Sefton Metropolitan Borough Council

2025 Annual Status Report

July 2025

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Sefton Council

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: July 2025

Foreword by Director of Public Health and Assistant Director (Highways and Public Protection)

Sefton Council is committed to improving air quality in the Borough and is working to ensure that Sefton will be a place where improved health and wellbeing is experienced by all. This work directly supports Sefton's 2030 vision of a cleaner, greener and healthier Borough.

Poor air quality has a negative impact on public health, with potentially serious consequences for individuals, families and communities. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Sefton's residents.

The latest monitoring undertaken by the Council over the last 5 years shows that air quality across Sefton has been steadily improving with most of the borough having good air quality. Some areas in South Sefton, however, experience higher levels of air pollution than the rest of the Borough and we continue to develop and implement focused air quality improvement actions to help reduce air pollution in these areas.

We endorse this Annual Status Report which sets out the position in Sefton and our on-going work programme to address air quality issues.

Margaret Jones - Director of Public Health
Peter Moore - Assistant Director (Highways and Public Protection)

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Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of Sefton Metropolitan Borough Council with the support and agreement of the following officers and departments:

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Greg Martin- Environmental Health and Licensing Service Manager (Highways and Public Protection)

Helen Cumiskey - Manager/ Strategic Transport Planner (Highways and Public Protection)

Andrew Dunsmore - Transport Planning Manager (Highways and Public Protection)

This ASR has been approved by:

Peter Moore- Assistant Director (Highways and Public Protection)

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

If you have any comments on this ASR, please send them to Greg Martin at:

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Executive Summary: Air Quality in Our Area

Air Quality in Sefton Metropolitan Borough Council

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.

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

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

During 2024, Sefton Metropolitan Borough Council continued to undertake an extensive monitoring programme including both passive and automatic methods, as part of its ongoing Local Air Quality Management responsibilities.

There were no exceedances of the relevant air quality objectives in Sefton for NO_2, PM_{10} or $PM_{2.5}$ and there is a general decreasing trend across all pollutants recorded.

The following locations have been previously identified as areas of concern in Sefton and are currently designated Air Quality Management Areas (AQMAs). The pollutant(s) which each AQMA has been designated are shown in brackets alongside the corresponding criteria:

- (AQMA 2) Lathom Close, Princess Way, Seaforth (annual mean NO_2, 40µg/m^3);
- (AQMA 3) Millers Bridge/Derby Road junction, Bootle (annual mean NO_2, 40µg/m^3 and 24-hour Mean PM_{10}, 50µg/m^3 not to be exceeded more than 35 times a year);
- (AQMA 4) South Road/Crosby Road North junction, Waterloo (annual mean NO_2, 40µg/m^3); and,
- (AQMA 5) Hawthorne Road/Church Road junction, Litherland (annual mean NO_2, 40µg/m^3).

AQMA 2 and AQMA 5 have been compliant with the NO_2 annual mean objective for the past five years. AQMA 4 has been compliant for the past four years. In line with DEFRA guidance the council will look to revoke these AQMAs in the coming months.

Maps have been produced showing the extent of the AQMAs in Appendix D. These can also be viewed on the DEFRA UK Air website.

In Sefton, road traffic is the main source of NO_2, PM_{10} and $PM_{2.5}$, particularly emissions from Heavy Goods Vehicles (HGVs), Light Goods Vehicles (LGVs) and diesel cars. Emissions from activities associated with the Port of Liverpool also have an impact on air quality in the Bootle and Seaforth area.

Current Air Quality Levels in Sefton

During 2024, all automatic monitoring sites within Sefton were compliant with the NO_2 air quality objective with no reported exceedances of the 1-hour mean objective, concentrations of 200µg/m^3 more than 18 times per year.

Automatic monitoring locations CM2 – Crosby Road North, CM4 – Princess Way and CM5 – Hawthorne Road recorded reductions in NO_2 concentrations in 2024 when compared to 2023 levels. Concentrations at the CM3 – Millers Bridge location increased slightly from 32.1µg/m^3 to 32.5µg/m^3.

For the passive monitoring programme, 61 sites reported a decrease in NO_2 concentrations when compared to 2023 levels and 20 reported an increase. Of the 20 sites that recorded increases, 14 of those increases were less than 1µg/m^3. It should be noted that all 86 locations recorded concentrations below the annual mean NO_2 objective during 2024.

The maximum annual average NO_2 concentration recorded in 2024 was 38.3µg/m^3 at BR – Derby Road, Bootle site which is located within the Millers Bridge AQMA (AQMA 3). The BR monitoring position is not considered a representative location of relevant exposure. As such, the concentration at the nearest receptor for this location was estimated using the distance correction via the DEFRA Diffusion Tube Processing Tool. Following distance correction, the predicted concentration at the receptor for BR – Derby Road, Bootle was not within 10% of the annual average objective (35.8µg/m^3) within AQMA 3.

DO and HB also recorded concentrations within 10% of the annual average NO_2 objective, DO (36.0µg/m^3) and HB (36.4µg/m^3) during 2024. Both sites are not within any AQMA, and following distance correction, the predicted concentration at the receptor for DO was 27.6µg/m^3 and for HB was 32.2µg/m^3. Both sites are not within 10% of the annual average NO_2 objective.

Compliance of both the annual mean PM_{10} objective (40µg/m^3) and compliance with the 24-hour PM_{10} objective has been achieved at all relevant automatic monitoring stations during 2024. CM4 and CM7 have all recorded reductions in PM_{10} concentrations in 2024 when compared to 2023 levels. The maximum annual mean concentration recorded during 2024 was 22.1µg/m^3 at CM5, which is a slight increase since 2023 of 1.6µg/m^3.

All three automatic monitoring sites recorded $PM_{2.5}$ concentrations well below the current $PM_{2.5}$ target of 20µg/m^3.

The maximum annual mean concentration recorded was 9.9µg/m^3 at CM3 – Millers Bridge. Concentrations have increased slightly at CM3 in 2024 but decreased at CM4 and CM7.

Overall concentrations appear to be stable and consistent with previous levels during the last five years.

The extensive air pollution monitoring programme will continue in 2025 and beyond to determine future trends and compliance in Sefton.

Members of the public can view current and historic pollutant levels throughout Sefton on the council's Breathing Space website.

Previous Annual Air Quality Status Reports can also be viewed here.

Working in Partnership to Improve Air Quality

As in previous years Sefton Council's Officers continue to work closely with a number of internal and external partners with the objective of collaboratively improving air quality in the Borough. Sefton Council plans to identify Lead Cabinet Member(s) so the Cabinet, and the Overview and Scrutiny Committee (OSC) can be regularly briefed.

Officers regularly work with external partners outside the Council including National Highways, the Liverpool City Region Combined Authority, The Environment Agency, Public Health England, Liverpool John Moores, University of Liverpool, Merseytravel and Peel Ports (who operate the Port of Liverpool).

In addition, Sefton Council's Air Quality Officers attend regular scheduled meetings with air quality officers from other local authorities within the Merseyside & Cheshire region, through the Merseyside and Cheshire Air Quality Management Group, to discuss air quality issues and how to improve air quality within the wider Liverpool City Region and Cheshire. This group includes Liverpool City Region air quality officers from Sefton Council, Liverpool City Council, St Helens Council, Knowsley Council, Wirral Council, Halton Borough Council, and officers from Cheshire East, Cheshire West and Chester Councils.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[1] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant that is most harmful to human health. The Air Quality Strategy[2] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

[1] DEFRA. Environmental Improvement Plan 2023, January 2023

[2] DEFRA. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

The Road to Zero[3] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of AQMAs are designated due to elevated concentrations heavily influenced by transport emissions.

The following air quality actions have been progressed during the 2024 reporting year.

APM4 Maritime Corridor Improvement Scheme

The Maritime Corridor is the area spanning from Switch Island to Netherton Way. It links to Atlantic Park and the wider area to the Port of Liverpool and includes the A5036, A59 and A5038.

The Maritime Corridor scheme is focused on improving transport links throughout this area by improving junctions and introducing walking and cycling routes along Dunnings Bridge Road (A5036), Netherton Way (A5038), Bridle Road, Park Lane, Heysham Road and Atlantic Park Drive. We want to make it easier for vehicles, cyclists and those walking to move around the area.

A number of scheme benefits are anticipated including:

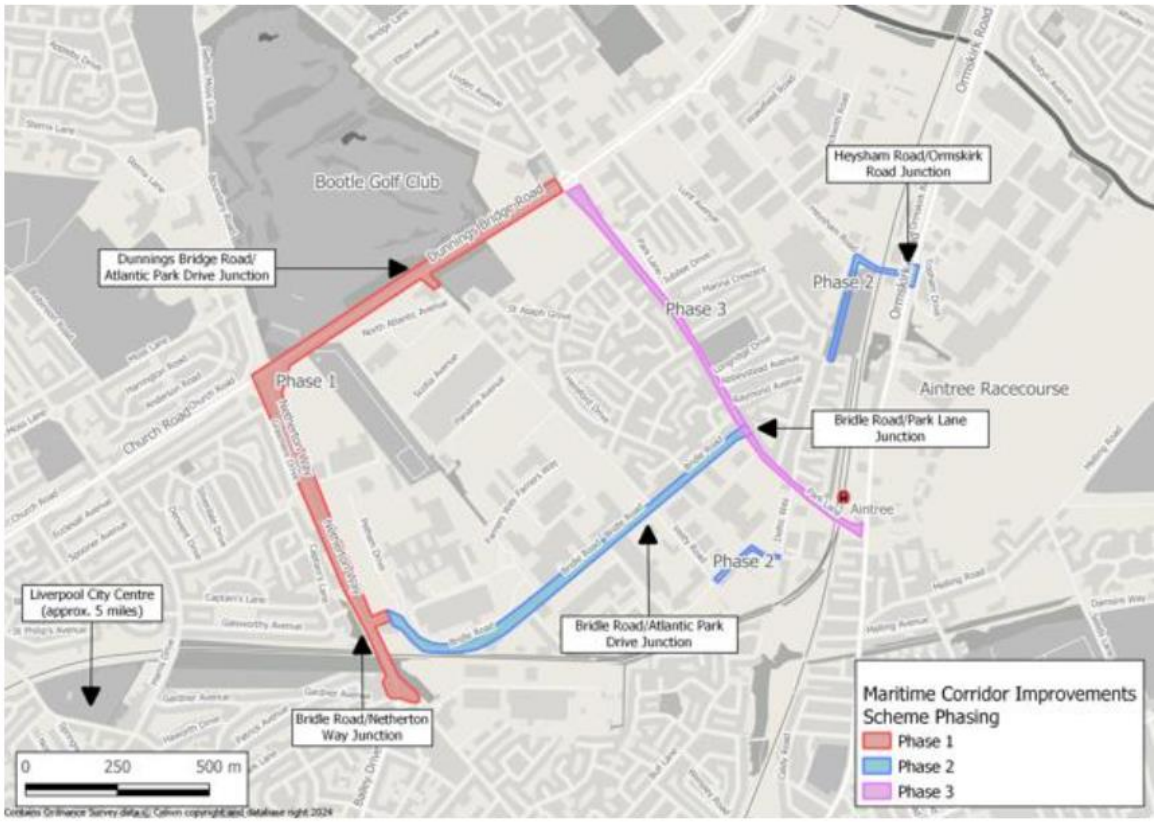
- Promoting new development along the A5036 Dunnings Bridge Road that will create new jobs for local people.
- Making it safer for people to walk and cycle in the area, helping to reduce pollution.
- Making it easier for people to get about who don't have access to a car.
- Speed up journey times/reducing congestion for those travelling by car or public transport also helping to improve air quality in the area.

The improvement scheme has been split up into several phases, where we will improve junctions for walking and cycling accessibility and improved traffic flow.

The Map below shows the walking and cycling improvements as well as the junctions which are going to be improved.

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

Figure 1- Maritime Corridor Improvements Scheme



Phasing of how each area of the scheme is planned to be delivered is outlined below:

- Phase 1 – To be delivered in 2025
    - Dunnings Bridge Road
    - Netherton Way
- Phase 2 – To be delivered from 2026
    - Bridle Road
    - Heysham Road
    - Vesty Road
- Phase 3 – To be delivered in/after 2027 (subject to funding)
    - Park Lane
- Work on Phase 1 of the scheme has now commenced. Further details on the project can be found here. Maritime Corridor - Phase 1.

APM5 - Targeting local non-compliant HGVs (particularly rigids) to encourage vehicle upgrade

As part of our ongoing Clean Air Plan work a number of Automatic Number Plate Recognition (ANPR) Surveys have been undertaken to determine the age and make up (in terms of Euro Standard) of Sefton's vehicle fleet.

The ANPR study provided up to date information on the age and Euro standard composition of the fleet and highlighted a number of vehicle categories that were significantly older (and thus more polluting) in Sefton than the national fleet.

Rigid HGVs were identified as a vehicle type that overall was much older and as such worth targeting in terms of encouraging vehicle upgrade as a means of improving air quality

Although ANPR data can provide quantitative data on the age (and by default Euro engine standard) of vehicles captured; it is unable to provide specific information on which operators are using commercial vehicles below Euro VI standard – the most polluting for NOx, and PM.

Sefton Council has engaged Environmental Consultants TRL to identify the operators of HGVs that are not Euro VI and engage with those businesses in order to encourage uptake of newer less polluting vehicles and make improvements through membership of the ECO Stars Fleet Recognition Scheme.

The project is split into the following workstreams

- Workstream 1.1 - Identify the commercial vehicle operators completing journeys through areas currently designated as AQMAs utilising vehicles below Euro VI standard, thereby having the biggest impact on local air quality and carbon emissions
- Workstream 1.2 - Engage with the identified commercial vehicle operators to understand the barriers to upgrading and encourage the adoption of less polluting vehicles, through membership of the ECO Stars scheme
- Workstream 2 - Engage with existing Sefton ECO Stars members to determine the extent to which they have improved their environmental performance since the 2021 scheme engagement activity
- Workstream 3 - Identify and prepare a case study of a Sefton based scheme member that has made environmental improvements that have a direct impact on local air quality

Work stream 1 has commenced with roadside surveys taking place in Princess Way and Millers Bridge AQMAs in April 2025 enabling the direct identification of commercial vehicle operators by named businesses, using HGVs below Euro VI standard.

Identification of HGVs below Euro VI engine standard was made from their registration plate (2014 and older) and by making a judgement on general condition if using cherished (personalised) number plates and noting the company or business livery.

The surveys have been completed, and work is now underway to identify the operator and depot location through desk-based research to enable the next phase of the project to commence.

APM10 - Detailed AQ study around Millers bridge to understand significant non-traffic background sources contributing to NO_2 exceedances

Work undertaken as part of our ongoing assessment/Clean Air Plan has identified some non-traffic sources of pollution that are impacting on levels of NO_2 and PM in the Millers Bridge AQMA.

A detailed air quality study around Millers bridge to understand significant non-traffic background sources contributing to NO_2 exceedances (and also PM levels) is therefore required. This will assist in identifying the key issues/contributors to the high NO_2 and PM background concentrations (non-traffic) and enables targeted proposals to be developed for tackling emissions from industry operations/shipping and internal fleet.

To progress this, a joint PhD study has been developed with Liverpool and John Moores Universities with Sefton acting as a partner and sponsoring a PhD student.

This PhD study aims to address the problem of identifying pollution sources in areas around Port cities by harnessing the power of cutting-edge machine learning / data analytics techniques and untapped data sources, allowing local authorities and public health bodies to target regulations and interventions to protect public health. It will also investigate the impact of net zero strategies generally associated with future port cities, such as green shipping, renewable energy and regeneration, on outdoor air pollution and its sources.

A post graduate student has recently been appointed and has now commenced the PhD programme. Further updates on this action will be included in future ASRs.

SCOOT Validation and Strategy Development Project

Officers from Environmental Health are currently working with Highways Officers and Yunex Traffic on a joint project which will entail the revalidation of the SCOOT (Split Cycle and Offset Optimisation Technique) urban traffic light control system at 20 key traffic light-controlled junctions and nine crossings situated on Moor Lane, Crosby Road North, Derby Road, Dunnings Bridge Road, Southport Road and Northway.

Surveys will be carried out at each of the key junctions/crossings to determine how effectively the junction is currently functioning in terms of traffic flow and minimising air pollution.

Based on the outcome of the surveys, new strategies will be developed which will be aimed at improving traffic flow and managing the air quality issues in the locality. The new strategies will be incorporated into Sefton's SCOOT system and then tested for effectiveness.

Emissions Enforcement -Joint Sefton/DVSA emissions monitoring enforcement project

To target HGV related emissions in key areas, officers from Sefton working in collaboration with Driver and Vehicle Standards Agency (DVSA) Inspectors developed and have now undertaken three joint vehicle emissions monitoring/enforcement activities to identify HGVs travelling along the A5036, A565 and motorway network which were emitting unacceptable levels of air pollution thus potentially indicating emission control system tampering or faults.

During the most recent exercise sophisticated air pollution monitoring equipment was installed in DVSA stop cars and levels of NOx and PM were monitored in live traffic to detect suspect vehicles. The DVSA were also testing a new Particulate Monitor (Total Particle Count) in anticipation of bringing in HGV particulate emission limits as part of the HGV MOT.

Exhaust plume emissions from 230 vehicles were monitored over the two-day project. 11 suspect vehicles were stopped at the switch Island DVSA inspection site and subject to further detailed examination by DVSA inspectors.

Compared to previous years very few HGVs were identified for High NOx emissions and those stopped did not show faults. More HGVs were identified for high PM emissions

when followed but when tested using the DVSA MOT Particulate monitor they were found to be within acceptable parameters for the age of the vehicle.

The recent study confirms that fewer HGVs were operating with cheat devices/emission control faults than previous years which is obviously positive and likely to be one of the contributing factors that has led to the reductions in NO_2/PM observed when analysing the monitoring data in these key areas.

To ensure this trend continues further joint work is being explored with DVSA, which will continue to target HGVs but also include LGVs and private cars as these now represent the largest non-complaint (i.e. Euro 5 or older) element of Sefton's Vehicle fleet.

Conclusions and Priorities

Poor air quality is a public health issue that can cause negative impacts for those who are exposed to it and affect quality of life. Air pollution can be harmful to health at all concentrations, whether above or below the air quality objectives so this remains a key issue for Sefton Metropolitan Borough Council.

Exposure to NO_2, whether short or long term is known to cause respiratory infections, airway inflammation and aggravates the symptoms of those suffering from chronic lung conditions such as asthma and chronic obstructive pulmonary disease.

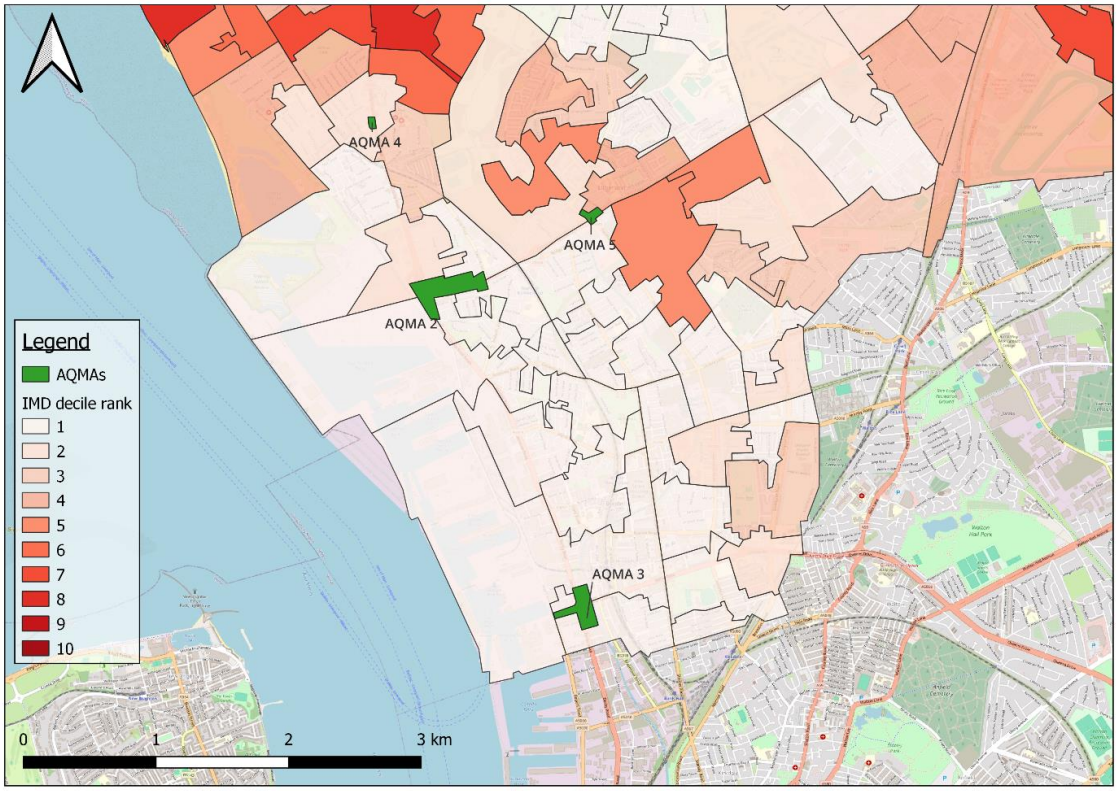
Fine particulate matter (particles of a diameter of 2.5µm and below) has been identified as a significant health risk as its small size means that it is easily able to access the nose, throat, lungs and bloodstream leading to increased mortality and morbidity from cardiovascular and respiratory issues. Evidence has also been found linking higher rates of particulate matter to increased risk of dementia and the International Agency for Research on Cancer has classified particulate matter as carcinogenic to humans.

The Public Health Outcomes Framework data tool published by Department of Health and Social Care quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The latest data for fraction of mortality attributable to $PM_{2.5}$ pollution (indicator D01) within Sefton is 4.9%. This is equal to the regional average for the North West, and lower than the average for England as a whole (5.2%).

The Consumer Data Research Centre (CDRC) provide Index of Multiple Deprivation (IMD)[4] datasets for the UK. The levels of deprivation within the UK are measured through consideration of a number of broad themes, these include income, employment, education, health, crime, barriers to housing services, and the living environment. IMD data was gathered for Sefton and reviewed in relation to proximity to AQMAs and diffusion tube monitoring sites. The IMD dataset ranks areas from most deprived (rank 1) to least deprived (rank 10). The areas are also split into 10 bandings known as deciles.

Review of the latest IMD dataset from 2019 has shown that the AQMAs declared by Sefton Metropolitan Borough Council are located in the areas which represent the top three most deprived deciles in Sefton. It should be noted that the IMD dataset is due to be updated in 2025. Figure 2 presents this analysis.

Figure 2: IMD Decile Rankings within AQMA's Declared by Sefton Metropolitan Borough Council



[4] Index of Multiple Deprivation (IMD) ranking – Communities Open Data - https://communitiesopendata-communities.hub.arcgis.com/datasets/d473e9ad137240b6aa47c9e3f4bdd674_0/explore?filters=eyJJTUREZWNpbCI6WzAsMTBdfQ%3D%3D&location=53.468860%2C-2.901315%2C12.10

As can be seen in Figure 2, AQMA 2 and AQMA 3 are in areas which represent some of the most deprived deciles in Sefton. AQMA 4 is located within a decile which is ranked one of the second most deprived areas, and AQMA 5 is located within a decile which is ranked one of the third most deprived areas.

Sefton is therefore focusing its efforts on improving air quality in its AQMAs and surrounding areas where Sefton's most deprived and vulnerable residents reside.

The Port of Liverpool has recently undergone a £300 million expansion. Although the expansion is expected to bring economic benefits to the region, it is also predicted to lead to a significant increase in HGVs using the A5036, the main port access route, and to a lesser extent the A565, and will pass through three areas designated as AQMAs, potentially leading to a worsening of air quality in areas that were previously identified as having poor air quality and congestion, particularly the A5036.

The Council has developed a range of actions which aim to improve air quality in and around our current AQMAs and also manage future air quality issues associated with the anticipated increasing traffic levels due to the expansion of the Port.

The Council will continue to work with partners and stakeholders to explore multi-modal / integrated network solutions to the issues created by traffic traveling through south Sefton to the port and other destinations.

How to get Involved

Sefton continues to engage with the community on air quality and uses a number of different techniques to facilitate this.

Sefton is using our internet based 'Your Sefton Your Say' (YSYS) consultation hub to provide information to the public about specific studies and air quality matters in general. The YSYS hub can be accessed here.

Real time data from Sefton's monitoring network can be viewed by the public using Sefton's Breathing Space website. Historical information and air quality reports are also available here.

Sefton's air quality officers have completed a DEFRA air quality grant funded domestic solid fuel behaviour change project with the aim of reducing particulate emissions from the burning of this fuel. Additionally, a public website was developed which provides information and advice on this topic for residents who may be using solid fuel stoves/fires and businesses selling stoves and/or fuels. The website can be found here.

Sefton has recently completed a DEFRA grant funded schools air quality education project. Part of the project included the development of an immersive room at Sefton's Ecocentre. The immersive room is now fully operational and being used as an educational and engagement tool on air quality for school pupils and the wider community alike. Sefton's Clean Air Crew website which was designed to engage with school children, teachers and parents has also been further developed as part of the grant project. This can be found here.

Work With Schools

School Streets AQ Monitoring

Officers from Environmental Health and Highways are currently working on a joint air quality monitoring project as part of Sefton's School Streets initiative to help evaluate the effectiveness of the School Street restrictions. (A School Street is a road outside a school with a temporary restriction on motorised traffic at school drop-off and pick-up times. The restriction applies to school traffic and through traffic). The School Street schemes offer a proactive solution for school communities to tackle air pollution, poor health and road danger reduction.

Since 2022, four automatic air quality sensors have been installed to monitor air quality levels at schools participating in the project. Air Quality levels have been monitored initially prior to the restrictions coming into force to allow effective evaluation of the measures.

Analysis of the air quality monitoring results show noticeable differences between pre implementation and post implementation with short term levels of NO_2 during drop off/pick

up times notably higher prior to school streets restrictions coming into force compared to levels following the implementation of the measures.

The initial results show the introduction of the restrictions in the School Street localities are having a positive effect on improving short term air quality. Work is on-going to roll out further School Streets initiatives across the borough. Five additional low-cost automatic monitors (Clarity Nodes) have been purchased and will be installed at new School Streets locations in the coming months.

School Streets & School Neighbourhood initiative

Highways officers are continuing to develop the School Streets (the street(s) near the school entrance(s) are only open to people walking, scooting and cycling at the start & end of the school day) and School Neighbourhoods – (changes made to create safer and more inviting walking, cycling and scooting environment over a wider area) initiatives in Sefton.

Three School Streets have been implemented so far, and officers are working with a further 14 schools (ten primary & four secondary) and hope to work with six more in 2025.

The project empowers and engages children and the community to identify and develop community-led solutions to local issues. The projects:

- Encourages walking, wheeling and cycling
- Reduces traffic around schools
- Improves air quality around schools
- Integrates the approach with Walkability principles (purpose, safe, comfortable, interest) and wider Walkable Bootle project

Simple Actions Which Can be Taken to Help Reduce Air Pollution

There are a number of things the public can do to help improve air quality in their area. These include:

- Reducing the use of your car and consider cycling, walking, or using public transport. 55% of car journeys are less than five miles. Many of these trips could be walked or made by bike or public transport.
- Consider car sharing. When two or more people share a car and travel together, it allows people to benefit from the convenience of the car, sharing travel costs, whilst helping to reduce congestion and air pollution.

- When using your car consider taking an ‘eco-driving’ approach. This can not only save you money in reduced fuel costs but also reduce emissions of air pollutants and impact on climate change. This includes:
    - Regular maintenance and servicing of your vehicle according to the manufacturers schedule to maintain the engine’s efficiency;
    - Making sure your tyres are inflated to the manufacturer’s recommended pressures. Under-inflated tyres create more rolling resistance and so use more fuel;
    - Removing unused roof racks or roof boxes to reduce wind resistance and not overloading your vehicle or carrying unnecessary weight;
    - Reducing your use of air conditioning which increases fuel consumption at low speeds;
    - Avoid warming up your car while stationary this can consume more fuel and increase pollution. If you start driving immediately, the engine will reach its working temperature quicker;
    - Avoiding unnecessary idling of your car engine when in traffic or waiting to pick up people;
    - Driving smoothly and avoiding sharp acceleration and harsh braking;
    - Shifting into a higher gear as soon as possible; Maintaining a steady speed, using the highest gear possible as soon as possible between 2000rpm and 2500rpm to keep your engine working most efficiently; and
    - The faster you go, the greater the fuel consumption and pollution. For example, driving at 70mph uses up to 9% more fuel than at 60mph and up to 15% more than at 50mph.
- Consider purchasing a lower emissions, hybrid or electric vehicle or high efficiency petrol vehicle.
- If possible, avoid driving during the morning and evening peak times as levels of congestion and therefore air pollution will be highest.
- If stationary in a traffic jam, traffic lights or at a pelican crossing for over 30 seconds, switch off your engine to reduce air pollution.
- Don’t burn garden or domestic waste. This not only releases pollutants into the atmosphere, but it can also cause a nuisance to your neighbours. All waste should be either disposed of or recycled. Details of waste and recycling facilities in Sefton can be found here.

- Should I burn wood? Air pollution affects the health of everyone in Sefton. Along with emissions from transport and construction, burning wood and other solid fuels can contribute to this air pollution problem. The main pollutant emitted by solid fuel burning is ultra-fine particulate matter, also known as $PM_{2.5}$. This pollutant is not visible to the naked eye, so even "smokeless" fuels and appliances may be causing pollution.
- If you need to burn solid fuels to heat your home, choosing what you burn and how you burn it can make a big difference to the pollution it creates.
- Parts of Sefton are designated as Smoke Control Areas and the type of fuel and/or appliance you are allowed to use is restricted in these locations. You can check if your property is in one of Sefton's Smoke Control Areas here.
- Open fireplaces are the most polluting way to burn solid fuels. Using a well-designed, properly installed stove or appliance can make a big difference.
- As a minimum, you should make sure that your stove meets the legal requirements, but even approved stoves can emit high levels of pollution. The Stove Industry Alliance has recently introduced the "Eco-design Ready" label.
- An Eco-design Ready stove can emit up to 80% less pollution than a normal DEFRA approved appliance. An up-to-date list of these stoves can be found on the HETAS website.
- Any stove or fireplace should also be properly maintained, and your chimney should be swept regularly.
- If you are using an open fireplace, it is recommended that you should only burn smokeless fuels, if in doubt ask your supplier.

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in Sefton 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 or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Sefton Metropolitan Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

A summary of AQMAs declared by Sefton Metropolitan Borough Council can be found in Table 2.1. The table presents a description of the four AQMAs that are currently designated within Sefton Metropolitan Borough Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean; and
- PM_{10} 24-hour mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 2 Princess Way	Declared 2009, Amended 2015, 2016	NO_2 Annual Mean	An area encompassing a number of residential properties from the Ewart Road flyover, Princess Way (A5036) up to and including the Roundabout and flyover at the junction with Crosby Road South (A565)	YES	45.8µg/m^3	30.6µg/m^3	5 years	Draft Air Quality Action Plan for Sefton Council, 2015	Draft Air Quality Action Plan for Sefton Council for Air Quality Management Areas 1 - 5
AQMA 3 Millers Bridge	Declared 2009, Amended 2015, 2016	NO_2 Annual Mean PM_{10} 24-Hour Mean	An area encompassing a number of residential properties around the junction of Millers Bridge (A5058) and Derby Road (A565)	NO	60µg/m^3 46 hours	35.8µg/m^3 2 hours	1 year Over 5 years	Draft Air Quality Action Plan for Sefton Council, 2015	Draft Air Quality Action Plan for Sefton Council for Air Quality Management Areas 1 - 5

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 4 South Road	Declared 2012, Amended 2015, 2016	NO_2 Annual Mean	An area encompassing the Liver Hotel and a number of residential properties around the junction of Crosby Road North (A565) and South Road	NO	48.0µg/m^3	33.2µg/m^3	4 years	Draft Air Quality Action Plan for Sefton Council for Air Quality Management Areas 1 - 5	Draft Air Quality Action Plan for Sefton Council for Air Quality Management Areas 1 - 5
AQMA 5 Hawthorne Road	Declared 2012, Amended 2015, 2016	NO_2 Annual Mean	An area encompassing a number of residential properties around the junction of Hawthorne Road (B5058) and Church Road (A5036)	YES	42.6µg/m^3	33.2µg/m^3	5 years	Draft Air Quality Action Plan for Sefton Council for Air Quality Management Areas 1 - 5	Draft Air Quality Action Plan for Sefton Council for Air Quality Management Areas 1 - 5

☒ Sefton Metropolitan Borough Council **confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ Sefton Metropolitan Borough Council **confirm that all current AQAPs have been submitted to Defra.**

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

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

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

1. AQMA 2 and AQMA 5 must be revoked as concentrations have been fully compliant with the annual mean NO_2 objective since 2019. Plans to revoke AQMA 4 should be considered; it is likely revocation will be required if concentrations are fully compliant in 2024.

   The council is aware that these AQMAs should be revoked consistent with the 2024 monitoring data

2. A screen capture of the appropriate national bias adjustment factor spreadsheet has been included to demonstrate the use of the correct factor. Good reasoning for the use of the national bias adjustment factor as opposed to the local bias adjustment factor has also been provided. This is commended and should be continued in future reports.

   A consistent approach has been used.

3. Figures have been provided which highlight the location of monitoring sites and AQMA. The locations of sites are easy to see, but some labels blend into the base mapping (such as GL, GC, and HE). The labels should be adjusted so that these stand out against the base mapping.

   Figures have been made clearer.

4. The Council have included a section on measures to reduce $PM_{2.5}$ concentrations. This section includes statistics on the fraction of mortality attributable to particulate matter. The statistic for SMBC is 6.6%, which is higher than both the national average (5.8%) and regional average (5.6%).

   The new 2023 data has been applied.

5. Trends within each AQMA has been discussed. These discussions are supported by the inclusion of trend graphs, which highlight the relevant objective for easy comparison of monitored concentrations to the objectives. These graphs are clear and have been presented for AQMAs and for certain areas within the borough.

   A consistent approach has been used.

6. AQMA 3 (for exceedances of the daily PM_{10} objective) has been included twice on the LAQM portal. The Council should update the LAQM portal with the correct number of AQMA declarations. Please contact the LAQM helpdesk for assistance.

   This has now been rectified on the LAQM Portal.

Sefton Metropolitan Borough Council 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. In total there are 15 measures within Table 2.2, with the type of measure and the progress Sefton Metropolitan Borough Council 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.

As reported in last year's ASR, Sefton's AQAP required updating. A draft AQAP has been submitted to Defra which has recently been approved. External consultation with stakeholders and the public on the draft AQAP is underway. The AQAP will be available via the link contained within Table 2.1.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
APM4	Maritime Corridor (A5036) improvement project	Traffic Management	Strategic Highway Improvement	2025	2027	Sefton Combined Authority, National Highways	External Funding	No	Funded	£1 million - £10 million	Implementation	Improved traffic flow, reduced vehicle emissions	Measured concentration of NO_2 within AQMAs	Phase 1 of the project underway Maritime Corridor - Phase 1	
APM5	Targeting local non-compliant HGVs (particularly rigids) to encourage vehicle upgrade	Vehicle Fleet Efficiency	Other	2024	2026	Sefton, Fleet operators, Peel, Port Access SG, Freeport, LCRCA, DfT, JAQU	External Funding Required	No	Not Funded	£100k - £500k	Implementation	Reduced vehicle emissions/Number of non-compliant HGVs	Measured concentration of NO_2 within AQMA's	Traffic Consultants procured. Roadside surveys underway to identify operators of Euro 5 and older HGVs	
APM10	Detailed study around Millers bridge to understand significant non-traffic background sources contributing to NO_2 exceedances	Environmental Permits	Other	2024	2026	Sefton, Peel/Port Industries, Environment Agency	External Funding	No	Not Funded	£10k - £50k	Implementation	No direct impact	No direct impact	Joint PhD Study developed with Liverpool John Moores University. Ph.D. Student started April 2025 – Study commencing	
AQMA4 - Junction Improvements	South Road/Crosby Road North Junction improvements	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2020	Sefton	LA	No	Funded	£1 million - £10 million	Completed	No Target pollution reduction set-hard to quantify	Compliance with the NO_2 objective in AQMA	Junction improvement works now completed - Compliance observed for the past 5 years revocation of AQMA commencing	
AQMA 3 - Junction Improvements	Millers Bridge Junction improvements	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2020	2022	Sefton	LA/CA	No	Funded	£1 million - £10 million	Completed	No Target pollution reduction set-hard to quantify	Compliance with the NO_2 objective in AQMA	Millers Bridge Junction improvement works completed	Levels of NO_2 are showing a declining trend within the AQMA which is due to a number of factors including the junction improvements. Whilst levels of NO_2 have improved we are not currently considering revocation of this AQMA
APM1	Sefton/DVSA emissions monitoring and enforcements project - targeting high emission HGVs/LGVs	Traffic Management	Testing Vehicle Emissions	2024	2026	Sefton, DVSA, Police	Sefton/DVSA	No	Not Funded	£10k - £50k	Planning	Reduced vehicle emissions	Number of vehicles found with high emissions	Currently in planning phase	Currently in discussions with DVSA following completion of a successful project in 2023. Unable to progress without support from DVSA
APM2	Traffic signal strategies optimisation	Traffic Management	UTC, congestion management,	2024	2025	Sefton, Consultants	Internal Funding	No	Fully Funded	£10k - £50k	Implementation	Reduced vehicle emissions	Measured concentration of NO_2 within AQMA's	All survey work completed. Repairs underway to loop/sensor systems and new strategies being developed	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
			traffic reduction												
APM3	Explore feasibility of using Air Quality Sensors to trigger traffic light strategies	Traffic Management	UTC, congestion management, traffic reduction	2024	2026	Sefton, Consultants	Internal Funding	No	Not Funded Yet	£10k - £50k	Planning	Reduced vehicle emissions	Measured concentration of NO_2 within AQMA's	Currently in planning phase	Currently in discussions with Traffic Engineers and consultants to explore possibility of using existing AQ sensors to trigger specific traffic light strategies during periods of congestion
APM6	Working with Peel Ports to explore further opportunities to reduce HGV related emissions	Freight and Delivery Management	Delivery and Service Plans	2024	2026	Sefton, Peel, Port Access SG, Haulage Companies, Freeport	External Funding Required	No	Not Funded	£100k - £500k	Planning	Reduced vehicle emissions	Measured concentration of NO_2 within AQMA's	Currently in planning/development phase	Currently developing this action
APM7	Working with Peel Ports to explore further opportunities to reduce non-HGV related emissions	Promoting Low Emission Transport	Other	2024	2026	Sefton, Peel Ports, Shipping Companies, Energy Supply Companies, Peel Ports tenant businesses	Some External Funding	No	Not Funded	£10k - £50k	Planning	Reduced vehicle emissions	Hard to quantify	Currently in planning/development phase	Currently developing this action
APM8	Working with LCRCA, Bus Operators and LCRCA Bus Alliance to concentrate compliant fleet in areas with worst AQ	Transport Planning	Other	2024	2026	Sefton, LCRCA, Bus operators	Some External Funding	No	Not Funded	£10k - £50k	Planning	Reduced bus emissions	Measured concentration of NO_2 within AQMA's	Currently in planning/development phase	Currently in development stage. Barriers include willingness of operators to locate fleet on key Sefton routes
APM9	Working with LCRCA, Bus operators and LCRCA Bus Alliance on fleet improvements: - retrofit grants, - Use of hybrid vehicles, - Implementation of Green Bus Corridor, - Hydrogen buses	Promoting Low Emission Transport	Other	2024	2027	Sefton, LCRCA, Bus operators	Some External Funding	No	Not Funded	£10k - £50k	Planning	Reduced bus emissions	Measured concentration of NO_2 within AQMA's	Currently in planning/development phase	Action currently in development phase. Barriers include funding for newer fleet. Assume not all vehicles will be compliant with this technology
APM11	Intensive road and footpath cleaning in AQMA's	Other	Other	2024	2026	Sefton	Sefton	No	Funded	£10k - £50k	Planning	Reduced PM in AQMA's	Reduced PM in AQMA's	Currently in planning/development phase	
APM12	Use the planning system to mitigate the air quality impacts of any new development likely to have an impact on the AQMAs through the use of planning conditions incorporating Low Emissions Strategy measures from developers and the	Policy Guidance and Development Control	Air Quality Planning and Guidance	2024	Ongoing	Sefton	Sefton	No	Funded	N/A	Implementation	Hard to quantify	Number of Planning applications consulted on/Number of AQA reviewed	Ongoing	All planning applications received are reviewed and where an AQ concern is identified an AQA will be required. Measures to mitigate impacts will be required as part of

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	use of Section 106 Agreements														planning approval where AQA concludes the development will impact AQ negatively
APM13	Develop and promote active travel initiatives and campaigns	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2024	Ongoing	Sefton	Sefton	No	Funded	N/A	Development/ Implementation	Hard to quantify	Number of campaigns and initiatives undertaken	Ongoing/ In development	A number of successful active travel initiatives campaigns already underway others being developed

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[5], 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.

During 2024 all three automatic monitoring sites recording $PM_{2.5}$ concentrations indicated levels were well below the current national $PM_{2.5}$ target of 20µg/m^3. The results of the $PM_{2.5}$ monitoring are discussed in more detail in Section 3.2.3.

The Public Health Outcomes Framework data tool[6] compiled by Public Heath England (PHE) quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2023 fraction of mortality attributable to $PM_{2.5}$ pollution across England is 5.2%. Sefton is 0.3% lower at 4.9%, the same as North West region average.

Sefton Metropolitan Borough Council has already implemented a number of measures to address $PM_{2.5}$, as many of the existing actions in the current Air Quality Action Plans to reduce PM_{10} also serve in reducing $PM_{2.5}$, outlined in Table 2.2.

Smoke Control Areas

Areas of Sefton are already covered by Smoke Control Areas which formally restrict the type of fuel and/or appliance that can be used in these areas. Residents can easily determine if their property is within a Smoke Control Area by checking on Sefton's mapping system and website. The online maps can be found here.

Compliance in Sefton's smoke control areas is actively enforced and any complaints or allegations of properties breaching the smoke control area regulations are investigated and appropriate action taken. These measures although hard to quantify assist in reducing levels of particulates including $PM_{2.5}$ in Sefton.

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

[6] https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/gid/1000043/pat/6/par/E12000004/ati/301/are/E07000136/yrr/3/cid/4/tbm/1

Sefton also have a dedicated smoke control website which aims to promote good practice when using solid fuels. Information on how to protect your family and yourself from stove emissions can be found here.

Particulate Control at Construction/Demolition sites

Through the development control process officers in the Pollution and Air Quality teams are consulted on developments which involve external construction/demolition works likely to give rise to particulate emissions. To proactively control PM emissions from construction works officers recommend the inclusion of formal conditions requiring the submission and approval of a detailed Construction Environmental Management Plan (CEMP) which includes dust control measures. This helps reduce and mitigate the release of particulates during the demolition and future construction phase of a development thus helping to reduce $PM_{2.5}$ emissions from these activities.

Commercial Dust/Smoke complaints

Sefton continues to robustly investigate complaints of commercial dust being emitted from premises along with burning on commercial premises which is giving rise to dark smoke/nuisance smoke. Enforcement action under the Clean Air Act 1993 and/or the Environmental Protection Act 1990 is taken as appropriate to ensure dust/smoke emissions are effectively controlled and emission of dark smoke are prevented.

Control of Industrial Processes under the Local Authority Pollution Prevention Control regime

Sefton ensures that all industrial processes which fall under the Local Authority Regime of the Environmental Permitting Regulations 2016 are issued with a Part B/A2 Environmental Permit as appropriate. All premises holding a LAPPC permit are inspected in line with DEFRA's risk-based inspection programme and any contraventions dealt with in line with our enforcement policy. This ensures all regulated emissions including particulate matter are within permitted limits helping reduce $PM_{2.5}$ emissions from these industrial processes.

Joint Sefton DVSA emissions enforcement project

As detailed earlier in the ASR a successful joint Sefton / DVSA emissions project was undertaken in December 2021 and then in September 2022 to identify vehicles emitting higher than expected emissions including NOx and PM. A number of vehicles were identified by our monitoring activities and then stopped by DVSA officers. Some of the faults identified included Diesel Particulate Matter (DPF) filter issues which required rectification.

The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020

The Government has introduced new regulations known as The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020 which are now in force restricting the supply of certain solid fuels with the aim of reducing air pollution. In particular they aim to reduce the amount of $PM_{2.5}$ emissions in smoke that can cause long term health problems for humans. Domestic burning of wood and coal has been identified by the Government as a major source of these emissions. Local Authorities are responsible for enforcing these regulations.

A summary of the changes/restrictions is provided below:

- The supply of traditional house coal (bituminous coal) has been phased out;
- The supply of wet wood in units up to two cubic metres has been phased out;
- Smoke emissions limits are introduced for manufactured solid fuels.

Only dry wood (Moisture content less the 20%) can be sold in quantities of two cubic metres or less and has to show the ready to burn logo:

Air quality officers in Sefton have been engaging with businesses likely to sell solid fuels for domestic purposes and an advisory letter and leaflet has been sent to over 200 businesses in the Borough. Officers from Environmental Health and Trading Standards continue to undertake targeted inspections of the main suppliers to ensure compliance with the new regulations. It is envisaged that with these powers restricting the use of wet wood, phasing out of traditional house coal in preference to smokeless fuel, emissions of $PM_{2.5}$ will further reduce in the Borough.

Further information on the new regulations and the ready to burn scheme can be found on Sefton's smoke control website and via the HETAS website.

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

This section sets out the monitoring undertaken within 2024 by Sefton 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

Sefton Metropolitan Borough Council undertook automatic (continuous) monitoring at five sites during 2024. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The automatic monitoring results for Sefton Metropolitan Borough Council, with automatic monitoring results are available through the UK-Air website.

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

3.1.2 Non-Automatic Monitoring Sites

Sefton Metropolitan Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 86 sites during 2024, including four triplicate locations.

Table A.2 in Appendix A presents the details of the non-automatic sites. No changes to the passive monitoring programme occurred in 2024.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 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.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Automatic Monitoring (NO_2)

All automatic monitoring sites within Sefton continue to show compliance with the air quality objectives with no reported exceedances of the annual mean or 1-hour mean NO_2 objectives in 2024.

Automatic monitoring locations CM2 – Crosby Road North, CM4 – Princess Way and CM5 – Hawthorne Road recorded reductions in NO_2 concentrations in 2024 when compared to 2023 levels. NO_2 Concentrations at the CM3 – Millers Bridge location increased slightly in 2024 from 32.1µg/m^3 to 32.5µg/m^3.

Diffusion Tube Monitoring (NO_2)

For the passive monitoring programme, 61 sites reported a decrease in NO_2 concentrations when compared to 2023 levels and 20 reported an increase. Of the 20 sites that recorded increases, 14 of those increases were less than 1µg/m^3. It should be noted that all 86 locations recorded concentrations below the annual mean NO_2 objective during 2024.

The maximum annual average NO_2 concentration recorded in 2024 was 38.3µg/m^3 at BR – Derby Road, Bootle site which is located within the Millers Bridge AQMA (AQMA 3). The BR monitoring position is not considered a representative location of relevant exposure. As such, the concentration at the nearest receptor for this location was estimated using the distance correction tool via the DEFRA Diffusion Tube Processing Tool. Following distance correction, the predicted concentration at the receptor for BR – Derby Road, Bootle was 35.8µg/m^3 which is not within 10% of the annual mean NO_2 objective.

DO and HB also recorded concentrations within 10% of the annual average NO_2 objective, DO (36.0µg/m^3) and HB (36.4µg/m^3) during 2024.

Both sites are not within any AQMA, and following distance correction, the predicted concentration at the receptor for DO was 27.6µg/m^3 and for HB was 32.2µg/m^3. Following distance correction, both sites are not within 10% of the annual mean NO_2 objective.

DP - Gordon Road/ Rawson Road, Bootle had no available months of data during 2024. Whilst these were deployed, on collection the diffusion tube was either missing itself or the diffusion tube holder was missing.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.6 shows that at CM4 and CM7, PM_{10} concentrations reduced from the previous monitoring year.

CM3 and CM5 showed slight increases in PM_{10} concentrations from the previous monitoring year – CM3 (0.7µg/m^3) and CM5 (1.6µg/m^3).

During 2024 there were several alarm faults with the CM4 FIDAS monitor when monitoring PM_{10} concentrations, which caused data loss. CM4 had a data capture below 75% (35%) and therefore required annualisation.

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

3.2.3 Particulate Matter ($PM_{2.5}$)

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

During 2024 all three automatic monitoring sites recorded $PM_{2.5}$ concentrations well below the current $PM_{2.5}$ target of 20µg/m^3 and below the national target of 10µg/m^3 that is not to be exceeded at any monitoring station by 31st December 2040.

The maximum annual mean $PM_{2.5}$ concentration measured in 2024 was 9.9µg/m^3 at CM3 – Millers Bridge. CM3 – Millers Bridge and CM4 – Princess Way recorded concentrations higher than the previous year (0.5µg/m^3 and 0.2µg/m^3), whilst CM7 – Regent Road recorded reductions in $PM_{2.5}$ concentrations in 2024 when compared to 2023 levels of 0.6µg/m^3.

Overall concentrations appear to be stable and consistent with previous levels during the last five years.

3.2.4 Sulphur Dioxide (SO_2)

No sulphur dioxide monitoring was undertaken by Sefton Metropolitan Borough Council in 2024.

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? (1)	Monitoring Technique	Distance to Relevant Exposure (m) (2)	Distance to kerb of nearest road (m) (1)	Inlet Height (m)
CM2	Crosby Road North	Roadside	322175	398483	NO_2	NO	N/A	Chemiluminescent	4.5	4.1	1.8
CM3	Millers Bridge, Bootle	Roadside	333772	394602	NO_2; PM_{10}; $PM_{2.5}$	YES	AQMA 3	Chemiluminescent; FIDAS	6.2	8.7	1.8
CM4	Lathom Close, Princess Way, Seaforth	Roadside	332649	396942	NO_2; PM_{10}; $PM_{2.5}$	YES	AQMA 2	Chemiluminescent; FIDAS	10.6	3.8	1.8
CM5	Hawthorne Road, Litherland	Roadside	333812	397519	NO_2; PM_{10};	YES	AQMA 5	Chemiluminescent; Beta Attenuation	13.8	7.0	1.8
CM7	Regent Road	Urban Background	331643	399588	PM_{10}; $PM_{2.5}$	NO	N/A	FIDAS	17.5	3.0	1.8

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).

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)
BB	Eaton Avenue, Seaforth	Roadside	333510	397186	NO_2	No	3.0	1.9	No	2.7
BO	Douglas Place, Bootle	Roadside	333847	394461	NO_2	Yes AQMA 3	5.2	1.9	No	2.7
BQ	Douglas Place/Millers Bridge, Bootle	Roadside	333835	394572	NO_2	Yes AQMA 3	6.5	1.8	No	2.8
BR	Derby Road, Bootle	Roadside	333753	394552	NO_2	Yes AQMA 3	1.6	1.1	No	2.6
BS	Derby Road, Bootle	Roadside	333757	394622	NO_2	Yes AQMA 3	7.2	2.8	No	2.5
BV	Quarry Road, Thornton	Roadside	333395	400863	NO_2	No	7.5	1.7	No	2.5
BW	Crosby Road South/Riversdale Road, Seaforth	Roadside	332600	397021	NO_2	Yes AQMA 2	2.1	1.3	No	2.6
CI	Hawthorne Road, Bootle	Roadside	333813	397514	NO_2	Yes AQMA 5	17.9	3.2	No	2.5
CJ	South Road, Waterloo	Roadside	332204	398229	NO_2	Yes AQMA 4	0.7	2.5	No	2.6
CR	Parker Avenue, Seaforth	Roadside	332511	397332	NO_2	No	2.5	2.1	No	2.7
CY	Lytton Grove, Seaforth	Roadside	332981	396972	NO_2	Yes AQMA 2	3.7	2.2	No	2.6
DC	Marsh Lane, Bootle	Kerbside	334339	395800	NO_2	No	4.1	0.6	No	2.5

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)
DD	Hawthorne Road, Litherland	Roadside	333778	397534	NO_2	Yes AQMA 5	5.6	2.3	No	2.6
DE	Wilson's Lane, Litherland	Roadside	333917	397575	NO_2	No	9.4	2.2	No	2.6
DF	Church Road flats. Litherland	Roadside	333916	397506	NO_2	No	3.9	12.3	No	2.6
DH	South Road, Waterloo	Roadside	332193	398193	NO_2	Yes AQMA 4	0.0	3.6	No	2.8
DI	Crosby Road North, Waterloo	Roadside	332206	398187	NO_2	Yes AQMA 4	0.0	3.6	No	2.5
DO	Hawthorne Road/ Linacre Lane, Bootle	Kerbside	334640	396399	NO_2	No	4.7	0.6	No	2.6
DP	Gordon Road/ Rawson Road, Bootle	Kerbside	332793	396974	NO_2	Yes AQMA 2	9.2	0.6	No	2.7
DQ	Rawson Road, Bootle	Roadside	332791	396922	NO_2	Yes AQMA 4	5.6	1.7	No	2.6
DR	Crosby Road North, Waterloo	Roadside	332226	398231	NO_2	Yes AQMA 2	21.1	2.5	No	2.5
DS	South Road, Waterloo	Roadside	332134	398169	NO_2	No	2.1	1.4	No	2.6
DU	Liverpool Road/ Kingsway, Waterloo	Roadside	332196	398786	NO_2	No	6.9	3.5	No	2.6
DV	Moor Lane, Crosby	Roadside	332341	400168	NO_2	No	4.7	1.4	No	2.6

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)
DW	Church Road/ Kirkstone Road North	Roadside	334572	397918	NO_2	No	7.4	7.3	No	2.6
DX	Merton Road, Bootle	Roadside	334738	395138	NO_2	No	13.6	5.8	No	2.6
DY	Hougoumont Avenue/Crosby Road North	Kerbside	332250	398008	NO_2	No	6.2	0.4	No	2.4
DZ	Bailey Drive, Bootle	Roadside	335394	397282	NO_2	No	8.3	2.3	No	2.6
EA	Copy Lane, Netherton	Roadside	336639	399496	NO_2	No	10.5	35.1	No	2.5
EB	Copy Lane, Netherton	Roadside	336592	399453	NO_2	No	22.7	1.0	No	2.6
EC	Copy Lane/ Dunnings bridge Road	Roadside	336539	399477	NO_2	No	25.7	2.7	No	2.6
EE	Copy Lane Police Station, Netherton	Roadside	336572	399524	NO_2	No	N/A	3.4	No	2.6
EK	Hawthorne Road, Bootle	Roadside	334782	395189	NO_2	No	13.1	1.1	No	2.3
EL	Breeze Hill, Bootle	Kerbside	335265	394968	NO_2	No	8.2	0.9	No	2.6
EN	Hawthorne Road, Litherland	Roadside	333740	397561	NO_2	No	9.6	3.9	No	2.5
EO	Hatton Hill Road, Litherland	Roadside	333692	397615	NO_2	No	8.4	2.0	No	2.6

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)
EP	Ash Road, Seaforth	Roadside	333343	397210	NO_2	No	11.5	1.3	No	2.6
EQ	Crosby Road South, Seaforth	Roadside	332611	396985	NO_2	Yes AQMA 2	3.8	2.3	No	2.6
ES	Chatham Close, Seaforth	Roadside	332712	397003	NO_2	Yes AQMA 2	7.1	1.3	No	2.6
EV	Princess Way, Seaforth	Kerbside	332650	396915	NO_2	Yes AQMA 2	N/A	0.2	No	2.6
EW	Crosby Road South, Seaforth	Roadside	332666	396822	NO_2	Yes AQMA 2	1.1	1.2	No	2.7
EY	Lathom Avenue, Seaforth	Roadside	332681	396949	NO_2	Yes AQMA 2	6.2	1.2	No	2.7
FB	Hawthorne Road, Litherland	Roadside	334017	397317	NO_2	No	N/A	2.4	No	2.6
FC	St Phillips Avenue, Litherand	Roadside	334217	397663	NO_2	No	9.9	2.3	No	2.6
FD	Church Road, Litherland	Roadside	334242	397713	NO_2	No	7.9	2.6	No	2.6
FE	Church Road, Litherland	Roadside	334642	397923	NO_2	No	6.4	7.0	No	2.6
FF	Boundary Road, Litherland	Roadside	334978	398171	NO_2	No	14.4	1.2	No	2.6
FH	Church Road, Netherton	Kerbside	334962	398134	NO_2	No	12.2	0.6	No	2.6

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)
FI	Hemans Street, Bootle	Roadside	333280	395958	NO_2	No	13.5	8.7	No	2.6
FL	Hawthorne Road opp 20A Litherland	Kerbside	333701	397574	NO_2	No	6.8	0.7	No	2.5
GA	Lord Street	Roadside	333431	417166	NO_2	No	9.6	1.5	No	2.6
GB	Lord Street	Roadside	333704	417415	NO_2	No	9.7	1.8	No	2.6
GC	Haigh Road - Illuminated Sign	Roadside	332296	398268	NO_2	No	15.0	1.0	No	2.6
GD	Crosby Road North - Lighting Column 46D	Roadside	332210	398338	NO_2	No	N/A	2.0	No	2.6
GE	Crosby Road North - Lighting Column 48D	Roadside	332206	398369	NO_2	No	N/A	1.6	No	2.6
GF	Bridle Road - Lighting Column 0010	Roadside	335347	397500	NO_2	No	12.5	1.3	No	2.6
GH	A565 opp car wash - Lighting Column 0044	Roadside	333231	396069	NO_2	No	12.4	3.5	No	2.6
GJ	A565 Liverpool Road - Lighting column 120D	Kerbside	332088	399829	NO_2	No	4.0	0.6	No	2.6

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)
GK	Derby Road, Bootle	Roadside	333669	394912	NO_2	No	8.0	2.1	No	2.6
GL	Green Lane, Seaforth	Roadside	333110	397072	NO_2	No	1.4	2.2	No	2.6
GM	South Road, Waterloo	Roadside	332189	398210	NO_2	Yes AQMA 4	9.5	1.5	No	2.6
GN	Moor Lane, Thornton	Roadside	333326	400772	NO_2	No	10.8	1.4	No	2.6
GO	Marsh Lane, Bootle	Roadside	334204	395749	NO_2	No	3.8	2.4	No	2.6
GP	Barkeley Drive, Seaforth	Roadside	332681	396776	NO_2	Yes AQMA 2	0.8	1.0	No	2.6
GQ	Mariners Road, Blundellsands	Roadside	330706	398904	NO_2	No	11.5	0.6	No	2.6
GR	School Lane	Roadside	339201	402503	NO_2	No	32.9	2.4	No	2.6
GS	Poverty Lane	Kerbside	338710	401571	NO_2	No	13.6	0.7	No	2.6
GT	Miller's Bridge	Roadside	333736	394597	NO_2	Yes AQMA 3	34.3	3.4	No	2.6
GU	Miller's Bridge	Roadside	333784	394596	NO_2	Yes AQMA 3	16.9	5.0	No	2.6
GV	Hall Lane	Roadside	337537	401542	NO_2	No	16.1	1.6	No	2.6
GW	A59 Northway	Roadside	337499	401552	NO_2	No	11.6	2.0	No	2.6

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)
GX	Prescot Road	Kerbside	340334	401214	NO_2	No	5.2	0.7	No	2.6
GY	Raven Meols Lane	Roadside	329188	406600	NO_2	No	1.6	2.0	No	2.6
GZ	Weld Parade	Roadside	332988	415800	NO_2	No	9.0	2.6	No	2.6
HA	Liverpool Road South	Roadside	337295	400874	NO_2	No	11.9	2.5	No	2.5
HB	Breeze Hill	Roadside	335137	394996	NO_2	No	7.6	2.1	No	2.5
HC	Breeze Hill	Roadside	335267	394995	NO_2	No	50.0	2.5	No	2.5
HD	Ormskirk Road	Roadside	336691	398032	NO_2	No	10.5	1.9	No	2.5
HE	Ormskirk Road	Roadside	337091	399333	NO_2	No	7.4	0.9	No	2.5
UK 2	Church Road, Litherland	Roadside	334799	398065	NO_2	No	7.1	1.7	No	2.5
UK 4	Crosby Road North, Waterloo	Kerbside	332171	398547	NO_2	No	3.5	0.9	No	2.6
W	Gladstone Road/Gordon Road, Seaforth	Roadside	332982	397022	NO_2	Yes AQMA 2	1.4	2.4	No	2.6
CO1, CO2, CO3	Waterloo/ Crosby Road North	Roadside	332175	398483	NO_2	No	4.5	4.1	Yes	1.8
CP1, CP2, CP3	Millers Bridge	Roadside	333772	394602	NO_2	Yes AQMA 3	6.2	8.7	Yes	1.8

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)
CQ1, CQ2, CQ3	Princess Way	Roadside	332649	396942	NO_2	Yes AQMA 2	10.6	3.8	Yes	1.8
DB1, DB2, DB3	Hawthorne Road	Roadside	333812	397519	NO_2	Yes AQMA 5	13.8	7.0	Yes	1.8

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	322175	398483	Roadside	99.6	99.6	25.9	30.0	25.1	23.2	21.2
CM3	333772	394602	Roadside	99.3	99.3	33.2	35.0	32.1	32.1	32.5
CM4	332649	396942	Roadside	99.8	99.8	31.7	32.9	33.8	27.8	27.0
CM5	333812	397519	Roadside	99.6	99.6	28.0	27.1	26.4	24.4	19.7

☒ **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.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
BB	333510	397186	Roadside	91.7	91.7	22.0	24.2	21.4	20.8	22.2
BO	333847	394461	Roadside	100.0	100.0	25.1	27.6	24.6	24.7	24.5
BQ	333835	394572	Roadside	85.5	85.5	28.4	30.3	31.0	25.8	25.6
BR	333753	394552	Roadside	100.0	100.0	**41.3**	**46.0**	**41.0**	38.8	38.3
BS	333757	394622	Roadside	90.1	90.1	34.0	36.9	33.6	31.9	31.9
BV	333395	400863	Roadside	100.0	100.0	25.4	25.7	24.0	24.4	22.5
BW	332600	397021	Roadside	100.0	100.0	24.3	27.6	25.3	24.2	23.0
CI	333813	397514	Roadside	90.9	90.9	33.3	34.0	32.2	31.9	30.1
CJ	332204	398229	Roadside	83.9	83.9	32.1	35.0	32.5	31.3	30.2
CR	332511	397332	Roadside	100.0	100.0	24.3	27.1	23.9	22.4	22.1
CY	332981	396972	Roadside	100.0	100.0	23.0	25.4	21.8	20.7	20.7
DC	334339	395800	Kerbside	75.0	75.0	32.2	34.0	30.4	29.8	28.6
DD	333778	397534	Roadside	92.7	92.7	35.0	36.4	34.3	31.4	33.2

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
DE	333917	397575	Roadside	100.0	100.0	23.9	25.3	22.0	21.6	20.8
DF	333916	397506	Roadside	82.5	82.5	22.8	23.4	21.3	20.0	18.8
DH	332193	398193	Roadside	100.0	100.0	27.7	29.3	27.9	26.8	26.5
DI	332206	398187	Roadside	100.0	100.0	28.7	31.5	30.9	29.2	27.3
DO	334640	396399	Kerbside	92.7	92.7	35.4	38.9	36.6	35.9	36.0
DP	332793	396974	Kerbside	0.0	0.0	28.6	29.8	27.0	26.5	-
DQ	332791	396922	Roadside	83.1	83.1	25.7	28.6	25.8	22.9	22.7
DR	332226	398231	Roadside	100.0	100.0	30.2	32.7	30.3	28.0	28.0
DS	332134	398169	Roadside	91.9	91.9	25.7	29.1	27.2	25.9	24.6
DU	332196	398786	Roadside	100.0	100.0	27.3	29.6	28.2	26.4	25.4
DV	332341	400168	Roadside	100.0	100.0	29.5	32.9	30.2	28.3	26.2
DW	334572	397918	Roadside	58.6	58.6	25.5	27.9	23.4	22.6	20.3
DX	334738	395138	Roadside	82.3	82.3	28.2	31.8	28.3	27.8	27.0

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
DY	332250	398008	Kerbside	100.0	100.0	20.8	21.7	21.0	20.4	20.2
DZ	335394	397282	Roadside	100.0	100.0	26.4	28.1	27.1	26.8	27.2
EA	336639	399496	Roadside	100.0	100.0	21.5	23.1	20.7	19.5	20.7
EB	336592	399453	Roadside	93.0	93.0	26.1	28.8	25.1	24.4	24.2
EC	336539	399477	Roadside	100.0	100.0	24.6	27.6	28.5	25.2	24.5
EE	336572	399524	Roadside	82.0	82.0	24.7	29.5	27.2	24.5	24.5
EK	334782	395189	Roadside	100.0	100.0	28.4	31.3	27.9	27.7	26.9
EL	335265	394968	Kerbside	100.0	100.0	31.5	35.2	31.4	33.6	30.8
EN	333740	397561	Roadside	100.0	100.0	27.6	28.3	28.3	27.3	27.2
EO	333692	397615	Roadside	100.0	100.0	28.1	30.7	30.3	29.7	29.0
EP	333343	397210	Roadside	100.0	100.0	22.8	24.8	23.0	22.2	21.6
EQ	332611	396985	Roadside	100.0	100.0	27.4	28.5	27.7	25.2	24.3
ES	332712	397003	Roadside	100.0	100.0	23.6	25.4	24.0	22.4	20.5

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
EV	332650	396915	Kerbside	100.0	100.0	30.3	34.0	29.5	27.6	27.5
EW	332666	396822	Roadside	100.0	100.0	30.0	33.1	29.4	29.2	28.2
EY	332681	396949	Roadside	100.0	100.0	32.1	35.9	34.8	30.1	30.0
FB	334017	397317	Roadside	81.7	81.7	30.0	31.1	27.4	26.4	25.4
FC	334217	397663	Roadside	100.0	100.0	22.5	23.9	21.3	20.2	18.3
FD	334242	397713	Roadside	100.0	100.0	22.2	23.8	22.0	19.9	19.0
FE	334642	397923	Roadside	91.1	91.1	24.7	27.7	22.3	21.4	20.5
FF	334978	398171	Roadside	100.0	100.0	27.2	28.9	28.3	25.9	24.2
FH	334962	398134	Kerbside	92.7	92.7	31.9	34.2	31.6	30.3	29.6
FI	333280	395958	Roadside	100.0	100.0	32.0	36.2	31.6	28.7	28.5
FL	333701	397574	Kerbside	100.0	100.0	26.7	29.3	31.1	28.1	28.3
GA	333431	417166	Roadside	100.0	100.0	24.5	26.9	25.2	25.8	26.1
GB	333704	417415	Roadside	100.0	100.0	28.4	27.4	27.7	26.4	28.2

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
GC	332296	398268	Roadside	100.0	100.0	18.1	22.0	17.6	16.1	15.0
GD	332210	398338	Roadside	100.0	100.0	23.1	26.6	23.9	21.8	22.2
GE	332206	398369	Roadside	90.9	90.9	22.9	26.7	24.8	22.5	22.7
GF	335347	397500	Roadside	91.7	91.7	29.9	30.0	28.5	27.2	27.5
GH	333231	396069	Roadside	81.7	81.7	38.6	**40.6**	38.1	34.4	35.5
GJ	332088	399829	Kerbside	100.0	100.0	26.1	32.1	29.5	27.4	27.7
GK	333669	394912	Roadside	100.0	100.0	31.6	35.0	32.7	29.9	29.2
GL	333110	397072	Roadside	100.0	100.0	24.8	26.4	24.0	23.1	22.8
GM	332189	398210	Roadside	83.6	83.6	33.9	35.2	33.0	32.9	33.2
GN	333326	400772	Roadside	100.0	100.0	26.1	29.0	26.8	25.8	25.6
GO	334204	395749	Roadside	100.0	100.0	26.7	32.5	29.2	27.6	25.9
GP	332681	396776	Roadside	100.0	100.0	28.7	31.2	30.8	28.7	26.0
GQ	330706	398904	Roadside	100.0	100.0	16.1	18.5	17.7	17.6	15.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
GR	339201	402503	Roadside	100.0	100.0	16.7	17.7	16.0	16.2	15.0
GS	338710	401571	Kerbside	100.0	100.0	13.7	14.4	14.1	14.1	12.4
GT	333736	394597	Roadside	90.1	90.1	36.9	38.2	35.6	35.8	32.5
GU	333784	394596	Roadside	83.1	83.1	35.5	36.2	32.9	33.8	30.9
GV	337537	401542	Roadside	90.9	90.9	23.7	25.6	22.4	21.9	22.5
GW	337499	401552	Roadside	90.1	90.1	22.8	24.2	23.1	22.0	22.6
GX	340334	401214	Kerbside	100.0	100.0	19.6	21.3	18.7	18.7	17.7
GY	329188	406600	Roadside	100.0	100.0	14.0	18.0	13.1	13.9	13.5
GZ	332988	415800	Roadside	100.0	100.0	14.6	15.6	13.8	13.9	14.1
HA	337295	400874	Roadside	75.0	75.0		19.2	17.8	16.7	17.8
HB	335137	394996	Roadside	75.0	75.0		**41.5**	36.5	38.6	36.4
HC	335267	394995	Roadside	93.0	93.0		**40.2**	36.5	32.8	33.6
HD	336691	398032	Roadside	75.0	75.0			21.8	21.9	19.7

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
HE	337091	399333	Roadside	100.0	100.0			24.4	24.2	22.1
UK 2	334799	398065	Roadside	82.0	82.0	22.2	21.4	20.8	20.6	18.9
UK 4	332171	398547	Kerbside	82.0	82.0	24.8	29.7	26.7	25.2	24.2
W	332982	397022	Roadside	100.0	100.0	27.3	27.9	24.5	23.3	22.2
CO1, CO2, CO3	332175	398483	Roadside	100.0	100.0				24.4	24.6
CP1, CP2, CP3	333772	394602	Roadside	90.1	90.1				28.5	28.0
CQ1, CQ2, CQ3	332649	396942	Roadside	100.0	100.0				31.5	30.6
DB1, DB2, DB3	333812	397519	Roadside	100.0	100.0				25.5	25.0

☒ **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 within AQMA 2

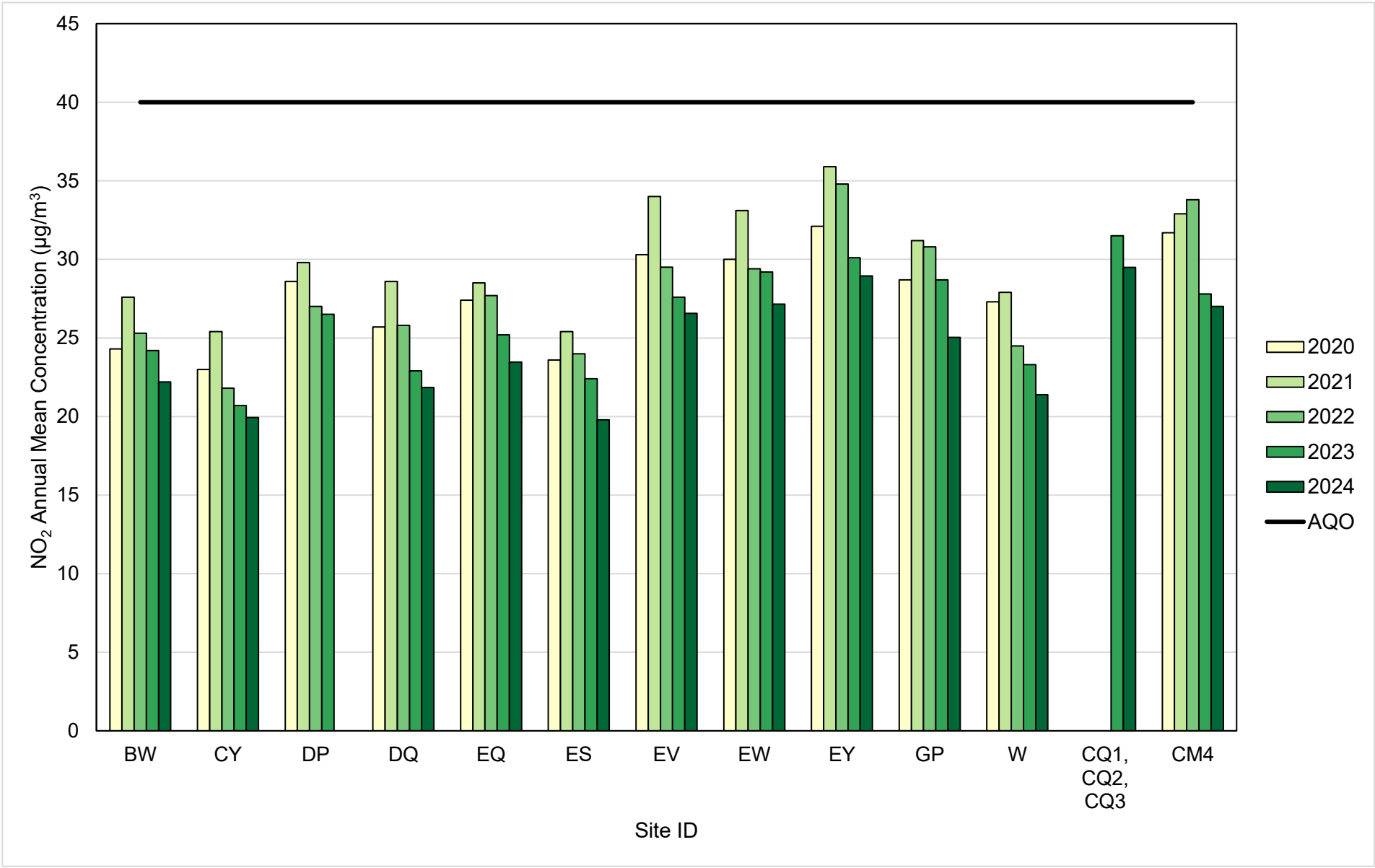


Figure A.2 – Trends in Annual Mean NO_2 Concentrations within AQMA 3

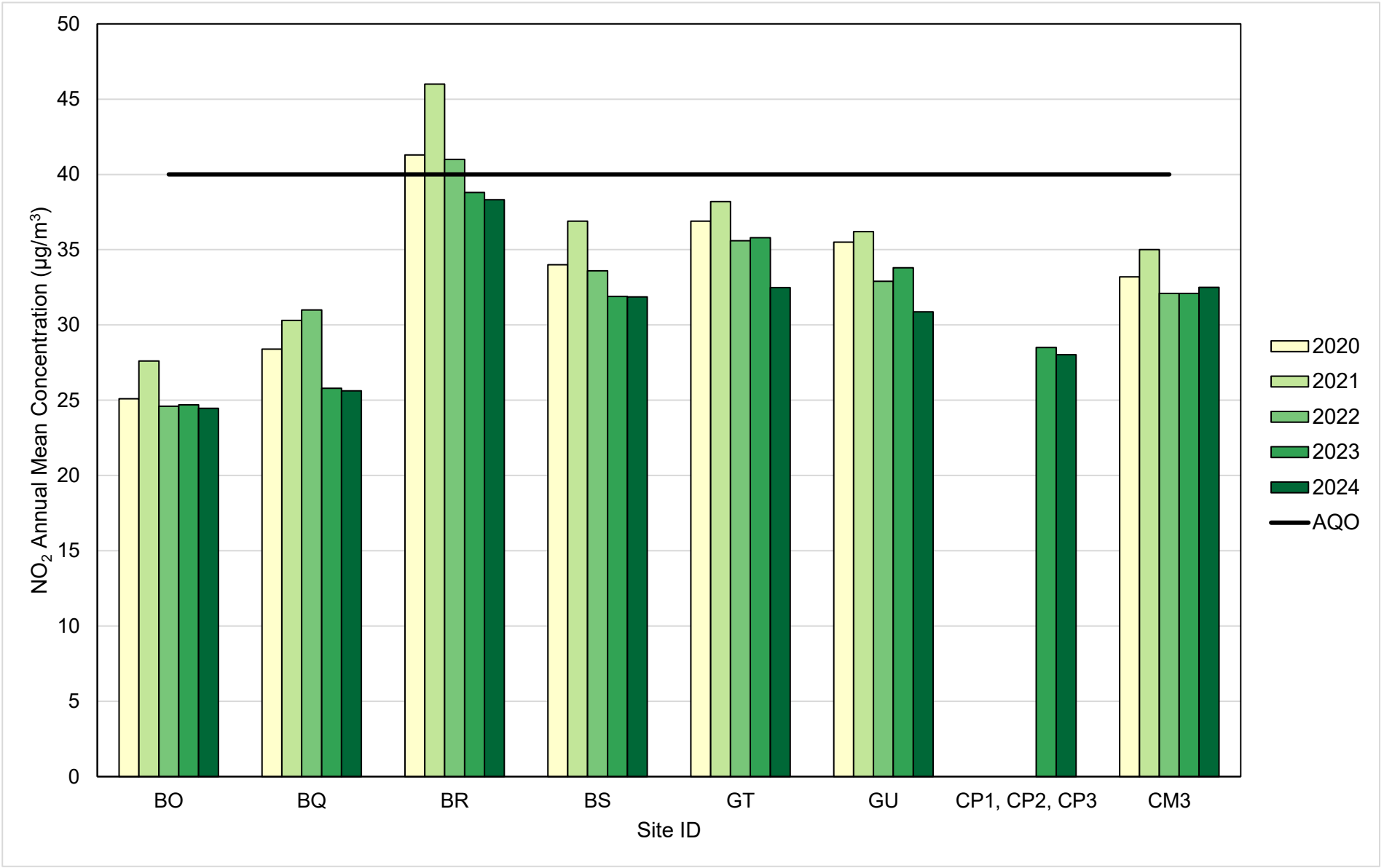


Figure A.3 – Trends in Annual Mean NO_2 Concentrations within AQMA 4

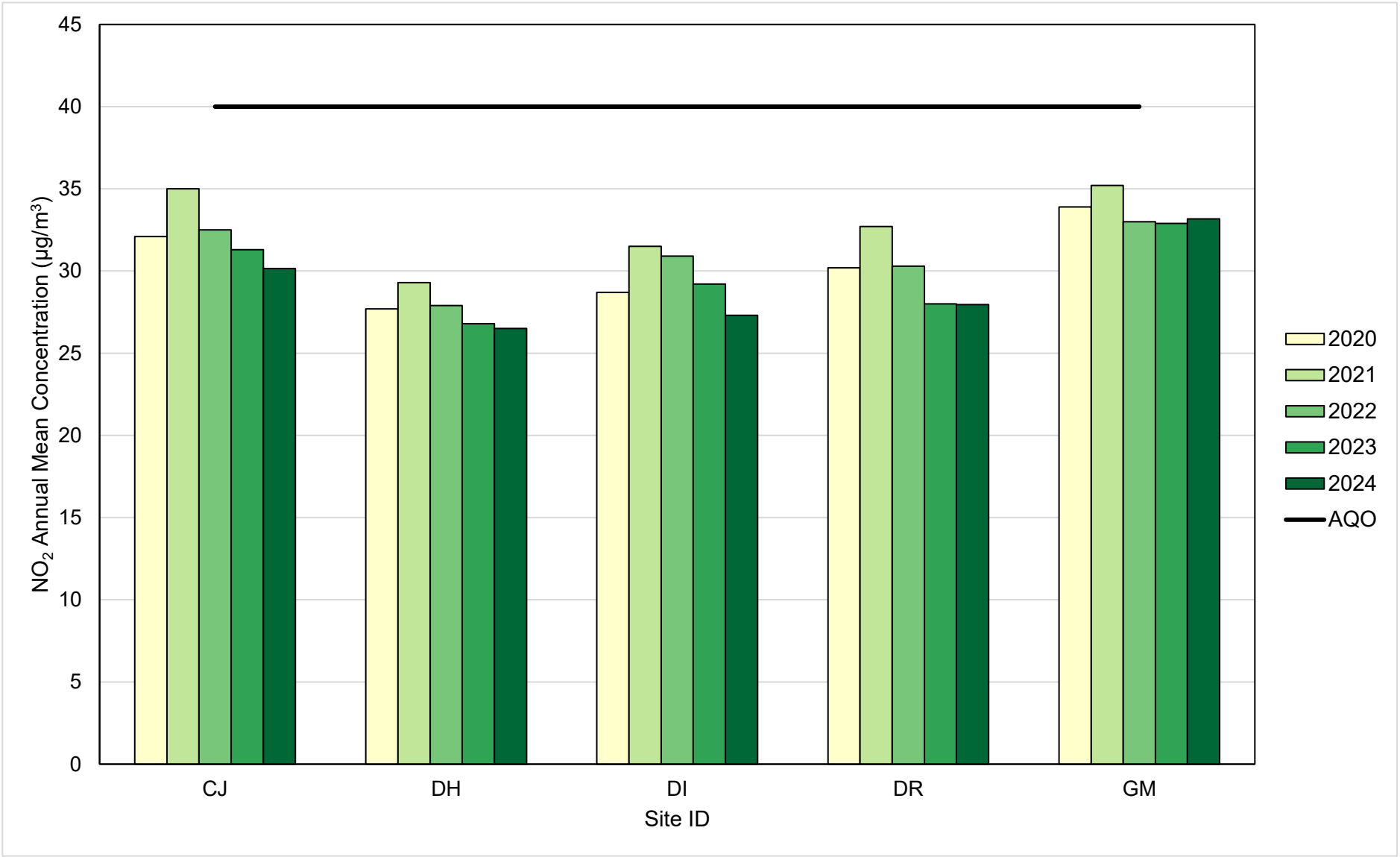


Figure A.4 – Trends in Annual Mean NO_2 Concentrations within AQMA 5

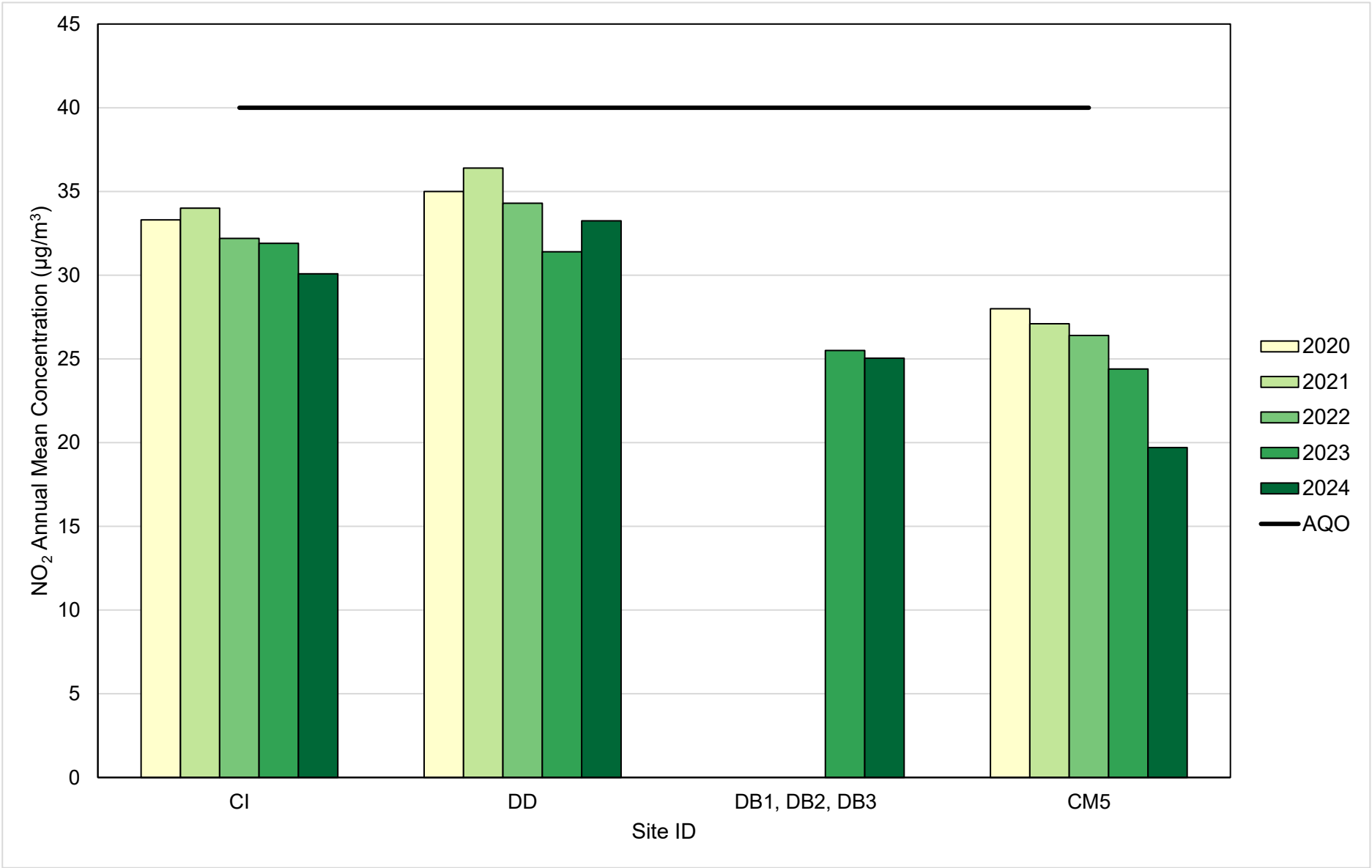


Figure A.5 – Trends in Annual Mean NO_2 Concentrations within Bootle (South Sefton)

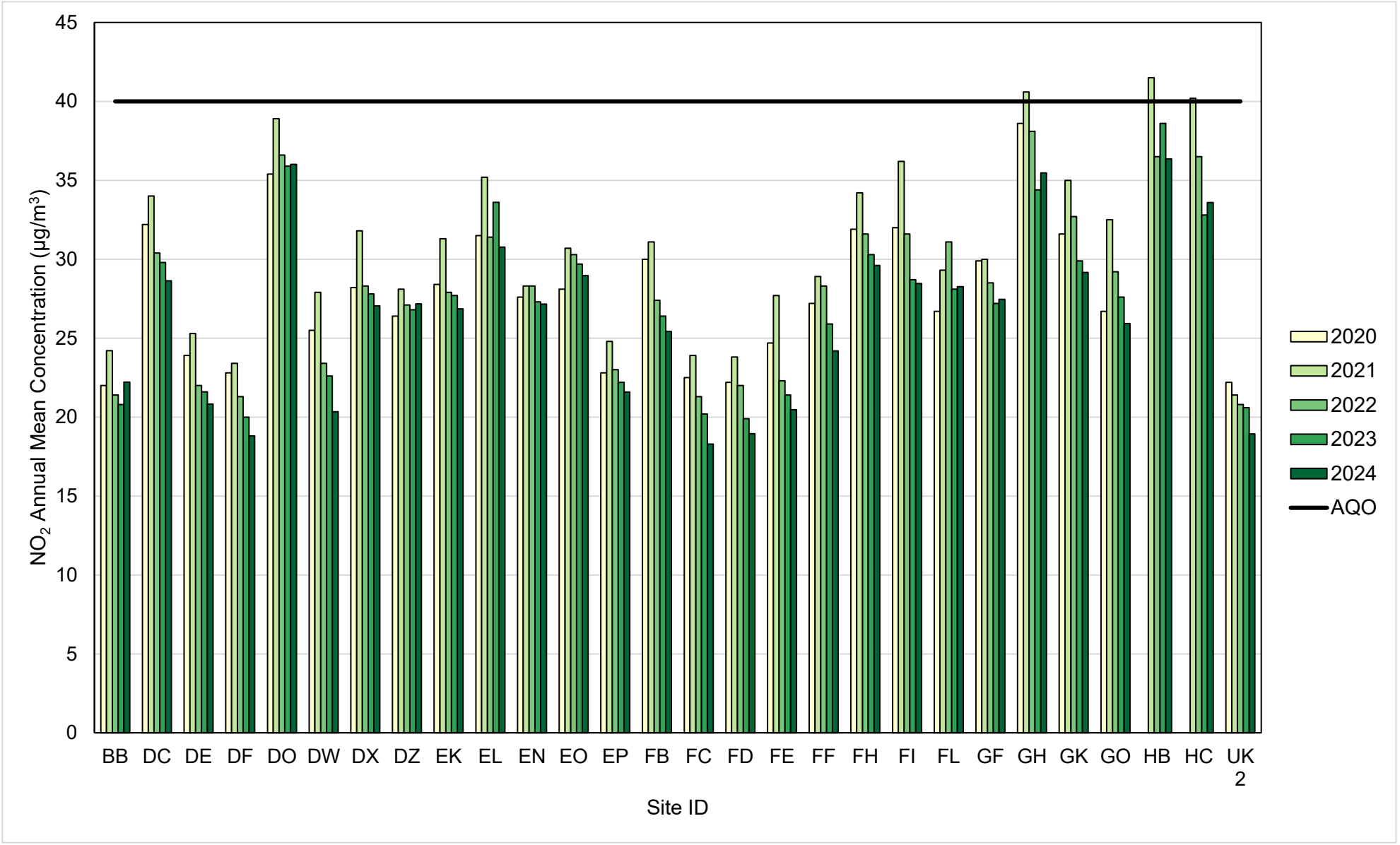


Figure A.6 – Trends in Annual Mean NO_2 Concentrations within Crosby (Central Sefton)

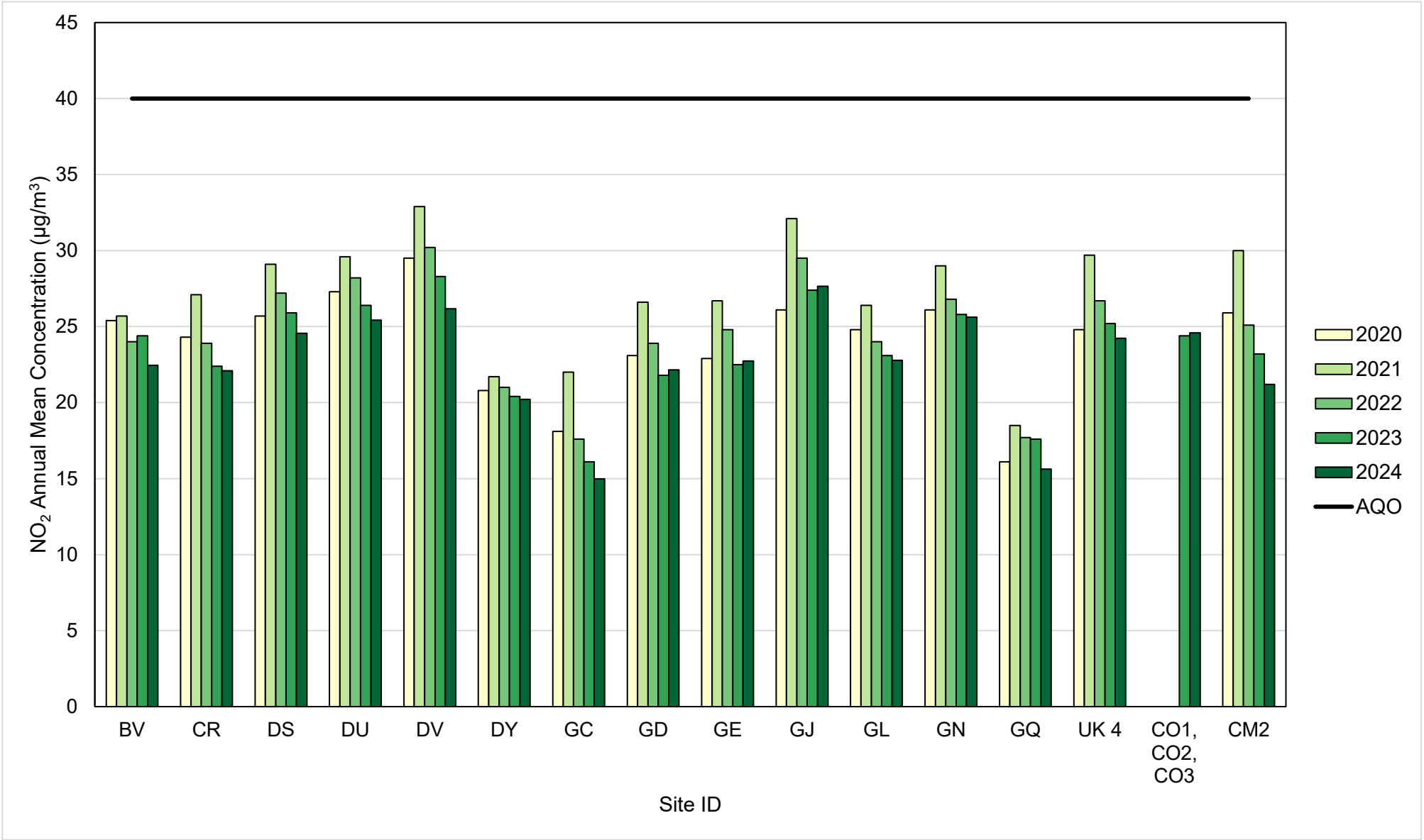


Figure A.7 – Trends in Annual Mean NO_2 Concentrations within Maghull/ Netherton (East Sefton)

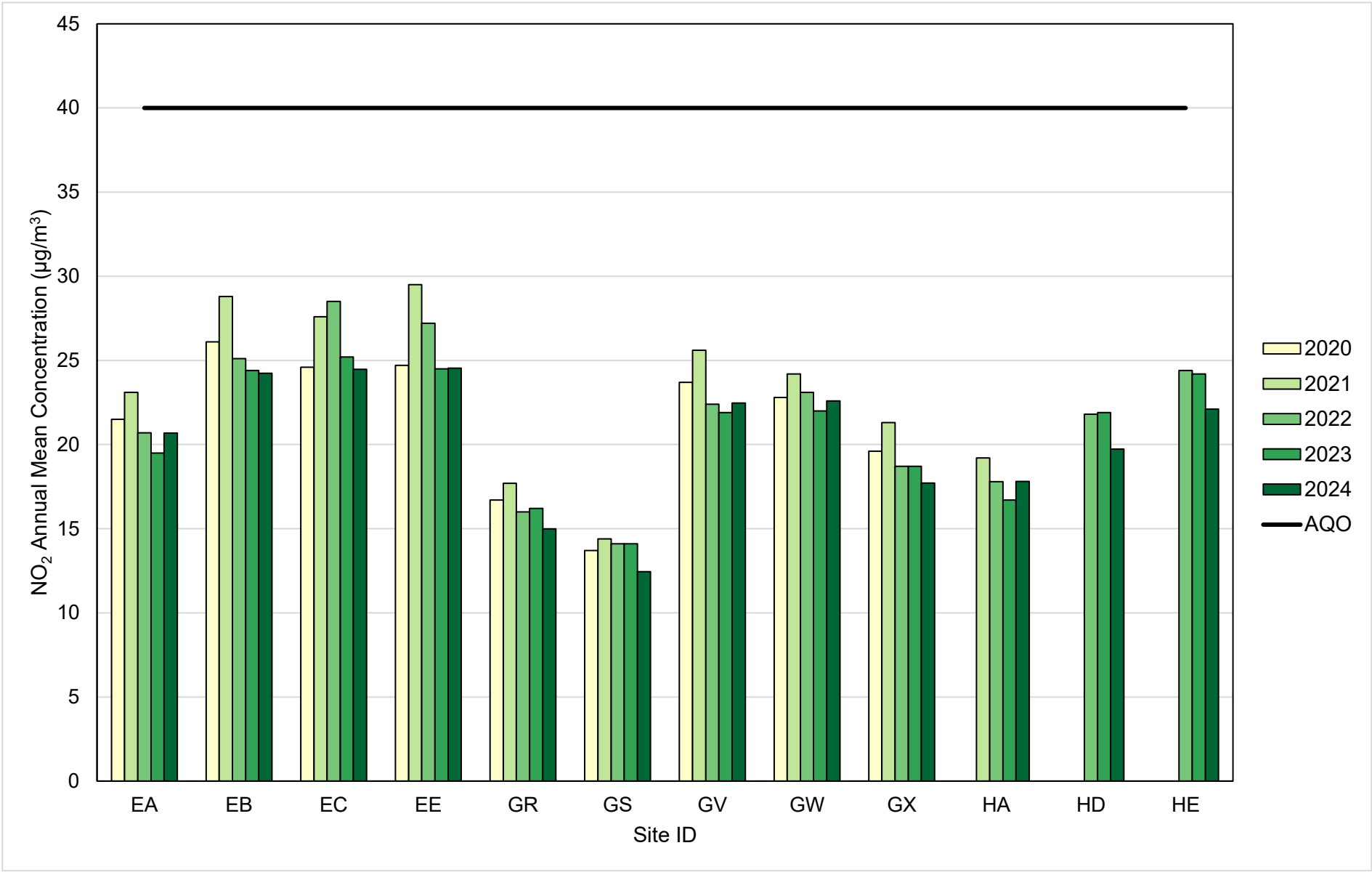


Figure A.8 – Trends in Annual Mean NO_2 Concentrations within Southport/ Formby (North Sefton)

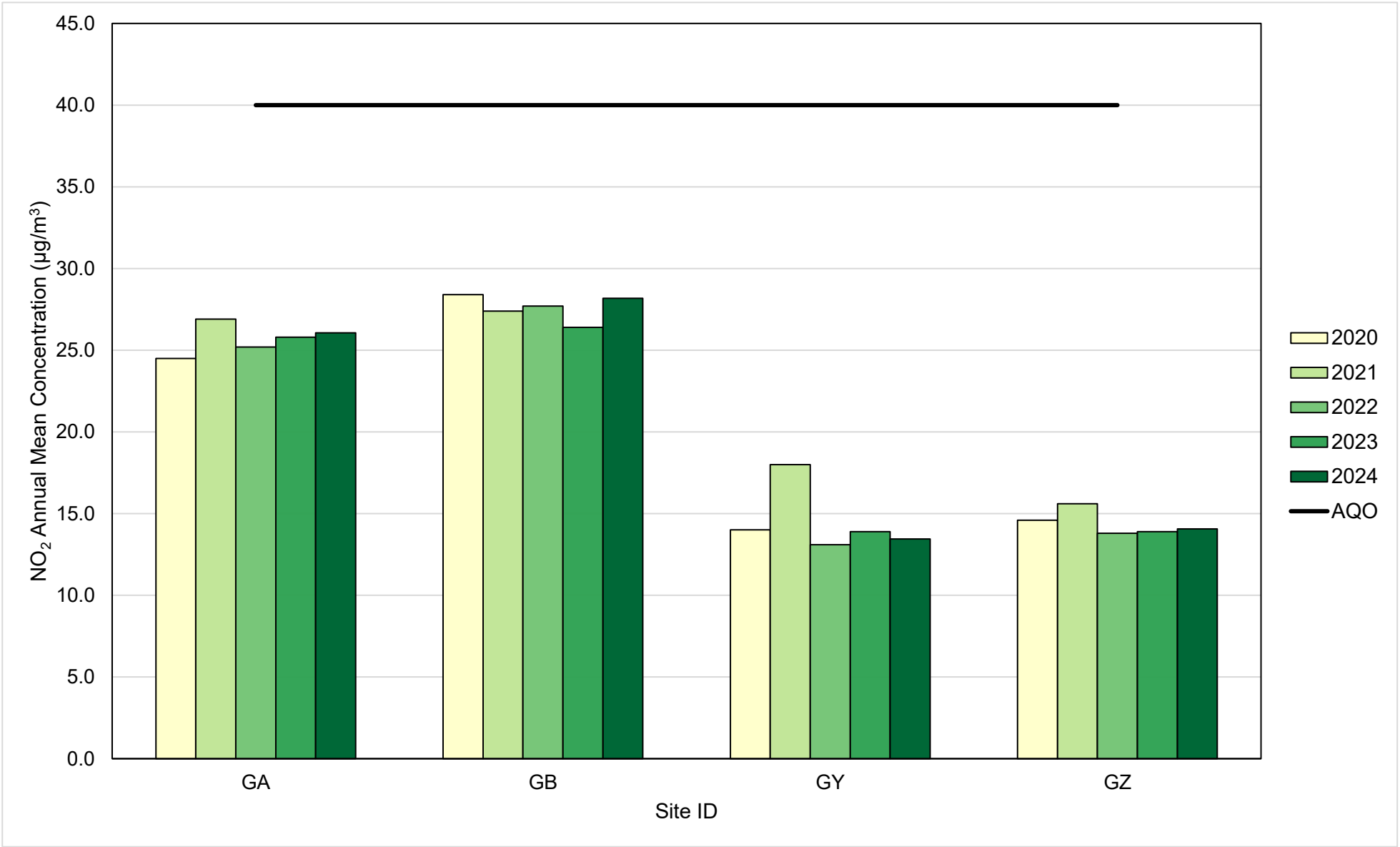


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM2	322175	398483	Roadside	99.6	99.6	0	0	0	0	0
CM3	333772	394602	Roadside	99.3	99.3	0	0	0	0	0
CM4	332649	396942	Roadside	99.8	99.8	0	0	0	0	0
CM5	333812	397519	Roadside	99.6	99.6	0	0	0	0	1

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

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
CM3	333772	394602	Roadside	99.3	99.3	16.1	19.5	19.9	19.2	19.9
CM4	332649	396942	Roadside	96.0	96.0	20.0	17.5	17.2	17.1	14.9
CM5	333812	397519	Roadside	99.6	99.6	20.3	18.7	21.5	20.5	22.1
CM7	331643	399588	Urban Background	82.4	82.4	13.2	9.5	12.9	12.9	11.9

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

Notes:

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

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ 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.9 – Trends in Annual Mean PM_{10} Concentrations

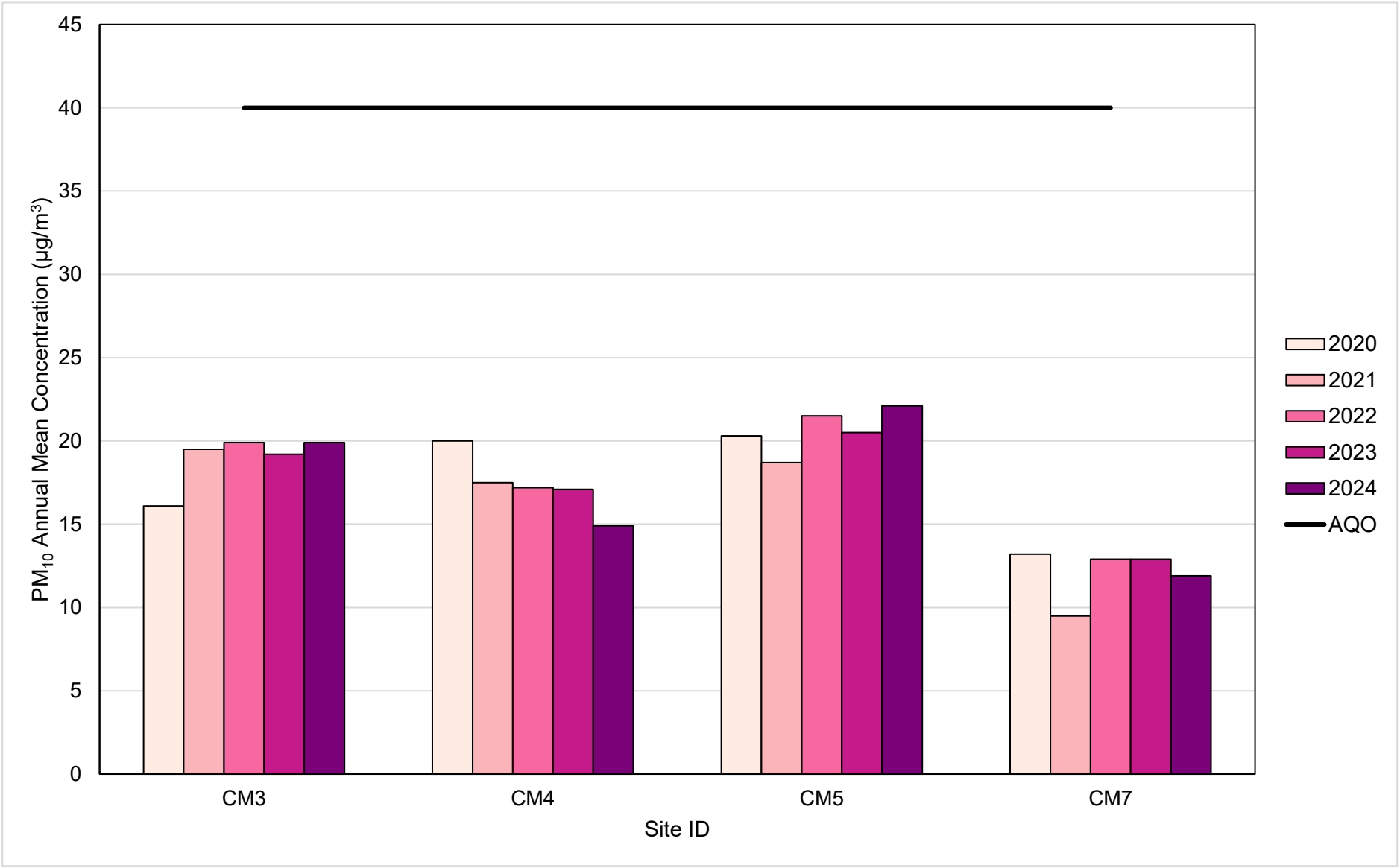


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM3	333772	394602	Roadside	100.0	99.3	2.0	3.0	6.0	4.0	2
CM4	332649	396942	Roadside	96.5	96.0	1.0	2.0	7(29)	1.0	1
CM5	333812	397519	Roadside	100.0	99.6	1.0	2.0	7.0	1.0	2
CM7	331643	399588	Urban Background	100.0	82.4	0(18)	0.0	3.0	0.0	0 (22)

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.10 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m^3

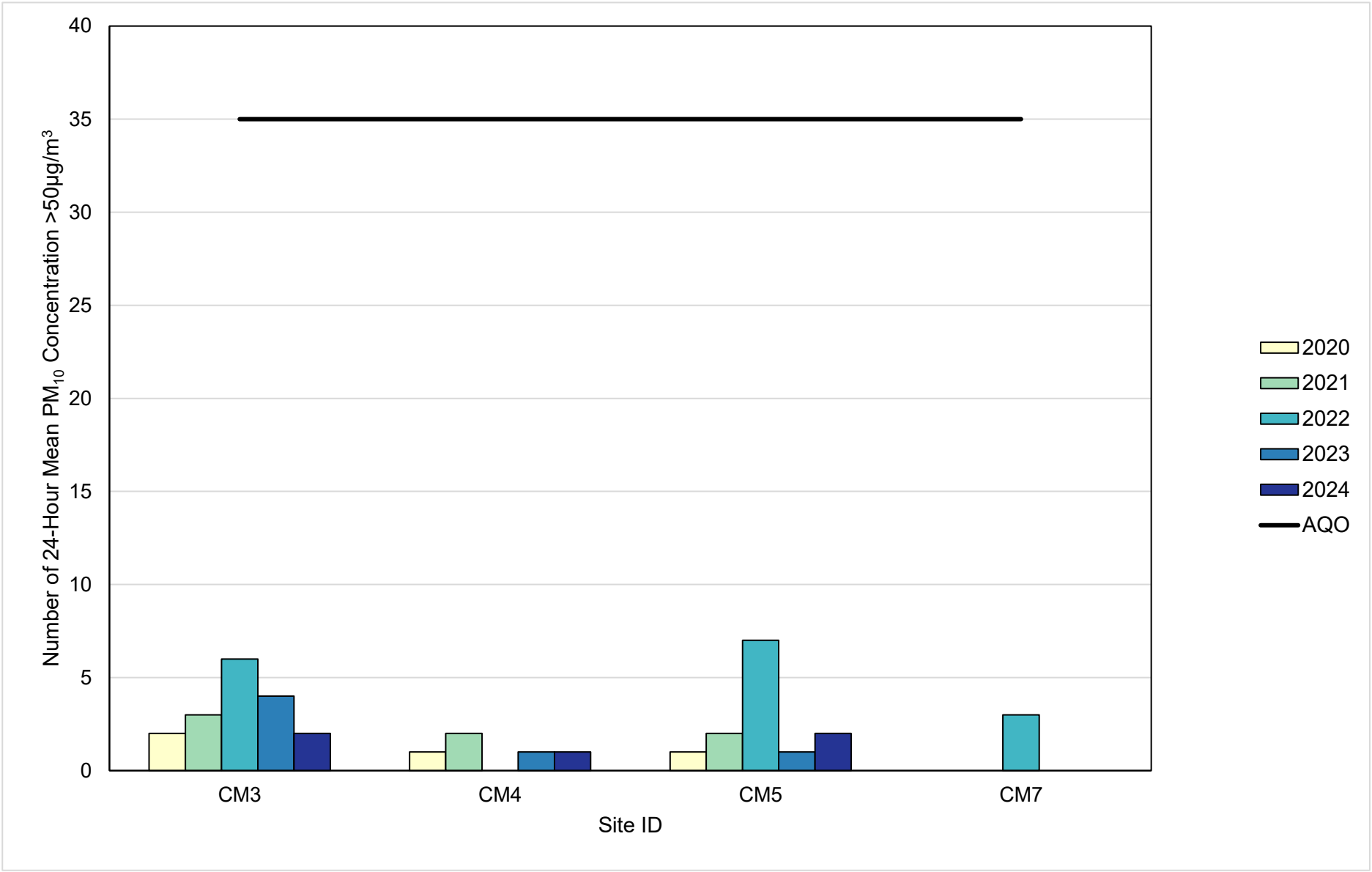


Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CM3	333772	394602	Roadside	99.3	99.3	8.3	9.6	9.7	9.4	9.9
CM4	332649	396942	Roadside	35.0	35.0	-	-	9.5	8.6	8.0
CM7	331643	399588	Urban Background	82.4	82.4	7.3	5.9	8.1	7.6	7.0

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

Notes:

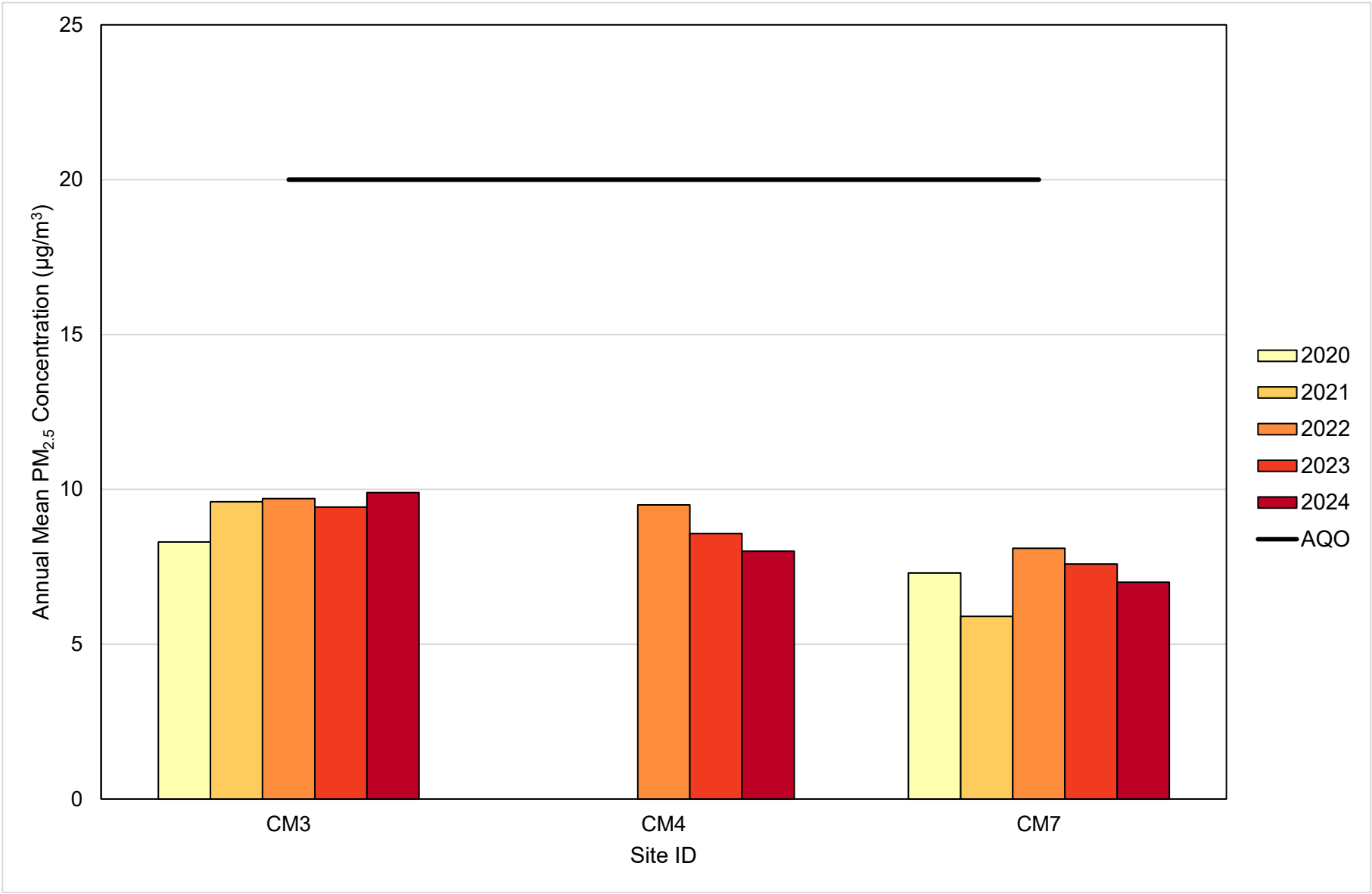
The annual mean concentrations are presented as µg/m^3.

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

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

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

Figure A.11 – Trends in Annual Mean $PM_{2.5}$ Concentrations



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 (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BB	333510	397186	30.0	32.5	23.1	21.2	21.2	16.4		31.4	21.3	28.9	35.7	29.1	26.4	22.2	-	Tube missing in July
BO	333847	394461	35.1	31.4	27.6	28.3	26.7	24.2	26.1	23.7	25.3	30.2	35.3	35.8	29.1	24.5	-	
BQ	333835	394572		36.6	28.3	29.0	31.3	28.3	29.2	23.9		27.9	34.7	36.0	30.5	25.6	-	Tube missing in January. Moisture and spider webs in September
BR	333753	394552	52.8	55.6	40.5	48.4	47.1	45.5	38.6	38.4	43.7	42.6	42.4	51.9	45.6	38.3	35.8	
BS	333757	394622	42.3	46.6	42.3	37.6	35.3	33.7	35.0	28.6	36.0	37.7	42.2		37.9	31.9	-	Tube missing in December
BV	333395	400863	35.1	34.0	28.5	23.1	26.1	18.6	20.5	20.2	25.9	29.4	33.6	25.7	26.7	22.5	-	
BW	332600	397021	31.8	31.9	28.3	27.5	23.9	18.5	23.1	23.9	23.5	30.4	35.0	31.2	27.4	23.0	-	
CI	333813	397514	38.0	49.5	40.4	35.3	32.0	24.3	29.5		28.4	41.0	40.5	35.2	35.8	30.1	-	Tube missing in August
CJ	332204	398229	40.1	44.2	36.7	33.1			29.3	30.0	36.6	35.1	39.4	34.2	35.9	30.2	-	No access in May. Tube missing in June
CR	332511	397332	32.3	35.2	29.4	23.7	23.4	18.8	21.5	23.1	21.2	28.4	32.3	26.4	26.3	22.1	-	Tube missing in June
CY	332981	396972	28.8	32.0	23.7	21.5	20.6	16.0	19.6	22.0	21.3	27.5	30.5	32.0	24.6	20.7	-	
DC	334339	395800	42.2			29.1	34.3	29.1	29.9	33.1	36.0	35.1	37.9		34.1	28.6	-	Tube missing in February, March and December
DD	333778	397534	39.6	48.8	43.0	37.1	37.0		33.0	35.6	30.6	46.5	46.0	38.3	39.6	33.2	-	Moisture/spider webs in June
DE	333917	397575	29.5	35.9	28.9	22.4	18.6	13.1	17.1	22.4	18.9	31.7	31.8	27.3	24.8	20.8	-	
DF	333916	397506	29.6		23.1	20.5	19.2	15.1	19.9	21.3	19.9	25.2		30.0	22.4	18.8	-	Moisture/spider webs in February. Tube missing in November
DH	332193	398193	37.1	42.0	37.0	28.6	28.9	21.5	26.0	29.2	27.8	34.1	36.6	30.1	31.6	26.5	-	
DI	332206	398187	35.6	40.9	33.8	29.0	30.8	27.1	28.7	28.9	31.3	32.0	36.7	35.2	32.5	27.3	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DO	334640	396399	49.1	52.7	44.3		42.4	33.9	36.3	36.7	46.0	44.4	45.6	40.3	42.9	36.0	27.6	Moisture/spider webs in April
DP	332793	396974														-	-	Missing tubes, and missing tube holders throughout the year
DQ	332791	396922		33.5	27.6	25.7	23.1	21.4	24.3	26.5	26.6	29.5	31.7		27.0	22.7	-	Tube missing in January and December
DR	332226	398231	40.5	42.8	36.0	32.0	32.2	25.0	28.2	28.2	28.3	38.2	36.4	31.8	33.3	28.0	-	
DS	332134	398169	36.4	36.1	31.1	25.7	30.8	23.7	25.8	24.9	22.2	33.6		31.3	29.2	24.6	-	Tube missing in November
DU	332196	398786	36.0	40.8	32.7	27.8	27.9	23.2	24.9	25.8	26.6	31.5	34.4	32.0	30.3	25.4	-	
DV	332341	400168	15.2	41.2	35.5	29.7	32.6	27.2	29.3	26.3	34.5	33.4	34.6	34.5	31.2	26.2	-	
DW	334572	397918	29.0	37.0	29.2				16.1		24.5		32.5	28.7	28.1	20.3	-	Tube missing in April-June, August and October
DX	334738	395138	35.9	43.7	35.7	25.9		23.8	27.5	26.5	29.5		38.4	35.3	32.2	27.0	-	Tube missing in May. Moisture/spider webs in October
DY	332250	398008	32.6	31.3	26.0	19.8	20.5	13.5	17.8	17.0	26.4	27.5	32.3	24.3	24.1	20.2	-	
DZ	335394	397282	40.8	44.0	33.0	26.4	27.3	22.2	25.7	25.7	31.4	33.7	40.6	37.4	32.3	27.2	-	
EA	336639	399496	53.1	30.6	23.0	19.6	17.2	16.7	17.7	19.8	18.7	23.8	29.7	25.6	24.6	20.7	-	
EB	336592	399453		36.5	28.8	26.7	29.5	23.9	22.3	24.3	28.9	28.6	38.6	29.4	28.9	24.2	-	Two grey/white caps in January
EC	336539	399477	37.5	38.8	37.2	24.7	26.1	15.1	21.2	21.9	30.0	33.7	37.4	26.1	29.1	24.5	-	
EE	336572	399524	38.7	38.8	37.7	26.5	27.7	15.6	22.0	21.1	30.0	34.2			29.2	24.5	-	No access in November. Tube missing in December
EK	334782	395189	39.0	42.5	33.0	28.0	29.1	20.7	27.0	27.6	28.6	34.1	34.6	39.7	32.0	26.9	-	
EL	335265	394968	46.2	42.1	35.6	38.0	41.1	33.0	35.8	30.2	43.0	35.7	19.6	39.4	36.6	30.8	-	
EN	333740	397561	34.9	41.2	32.9	31.2	29.4	23.6	28.5	28.3	25.3	36.7	42.5	33.7	32.3	27.2	-	

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 (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EO	333692	397615	39.1	44.5	38.3	30.9	32.3	24.9	27.7	29.9	31.2	39.9	38.8	36.3	34.5	29.0	-	
EP	333343	397210	29.4	36.3	29.7	22.6	21.7	14.7	18.7	25.4	21.9	27.6	31.2	29.2	25.7	21.6	-	
EQ	332611	396985	35.2	38.9	33.5	29.0	22.6	18.1	23.1	24.6	23.3	32.6	37.0	29.7	29.0	24.3	-	
ES	332712	397003	29.5	33.5	27.7	23.5	19.6	13.1	15.8	22.8	17.5	30.6	31.2	28.4	24.4	20.5	-	
EV	332650	396915	40.2	38.9	31.4	33.7	28.2	26.6	27.4	26.1	31.0	33.3	39.1	37.7	32.8	27.5	-	
EW	332666	396822	36.5	42.0	34.7	35.0	31.3	26.5	27.3	28.5	26.0	39.3	40.4	34.9	33.5	28.2	-	
EY	332681	396949	41.0	45.0	39.0	34.8	31.7	25.3	29.3	34.4	30.4	41.7	39.4	37.0	35.7	30.0	-	
FB	334017	397317	33.2	39.1		27.6	24.2	22.4	26.2	30.4	24.2	37.1	38.3		30.3	25.4	-	Moisture/spider webs in March. Tube missing in December
FC	334217	397663	31.0	31.4	22.4	20.0	19.8	15.5	19.3	19.2	20.9	25.1	30.8	5.9	21.8	18.3	-	
FD	334242	397713	29.0	32.8	25.5	17.4	17.1	12.0	16.7	19.1	15.2	25.8	30.5	29.8	22.6	19.0	-	
FE	334642	397923	31.5	29.4	24.2	19.2		20.1	19.9	18.6	21.7	23.5	30.4	29.7	24.4	20.5	-	
FF	334978	398171	35.6	37.3	35.0	23.9	26.3	15.0	20.4	23.0	29.0	33.7	37.1	29.5	28.8	24.2	-	Tube missing in May
FH	334962	398134	45.0	40.5	36.3	31.9	32.7		29.3	29.5	35.0	36.1	37.0	34.6	35.2	29.6	-	Tube missing in June
FI	333280	395958	37.8	40.9	33.7	30.9	32.1	31.0	30.3	29.1	28.2	33.4	40.9	38.2	33.9	28.5	-	
FL	333701	397574	40.4	39.6	36.1	29.8	28.3	17.4	26.3	25.4	33.1	41.8	44.9	40.6	33.6	28.3	-	
GA	333431	417166	38.3	34.0	29.1	28.3	29.9	25.8	29.4	23.9	30.5	28.3	39.5	35.4	31.0	26.1	-	
GB	333704	417415	42.2	43.6	32.3	32.1	29.2	27.0	29.5	30.0	27.5	35.2	40.6	33.4	33.5	28.2	-	
GC	332296	398268	24.1	24.2	20.7	13.6	15.3	10.2	13.5	13.8	13.6	20.7	23.7	20.7	17.8	15.0	-	
GD	332210	398338	36.5	33.2	28.1	24.0	22.5	16.7	21.3	21.1	24.2	28.5	31.2	29.5	26.4	22.2	-	
GE	332206	398369	35.9	34.2	29.5	24.2	23.4	16.5	20.9		22.9	26.6	35.0	28.7	27.1	22.7	-	Moisture/spider webs in August
GF	335347	397500	39.7	41.0		29.4	28.5	26.7	26.3	30.1	28.4	36.5	37.9	35.3	32.7	27.5	-	Moisture/spider webs in March

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 (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
GH	333231	396069	43.9	47.0	41.9	42.5	43.2	41.3		33.4	41.5	38.0	49.5		42.2	35.5	-	Tube missing in July. Moisture/spider webs in December
GJ	332088	399829	41.7	42.0	35.8	31.1	29.2	22.7	25.5	27.1	29.7	37.2	38.8	34.3	32.9	27.7	-	
GK	333669	394912	40.9	40.6	35.0	34.6	32.2	27.5	28.8	32.2	24.1	35.1	45.1	40.7	34.7	29.2	-	
GL	333110	397072	33.0	35.5	28.6	23.8	23.9	19.5	21.8	24.9	24.7	29.4	33.3	27.3	27.1	22.8	-	
GM	332189	398210	45.0	44.5	40.7	36.5	38.3		26.3		37.2	42.1	42.9	41.4	39.5	33.2	-	Moisture/spider webs in June. Tube missing in August
GN	333326	400772	38.8	36.9	32.6	25.7	31.5	21.8	26.3	22.7	28.6	33.7	38.3	29.2	30.5	25.6	-	
GO	334204	395749	42.6	37.1	36.8	28.0	14.8	19.2	25.3	24.9	32.8	33.3	37.9	37.6	30.9	25.9	-	
GP	332681	396776	36.7	38.6	28.2	30.4	28.8	24.7	26.4	27.1	26.7	32.7	35.6	35.2	30.9	26.0	-	
GQ	330706	398904	24.3	23.2	24.0	13.3	16.0	7.8	12.4	12.4	14.6	24.4	28.3	22.5	18.6	15.6	-	
GR	339201	402503	22.1	25.4	20.4	13.7	16.1	10.2	13.8	13.9	15.3	18.0	26.4	18.9	17.8	15.0	-	
GS	338710	401571	19.9	21.1	16.2	10.6	13.6	6.6	9.9	9.7	13.3	17.5	24.5	15.0	14.8	12.4	-	
GT	333736	394597	51.1	47.1	45.3	40.2	37.4	30.5	35.0	31.8	37.4	47.5	22.0		38.7	32.5	-	Tube missing in December
GU	333784	394596		47.6	41.8	37.2	39.9	33.3	36.6	32.2	19.9	36.5	42.6		36.8	30.9	-	Tube missing in January and December
GV	337537	401542	31.9	33.6	24.3	20.7	26.2	21.6	23.6		22.2	29.5	34.1	26.4	26.7	22.5	-	Moisture/spider webs in August
GW	337499	401552	33.2	31.4	25.9	22.5	24.4	21.0	21.1	23.8	35.9	25.9	30.6		26.9	22.6	-	Tube missing in December
GX	340334	401214	28.4	26.4	20.9	18.1	19.5	14.2	17.6	16.6	21.8	21.0	28.1	20.3	21.1	17.7	-	
GY	329188	406600	20.4	22.4	18.5	12.0	13.3	9.8	12.4	10.9	15.2	17.6	20.5	19.2	16.0	13.5	-	
GZ	332988	415800	21.0	22.6	16.5	13.5	13.9	10.5	12.5	11.9	15.8	18.8	24.4	19.5	16.7	14.1	-	
HA	337295	400874	27.1	27.2	25.5	16.8		9.7	12.5			24.3	25.8	21.8	21.2	17.8	-	Moisture/spider webs in May and August. Tube missing in September

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 (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HB	335137	394996		52.4	47.2	37.9		32.0	40.9		45.5	45.3	48.8	39.6	43.3	36.4	32.2	Two grey/white caps in January. Moisture/spider webs in May. Tube missing in August
HC	335267	394995		53.9	47.1	34.5	40.0	33.9	36.2	35.7	30.5	41.5	46.2	40.3	40.0	33.6	-	Two grey/white caps in January.
HD	336691	398032	32.2	30.6	27.7		22.4	13.8	17.3	16.6	25.3			25.5	23.5	19.7	-	Tube missing in April and November. Holder missing in October
HE	337091	399333	36.4	36.0	30.0	22.8	23.0	17.3	21.1	16.8	21.6	29.7	33.7	27.3	26.3	22.1	-	
UK 2	334799	398065	29.6	29.6	24.2	16.9		11.9	15.1		20.2	26.6	28.9	22.5	22.5	18.9	-	Moisture in May and August
UK 4	332171	398547	36.6	36.1	32.1	27.7	27.3	23.3	26.0	20.7	26.4	32.4			28.9	24.2	-	Holder missing in November. Tube missing in December.
W	332982	397022	32.4	38.6	28.8	24.3	21.3	12.8	19.8	23.1	19.0	31.8	32.5	32.7	26.4	22.2	-	
CO1	332175	398483	37.2	34.5	30.1	27.7	27.1	21.2	23.3	22.5	27.4	34.0	34.7	30.4	-	-	-	Triplicate Site with CO1, CO2 and CO3 - Annual data provided for CO3 only
CO2	332175	398483	38.7	33.6	31.4	26.4	27.6	21.1	25.4	22.7	29.3	31.1	34.7	29.7	-	-	-	Triplicate Site with CO1, CO2 and CO3 - Annual data provided for CO3 only
CO3	332175	398483	36.8	34.9	31.7	26.5	26.6		23.9	22.9	29.8	29.8	36.4	31.6	29.3	24.6	-	Triplicate Site with CO1, CO2 and CO3 - Annual data provided for CO3 only
CP1	333772	394602	34.0	42.7	34.0	31.8	35.4	30.1	31.4	27.5	30.6	35.6	35.0		-	-	-	Moisture in tubes in December for CP1, CP2 and CP3
CP2	333772	394602	36.3	39.9	35.5	32.8	33.9	30.3	30.4	26.4	29.9	31.7	39.1		-	-	-	Triplicate Site with CP1, CP2 and CP3 - Annual data provided for CP3 only
CP3	333772	394602	35.7	43.7	34.4	32.3	33.9	29.5	28.6	28.8	30.4	30.7	38.6		33.4	28.0	-	Triplicate Site with CP1, CP2 and CP3 - Annual data provided for CP3 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 (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CQ1	332649	396942	40.2	46.9	41.5	37.2	31.9	29.1	28.5	36.2	29.6	43.2	38.2	39.0	-	-	-	Triplicate Site with CQ1, CQ2 and CQ3 - Annual data provided for CQ3 only
CQ2	332649	396942	40.2	45.9	38.4	35.5	33.1	29.0	33.1	36.5	29.6	39.3	38.9	33.1	-	-	-	Triplicate Site with CQ1, CQ2 and CQ3 - Annual data provided for CQ3 only
CQ3	332649	396942	39.7	49.8	44.0	34.4	29.9	25.5	31.2	34.6	31.9	37.0	41.6	36.8	36.4	30.6	-	Triplicate Site with CQ1, CQ2 and CQ3 - Annual data provided for CQ3 only
DB1	333812	397519	32.0	41.3	32.1	28.5	25.9	20.4	24.6	25.5	21.9	32.3	38.0	30.5	-	-	-	Triplicate Site with DB1, DB2 and DB3 - Annual data provided for DB3 only
DB2	333812	397519	32.9	40.5	34.3	29.3	25.4	20.5	23.4	26.8	22.1	36.9	36.1	30.4	-	-	-	Triplicate Site with DB1, DB2 and DB3 - Annual data provided for DB3 only
DB3	333812	397519	33.7	40.8	32.5	29.2	25.5	19.7	24.6	28.0	21.7	38.1	35.8	32.2	29.8	25.0	-	Triplicate Site with DB1, DB2 and DB3 - Annual data provided for DB3 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.**

☒ **National bias adjustment factor used.**

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

☒ **Sefton Metropolitan Borough Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

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

In 2024 Sefton Air Quality Officers were specifically consulted on 49 developments/proposals which had the potential to impact on air quality. These proposals were reviewed in detail and where appropriate, air quality assessments and/or specific conditions to mitigate AQ impacts were required.

The following applications in 2024 required or were supported by an AQA/CEMP/DMP

AQA:

DC/2024/01890

Redevelopment and change of Use Class E to Use Class E, F1, F2 (b) and Sui Generis (public houses, wine bars, or drinking establishments, drinking establishments with expanded food provision hot food takeaways off the premises) with external alterations including partial demolition and landscaping.

DC/2024/01997

Erection of petrol filling station with retail unit and kiosk following demolition of 88 Liverpool Road North, Land Off Liverpool Road North Maghull L31 0AE

DC/2024/01682

Demolition of redundant plant building and demolition and relocation of sub-station. Extend and amend HGV and car parking layout and amend vehicle access and egress. Erection of single storey security hut and gates.

DC/2024/01893

Land At Bridle Road, Bootle,

Application seeking full planning permission for employment floorspace (Use Classes E(g)(iii), B2, and B8) with ancillary (integral) office floorspace (Use Class E(g)i), associated parking, landscaping, and reprofiling of site

DC/2024/01492

Land At Pendle Drive, Litherland, Sefton, L21 0JH

Erection of a Use Class E foodstore with new vehicular access / egress to Pendle Drive, new internal vehicular access road, car parking, servicing area, and hard and soft landscaping, following demolition of existing site structures.

DC/2024/00259

New Strand service way Bootle

DC/2023/01492

Former Old Roan Public House, Copy Lane, Netherton, L30 8RD

Erection of a 3-storey block of residential apartments, associated works and landscaping following the demolition of the existing vacant public house.

DC/2023/01894

238 Marsh Lane, Bootle, L20 5BW

Change of use of the existing vacant pub into 2 commercial units at ground floor level (CLASS E (a), (b), (c)) and apartments at ground/first floor level, with the installation of a terrace with privacy screen to the rear.

Construction Environmental Management Plans /Dust Management Plans

DC/2024/01694

Land East of Damfield Lane/Bournehurst Drive, Maghull

Proposed extra care development (Use Class C3) comprising 129 no. apartments including

solar panels to the roof, with internal and external amenity spaces and associated parking, access and landscaping

DC/2024/00603

Land Off Bankfield Lane, Churchtown, Southport,

Erection of 240 No. dwellinghouses with associated works.

DC/2024/00746

Summerhill Primary School, Poverty Lane, Maghull, L31 3DT

Erection of a two-storey extension classroom block, extending of existing hall, provision of internal mezzanine floor and raising of hall roof. Erection of single storey extension to form office with linking corridor extension, new playground area, expansion of car parking area, installation of low level and perimeter fencing to match, and landscaping (alternative to DC/2022/01702)

DC/2024/00307

Former Gasworks, Litherland Road, Bootle, L20 3JE

Approval of details reserved by Conditions 3,4,5,6,7,8 and 19 attached to planning permission DC/2023/00560 approved on 7/12/2023

DC/2023/02111

Land To The North East Of Poverty Lane, North West Of Harrier Close, Poverty Lane, Maghull,

Erection of a residential care home (C2) with associated parking, infrastructure and landscaping.

DC/2023/01891

KTC Edible Oils, Rear of Allied Bakeries, Dunnings Bridge Road, Netherton, L30 6TG

Erection of a single storey extension to side elevation, raising section of existing roof, a single storey security hut with gate and fencing, installation of 2 no. silos within new bunded area and installation of acoustic fencing

DC/2023/02195

Site Of 2, Well Lane, Bootle.

Erection of 21 dwellings comprising 8 No. 2 storey apartments, 12 No. 3 storey apartments and 1 No. bungalow with associated car parking and vehicular access.

Further detail on the above developments and our response can be found here.

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

Sefton Metropolitan Borough Council has not completed any additional works within the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

Sefton Metropolitan Borough Council's monitoring network is operated and run by officers who have been trained in all aspects of air quality monitoring, including routine site maintenance, calibration of analysers and data ratification. The QA/QC procedures used are detailed below.

Horiba 360 and 370 series analysers are used for gaseous pollutants and BAM analysers used for particulates PM_{10}. FIDAS dual Particulate monitor is used for PM_{10}/$PM_{2.5}$.

Sefton Council have in place a rigorous QA/QC programme which incorporates the daily screening, by visual examination of all monitoring and calibration data to ascertain if any immediate action is necessary, fortnightly site visits to carry out routine maintenance and calibration checks, equipment maintenance support including breakdown repair and 6 monthly servicing following the manufacturers recommendations carried out by trained service engineers, 6 monthly QA/QC audits carried out by an external UKAS accredited field auditor (Ricardo) and data validation and ratification of all datasets.

The QA/QC audit independent organisation used must hold UKAS accreditation to ISO 17025 for the on-site calibration of the NO_x gas analysers and for flow rate checks on particulate (PM_{10}) analysers and for the determination of the spring constant, k0, for conventional and TEOM-FDMS instruments. ISO17025 accreditation provides confidence that the analyser calibration factors produced are traceable to national metrology standards, that the calibration methodology is suitable, and that the uncertainties are appropriate for data reporting purposes and ISO17025 accreditation for laboratory certification of NO, NO_2, CO and SO_2 gas cylinders is also held.

Horiba gas analysers carry out automatic checks every three days for zero and span calibration and Horiba software scales the data of the three-day calibration checks. Monitoring and calibration data from automatic monitors for the previous day(s) are examined on the morning of each working day by an air quality officer to check for spurious or unusual readings, allowing for the identification of anomalies or instrument faults, so they can be investigated and dealt with promptly.

An air quality officer carries out routine site visits every 30 days in accordance with a documented procedure, during which routine maintenance is carried out including the changing of all sample inlet filters. Zero and span calibration checks, and gas cylinder pressures checks are also made. Any faults identified are either rectified at the time of the visit or are reported immediately to the instrument supplier service department to arrange an engineer call out.

Sefton Council has a maintenance contract currently with Horiba UK, which includes six monthly servicing intervals and breakdown cover to ensure optimum performance of the analysers throughout the year. External QA/QC audits are carried out at six-monthly intervals. This work is presently carried out by Ricardo Energy & Environment, who provide a report with recommendations and comments relating to data management as a result of the audit and any necessary action to correct data for long term drift or any other matters which need to be addressed.

Primary data validation (application of calibration factors, screening of data for spurious and unusual measurements) is followed up with a more detailed process known as data ratification, a more rigorous data management procedure involving a critical review of all information relating to a particular dataset, the purpose being to verify, amend or reject as necessary. These methods are given in more detail in DEFRA technical guidance LAQM.TG(22).

DEFRA and the Devolved Administrations have approved a number of different monitoring technologies to be equivalent to the reference method. In some cases, the data must be corrected before they can be used.

DP - Gordon Road/ Rawson Road, Bootle had no available months of data during 2024. The diffusion tube was missing almost every month of 2024, and for three months the diffusion tube holder was missing.

Diffusion Tube Annualisation

LAQM.TG(22) states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Passive monitoring site DW recorded a data capture of 58.6% in 2024 and therefore required annualisation. Annualisation was completed using version 5.4 of the ‘Diffusion Tube Data Processing Tool’. Four continuous background monitoring locations were used:

- Wirral Tranmere;

- Birkenhead Borough Road;
- Liverpool Speke; and
- Widnes Milton Road;

Each location had >85% data capture and therefore could be used for annualisation. The results, taken from the 'Diffusion Tube Data Processing Tool', are presented below.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Wirral Tranmere	Annualisation Factor Birkenhead Borough Road	Annualisation Factor Liverpool Speke	Annualisation Factor Widnes Milton Road	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m^3)	Annualised Data Simple Annual Mean (µg/m^3)
DW	0.8151	0.8473	0.8700	0.9113	0.8609	28.1	24.2

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2025 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.

Sefton Metropolitan Borough Council have applied a national bias adjustment factor of 0.84 to the 2024 monitoring data. A summary of bias adjustment factors used by Sefton Metropolitan Borough Council over the past five years is presented in Table C.2.

The national bias adjustment spreadsheet (version 06/25) was used to derive the national bias adjustment factor for diffusion tubes analysed by Gradko during 2024. The national bias adjustment factor for Gradko was 0.84 and was based on 27 studies. As shown in Figure C.1.

Figure C.1 – 2024 National Bias Adjustment Factor for Gradko

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/25

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

This spreadsheet will be updated at the end of September 2025

LAQM Helpdesk Website

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

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

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2024	R	Cambridge City Council	12	19	15	28.5%	G	**0.78**
Gradko	20% TEA in water	2024	UB	Plymouth City Council	12	16	14	13.8%	G	**0.88**
Gradko	20% TEA in water	2024	R	Plymouth City Council	12	31	23	33.4%	S	**0.75**
Gradko	20% TEA in water	2024	R	Monmouthshire County Council	12	29	24	19.4%	G	**0.84**
Gradko	20% TEA in water	2024	KS	Marylebone Road Intercomparison	11	41	36	16.1%	G	**0.86**
Gradko	20% TEA in water	2024	R	Lisburn & Castlereagh City Council	12	24	19	27.8%	G	**0.78**
Gradko	20% TEA in water	2024	R	Ards And North Down Borough Council	11	28	20	44.5%	G	**0.69**
Gradko	20% TEA in water	2024	R	Eastleigh Borough Council	12	29	24	20.3%	G	**0.83**
Gradko	20% TEA in water	2024	UB	Eastleigh Borough Council	12	19	17	12.4%	G	**0.89**
Gradko	20% TEA in water	2024	R	Eastleigh Borough Council	12	19	17	12.0%	G	**0.89**
Gradko	20% TEA in water	2024	R	Gateshead Council	12	20	18	13.9%	G	**0.88**
Gradko	20% TEA in water	2024	R	Gateshead Council	11	20	17	19.7%	G	**0.84**
Gradko	20% TEA in water	2024	R	Gateshead Council	12	24	20	21.7%	G	**0.82**
Gradko	20% TEA in water	2024	R	Gateshead Council	12	27	23	19.0%	G	**0.84**
Gradko	20% TEA in water	2024	R	Gateshead Council	12	28	30	-6.0%	G	**1.06**
Gradko	20% TEA in water	2024	R	Brighton & Hove City Council	11	34	27	26.3%	G	**0.79**
Gradko	20% TEA in water	2024	R	Liverpool City Council	12	34	25	35.7%	G	**0.74**
Gradko	20% TEA in water	2024	KS	Liverpool City Council	10	52	47	10.2%	G	**0.91**
Gradko	20% TEA in water	2024	R	Nottingham City Council	10	29	26	12.2%	G	**0.89**
Gradko	20% TEA in water	2024	R	Wychavon District Council	10	29	26	14.7%	G	**0.87**
Gradko	20% TEA in water	2024	R	Worcestershire	12	12	12	-3.4%	G	**1.04**
Gradko	20% TEA in water	2024	R	Cheshire West And Chester	12	33	27	21.7%	G	**0.82**
Gradko	20% TEA in water	2024	R	Cheshire West And Chester	11	30	27	12.9%	G	**0.89**
Gradko	20% TEA in water	2024	R	The Highland Council	12	19	18	6.9%	G	**0.94**
Gradko	20% TEA in water	2024	R	The Highland Council	11	15	11	35.3%	G	**0.74**
Gradko	20% TEA in water	2024		**Overall Factor[3] (31 studies)**				**Use**		**0.84**

For completeness, a combined local bias adjustment factor was also calculated utilising Sefton Metropolitan Borough Council's triplicate co-location studies. As shown in Table C.3, the combined local bias adjustment factor of 0.75 was lower than the national factor of 0.84 As such, the national bias adjustment factor was applied to the 2024 monitoring data to ensure the reported concentrations are robust. It should be noted that the national bias adjustment factor for 2024 is in line with factors applied in previous years.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	National	06/25	0.84
2023	National	03/24	0.81
2022	Local	-	0.81
2021	Local	-	0.87
2020	National	09/20	0.81

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 – CM2	Local Bias Adjustment Input 2 – CM3	Local Bias Adjustment Input 3 – CM4	Local Bias Adjustment Input 4 – CM5
Periods used to calculate bias	12	11	12	12
Bias Factor A	0.73 (0.6 - 0.91)	0.97 (0.92 - 1.02)	0.73 (0.68 - 0.79)	0.65 (0.44 - 1.24)
Bias Factor B	38% (9% - 66%)	3% (-2% - 9%)	36% (26% - 46%)	53% (-19% - 125%)
Diffusion Tube Mean (µg/m^3)	29.3	33.4	36.4	29.8
Mean CV (Precision)	2.9%	3.6%	5.3%	2.9%
Automatic Mean (µg/m^3)	21.3	32.3	26.7	19.5
Data Capture	98%	98%	98%	98%
Adjusted Tube Mean (µg/m^3)	21 (18 - 27)	32 (31 - 34)	27 (25 - 29)	19 (13 - 37)
Combined Local Bias Adjustment Factor	0.75			

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.

There were three sites that required distance correction in 2024. BR, located at the XY coordinates (333500:394500), DO located at the XY coordinates (334500:396500) and HB located at the XY coordinates (333500:394500). The results of the distance correction calculation are presented in Table C.4.

Table C.4 – Non-Automatic NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
BR	1.1	2.7	38.3	25.0	35.8	
DO	0.6	5.3	36.0	14.7	27.6	
HB	2.1	9.7	36.4	25.0	32.2	

QA/QC of Automatic Monitoring

Sefton Metropolitan Borough Council's monitoring network is operated and run by officers who have been trained in all aspects of air quality monitoring, including routine site maintenance, calibration of analysers and data ratification. The QA/QC procedures used are detailed below.

Horiba 360 and 370 series analysers are used for gaseous pollutants and BAM analysers used for particulates PM_{10}. FIDAS dual Particulate monitor is used for PM_{10}/$PM_{2.5}$.

Sefton Council have in place a rigorous QA/QC programme which incorporates the daily screening, by visual examination of all monitoring and calibration data to ascertain if any immediate action is necessary, fortnightly site visits to carry out routine maintenance and calibration checks, equipment maintenance support including breakdown repair and 6 monthly servicing following the manufacturers recommendations carried out by trained service engineers, six monthly QA/QC audits carried out by an external UKAS accredited field auditor (Ricardo) and data validation and ratification of all datasets.

The QA/QC audit independent organisation used must hold UKAS accreditation to ISO 17025 for the on-site calibration of the NO_x gas analysers and for flow rate checks on particulate (PM_{10}) analysers and for the determination of the spring constant, k0, for conventional and TEOM-FDMS instruments. ISO17025 accreditation provides confidence that the analyser calibration factors produced are traceable to national metrology standards, that the calibration methodology is suitable, and that the uncertainties are appropriate for data reporting purposes and ISO17025 accreditation for laboratory certification of NO, NO_2, CO and SO_2 gas cylinders is also held.

Horiba gas analysers carry out automatic checks every three days for zero and span calibration and Horiba software scales the data of the three-day calibration checks. Monitoring and calibration data from automatic monitors for the previous day(s) are

examined on the morning of each working day by an air quality officer to check for spurious or unusual readings, allowing for the identification of anomalies or instrument faults, so they can be investigated and dealt with promptly.

An air quality officer carries out routine site visits every 30 days in accordance with a documented procedure, during which routine maintenance is carried out including the changing of all sample inlet filters. Zero and span calibration checks, and gas cylinder pressures checks are also made. Any faults identified are either rectified at the time of the visit or are reported immediately to the instrument supplier service department to arrange an engineer call out.

Sefton Council has a maintenance contract currently with Horiba UK, which includes six monthly servicing intervals and breakdown cover to ensure optimum performance of the analysers throughout the year. External QA/QC audits are carried out at 6 monthly intervals. This work is presently carried out by Ricardo Energy & Environment, who provide a report with recommendations and comments relating to data management as a result of the audit and any necessary action to correct data for long term drift or any other matters which need to be addressed.

Primary data validation (application of calibration factors, screening of data for spurious and unusual measurements) is followed up with a more detailed process known as data ratification, a more rigorous data management procedure involving a critical review of all information relating to a particular dataset, the purpose being to verify, amend or reject as necessary. These methods are given in more detail in DEFRA technical guidance LAQM.TG(22).

DEFRA and the Devolved Administrations have approved a number of different monitoring technologies to be equivalent to the reference method. In some cases, the data must be corrected before they can be used.

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

The type of PM_{10} and $PM_{2.5}$ monitors utilised within Sefton Metropolitan Borough Council did not require the application of a correction factor.

Automatic Monitoring Annualisation

One automatic monitoring site recorded below the acceptable data capture in 2024 for $PM_{2.5}$ and therefore required annualisation. CM4 had a data capture of 35% in 2024. Annualisation was completed using version 1.06 of the ‘Automatic Data Processing Tool’.

Four continuous background monitoring locations within a 50-mile radius were selected to annualise the data:

- Wirral Tranmere;
- Blackpool Marton;
- Warrington; and
- Wigan.

Each location had >85% data capture and therefore could be used for annualisation. Table C.5 presents the annualisation summary, taken from the 'Automatic Data Processing Tool'.

Table C.5 – Automatic $PM_{2.5}$ Annualisation Summary (concentrations presented in $\mu g/m^3$

Background Site	Annual Data Capture (%)	Annual Mean (A_m)	CM4	
			Period Mean (P_m)	Ratio (A_m / P_m)
Wirral Tranmere	99.9	7.0	7.7	0.915
Warrington	93.6	8.2	9.6	0.854
Wigan	98.1	7.5	8.0	0.938
Blackpool Marton	99.9	7.5	7.4	1.020
Average (R_a)			**0.932**	
Raw Data Annual Mean (M)			**8.8**	
Annualised Annual Mean (M x R_a)			**8.2**	

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Sefton Metropolitan Borough Council required distance correction during 2024.

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

Figure D.1 – Map of Non-Automatic Monitoring Site – CM2 Crosby Road North

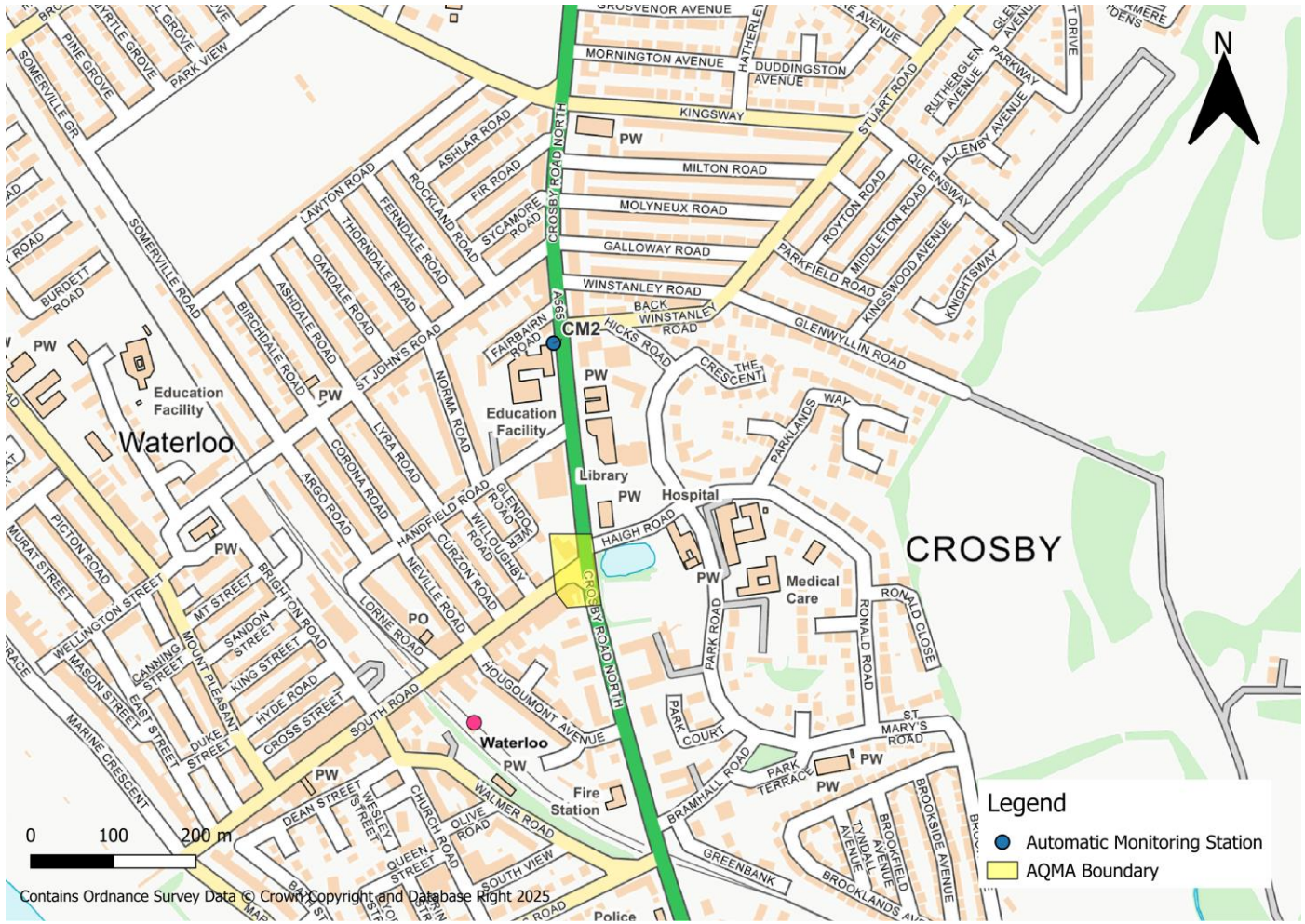


Figure D.2 – Map of Non-Automatic Monitoring Site – CM3 – Millers Bridge, Bootle

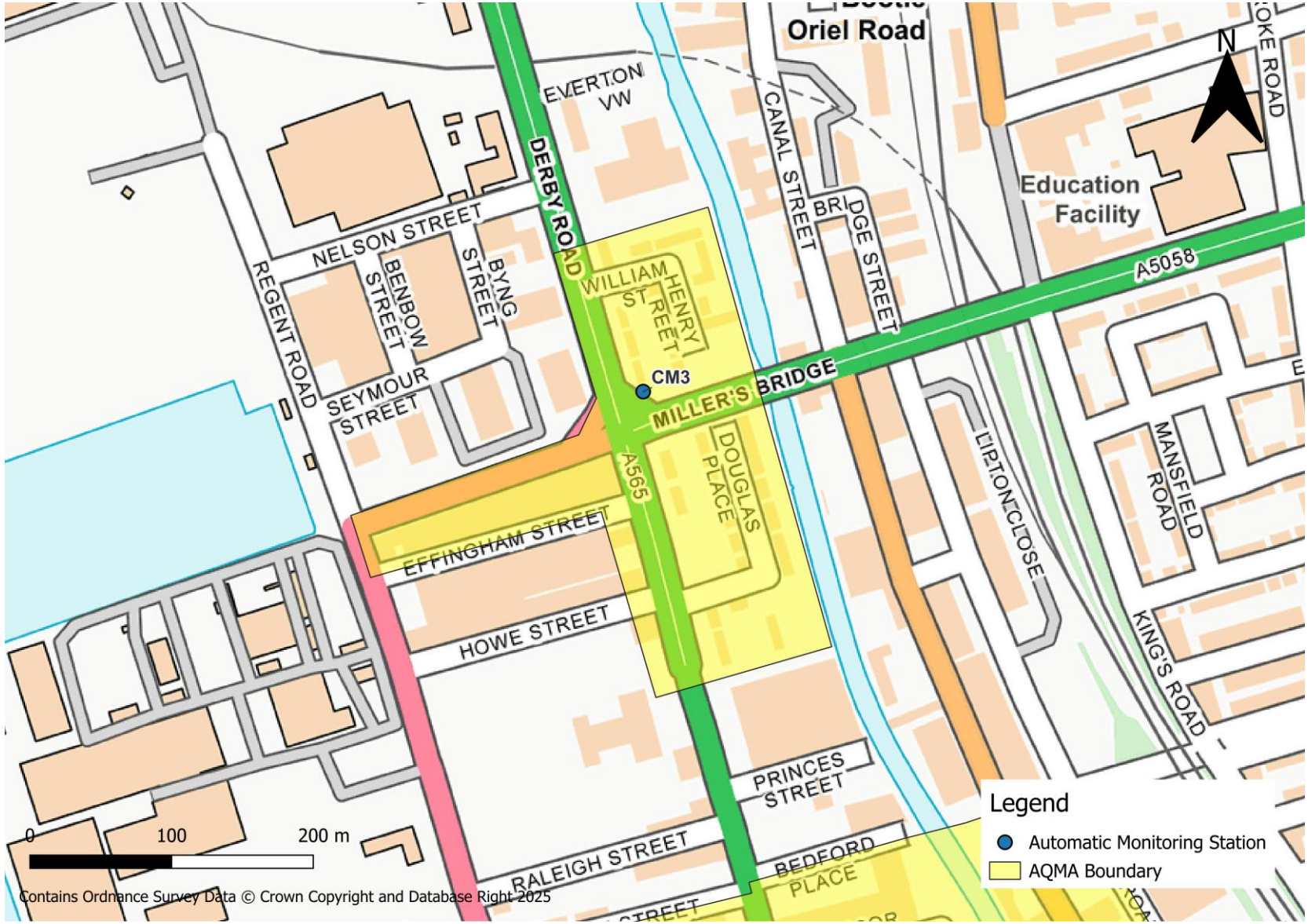


Figure D.3 – Map of Non-Automatic Monitoring Site - CM4 – Lathom Close, Princess Way, Seaforth

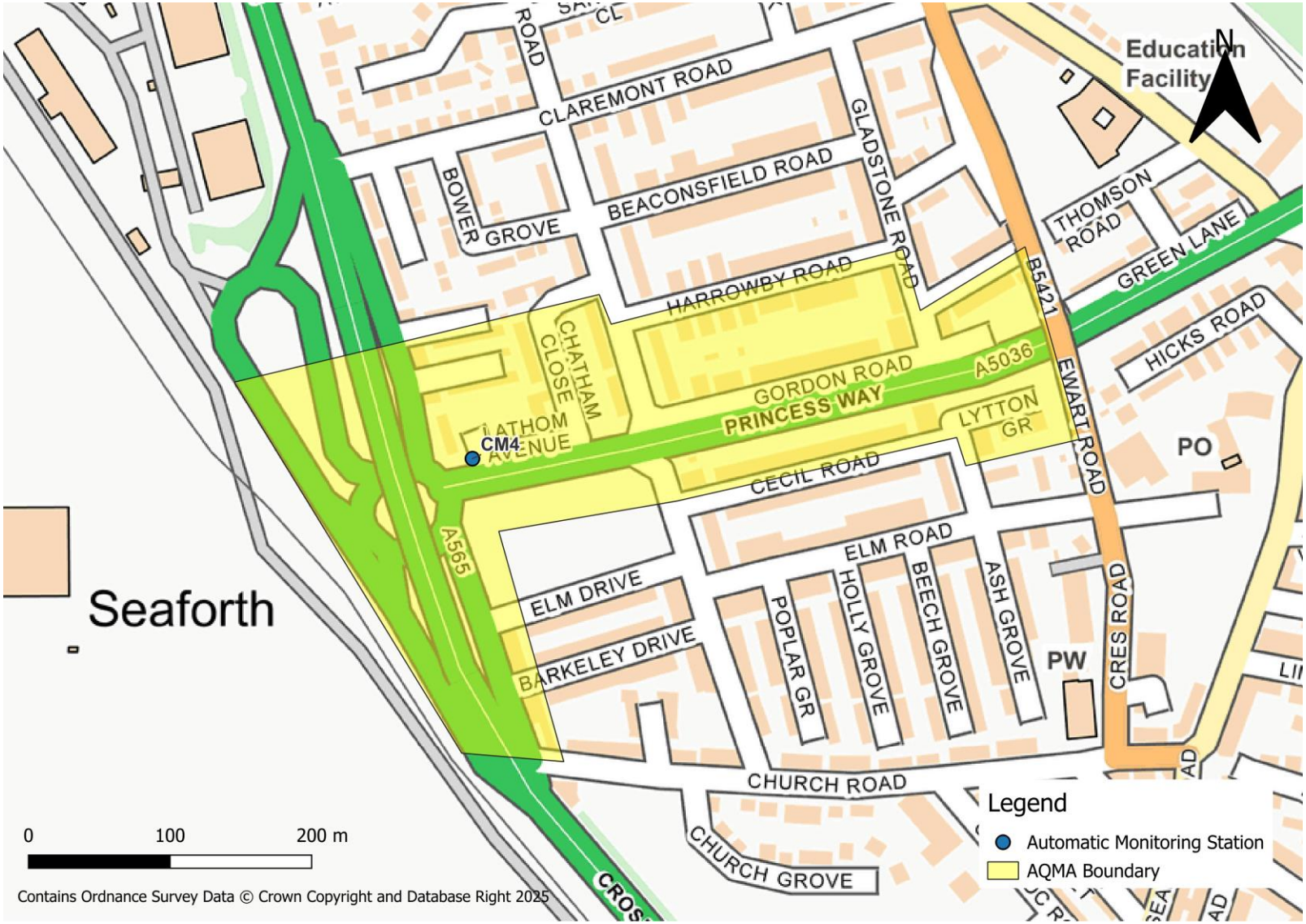


Figure D.4 – Map of Non-Automatic Monitoring Site - CM5 – Hawthorne Road, Litherland

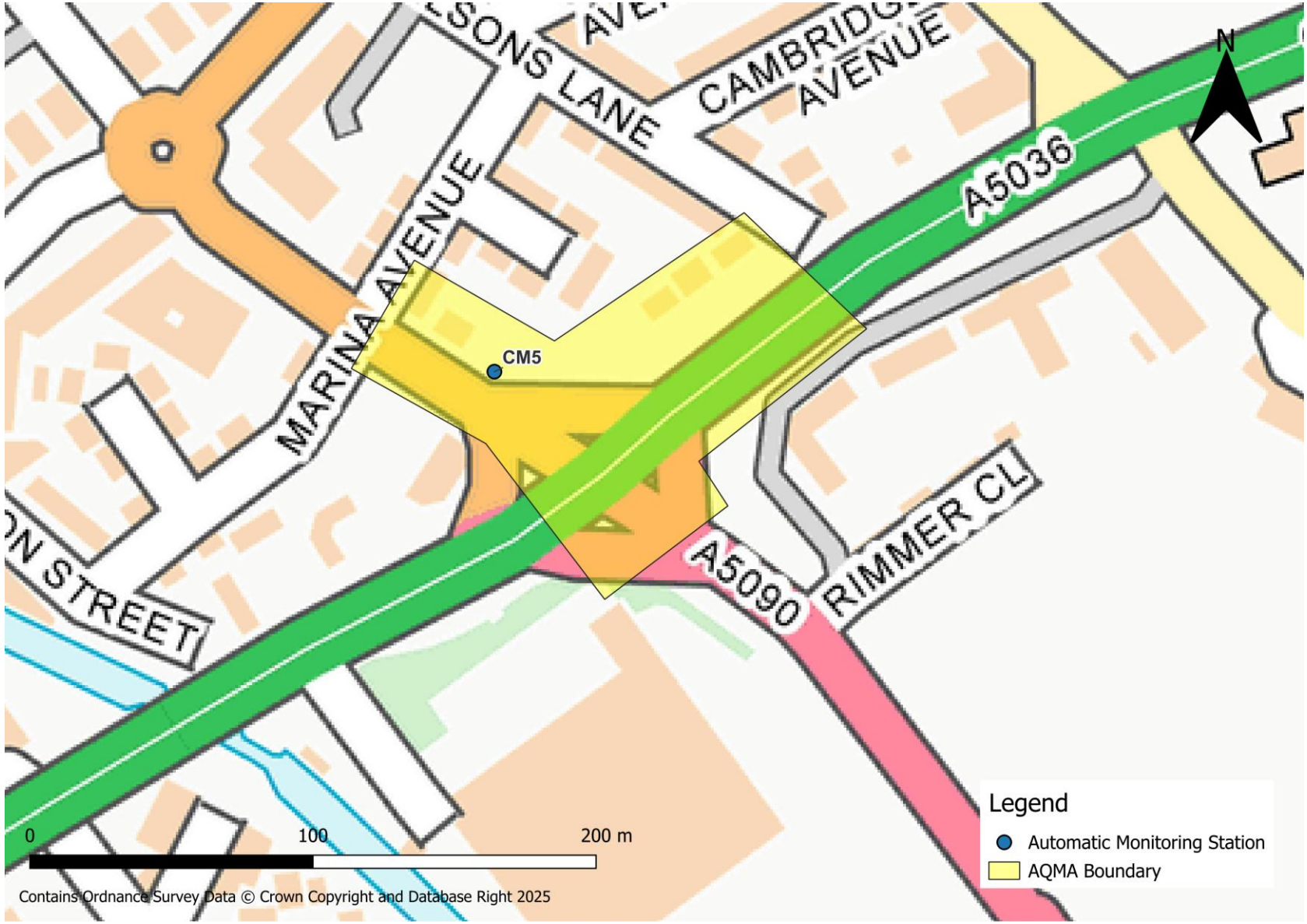


Figure D.5 – Map of Non-Automatic Monitoring Site - CM7 – Regent Road

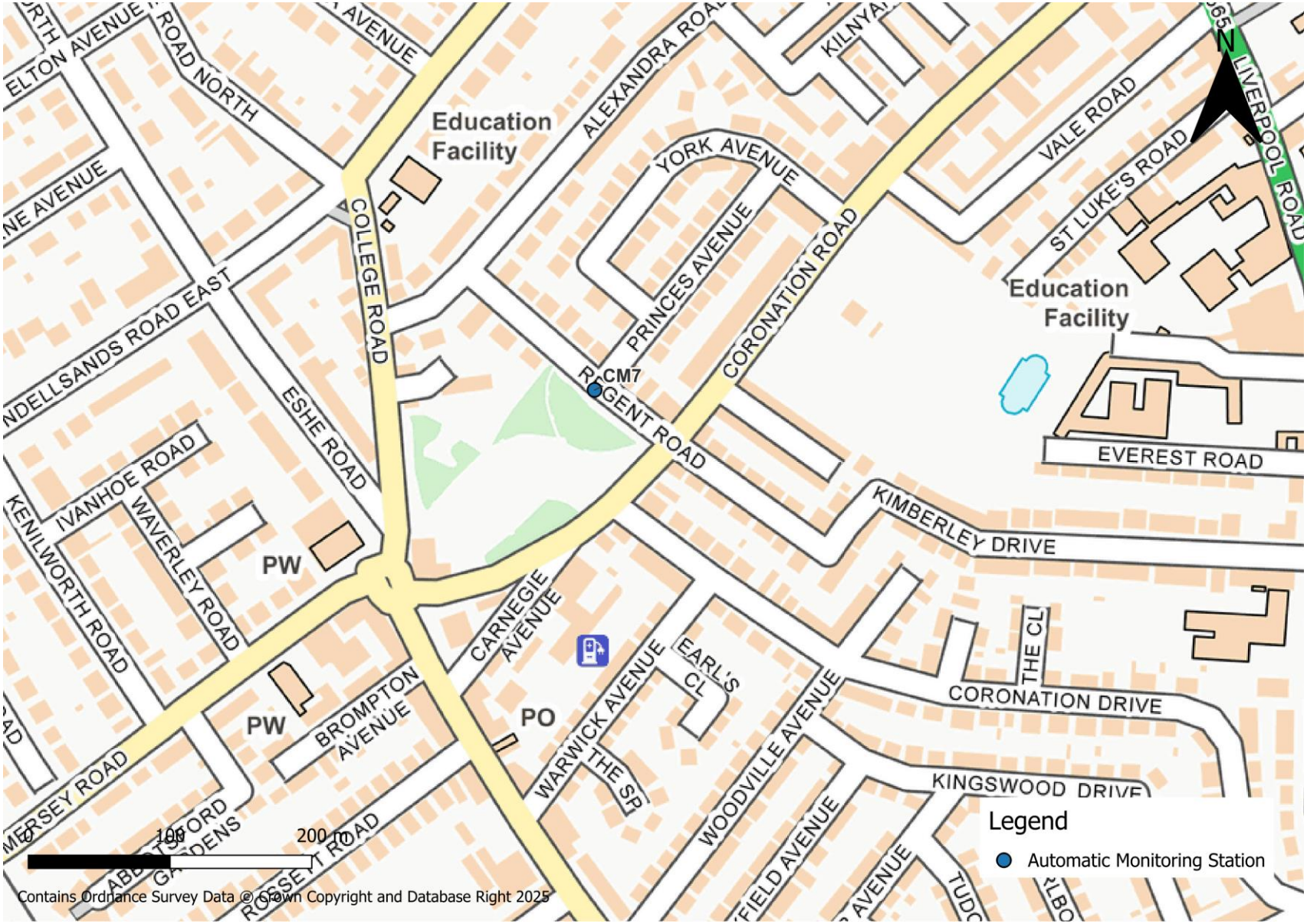


Figure D.6 – Map of Non-Automatic Monitoring Sites within and around AQMA 2

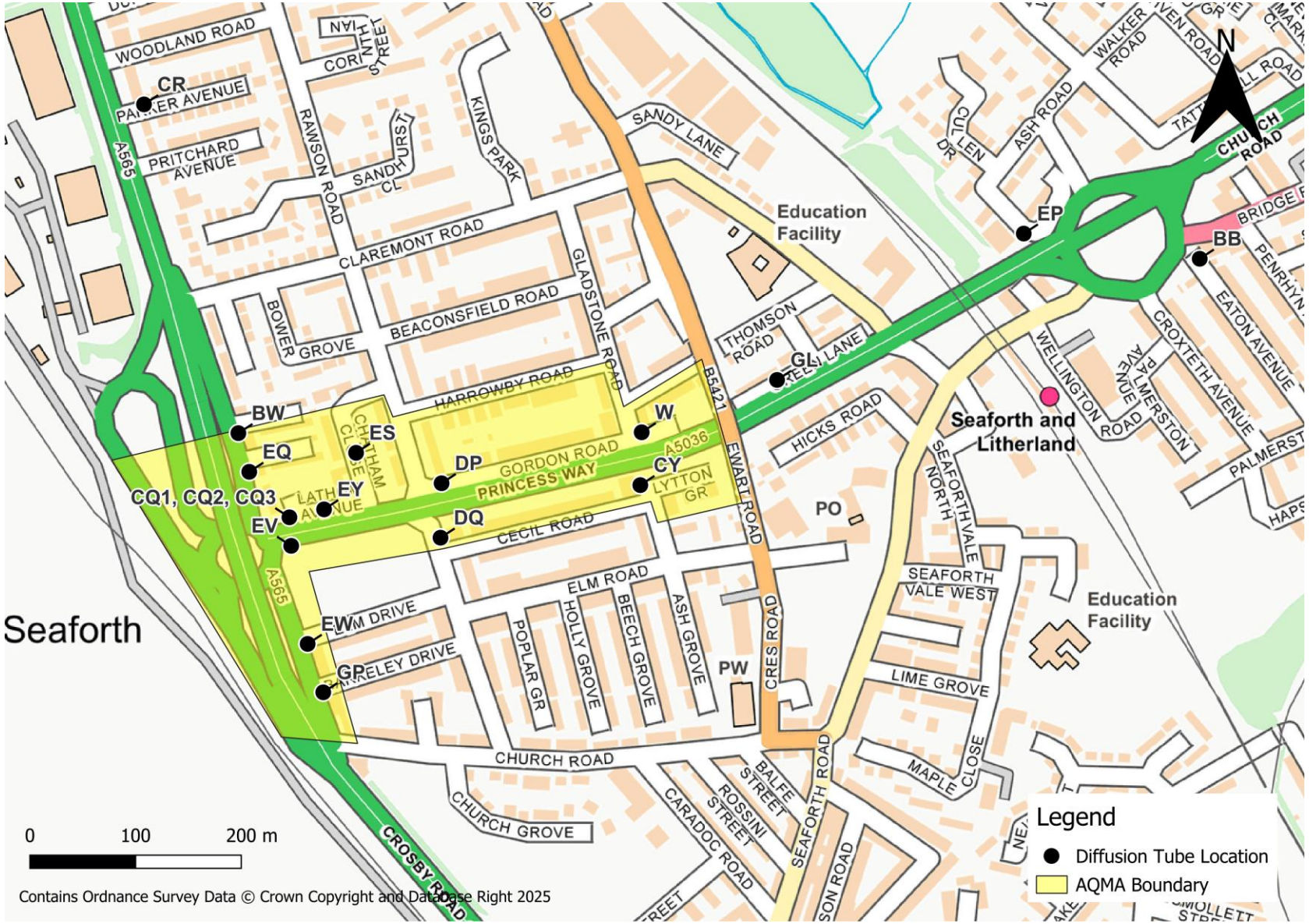


Figure D.7 – Map of Non-Automatic Monitoring Sites within and around AQMA 3

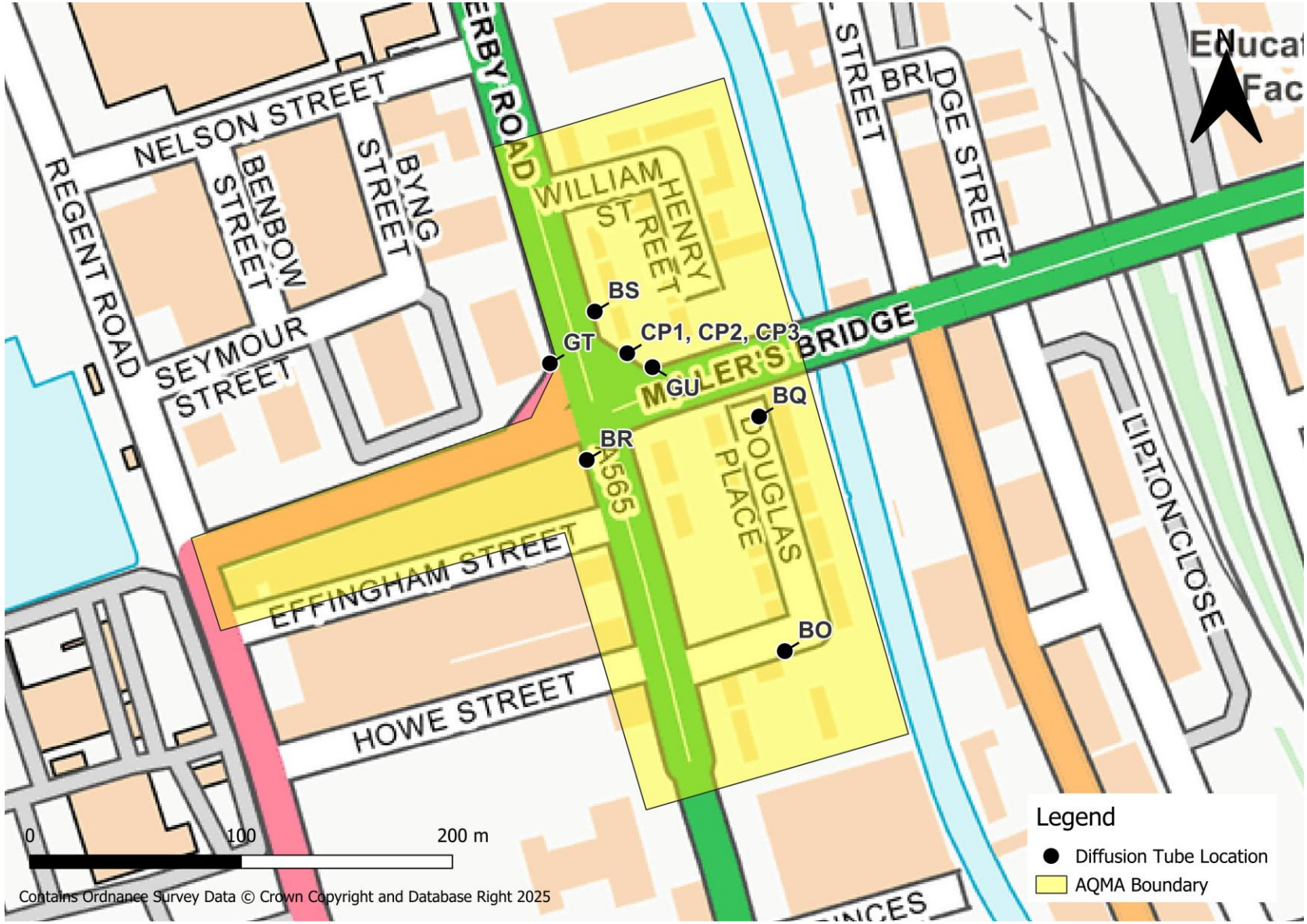


Figure D.8 – Map of Non-Automatic Monitoring Sites within and around AQMA 4

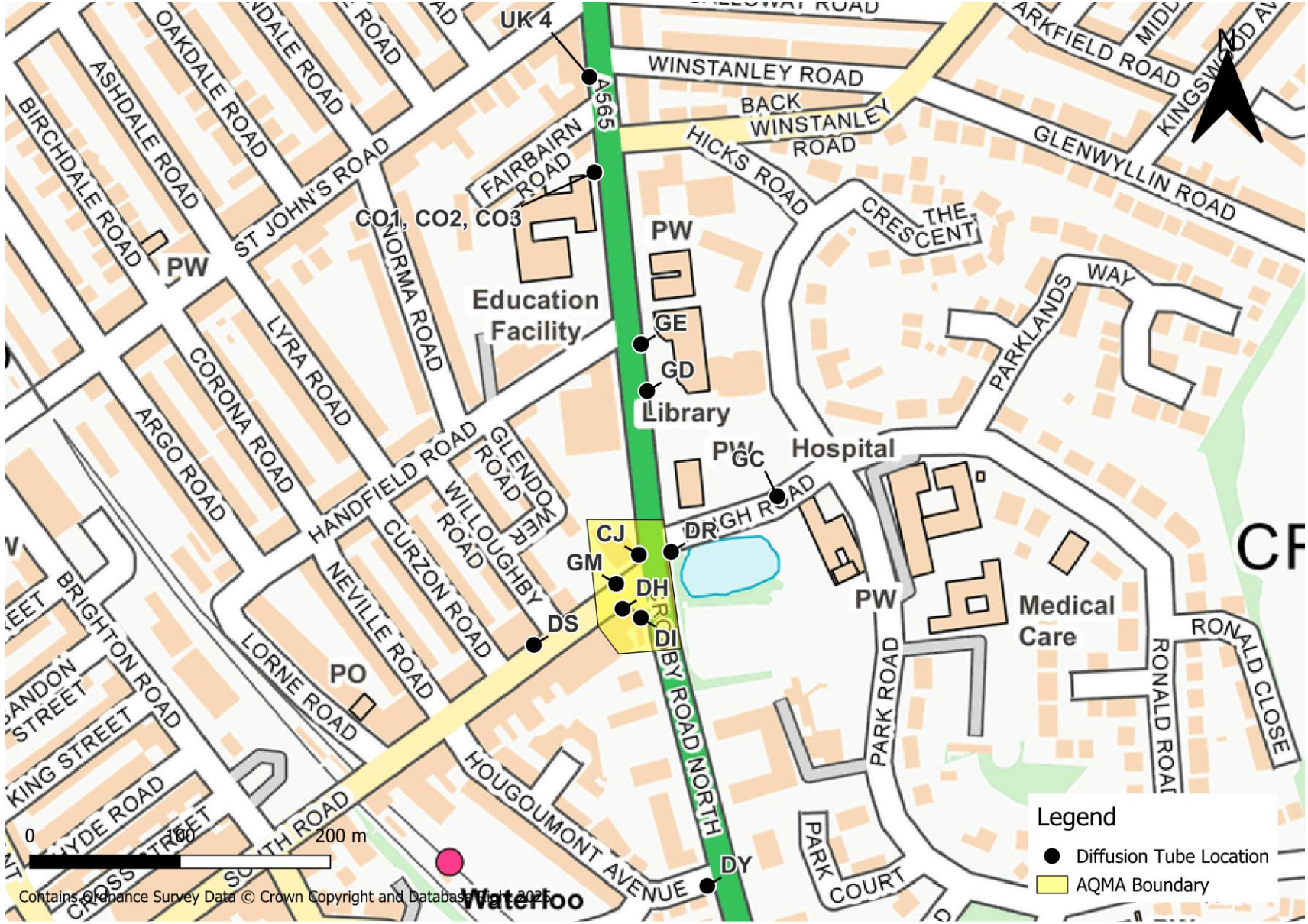


Figure D.9 – Map of Non-Automatic Monitoring Sites within and around AQMA 5

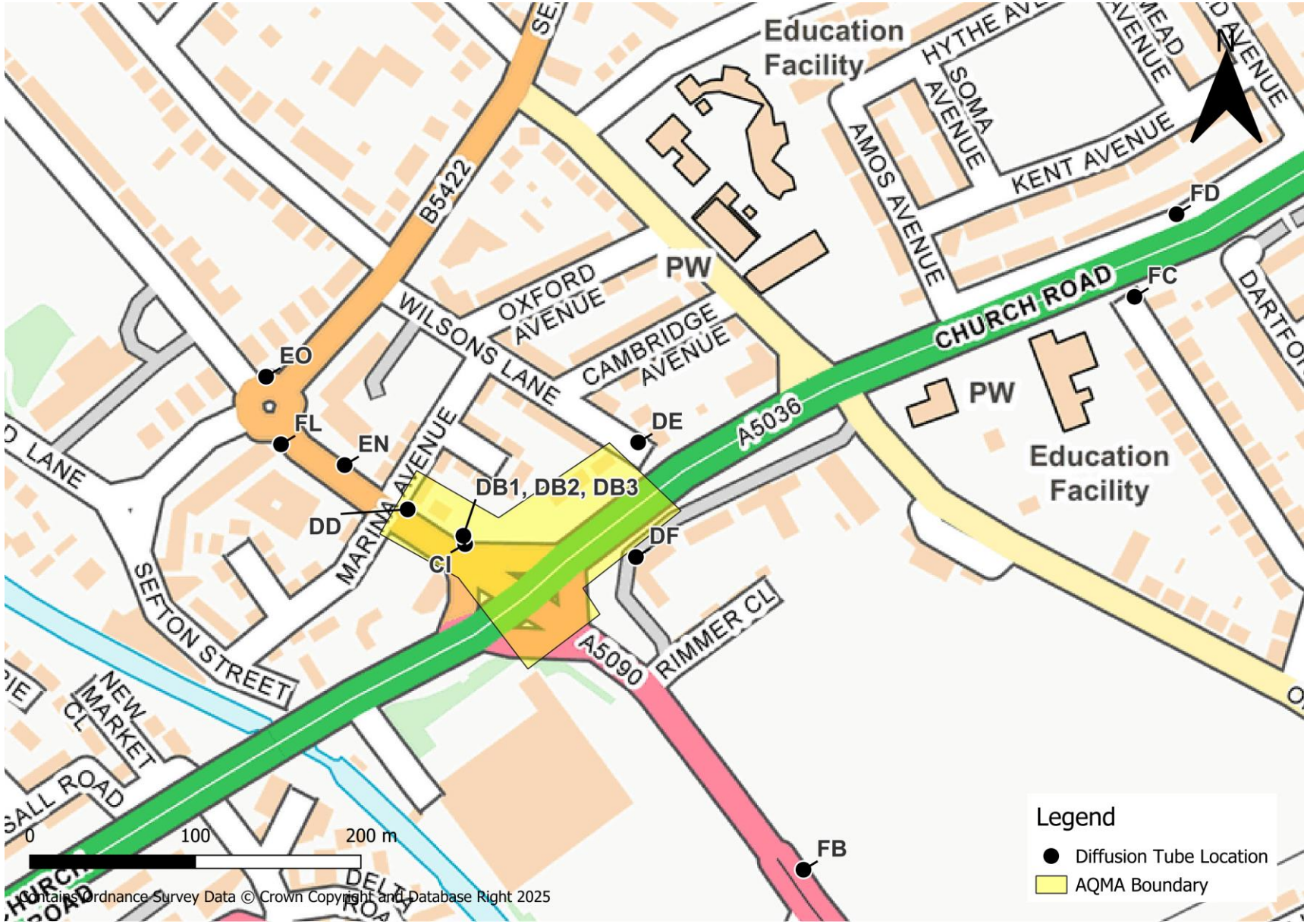


Figure D.10 – Map(s) of Non-Automatic Monitoring Sites within Bootle

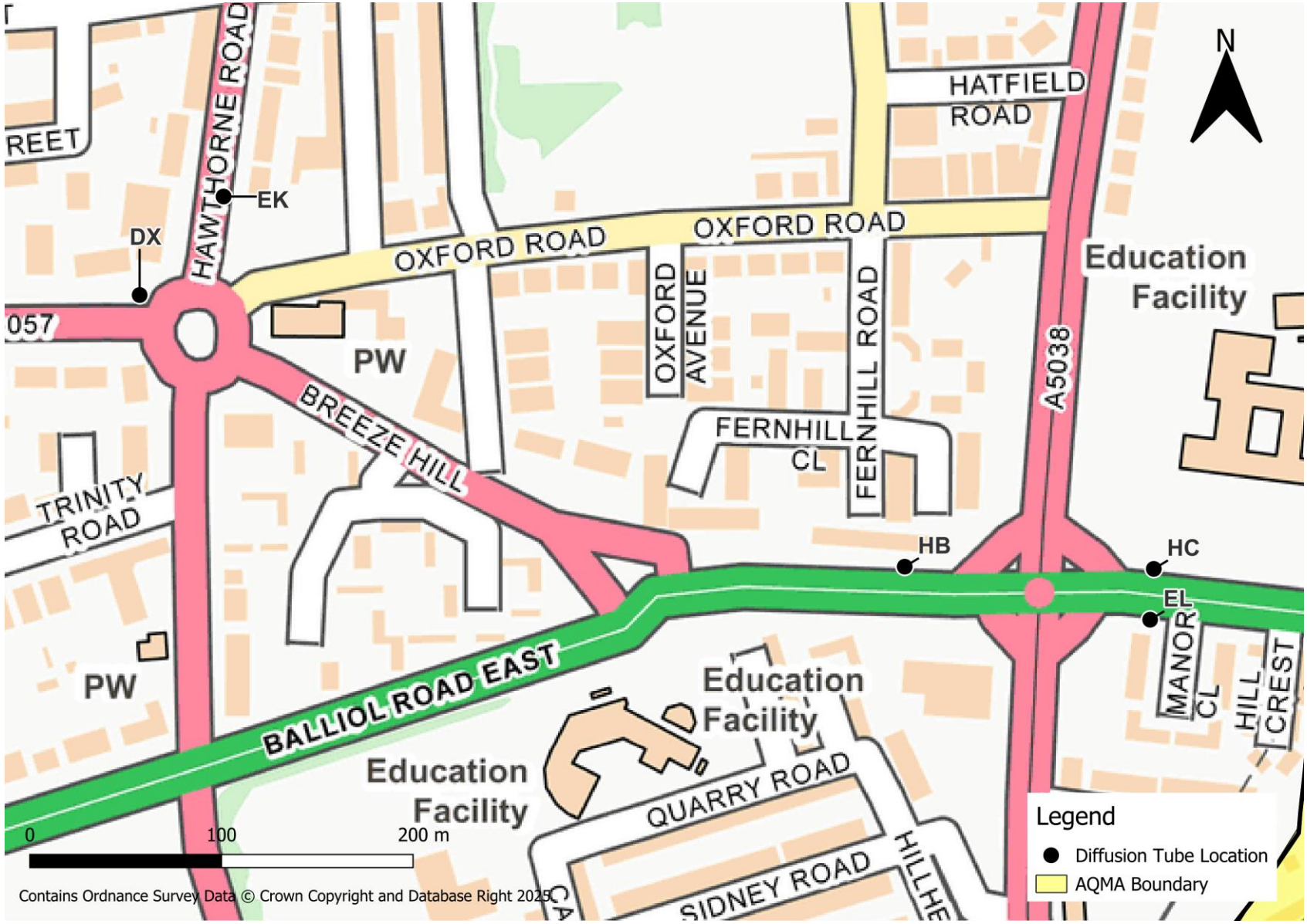


Figure D.11 – Non-Automatic Monitoring Sites within Bootle – DC, DO and GO

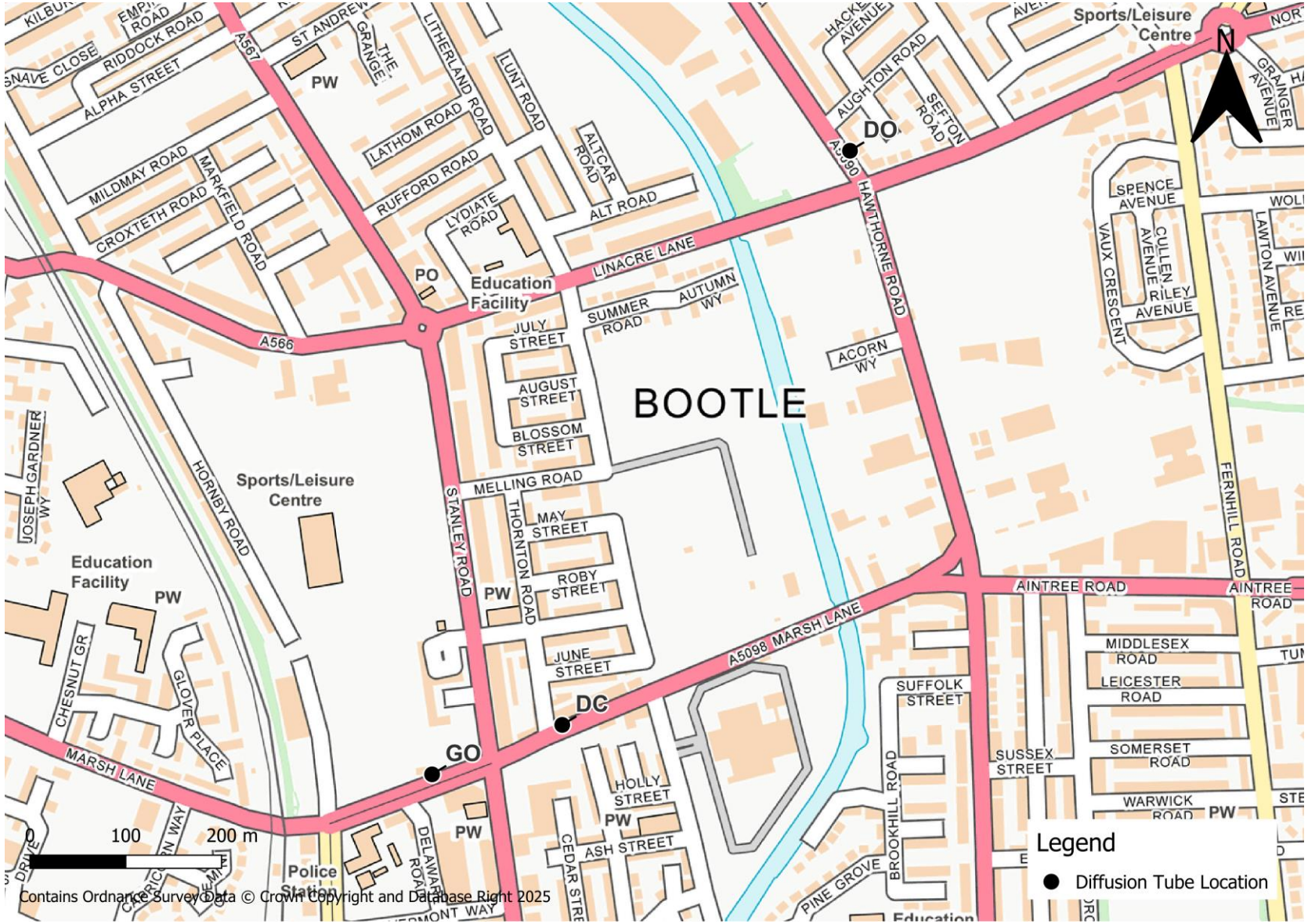


Figure D.12 - Non-Automatic Monitoring Sites within Bootle – GG, GH and FI

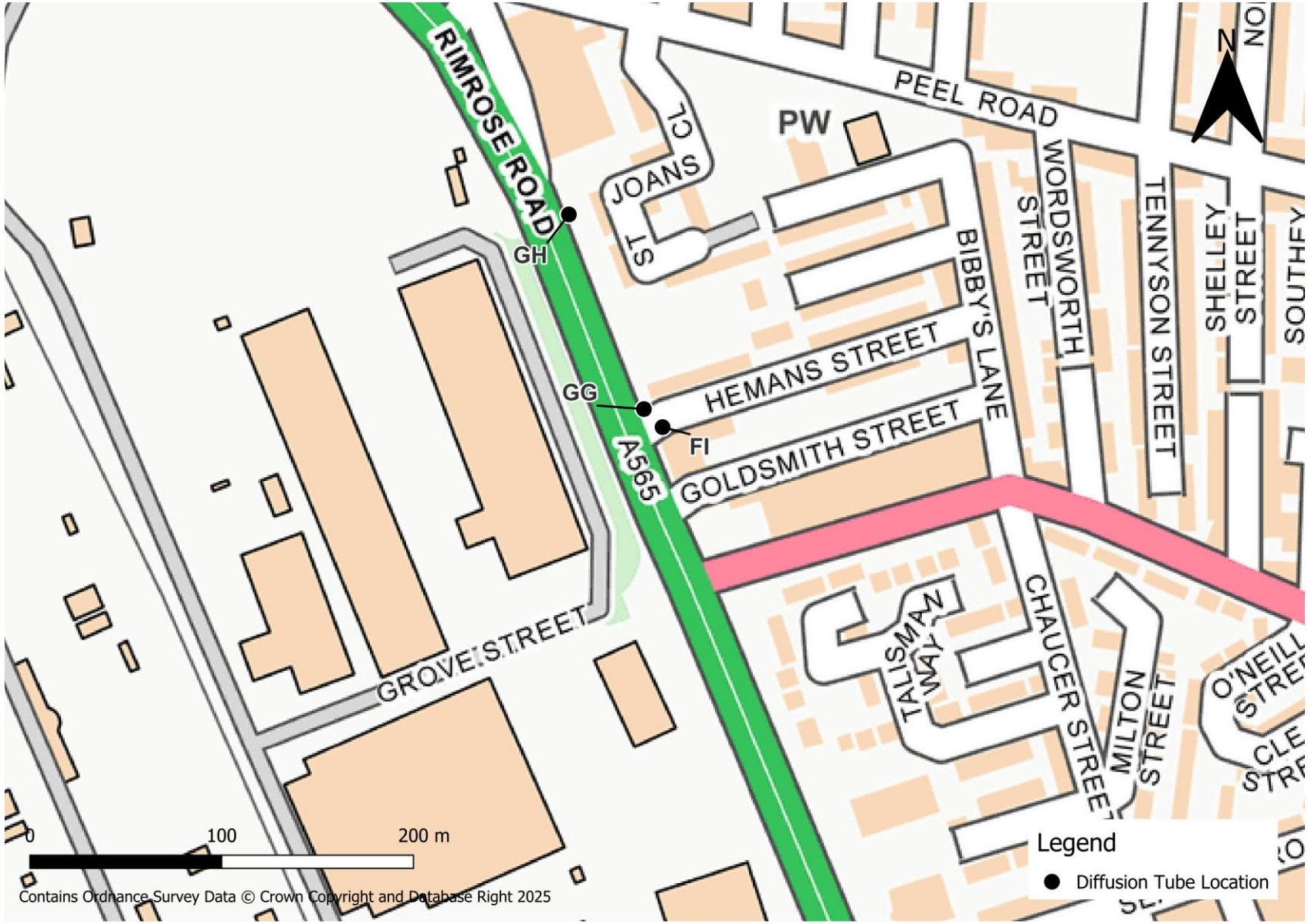


Figure D.13 – Map of Non-Automatic Monitoring Sites within Maghull

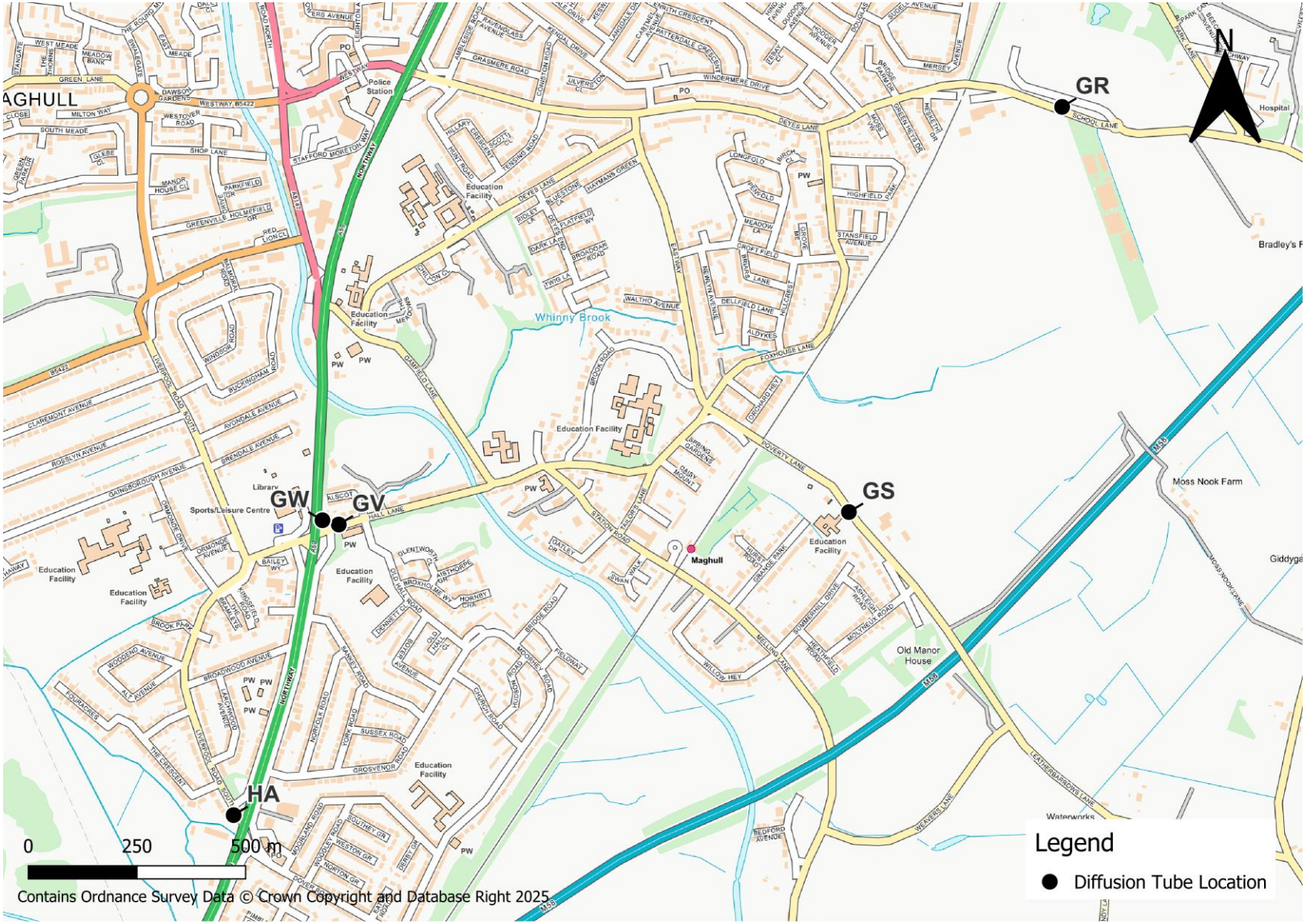


Figure D.14 – Map of Non-Automatic Monitoring Sites within Netherton

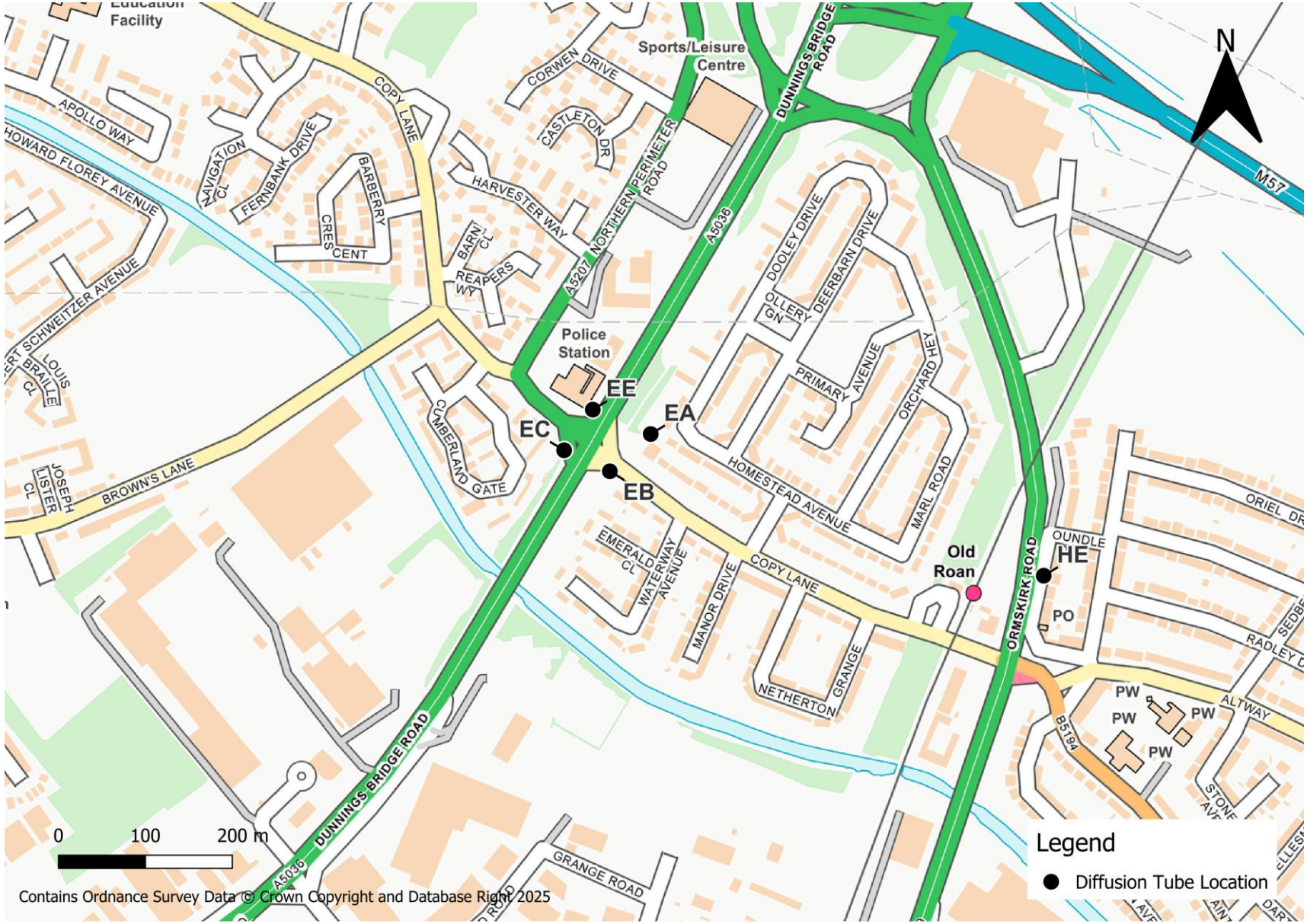


Figure D.15 – Map of Non-Automatic Monitoring Sites within Formby

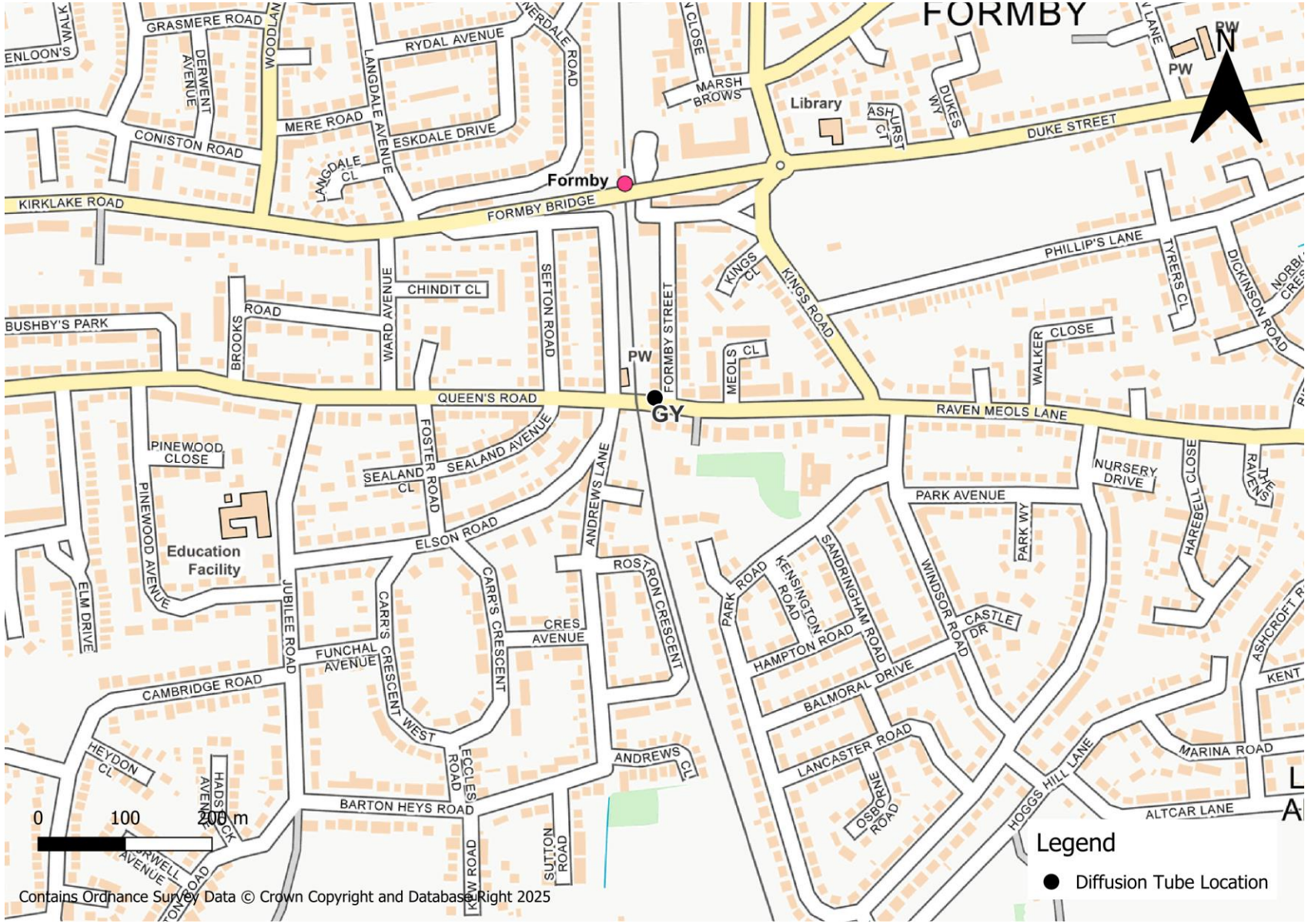


Figure D.16 – Map of Non-Automatic Monitoring Sites within Orrell

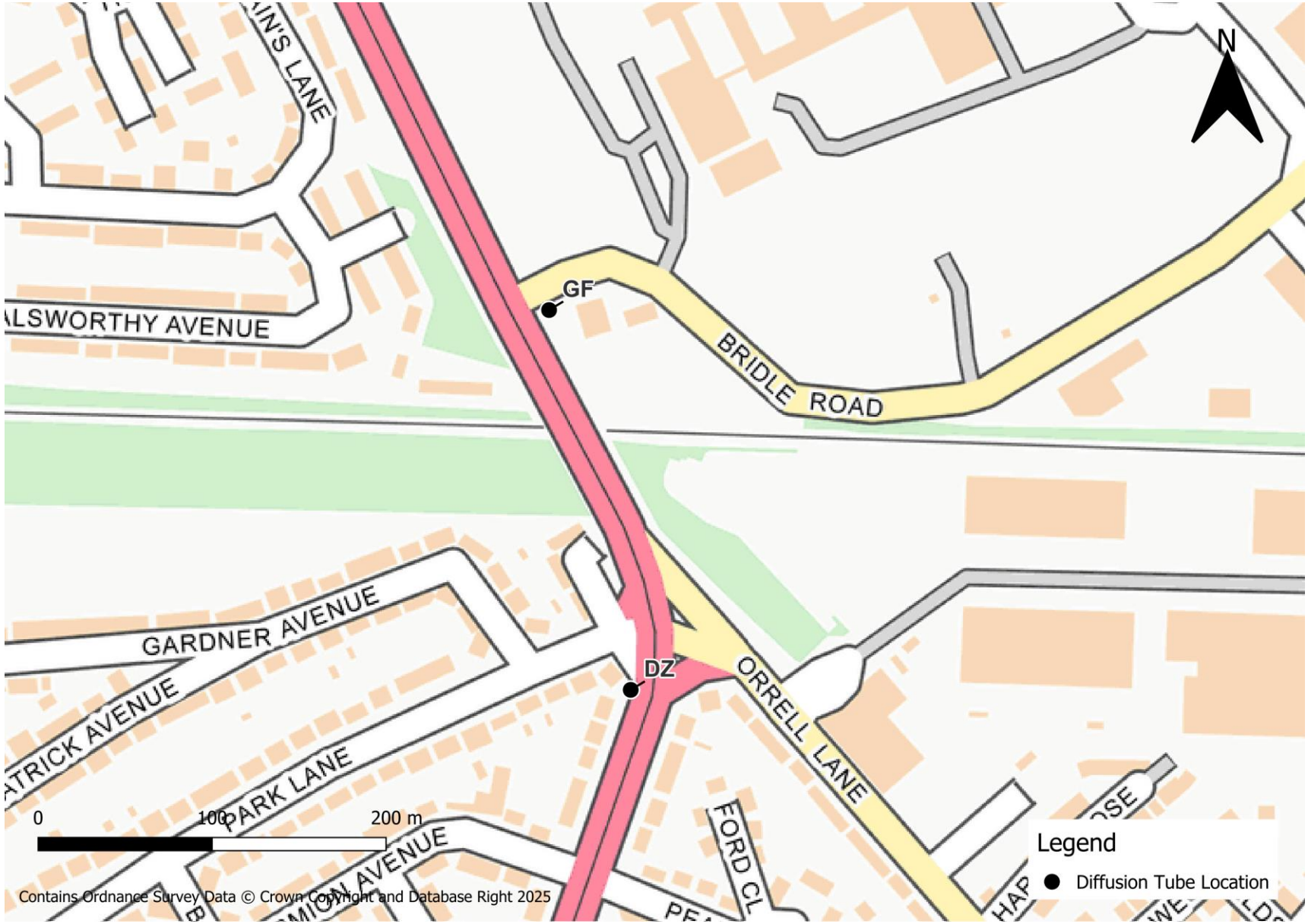


Figure D.17 – Map of Non-Automatic Monitoring Sites within Litherland

Figure D.18 – Map of Non-Automatic Monitoring Sites within Southport

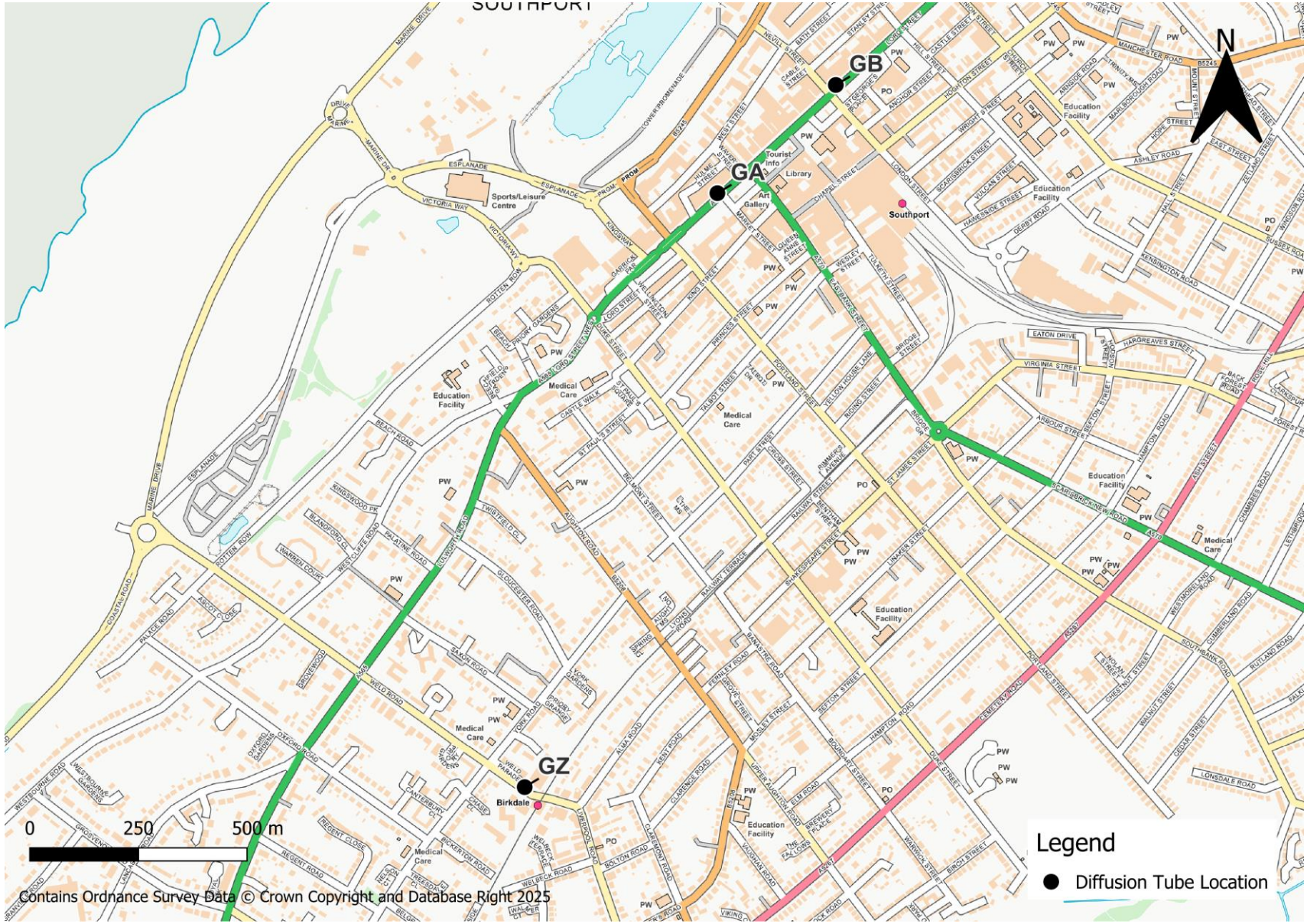


Figure D.19 – Map of Non-Automatic Monitoring Sites within Blundellsands

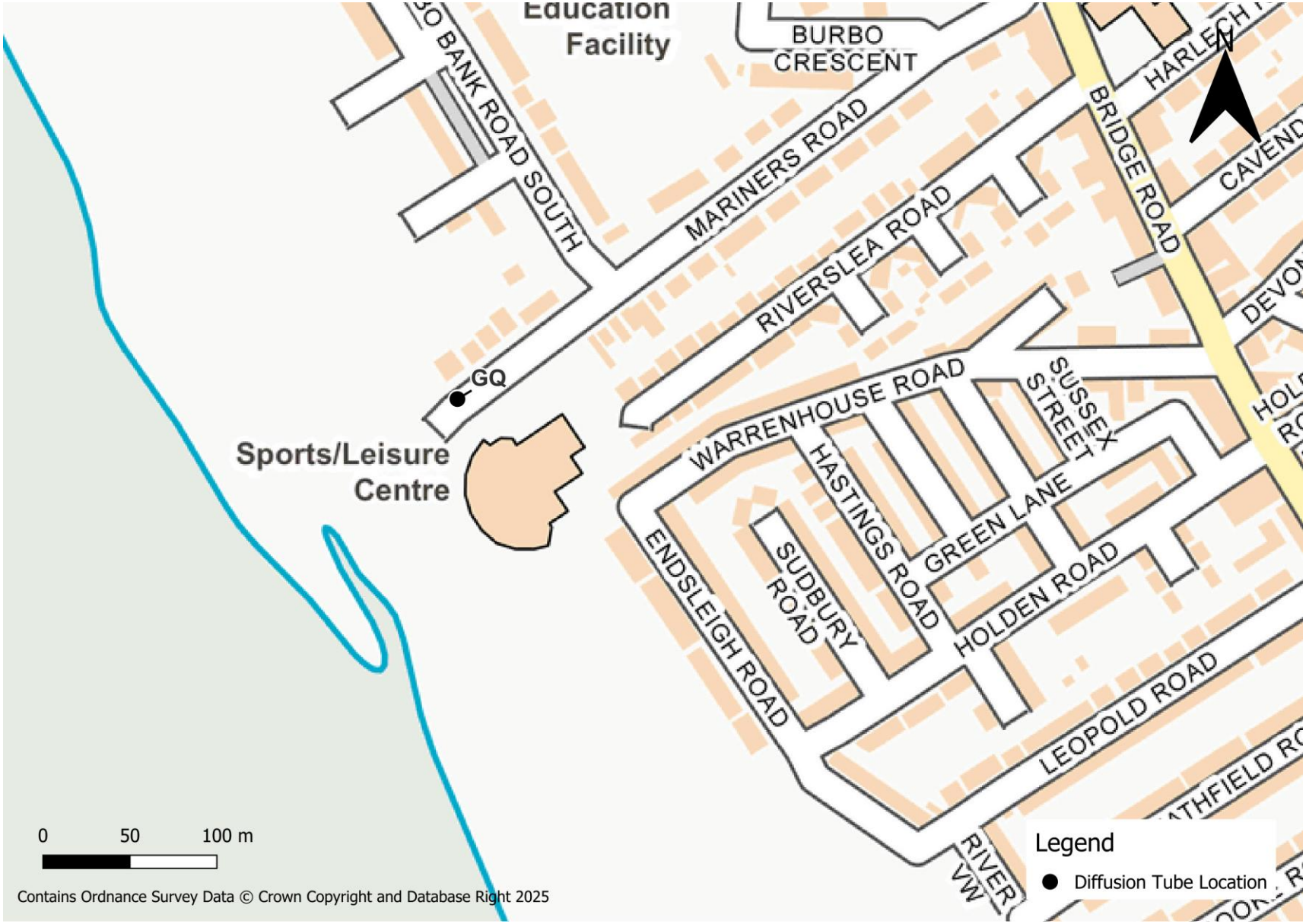


Figure D.20 – Map of Non-Automatic Monitoring Sites within Aintree

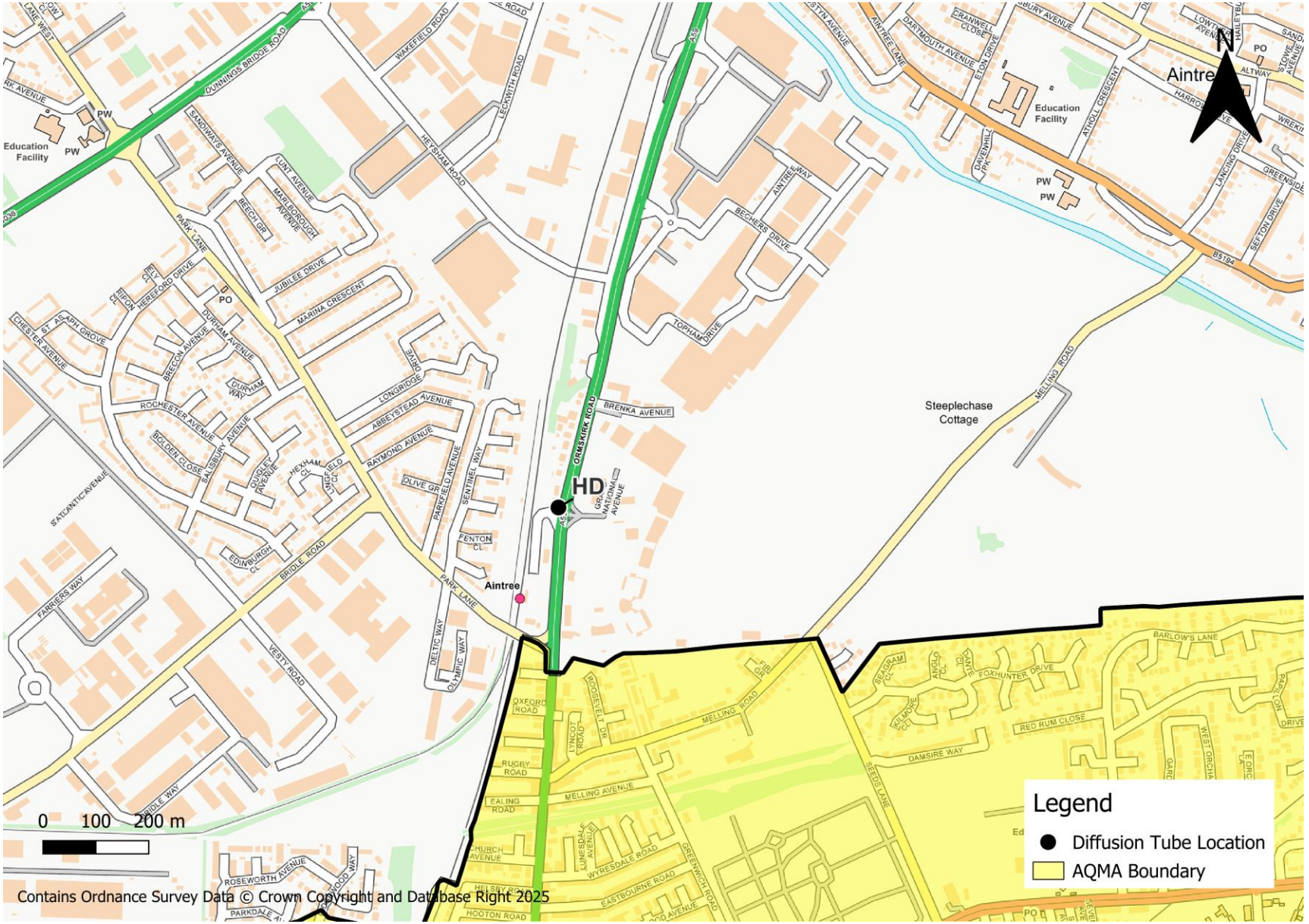


Figure D.21 – Map of Non-Automatic Monitoring Sites within Thornton

Figure D.22 – Map of Non-Automatic Monitoring Sites within Crosby

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
CAZ	Clean Air Z
CDRC	Consumer Data Research Centre
CEMP	Construction Environmental Management Plan
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
LGV	Light Goods Vehicle
HGV	Heavy Goods Vehicle
IMD	Index of Multiple Deprivation
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
OSC	Overview and Scrutiny Committee
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
PM	Particulate Matter
POLAS	Port of Liverpool Access Scheme
QA/QC	Quality Assurance and Quality Control
SCOOT	Split Cycle and Offset Optimisation Technique
SO_2	Sulphur Dioxide
YSYS	Your Sefton Your Say

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- Sefton's Smoke Control Areas available at: https://www.sefton.gov.uk/environment/pests-pollution-and-food-hygiene/pollution/smoke-control-areas/.
- Sefton's Smoke Control Mapping Tool available at: http://maps.sefton.gov.uk/webmaplayers/?datalayers=Smoke%20Control%20Areas&resolution.
- Sefton planning and appeals - https://www.sefton.gov.uk/planning-building-control/search-and-view-planning-applications-and-appeals/
- Smoke Control Sefton available at: https://smokecontrolsefton.co.uk/.