
- Collaboration with Lincolnshire County Council, neighbouring local authorities and local residents through the Clean Air Lincolnshire project to increase awareness of air pollution, the sources and impacts of it, and encourage supportive actions that will improve air quality for the District and individual's health, with a focus on The King's School in Grantham who deploy air quality monitoring equipment in and around their grounds; and
- Enhancement and further endorsement of the Witham Wheelers and Cliff Edge Cycles innovative bike sharing services who offer cycling activities such as: club rides, supported rides, as well as chargeable bike maintenance workshops for locals to ensure bikes are safe and road worthy and broader bicycle hire. Thus, promoting the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake, supporting the establishment of a greener, cleaner District.

The following measures are possible alternatives to private travel and actions that

everyone can complete that would contribute to improving air quality within the area:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the volume of vehicles and limits congestion;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added health benefits through exercise;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the volume of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools;
- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel efficient cars are available, and all have different levels benefits by reducing the amount of emissions being released; and
- Asking your employer, school or college about the possibility of developing a green travel plan.

The public can also engage with air quality issues via South Kesteven District Council's dedicated Air Quality Website. This provides information on a range of air quality topics, such as the current monitoring locations, the latest AQAP, declared AQMAs, and copies of previous ASRs.

Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of South Kesteven District Council, with the support of the following officers and departments:

- Francesca Bell, Senior Environmental Health Officer

This ASR has been approved by:

- Francesca Bell, Senior Environmental Health Officer

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Francesca Bell at: South Kesteven District Council, The Picture House, St Catherine's Rd, Grantham, Lincolnshire, NG31 6TT.

- Francesca Bell
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1 Local Air Quality Management

This report provides an overview of air quality in South Kesteven 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 Kesteven District 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.

In August 2013, South Kesteven District Council declared AQMA No.6 for exceedances of the NO_2 annual mean and 1-Hour objectives. The AQMA is described as an:

"Area encompassing Manthorpe Road, Wharf Road, High Street and London Road."

The extent of AQMA No.6 is shown below in Figure 2.1, and details of the AQMA are described in Table 2.1.

The Council has not achieved compliance with the NO_2 annual mean objective of 40 µg/m^3 since 2019, with duplicated monitoring location SK33 and SK34 reporting a concentration above the annual objective of 40.7 µg/m^3 in 2019. Between 2021-2023 this location has consistently reported concentrations within 10% of the NO_2 annual mean AQS, 36.6 µg/m^3 (2021), 37.8 µg/m^3 (2022) and 36.1 µg/m^3 (2023). Duplicate monitoring location SK50 and SK51 also fell within 10% of the annual mean NO_2 objective in 2019 reporting a concentration of 39.6 µg/m^3.

2020 and 2021 were affected by COVID-19 management measures which restricted travel. These years are therefore not considered representative of long term trends for when discussing NO_2 annual mean compliance if an exceedance of the objective occurred in 2019. Given compliance with the annual mean NO_2 objective (40 µg/m^3) was not achieved in 2019 with the known exceedance at SK33 and SK34, and concentrations have been within 10% of the annual mean NO_2 objective between 2021-2023, the monitoring data is currently insufficient to support the Council's revocation of AQMA No.6. It is noted that there are two consecutive years of compliance to date, 2022 and 2023, when considering the NO_2 annual mean objective of 40 µg/m^3, excluding concentrations reported within 10% of the objective.

As such, the Council have prepared an updated AQAP for the District which will replace

the outdated 2016 version. The latest AQAP document is scheduled for issue on 8th October 2024, pending Councillor and Cabinet approval, and is only for the NO_2 annual mean, as the Council intend to submit for revocation of the NO_2 1-Hour AQMA No.6 in 2024. Appendix F evidences the Source Apportionment Study which is included within the AQAP.

Figure 2.1 – South Kesteven District Council AQMA No.6 (2013)

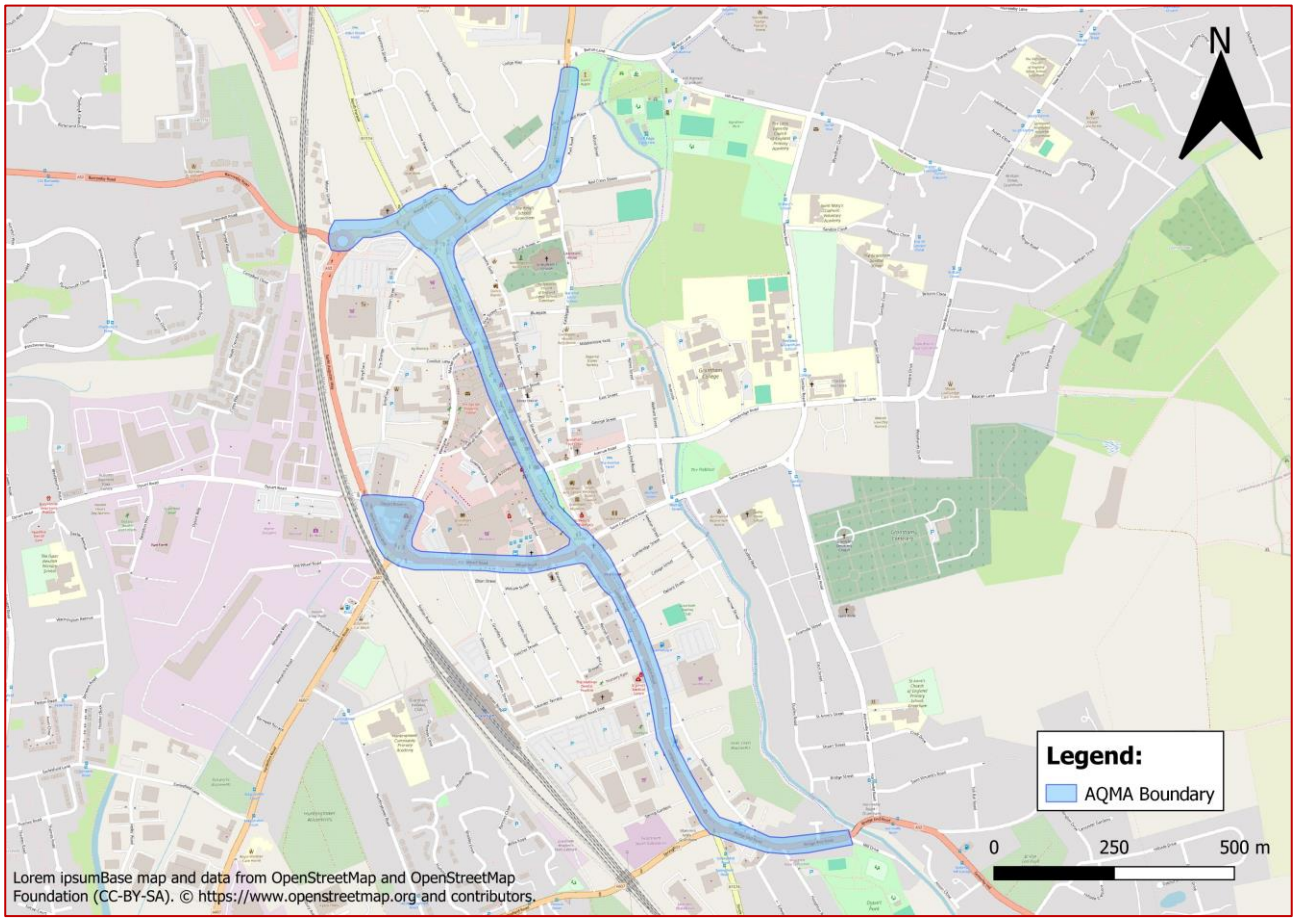


Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
SKDC AQMA No.6	08/08/2013	NO_2 Annual Mean	An area encompassing Manthorpe Road, Wharf Road, High Street and London Road.	No	58.2 µg/m^3	36.1 µg/m^3 (SK33/SK34)	2 (2022 and 2023 – 2020 and 2021 rejected COVID-19 years)	SKDC Air Quality Action Plan 2016	https://www.southkesteven.gov.uk/sites/default/files/2023-07/Air_Quality_Action_Plan_2016.pdf
SKDC AQMA No.6	08/08/2013	NO_2 1 Hour Mean	An area encompassing Manthorpe Road, Wharf Road, High Street and London Road.	No	None predicted as annual mean is below 60 µg/m^3	None predicted as annual mean is below 60 µg/m^3	11	SKDC Air Quality Action Plan 2016	https://www.southkesteven.gov.uk/sites/default/files/2023-07/Air_Quality_Action_Plan_2016.pdf

☒ **South Kesteven District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **South Kesteven District Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in South Kesteven

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

"The report is well structured, detailed, and provides the information specified in the Guidance."

The following comments were designed to help inform South Kesteven 2024 ASR:

1. Incorrect annual mean concentration data in Tables A.2 and B.1. The 2022 annual mean concentration data in Table A.2 do not match with those provided in Table B.1 (from SK37 and below).
    a. This was addressed in a re-submission of the 2023 ASR, and the annual mean concentration data was corrected. Data has been checked in 2024 ASR to ensure it is correct.
2. Comments from last year's ASR have been mentioned and addressed, which is welcomed, and it is encouraged that this continues with future ASRs.
    a. The appraisal comments from 2023 ASR have been addressed in the 2024 ASR.
3. The AQAP is now seven years old and is therefore due for review. If it is determined by the Council that the AQMA is no longer required due to the completion of three consecutive years of compliance, an AQS should be prepared.
    a. The Council confirm that they have prepared a new AQAP due for issue on 8th October 2024 pending Councillor and Cabinet approval.
4. All graphs are well presented and are clear to read, with the addition of the AQO allowing for visual analysis of the monitoring data. Formatting is consistent between all charts. The Council have also provided a detailed discussion of these trends.
    a. This has been continued in the 2024 ASR.
5. When additional staffing resource is available, the Council should consider the relocation of some monitoring sites that continuously show low concentrations, such as site SK3.
    a. SK3 remains in the location previously reported in the 2024 ASR, the Council are aware of the requirement to relocate or remove this tube as well as

additional tubes across the District that have consistently reported low concentrations.

6. NO_2 1 hour mean is compliant with Air Quality Objective for ten years and the AQMA declaration for the NO_2 1 hour mean objective should be revoked.
    a. The Council confirm that the new AQAP due for issue on 8th October 2024 pending Councillor and Cabinet approval is only for the NO_2 annual mean, as the Council intend to submit for revocation of the NO_2 1-Hour AQMA No.6 in 2024.
7. Defra recommends that Directors of Public Health approve draft ASRs. Sign off is not a requirement, however collaboration and consultation with those who have responsibility for Public Health is expected to increase support for measures to improve air quality, with co-benefits for all. Please bear this in mind for the next annual reporting process too.
    a. The Council acknowledge that ASR sign off by a Director of Public Health is not a requirement but recommended, however, this has not been organised for the 2024 ASR. It is noted to try arranging such sign off for 2025 ASR.
8. A national bias adjustment factor has been applied. It would be beneficial to include a screenshot of the tool so the factor can be verified.
    a. This has been included in the 2024 ASR.
9. All DT locations are illustrated on four different maps. However, it would be helpful to include a map that shows all DT locations withing the SKDC boundaries.
    a. Various maps have been provided in Appendix D of the 2024 ASR to show monitoring locations across South Kesteven District Council, including one highlighting all monitoring locations in the District.

South Kesteven District 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 2.2. There are 10 measures included within Table 2.2, with the type of measure and the progress South Kesteven District 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 2.2.

South Kesteven District Council's key completed measures are:

- Updating the existing AQAP document for issue on 8th October 2024;
- Commissioning a Source Apportionment Exercise to support the updated AQAP, reviewing Automatic Traffic Count (ATC) and Automatic Number Plate Recognition (ANPR) traffic data within and around the outskirts of the AQMA boundary to determine the composition of vehicles travelling in the centre of Grantham. Thus, ascertaining which vehicle types are most polluting and contributing to increased NO_2 concentrations across South Kesteven. From the exercise, the Council were able to outline key strategies to implement which seek to reduce air pollutant concentrations in the District, as detailed in the updated AQAP;
- Acquiring funding through The Rural Fund, integrated into the UK Shared Prosperity Fund (UKSPF), for projects with a key objective of productivity enhancement, energy efficient and low carbon technologies and techniques;
- Successfully implementing 12 new EV charging points in Council owned car parks across the District;
- Collaboration between local businesses and clubs via Let's Move Lincolnshire initiative to host events promoting active transport and the benefits supporting people in becoming more sustainable and reducing their air pollutant contributions;
- Through the Green Homes Grant (GHG) and Local Authority Delivery Phase 2 (LAD2), the Council has upgraded the District's social housing stock with 164 properties improved. Thus, increasing property thermal efficiency across South Kesteven with EPC ratings updated to minimum of Band C, as well as reducing broader carbon footprint;
- Secured £1.2 million in funding through the Home Upgrade Grant (HUG), currently in phase two (HUG2), and the Local Authority Delivery Phase 3 (LAD3) scheme, to alleviate fuel poverty alongside reducing carbon emissions associated with energy used in domestic properties. Working in collaboration with YES Energy Solutions to deliver this incentive, the initiative has supported the improvement of 49 properties in the District;
- Continue to offer active transport education to children, the future generation, and adults through cycling proficiency courses via the 'Bikeability' initiative, reducing vehicular pollutant emissions with circa 100,000 people engaging in the scheme confirmed in May 2023; and
- Supported Lincolnshire County Council issue of the finalised Grantham Transport Strategy, encouraging active travel across the District and wider East Midlands region, with a community focus.

South Kesteven District Council's priorities for the coming year are:

- Acquiring Councillor and Cabinet approval of the AQAP so it can be a public facing issued document in 2024;
- Implement measures within the South Kesteven Climate Action Strategy to further reduce concentrations of NO_2 and PM;
- Progress upgrades of District housing stock through the Home Upgrade Grant (HUG) and Green Homes Grant (GHG) to alleviate fuel poverty alongside reducing carbon emissions associated with energy used in domestic properties, thus improving South Kesteven's carbon footprint;
- Promote engagement with the Lincolnshire County Council led Clean Air Lincolnshire project to increase awareness of air pollution, the sources and impacts of it, and encourage supportive actions that will improve air quality for the District and individual's health;
- Further develop the area through the Grantham Transport Strategy, expanding active transport accessibility and encouraging adoption of it as well as improving road connectivity across the District; and
- Continue to implement EV charging points throughout the District as part of the Lincolnshire Electric Vehicle Strategy to support the uptake of EVs and those residing in remote locations, with circa 1100 charging points planned for development in the District.

South Kesteven District Council worked to implement measures in partnership with the following stakeholders during 2023:

- UK Government (DfT);
- Local businesses and charities;
- Neighbouring local authorities; and
- Lincolnshire County Council.

Table 2.2 – 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
M1	Grantham Southern Quadrant East West Relief Road	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2016	2023	Lincolnshire County Council Highways & South Kesteven DC	Lincolnshire County Council	NO	Funded	> £10 million	Implementation	0.5 - 1µg/m3	Reduced HGV through traffic in the town centre – reduced overall traffic flows through the town.	Under construction	
M2	Improve traffic management at key junctions	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2016	Ongoing	Lincolnshire County Council Highways	Lincolnshire County Council	NO	Funded	£100k - £500k	Implementation	1 - 2µg/m3	Reduced congestion and increased average speeds through the AQMA.	Lincolnshire County Council consulted on an Active Travel Zone for Grantham in 2021. The Proposal would see the High Street become one-way, with the creation of a 'sustainable travel corridor', while the footpath on St Peter's Hill would be extended into one lane of the road and the junction between Guildhall Street and High Street closed. Ongoing contributions from developments. SCOOT in operation at 4 key junctions in Grantham.	
M3	Improvements in Bus fleet emissions	Promoting Low Emission Transport	Other	2016	-	Lincolnshire County Council Highways & South Kesteven DC	Lincolnshire County Council	NO	Not Funded	£50k - £100k	Aborted	1 - 2µg/m3	Improved bus fleet composition but no direct traffic reduction. Bus use more attractive to potential users – increased bus use.	We currently have no plans to increase the emission standard or to change the age of vehicles operating within the passenger transport contracts. It is worth noting that not all vehicles will be operating as a contract for LCC.	
M4	Encouraging modal shift	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2016	Ongoing	Lincolnshire County Council & South Kesteven DC	Lincolnshire County Council	NO	Funded	< £10k	Implementation	0.2 - 0.5µg/m3	Reduced vehicle use and increased use of public transport.	Grantham Transport Strategy was published in 2022 following a public consultation. Full and summary versions can be seen here: https://urldefense.com/v3/__https:/www.lincolnshire.gov.uk/directory-record/61682/grantham-transport-strategy__;!!NslPjgbbnDqexg!NjrFO77ct7RP8ACO3LdcNUOoehQ4c8zpo_TiuvGTqEjEfR6AX-KQOrSCkBoz5cYNemmHY2N6LxPUGkDzhtLZNH5Qy3zvwpVwGuKoPAlcOq8-05c$ Local Cycling and Walking Infrastructure Plan development for Grantham Other smaller plans being considered in other areas of SK District. Draft LCWIP in existence.	
M5	Reduction in Idling Traffic	Public Information	Via leaflets	2016	2020	South Kesteven DC	South Kesteven DC	NO	Funded	< £10k	Completed	0 - 0.2µg/m3	Reduced idling in key areas.	Public information is provided at the Council's web site on reducing idling time in vehicles. http://www.southkesteven.gov.uk/index.aspx?articleid=8323	
M6	Provision of Cycling infrastructure	Promoting Travel Alternatives	School Travel Plans	2016	Ongoing	Lincolnshire County Council Highways	Lincolnshire County Council	NO	Funded	£50k - £100k	Implementation	0 - 0.2µg/m3	Increased number of cycle lanes makes cycling a more attractive alternative method of transport.	There is no update on the Walking and Cycling Strategy. However, with this document in place any future opportunities arising from the developments or highway improvements will be taken.	
M7	Rolling programme of replacing older more polluting	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low	2016	Ongoing	South Kesteven DC	South Kesteven DC	NO	Funded	£10k - 50k	Implementation	0 - 0.2µg/m3	Improve average euro class of the whole council owned fleet.	The Fleet has been improved with vehicles being replaced through a rolling program. Two pool cars used by staff are fully electric Work to consider options for decarbonisation of the fleet is in progress.	

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
	vehicles with newer cleaner vehicles		emission vehicles												
M8	Promote the use of cleaner or alternative fuels where possible	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2016	2020	South Kesteven DC	South Kesteven DC	NO	Funded	£10k - 50k	Completed	0 - 0.2µg/m3	Introduce new electric and hybrid vehicles to the council fleet.	The Council is promoting the Woodsure Ready to Burn scheme for log burners to improve air quality on their website. http://www.southkesteven.gov.uk/index.aspx?articleid=8323	
M9	Investigate options for better travel planning amongst the council's employees	Public Information	Via other mechanisms	2016	2020	South Kesteven DC	South Kesteven DC	NO	Not Funded	< £10k	Completed	0 - 0.2µg/m3	Reduce number of council staff driving to work.	Public information is provided at the Council's web site on driving less and cycling. http://www.southkesteven.gov.uk/index.aspx?articleid=8323 The Council has implemented flexible working arrangements which enable many staff to work from home for a proportion of the working week, reducing travel to and from the offices	
M10	Promotion of walking, cycling and public transport	Public Information	Via the Internet	2016	2017	South Kesteven DC	South Kesteven DC	NO	Not Funded	< £10k	Completed	0 - 0.2µg/m3	Increased public awareness of air quality issues and ultimate shift to less polluting forms of transport. Increased uptake of bicycle use and walking. Removal of existing road traffic from the road network and minimisation of that introduced by new schemes. Provision of cycle route maps.	Implemented. Further updates to the Air Quality page on the SKDC website have been carried out. http://www.southkesteven.gov.uk/index.aspx?articleid=8323. Continued work with Active Lincs and Love to Ride, exploration of Grantham based projects.	

2.3 $PM_{2.5}$ – 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.

$PM_{2.5}$ Monitoring:

Between 2019-2023 there has been no monitoring of PM_{10} or $PM_{2.5}$ within South Kesteven District Council. As such, no concentration values can be reported or estimated using the method described in Box 7.7 of LAQM.TG(22), which provides a for estimating $PM_{2.5}$ concentrations from PM_{10} measurements.

$PM_{2.5}$ Background Concentrations:

The current Defra 2023 background maps for South Kesteven District Council (2018 based)[7] show that all background concentrations of $PM_{2.5}$ are significantly below the current annual mean AQS objective of 20 µg/m^3. The highest background concentration is predicted to be 10.12 µg/m^3 within the grid square (1 km x 1 km) with the centroid grid reference 490500, 337500. This grid square encompasses North Grantham, including Gonerby Road (B1174), which is a key arterial route from the A1 into and through Great Gonerby and Gonerby Hill Foot towards the centre of Grantham, surrounding areas such as Little Ponton and rejoins the A1 southbound, where the PM secondary fraction (formed of gaseous pollutants) constitutes as the key contributor to $PM_{2.5}$.

It is noted that although the maximum predicted $PM_{2.5}$ background concentration in 2023 is well below the current annual mean AQS objective of 20 µg/m^3, it is above the AQS objective of 10 µg/m^3 that is not to be exceeded at any monitoring station by 31st December 2040. Therefore, South Kesteven District Council will consider further actions as well as continuing those implemented already to reduce $PM_{2.5}$ across the District.

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

[7] Defra Background Mapping (2018 Based). Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

Smoke Control Areas:

Smoke control areas (SCAs) are designated zones in which it is an offence to emit smoke from a chimney of a building, from a furnace or from any fixed boiler. It is also an offence to acquire an unauthorised fuel for use within a SCA unless it is used within an exempt appliance (exempted from the controls which generally apply in SCAs).

There are currently 42 SCAs declared within South Kesteven District. These areas are defined regions throughout Grantham and Stamford where smoke emissions from chimney's are legally prohibited. Only authorised fuels and 'exempt appliances' are not subject to these rules.

The Council have outlined if they determine an increase in smoke reports causing a statutory nuisance, they will enforce further SCAs within the District with accompanying fines for those who do not comply to the guidelines.

More information regarding the District's SCAs, including maps of the SCA enforcement areas, are available to review here: https://www.southkesteven.gov.uk/environmental-health/noise-and-pollution/smoke-and-odour

Impact on Human Health:

The Public Health Outcomes Framework data tool[8], compiled by Public Health England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2022 fraction of mortality attributable to $PM_{2.5}$ emissions within South Kesteven is 5.5%, which is lower than the regional average for the East Midlands (6.1%) and England as a whole (5.8%).

Measures to Improve $PM_{2.5}$ Concentrations:

South Kesteven District Council is taking the following measures to address $PM_{2.5}$:

- Actively encouraging large developers at the planning stage to install EV charging points or the consideration of suitable infrastructure to allow for future cost efficient installations;
- Implementation of the Grantham Transport Strategy to reduce the number of vehicle trips generated by South Kesteven District and subsequent pollutant emission release, due to its moderate population concentration and related

[8] Public Health England – Public Health Outcomes Framework. Available at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/gid/1000043/pat/6/ati/501/are/E07000141/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/fip/0

hierarchical position in the East Midlands settlements as well as its associated tourism appeal;

- Implementation of an EV charging programme alongside Lincolnshire County Council, with approximately 1100 publicly accessible EV charging points scheduled for implementation through Lincolnshire Electric Vehicle Strategy to encourage cleaner vehicle adoption;
- Promotion of railway routes across the area, with a core, busy commuter line between Edinburgh and London, and enhancement of existing networks to encourage more sustainable transportation uptake; and
- Introduction of strategies within the South Kesteven Climate Action Strategy to assist achievement of net-zero carbon emissions from Council activities by 2030 with many of the measures addressing local air quality including $PM_{2.5}$.

The Council acknowledge that the move to electric vehicles is not the only solution for air quality and associated heath concerns due to particulate matter, including $PM_{2.5}$, being sourced from break and tyre wear. As such, the Council have also implemented alternate initiatives with active travel at the forefront:

- Investment into enhancing the existing active travel network for walking and cycling, promoting active travel and supporting the reduction in vehicle volume and associated emission releases;
- Promotion of its established and well-connected railway branch lines between Edinburgh and London via Grantham, a core, busy commuter line that connects South Kesteven with wider English and Scottish destinations. Highlighting the benefits of public transport on air quality comparative to private vehicle use to commute;
- Endorsement of the bicycle mechanic and hire business Cliff Edge Cycles who host servicing sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road, as well as offering bicycle hire. Thus, incentivising active transportation uptake throughout the District whilst seeking to reduce air pollution contributions from frequent vehicular usage;
- Enhancement of the Komoot app to encourage cycling in South Kesteven, with users able to review a collection of road biking routes around the area. The app seeks to promote an inclusive community with future collaboration between the Council, neighbouring local authorities, and people by working together to identify opportunities to improve air quality by limiting emission source(s) use whilst

encouraging mortality longevity;

- Collaboration with Witham Wheelers to promote cycling activities such as: club rides, track racing, and charity events. This relationship promotes the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake thus promoting the area as inclusive and an enabler of active travel for all; and
- Promotion and development of the National Cycle Network (NCN) as well as the Local Cycle Network (LCN), demonstrating South Kesteven District Council's commitment to cycling development in the area. The NCN highlights a key course (Route 15) available to cycle, walk, and run thus promoting alternative forms of travel and reducing emissions.

The Environmental Protection Team of South Kesteven District Council continues to work collaboratively alongside industrialised organisations in the District with activities permitted by the Council, subject to regular inspections. Inspections are undertaken to establish where combustion and non-combustion processes could lead to anthropogenic emissions of $PM_{2.5}$, thus worsening air quality. The Council seeks to reduce, if not eliminate, additional anthropogenic $PM_{2.5}$ emissions by ensuring that they inspect and review industrialised activities and implement appropriate mitigation where necessary.

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 Kesteven District 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 Kesteven District Council did not undertake any automatic (continuous) monitoring in 2023.

3.1.2 Non-Automatic Monitoring Sites

South Kesteven District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 58 sites during 2023, including single, duplicate and triplicate locations. Of the 58 Site ID's, 16 were single tube locations, 15 were noted duplicate monitoring locations, and four were triplicate monitoring sites. Thus, 35 sites are monitored across South Kesteven. Table A.1 in Appendix A presents the details of the non-automatic sites. Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

During 2023, the diffusion tube network was well maintained, with an average data capture of approximately 91.86%, as such no tubes required annualisation in 2023. It is noted that no tube reports data for October 2023 due to the tubes being lost in transit to the laboratory for analysis.

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.2 and Figure A.1 - Figure A.4 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).

Figure A.1 - Figure A.4 highlight a decreasing trend in NO_2 concentrations reported across South Kesteven between 2019-2023, albeit in 2021 and 2022 there are slight increases shown. These could be attributable to a return to normalised traffic conditions post COVID-19 lockdown where UK Government advice was given to stay at home where possible, resulting in decreased levels of traffic observed across the UK, and as such, reduced annual mean NO_2 concentrations recorded.

Of the 35 sites that made up the diffusion tube monitoring network in 2023, the NO_2 annual mean concentration decreased at 24 locations compared to 2022 monitoring, equating to a reduction in pollutant concentration at 68.57% of sites from 2022. The maximum decrease in NO_2 concentration between the two reporting years was 10.8 µg/m^3 at SK 49, followed by 10.7 µg/m^3 at SK 40 and 10.2 µg/m^3 at SK 58. These tubes are located on Launder Terrace, east of Grantham Train Station, St Peter's Hill/ Avenue Road in Grantham Centre, and Wharf Road (A1175) in Stamford respectively, SK 49 and SK 58 are beyond the extent of the current AQMA boundary. SK 40 is located approximately 30 m beyond the AQMA boundary but is considered representative of concentrations within the AQMA by the Council. Figure D. 4 presents the location of SK 40 in relation to the AQMA boundary. The Council utilise the SK 40 to understand concentrations within the AQMA, as historically concentrations reported at SK 40 have been similar to those reported by sites within the AQMA. The greater percentage decrease in concentrations at sites across South Kesteven between 2022 and 2023 is in contrast to the previous reporting year, where concentrations decreased between 2021 and 2022 at 57.14% of sites. It is noted that SK 9 reported no concentration change between 2022 and 2023, and SK1/SK2 reported no change between 2021 and 2022.

The diffusion tubes around the edge of the current AQMA boundary showed an increase

of 0.1 µg/m^3 at SK 26 and decrease of 10.8 µg/m^3 at SK 49 respectively. SK 26 highlights a lower increase than the average increase observed across the entire diffusion tube network (2.2 µg/m^3), and SK 49 outlines a greater decrease than the average decreased seen across the complete diffusion tube network (3.1 µg/m^3). Recent monitoring evidence suggests that there is no need to extend the current boundary for which the AQMA is designated, but there is a requirement to maintain the AQMA, particularly for the annual mean NO_2 objective. However, AQMA revocation is proposed for the 1-Hour NO_2 objective.

Across the 14 diffusion tube sites that are located within the AQMA (SK 19-22, 27-42, 50-57), all sites recorded an NO_2 annual mean concentration below the air quality objective of 40 µg/m^3, with the maximum concentration recorded within the AQMA at SK33/SK34 being 36.1 µg/m^3. Beyond the AQMA, the maximum reported NO_2 annual mean concentration was 29.3 µg/m^3 at location SK45/SK46. SK33/SK34 was the only diffusion tube monitoring site in 2023 that recorded an NO_2 annual mean concentration within 10% of the objective.

In 2019, SK33/SK34 exceeded the NO_2 annual mean objective of 40 µg/m^3 by 0.7 µg/m^3, as such this year cannot be considered one of compliance. It is known that 2020 and 2021 are considered COVID-19 years and cannot be accounted for when discussing NO_2 annual mean compliance if an exceedance of the objective occurred in 2019. Given compliance was not achieved in 2019, and concentrations have been within 10% of the annual mean NO_2 objective between 2021-2023, the monitoring data is currently insufficient to support the Council's revocation of AQMA No.6. It is noted that there are two consecutive years of compliance to date, 2022 and 2023, when considering the NO_2 annual mean objective of 40 µg/m^3, excluding concentrations reported within 10% of the objective.

It is acknowledged that the Council have prepared an updated AQMA No.6 AQAP document for issue on 8th October 2024 pending Councillor and Cabinet approval. The AQAP will cover AQMA No.6 for exceedances of the annual mean NO_2 objective, with the Council seeking to revoke the AQMA for exceedances of the 1-Hour NO_2 objective.

For diffusion tubes, the full 2023 dataset of monthly values is provided in Appendix B, Table B. 1. It is noted that the monitoring dates coincide with the Defra calendar dates. As such, there is a degree of certainty surrounding the monitoring results provided.

It is possible to infer the risk of exceedances of the 1-hour mean NO_2 AQS objective at diffusion tube monitoring sites. LAQM.TG(22) provides an empirical relationship that states exceedances of the 1-hour objective are unlikely when the annual mean concentration is

below 60 µg/m^3. Given that the highest recorded annual mean concentration at any of the diffusion tube monitoring sites is 40.7 µg/m^3 in 2019 (SK33/SK34), and the penultimate highest 37.8 µg/m^3 in 2022, it is possible to conclude that there have been no exceedances of the hourly mean NO_2 objective at all monitoring locations in the last five years.

3.2.2 Particulate Matter (PM_{10})

Particulate Matter (PM_{10}) is not monitored in South Kesteven.

3.2.3 Particulate Matter ($PM_{2.5}$)

Particulate Matter ($PM_{2.5}$) is not monitored in South Kesteven.

3.2.4 Sulphur Dioxide (SO_2)

Sulphur Dioxide (SO_2) is not monitored in South Kesteven.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	Town Location	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)
SK 1	Scotgate	Roadside	Stamford	502659	307218	NO_2	No	3.2	1.6	No	2.5
SK 2	Scotgate	Roadside	Stamford	502659	307218	NO_2	No	3.2	1.6	No	2.5
SK 3	Essex Rd	Roadside	Stamford	502717	307750	NO_2	No	14.3	23.4	No	2.5
SK 4	Opp Stamford School	Roadside	Stamford	503291	307420	NO_2	No	0.0	5.7	No	2.5
SK 5	East St/St Pauls St	Roadside	Stamford	503391	307396	NO_2	No	0.0	3.2	No	2.5
SK 6	East St/St Pauls St	Roadside	Stamford	503391	307396	NO_2	No	0.0	3.2	No	2.5
SK 7	Stamford School	Roadside	Stamford	503281	307398	NO_2	No	0.0	2.5	No	2.5
SK 8	London Inn	Roadside	Stamford	502910	307120	NO_2	No	0.0	2.3	No	2.5
SK 9	All Saints Rd	Roadside	Stamford	502873	307141	NO_2	No	19.0	2.5	No	2.5
SK 10	Avondale Roundabout	Roadside	Stamford	502382	306890	NO_2	No	4.7	1.3	No	2.5
SK 11	Welwyn Cl	Roadside	Grantham	490118	334165	NO_2	No	5.0	2.0	No	2.5
SK 12	Welwyn Cl	Roadside	Grantham	490118	334165	NO_2	No	5.0	2.0	No	2.5
SK 13	Welwyn Cl	Roadside	Grantham	490118	334165	NO_2	No	5.0	2.0	No	2.5
SK 14	Springfield Rd	Roadside	Grantham	490877	334642	NO_2	No	24.5	2.1	No	2.5
SK 15	Springfield Rd	Roadside	Grantham	490877	334642	NO_2	No	24.5	2.1	No	2.5
SK 16	Meres Rd	Roadside	Grantham	489263	335353	NO_2	No	26.0	12.1	No	2.5
SK 17	Meres Rd	Roadside	Grantham	489263	335353	NO_2	No	26.0	12.1	No	2.5
SK 18	Balmoral Dr	Urban Background	Grantham	489956	336574	NO_2	No	32.1	0.8	No	2.5
SK 19	Opp Asda	Roadside	Grantham	491067	336209	NO_2	Yes - No.6	2.6	5.4	No	2.5
SK 20	Opp Asda	Roadside	Grantham	491067	336209	NO_2	Yes -	2.6	5.4	No	2.5

Diffusion Tube ID	Site Name	Site Type	Town Location	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)
							No.6				
SK 21	Broad St Scout Hut	Roadside	Grantham	491270	336256	NO_2	Yes - No.6	0.0	7.6	No	2.5
SK 22	Brook St	Roadside	Grantham	491260	336188	NO_2	Yes - No.6	0.5	6.0	No	2.5
SK 23	Gt Gonerby Pond St	Roadside	Grantham	489720	338204	NO_2	No	16.0	9.5	No	2.5
SK 24	Gt Gonerby Park	Roadside	Grantham	489870	338683	NO_2	No	10.8	5.0	No	2.5
SK 25	Manthorpe	Roadside	Grantham	492069	337874	NO_2	No	49.6	7.6	No	2.5
SK 26	Belton Ln	Roadside	Grantham	491280	336573	NO_2	No	9.9	7.0	No	2.5
SK 27	Jet Garage	Roadside	Grantham	491496	336354	NO_2	Yes - No.6	0.0	2.3	No	2.5
SK 28	Jet Garage	Roadside	Grantham	491496	336354	NO_2	Yes - No.6	0.0	2.3	No	2.5
SK 29	Jet Garage	Roadside	Grantham	491496	336354	NO_2	Yes - No.6	0.0	2.3	No	2.5
SK 30	King School 5 Bells	Roadside	Grantham	491472	336315	NO_2	Yes - No.6	2.2	2.7	No	2.5
SK 31	King School 5 Bells	Roadside	Grantham	491472	336315	NO_2	Yes - No.6	2.2	2.7	No	2.5
SK 32	King School 5 Bells	Roadside	Grantham	491472	336315	NO_2	Yes - No.6	2.2	2.7	No	2.5
SK 33	Opp Jet Garage	Roadside	Grantham	491515	336389	NO_2	Yes - No.6	0.0	1.7	No	2.5
SK 34	Opp Jet Garage	Roadside	Grantham	491515	336389	NO_2	Yes - No.6	0.0	1.7	No	2.5
SK 35	Black Dog	Roadside	Grantham	491330	336022	NO_2	Yes - No.6	5.0	1.0	No	2.5
SK 36	Black Dog	Roadside	Grantham	491330	336022	NO_2	Yes - No.6	5.0	1.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	Town Location	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)
SK 37	High St	Roadside	Grantham	491460	335715	NO_2	Yes - No.6	1.2	0.8	No	2.5
SK 38	High St	Roadside	Grantham	491460	335715	NO_2	Yes - No.6	1.2	0.8	No	2.5
SK 39	High St	Roadside	Grantham	491460	335715	NO_2	Yes - No.6	1.2	0.8	No	2.5
SK 40	Old Job Centre	Roadside	Grantham	491512	335719	NO_2	Yes - No.6	51.2	1.7	No	2.5
SK 41	London Rd	Roadside	Grantham	491602	335485	NO_2	Yes - No.6	2.4	3.9	No	2.5
SK 42	London Rd	Roadside	Grantham	491602	335485	NO_2	Yes - No.6	2.4	3.9	No	2.5
SK 43	Welcome Takeaway	Roadside	Grantham	491734	335196	NO_2	No	2.0	0.5	No	2.5
SK 44	Welcome Takeaway	Roadside	Grantham	491734	335196	NO_2	No	2.0	0.5	No	2.5
SK 45	South Parade	Roadside	Grantham	491869	334960	NO_2	No	0.0	3.5	No	2.5
SK 46	South Parade	Roadside	Grantham	491869	334960	NO_2	No	0.0	3.5	No	2.5
SK 47	White Lion	Roadside	Grantham	492067	334922	NO_2	No	5.0	1.0	No	2.5
SK 48	White Lion	Roadside	Grantham	492067	334922	NO_2	No	5.0	1.0	No	2.5
SK 49	Launder Terrace	Roadside	Grantham	491427	335193	NO_2	No	4.0	1.4	No	2.5
SK 50	Gt Northern Ct	Roadside	Grantham	491184	335575	NO_2	Yes - No.6	0.0	3.6	No	2.5
SK 51	Gt Northern Ct	Roadside	Grantham	491184	335575	NO_2	Yes - No.6	0.0	3.6	No	2.5
SK 52	Blue Bull	Roadside	Grantham	491200	335636	NO_2	Yes - No.6	2.0	0.5	No	2.5
SK 53	Blue Bull	Roadside	Grantham	491200	335636	NO_2	Yes - No.6	2.0	0.5	No	2.5
SK 54	Bus Stn/Post Office	Roadside	Grantham	491492	335505	NO_2	Yes - No.6	1.5	1.4	No	2.5
SK 55	Bus Stn/Post Office	Roadside	Grantham	491492	335505	NO_2	Yes - No.6	1.5	1.4	No	2.5
SK 56	Wharf Rd Morrisons	Roadside	Grantham	491402	335501	NO_2	Yes - No.6	0.8	0.9	No	2.5
SK 57	Wharf Rd Morrisons	Roadside	Grantham	491402	335501	NO_2	Yes -	0.8	0.9	No	2.5

Diffusion Tube ID	Site Name	Site Type	Town Location	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)
							No.6				
SK 58	Wharf Rd Stamford	Roadside	Stamford	503070	306957	NO_2	No	3.4	1.5	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.2 – 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	Town Location	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
SK 1, SK 2	502659	307218	Roadside	Stamford	92.3	92.3	28.4	21.4	24.3	24.3	23.4
SK 3	502717	307750	Roadside	Stamford	92.3	92.3	13.1	9.5	11.0	8.7	9.6
SK 4	503291	307420	Roadside	Stamford	84.6	84.6	30.3	21.3	24.9	26.2	26.6
SK 5, SK 6	503391	307396	Roadside	Stamford	92.3	92.3	30.1	23.5	27.0	24.6	24.5
SK 7	503281	307398	Roadside	Stamford	84.6	84.6	32.8	25.5	28.0	28.3	24.1
SK 8	502910	307120	Roadside	Stamford	92.3	92.3	22.5	15.8	18.4	17.3	17.1
SK 9	502873	307141	Roadside	Stamford	92.3	92.3	23.9	17.9	19.2	17.5	17.5
SK 10	502382	306890	Roadside	Stamford	92.3	92.3	18.3	14.7	15.1	14.5	13.4
SK 11, SK 12, SK 13	490118	334165	Roadside	Grantham	92.3	92.3	19.6	13.4	15.1	14.9	12.3
SK 14, SK 15	490877	334642	Roadside	Grantham	92.3	92.3	23.9	20.9	21.2	22.4	22.8
SK 16, SK 17	489263	335353	Roadside	Grantham	92.3	92.3	27.3	19.7	20.4	20.8	22.0
SK 18	489956	336574	Urban Background	Grantham	92.3	92.3	15.3	12.2	13.1	11.5	12.8
SK 19, SK 20	491067	336209	Roadside	Grantham	92.3	92.3	27.9	18.2	25.8	25.5	23.4
SK 21	491270	336256	Roadside	Grantham	92.3	92.3	25.0	18.8	22.4	20.6	19.3
SK 22	491260	336188	Roadside	Grantham	92.3	92.3	27.1	20.3	23.2	24.5	20.6
SK 23	489720	338204	Roadside	Grantham	92.3	92.3	18.7	14.3	16.2	15.1	13.1
SK 24	489870	338683	Roadside	Grantham	92.3	92.3	19.4	15.2	15.5	15.1	13.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Town Location	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
SK 25	492069	337874	Roadside	Grantham	92.3	92.3	17.8	13.2	15.3	14.7	13.7
SK 26	491280	336573	Roadside	Grantham	92.3	92.3	22.2	15.7	21.1	19.1	19.2
SK 27, SK 28, SK 29	491496	336354	Roadside	Grantham	92.3	92.3	39.1	27.3	35.1	34.3	32.1
SK 30, SK 31, SK 32	491472	336315	Roadside	Grantham	92.3	92.3	28.5	22.0	24.6	24.5	24.6
SK 33, SK 34	491515	336389	Roadside	Grantham	92.3	92.3	**40.7**	31.3	36.6	37.8	36.1
SK 35, SK 36	491330	336022	Roadside	Grantham	92.3	92.3	31.8	25.3	26.8	27.4	26.3
SK 37, SK 38, SK 39	491460	335715	Roadside	Grantham	92.3	92.3	34.0	30.6	22.1	27.5	25.8
SK 40	491512	335719	Roadside	Grantham	92.3	92.3	30.6	22.1	27.5	27.7	17.0
SK 41, SK 42	491602	335485	Roadside	Grantham	92.3	92.3	21.9	18.7	19.8	18.7	24.8
SK 43, SK 44	491734	335196	Roadside	Grantham	92.3	92.3	30.8	22.5	27.7	25.2	23.9
SK 45, SK 46	491869	334960	Roadside	Grantham	92.3	92.3	27.9	21.2	26.0	26.3	29.3
SK 47, SK 48	492067	334922	Roadside	Grantham	92.3	92.3	34.5	26.4	29.7	31.2	23.6
SK 49	491427	335193	Roadside	Grantham	92.3	84.6	30.2	25.2	24.9	25.5	14.7
SK 50, SK 51	491184	335575	Roadside	Grantham	92.3	92.3	19.7	14.7	15.3	15.1	23.9
SK 52, SK 53	491200	335636	Roadside	Grantham	92.3	92.3	32.1	24.2	27.0	27.4	25.7
SK 54, SK 55	491492	335505	Roadside	Grantham	92.3	92.3	31.9	31.9	28.9	29.1	31.8
SK 56, SK 57	491402	335501	Roadside	Grantham	92.3	92.3	39.6	29.1	35.2	34.4	27.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Town Location	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
SK 58	503070	306957	Roadside	Stamford	92.3	92.3	33.1	26.1	29.8	29.4	19.2

☒ **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 – Diffusion Tubes (Within AQMA No.6)

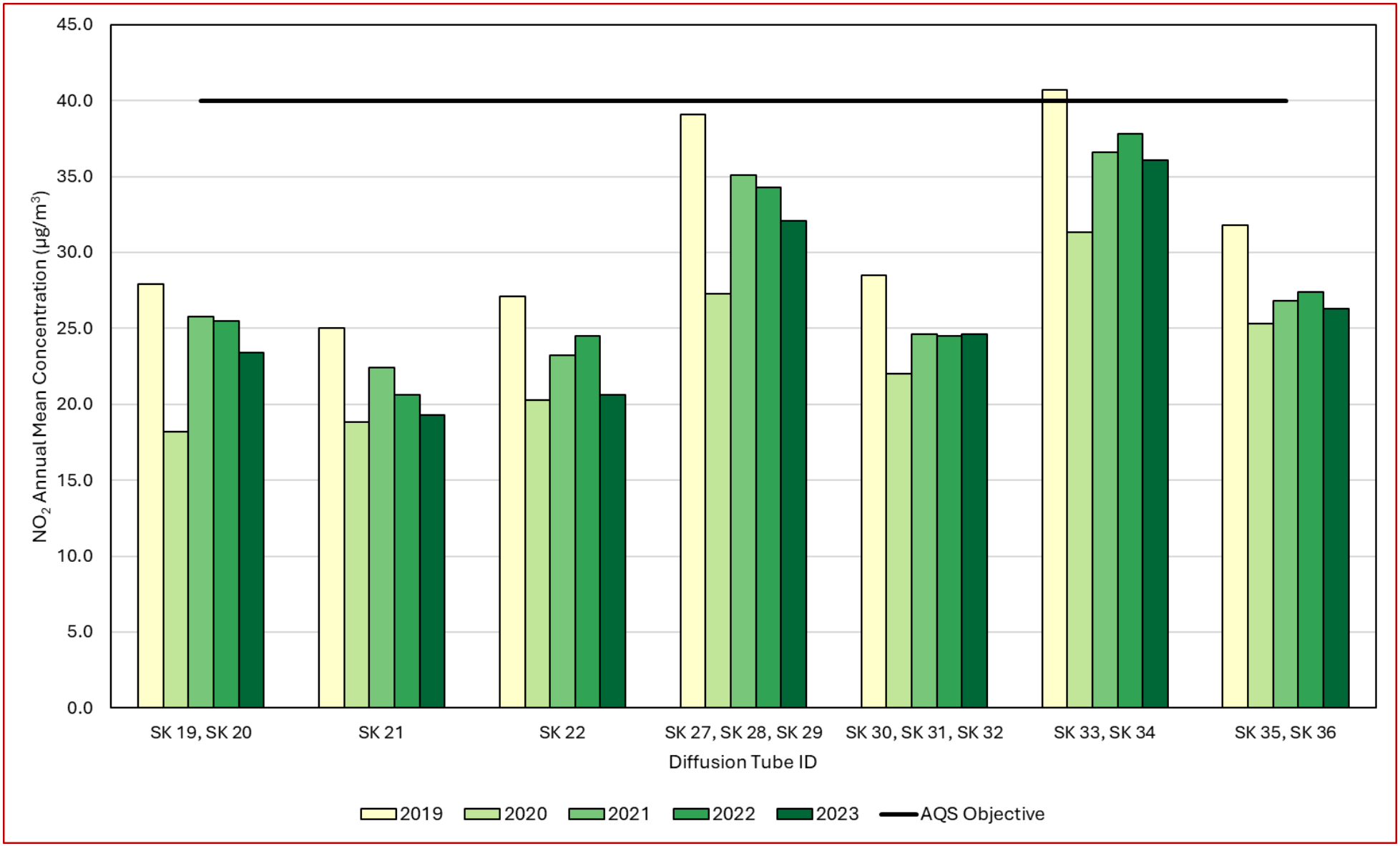


Figure A.2 – Trends in Annual Mean NO2 – Diffusion Tubes (Within AQMA No.6 - Continued)

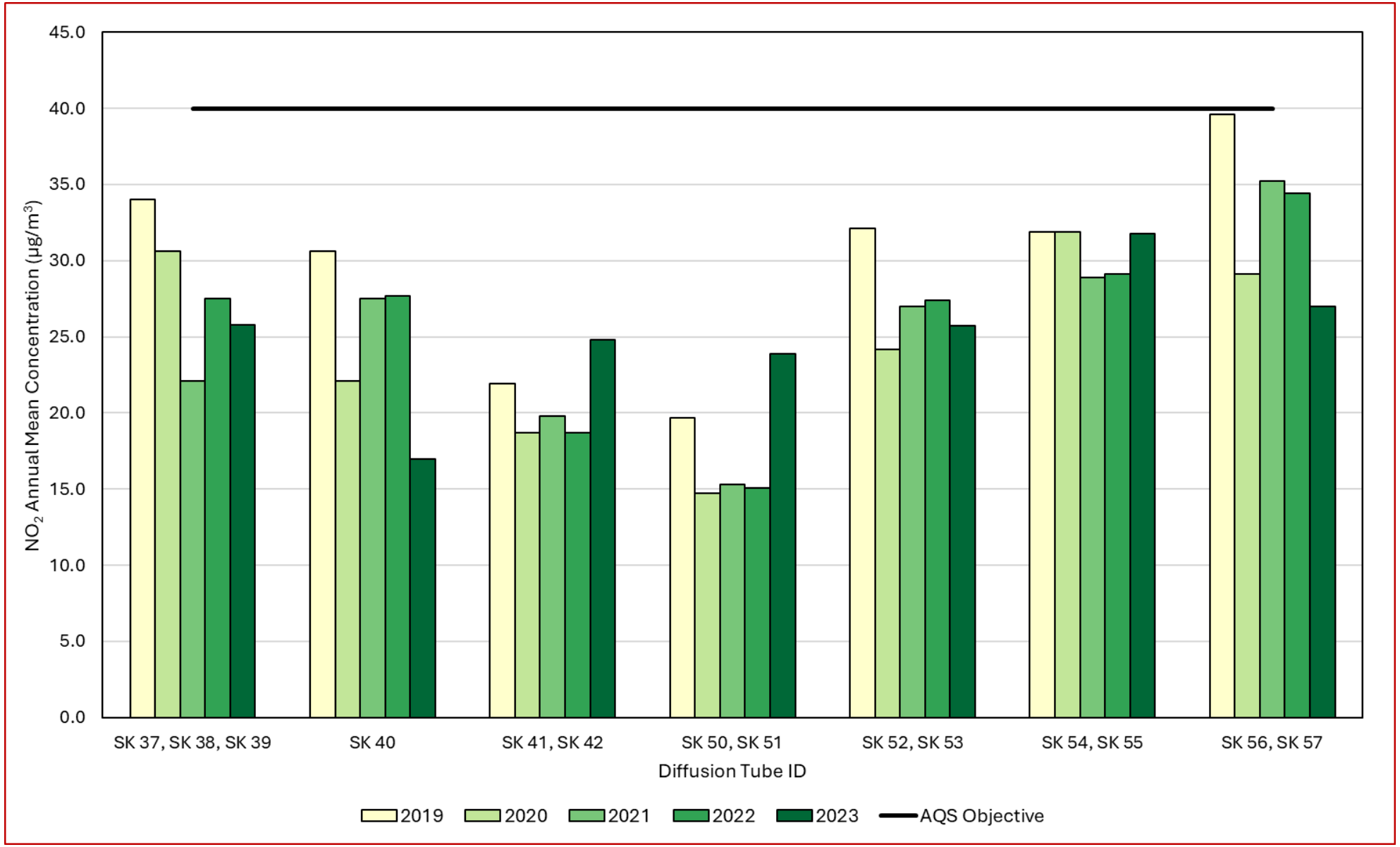


Figure A.3 – Trends in Annual Mean NO_2 – Diffusion Tubes (Sites in Grantham (Outside AQMA))

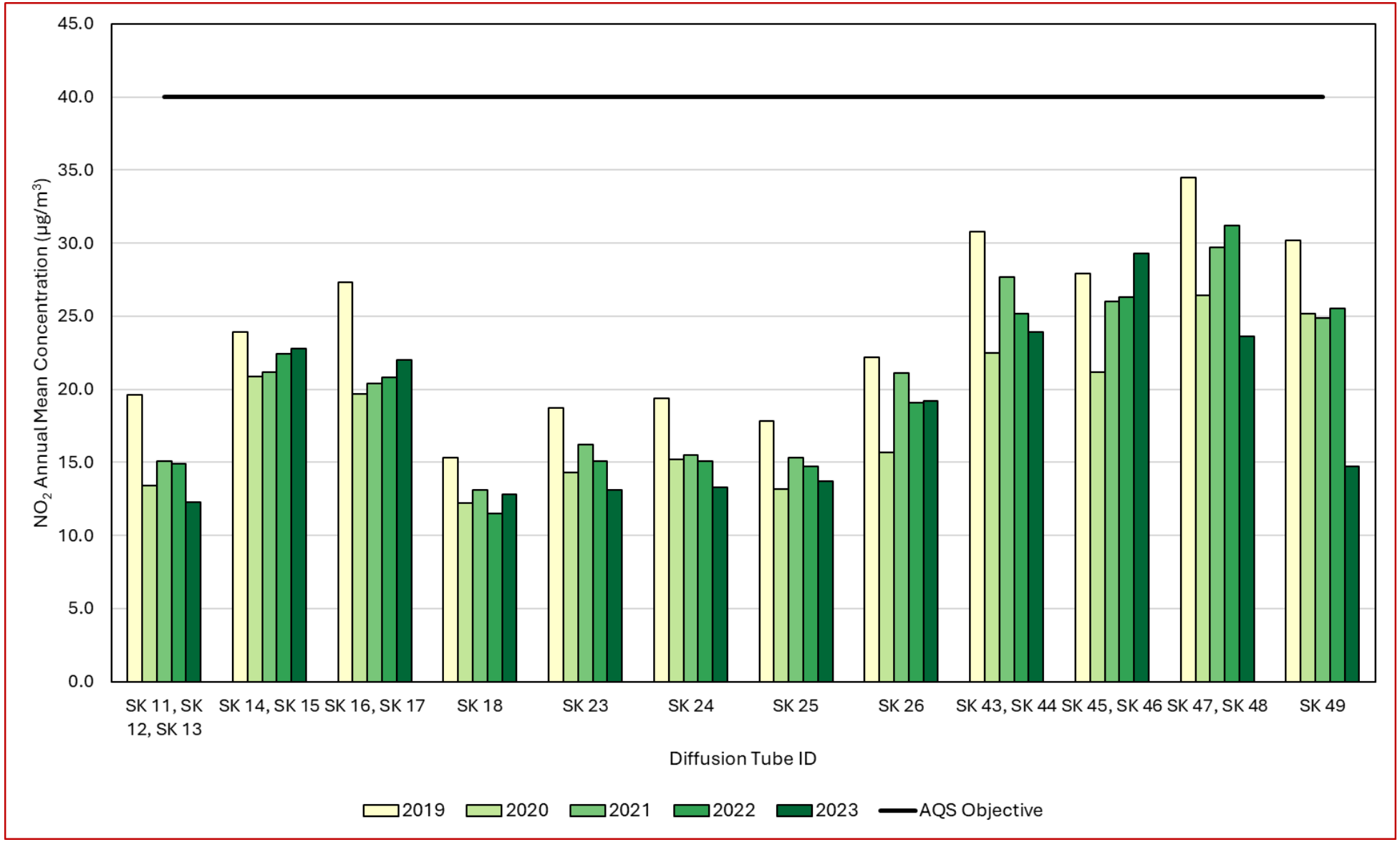
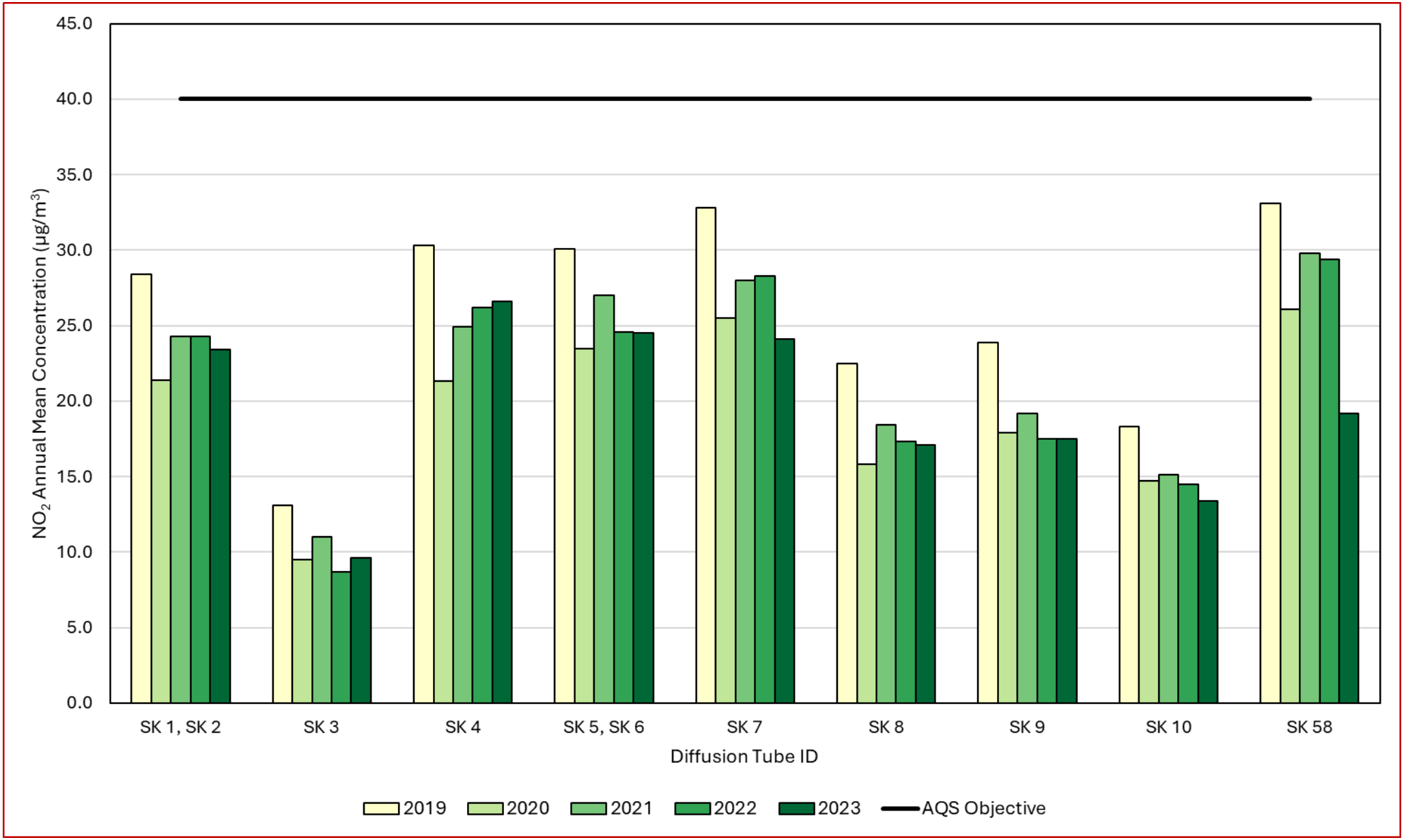


Figure A.4 – Trends in Annual Mean NO_2 – Diffusion Tubes (Sites in Stamford)



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B. 1 – NO_2 2023 Diffusion Tube Results (µg/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 (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
SK 1	502659	307218	35.0	29.6	34.3	29.9	31.4	26.0	21.2	23.6	27.9	-	38.4	25.2	-	-	-	Duplicate Site with SK 1 and SK 2 - Annual data provided for SK 2 only
SK 2	502659	307218	30.1	30.9	28.5	29.8	31.3	21.8	20.7	22.5	31.1	-	27.6	22.6	28.2	23.4	-	Duplicate Site with SK 1 and SK 2 - Annual data provided for SK 2 only
SK 3	502717	307750	16.4	15.2	10.7	9.1	8.9	6.7	7.9	7.8	10.5	-	18.0	15.5	11.5	9.6	-	
SK 4	503291	307420	**42.0**	38.9	32.3	31.7	-	23.8	21.8	24.2	34.0	-	42.1	29.8	32.1	26.6	-	
SK 5	503391	307396	29.4	33.6	33.5	31.3	**40.3**	24.9	22.4	24.9	32.8	-	33.2	22.8	-	-	-	Duplicate Site with SK 5 and SK 6 - Annual data provided for SK 6 only
SK 6	503391	307396	26.6	28.4	29.7	31.1	**48.1**	23.7	20.1	23.9	30.4	-	33.8	23.5	29.5	24.5	-	Duplicate Site with SK 5 and SK 6 - Annual data provided for SK 6 only
SK 7	503281	307398	31.3	25.1	31.2	-	27.9	27.4	24.2	26.4	39.0	-	34.5	23.5	29.1	24.1	-	
SK 8	502910	307120	21.0	23.7	25.7	21.2	28.0	17.8	14.8	15.3	20.2	-	19.8	18.7	20.6	17.1	-	
SK 9	502873	307141	24.4	27.3	23.1	18.7	24.0	13.7	15.3	17.3	22.7	-	26.2	19.2	21.1	17.5	-	
SK 10	502382	306890	20.2	21.3	15.4	13.5	17.0	12.9	12.0	10.4	17.7	-	24.4	13.4	16.2	13.4	-	
SK 11	490118	334165	14.2	16.9	15.7	14.7	12.7	9.9	10.9	13.5	18.0	-	19.2	11.9	-	-	-	Triplicate Site with SK 11, SK 12 and SK 13 - Annual data provided for SK 13 only
SK 12	490118	334165	19.0	14.9	16.5	15.3	12.7	10.4	12.3	14.7	17.2	-	21.3	13.8	-	-	-	Triplicate Site with SK 11, SK 12 and SK 13 - Annual data provided for SK 13 only
SK 13	490118	334165	19.5	6.3	15.2	15.4	14.0	9.4	13.3	13.6	18.5	-	20.0	18.1	14.8	12.3	-	Triplicate Site with SK 11, SK 12 and SK 13 - Annual data provided for SK 13 only
SK 14	490877	334642	36.5	24.8	27.5	22.2	25.2	18.4	22.2	23.1	28.4	-	**41.6**	23.7	-	-	-	Duplicate Site with SK 14 and SK 15 - Annual data provided for SK 15 only
SK 15	490877	334642	32.5	35.6	28.7	22.6	23.2	19.9	19.6	23.5	30.4	-	**47.9**	26.0	27.4	22.8	-	Duplicate Site with SK 14 and SK 15 - Annual data provided for SK 15 only
SK 16	489263	335353	23.3	22.3	23.5	16.1	18.1	16.8	24.0	27.1	28.3	-	**50.6**	29.7	-	-	-	Duplicate Site with SK 16 and SK 17 - Annual data provided for SK 17 only
SK 17	489263	335353	26.5	34.4	20.5	17.7	19.2	15.8	26.7	26.1	28.3	-	**54.4**	32.7	26.5	22.0	-	Duplicate Site with SK 16 and SK 17 - Annual data provided for SK 17 only
SK 18	489956	336574	15.9	20.9	20.4	12.0	13.7	8.7	10.6	11.2	18.1	-	25.3	12.7	15.4	12.8	-	
SK 19	491067	336209	31.2	30.6	13.7	28.9	25.3	20.3	23.9	24.7	33.7	-	**43.5**	23.7	-	-	-	Duplicate Site with SK 19 and SK 20 - Annual data provided for SK 20 only

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 (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
SK 20	491067	336209	31.0	32.6	30.3	29.1	25.1	22.7	23.4	25.8	33.3	-	**41.6**	26.6	28.2	23.4	-	Duplicate Site with SK 19 and SK 20 - Annual data provided for SK 20 only
SK 21	491270	336256	25.2	32.6	21.9	21.1	18.1	14.3	21.1	17.0	27.6	-	27.3	30.1	23.3	19.3	-	
SK 22	491260	336188	36.1	34.2	25.4	24.2	24.5	17.4	19.8	22.7	13.9	-	30.2	24.4	24.8	20.6	-	
SK 23	489720	338204	22.0	15.3	16.7	15.0	13.9	11.8	11.4	13.5	17.5	-	24.0	12.4	15.8	13.1	-	
SK 24	489870	338683	23.9	14.8	19.3	14.9	13.7	8.3	13.2	13.7	19.1	-	19.6	15.2	16.0	13.3	-	
SK 25	492069	337874	21.4	23.5	19.2	12.6	18.8	11.2	11.9	13.0	18.1	-	18.0	13.8	16.5	13.7	-	
SK 26	491280	336573	28.5	27.0	24.5	20.5	20.6	16.7	17.8	16.8	26.4	-	31.8	23.7	23.1	19.2	-	
SK 27	491496	336354	**45.2**	35.5	**44.9**	39.5	**42.3**	32.9	30.3	30.6	**52.0**	-	**46.4**	34.2	-	-	-	Triplicate Site with SK 27, SK 28 and SK 29 - Annual data provided for SK 29 only
SK 28	491496	336354	**46.8**	**48.4**	**43.5**	**42.0**	**41.2**	29.3	28.9	30.7	**42.9**	-	**51.4**	30.8	-	-	-	Triplicate Site with SK 27, SK 28 and SK 29 - Annual data provided for SK 29 only
SK 29	491496	336354	32.3	36.9	**42.7**	**40.5**	38.1	35.5	31.6	35.5	**44.3**	-	**48.3**	22.5	38.7	32.1	-	Triplicate Site with SK 27, SK 28 and SK 29 - Annual data provided for SK 29 only
SK 30	491472	336315	37.7	**40.7**	28.4	26.5	31.3	21.8	24.3	22.4	28.5	-	**48.4**	24.7	-	-	-	Triplicate Site with SK 30, SK 31 and SK 32 - Annual data provided for SK 32 only
SK 31	491472	336315	36.8	28.5	25.5	25.7	29.7	24.3	24.9	24.4	30.0	-	**46.1**	24.3	-	-	-	Triplicate Site with SK 30, SK 31 and SK 32 - Annual data provided for SK 32 only
SK 32	491472	336315	35.4	23.9	29.3	26.0	30.9	23.1	20.4	22.9	16.0	-	**61.3**	32.7	29.6	24.6	-	Triplicate Site with SK 30, SK 31 and SK 32 - Annual data provided for SK 32 only
SK 33	491515	336389	**55.4**	**59.0**	**48.8**	**41.8**	**41.2**	32.5	**40.0**	33.9	**50.9**	-	**50.6**	35.8	-	-	-	Duplicate Site with SK 33 and SK 34 - Annual data provided for SK 34 only
SK 34	491515	336389	35.8	**57.4**	**51.2**	**43.2**	**43.6**	28.9	39.4	37.5	**46.9**	-	**55.5**	26.4	43.4	36.1	-	Duplicate Site with SK 33 and SK 34 - Annual data provided for SK 34 only
SK 35	491330	336022	38.3	33.0	33.1	32.1	39.7	23.3	22.2	27.8	36.5	-	**45.5**	24.3	-	-	-	Duplicate Site with SK 35 and SK 36 - Annual data provided for SK 36 only
SK 36	491330	336022	32.1	35.5	30.5	30.2	36.7	27.0	23.1	28.1	22.2	-	**50.7**	25.3	31.7	26.3	-	Duplicate Site with SK 35 and SK 36 - Annual data provided for SK 36 only
SK 37	491460	335715	29.5	34.6	33.1	33.9	38.5	27.7	21.0	22.9	35.4	-	**43.5**	25.7	-	-	-	Triplicate Site with SK 37, SK 38 and SK 39 - Annual data provided for SK 39 only
SK 38	491460	335715	31.3	33.4	-	33.4	39.8	26.8	21.6	24.1	35.6	-	**46.2**	25.4	-	-	-	Triplicate Site with SK 37, SK 38 and SK 39 - Annual data provided for SK 39 only
SK 39	491460	335715	32.1	23.2	32.9	34.4	34.2	26.3	22.4	24.3	34.6	-	**44.8**	20.7	31.1	25.8	-	Triplicate Site with SK 37, SK 38 and SK 39 - Annual data provided for SK 39 only
SK 40	491512	335719	14.5	18.8	20.8	20.6	24.5	16.5	16.6	16.9	24.1	-	33.3	18.5	20.5	17.0	-	
SK 41	491602	335485	26.9	32.4	31.2	30.2	-	24.6	22.2	24.1	35.3	-	**42.6**	21.8	-	-	-	Duplicate Site with SK 41 and

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 (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
																		SK 42 - Annual data provided for SK 42 only
SK 42	491602	335485	29.9	32.9	33.0	31.6	36.1	27.0	20.0	24.6	31.8	-	**41.4**	20.5	29.8	24.8	-	Duplicate Site with SK 41 and SK 42 - Annual data provided for SK 42 only
SK 43	491734	335196	29.0	**40.7**	28.7	23.4	31.2	20.5	25.1	20.5	36.0	-	**45.1**	25.0	-	**-**	-	Duplicate Site with SK 43 and SK 44 - Annual data provided for SK 44 only
SK 44	491734	335196	31.2	16.8	34.5	32.5	24.3	25.2	18.9	28.8	33.2	-	**40.2**	23.9	28.9	23.9	-	Duplicate Site with SK 43 and SK 44 - Annual data provided for SK 44 only
SK 45	491869	334960	**43.3**	**40.2**	**42.4**	32.8	33.6	26.6	25.2	26.9	**50.1**	-	**43.7**	19.8	-	**-**	-	Duplicate Site with SK 45 and SK 46 - Annual data provided for SK 46 only
SK 46	491869	334960	**43.1**	27.4	37.6	34.3	31.0	30.1	30.4	31.9	**40.4**	-	**49.0**	37.6	35.3	29.3	-	Duplicate Site with SK 45 and SK 46 - Annual data provided for SK 46 only
SK 47	492067	334922	31.6	10.5	30.9	29.4	22.4	23.4	26.0	26.8	38.1	-	**46.8**	26.6	-	**-**	-	Duplicate Site with SK 47 and SK 48 - Annual data provided for SK 48 only
SK 48	492067	334922	32.3	18.6	32.4	26.3	24.2	22.4	26.6	28.9	36.9	-	36.1	28.5	28.4	23.6	-	Duplicate Site with SK 47 and SK 48 - Annual data provided for SK 48 only
SK 49	491427	335193	23.1	25.8	18.0	13.3	13.3	9.5	12.1	12.9	17.3	-	31.6	-	17.7	14.7	-	
SK 50	491184	335575	-	23.8	33.6	28.7	29.6	24.4	-	27.4	-	-	38.9	-	-	**-**	-	Duplicate Site with SK 50 and SK 51 - Annual data provided for SK 51 only
SK 51	491184	335575	34.2	**40.4**	-	24.0	26.4	18.6	23.8	29.1	30.9	-	33.7	21.8	28.8	23.9	-	Duplicate Site with SK 50 and SK 51 - Annual data provided for SK 51 only
SK 52	491200	335636	20.4	38.3	31.6	33.0	24.6	24.4	27.5	28.7	32.8	-	32.9	33.0	-	**-**	-	Duplicate Site with SK 52 and SK 53 - Annual data provided for SK 53 only
SK 53	491200	335636	26.9	39.7	36.0	31.7	30.1	25.0	25.6	28.2	39.3	-	**41.2**	29.8	30.9	25.7	-	Duplicate Site with SK 52 and SK 53 - Annual data provided for SK 53 only
SK 54	491492	335505	38.3	41.3	38.0	**41.9**	**47.1**	28.0	30.3	34.6	**48.0**		**42.0**	26.8	-	**-**	-	Duplicate Site with SK 54 and SK 55 - Annual data provided for SK 55 only
SK 55	491492	335505	37.1	39.7	36.6	**41.8**	**46.3**	34.4	37.0	34.0	**50.4**	--	**47.1**	23.4	38.4	31.8	-	Duplicate Site with SK 54 and SK 55 - Annual data provided for SK 55 only
SK 56	491402	335501	36.8	**45.0**	**42.4**	31.2	32.6	27.1	-	30.9	**40.9**	-	**47.4**	35.4	-	**-**	-	Duplicate Site with SK 56 and SK 57 - Annual data provided for SK 57 only
SK 57	491402	335501	33.6	27.6	**43.1**	30.3	29.0	21.0	16.4	28.9	39.2	-	30.2	30.1	32.5	27.0	-	Duplicate Site with SK 56 and SK 57 - Annual data provided for SK 57 only
SK 58	503070	306957	32.3	28.8	24.1	19.4	18.5	17.0	27.7	20.2	21.3	-	22.2	23.1	23.1	19.2	-	

☒ **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.**

☒ **National bias adjustment factor used.**

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

☒ **South Kesteven District 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 QA/QC

New or Changed Sources Identified Within South Kesteven During 2023

South Kesteven District Council has identified no new developments within the monitoring year of 2023 that are expected to significantly impact the air quality objectives within the area into the 2024 monitoring year and onwards.

Additional Air Quality Works Undertaken by South Kesteven District Council During 2023

During 2023, South Kesteven District Council commissioned Bureau Veritas UK to undertake a Source Apportionment Exercise in support of the updated AQAP due for issue on 8th October 2024 pending Councillor and Cabinet approval. The Source Apportionment Exercise can be reviewed in Appendix F.

The Council indicated they may undertake short term monitoring in Bourne, a small market town within the Council jurisdiction, although this is yet to be confirmed as such will likely occur in 2024 monitoring year.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2023 were supplied and analysed by Gradko International, using the 50% Triethanolamine (TEA) in acetone preparation method. Gradko International, a UKAS accredited laboratory, participate in the AIR-PT scheme for NO_2 diffusion tube analysis and Annual Field Intercomparison Exercise. These provide strict criteria relating to performance that participating laboratories must meet, ensuring that the reported NO_2 concentrations are of a high calibre. From the most recent set of AIR-PT results (AR058, July – August and AR059, September – October), in which Gradko scored 100% – the percentage score reflects the results deemed satisfactory based upon the z-score of ± 2.

There were 15 local authority co-location studies which used tubes supplied by Gradko with the 50% TEA in acetone preparation method in 2023, 14 were rated as ‘good’, as shown by the precision summary results. This precision reflects the laboratory’s

performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a “good” precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Monitoring in 2023 throughout South Kesteven District was completed in adherence with the 2023 Diffusion Tube Monitoring Calendar, whereby all changeovers throughout the monitoring year were completed in line with Defra guidance. It is noted that no tube reports data for October 2023 due to the tubes being lost in transit to the laboratory for analysis.

Diffusion Tube Annualisation

For any site where data capture is below 75%, annualisation is to be performed. This is because section 7.196 of TG(22) states that:

“If data capture is below 75% for the year, then it is necessary to annualise the data… [as] the concentration varies throughout the year, and the instrument may have been operational for a period of above or below average concentrations”.

During 2023, there was no requirement for annualisation at any diffusion tube sites within South Kesteven District, as all sites had greater than 75% data capture.

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. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Kesteven District Council have applied a national bias adjustment factor of 0.83 to the 2023 monitoring data. A summary of bias adjustment factors used by South Kesteven District Council over the past five years is presented in Table C. 1.

No co-location studies are carried out by South Kesteven District Council therefore only a national factor can be applied. The national factor for Gradko 50% TEA in acetone, as presented in the Diffusion Tube Bias Factors Spreadsheet v03/24, was 0.83 based on 15 studies. The National Bias Adjustment Spreadsheet is presented in Figure C. 1.

Table C. 1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.83
2022	National	03/23	0.82
2021	National	03/22	0.83
2020	National	03/21	0.84
2019	National	03/20	0.89

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 monitoring location within South Kesteven District required distance correction during 2023.

Figure C. 1 - National Bias Adjustment Factor Spreadsheet (03/24)

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/24

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2024

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data [2]

Step 4:

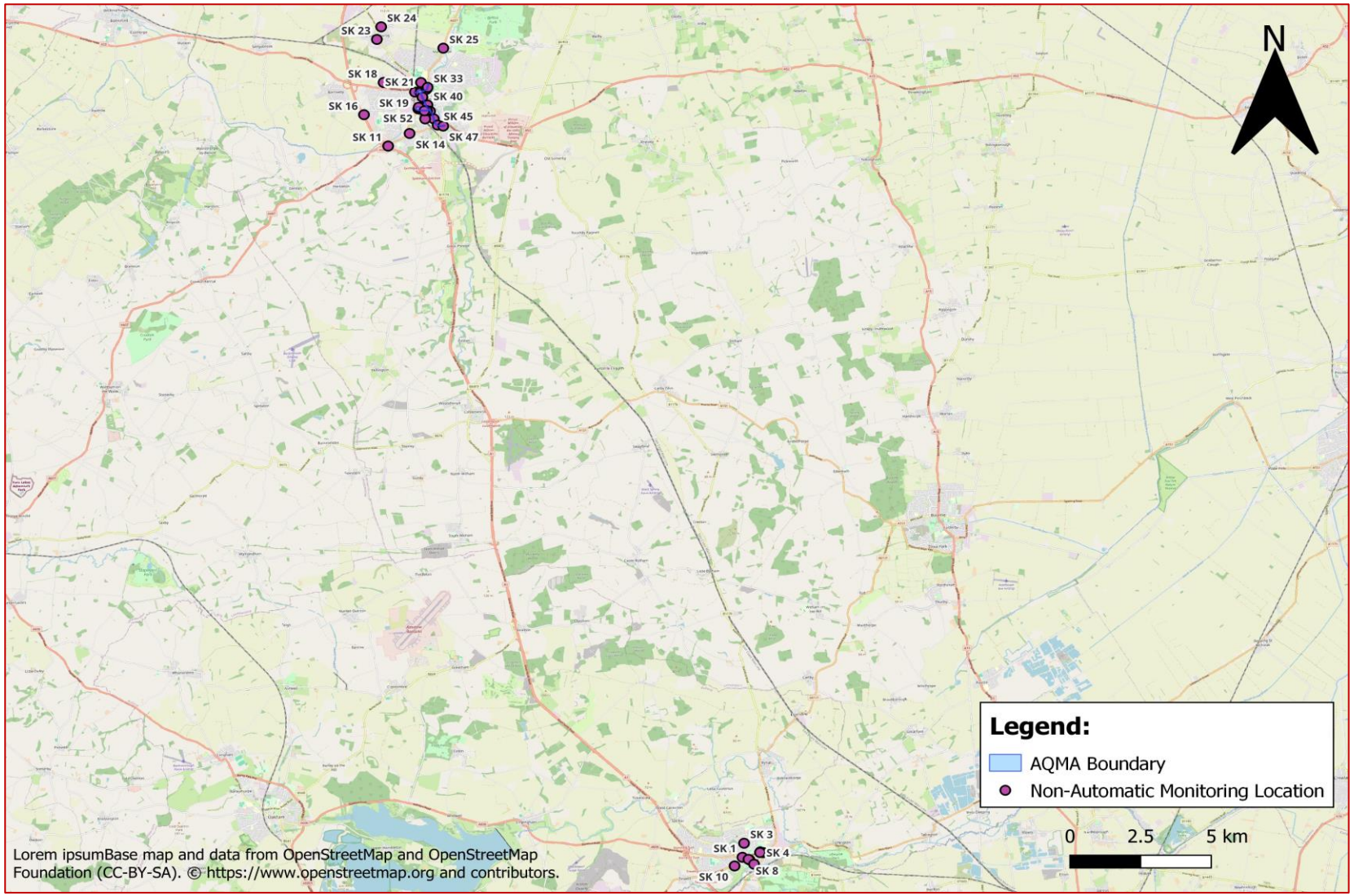
Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor [3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote [4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By [1]	Method	Year [5]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision [6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	50% TEA in acetone	2023	UB	City Of London Corporation	10	28	22	26.3%	G	**0.79**
Gradko	50% TEA in acetone	2023	R	City Of London Corporation	11	36	31	15.0%	G	**0.87**
Gradko	50% TEA in acetone	2023	R	LB Newham	12	27	21	28.0%	G	**0.78**
Gradko	50% TEA in acetone	2023	SU	Redcar And Cleveland Borough Council	12	14	10	48.0%	G	**0.68**
Gradko	50% TEA in Acetone	2023	R	Sandwell Mbc	12	33	26	27.6%	G	**0.78**
Gradko	50% TEA in acetone	2023	UB	Sandwell Mbc	11	21	18	15.8%	G	**0.86**
Gradko	50% TEA in acetone	2023	R	Sandwell Mbc	12	23	20	14.2%	S	**0.88**
Gradko	50% TEA in Acetone	2023	UC	Falkirk Council	12	33	29	14.3%	G	**0.87**
Gradko	50% TEA in Acetone	2023	UB	Falkirk Council	12	15	13	8.3%	G	**0.92**
Gradko	50% TEA in acetone	2023	R	London Borough Of Lewisham	11	33	27	22.7%	G	**0.82**
Gradko	50% TEA in Acetone	2023	R	London Borough Of Merton	12	37	31	18.5%	G	**0.84**
Gradko	50% TEA in acetone	2023	KS	Marylebone Road intercomparison	11	47	38	25.7%	G	**0.80**
Gradko	50% TEA in acetone	2023	R	Royal Borough Of Windsor And Maidenhead	11	27	23	21.6%	G	**0.82**
Gradko	50% TEA in acetone	2023	R	Royal Borough Of Windsor And Maidenhead	12	24	24	0.6%	G	**0.99**
Gradko	50% TEA in acetone	2023	R	London Borough Of Richmond Upon Thames	11	18	16	15.6%	G	**0.86**
Gradko	50% TEA in acetone	2023		**Overall Factor [3] (15 studies)**				**Use**		**0.83**

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D. 1 – All Non-Automatic Monitoring Locations in South Kesteven and AQMA No.6



NOTE: As majority of the monitoring locations in South Kesteven are duplicate or triplicates, only one Site ID has been provided for ease of visuals in the Appendix D Figures. Refer to Table A.2 to match up locations.

Figure D. 2 – Non-Automatic Monitoring Locations: Stamford

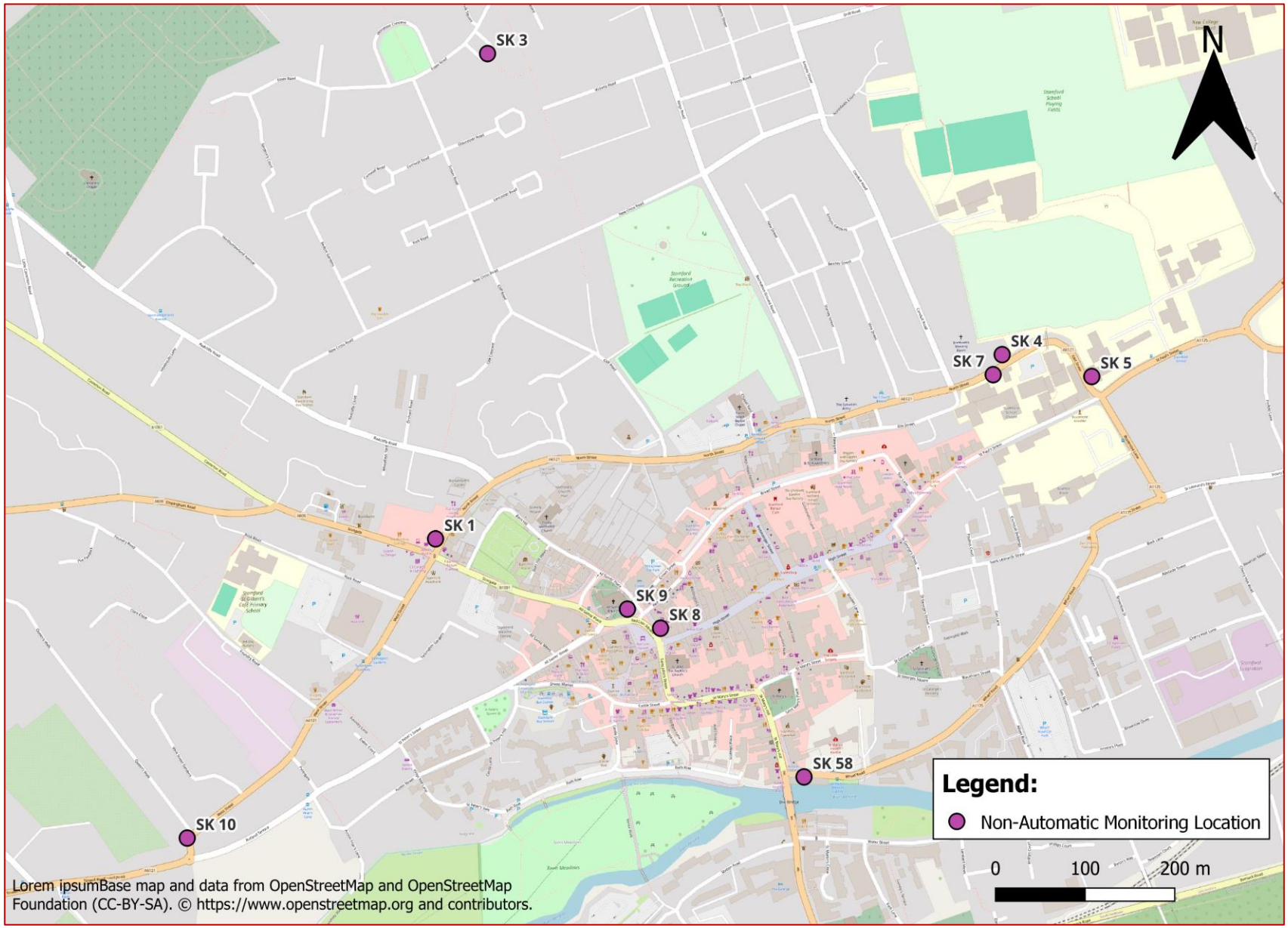


Figure D. 3 – Non-Automatic Monitoring Locations: Grantham

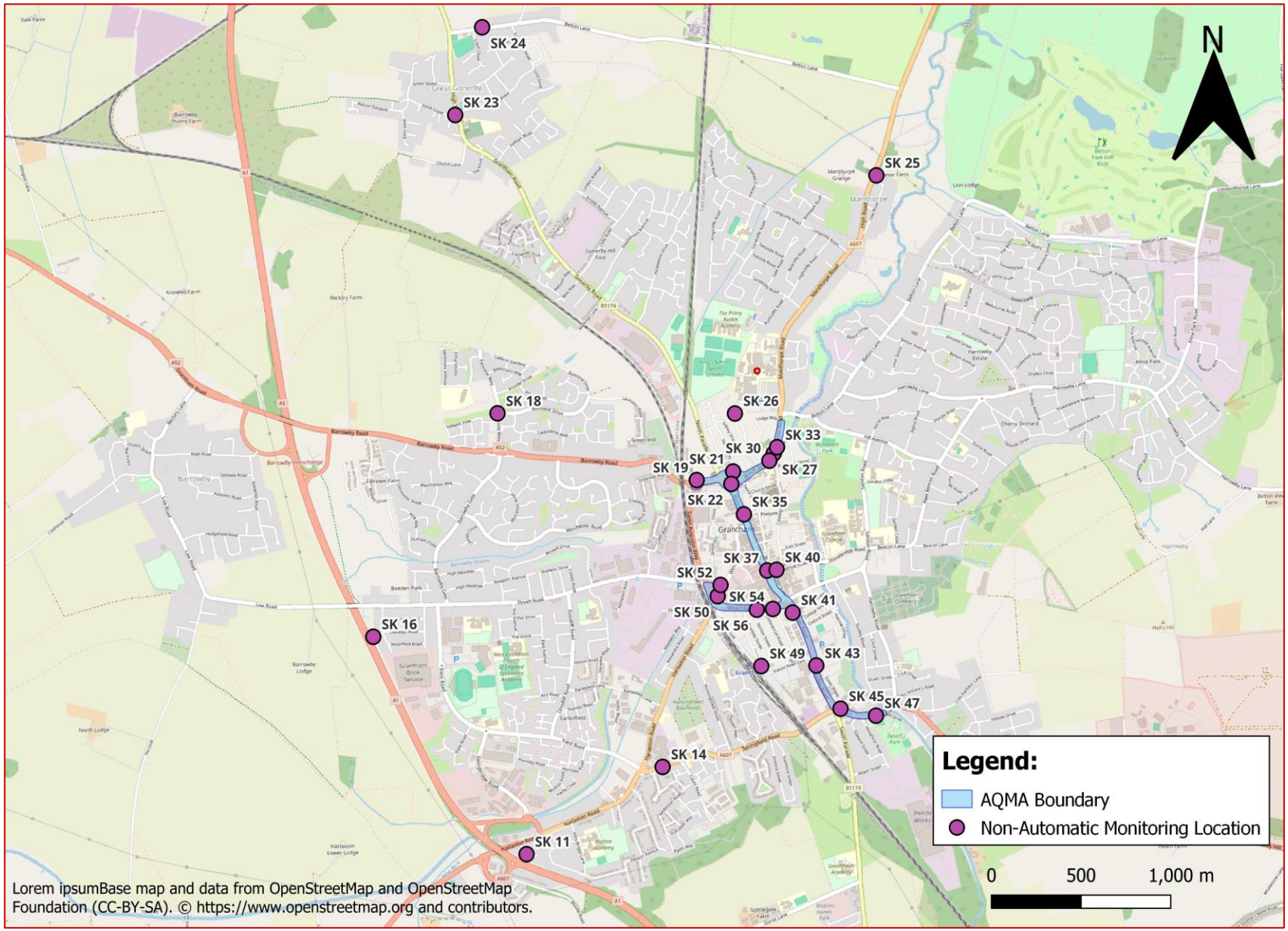
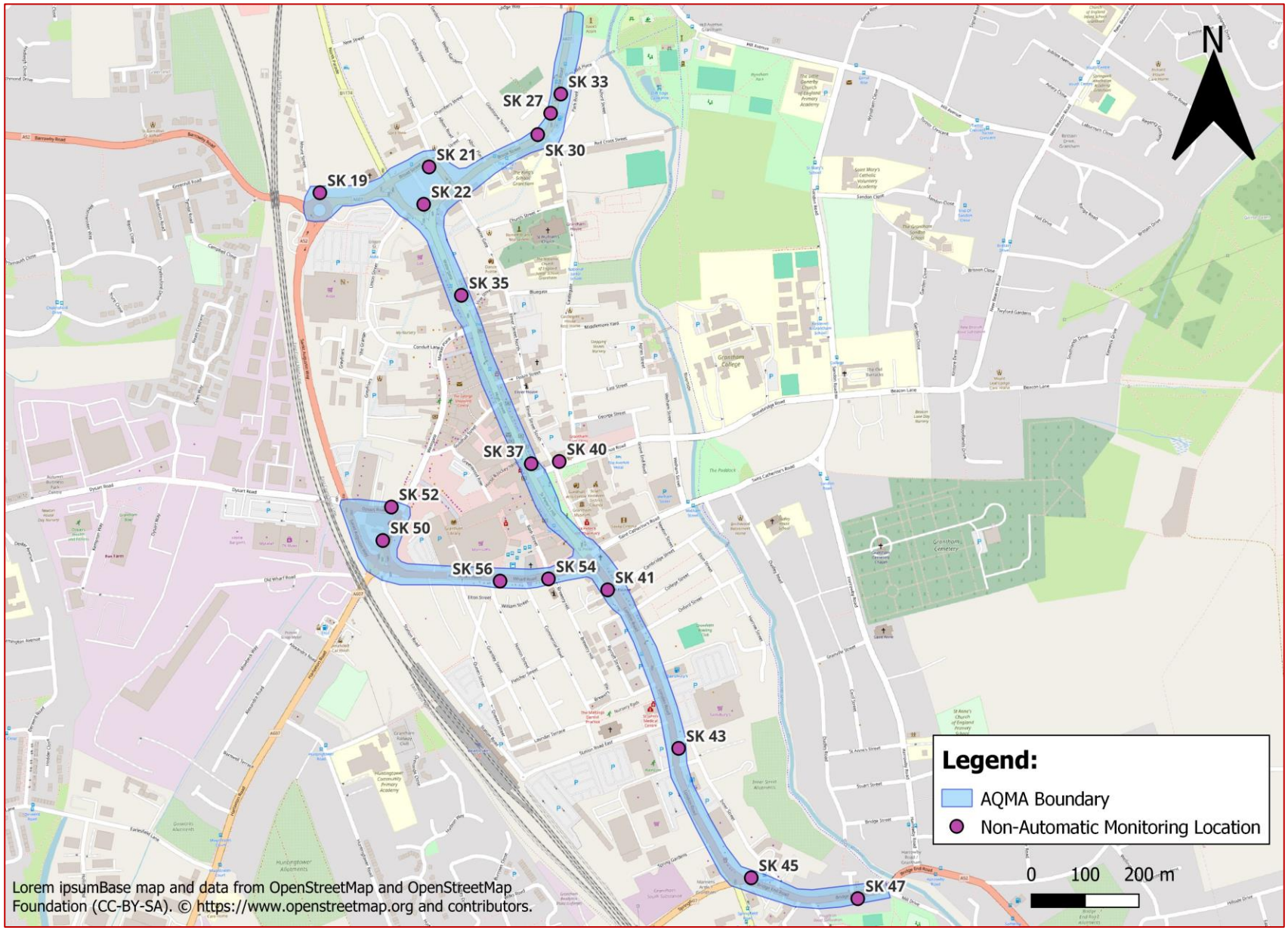


Figure D. 4 – Non-Automatic Monitoring Locations: Grantham AQMA No.6



NOTE: Figure D. 4 shows SK40 on the outskirts of the AQMA boundary. It has been included in the Figure as the Council still consider SK40 to be a good representation of concentrations within the AQMA despite being near the border.

Figure D. 5 – 2023 Annual NO_2 Concentrations All Non-Automatic Monitoring Locations

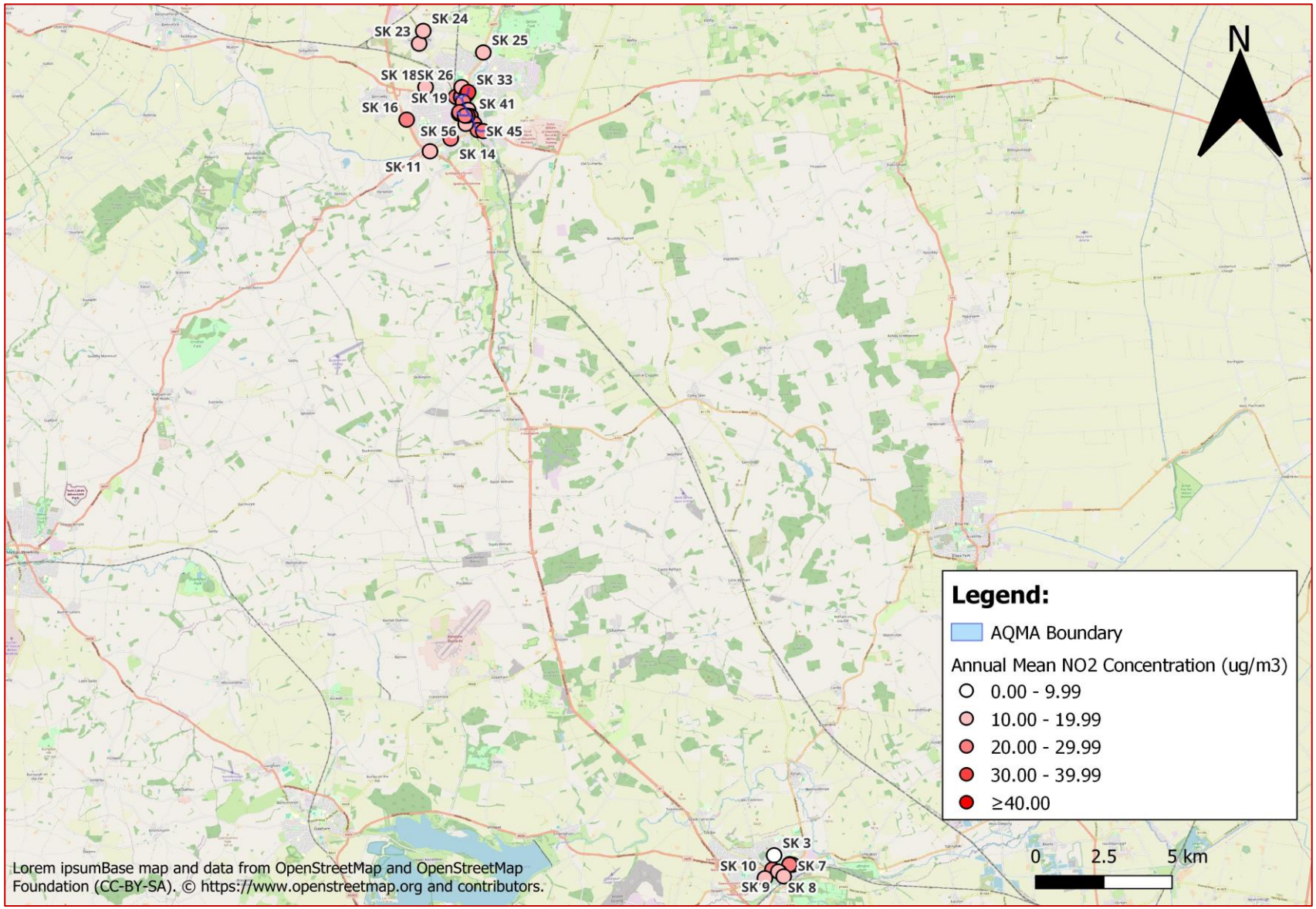


Figure D. 6 – 2023 Annual NO_2 Concentrations All Non-Automatic Monitoring Locations: Stamford

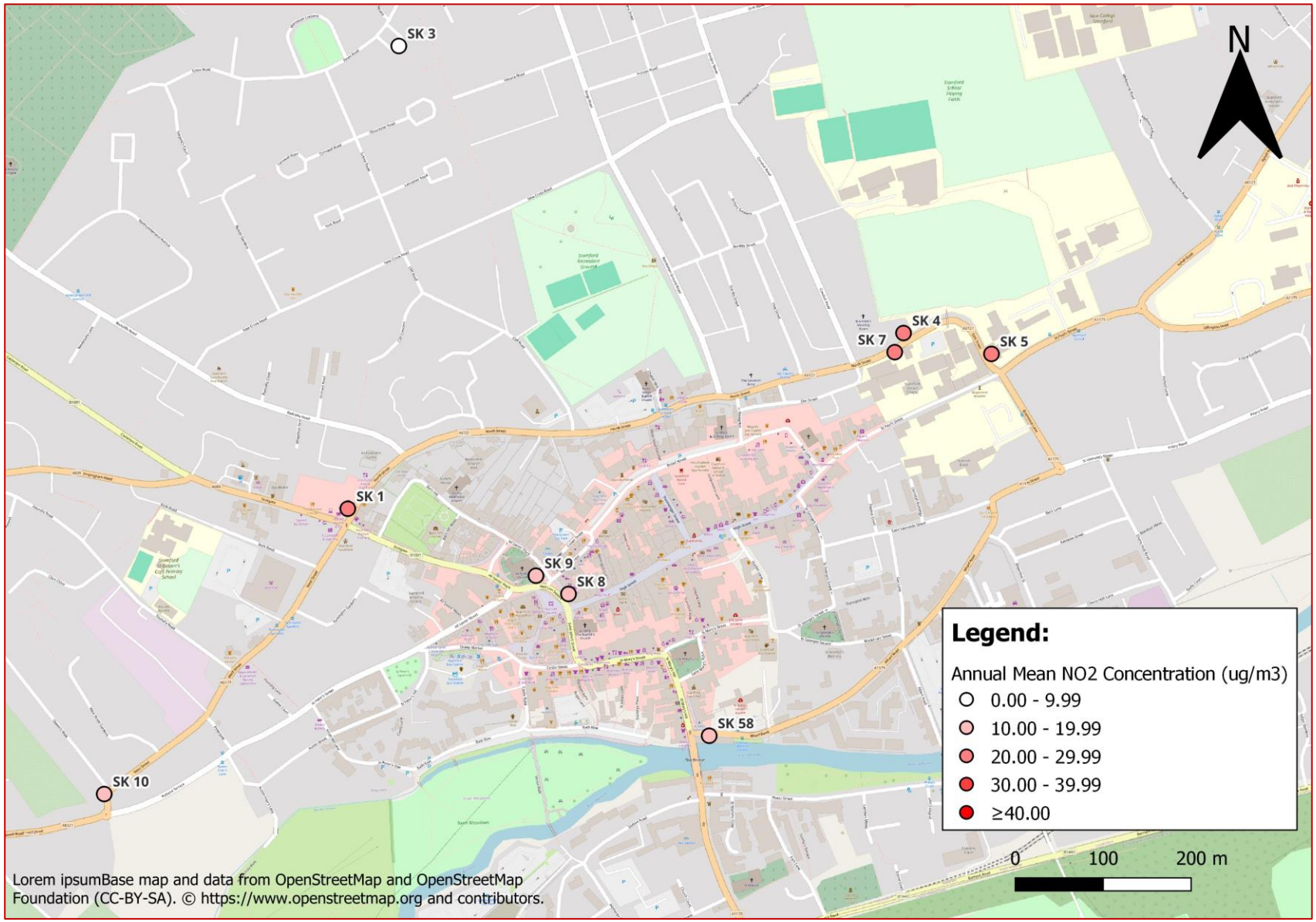


Figure D. 7 – 2023 Annual NO_2 Concentrations All Non-Automatic Monitoring Locations: Grantham

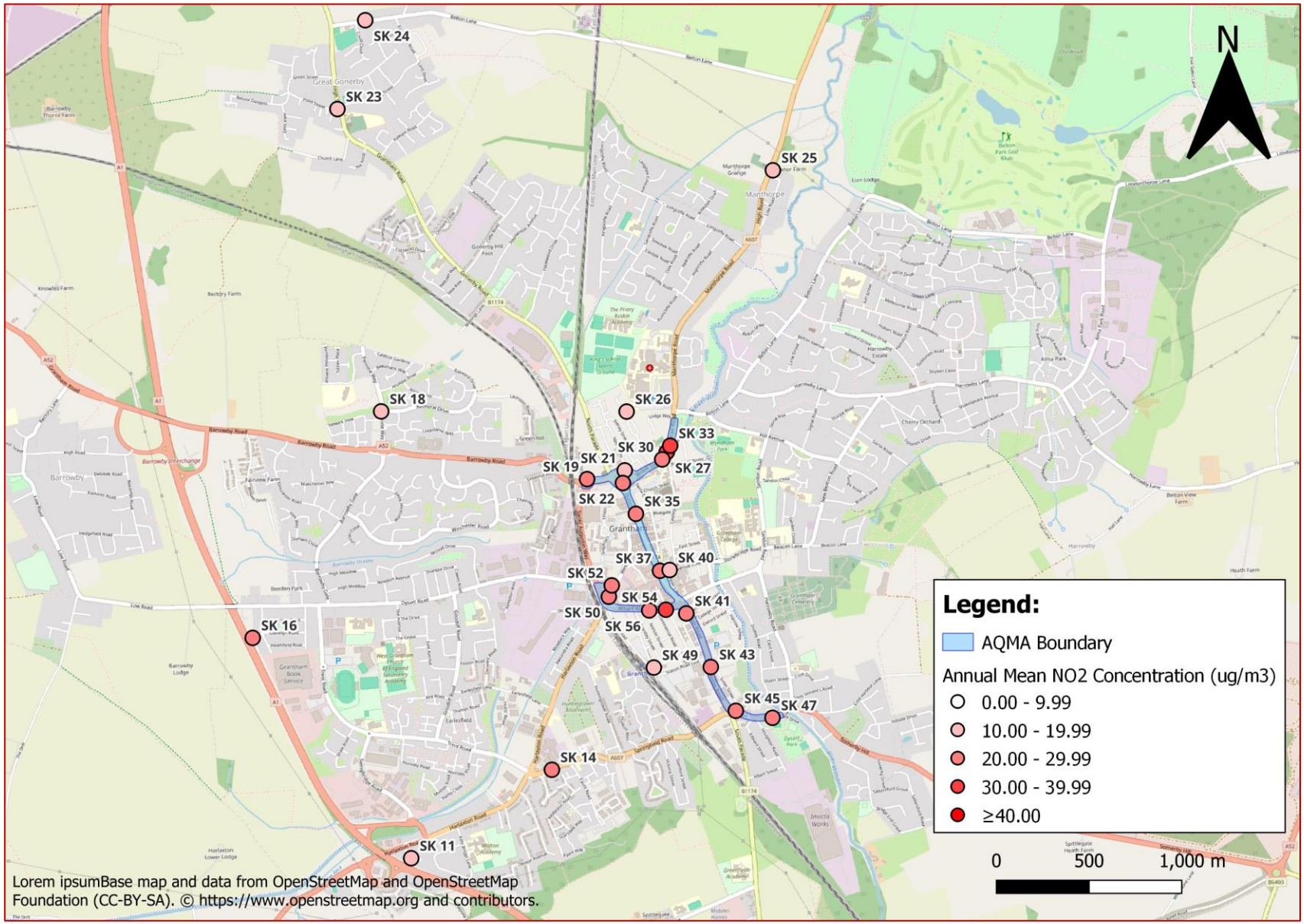
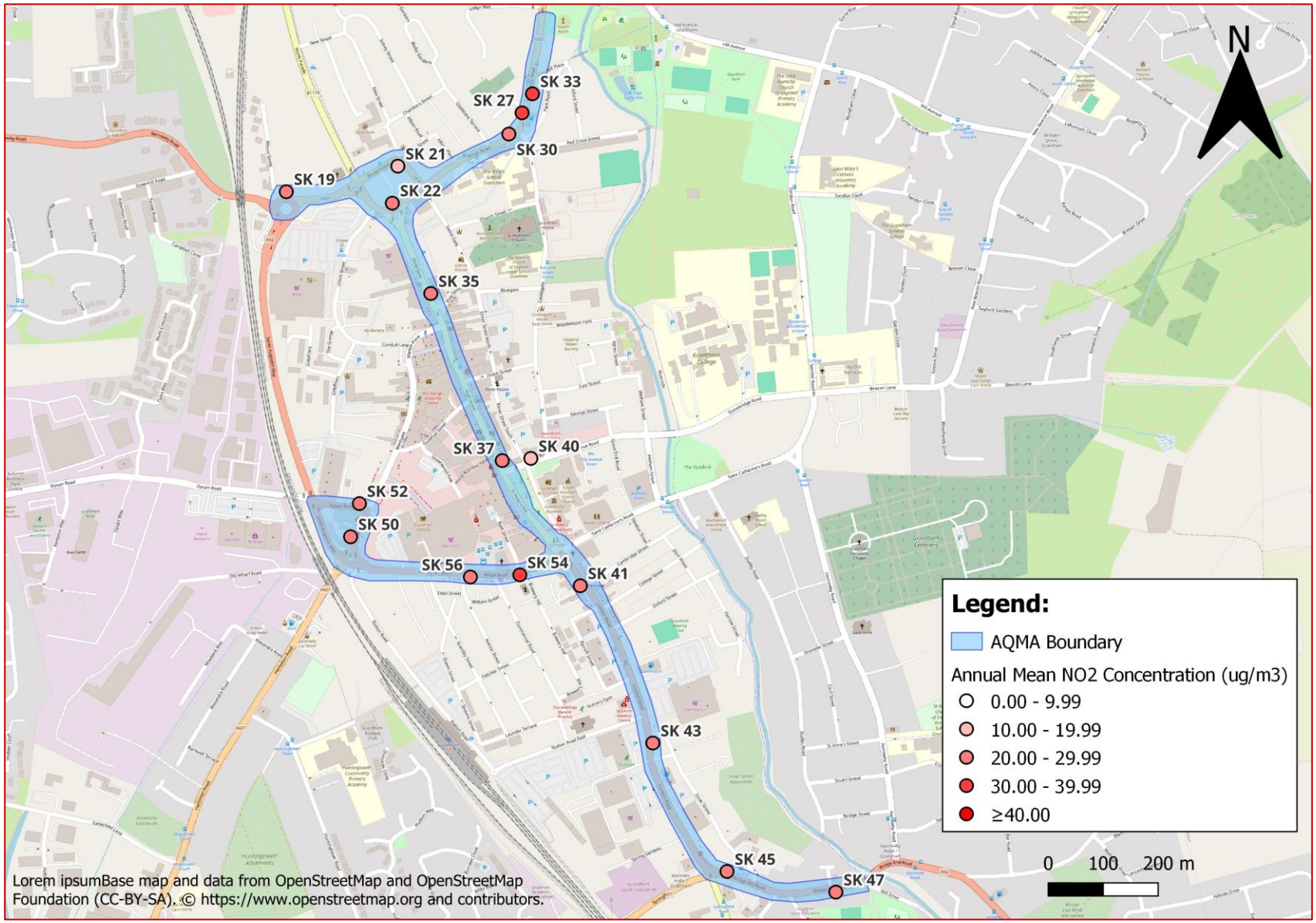


Figure D. 8 – 2023 Annual NO_2 Concentrations All Non-Automatic Monitoring Locations: Grantham AQMA No.6



Appendix E: Summary of Air Quality Objectives in England

Table E. 1 – Air Quality Objectives in England[9]

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

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

Appendix F: Source Apportionment Exercise – AQAP

Glossary of Terms

Abbreviation	Description
AIR-PT	Air and Stack Emissions
AONB	Areas of Outstanding Natural Beauty
AQA	Air Quality Assessment
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
AQS	Air Quality Standard
ASR	Annual Status Report
AURN	Automatic Urban Rural Network
B&B	Bed and Breakfasts
CMCU	Central Management and Coordination Unit
CO_2	Carbon Dioxide
COVID-19	Coronavirus-19
CWZ	Core Walking Zones
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
DT	Diffusion Tube
EA	Environment Agency
ESU	Equipment Support Unit
EU	European Union
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
LAD2	Local Authority Delivery Phase 2
LAD3	Local Authority Delivery Phase 3

Abbreviation	Description
LAQM	Local Air Quality Management
LCC	Lincolnshire County Council
LCN	Local Cycle Network
LCWIP	Local Cycling and Walking Infrastructure Plan
LEVI	Local Electric Vehicle Infrastructure
LED	Light Emitting Diode
LSO	Local Site Operator
NCN	National Cycle Network
NHS	National Health Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
ONS	Office for National Statistics
PG	Policy Guidance
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
SAC	Special Areas of Conservation
SCA	Smoke Control Area
SO_2	Sulphur Dioxide
SSSI	Sites of Special Scientific Interest
TEA	Triethanolamine
TG	Technical Guidance
UKAS	United Kingdom Accreditation Service
ULEV	Ultra Low Emission Vehicle

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.
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