2023 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: October 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Barnsley Metropolitan Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equality issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

The Barnsley Metropolitan Borough Council area covers 32,853 hectares (127 square miles) and has an estimated population of approximately 239,300.

Barnsley Metropolitan Borough Council's air quality issues are typical of an urban location, with emissions from road transport being a major source of air pollution, and the underlying reason for declaration of the six Air Quality Management Areas (AQMAs). Emissions from industrial and domestic sources are still of importance however, and continue to be subject to the relevant regulation, where appropriate.

Previous assessment of Barnsley Metropolitan Borough Council's air quality revealed a breach (exceedance) of the annual average Air Quality Objective (standard) for nitrogen dioxide gas (NO_2) at receptors (mainly houses). Nitrogen dioxide is strongly associated with traffic emissions in particular, and contributes to respiratory symptoms[5]. There have

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

[5] DEFRA, February 2015 – Getting to grips with air pollution – the latest evidence and techniques – A briefing for Directors of Public Health

been inter-year fluctuations of NO_2 concentrations, but there is a general downward trend and there have been no exceedances of the Air Quality Objectives in AQMA 1 or 2A over the past three years. As a result of this, the Council aims to explore revocation of AQMA 1 in the coming year. These areas are close to several arterial roads and junctions near to Barnsley town centre and close to the M1 motorway. All Barnsley's current AQMAs are summarised in the table below:

AQMA No.	Adjacent Roads / Junctions	Year Declared	Estimated Number of Domestic Dwellings within AQMA
1	M1 Motorway, 100 metres either side of the central reservation within the Barnsley Borough	2001	356
2A	A628 Dodworth Road	2005	291
4	A61 Harborough Hill Road	2008	42
6	A616 passing through Langsett	2012	7
7	Junction of A61 Sheffield and A6133 Cemetery Road	2012	23

Further details of our AQMAs can be found at List of Local Authorities with AQMAs - DEFRA, UK.

The Council has an Air Quality Action Plan (AQAP), published in May 2017 (and updated in 2019) available at https://www.barnsley.gov.uk/services/pollution/air-pollution/air-quality/, which contains measures designed to improve air quality within the AQMAs and within the Council as a whole, as it is important to continually drive down emissions and reduce air pollution, even below legal standards to protect public health.

As with last year's Annual Status Report (ASR), this ASR is being written during a period of change within air quality management. The Government released the Clean Air Strategy[6] in 2019, which proposed new ways to tackle air pollution, particularly domestic emissions, and the Council await further direction from the forthcoming Environment Act on how air pollution can be further reduced. The Council is also aware of recent updates of the Environment Act 2021 and Clean Air Act 1993, concerning the Prohibition of smoke

[6] Available at Clean Air Strategy 2019 - GOV.UK (www.gov.uk)

from chimneys in Smoke Control Areas (SCAs). These changes may have a significant impact on future emissions and the Council is looking at the implications of these updates. Furthermore, Clean Air Zones (CAZs) are currently being implemented, have been implemented, or considered for neighbouring cities (Leeds, Greater Manchester, Sheffield-Rotherham), and the Council will monitor these developments for any potential impacts on Barnsley Metropolitan Borough Council.

Barnsley Metropolitan Borough Council will continue to monitor concentrations in future years, and further monitoring is required in order to continue assessing longer term trends, particularly as traffic flows are now returning back to pre-Covid-19 levels. Concentrations of other air pollutants such as PM_{10} particulate matter were not impacted significantly by the Covid-19 lockdowns, due to the greater number of particulate matter sources and this pollutants transboundary nature. It is anticipated that $PM_{2.5}$ particulate matter monitoring will commence within the borough within the next 12 months.

Further details of Barnsley's local air quality, including up-to-date local data and comparison with the Daily Air Quality Index (AQI; which tells us the daily pollution concentrations and their impacts on our health), can be found at our Barnsley Metropolitan Borough Council air quality webpage or the Air Quality in England webpage. The Council believes it is important that Barnsley residents are made aware of the air quality they breathe and how it may impact them.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[7] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[8] details the approach to reduce exhaust

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

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

emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Conclusions and Priorities

Barnsley Metropolitan Borough Council's 2023 ASR is an update of the monitoring carried out within the last year and illustrates that there has been a general improvement in air quality across the district over several years, with levels remaining relatively stable from 2021 to 2022. This includes a noted improvement in NO_2 concentrations measured within AQMA 2A, where there has been no exceedance since 2019.

There were two exceedances of the NO_2 annual mean air quality objective identified across the 64 passive monitoring sites and two automatic monitoring sites. These exceedances both occurred within AQMA 4. In 2022, NO_2 concentrations increased and decreased compared to 2021 concentrations, with the greatest decrease seen at the triplicate site with tubes 15, 16 and 17, from 26.6 µg/m^3 in 2021 to 19.2 µg/m^3 in 2022.

The annual mean NO_2 concentration did not exceed 60 µg/m^3 at any monitoring locations during 2022, which indicates that an exceedance of the 1-hour mean objective (200 µg/m^3) is unlikely at these sites.

Barnsley Metropolitan Borough Council's priorities for the coming year are:

- To explore revocation of AQMA 1.
- Where appropriate, the Council will bid for funding for actions within our AQAP, as and when this funding become available.
- Following the successful road closure scheme aimed at improving awareness and air quality around a local school, it is planned that further schemes will be implemented following the same template. This scheme was funded by DEFRA and was successful as part of a joint air quality grant bid with our partners Doncaster Metropolitan Borough Council and Sheffield City Region. The scheme involved temporary road closures around a local school, along with active travel initiatives, in order to highlight the benefits of cycling and walking.
- To continue to work with developers to minimise the air quality impact of new development, and to ensure that this development takes account of future sustainable transport modes, and in particular refine the Council's requirement of

electric vehicle (EV) charge points for new developments in the Borough, in order ensure installation of the most optimum charge point schemes.

- To align the AQAP with the Council's Sustainable Energy Action Plan to ensure that the co-benefits of improved air quality and reductions in carbon emissions in the Borough are maximised.
- Continue monitoring both inside and outside of AQMAs to gauge progress with actions and ensure continued compliance outside of our AQMAs, and assess the continued direct and indirect impact of the pandemic and subsequent recovery on air pollution concentrations.
- To work with Public Health colleagues in order to raise awareness of poor air quality and actions that can be taken to reduce emissions, and develop programmes such as anti-idling and promotion of Clean Air Day.
- To work with nearby local authorities who may be required to implement Clean Air Zones, to understand the impacts these zones may have on Barnsley.
- To re-draft the Action Plan, in light of completion of the previous Action Plan 2016 to 2021 and development of the Council's Sustainable Energy Action Plan.

Local Engagement and How to get Involved

As part of the ongoing AQMA process, and since publication of the AQAP we welcome continuous suggestions from residents, local business and interest groups in order to improve air quality in the area. We have further met with local and regional organisations and Councils to ensure that we are in touch with local concerns and are better placed to explore potential solutions.

Find out more about your local air quality by: -

- Contacting the Air Quality officer at Barnsley (details at the beginning of this report) or through BMBC's website https://www.barnsley.gov.uk/air-quality
- Contact your local Councillor with any concerns.

Consider how and when you use your car, especially at peak times. Consider using public transport where possible for trips into towns and walking or cycling for a non-polluting and healthy alternative.

Local Responsibilities and Commitment

This ASR was prepared by the Ricardo Energy and Environment with the support and agreement of the following officers and departments:

John Scott, Service Manager (Pollution Control)

This ASR has been not been officially approved by the Director Of Public Health, but they have reviewed the contents prior to its submission:

If you have any comments on this ASR please send them to John Scott at:

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1 Local Air Quality Management

This report provides an overview of air quality in Barnsley Metropolitan Borough Council during 2022. 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 Barnsley Metropolitan Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months[9]. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

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

- NO_2 annual mean;
- NO_2 1-hour mean (AQMA 6 only).

In February 2022, Barnsley Metropolitan Borough Council successfully revoked AQMA 5, originally declared in 2008 due to exceeding the NO_2 annual mean Air Quality Objective.

The Council is considering and collating the evidence for the revocation of AQMA 1. AQMA 1 covers parts of the M1 and extends to 100 m either side of the motorway carriageway. The case for revocation is based on monitoring data showing compliance with the Air Quality Objective for NO_2 for several years. Barnsley Council previously postponed the revocation process as a proposed “Smart Motorway” was planned for the stretch of M1 passing though the Borough; however, an announcement by the UK Government in April 2023 stated that “*plans for new smart motorways will be cancelled in recognition of the current lack of public confidence felt by drivers and cost pressures*” and so the Council is revisiting the case.

[9] Paragraph 2.21, Local Air Quality Management Policy Guidance (PG22), Defra, https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-Policy-Guidance-2022.pdf

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
No.1	03/10/2001	NO_2 Annual Mean	An area encompassing residential properties one hundred metres either side of the central reservation of the M1 motorway in Barnsley	YES	46.4 µg/m^3	31.5 µg/m^3	3 years	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf
No.2A	16/06/2005	NO_2 Annual Mean	Residential properties along Dodworth Road between Junction 37 of the M1 motorway and Town End roundabout, including a portion of Summer Lane.	NO	49.7 µg/m^3	35.8 µg/m^3	3 years	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf

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
No.4	07/07/2008	NO_2 Annual Mean	Residential properties along the uphill carriageway of Harborough Hill Road from the gyratory	NO	58.6 µg/m^3	50 µg/m^3	Exceedance	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf
No.6	30/08/2012 (Amended 27/10/2016 to include NO2 1-hour mean)	NO_2 Annual Mean NO_2 1 Hour Mean	Residential properties along the A616 Manchester Road in Langsett	YES	77.1 µg/m^3	40.2 µg/m^3	Exceedance	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf
No.7	30/08/2012	NO_2 Annual Mean NO_2 1 Hour Mean	Residential properties at the junction of Sheffield Road and the A6133 Cemetery Road	NO	48.5 µg/m^3	36.9 µg/m^3	3 years	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf

☒ **Barnsley MBC confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Barnsley MBC confirm that all current AQAPs have been submitted to Defra.**

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

Unfortunately, due to extreme staffing pressures within the Council, the 2021 ASR has yet to be assessed by DEFRA. This means Barnsley Metropolitan Borough Council has not received any feedback or recommendations.

Barnsley Metropolitan Borough Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. A total of 13 measures are included within Table 2.2, with the type of measure and the progress Barnsley Metropolitan Borough Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Key completed measures are:

- South Yorkshire Enhanced Partnership; and
- Barnsley Intelligent Transport Systems.

South Yorkshire Enhanced Partnership

The Barnsley Bus partnership was recently replaced with the South Yorkshire Enhanced Partnership. The South Yorkshire Enhanced Partnership incorporates a statutory scheme, as opposed to the previous scheme which was a Voluntary Agreement. The plan targets increased use of public transport through fare alteration, system reliability, and improved user experience. A copy of the plan can be found at: https://southyorkshire-ca.gov.uk/getattachment/b396e5dd-eb2a-4e2a-b108-c539b658e996/South-Yorkshire-Enhanced-Partnership-Plan-FINAL.pdf

Barnsley Intelligent Transport Systems

This process involved the installation of intelligent systems (SCOOT / MOVA) within AQMAs. Several of our AQMAs now have SCOOT/MOVA installed with performance reviewed. Ongoing maintenance along with minor upgrades when funding allows. Barnsley Metropolitan Borough Council will continue to investigate the installation of new Intelligent Transport Systems where the opportunity presents, such as new developments and new road schemes.

Electric Vehicle Infrastructure

Barnsley are reviewing the most suitable locations and technology to facilitate electric vehicle technology and have faced some technical challenges and will provide a progress updates in following ASRs.

Penny Pie Park Gyratory

Whilst not a measure in Barnsley's MBC Air Quality Action Plan, BMBC's Highway's developed a scheme to relieve congestion on the A628 near access to Junction 37 of the M1 and into Barnsley town centre. This scheme became operational in January 2022 and a 7.3 $\mu g/m^3$ decrease can be observed at the triplicate site (measurements with three diffusion tubes) 15,16,17 between 2021 and 2022. Consequently, Penny Pie Park is

believed to be principal factor in the observed decreases in NO_2 annual mean concentrations.

Barnsley MBC does not anticipate any measures being completed over the following year. The next completion year of a measure is 2025 associated with measures 3 and 9, which are to encourage uptake of lower emission vehicles and alternative fuels and BMBC Fleet Improvements respectively.

The principal challenges and barriers to implementation that Barnsley MBC anticipates facing are significant resourcing constrains which will hinder monitoring and review of existing and development of new policies to improve air quality.

AQMA 4 and 6 are in exceedance at locations that LAQM.TG.22 box 1.1 does not class as applicable Air Quality Strategy Objectives. As such when concentrations become compliant when corrected for distance between exposure and relevant exposure (residential buildings). Barnsley will review the placement of diffusion tubes in AQMA 4 and 6 to ensure locations are applicable for the objective. Barnsley MBC anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA 4 and 6.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	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	Carriageway improvements	Traffic Management	UTC, Congestion management, traffic reduction	2018	2027	Local Authority Highways and Major Projects departments	South Yorkshire Mayoral Combined Authority (SYMCA)	NO	Funded		Implementation		Date of completion	Commencement of construction on the scheme	None
2	South Yorkshire Enhanced Bus Partnership	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2022	2023	LA Transport department and private company	South Yorkshire Mayoral Combined Authority (SYMCA)	NO	Funded		Implementation		A cap on daily and weekly fares, free travel for under 18s. A faster, more reliable and punctual system. A better bus experience. A new zero emission bus fleet.	Ongoing	Potential impact of COVID-19 and lockdown on fleet renewal. Estimated funding cost due to funding from private source.]
3	Encourage uptake of lower emission vehicles and alternative fuels	Promoting low emission transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2025	Growth and sustainability, Local Authority Housing and Energy departments	Joint funding from office for zero emissions vehicles (OZEV) grant award, On-street Residential Charge point Scheme (ORCS), South Yorkshire Mayoral Combined Authority (SYMCA), BMBC Funding	NO	Funded	£100k - £500k	Implementation		Date of completion	Electric vehicle charging points to charge up to 30 vehicles at the same time have been installed at Barnsley Council's Smithies Depot, Rapid chargers are now available within the town centre. Barnsley's sustainability and Climate Change Team is working with SYMBCA on a regional EV strategy due for completion by the end of 2023 and will be followed by a policy for Barnsley in 2024.	Up to £275,384.98 funding, from South Yorkshire Mayoral Combined Authority (SYMCA), £100k from ORCS. Barnsley falls below current average UK provision for number of EV chargers per 100,000 people. The sale of new diesel and petrol engine vehicles will be banned in the UK from 2035 and residents will increasingly need to adapt to electric vehicles. The Council will need to ensure that adequate infrastructure is available to support residents to make the transition to electric vehicles.
4	Planning applications – air quality mitigation and assessment	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	2031	Local Authority Environmental Health and Planning departments	BMBC	NO	Funded	£10k – 50k	Implementation		Number of planning applications where AQ actions have been agreed / conditioned / recommended	17 planning applications in 2016 where AQ actions have been agreed / conditioned / recommended. 35 in 2017, 40 in 2018, 43 in 2019, 213 in 2020.	This action will be ongoing as BMBC guidance and planning documents are continually refined
5	Control over emissions from Part B and A2 processes, and act as consultees for Part A1 processes	Other	Other	2012	2032	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	The Environmental Bill did not have any implication for Part B and A2 processes.
6	Enforcement of Clean Air Act with regards to industrial smoke	Other	Other	2012	2032	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	
7	Enforcement of Clean Air Act with regards to domestic smoke	Other	Other	2012	2033	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	Schedule 12 of the Environmental Bill amends the Clean Air Act 1993 to allow local authorities to impose financial penalties in smoke control areas. The existing

Measure No.	Measure	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
															criminal offence of emitting smoke from a chimney in a Smoke Control Area is replaced with a civil penalty regime.
8	Investigation of nuisance complaints, including appropriate action to resolve the complaint	Other	Other	2012	2033	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	The use of Abatement Enforcement Notices (Under the Environmental Protection Act 1990) and Community Protection Warning / Notices (ASB, Crime and Policing Act 2014) will be utilised to help tackle antisocial burning
9	BMBC Fleet Improvements	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2016	2025	Local Authority Fleet Operations department	BMBC	NO	Funded	£1 million - £10 million	Implementation		Number of electric vehicles purchased (minimum of 30)	33 fully electric vehicles, which amount to 15 percent of the Council fleet	Vehicle Replacement Programme for 2021/2022 should see a further 5 added to the Council fleet
10	Barnsley Intelligent Transport Systems	Traffic Management	UTC, Congestion management, traffic reduction	2012	2023	Local Authority Highways department	BMBC	NO	Funded	£1 million - £10 million	Completed		Installation of intelligent systems (SCOOT / MOVA) within AQMAs. Several of our AQMAs now have SCOOT/MOVA installed with performance reviewed	Completed	Ongoing maintenance along with minor upgrades when funding allows. BMBC will continue to investigate the installation of new Intelligent Transport Systems where the opportunity presents, such as new developments and new road schemes.
11	Encourage cycling and walking (developing infrastructure and campaigns)	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2022	2040	Local Authority Highways department	South Yorkshire Mayoral Combined Authority (SYMCA)	NO	Funded	> £10 million	Planning		Completion of schemes	Successful Sheffield City Region bid for £166 million. Barnsley to submit and implement schemes to this funding with schemes completed by March 2023. River Dearne long route (RDLR) scheme is part of the South Yorkshire Mayoral Combined Authority's Transforming Cities fund. The RDLR will improve active travel routes within the Dearne valley Park area between Harborough Hill Road, Pontefract Road, and Grange Lane. Where possible, the existing route will be widened to a four-metre shared use foot and cycle way.	One scheme is designed to enhance walking and cycling routes to retail estates located close to AQMA 4. Promotion of Active Travel as part of Clean Air Day. A number of schemes which will help give people more choices to travel without relying on their cars, so we can all work towards a health more sustainable Barnsley and meet our target of a net zero carbon Barnsley by 2045.
12	Assessment of air quality impact of major traffic schemes	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2032	Local Authority Environmental Health department	BMBC	NO	Funded	< £10k	Implementation		Assessment of air quality impact of major road schemes with alotted timescale	Assessments completed to allotted timescales	Ongoing subject to future road schemes
13	Promoting Travel Alternatives (workplace travel planning: encourage/facilitate home-working: personalised travel planning: school travel plans)	Promoting Travel Alternatives	Workplace Travel Planning	2017	2019	Local Authority Transportation department	BMBC and developer contributions	NO	Funded	£10k - 50k	Completed		Adoption of Sustainable Travel Supplementary Planning Document (SPD)	Adoption of SPD in 2019	SPD updated in November 2021, currently in Draft available at https://www.barnsley.gov.uk/media/20294/draft-sustainable-travel-spd-2021.pdf , which now reflects latest developments in provision of electric vehicle charge points,

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Barnsley MBC does not currently monitor $PM_{2.5}$. In order to obtain an indication of $PM_{2.5}$ concentrations within the Borough, we have therefore applied the procedure within paragraph 7.118 and Box 7.7 of the local authority air quality management technical guidance (LAQM TG:22). This procedure uses a national PM_{10} to $PM_{2.5}$ annual mean factor (5.5 µg/m^3 at background sites and 6.4 µg/m^3 at roadside sites in 2022, and 4.9 µg/m^3 at background sites and 5.7 µg/m^3 at roadside sites in 2021). This correction factor has been applied to 2021 and 2022 data, with previous years adjustments being made through an annual mean conversion factor of (0.7). These have been applied to measurements at our roadside Barnsley Kendray monitoring station. The table below details the conversion.

Year	2018	2019	2020	2021	2022
PM_{10} annual mean (µg/m^3)	18	20	20	19	21
$PM_{2.5}$ annual mean (µg/m^3)	12.6	14	14	13.3	14.6

Whilst these indicative $PM_{2.5}$ concentrations have been obtained from a roadside monitoring site; we note that concentrations have been greater than the World Health Organisation (WHO) annual mean guideline of 10 µg/m^3.

Public Health England have created outcome framework indicators, one of these relates to fraction of mortality attributable to particulate air pollution[10].

Barnsley MBC is taking the following measures to address $PM_{2.5}$:

Reducing emissions of $PM_{2.5}$ has been addressed within Barnsley MBC's Air Quality Action Plan (AQAP) revised in 2017. AQAP Appendix G includes further evaluation of actions, including an assessment of actions with regard to their effect of reducing PM2.5 concentrations, in accordance with Table A.1 of LAQM TG (22), Action Plan Toolbox. Applying Table A.1 therefore, all of the actions within the Plan will assist in reducing PM2.5 concentrations, including those actions in the Plan which deal with industrial and domestic emissions, particularly actions five to eight which specifically target domestic and industrial PM2.5 emissions. These actions are becoming increasingly important in reducing PM2.5 emissions as domestic emissions have recently been identified as a significant source of PM2.5 within the recently published Clean Air Strategy. The entire Barnsley borough is covered by smoke control orders.

The Clean Air Strategy, published in 2019, demonstrated further commitment to reducing PM2.5 concentrations, particularly domestic emissions. Following the 2021 Environment Act update new targets for $PM_{2.5}$ and Barnsley MBC will use the measures indicated, as well as any other required measures, in moving to ensure that these targets are met.

[10] https://data.england.nhs.uk/dataset/phe-indicator-30101

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

This section sets out the monitoring undertaken within 2022 by Barnsley Metropolitan Borough Council and how it compares with the relevant Air Quality Objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Barnsley MBC undertook automatic (continuous) monitoring at three sites during 2022. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The Air Quality England webpage presents automatic monitoring results for Barnsley Council, with automatic monitoring results also available through the UK-Air website.

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

3.1.2 Non-Automatic Monitoring Sites

Barnsley MBC undertook non- automatic (i.e. passive) monitoring of NO_2 at 64 sites during 2022. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. 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.

Monitoring ceased at six sites within the local authority during 2022, those sites being; Lansdowne Crescent (10), Westway Town Centre (33), Mexborough Road, Bolton-u-Dearne (45), Carlton Road (W'fd Road Junction (Downhill) (51), and two locations in Langsett (54 and 56).

Monitoring commenced at 5 locations in 2022:

- 48 Sheffield Road, Barnsley,
- 272 Dodworth Road, J37, Outbound,
- Hoyland Common Primary School,
- Penny Pie Park, No Loading Lamp Post
- Penny Pie Park, Play Area.

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.

3.1.3 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

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

Exceedances were identified at four diffusion tube locations in 2022: diffusion tube 8, 41, 43 and 53. Locations 41 and 43 have been in exceedance for the past five years, location 53 has been in exceedance 3 out of the last 4 years, and location 8 has been in exceedance in 3 of the last 5 years; however, it must be noted that at location 41 a decrease of 1.6 µg/m^3 was observed from 2021 to 2022. Both location 41 and 43 sit within AQMA 4 and are being managed with the AQAP published in 2019. Location 8 sits within AQMA 6 and has seen an increase of 3.9 µg/m^3 from 2021 to 2022 taking it back into

exceedance this site is also being managed by the 2019 AQAP. An exceedance has not been seen at this location since 2019 until 2022. It should be noted that, due to impacts from COVID-19 and changes in working and commuting patterns, an increase since 2020 is not uncommon. However, these sites show a significant decrease since 2019. Location 53 showed an exceedance occurring in every year of monitoring outside of 2020, this location however it should be again noted that there has been a significant decrease since 2019, as well as a decrease of 1.4 µg/m^3 from 2021 to 2022. This location will continue to be monitored by the local authority to assess the situation.

Across the local authority, measured results are relatively stable with minor increases and decreases being observed which can generally be attributed to changing traffic flows and meteorological impacts, on the most part decreases were observed. The most significant decreases were seen at sites 15-17 within AQMA 2A with decreases of more 7.3 µg/m^3. Sites within AQMA 1 have been compliant for five years and Barnsley MBC has plans to apply for revocation of this AQMA due to long term compliance. No site within the local authority has exceeded 60 µg/m^3 during 2022, indicating that an exceedance of the 1-hour mean objective is unlikely to have occurred at any site.

3.1.4 Particulate Matter (PM$_{10}$)

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

Automatic monitoring of PM$_{10}$ annual mean displayed a mean consistently below the 40 µg/m^3 objective for the past five years.

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

Automatic monitoring of PM$_{10}$ 24 hour mean shows that the 24 hour mean has not exceeded the objective more than 35 times each year for the past five years, with the number of exceedances each year remaining well below levels indicated by the Air Quality Objectives.

3.1.5 Particulate Matter (PM$_{2.5}$)

The local authority did not undertake any automatic monitoring of PM$_{2.5}$ in 2022. The authority expects to begin automatic monitoring of PM$_{2.5}$ at some sites in 2023.

3.1.6 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2022 with the air quality objectives for SO_2.

No exceedances of the 15-minute mean, 1-hour mean, and 24-hour mean occurred in 2022 at the one automatic monitoring location.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
BAR9	Barnsley A635 Kendray Roadside	Roadside	436298	405691	PM_{10}	No	Beta Attenuation	N/A	5	1.45
BAR11	Barnsley A628 Roadside 2 (began September 2021)	Roadside	432584	406085	NO_2	Yes, 2A	Chemiluminescent	N/A	7	1.8
BAR3	Barnsley Gawber	Urban Background	432525	407475	NO_2, SO_2, O_3	No	Chemiluminescent, UV Fluorescence, UV Absorption	N/A	N/A	4.0 (estimated)

Notes:

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co located with a Continuous Analyser?	Tube Height (m)
1	Midhopestones Eastbound	Roadside	423621	399817	NO_2	No	3.0	2.5	No	2.9
2	Langsett, Stanley Cottages	Roadside	421102	400496	NO_2	Yes, AQMA 6	0.0	1.5	No	3.0
3	Footpath Sign, School House, Langsett	Roadside	421143	400481	NO_2	Yes, AQMA 6	0.0	3.5	No	1.9
4	Langsett, School House	Roadside	421126	400485	NO_2	Yes, AQMA 6	0.0	2.0	No	2.8
5	Langsett, Café	Roadside	421291	400482	NO_2	Yes, AQMA 6	0.0	2.0	No	2.9
6	Langsett, Wagon and Horses	Roadside	421282	400471	NO_2	Yes, AQMA 6	0.0	3.0	No	2.6
7	Gilbert Hill - Langsett	Roadside	421117	400501	NO_2	No	7.5	2.5	No	2.6
8	Langsett - Footpath Sign	Roadside	421215	400475	NO_2	Yes, AQMA 6	2.0	2.0	No	2.1
9	Claycliffe Road / Barugh Lane	Kerbside	431482	408572	NO_2	No	0.0	1.5	No	2.8
10	Lansdowne Crescent, Darton	Façade	434960	406767	NO_2	Yes, AQMA 1	0.0		No	2.0
11	23 Dodworth Road	Roadside	434000	406292	NO_2	Yes, AQMA 2A	0.0		No	2.7
12	53 Dodworth Road	Roadside	433910	406290	NO_2	Yes, AQMA 2A	0.0		No	2.8
13	Traffic Lights Dodworth Road	Roadside	433820	406278	NO_2	Yes, AQMA 2A	2.5	2.5	No	2.9
14	Dodworth Road - SE of Cross Roads	Roadside	432702	406160	NO_2	Yes, AQMA 2A	13.0	3.0	No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co located with a Continuous Analyser?	Tube Height (m)
15, 16, 17	Pogmoor Crossroads	Roadside	432674	406180	NO_2	Yes, AQMA 2A	0.0	7.0	Yes	1.7
18	Pogmoor Road, Pogmoor	Roadside	432603	406312	NO_2	No	0.0	5.3	No	2.8
19	Post Office, Crown Hill Rd	Roadside	432481	406068	NO_2	Yes, AQMA 2A	0.0		No	2.8
20	Dodworth Road - Outbound - LC 54	Roadside	432535	406071	NO_2	Yes, AQMA 2A	7.5	1.5	No	3.0
21	305 Dodworth Road	Roadside	432402	406013	NO_2	Yes, AQMA 2A	8.0	3.0	No	2.9
22	315 Dodworth Rd, Pogmoor	Kerbside	432351	405985	NO_2	Yes, AQMA 2A	11.5	2.5	No	2.9
23	329 Dodworth Road	Roadside	432262	405950	NO_2	Yes, AQMA 2A	8.0	2.0	No	3.0
24	Cross Keys, Sheffield Road, Birdwell	Kerbside	435274	400384	NO_2	No	6.5	1.0	No	2.8
25	25/26, Wood View, Sheffield Road	Roadside	434832	400405	NO_2	No	3.0	1.5	No	2.9
26	20/21, Wood View, Sheffield Road	Roadside	434820	400421	NO_2	No	3.0	1.5	No	2.8
27	Aetherius Temple, Sheffield Road	Roadside	434823	400398	NO_2	No	0.0		No	2.9
28	Tankersley School	Roadside	434652	400231	NO_2	Yes, AQMA 1	0.0		No	2.8
29	5, Moor Lane, Birdwell	Urban Background	434721	400352	NO_2	Yes, AQMA 1	0.0		No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co located with a Continuous Analyser?	Tube Height (m)
30	Cock Inn, Birdwell	Roadside	434309	401032	NO_2	Yes, AQMA 1	0.0		No	2.6
31	Sheffield Rd - LC 32	Roadside	434595	401107	NO_2	No	3.5	2.5	No	3.0
32	Sheffield Rd – Chapel Street, Birdwell	Roadside	434559	401274	NO_2	No	0.0		No	2.8
33	Westway - Town Centre	Roadside	434831	406001	NO_2	No	5.0	3.0	No	2.9
34	Wakefield Road / Carlton Road	Roadside	435011	408281	NO_2	No	7.0	2.0	No	3.5
35	Wakefield Road - South of Carlton Road	Roadside	435027	408190	NO_2	No	0.0		No	2.8
36	Wakefield Road / Smithies Lane (North)	Roadside	435027	408104	NO_2	No	6.5	2.0	No	2.7
37	Wakefield Rd – app. Burton Rd junc.	Roadside	435174	407499	NO_2	No	5.8	1.7	No	2.8
38	Old Mill Lane / Honeywell Street	Kerbside	434757	406995	NO_2	No	3.0	0.3	No	2.8
39	Burton Road – app Rotherham Rd junc.	Kerbside	436072	407320	NO_2	No	2.5	0.5	No	2.7
40	Grange Lane, Cundy Cross junction	Roadside	437122	406557	NO_2	No	6.0	1.4	No	2.8
41	49 Harborough Hill Road	Roadside	434933	406695	NO_2	Yes, AQMA 4	8.0	2.0	No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co located with a Continuous Analyser?	Tube Height (m)
42	Mottram Street / Eldon Street	Roadside	434733	406774	NO_2	No	4.0	0.5	No	2.8
43	Harborough Hills Road – near to bakery	Roadside	434955	406769	NO_2	Yes, AQMA 4	5.0	2.0	No	2.9
44	119 Harborough Hill Road	Roadside	435049	407047	NO_2	Yes, AQMA 4	0.0		No	2.9
45	Mexborough Road, Bolton-u-Dearne	Roadside	432281	405927	NO_2	No	8.1	1.8	No	3.2
46	Tesco, Wwell Lane	Kerbside	437554	405291	NO_2	No	4.0	0.7	No	3.2
47	Sheffield Road / Park Road Xrds	Roadside	434958	405672	NO_2	No	0.0		No	2.8
48	Sheffield Road / Cemetery Road Xrds	Roadside	434964	405709	NO_2	Yes, AQMA 7	1.5	2.0	No	2.7
49	Doncaster Road, Ardsley	Kerbside	437528	405675	NO_2	No	3.9	0.5	No	2.8
50	Carlton Road (W'fd Road Junction (Uphill)	Roadside	435062	408244	NO_2	No	5.5	1.5	No	2.8
51	Carlton Road (W'fd Road Junction (Downhill)	Roadside	435481	400222	NO_2	No	6.0	1.4	No	2.4
52	Wakefield Road / Bar Lane Junction	Roadside	434112	409625	NO_2	No	2.8	1.6	No	2.7
53	Sheffield Road, Town Centre	Roadside	434809	406023	NO_2	No	2.5	0.3	No	2.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co located with a Continuous Analyser?	Tube Height (m)
54	Langsett, sign, car park	Roadside	432659	406309	NO_2	No	0.0	15.0	No	2.0
55	Wombwell Lane, adj, Keel Inn	Roadside	437367	405458	NO_2	No	2.4	1.6	No	2.7
56	Langsett, 40 mph sign	Roadside	432636	406299	NO_2	No	0.0	12.0	No	2.0
57	Grange Lane, Stairfoot, Northbound	Roadside	437242	405772	NO_2	No	1.5	1.5	No	2.8
58	Grange Lane, Stairfoot, Southbound	Roadside	437250	405813	NO_2	No	2.3	2.3	No	2.9
59	Signpost - Entrance To Horizon College	Roadside	432882	406259	NO_2	No	52.0	3.0	No	2.5
60	LC41, inbound, opposite Horizon College	Roadside	432817	406244	NO_2	No	90.0	3.0	No	2.7
61	LC16, Manx Arms, Sheffield Road	Roadside	434780	406055	NO_2	No	40.0	1.5	No	2.7
62	LC22, junc.Quarry St/Sheffield Road	Roadside	434855	405957	NO_2	No	5.1	1.4	No	2.7
63	LC35, Smokey Sam's, Sheffield Road	Roadside	434912	405817	NO_2	No	0.0	4.6	No	2.7
64	LC32, Lidia Supermarket, Sheff Road	Roadside	434931	405781	NO_2	No	12.0	4.6	No	2.7
65	48 Sheffield Road, Barnsley	Roadside	434831	406001	NO_2	No	5.0	3.0	No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co located with a Continuous Analyser?	Tube Height (m)
66	272 Dodworth Rd, J37, Outbound	Roadside	432263	405951	NO_2	No	8.1	1.8	No	2.7
67	Hoyland Common Primary School	Roadside	435486	400218	NO_2	No	6.0	1.4	No	2.7
68	PPP, No Loading Lamp Post	Roadside	432663	406325	NO_2	No		15.0	No	2.7
69	PPP Play Area	Roadside	432628	406311	NO_2	No		12.0	No	2.7

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
BAR11	432584	406085	Roadside	99.9	99.7	-	-	-	24	19
BAR3	432525	407475	Urban Background	93.3	95.2	16	17	12	13	13

☒ **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.**

Notes:

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

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

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

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
1	423621	399817	Roadside	100	100.0	29.5	29.3	18.1	19.3	19.7
2	421102	400496	Roadside	100	100.0	34.5	33.8	23.5	23.5	26.8
3	421143	400481	Roadside	91.7	90.4	**49.5**	**49.0**	31.2	34.4	37.2
4	421126	400485	Roadside	100	100.0	**48.2**	**48.8**	31.5	34.8	37.5
5	421291	400482	Roadside	100	100.0	31.8	31.9	21.1	22.5	24.7
6	421282	400471	Roadside	100	100.0	39.3	38.8	24.2	27.7	26.7
7	421117	400501	Roadside	91.7	92.3	28.5	28.3	18.6	18.8	21.7
8	421215	400475	Roadside	100	100.0	**55.7**	**55.6**	36.2	36.3	**40.2**
9	431482	408572	Kerbside	100	100.0	27.7	31.7	19.2	20.0	21.2
10	434960	406767	Façade	100	7.7	22.2	24.4	-	17.1	-
11	434000	406292	Roadside	100	100.0	35.0	39.1	26.5	29.1	28.2
12	433910	406290	Roadside	100	100.0	38.9	38.9	25.3	29.0	29.7
13	433820	406278	Roadside	100	100.0	39.0	**43.3**	29.3	31.8	31.6
14	432702	406160	Roadside	100	100.0	39.4	**40.5**	26.6	29.7	26.3
15, 16, 17	432674	406180	Roadside	100	100.0	33.6	31.9	24.6	26.6	19.3
18	432603	406312	Roadside	91.7	92.3	27.6	30.3	16.2	17.3	17.3
19	432481	406068	Roadside	100	100.0	25.7	27.2	18.1	19.1	19.5
20	432535	406071	Roadside	100	100.0	37.0	39.6	29.3	31.0	29.7
21	432402	406013	Roadside	100	100.0	**45.8**	**46.2**	29.5	31.8	32.8
22	432351	405985	Kerbside	100	100.0	**44.2**	**48.1**	32.6	34.6	35.8
23	432262	405950	Roadside	100	100.0	**43.4**	**47.0**	28.9	31.5	31.6
24	435274	400384	Kerbside	100	100.0	30.2	30.3	20.6	24.4	23.1
25	434832	400405	Roadside	100	100.0	34.3	38.6	26.0	32.4	27.8
26	434820	400421	Roadside	100	100.0	**40.1**	**40.3**	25.7	32.5	29.1
27	434823	400398	Roadside	91.7	84.6	39.1	39.8	23.9	27.4	27.8
28	434652	400231	Roadside	91.7	92.3	23.9	23.6	15.1	16.6	16.1
29	434721	400352	Urban Background	100	100.0	27.6	28.3	17.8	19.0	20.3
30	434309	401032	Roadside	91.7	92.3	29.5	33.4	20.1	25.0	23.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
31	434595	401107	Roadside	83.3	80.8	29.7	29.7	19.1	21.7	21.5
32	434559	401274	Roadside	75	71.2	32.8	35.5	23.0	24.7	25.9
33	434831	406001	Roadside	100	100.0	-	-	-	-	34.0
34	435011	408281	Roadside	91.7	88.5	33.1	32.2	21.6	24.3	23.8
35	435027	408190	Roadside	100	100.0	37.4	35.9	25.7	28.9	26.6
36	435027	408104	Roadside	100	100.0	**40.1**	**40.3**	27.4	31.7	31.3
37	435174	407499	Roadside	100	100.0	30.2	32.3	21.0	23.7	23.0
38	434757	406995	Kerbside	100	100.0	**40.4**	37.8	24.7	29.5	29.5
39	436072	407320	Kerbside	100	100.0	**44.4**	**41.9**	28.9	34.8	32.6
40	437122	406557	Roadside	100	100.0	-	**42.2**	30.0	35.4	33.1
41	434933	406695	Roadside	100	100.0	**59.3**	**60.3**	**42.4**	**51.3**	**49.7**
42	434733	406774	Roadside	100	100.0	-	-	-	28.2	29.6
43	434955	406769	Roadside	100	100.0	**59.7**	**58.9**	**41.4**	**47.9**	**50.1**
44	435049	407047	Roadside	100	100.0	37.2	39.1	27.4	30.3	32.8
45	432281	405927	Roadside	100	23.1	-	-	-	27.3	26.1
46	437554	405291	Kerbside	100	100.0	38.4	**42.2**	29.0	29.4	33.1
47	434958	405672	Roadside	100	100.0	30.3	33.5	22.5	24.9	26.6
48	434964	405709	Roadside	100	100.0	**43.4**	**47.4**	32.1	33.6	36.9
49	437528	405675	Kerbside	100	100.0	39.0	**41.9**	30.2	31.2	33.9
50	435062	408244	Roadside	91.7	92.3	-	37.4	25.0	27.1	27.9
51	435481	400222	Roadside	100	23.1	-	-	-	23.8	21.5
52	434112	409625	Roadside	100	100.0	-	35.4	24.3	25.0	26.3
53	434809	406023	Roadside	100	100.0	-	**59.0**	38.6	**45.0**	**43.6**
54	432659	406309	Roadside	100	100.0	-	-	-	-	19.6
55	437367	405458	Roadside	91.7	92.3	-	**42.6**	27.0	30.2	30.1
56	432636	406299	Roadside	100	100.0	-	-	-	-	18.5
57	437242	405772	Roadside	75	75.0	-	38.9	29.1	27.9	31.7
58	437250	405813	Roadside	100	100.0	-	37.4	26.1	26.6	27.3
59	432882	406259	Roadside	83.3	84.6	-	-	-	22.2	20.1
60	432817	406244	Roadside	83.3	84.6	-	-	-	23.0	19.2
61	434780	406055	Roadside	91.7	92.3	-	-	-	38.9	36.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
62	434855	405957	Roadside	100	100.0	-	-	-	**42.6**	39.1
63	434912	405817	Roadside	91.7	90.4	-	-	-	24.2	25.4
64	434931	405781	Roadside	100	100.0	-	-	-	26.4	26.4
65	434831	406001	Roadside	100	76.9	-	-	-	-	34.6
66	432263	405951	Roadside	100	76.9	-	-	-	-	29.1
67	435486	400218	Roadside	100	69.2	-	-	-	-	23.9
68	432663	406325	Roadside	100	76.9	-	-	-	-	18.8
69	432628	406311	Roadside	100	76.9	-	-	-	-	17.7

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

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

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

Notes:

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

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

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

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

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

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

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

Figure A.1.1 – Trends in Annual Mean NO_2 Concentrations in AQMA 1

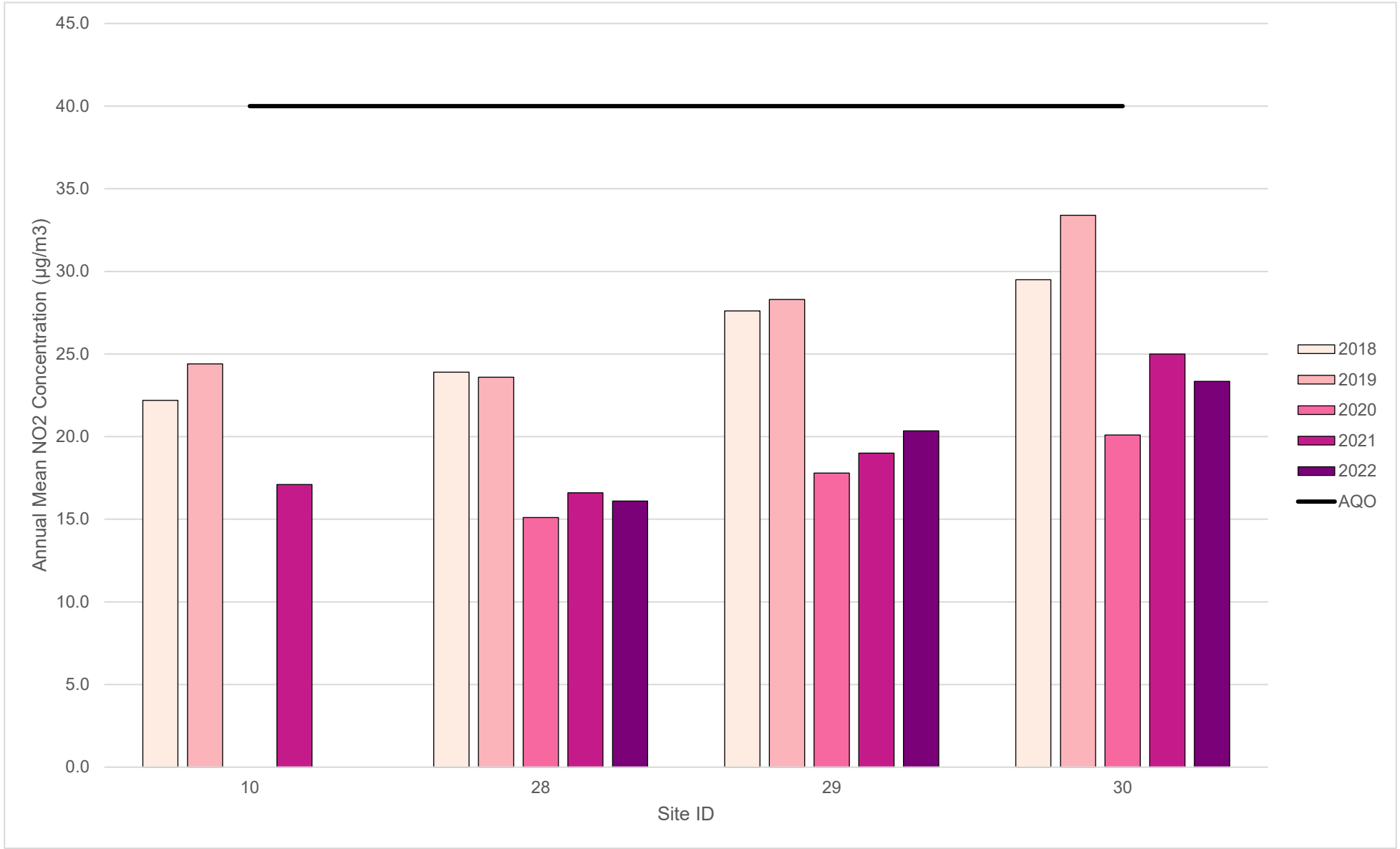


Figure A.2.2 – Trends in Annual Mean NO_2 Concentrations in AQMA 2A

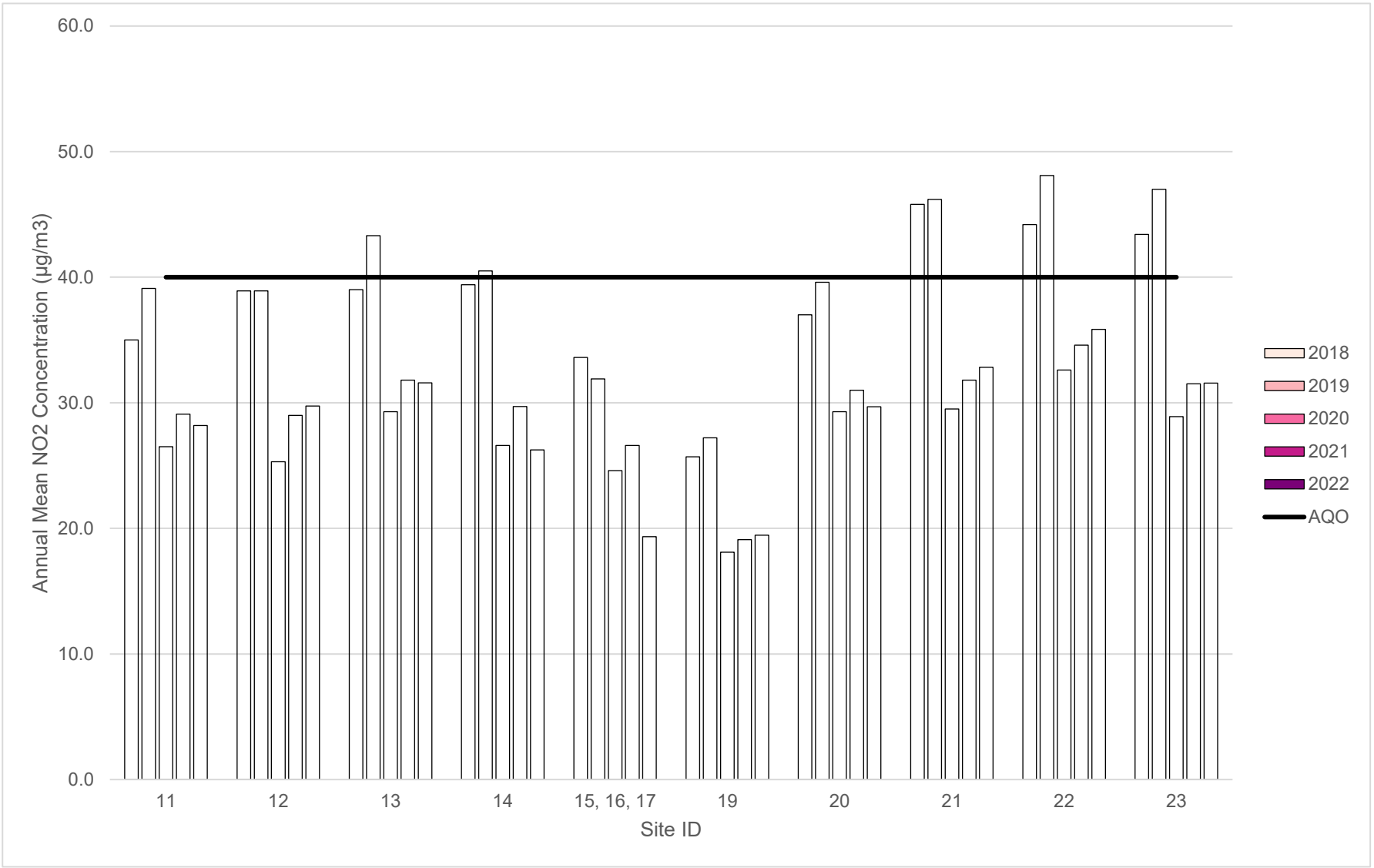


Figure A.3.3 – Trends in Annual Mean NO_2 Concentrations in AQMA 4

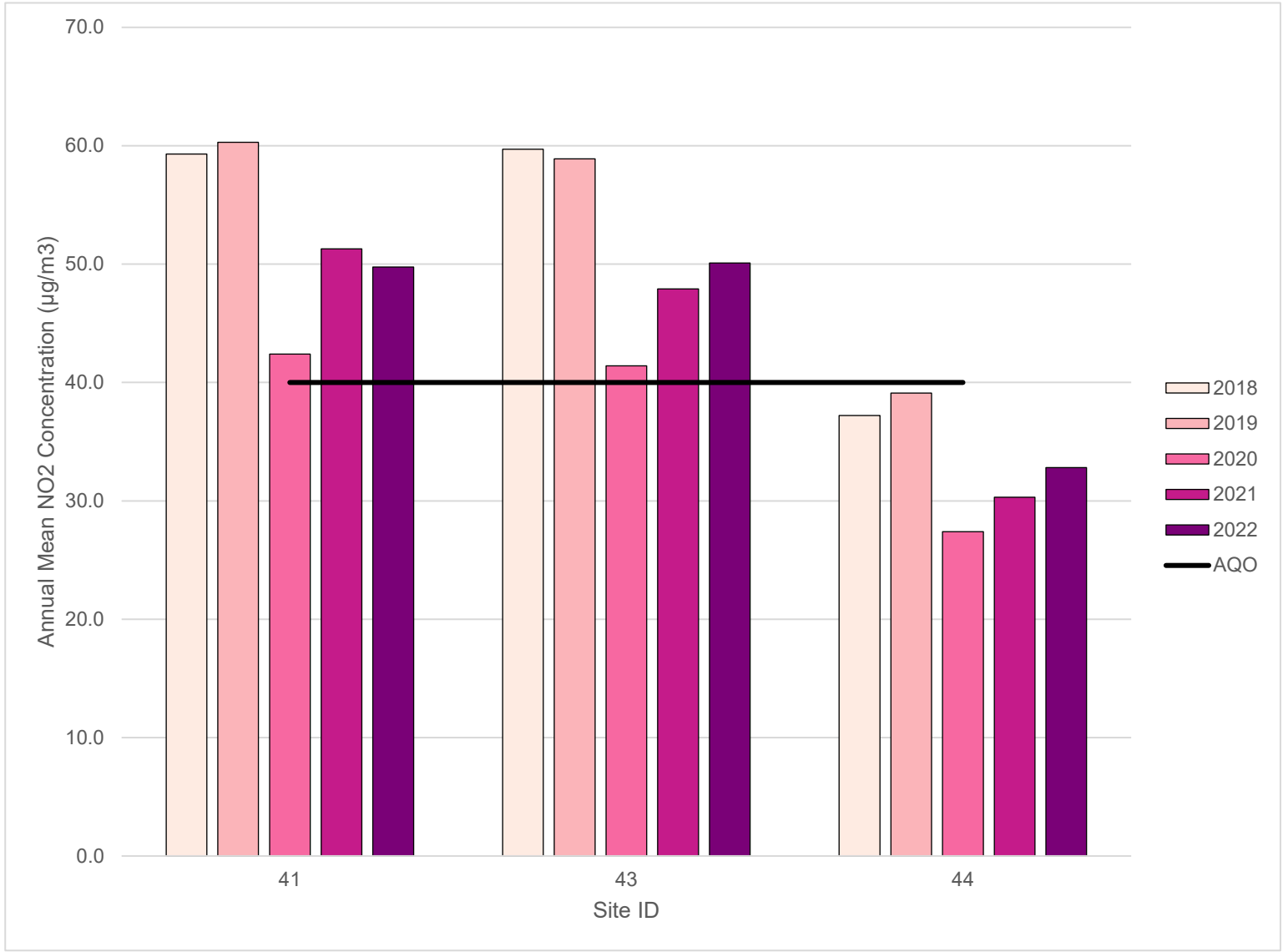


Figure A.4.4 – Trends in Annual Mean NO_2 Concentrations in AQMA 6

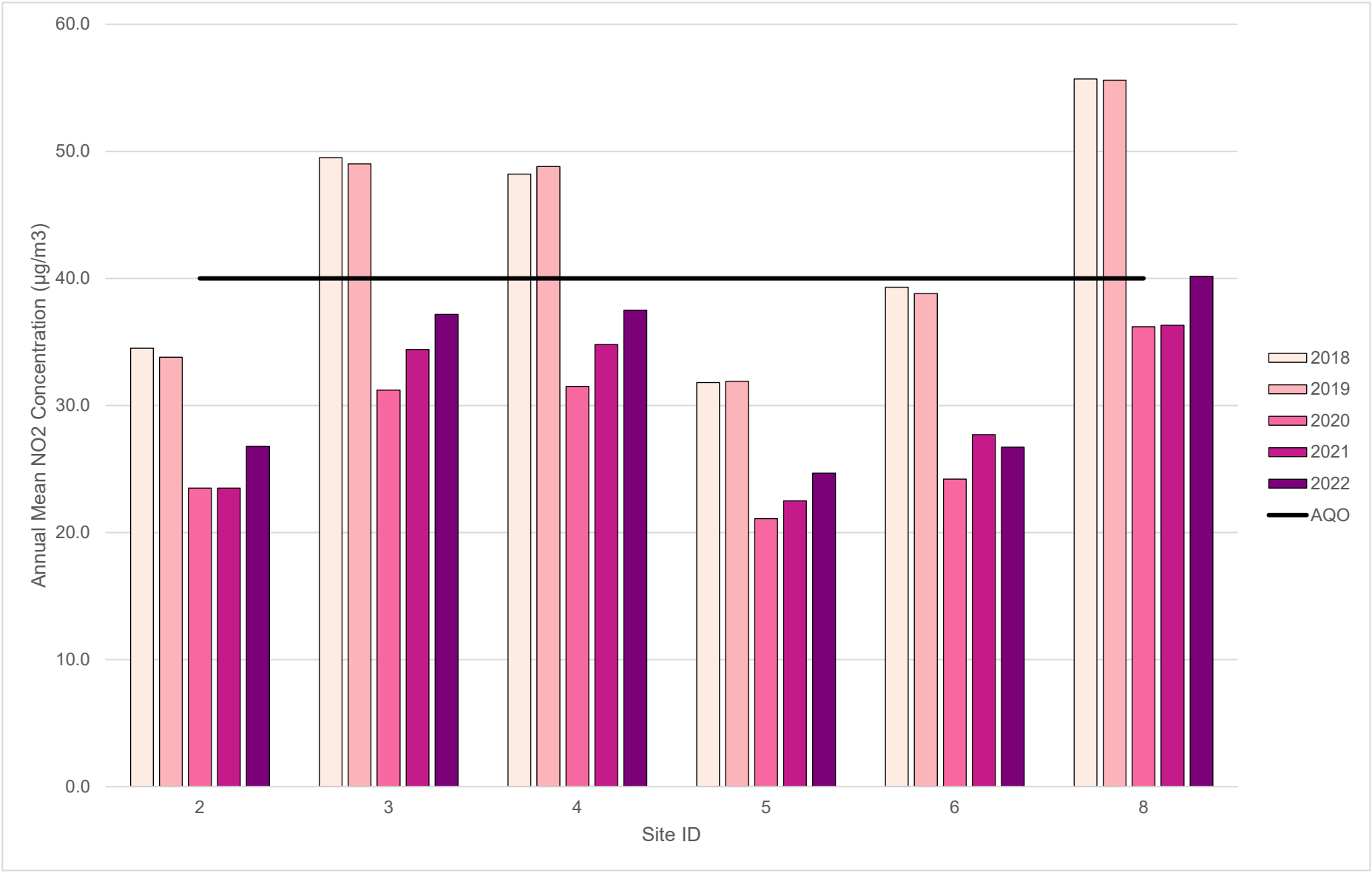


Figure A.5.5 – Trends in Annual Mean NO_2 Concentrations in AQMA 7

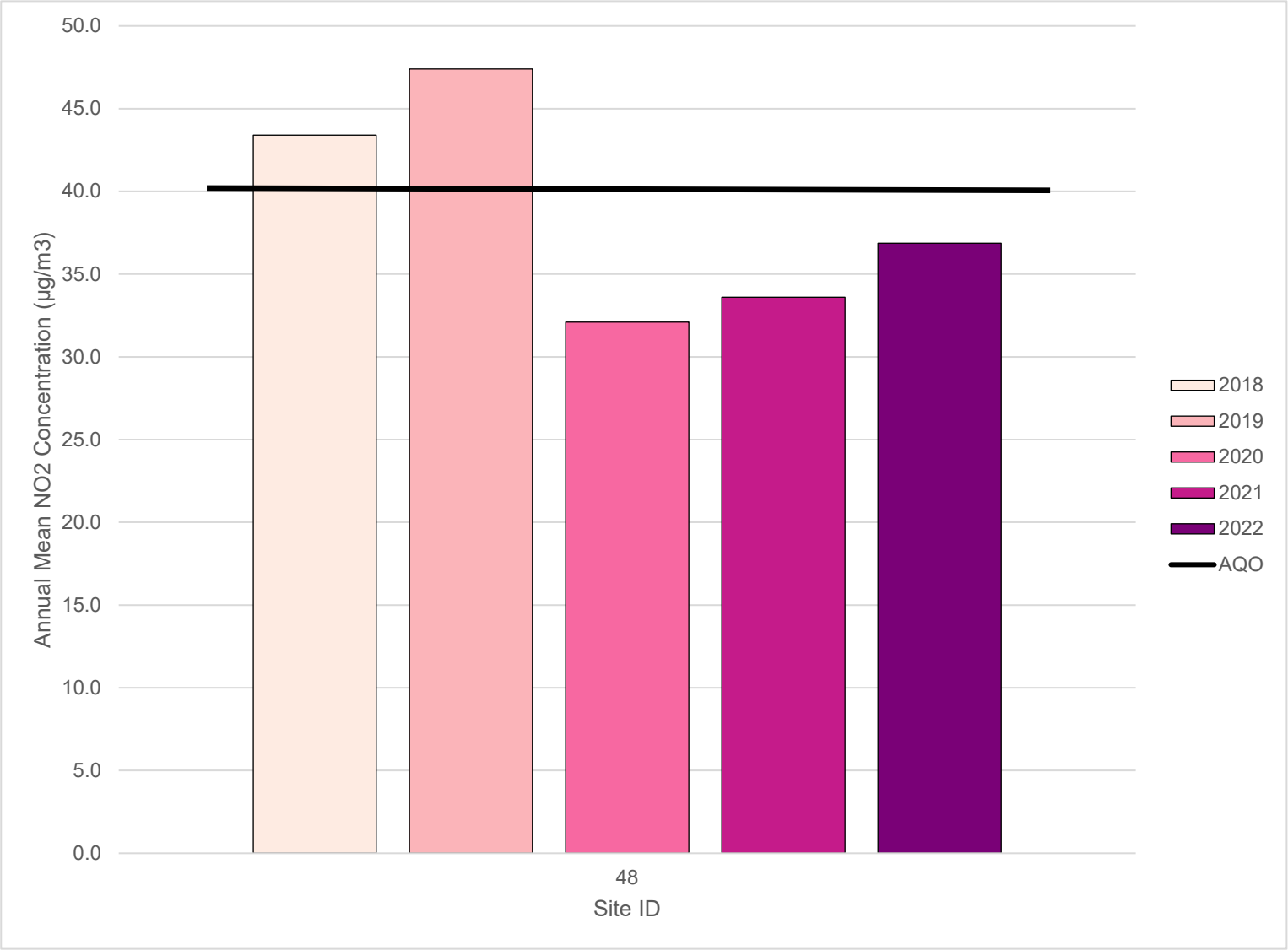


Figure A.6.6 – Trends in Annual Mean NO_2 Concentrations outside of all AQMAs

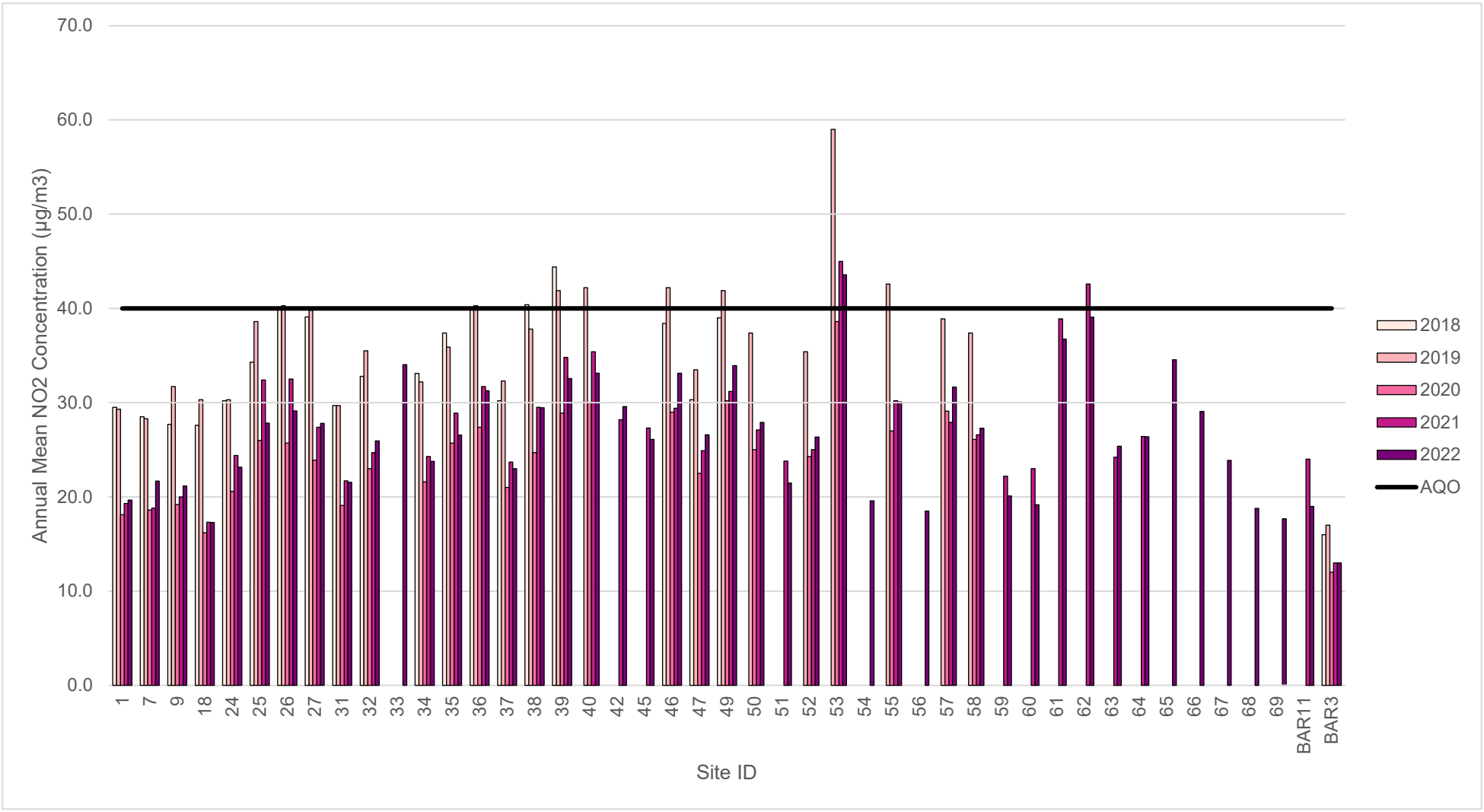


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
BAR11	432680	406174	Roadside	99.9	99.70%	-	-	-	0	0
BAR3	432525	407475	Urban Background	93.3	95%	0	0	0	0	0
BAR6	432684	406173	Roadside	84.7	0%	0	0	0	0	-

Notes:

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

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

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
BAR9	436298	405691	Roadside	92.6	98.61	**18**	**20**	**20**	**19**	**21**

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

Notes:

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

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

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

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

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

Figure A.3 – Trends in Annual Mean PM_{10} Concentrations

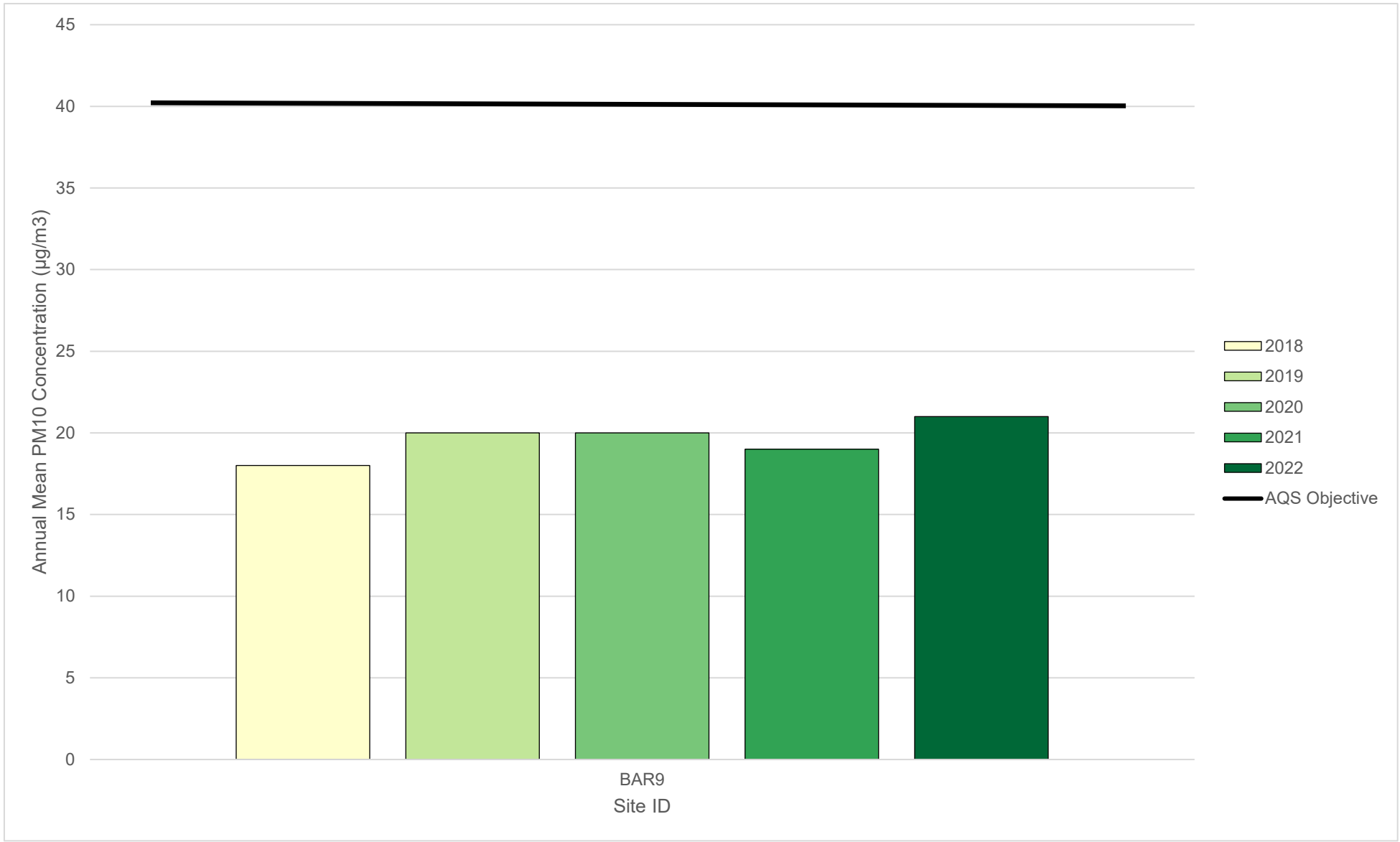


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
BAR9	436298	405691	Roadside	92.6	98.61	5	11	3	1	7

Notes:

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

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

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

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

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

Figure A.4 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m³

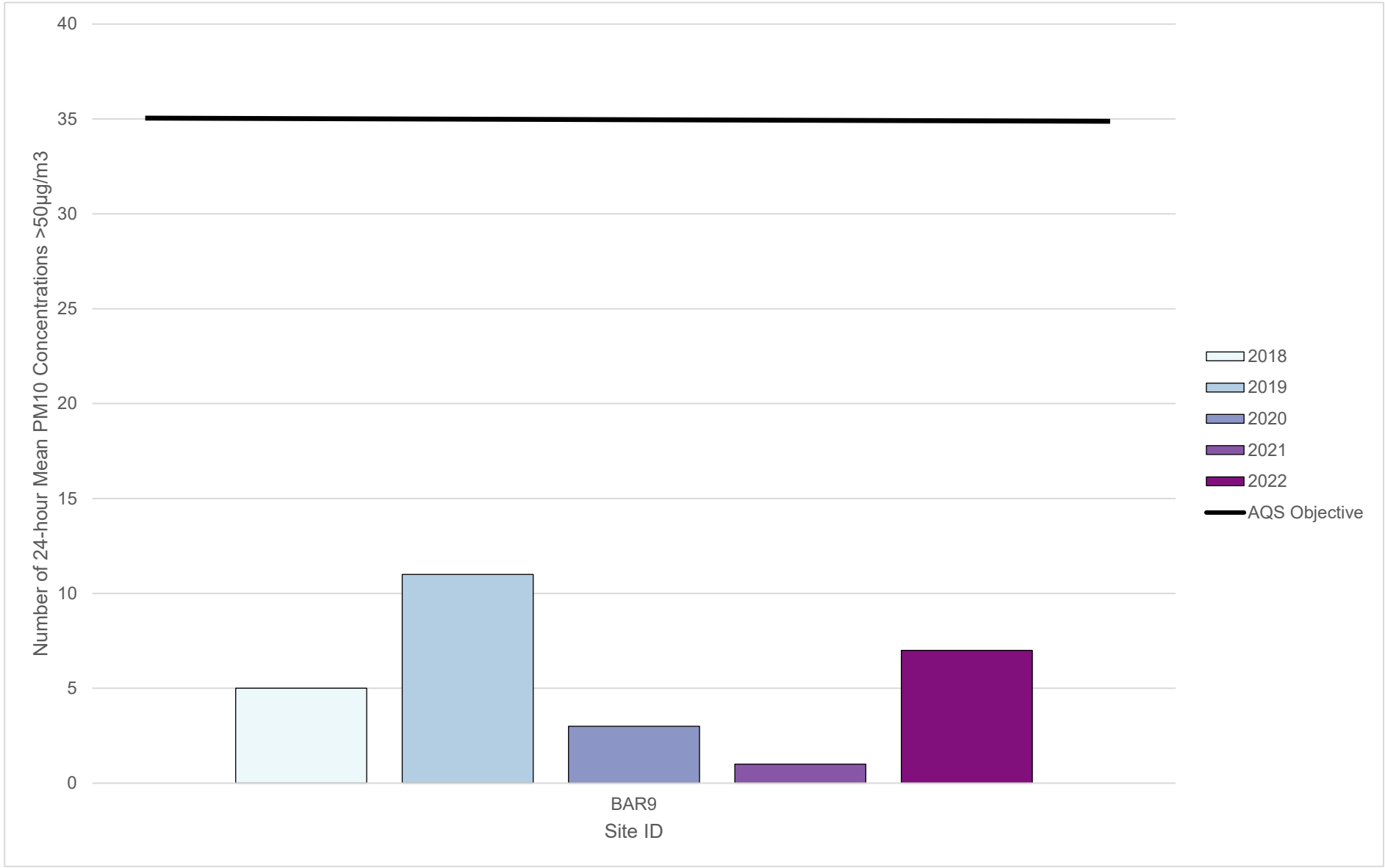


Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

The Local Authority does not undertake any $PM_{2.5}$ monitoring for the period being reported on.

Table A.9 – SO_2 2022 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of 15 minute Means > 266µg/m³	Number of 1 hour Means > 350µg/m³	Number of 24 hour Means > 125µg/m³
BAR3	432525	407475	Urban Background	96%	99%	0	0	0

Notes:

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are 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%).

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	423621	399817	29.0	16.4	29.0	6.9	22.7	21.1	23.3	30.6	29.6	25.6	23.8	26.3	23.7	19.7	-	
2	421102	400496	26.7	22.2	32.9	31.1	29.7	28.4	34.4	41.1	35.2	36.9	36.2	31.7	32.3	26.8	-	
3	421143	400481	41.2	33.9	38.7	43.7	45.1	48.9	52.2	53.5	47.0		45.7	42.4	44.8	37.2	-	
4	421126	400485	44.7	35.1	41.1	42.9	47.9	44.1	48.9	54.9	45.1	47.0	45.8	42.9	45.2	37.5	-	
5	421291	400482	28.5	18.9	30.8	29.1	28.4	26.9	32.9	38.0	35.3	28.4	30.0	30.5	29.7	24.7	-	
6	421282	400471	33.7	20.2	27.9	36.2	32.0	28.9	37.1	42.1	40.0	30.4	30.6	28.3	32.2	26.7	-	
7	421117	400501	27.9	22.2	22.8	23.9	24.0		26.9	31.8	25.3	28.8	26.8	27.1	26.1	21.7	-	
8	421215	400475	47.1	31.2	44.6	49.2	49.5	47.8	53.0	59.3	54.6	50.3	48.1	45.1	48.4	**40.2**	34.6	
9	431482	408572	26.2	16.1	31.7	25.2	20.8	19.2	20.6	25.4	27.1	22.4	37.4	34.4	25.5	21.2	-	
10	434960	406767	27.0												-	-	-	
11	434000	406292	26.0	25.9	31.7	34.3	31.6	30.9	41.7	33.1	39.8	33.3	40.5	38.7	34.0	28.2	-	
12	433910	406290	42.9	29.2	36.7	41.9	32.7	28.2	32.1	36.2	36.5	34.7	38.8	41.2	35.8	29.7	-	
13	433820	406278	42.9	33.3	38.0	32.2	32.3	34.2	34.1	40.8	38.2	43.2	45.8	41.5	38.1	31.6	-	
14	432702	406160	38.5	27.9	28.2	32.2	23.4	28.1	37.9	34.9	33.7	28.8	33.2	37.1	31.6	26.3	-	
15	432674	406180	26.1	20.5	28.3	18.4	19.5	15.4	19.0	20.4	23.4	26.1	33.0	26.0	-	-	-	Triplicate Site with 15, 16 and 17 - Annual data provided for 17 only
16	432674	406180	30.7	19.5	26.6	21.8	19.9	16.8	19.3	22.0	22.9	26.3	31.0	30.5	-	-	-	Triplicate Site with 15, 16 and 17 - Annual data provided for 17 only
17	432674	406180	29.0	19.0	26.3	21.5	13.9	16.1	18.9	22.1	23.5	23.0	33.1	30.0	23.3	19.3	-	Triplicate Site with 15, 16 and 17 - Annual data provided for 17 only
18	432603	406312	18.7	17.6	29.1	19.5	15.6	14.5	15.7		22.2	24.9	28.0	23.2	20.8	17.3	-	
19	432481	406068	24.9	18.6	29.2	18.2	17.0	17.5	19.9	20.9	22.3	27.3	33.0	32.5	23.5	19.5	-	
20	432535	406071	42.5	27.3	38.9	36.6	28.6	28.4	29.7	37.7	37.1	38.9	42.0	42.7	35.8	29.7	-	
21	432402	406013	40.7	30.9	38.4	35.9	37.9	35.9	38.8	40.6	41.2	40.2	46.8	46.2	39.5	32.8	-	
22	432351	405985	48.6	41.0	43.2	39.9	39.8	40.8	40.3	44.8	42.3	45.1	46.7	46.1	43.2	35.8	-	
23	432262	405950	46.8	33.5	37.4	33.2	33.7	32.8	37.9	40.1	39.7	41.0	43.6	37.3	38.0	31.6	-	
24	435274	400384	39.4	24.2	27.1	26.3	23.5	25.2	27.7	27.3	27.3	26.2	29.1	33.7	27.9	23.1	-	
25	434832	400405	34.3	20.9	39.6	36.2	31.6	27.0	31.4	37.3	36.7	33.1	37.5	36.9	33.5	27.8	-	

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
26	434820	400421	36.9	23.5	46.5	35.2	30.8	26.4	32.5	38.2	37.2	34.4	40.5	39.8	35.1	29.1	-	
27	434823	400398	36.1	< 1	40.7	30.4	26.9	25.9		33.0	36.4	30.6	39.1	38.5	33.5	27.8	-	
28	434652	400231	20.4	9.9	31.1	22.5	14.2		13.5	18.9	18.6	18.5	24.9	22.5	19.4	16.1	-	
29	434721	400352	25.8	21.0	30.8	22.9	22.0	19.7	20.3	23.6	21.4	25.8	30.3	30.2	24.5	20.3	-	
30	434309	401032	32.7	12.2		25.9	24.4	27.4	28.2	26.9	28.6	32.3	34.2	36.1	28.1	23.4	-	
31	434595	401107	26.9	18.9	33.1	23.0			18.5	20.6	25.7	26.1	33.7	31.0	25.9	21.5	-	
32	434559	401274	32.3	21.8	34.6	27.2		24.8		29.2	29.4		38.8	41.1	31.2	25.9	-	
33	434831	406001	33.9	29.5	53.2												-	
34	435011	408281	35.0	25.9	31.7	25.7		19.9	20.7	24.7	26.4	27.4	36.5	39.3	28.6	23.8	-	
35	435027	408190	37.8	28.6	34.0	32.7	25.7	25.6	26.2	32.5	29.8	31.3	41.3	39.8	32.0	26.6	-	
36	435027	408104	47.4	37.7	37.4	36.3	32.2	33.6	33.1	38.8	38.6	35.1	42.2	42.1	37.7	31.3	-	
37	435174	407499	33.4	22.9	32.6	25.9	22.1	21.9	22.1	25.7	30.3	27.4	32.5	37.3	27.7	23.0	-	
38	434757	406995	45.4	29.3	38.4	32.6	31.4	28.1	30.8	32.7	37.8	35.0	39.3	46.2	35.5	29.5	-	
39	436072	407320	43.4	29.5	50.1	45.8	34.5	32.8	35.0	42.7	41.7	34.4	41.1	43.1	39.2	32.6	-	
40	437122	406557	52.4	29.3	50.9	45.4	30.3	30.5	34.9	43.9	45.1	31.4	44.8	45.8	39.9	33.1	-	
41	434933	406695	58.4	49.3	63.0	56.9	57.0	58.3	60.2	64.1	63.6	62.6	63.2	62.9	59.9	**49.7**	36.7	
42	434733	406774	39.0	29.0	41.4	32.2	31.9	26.8	31.4	34.9	35.3	40.2	43.8	40.8	35.6	29.6	-	
43	434955	406769	62.2	45.7	57.6	63.7	60.3	57.1	61.9	66.9	64.2	54.9	62.2	68.5	60.4	**50.1**	39.9	
44	435049	407047	46.1	30.3	40.5	37.6	38.9	34.6	37.2	35.7	42.3	41.2	41.3	47.8	39.5	32.8	-	
45	432281	405927	52.4	30.8	33.6										38.9	26.1	-	
46	437554	405291	49.6	38.7	41.3	36.4	32.0	33.0	40.2	38.4	40.2	40.3	41.9	50.0	39.9	33.1	-	
47	434958	405672	35.5	29.0	39.5	33.0	25.8	27.3	29.1	32.4	33.5	30.4	35.2	36.5	32.0	26.6	-	
48	434964	405709	45.0	30.3	58.3	50.5	43.0	34.1	40.1	51.1	51.5	38.7	45.4	46.9	44.4	36.9	33.5	
49	437528	405675	42.5	32.0	43.9	44.3	40.1	35.6	37.3	43.7	45.1	40.7	44.7	40.4	40.9	33.9	-	
50	435062	408244		28.1	35.1	33.6	30.6	31.0	30.0	34.4	33.7	34.8	37.2	41.7	33.6	27.9	-	
51	435481	400222	31.3	24.7	40.2										32.1	21.5	-	
52	434112	409625	37.0	20.1	39.2	34.7	27.5	22.6	28.5	34.3	35.7	29.5	34.9	38.7	31.7	26.3	-	
53	434809	406023	54.7	44.6	57.2	57.1	54.8	39.4	51.4	62.7	62.9	46.6	51.6	47.6	52.5	**43.6**	33.3	
54	432659	406309	27.4	20.1	32.8													
55	437367	405458	40.3		38.3	36.6	30.9	30.4	34.3	39.9	39.3	31.7	39.0	41.0	36.2	30.1	-	
56	432636	406299	26.9	17.3	32.6													

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
57	437242	405772	45.9	39.1	44.4	32.7	28.6	29.9	30.7				45.5	49.5	38.1	31.7	-	
58	437250	405813	39.6	26.5	44.6	33.8	24.4	23.8	27.0	32.6	35.1	32.2	37.4	40.9	32.9	27.3	-	
59	432882	406259	44.2			25.0	23.2	15.6	17.3	21.2	20.2	20.5	25.6	30.3	24.2	20.1	-	
60	432817	406244			33.2	22.1	19.9	13.4	17.9	20.0	20.5	27.0	31.8	23.7	23.1	19.2	-	
61	434780	406055	56.0		58.4	31.0	38.5	32.1	41.6	43.6	47.8	47.0	45.4	47.5	44.3	36.7	18.3	
62	434855	405957	55.4	36.9	56.5	53.4	44.4	38.6	41.3	46.5	54.5	38.8	50.2	51.4	47.1	39.1	29.9	
63	434912	405817	37.6	23.5	41.8	27.9	25.6	22.4	21.7	29.0	35.1		35.1	37.8	30.6	25.4	-	
64	434931	405781	34.5	22.0	43.9	33.9	26.8	20.1	24.8	33.0	36.5	30.6	38.3	38.5	31.8	26.4	-	
65	434831	406001				46.7	41.7	34.4	43.7	48.3	48.4	40.9	32.5	40.3	41.6	34.6	-	
66	432263	405951				31.8	33.9	27.2	31.3	40.7	36.8	35.1	37.0	41.4	35.0	29.1	-	
67	435486	400218				25.5	25.5		24.4	22.9	27.1	28.9	33.2	31.4	27.4	23.9	-	
68	432663	406325				21.0	15.1	14.7	17.2	21.4	22.8	28.6	32.9	29.7	22.6	18.8	-	
69	432628	406311				19.4	17.5	13.6	16.2	19.4	22.4	26.6	27.1	28.6	21.3	17.7	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

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

☒ **Local bias adjustment factor used.**

☐ **National bias adjustment factor used.**

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

☒ **Barnsley MBC confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Barnsley MBC During 2022

Air quality assessments have been undertaken in support of various planning applications which have potential to impact on local air quality. In addition, following adoption of the Councils' Local Plan in 2019, the Council has been developing Masterplan Frameworks as Barnsley's Local Plan includes some site allocations which require the production of such a framework. Masterplan frameworks are subject to public consultation and approval by the Council prior to the determination of any planning applications on the affected sites. Air quality impact has been included within these frameworks in order to ensure that this is considered appropriately at subsequent planning stage. The Council has its own Air Quality and Emissions Good Practice Planning Guidance (https://www.barnsley.gov.uk/media/16257/pdc-2020-mar-bmbc-aqe-technical-planningguidance-v12.pdf) which requires that air quality impact from future development are reasonably mitigated.

Specifically, in 2020, the following significant planning applications were assessed for air quality impact: 2020/0647 - Hybrid planning application for a development up to 103,086sqm of employment uses (use classes B1/B2 and B8) 2020/0027 and 2020/0028 - Hybrid planning application for a development up to 103,086sqm of employment uses (use classes B1/B2 and B8) 2020/1005 - Outline planning permission (with all matters reserved except access) for redevelopment of the site to include up to 500 residential units.

In 2021 planning application was approved for the MU1 development[11] by Barnsley MBC, which comprises of 1,760 dwellings and business parks with an estimated operational year of 2026. An air quality assessment was submitted demonstrating that air quality impacts would be negligible within all AQMAs.

[11] https://www.barnsley.gov.uk/services/planning-and-buildings/local-planning-and-development/our-local-plan/masterplan-frameworks/barnsley-west-masterplan-framework/planning-applications-for-barnsley-west-mu1/

Additional Air Quality Works Undertaken by Barnsley MBC During 2022

Due to extreme resource limitations Barnsley Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide diffusion tubes for 2022 were analysed by South Yorkshire Air Quality Samplers for the period January to March and by Gradko from April to December. The South Yorkshire Air Quality Samplers laboratory uses the analytical technique of the grid adsorbent being 50% triethanolamine (TEA) in acetone. Reagents used in the analysis are sulphanilamide and Naphthyl-1Ethylene Diamine Dihydrochloride (NEDA). The analytical technique used is spectrometry, at a wavelength of 540 nanometres. South Yorkshire Air Quality Samplers participates in the WASP / AIR PT scheme for nitrogen dioxide and has previously participated within the survey's inter laboratory comparison scheme. The Gradko lab used the analytical technique of the grid adsorbent being 50% triethanolamine (TEA) in acetone. Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The laboratory follows the procedures set out in the Harmonisation Practical Guidance and participates in the AIR proficiency-testing (AIR-PT) scheme. Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in the AIR-PT is also assessed by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Inter-Comparison Exercise.

In the 2022 AIR-PT results, Gradko scored 100% in AIR-PT AR050 (May – June 2022)[12]. At the time of writing this ASR, there were no results available for July 2022 onwards. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ±2.

[12] Available at https://laqm.defra.gov.uk/wp-content/uploads/2022/07/LAQM-NO2-Performance-data_Up-to-June-2022_V2.1.pdf

The diffusion tube calendar was adhered to for the majority of the schedule, although diffusion tubes from May 2022 had a slightly elongated period of exposure lasting longer than the recommended 5 weeks (+ 4 days).

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. This was conducted for 3 sites in 2022.

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

Site ID	Annualisation Factor <Site 1 Name>	Annualisation Factor <Site 2 Name>	Annualisation Factor <Site 3 Name>	Annualisation Factor <Site 4 Name>	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
45	0.8075	0.8641	0.7249	0.8327	0.8073	38.9	31.4
51	0.8075	0.8641	0.7249	0.8327	0.8073	32.1	25.9
DT51a	1.0317	1.0228	1.0993	1.0391	1.0482	27.4	28.8

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Barnsley MBC have applied a local bias adjustment factor of 0.83 to the 2022 monitoring data. A summary of bias adjustment factors used by Barnsley MBC over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	Local	-	0.83
2021	Local	-	-
2020	Local	-	0.84

2019	Local	-	0.98
2018	Local	-	0.95

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12				
Bias Factor A	0.83 (0.78 - 0.89)				
Bias Factor B	21% (13% - 28%)				
Diffusion Tube Mean (µg/m^3)	23.3				
Mean CV (Precision)	6.3%				
Automatic Mean (µg/m^3)	19.3				
Data Capture	100%				
Adjusted Tube Mean (µg/m^3)	19				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2022 diffusion tube results.

NO_2 Fall-off with Distance from the Road

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

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

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
8	2.0	4.0	40.2	6.1	34.6	
41	2.0	10.0	49.7	15.2	*36.7*	*Predicted concentration at Receptor within 10% the AQS objective.*

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
43	2.0	7.0	50.1	15.2	*39.9*	*Predicted concentration at Receptor within 10% the AQS objective.*
48	2.0	3.5	36.9	11.4	33.5	
53	0.3	2.8	43.6	15.2	33.3	
61	1.5	41.5	36.7	11.4	18.3	*Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.*
62	1.4	6.5	39.1	11.4	29.9	

QA/QC of Automatic Monitoring

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

The type of PM_{10} monitors utilised within Barnsley MBC do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Barnsley MBC recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

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

No automatic NO_2 monitoring locations within Barnsley MBC required distance correction during 2022.

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

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

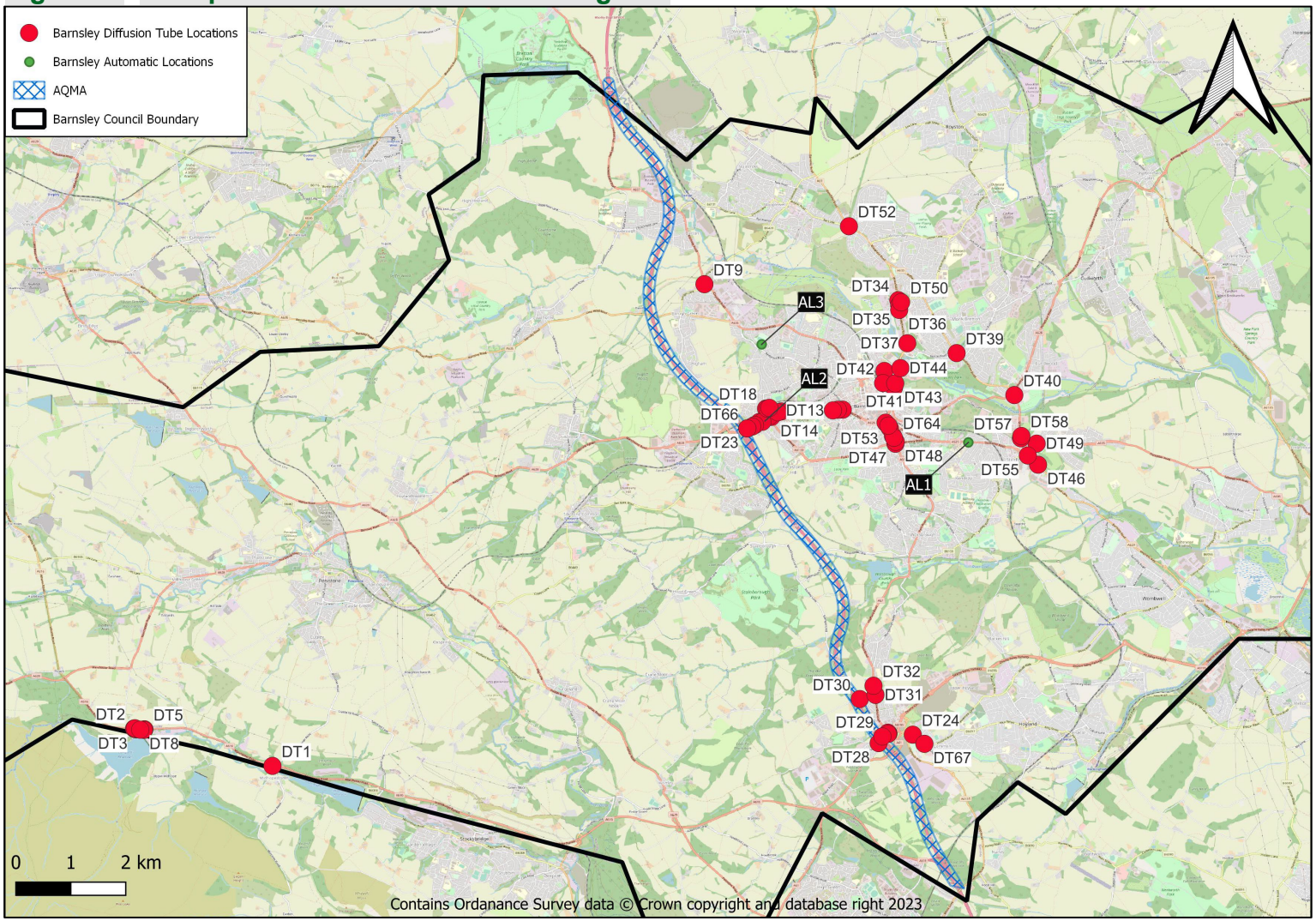


Figure D.1.1 – Map displaying diffusion tube 1.

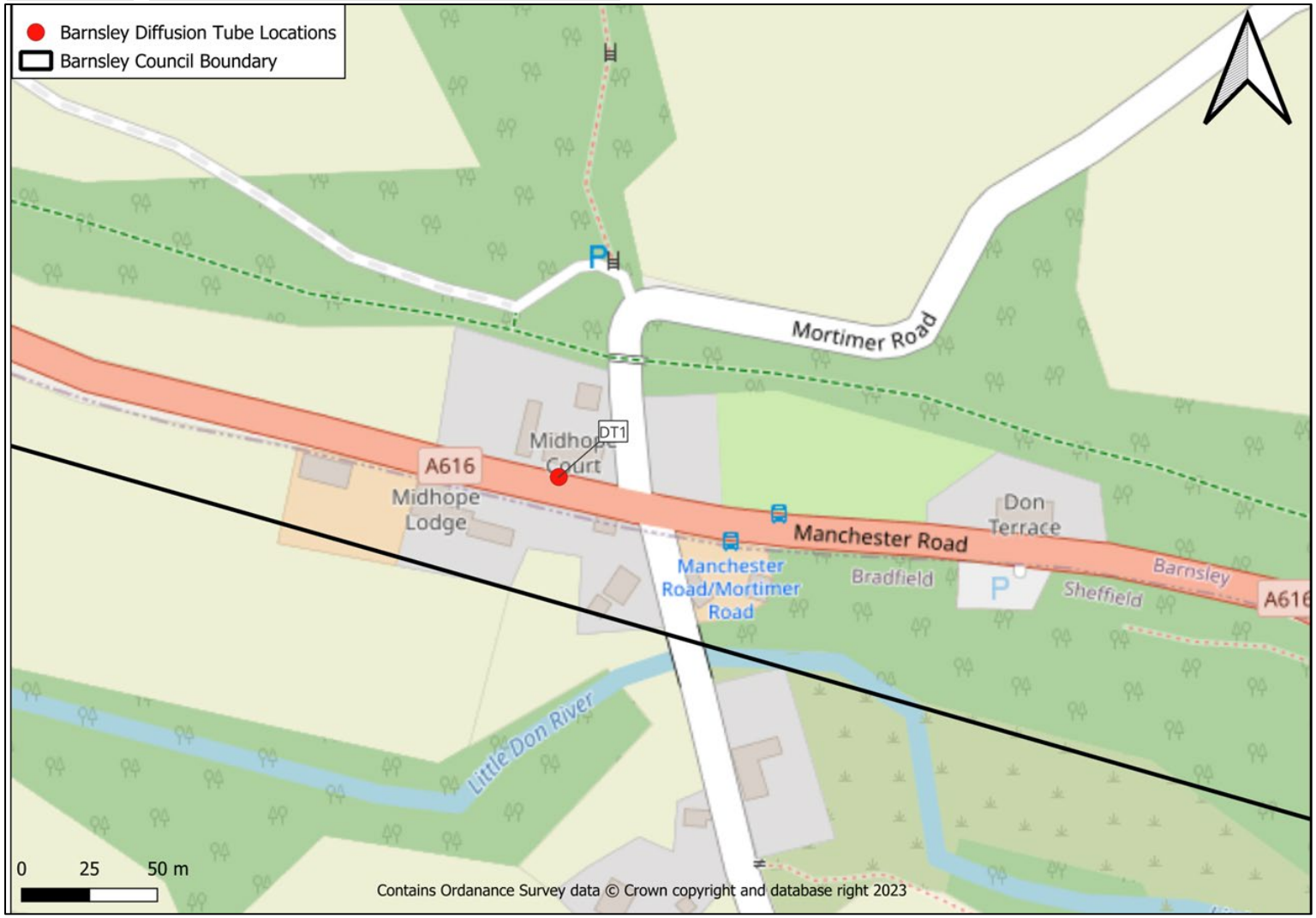


Figure D.1.2 – Map displaying diffusion tubes 2 to 8, and AQMA 6

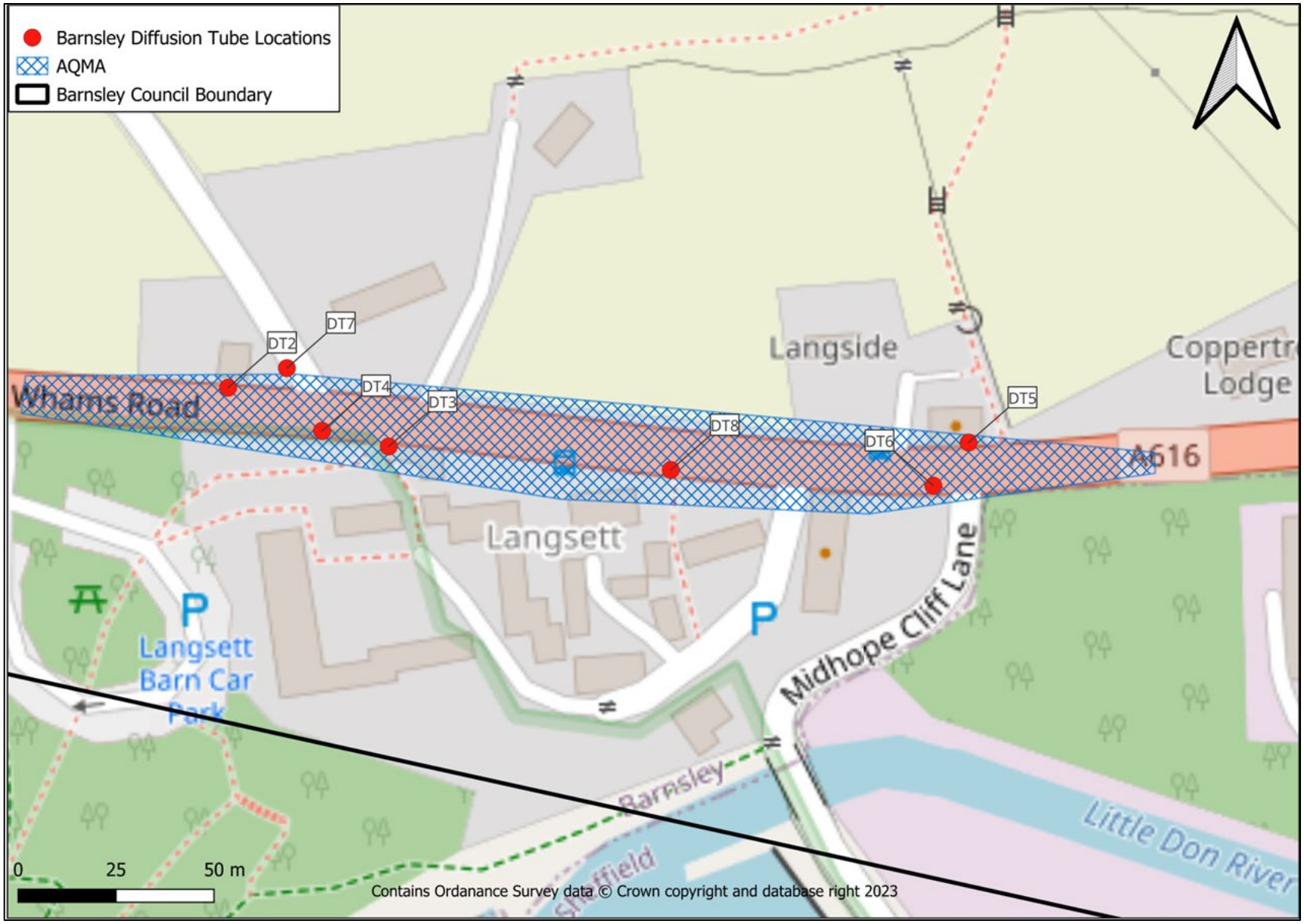


Figure D.1.3 – Map displaying diffusion tube 9.

Figure D1.4 – Map displaying diffusion tubes 11 to 13, and AQMA 2A.

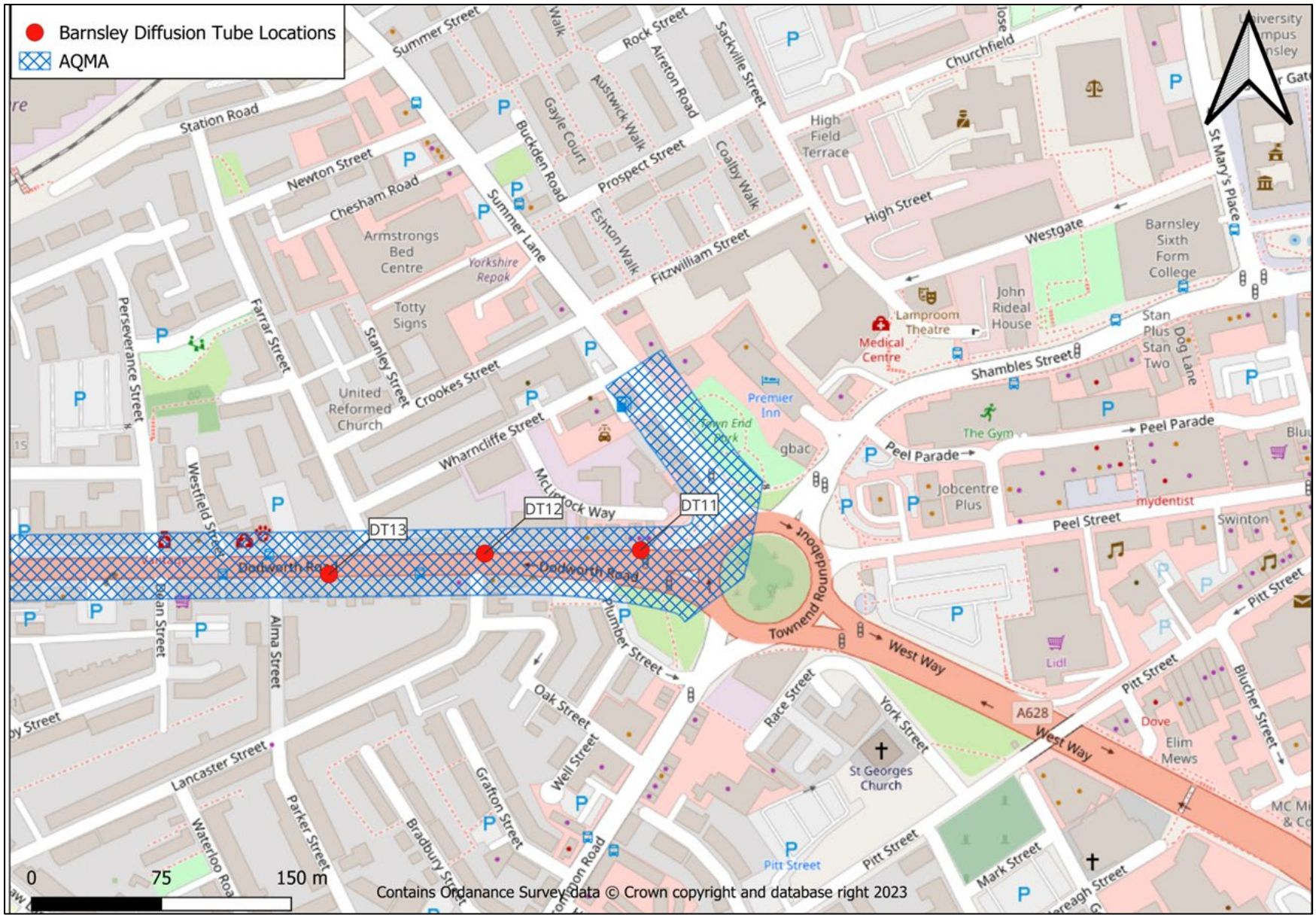


Figure D.1.5 – Map displaying diffusion tubes 14 to 18, 59, 60, 68, 69 and AQMA 2A.

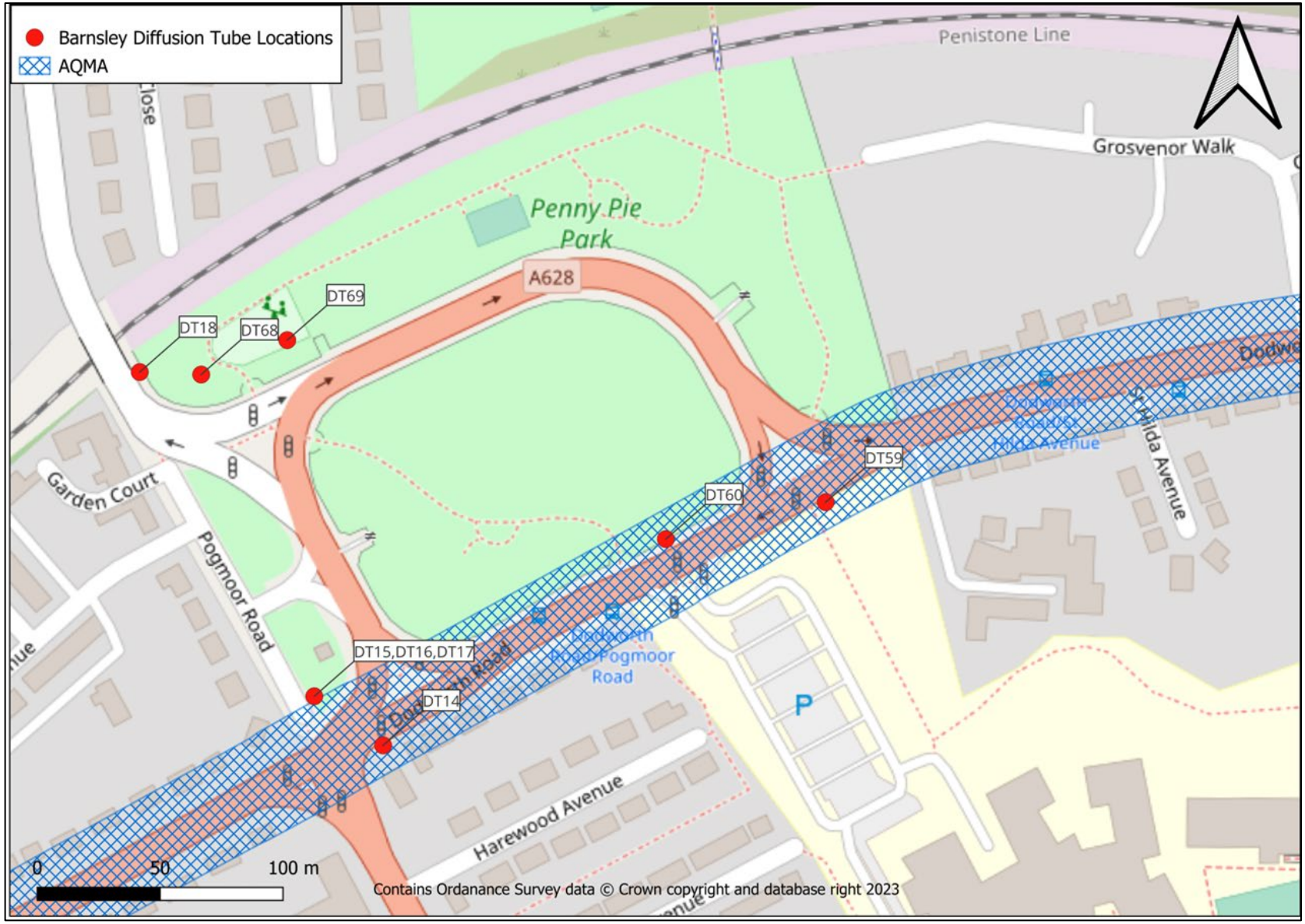


Figure D.1.6 – Map displaying diffusion tubes 19 to 23, 66, and AQMA 1.

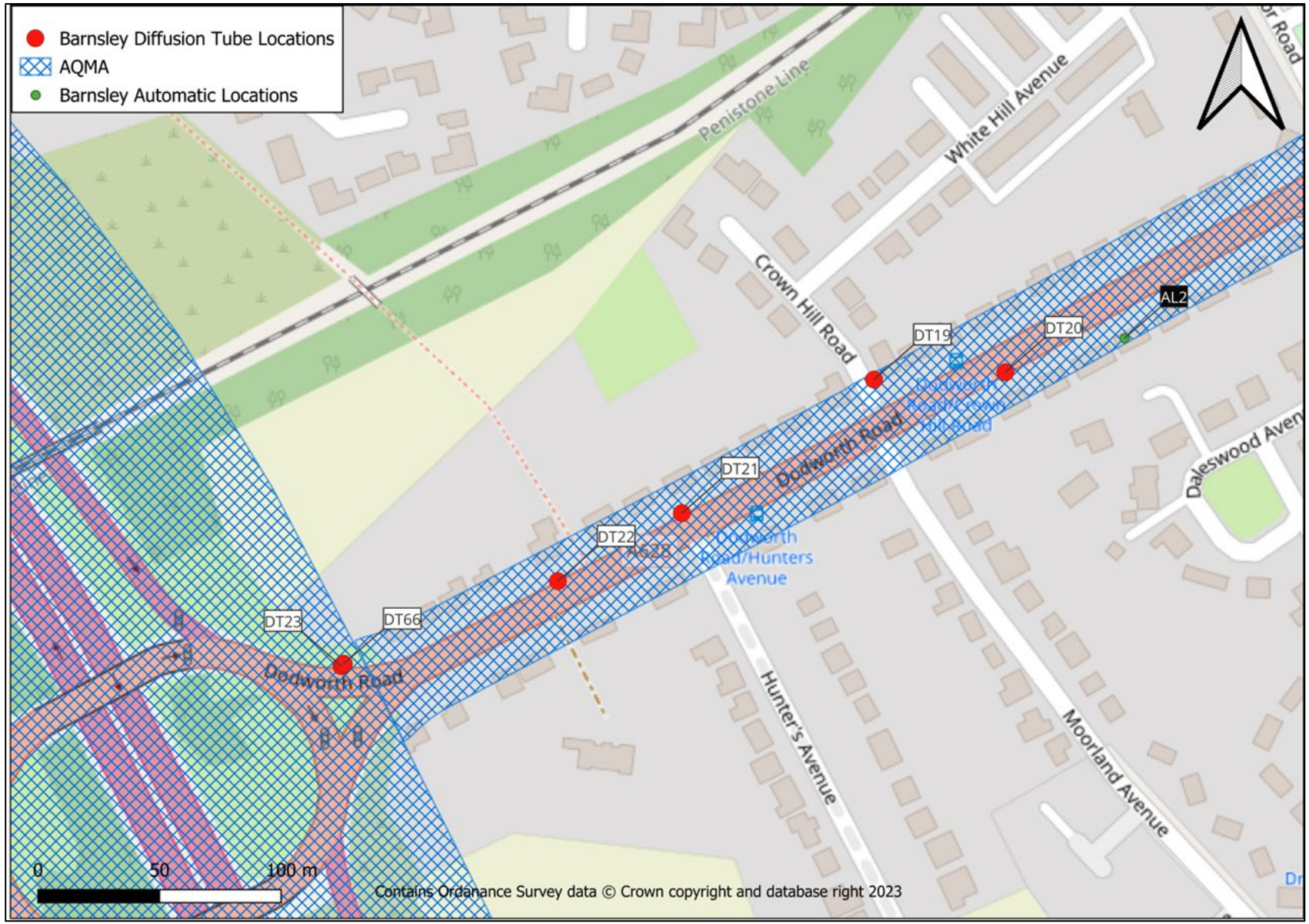


Figure D.1.7 – Map displaying diffusion tubes 24 to 27,29 and 67, and AQMA 1.

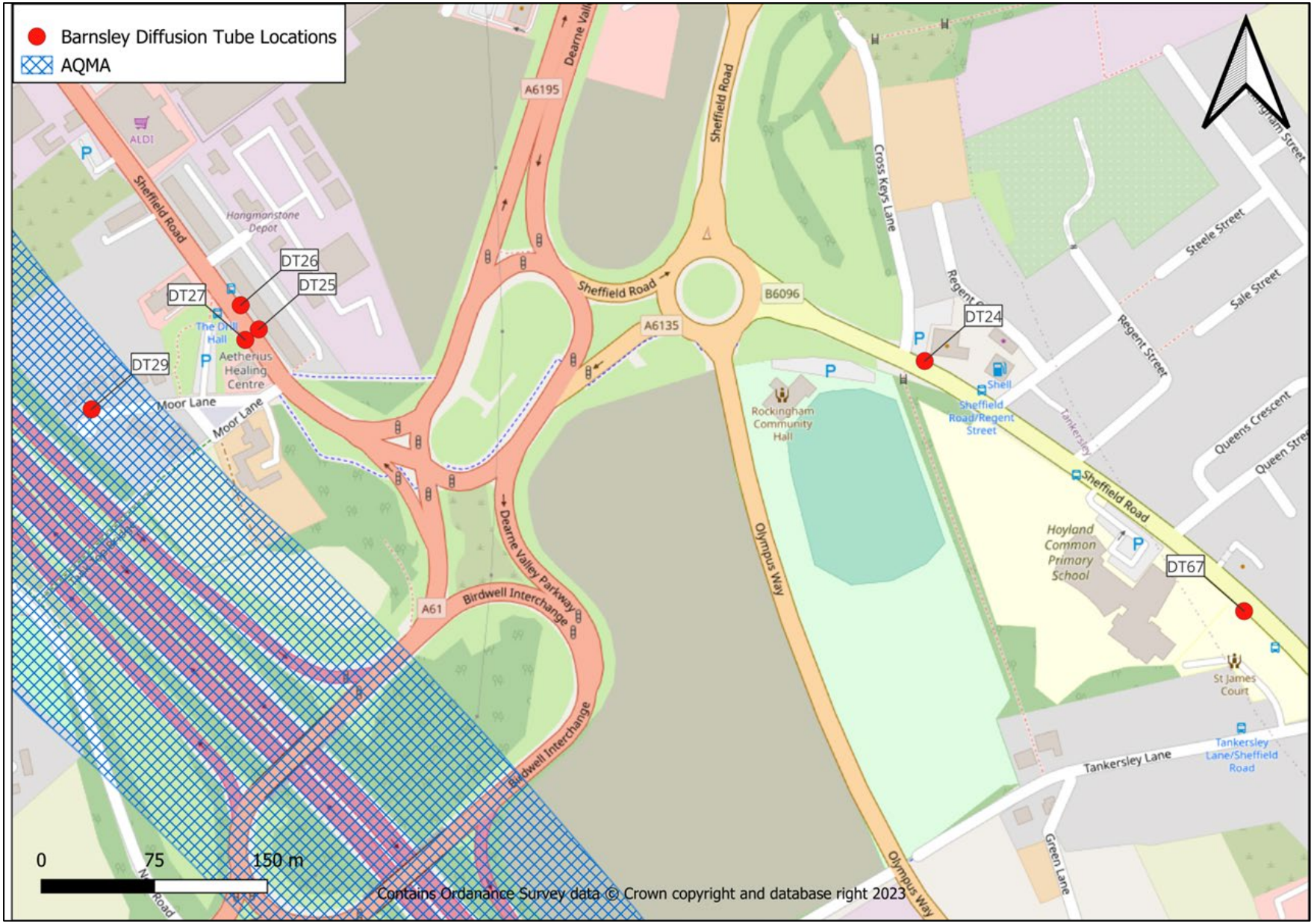


Figure D.1.8 – Map displaying diffusion tubes 30 to 32, and AQMA 1.

Figure D.1.9 – Map displaying diffusion tubes 34 to 36, and 50.

Figure D.1.10 – Map displaying diffusion tube 37.

Figure D.1.11 – Map displaying diffusion tube 39.

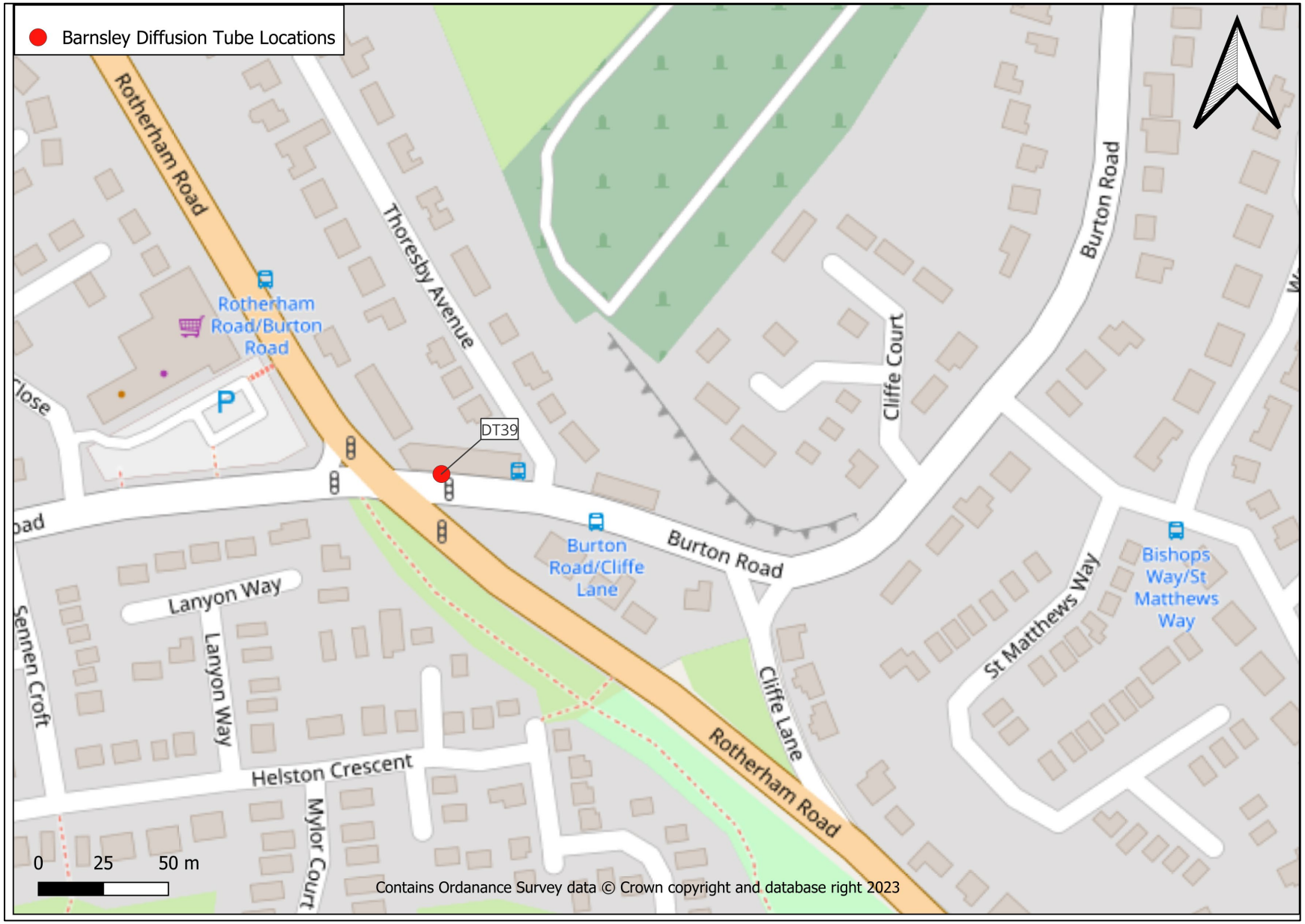


Figure D.1.12 – Map displaying diffusion tube 40.

Figure D.1.13 – Map displaying diffusion tube 38, and 41 to 44, and AQMA 4.

Figure D.1.14 – Map displaying diffusion tube 46, 49, 55, 57, and 58.

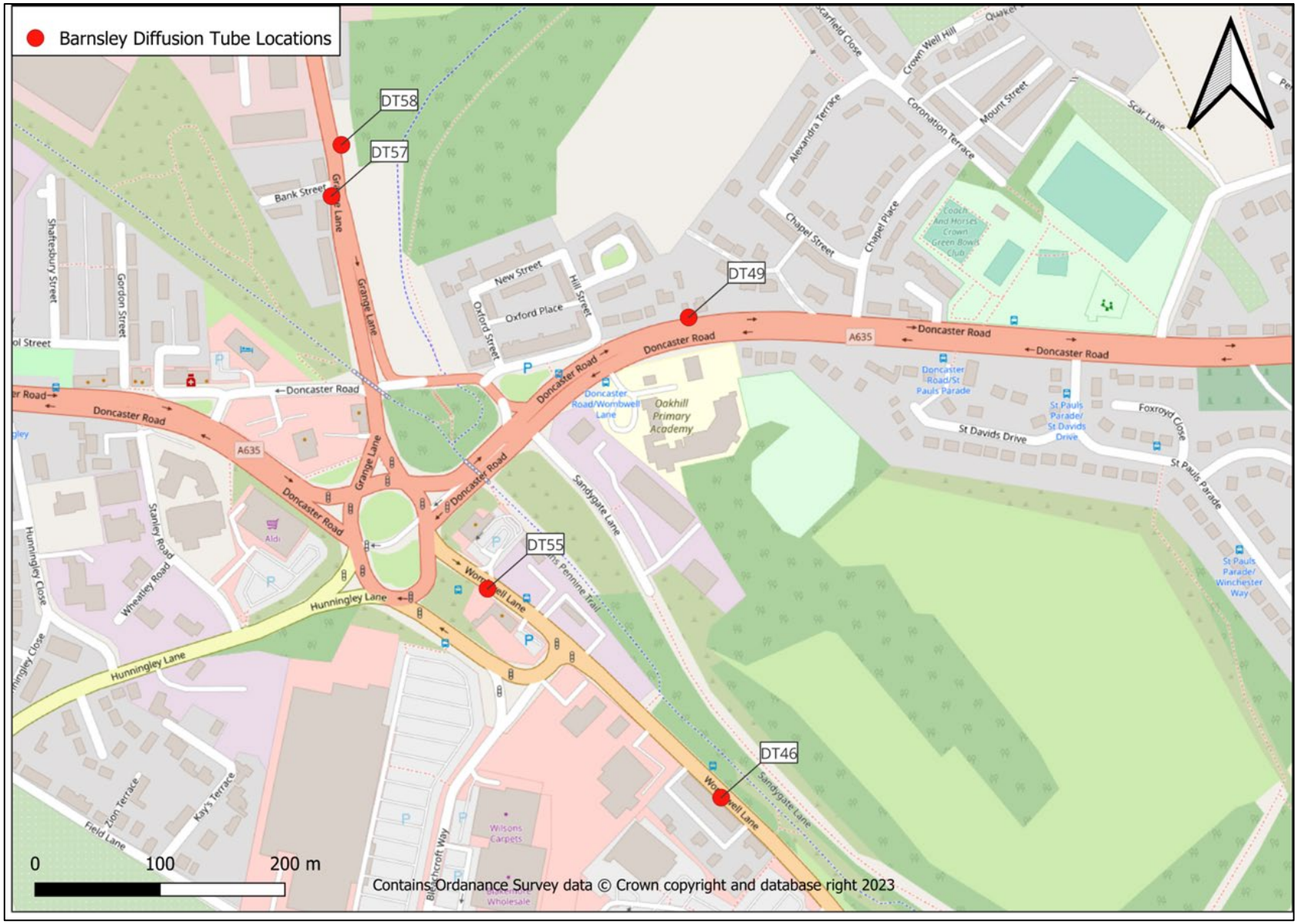


Figure D.1.15 – Map displaying diffusion tube 47, 48, 63 and 64, and AQMA 7.

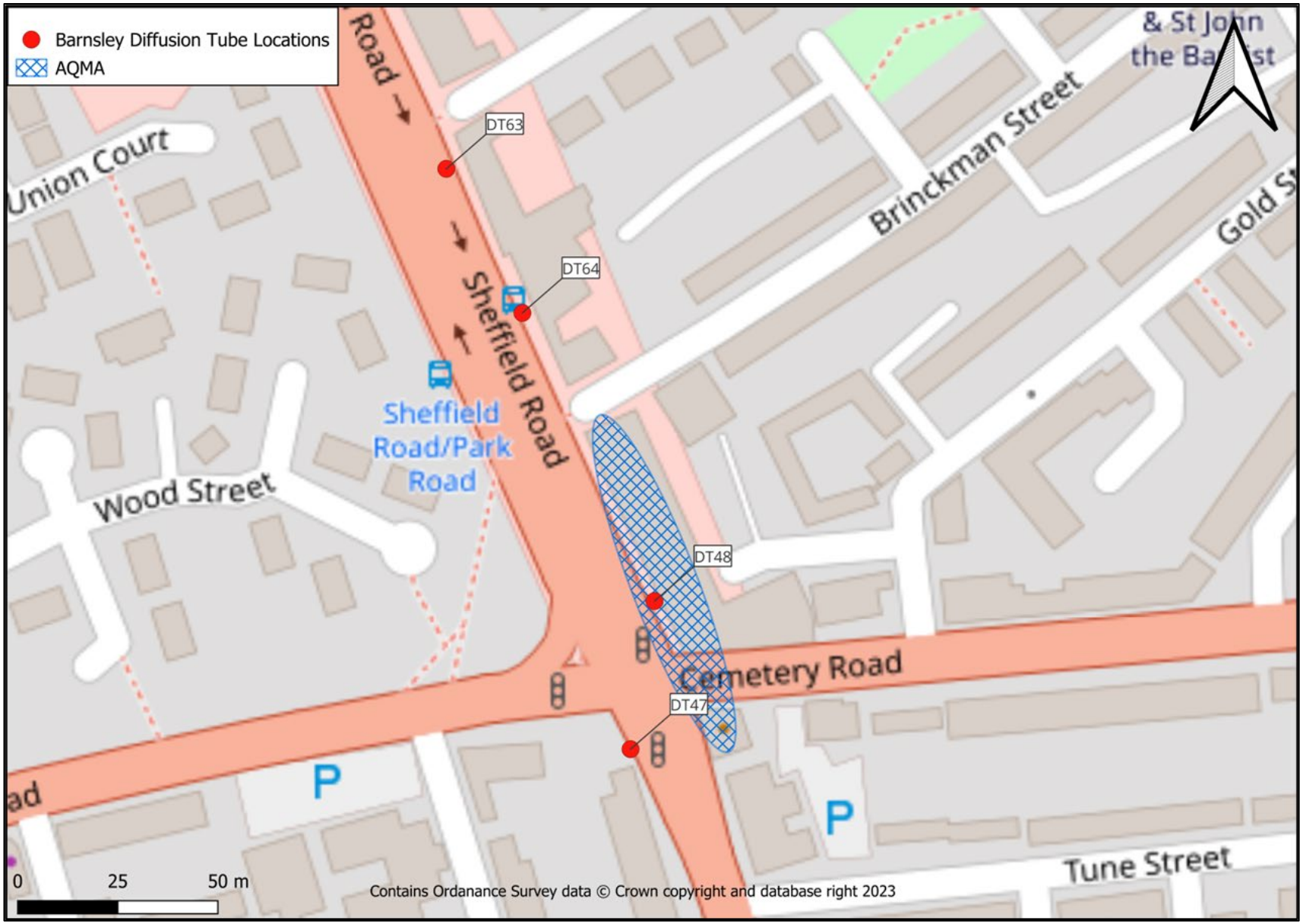


Figure D.1.16 – Map displaying diffusion tube 52.

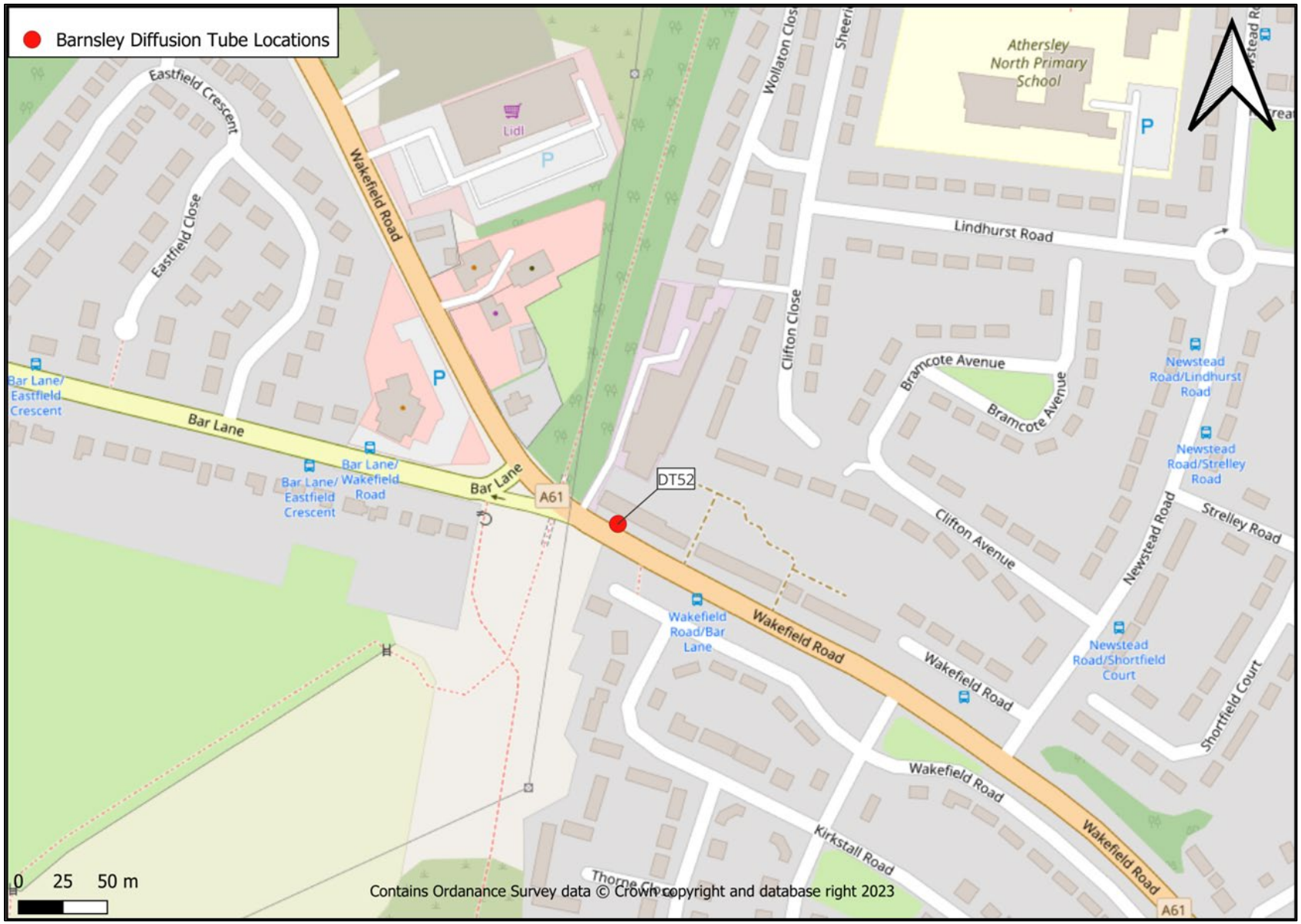
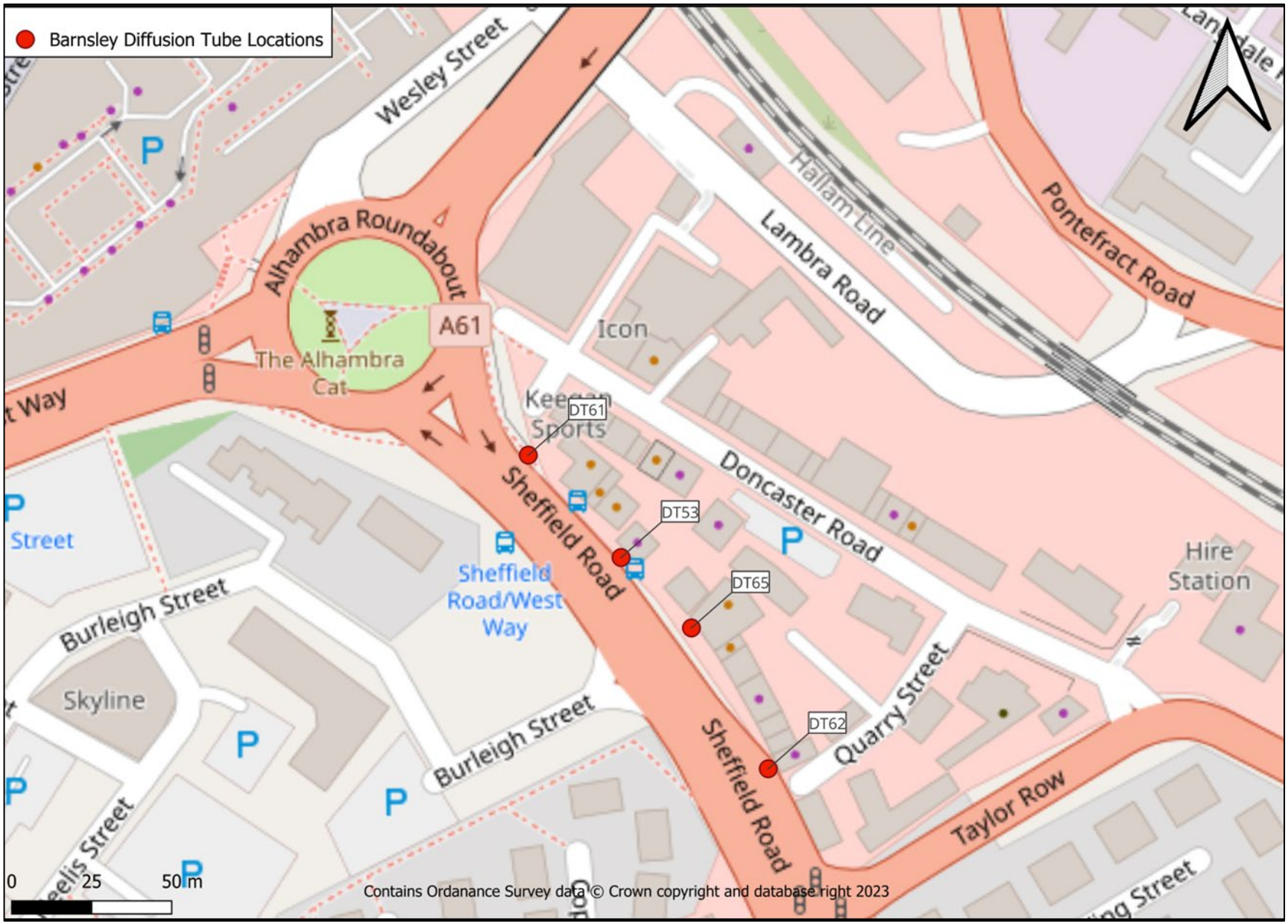


Figure D.1.17 – Map displaying diffusion tube 53, 61, 62 and 65.



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[13]

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.