2025 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 2025

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Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Knowsley Metropolitan Borough Council with the support and agreement of the following officers and departments:

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This ASR has been approved by:

- Denise Best (Assistant Executive Director (N&C Services))

  Signature 

- Sarah McNulty (Director of Public Health)

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

This report has been shared with Cllr Shelley Powell, Cabinet Member for Communities and Neighbourhoods.

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Executive Summary: Air Quality in Our Area

Air Quality in Knowsley Metropolitan Borough

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Low-income communities are also disproportionately impacted by poor air quality, exacerbating health and social inequalities.

Error! Reference source not found. 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.

The main sources of air pollution in Knowsley, as identified from previous air quality reviews and assessments, as well as the work carried out in the Merseyside Atmospheric Emissions Inventory[3], are from industrial sources and road traffic vehicle emissions.

Knowsley is home to a wide range of commercial and industrial developments and is an important location for employment in the Liverpool City Region. The borough has large industrial bases concentrated mainly on Knowsley Business Park (situated in Kirkby),

Huyton, Kings and Prescot Business Parks (situated in the centre of the borough), and Jaguar Land Rover car plant (situated in Halewood).

Neighbouring authorities also house large industries that can have an impact on the air quality in Knowsley. For example, the Shell oil refinery and petro chemical complex in Ellesmere Port lies to the southwest of Knowsley as well as major glass manufacturing sites in St Helens.

Traffic movements within the borough also play a significant role when considering air quality. Knowsley has a variety of road connections. The M57 is the 'backbone' of the borough, running Northwest to Southeast. The M62 and A580 (East Lancashire Road) link with the M57 and cut through the borough East to West. The A5300 acts as the southerly extension of the M57. The motorway and main A-roads are connected via a network of smaller roads, which link towns and villages in the borough.

Knowsley Metropolitan Borough Council (MBC) had 3 automatic monitoring stations located in Huyton, Halewood and Kirkby, which were operated from 2008 to September 2021. In 2021, the air quality monitoring stations monitored the following pollutants:

- Kirkby – nitrogen dioxide (NO_2) and particulate matter less than 10 microns (PM_{10})
- Halewood and Huyton both reported for NO_2 only, as the TEOM particulate monitors installed in these units were no longer producing data that could be used, as it couldn't be validated against the volatile correction model.

All 3 automatic monitors demonstrated long-term compliance with the Air Quality Standards (AQS) objectives for Nitrogen Dioxide (NO_2) and particulate matter (PM_{10}), both are principal pollutants of concern for air quality.

In September 2021, the automatic monitoring stations were decommissioned because of the compatibility of the automatic monitoring stations and the completion of the contract with www.wecare4air.co.uk. With the current austerity conditions the replacement of new automatic monitoring stations is currently being reviewed. Knowsley MBC have continued to monitor NO_2 within the areas of Huyton, Prescot and Kirkby through the use of diffusion tubes. In February 2022, an area within Halewood was incorporated within the network of diffusion tube monitoring. The diffusion tube network within Knowsley has demonstrated long term compliance with the AQS objective.

In previous years, the ASR reports have identified an area of concern in Huyton, at the junction of Whitefield Lane / Cronton Road. The NO_2 levels (from the diffusion tube monitoring) in the area of concern in Huyton has reduced concurrently in the last two years,

when compared to the previous year's results, although the results have been adjusted using the national bias adjustment. In previous years Knowsley MBC were able to calculate a local bias adjustment factor using the continuous monitor positioned on Cronton Road in Huyton, however this was decommissioned in September 2021, and therefore the national bias adjustment factor is now being used.

During 2024, all diffusion tube monitoring sites reported NO_2 values compliant with the NO_2 AQS objective, similar to that of 2023.

In 2024, 3 sites in Huyton (H7, H9 and H10), 1 site in Kirkby (K4), and 5 sites in Prescot (P1, P3, P4, P7, P10) recorded a very slight increase in NO_2 concentrations compared with 2023, although all the results for these sites were significantly below the NO_2 AQS objective when the national bias adjustment factor was applied. The remaining sites are significantly below the AQS objective. The increase in the level in Huyton, Kirkby and Prescot, when compared to previous years, may be due to the construction of new housing developments and industrial premises close to the diffusion tube sites. We will continue to monitor using diffusion tubes in this area in 2025.

Knowsley MBC have not introduced any Air Quality Management Areas (AQMAs) in 2024.

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.

To improve the air quality in the borough, Knowsley MBC continues to work with the Liverpool City Region (LCR) local authorities, Merseytravel, Environment Agency and a range of other partners. The LCR Combined Authority Air Quality Group has been established to identify opportunities in the LCR to improve air quality and, of equal importance, the associated benefits to health and well-being, whilst supporting the growth and development of the region.

Key completed measures in Knowsley are:

- Development of an Air Quality Strategy 2024 – 2027.
- Development of an Air Quality Action Group to monitor priorities set out in the Air Quality Strategy.
- Regular Air Quality Technical Group meetings.

- Worked with the planning system to embed the role of air quality in sustainable development.
- Developed local supplementary planning documents, to mitigate air quality impacts (Supplementary planning documents | Knowsley Council).
- Introduced active travel measures (Constructed cycle ways/walkways in the borough), to promote alternative travel modes to reduce traffic volumes, leading to reduced emissions (Travel strategies | Knowsley Council).
- Improved the efficiency of road junctions and signals, to reduce idling traffic and congestion.
- Educational activities with 'Clean Air Kids' workbook for every Year 3 pupil in the borough and promotion of the Living Streets WOW scheme, Walk / Bike to school week. Through collaborative working with schools, school travel plans have been established with a package of measures to reduce car dependency on the school run.
- Environmental improvements through increasing woodland and increasing biodiversity.
- As part of the LCR combined authority we have been included in a new air quality monitoring exercise. 'EarthSense Zephyr' monitors have been installed close to some traffic light junctions throughout the region. These sensors monitor for a variety of pollutants. For further information see (www.earthsense.co.uk/zephyr).

Air Quality Strategy 2024 – 2027

Knowsley Council have implemented an Air Quality Strategy (2024 – 2027) to outline clear priorities for the borough to improve air quality. The Air Quality Strategy also supports our Climate Emergency Action Plan 2040 commitments, to help deliver local air quality improvements and objectives alongside supporting national air quality objectives taking into consideration the range of local government, and Liverpool (LCR) City Region frameworks.

The proposed new Strategy sets out priorities for Knowsley as follows:

- *Priority One – Supporting the reduction of domestic, commercial, and industrial emissions.*

  This priority focuses on the Council's responsibilities to monitor and capture data to inform measures to reduce exposure to emissions. The information gathered will allow

officers to review the appropriateness of smoke control areas along with the review of current environmental permits associated with the release of substances into the atmosphere. Where emissions are high, the council can use enforcement powers to tackle some of the worst polluters, however this priority is predominantly focussed on working with those who create the most pollution (developers, industry, residents) and explore alternatives to energy use and processes within daily tasks, to help to reduce the amounts of pollution put into the air within the borough.

- *Priority Two – Supporting the reduction of emissions from transport.*
  This priority aims to support the Government's commitment for the UK to achieve Net Zero by 2050. The decarbonisation of transport has its own dedicated policy in place to reduce air pollution including a zero emissions vehicle (ZEV) mandate. Knowsley will develop its own active travel plan in conjunction with the Liverpool City Region Transport Plan. When available the council will signpost funding for both private and commercial transport supporting all stakeholders to make the move to zero emissions transport. The council will bring focus to the development of electric vehicle and alternative fuels infrastructures working with the private sector and using government funding to ensure charging equity, this will include working towards the production of a dedicated Electric Vehicles and Alternative Fuels Strategy.

- *Priority Three - Raise public awareness of air quality and encourage behaviour change.*
  This priority will see the development of a co-ordinated communications strategy and delivery plan assisting local, and national policies that support improving air quality. We will promote the national agenda to move towards net zero, encouraging behaviour change and providing the related information and guidance to make those changes. Where we can, we will promote funding opportunities and continue to support city region schemes for solar panels, heat pumps and other alternative fuels. We will promote active travel working from our own employees outwards, encouraging walking and cycling for short journeys and advance the use of greener public transport through a clear green message. This will all be done through the development of a digital platform through which we can share relevant detail and information.

- *Priority Four – Supporting improvements to indoor air quality.*
  This priority will work towards raising awareness of how indoor air quality can be improved. This will build on the work that was undertaken during the Covid-19 pandemic

ensuring households, places or work and public spaces are well ventilated, along with identifying those practices that increase the risks of poor air quality such as log burning stoves or the use of different types of chemicals. This priority will work to identify those most vulnerable populations who are most likely to be exposed to indoor air pollution and work to engage with them. We will also work with all tenure types to deliver information advice and guidance relating to indoor air pollution, monitor and enforce where needed, and promote actions to improve indoor air quality.

Addressing these priorities has been identified as key in helping to tackle some of the challenges the borough faces through air pollution and its impacts on those who live, work in and visit Knowsley.

Conclusions and Priorities

In 2024, there were no exceedances of any of the relevant NO_2 AQS objectives at areas of relevant exposure following fall of with distance corrections. As such, compliance has been achieved throughout the Borough, with a decrease in concentrations at sites within Huyton, Kirkby, Prescot and Halewood due to the use of the national bias adjustment figure, there is still concern for air quality within the areas discussed above, therefore Knowsley MBC will continue to use diffusion tubes to closely monitor these hotspot areas.

Knowsley MBC will also look at ways the continuous monitoring regime can be brought back into use, which would also help us to calculate our own local bias adjustment figure, which would provide a more accurate picture of air quality within the area.

Knowsley will continue to work with the LCR combined authority to progress improvements to air quality in the area, and will continue with the EarthSense Zephyr scheme, setup by LCR in 2022.

The council will continue to raise awareness and understanding of air pollution, primarily through participating in the national Clean Air Day and implementation of the Air Quality Strategy. There is an ongoing commitment to monitor the implementation of the Strategy and measure performance in line with action plans that will be developed in response to the Strategy.

How to get Involved

- Knowsley MBC was involved in the 2024 National Clean Air Day and worked with schools and taxi firms to prevent idling, through the Anti-idling Campaign.
- Schools have been provided resources to encourage walking, biking, or scooting to school, educating through assemblies and lessons.
- Environmental improvements within woodland areas. Woodland management works were undertaken at 9 sites across the site. This involved selectively thinning out trees within a woodland to support growth of the remaining trees by decreasing competition for light and nutrients. This process also removes the dead, dying, or dangerous trees to improve the health of the woodland and increase accessibility. Projects included:
    - **Finch Woods (Halewood)** - £1m Section 106 private developer improvements increasing the woodland by approximately 50% with a network of accessible paths/walkways, and habitat improvement works to the woodlands, ponds and meadowlands, with the creation of new pond/wetland features to support flood resilience in the area. (Major improvement works progress at Halewood's Finch Woods - Knowsley News)
    - **Mellors Pond (Whiston)** – Site enhancements to improve climate change resilience through better drainage and increased biodiversity through habitat management and creation. (Mellors Pond re-opens following improvement works - Knowsley News)
    - **Oak Plantation Community Woodland (Huyton**), A £0.260m improvement scheme has created over 1km of pathways and natural habitat improvements, including ponds/watercourse, grasslands, and woodland vegetation management and essential tree works. (North Huyton community woodland re-opens to the public - Knowsley News).

Consultation work took place during the development of the Air Quality Strategy 2024 - 2027. This included a comprehensive survey, facilitated through various channels with council services, residents, partner agencies, businesses, industry, the Council workforce, and those who have been identified as needing to be heard as a part of the development of this strategy. The consultation survey was co-produced across internal services to ensure that all aspects of air quality were included. The consultation was launched on 27th October 2023 for a period of four weeks. The consultation was shared via social media, through public engagement activities and via our services partnership's networks both internally and externally.

Table of Contents

Tables / Figures

1 Local Air Quality Management

This report provides an overview of air quality in Knowsley Metropolitan Borough Council during 2024. 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 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 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 Knowsley MBC 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 F.1, Appendix G.

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.

Knowsley MBC currently does not have any declared AQMAs. A local Air Quality Strategy is in place to prevent and reduce polluting activities. The Local Air Quality Strategy is available at Air quality | Knowsley Council

Our results showed that no monitoring sites exceeded the AQS objective following bias adjustment, no sites required a distance correction, and no sites were within the 10% of the AQS objective.

2.2 Progress and Impact of Measures to address Air Quality in Knowsley Metropolitan Borough Council

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

1. *The Council have highlighted that comments from the previous ASR appraisal have been addressed. This is encouraging and the Council should continue to address comments in future reports.*
2. *KMBC have outlined the key priorities of their local air quality strategy alongside the national air quality objectives.*
3. *Minor formatting errors included within the report, such as:*
   a. *Some of the template text remains in the tables, for example page 2 where the <local authority name> should have been replaced with Knowsley Metropolitan Borough Council.*
   b. *In Table B.1, the bias adjustment factor should be included in the table heading.*

c. *Minor formatting errors within figures. The scale bar in figures D.1-D.5 is different to the scale bar in figure D.6. Figures D.7-D.9 do not contain a scale bar. KMBC should ensure that there is consistency between figures in future ASRs.*

4. *The Council have included a detailed section on any planning applications which may impact air quality adversely. It is recommended that the Council reviews their monitoring network to ensure that any potential impacts of the approved planning applications are captured.*

Knowsley MBC has taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2-2 – Progress on Measures to Improve Air Quality

. The Air Quality Strategy implementation plan priorities are included within Table 2-2 – Progress on Measures to Improve Air Quality

, with the type of measure and the progress Knowsley MBC have made during the reporting year of 2024 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2-2 – Progress on Measures to Improve Air Quality

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Knowsley MBC has taken forward a few direct measures during the current reporting year of 2024 in pursuit of improving local air quality. There are new updates for the 2024 reporting year on impact measures to help improve air quality:

- New zebra crossing on Mill Lane and new signalised crossings at Hillside Avenue, Huyton and Carr Lane, Prescot / Huyton, and a number of dropped kerbs across the borough to improve accessibility for ease of walking and safer spaces to cross encouraging people to leave cars at home.
- Installation of traffic calming on Pilch Lane East and Bowring Park estate, encouraging vehicles to travel slower and provide a better environment for walking / cycling.
- Road Safety team have delivered a ‘Clean Air Kids’ workbook for every Year 3 pupil in the borough in 2024. They have promoted the Living Streets Wow (Walk Once a Week) scheme, as well as Walk to School Week, bike week etc. We will work with any school to produce a school travel plan – a package of measures to reduce car dependency on the school run.

- **Finch Woods (Halewood)** - £1m Section 106 private developer improvements increasing the woodland by approximately 50% with a network of accessible paths/walkways, and habitat improvement works to the woodlands, ponds and meadowlands, with the creation of new pond/wetland features to support flood resilience in the area. (Major improvement works progress at Halewood's Finch Woods - Knowsley News)
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- Natural habitat improvements, including ponds/watercourse, grasslands, and woodland vegetation management and essential tree works. Knowsley have planted 6643 trees this season, within our Public Open Spaces, trees may have also been planted as part of planning and highways, including a community orchard project with four community groups across the borough. Woodland management works were undertaken at 9 sites. This involved selectively thinning out trees within a woodland to support growth of the remaining trees by decreasing competition for light and nutrients.
- Implementation of the Net Zero Delivery Plan and Climate Emergency Action Plan Action on Climate | Knowsley Council
- Knowsley Local Cycling and Walking Infrastructure Plan.
- Trading standards team surveyed wood fuel products being sold in Knowsley, undertaken to ascertain compliance of wood fuel products with the Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020. One retailer / supplier was identified as selling non authorised wood products and received appropriate warnings – they are now applying for required registration and certification. Another retailer was found selling wood products with a moisture content higher than the 20% maximum. However, the products were found to be authorised wood (certified wood), but the retailer had stored the wood outside (which was being supplied within string nets) on a pallet, wrapped in polyethylene but open at the top, thus allowing rainwater

to pool within the poly-wrap and being absorbed by the wood. Appropriate warning and storage advice was given to the business.

An external air quality monitoring scheme was setup in 2022, by the Liverpool City Region, using EarthSense Zephyr Sensors. The scheme is ongoing:

- The AQ sensors have been located at selected traffic junctions throughout the region. The Intelligent Transport Systems (ITS) Zephyr® is an ambient air quality monitor that accurately measures harmful gases and particle matter, the monitors provide detailed air quality measurements in real time to help identify pollution hotspots at a localised level such as busy road junctions. They can be used to redirect traffic and, adjust timing on traffic lights in heavy polluted areas, creating smarter and cleaner towns. It is recognised that these monitors are not approved by Defra, but the data can be used indicatively and may help identify if further monitoring is required using approved methods.

The sensors within Knowsley were installed on 07/08th March 2022, at junctions detailed below. The lamppost on Cronton Road with the sensor attached was replaced in January 2023 during junction improvement works, the sensor has been replaced, however, it was only set up to measure ambient air quality in May 2024.

Site ID	Site Location	Council	XOS Grid Ref (Easting)	YOS Grid Ref (Northing)
Cronton Road	Whitefield Lane (Junction)	Knowsley	345553	389405
County Road	Westhead Ave	Knowsley	341465	398820
Hall Lane	Millbrook Drive	Knowsley	341159	398942
County Road	Melling Drive	Knowsley	341243	399491
Old Rough Lane	Near Bigdale Drive	Knowsley	341974	398961

Knowsley (MBC) have several policies which can directly or indirectly impact on air quality in the borough. These range from national requirements, through to local Supplementary Planning Documents:

- ***Air Quality Strategy 2024 – 2027 –*** The new strategy is the first dedicated Air Quality Strategy for Knowsley and feeds into a wider strategic landscape across the Knowsley Better Together Partnership and the commitment set out in the Council's Climate Emergency Action Plan, to help deliver local air quality improvements and objectives alongside supporting national air quality objectives taking into consideration the range of local government, and Liverpool (LCR) City Region frameworks. Air quality | Knowsley Council The Strategy sets out the following priorities:
    - Priority One – Supporting the reduction of domestic, commercial, and industrial emissions,
    - Priority Two – Supporting the reduction of emissions from transport,
    - Priority Three - Raise public awareness of air quality and encourage behaviour change; and,
    - Priority Four – Supporting improvements to indoor air quality.
- ***Knowsley Local Plan Core Strategy*** – Policy CS2 Development Principles (design to reduce travel and mitigate AQ impact of traffic, encourage sustainable transport, requiring assessments to be carried out). Policy CS7 Transport Network (to encourage sustainable transport and design out AQ impacts, including improving infrastructure). Policy CS23 Renewable and Low Carbon Infrastructure (supporting low carbon and renewable energy initiatives which don't impact AQ) Adopted documents | Knowsley Council
- ***Supplementary Planning Document – Ensuring a Choice of Travel*** – Includes various initiatives to be implemented through the development process, such as Air Quality Assessments, Travel Plans and Electric Vehicle Charging Infrastructure. Supplementary planning documents | Knowsley Council
- ***New Residential Development Supplementary Planning Document*** – Criteria for minimum numbers and standards of Electric Vehicle Charging points in new housing developments, sustainability, and energy efficiency of new houses. Supplementary planning documents | Knowsley Council

- ***Area-specific Supplementary Planning Documents*** - (for example Halsnead and East of Halewood Masterplan SPD's) which ensure cycling and pedestrian links are provided as part of larger developments, along with Travel Plans were deemed feasible. Supplementary planning documents | Knowsley Council
- ***Climate Emergency Action Plan 2022-2025 –*** Knowsley MBC declared a Climate Emergency in January 2020 and set a target of Net Zero carbon emissions from its estate and services by 2040. The council is working with partner organisations to reduce emissions across the borough. The plan sets out 10 key themes where targeted actions to reduce carbon emissions are to be undertaken. Tackling climate change | Knowsley Council
- ***Net Zero Delivery Plan 2022-2025 –*** The plan sets out short-term priorities that the council intends to complete by 2025, based on the actions in the Climate Emergency Action Plan. Action on Climate | Knowsley Council

Public Health Policies Public Health | Knowsley Council

- **The Joint Health and Wellbeing Strategy 2020-2025** – In 2020, the COVID-19 pandemic had a profound impact on the Knowsley community and has expanded the gap of existing health inequalities. The purpose of the strategy is to address matters in areas where Knowsley under performs in comparison to other parts of the country and to improve mental health, well- being and social isolation among all age groups. The Council recognises the importance of air quality as it can contribute to poorer health of the most vulnerable in society such as children, older people and those with heart disease and lung conditions. Knowsley has declared a Climate Emergency early in 2020 and work is underway to mitigate the impacts of climate change on the social and environmental determinants of health. Joint Health and Wellbeing Strategy 2020-2025
- ***Child Health Strategy –*** The strategy provides a starting point in learning and actively engaging with children, young people, families and key partners to identify the significant factors involved in ensuring their better health in the future, partially through promoting an active lifestyle as a family working with education facilities to promote active travel.
- ***Active Travel Fund*** – This has plans in place both short term and long term to improve the walking and cycling routes throughout the borough, especially in areas

with poor levels of air quality (Cronton Road) and encouraging access to retail and places of work such as Jaguar Land Rover, the boroughs largest employer.

- ***Reducing Health Inequalities*** – One of the objectives in reducing health inequalities is to ensure deprived areas have access to the same opportunities to those living in less deprived zones. This will include entry to open spaces that are of good quality by reducing air pollution such as decreasing or slowing down traffic in neighbourhoods predominantly around schools, to help protect children's health as they are particularly vulnerable to air pollution. Promoting walking and cycling to school will also correspond with being active and improving cleaner air, as those living in disadvantages communities are more at risk to poor air quality and more likely to be in poorer health.
- ***Housing Developments*** – Part of new housing developments is to encourage promoting the use of bike or walking trips with segregated cycleways and pedestrian routes and the use of green corridors that creates a safe space for residents. An example of this is having better lit areas so that the spaces can be used after dark and allow for traffic movement in a way that reduces air pollution around the homes. Electrical charging points to be installed in all new housing developments.

Further to this Knowsley MBC are currently working on the following strategies and plans to improve the health of its residents:

- Smoking & Vaping Strategy
- Local Transport Implementation Plan
- Green Spaces Strategy
- Physical Activity Strategy
- Healthy Weight / Childhood Obesity Plan
- Local Cycling and Walking infrastructure Plan

More detail on these measures can be found in their respective Action Plans, (Policies, plans and strategies | Knowsley Council). The measures undertaken to ensure the council is tackling the key priorities outlined within the Air Quality Strategy and the Air Quality Strategy implementation plan are set out in Table 2.2 below. Completed measures are set out in Section 2.2 above.

Knowsley MBC expects the measures identified in Table 2.2 to be completed over the course of the next 5 years, with a number of projects / measures having a rolling programme. The priorities for the coming year are:

- Review of Smoke Control Areas within the borough.
- Review of feasibility of installation of automatic monitoring stations within the borough.
- Anti idling campaign around schools and taxi ranks across the borough.

The principal challenges and barriers to implementation that Knowsley MBC anticipates facing are council officer time constraints and funding resources.

Table 2-2 – Progress on Measures to Improve Air Quality

*Knowsley MBC do not have an AQMA, the information provided in the table has been identified from the priorities stated within the Knowsley Air Quality Strategy 2024 – 2027 and detailed within the Air Quality Implementation Plan to ensure the priorities are addressed.

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Implementation of new borough wide Smoke Control Order	Policy Guidance and Development Control	Other policy	2025	2027	Local Authority Environmental Health	Defra and LA	Partially funded	£11k - £20k	Planning	Reduced emissions from indoor / outdoor burning	Review number of complaints associated with burning. Number of fixed penalty notices.	Determine whether whole borough should be declared as a smoke control area. Assess feasibility of outsourcing the revocation of existing smoke control areas and declaring the whole borough as a smoke control area.	Potential challenge from residents / businesses opposing smoke control areas. Time / Staffing.
2	Electric Vehicle Charging Infrastructure (EVCI)	Transport Planning and Infrastructure	Other policy	2025	On-going	Climate Team, Highways, Legal, Procurement and Policy Teams.	Local Electric Vehicle Infrastructure (LEVI) Capital funding to invest into EVCI via a regional contract.	Partial funding of £9,647,000 given to the Liverpool City Region Combined Authority (LCRCA)	Unknown at present	A cross authority LCR steering group has been set up to develop the delivery of a charging network across the LCR and to determine suitable approaches such as cross pavement solution trials.	NO_2 ($\mu g/m^3$) reduction, achievement of NO_2 annual mean air quality objective	Measure of EV uptake with Knowsley Residents / Businesses.	Significant highways support is required, due to charging points being on residential streets, feasibility checks are being undertaken on current proposed locations and a review of potential pavement channel charging equipment to assist residents without driveways to charge from home and address public liability risk, to mitigate risk for Council. The funding will be used to leverage private investment and is planned to deliver: • 63 locations for on street chargers 7kW-11kW. • 170 bays for LEVI funded charge points up to 22kW in public car parks and additional opportunities for the CPO to propose rapid/ultra rapid charging hubs. • 4 Spaces in 1 Merseyrail station car park in Knowsley that have potential for a mix of LEVI funded chargers up to 22kW. • 237 bays for 157 fast charges (within the LCR before levering in additional charging from CPO. To date in Knowsley, there are 22 publicly owned electric vehicle charging points available to the public. Development of a policy position for Knowsley, working alongside the LCR to expand the network will be undertaken during 2025.	The approach to date is due to the reliance on external funding for the equipment, low car ownership in the Borough, limited EV uptake to date (though demand is increasing), risk of equipment obsolescence from technological change and the long-term contractual nature of engagement (20 years) with commercial charge point operators (CPOs). The LEVI scheme anticipates levering in commercial charge point operator investment in key sites, which will include Town Centre car parks as sustainable transport hubs with access to other modes of travel. An internal Electric Vehicle and Alternative Fuels steering group has been established to support development of the Electric Vehicle and Alternative Fuels Plan. The Electric Vehicle and Alternative Fuels Plan will be finalised in 2025.
3	School Streets initiative	Transport Planning and Infrastructure	Other policy	2025	Ongoing	Local Authority Highways and Capital Delivery, Environmental Health.	LA	Unknown	Unknown	Experimental Traffic Regulation Order	Reduced emissions around schools, NO_2 ($\mu g/m^3$) reduction, achievement of NO_2 annual mean air quality objective / health improvement of children.	Improvement in health Reduction from Emissions	In September 2025, Knowsley will implement a school streets initiative that will involve closing streets immediately outside school gates at drop-off and pick-up times to most vehicle traffic (there are exemptions for residents, blue badge holders, emergency services etc).	It aims to create safer and more pleasant environment for everyone around the school by encouraging walking, cycling and scooting or parking further away from the school and walk the last part of the journey and by preventing vehicles from entering specific roads around the vicinity of the school.
4	Continue to review current environmental permits associated with the release of substances to	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2024 (However, this has been undertaken for many years previously as	Ongoing	Local Authority Environmental Health	LA / Private Sector	Partially Funded	Businesses pay for permit on a yearly basis. ~£10,000	Implementation	Reduction in emissions from release of substances indoor / outdoor. Improvement in outdoor air quality and	Relevant inspection visits completed annually as scheduled. Carry out investigations to see if there are any	There are 33 businesses within the borough that currently have environmental permits, of which 32 are active. Businesses that have an A2 Environmental Permit or are a medium risk (Part B process) are inspected at least once per year. The other Part B	Time / Staffing constraints. Trying to identify unknown businesses in the borough that require a permit. Environmental Health are currently in discussion with

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	atmosphere in industrial premises in line with Government standards, take appropriate action on unauthorised processes when identified.			a statutory activity)					Extra costs associated with staff time in relation to research, and review of permitting activities.		health of workers / residents.	unknown processes in the borough that require a permit.	businesses are inspected as required by legislation.	two businesses that may require a permit.
5	Raise awareness of health impacts from burning for use as a heating source and from burning on allotments / industrial estates.	Public Information / Policy Guidance and Development Control	Via leaflets, and Air Quality Planning and Policy Guidance	2024	Ongoing	Local Authority Environmental Health, Communications, Public Health & Trading Standards	LA	Partially Funded	<£5k	Implementation	Reduced emissions from indoor / outdoor burning, improvement in health	Health figures of Knowsley residents. Number of leaflets / letters to residents / businesses. Review number of complaints associated with burning.	Draft communication messaging to the community on the health implications and legalities on the burning of waste. Enforcement of Ready to Burn requirements as per Air Quality (Domestic Solid Fuels Standards) Regulations.	Time / Staffing.
6	Provision of EV infrastructure in new developments	Transport Planning and Infrastructure	Other	2022	On-going	Local Authority Transport Dept, Planning Dept.	Private sector	Not funded	Unknown	Planning	NO_2 ($\mu g/m^3$) reduction, achievement of NO_2 annual mean air quality objective	Planning consent	New commercial and industrial developments require EV charging points as part of their new developments. Building Regulations, Part S which require new residential developments to provide charging points for electric vehicles are in force.	Delivered through private sector development.
7	Assisting with the development of workplace travel plans for both business and industry and further develop this support.	Promoting Travel Alternatives	Workplace Travel Planning	Start date unknown	Ongoing	Local Authority Highways and Planning	Private Sector	Not Funded	Unknown	Implementation	Reduction in emissions due to alternative travel set up.	The Sustainable Travel team will support workplace travel through developing and maintaining cycling maps with employment routes.	Ongoing	This is only relevant where a planning application is approved requiring a travel plan. Previously all businesses were offered the opportunity to access the mode shift online travel plan platform as funding was available via active travel capability. Despite widespread promotion of the offer, uptake was limited. The funding has now ceased.
8	Ensure air quality assessments are considered during planning applications and seek appropriate mitigation where nexessary.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Start date unknown	Ongoing	Local Authority Planning and Environmental Health	Private Sector	Not Funded	Unknown	Implementation	Ensure NO_2 levels do not increase in areas of new developments.	Depending on the nature and scale of the development the Council may ask for an Air Quality Assessment (AQA) to be submitted as part of a planning application. The AQA will assess the impacts of the development and identify whether mitigation would be effective. Where relevant, require the submission of a construction management plan. Where relevant, require particulate matter emission controls in commercial kitchens.	Ongoing	Air Quality assessments are always requested when needed. It depends on the size and nature of the development. The need for one is assessed using the Institute of Air Quality Management (IAQM) document "Land use Planning and Development Control; Planning for Air Quality". The IAQM document lists the criteria that need to be assessed against. Construction management plans in place to
9	Install automatic air quality monitoring stations to support current measures to monitor air quality within the	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2024	Ongoing	LA Environmental Health, Highways and Assets,	LA	Potentially LA funded	£100,000 to £200,000	Planning	Accurate air quality monitoring in areas of concern within the borough. It would also enable the calculation of a local bias adjustment figure.	N/A	Officers have identified potential areas of concern where automatic monitors may be needed. As part of this identification process, a discussion with Highways on traffic numbers is required and a review of the current placement of the nitrogen dioxide diffusion tubes we have in the	Review of the costs involved for the installation of automatic air quality monitoring stations.

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	borough and to help inform measures to reduce exposure to pollutants.												borough. The results of this review may lead to the installation of further tubes and / or the relocation of the existing ones.	
10	Encourage reduction in the idling of licensed vehicles	Traffic Management	Anti-idling enforcement	2024	Ongoing	LA Licensing / Liverpool City Region	LA / LCR	LA Funded	Unknown	Implementation	Reduction in emissions	Implement and adherence to statutory taxi and private hire vehicle standards.	Promoting National Idling Awareness Day – 21 May 2025 Work is continuing with LCR Licensing Managers to bring closer harmonisation of conditions for licensed vehicles based on updated suitability guidance and standards published by Department for Transport. this encourages a licensing regime that focuses on vehicle emissions - referencing Euro 5 and 6 compliant vehicles as being the desired benchmark for licensed vehicles.	Knowsley Licensing will be reviewing its vehicle licence conditions during the 2025 / 26 committee cycle.
11	Moving Knowsley's own fleet over to zero emission fuels, developing a Green Fleet.	Promoting Low Emission Transport Vehicle Fleet Efficiency	Company Vehicle Procurement – Prioritising uptake of low emission vehicles Fleet efficiency and recognition schemes	2024	2025	Fleet and Logistics Service, LA	LA	Funded	Unknown	Implementing	Reduction in Emissions	Fleet replacement strategy will be completed during Q3 of 2024/2025. Additional charging infrastructure will be factored in when new EV vehicles are brought on to fleet. Training for technicians arranged for Q4 2024/2025.	Fleet replacement ongoing	N/A
12	Encouraging Knowsley partners and contractors to make the change to zero emission fuels.	Promoting Low Emission Plant Promoting Low Emission Transport	Shift to installations using low emission fuels for stationary and mobile sources Other	2024	Ongoing	LA Environmental Sustainability, Procurement, Highways and Licensing	LA	N/A	Unknown	Implementing	Reduction in Emissions	Signposting to maximise take up of EV infrastructure opportunities. Assessing Contractor's Net Zero capacity through tender review. Award new Highways service Contract which has targets for reducing Carbon through Construction processes. Encourage licensed vehicle proprietors and operators to utilise zero emission fuel vehicles where possible.	Climate Literacy Training is being developed for staff/schools and this can be used with partners/businesses to increase awareness and benefits of Net Zero measures	N/A
13	Developing the Knowsley Local Cycling and Walking Improvement Plan (LCWIP)	Policy Guidance and Development Control	Other policy Regional Groups Co-ordinating programmes to develop area wise strategies to reduce emissions and improve air quality	2024	Ongoing	LA Highways	LA	LA Funded	Unknown	Implementing	Improvement in health Reduction of Emissions	Improvement in health Reduction from Emissions	The final stage of consultation for the LCWIP (Public) ended on 31st March. Final amendments to the plan are now underway. It is anticipated that the LCWIP will be formally adopted in June/July 2025.	N/A
14	Promote active travel and the use of public transport.	Promoting Travel Alternatives	Active travel campaign and infrastructure	2024	Ongoing	LA Communications, Public Health and Highways departments,	LA	LA Funded	Unknown	Implementing	Improvement in health Reduction of Emissions	Staff Travel Plan promoted on internal intranet - includes information about car sharing,	A range of internal and external communication channels used to share updates on active travel and the use of public transport. Where appropriate, communications are shared with schools	

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						Chamber of Commerce						Merseytravel, loans for travel passes, and cycling. Walk to School Week19-23 May 2025	to cascade to pupils and parents via their newsletter, website and social media channels. Continue to promote active travel through the Working Well programme with businesses engaged. Active travel promoted as part of the Healthy Weight Strategy – Action Plan.	
15	Investigate opportunities for reducing emissions from non-road mobile machinery (NRMM) e.g. agriculture and landscape services.	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources.	2025	Q4 2025/2026	LA Environmental Health	LA Funded	LA Funded	<£1000	Planning	Reduction in Emissions	Reduction in NO_2 across borough as measured in the ASR	To be planned	Look to draft a letter to arable and livestock farmers within the borough, making them aware of the potential impact on air quality due to the emissions arising from their non-road mobile machinery. We will advise of the importance to ensure all machinery is serviced and maintained regularly.
16	Develop Knowsley Council's Electric Vehicle and Alternative Fuels Implementation Plan	Policy Guidance and Development Control	Other policy	2024/2025	2024/2025	LA Environmental Sustainability	LA Funded and Local Electric Vehicle Infrastructure Fund	Part funded	Unknown	Planning	Reduction in Emissions	N/A	EV Working Group will focus on developing the EVAF Action Plan and this will be finalised in 2025-26	Maximise external grant funding resource to support residential charging (Local Electric Vehicle Infrastructure Fund) Prioritise charge point locations according to the determined hierarchy of need and subject to suitable site conditions and funding eligibility
17	Staff Travel Plan	Policy Guidance and Development Control	Other policy	2023	Ongoing	LA Environmental Sustainability, Communications	LA Funded	LA Funded	Unknown	Implementing	Reduction in Emissions Improved Health	Internal communication channels are used to promote the staff travel plan including Bertha, Team Briefing, team meetings, Chief Executive's Staff Update and the Ask the Chief Executive Q/A sessions. These channels were used when the Staff Travel Plan was updated following a survey in November 2023.	Continued promotion of opportunities to staff for active travel (discounted bus passes, cycle to work mileage, Vivup EV opportunities, etc.)	N/A
18	School Street Pilot	Promoting Travel Alternatives	School travel plans Promoting Alternative travel	2024	2026	LA Highways	LA Funded	LA Funded	Unknown	Implementing	Reduction in Emissions Improvement in Health	To be confirmed	A one-week trial, ahead of the experimental implementation, took place w/c 24th March 2025. The results of the trial are being assessed to determine what amendments are required to the proposals. The scheme will be implemented for an 18-month experimental period commencing in September 2025.	N/A
19	Tree Planting and Bio Diversity Measures	Policy Guidance and Development Control	Other policy	2023	Ongoing	LA Environmental Sustainability	LA Funded	LA Funded	Unknown	Implementing	Reduction in Emissions Improvement in Health	Supporting Bio-Diversity Net Gain implementation across Knowsley. This contributes to carbon capture and assisting air quality.	Programme of tree planting/woodland creation commenced 2023.	Tree planting will continue through woodland management practice (Finch Woods, in future *Whiston Woods - subject to St Helens MBC planning approval and site acquisition and creation of biodiversity net gain sites across the borough (some sites to have adverse possession, e.g.

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														South Alt Greenway land parcel, Cyril Cook Park, etc).
20	Identify best practice for communication methods, improving green spaces and biodiversity .	Public Information	Other	2024	Ongoing	LA Environmental Sustainability / Communications / Public Health	LA Funded	LA Funded	Unknown	Implementing	Reduction in Emissions Improvement in Health	Public Health indices	Promotion of greenspace investment/habitat creation Promote access and use of green spaces through the Physical Activity Promotion plan and Healthy Weight Strategy/Action Plan.	Using opportunities of public consultation for green infrastructure projects. Utilisation of Parks social media channel and all corporate comms channels.
21	Develop a school engagement programme to encourage active travel and raise awareness of poor air quality.	Promoting Travel Alternatives	School Travel Plans	2024	Ongoing	LA Highways / Education / Culture	LA Funded	LA Funded	Unknown	Implementing	Reduction in Emissions Improvement in Health	Promotion of the following: World Health Day 7 April 2025 Sustans Big Walk and Wheel - 24 March - 04 April 2025 National Clean Air Month - 01-31 May 2025 Walk to School Week 19-23 May 2025 Cycling UK Bike Week - 09-15 June 2025 World Car Free Day 22 September 2025	Highways consultation exercise with targeted schools regarding travel restrictions with a view to implementing a trial in Spring 2025 Continue to promote and encourage schools to participate in the Walk Once a Week (WOW) programme. Engage with schools to determine their current active travel plan provisions via Modeshift.	Sustans Big Walk and Wheel - information was sent to all schools to register for the campaign. Provide a resource to primary schools to promote active travel by demonstrating the benefits it has to the environment and air quality, as well as their own health. Continue to deliver the road safety educational programme.
22	Seek collaboration opportunities with partners and schools to promote indoor air quality actions.	Public Information	Via leaflets, Internet, Other	2025	Ongoing	LA Communications / Environmental Health / Health and Safety / Education / Public Health	LA Funded / DEFRA	Part Funded	<£10,000	Implementing	Reduction in Emissions Improvement in Health	Public Health indices	Engaged with SAMHE to explore funding opportunities for a project that installs air quality monitors in schools. These monitors allow pupils to interact with real-world data on their indoor environment and take proactive steps to improve classroom air quality. Promoting campaigns with schools, SUSTRANS big wheel and walk which encourages active travel, reduces vehicle emissions around schools and raises awareness about air pollution and the impacts.	Promoting Clean Air Day 19 June 2025
23	Produce communications to raise awareness of indoor air pollutants and what measures can be taken to improve indoor air.	Public Information	Via leaflets, Internet, Other	2024	Ongoing	LA Communications / Environmental Health / Waste / Trading Standards / Public Health / Health and Safety / Education	LA Funded	LA Funded	Unknown	Implementing	Reduction in Emissions Improvement in Health	Public Health indices	Nov 2024 - Clean air leaflet for households produced on indoor heat sources. Knowsley News article published 10.12.24. Fact sheet promoted through community action days and included on website. Emphasise messages about burning in gardens and recycling where possible. Emphasise messages about correct use of wood burners through implementation of Clean Air Act 1993 enforcement and Solid Fuel Regulations and communications Advise on making use of ventilation with a balance between keeping properties warm to avoid mould, and keeping windows closed in any pollution events. Working with housing providers to ensure their housing stock has good ventilation	Trading Standards have commenced test purchasing / screen testing exercise focusing on the sale of wood for use in domestic open fires and / or wood burning stoves, seeking compliance to the "Ready to Burn" scheme and maximum 20% moisture content. Further training identified for EH officers on indoor AQ to be completed by Q4. To continue: Identify vulnerable populations most exposed to poor indoor air quality and engage with them to work towards improved air through the 'Stop Spores, Open Doors, Don't Hesitate to Ventilate' campaign.

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													and that government guidance regarding good air quality is circulated to all tenants. Healthy Homes project has been running since July 2024. EH website has been updated with information on damp and mould. Advice leaflets have been developed to raise awareness on damp and mould. These have been promoted via the council's comms channels. Seven 'Healthy Home' road shows have taken place across Knowsley as a 'drop' in for residents to report housing issues. Training was provided on 7 Feb 2025 to 22 private landlords on damp and mould growth delivered by NRLA.	In implementing the Minimum Level of Energy Efficiency standards, identify the dwellings with lowest ratings to support occupants over improving the efficiency and thus reducing the potential for mould spores and improving heating provision.

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[1], 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.

Knowsley Metropolitan Borough Council is taking the following measures to address $PM_{2.5}$:

- EarthSense Zephyr monitoring
- Any new continuous monitoring stations in Knowsley would include a $PM_{2.5}$ monitor.
- Proposed installation of a particulate monitor to measure background $PM_{2.5}$ as part of the Automatic Urban and Rural Network (AURN), in partnership with the Environment Agency, to assist in the expansion of the monitoring network to assess compliance against the new $PM_{2.5}$ targets in England.
- Identify any developments that have the potential to increase $PM_{2.5}$ levels through the planning regime and environmental permitting, and where necessary use conditions or enforcement to secure improvements. $PM_{2.5}$ will be the focus of new planning applications and environmental permitting.

Section 2.2 details the continuing work Knowsley MBC are undertaking to improve the air quality of the borough, which will help reduce $PM_{2.5}$. Knowsley MBC are in the process of looking to revoke the current designated Smoke Control Areas (SCA) within the borough and re-designate the whole borough as a Smoke Control Area. In 2024, the Environmental Health Department received 38 complaints relating to dark smoke (8 in relation to commercial premises and 30 associated with domestic premises). No financial penalties were issued, however warning letters were sent to the alleged offenders.

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

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

This section sets out the monitoring undertaken within 2024 by Knowsley MBC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2020 and 2024 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Knowsley MBC did not undertake any automatic (continuous) monitoring within 2024, as the stations were decommissioned as discussed above.

in Appendix A shows the historical information from the three automatic monitoring sites, previously monitored until 2021.

The We Care 4 Air page presented the automatic monitoring results for Knowsley MBC and whilst there is no current data, due to the contract ending, the historic data is still available at the time of writing this report.

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

3.1.2 Non-Automatic Monitoring Sites

Knowsley MBC undertook non- automatic (i.e. passive) monitoring of NO_2 at 35 sites during 2024.

Table A.2 – Details of Non-Automatic Monitoring Sites

in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations and AQMAs. Further details on Quality Assurance/Quality Control

(QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.1 and Table A.2 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment) No annualisation of the data was required.

For diffusion tubes, the full 2024 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant. The concentration data for December 2024 were over exposed due to extreme weather conditions, after consultation with the LAQM helpdesk over how to calculate the annual mean concentrations with the December data, the time weighted average data for December was included as it provided a worst-case scenario. Further details showing a comparison of the data (exclusion of December data or time weighted data) as advised by LAQM helpdesk is in Appendix E.

Previous reports identified an area of concern in Huyton at the junction of Whitefield Lane / Cronton Road. The same reports demonstrated that air quality in other parts of Huyton, monitored using the diffusion tubes, is good, and the results have been significantly below the NO_2 AQS objective. Taking this into account, in 2021, Knowsley moved five of the tubes which had previously shown no concerns and concentrated them around the Whitefield Lane / Cronton Road junction. The tables below (Old Diffusion Tube Locations and New Diffusion Tube Locations) indicate where Knowsley MBC stopped monitoring in 2021 and where we continue to monitor.

Environmental Health had received concerns from residents in areas of Prescot and Halewood, detailing an increase in traffic within the area, therefore in 2022, Knowsley MBC

moved 7 of the diffusion sites within Prescot (which had previously shown no concerns) to other roads within the area and included a further 3 sites within Halewood. The information is detailed in the tables below.

Table A.3 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Old Diffusion Tube Locations (Huyton)

Site ID	Site Location	X OS Grid Ref (Eastings)	Y OS Grid Ref (Northing)	Comment
H5	LC001 Sevenoak Grove off Cronton Road	345675	389363	To assess impact of petrol station and traffic congestion nearby. Impact of Sevenoaks
H6	LC 023 on Cronton Road near junction with Wilson Road	345840	389407	To assess impact at Wilson Road / Cronton Road junction.
H7	LC 029 on Cronton Road near Tarbock Island	345996	389471	Assess impact at Tarbock Island on hotel and bus stop
H8	LC 005 on Cronton Road opposite Natruscot	345301	389479	To assess tailback of traffic approaching junction and potential impact on receptor at Natruscot
H9	LC 013 outside 29 Southford Road	345596	389180	A location away from the junction but potentially still impacted by M62

New Diffusion Tube Locations (Huyton)

Site ID	Site Location	X OS Grid Ref (Eastings)	Y OS Grid Ref (Northing)	Comment
H5A	Positioned on drainpipe on side of house of 1 Whitefield Lane	345563	389397	To assess impact of the traffic congestion at the T-junction. Impact of receptor.
H6A	Traffic light column adjacent to 2 Whitefield Lane	345543	389390	To assess impact at Wilson Road / Cronton Road junction.
H7A	LC 011 outside of 2 Cronton Road	345503	389429	Assess impact at Wilson Road / Cronton Road junction.
H8A	LC 014 on Cronton Road on property line of 1 Whitefield Lane, just before Cymru Cronton Road.	345577	389394	Assess impact at Wilson Road / Cronton Road junction.
H9A	LC 001 outside 3 Whitefield Lane	345555	389392	Assess impact at Wilson Road / Cronton Road junction.

Old Diffusion Tube Locations (Prescot)

Site ID	Site Location	X OS Grid Ref (Eastings)	Y OS Grid Ref (Northing)	Comment
P4	Stop sign on Leyland St junction with High St	346,669	392,875	Impact of junction of Leyland Street, High St & Hope Street
P5	LC010 Outside 49 High Street	346,757	392,916	Impact of junction of High St, Warrington Road and St Helens Road
P6	LC 004 Outside 31 St Helens Road	346,831	393,005	Impact of petrol station and bus stop

P7	LC005 Oliver Lyme Road near Tinling Close	347,091	392,729	Traffic queuing for Warrington Road. Customer complaint.
P8	LC070 Outside 81 Warrington Road	347,090	392,570	Traffic queuing for roundabout impacting on flats
P9	Traffic signal Outside 53 Kemble Street	346,788	392,648	Traffic queuing on Kemble St for Aspinall St junction
P10	LC008 Outside Greenall Court, Sewell Street	346,584	392,609	Properties close to street and any impact of Shakespeare North

New Diffusion Tube Locations (Prescot)

Site ID	Site Location	X OS Grid Ref (Eastings)	Y OS Grid Ref (Northing)	Comment
P4A	LC017 Outside 23 Steley Way, opposite McDonalds	346,942	392,387	Traffic increase on Steley Way, at round about to shopping complex.
P5A	LC013 Outside apartments on Steley Way, opposite roundabout	346,898	392,367	Traffic increase on Steley Way, at round about to shopping complex.
P6A	LC 009 Outside apartments on Steley Way, opposite roundabout	346,850	392,360	Traffic increase on Steley Way, at round about to shopping complex.
P7A	LC012 near to 89 Cross Lane	346,799	391,419	Traffic increase on Cross Road, cars not reducing speed over speed bumps. Complaints received of increase in traffic.

P8A	LC019 116 Cross Lane, Corner of junction with Saunders Avenue	346,792	391,617	Traffic increase on Cross Road, cars not reducing speed over speed bumps. Complaints received of increase in traffic.
P9A	LC012 Outside 39 Delph Lane	347,950	392,325	Complaints received of increase in traffic.
P10A	LC051 Outside 115 and 117 Warrington Road	347,393	392,307	Complaints received of increase in traffic.

New Diffusion Tube Locations (Halewood)

Site ID	Site Location	X OS Grid Ref (Eastings)	Y OS Grid Ref (Northing)	Comment
HW1	LC01 Outside 139 Roseheath Drive, Halewood	344,843	385,022	Increase in vehicle movement due to commercial area.
HW2	LC023 Outside 140 Leathers Lane, Halewood	344,827	385,202	Increase in vehicle movement due to commercial area.
HW3A	LC003, at side of bus station, off Hillingden Avenue	344,927	385,128	Bus station close to houses.

During 2024, all diffusion tube monitoring sites reported NO_2 values compliant with the NO_2 AQS objective, similar to that of 2023.

In 2024, 3 sites in Huyton (H7, H9 and H10), 1 site in Kirkby (K4), and 5 sites in Prescot (P1, P3, P4, P7, P10) recorded a very slight increase in NO_2 concentrations compared with 2023, although all the results for these sites were significantly below the NO_2 AQS objective. The remaining sites are significantly below the AQS objective. The increase in the level in Huyton, Kirkby and Prescot, when compared to previous years, may be due to the construction of a new housing developments and commercial premises next to the diffusion tube sites.

Huyton

The monitoring results in Huyton in 2024, when compared against the previous year, show decreases in concentrations at the majority of diffusion tube monitoring sites, with only 3 sites having a slight increase (H7, H9 and H10). All sites are significantly below the 10% of the 40 µg/m^3 AQS objective.

Halewood

Within the first year of monitoring (2022), site HW3Aa/b reported concentrations within 10% of the AQS (36.1 µg/m3), however in 2023 and 2024, concentrations were lower. In 2024, there was a slight decrease in NO_2 concentrations at all sites compared to 2023. NO_2 concentrations will still be closely monitored at these locations.

Kirkby

Monitoring in Kirkby (2021) showed that site K1a/b reported an NO_2 concentration within 10% of the AQS objective of 39.1 µg/m^3, although following the fall-off with distance correction, the NO_2 concentration was significantly below the AQS objective, reporting a concentration of 27.1 µg/m^3. For 2022 to 2024, the site reported a decrease in NO_2 concentrations, the result did not fall within 10% of the AQS objective. All but one site (K4), showed a decrease compared with the year 2023. All sites are significantly below the 10% of the 40 µg/m^3 AQS objective.

Prescot

No monitoring sites reported concentrations within 10% of the AQS. In 2024, there was a slight increase in NO_2 concentrations at 5 sites (P1, P3, P4, P7, P10) compared to 2023, although values for 2023 and 2024 are very similar.

Automatic Monitoring Stations

The three automatic monitoring stations within Knowsley captured data from 2018 – 2021 (Knowsley MBC do not monitor now due to contract termination with We Care 4 Air). Within this period all three stations reported an increase in annual NO_2 concentrations from 2020.

The Kirkby monitoring station showed an increasing trend in concentrations, although not exceeding the AQS objective.. Huyton showed an increase in results from 2018 – 2019, a decrease in 2020 due to COVID – 19, followed by an increase in 2021, with a concentration similar to the pre-pandemic levels. For Halewood there was no clear trend, but the results for the past 4 years are significantly below the AQS objective and not of a concern. The 1-hour mean for NO_2 was not exceeded in 2021, maintaining the trend seen over the last four years.

EarthSense Zephyr Sensors

In 2024, NO_2 levels were also monitored at various locations using EarthSense Zephyr Sensors. Whilst it is recognised that these sensors are not Defra approved and the information is indicative only, our results have been discussed below.

NO_2 did not exceed 200µg/m^3 (1 hour mean) at any time during the monitoring period. The annual mean was calculated for each site and it did not exceed the 40µg/m^3.

There was a slight decrease in NO_2 from the previous year (2023) for the monitor positioned at County Road / Melling Way, Hall Lane, with a slight increase at Old Rough Lane, and County Road / West Head Avenue. No results were recorded for the monitoring station at Cronton Road in 2023 due to a change in traffic signals causing a loss of internet connection.

See Appendix F for further information.

3.2.2 Particulate Matter (PM_{10})

Table A.4 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

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

In 2024, PM_{10} levels were monitored at various locations using EarthSense Zephyr Sensors. Whilst it is recognised that these sensors are not Defra approved, and the information is indicative only, the results showed that the PM_{10} level did not exceed 50µg/m^3 (24 hour mean) at any time during the monitoring period, with one peak identified within the Kirkby

monitoring sites on the 5th November 2024, between 19:00 and 21:00 of values >100 µg/m3. The annual mean was calculated for each site, and it did not exceed the 40µg/m3 objective.

See Appendix F for further information.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.6 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

From 2020 we have no data for $PM_{2.5}$ from our automatic monitoring stations. Historical data can still be seen in Table A.8.

In 2024, $PM_{2.5}$ levels were monitored at various locations using EarthSense Zephyr Sensors. Whilst it is recognised that these sensors are not Defra approved, and the information is indicative only. The results showed that the $PM_{2.5}$ level did not exceed 20µg/m3 (annual mean).

See Appendix F for further information.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
Huyton	Cronton Road, Huyton	Roadside	345552	389413	NO_2, PM_{10}*, $PM_{2.5}$*	NO	Chemiluminescent, TEOMS*	18	2	2
Halewood	Higher Road, Halewood	Roadside	345213	384691	NO_2, PM_{10}*, $PM_{2.5}$*	NO	Chemiluminescent, TEOMS*	10	2	2
Kirkby	Old Rough Lane, Kirkby	Roadside	341414	398991	NO_2, PM_{10}, $PM_{2.5}$	NO	BAMS	15	1	2.4

Notes:

(1) N/A if not applicable

(2) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property)

(3) The TEOMS particular matter data (*) from 2020 was unable to be validated against the volatile correction model and is therefore not reported

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
H1a, H1b	Station co-location	Roadside	345552	389413	NO_2	No	3.6	2.2	No	2.5
H2a, H2b	Outside 2 Whitefield Lane	Roadside	345537	389407	NO_2	No	1.5	1.2	No	2.4
H3a, H3b	Outside 1 Whitefield Lane	Kerbside	345563	389399	NO_2	No	2.8	0.8	No	2.3
H4a, H4b	Opp Smithford Walk	Roadside	345517	389329	NO_2	No	3.8	1.3	No	2.4
H5Aa, H5Ab	Positioned on drainpipe on side of house of 1 Whitefield Lane	Roadside	345563	389397	NO_2	No	0.2	2.9	No	2.2
H6Aa, H6Ab	Traffic light column adjacent to 2 Whitefield Lane	Kerbside	345543	389390	NO_2	No	5.6	0.5	No	2.3
H7Aa, H7Ab	LC 011 outside of 2 Cronton Road	Roadside	345503	389429	NO_2	No	5.3	1.5	No	2.4
H8Aa, H8Ab	LC 014 on Cronton Road on property line of 1 Whitefield Lane, just before Cymru Cronton Road.	Roadside	345577	389394	NO_2	No	9.5	1.9	No	2.4
H9Aa, H9Ab	LC 001 outside 3 Whitefield Lane	Roadside	345555	389392	NO_2	No	2.8	1.6	No	2.3
H10a, H10b	Outside 9 Ribchester Way	Suburban	345424	389325	NO_2	No	4.9	1.6	No	2.2
H11a, H11b	Outside 12 Windy Arbor Brow	Suburban	346329	389782	NO_2	No	3.1	1.9	No	2.2
H12a, H12b	Halsnead development	Roadside	346425	389669	NO_2	No	-	2.4	No	2.5
K1a, K1b	LC056A Junction of M57 and Valley Road	Roadside	340355	397795	NO_2	No	15.9	1.6	No	2.3
K2a, K2b	LC006 Outside Kirkby C of E School, Hall Lane	Roadside	341165	398953	NO_2	No	13.5	6.4	No	2.4
K3a, K3b	LC005 outside 12 Hall Drive	Roadside	341317	399000	NO_2	No	8.1	1.6	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
K4a, K4b	LC021 to rear of 12 Brakenhurst Grove	Roadside	341464	398997	NO_2	No	10.1	3.0	No	2.4
K5a, K5b	LC091 Junction of Old Rough Lane and County Road	Roadside	341407	398988	NO_2	No	20.3	3.2	No	2.4
K6a, K6b	LC085 On County Road near 18 Kelday Close	Roadside	341426	398922	NO_2	No	8.9	1.1	No	2.4
K7a, K7b	LC067 Corner of County Road and Webster	Roadside	341576	398654	NO_2	No	6.6	1.4	No	2.4
K8a, K8b	LC002 Outside Webster Drive	Roadside	341371	398537	NO_2	No	10.6	1.3	No	2.4
K9a, K9b	LC 017 on Cherryfield Drive	Roadside	341387	398504	NO_2	No	5.4	0.9	No	2.4
K10a, K10b	Outside 19 Moorgate Road (A5207)	Roadside	342421	397755	NO_2	No	1.4	6.9	No	2.4
P1a, P1b	LC227 Near Liverpool Road	Roadside	345816	392660	NO_2	No	6.9	3.5	No	2.4
P2a, P2b	LC003 Outside 50 Derby Street	Roadside	346164	392807	NO_2	No	0.6	2.0	No	2.4
P3a, P3b	LC014 Adjacent 2 Stanley Crescent	Roadside	346393	392844	NO_2	No	5.6	3.0	No	2.4
P4Aa, P4Ab	LC017 Outside 22 Steley Way, opposite McDonalds	Roadside	346942	392387	NO_2	No	4.2	1.5	No	2.4
P5Aa, P5Ab	LC013 Outside apartments on Steley Way, opposite roundabout	Roadside	346898	392367	NO_2	No	4.3	1.8	No	2.4
P6Aa, P6Ab	LC009 Outside apartments on Steley Way, opposite roundabout	Roadside	346850	392360	NO_2	No	5.5	1.7	No	2.4
P7Aa, P7Ab	LC012 near to 89 Cross Lane	Roadside	346799	391419	NO_2	No	10.2	1.5	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
P8Aa, P8Ab	LC019 116 Cross Lane, corner of junction with Saunders Avenue	Roadside	346792	391617	NO_2	No	7.7	2.4	No	2.4
P9Aa, P9Ab	LC012 Outside 39 Delph Lane	Roadside	347950	392325	NO_2	No	7.2	3.1	No	2.2
P10Aa, P10Ab	LC051 Outside 115 and 117 Warrington Road	Roadside	347393	392307	NO_2	No	5.8	2.0	No	2.2
HW1a, HW1b	LC014 Outside 139 Roseheath Drive, Halewood	Roadside	344843	385022	NO_2	No	8.5	3.0	No	2.4
HW2a, HW2b	LC023 Outside 140 Leathers Lane Halewood	Roadside	344827	385202	NO_2	No	4.5	3.6	No	2.3
HW3Aa, HW3Ab	LC003 at side of bus station, off Hillingden Avenue	Roadside	344927	385128	NO_2	No	3.9	2.5	No	2.3

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.1 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2020	2021	2022	2023	2024
Huyton	345552	389413	Roadside	72.5	72.5	29.5	36	-	-	-
Halewood	345213	384691	Roadside	74.5	74.5	18.2	21.4	-	-	-
Kirkby	341414	398991	Roadside	73.4	73.4	25.8	30.8	-	-	-

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

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

☐ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2024.**

Notes:

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

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

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

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

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

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

Table A.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	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
H1a, H1b	345552	389413	Roadside	100.0	100.0	29.5	34.4	28.4	24.9	24.4
H2a, H2b	345537	389407	Roadside	100.0	100.0	35.1	38.2	30.1	29.0	26.8
H3a, H3b	345563	389399	Kerbside	100.0	100.0	**42.2**	**46.7**	39.3	33.6	31.7
H4a, H4b	345517	389329	Roadside	100.0	100.0	25.3	30.1	25.0	21.5	20.4
H5Aa, H5Ab	345563	389397	Roadside	100.0	100.0	-	38.1	31.4	28.1	26.0
H6Aa, H6Ab	345543	389390	Kerbside	100.0	100.0	-	**45.4**	36.7	32.4	31.4
H7Aa, H7Ab	345503	389429	Roadside	100.0	100.0	-	33.1	25.7	24.0	24.5
H8Aa, H8Ab	345577	389394	Roadside	100.0	100.0	-	**46.9**	34.4	30.1	29.6
H9Aa, H9Ab	345555	389392	Suburban	100.0	100.0	-	36.5	30.3	26.7	27.0
H10a, H10b	345424	389325	Suburban	100.0	100.0	19.1	22.2	18.5	15.3	15.7
H11a, H11b	346329	389782	Suburban	100.0	100.0	23.3	21.9	21.6	22.4	21.3
H12a, H12b	346425	389669	Roadside	100.0	100.0	27.2	35.9	28.7	26.3	24.6
K1a, K1b	340355	397795	Roadside	100.0	100.0	38.0	33.3	34.0	31.5	29.7
K2a, K2b	341165	398953	Roadside	100.0	100.0	22.1	20.1	19.6	16.6	16.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
K3a, K3b	341317	399000	Roadside	100.0	100.0	22.5	19.8	20.1	17.7	16.8
K4a, K4b	341464	398997	Roadside	100.0	100.0	26.9	26.3	23.6	20.7	21.7
K5a, K5b	341407	398988	Roadside	90.6	90.6	30.9	28.1	28.9	26.2	25.0
K6a, K6b	341426	398922	Roadside	100.0	100.0	28.1	26.6	28.7	26.4	25.4
K7a, K7b	341576	398654	Roadside	100.0	100.0	24.1	21.7	20.0	18.7	17.7
K8a, K8b	341371	398537	Roadside	100.0	100.0	28.7	25.8	24.7	22.8	19.8
K9a, K9b	341387	398504	Roadside	100.0	100.0	27.7	27.1	28.6	24.3	22.7
K10a, K10b	342421	397755	Roadside	100.0	100.0	24.1	22.9	20.6	19.8	17.7
P1a, P1b	345816	392660	Roadside	100.0	100.0	22.6	25.1	21.9	21.5	22.7
P2a, P2b	346164	392807	Roadside	75.0	75.0	22.4	25.6	22.4	20.3	20.0
P3a, P3b	346393	392844	Roadside	92.7	92.7	26.4	25.7	24.9	25.1	25.3
P4Aa, P4Ab	346942	392387	Roadside	100.0	100.0	-	-	23.5	21.4	21.5
P5Aa, P5Ab	346898	392367	Roadside	75.0	75.0	-	-	20.4	19.0	17.7
P6Aa, P6Ab	346850	392360	Roadside	100.0	100.0	-	-	21.1	19.0	18.7
P7Aa, P7Ab	346799	391419	Roadside	100.0	100.0	-	-	17.9	16.2	17.1
P8Aa, P8Ab	346792	391617	Roadside	100.0	100.0	-	-	17.9	16.0	16.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
P9Aa, P9Ab	347950	392325	Roadside	100.0	100.0	-	-	24.0	22.3	21.7
P10Aa, P10Ab	347393	392307	Roadside	100.0	100.0	-	-	18.6	18.6	18.7
HW1a, HW1b	344843	385022	Roadside	100.0	100.0	-	-	15.7	15.2	15.2
HW2a, HW2b	344827	385202	Roadside	100.0	100.0	-	-	20.5	20.6	20.5
HW3Aa, HW3Ab	344927	385128	Roadside	100.0	100.0	-	-	36.1	33.0	31.7

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

☒ **Diffusion tube data has been bias adjusted.**

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

Notes:

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

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

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations (Automatic Monitors)

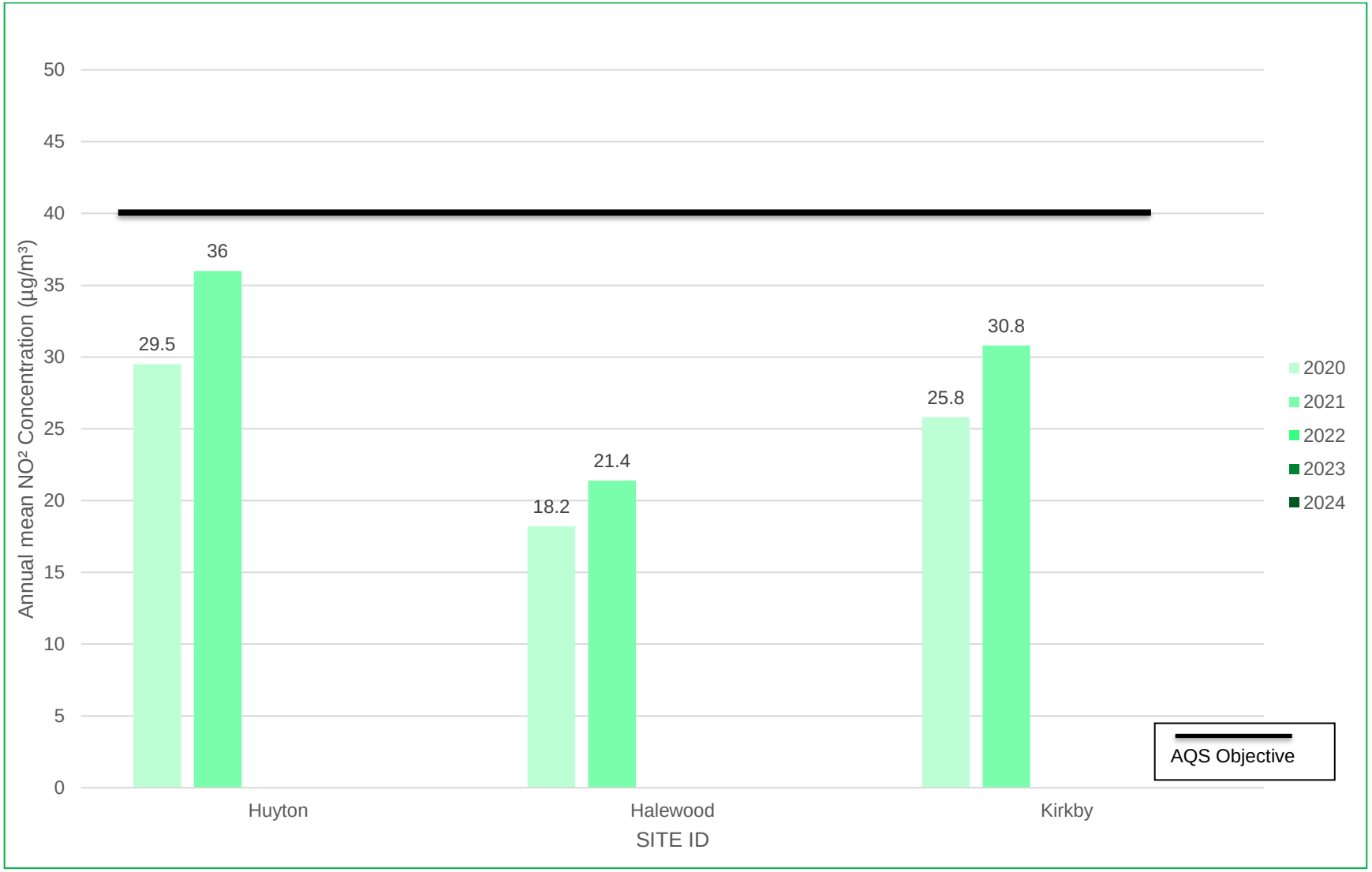

Figure A.2 – Trends in Annual Mean NO_2 Concentrations (Diffusion Tubes) (Huyton)

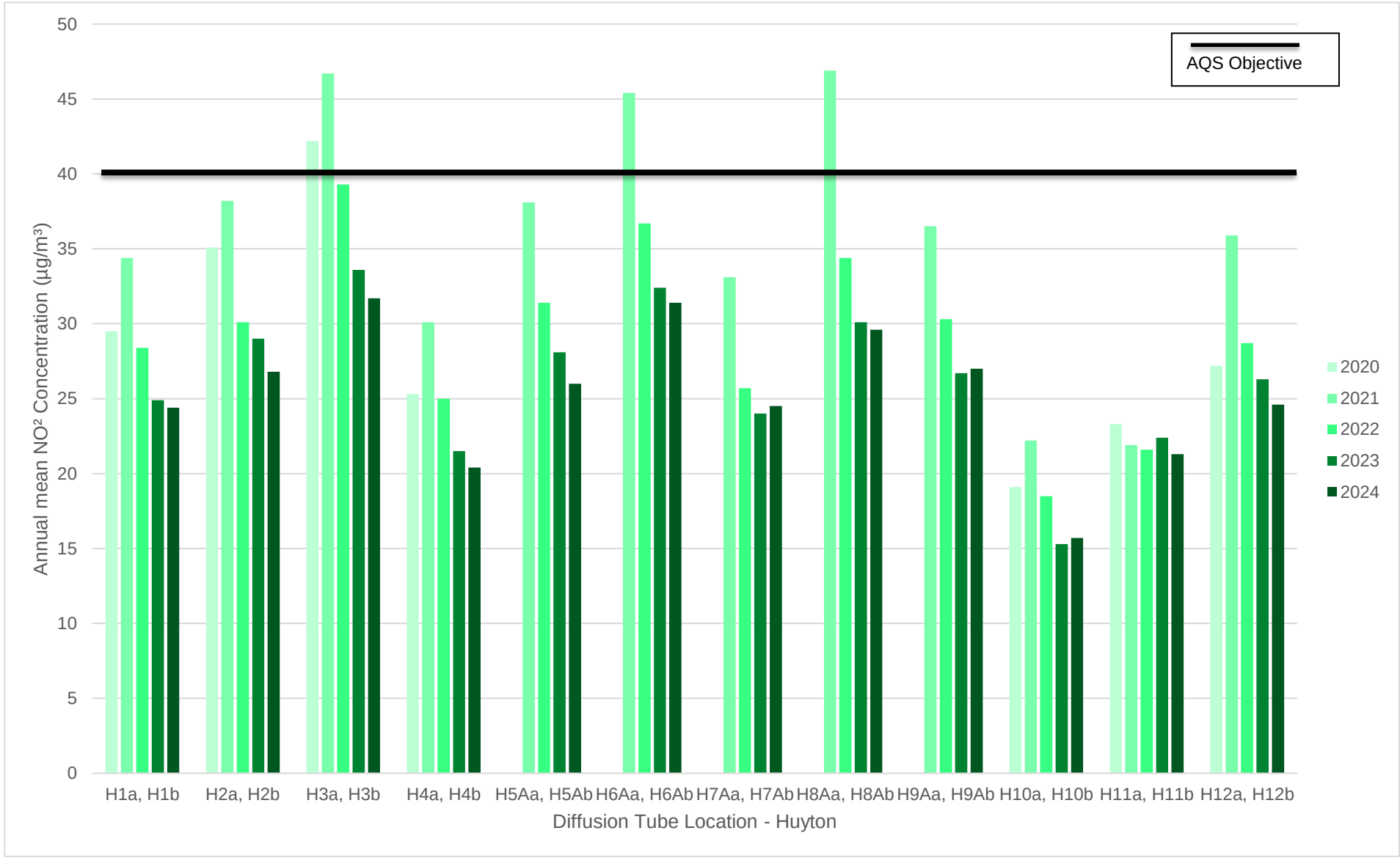

Figure A.3 – Trends in Annual Mean NO_2 Concentrations (Diffusion Tubes) (Kirkby)

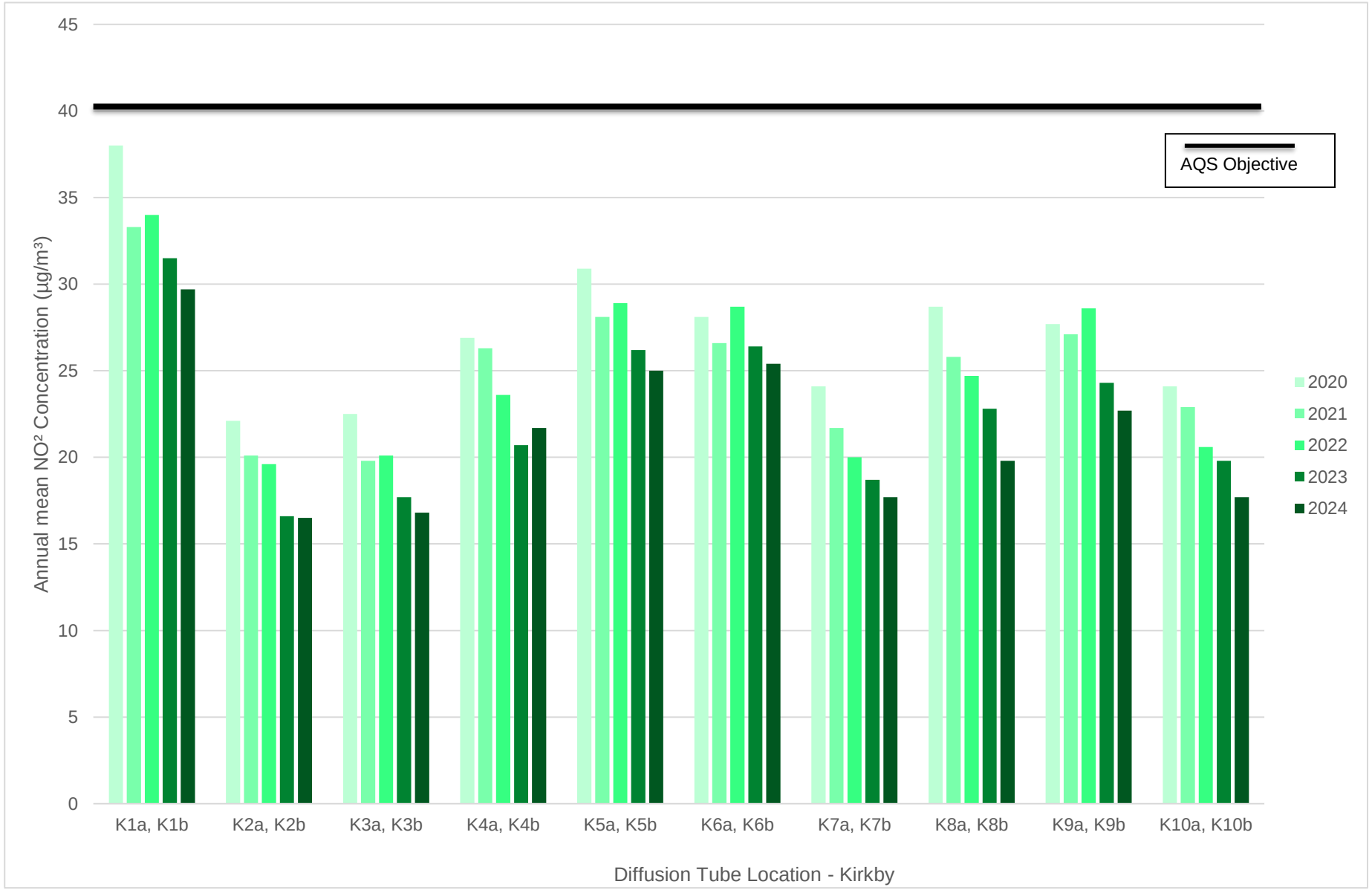

Figure A.4 – Trends in Annual Mean NO_2 Concentrations (Diffusion Tubes) (Prescot)

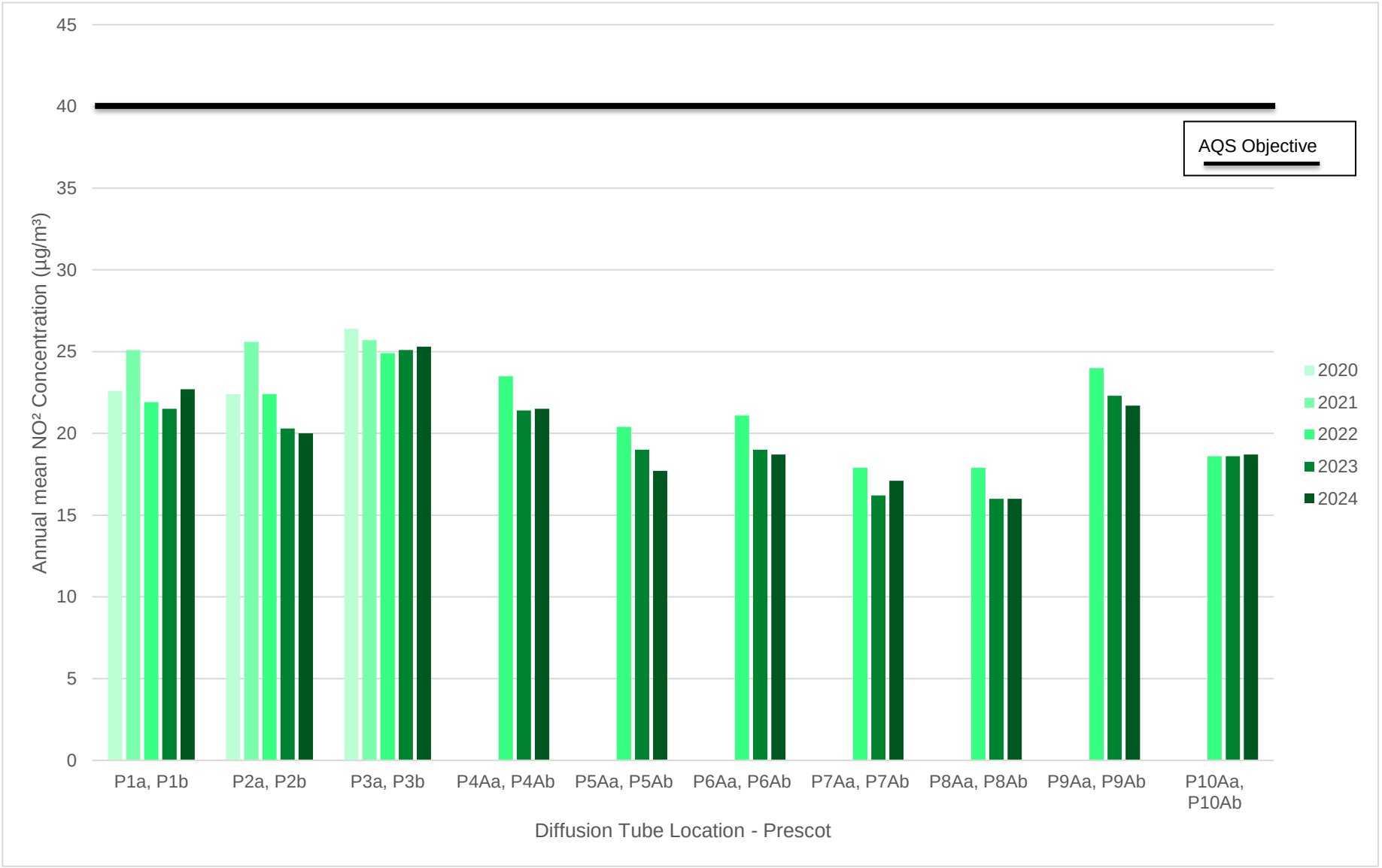

Figure A.5 – Trends in Annual Mean NO_2 Concentrations (Diffusion Tubes) (Halewood)

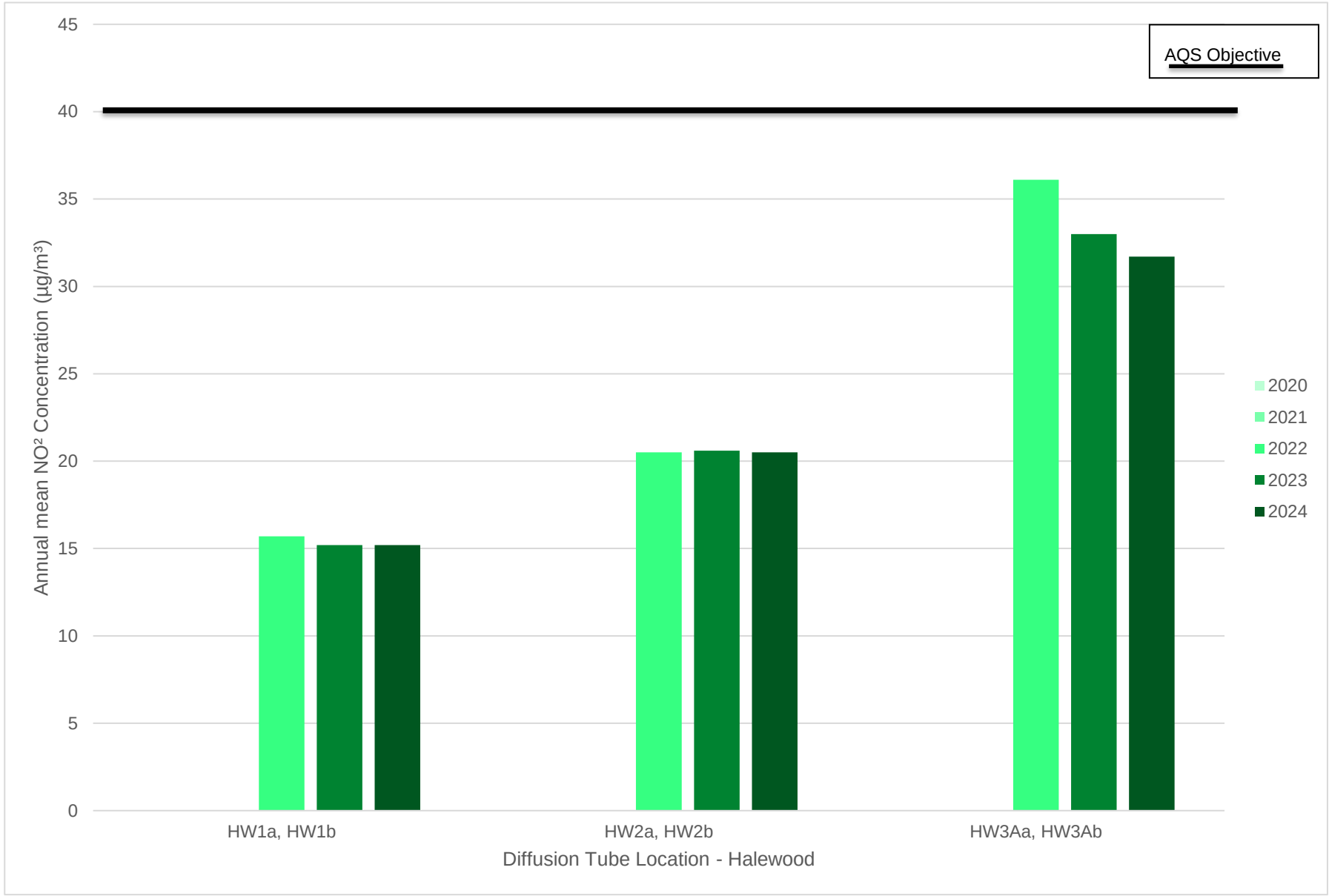

Table A.3 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
Huyton	345552	389413	Roadside	72.5	72.5	0	**0 (119)**	-	-	-
Halewood	345213	384691	Roadside	74.5	74.5	0	**0 (74)**	-	-	-
Kirkby	341414	398991	Roadside	73.4	73.4	0	**0 (113)**	-	-	-

Notes:

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

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

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

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

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

Table A.4 – Annual Mean PM_{10} Monitoring Results (µg/m3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
Huyton	345552	389413	Roadside	63.8	63.8	-	-	-	-	-
Halewood	345213	384691	Roadside	74.5	74.5	-	-	-	-	-
Kirkby	341414	398991	Roadside	69.1	69.1	33.3	32.2	-	-	-

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

Notes:

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

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

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

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

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

Figure A.6 – Trends in Annual Mean PM_{10} Concentrations

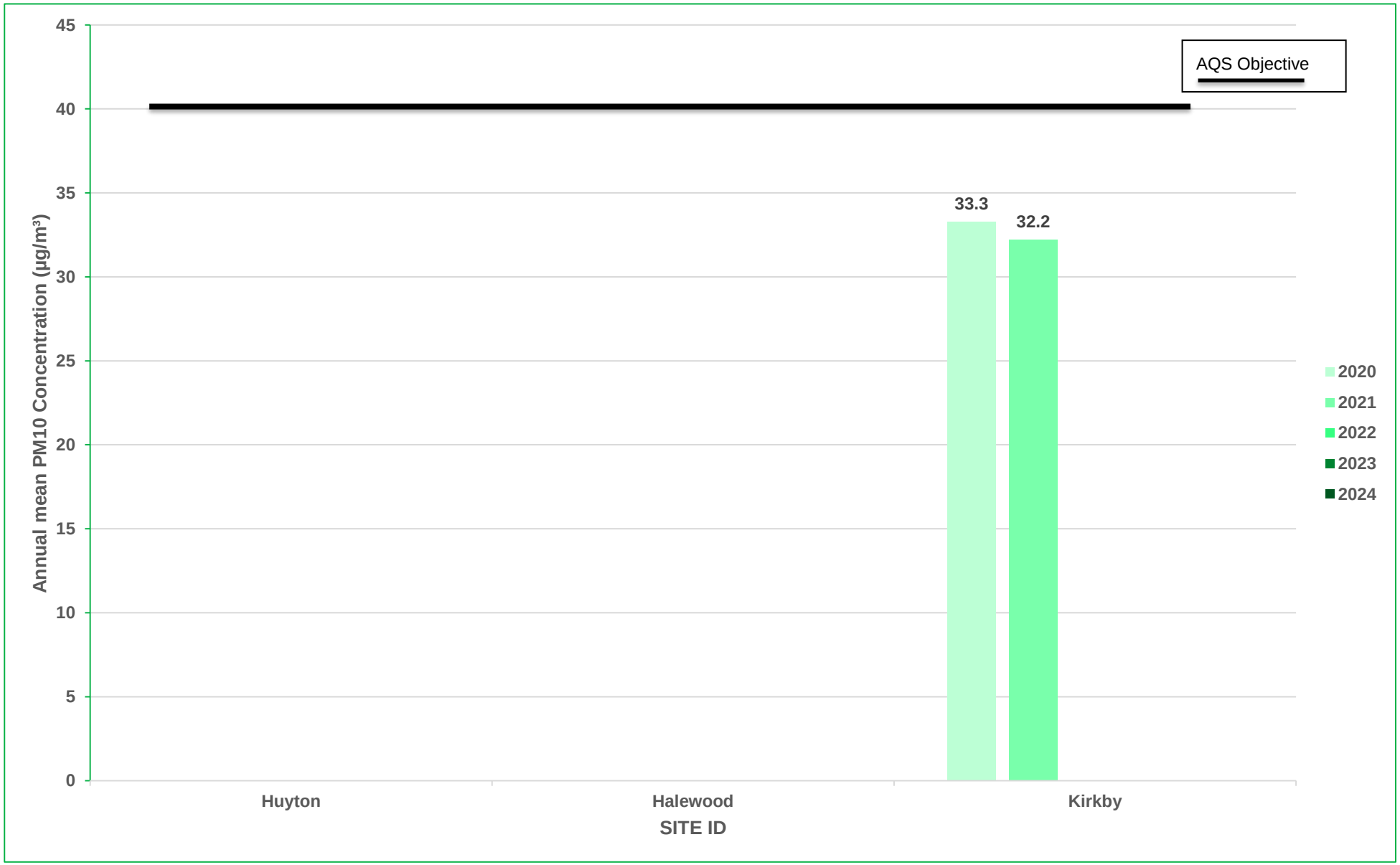

Table A.5 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
Huyton	345552	389413	Roadside	63.8	63.8	-	-	-	-	-
Halewood	345213	384691	Roadside	74.5	74.5	-	-	-	-	-
Kirkby	341414	398991	Roadside	69.1	69.1	35	18 (48)	-	-	-

Notes:

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

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

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

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

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

Figure A.7 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m³

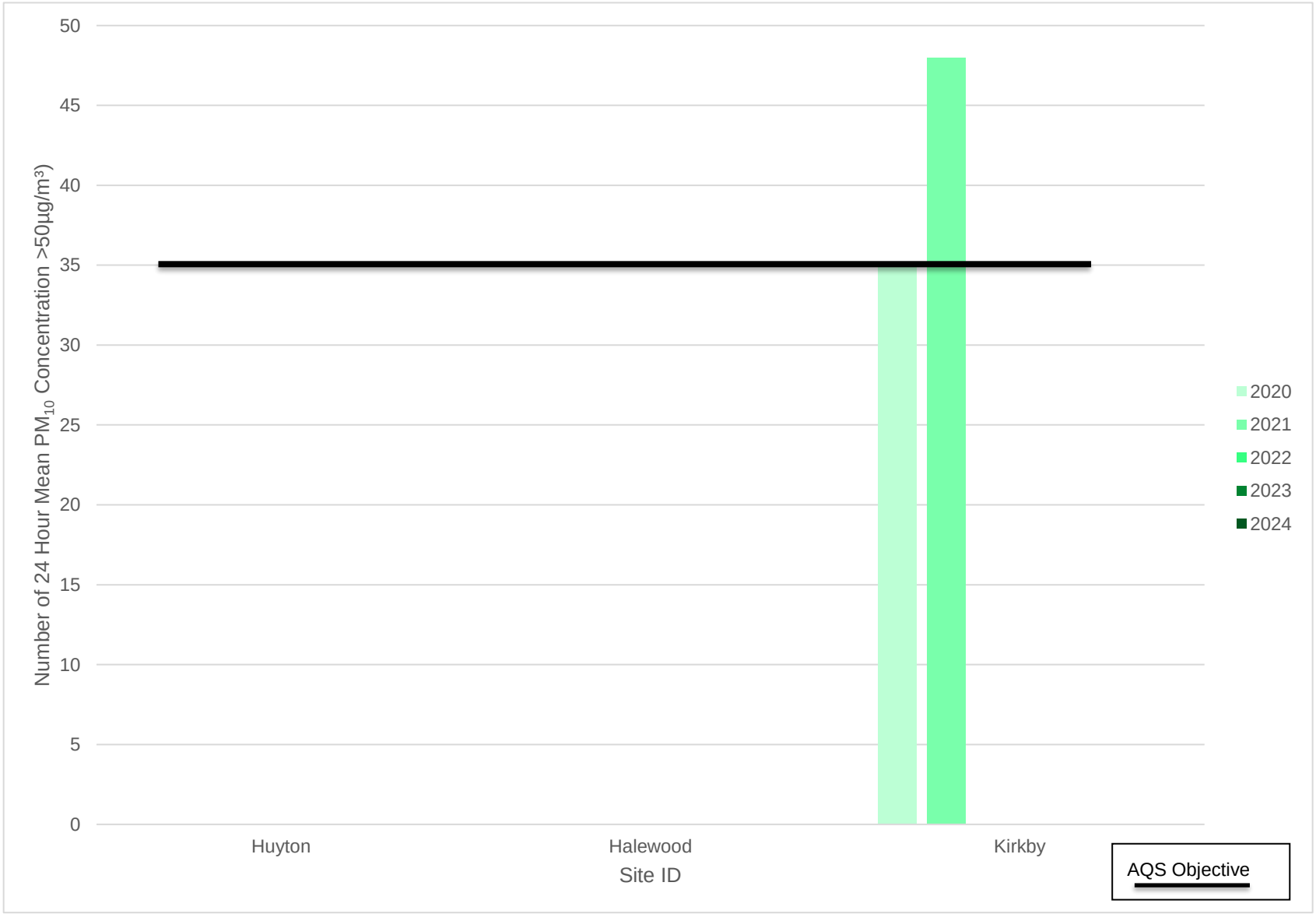

Table A.6 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
Huyton	345552	389413	Roadside	72.4	72.4	-	-	-	-	-
Halewood	345213	384691	Roadside	74.2	74.2	-	-	-	-	-

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

Notes:

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2024

Table B.1 – NO_2 2024 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
H1a	345552	389413	39.6	37.4	35.4	28.5	30.6	25.8	26.2	22.5	26.1	35.5	39.4	24.4	-	-		Duplicate Site with H1a and H1b - Annual data provided for H1b only
H1b	345552	389413	39.0	41.6	33.2	26.7	25.7	23.3	26.8	23.7	26.9	37.3	39.5	35.0	31.3	24.4		Duplicate Site with H1a and H1b - Annual data provided for H1b only
H2a	345537	389407	39.7	43.7	40.0	31.0	37.0	25.1	28.1	28.3	41.3	33.9	42.1	35.8	-	-		Duplicate Site with H2a and H2b - Annual data provided for H2b only
H2b	345537	389407	32.7	47.0	40.2	32.0	39.0	19.2	30.1	24.2	35.9	34.0	39.6	25.3	34.4	26.8		Duplicate Site with H2a and H2b - Annual data provided for H2b only
H3a	345563	389399	50.3	52.5	45.7	40.1	38.2	32.8	36.0	33.5	50.7	44.5	44.7	35.3	-	-		Duplicate Site with H3a and H3b - Annual data provided for H3b only
H3b	345563	389399	53.9	53.0	41.6	37.2	44.6	31.5	38.7	33.0	47.1	43.8	38.7	7.1	40.6	31.7		Duplicate Site with H3a and H3b - Annual data provided for H3b only
H4a	345517	389329	30.4	23.1	21.0	23.0	25.1	17.6	22.4	21.2	31.6	18.6	39.4	30.5	-	-		Duplicate Site with H4a and H4b - Annual data provided for H4b only
H4b	345517	389329	35.2	26.1	27.1	25.2	25.4	18.3	22.8	19.0	25.9	29.1	37.9	32.6	26.2	20.4		Duplicate Site with H4a and H4b - Annual data provided for H4b only
H5Aa	345563	389397	45.7	40.9	33.0	32.5	31.2	25.3	28.0	26.7	39.0	31.1	35.9	37.6	-	-		Duplicate Site with H5Aa and H5Ab - Annual data provided for H5Ab only
H5Ab	345563	389397	43.2	37.8	33.0	22.7	31.2	25.7	30.9	24.3	39.8	31.8	35.7	38.3	33.4	26.0		Duplicate Site with H5Aa and H5Ab - Annual data provided for H5Ab only
H6Aa	345543	389390	49.7	42.2	42.5	33.8	40.6	31.5	34.1	32.5	47.1	37.3	50.7	43.4	-	-		Duplicate Site with H6Aa and H6Ab - Annual data provided for H6Ab only
H6Ab	345543	389390	46.6	45.5	37.5	37.5	40.4	35.9	37.7	34.7	45.1	24.6	49.3	46.1	40.3	31.4		Duplicate Site with H6Aa and H6Ab - Annual data provided for H6Ab only
H7Aa	345503	389429	30.2	25.9	38.8	26.6	32.3	19.6		22.9	39.9	36.5	38.5	30.6	-	-		Duplicate Site with H7Aa and H7Ab - Annual data provided for H7Ab only
H7Ab	345503	389429	43.0	33.7	31.7	27.5	32.2	21.1	26.5	23.9	35.2	36.9	40.0	34.7	31.4	24.5		Duplicate Site with H7Aa and H7Ab - Annual data provided for H7Ab only
H8Aa	345577	389394	37.9	38.2	33.2	36.4	38.2	28.0	35.3	31.7	51.6	37.5	46.9	40.9	-	-		Duplicate Site with H8Aa and H8Ab - Annual data provided for H8Ab only
H8Ab	345577	389394	45.0	38.3	35.3	35.4	36.8	30.8	34.6	33.3	44.9	40.5	47.6	33.0	38.0	29.6		Duplicate Site with H8Aa and H8Ab - Annual data provided for H8Ab only
H9Aa	345555	389392	43.7	33.2	36.7	25.2	31.6	22.7	27.2	26.5	46.1	35.4	42.7	37.6	-	-		Duplicate Site with H9Aa and H9Ab - Annual data provided for H9Ab only
H9Ab	345555	389392	44.2	41.4	35.0	30.7	33.4	24.4	27.9	27.1	40.4	35.1	43.6	37.8	34.6	27.0		Duplicate Site with H9Aa and H9Ab - Annual data provided for H9Ab only
H10a	345424	389325	32.1	28.6	22.7	13.8	17.2	10.4	14.6	14.2	21.1	23.1	26.7	25.7	-	-		Duplicate Site with H10a and H10b - Annual data provided for H10b only
H10b	345424	389325	27.8	29.1	19.5	15.9	17.4	10.8	12.8	14.4	19.3	20.8	27.3	18.6	20.2	15.7		Duplicate Site with H10a and H10b - Annual data provided for H10b only
H11a	346329	389782	32.6	36.1	29.9	23.0	25.8	28.2	25.5	24.3	24.5	21.5	32.7	35.5	-	-		Duplicate Site with H11a and H11b - Annual data provided for H11b only
H11b	346329	389782	30.4	38.5	30.3	23.0	25.8	28.7	18.9	17.3	24.7	28.0	30.6	19.4	27.3	21.3		Duplicate Site with H11a and H11b - Annual data provided for H11b only
H12a	346425	389669	40.5	39.7	30.9	31.8	33.4	33.2	32.6	30.2	30.6	32.9	35.2	8.6	-	-		Duplicate Site with H12a and H12b - Annual data provided for H12b only
H12b	346425	389669	40.5	32.9	34.0	30.7	33.4	33.9	28.4	25.8	27.1	33.4	36.8	19.1	31.5	24.6		Duplicate Site with H12a and H12b - Annual data provided for H12b 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
K1a	340355	397795	51.1	24.6	42.9	35.8	38.1	31.8	34.4	34.4	30.5	40.4	45.7	36.9	-	-		Duplicate Site with K1a and K1b - Annual data provided for K1b only
K1b	340355	397795	49.9	48.5	30.6	38.0	38.2	32.3	34.1	37.9	34.0	41.6	46.9	34.2	38.0	29.7		Duplicate Site with K1a and K1b - Annual data provided for K1b only
K2a	341165	398953	29.1	30.1	23.5	16.0	16.9	10.2	13.9	12.9	16.7	27.5	28.2	24.1	-	-		Duplicate Site with K2a and K2b - Annual data provided for K2b only
K2b	341165	398953	29.4	30.6	25.3	16.0	17.1	9.7	16.0	15.3	18.3	28.2	26.9	24.9	21.1	16.5		Duplicate Site with K2a and K2b - Annual data provided for K2b only
K3a	341317	399000	28.1	33.8	26.9	16.9	17.9	9.7	15.1	17.3	19.6	29.9	21.3	27.3	-	-		Duplicate Site with K3a and K3b - Annual data provided for K3b only
K3b	341317	399000	28.4	34.9	28.4	18.4	18.7	9.9	14.7	16.5	15.7	27.0	32.1	7.0	21.5	16.8		Duplicate Site with K3a and K3b - Annual data provided for K3b only
K4a	341464	398997	37.0	34.0		22.0	25.4	20.0	24.0	23.3	26.0	17.2		33.9	-	-		Duplicate Site with K4a and K4b - Annual data provided for K4b only
K4b	341464	398997	37.2	37.8	28.3	23.7	25.2	19.8	23.1	19.1	25.0	31.9	39.4	26.2	27.8	21.7		Duplicate Site with K4a and K4b - Annual data provided for K4b only
K5a	341407	398988	40.2	41.1	29.2	30.0	30.3	26.2	29.8	29.8	28.7		34.7	37.5	-	-		Duplicate Site with K5a and K5b - Annual data provided for K5b only
K5b	341407	398988	47.5	41.8	22.3	30.4	30.2	24.0	28.0	30.8	31.8		40.7	20.8	32.1	25.0		Duplicate Site with K5a and K5b - Annual data provided for K5b only
K6a	341426	398922	43.3	41.3	31.2	28.5	32.3	23.9	30.1	29.6	30.2	32.0	42.7	23.9	-	-		Duplicate Site with K6a and K6b - Annual data provided for K6b only
K6b	341426	398922	42.9	44.5	32.7	28.0	30.8	26.7	28.9	32.6	29.4	29.3	36.5	30.0	32.6	25.4		Duplicate Site with K6a and K6b - Annual data provided for K6b only
K7a	341576	398654	30.4	29.0	24.4	18.3	20.2	13.5	17.5	17.2	15.2	29.8	16.6	19.6	-	-		Duplicate Site with K7a and K7b - Annual data provided for K7b only
K7b	341576	398654	30.8	31.4	30.6	18.5	19.9	12.5	19.1	17.2	19.3	32.1	36.7	26.2	22.8	17.7		Duplicate Site with K7a and K7b - Annual data provided for K7b only
K8a	341371	398537	36.2	32.6	25.6	22.8	27.3	17.6	23.0	24.3	20.5	30.7	35.2	23.5	-	-		Duplicate Site with K8a and K8b - Annual data provided for K8b only
K8b	341371	398537	29.4	38.7	31.2	22.2	24.9	17.8	19.1	23.7	24.8	31.2	19.3	8.0	25.4	19.8		Duplicate Site with K8a and K8b - Annual data provided for K8b only
K9a	341387	398504	36.0	37.1	29.2	24.2	29.4	18.7	25.2	22.3	28.6	32.0	36.5	36.6	-	-		Duplicate Site with K9a and K9b - Annual data provided for K9b only
K9b	341387	398504	42.9	34.6	29.9	23.8	28.1	22.7	26.4	25.2	25.2	33.7	38.4	11.7	29.1	22.7		Duplicate Site with K9a and K9b - Annual data provided for K9b only
K10a	342421	397755	26.6	33.2	12.3	19.3	18.5	13.6	17.5	16.4	19.8	26.5	35.9	30.0	-	-		Duplicate Site with K10a and K10b - Annual data provided for K10b only
K10b	342421	397755	35.0	29.5	24.9	20.3	22.2	12.5	17.8	17.1	24.7	29.9	24.2	18.3	22.8	17.7		Duplicate Site with K10a and K10b - Annual data provided for K10b only
P1a	345816	392660	34.9	36.0	28.1	27.3	27.1	22.9	25.3	23.2	32.9	30.1	38.9	27.7	-	-		Duplicate Site with P1a and P1b - Annual data provided for P1b only
P1b	345816	392660	36.1	33.1	28.9	26.1	28.4	23.1	24.5	21.0	30.9	30.8	31.6	31.0	29.2	22.7		Duplicate Site with P1a and P1b - Annual data provided for P1b only
P2a	346164	392807	36.9	32.1	26.7	19.5	23.7	19.9	21.5	28.5		24.6	36.6	28.8	-	-		Duplicate Site with P2a and P2b - Annual data provided for P2b only
P2b	346164	392807	29.3	22.3	28.5		23.5		22.8	29.1		27.7	35.1	8.1	25.7	20.0		Duplicate Site with P2a and P2b - Annual data provided for P2b only
P3a	346393	392844	29.4	40.7	39.5	25.6	30.9	22.9		19.7	27.1	36.1	44.8	28.8	-	-		Duplicate Site with P3a and P3b - Annual data provided for P3b only
P3b	346393	392844	36.1	44.5	40.3	25.6	30.8	24.2		19.7	29.3	43.7	38.2	36.0	32.5	25.3		Duplicate Site with P3a and P3b - Annual data provided for P3b only
P4Aa	346942	392387	34.4	33.3	22.6	23.2	26.1	18.6	21.9	22.3	27.0	32.1	31.2	33.6	-	-		Duplicate Site with P4Aa and P4Ab - Annual data provided for P4Ab only
P4Ab	346942	392387	34.4	36.1	25.9	23.3	24.7	18.3	23.0	30.2	23.0	29.5	33.3	33.0	27.5	21.5		Duplicate Site with P4Aa and P4Ab - Annual data provided for P4Ab 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P5Aa	346898	392367	26.5			18.3	20.9	15.3	18.5	17.6	22.6	24.9	30.2	30.3	-	-		Duplicate Site with P5Aa and P5Ab - Annual data provided for P5Ab only
P5Ab	346898	392367	27.0			18.9	22.7	16.5		15.7	20.9	25.1	33.7	29.2	22.7	17.7		Duplicate Site with P5Aa and P5Ab - Annual data provided for P5Ab only
P6Aa	346850	392360	31.2	31.6	27.1	20.7	22.3	14.8	20.2	16.4	24.2	25.1	23.1	30.5	-	-		Duplicate Site with P6Aa and P6Ab - Annual data provided for P6Ab only
P6Ab	346850	392360	31.3	31.5	25.3	17.9	20.3	14.5	23.0	17.9	24.3	25.1	29.6	28.6	24.0	18.7		Duplicate Site with P6Aa and P6Ab - Annual data provided for P6Ab only
P7Aa	346799	391419	26.7	26.7	23.1	16.4	19.7	13.1	17.3	14.7	19.9	25.6	32.4	27.6	-	-		Duplicate Site with P7Aa and P7Ab - Annual data provided for P7Ab only
P7Ab	346799	391419	28.2	30.8	23.7	18.1	17.6	11.6	16.5	14.3	20.3	28.2	30.7	23.0	21.9	17.1		Duplicate Site with P7Aa and P7Ab - Annual data provided for P7Ab only
P8Aa	346792	391617	24.9	29.7	21.5	17.3	17.2	11.9	16.0	13.7	20.6	24.4	26.2	26.1	-	-		Duplicate Site with P8Aa and P8Ab - Annual data provided for P8Ab only
P8Ab	346792	391617	26.1	23.2		17.7	17.3	12.9	15.5	16.8	16.0	20.3	30.8	23.4	20.5	16.0		Duplicate Site with P8Aa and P8Ab - Annual data provided for P8Ab only
P9Aa	347950	392325	34.3	35.7	27.4	22.6	28.4	22.9	23.5	25.6	18.5	27.3	34.3	31.7	-	-		Duplicate Site with P9Aa and P9Ab - Annual data provided for P9Ab only
P9Ab	347950	392325	35.5	35.5	31.4	23.8	29.6	22.9		26.1	25.7	26.4	27.1	29.5	27.9	21.7		Duplicate Site with P9Aa and P9Ab - Annual data provided for P9Ab only
P10Aa	347393	392307	34.6	34.1	24.4	20.2	20.7	14.9	17.9	17.7	21.7	34.9	28.5	3.9	-	-		Duplicate Site with P10Aa and P10Ab - Annual data provided for P10Ab only
P10Ab	347393	392307	34.3	33.1	26.4	21.2	18.2	14.5	17.9	16.8	22.4	38.6	43.9	15.9	24.0	18.7		Duplicate Site with P10Aa and P10Ab - Annual data provided for P10Ab only
HW1a	344843	385022	30.6	21.7	20.1	15.8	16.9	11.2	15.7	15.7	21.1	20.4	29.5	17.9	-	-		Duplicate Site with HW1a and HW1b - Annual data provided for HW1b only
HW1b	344843	385022	28.6	19.7	20.5	16.1	18.0	13.2	15.9	14.9	19.9	19.0	27.1	19.5	19.5	15.2		Duplicate Site with HW1a and HW1b - Annual data provided for HW1b only
HW2a	344827	385202	34.9	34.3	26.7	23.2	23.1	15.0	21.9	21.0	18.6	29.7	36.4	28.6	-	-		Duplicate Site with HW2a and HW2b - Annual data provided for HW2b only
HW2b	344827	385202	31.4	32.3	28.5	21.8	23.4	16.7	20.9	20.1	22.7	31.3	38.7	29.1	26.3	20.5		Duplicate Site with HW2a and HW2b - Annual data provided for HW2b only
HW3Aa	344927	385128	46.7	43.3	45.8	36.4	34.2	28.5	37.8	33.4	37.9	49.4	51.0	37.9	-	-		Duplicate Site with HW3Aa and HW3Ab - Annual data provided for HW3Ab only
HW3Ab	344927	385128	52.6	46.7	45.6	32.5	36.6	29.2	35.5	41.3	37.4	50.2	42.7	41.6	40.6	31.7		Duplicate Site with HW3Aa and HW3Ab - Annual data provided for HW3Ab only

☒ **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.**

☒ **Knowsley MBC confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**. **Dec* data was time weighted, due to over exposure, see Appendix E.**

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.

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

New or Changed Sources Identified Within Knowsley Metropolitan Borough Council During 2024

Knowsley MBC have identified the following planning applications as having the potential to impact air quality:

23/02677/FUL - Date Granted: 16 January 2024

Address/Location of Development: Land At Carr Lane Prescot Knowsley

Description of Development: ERECTION OF 88 NO. AFFORDABLE RESIDENTIAL DWELLINGS AND ASSOCIATED INFRASTRUCTURE

Air Quality Report Submitted and Approved

23/01197/FUL - Date Granted: 9 April 2024

Address/Location of Development: Land To The North East Of The Junction Of Gale Road And Admin Road, Knowsley Industrial Park, Kirkby, Knowsley

Description of Development: ERECTION OF 1 NO. INDUSTRIAL UNIT (USE CLASSES B2 OR B8) WITH ANCILLARY OFFICE SPACE INCLUDING SERVICE YARD, PARKING, SUB STATION AND OTHER ASSOCIATED WORKS

Air Quality Report Submitted and Approved

23/00456/FUL - Date Granted: 24 April 2024

Address/Location of Development: Vacant Land At Alchemy Way, Knowsley Industrial Park, Kirkby, Knowsley

Description of Development: ERECTION OF 2 NO. UNITS (USE CLASS E (G) (II) (III) OR B2 OR B8 USE) WITH ANCILLARY OFFICE SPACE, CAR PARKING AND VEHICULAR, PEDESTRIAN CIRCULATION WITH ACCESS ONTO ALCHEMY WAY

Air Quality Report Submitted and Approved

23/02815/FUL - Date Granted: 26 April 2024

Address/Location of Development: Car Park St Chads Drive Kirkby Town Centre Knowsley L32 8RE

Description of Development: ERECTION OF A 53 NO. APARTMENT RETIREMENT LIVING DEVELOPMENT (USE CLASS C3), LANDSCAPING, CAR PARKING AND ALL ASSOCIATED WORKS

Air Quality Report Submitted and Approved

23/02008/FUL - Date Granted: 30 April 2024

Address/Location of Development: Land At Coopers Lane Knowsley Industrial Park Kirkby Knowsley

Description of Development: PROPOSED DEVELOPMENT OF A BATTERY STORAGE FACILITY AND ASSOCIATED INFRASTRUCTURE

Air Quality Report Submitted and Approved

23/02819/FUL - Date Granted: 10 May 2024

Address/Location of Development: Mersey Pallets Co Kirkby Bank Road Knowsley Industrial Park Kirkby Knowsley L33 7SY

Description of Development: ERECTION OF 4NO INDUSTRIAL UNITS (USE CLASS B8 - STORAGE AND DISTRIBUTION) AND ASSOCIATED WORKS (SITE ACCESS TO BE TAKEN FROM ACORNFILED ROAD AND KIRKBY BANK ROAD)

Air Quality Report Submitted and Approved

22/00600/FUL - Date Granted: 30 May 2024

Address/Location of Development: Land To The South Of Lickers Lane, Halsnead Garden Village, Whiston, Knowsley

Description of Development: ERECTION OF 120 NO. DWELLINGS WITH 1 NO. VEHICULAR ACCESS OFF LICKERS LANE AND OTHER ASSOCIATED WORKS

Air Quality Report Submitted and Approved

22/00233/FUL - Date Granted: 4 October 2024

Address/Location Of Development: DYE HOUSE, LIVERPOOL ROAD, PRESCOT, KNOWSLEY, L34 3LX.

Description of Development: DEMOLITION OF EXISTING BUILDING AND REDEVELOPMENT OF LAND AT DYE HOUSE, PRESCOT, TO ERECT UP TO 45 RESIDENTIAL UNITS (TO INCLUDE A MIX OF HOUSES AND APARTMENTS) WITH ASSOCIATED INFRASTRUCTURE AND LANDSCAPING (ACCESS TO BE TAKEN FROM THE EXISTING DEVELOPMENT TO THE NORTHEAST).

Air Quality Report Submitted and Approved

Additional Air Quality Works Undertaken by Knowsley Metropolitan Borough Council During 2024

Knowsley MBC has not completed any additional works within the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by SOCOTEC Didcot using the 50% triethanolamine (TEA) in acetone preparation method. For the 2024 reporting year, based on 33 studies, a national bias adjustment factor of 0.78 was derived from the national bias adjustment calculation spreadsheet (version number 04/25).

SOCOTEC Didcot, a UKAS accredited laboratory, participate in the AIR-PT scheme for NO_2 diffusion tube analysis and the Annual Field Intercomparison Exercise. These provide strict criteria relating to performance that participating laboratories must meet, thereby ensuring that the reported NO_2 concentrations are of a high calibre. In the latest AIR-PT results, AIR-PT AR062 (January – February 2024), AIR-PT AR063 (April – June 2024), and AIR-PT AR066 (September – October 2024) SOCOTEC were awarded a score of 100% - the percentage score is an indication of the results deemed satisfactory based upon the z-score of $<\pm 2$. For all observations in 2024, the precision of the NO_2 diffusion tubes supplied by SOCOTEC Didcot was classified as ‘satisfactory’. The precision is an indication of the laboratory’s performance and consistency in the preparation, analysis, and handling of the diffusion tubes. All diffusion tubes were collected in line with the monitoring calendar, except for December 2024. The December data was collected on the 13th January 2025 as the extreme cold weather made it to dangerous to travel across the borough to collect the tubes on the dates suggested by DEFRA. The LQMA Helpdesk advised that an assessment was

required with two options – removal of December data or use time weighted December data, this is discussed within Appendix E.

Diffusion Tube Annualisation used within the Option Assessment as detailed in Appendix E.

Within option 1 assessment (see appendix E), all diffusion tube monitoring locations, except for Prescot, within Knowsley MBC recorded data capture of 75% or more therefore it was not required to annualise any monitoring data.

Two continuous background monitoring locations were used, within a 10-mile radius to annualise the data:

- Liverpool Speke
- Widnes Milton Road

These continuous background monitoring sites were applicable to use as they all had >85% data capture and therefore could be used for annualisation. Unfortunately, the other two sites within a 10-mile radius had insufficient data capture (<85%):

- St Helens Linkway
- Warrington

Table C.1 presents the annualisation summary.

Table C.1 – Annualisation Summary for Option 1 of the data assessment detailed within Appendix E (concentrations presented in µg/m^3) for one monitoring location within Halewood

Site ID	Annualisation Factor Liverpool Speke	Annualisation Factor Widnes Milton Road	Annualisation Factor St Helens Linkway	Annualisation Factor Warrington	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
P5 Ab	1.0169	1.0317	-	-	1.0243	21.9	22.4

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 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.

Knowsley Metropolitan Borough Council have applied a national bias adjustment factor of 0.78 to the 2024 monitoring data. A summary of bias adjustment factors used by Knowsley MBC over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	National	04/25	0.78
2023	National	03/24	0.77
2022	National	03/22	0.76
2021	Local	-	0.93
2020	Local	-	0.81

NO_2 Fall-off with Distance from the Road

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

No diffusion tube NO_2 monitoring locations within Knowsley MBC required distance correction during 2023.

QA/QC of Automatic Monitoring

The Kirkby station used Beta Automatic Mass (BAM) monitors to measure PM_{10}. As per TG.16, the BAM met the equivalence criteria for monitoring providing the results were corrected for slope. The data in this report had the correction factor applied so it could be compared to the National Air Quality Objectives. Both PM_{10} and $PM_{2.5}$ were previously recorded at the Huyton and Halewood sites using TEOMS. All three sites had NO_2 monitors installed. Data from the analyser was stored as ‘raw’ or ‘uncorrected’ data on the logger and therefore needed to be corrected or validated. To validate the data, the NO_2 analyser

needed to be checked against a referenced standard of ‘zero’ air and ‘span’ gas. Data was corrected using either daily or monthly calibration checks to verify that the analyser was corrected for any response change.

A regular manual calibration check was performed on all three automatic monitoring stations. For the NO_2 analyser, this check was performance to verify the response of the analyser in reference to ‘zero’ and ‘span’ by introducing a high concentration of NO gas. These results provided a validation of the NOx analyser in the automatic monitoring station.

For the year 2021, all automatic monitors (Huyton, Halewood and Kirkby) were only in operation from January – September. Knowsley have not renewed their contract with We Care 4 Air, resulting in contract termination in September 2021 as the monitors used for PM_{10} and $PM_{2.5}$ were unable to be validated against the volatile correction model and costs associated with updating equipment was not feasible at the time of contract renewal. There has been no automatic monitoring data since October 2021.

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

PM_{10} and $PM_{2.5}$ data was corrected using the volatile correction model. However, in 2021 the TEOMS measurements at the Huyton and Halewood monitoring stations were unable to be validated against the volatile correction model, as there were no FDMS instruments within 130 km of the sites.

Automatic Monitoring Annualisation

Knowsley Metropolitan Borough Council did not have any automatic monitoring locations in 2022.

In 2021 all three automatic monitoring sites recorded below the acceptable data capture for NO_2, PM_{10} and $PM_{2.5}$, therefore required annualisation. Annualisation was carried out for the annual mean NO_2 and PM_{10} at Kirkby Old Rough Lane (with data captures of 73.4% and 69.1% for each pollutant, respectively) NO_2 at Halewood (74.5%) and Huyton Cronton Road (72.5%). Four continuous background monitoring locations were used, the three locations within a 50-mile radius were selected to annualise the data:

- Glazebury
- Wirral Tranmere
- Wigan Centre
- Salford Eccles

These continuous background monitoring sites were applicable to use as they all had >85% data capture and therefore could be used for annualisation. This information was presented within the 2022 ASR.

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

*The commentary supplied for the ASR June 2024 (ASR24-2129) by LAQM (point 3.c) states the scale bars within the figures are different, or not present. Please disregard the scales on the maps as they are only indicative maps to show the locations of the monitoring sites.

Figure D.1 – Map of Non-Automatic Monitoring Site

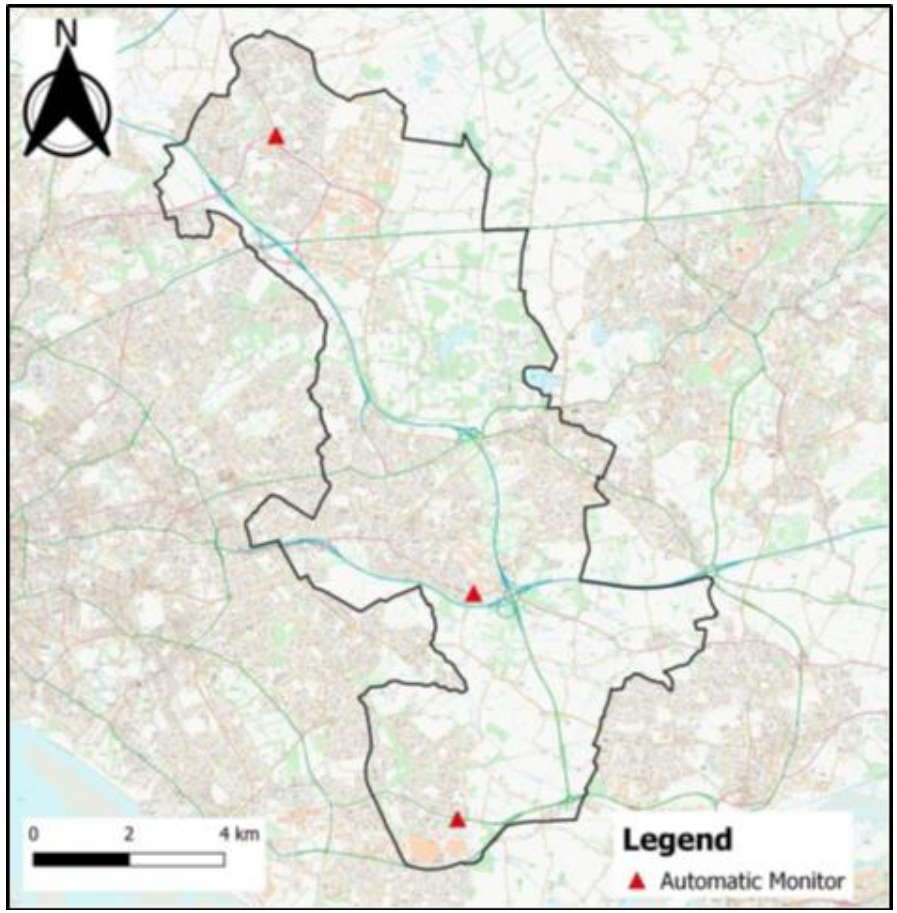

Figure D.2 – Map of Huyton Automatic Monitoring Station Site (Cronton Road)

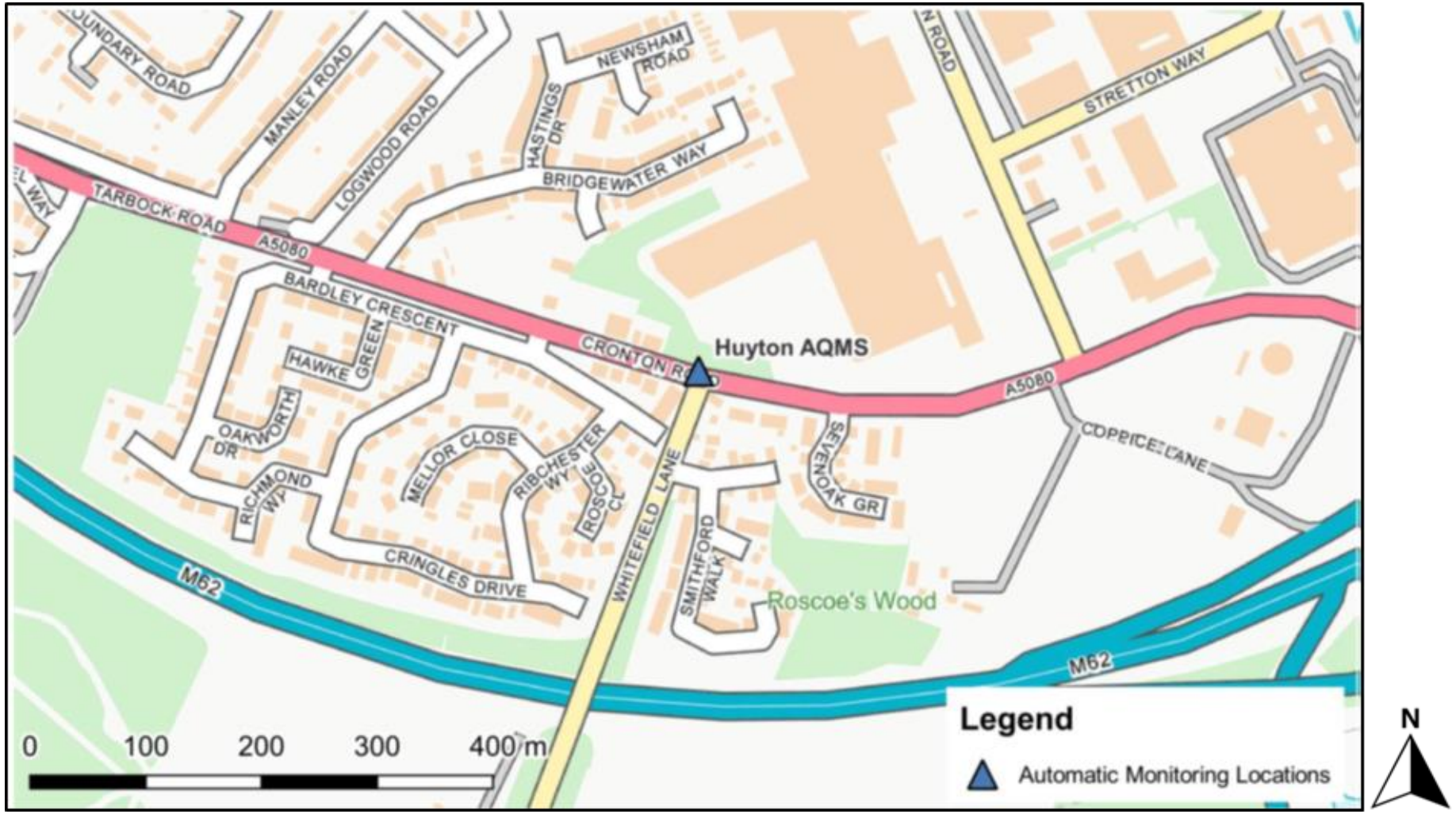

Figure D.3 – Map of Kirkby Automatic Monitoring Station (Old Rough Lane)

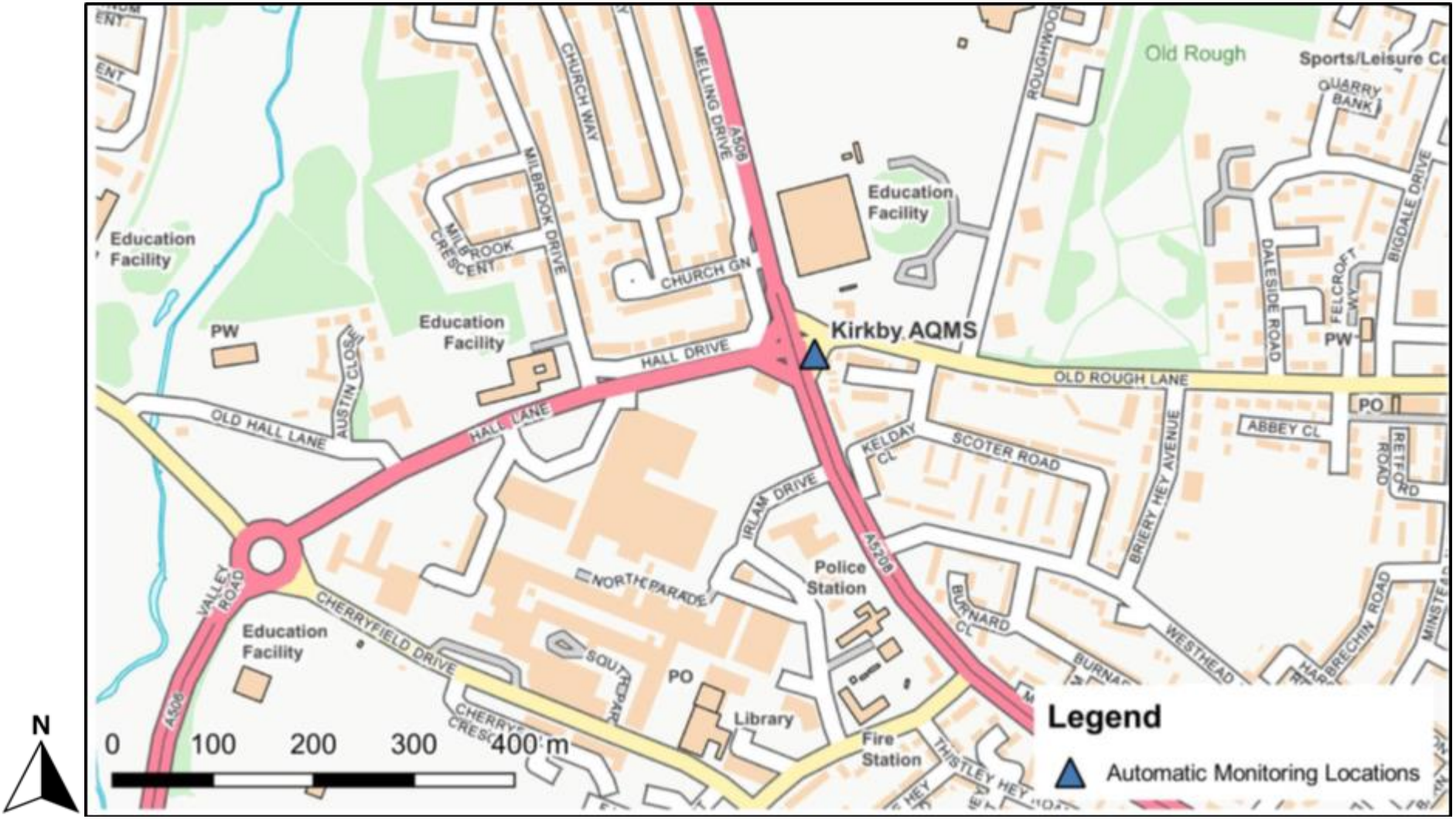

Figure D.4 – Map of Halewood Automatic Monitoring Station (Higher Road)

Figure D.5 – Map of Non-Automatic (Diffusion Tube) Sites in Huyton

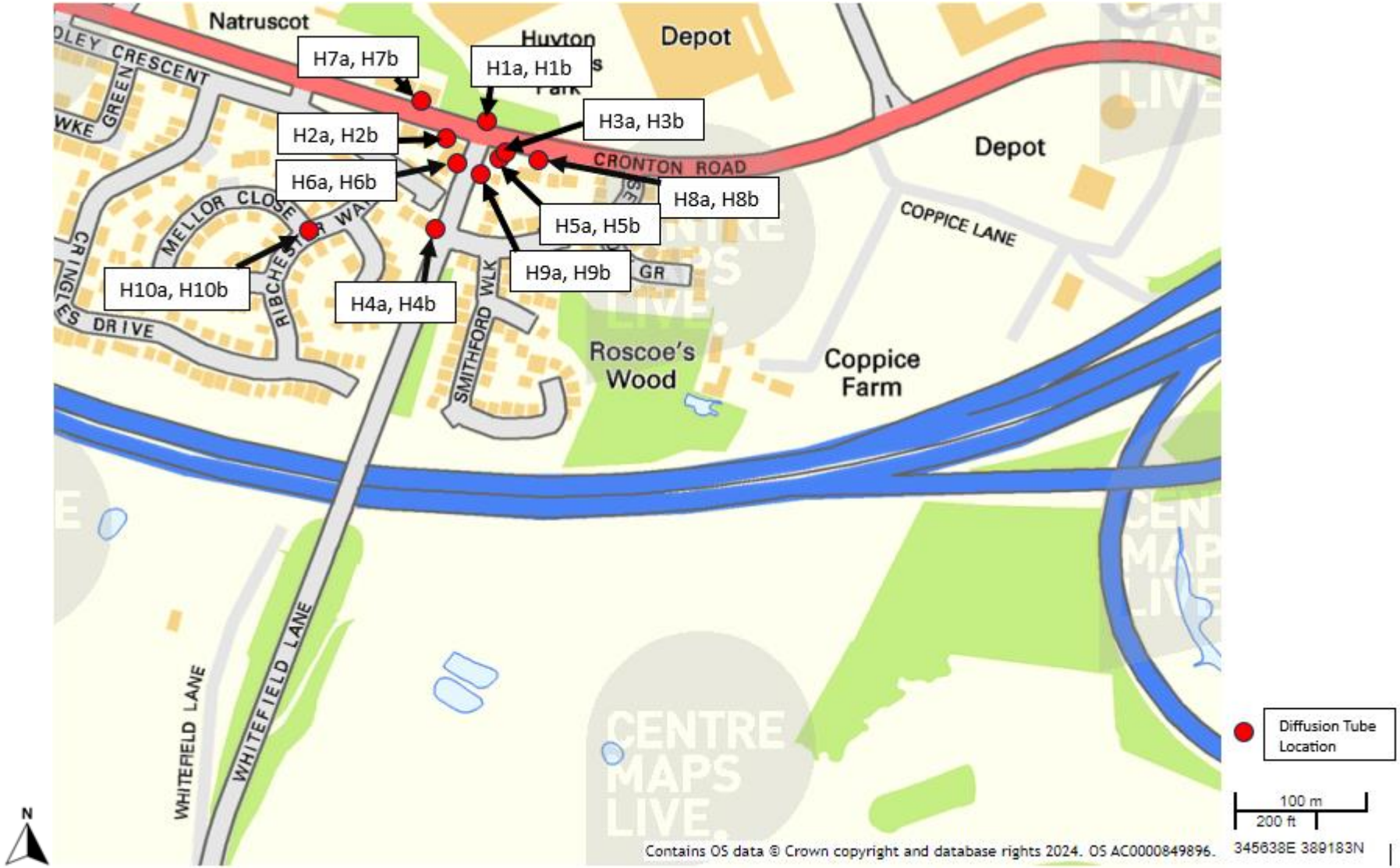

Figure D.6 – Map of Non-Automatic (Diffusion Tube) Sites in Huyton

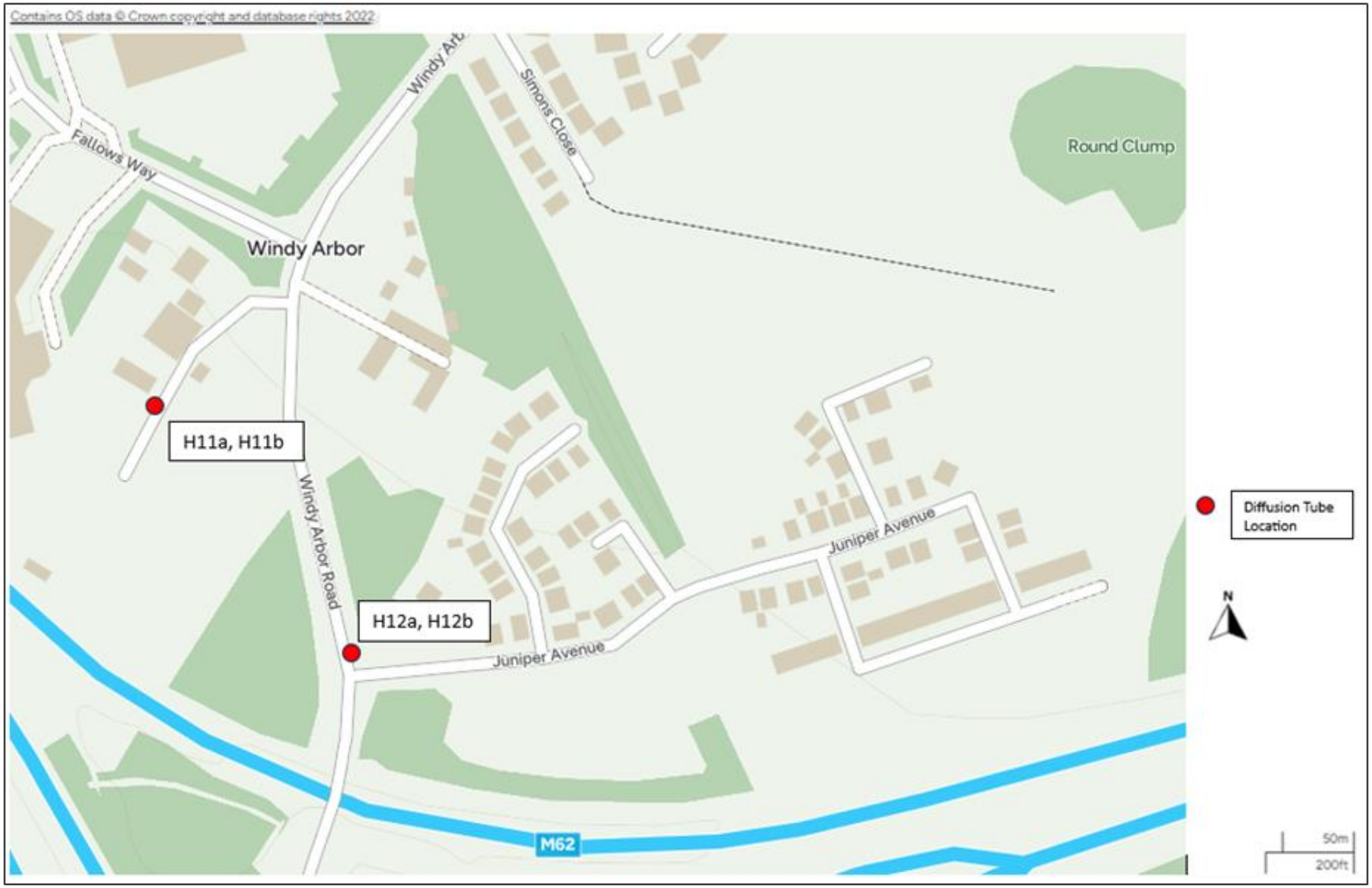

Figure D.7 – Map of Non-Automatic (Diffusion Tube) Sites in Prescot

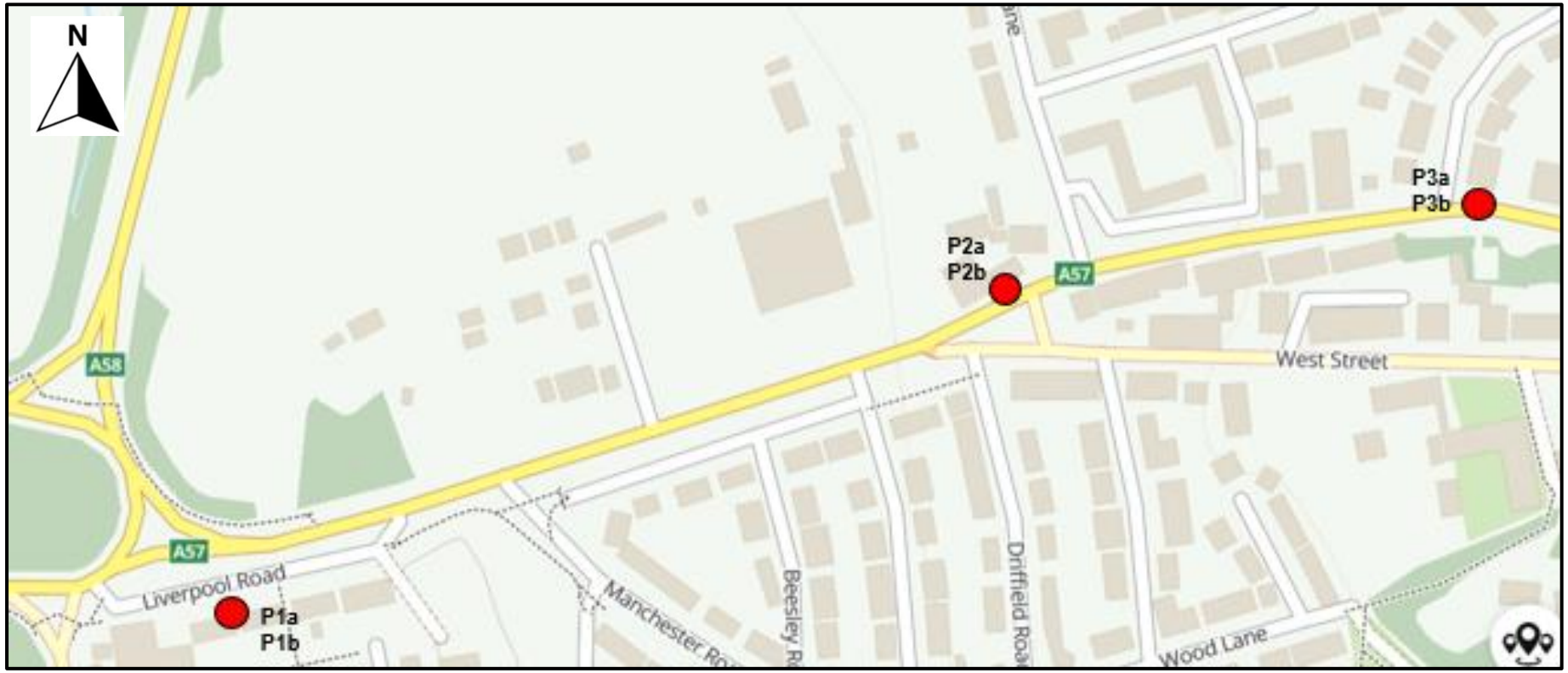

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Figure D.8 – Map of Non-Automatic (Diffusion Tube) Sites in Prescot

Figure D.9 – Map of Non-Automatic (Diffusion Tube) Sites in Prescot

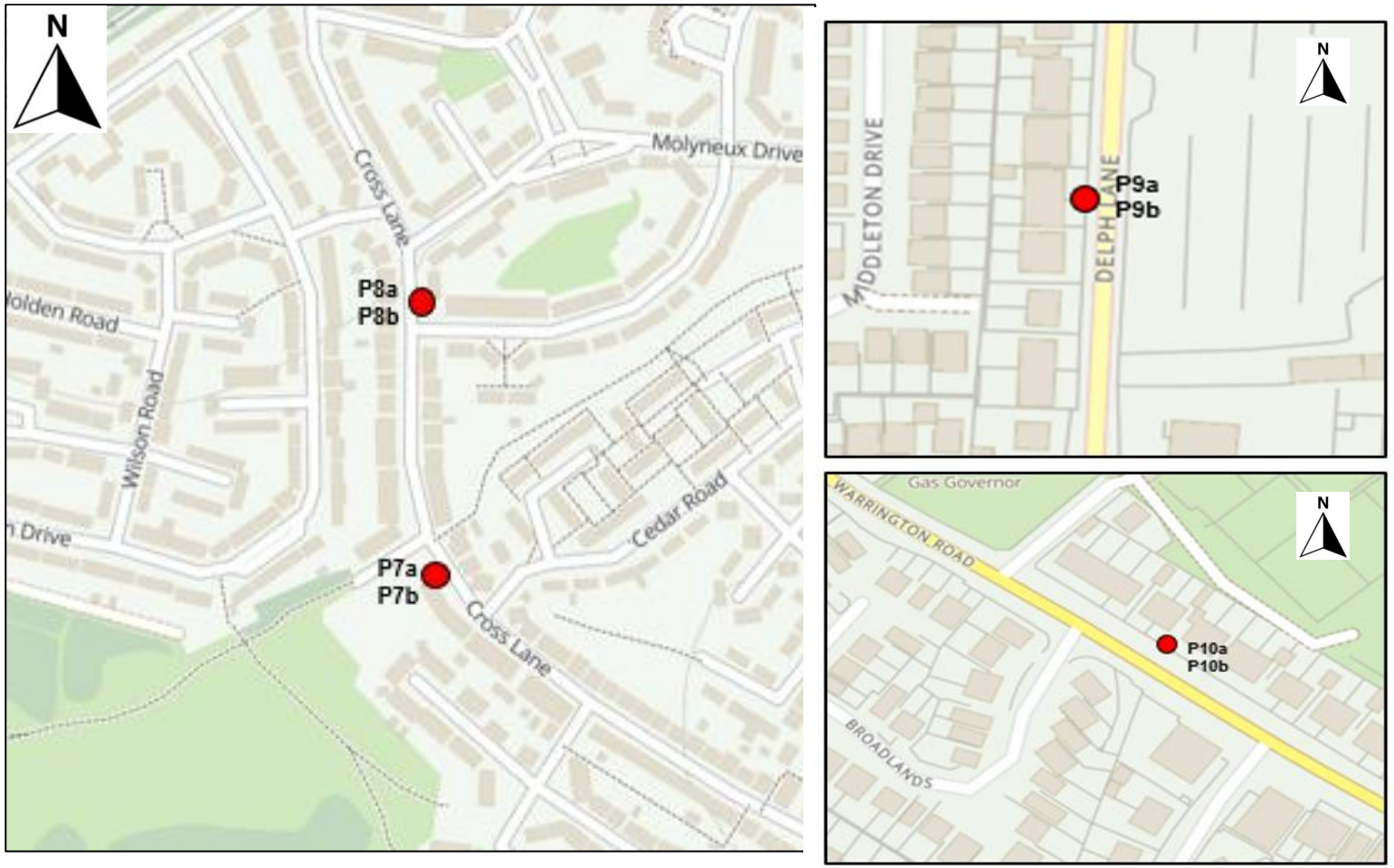

Figure D.10 – Map of Non-Automatic (Diffusion Tube) Sites in Kirkby (Town Centre)

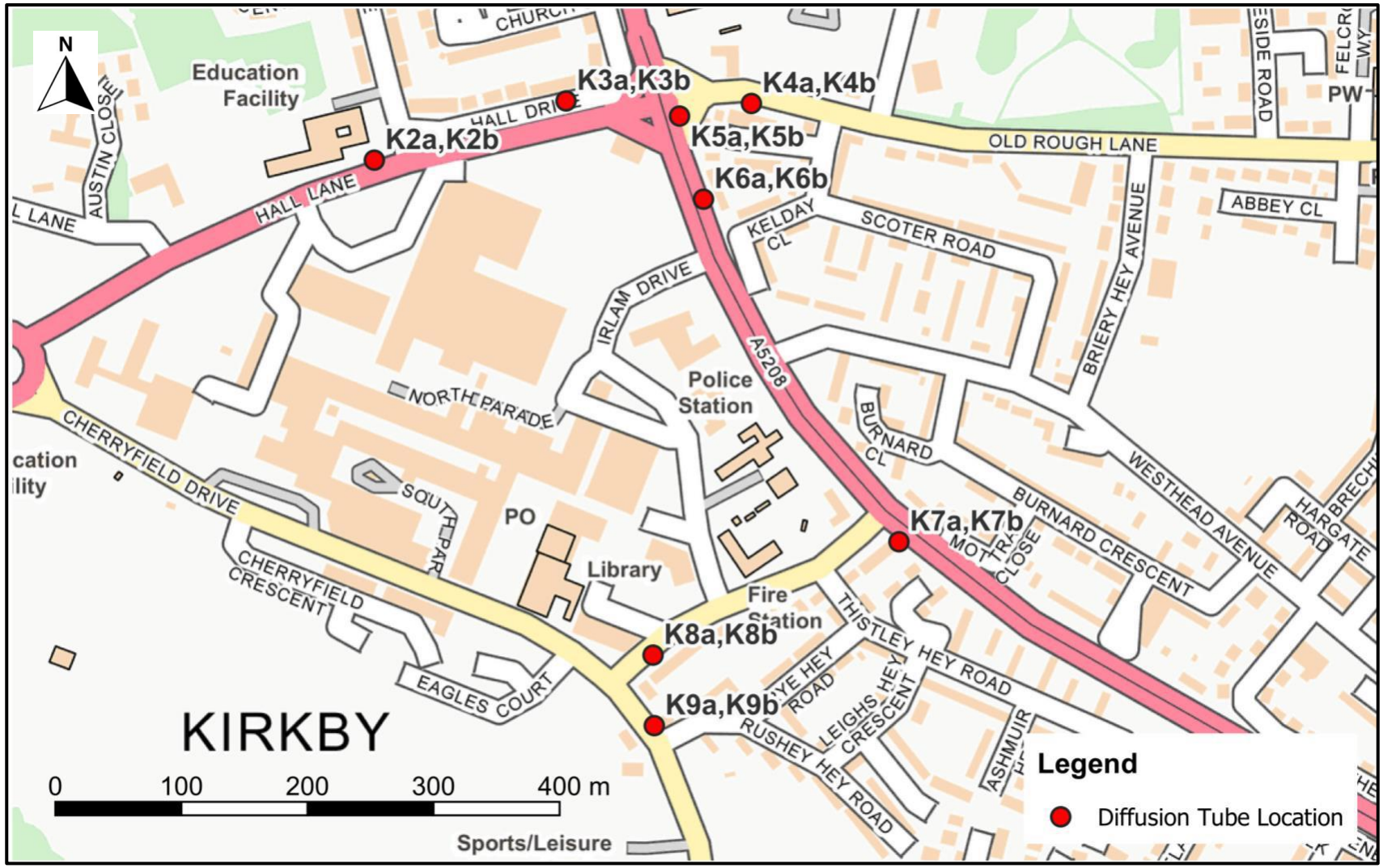

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Figure D.11 – Map of Non-Automatic (Diffusion Tube) Sites in Kirkby (M57 Junction 6)

Figure D.12 – Map of Non-Automatic (Diffusion Tube) Sites in Kirkby (Moorgate Road)

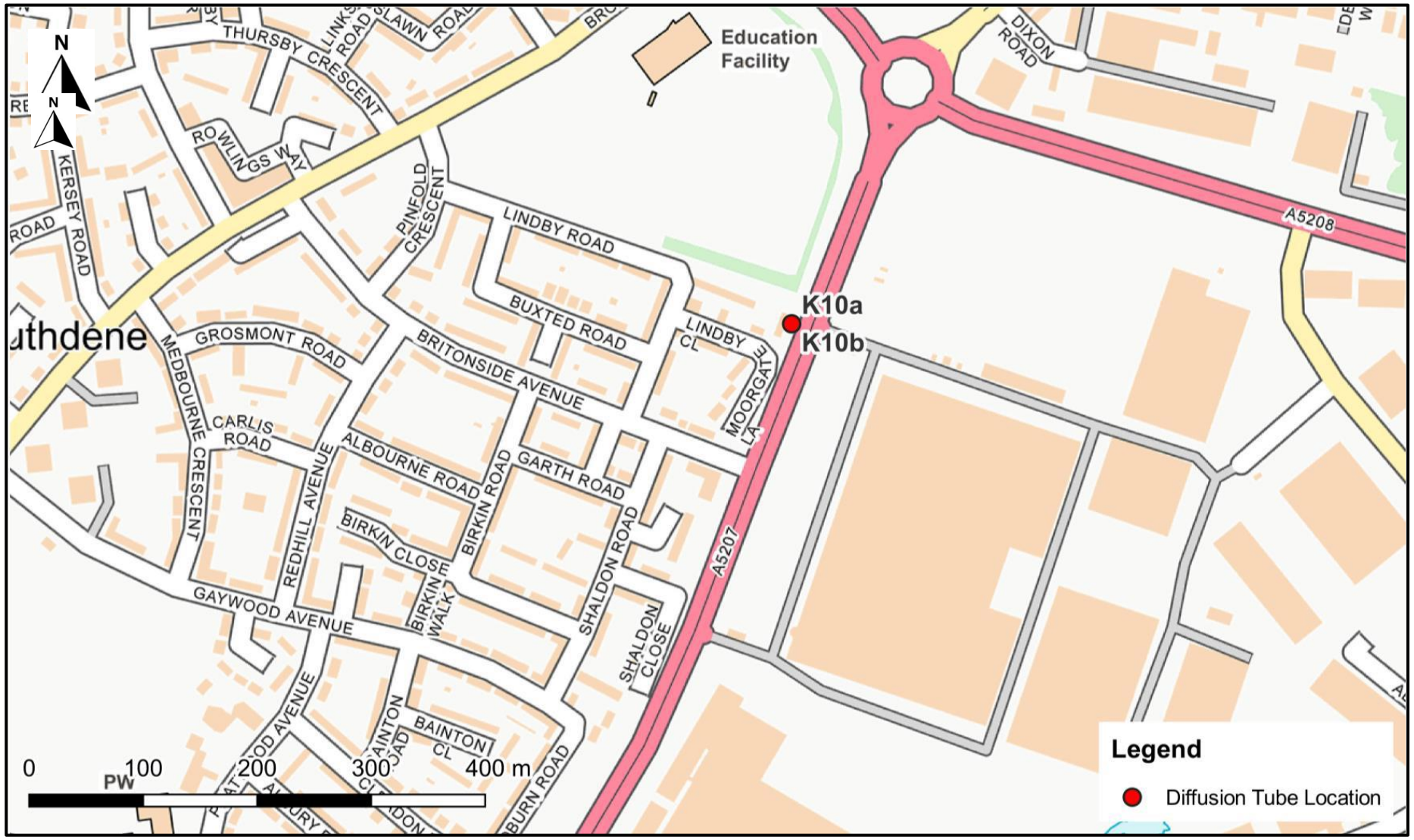


Figure D.13 – Map of Non-Automatic (Diffusion Tube) Sites in Halewood

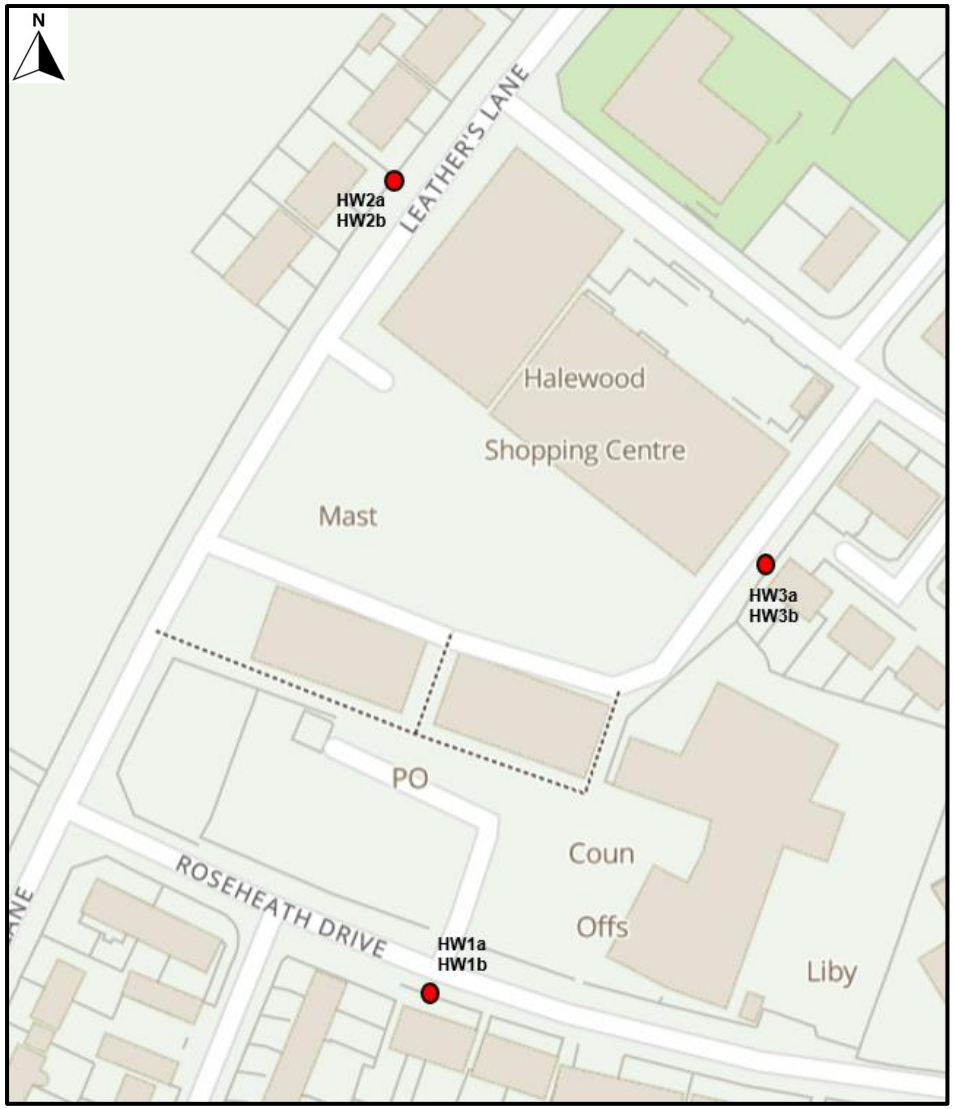


Figure D.14 – Map of Automatic Monitoring Stations, Non-Automatic (Diffusion Tube) Sites and the EarthSense Zephyr Site in Huyton

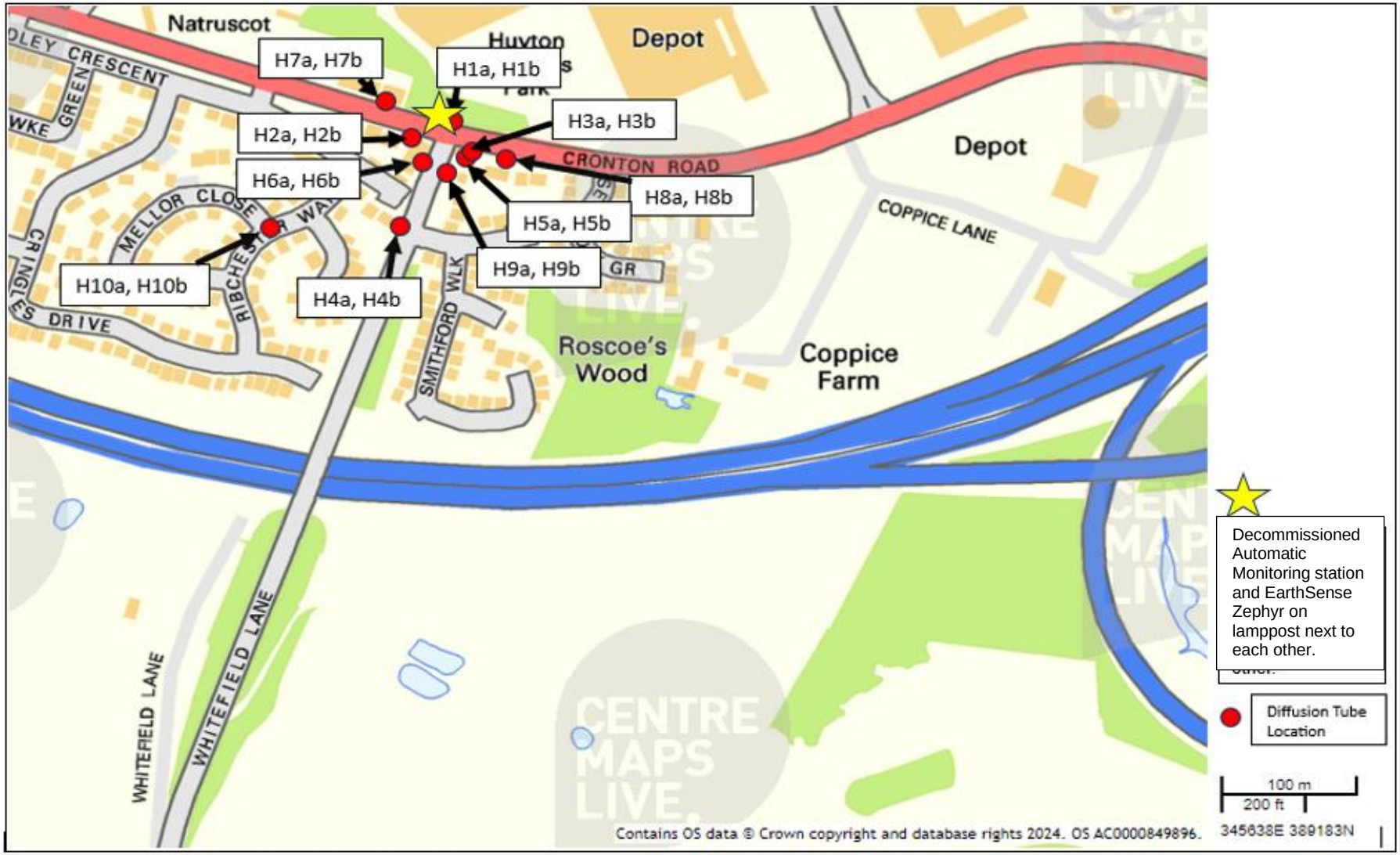
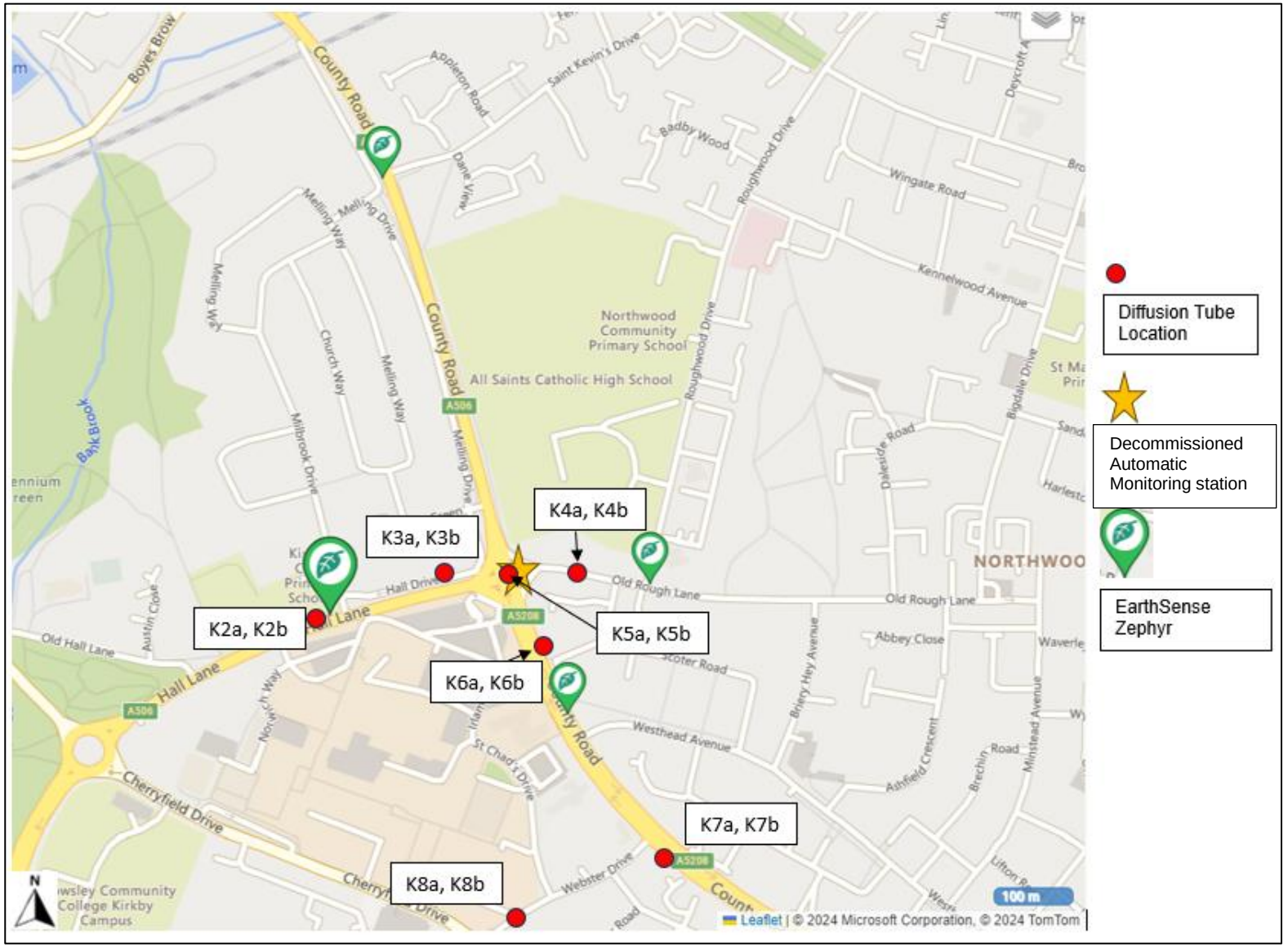


Figure D.15 – Map of Automatic Monitoring Stations, Non-Automatic (Diffusion Tube) Sites and the EarthSense Zephyr Site in Kirkby



Appendix E: Duration of Monitoring Programme

Diffusion Tube Exposure

In December 2024, the diffusion tubes were exposed from 4th December 2024 to 13th January 2025, the removal date was greater than the date proposed by DEFRA due to adverse weather conditions, with a number of areas covered in ice, making it too dangerous to collect the diffusion tubes.

LAQM Helpdesk was notified of the extended date, advice received in an email on Friday 02/05/2025 14:45 (reference code 10301) was as follows:

Section 3.2.5 of the Diffusion Tube Practical Guidance ('Duration of Monitoring Programme') states the following in relation to exposure periods:

"Individual exposure should ideally be 2-4 weeks (no longer than 5 weeks and no shorter than 1 week)".

Assuming you completed the changeover on 4th December (as per the LAQM calendar), these tubes will have been exposed beyond the recommended limit (approximately 5.5. weeks). Therefore, there are two options to which you can do with the December data:

Option 1 – Remove the Data:

The data could be removed from the annual mean calculation as it has been overexposed. However, for transparency, I would recommend you still present the December data in Table B.1, but flag that this data was omitted from the annual mean calculation (maybe be presenting it as red text). The tool can still be used if the December data is removed.

Option 2 – Perform a Time-Weight Average:

The data could be included by performing a time-weighted average of the annual mean for the full year. The methodology for this is outlined in Section 7.213 of LAQM TG(22):

"If the periods that the tubes were out varied beyond the four to five week recommendation, then it may be necessary to do a time weighted average. In order to do this, each concentration is multiplied by the number of days that the tube was out. These results are then added together for every period of the year. Finally, this is divided by the total number of days that all the tubes were out. For example, if Tube 1 was out for 32 days and had a 45µg/m^3 average, and Tube 2 was out for 46 days and had a 25µg/m^3 average, the simple average is (45+25)/2 = 35µg/m^3; whereas the time weighted average = ((45×32)+(25×46))/(32+46) = 33.2µg/m^3".

This will need to be completed outside of the tool.

I recommend that you investigate both options to understand the differences in the overall dataset and provide clear justification within the ASR as to the option which was taken to process the data.

Option 1: Removal of December NO_2 figures

The December diffusion tube figures were omitted from the Diffusion Tube Data Processing Tool to determine the raw annual mean (µg/m³) and then the bias adjusted and annualised annual mean (µg/m³) for the whole year, as detailed in Table E.2 below.

Option 2: Time Weight Average Calculations for December

To review both options, the time weighted average for the December nitrogen dioxide values were calculated, as detailed in Table E.1 below. The time weighted figure was then used within the DTDES inputs table to be able to calculate the raw annual mean (µg/m³) and then the bias adjusted and annual mean (µg/m³) for the whole year, as detailed in Table E.1 below. Annualisation of the data was not required.

Table E.1 – Time Weight Average Calculations for December 2024 NO_2 Diffusion Tube Results (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	DEC	Time weighted average for DEC
H1a	345552	389413	24.4	
H1b	345552	389413	35	**29.7**
H2a	345537	389407	35.8	
H2b	345537	389407	25.3	**30.6**
H3a	345563	389399	35.3	
H3b	345563	389399	7.1	**21.2**
H4a	345517	389329	30.5	
H4b	345517	389329	32.6	**31.6**
H5Aa	345563	389397	37.6	
H5Ab	345563	389397	38.3	**38.0**
H6Aa	345543	389390	43.4	
H6Ab	345543	389390	46.1	**44.8**
H7Aa	345503	389429	30.6	
H7Ab	345503	389429	34.7	**32.7**
H8Aa	345577	389394	40.9	

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	DEC	Time weighted average for DEC
H8Ab	345577	389394	33	**37.0**
H9Aa	345555	389392	37.6	
H9Ab	345555	389392	37.8	**37.7**
H10a	345424	389325	25.7	
H10b	345424	389325	18.6	**22.2**
H11a	346329	389782	35.5	
H11b	346329	389782	19.4	**27.5**
H12a	346425	389669	8.6	
H12b	346425	389669	19.1	**13.9**
K1a	340355	397795	36.9	
K1b	340355	397795	34.2	**35.6**
K2a	341165	398953	24.1	
K2b	341165	398953	24.9	**24.5**
K3a	341317	399000	27.3	
K3b	341317	399000	7	**17.2**
K4a	341464	398997	33.9	
K4b	341464	398997	26.2	**30.1**
K5a	341407	398988	37.5	
K5b	341407	398988	20.8	**29.2**
K6a	341426	398922	23.9	
K6b	341426	398922	30	**27.0**
K7a	341576	398654	19.6	
K7b	341576	398654	26.2	**22.9**
K8a	341371	398537	23.5	
K8b	341371	398537	8	**15.8**
K9a	341387	398504	36.6	
K9b	341387	398504	11.7	**24.2**
K10a	342421	397755	30	
K10b	342421	397755	18.3	**24.2**
P1a	345816	392660	27.7	
P1b	345816	392660	31	**29.4**
P2a	346164	392807	28.8	

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	DEC	Time weighted average for DEC
P2b	346164	392807	8.1	**18.5**
P3a	346393	392844	28.8	
P3b	346393	392844	36	**32.4**
P4Aa	346942	392387	33.6	
P4Ab	346942	392387	33	**33.3**
P5Aa	346898	392367	30.3	
P5Ab	346898	392367	29.2	**29.8**
P6Aa	346850	392360	30.5	
P6Ab	346850	392360	28.6	**29.6**
P7Aa	346799	391419	27.6	
P7Ab	346799	391419	23	**25.3**
P8Aa	346792	391617	26.1	
P8Ab	346792	391617	23.4	**24.8**
P9Aa	347950	392325	31.7	
P9Ab	347950	392325	29.5	**30.6**
P10Aa	347393	392307	3.9	
P10Ab	347393	392307	15.9	**9.9**
H1a	345552	389413	17.9	
H1b	345552	389413	19.5	**18.7**
H2a	345537	389407	28.6	
H2b	345537	389407	29.1	**28.9**
H3a	345563	389399	37.9	
H3b	345563	389399	41.6	**39.8**

Table E.2 – DTDES Inputs using Time Weight Average Calculations for December 2024 detailing Raw and Bias Adjusted Annualised Annual Mean figures for NO_2 (µg/m^3)

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
H1a, H1b	345552	389413	90.1	National	0.78	39.3	39.5	34.3	27.6	28.2	24.6	26.5	23.1	26.5	36.4	39.5			31.4	24.5	
H2a, H2b	345537	389407	90.1	National	0.78	36.2	45.4	40.1	31.5	38.0	22.2	29.1	26.3	38.6	34.0	40.9			34.7	27.1	
H3a, H3b	345563	389399	90.1	National	0.78	52.1	52.8	43.7	38.7	41.4	32.2	37.4	33.3	48.9	44.2	41.7			42.4	33.0	
H4a, H4b	345517	389329	90.1	National	0.78	32.8	24.6	24.1	24.1	25.3	18.0	22.6	20.1	28.8	23.9	38.7			25.7	20.0	
H5Aa, H5Ab	345563	389397	90.1	National	0.78	44.5	39.4	33.0	27.6	31.2	25.5	29.5	25.5	39.4	31.5	35.8			33.0	25.7	
H6Aa, H6Ab	345543	389390	90.1	National	0.78	48.2	43.9	40.0	35.7	40.5	33.7	35.9	33.6	46.1	31.0	50.0			39.9	31.1	
H7Aa, H7Ab	345503	389429	90.1	National	0.78	36.6	29.8	35.3	27.1	32.3	20.4	26.5	23.4	37.6	36.7	39.3			31.3	24.4	
H8Aa, H8Ab	345577	389394	90.1	National	0.78	41.5	38.3	34.3	35.9	37.5	29.4	35.0	32.5	48.3	39.0	47.3			38.1	29.7	
H9Aa, H9Ab	345555	389392	90.1	National	0.78	44.0	37.3	35.9	28.0	32.5	23.6	27.6	26.8	43.3	35.3	43.2			34.3	26.7	
H10a, H10b	345424	389325	90.1	National	0.78	30.0	28.9	21.1	14.9	17.3	10.6	13.7	14.3	20.2	22.0	27.0			20.0	15.6	

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
H11a, H11b	346329	389782	90.1	National	0.78	31.5	37.3	30.1	23.0	25.8	28.5	22.2	20.8	24.6	24.8	31.7			27.3	21.3	
H12a, H12b	346425	389669	90.1	National	0.78	40.5	36.3	32.5	31.3	33.4	33.6	30.5	28.0	28.9	33.2	36.0			33.1	25.8	
K1a, K1b	340355	397795	90.3	National	0.78	50.5	36.6	36.8	36.9	38.2	32.1	34.3	36.2	32.3	41.0	46.3			38.3	29.8	
K2a, K2b	341165	398953	90.3	National	0.78	29.3	30.4	24.4	16.0	17.0	10.0	15.0	14.1	17.5	27.9	27.6			20.8	16.2	
K3a, K3b	341317	399000	90.3	National	0.78	28.3	34.4	27.7	17.7	18.3	9.8	14.9	16.9	17.7	28.5	26.7			21.9	17.1	
K4a, K4b	341464	398997	90.3	National	0.78	37.1	35.9	28.3	22.9	25.3	19.9	23.6	21.2	25.5	24.6	39.4			27.6	21.5	
K5a, K5b	341407	398988	81.0	National	0.78	43.9	41.5	25.8	30.2	30.3	25.1	28.9	30.3	30.3		37.7			32.4	25.3	
K6a, K6b	341426	398922	90.3	National	0.78	43.1	42.9	32.0	28.3	31.6	25.3	29.5	31.1	29.8	30.7	39.6			33.1	25.8	
K7a, K7b	341576	398654	90.3	National	0.78	30.6	30.2	27.5	18.4	20.1	13.0	18.3	17.2	17.3	31.0	26.7			22.7	17.7	
K8a, K8b	341371	398537	90.3	National	0.78	32.8	35.7	28.4	22.5	26.1	17.7	21.1	24.0	22.7	31.0	27.3			26.3	20.5	
K9a, K9b	341387	398504	90.3	National	0.78	39.5	35.9	29.6	24.0	28.8	20.7	25.8	23.8	26.9	32.9	37.5			29.6	23.0	
K10a, K10b	342421	397755	90.3	National	0.78	30.8	31.4	18.6	19.8	20.4	13.1	17.7	16.8	22.3	28.2	30.1			22.6	17.6	

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
P1a, P1b	345816	392660	90.3	National	0.78	35.5	34.6	28.5	26.7	27.8	23.0	24.9	22.1	31.9	30.5	35.3			29.1	22.7	
P2a, P2b	346164	392807	82.8	National	0.78	33.1	27.2	27.6	19.5	23.6	19.9	22.2	28.8		26.2	35.9			26.4	20.6	
P3a, P3b	346393	392844	83.1	National	0.78	32.8	42.6	39.9	25.6	30.9	23.6		19.7	28.2	39.9	41.5			32.5	25.3	
P4Aa, P4Ab	346942	392387	90.3	National	0.78	34.4	34.7	24.3	23.3	25.4	18.5	22.5	26.3	25.0	30.8	32.3			27.0	21.1	
P5Aa, P5Ab	346898	392367	73.2	National	0.78	26.8			18.6	21.8	15.9	18.5	16.7	21.8	25.0	32.0			21.9	17.5	
P6Aa, P6Ab	346850	392360	90.3	National	0.78	31.3	31.6	26.2	19.3	21.3	14.7	21.6	17.2	24.3	25.1	26.4			23.5	18.3	
P7Aa, P7Ab	346799	391419	90.3	National	0.78	27.5	28.8	23.4	17.3	18.7	12.4	16.9	14.5	20.1	26.9	31.6			21.6	16.9	
P8Aa, P8Ab	346792	391617	90.3	National	0.78	25.5	26.5	21.5	17.5	17.3	12.4	15.8	15.3	18.3	22.4	28.5			20.1	15.7	
P9Aa, P9Ab	347950	392325	90.3	National	0.78	34.9	35.6	29.4	23.2	29.0	22.9	23.5	25.9	22.1	26.9	30.7			27.6	21.6	
P10Aa, P10Ab	347393	392307	90.3	National	0.78	34.5	33.6	25.4	20.7	19.5	14.7	17.9	17.3	22.1	36.8	36.2			25.3	19.7	
HW1a, HW1b	344843	385022	90.3	National	0.78	29.6	20.7	20.3	16.0	17.5	12.2	15.8	15.3	20.5	19.7	28.3			19.6	15.3	
HW2a, HW2b	344827	385202	90.3	National	0.78	33.2	33.3	27.6	22.5	23.3	15.9	21.4	20.6	20.7	30.5	37.6			26.0	20.3	

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
HW3Aa, HW3Ab	344927	385128	90.3	National	0.78	49.7	45.0	45.7	34.5	35.4	28.9	36.7	37.4	37.7	49.8	46.9			40.7	31.7	

Table E.3 – DTDES Inputs using Time Weight Average Calculations for December 2024 detailing Raw and Bias Adjusted Annualised Annual Mean figures for NO_2 (µg/m^3)

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
H1a, H1b	345552	389413	100.0	National	0.78	39.3	39.5	34.3	27.6	28.2	24.6	26.5	23.1	26.5	36.4	39.5	29.7		31.3	24.4	
H2a, H2b	345537	389407	100.0	National	0.78	36.2	45.4	40.1	31.5	38.0	22.2	29.1	26.3	38.6	34.0	40.9	30.6		34.4	26.8	
H3a, H3b	345563	389399	100.0	National	0.78	52.1	52.8	43.7	38.7	41.4	32.2	37.4	33.3	48.9	44.2	41.7	21.2		40.6	31.7	
H4a, H4b	345517	389329	100.0	National	0.78	32.8	24.6	24.1	24.1	25.3	18.0	22.6	20.1	28.8	23.9	38.7	31.6		26.2	20.4	
H5Aa, H5Ab	345563	389397	100.0	National	0.78	44.5	39.4	33.0	27.6	31.2	25.5	29.5	25.5	39.4	31.5	35.8	38.0		33.4	26.0	
H6Aa, H6Ab	345543	389390	100.0	National	0.78	48.2	43.9	40.0	35.7	40.5	33.7	35.9	33.6	46.1	31.0	50.0	44.8		40.3	31.4	
H7Aa, H7Ab	345503	389429	100.0	National	0.78	36.6	29.8	35.3	27.1	32.3	20.4	26.5	23.4	37.6	36.7	39.3	32.7		31.4	24.5	
H8Aa, H8Ab	345577	389394	100.0	National	0.78	41.5	38.3	34.3	35.9	37.5	29.4	35.0	32.5	48.3	39.0	47.3	37.0		38.0	29.6	
H9Aa, H9Ab	345555	389392	100.0	National	0.78	44.0	37.3	35.9	28.0	32.5	23.6	27.6	26.8	43.3	35.3	43.2	37.7		34.6	27.0	
H10a, H10b	345424	389325	100.0	National	0.78	30.0	28.9	21.1	14.9	17.3	10.6	13.7	14.3	20.2	22.0	27.0	22.2		20.2	15.7	

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
H11a, H11b	346329	389782	100.0	National	0.78	31.5	37.3	30.1	23.0	25.8	28.5	22.2	20.8	24.6	24.8	31.7	27.5		27.3	21.3	
H12a, H12b	346425	389669	100.0	National	0.78	40.5	36.3	32.5	31.3	33.4	33.6	30.5	28.0	28.9	33.2	36.0	13.9		31.5	24.6	
K1a, K1b	340355	397795	100.0	National	0.78	50.5	36.6	36.8	36.9	38.2	32.1	34.3	36.2	32.3	41.0	46.3	35.6		38.0	29.7	
K2a, K2b	341165	398953	100.0	National	0.78	29.3	30.4	24.4	16.0	17.0	10.0	15.0	14.1	17.5	27.9	27.6	24.5		21.1	16.5	
K3a, K3b	341317	399000	100.0	National	0.78	28.3	34.4	27.7	17.7	18.3	9.8	14.9	16.9	17.7	28.5	26.7	17.2		21.5	16.8	
K4a, K4b	341464	398997	100.0	National	0.78	37.1	35.9	28.3	22.9	25.3	19.9	23.6	21.2	25.5	24.6	39.4	30.1		27.8	21.7	
K5a, K5b	341407	398988	90.6	National	0.78	43.9	41.5	25.8	30.2	30.3	25.1	28.9	30.3	30.3		37.7	29.2		32.1	25.0	
K6a, K6b	341426	398922	100.0	National	0.78	43.1	42.9	32.0	28.3	31.6	25.3	29.5	31.1	29.8	30.7	39.6	27.0		32.6	25.4	
K7a, K7b	341576	398654	100.0	National	0.78	30.6	30.2	27.5	18.4	20.1	13.0	18.3	17.2	17.3	31.0	26.7	22.9		22.8	17.7	
K8a, K8b	341371	398537	100.0	National	0.78	32.8	35.7	28.4	22.5	26.1	17.7	21.1	24.0	22.7	31.0	27.3	15.8		25.4	19.8	
K9a, K9b	341387	398504	100.0	National	0.78	39.5	35.9	29.6	24.0	28.8	20.7	25.8	23.8	26.9	32.9	37.5	24.2		29.1	22.7	
K10a, K10b	342421	397755	100.0	National	0.78	30.8	31.4	18.6	19.8	20.4	13.1	17.7	16.8	22.3	28.2	30.1	24.2		22.8	17.7	

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
K1a, K1b	340355	397795	100.0	National	0.78	50.5	36.6	36.8	36.9	38.2	32.1	34.3	36.2	32.3	41.0	46.3	35.6		38.0	29.7	
K2a, K2b	341165	398953	100.0	National	0.78	29.3	30.4	24.4	16.0	17.0	10.0	15.0	14.1	17.5	27.9	27.6	24.5		21.1	16.5	
P1a, P1b	345816	392660	100.0	National	0.78	35.5	34.6	28.5	26.7	27.8	23.0	24.9	22.1	31.9	30.5	35.3	29.4		29.2	22.7	
P2a, P2b	346164	392807	75.0	National	0.78	33.1	27.2	27.6	19.5	23.6	19.9	22.2	28.8		26.2	35.9	18.5		25.7	20.0	
P3a, P3b	346393	392844	92.7	National	0.78	32.8	42.6	39.9	25.6	30.9	23.6		19.7	28.2	39.9	41.5	32.4		32.5	25.3	
P4Aa, P4Ab	346942	392387	100.0	National	0.78	34.4	34.7	24.3	23.3	25.4	18.5	22.5	26.3	25.0	30.8	32.3	33.3		27.5	21.5	
P5Aa, P5Ab	346898	392367	75.0	National	0.78	26.8			18.6	21.8	15.9	18.5	16.7	21.8	25.0	32.0	29.8		22.7	17.7	
P6Aa, P6Ab	346850	392360	100.0	National	0.78	31.3	31.6	26.2	19.3	21.3	14.7	21.6	17.2	24.3	25.1	26.4	29.6		24.0	18.7	
P7Aa, P7Ab	346799	391419	100.0	National	0.78	27.5	28.8	23.4	17.3	18.7	12.4	16.9	14.5	20.1	26.9	31.6	25.3		21.9	17.1	
P8Aa, P8Ab	346792	391617	100.0	National	0.78	25.5	26.5	21.5	17.5	17.3	12.4	15.8	15.3	18.3	22.4	28.5	24.8		20.5	16.0	
P9Aa, P9Ab	347950	392325	100.0	National	0.78	34.9	35.6	29.4	23.2	29.0	22.9	23.5	25.9	22.1	26.9	30.7	30.6		27.9	21.7	
P10Aa, P10Ab	347393	392307	100.0	National	0.78	34.5	33.6	25.4	20.7	19.5	14.7	17.9	17.3	22.1	36.8	36.2	9.9		24.0	18.7	

Site ID	X OS Grid Ref	Y OS Grid Ref	Data Capture (%)	National or Local Bias Adjustment	Bias Adjustment Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	Raw Annual Mean (µg/m^3)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
HW1a, HW1b	344843	385022	100.0	National	0.78	29.6	20.7	20.3	16.0	17.5	12.2	15.8	15.3	20.5	19.7	28.3	18.7		19.5	15.2	
HW2a, HW2b	344827	385202	100.0	National	0.78	33.2	33.3	27.6	22.5	23.3	15.9	21.4	20.6	20.7	30.5	37.6	28.9		26.3	20.5	
HW3Aa, HW3Ab	344927	385128	100.0	National	0.78	49.7	45.0	45.7	34.5	35.4	28.9	36.7	37.4	37.7	49.8	46.9	39.8		40.6	31.7	

Comparison between Option 1 (Removal of December Data) and Option 2 (Time Weighted December Data)

On calculation of the two options advised by the LQMA Helpdesk, the bias adjusted and annualised annual mean figures for NO_2 were compared against each other, as detailed in Table E.4. Whilst the figures for both option 1 and 2 where similar, option 2, time weighted December Data, had a higher number of sites that had a higher NO_2 figure then compared to option 1, removal of December data, therefore to more cautious of the NO_2 figure. Option 2 data was used within the assessment.

Table E.4 – Time Weight Average Calculations for December 2024 NO_2 Diffusion Tube Results (µg/m^3)

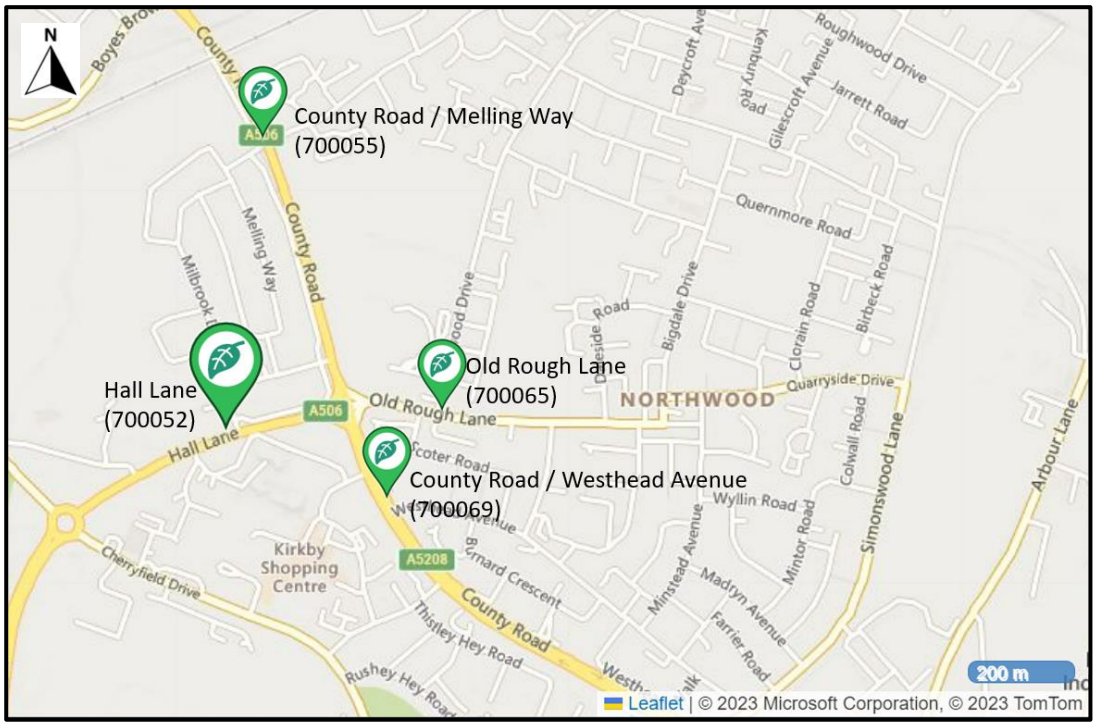
Diffusion Tube ID	Option 1 Raw Annual Mean (µg/m^3)	Option 1 Bias Adjusted and Annualised Annual Mean (µg/m^3)	Option 2 Raw Annual Mean (µg/m^3)	Option 2 Bias Adjusted and Annualised Annual Mean (µg/m^3)
H1a, H1b	31.4	24.5	31.3	24.4
H2a, H2b	34.7	27.1	34.4	26.8
H3a, H3b	42.4	33	40.6	31.7
H4a, H4b	25.7	20	26.2	20.4
H5Aa, H5Ab	33	25.7	33.4	26
H6Aa, H6Ab	39.9	31.1	40.3	31.4
H7Aa, H7Ab	31.3	24.4	31.4	24.5
H8Aa, H8Ab	38.1	29.7	38	29.6
H9Aa, H9Ab	34.3	26.7	34.6	27
H10a, H10b	20	15.6	20.2	15.7
H11a, H11b	27.3	21.3	27.3	21.3
H12a, H12b	33.1	25.8	31.5	24.6
K1a, K1b	38.3	29.8	38	29.7
K2a, K2b	20.8	16.2	21.1	16.5
K3a, K3b	21.9	17.1	21.5	16.8
K4a, K4b	27.6	21.5	27.8	21.7
K5a, K5b	32.4	25.3	32.1	25
K6a, K6b	33.1	25.8	32.6	25.4

Diffusion Tube ID	Option 1 Raw Annual Mean (µg/m^3)	Option 1 Bias Adjusted and Annualised Annual Mean (µg/m^3)	Option 2 Raw Annual Mean (µg/m^3)	Option 2 Bias Adjusted and Annualised Annual Mean (µg/m^3)
K7a, K7b	22.7	17.7	22.8	17.7
K8a, K8b	26.3	20.5	25.4	19.8
K9a, K9b	29.6	23	29.1	22.7
K10a, K10b	22.6	17.6	22.8	17.7
P1a, P1b	29.1	22.7	29.2	22.7
P2a, P2b	26.4	20.6	25.7	20.0
P3a, P3b	32.5	25.3	32.5	25.3
P4Aa, P4Ab	27	21.1	27.6	21.5
P5Aa, P5Ab	21.9	17.5	22.7	17.7
P6Aa, P6Ab	23.5	18.3	24.1	18.7
P7Aa, P7Ab	21.6	16.9	22.0	17.1
P8Aa, P8Ab	20.1	15.7	20.5	16.0
P9Aa, P9Ab	27.6	21.6	27.9	21.7
P10Aa, P10Ab	25.3	19.7	24.1	18.7
HW1a, HW1b	19.6	15.3	19.5	15.2
HW2a, HW2b	26	20.3	26.3	20.5
HW3Aa, HW3Ab	40.7	31.7	40.6	31.7
Total	Number of diffusion tube sites with the higher level of NO_2 or same	18	Number of diffusion tube sites with the higher level of NO_2 or same	22

Appendix F: Map(s) of Monitoring Locations of Zephyr Automatic Stations and Analysis of Monitoring Results

Maps of Monitoring Locations

Kirkby



Huyton

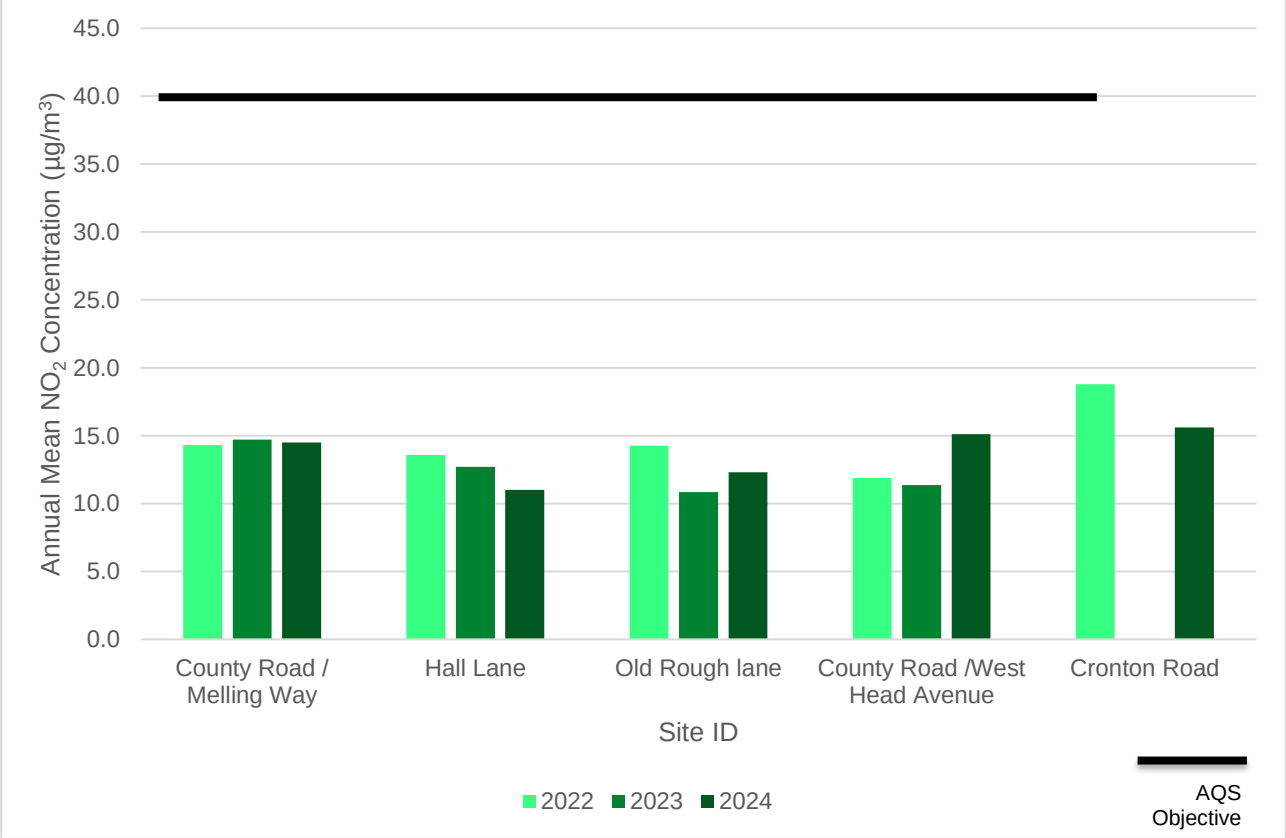
Data

The National air quality objectives were used to analyse the data from the Zephyr Automatic Stations. Data has been collated for the last 3 years, however the data had insufficient (<85%) annual data capture and as the system is continuing to be a trial no sites are available to annualise the data. Therefore, the information is to be used indicatively. Data was collated for NO_2, PM_{10} and $PM_{2.5}$.

Nitrogen Dioxide

NO_2 did not exceed 200µg/m^3 (1 hour mean) at any time during the monitoring period. The annual mean was calculated for each site and did not exceed the 40µg/m^3.

Trends in Annual Mean NO_2 Concentrations (Zephyr Automatic Monitors) for 2022 – 2024

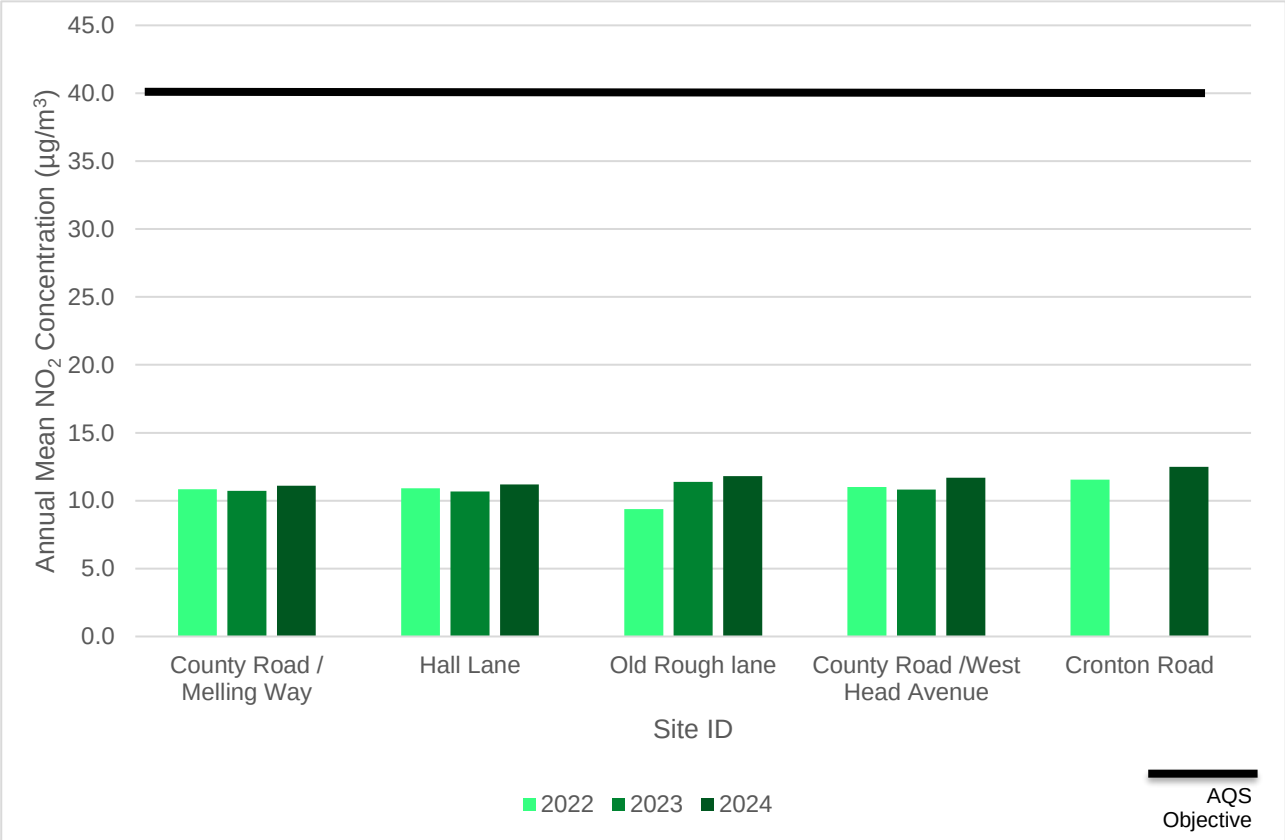


PM_{10}

PM_{10} did not exceed 50µg/m^3 (24 hour mean) at any time during the monitoring period, however one peak was identified within the Kirkby monitoring sites on the 5th November

2024, between 19:00 and 21:00 of values >100 µg/m$^{3.}$ The annual mean was calculated for each site and did not exceed the 40µg/m^3.

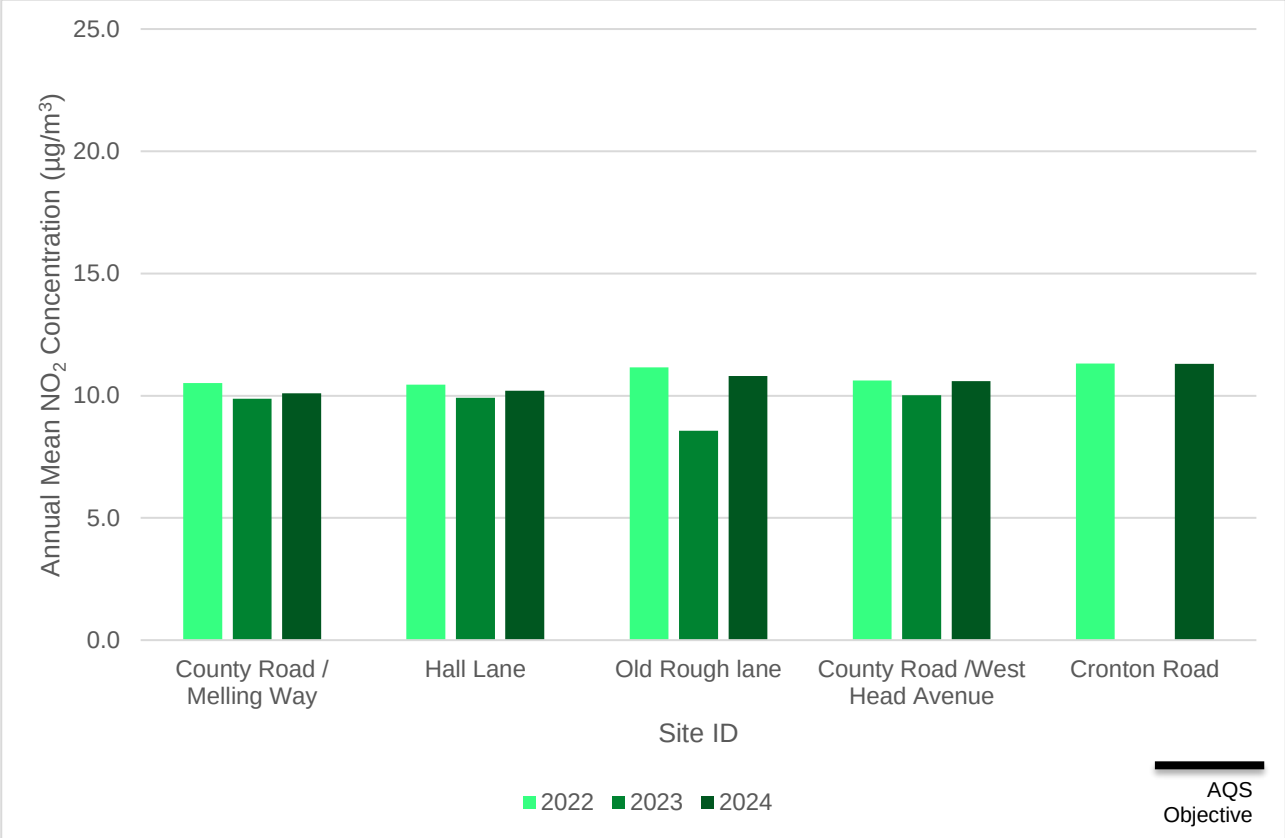
Trends in Annual Mean PM_{10} Concentrations (Zephyr Automatic Monitors) for 2022 - 2024



$PM_{2.5}$

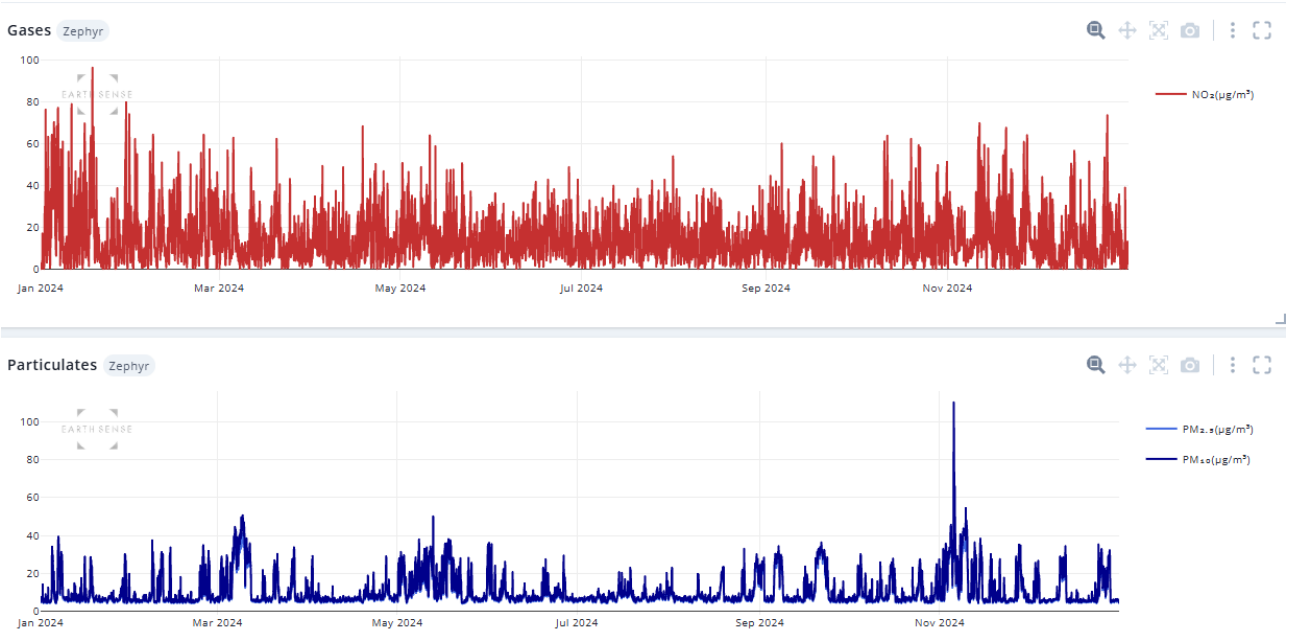
$PM_{2.5}$ did not exceed 20µg/m^3 (annual mean).

Trends in Annual Mean $PM_{2.5}$ Concentrations (Zephyr Automatic Monitors) for 2022 – 2024

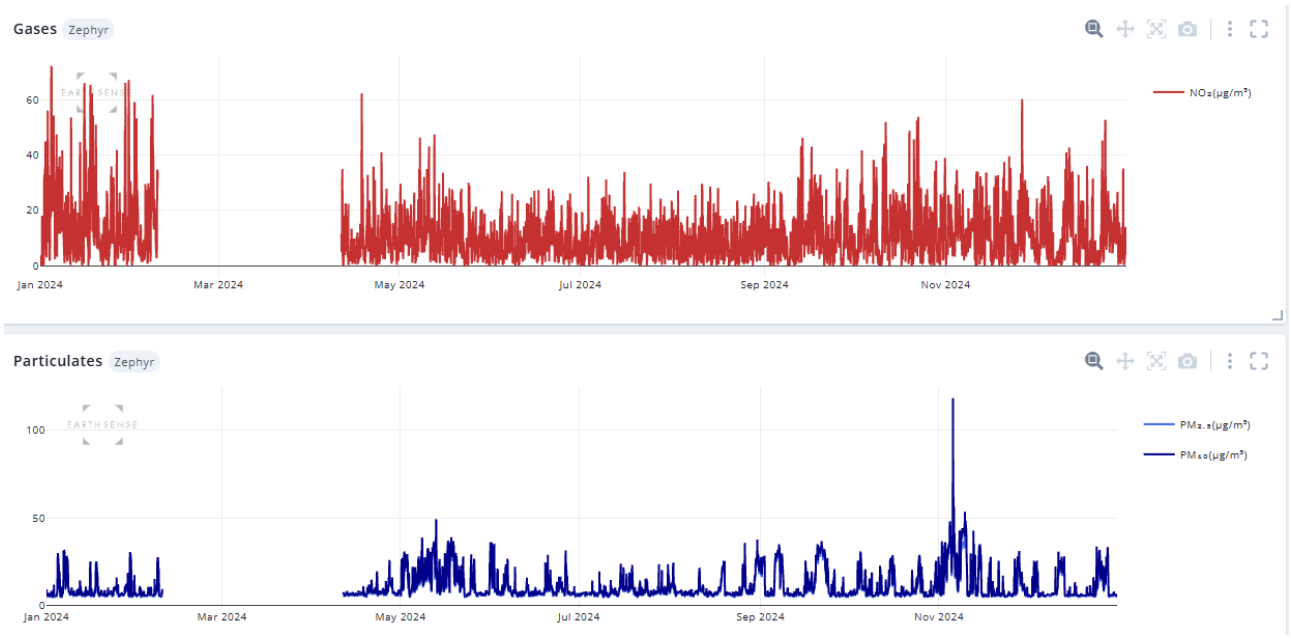


Zephyr Data showing the yearly trend in NO_2, PM_{10} and $PM_{2.5}$ for each site.

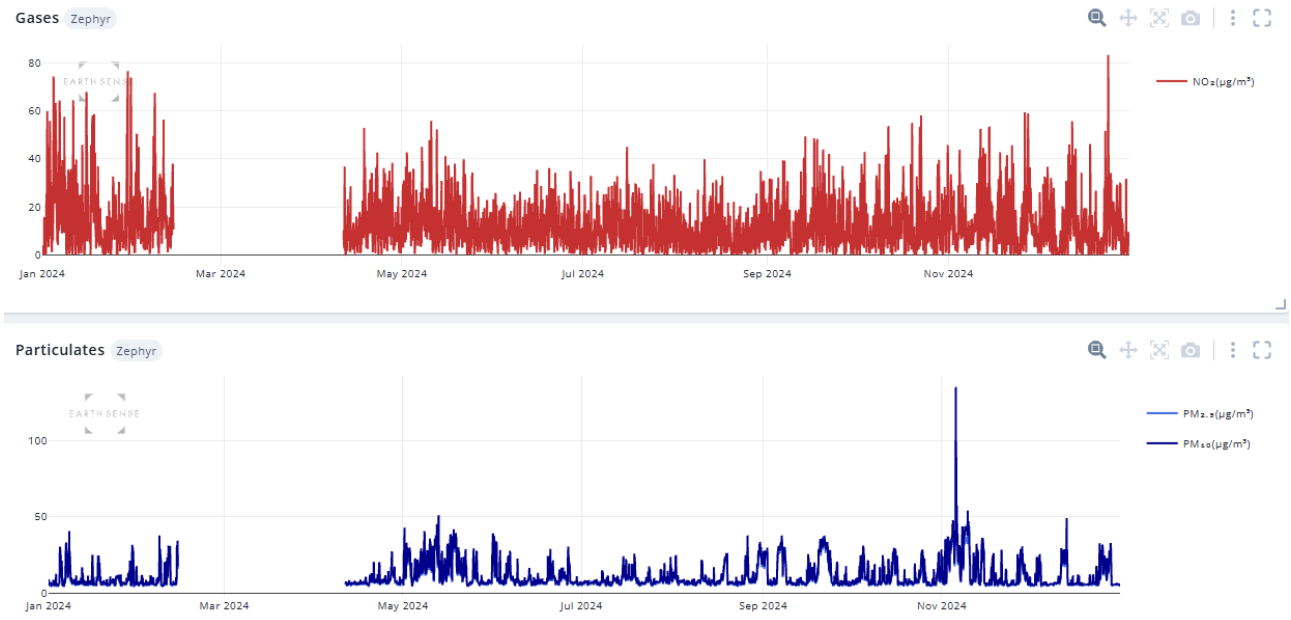
County Road / Melling Way, Kirkby



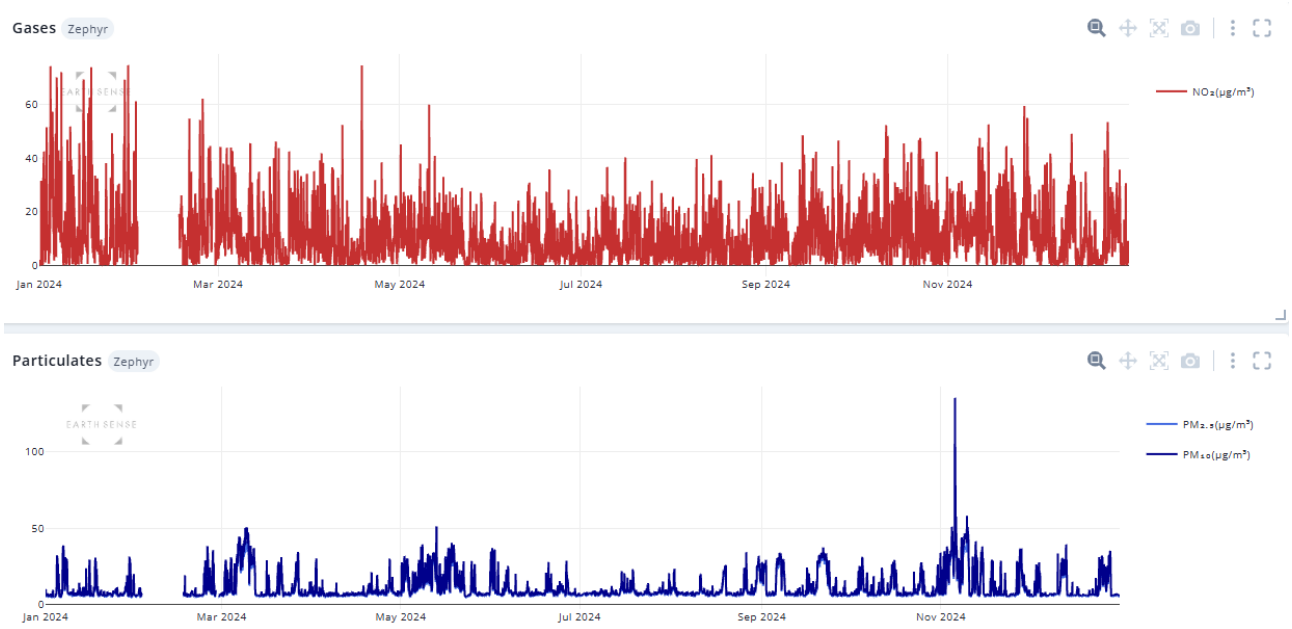
Hall Lane, Kirkby



Old Rough Lane, Kirkby



County Road / West Head Avenue, Kirkby



Cronton Road, Huyton

Appendix G: Summary of Air Quality Objectives in England

Table F.1 – Air Quality Objectives in England2

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides

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

Abbreviation	Description
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.