



# 2025 Air Quality Annual Status Report (ASR)

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

Date: June 2025

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|-------------------------|----------------------------------------------------------------------------------------------|
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| Report Reference Number | ASR 25                                                                                       |
| Date                    | June 2025                                                                                    |

## Local Responsibilities and Commitment

This ASR was prepared by the Communities and Public Protection Service of Cumberland Council with the support of the Directorate of Places Sustainable Growth and Transport.

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



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## Executive Summary: Air Quality in Our Area

### Air Quality in Cumberland

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 <sub>2</sub> )                          | Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.                                                                                                                                                                                                                                                           |
| Sulphur Dioxide (SO <sub>2</sub> )                           | Sulphur dioxide (SO <sub>2</sub> ) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.                                                                                                                                                                                                                                                                        |
| Particulate Matter (PM <sub>10</sub> and PM <sub>2.5</sub> ) | <p>Particulate matter is everything in the air that is not a gas.</p> <p>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.</p> <p>PM<sub>10</sub> refers to particles under 10 micrometres. Fine particulate matter or PM<sub>2.5</sub> are particles under 2.5 micrometres.</p> |

On 1<sup>st</sup> April 2023 Cumberland Council replaced Cumbria County Council and the three local authorities: Carlisle City Council, Allerdale Borough Council and Copeland Borough Council. This report continues the collation of air quality data for the combined former authorities.

Air quality has been monitored in Cumberland as part of the local authority review and assessment process since 1996. In addition to nitrogen dioxide, other pollutants measured include particulate matter (both PM<sub>10</sub> and PM<sub>2.5</sub>) and benzene (measured as part of Defra's Non-Automatic Hydrocarbon Network). These continue to be measured in the former Carlisle City Council area. However, as local authorities are no longer required to report benzene concentrations, we are not reporting these in this Annual Status Report.

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

The Environmental Improvement Plan<sup>1</sup> 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<sub>2.5</sub>), the pollutant of most harmful to human health. The Air Quality Strategy<sup>2</sup> provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

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

Cumberland Council has taken forward a number of measures during the current reporting year, in pursuit of improving local air quality. Key local measures continue to support improvements in local air quality and the City Council continues to work on:

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<sup>1</sup> Defra. Environmental Improvement Plan 2023, January 2023

<sup>2</sup> Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

<sup>3</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- Carlisle Southern Link Road: This will connect Junction 42 of the M6 with the A595 to the west. The route will include new junctions linking existing radial routes into Carlisle and the Garden Village. The 8km route will include bridges over two main railway lines and the Caldew and Petteril rivers, a network of footways and cycleway. This construction work is underway and is scheduled to open to the public in 2025.
- Ongoing work to provide grant funding for home insulation improvement measures and domestic renewable heating options.
- Ongoing schemes to introduce vehicle charging points on council owned land and as part of new private development, including charging provision in all new residential developments.
- Harmonization of existing policies and procedures across Cumberland, to include formal adoption of a Civil Penalty Policy (CPP) for Smoke Control Areas (SCA) across Cumberland and adopting supplementary planning guidance document for Developers and Planners which provides essential information on air quality considerations allowing greater clarity and consistency in the decision making process.

## Conclusions and Priorities

Nitrogen dioxide concentrations were generally lower across Cumberland in 2024 compared to 2023. Of the seventy locations where monitoring took place in 2023 and 2024, NO<sub>2</sub> concentrations decreased at forty-six sites and increased at twenty-four. There continues to be no exceedance of the annual objective concentration for NO<sub>2</sub> at locations relevant for human exposure anywhere in Cumberland.

Air Quality Management Areas AQMA 1, AQMA 2 and AQMA 5 were officially revoked in June 2025. Within AQMA 4, NO<sub>2</sub> levels in 2024 dropped to their lowest recorded level 30.9 µg/m<sup>3</sup>, down from 34.1 µg/m<sup>3</sup> in 2023.

Monitoring should continue to ensure the ongoing measures in the AQAP are achieving success.

Cumberland Council's priorities for the coming year are:

- Drive forward on actions identified in the Action Plan.
- Continue to progress development of the Carlisle Southern Link Road

- Promote travel plans and introduction of green spaces for all new housing developments. Continue to work with businesses to promote more widespread use of alternative transport.
- Improve the vehicle charging infrastructure.
- Encourage zero and near zero emission vehicle uptake as part of new residential development.
- Continue to update and progress policy and procedural updates around matters of air quality and associated regulations, to ensure harmonisation of services across Cumberland.

## How to get Involved

There are a number of ways in which the public can get involved with improving air quality:

- Taking part in Green Travel Plan arrangements with their employer.
- Joining local cycle groups and walk to school/work groups.
- The use of sustainable transport options including cycling, walking and the bus.
- Investigate how to improve the energy efficiency at home, including sustainable heating and improved home insulation. Contact Cumberland Council to find out what grants are currently available.
- Consider the available options in relation to zero and near zero emission vehicles.
- Taking part in High Public Interest Permit (HPI) Applications, that fall within the Environmental Permitting Regulations (England & Wales) 2016 (EPR) on Local Authority applications submitted in relation to Part A2 and Schedule 13 SWIP applications, in order to raise evidence-based concerns.

Cumberland Council's website can be used to view all previous air quality review and assessment reports as well as real time monitoring data and advice on how to reduce emissions to air.

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# 1 Local Air Quality Management

This report provides an overview of air quality in Cumberland 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 Cumberland 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 (AQMA) 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 AQMA declared by Cumberland Council can be found in Table 2.1.

AQMA1, AQMA 2 and AQMA 5 were revoked on 9<sup>th</sup> June 2025

The table presents a description of the single AQMA that is currently designated within Cumberland Council. Appendix D: Map(s) of Monitoring Locations and AQMA provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA.

The air quality objectives pertinent to the current AQMA designation are as follows:

- NO<sub>2</sub> annual 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 1    | 02/12/2005 Amended 25 <sup>th</sup> July 2019 Revoked 9 <sup>th</sup> June 2025 | NO <sub>2</sub> Annual Mean           | AQMA 1 Amended 25 <sup>th</sup> July 2019 to include just 100 m Section along B6264 Brampton Road.                                | N/A                                                                            | 45.3                             | 24.2                              | 12                                                   | Cumberland Council Air Quality Action Plan | <a href="https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d">https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d</a> |
| AQMA 2    | 26/01/2007 Revoked 9 <sup>th</sup> June 2025                                    | NO <sub>2</sub> Annual Mean           | AQMA 2 Currock Street and the properties immediately to the west of it, between the junction with James St/Water St and Crown St. | N/A                                                                            | 44.6                             | 28.8                              | 14                                                   | Cumberland Council Air Quality Action Plan | <a href="https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d">https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d</a> |
| AQMA 3    | 01/08/2008 Revoked 3 <sup>rd</sup> July 2019                                    | NO <sub>2</sub> Annual Mean           | AQMA 3 Wigton Road between Crummock Street and Caldewgate roundabout as well as properties on Caldcotes.                          | N/A                                                                            | 40                               | N/A                               | N/A                                                  | N/A                                        | N/A                                                                                                                                                                                                                                                             |
| AQMA 4    | 01/08/2008                                                                      | NO <sub>2</sub> Annual Mean           | AQMA 4 North side of the A595 at Bridge Street, northbound from the junction with Shaddongate.                                    | YES                                                                            | 43.9                             | 30.9                              | 5                                                    | Cumberland Council Air Quality Action Plan | <a href="https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d">https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d</a> |
| AQMA 5    | 01/08/2008 Revoked 9 <sup>th</sup> June 2025                                    | NO <sub>2</sub> Annual Mean           | AQMA 5 Junction of Dalston Road and Junction Street                                                                               | N/A                                                                            | 48                               | 27.1                              | 9                                                    | Cumberland Council Air Quality Action Plan | <a href="https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d">https://www.carlisle.gov.uk/Portals/0/Documents/Residents/Environment/AQAP_CCC_2021.pdf?ver=MTwIH1-2grJugOerj9V9rQ%3d%3d</a> |
| AQMA 6    | 01/08/2008 Revoked 3 <sup>rd</sup> July 2019                                    | NO <sub>2</sub> Annual Mean           | AQMA 6 London Road and properties on either side near the junction with Blake Street                                              | N/A                                                                            | 43.3                             | N/A                               | N/A                                                  | N/A                                        | N/A                                                                                                                                                                                                                                                             |

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

☒ Cumberland Council confirm that all current AQAPs have been submitted to Defra.

## 2.2 Progress and Impact of Measures to address Air Quality in Cumberland Council

Defra's appraisal of last year's ASR concluded that the report was well structured, detailed, and provides the information specified in the Guidance. The following comments were made to help inform future reports and were appropriate a response is provided:

1. *The Council have stated their intentions to revoke AQMAs 1, 2 and 5 due to continuous compliance with the relevant AQOs, setting this as a priority for the coming year. This is supported and in line with LAQM Technical Guidance. Progress on the status of this is expected in next year's report.*

**Response:** The AQMAs were revoked on 9<sup>th</sup> June 2025

2. *Cumberland Council should be reminded that the UK Air Defra website still states that the AQMAs are listed under the Carlisle City Council local authority and should update this in the future.*

**Response:** An action to do this has started.

3. Good QA/QC has been applied to both the Diffusion Tube and Automatic monitoring data clearly stating adjustment factors, calculation methods (if applicable) and their sources. Justification of the chosen adjustment factor has also been stated clearly. However, to add further clarification to future reports the following is recommended:
  - a. It is visible from screenshots of the National Bias Adjustment Factor Calculations Spreadsheet, but it would be good to specify in text which Socotec lab was used (Didcot or Glasgow).
  - b. It is good practice to use the latest version of the National Bias Adjustment Factor Calculations Spreadsheet (Version 09/24) before submission of an ASR. Version 09/24 produced the same bias adjustment factors as 03/24 for 2023 at each lab so there is no impact on the reported monitoring data for this year's ASR.
  - c. The automatic monitoring Carlisle Morton was used in the annualization of this year's monitoring data, which is an urban traffic site. LAQM.TG22 states the following "*continuous monitoring sites used for comparison, where available, should be background (Urban Background, Suburban or Rural) sites to avoid*

*any very local effects that may occur at Urban Centre, Industrial, Roadside or Kerbside sites.”*

**Response:** For the annualisation required for this year, the Carlisle Morton A595 site (roadside) has been replaced by Sunderland Silksworth urban background site.

4. The Council has provided a detailed list of measures to improve air quality, including funding status and progress to date. However, the reductions in emissions from measures have been marked as not calculated, it is recommended that the council qualitatively explains how the measure reduces emissions in this section, i.e. reduced congestion, promotion of air quality awareness, increase in sustainable transport.

**Response:** A qualitative explanation will be provided this year.

5. The Council have made reference to the Public Health Outcomes Framework (PHOF) indicator to give additional context for PM<sub>2.5</sub> concentrations which is encouraged. To add further clarity the council could add graphs showing the trend in the PHOF indicator in recent years
6. The Council have stated clearly what has been accomplished over the recent monitoring year and provided detailed clear priorities for the coming year. This is commended and should be continued in future ASRs.
7. Trends in monitoring data are discussed in detail and are specific to key areas within the Council's jurisdiction. It is also clear that the council uses this data to review and update their monitoring network, changing monitoring locations to assess areas of concern. This is encouraging to see.

Cumberland 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. Thirteen measures are included within Table 2.2, with the type of measure and the progress Cumberland 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.

More detail on these measures can be found in the respective Action Plans: 'Cumberland Council Air Quality Action Plan 2021 (Carlisle Area) (Revised October 2023)'.

Key completed measures are:

- Improvements to the signalling on Castle Way and Bridge Street was implemented in August 2022. This change prevents vehicles, including HGV's and buses from leaving the Willowholme industrial estate and then being subsequently stopped at the pedestrian crossing on Bridge Street. This has reduced the number of standing starts at this incline in the road.
- Construction work is underway on the Carlisle Southern Link Road. This is expected to provide a major improvement on traffic volumes and congestion in the city centre. Work will be undertaken to identify any new relevant receptors that may be negatively impacted by the new road, through increased traffic volumes. Additional monitoring may be undertaken when the road is complete and opened for use.

Cumberland Council does not expect any of our measures to be completed over the course of the next reporting year, as many of our measures are ongoing in nature, with no expected completion date. The Carlisle Southern Link Road is scheduled to open to the public in 2025.

Cumberland Council's priorities for the coming year are:

- Drive forward on actions identified in the Action Plan.
- Continue to progress development of the Carlisle Southern Link Road
- Promote travel plans and introduction of green spaces for all new housing developments. Continue to work with businesses to promote more widespread use of alternative transport.
- Improve the vehicle charging infrastructure.
- Increase zero and near zero emission vehicle uptake as part of new residential development.

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

- Highways department
- Planning department
- Green Spaces department

The principal challenges and barriers to implementation that Cumberland Council anticipates facing are funding restrictions and staff resources to implement measures such as public awareness campaigns.

Progress on some measures has been slower than expected due to restrictions in available funding. Some measures such as the Carlisle Southern Link Road are dependent on external organisations and influences such as inflationary pressure and global events.

Cumberland Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in all our AQMA's.

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                                                                                                                                                                                                                                                                          |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------|---------------------------------|------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------|---------------------|---------------------------|---------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | Construction of the new Carlisle Southern Link Road (CSLR). This will extend the existing Carlisle Northern Development Route (CNDR). Monitor the air quality impacts of the CSLR and CNDR. | Traffic Management                      | Other                                         | <2021                           | 2025                               | Cumberland Council                                      | Cumberland Council and Ministry of Housing, Communities and Local Government | No                          | Funding is in place | £150 million              | Building work is underway | Potential for significant improvement in NO2 levels across the city centre.                     | Reduced NO2 levels at monitoring locations and within AQMA's.                                                  | The CNDR is operational. Monitoring at receptors on new road revealed consistently low NO2 levels. There is evidence of NO2 improvements and traffic reduction in the city centre. Several new cycle links from arterial roads are in place. Construction of the Carlisle Southern Link Road is underway. Environmental Health assisted in the consultation process. Delays were incurred due to rising costs and supply issues caused by global events. Expected to be open to the public in 2025. | The new Carlisle Southern Link Road is part of the wider Garden Village housing project, which is expected to deliver 10'000 new homes. The road would extend the existing CNDR. This would provide a complete bypass around the City Centre with both ends of the route connected to the M6 Motorway.         |
| 2           | Effective traffic management measures will be implemented to improve traffic flow on the existing road network and in new developments.                                                     | Traffic Management                      | UTC, Congestion management, traffic reduction | 2012                            | Ongoing.                           | Cumberland Council                                      | Cumberland Council                                                           | No. 2022 funding bid failed | Ongoing.            | Unknown                   | Ongoing                   | Modelling undertaken at AQMA 4 indicates that a 2.7% reduction in NOx would achieve compliance. | Reduced NO2 levels and standing traffic within AQMA's.                                                         | Traffic modelling has shown that emissions from diesel vehicles dominate emissions. Emissions factor toolkit has been used to show increased traffic speeds would reduce oxide of nitrogen emissions within Bridge Street AQMA. Work has been carried out to the traffic light sequence in this area to reduce standing start traffic. The latest monitoring data indicates a significant improvement in NO2 levels within the AQMA which are now below the objective level.                        | Improvements to the signalling on Castle Way and Bridge Street was implemented in August 2022. Early monitoring data shows significant improvement in AQMA 4. A funding bid to make wider improvements to traffic management around Bridge St AQMA including automatic NOx measurements was rejected by Defra. |
| 3           | Environmental Health will work alongside the Planning Department to minimise the air quality impacts of new developments.                                                                   | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance      | 2012                            | Ongoing                            | Cumberland Council                                      | Cumberland Council                                                           | No                          | Ongoing.            | Unknown                   | Ongoing.                  | Minimise any negative air quality impacts of new developments                                   | Effective links between EH and Planning. AQIA's submitted where necessary. Early consultation with applicants. | Environmental Health is consulted on all proposed developments which may impact on air quality. Responses are aimed at minimising AQ impacts, particularly within or close to our AQMA's. This includes large residential developments. Recommendations are made for car charging points for all new residential properties.                                                                                                                                                                        | Environmental Health comment on all potentially polluting developments. The outcome depends on Planning Department and current policy                                                                                                                                                                          |
| 4           | Improvements to passenger transport infrastructure. Sustainable transport will be integrated into major new developments                                                                    | Transport Planning and Infrastructure   | Bus route improvements                        | 2012                            | Ongoing                            | Cumberland Council and local public transport providers | Cumberland Council and local public transport providers                      | No                          | Ongoing.            | Unknown                   | Ongoing.                  | Improve sustainable transport                                                                   | Improved bus service. Increased use of transport provided. Reduced NO2 along main routes                       | Ongoing improvements to bus services with new shelters and raised kerbs. Plans for large new housing developments include public transport provision and/or sustainable transport options.                                                                                                                                                                                                                                                                                                          | Success is dependent on public uptake of sustainable transport options. The council has no real control over the improvement of vehicle fleet.                                                                                                                                                                 |
| 5           | Cycling and walking will be encouraged. Implement new and improved pedestrian and cycle links                                                                                               | Transport Planning and Infrastructure   | Cycle network                                 | 2012                            | Ongoing                            | Cumberland Council                                      | Cumberland Council with various funding bids.                                | No                          | Ongoing.            | Unknown                   | Ongoing.                  | Improve and encourage the use of sustainable transport links                                    | Completion of proposed works and ongoing improvement of the cycle and pedestrian route network.                | Ongoing applications for government funding for schemes that aim to improve the existing cycleways, creating new sections of cycle track Extensive plans to increase the cycle path network are now in place. Several new cycleways are now complete. Work has started on a cycle path to connect Cargo village to the CNDR.                                                                                                                                                                        | Ongoing plans associated with improved pedestrian and cycle connections to the CNDR and CSLR. Funding required to accelerate major improvements.                                                                                                                                                               |

| 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                                                                                                                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------|---------------------------------|------------------------------------|------------------------|-----------------------------------------------|------------------------|----------------|---------------------------|----------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6           | Travel plans will be required for all new developments that meet the criteria. Existing businesses will be encouraged to implement, monitor and review travel plans.           | Promoting Travel Alternatives           | Workplace Travel Planning                                     | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council                            | No                     | Ongoing.       | Unknown                   | Ongoing.       | Encourage the use of sustainable transport and raise awareness                       | Increased number of participant businesses and more widespread use of alternative transport.                                    | All schools within the city now have travel plans. New developments likely to result in increased highway usage must submit a travel plan for approval when making an application.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Difficult to quantify the impact of Travel Plans.                                                                                                                                                                                                                                                              |
| 7           | The council will continue to provide comprehensive environmental control over emissions from all Part A2 and B Processes located within the local authority area.              | Environmental Permits                   | Other measure through permit systems and economic instruments | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council                            | No                     | Ongoing.       | Unknown                   | Ongoing.       | Minimise air quality impacts from industrial sources                                 | Risk based inspections showing that emission limits are being met and efforts are being made to improve on national objectives. | All processes which fall under part B & A2 processes are permitted by Cumberland Council. No recent enforcement action required in relation to emissions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Any new applications are considered by Environmental Health as part of the planning consultation process and the environmental permitting procedures.                                                                                                                                                          |
| 8           | The council will continue to investigate complaints of black smoke and smoke nuisance as well as managing smokeless zones. Enforcement action will be taken as necessary.      | Public Information                      | Other                                                         | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council                            | No                     | Ongoing.       | Unknown                   | Ongoing.       | Minimise air quality impacts from domestic burning                                   | Reduction in the number of complaints from members of the public. Reduction in repeat offences.                                 | There is information on our website. Environmental Health provide advice and enforcement as required. Smoke complaints are responded to involving domestic fires, bonfires, trade waste, industrial and dark smoke.. Advice given to minimise potential for smoke issues and ensure compliance with smokeless zones.                                                                                                                                                                                                                                                                                                                                         | The Air Quality Strategy set out a goal to cut public exposure to particulate matter pollution. The aim is to reduce by half the number of people in the United Kingdom exposed to the WHO guideline concentration of 10 µg m <sup>-3</sup> by 2025. The measures set out here will contribute to this target. |
| 9           | Provision of home improvement grants and energy saving advice to the public.                                                                                                   | Public Information                      | Other                                                         | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council with various funding bids. | No                     | Ongoing.       | Unknown                   | Ongoing.       | Improve the efficiency of domestic heating and raise awareness                       | Number of properties taking up schemes, resulting in Improved energy efficiency of housing stock.                               | Cumberland Council Home Improvement Agency is currently delivering Health through Warmth Scheme, supported by the Energy Companies Obligation. This includes boiler upgrades and home insulation. Safe and warm grants are provided by the council to deliver up to £7,500 to enable low income homes to carry out minor repairs and energy efficiency measures to their homes. Work has begun on enforcing the Minimum Energy Efficiency Standards, specifically aimed at private rented sector properties. New energy efficiency grants are now available up to £3000 through council grant scheme. Available schemes are regularly changing and evolving. | Cumberland Council have now revised Housing Renewal Assistance Policy under the Regulatory Reform Order 2002. This covers all grants involving housing and energy efficiency measures.                                                                                                                         |
| 10          | Environmental Health will work alongside the Neighbourhoods and Green Spaces team to implement the effective use of trees and green areas to offset traffic derived emissions. | Public Information                      | Other                                                         | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council                            | No                     | Ongoing.       | Unknown                   | Ongoing.       | Utilise trees and green spaces to improve air quality.                               | Increase in trees and vegetation in visible locations. Increased public interest.                                               | Cumberland Council continues to manage and maintain trees in parks and green spaces, including some additional planting, of mainly mixed broadleaf species, where necessary. Planting of green areas is an essential part of many new developments, including residential.                                                                                                                                                                                                                                                                                                                                                                                   | Limitations to planting options in busy urban areas. Parks and open spaces do not have significant air quality issues. Green Spaces continue to have a positive public impact.                                                                                                                                 |
| 11          | Air Quality considerations to be included in all relevant council policies and strategies.                                                                                     | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance                      | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council                            | No                     | Ongoing.       | Unknown                   | Ongoing.       | To raise awareness and ensure that air quality is part of decision-making processes. | Increased awareness of air quality issues and consideration given by more council departments.                                  | Included air quality links within most major relevant policies including Local Transport Plan (LTP 3) (2011-26) and The Carlisle District Local Plan (2015-30).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Air Quality considerations are put forward during discussion and consultation stages of policy development.                                                                                                                                                                                                    |

| 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                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------|------------------------|-----------------------------------------------|------------------------|----------------|---------------------------|----------------|-----------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|             |                                                                                                                                        |                                  |                                                                                                                      |                                 |                                    |                        |                                               |                        |                |                           |                |                                                           |                                                                        | New schemes being developed to deliver improved cycling routes and vehicle charging infrastructure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                    |
| 12          | Promotion of air quality and sustainable transport issues. Air quality information and monitoring data will be provided to the public. | Public Information               | via the Internet                                                                                                     | 2012                            | Ongoing                            | Cumberland Council     | Cumberland Council                            | No                     | Ongoing.       | Unknown                   | Ongoing.       | To raise awareness and encourage sustainable choices      | Increased public awareness and participation in improving air quality. | Air quality info and real time monitoring data is available on the website. Monitoring data shows continued improvement in most areas. Cumberland Council is actively supporting and promoting Clean Air Day, utilising social media and our website, as part of the Global Action Plan. Cumberland Council has ongoing projects to cut carbon emissions. These aim to raise ambition to tackle climate change and sharing learning and resources. The public can influence and drive climate action through citizens' juries and other projects, with community groups steering the programme. | Difficult to quantify improvements as a direct result of promotional work or providing monitoring data.                                            |
| 13          | Installation of charging points and development of charging network                                                                    | Promoting Low Emission Transport | Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging | 2023                            | Ongoing                            | Cumberland Council     | Cumberland Council with various funding bids. | No                     | Ongoing.       | Unknown                   | Ongoing.       | To facilitate the widespread uptake of electric vehicles. | More charging points available                                         | In 2023, Cumberland Council received notification that it had been successful with funding to install up to 900 charging points and develop its strategy <sup>4</sup> .                                                                                                                                                                                                                                                                                                                                                                                                                         | Difficult to quantify improvements as a direct result of providing charging points. The aim is to assist with the transition to Electric Vehicles. |

<sup>4</sup> <https://www.yourcumbria.org/News/2021/partnershipsuccessfulbidtodriveforwardevpoints.aspx>

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy<sup>5</sup>, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM<sub>2.5</sub>). There is clear evidence that PM<sub>2.5</sub> (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Cumberland Council is taking the following measures to address PM<sub>2.5</sub>:

- Cumberland Council had monitored PM<sub>2.5</sub> levels at Paddy's Market AQMS since 2009 as part of the AURN. This is a busy city centre junction between two AQMA's. The annual mean concentrations were consistently well below the objective at around 8-11 µg m<sup>-3</sup> at this location. The monitoring equipment was relocated to Morton Manor Community Centre in 2021. PM<sub>2.5</sub> concentrations have remained within this range. There are ongoing efforts to reduce to reduce the PM<sub>2.5</sub> concentrations.
- The Environmental Health Department will continue to work in partnership with the Highways Department to improve traffic flows and reduce congestion at key junctions.
- Environmental Health will continue to work with the Planning Department with regard to new local developments with significant air quality implications and ensure that air quality implications and mitigation measures are taken into consideration in the planning process.
- Environmental Health will continue to work alongside the Neighbourhoods and Green Spaces team to investigate and implement the effective use of trees and green areas to offset traffic derived emissions in existing AQMA's and in new development areas.
- The Council will also continue to provide comprehensive control over emissions from all Part A2 and B Processes located within the local authority area. We will work

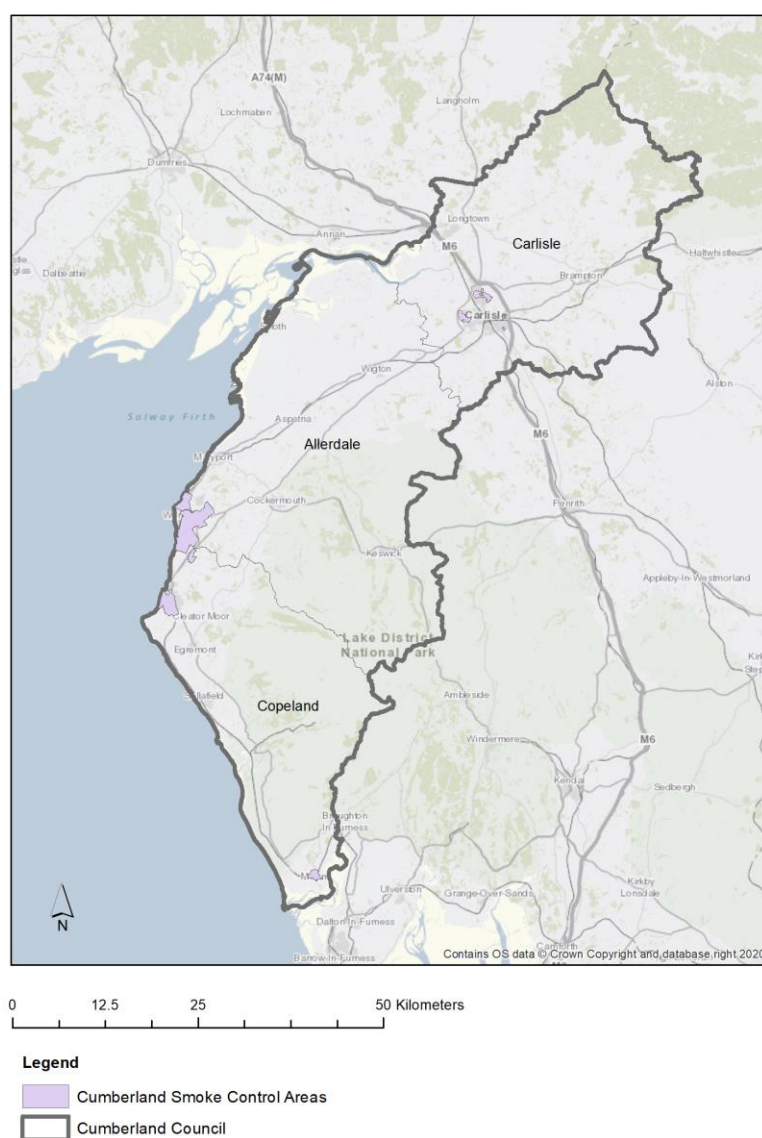
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<sup>5</sup> Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

closely with the operators of these installations to continuously monitor and improve on their emissions to air as part of the permitting process.

Cumberland Council has nine designated smoke control areas. These are shown in Figure 2-1.

**Figure 2-1 Location of Smoke Control Areas within Cumberland Council**



- Five are within the former Carlisle City Council area. More detail can be found at the following link:  
<http://www.carlisle.gov.uk/LinkClick.aspx?fileticket=9E67HYHexDw%3d&tabid=729&portalid=0&mid=2838>).

- Three within the former area of Copeland Borough Council. More detail can found at the following link: [Smoke control areas | Copeland Borough Council](#)
- One is found with the former Allerdale Borough Council.

The most recent available data from Public Health England's Public Health Outcomes Framework<sup>6</sup> show that the fraction of total mortality which is attributable to particulate air pollution (D01) within Cumberland Council was 3.4 % in 2023 (the most recent data available). This is the lowest for all local authorities within the North-West region. The averages for the North-West region and England are 4.9% and 5.2%, respectively.

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<sup>6</sup> <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000002/ati/502/are/E06000063/iid/93861/age/230/sex/4/c-at/-1/ctp/-1/yr/1/cid/4/tbm/1/page-options/car-do-0>

Data accessed 11<sup>th</sup> June 2025.

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

This section sets out the monitoring undertaken within 2024 by Cumberland Council 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.

On 1<sup>st</sup> April 2023 Cumberland Council replaced Cumbria County Council and the three local authorities: Carlisle City Council, Allerdale Borough Council and Copeland Borough Council. As for last year's report, the results from the respective former monitoring networks will be combined in this year's annual status report.

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

Cumberland Council undertook automatic (continuous) monitoring at Morton Manor Community Centre<sup>7</sup> during 2024. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. Automatic monitoring results are available through the UK-Air website ([https://uk-air.defra.gov.uk/data/data\\_selector](https://uk-air.defra.gov.uk/data/data_selector)).

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.

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<sup>7</sup> This site is known as Carlisle Morton A595 within Defra's compliance monitoring network. More information is available through UK\_AIR website: [Site Information for Carlisle Morton A595\(UKA00932\) - Defra, UK](#)

### 3.1.2 Non-Automatic Monitoring Sites

Cumberland Council undertook non- automatic (i.e. passive) monitoring of NO<sub>2</sub> at 70 sites during 2023. This includes 28 sites for former Carlisle City Council, 18 sites for former Allerdale Borough Council and 24 sites for former Copeland Borough Council. Appendix A presents the details of the non-automatic sites.

There are no changes in site numbers in 2024 compared to 2023.

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<sub>2</sub>)

Automatic monitoring occurs only at Morton Manor Community Centre. Sampling at this site began in October 2021<sup>8</sup>. In 2024, the annual NO<sub>2</sub> average concentration decreased slightly to 8.8 µg m<sup>-3</sup> from the 9.0 µg m<sup>-3</sup> measured in 2023.

Elsewhere within Cumberland Council automatic monitoring of nitrogen dioxide concentrations began at Paddy's Market and Stanwix Bank in 2006 and 2007 and stopped at each site in 2021 and 2016, respectively. Figure 3-1 shows that the annual mean concentration has been below the annual mean objective since 2011.

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<sup>8</sup> The annual mean concentration for 2021 at Morton Manor Community Centre was 11.4 µg m<sup>-3</sup>. Because the data capture was 18.9 % and outside the permissible range for annualisation the annual concentration is only be considered an indicative measurement.

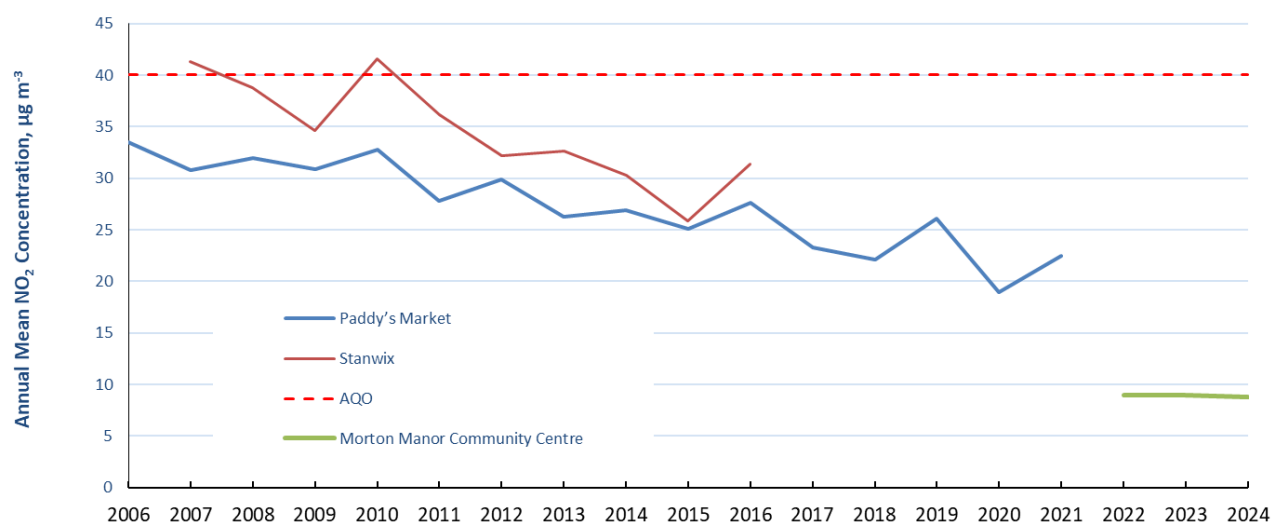
**Figure 3-1 Automatic monitoring data (2006 – 2024)**

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40 µg m<sup>-3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment). The annual mean concentrations are compared with the air quality objective of 40 µg m<sup>-3</sup> in Figures A.1 to A.7. Generally, the NO<sub>2</sub> concentrations are less than those measured in 2023.

Figure A.1 shows the NO<sub>2</sub> concentration measured by the automatic monitor at Morton Manor Community Centre in 2024. The concentration 8.8 µg m<sup>-3</sup> is considerably less than those measured at Paddy's Market which over the five-year period (2016 to 2020) ranged from a low of 19 µg m<sup>-3</sup> in 2020 to a high of 27.6 µg m<sup>-3</sup> in 2016.

For the purposes of the presenting results for each of the former local authorities Figures A.2 to A.5 show the trends within the former local authority area of Carlisle City Council and had been grouped historically according to Air Quality Management Areas- either revoked or current as well as showing trends in a number of other areas.

Figures A.6 and A.7 show the five-year trends within the former respective local authority areas of Allerdale and Copeland.

For sites situated along the A7 (see Figure A.2), the highest concentration ( $27.9 \mu\text{g m}^{-3}$ ) was measured at Stanwix Bank (A10) which represented a decrease of  $0.7 \mu\text{g m}^{-3}$  compared to what was measured in 2023.

At sites within the former AQMA 2 (Currock Street, B7) and former AQMA 5 (Dalston Road, B4), the annual mean  $\text{NO}_2$  concentrations were  $28.8 \mu\text{g m}^{-3}$  and  $27.1 \mu\text{g m}^{-3}$ , respectively. This represents an increase of  $2.0 \mu\text{g m}^{-3}$  at Currock Street and a decrease of  $1.0 \mu\text{g m}^{-3}$  at Dalston Road compared to the 2023 measurements. Elsewhere in the city centre, concentrations decreased at all sites with the exception of 282 Warwick Road, where the concentrations increased by  $0.1 \mu\text{g m}^{-3}$  (Figure A.3).

For sites situated along the section of Wigton Road closer to the city centre, Bridge Street and London Road (see Figure A.4) the highest concentration ( $30.9 \mu\text{g m}^{-3}$ ) continues to be measured in AQMA 4 Bridge Street (E8). This represents a decrease of  $3.2 \mu\text{g m}^{-3}$  compared to 2023 and is the largest decrease, in terms of  $\mu\text{g m}^{-3}$  measured, in the former Carlisle City Council area. At most other sites in this part of the city concentrations also decreased in 2024 compared to 2023.

The remaining sites along the Carlisle Northern Development Route and at a number of locations to the south of city centre and at the airport all measured concentrations considerably less than the annual objective concentration (see Figure A.5) The largest concentration ( $11.9 \mu\text{g m}^{-3}$ ) was measured at Wigton Road (H5).

Figure A.6 presents the five-year trend in the former local authority of Allerdale Borough Council. In 2024, the highest  $\text{NO}_2$  concentration ( $22.4 \mu\text{g m}^{-3}$ ) continues to be measured at Murray Road (DT 2); this represents a decrease of  $0.5 \mu\text{g m}^{-3}$  compared to 2023.

At most sites the  $\text{NO}_2$  concentrations decreased in 2024 compared to 2023 (13 sites decreased within a total of 18 sites). With the largest decrease ( $4.8 \mu\text{g m}^{-3}$ ) occurring at Ramsey Brow (DT 6), where the concentration decreased from  $21.0 \mu\text{g m}^{-3}$  to  $16.2 \mu\text{g m}^{-3}$ . The largest increase ( $3.2 \mu\text{g m}^{-3}$ ) occurring at Hall Park View (DT11), where the concentration increased from  $11.6 \mu\text{g m}^{-3}$  to  $14.8 \mu\text{g m}^{-3}$ .

Figure A.7 presents the five-year trend in the former local authority of Copeland Borough Council. In 2023 the highest NO<sub>2</sub> concentration (15.4 µg m<sup>-3</sup>) continues to be measured at Strand St, Whitehaven (N11); this represents a decrease of 0.2 µg m<sup>-3</sup> compared to 2023. There were marginally more increases in NO<sub>2</sub> concentrations in 2024 compared to what was measured in 2023: 13 sites showed an increase, while 11 sites showed a decrease. The variation between each year is relatively small. The largest increase was observed at Council Centre, St Georges Rd, Millom (N10) where the concentration increased from 6.0 µg m<sup>-3</sup> in 2023 to 7.4 µg m<sup>-3</sup>. The largest decrease occurred at 4 Holyoak, Beckermat (N13) where the concentration decreased by 1.9 µg m<sup>-3</sup> from 6.4 µg m<sup>-3</sup> in 2023 to 4.6 µg m<sup>-3</sup>.

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<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200 µg m<sup>-3</sup>, not to be exceeded more than 18 times per year.

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

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40 µg m<sup>-3</sup>.

Table A.7 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past five years with the air quality objective of 50 µg m<sup>-3</sup>, not to be exceeded more than 35 times per year. There were no days for which the short term AQO exceeded 50 µg m<sup>-3</sup>.

The automatic monitors within Carlisle were relocated from Paddy's Market to Morton Manor Community Centre during 2021. However, there was insufficient data capture at Morton Manor in 2021 to calculate a valid annual mean.

In 2024, the PM<sub>10</sub> concentration measured at Morton Manor Community Centre was 12.9 µg m<sup>-3</sup>. This represented an increase of 1.1 µg m<sup>-3</sup> compared to what was measured in 2023 (11.8 µg m<sup>-3</sup>) and was lower than had been measured previously at Paddy's Market;

over the five-year period 2016 to 2020 the PM<sub>10</sub> concentration ranged from a low of 13.6 µg m<sup>-3</sup> in 2016 to a high of 18.6 m<sup>-3</sup> in 2019.

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

Table A.8 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past five years.

PM<sub>2.5</sub> is the pollutant which has the biggest impact on public health and on which the Public Health Outcomes Framework (PHOF) indicator is based. Therefore, although not covered by the LAQM regulations, local authorities are encouraged to understand the PM<sub>2.5</sub> concentration within their council area.

In 2024, the PM<sub>2.5</sub> concentration measured at Morton Manor Community Centre was 7.6 µg m<sup>-3</sup>, which is lower than the World Health Organisation guideline of 10 µg m<sup>-3</sup>.

Elsewhere, the background PM<sub>2.5</sub> maps for Cumberland Council for 2024 also showed no exceedance of the guideline concentration. The highest modelled background PM<sub>2.5</sub> concentrations<sup>9</sup> anywhere within Cumberland Council was 6.6 µg m<sup>-3</sup>. This occurred for a 1 km x 1 km square located in Shaddongate, Carlisle. The square was centred on Ordnance Survey coordinates of 339500, 555500 (equivalent to latitude and longitude of 54.890561, -2.944725).

Cumberland Council also acknowledges Defra's proposed Environmental Targets for PM<sub>2.5</sub>.

- Annual mean concentration target – 10 µg m<sup>-3</sup> to be achieved by 2040;
- Population Exposure Reduction Target – 35% reduction (on 2018 baseline) by 2040.

The Government expects local authorities will need to take actions in support of the new targets.

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<sup>9</sup> <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>

## 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? <sup>(1)</sup> | Monitoring Technique               | Distance to Relevant Exposure (m) <sup>(2)</sup> | Distance to kerb of nearest road (m) <sup>(1)</sup> | Inlet Height (m) |
|---------|-------------------------------|-----------|-------------------------|--------------------------|--------------------------------------------------------|----------|----------------------------|------------------------------------|--------------------------------------------------|-----------------------------------------------------|------------------|
| MMCC    | Morton Manor Community Centre | Roadside  | 338195                  | 554990                   | NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> | No       |                            | Chemiluminescence, BAM 1020 heated | 6.0                                              | 8.0                                                 | 2.37, 2.67, 2.77 |

**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) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|-----------------------|--------------|-------------------------|--------------------------|----------------------|---------------------------|--------------------------------------------------|-----------------------------------------------------|---------------------------------------------|-----------------|
| A1                | 45 SCOTLAND RD        | Roadside     | 339995                  | 557188                   | NO <sub>2</sub>      | NO                        | 4.5                                              | 1.5                                                 | NO                                          | 3.1             |
| A10               | STANWIX BANK          | Roadside     | 340008                  | 556842                   | NO <sub>2</sub>      | NO                        | 1.5                                              | 1.5                                                 | NO                                          | 3.0             |
| A12               | STANWIX BANK CAR PARK | Roadside     | 339935                  | 557125                   | NO <sub>2</sub>      | NO                        | 0.0                                              | 3.0                                                 | NO                                          | 2.8             |
| A5                | 37 KINGSTOWN RD       | Roadside     | 339758                  | 558059                   | NO <sub>2</sub>      | NO                        | 0.0                                              | 4.0                                                 | NO                                          | 2.8             |
| A7                | 282 KINGSTOWN RD      | Roadside     | 339526                  | 559285                   | NO <sub>2</sub>      | NO                        | 7.5                                              | 4.0                                                 | NO                                          | 2.7             |
| A9                | BRAMPTON RD           | Roadside     | 340028                  | 556833                   | NO <sub>2</sub>      | Revoked June 2025, AQMA 1 | 0.0                                              | 1.5                                                 | NO                                          | 2.8             |
| B4                | DALSTON RD            | Roadside     | 339434                  | 555638                   | NO <sub>2</sub>      | Revoked June 2025, AQMA 5 | 0.0                                              | 3.5                                                 | NO                                          | 2.8             |
| B7                | 12 CURROCK ST         | Roadside     | 340205                  | 555198                   | NO <sub>2</sub>      | Revoked June 2025, AQMA 2 | 0.0                                              | 3.0                                                 | NO                                          | 3.1             |
| C1                | LOWTHER ST            | Roadside     | 340216                  | 556131                   | NO <sub>2</sub>      | NO                        | 0.0                                              | 3.0                                                 | NO                                          | 2.9             |
| C2                | TOURIST INFO          | Urban Centre | 340069                  | 555955                   | NO <sub>2</sub>      | NO                        | N/A                                              | N/A                                                 | NO                                          | 2.7             |

| Diffusion Tube ID | Site Name       | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|-----------------|-----------|-------------------------|--------------------------|----------------------|----------------------|--------------------------------------------------|-----------------------------------------------------|---------------------------------------------|-----------------|
| C3                | DEVONSHIRE ST   | Roadside  | 340218                  | 555768                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 3.0                                                 | NO                                          | 2.9             |
| D12               | POST OFFICE     | Kerbside  | 340307                  | 555718                   | NO <sub>2</sub>      | NO                   | N/A                                              | 5.0                                                 | NO                                          | 3.0             |
| D7                | 282 WARWICK RD  | Roadside  | 341593                  | 555893                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 7.0                                                 | NO                                          | 2.8             |
| E22               | FINKLE ST       | Roadside  | 339834                  | 556137                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 12.0                                                | NO                                          | 2.8             |
| E12               | 3 WIGTON RD     | Roadside  | 339225                  | 555821                   | NO <sub>2</sub>      | NO                   | 2.0                                              | 2.5                                                 | NO                                          | 3.0             |
| E15               | 22 WIGTON RD    | Roadside  | 339091                  | 555736                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 4.5                                                 | NO                                          | 3.9             |
| E16               | JOVIAL SAILOR   | Roadside  | 339141                  | 555900                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.5                                                 | NO                                          | 2.7             |
| E19               | 49 WIGTON RD    | Roadside  | 338953                  | 555610                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.5                                                 | NO                                          | 3.1             |
| E6, E61, E62      | MORTON MANOR 3  | Roadside  | 339467                  | 555974                   | NO <sub>2</sub>      | NO                   | 6.0                                              | 8.0                                                 | Yes                                         | 2.4             |
| E8                | BRIDGE ST       | Roadside  | 339516                  | 556024                   | NO <sub>2</sub>      | Yes, AQMA 4          | 0.0                                              | 4.0                                                 | NO                                          | 3.1             |
| F10               | 155 BOTCHERGATE | Roadside  | 340600                  | 555349                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 3.0                                                 | NO                                          | 2.7             |
| F7                | 24 LONDON RD    | Roadside  | 340708                  | 555240                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 4.5                                                 | NO                                          | 2.7             |
| F9                | 129 LONDON RD   | Kerbside  | 341099                  | 554931                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 0.5                                                 | NO                                          | 3.0             |

| Diffusion Tube ID | Site Name                  | Site Type    | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|----------------------------|--------------|-------------------------|--------------------------|----------------------|----------------------|--------------------------------------------------|-----------------------------------------------------|---------------------------------------------|-----------------|
| G4                | THE HOBBIT                 | Rural        | 336905                  | 554036                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 19.0                                                | NO                                          | 2.9             |
| H5                | WIGTON RD                  | Roadside     | 337643                  | 554100                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 1.5                                                 | NO                                          | 2.4             |
| H6                | PETER LANE                 | Roadside     | 337962                  | 553220                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 4.0                                                 | NO                                          | 2.4             |
| H7                | DALSTON RD                 | Roadside     | 338282                  | 553396                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 6.5                                                 | NO                                          | 2.4             |
| H8                | AIRPORT                    | Other        | 347874                  | 561254                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.0                                                 | NO                                          | 2.4             |
| DT1, DT1B         | Hall Park View, Workington | Kerbside     | 300721                  | 528958                   | NO <sub>2</sub>      | No                   | 0.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT2, DT2B         | Murray Road, Workington    | Urban Centre | 301194                  | 528711                   | NO <sub>2</sub>      | No                   | N/A                                              | 1.0                                                 | No                                          | 2.5             |
| DT3, DT3B         | Crown Street, Cockermouth  | Kerbside     | 311652                  | 530658                   | NO <sub>2</sub>      | No                   | 0.0                                              | 0.5                                                 | No                                          | 2.5             |
| DT4, DT4B         | Main Street, Keswick       | Roadside     | 326419                  | 523602                   | NO <sub>2</sub>      | No                   | 4.0                                              | 1.5                                                 | No                                          | 2.5             |
| DT5, DT5B         | Curzon Street, Maryport    | Kerbside     | 303778                  | 536534                   | NO <sub>2</sub>      | No                   | 5.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT6, DT6B         | Ramsay Brow, Workington    | Kerbside     | 300588                  | 528682                   | NO <sub>2</sub>      | No                   | 0.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT7, DT7B         | King Street, Wigton        | Kerbside     | 325508                  | 548419                   | NO <sub>2</sub>      | No                   | 2.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT8, DT8B         | Main Road, High Harrington | Roadside     | 299591                  | 525545                   | NO <sub>2</sub>      | No                   | 0.0                                              | 2.0                                                 | 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) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|---------------------------------------|------------------|-------------------------|--------------------------|----------------------|----------------------|--------------------------------------------------|-----------------------------------------------------|---------------------------------------------|-----------------|
| DT9, DT9B         | Lawson Street, Aspatria               | Kerbside         | 315299                  | 542145                   | NO <sub>2</sub>      | No                   | 0.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT10, DT10B       | South Street, Cockermouth             | Kerbside         | 312091                  | 530547                   | NO <sub>2</sub>      | No                   | 8.7                                              | 0.5                                                 | No                                          | 2.5             |
| DT11, DT11B       | Penrith Road, Keswick                 | Kerbside         | 327949                  | 523764                   | NO <sub>2</sub>      | No                   | 7.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT12, DT12B       | Northside Primary School, Northside   | Kerbside         | 299939                  | 529709                   | NO <sub>2</sub>      | No                   | 8.0                                              | 1.0                                                 | No                                          | 2.5             |
| DT15, DT15B       | Eden Street Sillioth                  | Industrial       | 310949                  | 553517                   | NO <sub>2</sub>      | No                   | 2.0                                              | 0.5                                                 | No                                          | 2.5             |
| DT16, DT16B       | Main Road Seaton                      | Kerbside         | 301765                  | 530720                   | NO <sub>2</sub>      | No                   | 6.1                                              | 1.0                                                 | No                                          | 2.5             |
| DT17, DT17B       | South End Street Wigton               | Urban Background | 325568                  | 547874                   | NO <sub>2</sub>      | No                   | 2.9                                              | 3.1                                                 | No                                          | 2.5             |
| DT18, DT18B       | West Street Aspatria                  | Roadside         | 314286                  | 541751                   | NO <sub>2</sub>      | No                   | 15.0                                             | 2.0                                                 | No                                          | 2.5             |
| DT19, DT19B       | Marvejols Park Cockermouth            | Suburban         | 311391                  | 529810                   | NO <sub>2</sub>      | No                   | 4                                                | 1                                                   | No                                          | 2.5             |
| DT20, DT20B       | Eaglesfield Street Maryport           | Urban Background | 303720                  | 536702                   | NO <sub>2</sub>      | No                   | 3                                                | 0                                                   | No                                          | 2.5             |
| N1                | 55/56 Lowther St, Whitehaven          | Urban Centre     | 297305                  | 518185                   | NO <sub>2</sub>      | NO                   | 2.0                                              | 0.0                                                 | No                                          | 2.5             |
| N2                | Police Station, Scotch St, Whitehaven | Urban Centre     | 297515                  | 518070                   | NO <sub>2</sub>      | NO                   | 4.0                                              | 1.0                                                 | No                                          | 2.5             |
| N3                | Fire Station, Hensingham              | Urban Background | 299020                  | 517245                   | NO <sub>2</sub>      | NO                   | 20.0                                             | 20.0                                                | 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) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|---------------------------------------|------------------|-------------------------|--------------------------|----------------------|----------------------|--------------------------------------------------|-----------------------------------------------------|---------------------------------------------|-----------------|
| N4                | 116 Holborn Hill, Millom              | Urban Background | 316725                  | 480340                   | NO <sub>2</sub>      | NO                   | 1.0                                              | 1.0                                                 | No                                          | 2.5             |
| N5                | Aldby Grove, Cleator Moor             | Urban Background | 302260                  | 514890                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.0                                                 | No                                          | 2.5             |
| N6                | White House, Strand St, Whitehaven    | Urban Centre     | 297230                  | 518155                   | NO <sub>2</sub>      | NO                   | 4.0                                              | 2.0                                                 | No                                          | 2.5             |
| N7                | Tourist Info, Main St, Egremont       | Urban Centre     | 301095                  | 510930                   | NO <sub>2</sub>      | NO                   | 5.0                                              | 3.0                                                 | No                                          | 2.5             |
| N8                | Presbytery, St Bridgets Ln, Egremont  | Urban Background | 300895                  | 510695                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 10.0                                                | No                                          | 2.5             |
| N9                | Primary School, Ennerdale Bridge      | Rural            | 307000                  | 515855                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.0                                                 | No                                          | 2.5             |
| N10               | Council Centre, St Georges Rd, Millom | Urban Centre     | 317310                  | 479980                   | NO <sub>2</sub>      | NO                   | 40.0                                             | 2.0                                                 | No                                          | 2.5             |
| N11               | Opp JPJ, Strand St, Whitehaven        | Urban Centre     | 297320                  | 518280                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 3.0                                                 | No                                          | 2.5             |
| N12               | 2 The Crescent, Thornhill             | Suburban         | 301225                  | 508805                   | NO <sub>2</sub>      | NO                   | 4.0                                              | 0.0                                                 | No                                          | 2.5             |
| N13               | 4 Holyoak, Beckermest                 | Rural            | 301975                  | 506635                   | NO <sub>2</sub>      | NO                   | 3.0                                              | 0.0                                                 | No                                          | 2.5             |
| N14               | The Globe, The Square, Gosforth       | Urban Background | 306695                  | 503535                   | NO <sub>2</sub>      | NO                   | 4.0                                              | 0.0                                                 | No                                          | 2.5             |
| N15               | 21 Scafell Close, Seascale            | Urban Background | 304440                  | 501495                   | NO <sub>2</sub>      | NO                   | 6.0                                              | 1.0                                                 | 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) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|--------------------------------------|------------------|-------------------------|--------------------------|----------------------|----------------------|--------------------------------------------------|-----------------------------------------------------|---------------------------------------------|-----------------|
| N16               | Greendale Guest House, Wasdale       | Rural            | 314410                  | 505570                   | NO <sub>2</sub>      | NO                   | 30.0                                             | 18.0                                                | No                                          | 2.5             |
| N17               | Holmrook Service Station, Holmrook   | Roadside         | 308235                  | 499295                   | NO <sub>2</sub>      | NO                   | 30.0                                             | 5.0                                                 | No                                          | 2.5             |
| N18               | 98 Main St, Distington               | Urban Background | 300590                  | 523220                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.0                                                 | No                                          | 2.5             |
| N19               | Railway Station, Bootle              | Rural            | 309345                  | 489300                   | NO <sub>2</sub>      | NO                   | 4.0                                              | 1.0                                                 | No                                          | 2.5             |
| N20               | King's Head, Bootle                  | Roadside         | 310735                  | 488320                   | NO <sub>2</sub>      | NO                   | 6.0                                              | 2.0                                                 | No                                          | 2.5             |
| N21               | Nr Seascale Hall Farm, Seascale      | Rural            | 303995                  | 502445                   | NO <sub>2</sub>      | NO                   | 350.0                                            | 1.0                                                 | No                                          | 2.5             |
| N22               | Trinity Court, Scotch St, Whitehaven | Urban Centre     | 297440                  | 517960                   | NO <sub>2</sub>      | NO                   | 2.0                                              | 0.0                                                 | No                                          | 2.5             |
| N23               | 2a Main St, Distington               | Roadside         | 300885                  | 523890                   | NO <sub>2</sub>      | NO                   | 0.0                                              | 2.0                                                 | No                                          | 2.5             |
| N24               | New Lowther St, Whitehaven           | Urban Centre     | 297260                  | 518225                   | NO <sub>2</sub>      | NO                   | 3.0                                              | 1.0                                                 | No                                          | 2.5             |

**Notes:**

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

(2) N/A if not applicable.

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

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|---------|-------------------------|--------------------------|-----------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| MMCC    | 338195                  | 554990                   | Roadside  | 96.7                                                        | 96.7                                       |      |      | 9.0  | 9.0  | 8.8  |

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

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

☒ Where exceedances of the NO<sub>2</sub> 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<sup>-3</sup>.

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

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

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

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

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

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

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type    | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------|-------------------------|--------------------------|--------------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| A1                | 339995                  | 557188                   | Roadside     | 90.6                                                        | 90.6                                       | 23.3 | 25.5 | 23.6 | 22.1 | 21.0 |
| A10               | 340008                  | 556842                   | Roadside     | 90.6                                                        | 90.6                                       | 24.9 | 30.5 | 28.7 | 28.6 | 27.9 |
| A12               | 339935                  | 557125                   | Roadside     | 90.6                                                        | 90.6                                       | 20.8 | 24.3 | 22.3 | 20.5 | 21.1 |
| A5                | 339758                  | 558059                   | Roadside     | 90.6                                                        | 90.6                                       | 21.4 | 25.2 | 23.8 | 21.5 | 20.4 |
| A7                | 339526                  | 559285                   | Roadside     | 90.6                                                        | 90.6                                       | 14.1 | 17.1 | 15.5 | 14.2 | 13.9 |
| A9                | 340028                  | 556833                   | Roadside     | 90.6                                                        | 90.6                                       | 23.0 | 26.9 | 26.1 | 24.3 | 24.2 |
| B4                | 339434                  | 555638                   | Roadside     | 90.6                                                        | 90.6                                       | 28.3 | 32.9 | 29.3 | 28.1 | 27.1 |
| B7                | 340205                  | 555198                   | Roadside     | 74.9                                                        | 74.9                                       | 27.0 | 30.4 | 28.8 | 26.8 | 28.8 |
| C1                | 340216                  | 556131                   | Roadside     | 90.6                                                        | 90.6                                       | 19.7 | 22.1 | 22.1 | 20.9 | 20.3 |
| C2                | 340069                  | 555955                   | Urban Centre | 56.6                                                        | 56.6                                       | 11.5 | 13.2 | 13.0 | 12.9 | 11.7 |
| C3                | 340218                  | 555768                   | Roadside     | 41.5                                                        | 41.5                                       | 18.6 | 22.8 | 20.8 | 19.9 | 17.3 |
| D12               | 340307                  | 555718                   | Kerbside     | 90.6                                                        | 90.6                                       | 20.4 | 24.7 | 23.0 | 23.5 | 21.5 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------|-------------------------|--------------------------|-----------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| D7                | 341593                  | 555893                   | Roadside  | 90.6                                                        | 90.6                                       | 20.8 | 24.8 | 22.9 | 21.2 | 21.3 |
| E22               | 339834                  | 556137                   | Roadside  | 83.0                                                        | 83.0                                       | 22.0 | 24.7 | 24.0 | 22.4 | 22.3 |
| E12               | 339225                  | 555821                   | Roadside  | 90.6                                                        | 90.6                                       | 24.6 | 29.5 | 25.9 | 27.1 | 26.1 |
| E15               | 339091                  | 555736                   | Roadside  | 90.6                                                        | 90.6                                       | 21.4 | 26.4 | 22.5 | 22.8 | 22.3 |
| E16               | 339141                  | 555900                   | Roadside  | 90.6                                                        | 90.6                                       | 22.6 | 27.3 | 24.2 | 23.9 | 23.2 |
| E19               | 338953                  | 555610                   | Roadside  | 90.6                                                        | 90.6                                       | 22.2 | 29.4 | 25.9 | 24.7 | 24.5 |
| E6, E61, E62      | 339467                  | 555974                   | Roadside  | 90.6                                                        | 90.6                                       |      | 10.6 | 9.9  | 9.5  | 9.6  |
| E8                | 339516                  | 556024                   | Roadside  | 90.6                                                        | 90.6                                       | 31.7 | 36.3 | 33.5 | 34.1 | 30.9 |
| F10               | 340600                  | 555349                   | Roadside  | 90.6                                                        | 90.6                                       | 25.4 | 29.9 | 25.8 | 25.3 | 24.8 |
| F7                | 340708                  | 555240                   | Roadside  | 90.6                                                        | 90.6                                       | 24.7 | 31.0 | 26.1 | 25.9 | 25.7 |
| F9                | 341099                  | 554931                   | Kerbside  | 83.0                                                        | 83.0                                       | 23.6 | 28.9 | 27.1 | 25.6 | 25.0 |
| G4                | 336905                  | 554036                   | Rural     | 90.6                                                        | 90.6                                       | 8.0  | 9.5  | 10.1 | 8.1  | 7.4  |
| H5                | 337643                  | 554100                   | Roadside  | 90.6                                                        | 90.6                                       | 10.4 | 12.0 | 11.0 | 10.1 | 11.9 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type    | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------|-------------------------|--------------------------|--------------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| H6                | 337962                  | 553220                   | Roadside     | 49.1                                                        | 49.1                                       | 8.4  | 8.4  | 7.4  | 6.1  | 6.9  |
| H7                | 338282                  | 553396                   | Roadside     | 83.0                                                        | 83.0                                       | 11.6 | 13.2 | 11.8 | 11.1 | 9.3  |
| H8                | 347874                  | 561254                   | Other        | 90.6                                                        | 90.6                                       | 4.8  | 5.5  | 5.6  | 4.9  | 4.5  |
| DT1, DT1B         | 300721                  | 528958                   | Kerbside     | 81.7                                                        | 81.7                                       | 13.0 | 13.1 | 11.6 | 11.6 | 14.8 |
| DT2, DT2B         | 301194                  | 528711                   | Urban Centre | 73.6                                                        | 73.6                                       | 21.6 | 21.8 | 22.0 | 22.9 | 22.4 |
| DT3, DT3B         | 311652                  | 530658                   | Kerbside     | 100.0                                                       | 100.0                                      | 15.0 | 16.9 | 15.2 | 14.0 | 13.5 |
| DT4, DT4B         | 326419                  | 523602                   | Roadside     | 90.6                                                        | 90.6                                       | 18.4 | 21.1 | 21.6 | 19.9 | 19.0 |
| DT5, DT5B         | 303778                  | 536534                   | Kerbside     | 100.0                                                       | 100.0                                      | 19.7 | 19.1 | 20.0 | 18.9 | 16.2 |
| DT6, DT6B         | 300588                  | 528682                   | Kerbside     | 100.0                                                       | 100.0                                      | 22.4 | 22.3 | 22.9 | 21.0 | 16.2 |
| DT7, DT7B         | 325508                  | 548419                   | Kerbside     | 91.1                                                        | 91.1                                       | 19.9 | 20.0 | 19.3 | 17.3 | 16.7 |
| DT8, DT8B         | 299591                  | 525545                   | Roadside     | 100.0                                                       | 100.0                                      | 12.6 | 12.5 | 12.5 | 10.1 | 11.5 |
| DT9, DT9B         | 315299                  | 542145                   | Kerbside     | 100.0                                                       | 100.0                                      | 13.0 | 12.9 | 12.5 | 11.6 | 11.0 |
| DT10, DT10B       | 312091                  | 530547                   | Kerbside     | 100.0                                                       | 100.0                                      | 12.5 | 11.7 | 12.5 | 12.9 | 12.0 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type        | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------|-------------------------|--------------------------|------------------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| DT11, DT11B       | 327949                  | 523764                   | Kerbside         | 100.0                                                       | 100.0                                      | 20.2 | 13.1 | 14.8 | 14.1 | 13.3 |
| DT12, DT12B       | 299939                  | 529709                   | Kerbside         | 83.0                                                        | 83.0                                       | 10.0 | 9.7  | 11.8 | 12.7 | 9.1  |
| DT15, DT15B       | 310949                  | 553517                   | Industrial       | 74.1                                                        | 74.1                                       |      | 8.3  | 7.9  | 7.1  | 9.1  |
| DT16, DT16B       | 301765                  | 530720                   | Kerbside         | 66.6                                                        | 66.6                                       |      | 9.0  | 8.8  | 9.3  | 8.6  |
| DT17, DT17B       | 325568                  | 547874                   | Urban Background | 81.7                                                        | 81.7                                       |      | 8.1  | 7.2  | 7.0  | 6.3  |
| DT18, DT18B       | 314286                  | 541751                   | Roadside         | 90.6                                                        | 90.6                                       |      | 12.1 | 13.4 | 13.9 | 14.3 |
| DT19, DT19B       | 311391                  | 529810                   | Suburban         | 100.0                                                       | 100.0                                      |      |      |      | 5.5  | 5.2  |
| DT20, DT20B       | 303720                  | 536702                   | Urban Background | 100.0                                                       | 100.0                                      |      |      |      | 6.2  | 6.5  |
| N1                | 297305                  | 518185                   | Urban Centre     | 100.0                                                       | 100.0                                      | 10.2 | 13.5 | 13.4 | 12.5 | 12.8 |
| N2                | 297515                  | 518070                   | Urban Centre     | 100.0                                                       | 100.0                                      | 12.2 | 13.6 | 12.0 | 11.8 | 11.3 |
| N3                | 299020                  | 517245                   | Urban Background | 100.0                                                       | 100.0                                      | 6.0  | 6.2  | 5.7  | 5.1  | 5.0  |
| N4                | 316725                  | 480340                   | Urban Background | 100.0                                                       | 100.0                                      | 5.8  | 6.3  | 6.0  | 5.7  | 5.9  |
| N5                | 302260                  | 514890                   | Urban Background | 100.0                                                       | 100.0                                      | 7.4  | 7.9  | 6.9  | 6.9  | 6.6  |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type        | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------|-------------------------|--------------------------|------------------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| N6                | 297230                  | 518155                   | Urban Centre     | 100.0                                                       | 100.0                                      | 12.0 | 11.8 | 12.2 | 11.6 | 10.7 |
| N7                | 301095                  | 510930                   | Urban Centre     | 100.0                                                       | 100.0                                      | 12.4 | 13.5 | 12.5 | 11.6 | 12.5 |
| N8                | 300895                  | 510695                   | Urban Background | 100.0                                                       | 100.0                                      | 5.1  | 5.1  | 4.9  | 4.9  | 4.6  |
| N9                | 307000                  | 515855                   | Rural            | 100.0                                                       | 100.0                                      | 3.8  | 4.2  | 3.7  | 3.5  | 4.1  |
| N10               | 317310                  | 479980                   | Urban Centre     | 32.1                                                        | 32.1                                       | 7.4  | 8.0  | 7.3  | 6.0  | 7.2  |
| N11               | 297320                  | 518280                   | Urban Centre     | 100.0                                                       | 100.0                                      | 15.4 | 17.5 | 16.8 | 15.6 | 15.4 |
| N12               | 301225                  | 508805                   | Suburban         | 100.0                                                       | 100.0                                      | 5.3  | 5.9  | 5.8  | 5.9  | 5.5  |
| N13               | 301975                  | 506635                   | Rural            | 100.0                                                       | 100.0                                      | 5.4  | 4.9  | 5.0  | 6.4  | 4.6  |
| N14               | 306695                  | 503535                   | Urban Background | 100.0                                                       | 100.0                                      | 7.4  | 8.6  | 9.3  | 8.5  | 8.8  |
| N15               | 304440                  | 501495                   | Urban Background | 100.0                                                       | 100.0                                      | 4.1  | 3.6  | 3.9  | 4.2  | 3.7  |
| N16               | 314410                  | 505570                   | Rural            | 90.6                                                        | 90.6                                       | 2.2  | 2.0  | 2.2  | 2.1  | 2.1  |
| N17               | 308235                  | 499295                   | Roadside         | 100.0                                                       | 100.0                                      | 4.9  | 5.4  | 5.2  | 4.8  | 4.9  |
| N18               | 300590                  | 523220                   | Urban Background | 100.0                                                       | 100.0                                      | 7.0  | 7.6  | 7.5  | 6.8  | 7.1  |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type    | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------------|-------------------------|--------------------------|--------------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| N19               | 309345                  | 489300                   | Rural        | 100.0                                                       | 100.0                                      | 4.0  | 3.9  | 4.1  | 3.7  | 3.9  |
| N20               | 310735                  | 488320                   | Roadside     | 100.0                                                       | 100.0                                      | 7.0  | 6.9  | 6.7  | 6.4  | 6.7  |
| N21               | 303995                  | 502445                   | Rural        | 100.0                                                       | 100.0                                      | 3.8  | 3.7  | 3.6  | 3.1  | 3.2  |
| N22               | 297440                  | 517960                   | Urban Centre | 100.0                                                       | 100.0                                      | 9.7  | 11.4 | 10.4 | 9.6  | 9.5  |
| N23               | 300885                  | 523890                   | Roadside     | 100.0                                                       | 100.0                                      | 13.5 | 14.7 | 14.5 | 15.3 | 14.6 |
| N24               | 297260                  | 518225                   | Urban Centre | 100.0                                                       | 100.0                                      | 11.0 | 12.0 | 12.0 | 11.3 | 11.5 |

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

☒ Diffusion tube data has been bias adjusted.

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

#### Notes:

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

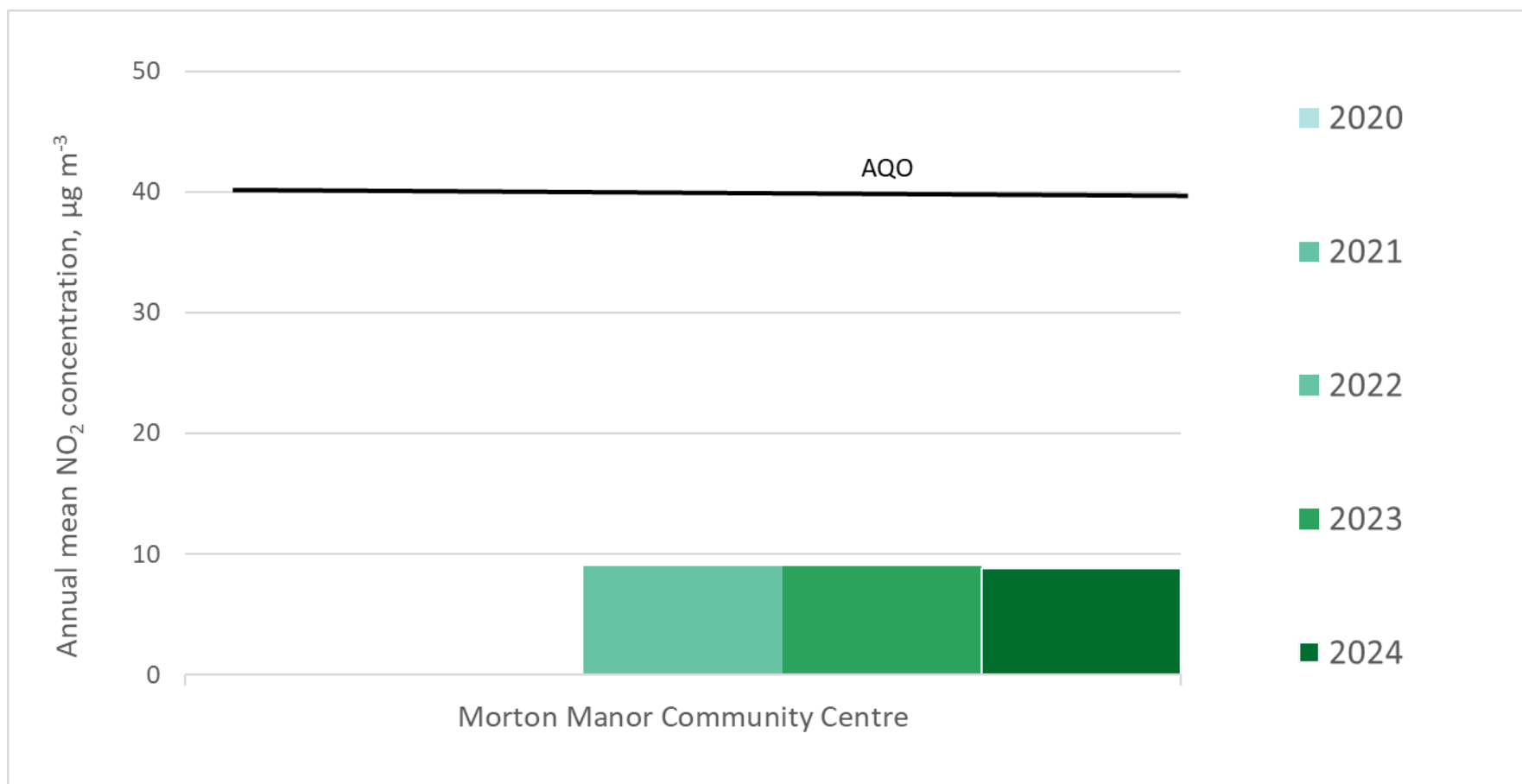
Exceedances of the NO<sub>2</sub> annual mean objective of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

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

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

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

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

**Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations: automatic monitoring at Morton Manor**

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

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|---------|-------------------------|--------------------------|-----------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| MMCC    | 338195                  | 554990                   | Roadside  | 96.7                                                        | 96.7                                       |      |      | 0    | 0    | 0    |

**Notes:**

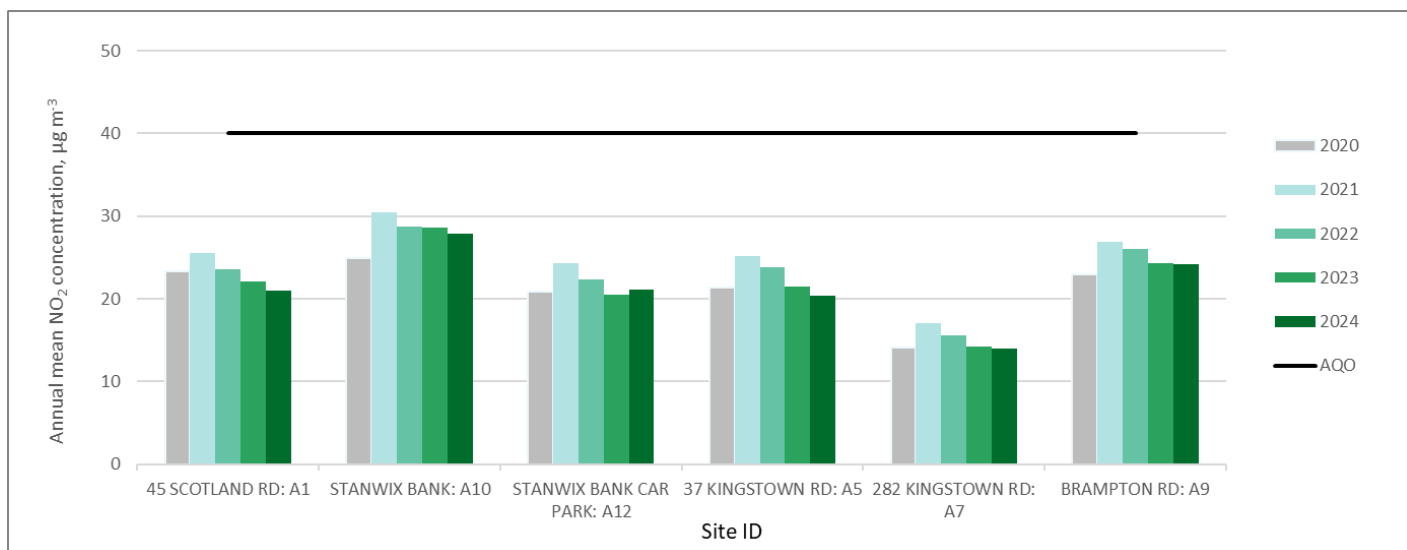
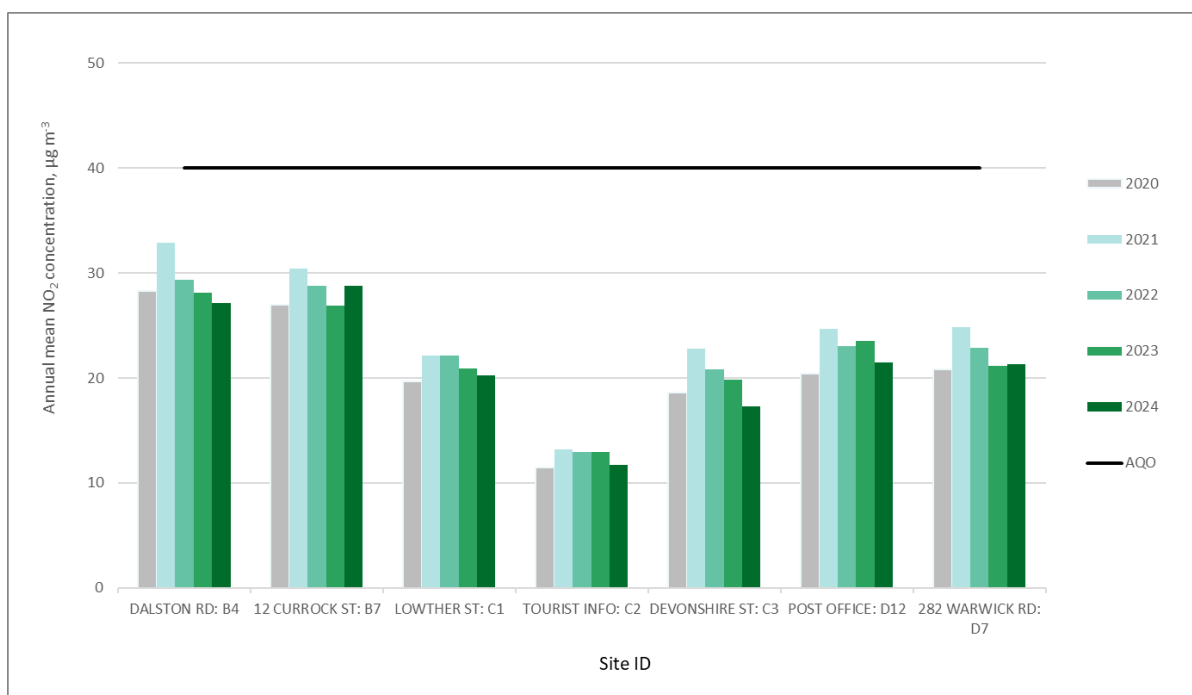
Results are presented as the number of 1-hour periods where concentrations greater than 200 µg m<sup>-3</sup> have been recorded.

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

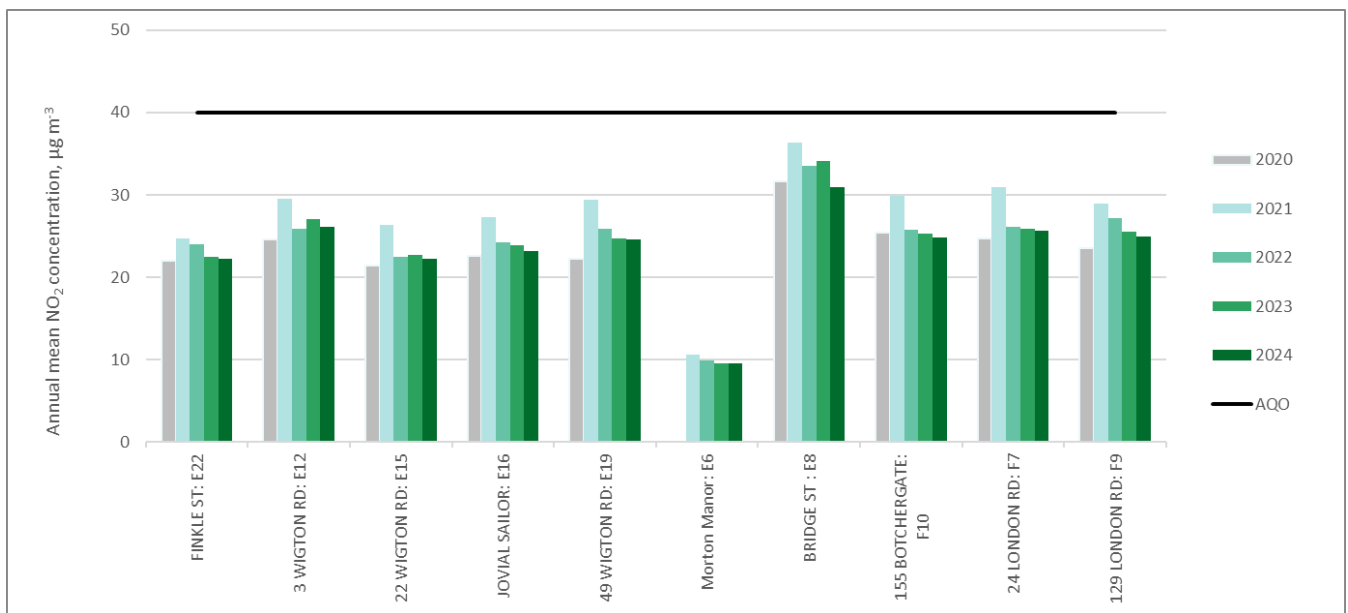
If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

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

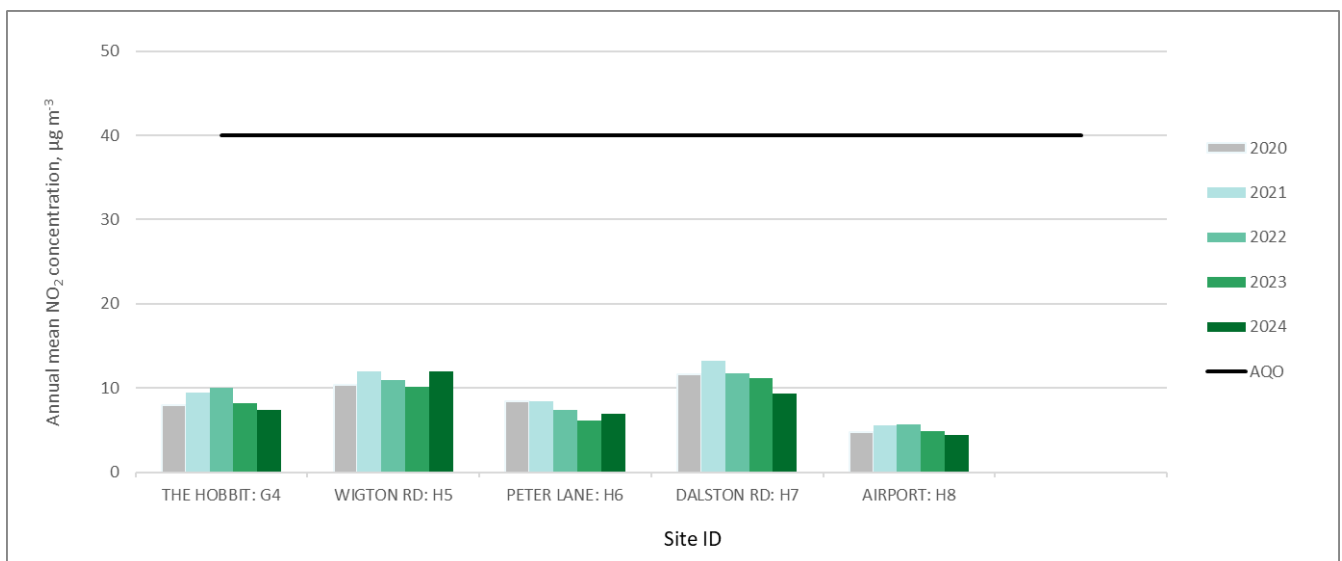
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

**Figure A.2 - Trends in Annual Mean NO<sub>2</sub> Concentrations: Along A7****Figure A.3 - Trends in Annual Mean NO<sub>2</sub> Concentrations: for sites in city centre and within AQMA 2 and AQMA 5**

**Figure A.4 - Trends in annual mean NO<sub>2</sub>: along Wigton Road, Bridge Street and London Road**



**Figure A.5 - Trends in annual mean NO<sub>2</sub>: Carlisle Northern Development Route and various other locations**



**Figure A.6 - Trends in annual mean NO<sub>2</sub> concentrations in the former council area of Allerdale BC**

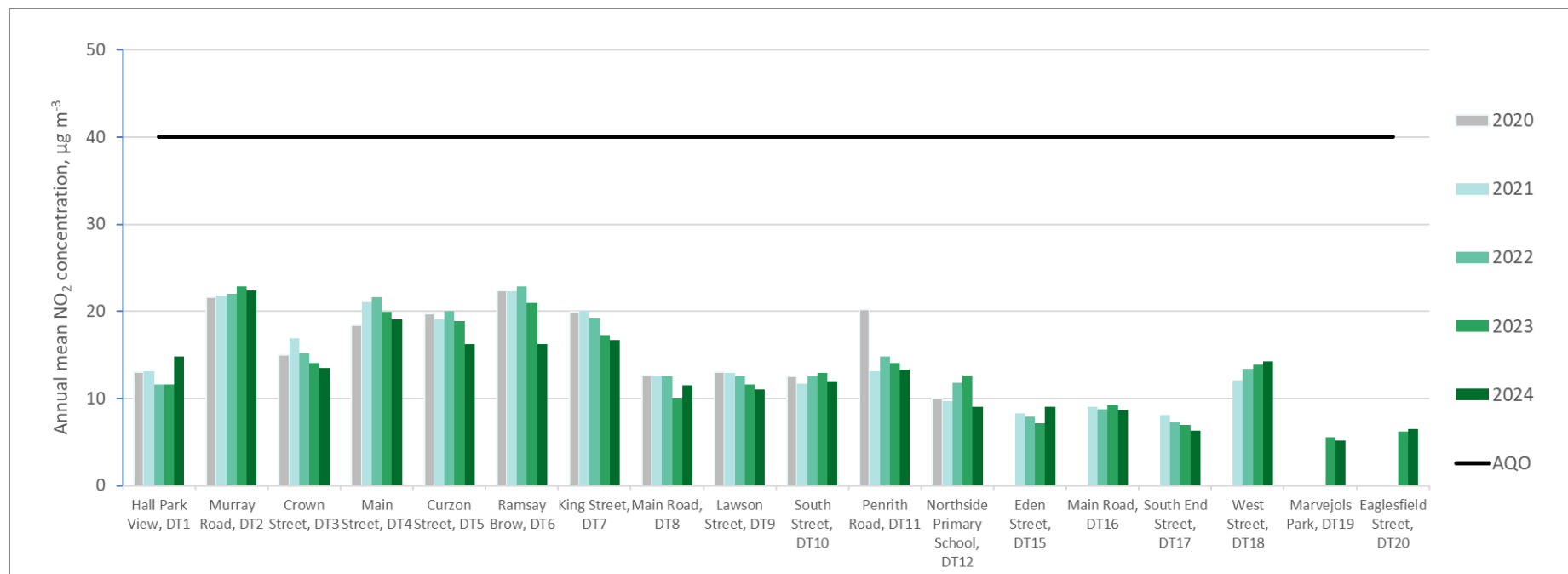
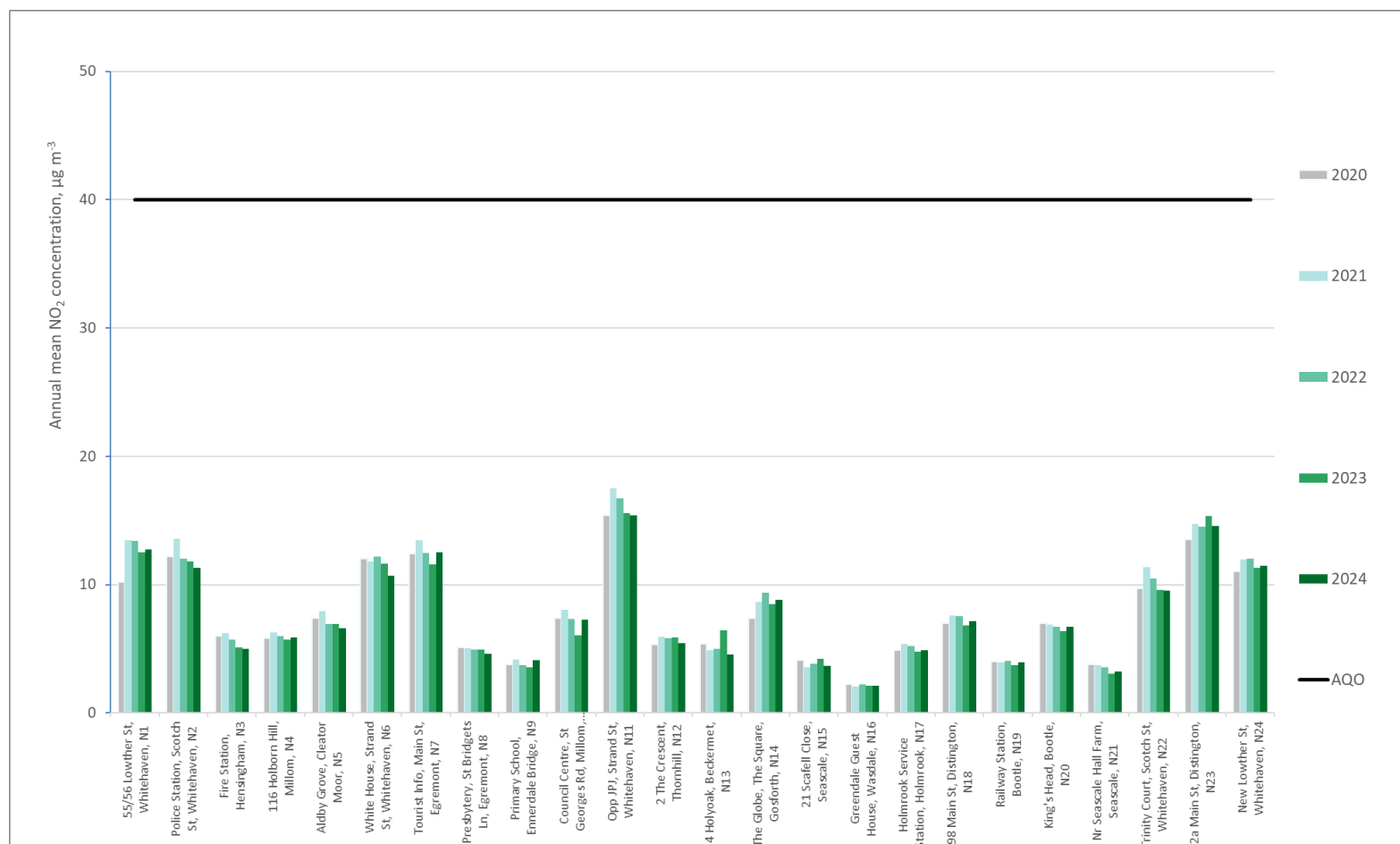
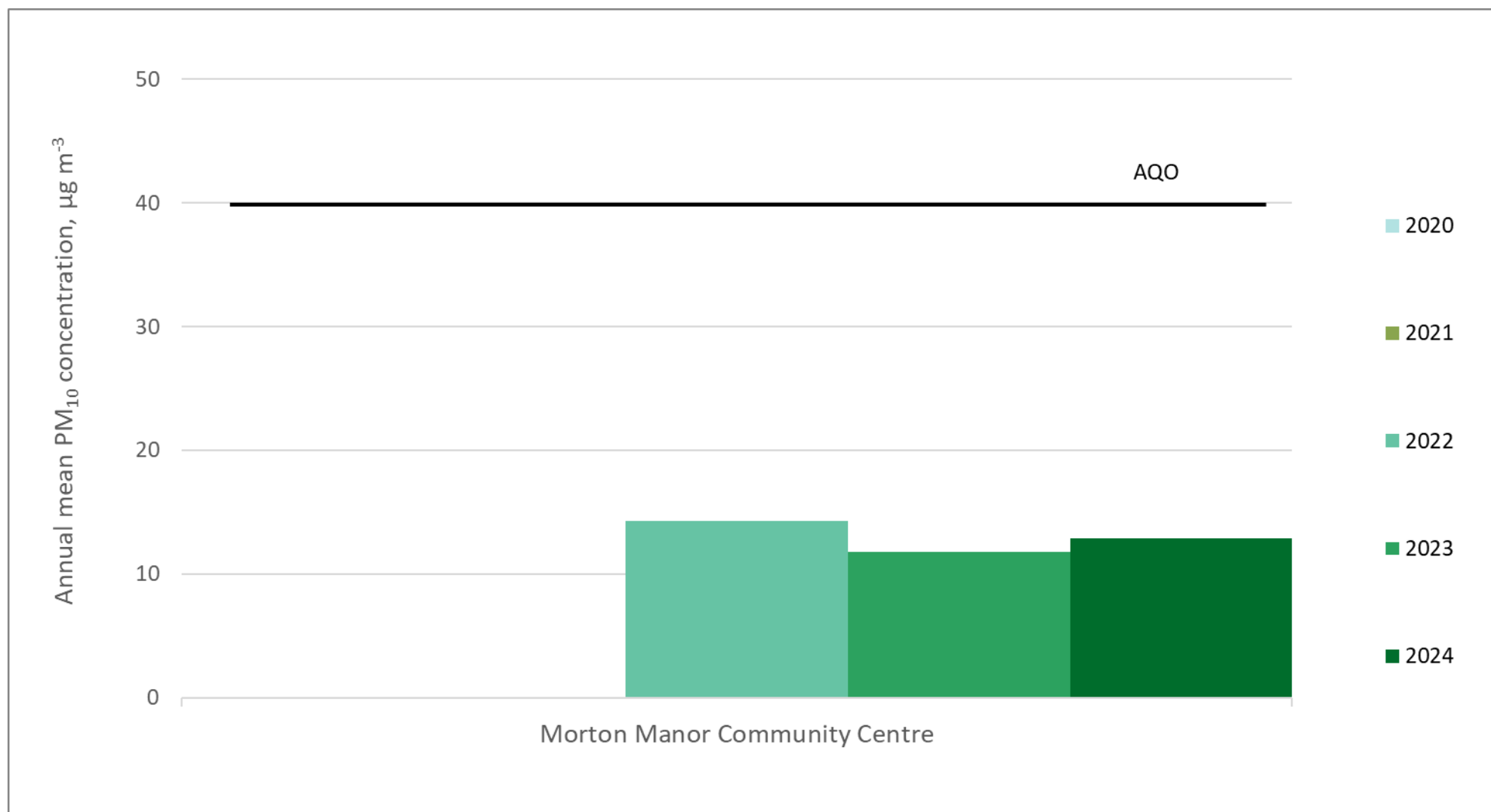


Figure A.7 - Trends in annual mean NO<sub>2</sub> concentrations in the former council area of Copeland BC

**Table A.6 – Annual Mean PM<sub>10</sub> Monitoring Results (µg m<sup>-3</sup>)**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|---------|-------------------------|--------------------------|-----------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| MMCC    | 338195                  | 554990                   | Roadside  | 94.6                                                        | 94.6                                       |      |      | 14.3 | 11.8 | 12.9 |

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

**Figure A.8 – Trends in Annual Mean PM<sub>10</sub> Concentrations**

**Table A.7 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50 µg m<sup>-3</sup>**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|---------|-------------------------|--------------------------|-----------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| MMCC    | 338195                  | 554990                   | Roadside  | 94.6                                                        | 94.6                                       |      |      | 1    | 0    | 0    |

**Notes:**

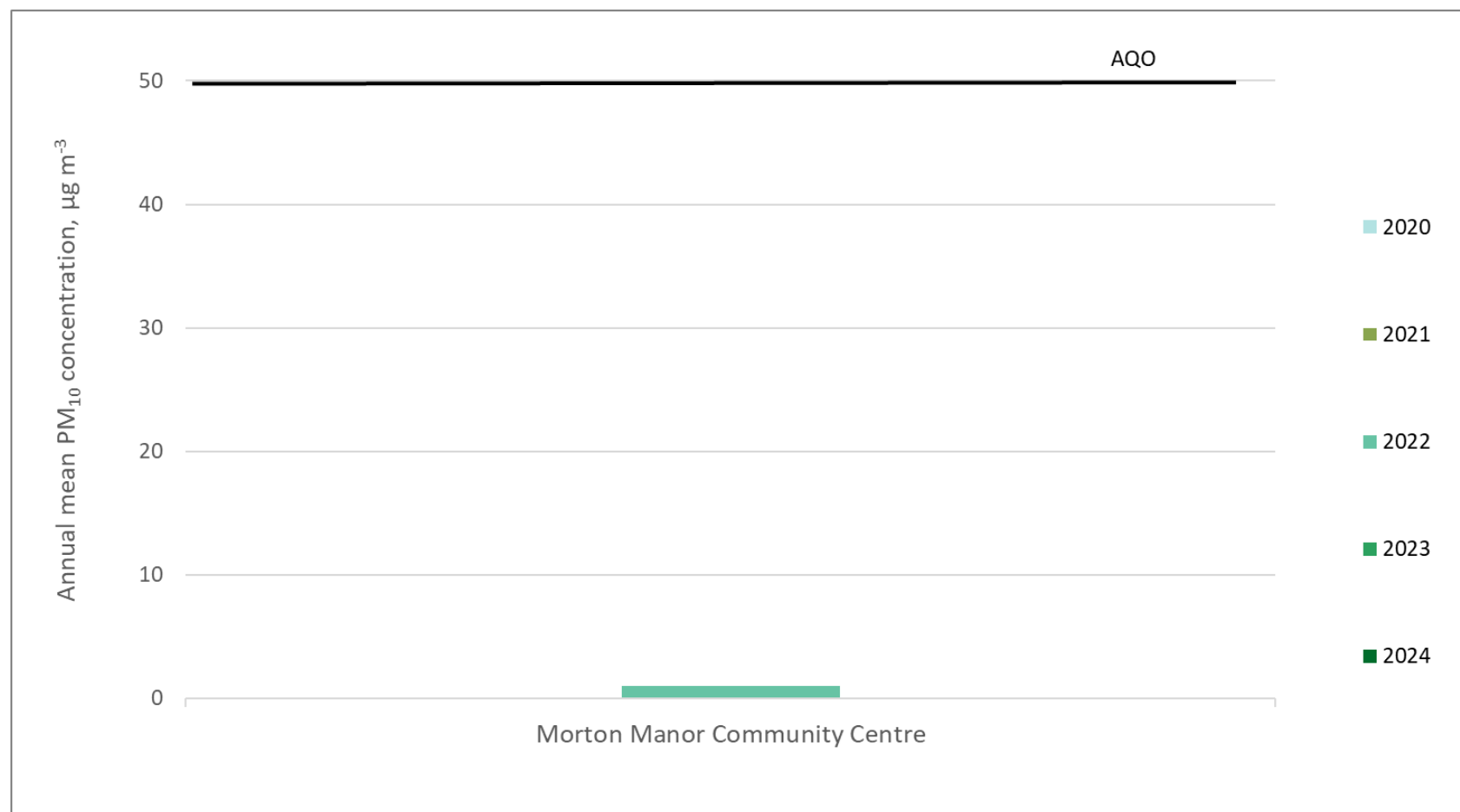
Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50 µg m<sup>-3</sup> have been recorded.

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

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

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

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

**Figure A.9 – Trends in Number of 24-Hour Mean PM<sub>10</sub> Results > 50 µg m<sup>-3</sup>**

**Table A.8 – Annual Mean PM<sub>2.5</sub> Monitoring Results (µg m<sup>-3</sup>)**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2024 (%) <sup>(2)</sup> | 2020 | 2021 | 2022 | 2023 | 2024 |
|---------|-------------------------|--------------------------|-----------|-------------------------------------------------------------|--------------------------------------------|------|------|------|------|------|
| MMCC    | 338195                  | 554990                   | Roadside  | 65.8                                                        | 65.8                                       |      |      | 9.3  | 7.9  | 7.6  |

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

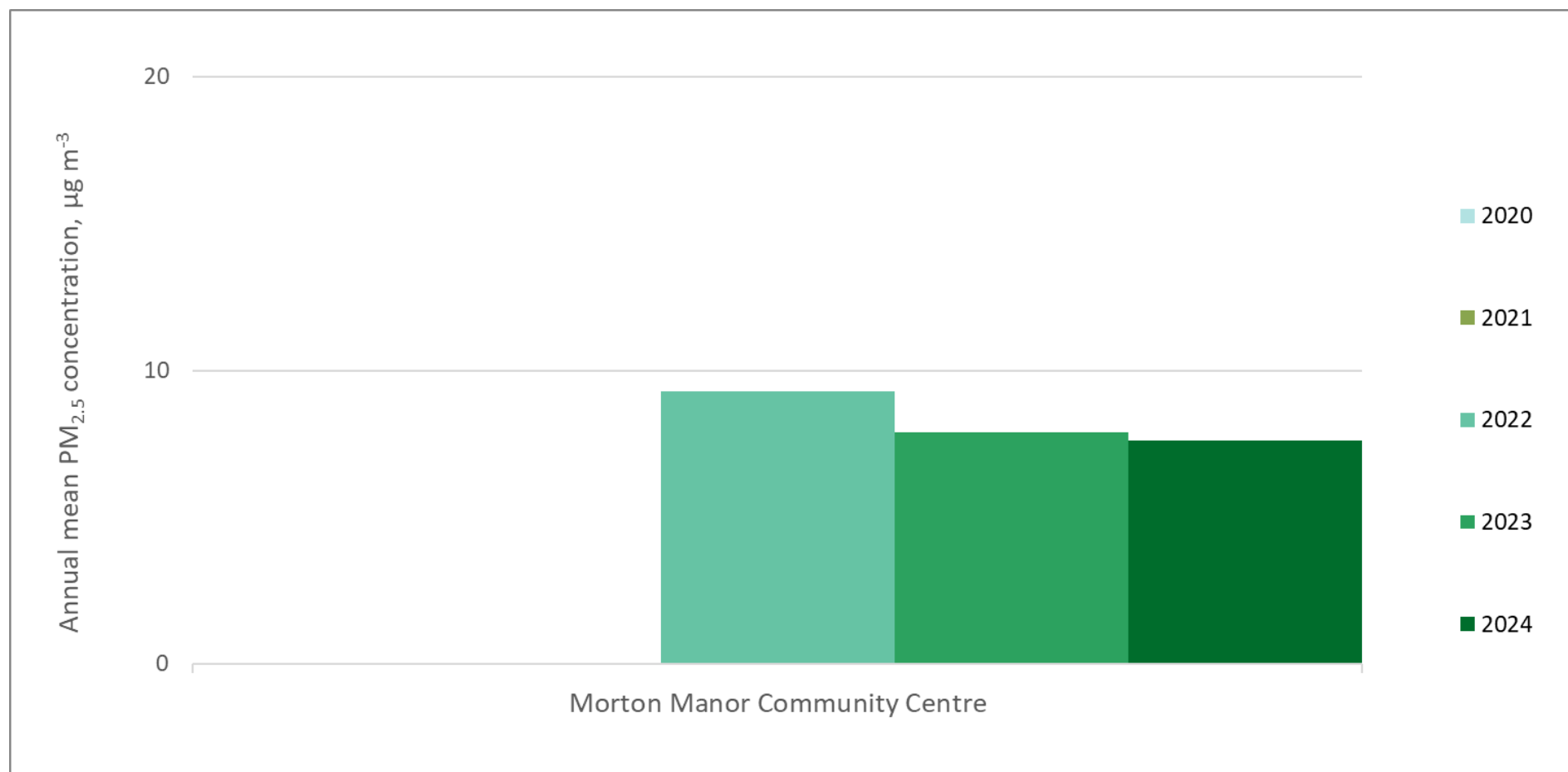
**Notes:**

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

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

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

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

**Figure A.10 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations**

## Appendix B: Full Monthly Diffusion Tube Results for 2024

**Table B.1 – NO<sub>2</sub> 2024 Diffusion Tube Results (µg m<sup>-3</sup>)**

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct | Nov  | Dec  | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted<br>CCC = 0.84<br>ABC = 0.78<br>CBC = 0.88 | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|-------|-------------------------|--------------------------|------|------|------|------|------|------|------|------|------|-----|------|------|-----------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------|---------|
| A1    | 339995                  | 557188                   | 29.1 | 30.1 | 26.3 | 23.1 | 21.0 | 22.6 | 19.5 | 24.2 | 18.5 |     | 31.0 | 29.4 | 25.0                  | 21.0                                                                                | -                                                   |         |
| A10   | 340008                  | 556842                   | 36.9 | 30.6 | 39.2 | 35.2 | 37.4 | 22.9 | 29.4 | 24.3 | 37.6 |     | 39.9 | 32.1 | 33.2                  | 27.9                                                                                | -                                                   |         |
| A12   | 339935                  | 557125                   | 27.1 | 26.7 | 24.0 | 27.0 | 26.8 | 21.4 | 23.5 | 19.8 | 26.0 |     | 28.7 | 25.8 | 25.2                  | 21.1                                                                                | -                                                   |         |
| A5    | 339758                  | 558059                   | 28.1 | 28.4 | 21.1 | 22.0 | 21.5 | 22.1 | 22.7 | 22.5 | 17.5 |     | 32.3 | 29.3 | 24.3                  | 20.4                                                                                | -                                                   |         |
| A7    | 339526                  | 559285                   | 20.6 | 18.3 | 15.0 | 13.9 | 15.0 | 13.8 | 15.0 | 14.3 | 12.5 |     | 22.9 | 21.2 | 16.6                  | 13.9                                                                                | -                                                   |         |
| A9    | 340028                  | 556833                   | 30.3 | 36.6 | 24.2 | 27.1 | 29.9 | 27.3 | 29.2 | 22.9 | 26.7 |     | 32.0 | 30.6 | 28.8                  | 24.2                                                                                | -                                                   |         |
| B4    | 339434                  | 555638                   | 32.8 | 37.9 | 33.6 | 31.7 | 31.0 | 28.5 | 30.6 | 26.4 | 28.5 |     | 39.8 | 34.6 | 32.3                  | 27.1                                                                                | -                                                   |         |
| B7    | 340205                  | 555198                   | 34.8 | a    | 29.5 | 31.1 | 31.4 | 28.8 | 30.1 | 26.0 | a    |     | 41.4 | 38.2 | 32.4                  | 28.8                                                                                | -                                                   |         |
| C1    | 340216                  | 556131                   | 25.4 | 29.9 | 26.3 | 22.2 | 23.7 | 18.9 | 19.4 | 19.9 | 21.7 |     | 30.9 | 27.3 | 24.1                  | 20.3                                                                                | -                                                   |         |
| C2    | 340069                  | 555955                   | 18.0 | 18.2 | 16.4 | 11.4 | 10.4 | 8.9  | 9.5  | a    | a    | a   | a    | a    | 13.3                  | 11.7                                                                                | -                                                   |         |
| C3    | 340218                  | 555768                   | 24.8 | 24.4 | a    | a    | a    | a    | a    | a    | 22.1 |     | 26.1 | 23.0 | 24.1                  | 17.3                                                                                | -                                                   |         |
| D12   | 340307                  | 555718                   | 27.3 | 31.7 | 26.5 | 21.2 | 23.6 | 21.6 | 23.0 | 23.9 | 20.7 |     | 31.0 | 30.9 | 25.6                  | 21.5                                                                                | -                                                   |         |
| D7    | 341593                  | 555893                   | 28.7 | 32.5 | 24.1 | 21.7 | 24.1 | 25.5 | 20.9 | 25.7 | 17.0 |     | 29.9 | 28.6 | 25.3                  | 21.3                                                                                | -                                                   |         |
| E22   | 339834                  | 556137                   | 28.0 | 32.5 | 25.5 | 25.5 | 24.5 | 21.1 | 22.7 | 23.3 | a    |     | 32.7 | 29.5 | 26.5                  | 22.3                                                                                | -                                                   |         |
| E12   | 339225                  | 555821                   | 29.0 | 31.2 | 33.9 | 30.0 | 33.6 | 27.2 | 31.9 | 25.5 | 34.8 |     | 33.4 | 31.4 | 31.1                  | 26.1                                                                                | -                                                   |         |
| E15   | 339091                  | 555736                   | 29.8 | 30.9 | 27.9 | 24.3 | 26.6 | 21.9 | 24.5 | 17.6 | 26.0 |     | 32.8 | 29.5 | 26.5                  | 22.3                                                                                | -                                                   |         |
| E16   | 339141                  | 555900                   | 24.8 | 32.7 | 32.4 | 26.7 | 31.7 | 19.5 | 22.7 | 18.5 | 33.6 |     | 33.2 | 28.3 | 27.6                  | 23.2                                                                                | -                                                   |         |

| 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<br>CCC =0.84<br>ABC = 0.78<br>CBC = 0.88 | Annual Mean: Distance Corrected to Nearest Exposure | Comment                                                                  |
|-------|-------------------------|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------|------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------|
| E19   | 338953                  | 555610                   | 26.4 | 35.5 | 34.8 | 30.2 | 30.9 | 22.6 | 24.2 | 20.7 | 31.5 |      | 35.0 | 29.6 | 29.2                  | 24.5                                                                               | -                                                   |                                                                          |
| E6    | 339467                  | 555974                   | 15.8 | 14.2 | 10.4 | 9.9  | 10.0 | 7.8  | 9.7  | 6.9  | 12.0 |      | 17.0 | 14.5 | -                     | -                                                                                  | -                                                   | Triplicate Site with E6, E61 and E62 - Annual data provided for E62 only |
| E61   | 339467                  | 555974                   | 15.2 | 14.6 | 10.5 | 9.5  | 10.2 | 7.6  | 9.7  | 7.0  | 11.9 |      | 16.5 | 12.8 | -                     | -                                                                                  | -                                                   | Triplicate Site with E6, E61 and E62 - Annual data provided for E62 only |
| E62   | 339467                  | 555974                   | 16.1 | 13.1 | 11.0 | 10.0 | 8.6  | 6.9  | 8.7  | 6.4  | 10.2 |      | 15.7 | 15.3 | 11.4                  | 9.6                                                                                | -                                                   | Triplicate Site with E6, E61 and E62 - Annual data provided for E62 only |
| E8    | 339516                  | 556024                   | 14.2 | 42.4 | 43.0 | 41.8 | 42.2 | 37.1 | 38.6 | 27.2 | 42.6 |      | 38.3 | 37.5 | 36.8                  | 30.9                                                                               | -                                                   |                                                                          |
| F10   | 340600                  | 555349                   | 31.9 | 34.2 | 29.9 | 28.4 | 31.4 | 24.6 | 26.4 | 22.4 | 29.0 |      | 32.9 | 34.2 | 29.6                  | 24.8                                                                               | -                                                   |                                                                          |
| F7    | 340708                  | 555240                   | 32.5 | 36.4 | 30.4 | 30.7 | 30.4 | 29.2 | 28.1 | 27.8 | 23.9 |      | 33.9 | 32.7 | 30.6                  | 25.7                                                                               | -                                                   |                                                                          |
| F9    | 341099                  | 554931                   | 29.7 | 34.1 | 30.1 | 28.8 | 32.3 | 24.5 | a    | 21.5 | 31.6 |      | 34.0 | 30.5 | 29.7                  | 25.0                                                                               | -                                                   |                                                                          |
| G4    | 336905                  | 554036                   | 11.3 | 11.1 | 8.5  | 6.7  | 7.0  | 5.9  | 6.7  | 7.0  | 7.4  |      | 13.3 | 11.9 | 8.8                   | 7.4                                                                                | -                                                   |                                                                          |
| H5    | 337643                  | 554100                   | 36.8 | 15.5 | 12.7 | 9.9  | 8.6  | 8.0  | 8.8  | 9.1  | 10.9 |      | 19.0 | 17.1 | 14.2                  | 11.9                                                                               | -                                                   |                                                                          |
| H6    | 337962                  | 553220                   | a    | a    | a    | a    | a    | 4.5  | 6.3  | 4.6  | 9.7  |      | 11.2 | 9.1  | 7.6                   | 6.9                                                                                | -                                                   |                                                                          |
| H7    | 338282                  | 553396                   | 15.6 | 14.8 |      | 9.4  | 9.4  | 7.2  | 7.8  | 8.4  | 11.8 |      | 14.8 | 11.2 | 11.0                  | 9.3                                                                                | -                                                   |                                                                          |
| H8    | 347874                  | 561254                   | 6.7  | 6.9  | 5.6  | 3.5  | 4.1  | 3.4  | 4.1  | 4.2  | 5.6  |      | 8.0  | 6.4  | 5.3                   | 4.5                                                                                | -                                                   |                                                                          |
| DT1   | 300721                  | 528958                   | a    | 16.8 | 16.9 | 13.5 | 13.5 | 25.4 | 22.1 | 13.6 | 23.0 | a    | 28.3 | 17.0 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT1 and DT1B - Annual data provided for DT1B only    |
| DT1B  | 300721                  | 528958                   | a    | 16.8 | 16.9 | 13.5 | 13.5 | 25.4 | 22.1 | 13.6 | 23.0 | a    | 28.3 | 17.0 | 19.0                  | 14.8                                                                               | -                                                   | Duplicate Site with DT1 and DT1B - Annual data provided for DT1B only    |
| DT2   | 301194                  | 528711                   | 33.2 | 29.3 | 23.6 | 24.0 | 28.6 | 29.5 | 20.1 | 22.1 | 23.4 | a    | a    | a    | -                     | -                                                                                  | -                                                   | Duplicate Site with DT2 and DT2B - Annual data provided for DT2B only    |
| DT2B  | 301194                  | 528711                   | 33.2 | 29.3 | 23.6 | 24.0 | 28.6 | 29.5 | 20.1 | 22.1 | 23.4 | a    | a    | a    | 26.0                  | 22.4                                                                               | -                                                   | Duplicate Site with DT2 and DT2B - Annual data provided for DT2B only    |
| DT3   | 311652                  | 530658                   | 20.4 | 23.0 | 8.7  | 16.2 | 16.7 | 15.5 | 15.7 | 13.3 | 18.6 | 17.7 | 17.1 | 24.8 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT3 and DT3B - Annual data provided for DT3B only    |
| DT3B  | 311652                  | 530658                   | 20.4 | 23.0 | 8.7  | 16.2 | 16.7 | 15.5 | 15.7 | 13.3 | 18.6 | 17.7 | 17.1 | 24.8 | 17.3                  | 13.5                                                                               | -                                                   | Duplicate Site with DT3 and DT3B - Annual data provided for DT3B 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<br>CCC =0.84<br>ABC = 0.78<br>CBC = 0.88 | Annual Mean: Distance Corrected to Nearest Exposure | Comment                                                                  |
|-------|-------------------------|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------|------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------|
| DT4   | 326419                  | 523602                    | 24.5 | 25.1 | 24.0 | 23.1 | a    | 28.0 | 8.6  | 39.4 | 15.4 | 26.0 | 25.7 | 28.6 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT4 and DT4B - Annual data provided for DT4B only    |
| DT4B  | 326419                  | 523602                    | 24.5 | 25.1 | 24.0 | 23.1 | a    | 28.0 | 8.6  | 39.4 | 15.4 | 26.0 | 25.7 | 28.6 | 24.4                  | 19.0                                                                               | -                                                   | Duplicate Site with DT4 and DT4B - Annual data provided for DT4B only    |
| DT5   | 303778                  | 536534                    | 23.0 | 27.9 | 24.6 | 21.3 | 18.2 | 4.7  | 17.8 | 17.9 | 21.4 | 23.1 | 21.7 | 27.5 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT5 and DT5B - Annual data provided for DT5B only    |
| DT5B  | 303778                  | 536534                    | 23.0 | 27.9 | 24.6 | 21.3 | 18.2 | 4.7  | 17.8 | 17.9 | 21.4 | 23.1 | 21.7 | 27.5 | 20.8                  | 16.2                                                                               | -                                                   | Duplicate Site with DT5 and DT5B - Annual data provided for DT5B only    |
| DT6   | 300588                  | 528682                    | 26.3 | 28.1 | 31.7 | 25.7 | 25.6 | 10.6 | 11.9 | 8.4  | 13.8 | 15.0 | 17.1 | 34.9 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT6 and DT6B - Annual data provided for DT6B only    |
| DT6B  | 300588                  | 528682                    | 26.3 | 28.1 | 31.7 | 25.7 | 25.6 | 10.6 | 11.9 | 8.4  | 13.8 | 15.0 | 17.1 | 34.9 | 20.8                  | 16.2                                                                               | -                                                   | Duplicate Site with DT6 and DT6B - Annual data provided for DT6B only    |
| DT7   | 325508                  | 548419                    | a    | 27.2 | 16.3 | 20.6 | 23.8 | 20.0 | 20.1 | 14.7 | 23.8 | 22.5 | 17.4 | 29.8 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT7 and DT7B - Annual data provided for DT7B only    |
| DT7B  | 325508                  | 548419                    | a    | 27.2 | 16.3 | 20.6 | 23.8 | 20.0 | 20.1 | 14.7 | 23.8 | 22.5 | 17.4 | 29.8 | 21.5                  | 16.7                                                                               | -                                                   | Duplicate Site with DT7 and DT7B - Annual data provided for DT7B only    |
| DT8   | 299591                  | 525545                    | 16.0 | 15.9 | 20.6 | 13.8 | 15.1 | 8.8  | 8.5  | 6.1  | 20.1 | 15.2 | 19.0 | 18.3 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT8 and DT8B - Annual data provided for DT8B only    |
| DT8B  | 299591                  | 525545                    | 16.0 | 15.9 | 20.6 | 13.8 | 15.1 | 8.8  | 8.5  | 6.1  | 20.1 | 15.2 | 19.0 | 18.3 | 14.8                  | 11.5                                                                               | -                                                   | Duplicate Site with DT8 and DT8B - Annual data provided for DT8B only    |
| DT9   | 315299                  | 542145                    | 17.2 | 17.2 | 12.0 | 13.2 | 14.2 | 13.2 | 12.4 | 10.0 | 14.2 | 14.0 | 11.6 | 19.8 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT9 and DT9B - Annual data provided for DT9B only    |
| DT9B  | 315299                  | 542145                    | 17.2 | 17.2 | 12.0 | 13.2 | 14.2 | 13.2 | 12.4 | 10.0 | 14.2 | 14.0 | 11.6 | 19.8 | 14.1                  | 11.0                                                                               | -                                                   | Duplicate Site with DT9 and DT9B - Annual data provided for DT9B only    |
| DT10  | 312091                  | 530547                    | 18.5 | 19.5 | 16.7 | 13.3 | 15.3 | 11.8 | 12.0 | 7.8  | 15.9 | 15.6 | 19.4 | 18.6 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT10 and DT10B - Annual data provided for DT10B only |
| DT10B | 312091                  | 530547                    | 18.5 | 19.5 | 16.7 | 13.3 | 15.3 | 11.8 | 12.0 | 7.8  | 15.9 | 15.6 | 19.4 | 18.6 | 15.4                  | 12.0                                                                               | -                                                   | Duplicate Site with DT10 and DT10B - Annual data provided for DT10B only |
| DT11  | 327949                  | 523764                    | 15.5 | 17.9 | 21.2 | 14.8 | 17.4 | 11.0 | 10.5 | 19.2 | 19.5 | 19.7 | 19.8 | 18.0 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT11 and DT11B - Annual data provided for DT11B only |
| DT11B | 327949                  | 523764                    | 15.5 | 17.9 | 21.2 | 14.8 | 17.4 | 11.0 | 10.5 | 19.2 | 19.5 | 19.7 | 19.8 | 18.0 | 17.0                  | 13.3                                                                               | -                                                   | Duplicate Site with DT11 and DT11B - Annual data provided for DT11B only |
| DT12  | 299939                  | 529709                    | 13.5 | 15.0 | 11.4 | 10.2 | 9.7  | 10.2 | a    | a    | 6.5  | 14.2 | 9.4  | 16.4 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT12 and DT12B - Annual data provided for DT12B 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<br>CCC =0.84<br>ABC = 0.78<br>CBC = 0.88 | Annual Mean: Distance Corrected to Nearest Exposure | Comment                                                                  |
|-------|-------------------------|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------|------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------|
| DT12B | 299939                  | 529709                    | 13.5 | 15.0 | 11.4 | 10.2 | 9.7  | 10.2 | a    | a    | 6.5  | 14.2 | 9.4  | 16.4 | 11.7                  | 9.1                                                                                | -                                                   | Duplicate Site with DT12 and DT12B - Annual data provided for DT12B only |
| DT15  | 310949                  | 553517                    | a    | 11.8 | 6.3  | 9.5  | 25.8 | a    | 9.4  | 6.6  | 8.4  | a    | 11.9 | 14.1 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT15 and DT15B - Annual data provided for DT15B only |
| DT15B | 310949                  | 553517                    | a    | 11.8 | 6.3  | 9.5  | 25.8 | a    | 9.4  | 6.6  | 8.4  | a    | 11.9 | 14.1 | 11.5                  | 9.1                                                                                | -                                                   | Duplicate Site with DT15 and DT15B - Annual data provided for DT15B only |
| DT16  | 301765                  | 530720                    | a    | 14.1 | 12.3 | a    | 11.6 | 10.1 | a    | a    | 10.8 | 9.5  | 9.2  | 17.8 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT16 and DT16B - Annual data provided for DT16B only |
| DT16B | 301765                  | 530720                    | a    | 14.1 | 12.3 | a    | 11.6 | 10.1 | a    | a    | 10.8 | 9.5  | 9.2  | 17.8 | 11.9                  | 8.6                                                                                | -                                                   | Duplicate Site with DT16 and DT16B - Annual data provided for DT16B only |
| DT17  | 325568                  | 547874                    | a    | 9.9  | 9.4  | 6.7  | 9.1  | 5.3  | 5.6  | 3.9  | 8.2  | a    | 10.5 | 12.1 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT17 and DT17B - Annual data provided for DT17B only |
| DT17B | 325568                  | 547874                    | a    | 9.9  | 9.4  | 6.7  | 9.1  | 5.3  | 5.6  | 3.9  | 8.2  | a    | 10.5 | 12.1 | 8.1                   | 6.3                                                                                | -                                                   | Duplicate Site with DT17 and DT17B - Annual data provided for DT17B only |
| DT18  | 314286                  | 541751                    | 20.7 | 22.1 | 20.4 | 16.3 | a    | 15.5 | 15.9 | 13.0 | 18.2 | 16.0 | 22.3 | 21.0 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT18 and DT18B - Annual data provided for DT18B only |
| DT18B | 314286                  | 541751                    | 20.7 | 22.1 | 20.4 | 16.3 | a    | 15.5 | 15.9 | 13.0 | 18.2 | 16.0 | 22.3 | 21.0 | 18.3                  | 14.3                                                                               | -                                                   | Duplicate Site with DT18 and DT18B - Annual data provided for DT18B only |
| DT19  | 311391                  | 529810                    | 8.2  | 9.1  | 7.7  | 5.2  | 5.3  | 4.0  | 4.2  | 3.9  | 6.2  | 8.2  | 5.9  | 12.0 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT19 and DT19B - Annual data provided for DT19B only |
| DT19B | 311391                  | 529810                    | 8.2  | 9.1  | 7.7  | 5.2  | 5.3  | 4.0  | 4.2  | 3.9  | 6.2  | 8.2  | 5.9  | 12.0 | 6.7                   | 5.2                                                                                | -                                                   | Duplicate Site with DT19 and DT19B - Annual data provided for DT19B only |
| DT20  | 303720                  | 536702                    | 8.1  | 8.7  | 8.1  | 5.6  | 5.7  | 20.1 | 5.4  | 4.7  | 4.1  | 8.5  | 9.8  | 10.7 | -                     | -                                                                                  | -                                                   | Duplicate Site with DT20 and DT20B - Annual data provided for DT20B only |
| DT20B | 303720                  | 536702                    | 8.1  | 8.7  | 8.1  | 5.6  | 5.7  | 20.1 | 5.4  | 4.7  | 4.1  | 8.5  | 9.8  | 10.7 | 8.3                   | 6.5                                                                                | -                                                   | Duplicate Site with DT20 and DT20B - Annual data provided for DT20B only |
| N1    | 297305                  | 518185                    | 19.2 | 18.3 | 13.9 | 14.1 | 14.4 | 10.2 | 11.8 | 9.7  | 13.7 | 16.4 | 16.5 | 15.8 | 14.5                  | 12.8                                                                               | -                                                   |                                                                          |
| N2    | 297515                  | 518070                    | 16.6 | 16.9 | 12.5 | 11.0 | 12.7 | 10.2 | 9.9  | 9.6  | 12.0 | 14.1 | 16.2 | 12.0 | 12.8                  | 11.3                                                                               | -                                                   |                                                                          |
| N3    | 299020                  | 517245                    | 5.6  | 7.5  | 6.1  | 4.3  | 5.5  | 3.3  | 4.4  | 3.8  | 4.8  | 7.7  | 8.2  | 6.9  | 5.7                   | 5.0                                                                                | -                                                   |                                                                          |
| N4    | 316725                  | 480340                    | 7.7  | 9.4  | 6.4  | 4.8  | 5.5  | 4.4  | 4.3  | 4.8  | 5.0  | 9.0  | 11.3 | 7.5  | 6.7                   | 5.9                                                                                | -                                                   |                                                                          |
| N5    | 302260                  | 514890                    | 9.1  | 9.7  | 7.3  | 6.3  | 7.8  | 6.3  | 6.1  | 6.2  | 6.9  | 8.5  | 11.0 | 4.3  | 7.5                   | 6.6                                                                                | -                                                   |                                                                          |

| 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<br>CCC =0.84<br>ABC = 0.78<br>CBC = 0.88 | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|-------|-------------------------|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------|------------------------------------------------------------------------------------|-----------------------------------------------------|---------|
| N6    | 297230                  | 518155                    | 15.4 | 10.9 | 16.1 | 11.3 | 12.0 | 8.4  | 9.4  | 8.7  | 10.0 | 14.9 | 15.8 | 12.6 | 12.1                  | 10.7                                                                               | -                                                   |         |
| N7    | 301095                  | 510930                    | 21.2 | 14.7 | 14.6 | 13.0 | 14.6 | 9.2  | 12.1 | 10.3 | 14.3 | 11.9 | 19.8 | 14.6 | 14.2                  | 12.5                                                                               | -                                                   |         |
| N8    | 300895                  | 510695                    | 7.7  | 6.0  | 4.9  | 3.6  | 4.1  | 2.6  | 3.1  | 3.5  | 4.5  | 6.5  | 9.2  | 6.9  | 5.2                   | 4.6                                                                                | -                                                   |         |
| N9    | 307000                  | 515855                    | 5.8  | 4.8  | 4.0  | 3.3  | 3.9  | 2.8  | 3.6  | 4.8  | 4.8  | 5.3  | 6.8  | 5.9  | 4.7                   | 4.1                                                                                | -                                                   |         |
| N10   | 317310                  | 479980                    | 11.0 | 9.5  | a    | 6.7  | a    | a    | a    | a    | 6.4  | a    | a    | a    | 8.4                   | 7.2                                                                                | -                                                   |         |
| N11   | 297320                  | 518280                    | 16.7 | 25.6 | 21.3 | 17.0 | 18.8 | 13.6 | 15.9 | 13.0 | 14.4 | 17.6 | 19.7 | 16.8 | 17.5                  | 15.4                                                                               | -                                                   |         |
| N12   | 301225                  | 508805                    | 10.1 | 5.8  | 6.5  | 4.5  | 5.1  | 3.3  | 3.9  | 3.8  | 5.5  | 6.8  | 11.6 | 7.4  | 6.2                   | 5.5                                                                                | -                                                   |         |
| N13   | 301975                  | 506635                    | 7.9  | 6.4  | 5.5  | 3.9  | 4.4  | 3.3  | 3.3  | 3.6  | 4.6  | 5.7  | 7.6  | 6.1  | 5.2                   | 4.6                                                                                | -                                                   |         |
| N14   | 306695                  | 503535                    | 12.3 | 11.3 | 10.8 | 8.6  | 10.2 | 8.8  | 9.4  | 9.3  | 8.1  | 10.8 | 11.8 | 8.8  | 10.0                  | 8.8                                                                                | -                                                   |         |
| N15   | 304440                  | 501495                    | 6.5  | 5.5  | 4.6  | 3.2  | 0.7  | 2.7  | 2.8  | 3.1  | 3.1  | 6.2  | 6.4  | 5.2  | 4.2                   | 3.7                                                                                | -                                                   |         |
| N16   | 314410                  | 505570                    | 1.9  | 3.2  | 2.8  | 2.2  | 2.4  | 1.3  | 1.6  | 2.3  | 2.0  | 3.6  | 3.4  | a    | 2.4                   | 2.1                                                                                | -                                                   |         |
| N17   | 308235                  | 499295                    | 6.9  | 5.4  | 5.3  | 4.8  | 4.4  | 3.5  | 3.6  | 4.7  | 5.9  | 6.5  | 9.6  | 6.5  | 5.6                   | 4.9                                                                                | -                                                   |         |
| N18   | 300590                  | 523220                    | 11.4 | 8.2  | 7.2  | 7.2  | 7.1  | 6.0  | 5.8  | 6.1  | 7.0  | 8.4  | 12.4 | 10.4 | 8.1                   | 7.1                                                                                | -                                                   |         |
| N19   | 309345                  | 489300                    | 5.2  | 5.3  | 4.7  | 3.5  | 4.0  | 2.4  | 3.4  | 3.2  | 3.3  | 6.0  | 7.7  | 5.1  | 4.5                   | 3.9                                                                                | -                                                   |         |
| N20   | 310735                  | 488320                    | 9.6  | 8.4  | 7.8  | 7.0  | 7.1  | 5.4  | 6.8  | 6.9  | 5.9  | 9.8  | 9.9  | 7.5  | 7.7                   | 6.7                                                                                | -                                                   |         |
| N21   | 303995                  | 502445                    | 4.3  | 3.5  | 3.7  | 2.9  | 3.3  | 2.8  | 2.6  | 2.9  | 3.2  | 3.6  | 6.1  | 4.7  | 3.6                   | 3.2                                                                                | -                                                   |         |
| N22   | 297440                  | 517960                    | 16.5 | 14.3 | 11.2 | 8.9  | 10.8 | 6.5  | 8.2  | 7.2  | 9.1  | 12.9 | 12.1 | 12.4 | 10.8                  | 9.5                                                                                | -                                                   |         |
| N23   | 300885                  | 523890                    | 20.2 | 18.6 | 14.6 | 15.4 | 17.5 | 13.9 | 10.9 | 11.5 | 20.6 | 15.1 | 23.3 | 17.1 | 16.6                  | 14.6                                                                               | -                                                   |         |
| N24   | 297260                  | 518225                    | 16.5 | 17.1 | 16.7 | 11.5 | 12.5 | 6.9  | 11.6 | 8.8  | 10.2 | 15.0 | 14.8 | 14.7 | 13.0                  | 11.5                                                                               | -                                                   |         |

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

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

- ☒ Local bias adjustment factor used.
- ☒ National bias adjustment factor used.
- ☒ Where applicable, data has been distance corrected for relevant exposure in the final column.
- ☒ Cumberland Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg m<sup>-3</sup> are shown in **bold**.  
NO<sub>2</sub> annual means exceeding 60 µg m<sup>-3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.  
See Appendix C for details on bias adjustment and annualisation.

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

### New or Changed Sources Identified Within Cumberland Council During 2024

Cumberland Council has not identified any new sources relating to air quality within the reporting year of 2024.

### Additional Air Quality Works Undertaken by Cumberland Council During 2024

Cumberland Council has not completed any additional works within the reporting year of 2024.

### QA/QC of Diffusion Tube Monitoring

As discussed previously Cumberland Council replaced Cumbria County Council and the three local authorities: Carlisle City Council (CCC), Allerdale Borough Council (ABC) and Copeland Borough Council (CBC) on 1<sup>st</sup> April 2023. Each former local authority used a different combination of analytical laboratory or NO<sub>2</sub> absorbent for the analysis of the diffusion tubes. This section provides detail relating to the following aspects of non-automatic monitoring using diffusion tubes.

#### Diffusion tube supplier

The analytical laboratories and NO<sub>2</sub> absorbent used in 2024 are listed below:

| Former local authority    | Analytical laboratory | NO <sub>2</sub> absorbent |
|---------------------------|-----------------------|---------------------------|
| Carlisle City Council     | Gradko                | 20 % TEA in water         |
| Allerdale Borough Council | Socotec               | 50% TEA in Acetone        |
| Copeland Borough Council  | Gradko                | 50% TEA in Acetone        |

Both analytical laboratories also participate in the AIR-PT analysis scheme<sup>10</sup>. This is an independent analytical proficiency-testing scheme, operated by LGC Standards and

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<sup>10</sup> LGC. Summary of Laboratory Performance in AIR NO<sub>2</sub> Proficiency Testing Scheme (February 2023 – February 2025) at <https://laqm.defra.gov.uk/wp-content/uploads/2025/04/AIR-PT-Rounds-55-to-68-January-2023-to-February-2025.pdf>

supported by the Health and Safety Laboratory (HSL). Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality management (LAQM) should be obtained from laboratories that have demonstrated satisfactory performance in the AIR NO<sub>2</sub> PT scheme. Results for recent analytical laboratory performance are summarised below:

| AIR PT Round             | AIR PT AR062            | AIR PT AR063      | AIR PT AR065     | AIR PT AR066           |
|--------------------------|-------------------------|-------------------|------------------|------------------------|
| Period                   | January – February 2024 | April – June 2024 | July-August 2024 | September October 2024 |
| Socotec UK Limited       | 100%                    | 100%              | 100%             | 100%                   |
| Gradko International Ltd | 100%                    | 100%              | 100%             | 100%                   |

For those reporting periods in 2024 for which Gradko and Socotec reported results all were considered satisfactory (based on z-scores less than or equal to 2).

### Diffusion Tube Calendar

The diffusion tube calendar used is provided below:

| Month      | Tube On    | Tube Off   |
|------------|------------|------------|
| <b>Jan</b> | 03/01/2024 | 05/02/2024 |
| <b>Feb</b> | 05/02/2024 | 06/03/2024 |
| <b>Mar</b> | 06/03/2024 | 03/04/2024 |
| <b>Apr</b> | 03/04/2024 | 01/05/2024 |
| <b>May</b> | 01/05/2024 | 05/06/2024 |
| <b>Jun</b> | 05/06/2024 | 03/07/2024 |
| <b>Jul</b> | 03/07/2024 | 31/07/2024 |
| <b>Aug</b> | 31/07/2024 | 04/09/2024 |
| <b>Sep</b> | 04/09/2024 | 02/10/2024 |
| <b>Oct</b> | 02/10/2024 | 06/11/2024 |
| <b>Nov</b> | 06/11/2024 | 04/12/2024 |
| <b>Dec</b> | 04/12/2024 | 08/01/2024 |

Apart from the end date for the first sampling period and the start date for the next sample (5<sup>th</sup> February 2024 instead of 31<sup>st</sup> January 2024) the changeover dates are the same as the LAQM calendar. This slight deviation is very unlikely to significantly impact the estimate of annual means.

## Diffusion Tube Annualisation

A total of eleven diffusion tubes required annualisation: four (B7, C2, C3 and H6) with the former area of Carlisle City Council, six (DT2, DT2B, D15, D15B, DT16 and DT16B) within the former area of Allerdale Borough Council and one with the former area of Copeland Borough Council. The annualisation factors and annualisation simple annual means are presented in Table C.1

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

| Diffusion Tube ID | Annualisation Factor Blackpool Marton | Annualisation Factor Newcastle Centre | Annualisation Factor Sunderland Silksworth | Average Annualisation Factor | Raw Data Simple Annual Mean ( $\mu\text{g m}^{-3}$ ) | Annualised Data Simple Annual Mean ( $\mu\text{g m}^{-3}$ ) | Comments                                                                 |
|-------------------|---------------------------------------|---------------------------------------|--------------------------------------------|------------------------------|------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| B7                | 1.0705                                | 1.0677                                | 1.0412                                     | 1.0598                       | 32.4                                                 | 34.3                                                        |                                                                          |
| C2                | 1.0984                                | 1.0658                                | 0.9959                                     | 1.0534                       | 13.3                                                 | 14.0                                                        |                                                                          |
| C3                | 0.8043                                | 0.8594                                | 0.8982                                     | 0.8540                       | 24.1                                                 | 20.5                                                        |                                                                          |
| H6                | 1.1048                                | 1.0662                                | 1.0795                                     | 1.0835                       | 7.6                                                  | 8.2                                                         |                                                                          |
| DT2               | 1.1475                                | 1.1019                                | 1.0627                                     | 1.1040                       | -                                                    | -                                                           | Duplicate Site with DT2 and DT2B - Annual data provided for DT2B only    |
| DT2B              | 1.1475                                | 1.1019                                | 1.0627                                     | 1.1040                       | 26.0                                                 | 28.7                                                        |                                                                          |
| DT15              | 1.0124                                | 1.0019                                | 1.0136                                     | 1.0093                       | -                                                    | -                                                           | Duplicate Site with DT15 and DT15B - Annual data provided for DT15B only |
| DT15B             | 1.0124                                | 1.0019                                | 1.0136                                     | 1.0093                       | 11.5                                                 | 11.6                                                        |                                                                          |
| DT16              | 0.9404                                | 0.9208                                | 0.9217                                     | 0.9276                       | -                                                    | -                                                           | Duplicate Site with DT16 and DT16B - Annual data provided for DT16B only |
| DT16B             | 0.9404                                | 0.9208                                | 0.9217                                     | 0.9276                       | 11.9                                                 | 11.1                                                        |                                                                          |
| N10               | 0.9508                                | 0.9895                                | 0.9993                                     |                              | 0.9799                                               | 8.4                                                         | 8.2                                                                      |

## Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Cumberland Council have applied the respective national bias adjustment factors of 0.84, 0.78 and 0.88 for the former areas of CCC, ABC and CBC to the monitoring data. A summary of bias adjustment factors used by Cumberland Council over the past five years is presented in Table C.2.

Screenshots of the respective adjustment spreadsheets are shown in Figure C.1, Figure C.2 and Figure C.3, respectively.

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

| Former local authority | Laboratory/Absorbent       | Monitoring Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|------------------------|----------------------------|-----------------|-------------------|----------------------------------------------|-------------------|
| CCC                    | Gradko 20 % TEA in water   | 2024            | National          | 04/25                                        | 0.84              |
| CCC                    | Gradko 20 % TEA in water   | 2023            | National          | 03/24                                        | 0.81              |
| CCC                    | Gradko 20 % TEA in water   | 2022            | National          | 03/23                                        | 0.83              |
| CCC                    | Gradko 20 % TEA in water   | 2021            | National          | 06/22                                        | 0.84              |
| CCC                    | Gradko 20 % TEA in water   | 2020            | National          | 06/21                                        | 0.81              |
| ABC                    | Socotec 50% TEA in Acetone | 2024            | National          | 04/25                                        | 0.78              |
| ABC                    | Socotec 50% TEA in Acetone | 2023            | National          | 03/24                                        | 0.77              |
| ABC                    | Socotec 50% TEA in Acetone | 2022            | National          | 03/23                                        | 0.76              |
| ABC                    | Socotec 50% TEA in Acetone | 2021            | National          | 03/22                                        | 0.78              |
| ABC                    | Socotec 50% TEA in Acetone | 2020            | National          | 03/21                                        | 0.77              |
| CBC                    | Gradko 50% TEA in Acetone  | 2024            | National          | 04/25                                        | 0.88              |
| CBC                    | Gradko 50% TEA in Acetone  | 2023            | National          | 03/24                                        | 0.83              |

| Former local authority | Laboratory/Absorbent      | Monitoring Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|------------------------|---------------------------|-----------------|-------------------|----------------------------------------------|-------------------|
| CBC                    | Gradko 50% TEA in Acetone | 2022            | National          | 03/24 <sup>11</sup>                          | 0.82              |
| CBC                    | Gradko 50% TEA in Acetone | 2021            | National          | 03/24 <sup>10</sup>                          | 0.82              |
| CBC                    | Gradko 50% TEA in Acetone | 2020            | National          | 03/21                                        | 0.82              |

Figure C.1 - National bias adjustment spreadsheet (former Carlisle City Council)

| National Diffusion Tube Bias Adjustment Factor Spreadsheet                                                                                                                             |  |                                                                                           |  |                                                             |  | Spreadsheet Version Number: 04/25                                                                                                                                                                                                                  |  |                          |                                                     |                                                        |          |                             |                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------|--|-------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------|-----------------------------------------------------|--------------------------------------------------------|----------|-----------------------------|------------------------------------|
| Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> co-location studies                                                                          |  |                                                                                           |  |                                                             |  | This spreadsheet will be updated at the end of June 2025                                                                                                                                                                                           |  |                          |                                                     |                                                        |          |                             |                                    |
| Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods                                                                  |  |                                                                                           |  |                                                             |  | LAQM Helpdesk Website                                                                                                                                                                                                                              |  |                          |                                                     |                                                        |          |                             |                                    |
| 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.                                     |  |                                                                                           |  |                                                             |  |                                                                                                                                                                                                                                                    |  |                          |                                                     |                                                        |          |                             |                                    |
| 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:<br>Select the Laboratory that Analyses Your Tubes from the Drop-Down List                                                                                                      |  | Step 2:<br>Select a Preparation Method from the Drop-Down List                            |  | Step 3:<br>Select a Year from the Drop-Down List            |  | Step 4:<br>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 <sup>1</sup> 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.                    |  | If you have your own co-location study then see footnote <sup>1</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953                                           |  |                          |                                                     |                                                        |          |                             |                                    |
| Analysed By <sup>1</sup>                                                                                                                                                               |  | Method<br><small>Trends your activities, choose [all] from the prep up list</small>       |  | Year<br><small>Trends your activities, choose [all]</small> |  | Local Authority                                                                                                                                                                                                                                    |  | Length of Study (months) | Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> ) | Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> ) | Bias (B) | Tube Precision <sup>1</sup> | Bias Adjustment Factor (A) (Cm/Dm) |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | UV                                                                                                                                                                                                                                                 |  | 10                       | 24                                                  | 20                                                     | 19.9%    | G                           | 0.83                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 43                                                  | 34                                                     | 28.8%    | G                           | 0.78                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 24                                                  | 21                                                     | 13.9%    | G                           | 0.88                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 34                                                  | 27                                                     | 25.5%    | G                           | 0.80                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 22                                                  | 17                                                     | 32.3%    | G                           | 0.75                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 25                                                  | 20                                                     | 22.6%    | G                           | 0.82                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 19                                                  | 15                                                     | 28.5%    | G                           | 0.78                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | UB                                                                                                                                                                                                                                                 |  | 12                       | 16                                                  | 14                                                     | 13.8%    | G                           | 0.88                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 31                                                  | 23                                                     | 33.4%    | S                           | 0.75                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 29                                                  | 24                                                     | 19.4%    | G                           | 0.84                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | KS                                                                                                                                                                                                                                                 |  | 11                       | 41                                                  | 36                                                     | 16.1%    | G                           | 0.86                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 24                                                  | 19                                                     | 27.8%    | G                           | 0.78                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 11                       | 28                                                  | 20                                                     | 44.5%    | G                           | 0.69                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 29                                                  | 24                                                     | 20.3%    | G                           | 0.83                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | UB                                                                                                                                                                                                                                                 |  | 12                       | 19                                                  | 17                                                     | 12.4%    | G                           | 0.89                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 19                                                  | 17                                                     | 12.0%    | G                           | 0.89                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 20                                                  | 18                                                     | 13.9%    | G                           | 0.88                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 11                       | 20                                                  | 17                                                     | 19.7%    | G                           | 0.84                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 24                                                  | 20                                                     | 21.7%    | G                           | 0.82                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 27                                                  | 23                                                     | 19.0%    | G                           | 0.84                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 28                                                  | 30                                                     | -6.0%    | G                           | 1.06                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 11                       | 34                                                  | 27                                                     | 26.3%    | G                           | 0.79                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 34                                                  | 25                                                     | 35.7%    | G                           | 0.74                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | KS                                                                                                                                                                                                                                                 |  | 10                       | 52                                                  | 47                                                     | 10.2%    | G                           | 0.91                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 10                       | 29                                                  | 26                                                     | 12.2%    | G                           | 0.89                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 10                       | 29                                                  | 26                                                     | 14.7%    | G                           | 0.87                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | R                                                                                                                                                                                                                                                  |  | 12                       | 12                                                  | 12                                                     | -3.4%    | G                           | 1.04                               |
| Gradko                                                                                                                                                                                 |  | 20% TEA in water                                                                          |  | 2024                                                        |  | Overall Factor <sup>1</sup> (27 studies)                                                                                                                                                                                                           |  |                          |                                                     | Use                                                    |          | 0.84                        |                                    |

<sup>11</sup> The annual averages for Copeland Borough Council for the data years 2021 and 2022 were first calculated in the 2024 ASR report using national adjustment factors obtained from the national adjustment factor spreadsheet 03/24.

**Figure C.2 - National bias adjustment spreadsheet (former Allerdale Borough Council)**

| National Diffusion Tube Bias Adjustment Factor Spreadsheet                                                                                                                             |  |                                                                                           |  |                                                                          |  | Spreadsheet Version Number: 04/25                                                                                                                                                                                                                            |                                              |                                                                                                   |                                                     |                                                        |          |                             |                                    |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|----------|-----------------------------|------------------------------------|------|
| Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> co-location studies                                                                          |  |                                                                                           |  |                                                                          |  |                                                                                                                                                                                                                                                              |                                              | This spreadsheet will be updated at the end of June 2025<br><a href="#">LAQM Helpdesk Website</a> |                                                     |                                                        |          |                             |                                    |      |
| 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.                                     |  |                                                                                           |  |                                                                          |  |                                                                                                                                                                                                                                                              |                                              |                                                                                                   |                                                     |                                                        |          |                             |                                    |      |
| 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 <sup>3</sup> shown in <b>blue</b> 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 <sup>2</sup>                     |  | If you have your own co-location study then see footnote <sup>4</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at <a href="mailto:LAQMHelpdesk@bureauveritas.com">LAQMHelpdesk@bureauveritas.com</a> or 0800 0327953 |                                              |                                                                                                   |                                                     |                                                        |          |                             |                                    |      |
| Analysed By <sup>1</sup>                                                                                                                                                               |  | Method<br><small>To make your selection, choose (All) from the pop-up list</small>        |  | Year <sup>2</sup><br><small>To make your selection, choose (All)</small> |  | Site Type                                                                                                                                                                                                                                                    | Local Authority                              | Length of Study (months)                                                                          | Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> ) | Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> ) | Bias (B) | Tube Precision <sup>5</sup> | Bias Adjustment Factor (A) (Cm/Dm) |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Cambridge City Council                       | 11                                                                                                | 20                                                  | 15                                                     | 31.0%    | G                           | 0.76                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Cardiff Council / Shared Regulatory Services | 9                                                                                                 | 35                                                  | 31                                                     | 14.2%    | G                           | 0.88                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Ipswich Borough Council                      | 9                                                                                                 | 24                                                  | 20                                                     | 21.0%    | G                           | 0.83                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Ipswich Borough Council                      | 11                                                                                                | 36                                                  | 26                                                     | 37.3%    | G                           | 0.73                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | UB                                                                                                                                                                                                                                                           | City Of York Council                         | 11                                                                                                | 13                                                  | 11                                                     | 16.0%    | P                           | 0.86                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | City Of York Council                         | 11                                                                                                | 22                                                  | 18                                                     | 22.3%    | G                           | 0.81                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | City Of York Council                         | 11                                                                                                | 26                                                  | 20                                                     | 31.0%    | G                           | 0.76                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | East Suffolk Council                         | 9                                                                                                 | 26                                                  | 20                                                     | 32.8%    | G                           | 0.75                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | KS                                                                                                                                                                                                                                                           | Marleybone Road Intercomparison              | 10                                                                                                | 47                                                  | 36                                                     | 30.5%    | G                           | 0.77                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | UB                                                                                                                                                                                                                                                           | Hull City Council                            | 10                                                                                                | 21                                                  | 16                                                     | 25.4%    | P                           | 0.80                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Hull City Council                            | 9                                                                                                 | 27                                                  | 20                                                     | 35.3%    | G                           | 0.74                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Waverley Borough Council                     | 10                                                                                                | 21                                                  | 18                                                     | 13.7%    | G                           | 0.88                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Waverley Borough Council                     | 11                                                                                                | 22                                                  | 16                                                     | 32.3%    | G                           | 0.76                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Wrexham County Borough Council               | 10                                                                                                | 15                                                  | 13                                                     | 17.0%    | G                           | 0.85                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | UB                                                                                                                                                                                                                                                           | Gravesham Borough Council                    | 11                                                                                                | 21                                                  | 19                                                     | 3.7%     | P                           | 0.91                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Slough Borough Council                       | 11                                                                                                | 35                                                  | 24                                                     | 43.5%    | G                           | 0.70                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Slough Borough Council                       | 11                                                                                                | 26                                                  | 20                                                     | 32.6%    | G                           | 0.75                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Slough Borough Council                       | 11                                                                                                | 23                                                  | 17                                                     | 34.0%    | G                           | 0.75                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Slough Borough Council                       | 10                                                                                                | 31                                                  | 23                                                     | 33.4%    | G                           | 0.75                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Slough Borough Council                       | 11                                                                                                | 30                                                  | 23                                                     | 33.7%    | G                           | 0.75                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Thanet District Council                      | 10                                                                                                | 19                                                  | 15                                                     | 24.3%    | G                           | 0.80                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | UB                                                                                                                                                                                                                                                           | Wirral Council                               | 9                                                                                                 | 14                                                  | 12                                                     | 13.3%    | G                           | 0.83                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Derry City And Strabane District Council     | 11                                                                                                | 28                                                  | 32                                                     | -11.8%   | G                           | 1.13                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | UB                                                                                                                                                                                                                                                           | Derry City And Strabane District Council     | 11                                                                                                | 11                                                  | 7                                                      | 58.1%    | G                           | 0.63                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Horsham District Council                     | 11                                                                                                | 22                                                  | 17                                                     | 31.1%    | G                           | 0.76                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Leeds City Council                           | 10                                                                                                | 36                                                  | 28                                                     | 32.5%    | G                           | 0.75                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | KS                                                                                                                                                                                                                                                           | Leeds City Council                           | 11                                                                                                | 29                                                  | 20                                                     | 42.7%    | G                           | 0.70                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Leeds City Council                           | 11                                                                                                | 24                                                  | 18                                                     | 36.4%    | G                           | 0.73                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | UC                                                                                                                                                                                                                                                           | Leeds City Council                           | 10                                                                                                | 25                                                  | 19                                                     | 31.2%    | G                           | 0.76                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | Huntingdonshire District Council             | 10                                                                                                | 28                                                  | 23                                                     | 21.1%    | G                           | 0.83                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | North East Lincolnshire Council              | 11                                                                                                | 39                                                  | 21                                                     | 84.1%    | G                           | 0.54                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | UB                                                                                                                                                                                                                                                           | North East Lincolnshire Council              | 10                                                                                                | 12                                                  | 10                                                     | 20.0%    | G                           | 0.83                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in Acetone                                                                        |  | 2024                                                                     |  | R                                                                                                                                                                                                                                                            | North East Lincolnshire Council              | 11                                                                                                | 21                                                  | 18                                                     | 15.7%    | G                           | 0.86                               |      |
| SOCOTEC Didcot                                                                                                                                                                         |  | 50% TEA in acetone                                                                        |  | 2024                                                                     |  | Overall Factor <sup>3</sup> (33 studies)                                                                                                                                                                                                                     |                                              |                                                                                                   |                                                     |                                                        |          | Use                         |                                    | 0.78 |

**Figure C.3 - National bias adjustment spreadsheet (former Copeland Council)**

| National Diffusion Tube Bias Adjustment Factor Spreadsheet                                                                                                                             |                                                                                    |                                                                                           |                                                      |                                                                                                                                                                                                                                         |                          | Spreadsheet Version Number: 04/25                                                                             |                                                        |                                                                                                                                                    |                             |                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------|
| Follow the steps below in the correct order to show the results of relevant co-location studies                                                                                        |                                                                                    |                                                                                           |                                                      |                                                                                                                                                                                                                                         |                          |                                                                                                               |                                                        | This spreadsheet will be updated at the end of June 2025                                                                                           |                             |                                    |
| Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods                                                                  |                                                                                    |                                                                                           |                                                      |                                                                                                                                                                                                                                         |                          |                                                                                                               |                                                        | LAQM Helpdesk Website                                                                                                                              |                             |                                    |
| 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. |                             |                                    |
| 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 <sup>3</sup> 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 <sup>2</sup> | If you have your own co-location study then see footnote <sup>4</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953                                |                          |                                                                                                               |                                                        |                                                                                                                                                    |                             |                                    |
| Analysed By <sup>1</sup>                                                                                                                                                               | Method<br><small>To make your selection, choose (All) from the pop-up list</small> | Year <sup>2</sup><br><small>To make your selection, choose (All)</small>                  | Site Type                                            | Local Authority                                                                                                                                                                                                                         | Length of Study (months) | Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )                                                           | Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> ) | Bias (B)                                                                                                                                           | Tube Precision <sup>5</sup> | Bias Adjustment Factor (A) (Cm/Dm) |
| Gradko                                                                                                                                                                                 | 50% TEA in Acetone                                                                 | 2024                                                                                      | UB                                                   | City Of London Corporation                                                                                                                                                                                                              | 10                       | 26                                                                                                            | 21                                                     | 26.8%                                                                                                                                              | G                           | 0.79                               |
| Gradko                                                                                                                                                                                 | 50% TEA in Acetone                                                                 | 2024                                                                                      | R                                                    | City Of London Corporation                                                                                                                                                                                                              | 12                       | 34                                                                                                            | 30                                                     | 12.1%                                                                                                                                              | G                           | 0.89                               |
| Gradko                                                                                                                                                                                 | 50% TEA in Acetone                                                                 | 2024                                                                                      | UB                                                   | Falkirk Council                                                                                                                                                                                                                         | 11                       | 13                                                                                                            | 13                                                     | -1.6%                                                                                                                                              | G                           | 1.02                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | SU                                                   | Redcar And Cleveland Borough Council                                                                                                                                                                                                    | 12                       | 12                                                                                                            | 9                                                      | 35.4%                                                                                                                                              | G                           | 0.74                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | KS                                                   | Marleybone Road Intercomparison                                                                                                                                                                                                         | 11                       | 43                                                                                                            | 36                                                     | 20.8%                                                                                                                                              | G                           | 0.83                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | R                                                    | Sandwell Mbc                                                                                                                                                                                                                            | 12                       | 30                                                                                                            | 25                                                     | 24.2%                                                                                                                                              | G                           | 0.81                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | UB                                                   | Sandwell Mbc                                                                                                                                                                                                                            | 12                       | 19                                                                                                            | 17                                                     | 8.0%                                                                                                                                               | G                           | 0.93                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | R                                                    | Sandwell Mbc                                                                                                                                                                                                                            | 12                       | 20                                                                                                            | 20                                                     | -2.6%                                                                                                                                              | S                           | 1.03                               |
| Gradko                                                                                                                                                                                 | 50% TEA in Acetone                                                                 | 2024                                                                                      | R                                                    | London Borough Of Merton                                                                                                                                                                                                                | 12                       | 27                                                                                                            | 22                                                     | 25.7%                                                                                                                                              | G                           | 0.80                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | UB                                                   | London Borough Of Wandsworth                                                                                                                                                                                                            | 10                       | 19                                                                                                            | 14                                                     | 31.7%                                                                                                                                              | G                           | 0.76                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | R                                                    | London Borough Of Richmond Upon Thames                                                                                                                                                                                                  | 12                       | 18                                                                                                            | 19                                                     | -9.1%                                                                                                                                              | G                           | 1.10                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | B                                                    | London Borough Of Richmond Upon Thames                                                                                                                                                                                                  | 12                       | 13                                                                                                            | 13                                                     | 5.0%                                                                                                                                               | G                           | 0.95                               |
| Gradko                                                                                                                                                                                 | 50% TEA in acetone                                                                 | 2024                                                                                      | Overall Factor <sup>3</sup> (12 studies)             |                                                                                                                                                                                                                                         |                          |                                                                                                               |                                                        | Use                                                                                                                                                |                             | 0.88                               |

## Local Bias Adjustment

A local bias adjustment factor of 0.78 was derived for the collocated triplicate tubes and the automatic analyser at Morton Community Centre. The bias adjustment was carried out using the NO<sub>2</sub> data processing tool<sup>12</sup> and the summary statistics are provided in Table C.3.

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

|                                              | Local Bias Adjustment Input 1 |
|----------------------------------------------|-------------------------------|
| Periods used to calculate bias               | 11                            |
| Bias Factor A                                | 0.78 (0.74 - 0.83)            |
| Bias Factor B                                | 28% (21% - 35%)               |
| Diffusion Tube Mean ( $\mu\text{g m}^{-3}$ ) | 11.4                          |
| Mean CV (Precision)                          | 5.7%                          |
| Automatic Mean ( $\mu\text{g m}^{-3}$ )      | 8.9                           |
| Data Capture                                 | 97%                           |
| Adjusted Tube Mean ( $\mu\text{g m}^{-3}$ )  | 9 (8 - 9)                     |

## Selection of Appropriate Bias Adjustment Factor

Morton Community Centre is the only location in Cumberland Council where a local bias adjustment factor is calculated. For 2024 the collocated bias adjusted value was calculated to be 0.78 and is less than the value obtained for the national bias adjustment factor (0.84). The national bias adjustment has been chosen so that the bias adjusted NO<sub>2</sub> tends to be conservative. This is in line with all previous ASRs carried out for the former Carlisle City Council.

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

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

No diffusion tube measurements required distance correction during 2024.

<sup>12</sup> [Diffusion tube data processing tool laqm \(defra.gov.uk\)](https://defra.gov.uk)

## QA/QC of Automatic Monitoring

Ricardo provides data management and local site operator (LSO) duties for the automatic monitoring sites within Carlisle. The instrumentation is calibrated every two weeks and a full site service is carried out every six months. The QA/QC is accredited to ISO 17025. All data are ratified to all LAQM reporting requirements. Measurement data are available through UKAIR.

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

PM<sub>10</sub> and PM<sub>2.5</sub> are measured using BAM 1020 heated instrument. For the PM<sub>10</sub> instrument a slope correction factor of 0.9662 is applied. No slope correction is required for the PM<sub>2.5</sub>.

## Automatic Monitoring Annualisation

As the data capture for the NO<sub>2</sub> and PM<sub>10</sub> measured at Morton Community Centre was greater than 85 % no annual was required for these pollutants. However, annualisation was required for PM<sub>2.5</sub> because the data capture was 65.8 %. The summary statistics are presented in Table C.4<sup>13</sup>. The annualisation did not result in a change in the annual mean- the concentration remained at 7.6 µg m<sup>-3</sup>.

**Table C.4 – Automatic PM<sub>2.5</sub> Annualisation Summary (concentrations presented in µg m<sup>-3</sup>)**

| Background Site                              | Annual Data Capture | Annual Mean (A <sub>m</sub> ) | MMCC                          |                                         |
|----------------------------------------------|---------------------|-------------------------------|-------------------------------|-----------------------------------------|
|                                              |                     |                               | Period Mean (P <sub>m</sub> ) | Ratio (A <sub>m</sub> /P <sub>m</sub> ) |
| Blackpool Marton                             | 100.0               | 7.5                           | 7.5                           | 0.999                                   |
| Newcastle Centre                             | 100.0               | 6.9                           | 7.0                           | 0.998                                   |
| Sunderland Silksworth                        | 100.0               | 6.7                           | 6.7                           | 0.998                                   |
| Average (R <sub>a</sub> )                    |                     |                               | 0.998                         |                                         |
| Raw Data Annual Mean (M)                     |                     |                               | 7.6                           |                                         |
| Annualised Annual Mean (M x R <sub>a</sub> ) |                     |                               | 7.6                           |                                         |

<sup>13</sup> The annualisation was carried out using the [Automatic Data Processing Tool | LAQM](#)

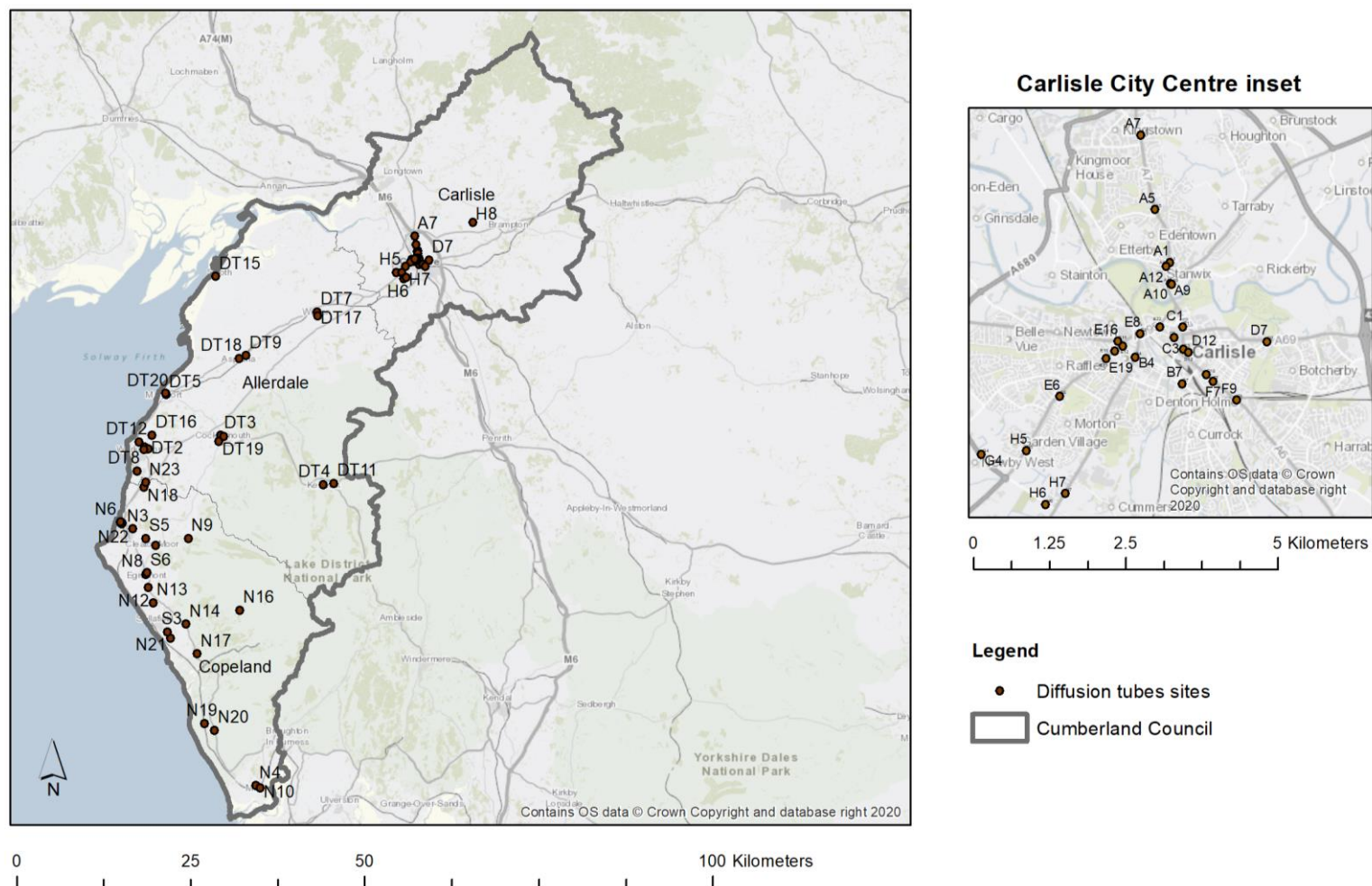
### **NO<sub>2</sub> Fall-off with Distance from the Road**

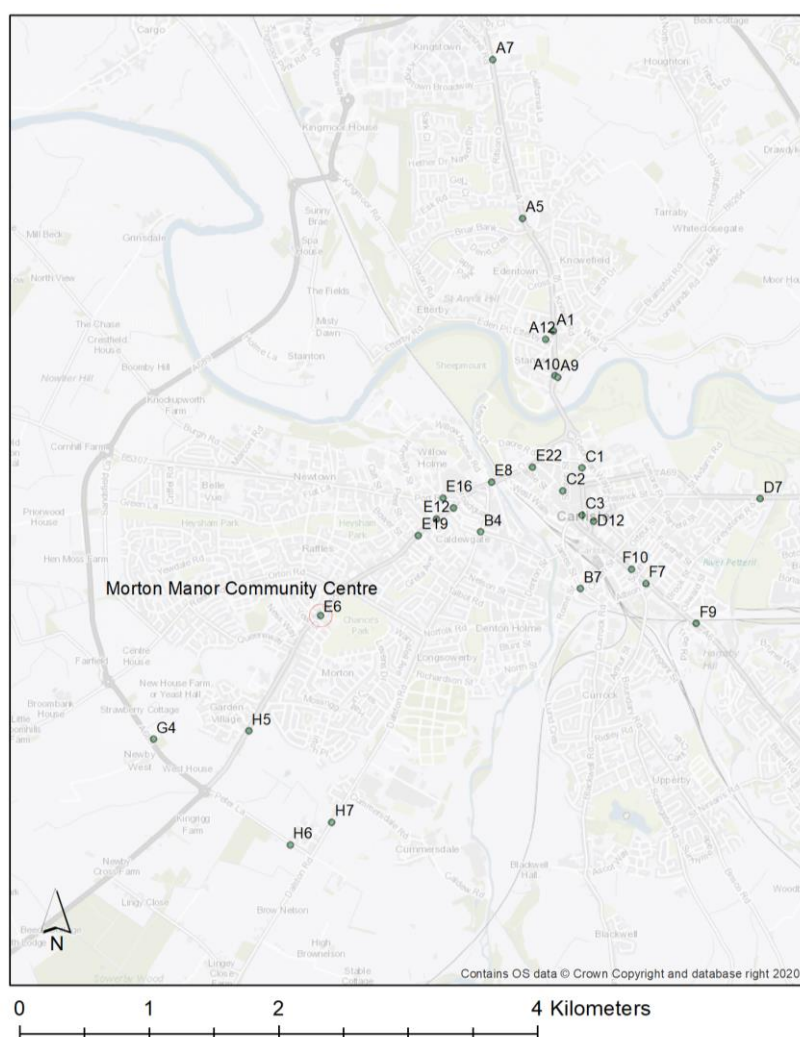
Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table A.3.

No automatic NO<sub>2</sub> monitoring locations required distance correction during 2024.

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

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



**Figure D.2 - Location of diffusion tubes within Cumberland Council (Carlisle Area)****Key to site codes**

|     |                       |
|-----|-----------------------|
| A1  | 45 SCOTLAND RD        |
| A10 | STANWIX BANK          |
| A12 | STANWIX BANK CAR PARK |
| A5  | 37 KINGSTOWN RD       |
| A7  | 282 KINGSTOWN RD      |
| A9  | BRAMPTON RD           |
| B4  | DALSTON RD            |
| B7  | 12 CURROCK ST         |
| C1  | LOWTHER ST            |
| C2  | TOURIST INFO          |
| C3  | DEVONSHIRE ST         |
| D12 | POST OFFICE           |
| D7  | 282 WARWICK RD        |
| E22 | FINKLE ST             |
| E12 | 3 WIGTON RD           |
| E15 | 22 WIGTON RD          |
| E16 | JOVIAL SAILOR         |
| E19 | 49 WIGTON RD          |
| E6  | MORTON MANOR 1        |
| E8  | BRIDGE ST             |
| F10 | 155 BOTCHERGATE       |
| F7  | 24 LONDON RD          |
| F9  | 129 LONDON RD         |
| G4  | THE HOBBIT            |
| H5  | WIGTON RD             |
| H6  | PETER LANE            |
| H7  | DALSTON RD            |
| H8  | AIRPORT               |

**Legend**

- Morton Manor Community Centre
- Diffusion tube

**Figure D.3 - Location of diffusion tubes within Cumberland Council (in outlying areas of former CCC)**



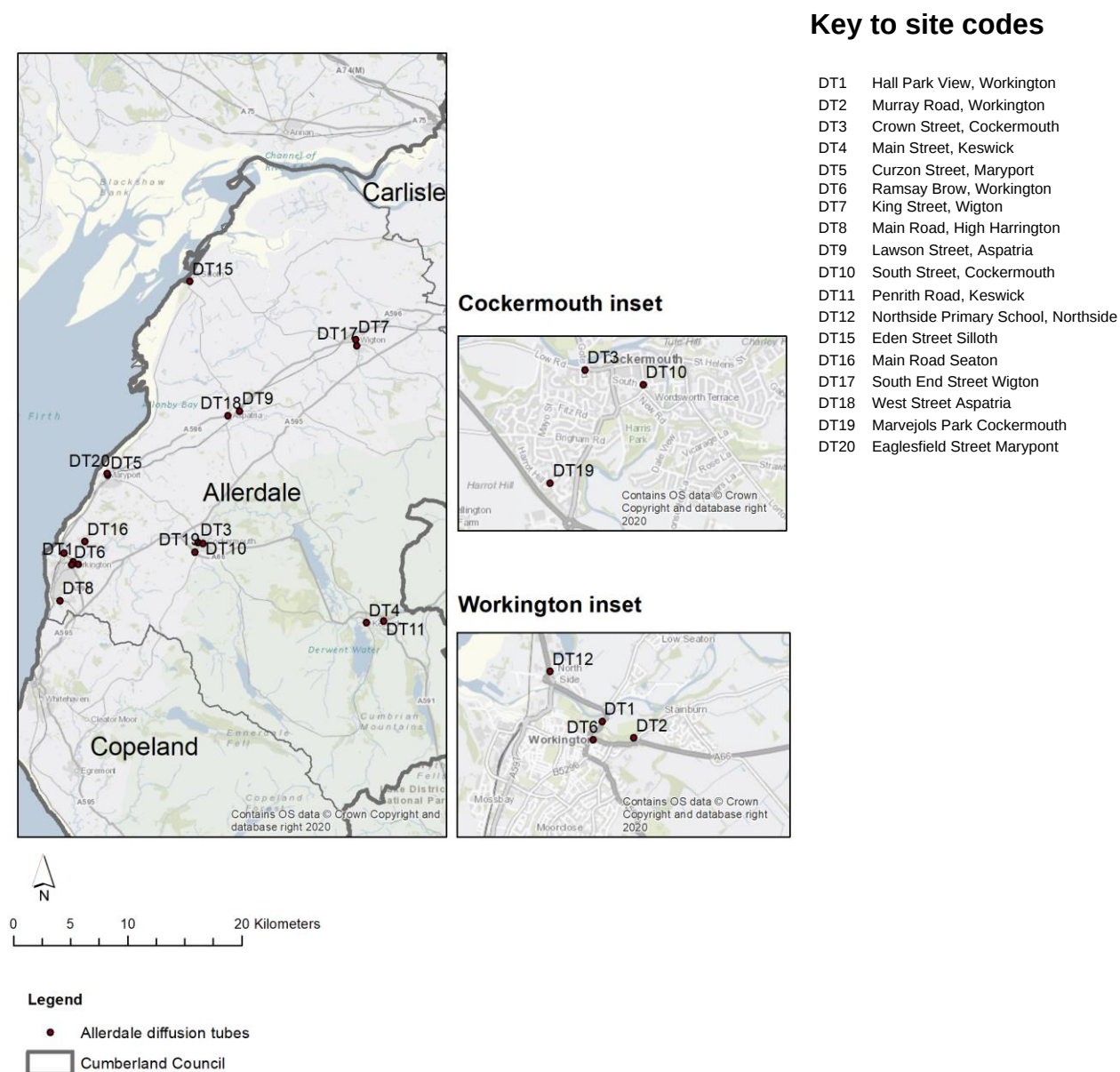
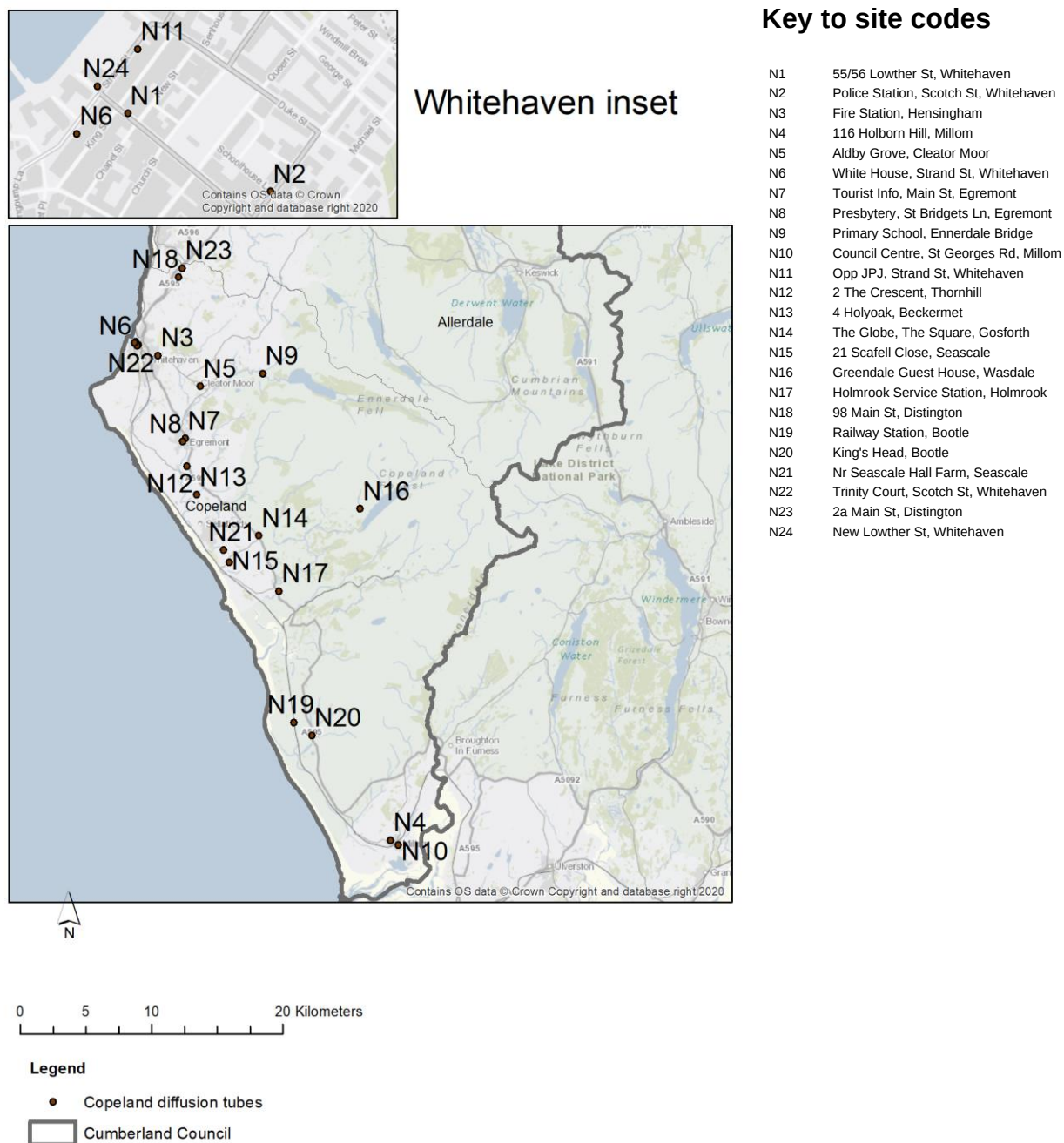
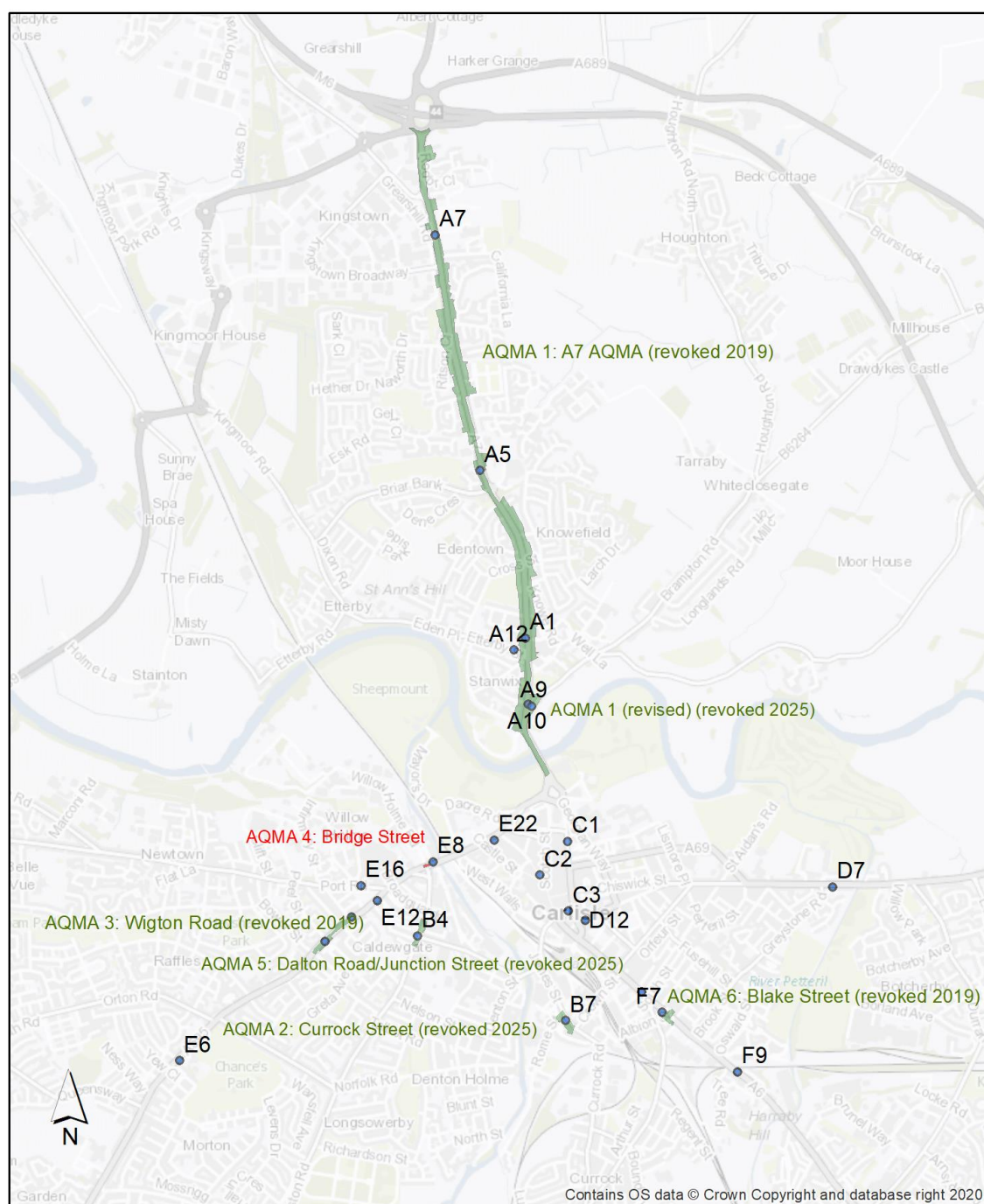
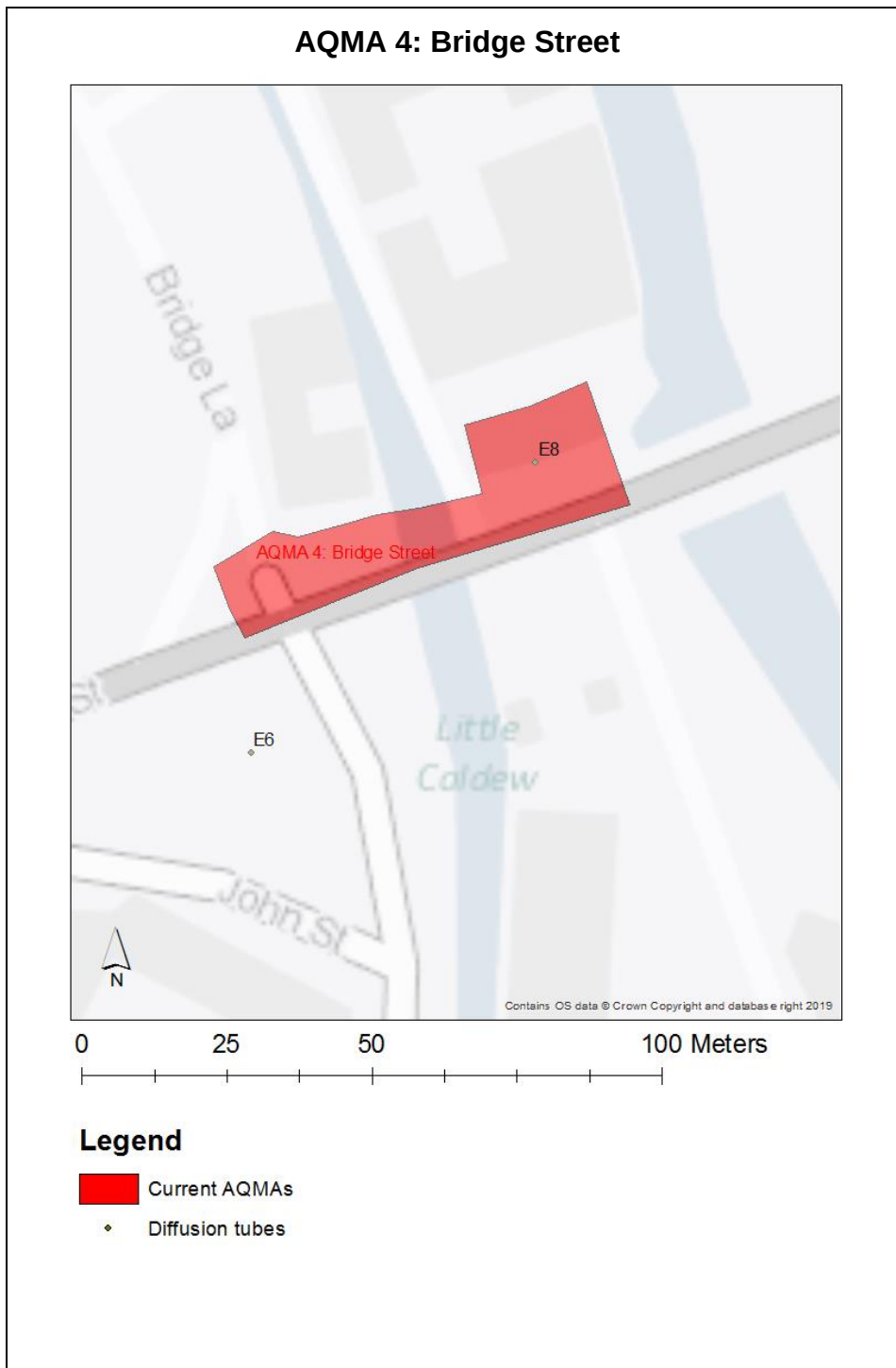
**Figure D.4 - Location of diffusion tubes within Cumberland Council (Allerdale)**

Figure D.5 - Location of diffusion tubes within Cumberland Council (Copeland)



**Figure D.6 - Location of air quality management areas and diffusion tubes**

**Figure D.7 - Location of air quality management areas (zoomed in)**

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

**Table E.1 – Air Quality Objectives in England<sup>14</sup>**

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

<sup>14</sup> The units are in microgrammes of pollutant per cubic metre of air (µg m<sup>-3</sup>).

## Glossary of Terms

| Abbreviation      | Description                                                                                                                                                                                           |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AQAP              | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'    |
| AQMA              | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| ASR               | Annual Status Report                                                                                                                                                                                  |
| Defra             | Department for Environment, Food and Rural Affairs                                                                                                                                                    |
| DMRB              | Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways                                                                                                        |
| LAQM              | Local Air Quality Management                                                                                                                                                                          |
| NO <sub>2</sub>   | Nitrogen Dioxide                                                                                                                                                                                      |
| NO <sub>x</sub>   | Nitrogen Oxides                                                                                                                                                                                       |
| PM <sub>10</sub>  | Airborne particulate matter with an aerodynamic diameter of 10µm or less                                                                                                                              |
| PM <sub>2.5</sub> | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less                                                                                                                             |
| QA/QC             | Quality Assurance and Quality Control                                                                                                                                                                 |
| SO <sub>2</sub>   | Sulphur Dioxide                                                                                                                                                                                       |

## References

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