North Devon District Council
2023 Annual Status Report
Bureau Veritas
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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: November 2023

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Executive Summary: Air Quality in Our Area

Air Quality in North Devon District

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 equalities 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 National Health Service (NHS) and social care of £157 million in 2017[4].

North Devon is a coastal District in Devon, situated in south-west England with neighbouring District's Torridge, Mid Devon and Somerset. The District is one of Britain's established visitor destinations with various holiday parks and Bed and Breakfasts (B&Bs) that support increasing tourism for the area. The District is popular for historical attractions, such as Watermouth Castle, and seeks to encourage countryside tourism through its established areas of geographical interest such as Braunton Burrows Sand Dunes, Woolacombe Beach, Saunton Sands and Croyde Bay. The location also seeks to encourage tourism by hosting several music events and festivals, for example PigStock, and promotes active travel through its South West Coast Path and Tarka Trail which involve various integrated walking and cycling routes that connect to the broader Devonshire region.

The area occupies a key strategic position in the South West, with a variety of national railway stations and facilitating access to the M5 motorway system, comparative to neighbouring Council jurisdictions. Thus, the District acts as a gateway for many to visit

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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

the coastline, alternate areas of interest within South West England and wider England as well as being recognised as a possible port entryway from England to Wales, and vice versa. North Devon District is also approximately 17.7 miles north-west from Exeter Airport, offering flights for passengers to continental Europe destinations such as Spain and France, and wider United Kingdom destinations such as Ireland, Scotland and northern England for example Newcastle.

North Devon District is approximately 419 square miles and boasts a rich variety of charming landscape, whilst providing access to local Areas of Outstanding Natural Beauty (AONB) such as North Devon Coast AONB covering 66 square miles and approximately 11 miles north-west from the District's largest settlement, Barnstaple. There are also over 200 Sites of Special Scientific Interest (SSSI) and seven Special Areas of Conservation (SAC) in the Devonshire region, with Braunton Burrows within North Devon District jurisdiction.

The District is predominantly a rural environment, with approximately 98,600 people residing there. The largest urban area is the town of Barnstaple where approximately 24,000 people live, followed by Fremington with approximately 12,800 people residing there. Other population centres across the District are Ilfracombe, Braunton, and South Molton. The District is the fifth least densely populated of the South West's 30 local authority areas, and is England's 250th most densely populated area of the 309 local authority areas, as per the Office for National Statistics (ONS).

The main source of pollution within the District is from road traffic emissions originating from the road network with four core major roads including the A361, A39, A399 and A377 that pass through and around the area. Additionally, car ownership in households in North Devon is higher than the national average, 81% compared to 73.2% respectively, as reported in the RAC Foundation. Vehicles as the major contributor to air pollution in North Devon is reiterated by the North Devon and Torridge Local Plan 2011-2031, which highlights that there is a dire need to minimise the requirement to travel by private car to employment, education and services due to the lack of provision of convenient public transport and sustainable travel modes in the District.

It is noted that major congestion does not often occur in the District due to the strategic nature of the road links in connecting the isolated area to wider England, with the majority of vehicles starting or ending their journeys within North Devon. However, it is acknowledged that the areas geographical attraction encourages through-flow traffic from the wider South West region and United Kingdom countries with approximately 5.77 billion

vehicle miles travelled on roads in Devon in 2022 as the [Department for Transport (DfT)](#) reports. Furthermore, the A39 is a gateway to the North Devon Coast AONB and Exmoor National Park, with seasonal traffic flows in the area significantly changing with the influx of tourist-related through-flow traffic, thus major congestion does occur periodically in the District. Other pollution sources including commercial, industrial, and domestic sources also contribute to pollutant concentrations in the District.

Due to North Devon District Council's historic high reported Nitrogen Dioxide (NO_2) concentrations, with some exceedances of the NO_2 Annual Mean Air Quality Standard (AQS) of $40\mu g/m^3$, and some occurrences within 10% of the AQS, the District is considered to have some areas where the air quality is poor. As a result of this, there is one declared Air Quality Management Area (AQMA) for NO_2 Annual Mean AQS within the Council area which covers an area encompassing the B3231 in Braunton between the junction, the square in the Village centre, and the Village Green, as declared on 11/07/2011. The Council continues to review its monitoring network, having removed monitoring locations Picston House and Babbages (Site IDs 17 OLD and 18 OLD respectively) in 2022 monitoring year and identifying a requirement to undertake monitoring at two new locations, opposite Murco Garage, High Street, Ilfracombe and outside Melian Pet Supplies, High Street, Ilfracombe with Site IDs 1 and 2 respectively, in the 2022 reporting year.

During 2022, there were no reported exceedances of the annual mean NO_2 AQS objective; this continues the trend of no exceedances over the last 5 years, therefore there is no requirement to declare a new AQMA. The maximum reported NO_2 concentration in 2022 was $30.9\mu g/m^3$ at monitoring location DT 15, below 10% of the AQS objective. The automatic monitor (Barnstaple A39) within the Council's jurisdiction forms the Automatic Urban and Rural Network (AURN) and recorded 2022 Particulate Matter (PM) annual mean concentrations of $12.7\mu g/m^3$ and $8.2\mu g/m^3$ for PM_{10} and $PM_{2.5}$ respectively. Both are below the annual mean AQS objectives of $40\mu g/m^3$ and $20\mu g/m^3$ respectively.

A decrease in annual mean concentrations from 2021 to 2022 was observed at 18 out of the 28 passive monitoring sites, acknowledging the removal and addition of two tube locations. The decrease in annual mean concentrations could be due to the establishment of a 'new normal' in traffic volumes, with organisations maintaining 'Working From Home' (WFH) patterns, thus reducing the number of vehicles comparative to pre-pandemic (COVID-19) periods. It is also acknowledged that the Council have implemented several

measures to address air quality within the District, thus, such approaches are supporting the reduction in pollutant emissions across the area.

There are no diffusion tube monitoring sites where the NO_2 annual mean is greater than 60μg/m³, therefore in accordance with Defra LAQM.TG(22) there are no sites likely to be at risk of exceeding the 1-hour mean AQS objective.

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[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term fine Particulate Matter ($PM_{2.5}$) 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[6] details the approach to reduce exhaust 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.

Since the initiation of the passive monitoring network within the North Devon District, there have been sites that have exceeded the NO_2 AQS annual mean objective of 40μg/m³. As a result, there is currently one designated AQMA, which has been declared since 11/07/2011 for an area encompassing the B3231 in Braunton between the junction, the square in the Village centre, and the Village Green. As such, an Air Quality Action Plan (AQAP) is required, which has established over 20 actions that seek to improve air quality in North Devon, although it is recognised the document requires updating. There are currently no plans to produce an Air Quality Strategy for the District, however the Council are advised to consider plans for revoking the 'North Devon AQMA No.1' with four years of

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

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

compliance from 2019 up to and including 2022 monitoring year therefore will require an Air Quality Strategy post revocation. The Council will continue to monitor and assess the results for the coming year within the NO_2 diffusion tube network.

As part of the North Devon District Council's commitment to reduce the impacts of climate change, and specifically air pollution, the Council declared a climate emergency in May 2019 and continues to progress and aim to hit net-zero carbon emissions by 2050 for Council activities and across the District, as reported in the Devon Carbon Plan. The Climate Plan sets out various actions to reduce Carbon Dioxide (CO_2) emissions, of which also have shared benefits in improving air quality through reducing both NO_2 and Particulate Matter (PM) emissions. Examples include offering smart meters to electricity consumers, support community bike rental schemes, use renewable energy sources to power buildings, adopt Light Emitting Diode (LED) lighting, and further improve public transportation infrastructure across the District.

North Devon District Council has established a collaborative relationship with the bicycle mechanic and hire businesses Planet Bike Barnstaple and Bike Shed UK who host free sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road, as well as offering bicycle hire. This relationship promotes the use and benefits of active transport on air quality and health.

The Council has a positive relationship with the bicycle club North Devon Velo who offer cycling activities such as: club rides, touring, time trials, road racing, track racing, sportives, cyclo-cross, mountain biking, and charity events. This relationship promotes the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake.

North Devon District Council maintains to promote the Tarka Trail Cycle Hire and Tidal and Trail innovative bike sharing services launched in 1989 and 1976 respectively. The schemes replicate notable cycle sharing schemes found in large metropolitan areas (e.g., Santander Cycles, Mobike, Lime) and compliment the coastal cycling routes. They also attempt to promote alternative and accessible forms of travel between neighbouring towns and villages across the South West region to help its residents lead active lifestyles and limit vehicular emissions.

The Council have an established Local Cycling and Walking Infrastructure Plan (LCWIP) in partnership with Torridge District Council produced between August 2022-December 2022, with identification of three key areas across the two Council jurisdictions with high propensity for walking and cycling: Barnstaple, Bideford and Northam. Identified routes

experience high commuting levels due to key destinations including the population centres as well as existing routes and geographical attractions such as the Tarka Trail and North Devon Coast AONB. Thus, it is proposed that greater active travel infrastructure is established to support the adoption comparative to vehicle commuting to these areas, therefore reducing emissions released.

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

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

North Devon District Council in conjunction with Devon County Council has established a free permitted 'Park and Cycle' initiative that operates alike the 'Park and Ride' public bus service in Barnstaple as well as broader Devonshire areas such as Exeter, to promote and encourage sustainable transport.

The District has implemented a cycling initiative 'Bikeability' in partnership with Devon County Council focussed at school children and adults, with frequent cycling proficiency courses. The initiative has centred on three core stages, Bikeability: Level 1, Level 2 and Level 3, with individuals required to meet specific criteria to enable being accredited the awards. There is also 'Bikeability Balance' and 'Bikeability Learn to Ride' levels which bode a suite of courses to meet needs and specifically to complement and support the core training delivered. The scheme also offers 'Bikeability Families' and 'Cycle Confidence' courses which provide parents/carers skills to cycle safely with children and allows individuals to develop cycling skills and build confidence. This programme seeks to encourage the uptake of cycling across the District, therefore, seeking to reduce pollutant concentrations imminently and through actions of longevity by also targeting future generations.

The Council promotes its established main rail network with the branch line to Exeter one of the area's sole railway routes, although there are five train stations in operation within North Devon for this route comparable with fewer in more urbanised boroughs of Plymouth and Mid Devon. Additionally, the reopening of the railway 'Dartmoor Line' since Q4 2021 saw in excess of 250,000 passenger journeys throughout 2022, with onwards connections via the Tarka Line to Barnstaple in North Devon. Highlighting the benefits well-connected and more frequent services of public transport on air quality comparative to private vehicle use to commute.

The North Devon District Council actively encourages developers at the planning stage to install electric charging points or consider suitable infrastructure to allow for future cost-efficient installations.

The Council have established a collaborative partnership with Devon County Council to roll out a programme of charging points for Electric Vehicles (EV) across the District, with plans for EV development in Hardaway Head car park (Barnstaple), Wilder Road car park (Ilfracombe) and Central car park (South Molton). There is formulation of a strategy to support increased roll-out of infrastructure scheduled into 2023 onwards, with over 400 publicly accessible EV charging bays installed as of December 2022. EV users can view the current charging points in North Devon at zap-map.com.

North Devon District Council has also encouraged Ultra Low Emission Vehicle (ULEV) adoption across the District during the 2022 monitoring year, with infrastructure to support the uptake of ULEVs being implemented as aforementioned with a wider extent planned for implementation.

There is a >£150 million 'Transport Capital Programme' proposed which aims at redeveloping rail and road travel for the county of Devon, inclusive of North Devon, in response to the climate emergency declared in 2019. The programme will set out the Council's transport infrastructure priorities for the next two years and will progress many schemes to the design or delivery stage. The scheme would be supported by >£130 million in funded grants from government programmes such as the Large Local Major Schemes, Major Road Network programme, Housing Infrastructure Fund and Levelling Up Fund. Remaining funding would come from the Department for Transport (DfT) and various councils, including £13 million from Devon County Council, and developer contributions. The structural amendments to North Devon's railway and road infrastructure seeks to allow easy interchange with other modes of public and active transport,

promoting a green, cleaner District and broader, South West region. Improvements proposed, inclusive of but not limited to, are:

- South West Resilience Programme – Enhancement of the coastal rail route between Exeter and Plymouth via Dawlish more resilient in the face of extreme weather;

- Reinstatement of the Tavistock to Bere Alston trainline – Construction of a new single platform station at Tavistock and re-use of approximately 8 kilometres of railway track;

- Construction of a railway line between Cullompton and Wellington; and

- Road improvements to the North Devon Link Road (A361 Landkey Junction).

Conclusions and Priorities

During 2022, the passive monitoring results show that there were no exceedances of the annual mean objective of 40µg/m^3 for NO_2 within the jurisdiction of North Devon District Council. Compliance was also achieved at the automatic monitoring station Barnstaple A39, part of the Automatic Urban and Rural Network (AURN) within the Council's jurisdiction, for the annual mean AQS objectives of PM_{10} and $PM_{2.5}$, as well as the PM_{10} 24-hour mean AQS objective. The Council are advised to consider plans for revoking the 'North Devon AQMA No.1' with four years of compliance from 2019 up to and including 2022 monitoring year.

The Council will continue to use the passive monitoring network and automatic station 'AURN Barnstaple A39' to monitor air quality within the district and ensure compliance is maintained with the AQS objective.

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

- Greater progression and completion of the 'Transport Capital Programme' improve rail and road infrastructure and to integrate greater public transport sources;

- Continue to review the current monitoring programme, exploring the need to deploy new monitoring locations in areas where monitoring has not previously been undertaken and where it is believed that there may be elevated concentrations of NO_2 in areas of relevant public exposure, relocate monitoring tubes, or remove locations where necessary;

- Actively engage with developers at planning application stages to promote the installation of electric vehicle charging or alternatively, provide suitable infrastructure to allow for future cost-efficient installations;

- Implementation of the scheduled EV charging points on streets and in car parks across the District;

- Continue to provide an integrated transport network to facilitate the efficient movement of pedestrian and vehicular traffic, goods, and services across the District;

- Continue to reduce the volume of traffic on the city roads by encouraging effective active transport methods (e.g. public transport, cycling, and walking);

- Continue to improve the existing walking and cycling network by acquiring funding for development; and

- Implement measures within the Devon Carbon Plan to further reduce concentrations of NO_2 and PM.

Local Engagement and How to get Involved

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

North Devon Council have progressed additional public engagement work in 2022 through the below schemes, although the engagement schemes in 2021 are still active:

- The collaborative relationship with Devon County Council to roll out a programme of charging points for EVs across the District, with EV charging points being implemented at Hardaway Head car park (Barnstaple), Wilder Road car park (Ilfracombe) and Central car park (South Molton), and scheduled infrastructure planned for 2023 onwards to support further EV charging points being implemented;

- Improving the use of ULEVs across the District through improving infrastructure to support the uptake with a wider extent planned for implementation;

- Planned investment via the 'Transport Capital Programme' to further enhance adoption and utilisation of the public transport network;

- Campaigns by local parish councils alongside ACE Rail and the Tarka Rail Association for the reconnection of Bideford to the national rail network;

- Collaboration between local businesses and charities to host events promoting active transport and the benefits;
- Offered active transport education to children, the future generation, and adults through cycling proficiency courses via the 'Bikeability' initiative, reducing vehicular pollutant emissions;
- Developed the positive relationship with the bicycle club North Devon Velo who offer cycling activities such as: club rides, road racing, track racing, and charity events thus promoting the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake;
- Promotion of the Local Cycling and Walking Infrastructure Plan (LCWIP) and the Core Walking Zones (CWZs) post COVID-19 lockdown, encouraging active travel across the District and wider South West region, with a community focus;
- Promotion of active transport uptake and sustainable travel through the establishment of a free permitted 'Park and Cycle' initiative that operates alike the 'Park and Ride' public bus service in Barnstaple. The scheme is a Business Engagement Programme, with bike lockers managed and rented by Bikeaway Ltd;
- Established relationships with local active transport businesses Planet Bike Barnstaple and Bike Shed UK to host free bike workshops for locals to ensure bikes are safe and road worthy, as well as bicycle hire, further encouraging active transport and supporting the establishment of a greener, cleaner District; and
- Enhancement and further endorsement of the Tarka Trail Cycle Hire and Tidal and Trail innovative bike sharing services launched in 1989 and 1976 respectively.

The following measures are possible alternatives to private travel and actions that everyone can complete that would contribute to improving air quality in the District:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the volume of vehicles and limits congestion;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added health benefits through exercise;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the volume of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools;

- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel efficient cars are available, and all have different levels benefits by reducing the amount of emissions being released; and

- Asking your employer, school or college about the possibility of developing a green travel plan.

The North Devon District Council are continuously working with local businesses, charities, developers, tourism bodies, schools, local transport operators and more organisations to develop measures to improve air quality across the District.

Local Responsibilities and Commitment

This Annual Status Report (ASR) was prepared by Bureau Veritas on behalf of the Environmental Protection Department of North Devon District Council with the support and agreement of the following officer and department:

- Darren Hale, Lead Environmental Health Officer – Environmental Protection

This ASR has been approved by:

- Darren Hale, Lead Environmental Health Officer – Environmental Protection

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

If you have any comments on this ASR please send them to Darren Hale at: North Devon District Council, PO Box 379, Barnstaple, Devon, EX32 2GR.

- Darren Hale
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1 Local Air Quality Management

This report provides an overview of air quality in North Devon District 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 North Devon District Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

It is acknowledged that the North Devon District Council AQAP is outdated, however, we will seek to revoke the North Devon AQMA No.1 given four years of monitored compliance including pre-Covid concentrations (see Monitoring section). As such, the Council do not intend to update the AQAP but will produce an Air Quality Strategy in line with requirements in LAQM.PG(22).

A summary of AQMAs declared by North Devon District Council can be found in Table 2.1. The table presents a description of the one AQMA that is currently designated within District of North Devon. Appendix D: Maps of Monitoring Locations and AQMA across North Devon District provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation is as follows:

- NO_2 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
North Devon Air Quality Management Area No.1	11/07/2011	NO_2 Annual Mean	An area encompassing the B3231 in Braunton between the junction the square in the middle of the village, and the Village Green.	No	44.4 µg/m³	26.4 µg/m³ (Site ID 19)	4 years	North Devon District Council – Air Quality Action Plan May 2016	https://www.northdevon.gov.uk/media/377432/final-air-quality-action-plan-2016-published-on-website-august-2016.pdf

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

☐ **North Devon District Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in North Devon District

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

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

The following comments are designed to help inform future reports:

- *The report is extremely thorough and comprehensive, with detailed discussions around both short-term and long-term trends. The Council have analysed these trends according to geographical area. This has enabled a comparison of air quality amongst the different parts of the North Devon District Council jurisdiction and is very much welcomed and encouraged in future ASRs;*
- *The Council have included a detailed account of the robust Quality Assurance and Quality Control (QA/QC) procedures that they have in place. This includes a detailed explanation of the annualisation methodology. This is to be commended, demonstrating the Council's adherence to the standards and methodologies prescribed within TG.16;*
- *The last AQAP was published in 2016, it needs to be reviewed as soon as possible. The Council states that they plan to being reviewing the AQAP during 2022. The Council is encouraged to review and publish their updated AQAP as soon as possible;*
  - The Council will seek to revoke their AQMA given the four years of monitored compliance including pre-Covid concentrations. As such, the Council do not intend to update the AQAP but will produce an Air Quality Strategy in line with requirements in LAQM.PG(22).;
- *There was a missing word on page 12 of the ASR. The sentence reads "During 2021, there were no exceedances of both the PM10 annual mean and the 24-hour mean". This should include the word "objective" at the end, for clarification;*
  - Where relevant, this has been addressed for the 2023 ASR submission;
- *As part of the report discussing $PM_{2.5}$, Council have appropriately included Public Health Outcomes Frameworks and provided details of $PM_{2.5}$ from Defra background maps. It is clear that the Council recognise the importance of $PM_{2.5}$, and this*

demonstrates their pro-active and dedicated approach to tackling air quality in their jurisdiction and is very much welcomed; and

- *Overall, the report is detailed, concise and satisfies the criteria of relevant reporting standards. The Council should continue their good and thorough work.*

North Devon District Council continues to use its monitoring network to review air quality and to ensure that all residents have access to safe levels of air quality. The review of monitoring locations in areas of relevant public exposure as consequence of the Council identifying continuous NO_2 concentration recordings below the AQS objective highlights a proactive nature which ensures that the Council are frequently reviewing monitoring locations and are able to identify areas that may be of potential concern at the nearest possible opportunity so that, if required, effective mitigation measures can be implemented. This ensures that compliant levels of air quality are available to all of its residents.

The Council are employing many additional measures to help improve and progress air quality within their respected area. The 2022 ASR outlines the schemes and partnerships that North Devon District Council are involved in, these measures are still active for the 2022 reporting year.

There have also been additional measures and initiatives implemented in the 2022 reporting year such as the collaborative relationship with the bicycle mechanic and hire businesses Planet Bike Barnstaple and Bike Shed UK who host free sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road, as well as offering bicycle hire. This relationship promotes the use and benefits of active transport on air quality and health comparative to vehicle use and encourages locals to support the establishment of a greener, cleaner District.

The Council has a positive relationship with the bicycle club North Devon Velo who offer cycling activities such as: club rides, touring, time trials, road racing, track racing, sportives, cyclo-cross, mountain biking, and charity events. The organisation is affiliated to Cycling Time Trials (CTT) and are a British Cycling Go Ride Accredited Club with a popular youth section trained by British Cycling qualified coaches, to cater for a range of disciplines and abilities for Under 18 riders. This relationship promotes the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake.

North Devon District Council maintains to promote the Tarka Trail Cycle Hire and Tidal and Trail innovative bike sharing services launched in 1989 and 1976 respectively. The

schemes replicate notable cycle sharing schemes found in large metropolitan areas (e.g., Santander Cycles, Mobike, Lime) and compliment the coastal cycling routes. They also attempt to promote alternative and accessible forms of travel between neighbouring towns and villages across the South West region to help its residents lead active lifestyles and limit vehicular emissions.

The Council have an established Local Cycling and Walking Infrastructure Plan (LCWIP) in partnership with Torridge District Council produced between August 2022-December 2022, with identification of three key areas across the two Council jurisdictions with high propensity for walking and cycling: Barnstaple, Bideford and Northam. Identified routes experience high commuting levels due to key destinations including the population centres as well as existing routes and geographical attractions such as the Tarka Trail and North Devon Coast AONB. Thus, it is proposed that greater active travel infrastructure is established to support the adoption comparative to vehicle commuting to these areas, therefore reducing emissions released. The LCWIP provides a strategic approach to identifying cycling and walking improvements required at the local District Council level, and wider South West region with the shared ambition to improve connectivity to other sub regions e.g. Somerset, Dorset, and Cornwall. LCWIPs enable a long-term approach to developing local cycling and walking networks, ideally over a 10 to 15-year period, and form a vital part of the Government's strategy to increase the number of trips made on foot or by cycle. North Devon District Council acknowledge that they are responsible for implementing actions in the LCWIP and proactively seek funding alongside neighbouring borough and district councils to improve the existing connecting network.

North Devon District Council promotes active travel, and the reduction in vehicle usage and subsequent emissions, through walking with established Core Walking Zones (CWZs) across the District. The CWZs have been assessed and audited to ensure safety and identify any required interventions along the pedestrian corridors within each CWZ. Interventions proposed include improving existing infrastructure as well as introducing new pedestrian facilities such as wayfinding, new pedestrian crossings and benches to improve the public realm. The Council promotes the LCWIP as it contains various initiatives which encourage people to continue their COVID-19 habits and improve uptake of active travel across the area alongside the associated health benefits and subsequent reduction in vehicular usage. Thus, promoting Noth Devon as an enabler of active travel.

The Council, alongside neighbouring and far-reach Councils, is host to the National Cycle Network (NCN) as well as having a Local Cycle Network (LCN) that forms the connections

between the KCN and destinations such as small town centres and villages. The NCN provides a strategic network for the county with connections to key destinations, towns, villages, transport hubs, employment and housing areas with long distance trails and loops that support the visitor economy in the District. There are three key routes that form the NCN within North Devon:

- Route 3 – Connecting Land's End in Cornwall to Bristol;
- Route 27 – Connecting beaches and estuaries of North Devon with West Country rivers; and
- Route 51 – Operating through Exmoor National Park.

Hosting and promoting the NCN aims to improve air quality across the South West region, inclusive of North Devon District Council, through active transport routes and encouragement of cycling/walking uptake.

North Devon District Council in conjunction with Devon County Council has established a free permitted 'Park and Cycle' initiative that operates alike the 'Park and Ride' public bus service in Barnstaple as well as broader Devonshire areas such as Exeter, to promote and encourage sustainable transport. The scheme is a Business Engagement Programme, with bike lockers managed and rented by Bikeaway Ltd and the current availability of lockers at each site is listed on their website under the 'Rent a Locker' section.

The District has implemented a cycling initiative 'Bikeability' in partnership with Devon County Council focussed at school children and adults, with frequent cycling proficiency courses. The initiative has centred on three core stages, Bikeability: Level 1, Level 2 and Level 3, with individuals required to meet specific criteria to enable being accredited the awards. There is also 'Bikeability Balance' and 'Bikeability Learn to Ride' levels which bode a suite of courses to meet needs and specifically to complement and support the core training delivered. The scheme also offers 'Bikeability Families' and 'Cycle Confidence' courses which provide parents/carers skills to cycle safely with children and allows individuals to develop cycling skills and build confidence. This programme seeks to encourage the uptake of cycling across the District, therefore, seeking to reduce pollutant concentrations imminently and through actions of longevity by also targeting future generations.

The Council promotes its established main rail network with the branch line to Exeter one of the area's sole railway routes, although there are five train stations in operation within North Devon for this route comparable with fewer in more urbanised boroughs of Plymouth

and Mid Devon. Additionally, the reopening of the railway 'Dartmoor Line' since Q4 2021 saw in excess of 250,000 passenger journeys throughout 2022, with onwards connections via the Tarka Line to Barnstaple in North Devon. However sizeable settlements of Braunton and Ilfracombe as well as Bideford are cut off from the Network Rail system, thus improvements are required with local parish council's campaigning alongside ACE Rail and the Tarka Rail Association for the reconnection of Bideford to the national rail network during the 2022 monitoring year. Highlighting the benefits well-connected and more frequent services of public transport would have on air quality comparative to private vehicle use to commute.

As part of the North Devon District Council's commitment to reduce the impacts of climate change, and specifically air pollution, the Council declared a climate emergency in May 2019 and continues to progress and aim to hit net-zero carbon emissions by 2050 for Council activities and across the District, as reported in the [Devon Carbon Plan](). The Climate Plan sets out various actions with eight core objectives across five themes inclusive of but not limited to the built environment, transport and energy supply, to reduce Carbon Dioxide (CO_2) emissions, of which also have shared benefits in improving air quality through reducing both NO_2 and Particulate Matter (PM) emissions. Examples include offering smart meters to electricity consumers, support community bike rental schemes, use renewable energy sources to power buildings, adopt Light Emitting Diode (LED) lighting, and further improve public transportation infrastructure across the District.

The Council has implemented measures in the following categories as part of the strategy in 2022 that have been effective in reducing air pollution concentrations and enhanced air pollutant compliance in the District with the required standards:

- Road Improvements;
- Public Transport Improvements;
- Specific Bus Route Improvements;
- Traffic Management;
- Promoting Travel Alternatives;
- Promoting Low Emission Vehicles (LEVs); and
- Air Quality Planning and Guidance.

North Devon District Council actively encourages developers at the planning stage to install electric charging points or consider suitable infrastructure to allow for future cost-efficient installations.

The Council have established a collaborative partnership with Devon County Council to roll out a programme of charging points for Electric Vehicles (EV) across the District, with plans for EV development in Hardaway Head car park (Barnstaple), Wilder Road car park (Ilfracombe) and Central car park (South Molton). There is formulation of a strategy to support increased roll-out of infrastructure scheduled into 2023 onwards, with over 400 publicly accessible EV charging bays installed as of December 2022. EV users can view the current charging points in North Devon at zap-map.com.

North Devon District Council has also encouraged Ultra Low Emission Vehicle (ULEV) adoption across the District during the 2022 monitoring year, with infrastructure to support the uptake of ULEVs being implemented as aforementioned with a wider extent planned for implementation.

There is a >£150 million 'Transport Capital Programme' proposed which aims at redeveloping rail and road travel for the county of Devon, inclusive of North Devon, in response to the climate emergency declared in 2019. The programme will set out the Council's transport infrastructure priorities for the next two years and will progress many schemes to the design or delivery stage. The scheme would be supported by >£130 million in funded grants from government programmes such as the Large Local Major Schemes, Major Road Network programme, Housing Infrastructure Fund and Levelling Up Fund. Remaining funding would come from the Department for Transport (DfT) and various councils, including £13 million from Devon County Council, and developer contributions. The structural amendments to North Devon's railway and road infrastructure seeks to allow easy interchange with other modes of public and active transport, promoting a green, cleaner District and broader, South West region. Improvements proposed, inclusive of but not limited to, are:

- South West Resilience Programme – Enhancement of the coastal rail route between Exeter and Plymouth via Dawlish more resilient in the face of extreme weather;
- Reinstatement of the Tavistock to Bere Alston trainline – Construction of a new single platform station at Tavistock and re-use of approximately 8 kilometres of railway track;
- Construction of a railway line between Cullompton and Wellington; and
- Road improvements to the North Devon Link Road (A361 Landkey Junction).

North Devon District Council has also 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 four measures are included within Table 2.2, with the type of measure and the progress North Devon District 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.

It is acknowledged that the Council has experienced a staff changeover since the 2022 monitoring period as such measures stipulated in Table 2.2 in the 2022 ASR require review with progress to date for 2022 onwards revised. Thus, there are fewer measures in Table 2.2 in the 2023 ASR than the previous reporting year.

More detail on these measures can be found in their respective Local Plan 2011-2031, Devon Carbon Plan and Local Cycling and Walking Infrastructure Plan (LCWIP). Key completed measures are:

- Bikeability – Offered active transport education to children, the future generation, and adults through cycling proficiency courses via the 'Bikeability' initiative, reducing vehicular pollutant emissions;
- 'Park and Cycle' Initiative – Promotion of the Business Engagement Programme that operates alike the 'Park and Ride' public bus service in Barnstaple with bike lockers managed and rented by Bikeaway Ltd;
- South West Cycle Hire – Enhancement and further endorsement of the Tarka Trail Cycle Hire and Tidal and Trail innovative bike sharing services launched in 1989 and 1976 respectively, promoting active transport and reducing emissions from vehicle transport.

The North Devon District Council worked to implement measures in the 2022 monitoring year in partnership with the following stakeholders:

- Devon County Council;
- Neighbouring local authorities;
- Local businesses;
- Charities; and
- Educational centres.

North Devon District Council expects the following measures to be completed over the course of the next reporting year:

- EV Charging Infrastructure – The collaborative relationship between the Council and Devon County Council to roll out a programme of EV charging points across

the District has been successful in the 2022 monitoring year with approximately 400 publicly accessible EV charging points being implemented already, although more are required with formulation of a strategy to support increased roll-out of infrastructure that is scheduled to be implemented in 2023;

- Bideford Railway Reconnection – Reinstatement Bideford to the national rail network during as campaigned for by local parish council's alongside ACE Rail and the Tarka Rail Association; and

- Transport Capital Programme - The structural amendments to North Devon's railway and road infrastructure seeks to allow easy interchange with other modes of public and active transport, promoting a green, cleaner District whilst reducing vehicular traffic congestion and pollutant emissions.

North Devon District Council's priorities for the 2023 monitoring year are:

- Transport Capital Programme – The >£150 million proposal aims at redeveloping rail and road travel for the county of Devon, inclusive of North Devon, in response to the climate emergency declared in 2019. The programme will set out the Council's transport infrastructure priorities for the next two years and will progress many schemes to the design or delivery stage. The scheme would be supported by >£130 million in funded grants from government programmes such as the Large Local Major Schemes, Major Road Network programme, Housing Infrastructure Fund and Levelling Up Fund. Remaining funding would come from the Department for Transport (DfT) and various councils, including £13 million from Devon County Council, and developer contributions. The structural amendments to North Devon's railway and road infrastructure seeks to allow easy interchange with other modes of public and active transport, promoting a green, cleaner District and broader, South West region.

The principal challenges and barriers to implementation that North Devon District Council anticipates facing are funding, local perception, geographical and wildlife protection and resource availability.

Progress on the following measures has been slower than expected due to:

- EV Charging Infrastructure – Extensive funding, resource availability and consideration of appropriate locations for EV development have slowed progress; and

- Transport Capital Programme – Extensive funding, resource availability and phased planning required have slowed progress alongside consultation periods and confirmation with regards to the definitive final design for development.

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	North Devon Council Supplementary Planning Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2031	Local Authority Environmental Health, Local Authority Planning	Developers	NO	Fully Funded	<£10k	Completed	0.05	% of NO$_x$, % of PM$_{10}$	SPD approved and implemented	Reduction in redevelopment / New build properties due to economic conditions.
2	North Devon Hospital Air Quality Assessment	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2022	2023	Local Authority Environmental Health / North Devon District Hospital	Local Authority	NO	Fully Funded	<£10k	Implementation	0.02	% of NO$_x$, % of PM$_{10}$	Pollution data survey ongoing	Practicalities of adoption of recommended measure.
3	North Devon - Corporate Environmental Assessment Guidance	Public Information	Other	2021	2032	Local Authority	Local Authority	NO	Fully Funded	<£10k	Implementation	0.02	% of NO$_x$, % of PM$_{10}$	Implemented in Council projects	Other economic and social priorities.
4	Local Authority Vehicle Procurement	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2030	Local Authority	Local Authority	NO	Fully Funded	<£10k	Implementation	0.02	% of NO$_x$, % of PM$_{10}$	Implemented into Council core business	Other economic and social priorities.

2.3 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.

There is currently monitoring of PM$_{10}$ and PM$_{2.5}$ at one location in the District, AURN Barnstaple A39, an Urban Traffic site. The annual mean PM$_{2.5}$ concentration for the 2022 monitoring year is 8.2µg/m^3, thus, the site demonstrates compliance with the annual mean AQS objective of 20µg/m^3, 11.8µg/m^3 below the limit.

Furthermore, the current Defra background maps for North Devon (2018 reference year) show that all 2022 background concentrations of PM$_{2.5}$ are far below the recommended annual mean AQS objective for PM$_{2.5}$ of 20µg/m^3. The highest concentration is predicted to be 10.7µg/m^3 within the 1km x 1km grid square with the centroid grid reference of 269500, 125500. This is largely rural area to the west of South Molton, with dominant activity likely to be industrial practices occurring within South Molton. The area is also south of the B3227 and A361.

The Public Health Outcomes Framework data tool compiled by Public Heath England (PHE) quantifies the mortality burden of PM$_{2.5}$ within England on a county and local authority scale. The 2021 fraction of mortality attributable to PM$_{2.5}$ pollution (indicator D01) within North Devon District is 4.50%. This is lower than the regional average for the South West (5.10%) and for England as a whole (5.50%). The 2021 fraction of mortality has been used as opposed to the 2022 fraction as the data has not been made available at the time of writing.

North Devon District Council is taking the following measures to address PM$_{2.5}$:

- Actively encouraging developers at the planning stage to install EV charging points or the consideration of suitable infrastructure to allow for future cost efficient installations;
- Implementation of an EV charging programme alongside Devon County Council, with approximately 400 publicly accessible EV charging points active currently in

the District and more scheduled for implementation to encourage cleaner vehicle adoption;

- Reinstatement of railway routes across the area and enhancement of existing networks to encourage more sustainable transportation uptake; and

- Introduction of strategies within the Devon Carbon Plan to assist achievement of net-zero carbon emissions across the area by 2050 with many of the measures addressing local air quality including $PM_{2.5}$.

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

- Investment into enhancing the existing active travel network for walking and cycling, promoting active travel and supporting the reduction in vehicle volume and associated emission releases;

- Collaboration to develop the Devon Carbon Plan which contains policies to promote sustainable and active transport across the area to reduce pollutant emissions;

- Promotion of its established and well-connected main railway branch line to Exeter as well as the reopening of the 'Dartmoor Line' with >250,000 passenger journeys in 2022. Highlighting the benefits of public transport on air quality comparative to private vehicle use to commute;

- Acknowledgment of campaigns and consideration of development plans for the reconnection of Bideford to the national rail network alongside ACE Rail and the Tarka Rail Association;

- Endorsement of the bicycle mechanic and hire businesses Planet Bike Barnstaple and Bike Shed UK who host free sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road, as well as offering bicycle hire. Thus, incentivising active transportation uptake throughout the District whilst seeking to reduce air pollution contributions from frequent vehicular usage;

- Collaboration with North Devon Velo to promote cycling activities such as: club rides, touring, road racing, track racing, and charity events. This relationship promotes the use and benefits of active transport on air quality and health whilst educating the next generation to reduce vehicle uptake thus promoting the area as inclusive and an enabler of active travel for all;

- Promotion of the 'Park and Cycle' initiative that operates alike the 'Park and Ride' public bus service in Barnstaple. The scheme is a Business Engagement Programme, with bike lockers managed and rented by Bikeaway Ltd and encourages active transportation uptake throughout the District whilst seeking to reduce air pollution contributions from frequent vehicular usage;

- Continual implementation of the North Devon District Council and Torridge District Council joint Local Cycling and Walking Infrastructure Plan (LCWIP) to reduce the number of vehicle trips generated by North Devon District and subsequent pollutant emission release, due to its moderate population concentration and related hierarchical position in the South West settlements as well as its associated tourism appeal; and

- Promotion and development of the National Cycle Network (NCN) as well as the Local Cycle Network (LCN), demonstrating North Devon District Council's commitment to cycling development in the area. The NCN highlights 3 key courses (Route 3, 27, and 51) available to cycle, walk, and run thus promoting alternative forms of travel and reducing emissions.

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

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

This section sets out the monitoring undertaken within 2022 by North Devon District 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.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

There was one Automatic (Continuous) Monitoring site in North Devon District Council's area operated as part of the AURN during 2022 monitoring year. Table A.1 in Appendix A shows the details of the automatic monitoring site. 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. The UK-AIR website presents automatic monitoring results for North Devon District Council.

Maps showing the location of the monitoring site are provided in Appendix D. Further details regarding the automatic monitoring station are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

North Devon District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 28 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.

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 (NO₂)

Error! Reference source not found. and Table A. in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the AQS of 40µg/m³. 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.

Additionally, the National Bias Adjustment Factor assumes monitoring is undertaken in accordance with the Defra calendar dates. It is confirmed that monitoring was carried out in line with the Defra calendar dates. As such, there is a degree of certainty surrounding the monitoring results provided.

All monitoring sites across North Devon reported annual mean NO₂ concentrations below the AQS objective in 2022. Due to the low monitored concentrations, fall-off with distance correction was not required. Following bias adjustment, the maximum reported concentration in 2022 is 30.9µg/m3 at Site ID 15, a kerbside site, located along Caen Street (B3231) within approximately 20m from the junction with A361 in Braunton. The penultimate highest 2022 concentration was 28.1µg/m³ reported at Site ID 9, which also reported the second highest maximum concentration in 2021 (2022 report) of 29.2µg/m³.

Site IDs 1 and 2 were first deployed in 2022, thus no comparison can be drawn to the previous monitoring year.

Figures A.1 and A.2 present the 2022 annual mean NO_2 concentrations across North Devon District Council's non-automatic monitoring sites. A total of 18 diffusion tube sites out of 28 (64.29%) recorded a decrease in concentrations reported between 2021 and 2022, acknowledging that Site IDs 1 and 2 were new tube deployments in 2022 monitoring year therefore cannot be compared to 2021 data.

It is possible to infer the risk of exceedances of the 1-hour mean NO_2 AQS objective at diffusion tube monitoring sites. LAQM.TG(22) provides an empirical relationship that states exceedances of the 1-hour objective are unlikely when the annual mean concentration is below $60\mu g/m^3$. Given that the highest recorded annual mean concentration at any of the diffusion tube monitoring sites was $30.9\mu g/m^3$ in 2022, and $39.9\mu g/m^3$ since 2018, it is possible to conclude that there have been no exceedances of the hourly mean NO_2 objective at all diffusion tube monitoring locations in the last few years.

Error! Reference source not found. in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of $200\mu g/m^3$, not to be exceeded more than 18 times per year.

3.2.2 Particulate Matter (PM_{10})

Table A. 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 $40\mu g/m^3$.

Concentrations of PM_{10} have decreased steadily in North Devon since 2019, although there has never been a recorded exceedance of the PM_{10} annual mean AQS objective in the District. The PM_{10} annual mean concentration for 2022 at AURN Barnstaple A39 was $12.7\mu g/m^3$, $0.5\mu g/m^3$ lower than the concentration reported in 2021 ($13.2\mu g/m^3$) and $27.3\mu g/m^3$ lower than the PM_{10} annual mean AQS objective of $40\mu g/m^3$.

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

The automatic monitor AURN Barnstaple A39 reported no exceedances of the PM_{10} 24-hour AQS objective. However, as the instruments data capture was 45.8% for PM_{10} monitoring during 2022, below the 85.0% threshold, the 90.4[th] percentile was calculated

achieving an exceedance occurrence value of 18. The automatic monitoring site AURN Barnstaple A39 did remain compliant overall with the daily mean PM_{10} AQS objective, as fewer than 35 days of exceedances were reported.

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

Table A. in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for 2018 to 2022. The results provided show little variation in $PM_{2.5}$ concentrations, especially since 2019, with values reported over the last five years significantly below the $PM_{2.5}$ annual mean objective. The 2022 annual mean $PM_{2.5}$ concentration was 8.2µg/m^3, the same as reported in 2021 monitoring year, and reiterating that in 2022 there was no exceedance of the $PM_{2.5}$ annual AQS objective.

3.2.4 Sulphur Dioxide (SO$_2$)

Sulphur Dioxide (SO$_2$) is not monitored in the North Devon District.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Locations

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)
AURN Barnstaple A39	AURN – Barnstaple A39 (UKA00574)	Roadside	257048	132591	PM_{10}, $PM_{2.5}$	No	BAM 1020 Heated	20	3.0	3.5

Notes:

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

(2) N/A if not applicable.

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

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	Opp Murco Garage High St, Ilfracombe	Kerbside	251649	147477	NO$_2$	No	1.8	0.6	No	2.6
2	O/s Melian Pet Supplies, High St Ilfracombe	Kerbside	251784	147588	NO$_2$	No	2.4	0.5	No	2.8
3	Ilfracombe Convenience Store, High Street, Ilfracombe	Kerbside	251971	147689	NO$_2$	No	0.0	2.5	No	3.0
4	Church Street, Ilfracombe	Kerbside	251533	147330	NO$_2$	No	0.5	1.6	No	2.6
5	Exeter Road 1 - Vellator	Kerbside	249042	135903	NO$_2$	No	11.0	1.3	No	2.7
6	Exeter Road 2 - Wingate	Kerbside	248969	136060	NO$_2$	No	6.8	2.9	No	2.7
7	Exeter Road 3 - Parklyn	Kerbside	248863	136403	NO$_2$	No	3.9	1.7	No	2.4
8	Exeter Road 4 - Kaya	Kerbside	248766	136437	NO$_2$	No	6.1	2.6	No	2.3
9	Exeter Road 5 - Paint a Pot	Kerbside	248862	136372	NO$_2$	No	3.9	0.5	No	2.5
10	South Street, Newport	Kerbside	256683	132130	NO$_2$	No	2.5	1.2	No	2.4
11	South Street 1 - Barton Lane	Kerbside	248716	136067	NO$_2$	No	7.0	0.0	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) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
12	South Street 2 - Village End	Kerbside	248787	136498	NO_2	No	2.4	0.0	No	2.8
13	Saunton Road 1 - Field Lane	Kerbside	248417	136610	NO_2	No	3.4	1.5	No	2.5
14	Saunton Road 2 - Sharlands	Kerbside	248363	136630	NO_2	No	9.8	1.4	No	3.9
15	Caen Street - Salt	Kerbside	248771	136591	NO_2	No	0.6	1.0	No	2.3
16	Caen Gardens - J Benning	Kerbside	248615	136596	NO_2	No	0.0	3.8	No	2.7
17	Chaloners Road - Parish Hall	Kerbside	248791	136621	NO_2	No	30.0	1.3	No	2.4
17 (OLD)	Picston House, Bickington	Kerbside	253595	132433	NO_2	No	10.2	2.8	No	2.7
18	The Square - Café Bistro	Kerbside	248731	136617	NO_2	No	0.0	6.0	No	2.3
18 (OLD)	Babbages, Bickington	Kerbside	253053	132541	NO_2	No	6.5	0.6	No	2.7
19	The London Inn	Kerbside	248732	136592	NO_2	Yes – North Devon AQMA No.1	0.0	1.1	No	2.4
20	Rolle Street	Kerbside	255556	133583	NO_2	No	2.2	1.3	No	2.5
21	Pilton Causeway	Kerbside	255774	133732	NO_2	No	7.0	1.0	No	2.6
22	Alexandra Road	Kerbside	256186	133164	NO_2	No	2.2	1.6	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
23	Newport Road	Kerbside	256706	132253	NO_2	No	0.5	1.2	No	2.6
24	Belle Meadow Road	Kerbside	255967	132985	NO_2	No	12.0	1.6	No	2.5
25	Cedars Roundabout	Urban Background	253886	132394	NO_2	No	25.0	1.6	No	2.5
26	Sticklepath School	Kerbside	254197	132354	NO_2	No	2.0	1.7	No	2.7
27	Lower Sticklepath Roundabout	Kerbside	255651	132808	NO_2	No	34.0	2.8	No	2.8
28	Castle Street	Kerbside	255661	133179	NO_2	No	0.0	1.7	No	2.4

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 NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

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	251649	147477	Kerbside	100.0	100.0	-	-	-	-	18.0
2	251784	147588	Kerbside	100.0	100.0	-	-	-	-	16.1
3	251971	147689	Kerbside	90.1	90.1	-	17.6	15.1	14.6	13.6
4	251533	147330	Kerbside	100.0	100.0	20.6	18.5	14.9	17.4	17.0
5	249042	135903	Kerbside	100.0	100.0	17.1	19.7	17.4	19.1	18.5
6	248969	136060	Kerbside	92.6	92.6	17.8	16.1	13.7	14.3	12.5
7	248863	136403	Kerbside	100.0	100.0	22.0	20.2	15.9	17.9	17.8
8	248766	136437	Kerbside	100.0	100.0	16.8	16.0	11.1	13.0	12.9
9	248862	136372	Kerbside	100.0	100.0	36.4	35.2	26.4	29.2	28.1
10	256683	132130	Kerbside	100.0	100.0	22.1	26.0	19.2	18.5	19.0
11	248716	136067	Kerbside	50.8	50.8	11.0	10.0	8.1	8.6	8.4
12	248787	136498	Kerbside	74.5	74.5	17.7	13.1	11.0	12.2	11.1
13	248417	136610	Kerbside	100.0	100.0	25.8	23.5	18.9	20.0	18.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
14	248363	136630	Kerbside	68.7	68.7	21.1	18.0	14.9	15.9	13.0
15	248771	136591	Kerbside	100.0	100.0	-	36.1	29.3	31.4	30.9
16	248615	136596	Kerbside	83.0	83.0	14.6	12.4	10.9	11.1	10.8
17	248791	136621	Kerbside	75.3	75.3	26.6	22.3	18.7	19.8	18.2
17 (OLD)	253595	132433	Kerbside	N/A[3]	N/A[3]	32.8	26.5	23.5	25.6	-
18	248731	136617	Kerbside	92.3	92.3	39.9	30.0	18.8	20.0	19.9
18 (OLD)	253053	132541	Kerbside	N/A[3]	N/A[3]	29.6	18.3	15.1	16.5	-
19	248732	136592	Kerbside	90.4	90.4	36.5	31.1	26.4	27.2	26.4
20	255556	133583	Kerbside	100.0	100.0	26.6	23.8	20.4	20.8	20.9
21	255774	133732	Kerbside	92.0	92.0	27.8	25.6	20.4	22.9	21.6
22	256186	133164	Kerbside	92.0	92.0	25.7	25.2	21.5	21.7	22.9
23	256706	132253	Kerbside	100.0	100.0	26.4	25.8	22.3	22.7	23.0
24	255967	132985	Kerbside	100.0	100.0	26.1	21.3	19.6	19.8	20.5
25	253886	132394	Urban Background	92.6	92.6	18.9	15.7	14.0	13.9	14.9

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
26	254197	132354	Kerbside	100.0	100.0	23.9	23.9	20.8	21.2	19.8
27	255651	132808	Kerbside	92.0	92.0	21.2	22.1	18.5	20.3	21.0
28	255661	133179	Kerbside	92.0	92.0	15.6	13.7	10.7	11.6	12.1

☒ **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%).

(3) N/A = Not Applicable (the site was removed).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations – Non-Automatic Locations
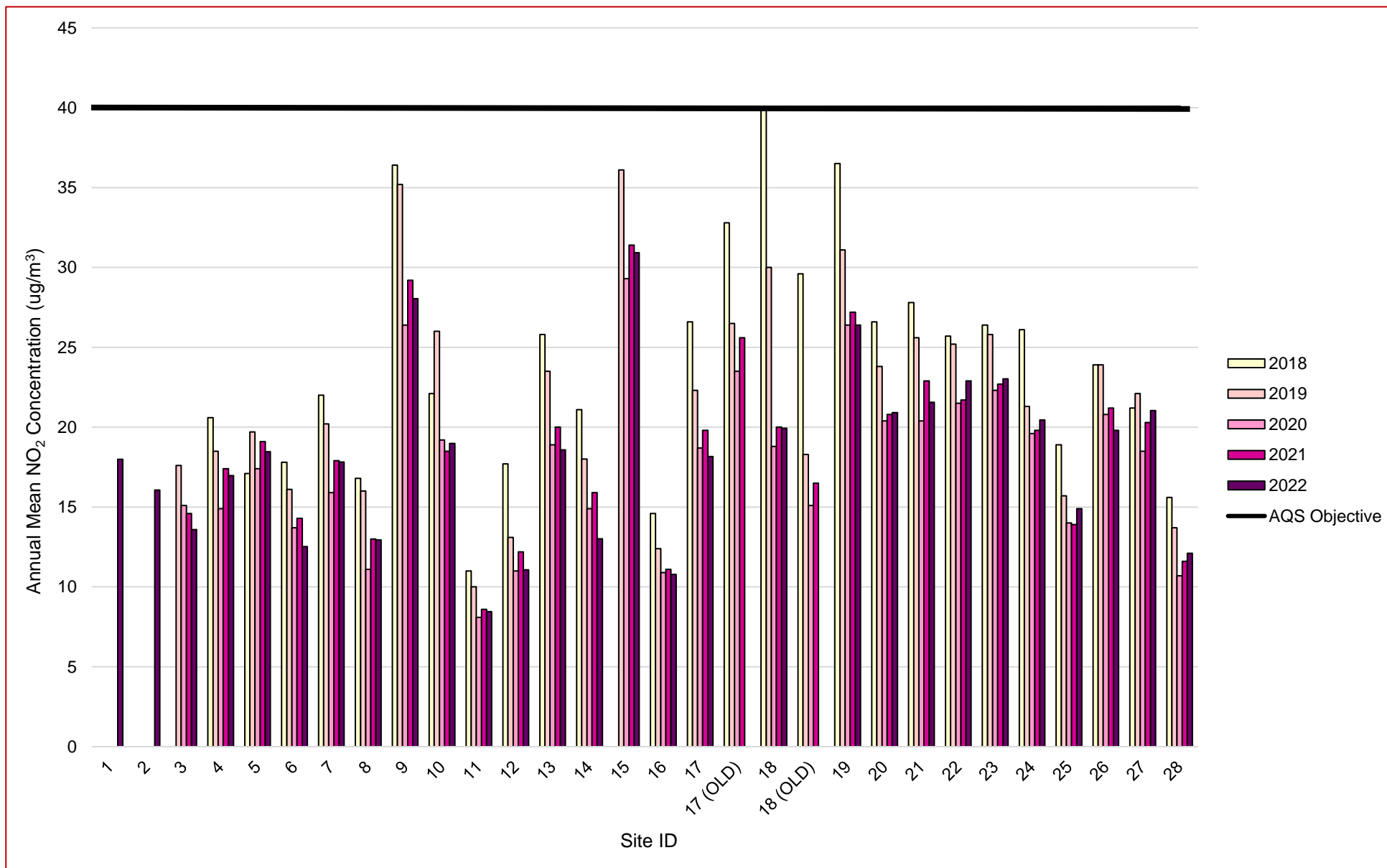
Figure A.2 – Trends in Annual Mean NO₂ Concentrations – Non-Automatic Locations (In AQMA Only)

Table A.4 – 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
AURN Barnstaple A39	257048	132591	Roadside	45.8	45.8	14.9	16.6	14.2	13.2	12.7

☒ **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 PM₁₀ Concentrations
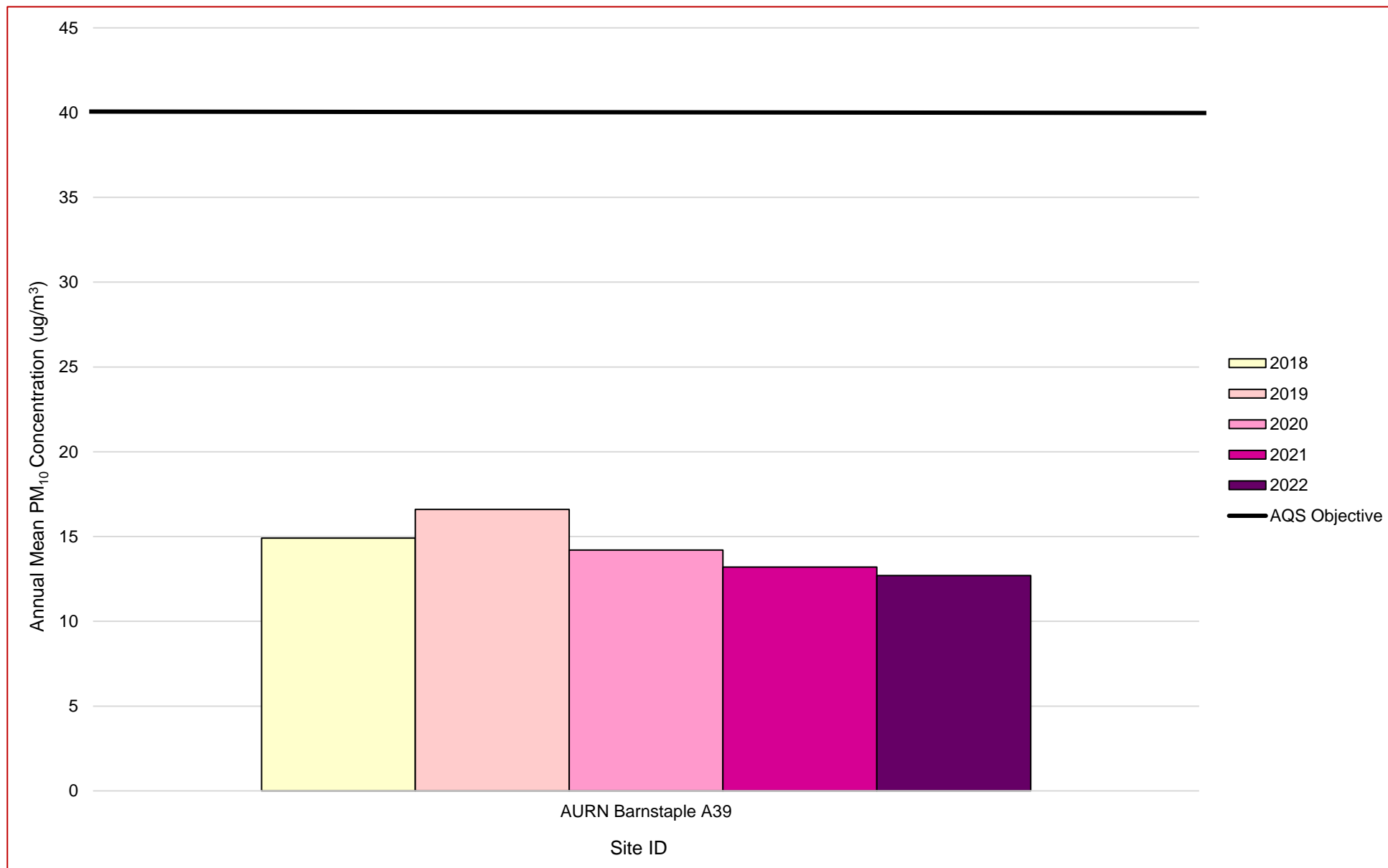
Table A.5 – 24-Hour Mean PM$_{10}$ Monitoring Results, Number of PM$_{10}$ 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
AURN Barnstaple A39	257048	132591	Roadside	45.8	45.8	0 (22.1)	2	0	1	0 (18.0)

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%).
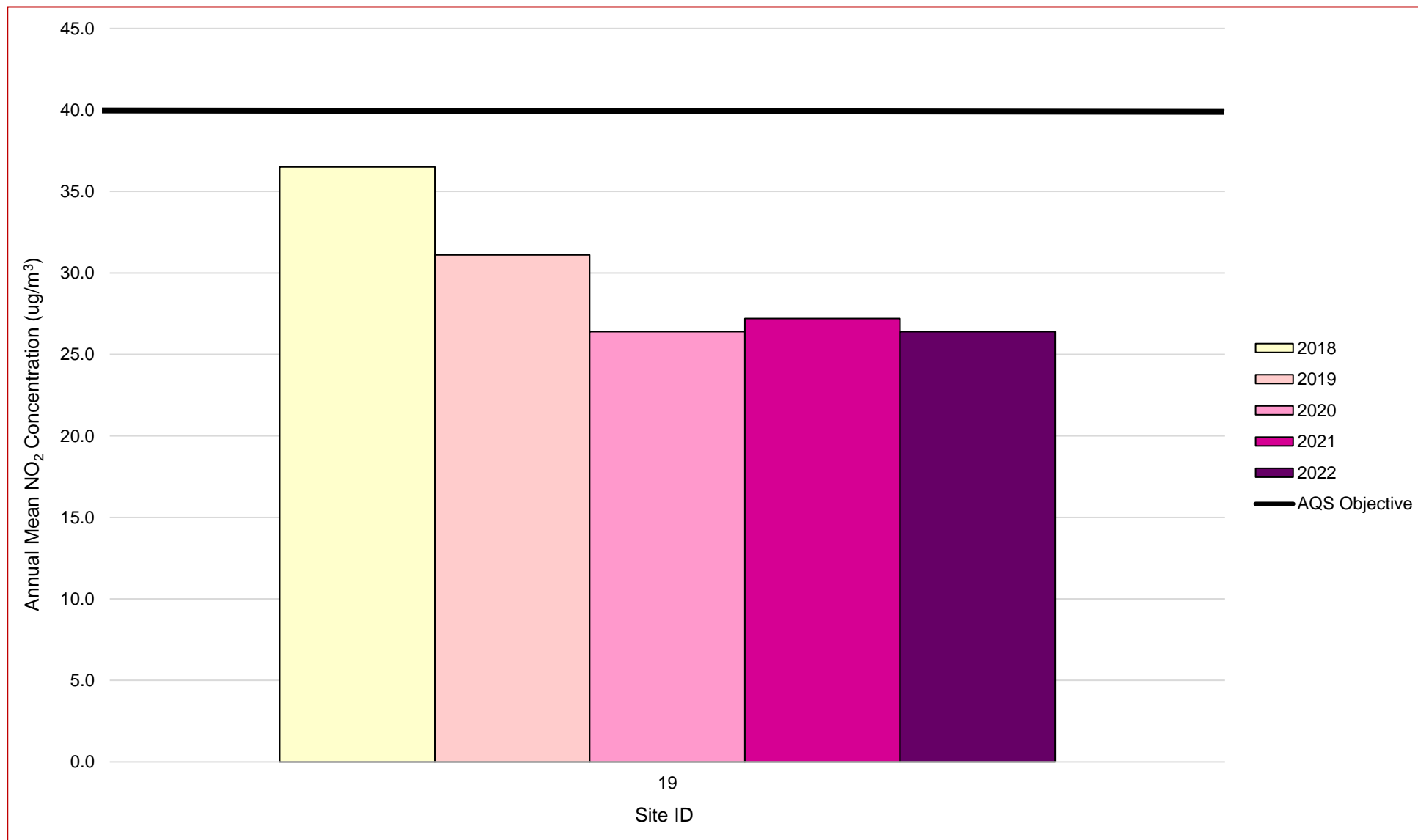
Table A.6 – Annual Mean PM$_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
AURN Barnstaple A39	257048	132591	Roadside	45.0	45.0	6.9	8.1	8.4	8.2	8.2

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

Notes:

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

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.4 – Trends in Annual Mean PM$_{2.5}$ Concentrations
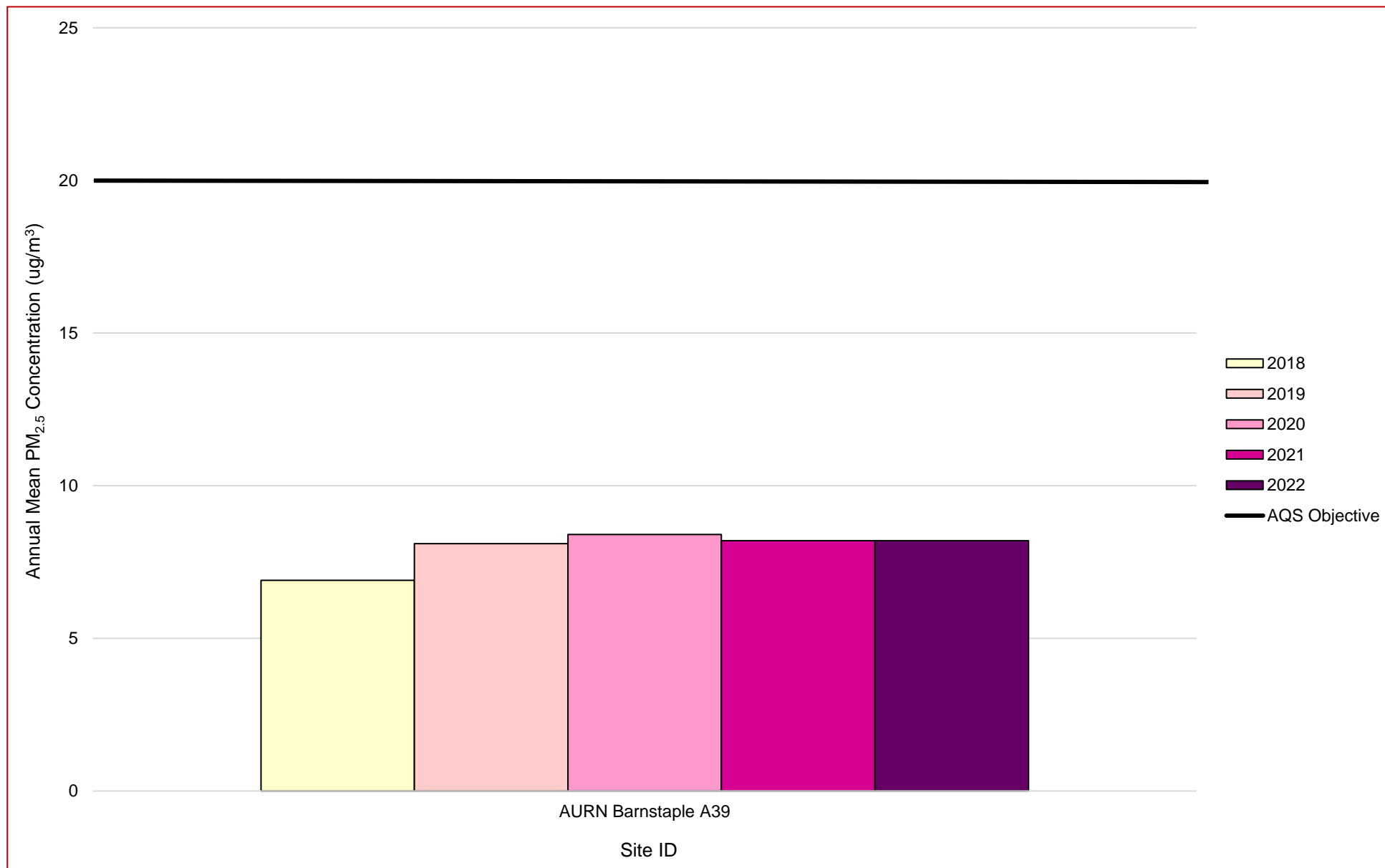
Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.85	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	251649	147477	25.7	19.9	17.4	19.1	20.4	18.8	22.6	25.5	20.6	20.0	22.3	21.9	21.2	18.0		
2	251784	147588	24.3	12.9	19.7	17.4	18.7	17.1	17.3	20.9	15.8	18.9	21.2	22.6	18.9	16.1		
3	251971	147689	18.3	18.6	13.0	-	17.6	16.0	14.8	17.9	10.9	16.0	15.3	17.6	16.0	13.6		
4	251533	147330	23.0	18.0	23.3	21.1	14.9	16.1	19.2	28.4	18.6	15.6	18.4	22.8	20.0	17.0		
5	249042	135903	27.5	17.9	21.9	22.2	19.5	19.7	20.6	24.6	22.3	20.8	20.9	22.8	21.7	18.5		
6	248969	136060	-	11.9	17.0	16.3	12.9	13.1	14.6	16.8	15.4	13.1	15.9	15.0	14.7	12.5		
7	248863	136403	26.3	16.6	20.3	22.0	18.2	21.7	23.5	26.8	21.6	16.2	17.8	20.6	21.0	17.8		
8	248766	136437	22.3	8.6	18.6	16.3	9.5	11.2	14.0	20.1	17.8	13.8	11.9	18.5	15.2	12.9		
9	248862	136372	33.5	32.1	26.6	34.0	35.2	34.0	39.0	**40.6**	35.9	28.7	30.3	26.0	33.0	28.1		
10	256683	132130	29.0	21.4	19.5	19.9	20.2	19.6	20.3	22.5	22.9	20.3	27.9	24.3	22.3	19.0		
11	248716	136067	15.5	-	10.6	-	8.2	-	-	-	9.4	9.3	-	15.2	11.4	8.4		
12	248787	136498	18.9	-	15.8	14.2	9.7	10.1	12.0	-	13.6	11.4	11.5	-	13.0	11.1		
13	248417	136610	25.0	14.1	25.9	24.7	19.4	17.7	22.3	29.7	22.0	18.7	17.0	25.8	21.9	18.6		
14	248363	136630	22.9	-	24.7	18.6	11.6	13.5	-	-	-	12.8	11.7	19.4	16.9	13.0		
15	248771	136591	**40.6**	29.8	39.0	38.8	31.1	31.5	38.7	**42.4**	38.9	37.4	32.7	35.8	36.4	30.9		
16	248615	136596	16.2	8.5	13.2	12.6	11.2	10.7	12.2	15.5	-	-	10.6	16.1	12.7	10.8		
17	248791	136621	26.3	18.9	24.6	20.2	19.9	-	21.2	26.0	-	-	10.5	24.8	21.4	18.2		
18	248731	136617	26.5	17.6	27.8	23.1	21.4	19.4	-	24.6	24.9	24.9	21.7	26.0	23.4	19.9		
19	248732	136592	29.2	25.6	33.8	29.8	31.4	29.8	30.5	32.1	29.6	33.3	36.4	-	31.0	26.4		
20	255556	133583	32.7	21.2	23.3	24.4	20.5	19.1	22.6	25.7	27.7	23.5	26.1	28.5	24.6	20.9		
21	255774	133732	30.9	-	27.7	23.0	17.5	19.2	19.4	27.6	28.2	25.2	29.2	31.4	25.4	21.6		
22	256186	133164	34.6	-	25.6	23.5	20.2	20.5	20.6	25.9	26.3	28.9	35.6	34.7	26.9	22.9		
23	256706	132253	37.6	24.1	26.9	24.9	22.6	20.3	22.0	25.2	27.5	27.2	32.5	34.2	27.1	23.0		
24	255967	132985	33.5	20.4	22.4	24.3	20.1	19.8	19.4	24.0	24.7	22.2	25.8	32.2	24.1	20.5		
25	253886	132394	-	30.6	20.2	16.1	13.3	13.0	11.7	14.0	14.2	20.1	17.9	21.7	17.5	14.9		
26	254197	132354	31.5	19.8	25.5	22.3	22.8	19.7	19.0	21.1	21.2	23.5	26.3	26.7	23.3	19.8		
27	255651	132808	27.5	-	24.2	22.7	18.7	18.1	19.3	24.7	26.7	25.4	31.7	33.1	24.8	21.0		
28	255661	133179	20.1	-	15.8	13.4	10.1	9.5	10.4	12.2	12.8	14.6	18.2	19.4	14.2	12.1		

☒ **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.**

☒ **North Devon District Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System (DTDES).**

Notes:

Exceedances of the NO$_2$ annual mean objective of 40µg/m^3 are shown in **bold**.

NO$_2$ annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO$_2$ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within North Devon District During 2022

North Devon District Council has identified six new developments, four residential applications and two employment land applications, that required an Air Quality Assessment (AQA) within the reporting year of 2022. Further investigation between the Council's Planning Department and Environmental Protection Department has identified that they are not expected to significantly impact the air quality objectives within the area as development progresses into the 2022 monitoring year and onwards. More detail regarding the specific applications can be obtained by contacting the Council.

Additional Air Quality Works Undertaken by North Devon District Council During 2022

North Devon District Council removed monitoring locations Picston House and Babbages (Site IDs 17 OLD and 18 OLD respectively) in 2022 monitoring year and undertook monitoring at two new locations, opposite Murco Garage, High Street, Ilfracombe and outside Melian Pet Supplies, High Street, Ilfracombe with Site IDs 1 and 2 respectively in the 2022 reporting year.

QA/QC of Diffusion Tube Monitoring

North Devon District Council's diffusion tubes in 2022 were supplied and analysed by Gradko, using the 20% Triethanolamine (TEA) in water preparation method. Gradko's laboratory is UKAS accredited, participating in the AIR-PT Scheme for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, Gradko currently holds the highest rank of a 'Good' laboratory.

Local authority co-location studies which use tubes supplied by Gradko with the 20% TEA in water preparation method in 2022, with all 33-studio rated as 'good', as shown by the precision summary results. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Monitoring in 2022 throughout North Devon District was completed in adherence with the 2022 Diffusion Tube Monitoring Calendar, whereby all changeovers throughout the monitoring year were completed in line with Defra guidance.

Diffusion Tube Annualisation

The LAQM.TG22 states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%, or has 3 months of data collected for the monitoring year in line with the Diffusion Tube Monitoring Calendar. Diffusion tube sites 11 and 14 required annualisation due to insufficient data capture in 2022. The sites reported data capture of 50.8% and 68.7% with over 3 months of data during the 2022 monitoring period in line with the Diffusion Tube Monitoring Calendar which was sufficient for annualisation.

Annualisation was completed using version 3.0 of the 'Diffusion Tube Data Processing Tool'. The automatic monitor that operates within North Devon District, AURN Barnstaple A39, does not monitor NO_2, as such the four nearest AURN monitoring stations selected to annualise the data are:

- Yarner Wood;

- Honiton;

- Charlton Mackrell; and

- Plymouth Centre.

The continuous background monitoring sites were suitable to use as they all had >85% data capture and therefore could be used for annualisation. Table C.1 presents the annualisation summary, taken from the 'Diffusion Tube Data Processing Tool'.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisation Factor AURN Yarner Wood	Annualisation Factor AURN Honiton	Annualisation Factor AURN Charlton Mackrell	Annualisation Factor AURN Plymouth Centre	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
11	0.8906	0.8956	0.8204	0.8876	0.8736	11.4	9.9
14	0.8689	0.9311	0.8828	0.9445	0.9068	16.9	15.3

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 Nitrogen Oxides (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.

North Devon District Council have applied a national bias adjustment factor of 0.85 to the 2022 monitoring data. A summary of bias adjustment factors used by North Devon District Council over the past five years is presented in Table C.2.

No co-location studies are carried out by North Devon District Council therefore only a national factor can be applied. The national factor for Gradko 20% TEA in water, as presented in the Diffusion Tube Bias Factors Spreadsheet v09_23, was 0.85 based on 33 studies. The National Bias Adjustment Spreadsheet is presented in Figure C.1.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	09/23	0.85
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	09/20	0.93
2018	National	06/19	0.93

NO₂ Fall-off with Distance from the Road

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

No diffusion tube NO_2 monitoring locations within North Devon District required distance correction during 2022.

QA/QC of Automatic Monitoring

The North Devon District Council outsources the data management of automatic monitoring data to Bureau Veritas UK Ltd in conjunction with their responsibilities for the Automatic Urban and Rural Network (AURN). The Barnstaple A39 automatic monitoring station is part of the AURN that is run by the Environment Agency (EA). It is the largest automatic monitoring network within the UK, and is the main network used for compliance reporting against the air quality objectives. As such, the PM_{10} and $PM_{2.5}$ monitoring at AURN Barnstaple A39 is completed in line with the operational procedures set out by the Central Management and Coordination Unit (CMCU) for the AURN, with data ratification completed by the Quality Assurance and Quality Control Unit (QA/QC Unit).

Members of North Devon District Council team regularly attend the monitoring site, acting as the Local Site Operator (LSO) to complete routine site calibrations and maintenance thus ensuring a consistent, accurate data flow. Equipment servicing is completed every six months by an Equipment Support Unit (ESU) for the site, and the QA/QC Unit completes scheduled site audits in accordance with the AURN Site Operators Manual.

Due to the monitoring site being operated by the Environment Agency, North Devon District Council do not have first-hand access to any data that has been manipulated or removed through the QA/QC procedure completed. The data presented within the 2023 ASR has been downloaded from the UK-Air website and all is shown as ratified.

PM₁₀ and PM₂.₅ Monitoring Adjustment

The PM_{10} and $PM_{2.5}$ monitors utilised within North Devon District do not require the application of a correction factor.

Automatic Monitoring Annualisation

Data capture for the automatic monitor AURN Barnstable A39 was below 75% for the annual period, 45.8% for PM_{10} and 45.0% for $PM_{2.5}$, therefore annualisation in accordance with LAQM.TG22 is required for the instrument. Results were annualised by Bureau Veritas UK Ltd using the guidance as per Chapter 7: Particulate Matter Monitoring (PM_{10} and $PM_{2.5}$) in LAQM.TG22, specifically Box 7-9. The PM_{10} and $PM_{2.5}$ 2022 annualised annual means were confirmed for AURN Barnstable A39 site as 12.7µg/m^3 and 8.2µg/m^3 respectively. Results from annualisation are presented in Table C.3 – C.5.

It is acknowledged that AURN Saltash Callington Road, an Urban Traffic site, was used for annualisation given that the data capture for PM_{10} and $PM_{2.5}$ at Urban Background and Rural Background sites within 50 miles of AURN Barnstaple A39 (AURN Yarner Wood, AURN Honiton, and AURN Charlton Mackrell) were below 85%, whereas AURN Saltash Callington Road had data capture of 96-99% for PM_{10}/$PM_{2.5}$ respectively. Furthermore, AURN Barnstaple A39 is a Roadside location, therefore it was permissible to use AURN Saltash Callington Road for automatic annualisation.

Table C.3 – AURN Barnstaple A39 PM_{10} Automatic Annualisation Calculations (concentrations presented in µg/m^3)

Site ID	Pollutant	Annual Mean 2022 (A_m)	Period Mean 2022 (P_m)	Ratio (A_m/P_m)	Average (R_a)	Annualised Annual Mean
AURN Saltash Callington Road	PM_{10}	14.73632566	13.7	1.076	1.051	12.681
AURN Plymouth Centre	PM_{10}	16.93243184	16.5	1.025		

Table C.4 – AURN Barnstaple A39 $PM_{2.5}$ Automatic Annualisation Calculations (concentrations presented in µg/m^3)

Site ID	Pollutant	Annual Mean 2022 (A_m)	Period Mean 2022 (P_m)	Ratio (A_m/P_m)	Average (R_a)	Annualised Annual Mean
AURN Saltash Callington Road	$PM_{2.5}$	9.092154787	8.5	1.065	1.045	8.247
AURN Plymouth Centre	$PM_{2.5}$	9.096944872	8.9	1.024		

Table C.5 – Automatic Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Pollutant	Annualisation Factor AURN Saltash Callington Road	Annualisation Factor AURN Plymouth Centre	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
AURN Barnstaple A39	PM$_{10}$	1.076	1.025	1.051	12.0	12.7
	PM$_{2.5}$	1.065	1.024	1.045	8.0	8.2

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.

Automatic monitoring for NO$_2$ was not undertaken within North Devon District during 2022.

Figure C.1 – National Bias Adjustment Factor Spreadsheet (09/23)

National Diffusion Tube Bias Adjustment Factor Spreadsheet		**Spreadsheet Version Number: 09/23**

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

This spreadsheet will be updated at the end of March 2024

LAQM Helpdesk Website

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

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

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

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

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

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

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

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

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

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

Analysed By[1]	Method To undo your selection, choose (All) from the pop-up list	Year[5] To undo your selection, choose (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022		Overall Factor[3] (33 studies)					Use	0.85

Appendix D: Maps of Monitoring Locations and AQMA across North Devon District

Figure D.1 – Map of All Monitoring Locations across North Devon District

NOTE:

Automatic monitoring station AURN Barnstaple A39 has been abbreviated and labelled as B-A39 in map Figure D.1.
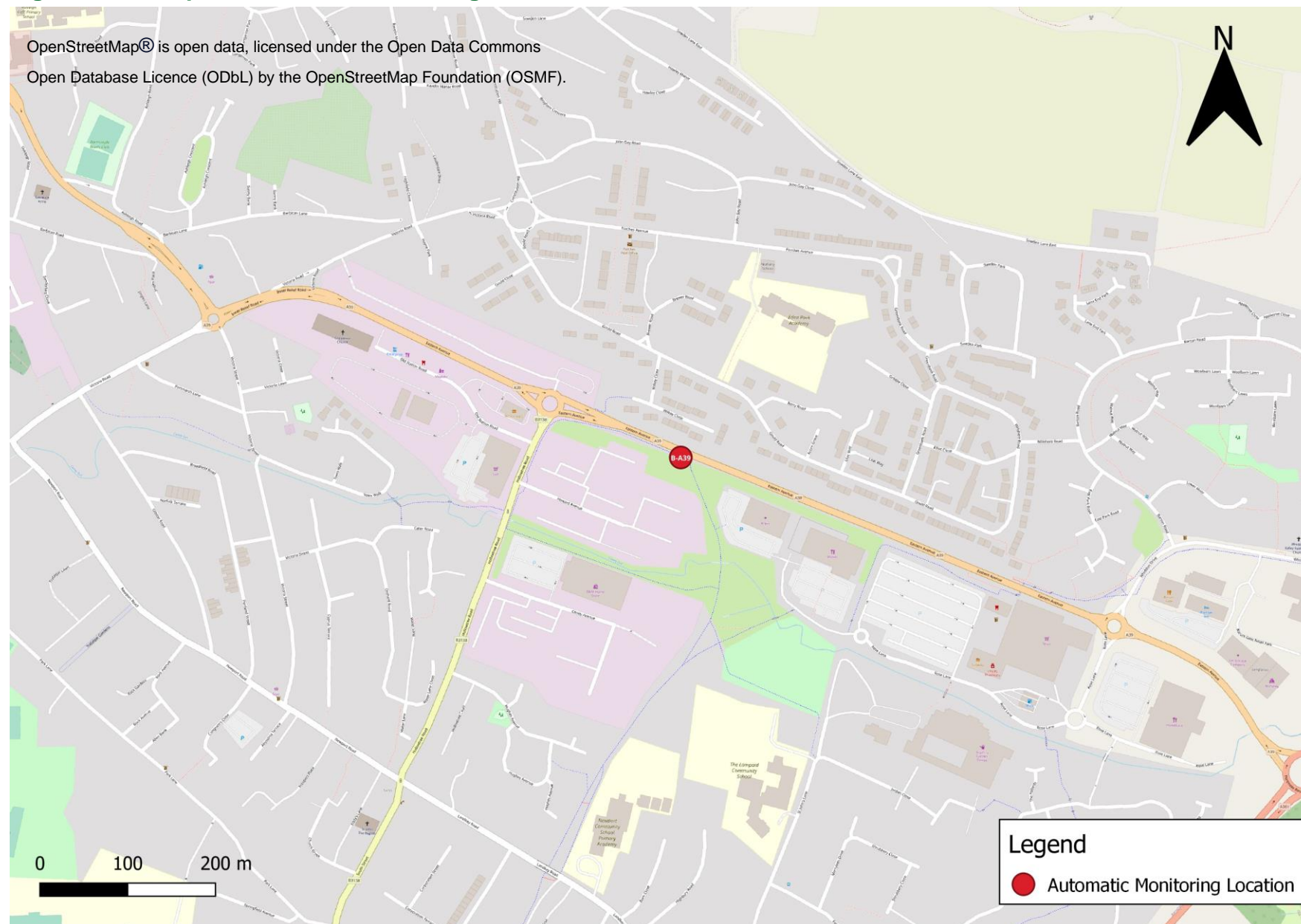
Figure D.1 North Devon AQMA overlaps Site IDs: 15, 17, 18 and 19.

Site IDs 17 (O) and 18 (O) abbreviate the Site IDs 17 (OLD) and 18 (OLD).

Non-automatic monitoring stations Site IDs that overlap on Figure D.1 due to locational proximity:

- 13 and 14;
- 8 and 12;
- 7 and 9;
- 15, 17, 18 and 19.

Figure D.2 – Map of Automatic Monitoring Location

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Open Database Licence (ODbL) by the OpenStreetMap Foundation (OSMF).

NOTE: Automatic monitoring station AURN Barnstaple A39 has been abbreviated and labelled as B-A39 in map Figure D.2.

Legend

🔴 Automatic Monitoring Location

Figure D.3 – Map of All Non-Automatic Monitoring Locations

NOTE:

Figure D.3 North Devon AQMA overlaps Site IDs: 15, 17, 18 and 19.

Site IDs 17 (O) and 18 (O) abbreviate the Site IDs 17 (OLD) and 18 (OLD).

Non-automatic monitoring stations Site IDs that overlap on Figure D.3 due to locational proximity:
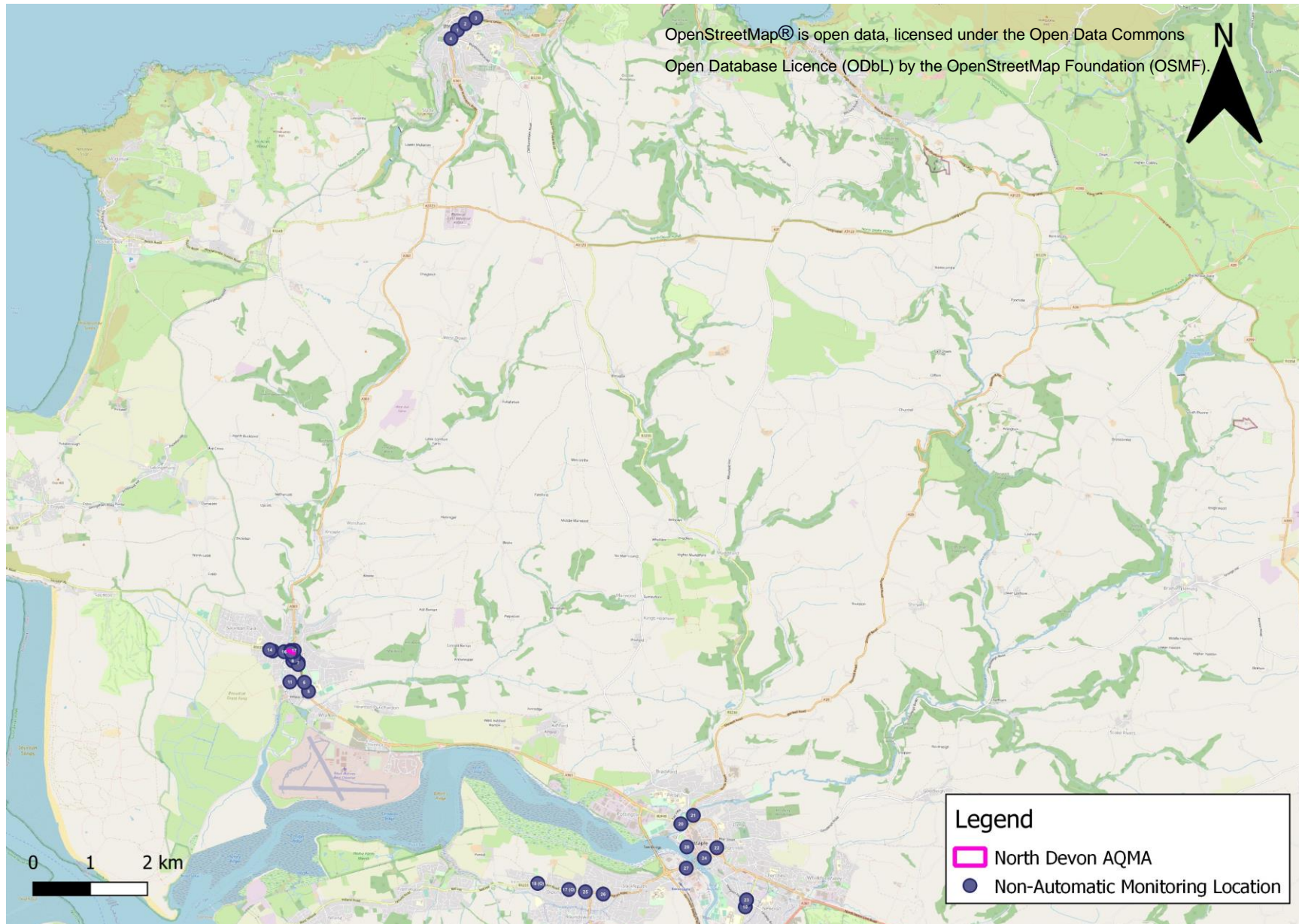
- 13 and 14;
- 8 and 12;
- 7 and 9;
- 15, 17, 18 and 19.

Legend

North Devon AQMA

Non-Automatic Monitoring Location

Figure D.4 – Map of Non-Automatic Monitoring Locations – Ilfracombe

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Legend

● Non-Automatic Monitoring Location

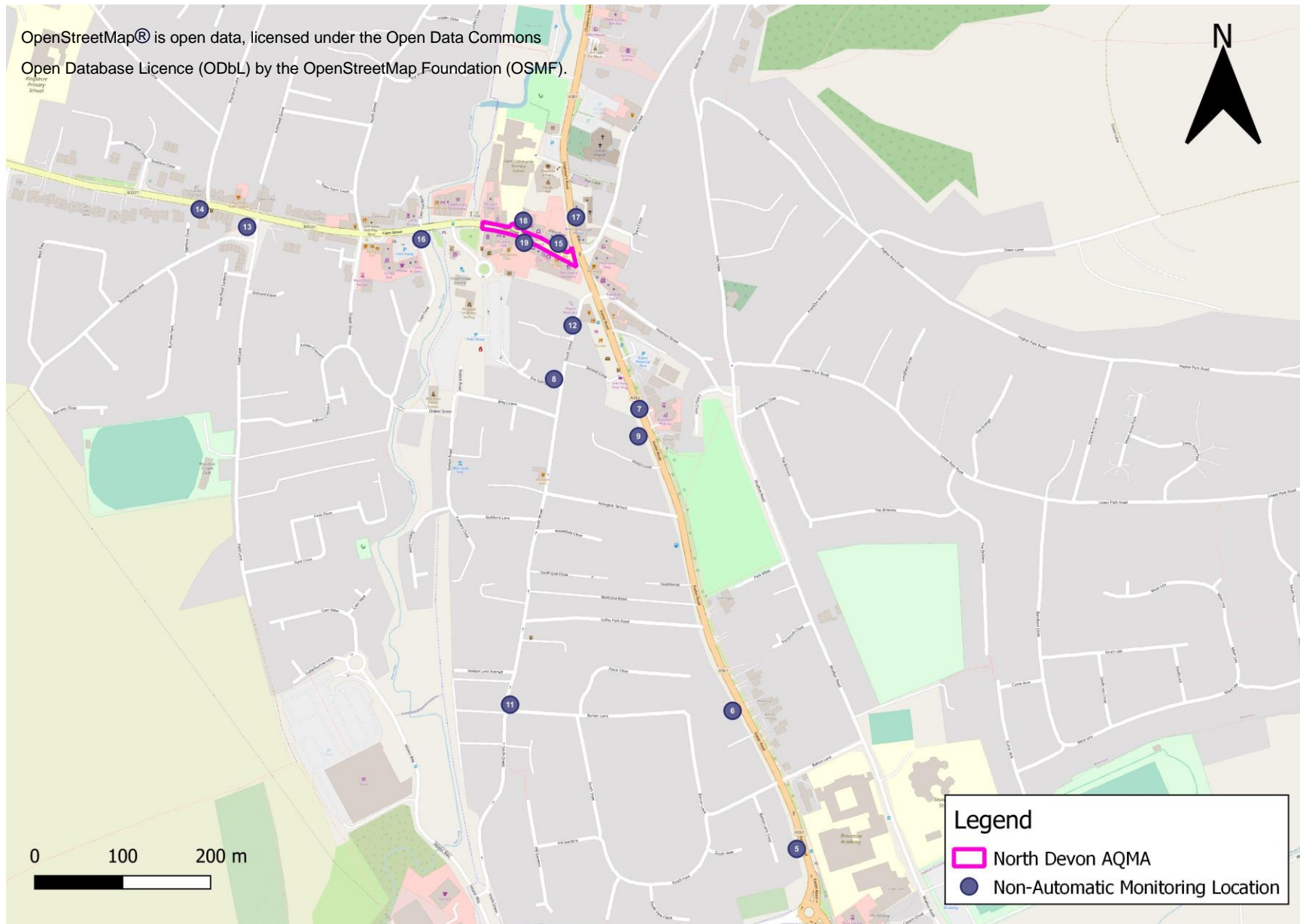**Figure D.5 – Map of Non-Automatic Monitoring Locations - Braunton**
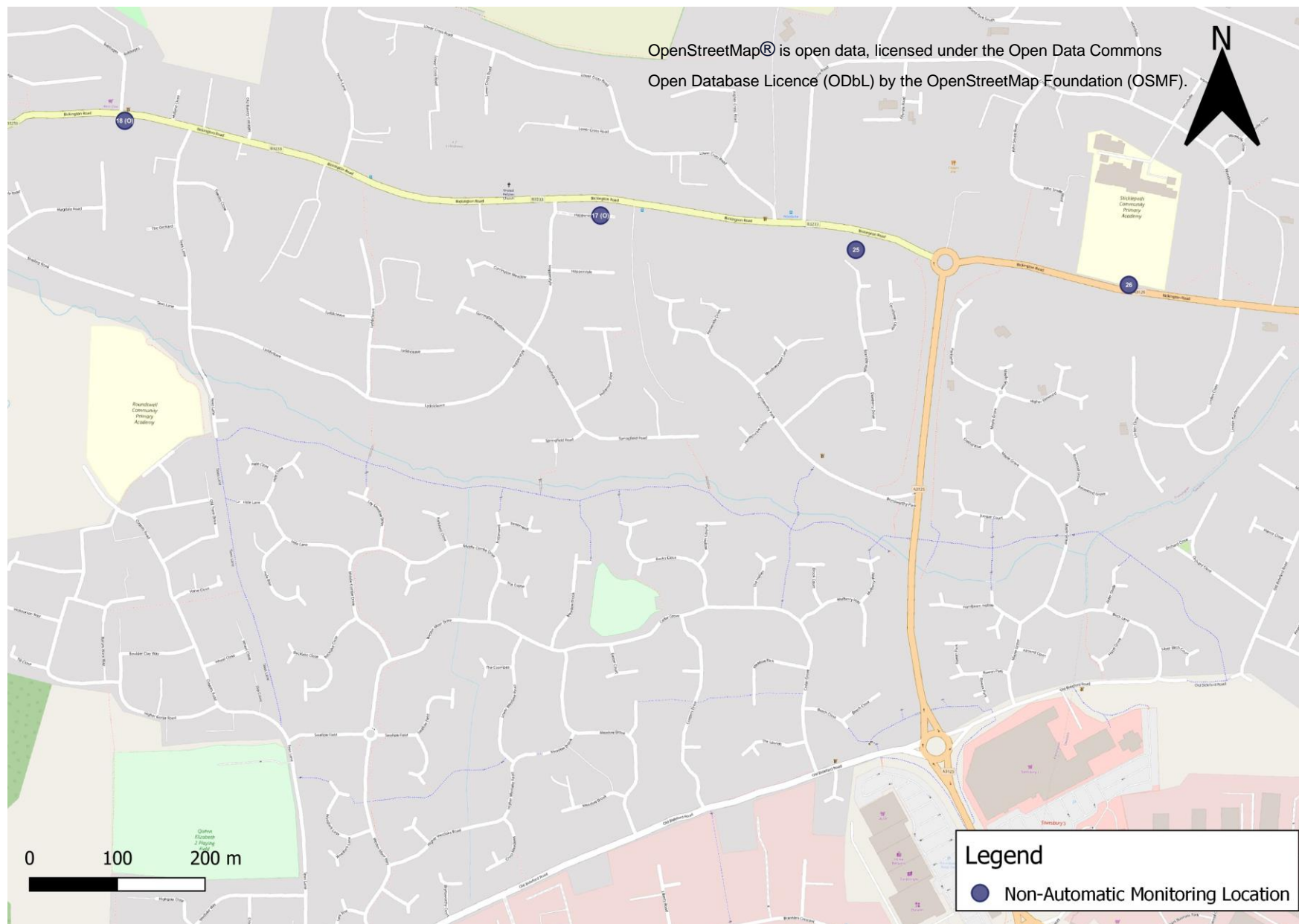
Figure D.6 – Map of Non-Automatic Monitoring Locations – Bickington

NOTE:

Non-automatic monitoring stations Site IDs 17 (O) and 18 (O) abbreviate the Site IDs 17 (OLD) and 18 (OLD).

Figure D.7 – Map of Non-Automatic Monitoring Locations – Barnstaple

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Legend

● Non-Automatic Monitoring Location
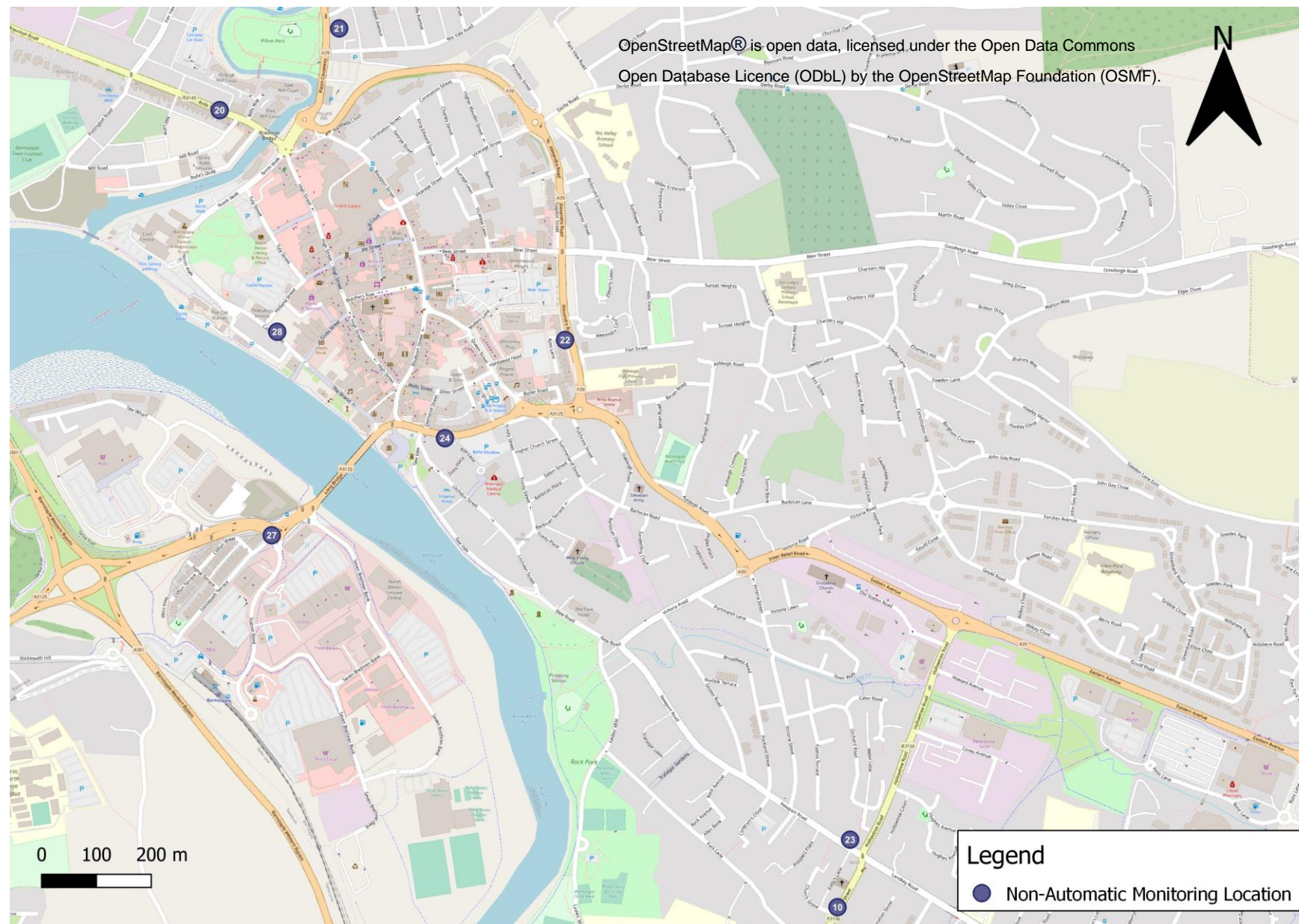
Figure D.8 – Map of North Devon Air Quality Management Area (AQMA)

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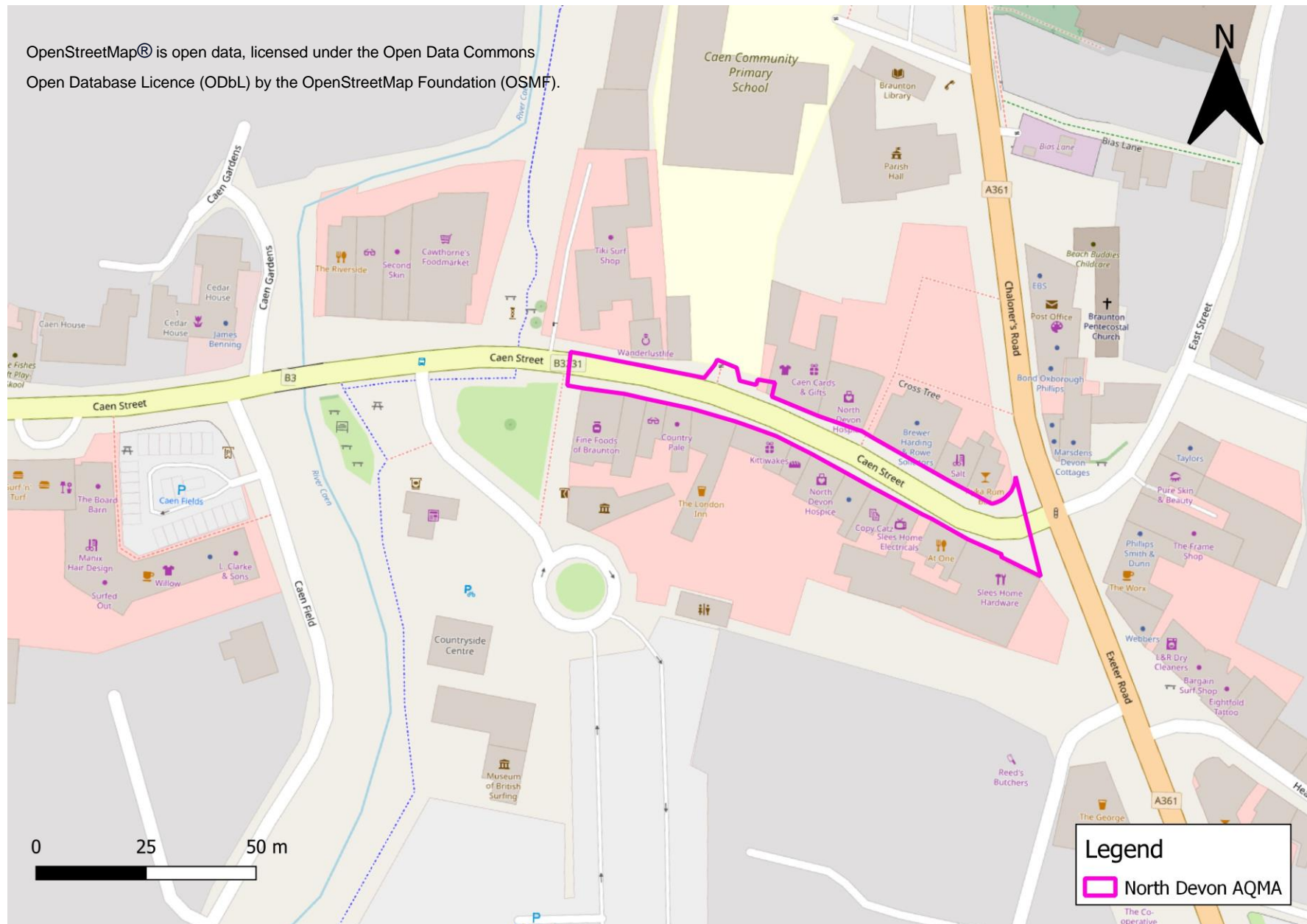
Appendix E: Summary of Air Quality Objectives in England

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

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

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

Glossary of Terms

Abbreviation	Description
AONB	Area of Outstanding Natural Beauty
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.
AQS	Air Quality Standard
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
B&B	Bed and Breakfast
CMCU	Central Management and Coordination Unit
CO_2	Carbon Dioxide
COVID-19	Coronavirus Disease 19 – An acute disease in humans caused by a coronavirus, which is characterized mainly by fever and cough and is capable of progressing to severe symptoms and in some cases death, especially in older people and those with underlying health conditions. It was originally identified in China in 2019 and became a pandemic in 2020.
CTT	Cycling Time Trials
CWZ	Core Walking Zone
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DTDES	Diffusion Tube Data Entry System
EA	Environment Agency
ESU	Equipment Support Unit
EV	Electric Vehicle
LAQM	Local Air Quality Management
LCN	Local Cycle Network
LCWIP	Local Cycling and Walking Infrastructure Plan

Abbreviation	Description
LED	Light Emitting Diode
LEV	Low Emission Vehicle
LSO	Local Site Operator
NCN	National Cycle Network
NHS	National Health Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
ONS	Office for National Statistics
PHE	Public Health England
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SAC	Special Areas of Conservation
SO_2	Sulphur Dioxide
SSSI	Sites of Special Scientific Interest
TEA	Triethanolamine
TG	Technical Guidance
UKAS	United Kingdom Accreditation Service
ULEV	Ultra Low Emission Vehicle
WFH	Working From Home

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