
# 2021 Air Quality Annual Status Report (ASR)

## In fulfilment of Part IV of the Environment Act 1995

## Local Air Quality Management

Date: May 2022

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|---|---|
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| **Date** | May 2022 |

# Foreword from the Director of Health and Care – Staffordshire County Council

Staffordshire County Council (SCC) is committed to working with partners to ensure that Staffordshire will be a place where improved health and wellbeing is experienced by all. Poor air quality has a negative impact on public health, with potentially serious consequences for individuals, families and communities. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Staffordshire residents. Improving air quality is often a complex issue, presenting a multi-agency challenge – so it is essential that all agencies work together effectively to deliver improvements where they are needed.

As Director of Health and Care across Staffordshire I endorse this Annual Status Report which sets out the position in all the Local Authorities across Staffordshire and Stoke-on-Trent.

At the end of 2020 our successful Staffordshire wide Air Aware Programme, a joint project led by Staffordshire County Council on behalf of all 8 Districts, Stoke-on-Trent City Council and funded by DEFRA, drew to a close. Building on this success Staffordshire County Council successfully bid for an additional £300k to develop and expand the Air Aware programme and deliver focused interventions in 3 Districts. The programme will be delivered between March 2020 and December 2022 and will focus on reducing levels of NO and PM, which will be monitored and evaluated through a network of air quality sensors.

In addition to the Air Aware programme, Staffordshire County Council is midway through trialling a number of innovative solutions to improve air quality in the county as part of our ADEPT Live Lab SIMULATE programme. SIMULATE is a £1.97 million challenge programme, delivered in partnership with AMEY, Keele University, Catapult Connected Places and is part of the ADEPT Smart Places Research Programme, designed to accelerate innovative solutions in Air Quality and Intelligent Mobility within local authorities. Trials include the installation of two living green walls and deployment of a number of Intelligent Transport Systems, all of which are being monitored and evaluated by a network of air quality sensors to understand their impact on air quality, and in particular levels of PM. The results of which will inform future activity and opportunities to scale up the most effective solutions to help combat poor air quality.

In addition, Officers from Newcastle Borough Council, Stoke City Council and Staffordshire County Council are jointly working under Ministerial Direction to improve transport related air pollution in North Staffordshire.

Yours sincerely

**Dr Richard Harling MBE**
**Director of Health & Care**

# Executive Summary: Air Quality in Our Area

## Air Quality in Newcastle under Lyme Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with 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 28,000 to 36,000 deaths at typical ages (3), with a total estimated healthcare cost to the NHS and social care of £157 million in 2017 (4).

The main pollutant of concern in the Borough is nitrogen dioxide ($NO_2$). Nitrogen Dioxide ($NO_2$) is one of a group of highly reactive gases known as oxides of nitrogen or nitrogen oxides ($NO_x$). Nitrogen Oxides are released into the atmosphere when fossil fuels (coal, natural gas, and petroleum) are used in power stations, area heating and vehicle engines.

NOx emissions from burning fossil fuels are mainly released as nitric oxide (NO), although some sources can release a substantial amount of NOx as $NO_2$. Reactions in the atmosphere can subsequently turn NO into $NO_2$.

Breathing air with high concentrations of $NO_2$ can irritate and inflame the airways and lungs, with those suffering with respiratory diseases such as asthma being particularly affected.

Road transport is the largest source of $NO_2$ emissions in the UK and is the major contributor to concentrations within the Borough. Strict European standards require

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, July 2020

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

emissions from vehicles to improve over time. This is achieved by improvements in engine design and fitting three way catalysts to road vehicles. The role that road transport plays in air quality is greater within urban areas.

The Borough of Newcastle under Lyme is located in North Staffordshire, with the town of Newcastle being the major urban area, together with the smaller town of Kidsgrove. Covering an area of 21,096 hectares (81 square miles) the Borough has a population of 129,600. The Borough is in a strategic location between roads running north from London to Carlisle, and west to Chester. Two major trunk roads pass through the Borough, along with a number of major roads which converge on the two main towns of Newcastle, and Kidsgrove;

- The M6, which is currently one of the most heavily trafficked and congested roads in the country
- The A500, a major road linking Newcastle under Lyme and Stoke on Trent with junctions 15 and 16 of the M6. These motorway junctions are adjacent to the Borough's boundary and so contribute to traffic congestion in the area.
- A34, A52, A525, A523 and A53 pass through Newcastle
- A50, A5011 and A34 pass through Kidsgrove

A high proportion of traffic travels into/through the four Air Quality Management Areas (AQMAs) within the Borough which have been declared for Nitrogen dioxide ($NO_2$), these are;

- AQMA 1: Liverpool Road, Kidsgrove
- AQMA 2: Newcastle-under-Lyme Town Centre
- AQMA 3: Maybank-Wolstanton-Porthill
- AQMA 4: Little Madeley

Road traffic is the most significant source of pollution to the Borough; however, other sources include industrial and domestic emissions. Certain industries (Permitted Processes) are regulated by the Borough Council in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (5). Currently there are 43 Part B

5 The Environmental Permitting (England and Wales) Regulations 2016 (legislation.gov.uk)

processes and 3 Part A2 processes within the Borough. The Environmental Permits for processes regulated by the Borough Council can be found on the Public Register 6.

The Environment Agency is responsible for the regulation of Part A processes, also under the Environmental Permitting (England and Wales) Regulations 2016. One of the Part A process within the borough is a landfill. Over the past 12 months, intensive work has been carried out by the Borough in conjunction with the Environment Agency, UK Health Security Agency, and Staffordshire County Council Public Health, to investigate complaints concerning gaseous emissions from this landfill, situated approximately 1.3 Kilometres outside of AQMA 2: Newcastle-under-Lyme Town Centre.

Complaints relating to odours from the site have been received from properties across the Borough. Although methane is the primary component of landfill gas, a number of other compounds, including nitric oxides are associated with the breakdown of waste substances. The Environmental Permits for processes regulated by the Environment Agency can be found on the Public Register (7).

## Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy (8) sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero (9) sets out 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.

6 https://www.newcastle-staffs.gov.uk/protection/environmental-permit

7 Public registers (data.gov.uk)

8 Defra. Clean Air Strategy, 2019

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

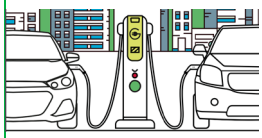
Pollutant concentrations in all areas were lower than in previous years, due to some extent to the Government's enforced travel restrictions in response to the Covid-19 pandemic. Vehicle miles travelled on Great Britain's road decreased by 21.3% in 2020 compared to the previous year (10). The reduction in traffic movement had a dramatic impact on the $NO_2$ concentrations for this period and is shown in lower than previous monitored concentrations across the Borough. Therefore, monitoring data should be treated with caution, as it may not be representative of concentrations when traffic return to more normal numbers.

## Local actions to improve air quality

| PROJECT | ACTION | OUTCOME/ IMPACT |
|---|---|---|
|  <br>**Ministerial Direction number 1. Mandating compliance with the EU's N0$_2$ annual mean limit value (which applies to the majority of areas which are publicly accessible) in the shortest possible time for the A53 from Basford Bank to Victoria Street** | An options appraisal to achieve compliance with the EU's N0$_2$ annual mean limit value (which applies to the majority of areas which are publicly accessible) in the shortest possible time, has identified that a traffic management scheme involving bus gate restrictions at peak times of the day would achieve compliance in the shortest possible time when compared to a benchmark Clean Air Zone. This together with measures in the neighbouring city of Stoke on Trent form the basis of the North Staffordshire Local Air Quality Plan | A full business case is to be prepared for submission to the DEFRA minister by Summer 2022. Subject to acceptance, it is anticipated that the bus gate and associated measures will be in place early in 2023.<br><br>For up-to-date information on progress with the associated North Staffordshire Local Air Quality Plan<br><br>Click here |

10 Road Traffic Estimates in Great Britain: 2020 (publishing.service.gov.uk)

| PROJECT | ACTION | OUTCOME/ IMPACT |
|---|---|---|
| **Ministerial Direction number 2. Mandating compliance with the EU's $N0_2$ annual mean limit value (which applies to the majority of areas which are publicly accessible) in the shortest possible time for the A53 from Basford Bank to Victoria Street– by a bus retrofit scheme requiring the upgrade of buses to Euro IV emissions standard by winter 2020 (NULBC lead)** | Works have been completed to 23 buses with CVRAS accredited exhaust abatement technology and replacement of hydraulic fans with electrical systems | Modelling shows that this will result in a reduction of 1µg/$m^3$ of $NO_2$ along the A53 and wider route. Monitoring to continue for 5 years to evaluate impact. Emissions likely to be greater impacted by Covid-19 related restrictions and reductions on private vehicle use due to working from home. Click here |

| PROJECT | ACTION | OUTCOME/ IMPACT |
|---|---|---|
|  **Low / zero emission taxi infrastructure charging scheme** | In progress. Sites being evaluated for suitability for installation of rapid charging infrastructure for both public and taxi / P.H.V. use | A contractor has been appointed to undertake the installation and operation of a network of EV charging infrastructure under a ten year concession. Planned installation and operation by spring 2022. Drivers will also be able to access sites in the Stafford Borough and Stoke-on-Trent City Council areas under this joint project.<br><br>There will be engagement with the taxi and P.H.V. trade to promote EV's during the life of the concession.<br><br>For further information Click here |
| **Air Aware' initiative** | In progress. This project is being delivered by Staffordshire County Council with the support of District Council's | Developments and further information can be found at<br><br>For further information Click here |
| **ADEPT -Simulate Live Labs' Air Labs Sensors around Newcastle Town Centre Ring Road** | Sensors are to be trialled for 12 months around the 'Belong' Care Home on Lower Street, which historically has been the site of the highest exceedances of the $NO_2$ annual mean objective. | Sensor data is providing a detailed picture on traffic flows and meteorological conditions influence vehicle emissions around the ring road at relatively little cost. The scheme is set to run until Autumn 2021 |

| PROJECT | ACTION | OUTCOME/ IMPACT |
|---|---|---|
| | Sensors will also be installed around the ring road. | For further information Click here |
| **ADEPT -Simulate Live Labs' Active Green Wall on boundary of playground at Hassell Street County Primary** | A living Green Wall with Active Airflow is to be installed along the perimeter of the early year's playground. Emissions either side will be measured to evaluate effectiveness | The early evidence from the Live Lab programme suggests that using plants in locations such as buildings and public spaces adjacent to main roads, train stations and construction sites, has the potential to make a noticeable difference to the quality of air.<br><br>For further information Click here |
|  <br>**DFT supported Electric scooter trial for hire at various sites** | Installed and in use, although COVID-19 pandemic has impacted upon uptake by members of the public | Trial hire scheme in selected areas of the Borough involving 110 e-scooters provided by Zwings Scooters, initially set to run from September 2020 to Summer 2021.<br><br>For further information Click here |
| **Continued Engagement with HS2 Ltd and contractors re design, build and operation of HS2 Phase 2a** | Borough Council Environmental Health staff continue to engage with HS2 Ltd and its contractors to ensure that the environmental health related effects of the scheme (air quality, noise, land contamination, light) as it passes through the Borough | HS2 have committed to best practice in the management of environmental health effects and is committed to not causing any exceedances of Air Quality Standards. The Council will continue to actively engage with HS2 during all phases leading to |

| PROJECT | ACTION | OUTCOME/ IMPACT |
|---|---|---|
| | are fully considered and assessed | the operation of the railway within the Borough. |

## Conclusions and Priorities

Monitoring data for 2020 shows that all annual mean concentrations were below the annual mean objective. However, this is due in part to reduced traffic numbers during Covid-19 travel restrictions. Monitoring will continue in all areas of the Borough to assess whether concentrations remain below the objective, once traffic numbers return to normal.

In addition to working to bring concentrations below the annual objective in all areas of the Borough, we will continue to assess planning applications to ensure that future developments and changes to the road networks across the Borough do not lead to an increase in the $NO_2$ concentration above the annual mean objective of 40µg/$m^3$,

### Conclusion Summary

| | CONCLUSIONS | SUMMARY |
|---|---|---|
| 1 | No exceedances within or outside of existing AQMAs | There were no exceedances in 2020, but this should be treated with caution. Traffic emissions were significantly reduced due to Covid-19 travel restrictions, leading to lower monitored concentrations. |
| 2 | Significant trends | AQMA 1: Liverpool Road, Kidsgrove – no clear trend. Five years of results less than 10% of the UK objective not yet achieved. Monitoring will continue.<br>AQMA 2: Newcastle-under-Lyme Town Centre – no clear trend. Five years of results less than 10% of the UK objective not yet achieved. Monitoring will continue. |

| | | |
|---|---|---|
| | | AQMA 3: Maybank-Wolstanton-Porthill - no clear trend. Five years of results less than 10% of the UK objective not yet achieved. Monitoring will continue.<br>AQMA 4: Little Madeley – downward trend. All monitoring below the objective for 5 consecutive years (2015-2019). AQMA can be revoked. |
| **3** | Revoking of AQMA 4: Little Madeley | Monitoring data for the five years 2015 to 2019, shows concentrations below 36 µg/m³ (10% of the objective). A downward trend is shown during that period. Therefore, AQMA 4: Little Madeley can be revoked. |
| **4** | Review AQMA 3: Maybank-Wolstanton-Porthill | $NO_2$ concentrations within this AQMA for years 2016 to 2019 have been below 36µg/m$^3$ at five of the six long-term monitoring sites. We propose to keep this AQMA in operation to assess the effects of the Etruria Valley Link Road and the impacts of the measures introduced to bring about compliance with the $NO_2$ annual mean limit value on the A53 in Newcastle-under-Lyme. |
| **6** | Exceedances of air quality objectives outside any existing AQMAs, which have led to the amendment or designation of a new AQMA | None identified in 2020. |
| **7** | New developments which may impact upon air quality | None identified in 2020 |

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| **8** | Air Quality Action Plan update | Will require updating following the revocation of AQMA 4: Little Madeley |

## Local Engagement and How to get Involved

If residents and businesses reduce the amount of fuel and chemicals used, it will improve air quality. The following ways can help:

**Commute**

- Visit Air Aware Staffordshire which includes;
  - Bulletins for inspiration and information on ways and initiatives to reduce pollution from travelling,
  - Leaving the car at home one day a week. Further information can be found at www.staffssaferroads.co.uk/
  - Turning off car engines when vehicle is idle
  - Consider car sharing your journey further guidance can be found at https://liftshare.com/uk
  - Using a low/ zero carbon vehicle
  - Servicing vehicles
  - Working from home
  - Using public transport Travel planning APP's are available for most smart phones. Further details can be found at https://www.travelsmartapp.com/
  - Consider an electric vehicle

**School Run**

- Walking or cycling to school is not only good for health but it will save on fuel costs and help reduce local air pollution. Further guidance can be found within Travel into School

https://www.staffordshire.gov.uk/Education/Schooltransport/Active-school-travel/Travelling-into-School.aspx

- Take turns with friends, neighbours or family to drive or walk the children to school. Check whether your school has a travel plan.

**Workplace energy, transport and infrastructure**

Bespoke workplace travelling plans to support employees and employers to use more environmentally sustainable methods of travel into work and use of vehicles for work. For further information visit https://www.staffordshire.gov.uk/Business/Workplace-health/Active-travel-and-air-quality-in-the-workplace.aspx

Grants may be available to support your business in becoming more energy efficient and towards the purchase of cleaner vehicles and support with charging infrastructure. Further information can be found from the following and also your energy supplier;

https://www.gov.uk/government/organisations/office-for-low-emission-vehicles

https://energysavingtrust.org.uk/

https://sben.co.uk/

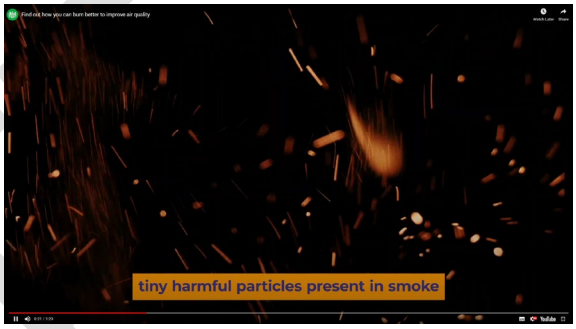
**Around The Home**


- Use water-based or low solvent paints, glues, varnishes and wood preservatives, look for brands with a low VOC content.
- Make sure your home is well ventilated especially during DIY or cleaning.
- Have your central heating system checked regularly to avoid risking exposure to toxic carbon monoxide. Make sure you use a Gas Safe Registered engineer.

- Keep wood stoves and fireplaces well maintained, and make sure that wood burners are exempted for use in smoke control areas. Visit https://uk-air.defra.gov.uk/library/burnbetter/ for advice.

✓ Ready to use wood bought from a Woodsure Certified Supplier, will offer the following benefits:

- Dry, Ready to Burn wood/logs & briquettes make any appliance more efficient. Look for the Woodsure logo.
- Burning dry wood instead of wet wood is part of the solution to reducing the impact on our environment.



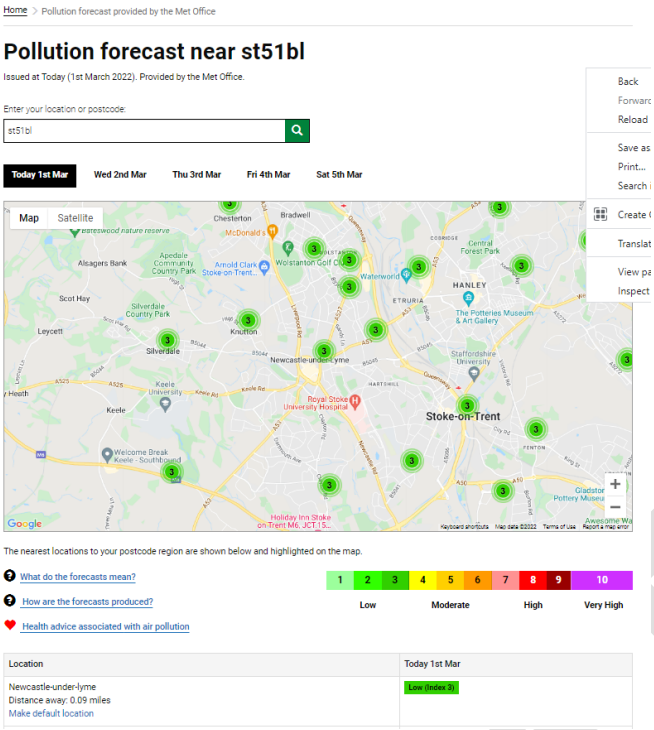

- Burning wet wood increases emissions and has a greater impact on air quality.
- Any appliance and chimney system will suffer from smoke produced from wet wood, which increases maintenance and repair requirements, making it harder for chimney sweeps to keep systems in safe, effective condition.
- Burning waste and treated wood (e.g. old furniture) can emit harmful

✓ Be energy efficient- make sure your house is well insulated and use energy efficient appliances. Your energy supplier may offer grants to insulate your home. Staffordshire County Council currently offers targeted grants. To make you home warmer and more energy efficient https://www.staffordshire.gov.uk/Warmer-Homes/Staffordshire-Warmer-Homes.aspx


✓ Purchase "Green Power" for the electricity in your home. (Contact your energy supplier or Staffordshire Warmer Homes)

✓ Avoid using bonfires to dispose of waste and never burn household waste, especially plastics, rubber and treated timber. See our webpages for advice on recycling, household rubbish and garden waste.

✓ Before organising days out, check the DEFRA air pollution forecast




For general information and air quality forecasts, Defra provide information at the following website: https://uk-air.defra.gov.uk. Forecasting uses a user-friendly index band to quickly demonstrate general short term air levels in a localised area, and supplements this with advice for 'at risk individuals' and the general public.

Newcastle-under- Lyme Borough Council's air quality reports and action plan documents are accessible from the following link https://www.newcastle-staffs.gov.uk/airquality

For enquires or suggestions on how to improve air quality please feel free to contact us:

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| Write to: | The Environmental Protection Team,<br>Newcastle-under- Lyme Borough Council<br>Castle House<br>Barracks Road<br>Newcastle under Lyme<br>ST5 1BL |
| Email: | environmental_health@newcastle-staffs.gov.uk |
| Telephone: | 01782 717717 |

# Table of Contents

## Figures



## Tables

# 1 Local Air Quality Management

This report provides an overview of air quality in Newcastle under Lyme Borough during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Newcastle under Lyme Borough Council to improve air quality and any progress that has been made.

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

# 2 Actions to Improve Air Quality

## Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

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

- $NO_2$ annual mean;

We propose to revoke AQMA 4: Little Madeley (see monitoring/additional section).

## 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 | Name and Date of AQAP Publication | Web Link to AQAP |
|---|---|---|---|---|---|---|---|---|
| AQMA 1: Liverpool Road, Kidsgrove | Jan-15 | NO2 Annual Mean | Exceedance of the $NO_2$ annual mean objective along Liverpool Road A50, Kidsgrove. | NO | 48 | 30.2 | Newcastle under Lyme Air Quality Action Plan 2019 – 2024 | www.newcastle-staffs.gov.uk/environment/air |
| AQMA 2: Newcastle-under-Lyme Town Centre | Jan-15 | NO2 Annual Mean | Exceedance of the $NO_2$ annual mean objective. Covers Newcastle under Lyme Town Centre including the ring road A53, King Street, George Street and London Road to the boundary with the City of Stoke on Trent AQMA | YES | 58.8 | 34.5 | Newcastle under Lyme Air Quality Action Plan 2019 – 2024 | www.newcastle-staffs.gov.uk/environment/air |
| AQMA 3: Maybank- | Jan-15 | NO2 Annual Mean | Covers the principal routes between Maybank, | YES | 46.5 | 24.6 | Newcastle under Lyme Air Quality | www.newcastle-staffs.gov.uk/environment/air |

| 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 | Name and Date of AQAP Publication | Web Link to AQAP |
|---|---|---|---|---|---|---|---|---|
| Wolstanton-Porthill | | | Wolstanton and Porthill. Declared due to exceedances of the $NO_2$ annual mean in Maybank High Street and in the Porthill area | | | | Action Plan 2019 – 2024 | |
| AQMA 4: Little Madeley Check all refs to AQMAs | Jan-15 | NO2 Annual Mean | Declared around two properties at Little Madeley due to an exceedance of the $NO_2$ annual mean arising from the M6 motorway. | YES | 52.1 | 18.4 | Newcastle under Lyme Air Quality Action Plan 2019 – 2024 | www.newcastle-staffs.gov.uk/environment/air |

☒ **Newcastle under Lyme Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

☒ **Newcastle-under-Lyme Borough Council confirm that all current AQAPs have been submitted to Defra**

# Progress and Impact of Measures to address Air Quality in Newcastle under Lyme Borough

Defra's appraisal of last year's ASR concluded

| DEFRA APPRAISAL COMMENT | NEWCASTLE UNDER LYME BOROUGH COUNCIL COMMENT |
|---|---|
| Report accepted | Noted |
| The Council have included new measures in 2020 which is welcomed. This demonstrates that the Council are continuing to review their measures and add additional measures when required. | Noted11 |
| The Council have provided an update on progress made on their AQAP measures. They have discussed which key measures they anticipate completing within the reporting year and what barriers to implementation they anticipate facing in the coming year. The Council anticipate funding to be the main barrier to implementation. The Council are encouraged to continue providing updates to their measure so that progress can be easily tracked. | Noted |
| An extensive list of measures on how the Council plan to tackle $PM_{2.5}$ has been included and is welcomed.<br>The Council have presented $NO_2$ trends with respects to AQMA. This is useful as it allows the reader to easily understand spatial trends in $NO_2$ within the AQMAs. However, it would also be beneficial for the Council to | Noted. A discussion on $NO_2$ trends outside of the AQMAs will be included. |

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| include a discussion on $NO_2$ trends outside of the AQMAs in future reports. | |
| There are inconsistencies in the concentrations provided for DT104. Table B.1 states that the concentration at this site is 58.8 µg/m$^3$ whilst in Tables 1.1, Table A.2 and in-text discussion states that the concentration is 54.5 µg/m$^3$. Can the Council rectify this issue before the publication of the ASR and ensure more care is taken in future ASRs. | Noted. Efforts will be made to avoid inconsistency in future reports. |
| It appears as though the incorrect concentration for the Kidsgrove AQMA has been included in Table 1.1. The table states the AQMA as having a maximum concentration of 47.2 µg/m$^3$ at a site of relevant exposure. This appears to be the non-distance corrected value. In-text discussions and other tables (such as in Table B.1) in the report state at the concentration is in fact 38.2 µg/m$^3$ once distance correction is applied. Can the Council please ensure that only distance corrected values are included in Table 1.1. | Noted. Only distance corrected values will be included in Table 1.1 |
| No discussion has been provided on the status of the AQMAs. As such Maybank-Wolstanton-Porthill AQMA and Madeley AQMA have shown compliance with the $NO_2$ annual mean since 2013. It is suggested that the Council may wish to consider the potential revocation of these AQMAs. | Noted. AQMA 4: Little Madeley is to be revoked following 5 years of compliance with the $NO_2$ annual mean objective.<br>Monitoring of AQMA 3: Maybank-Wolstanton-Porthill will be undertaken with a view to revoke this AQMA if concentrations remain below the objective once traffic |

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| | numbers return to normal. |
| The report still refers to Nitrogen Dioxide as $N0_2$ which is incorrect – the Council should ensure that all uses of $N0_2$ are replaced by $NO_2$. | Noted. |

Newcastle under Lyme Borough Council, along with partners has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Thirty measures are included within Table 2.2, together with the progress made by the Borough Council, Staffordshire County Council or Highways England during the reporting year of 2021. Barriers restricting the implementation of the measure are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans.12

Key completed measures are:

| MEASURE | SUMMARY |
|---|---|
| Review of AQMAs has identified compliance with $NO_2$ annual mean objective limits at AQMA 4: Little Madeley | Evidence for revocation of this AQMA is based on the measured annual mean nitrogen dioxide concentrations having been below the annual mean objective for the years 2015 to 2019. We will be consulting on revocation of this AQMA in 2022. |
| Upgrade of buses to Euro VI standard by winter 2020 | Works have been completed. It is hoped that this will result in a reduction of 1µg/m$^3$ of $NO_2$ along the A53 and wider route |

12 The Air Quality Action plan for the Borough can be found at www.newcastle-staffs.gov.uk/environment/air

| | |
|---|---|
| Electric Vehicles | The Borough Council has taken delivery of three electric vans for use by the Borough Council's Pest Control and Dog Warden Team. |
| 'Simulate Live Labs' | Market identified solutions are being trialled for 12 months around the 'Belong' Care Home on Lower Street, which has been the site of the highest exceedances of the $NO_2$ annual mean objective over previous years. The Borough Council is awaiting feedback from the 'Air Labs' team about the project. |
| Electric scooters for hire at sites across the Borough | Installed and in use, although COVID-19 pandemic has impacted upon uptake by members of the public |

Newcastle under Lyme Borough Council expects the following measures to be completed over the course of the next reporting year:

| MEASURE | SUMMARY |
|---|---|
| Low emission taxi infrastructure scheme<br><br>Network of rapid charging infrastructure to be established by 2021/2 | In progress. This tender is being led by Stoke on Trent City Council on behalf of Stafford BC and Newcastle under Lyme BC.<br><br>A contractor has been approved, site investigation for locations have been completed |
| Scheme to Reduce congestion on Liverpool Road, Kidsgrove | A revised scheme to reduce congestion on Liverpool Road, Kidsgrove is to be implemented by the County Council. This will see optimisation of traffic light signals at the junction of Liverpool Road / The Avenue and also a partial ban on turns out of Heathcote Street onto Liverpool Road |

| | |
|---|---|
| LSTF funding of cycling walking and bus links between Newcastle-under-Lyme and Stoke. | A new footpath and cycling link is to be installed as part of HE junction improvement works between the A500 at Wolstanton and Porthill |
| Borough Wide Air Quality Strategy | Delayed pending publication of the revised local development plan for Newcastle under Lyme. |
| Inclusion of air quality related planning policies in new joint local plan | Delayed pending publication of the revised local development plan for Newcastle under Lyme. |
| Develop policies to promote EV charging infrastructure in the Development Planning Process | Paused pending outcome of consultation on changes to building regulations concerning EV infrastructure for new and upgraded developments |
| Develop policies to support alternative vehicle fuelling technologies | Delayed pending publication of the revised local development plan for Newcastle under Lyme. Work is still continuing on drafting policies. |
| Voluntary Quality Network Partnership with bus operators | A decline in bus passenger travel and withdrawal and reliability of bus services is of major concern. Outside of a VQNP with operators, there is engagement with operators on an informal basis to identify issues and to jointly address challenges. |
| Kidsgrove Railway Station Transport hub | This scheme has been delayed due to unforeseen ground conditions on site. |
| Review location of bus stops to facilitate traffic flow around Liverpool Road / The Avenue. | An objection has been received which has led to the proposal being reviewed prior to a formal decision being made on whether to proceed |

| | |
|---|---|
| Borough Wide Air Quality Strategy | Delayed pending publication of the revised local development plan for Newcastle under Lyme. |

Newcastle-under-Lyme Borough Council's priorities for the coming year are;

| PROJECT NAME | SUMMARY |
|---|---|
| Revoke AQMA 4: Little Madeley | Currently proceeding with revocation of this AQMA |
| Review monitoring results for AQMA 3: Maybank-Wolstanton-Porthill | $NO_2$ concentrations have been at or below 36µg/$m^3$ at five of the six monitoring locations for the years 2016 to 2019. Concentrations for 2020 are lower than previous years due to reduced traffic emissions during travel restrictions. This AQMA will remain in place until monitoring confirms that all concentrations remain below 36µg/$m^3$ (10% of the objective) at all sites, following traffic number returning to normal. |
| Continue with current air quality monitoring. | To support LAQM process. No changes planned |
| Support uptake of ULEV | Continue with electric vehicle projects listed above. |
| Complete air quality developer guidance document. | As mentioned above. |
| Partnership working with Staffordshire County Council and other Staffordshire Authorities | Continue process that is delivering measures listed above. |

The principal challenges and barriers to implementation that Newcastle under Lyme Borough Council anticipates facing are:

| PROJECT NAME | POTENTIAL BARRIER |
|---|---|
| All projects | Staffing.<br><br>The continued impact that the COVID-19 pandemic has had on staff workloads coupled with an ongoing intensive investigation that Environmental Protection staff have been involved with, has greatly reduced staffing resource. |
| Revoke AQMA 4: Little Madeley | Challenges of objections to revocation process for AQMA 4 Little Madeley. |
| Review monitoring results AQMA 3: Maybank-Wolstanton-Porthill | Possible implications of future developments in the area include completion of junction improvements along the A500 between Wolstanton and Porthill, a new link round from Grange Lane in Etruria (Etruria Valley Link Road) and plans to address NO2 EU limit value exceedances on the A53 between Basford Bank and Victoria Street. (Current modelling predicts no exceedances of N02 annual mean objectives at relevant locations due these various schemes) |
| Uptake of ULEVs | • Cost & availability of electric vehicles.<br>• Charging infrastructure availability.<br>• Suitable vehicles for taxi purpose.<br>• Perceptions of limited journey range and battery life.<br>• Future environmental problems from sourcing battery materials reverse attitude / policies towards electric vehicles without alternatives available. |

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

| PROJECT NAME | REASON FOR DELAY |
|---|---|
| Developer guidance document & developer contributions procedure | Staffing.<br>The continued impact that the COVID-19 pandemic has had on staff workloads coupled with an ongoing intensive investigation that Environmental Protection staff have been involved with, has greatly reduced staffing resource. |
| Inclusion of air quality related planning policies in new joint local plan | Delayed pending publication of the revised local development plan for Newcastle under Lyme. |
| Develop policies to promote EV charging infrastructure in the Development Planning Process | Paused pending outcome of consultation on changes to building regulations concerning EV infrastructure for new and upgraded developments. |
| Develop policies to support alternative vehicle fuelling technologies | Delayed pending publication of the revised local development plan for Newcastle under Lyme. Work is still continuing on drafting policies. |
| Voluntary Quality Network Partnership with bus operators | A decline in bus passenger travel and withdrawal and reliability of bus services is of major concern. Outside of a VQNP with operators, there is engagement with operators on an informal basis to identify issues and to jointly address challenges. |
| Kidsgrove Railway Station Transport hub | This scheme has been delayed to due to unforeseen ground conditions on site. |
| Review location of bus stops to facilitate traffic flow around Liverpool Road / The Avenue. | An objection has been received which has led to the proposal being reviewed prior to a formal decision being made on whether to proceed |

| | |
|---|---|
| Borough Wide Air Quality Strategy | Delayed pending publication of the revised local development plan for Newcastle under Lyme. |

Newcastle under Lyme Borough Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in

- AQMA 1: Liverpool Road, Kidsgrove
- AQMA 3: Maybank-Wolstanton-Porthill

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Newcastle under Lyme Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Newcastle Town Centre AQMA.

## Table 2.2 – Progress on Measures to Improve Air Quality

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Kidsgrove AQMA – Action Plan Measures** | | | | | | | | | | | | | | | |
| **K1** | Kidsgrove Railway Station Transport hub including parking and improved bus/rail interchange with new bus facilities closer to the station, Real Time Passenger Information provided at Kidsgrove station and at the bus stops, disabled/cycle parking, drop off and taxi facilities, and safer pedestrian and cycle access routes to the station | Transport Planning and Infrastructure | Public transport improvements-interchanges stations and services | 2015 | 2025 | Kidsgrove Town Deal Board & East Midlands Trains | Developers & highway infrastructure funding | NO | Partially Funded | £1 million - £10 million | Planning | Has potential to increase patronage / increase use of public transport and private car | Delivery of measure | Business Case and approval from DCLG required | Business case requires approval and funding to deliver project |
| **K2** | Traffic light optimisation to reduce congestion along Liverpool Road and prevention of right turn into Heathcote Street from A50 | Traffic Management | UTC, Congestion management, traffic reduction | 2016 | 2021 | Staffordshire county Council | Staffordshire CC | NO | Funded | £50k - £100k | Completed | Reduced vehicle emissions | Delivery of measure | Completed | Community support / Funding. Scheme to be revised from original proposal to allow right turn. |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **K3** | Review location of bus stops to facilitate traffic flow around Liverpool Road / The Avenue | Traffic Management | UTC, Congestion management, traffic reduction | 2018 | 2020 | Staffordshire county Council | Staffordshire County Council | NO | Funded | £10k - 50k | Aborted | Reduced vehicle emissions | Delivery of measure | Postponed pending review of monitoring results | Community support Objection from a resident has caused the scheme to be withdrawn for time being. We will monitor the impact of the Heathcote Street scheme on air quality, before we decided whether we need to pursue delivery of this proposal |
| **Newcastle under Lyme Town Centre – Air Quality Management Area – Air Quality Action Plan Measures** | | | | | | | | | | | | | | | |
| **N1** | Ensure that effects of additional traffic generated by Ryecroft mixed retail / student development are properly understood | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2016 | 2019 | Henry Davidson Developments / Planning Application to Newcastle under Lyme Borough Council | Permission granted with conditions requiring assessment and mitigation | NO | Not Funded | £100k - £500k | Aborted | No breach of AQO's | Monitoring | Cancelled | Scheme not taken forward. Alternative proposals being explored for Ryecroft Site as part of Newcastle under Lyme Town Deal |
| **N2** | Ensure that effects of emissions from plant associated with Ryecroft mixed retail / student development are properly understood | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2016 | 2019 | Henry Davidson Developments / Planning Application to Newcastle under Lyme Borough Council | Permission granted with conditions requiring prior approval | NO | Not Funded | £10k - 50k | Aborted | No breach of AQO's | Emissions modelled and quantified | Cancelled | Scheme not taken forward. Alternative proposals being explored for Ryecroft Site as part of Newcastle under Lyme Town Deal |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **N3** | Wayfinding strategy Newcastle under Lyme Town Centre and outlying areas for walking and cycling | Promoting Travel Alternatives | Promotion of walking | 2016 | | Lead by Newcastle under Lyme Borough Council with support from Staffordshire County Council, Sustrans and Town Centre Business Improvement District | Future High Street Fund | NO | Funded | £50k - £100k | Planning | Not quantified | Delivery of strategy | Business Case and approval from DCLG required | Business case requires approval and funding to deliver project |
| **N7** | Ring-Road enhanced signage & subway improvements | Traffic Management | Other | 2016 | 2021 | Lead by Newcastle under Lyme Borough Council with support from Staffordshire County Council, Sustrans and Town Centre Business Improvement District | Staffordshire CC | NO | Funded | £10k - 50k | Completed | Reduced vehicle emissions | Delivery of strategy | Strategy and plans still under development. Improvements in air quality and congestion considered as a priority along with walking cycling and public transport connectivity. | Options identified for consultation / Funding possibly through FHSF. |
| **N8** | Car Park Variable Message Signing Street parking restrictions | Traffic Management | Other | 2016 | 2022 | Lead by Newcastle under Lyme Borough Council with support from Staffordshire County Council, Sustrans and Town Centre Business Improvement District | Newcastle under Lyme B.C. & Staffordshire CC | NO | Not Funded | £50k - £100k | Aborted | Reduced vehicle emissions | VMS signs in place and street parking restrictions enforced | Cancelled | Other priorities identified for budget |
| **N9** | RTPI and subsidised bus travel / green travel plans sought for large-scale multi occupancy residential accommodation. Town centre expected to accommodate 3000 students for local universities | Policy Guidance and Development Control | Other policy | 2016 | 2022 | Staffordshire County Council with support via conditions on planning applications for inclusion in high occupancy student / keyworker accommodation | Staffordshire County Council through Section 106 contributions and Future High Street Fund | NO | Partially Funded | £100k - £500k | Implementation | Increased bus journeys from stops | Reduced vehicle emissions | A number of developments within the town centre are capitalising on proximity to public transport links, cycling infrastructure improvement on development and in network sought through planning. Travel planning sought via planning and monitored via county highways. Reduced rate bus passes for university students promoted. | Financial viability of development schemes to support required S106 / Resistance from developers. |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MD 1** | Ministerial Direction to implement bus retrofit scheme for public bus service using A53 between Sandy Lane and A500/A53 Roundabout at latest by 2021 and in the soonest possible timeframe | Promoting Low Emission Transport | Other | 2018 | 2020 | NULBC / First PMT / JAQU | DEFRA grant (100%) | YES | Funded | £100k - £500k | Completed | EU N02 Annual mean exceedance non-compliance reduced by 1 year. | 23 Buses retrofitted by end of 2020 | Grant secured. Legal agreement entered into between operator and council | Traffic Regulation Condition is to be sought to require operator to utilise Euro IV or better moving forward |
| **MD 2** | Ministerial Directions served on NULBC and SOTCC requiring Further Evaluation of measures to achieve compliance with the Ambient Air Quality Directive requirements for Nitrogen Dioxide in the soonest possible timeframe | Traffic Management | Other | 2019 | 2022 | National Highways / Staffs County Council / Stoke on Trent City Council and Newcastle under Lyme Borough Council Environmental Health | DEFRA grant (100%) | YES | Funded | £1 million - £10 million | Planning | EU N02 Annual mean achieved in shortest possible timescale | Compliance with EU $NO_2$ limit value | Covid 19 has affected initial compliance date. Options appraisal undertaken and preferred option of bus gate and traffic management agreed for consultation agreed by JAQU | Preferred option of time restricted bus gate at peak hours and reduced turning across traffic is subject to public consultation. |
| **Maybank, Wolstanton and Porthill Air Quality Management Area – Air Quality Action Plan Measures** | | | | | | | | | | | | | | | |
| **W1** | Improvements to Wolstanton and Porthill Junctions on A500 to reduce congestion | Traffic Management | UTC, Congestion management, traffic reduction | 2016 | 2021 | National Highways | Highways Agency | NO | Funded | > £10 million | Completed | Reduction in congestion / improved journey times | Modelling of air quality impacts and monitoring | Completion by Summer 2020 delayed due to Covid 19 | Funding identified by HE. Project flagged as high risk for air quality along A500 due to exceedance of EU action level |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **W2** | Short term routing strategy to mitigate impact of congestion associated with works to A500 | Traffic Management | UTC, Congestion management, traffic reduction | 2019 | 2021 | National Highways / Staffs County Council / Stoke on Trent City Council and NULBC Environmental Health | Highways Agency | NO | Funded | £100k - £500k | Completed | Potential short term negative impact during build | Modelling of air quality impacts and monitoring | No negative impacts identified during build | Negative impacts not identified through monitoring or congestion impacts |
| **W3** | Evaluate the impact of the Etruria Valley Link Road in the May Bank, Porthill, Wolstanton area and provide appropriate mitigation | Traffic Management | Strategic highway improvements, | 2010 | 2022 | Lead by Stoke on Trent City Council with planning application to Newcastle under Lyme Borough Council/ Staffordshire County Council involved | Stoke on Trent City Council scheme | NO | Partially Funded | £10k - 50k | Implementation | unclear | Modelling of air quality impacts and monitoring | Minor adverse impact but no exceedances identified in 2021 | Potential negative effects on Maybank Porthill, Wolstanton AQMA. Potential to improve AQ in Stoke on Trent at Basford Bank where hourly mean N02 is being exceeded. Scheme has the potential to add a positive contribution to mitigation measures in this area Monitoring will continue in both areas for at least 5 years post opening to evaluate success. AQMA to remain as a safeguard. |
| **Little Madeley – Air Quality Management Area - Air Quality Action Plan Measures** | | | | | | | | | | | | | | | |
| **M1** | Continue to monitor N02 at relevant location in Little Madeley | Other | Other | 2010 | 2023 | Newcastle under Lyme Borough Council Environmental Health | Newcastle under Lyme Borough Council | NO | Funded | < £10k | Implementation | As per reported results | Monitoring | Compliance demonstrated since 2016. AMQA revocation planned to be subject to consultation and revocation in 2022 | Nil |
| **M2** | Engage with NH concerning proposals to introduce smart managed motorway / hard shoulder running in Madeley area between junctions 15 and 16 of the M6 motorway | Traffic Management | Other | 2010 | 2032 | Lead by National Highways | National Highways | NO | Not Funded | < £10k | Planning | Has potential to reduce congestion and vehicle emissions | Project delivered | Not yet commenced | Scheme not yet identified. Sections either side of junctions 15 and 16 of the M6 are being smart managed with hard shoulder running. Local geography is an issue to identifying appropriate solutions |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Borough Wide Air Quality Action Plan – Complementary Measures for all locations including AQMA's** | | | | | | | | | | | | | | | |
| **BW 1** | Borough Wide Air Quality Strategy | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2019 | 2023 | Newcastle under Lyme Borough Council Environmental Health | Newcastle under Lyme Borough Council | NO | Not Funded | < £10k | Planning | Reduction in emissions | Strategy in place | Funding secured, planning phase | Awaiting formal publication of Environment Act 2021 to include relevant criteria. |
| **BW 2** | Air Quality Planning Guidance | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2016 | 2023 | Newcastle under Lyme Borough Council Environmental Health | Newcastle under Lyme Borough Council | NO | Not Funded | < £10k | Postponed | Reduction in emissions | Strategy in place | Postponed | The Council has decided to develop its own Local Plan and the planning guidance will sit alongside this as a material document. |
| **BW 3** | Inclusion of air quality related policies in the joint Newcastle under Lyme and Stoke on Trent Local Plan | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2016 | 2020 | Newcastle under Lyme Borough Council Environmental Health and Planning (Joint project with Stoke on Trent City Council | Newcastle under Lyme Borough Council & Stoke on Trent City Council | NO | Not Funded | < £10k | Postponed | Reduction in emissions | Policies in JLP | postponed | The Council has decided to develop its own Local Plan and relevant polices are being identified. https://www.newcastle-staffs.gov.uk/planning-policy/local-plan |
| **BW 4** | Staffordshire and Stoke on Trent Eco-Stars | Vehicle Fleet Efficiency | Fleet efficiency and recognition schemes | 2015 | 2020 | Staffordshire Local Authorities | Staffordshire LA's | YES | Funded | £500k - £1 million | Completed | Reduction in emissions | Reduced vehicle emissions | Scheme has come to an end in Staffordshire. Several local and national operators including LA's have been appraised under the initiative | Slow take up by operators across County |
| **BW 5** | Eco Stars award for Council Street-Scene and Waste fleet | Vehicle Fleet Efficiency | Fleet efficiency and recognition schemes | 2015 | 2019 | Newcastle under Lyme Borough Council Street Scene Division | Staffordshire LA's | Yes | Funded | £500k - £1 million | Completed | Reduced vehicle emissions | Fleet achieves 5* rating | Implementation on-going | 4* Ecostars award with action plan to move to 5* |
| **BW 6** | Green Travel Plan for new Civic Hub development in Town Centre | Promoting Travel Alternatives | Workplace Travel Planning | 2015 | 2017 | Lead by Staffordshire County Council as building owner in conjunction with Borough Council, Police, Library Service, Social Services, Aspire Housing | Newcastle under Lyme Borough Council | NO | Not Funded | < £10k | Completed | Reduced vehicle emissions | Completed | Completed 2019. | Now in monitoring phase https://publicaccess.newcastle-staffs.gov.uk/online-applications/applicationDetails.do?activeTab=externalDocuments&keyVal=OUTZZDBM01S00 |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BW 7** | Voluntary Quality Network Partnership with bus operators | Alternatives to private vehicle use | Other | 2016 | 2019 | Staffordshire County Council / Stoke on Trent City Council/ Local Bus Companies | Staffordshire County Council as Highways Authority | NO | Not Funded | £50k - £100k | Aborted | Reduced vehicle emissions / | Voluntary quality network operative across area | Aborted | Requires commitment from bus operators and councils. Decline in bus passenger numbers and services affects financial viability for improvements. Local operators use older fleet vehicles across area. |
| **BW 8** | Develop policies to promote EV charging infrastructure and support alternative vehicle fuelling technologies | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2019 | | Newcastle under Lyme Borough Council / Staffordshire County Council | Newcastle under Lyme Borough Council | NO | Not Funded | < £10k | Aborted | Reduction in emissions | Planning Related EV policies in place | Policy drafted | Policy development in draft format. Proposed changes in Building Rags in respect of EV infrastructure has put policy on hold. Will require formal consultation if to be progressed. |
| **BW 9** | Support and participate in appropriate initiatives to encourage uptake of Zero and Low Emission Vehicle Technologies | Promoting Low Emission Transport | Public Vehicle Procurement - Prioritising uptake of low emission vehicles | 2016 | 2022 | Newcastle under Lyme Borough Council, Staffordshire Districts and Staffordshire County Council | OLEV, National Highways & 3rd party funded | YES | Funded | £500k - £1 million | Planning | Reduction in emissions | Details of technologies and initiatives | Successful bid to OLEV LETIS | Procurement is being led by SoTCC. OLEV funding transferred. Tender issued March 2020. Requires formal approval by Staffordshire LA's. Strategy currently in development. |
| **BW 10** | Review the Borough Council's Hackney Carriage and Private Hire Licensing Policy to reduce tail pipe emissions from this sector | Promoting Low Emission Transport | Taxi emission incentives | 2016 | 2019 | Newcastle under Lyme Borough Council | Newcastle under Lyme Borough Council | NO | Not Funded | < £10k | Completed | Reduction in emissions | Policies updated with conditions | Policy approved in spring 2019 | Policy adopted 2019 to 2025. Policies to support air quality improvement and improvements to latest emission standards and reduction in licence vehicle age not taken forward. Vehicles can be no older than 7 years old at date of first licence with council and no upper limit on age, subject to six month testing from 10 years old. If fails a retest will no longer be licensed. |

| Measure No. | Measure | Category | Classification | Year Measure Introduced | Estimated / Actual Completion Year | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BW 11** | Transition the Council Vehicle fleet to Zero and Low Emission Vehicle Technologies | Promoting Low Emission Transport | Public Vehicle Procurement - Prioritising uptake of low emission vehicles | 2016 | 2030 | Newcastle under Lyme Borough Council | Newcastle under Lyme Borough Council | NO | Partially Funded | £1 million - £10 million | Implementation | Reduction in emissions | Policies updated | EURO IV refuse fleet and recycling vehicles delivered March 2020. 3 EV vans for pest control and dog warden service have been delivered. EV chargers installed and operational for council fleet vehicles at Knutton Depot. | Requires budget for capital expenditure by council |
| **HS2 Phase 2a route** | Ensure that emissions associated with construction and operation including off network effects do not cause exceedances of objectives or limit values | Transport Planning and Infrastructure | Public transport improvements-interchanges stations and services | 2017 | 2032 | HS2 and contractors / Newcastle under Lyme Borough Council | HS2 and contractors | NO | Funded | £1 million - £10 million | Planning | Emissions do not breach objectives or limit values | Emissions do not breach objectives or limit values | Discussion to date have deified that HS2 and contractors have assessed air quality impacts and have Environmental Minimum Standards , Construction Plans and monitoring plans in place | Advance works to commence in 2021 with route construction anticipated to commence by 2026 and coming into operation by 2033 |

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), 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.

Particulate matter, or PM, is the term used to describe particles found in the air, including dust, dirt and liquid droplets. PM comes from both natural and man-made sources, including traffic emissions and Saharan-Sahel dust. These particles can be suspended in the air for long periods of time, and can travel across large distances.

PM less than 10 micrometres in diameter ($PM_{10}$) pose a health concern because they can be inhaled into and accumulate in the respiratory system. PM less than 2.5 micrometres in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the greatest health risks, as they can lodge deeply into the lungs and also pass into the bloodstream.

$PM_{2.5}$ is the pollutant which has the biggest impact on public health and on which the Public Health Outcomes Framework (PHOF) D01 Fraction of mortality attributable to particulate air pollution (2019), Public Health Outcomes Framework indicator (13) is based.

13 Public Health England. Public Health Outcomes Framework 1th June https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000005/ati/102/are/E10000028/iid/30101/age/230/sex/4/cid/4/tbm/1/page-options/car-do-0_ine-yo-1:2019:-1:-1_ine-ct-2_ine-pt-0

The Royal College of Physicians (RCP) undertook a review in February 2016 (14) where they found that long term exposure to air pollution impairs lung function growth in children, and that outdoor exposure is linked to lung cancer in adults. Within Staffordshire it is estimated that 5.1%of all deaths can be attributed to exposure to $PM_{2.5}$, compared to 5.1% across England (25,120 deaths annually) (15.) Overall, the estimated cost to individuals and society is more than £20 billion annually for the UK.

### 2.1.1 Particulate Matter (PM2.5) Levels in Staffordshire and Stoke-on-Trent

A number of the Staffordshire Authorities currently monitor locally for PM10. Defra's Automatic Urban and Rural Network (AURN) site, Stoke-on-Trent Centre has a dedicated $PM_{2.5}$ monitor. Table 2.3.1 presents data on the local level of $PM_{2.5}$ annual mean concentrations for the Staffordshire Authorities. Where the data is derived from $PM_{10}$ monitoring this has been adjusted by applying a correction factor of 0.7 to derive the $PM_{2.5}$ component. The correction factor has been derived from the average of all ratios of $PM_{2.5}/PM_{10}$ for the years from 2010 to 2014 for forty sites within the Automatic Urban and Rural Network (AURN) where these pollutants are measured on an hourly basis and follows the guidance published in LAQM (TG16)16.



14 ['Every Breath we Take: The Lifelong Impact of Air Pollution; Report of a working Party, February 2016, ISBN 978-1-86016-567-2],

15 Public Health England. Public Health Outcomes Framework 1th June https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000005/ati/102/are/E10000028/iid/30101/age/230/sex/4/cid/4/tbm/1/page-options/car-do-0_ine-yo-1:2019:-1:-1_ine-ct-2_ine-pt-0 © Crown copyright 2021

16 https://laqm.defra.gov.uk/air-quality/featured/uk-regions-exc-london-technical-guidance/

### Table 2.3. 1 Annual Mean $PM_{10}$ and $PM_{2.5}$ results of monitoring by Staffordshire Authorities 2016 to 2020

| Authority | Site Type | Monitor Location | OS Grid Ref | | Year | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2016 | 2017 | 2018 | 2019 | 2020 |
| Newcastle under Lyme | Roadside | Queen`s Gardens | E385057 | $PM_{10}$ | (5) | (5) | (5) | (5) | (5) |
| | | | N346137 | $PM_{2.5}$ | (5) | (5) | (5) | (5) | (5) |
| Cannock Chase | Roadside | Cannock A5190 | E401392 N309954 | $PM_{10}$ | - | 14 | 18 | 16 | (6) |
| | | | | $PM_{2.5}$ | - | 9.8 | 12.6 | 11.2 | (6) |
| Stoke on Trent | Roadside | Basford | E386288 | PM 10 | - | 23 | 23 | 23 | 17 |
| | | | N346802 | $PM_{2.5}$ | - | 16(1) | 16(1) | 16(1) | 12(1) |
| | Roadside | A50 Roadside Meir | E392548 | PM 10 | 20(2) | 18 | 19 | 20 | (3) |
| | | | N342572 | $PM_{2.5}$ | 14(2) | 13(1) | 13(1) | 14(1) | (3) |
| | Urban Background | Stoke on Trent Central | E388351 N347895 | PM 2.5 | 12 | 9 | 9 | 9 | 7 |
| East Staffordshire | Roadside | Derby Tum | E424671 N324019 | PM 10 | (4) | (4) | (4) | (4) | (4) |
| | | | | PM 2.5 | (4) | (4) | (4) | (4) | (4) |

Notes:

(1)$PM_{2.5}$ results are derived from PM10 monitored results corrected with a 0.7 correction factor in accordance with TG16 – Annex B: Derivation of $PM_{2.5}$ to $PM_{10}$ Ratio. All other results are directly monitored.

(2) Valid data capture for 2015 was 59%. The site was commissioned on 22 May 2015.

(3) Middleport monitor was decommissioned at the end 2015

(4) East Staffordshire`s monitors were decommissioned 2016

(5) Newcastle under Lyme monitors were decommissioned 2016

(6) Cannock Chase no longer monitor PM10 nor PM2.5

As can be seen from the results, concentrations of $PM_{2.5}$ within the Staffordshire Authorities are below the 2020 EU limit value of 25µg/m3.

### 2.1.2 $PM_{2.5}$ and Mortality in Staffordshire & Stoke-on-Trent

Although the levels of $PM_{2.5}$ within the County of Staffordshire and the City of Stoke on Trent are below the 2020 EU Limit value, the impact on adult mortality directly attributable to $PM_{2.5}$ is nonetheless still an important public health issue within Staffordshire and Stoke-on-Trent. This is revealed in data obtained from Public Health England used to inform Public Health Outcomes Framework indicator D01, as shown in Table 2.3.2.

The percentage estimated number of deaths attributable to $PM_{2.5}$ in adults over 30 has been translated into the estimated number of attributable deaths for each local authority area within Staffordshire, and are shown in Table 2.3.3. The data presented to 2019 is the latest data available at time of publication of this report. Approximately 5.1% of deaths within the County can be attributed to $PM_{2.5}$.

**Table 2.3. 2 Estimated average number of deaths by Local authority area attributable to PM2.5 within Staffordshire for adults over 30 (2019)**

| District/County | Percentage |
|---|---|
| **Newcastle-under-Lyme** | 4.9% |
| **Stafford** | 4.9% |
| **East Staffordshire** | 5.3% |
| **South Staffordshire** | 5.1% |
| **Lichfield** | 5.2% |
| **Staffordshire Moorlands** | 4.8% |
| **Cannock Chase** | 5.2% |
| **Tamworth** | 5.6% |
| **Stoke on Trent** | 4.7% |
| **Staffordshire County** | 5.1% |
| **England** | 5.1% |

**Table 2.3. 3 Public Health Outcomes Framework Indicator D.01- Fraction of annual all cause adult mortality attributable to anthropogenic (human made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$) for Staffordshire Authorities 2015 to 2019[5].**

| | 2015 | | | 2016 | | | 2017 | | | 2018 | | | 2019 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| District/ County | Deaths - all causes persons | %* | Estimated attributable deaths | Deaths - all causes persons 30+ | %* | Estimated attributable deaths | Deaths - all causes persons 30+ | %* | Estimated attributable deaths | Deaths - all causes persons | %* | Estimated attributable deaths | Deaths - all causes persons | %* | Estimated attributable deaths |
| **Newcastle-under-Lyme** | 55 | 4.2 | 50 | 1291 | 4.7 | 60 | 1197 | 4.2 | 50 | 1334 | 4.2 | 60 | 1282 | 4.9 | 60 |
| **Stafford** | 60 | 4.7 | 60 | 1254 | 4.8 | 60 | 1267 | 4.3 | 50 | 1336 | 4.2 | 60 | 1315 | 4.9 | 60 |
| **East Staffordshire** | 55 | 4.8 | 50 | 1065 | 5.6 | 60 | 1098 | 5.0 | 50 | 1093 | 4.6 | 50 | 1128 | 5.3 | 60 |
| **South Staffordshire** | 55 | 4.7 | 60 | 1128 | 5.1 | 60 | 1239 | 4.5 | 60 | 1211 | 4.6 | 60 | 1212 | 5.1 | 60 |
| **Lichfield** | 50 | 4.6 | 50 | 1044 | 5.5 | 60 | 1070 | 4.9 | 50 | 1087 | 4.6 | 50 | 1093 | 5.2 | 60 |
| **Staffordshire Moorlands** | 45 | 4 | 40 | 1110 | 4.6 | 50 | 1127 | 3.9 | 40 | 1108 | 3.8 | 40 | 1080 | 4.8 | 50 |
| **Cannock Chase** | 45 | 4.6 | 40 | 879 | 5.4 | 50 | 940 | 4.7 | 40 | 976 | 4.6 | 50 | 908 | 5.2 | 50 |
| **Tamworth** | 30 | 4.9 | 30 | 615 | 6 | 40 | 634 | 5.3 | 30 | 653 | 5.1 | 30 | 678 | 5.6 | 40 |
| **Stoke on Trent** | 2479 | 4.9 | 110 | 2454 | 5.0 | 120 | 2490 | 4.4 | 110 | 2746 | 4.4 | 120 | 2490 | 5.2 | 130 |
| **Staffordshire County** | 390 | 4.5 | 390 | 8386 | 5.2 | 430 | 8572 | 4.5 | 390 | 8792 | 4.4 | 390 | 8692 | 5.1 | 440 |

### 2.1.3 Actions being taken within the Borough of Newcastle-under-Lyme to reduce PM2.5

Newcastle under Lyme Borough Council and Staffordshire County Council are taking the measures detailed within Table 2.3.4 to address $PM_{2.5}$.

## Table 2.3. 4 Actions being taken within Newcastle-under-Lyme to reduce PM2.5

| Measures category | Measure Classification | Effect on reducing NOx and PM10 emissions(low, medium, high) | Reduces PM2.5 emissions | Existing Measure | Measure in Newcastle under Lyme |
|---|---|---|---|---|---|
| **Traffic Management** | Urban Traffic Control systems, Congestion management, traffic reduction | low | ✓ | ✓ | UTC in areas of AQMA 1: Liverpool Road, Kidsgrove and AQMA 2: Newcastle-under-Lyme Town Centre |
| **Promoting Travel Alternatives** | Workplace Travel Planning | low | ✓ | ✓ | www.staffordshire.gov.uk/Transport/Air-quality/Businesses.aspx |
| | Encourage / Facilitate home-working | low | ✓ | ✓ | Agile working policy adopted by Council |
| | School Travel Plans | low | ✓ | ✓ | Funded School Travel Plans for school expansions: 14 Newcastle Borough, |
| | Promotion of cycling | low | ✓ | ✓ | The Local Cycling and Walking Infrastructure Plan is currently under development by SCC |
| | Promotion of walking | low | ✓ | ✓ | |
| | Staffordshire Share a Lift Scheme | | ✓ | ✓ | A new provider is currently being sought for the Staffordshire Lift Scheme |
| **Transport Planning & Infrastructure** | Local Transport Plans and District Strategies | high | ✓ | ✓ | The transport strategy for Newcastle-under-Lyme can be found HERE |
| | Public transport improvements- interchanges stations and services | low | ✓ | ✓ | Kidsgrove Station interchange plans |
| | Cycle network | low | ✓ | ✓ | SCC currently looking to implement improved mapping software for future developments |
| | Bus route improvements | high | ✓ | ✓ | RTPI routes 3 & 4 Newcastle Town Centre. Improved future bus services to Chatterley Valley |
| **Policy Guidance and Development Control** | Planning applications to require assessment of exposure / emissions for development requiring air quality impact assessment | high | ✓ | ✓ | Local Validation list draws attention to requirements |
| | Planning Policies | | ✓ | ✓ | Local plan under development to include policies which will benefit air quality |
| | STOR Sites (Short Term Operating Reserve) Energy Generation. Regulation via planning / permitting regime | high | ✓ | ✓ | 1 STOR site regulated for emissions via Environmental Permit – Norkier Power Holditch |
| | Route Management Plans/ Strategic routing strategy for HGV's | high | ✓ | ✓ | The Local Transport Strategy for Newcastle-under-Lyme can be found HERE |
| **Vehicle Fleet Efficiency** | Promoting low emission public transport | high | ✓ | ✓ | Planned promotion of retrofitted buses on routes 3 / 4 and 4a in preference to private car |
| | Vehicle retrofitting programmes | medium | ✓ | ✓ | £370,000 DEFRA grant to retrofit 23 buses running on routes 3/ 4 and 4a to latest EURO IV. Completed November 2020 |

### 2.1.4 $PM_{2.5}$ in Staffordshire & Stoke-on-Trent - Next steps

As $PM_{2.5}$ is an issue requiring collaboration between the District, County and City authorities within Staffordshire, the following actions are proposed in addition to those

outlined in the action plan. Progress on these and the action plan will be detailed in the next ASR. This has been delayed due to the Covid Pandemic

- To agree a target for reducing Fraction of All-Cause Mortality from $PM_{2.5}$ in each district, city and county authority by 2020 this was delayed due to disruption caused by the Covid-19 Pandemic
- To agree a target for reducing $PM_{2.5}$ exposure (calculated from $PM_{10}$ exposure / background maps / local monitoring where available)
- To maintain compliance with the 2020 EU limit value of 25µg/m3
- To include Public Health Outcome Framework Indicator D01 in the Staffordshire and District Authority and City Council Joint Strategic Needs Assessment for 2019/2020 onwards and to report progress to the relevant Health and Wellbeing Boards. This has been delayed due to disruption caused by the Covid-19Pandemic
- To continue to identify risks affecting $PM_{2.5}$ which need to be addressed at a national level e.g.

  A number of authorities within Staffordshire are receiving applications for STOR (Short Term Operating Reserve) sites to supplement power to the National Electricity Grid at times of peak demand. These sites typically operate during the autumn / winter months and can be high emitters of PM.

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

This section sets out the monitoring undertaken within 2020 by Newcastle under Lyme Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

## Summary of Monitoring Undertaken

### 3.1.1 Automatic Monitoring Sites

Newcastle-under-Lyme Borough Council undertook automatic (continuous) monitoring at one site during 2020. 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 Air Quality Data Management page presents automatic monitoring results for Newcastle under Lyme Borough Council.

A map showing the location of the monitoring site is provided in Appendix D. Further details on how the monitor is calibrated and how the data has been adjusted are included in Appendix C.

### 3.1.2 Non-Automatic Monitoring Sites

Newcastle-under-Lyme Borough Council undertook non- automatic (i.e. passive) monitoring of $NO_2$ at 80 sites during 2020. Forty new triplicate sites (DT 107 to DT146) were set up at the beginning of the 2020 monitoring period to gain baseline data in preparation of possible effects of traffic increase on dispersion routes resulting from actions in the upcoming North Staffordshire Air Quality Action Plan. Single tubes were initially set up, but changed to triple sites from June 2020.

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.

## Individual Pollutants

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

### 3.1.3 Nitrogen Dioxide ($NO_2$)

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

For diffusion tubes, the full 2020 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. Since no concentrations were greater than 36 µg/m³ (within 10% of the objective), distance correction was not carried out.

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

The results from the monitoring campaign for 2020 shows that concentrations of $NO_2$ at all locations were significantly lower than in previous years. There were no exceedances of the annual mean or the hourly mean air quality objective in the borough at any site within or outside of the four AQMAs. The significant reduction in concentrations is in part due to the ‘lockdown’ restrictions enforced upon the Country by the UK Government during the

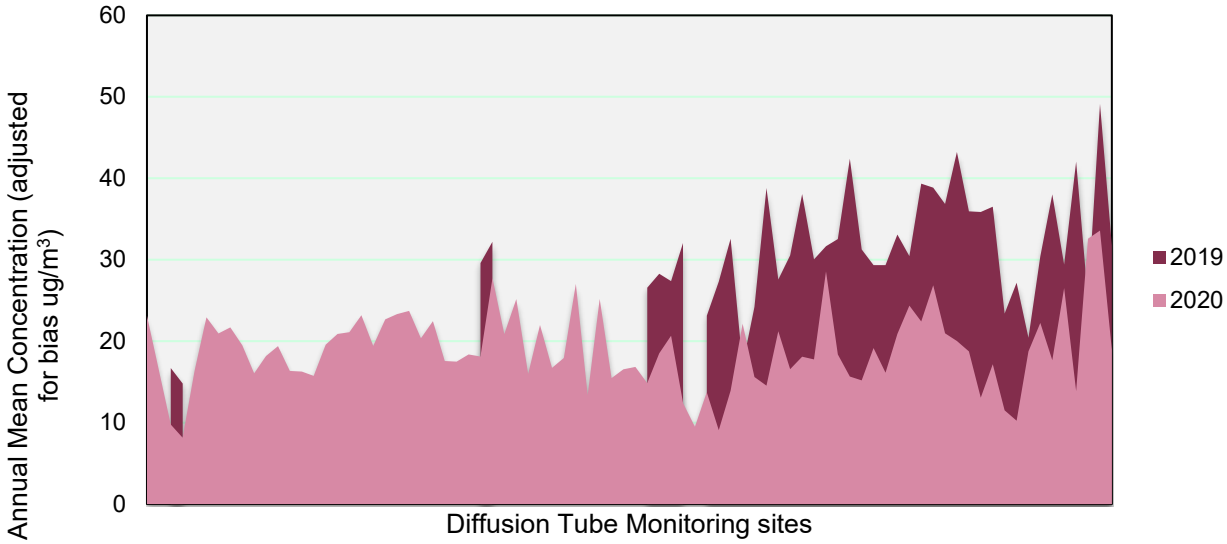
2020 Covid-19 pandemic, which severely restricted people's movement and imposed a "stay at home" restriction.

Vehicle movements across the UK decreased by 77% in May 2020 (17) compared with pre-pandemic figures. This reduction in traffic movement had a dramatic impact on the $NO_2$ concentrations for this period, with diffusion tubes across the Borough showing a 43% decrease on the previous year, as shown in Figure 1. Therefore, all concentrations should be treated with caution, as lower concnetrations may not be sustained once traffic numbers return to more normal values.



17 https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic

**Figure 1 Annual Mean $NO_2$ concentration 2019 and 2020**




### 3.1.4 Particulate Matter ($PM_{10}$)

$PM_{10}$ monitoring is not undertaken in the Borough.

### 3.1.5 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ monitoring is not undertaken in the Borough.

### 3.1.6 Sulphur Dioxide ($SO_2$)

$SO_2$ monitoring is not undertaken in the Borough

# Appendix A: Monitoring Results

### Table A.1 – Details of Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Inlet Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| CM1 | Newcastle under Lyme Queen's Gardens | Roadside | 385054 | 346134 | NO2 | YES | Chemiluminescent | 2 | 3 | 2 |

**Notes:**

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

(2) N/A if not applicable

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

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| DTK1 | K1 | Kerbside | 385051 | 345726 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 22.0 | 3.0 | No | 2.5 |
| DTK2 | K2 | Urban Centre | 385469 | 346362 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 3.0 | No | 2.0 |
| DTUB1 | UB1 | Kerbside | 384739 | 348326 | $NO_2$ | NO | 7.0 | 2.0 | No | 2.5 |
| DTUB2 | UB2 | Kerbside | 383916 | 345059 | $NO_2$ | NO | 23.0 | 2.0 | No | 3.0 |
| DT3 | 3 | Rural | 378116 | 345488 | $NO_2$ | YES - AQMA 4: Little Madeley | 0.2 | 128.0 | No | -2.0 |
| DT6 | 6 | Suburban | 384014 | 354429 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 0.2 | 4.0 | No | 3.0 |
| DT9 | 9 | Suburban | 385519 | 349055 | $NO_2$ | YES -AQMA 3: Maybank-Wolstanton-Porthill | 0.2 | 6.0 | No | 3.0 |
| DT11 | 11 | Suburban | 385112 | 345636 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.3 | 3.0 | No | 3.0 |
| DT24 | 24 | Roadside | 385574 | 347530 | $NO_2$ | YES -AQMA 3: Maybank-Wolstanton-Porthill | 0.2 | 3.0 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| DT28 | 28 | Rural | 377994 | 350105 | $NO_2$ | NO | 0.3 | 45.0 | No | 6.0 |
| DT34 | 34 | Urban Centre | 385059 | 345840 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 1.0 | 4.0 | No | 3.0 |
| DT39 | 39 | Suburban | 383560 | 354739 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 0.2 | 2.0 | No | 3.0 |
| DT40 | 40 | Suburban | 385128 | 348811 | $NO_2$ | YES -AQMA 3: Maybank-Wolstanton-Porthill | 0.2 | 20.0 | No | 5.0 |
| DT46 | 46 | Urban Centre | 385073 | 345685 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 4.0 | No | 3.0 |
| DT47 | 47 | Urban Centre | 385023 | 345678 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.3 | 5.0 | No | 3.0 |
| DT49 | 49 | Urban Centre | 385595 | 349129 | $NO_2$ | YES -AQMA 3: Maybank-Wolstanton-Porthill | 0.3 | 6.0 | No | 3.0 |
| DT64 | 64 | Urban Centre | 383950 | 354445 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 0.2 | 10.0 | No | 10.0 |
| DT72 | 72 | Roadside | 384981 | 345750 | $NO_2$ | YES - AQMA 2: Newcastle- | 0.2 | 3.0 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | under-Lyme Town Centre | | | | |
| DT73 | 73 | Roadside | 385070 | 345738 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 4.0 | No | 3.0 |
| DT74 | 74 | Roadside | 385132 | 345640 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 4.0 | No | 3.0 |
| DT76 | 76 | Roadside | 385226 | 346156 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 3.0 |
| DT84 | 84 | Roadside | 385548 | 346400 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 3.0 |
| DT85 | 85 | Urban Centre | 385575 | 346413 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 5.0 | No | 3.0 |
| DT86 | 86 | Urban Centre | 385075 | 345910 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 5.0 | No | 2.0 |
| DT87 | 87 | Urban Centre | 385105 | 346225 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 5.0 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| DT88 | 88 | Urban Centre | 384709 | 345881 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 5.0 | No | 2.0 |
| DT89a, DT89b, DT90c | 91 | Roadside | 385054 | 346134 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 1.0 | 5.0 | Yes | 1.0 |
| DT92 | 92 | Urban Centre | 383890 | 354461 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 1.0 | 5.0 | No | 1.0 |
| DT93 | 93 | Urban Centre | 384056 | 354393 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 0.2 | 2.0 | No | 3.0 |
| DT95 | 95 | Urban Centre | 385171 | 345539 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 4.0 | No | 3.0 |
| DT96 | 96 | Roadside | 385131 | 345601 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 4.0 |
| DT97 | 97 | Roadside | 384795 | 345796 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 3.0 | No | 4.0 |
| DT98 | 98 | Roadside | 385327 | 346148 | $NO_2$ | YES - AQMA 2: Newcastle- | 0.2 | 2.0 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | under-Lyme Town Centre | | | | |
| DT100 | 100 | Roadside | 384689 | 346284 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 2.0 |
| DT101 | 101 | Roadside | 384806 | 345842 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 2.0 |
| DT102 | 102 | Roadside | 384609 | 346007 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 2.0 |
| DT103 | 103 | Roadside | 385682 | 347909 | $NO_2$ | YES - AQMA 3: Maybank-Wolstanton-Porthill | 0.2 | 2.0 | No | 2.0 |
| DT104 | 104 | Roadside | 385213 | 346270 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 0.2 | 2.0 | No | 2.0 |
| DT105 | 105 | Roadside | 383991 | 354418 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 0.2 | 2.0 | No | 2.0 |
| DT106 | 94 | Urban Centre | 384030 | 354416 | $NO_2$ | YES - AQMA 1: Liverpool Road, Kidsgrove | 3.0 | 1.0 | No | 2.0 |

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| DT107a, DT107b, DT107c | N1c | Roadside | 384454 | 346245 | $NO_2$ | NO | 4.0 | 2.0 | No | 4.0 |
| DT108a, DT108b, DT108c | N2c | Roadside | 384961 | 345346 | $NO_2$ | NO | 5.0 | 2.0 | No | 4.0 |
| DT109a, DT109b, DT109c | N3c | Roadside | 385190 | 343318 | $NO_2$ | NO | 10.0 | 3.0 | No | 4.0 |
| DT110a, DT110b, DT110c | N4c | Roadside | 385110 | 342314 | $NO_2$ | NO | 49.0 | 2.0 | No | 4.0 |
| DT111a, DT111b, DT111c | N5c | Roadside | 383882 | 349558 | $NO_2$ | NO | 25.0 | 2.0 | No | 4.0 |
| DT112a, DT112b, DT112c | N6c | Roadside | 382286 | 341956 | $NO_2$ | NO | 120.0 | 2.0 | No | 3.0 |
| DT113a, DT113b, DT113c | N7c | Roadside | 383052 | 343666 | $NO_2$ | NO | 107.0 | 2.0 | No | 4.0 |
| DT114a, DT114b, DT114c | N8c | Roadside | 383953 | 344832 | $NO_2$ | NO | 5.0 | 2.0 | No | 3.0 |
| DT115a, DT115b, DT115c | N9c | Roadside | 383545 | 345195 | $NO_2$ | NO | 20.0 | 2.0 | No | 4.0 |
| DT116a, DT116b, DT116c | N10c | Roadside | 383157 | 345431 | $NO_2$ | NO | 40.0 | 2.0 | No | 4.0 |

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| DT117a, DT117b, DT117c | N11c | Roadside | 383199 | 352740 | $NO_2$ | NO | 10.0 | 2.0 | No | 4.0 |
| DT118a, DT118b, DT118c | N12c | Roadside | 382934 | 353388 | $NO_2$ | NO | 10.0 | 2.0 | No | 3.0 |
| DT119a, DT119b, DT119c | N13c | Roadside | 382600 | 354062 | $NO_2$ | NO | 15.0 | 2.0 | No | 4.0 |
| DT120a, DT120b, DT120c | N14c | Roadside | 382707 | 354305 | $NO_2$ | NO | 2.0 | 2.0 | No | 4.0 |
| DT121a, DT121b, DT121c | N15c | Roadside | 382736 | 354385 | $NO_2$ | NO | 10.0 | 2.0 | No | 4.0 |
| DT122a, DT122b, DT122c | N16c | Roadside | 384261 | 354207 | $NO_2$ | NO | 10.0 | 3.0 | No | 4.0 |
| DT123a, DT123b, DT123c | N17c | Roadside | 384638 | 354133 | $NO_2$ | NO | 20.0 | 2.0 | No | 4.0 |
| DT124a, DT124b, DT124c | N18c | Roadside | 385019 | 353832 | $NO_2$ | NO | 20.0 | 2.0 | No | 4.0 |
| DT125a, DT125b, DT125c | N19c | Roadside | 385387 | 348389 | $NO_2$ | YES - AQMA 3: Maybank-Wolstanton-Porthill | 5.0 | 2.0 | No | 4.0 |
| DT126a, DT126b, DT126c | N20c | Roadside | 385556 | 348224 | $NO_2$ | YES - AQMA 3: Maybank- | 20.0 | 2.0 | No | 4.0 |

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Wolstanton-Porthill | | | | |
| DT127a, DT127b, DT127c | N21c | Roadside | 385416 | 347424 | $NO_2$ | NO | 10.0 | 2.0 | No | 4.0 |
| DT128a, DT128b, DT128c | N22c | Roadside | 385512 | 347373 | $NO_2$ | NO | 20.0 | 2.0 | No | 4.0 |
| DT129a, DT129b, DT129c | N23c | Roadside | 384968 | 346228 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 30.0 | 2.0 | No | 4.0 |
| DT130a, DT130b, DT130c | N24c | Roadside | 385098 | 346395 | $NO_2$ | NO | 20.0 | 2.0 | No | 4.0 |
| DT131a, DT131b, DT131c | N25c | Roadside | 385463 | 346374 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 5.0 | 2.0 | No | 4.0 |
| DT132a, DT132b, DT132c | N26c | Roadside | 385612 | 346436 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 5.0 | 2.0 | No | 4.0 |
| DT133a, DT133b, DT133c | N27c | Roadside | 385926 | 346580 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 5.0 | 2.0 | No | 4.0 |
| DT134a, DT134b, DT134c | N28c | Roadside | 386009 | 346600 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 7.0 | 2.0 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| DT135a, DT135b, DT135c | N29c | Roadside | 385518 | 346128 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 20.0 | 2.0 | No | 4.0 |
| DT136a, DT136b, DT136c | N30c | Roadside | 385078 | 345687 | $NO_2$ | YES - AQMA 2: Newcastle-under-Lyme Town Centre | 4.0 | 2.0 | No | 3.0 |
| DT137a, DT137b, DT137c | N31c | Roadside | 382795 | 346011 | $NO_2$ | NO | 0.0 | 2.0 | No | 4.0 |
| DT138a, DT138b, DT138c | N32c | Roadside | 383113 | 346592 | $NO_2$ | NO | 20.0 | 2.0 | No | 4.0 |
| DT139a, DT139b, DT139c | N33c | Roadside | 383302 | 346727 | $NO_2$ | NO | 20.0 | 2.0 | No | 3.0 |
| DT140a, DT140b, DT140c | N34c | Roadside | 383930 | 347273 | $NO_2$ | NO | 10.0 | 2.0 | No | 4.0 |
| DT141a, DT141b, DT141c | N35c | Roadside | 384337 | 347534 | $NO_2$ | NO | 5.0 | 2.0 | No | 4.0 |
| DT142a, DT142b, DT142c | N36c | Roadside | 384207 | 347915 | $NO_2$ | NO | 50.0 | 2.0 | No | 3.0 |
| DT143a, DT143b, DT143c | N37c | Roadside | 384021 | 348925 | $NO_2$ | NO | 10.0 | 2.0 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| DT144a, DT144b, DT144c | N38c | Roadside | 383764 | 349912 | $NO_2$ | NO | 0.0 | 2.0 | No | 4.0 |
| DT145a, DT145b, DT145c | N39c | Roadside | 383670 | 350326 | $NO_2$ | NO | 0.0 | 2.0 | No | 4.0 |
| DT146a, DT146b, DT146c | N40c | Roadside | 383587 | 350790 | $NO_2$ | NO | 80.0 | 2.0 | No | 3.0 |

**Notes:**

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

(2) N/A if not applicable.

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

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| CM1 | 385046 | 346147 | Roadside | 100 | 83.2 | 37.5 | 23.1 | 23 | 25.6 | 18 |

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

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

**Notes:**

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

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

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

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

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| DTK1 | 385051 | 345726 | Kerbside | 100 | 100.0 | **44.6** | **41.7** | 37.2 | **47.4** | 27.4 |
| DTK2 | 385469 | 346362 | Urban Centre | 100 | 90.4 | 32.7 | 29.7 | 26.0 | 28.9 | 20.1 |
| DTUB1 | 384739 | 348326 | Kerbside | 100 | 100.0 | 19.7 | 19.0 | 17.7 | 17.9 | 12.3 |
| DTUB2 | 383916 | 345059 | Kerbside | 100 | 90.4 | 17.4 | 15.5 | 15.3 | 15.0 | 9.9 |
| DT3 | 378116 | 345488 | Rural | 100 | 100.0 | 31.9 | 30.7 | 24.8 | 27.3 | 18.4 |
| DT6 | 384014 | 354429 | Suburban | 100 | 100.0 | **41.8** | 37.7 | 37.1 | 38.6 | 27.3 |
| DT9 | 385519 | 349055 | Suburban | 100 | 100.0 | 36.0 | 33.4 | 29.3 | 33.2 | 24.6 |
| DT11 | 385112 | 345636 | Suburban | 100 | 92.0 | **41.5** | 39.5 | 35.1 | **56.5** | 25.7 |
| DT24 | 385574 | 347530 | Roadside | 100 | 100.0 | 37.7 | 35.3 | 30.4 | 34.8 | 22.9 |
| DT28 | 377994 | 350105 | Rural | 100 | 92.3 | 30.8 | 29.9 | 25.2 | 25.9 | 18.1 |
| DT34 | 385059 | 345840 | Urban Centre | 100 | 100.0 | 35.0 | 32.1 | 29.2 | 33.7 | 21.2 |
| DT39 | 383560 | 354739 | Suburban | 100 | 100.0 | 37.4 | 33.4 | 31.7 | 34.9 | 23.6 |
| DT40 | 385128 | 348811 | Suburban | 100 | 100.0 | 31.8 | 28.3 | 25.2 | 26.5 | 19.4 |
| DT46 | 385073 | 345685 | Urban Centre | 100 | 100.0 | 31.1 | 30.1 | 27.3 | 28.3 | 18.6 |
| DT47 | 385023 | 345678 | Urban Centre | 100 | 100.0 | 31.1 | 25.8 | 24.7 | 28.0 | 19.2 |
| DT49 | 385595 | 349129 | Urban Centre | 100 | 100.0 | 32.6 | 31.5 | 27.2 | 31.9 | 21.9 |
| DT64 | 383950 | 354445 | Urban Centre | 100 | 100.0 | 37.9 | 35.9 | 32.7 | 36.7 | 24.5 |
| DT72 | 384981 | 345750 | Roadside | 100 | 100.0 | 30.4 | 30.4 | 26.9 | 36.7 | 24.3 |
| DT73 | 385070 | 345738 | Roadside | 100 | 59.9 | 33.6 | 32.0 | 29.3 | 32.6 | 27.7 |
| DT74 | 385132 | 345640 | Roadside | 100 | 57.4 | 33.0 | 33.0 | 31.9 | 35.7 | 22.6 |
| DT76 | 385226 | 346156 | Roadside | 100 | 100.0 | 34.6 | 36.5 | 33.1 | 37.7 | 27.1 |
| DT84 | 385548 | 346400 | Roadside | 100 | 100.0 | 38.3 | 35.1 | 33.6 | 37.1 | 27.0 |
| DT85 | 385575 | 346413 | Urban Centre | 100 | 100.0 | **45.3** | **40.0** | 38.8 | **44.2** | 27.9 |
| DT86 | 385075 | 345910 | Urban Centre | 100 | 92.3 | 30.4 | 29.7 | 27.9 | 28.6 | 21.3 |
| DT87 | 385105 | 346225 | Urban Centre | 100 | 100.0 | 39.3 | 37.9 | 34.9 | 39.4 | 25.6 |
| DT88 | 384709 | 345881 | Urban Centre | 100 | 90.1 | 31.2 | 29.9 | 28.2 | 30.8 | 20.8 |

| 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 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| DT89a, DT89b, DT90c | 385054 | 346134 | Roadside | 100 | 100.0 | 31.9 | 30.2 | 29.8 | 30.1 | 20.9 |
| DT92 | 383890 | 354461 | Urban Centre | 100 | 100.0 | 33.9 | 33.5 | 31.9 | 33.3 | 22.5 |
| DT93 | 384056 | 354393 | Urban Centre | 100 | 92.3 | 33.4 | 30.4 | 28.2 | 31.5 | 21.7 |
| DT95 | 385171 | 345539 | Urban Centre | 100 | 100.0 | 34.8 | 32.1 | 31.8 | **47.2** | 24.6 |
| DT96 | 385131 | 345601 | Roadside | 100 | 100.0 | 33.7 | 34.3 | 28.5 | 33.2 | 28.9 |
| DT97 | 384795 | 345796 | Roadside | 100 | 100.0 | **40.2** | 39.8 | 35.8 | 39.5 | 19.7 |
| DT98 | 385327 | 346148 | Roadside | 100 | 92.3 | 29.5 | 28.6 | 27.6 | 29.8 | 24.3 |
| DT100 | 384689 | 346284 | Roadside | 100 | 80.5 | 39.0 | 37.7 | 36.5 | 38.8 | 20.1 |
| DT101 | 384806 | 345842 | Roadside | 100 | 100.0 | 32.0 | 30.0 | 27.9 | 30.4 | 21.6 |
| DT102 | 384609 | 346007 | Roadside | 100 | 100.0 | 38.8 | 33.0 | 32.8 | 32.9 | 31.4 |
| DT103 | 385682 | 347909 | Roadside | 100 | 75.3 | **43.5** | **60.4** | **44.1** | **44.8** | 17.1 |
| DT104 | 385213 | 346270 | Roadside | 100 | 100.0 | 27.9 | 24.1 | 25.1 | 23.1 | 34.5 |
| DT105 | 383991 | 354418 | Roadside | 100 | 100.0 | 37.6 | 38.2 | 37.9 | **58.8** | 18.7 |
| DT106 | 384030 | 354416 | Urban Centre | 100 | 67.3 | | 27.2 | 26.0 | 29.7 | 30.2 |
| DT107a, DT107b, DT107c | 384454 | 346245 | Roadside | 100 | 100.0 | | | | | 19.7 |
| DT108a, DT108b, DT108c | 384961 | 345346 | Roadside | 100 | 100.0 | | | | | 19.5 |
| DT109a, DT109b, DT109c | 385190 | 343318 | Roadside | 100 | 100.0 | | | | | 17.5 |
| DT110a, DT110b, DT110c | 385110 | 342314 | Roadside | 100 | 100.0 | | | | | 21.1 |

| 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 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| DT111a, DT111b, DT111c | 383882 | 349558 | Roadside | 100 | 75.3 | | | | | 24.0 |
| DT112a, DT112b, DT112c | 382286 | 341956 | Roadside | 100 | 100.0 | | | | | 14.8 |
| DT113a, DT113b, DT113c | 383052 | 343666 | Roadside | 100 | 90.1 | | | | | 13.5 |
| DT114a, DT114b, DT114c | 383953 | 344832 | Roadside | 100 | 100.0 | | | | | 16.1 |
| DT115a, DT115b, DT115c | 383545 | 345195 | Roadside | 100 | 100.0 | | | | | 11.1 |
| DT116a, DT116b, DT116c | 383157 | 345431 | Roadside | 100 | 100.0 | | | | | 16.4 |
| DT117a, DT117b, DT117c | 383199 | 352740 | Roadside | 100 | 100.0 | | | | | 25.1 |
| DT118a, DT118b, DT118c | 382934 | 353388 | Roadside | 100 | 100.0 | | | | | 18.5 |
| DT119a, DT119b, DT119c | 382600 | 354062 | Roadside | 100 | 84.6 | | | | | 18.0 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| DT120a, DT120b, DT120c | 382707 | 354305 | Roadside | 100 | 100.0 | | | | | 24.2 |
| DT121a, DT121b, DT121c | 382736 | 354385 | Roadside | 100 | 100.0 | | | | | 20.4 |
| DT122a, DT122b, DT122c | 384261 | 354207 | Roadside | 100 | 100.0 | | | | | 20.8 |
| DT123a, DT123b, DT123c | 384638 | 354133 | Roadside | 100 | 100.0 | | | | | 20.5 |
| DT124a, DT124b, DT124c | 385019 | 353832 | Roadside | 100 | 75.3 | | | | | 32.3 |
| DT125a, DT125b, DT125c | 385387 | 348389 | Roadside | 100 | 100.0 | | | | | 20.5 |
| DT126a, DT126b, DT126c | 385556 | 348224 | Roadside | 100 | 100.0 | | | | | 18.3 |
| DT127a, DT127b, DT127c | 385416 | 347424 | Roadside | 100 | 90.1 | | | | | 17.7 |
| DT128a, DT128b, DT128c | 385512 | 347373 | Roadside | 100 | 90.1 | | | | | 22.7 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| DT129a, DT129b, DT129c | 384968 | 346228 | Roadside | 100 | 92.3 | | | | | 19.8 |
| DT130a, DT130b, DT130c | 385098 | 346395 | Roadside | 100 | 100.0 | | | | | 24.9 |
| DT131a, DT131b, DT131c | 385463 | 346374 | Roadside | 100 | 75.3 | | | | | 28.9 |
| DT132a, DT132b, DT132c | 385612 | 346436 | Roadside | 100 | 100.0 | | | | | 25.2 |
| DT133a, DT133b, DT133c | 385926 | 346580 | Roadside | 100 | 75.3 | | | | | 31.9 |
| DT134a, DT134b, DT134c | 386009 | 346600 | Roadside | 100 | 100.0 | | | | | 24.0 |
| DT135a, DT135b, DT135c | 385518 | 346128 | Roadside | 100 | 92.3 | | | | | 22.8 |
| DT136a, DT136b, DT136c | 385078 | 345687 | Roadside | 100 | 92.3 | | | | | 22.2 |
| DT137a, DT137b, DT137c | 382795 | 346011 | Roadside | 100 | 100.0 | | | | | 15.8 |

| 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 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| DT138a, DT138b, DT138c | 383113 | 346592 | Roadside | 100 | 100.0 | | | | | 19.5 |
| DT139a, DT139b, DT139c | 383302 | 346727 | Roadside | 100 | 100.0 | | | | | 13.7 |
| DT140a, DT140b, DT140c | 383930 | 347273 | Roadside | 100 | 100.0 | | | | | 21.9 |
| DT141a, DT141b, DT141c | 384337 | 347534 | Roadside | 100 | 100.0 | | | | | 26.1 |
| DT142a, DT142b, DT142c | 384207 | 347915 | Roadside | 100 | 100.0 | | | | | 20.8 |
| DT143a, DT143b, DT143c | 384021 | 348925 | Roadside | 100 | 100.0 | | | | | 30.7 |
| DT144a, DT144b, DT144c | 383764 | 349912 | Roadside | 100 | 92.6 | | | | | 16.7 |
| DT145a, DT145b, DT145c | 383670 | 350326 | Roadside | 100 | 75.3 | | | | | 38.0 |
| DT146a, DT146b, DT146c | 383587 | 350790 | Roadside | 100 | 100.0 | | | | | 21.9 |

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **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.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

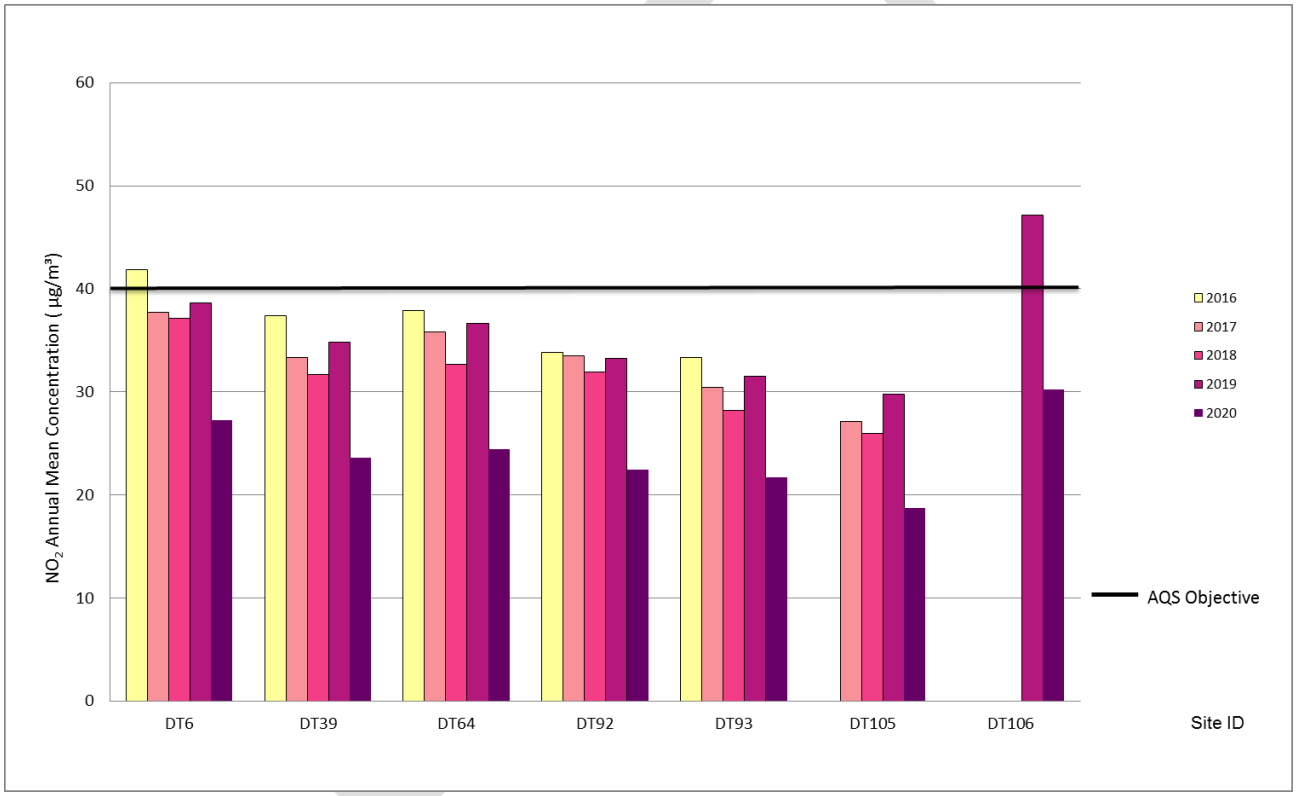
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

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

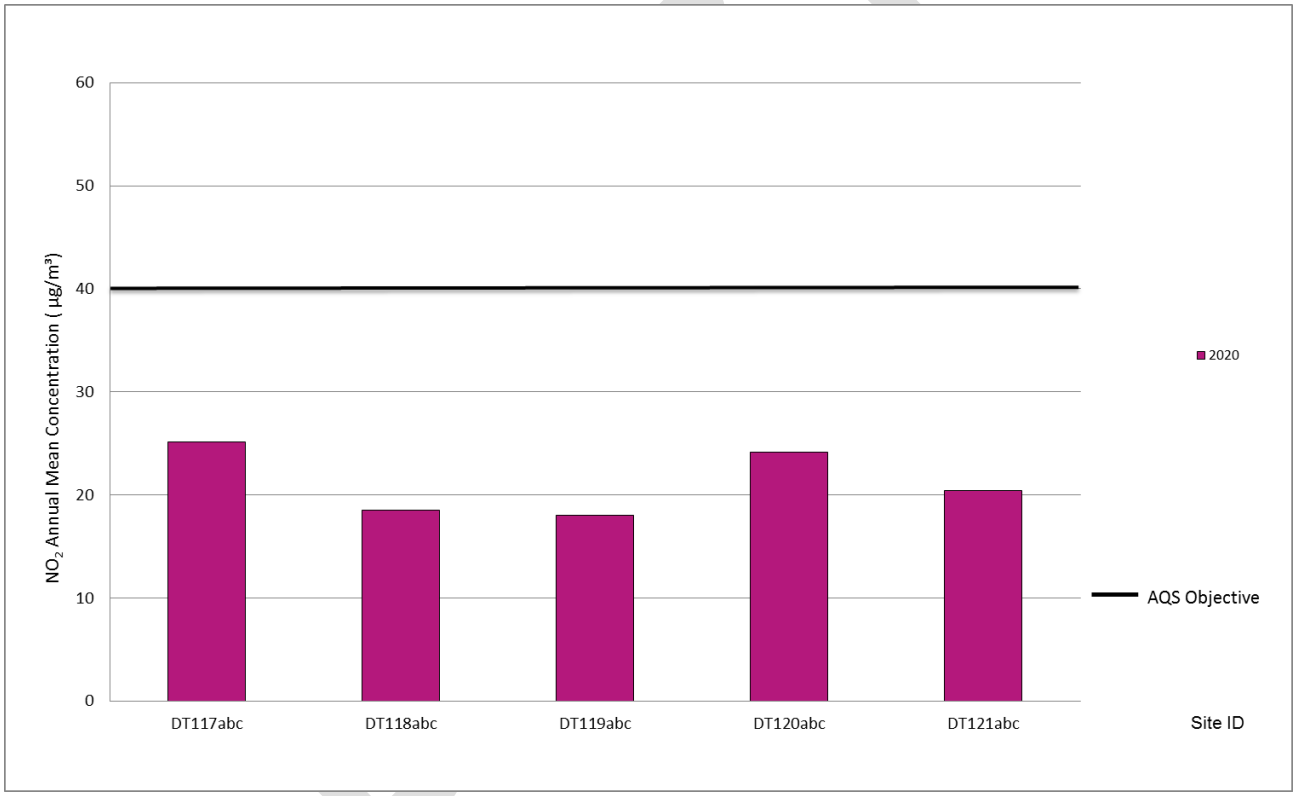
## Figure A. 1 – Trends in Annual Mean $NO_2$ Concentrations Area 1 – AQMA 1: Liverpool Road, Kidsgrove

Monitoring in AQMA 1: Liverpool Road, Kidsgrove shows no clear trend. There was no exceedance of the annual mean objective in 2020. It should be noted that in the Annual Status Report 2020 (2019 monitoring results) DT94 had been moved from the building façade to a lamppost closer to the road, because vegetation was inhibiting air flow around the tube. However, the tube had not been given a new identification number. This has been corrected for this report which shows 2019 and 2020 data for the relocated tube numbered DT106. The distance corrected concentration at DT106 in 2019 was 38.2µg/m³ and therefore the objective was not exceeded at the nearest residential property.



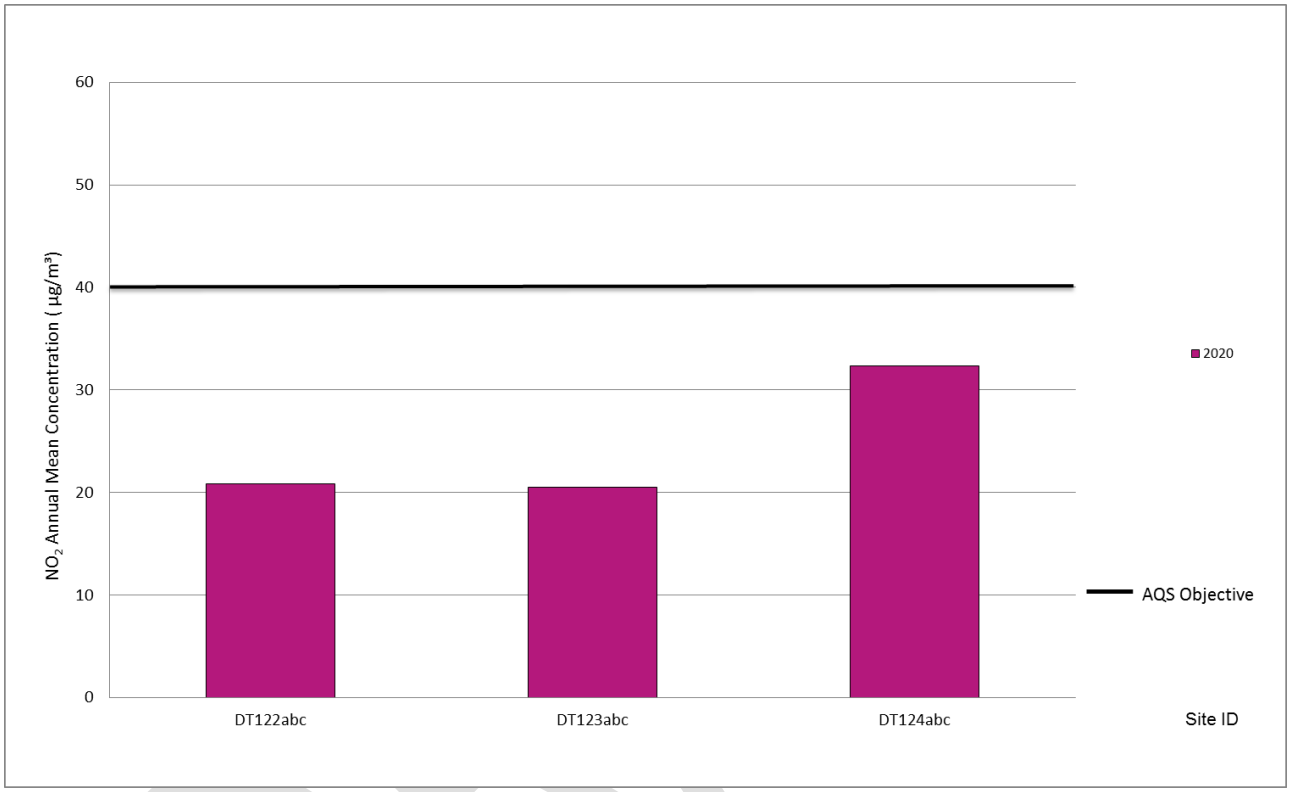
## Figure A. 2 - Trends in Annual Mean $NO_2$ Concentrations Area 2

Figure A.2 shows results for five new monitoring sites along the A34 between the A500 and A50 Liverpool Road, Kidsgrove. No trend data is available, as the sites were set up in 2020 to monitor the likely effects on concentration of the North Staffordshire Air Quality Plan being developed in response to the Ministerial Direction issued jointly to Newcastle under Lyme Borough Council, Staffordshire County Council and Stoke on Trent City Council to achieve compliance with the EU limit value of 40µg/m³ for $NO_2$ in the shortest possible time. New sites were set up to monitor concentrations of $NO_2$ on possible dispersion routes resulting from proposed measures in the plan. All concentrations were significantly below the annual objective.



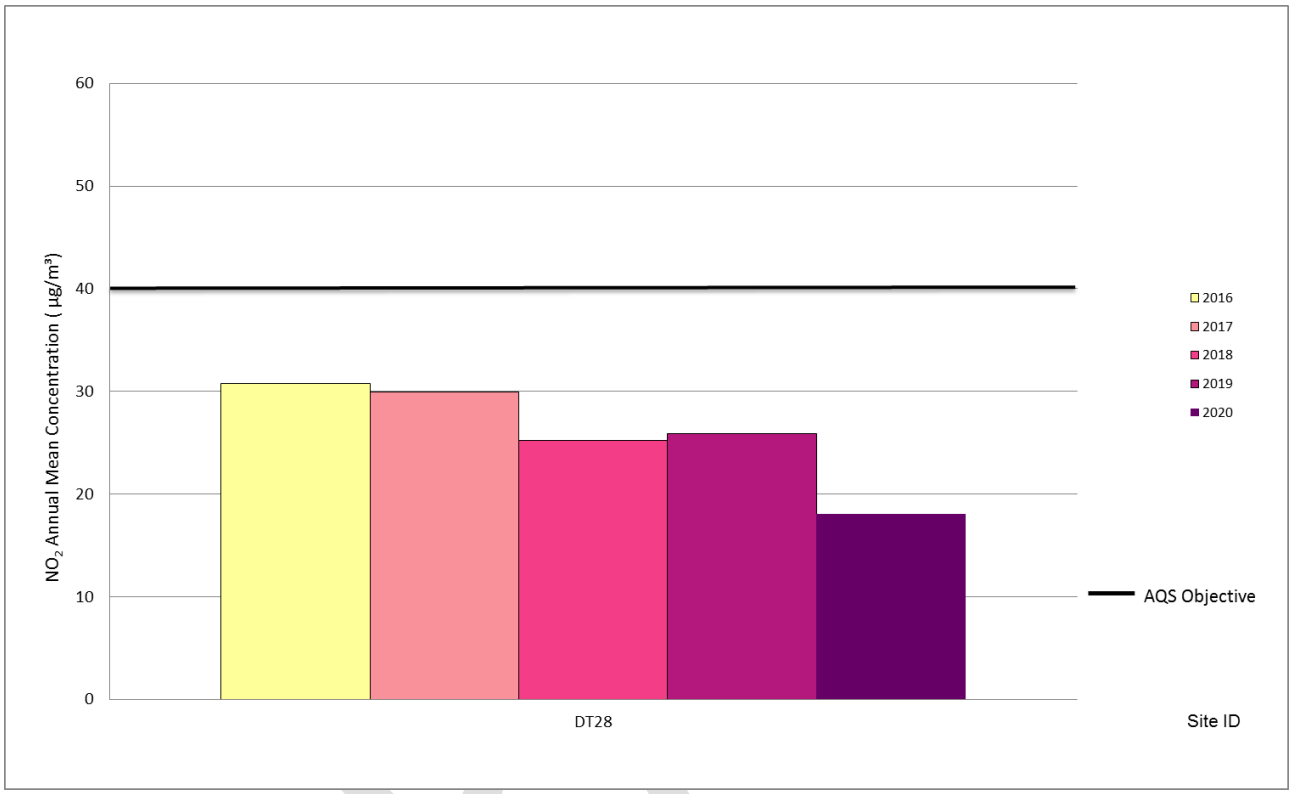
## Figure A. 3 - Trends in Annual Mean $NO_2$ Concentrations Area 3

Figure A.3 shows results for three new monitoring sites along the A50 Liverpool Road, Kidsgrove to the east of AQMA 1. No trend data is available, as the sites were set up in 2020 to monitor to monitor the likely effects on concentration of the North Staffordshire Air Quality Plan. All concentrations were significantly below the annual objective.



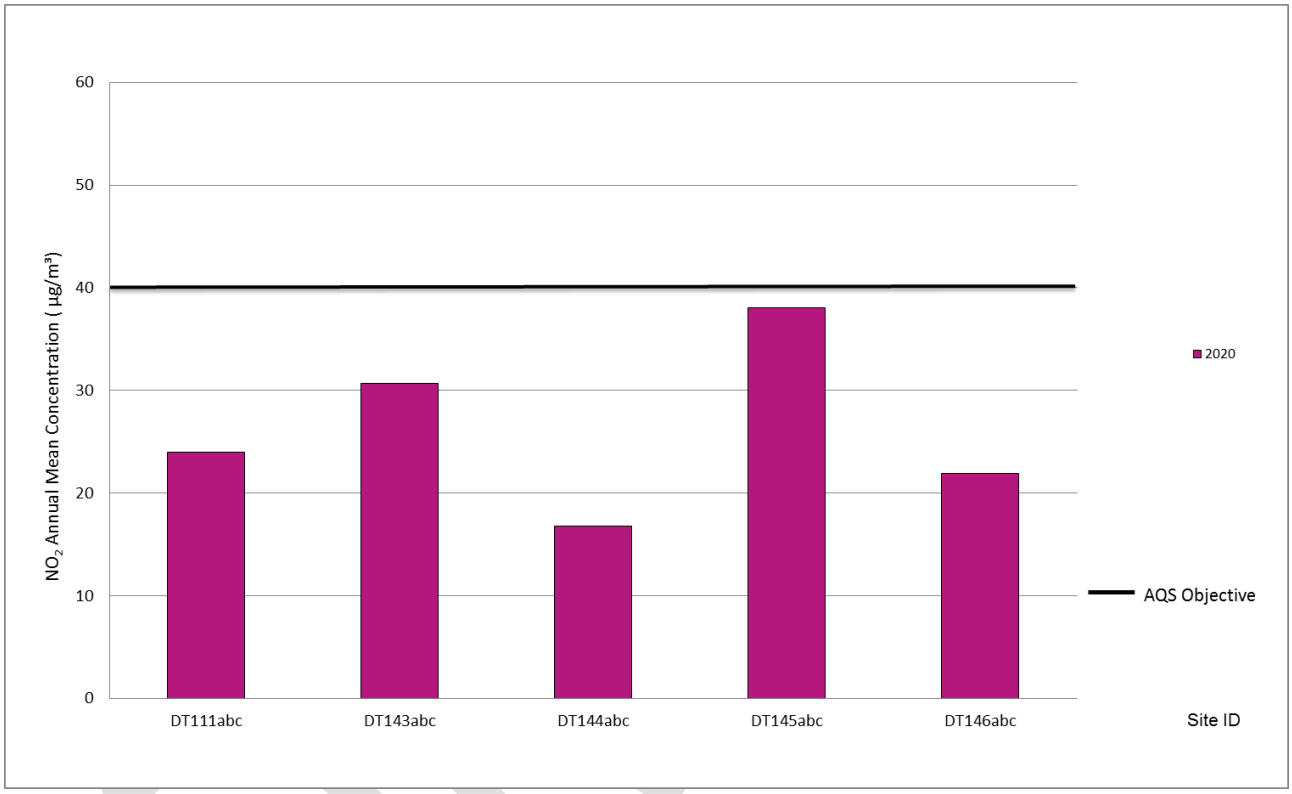
## Figure A. 4 - Trends in Annual Mean $NO_2$ Concentrations Area 4

Figure A.4 shows concentrations for one tube at Limbrick Farm located adjacent to the M6 motorway. Monitoring shows downward trend in concentrations at this location and no exceedance of the annual objective.



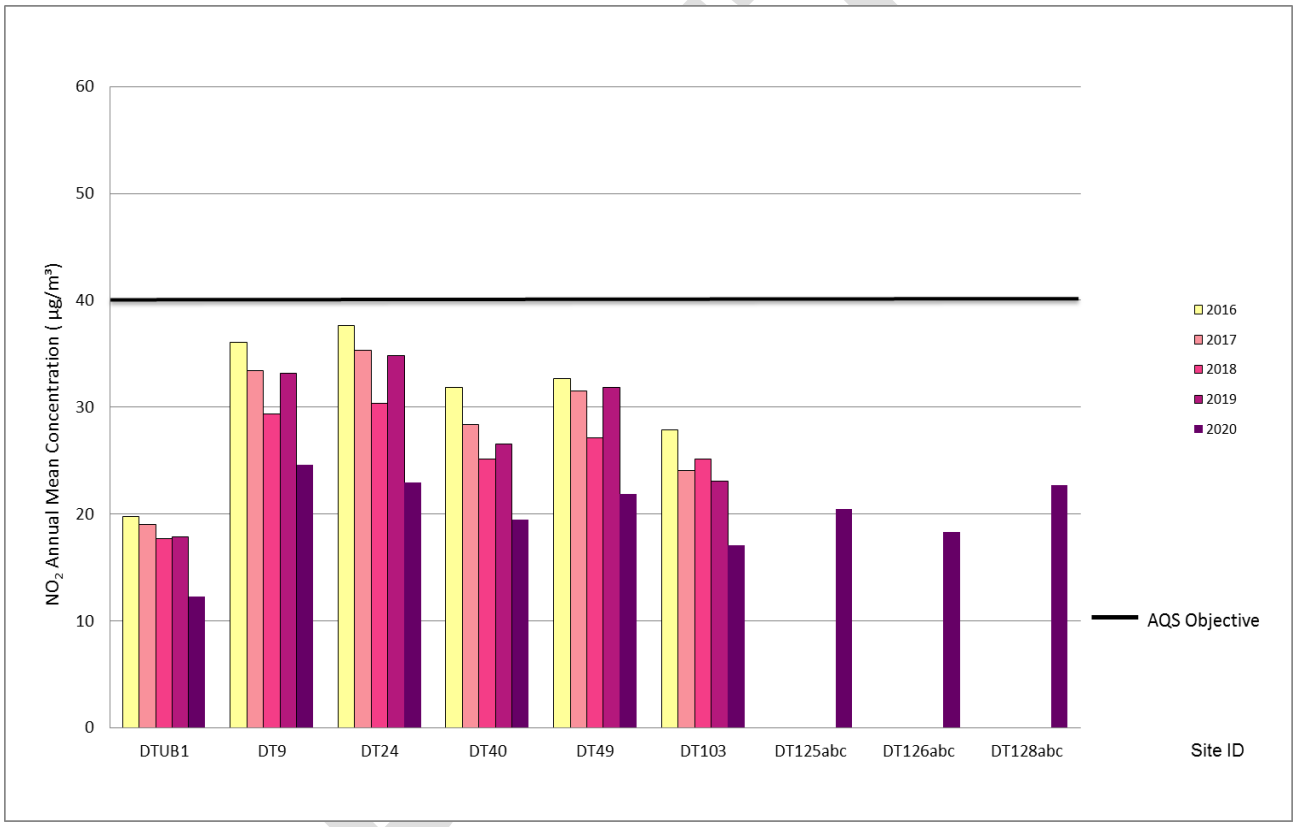
## Figure A. 5 - Trends in Annual Mean $NO_2$ Concentrations Area 5

Figure A.5 shows results for five new monitoring sites along the A34 between Newcastle Town Centre and the A500. No trend data is available, as the sites were set up in 2020 to monitor to monitor the likely effects on concentration of the North Staffordshire Air Quality Plan. Four of the five sites show concentrations significantly below the EU annual limit value. DT145 is within 10% of the annual limit value.



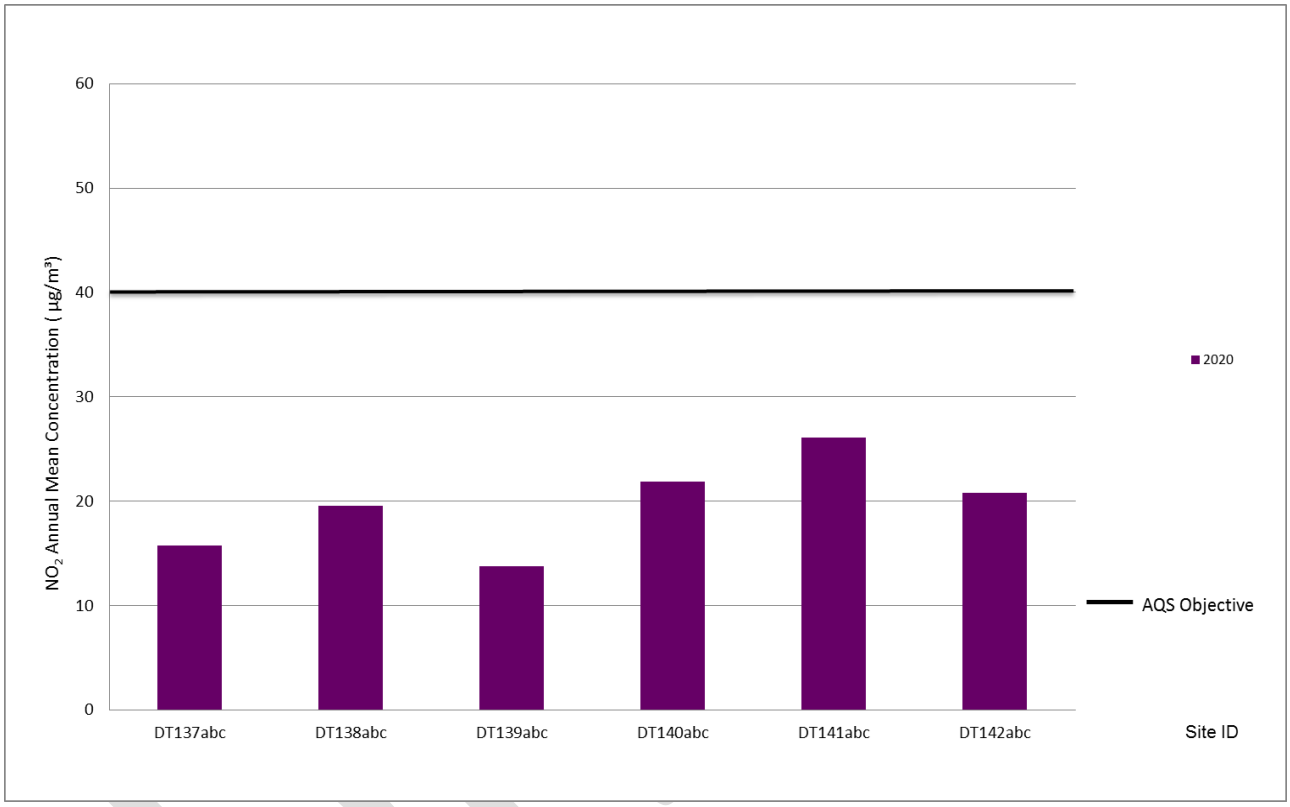
## Figure A. 6 - Trends in Annual Mean $NO_2$ Concentrations Area 6 - AQMA 3: Maybank-Wolstanton-Porthill

Figure A.6 shows concentrations within AQMA 3: Maybank-Wolstanton-Porthill. Six of the sites (DTUB1, DT9, dt24, DT40, DT49 and DT103) are existing sites, while three are new sites (DT125, DT126 and DT128), again set up in 2020 to monitor the likely effects on concentrations of N0$_2$ of the North Staffordshire Air Quality Plan and the possible impacts of the Etruria Valley Link Road being constructed in neighbouring Stoke on Trent. There is no clear trend shown in this area. All results for 2020 are significantly below the annual objective / EU annual mean limit value.



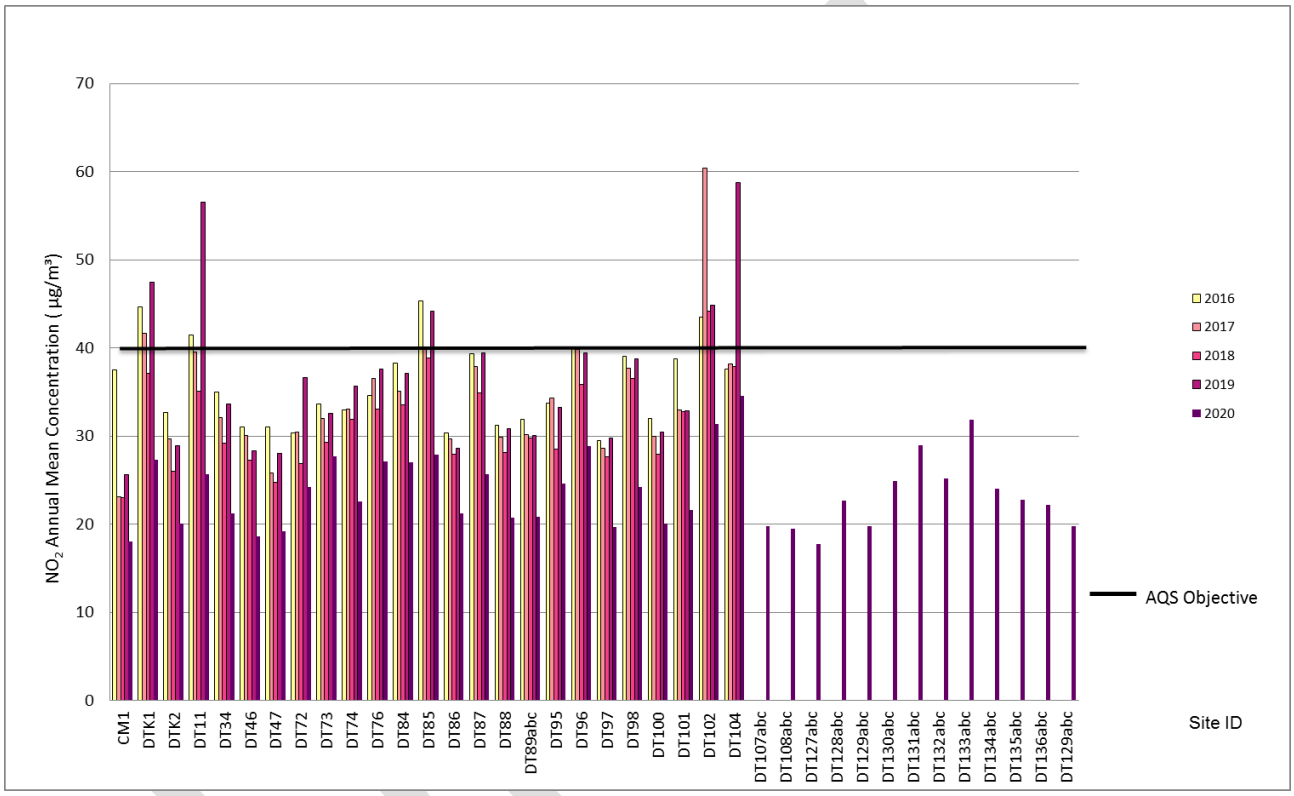
## Figure A. 7 Trends in Annual Mean $NO_2$ Concentrations Area 7

Figure A.7 shows concentrations at one site on the A34 between B5369 and the B5368 and five sites on the B5368 between the A34 and A525 Keele Road. No trend data is available, as the sites were set up in 2020 to monitor to monitor the likely effects on concentration of the North Staffordshire Air Quality Plan. All concentrations are significantly below the EU annual mean limit value.



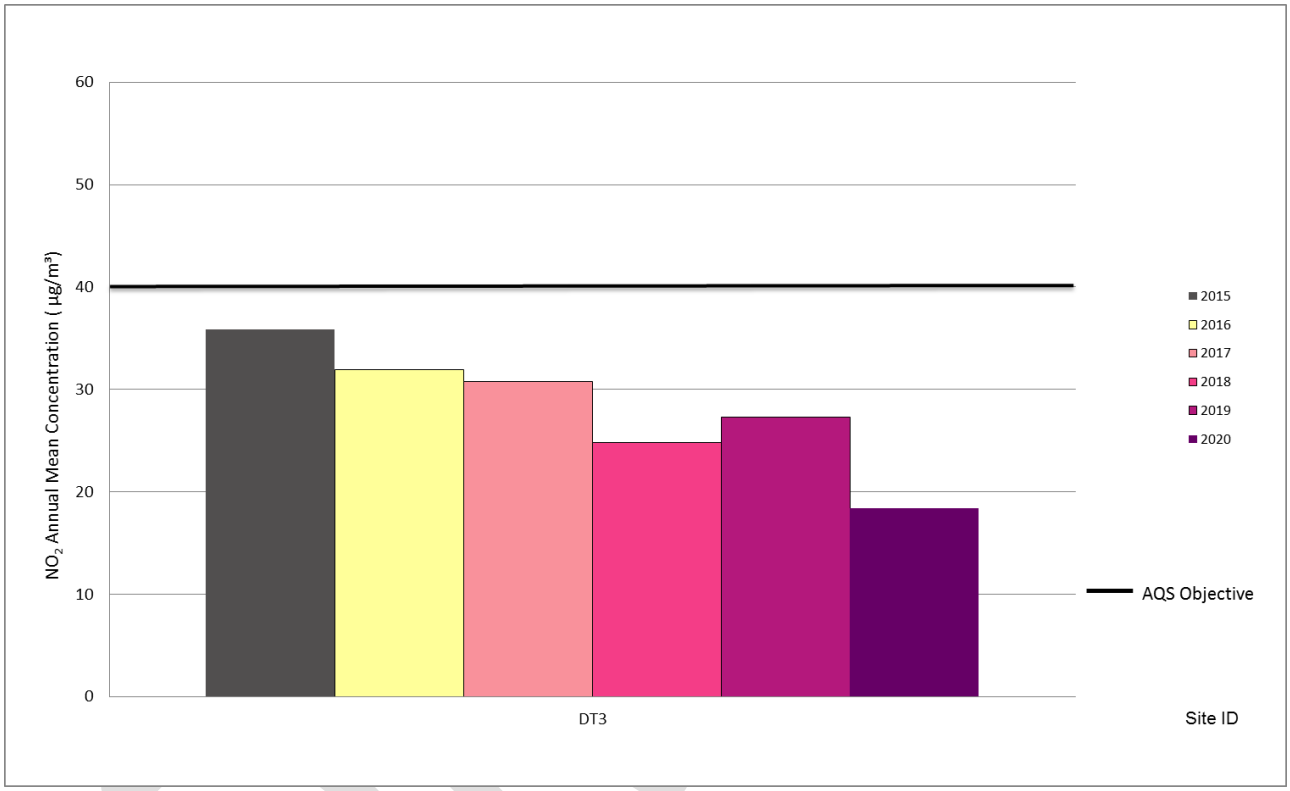
## Figure A. 8 Trends in Annual Mean $NO_2$ Concentrations Area 8 - AQMA 2: Newcastle-under-Lyme Town Centre

Figure A.8 shows concentrations at 25 long-term monitoring sites and 13 new sites in this area. All but three sites DT107, DT108 and DT130 are located within AQMA 2: Newcastle-under-Lyme Town Centre. There is no clear trend in concentrations in this area. All concentrations for 2020 were below the annual mean objective / EU annual mean limit value.



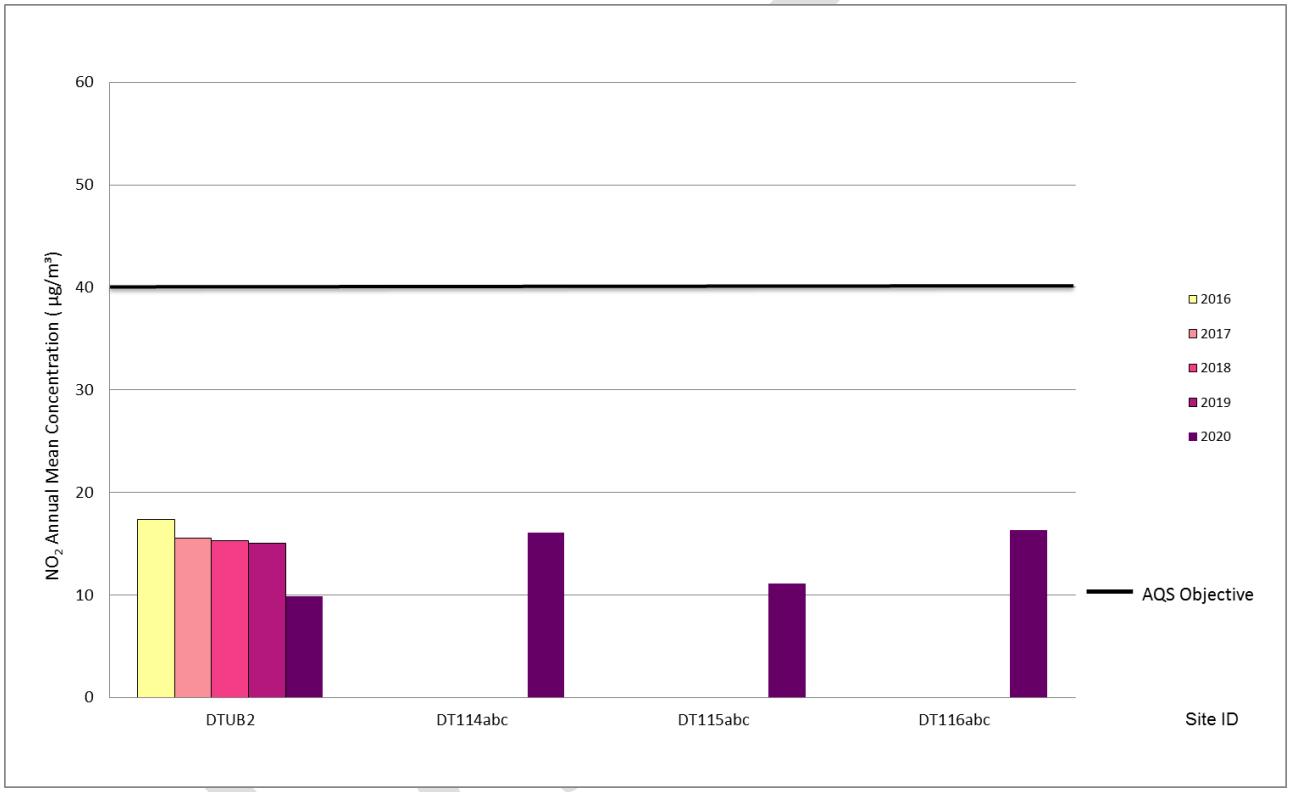
## Figure A. 9 Trends in Annual Mean $NO_2$ Concentrations Area 9 - AQMA 4: Little Madeley

Figure A.9 shows concentrations for one tube DT 3 located on a residential property adjacent to the M6 motorway. Monitoring shows downward trend in concentrations at this location and no exceedance of the annual objective for years 2015 to 2019, therefore AQMA 4: Little Madeley can be revoked.



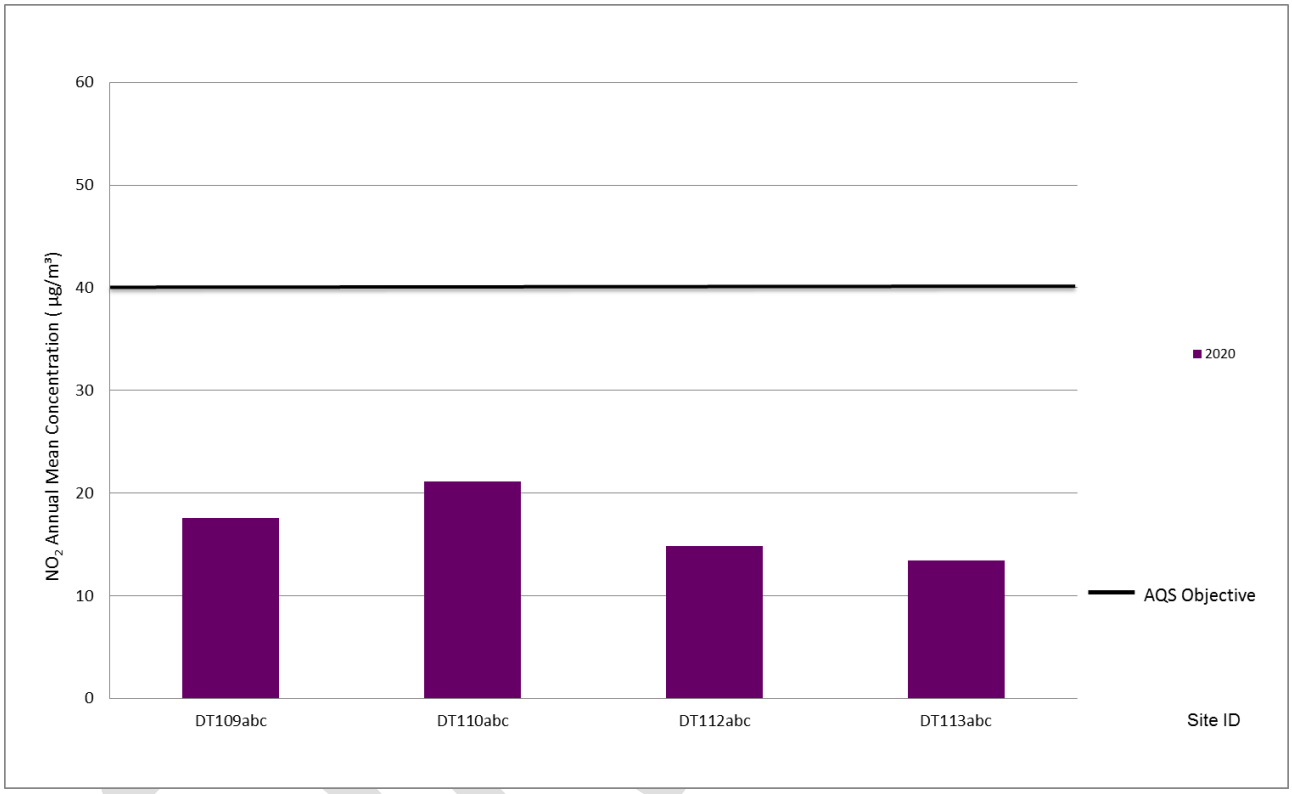
## Figure A. 10 - Trends in Annual Mean $NO_2$ Concentrations Area 10

Figure A.10 shows concentrations at the long term background site DTUB2 located at Sneyd Crescent; plus two tubes on Gallowstree Lane and one on Sneyd Avenue. The background site shows a downward trend in concentration. All results are significantly below the annual objective. Sites DT144, DT115 and DT116 were set up in 2020 to monitor the likely effects on concentration of the North Staffordshire Air Quality Plan. All concentrations are significantly below the annual mean objective / EU annual mean limit value.



## Figure A. 11 - Trends in Annual Mean $NO_2$ Concentrations Area 11

Figure A.1 shows concentrations at two sites on the A53 between A5182 Trentham Road and Seabridge Lane; and two sites on the A519 Clayton Road between the A500 and Clayton Lane. The sites were set up in 2020 to monitor to monitor the likely effects on concentration of the North Staffordshire Air Quality Plan. All concentrations are significantly below the annual objective.



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

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2020 (%) (2) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| CM1 | 385046 | 346147 | Urban Centre | 100 | 83.2 | 0 | 0 | 0 | 0 | 0 |

**Notes:**

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

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

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

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

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

# Appendix B: Full Monthly Diffusion Tube Results for 2020

## Table B.1 – $NO_2$ 2020 Diffusion Tube Results (µg/m$^3$)

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DTK1 | 385051 | 345726 | 43.4 | 36.7 | 17.3 | | | 28.4 | 29.4 | 36.1 | 37.3 | 37.0 | 40.4 | 43.9 | 32.2 | 27.4 | | |
| DTK2 | 385469 | 346362 | 31.4 | 25.5 | 15.3 | | | 22.5 | 16.2 | | 27.9 | 25.1 | 31.2 | 33.6 | 23.7 | 20.1 | | |
| DTUB1 | 384739 | 348326 | 18.6 | 16.8 | 9.0 | | | 11.0 | 10.1 | 13.7 | 14.6 | 15.4 | 23.6 | 21.6 | 14.4 | 12.3 | | |
| DTUB2 | 383916 | 345059 | 15.9 | 13.0 | 8.3 | | | 8.9 | 8.2 | | 11.7 | 13.9 | 18.4 | 13.0 | 11.6 | 9.9 | | |
| DT3 | 378116 | 345488 | 30.6 | 32.9 | 14.0 | | | 18.4 | 19.6 | 19.7 | 22.5 | 23.2 | 24.9 | 26.2 | 21.6 | 18.4 | | |
| DT6 | 384014 | 354429 | 38.9 | 32.9 | 22.2 | | | 34.5 | 26.0 | 37.8 | 36.6 | 33.4 | 35.9 | 40.6 | 32.1 | 27.3 | | |
| DT9 | 385519 | 349055 | 34.9 | 35.1 | 21.6 | | | 28.3 | 23.3 | 30.9 | 31.0 | 28.8 | 37.6 | 32.8 | 28.9 | 24.6 | | |
| DT11 | 385112 | 345636 | 38.5 | 35.3 | 18.8 | | | | 24.3 | 29.4 | 34.9 | 35.1 | 40.6 | 37.3 | 30.2 | 25.7 | | |
| DT24 | 385574 | 347530 | 40.3 | 31.1 | 17.0 | | | 22.6 | 22.7 | 25.5 | 31.5 | 31.4 | 34.5 | 33.2 | 27.0 | 22.9 | | |
| DT28 | 377994 | 350105 | 29.6 | 27.8 | 15.5 | | | 17.6 | 21.9 | 19.7 | 23.6 | 24.1 | | 23.4 | 21.2 | 18.1 | | |
| DT34 | 385059 | 345840 | 32.7 | 27.7 | 16.0 | | | 23.5 | 19.9 | 30.5 | 29.9 | 27.2 | 33.1 | 26.6 | 24.9 | 21.2 | | |
| DT39 | 383560 | 354739 | 30.9 | 25.6 | 18.8 | | | 27.3 | 20.2 | 32.4 | 34.1 | 33.5 | 32.2 | 37.1 | 27.7 | 23.6 | | |
| DT40 | 385128 | 348811 | 28.8 | 26.8 | 16.2 | | | 21.8 | 16.4 | 22.6 | 25.5 | 25.4 | 35.9 | 23.3 | 22.9 | 19.4 | | |
| DT46 | 385073 | 345685 | 33.3 | 31.0 | 14.2 | | | 17.6 | 19.4 | 19.8 | 24.5 | 21.6 | 30.0 | 24.8 | 21.9 | 18.6 | | |
| DT47 | 385023 | 345678 | 24.8 | 21.6 | 17.7 | | | 23.1 | 14.6 | 26.7 | 25.2 | 24.3 | 28.9 | 27.5 | 22.6 | 19.2 | | |
| DT49 | 385595 | 349129 | 35.2 | 33.1 | 17.2 | | | 24.3 | 24.6 | 26.3 | 29.4 | 30.9 | 28.6 | 25.5 | 25.8 | 21.9 | | |
| DT64 | 383950 | 354445 | 38.6 | 34.9 | 19.3 | | | 28.9 | 24.4 | 31.2 | 32.5 | 26.3 | 31.5 | 38.9 | 28.8 | 24.5 | | |
| DT72 | 384981 | 345750 | 36.7 | 35.8 | 17.9 | | | 27.7 | 24.0 | 31.3 | 33.5 | 31.7 | 37.8 | 30.6 | 28.5 | 24.3 | | |
| DT73 | 385070 | 345738 | | | | | | 30.1 | 25.3 | 33.6 | 35.5 | 35.6 | 34.5 | 39.6 | 33.7 | 27.7 | | |
| DT74 | 385132 | 345640 | 30.6 | 24.9 | | | | | 22.1 | 29.3 | 29.5 | | 37.4 | 34.8 | 30.0 | 22.6 | | |
| DT76 | 385226 | 346156 | 43.0 | 34.8 | 18.8 | | | 32.1 | 23.0 | 37.1 | 35.9 | 34.9 | 33.2 | 48.9 | 31.9 | 27.1 | | |
| DT84 | 385548 | 346400 | 39.3 | 32.9 | 19.0 | | | 30.5 | 23.1 | 32.4 | 57.9 | 37.6 | 43.6 | 29.4 | 31.8 | 27.0 | | |
| DT85 | 385575 | 346413 | 39.3 | 34.1 | 22.9 | | | 34.2 | 30.3 | 40.4 | 43.2 | 28.4 | 36.4 | 39.3 | 32.8 | 27.9 | | |
| DT86 | 385075 | 345910 | | 58.3 | 15.9 | | | 18.0 | 20.5 | 20.9 | 24.1 | 24.2 | 36.2 | 28.0 | 25.0 | 21.3 | | |
| DT87 | 385105 | 346225 | 38.7 | 34.6 | 19.4 | | | 29.4 | 27.9 | 36.0 | 37.0 | 33.9 | 27.2 | 37.4 | 30.2 | 25.6 | | |
| DT88 | 384709 | 345881 | 22.5 | 31.9 | 17.1 | | | 22.2 | 23.3 | 25.5 | 28.2 | | 32.6 | 31.3 | 24.5 | 20.8 | | |
| DT89a | 385054 | 346134 | 30.9 | 29.1 | 16.4 | | | 23.6 | 17.1 | 28.9 | 29.0 | 27.4 | 28.3 | 33.8 | - | - | | Triplicate Site with DT89a, DT89b and DT90c - Annual data provided for DT90c only |
| DT89b | 385054 | 346134 | 31.4 | 28.7 | 15.1 | | | 23.7 | 17.0 | 29.1 | 27.0 | 27.4 | 34.0 | 26.9 | - | - | | Triplicate Site with DT89a, DT89b and DT90c - Annual data provided for DT90c only |
| DT90c | 385054 | 346134 | 31.8 | 25.6 | 15.4 | | | 24.9 | 16.8 | 30.6 | 26.1 | 21.6 | 32.5 | 35.2 | 24.5 | 20.9 | | Triplicate Site with DT89a, DT89b and DT90c - Annual data provided for DT90c only |
| DT92 | 383890 | 354461 | 34.5 | 25.8 | 18.0 | | | 25.2 | 18.7 | 30.3 | 27.5 | 29.5 | 36.5 | 33.3 | 26.4 | 22.5 | | |
| DT93 | 384056 | 354393 | 29.2 | 22.9 | 16.8 | | | 28.2 | | 29.3 | 29.9 | 29.4 | 30.6 | 29.4 | 25.5 | 21.7 | | |
| DT95 | 385171 | 345539 | 37.0 | 33.1 | 18.1 | | | 22.6 | 40.5 | 25.5 | 29.8 | 32.6 | 35.3 | 36.8 | 28.9 | 24.6 | | |
| DT96 | 385131 | 345601 | 41.7 | 36.2 | 14.7 | | | 25.1 | 86.6 | 30.5 | 32.9 | 34.4 | 41.8 | 38.1 | 33.9 | 28.9 | | |
| DT97 | 384795 | 345796 | 27.4 | 25.5 | 14.5 | | | 20.6 | 16.7 | 24.6 | 25.1 | 26.1 | 39.8 | 27.9 | 23.1 | 19.7 | | |
| DT98 | 385327 | 346148 | 43.2 | 44.1 | 14.3 | | | 28.8 | 25.9 | 33.1 | 35.6 | 23.4 | | 38.3 | 28.6 | 24.3 | | |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT100 | 384689 | 346284 | 29.6 | 30.1 | 15.7 | | | 19.5 | 19.6 | 23.0 | 25.8 | | 32.9 | | 22.6 | 20.1 | | |
| DT101 | 384806 | 345842 | 29.8 | 26.4 | 13.8 | | | 27.2 | 19.7 | 29.5 | 29.7 | 30.9 | 33.0 | 35.3 | 25.4 | 21.6 | | |
| DT102 | 384609 | 346007 | 44.1 | 42.5 | 23.2 | | | 32.1 | 33.4 | 36.9 | 40.5 | 53.8 | 43.0 | 43.6 | 36.9 | 31.4 | | |
| DT103 | 385682 | 347909 | 23.0 | 19.7 | | | | 19.2 | 11.0 | 22.5 | 19.3 | 14.0 | 26.8 | 25.4 | 20.1 | 17.1 | | |
| DT104 | 385213 | 346270 | 41.8 | 37.3 | 18.5 | | | 27.7 | 31.5 | 46.5 | 33.9 | 51.0 | 53.9 | 95.2 | 40.6 | 34.5 | | |
| DT105 | 383991 | 354418 | 28.0 | 24.6 | 14.1 | | | 20.5 | 16.8 | 22.3 | 23.4 | 25.3 | 31.1 | 28.8 | 22.0 | 18.7 | | |
| DT106 | 384030 | 354416 | 40.4 | 34.3 | | | | | 31.5 | 44.9 | 41.8 | 40.9 | 39.6 | 41.7 | 39.7 | 30.2 | | |
| DT107a | 384454 | 346245 | 27.5 | 25.5 | 14.8 | | | 21.9 | 16.9 | 25.6 | 27.2 | 26.5 | 32.2 | 27.6 | - | - | | Triplicate Site with DT107a, DT107b and DT107c - Annual data provided for DT107c only |
| DT107b | 384454 | 346245 | | | | | | 22.5 | 17.0 | 26.7 | 27.8 | 28.8 | 26.7 | 30.1 | - | - | | Triplicate Site with DT107a, DT107b and DT107c - Annual data provided for DT107c only |
| DT107c | 384454 | 346245 | | | | | | 22.2 | 16.3 | 26.2 | 27.1 | | | 32.3 | 23.2 | 19.7 | | Triplicate Site with DT107a, DT107b and DT107c - Annual data provided for DT107c only |
| DT108a | 384961 | 345346 | 30.9 | 29.5 | 14.7 | | | 20.1 | 19.7 | 23.3 | 23.6 | 27.0 | 27.4 | 28.3 | - | - | | Triplicate Site with DT108a, DT108b and DT108c - Annual data provided for DT108c only |
| DT108b | 384961 | 345346 | | | | | | 20.0 | 22.0 | 22.8 | 23.6 | 25.2 | 27.9 | 24.9 | - | - | | Triplicate Site with DT108a, DT108b and DT108c - Annual data provided for DT108c only |
| DT108c | 384961 | 345346 | | | | | | 20.5 | 19.6 | 21.9 | 24.5 | 27.8 | 30.3 | 31.1 | 22.9 | 19.5 | | Triplicate Site with DT108a, DT108b and DT108c - Annual data provided for DT108c only |
| DT109a | 385190 | 343318 | 31.6 | 25.6 | 12.9 | | | 17.4 | 15.0 | 18.7 | 20.7 | 23.2 | 20.9 | 27.3 | - | - | | Triplicate Site with DT109a, DT109b and DT109c - Annual data provided for DT109c only |
| DT109b | 385190 | 343318 | | | | | | 15.9 | 14.7 | 20.7 | 24.5 | 24.2 | 26.8 | 28.3 | - | - | | Triplicate Site with DT109a, DT109b and DT109c - Annual data provided for DT109c only |
| DT109c | 385190 | 343318 | | | | | | 17.4 | 14.5 | 20.1 | 21.3 | 22.6 | 29.1 | 29.2 | 20.6 | 17.5 | | Triplicate Site with DT109a, DT109b and DT109c - Annual data provided for DT109c only |
| DT110a | 385110 | 342314 | 30.3 | 29.9 | 16.5 | | | 23.9 | 21.9 | 28.0 | 28.4 | 27.4 | 29.5 | 24.2 | - | - | | Triplicate Site with DT110a, DT110b and DT110c - Annual data provided for DT110c only |
| DT110b | 385110 | 342314 | | | | | | 24.1 | 24.0 | 27.0 | 29.8 | 31.0 | 29.6 | 24.5 | - | - | | Triplicate Site with DT110a, DT110b and DT110c - Annual data provided for DT110c only |
| DT110c | 385110 | 342314 | | | | | | 24.8 | 22.9 | 27.9 | 28.3 | 29.7 | 31.1 | 25.9 | 24.8 | 21.1 | | Triplicate Site with DT110a, DT110b and DT110c - Annual data provided for DT110c only |
| DT111a | 383882 | 349558 | 28.8 | 40.9 | | | | | 22.0 | 19.7 | 26.5 | 25.4 | 28.5 | 32.5 | - | - | | Triplicate Site with DT111a, DT111b and DT111c - Annual data provided for DT111c only |
| DT111b | 383882 | 349558 | | | | | | 23.5 | 21.5 | 23.7 | 26.1 | 30.2 | 35.9 | 30.5 | - | - | | Triplicate Site with DT111a, DT111b and DT111c - Annual data provided for DT111c only |
| DT111c | 383882 | 349558 | | | | | | | 19.0 | | 24.1 | 29.2 | 34.1 | 33.2 | 28.2 | 24.0 | | Triplicate Site with DT111a, DT111b and DT111c - Annual data provided for DT111c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT112a | 382286 | 341956 | 24.3 | 19.5 | 12.8 | | | 15.9 | 11.4 | 19.0 | 18.8 | 17.8 | 26.2 | 21.4 | - | - | | Triplicate Site with DT112a, DT112b and DT112c - Annual data provided for DT112c only |
| DT112b | 382286 | 341956 | | | | | | 17.0 | 11.4 | 19.8 | 17.7 | 17.3 | 23.8 | 21.4 | - | - | | Triplicate Site with DT112a, DT112b and DT112c - Annual data provided for DT112c only |
| DT112c | 382286 | 341956 | | | | | | 14.6 | 11.1 | | 17.9 | 18.8 | 18.2 | 20.7 | 17.4 | 14.8 | | Triplicate Site with DT112a, DT112b and DT112c - Annual data provided for DT112c only |
| DT113a | 383052 | 343666 | 22.9 | 2.5 | 11.9 | | | 17.3 | 14.0 | 7.5 | 22.3 | | 23.9 | 23.8 | - | - | | Triplicate Site with DT113a, DT113b and DT113c - Annual data provided for DT113c only |
| DT113b | 383052 | 343666 | | | | | | 17.9 | 14.2 | 20.6 | 20.8 | | 22.9 | 24.3 | - | - | | Triplicate Site with DT113a, DT113b and DT113c - Annual data provided for DT113c only |
| DT113c | 383052 | 343666 | | | | | | 18.8 | 13.8 | 13.6 | 21.6 | | 23.7 | 17.7 | 15.8 | 13.5 | | Triplicate Site with DT113a, DT113b and DT113c - Annual data provided for DT113c only |
| DT114a | 383953 | 344832 | 27.5 | 24.3 | 11.4 | | | 17.2 | 13.0 | 17.5 | 18.2 | 22.3 | 26.3 | 34.3 | - | - | | Triplicate Site with DT114a, DT114b and DT114c - Annual data provided for DT114c only |
| DT114b | 383953 | 344832 | | | | | | 16.8 | 13.0 | 17.7 | 18.1 | 28.5 | 23.3 | 14.8 | - | - | | Triplicate Site with DT114a, DT114b and DT114c - Annual data provided for DT114c only |
| DT114c | 383953 | 344832 | | | | | | 16.5 | 12.6 | 17.7 | 18.7 | 23.3 | 25.2 | 25.0 | 18.9 | 16.1 | | Triplicate Site with DT114a, DT114b and DT114c - Annual data provided for DT114c only |
| DT115a | 383545 | 345195 | 16.0 | 14.0 | 9.5 | | | 11.3 | 8.8 | 13.4 | 14.4 | 14.9 | 16.3 | 18.4 | - | - | | Triplicate Site with DT115a, DT115b and DT115c - Annual data provided for DT115c only |
| DT115b | 383545 | 345195 | | | | | | 11.2 | 9.5 | 14.0 | 12.5 | 14.0 | 17.5 | 19.9 | - | - | | Triplicate Site with DT115a, DT115b and DT115c - Annual data provided for DT115c only |
| DT115c | 383545 | 345195 | | | | | | 12.7 | 9.4 | 13.4 | 14.9 | 13.4 | 17.2 | 16.7 | 13.1 | 11.1 | | Triplicate Site with DT115a, DT115b and DT115c - Annual data provided for DT115c only |
| DT116a | 383157 | 345431 | 26.8 | 23.1 | 12.5 | | | 17.4 | 13.8 | 19.0 | 20.7 | 24.0 | 23.4 | 24.1 | - | - | | Triplicate Site with DT116a, DT116b and DT116c - Annual data provided for DT116c only |
| DT116b | 383157 | 345431 | | | | | | 18.1 | 14.6 | 19.0 | 18.3 | 23.6 | 24.6 | 23.7 | - | - | | Triplicate Site with DT116a, DT116b and DT116c - Annual data provided for DT116c only |
| DT116c | 383157 | 345431 | | | | | | 18.0 | 14.9 | 19.6 | 20.6 | 22.0 | | 24.6 | 19.2 | 16.4 | | Triplicate Site with DT116a, DT116b and DT116c - Annual data provided for DT116c only |
| DT117a | 383199 | 352740 | 42.5 | 38.4 | 15.7 | | | 28.3 | 26.5 | 32.8 | 34.6 | 36.8 | 35.2 | 32.7 | - | - | | Triplicate Site with DT117a, DT117b and DT117c - Annual data provided for DT117c only |
| DT117b | 383199 | 352740 | | | | | | 27.6 | 28.5 | 31.5 | 32.9 | 33.5 | 36.1 | 36.7 | - | - | | Triplicate Site with DT117a, DT117b and DT117c - Annual data provided for DT117c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT117c | 383199 | 352740 | | | | | | 28.3 | 26.2 | 31.9 | 32.7 | 35.1 | 36.1 | 34.0 | 29.5 | 25.1 | | Triplicate Site with DT117a, DT117b and DT117c - Annual data provided for DT117c only |
| DT118a | 382934 | 353388 | 28.1 | 24.3 | 14.3 | | | 21.8 | 15.6 | 25.5 | 23.3 | 24.4 | 28.6 | 26.3 | - | - | | Triplicate Site with DT118a, DT118b and DT118c - Annual data provided for DT118c only |
| DT118b | 382934 | 353388 | | | | | | 21.3 | 15.9 | 24.6 | 22.8 | 26.4 | 26.8 | 27.9 | - | - | | Triplicate Site with DT118a, DT118b and DT118c - Annual data provided for DT118c only |
| DT118c | 382934 | 353388 | | | | | | 22.5 | 15.8 | 23.9 | 22.5 | 23.8 | 28.8 | 26.9 | 21.8 | 18.5 | | Triplicate Site with DT118a, DT118b and DT118c - Annual data provided for DT118c only |
| DT119a | 382600 | 354062 | | | 14.8 | | | 20.9 | 12.9 | 24.3 | 23.8 | 24.1 | 29.5 | 27.9 | - | - | | Triplicate Site with DT119a, DT119b and DT119c - Annual data provided for DT119c only |
| DT119b | 382600 | 354062 | | | | | | 24.4 | 13.9 | 26.2 | 24.7 | 24.8 | 29.3 | 22.6 | - | - | | Triplicate Site with DT119a, DT119b and DT119c - Annual data provided for DT119c only |
| DT119c | 382600 | 354062 | | | | | | 23.3 | 13.0 | 26.4 | 22.6 | 24.4 | 24.2 | | 20.9 | 18.0 | | Triplicate Site with DT119a, DT119b and DT119c - Annual data provided for DT119c only |
| DT120a | 382707 | 354305 | 34.0 | 37.1 | 13.6 | | | 28.3 | 28.4 | 34.0 | 34.9 | 36.9 | 31.0 | 35.2 | - | - | | Triplicate Site with DT120a, DT120b and DT120c - Annual data provided for DT120c only |
| DT120b | 382707 | 354305 | | | | | | 26.8 | 26.3 | 32.4 | 33.2 | 36.8 | 41.2 | 35.0 | - | - | | Triplicate Site with DT120a, DT120b and DT120c - Annual data provided for DT120c only |
| DT120c | 382707 | 354305 | | | | | | | 28.3 | 31.2 | 34.1 | 34.2 | 36.0 | 33.0 | 28.4 | 24.2 | | Triplicate Site with DT120a, DT120b and DT120c - Annual data provided for DT120c only |
| DT121a | 382736 | 354385 | 29.3 | 25.8 | 18.1 | | | 19.8 | 18.7 | 22.8 | 24.3 | 26.6 | 29.4 | 26.9 | - | - | | Triplicate Site with DT121a, DT121b and DT121c - Annual data provided for DT121c only |
| DT121b | 382736 | 354385 | | | | | | 18.7 | 19.3 | 23.7 | 25.2 | 26.1 | 30.4 | 27.9 | - | - | | Triplicate Site with DT121a, DT121b and DT121c - Annual data provided for DT121c only |
| DT121c | 382736 | 354385 | | | | | | 19.2 | 18.9 | 22.8 | 24.3 | 25.8 | 31.0 | 49.3 | 24.0 | 20.4 | | Triplicate Site with DT121a, DT121b and DT121c - Annual data provided for DT121c only |
| DT122a | 384261 | 354207 | 32.1 | 29.0 | 19.3 | | | 26.8 | 17.0 | 27.2 | 27.6 | 25.5 | 27.8 | 29.9 | - | - | | Triplicate Site with DT122a, DT122b and DT122c - Annual data provided for DT122c only |
| DT122b | 384261 | 354207 | | | | | | 25.9 | 17.0 | 26.8 | 26.6 | 25.2 | 28.1 | 21.2 | - | - | | Triplicate Site with DT122a, DT122b and DT122c - Annual data provided for DT122c only |
| DT122c | 384261 | 354207 | | | | | | 24.1 | 17.6 | 25.6 | 26.5 | 26.6 | 27.8 | 24.4 | 24.5 | 20.8 | | Triplicate Site with DT122a, DT122b and DT122c - Annual data provided for DT122c only |
| DT123a | 384638 | 354133 | 38.2 | 31.0 | 15.1 | | | 22.2 | 19.9 | 23.2 | 25.1 | 25.1 | 25.1 | 24.0 | - | - | | Triplicate Site with DT123a, DT123b and DT123c - Annual data provided for DT123c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT123b | 384638 | 354133 | | | | | | 21.0 | 20.6 | 23.3 | 24.8 | 25.9 | 31.3 | 35.3 | - | - | | Triplicate Site with DT123a, DT123b and DT123c - Annual data provided for DT123c only |
| DT123c | 384638 | 354133 | | | | | | 21.7 | 20.3 | | | 26.8 | 27.8 | 34.1 | 24.1 | 20.5 | | Triplicate Site with DT123a, DT123b and DT123c - Annual data provided for DT123c only |
| DT124a | 385019 | 353832 | 53.3 | 44.9 | | | | 31.0 | 33.4 | 34.8 | 37.4 | 38.4 | 33.6 | 42.8 | - | - | | Triplicate Site with DT124a, DT124b and DT124c - Annual data provided for DT124c only |
| DT124b | 385019 | 353832 | | | | | | 29.8 | 30.0 | 34.7 | 39.9 | 40.9 | 32.0 | 36.3 | - | - | | Triplicate Site with DT124a, DT124b and DT124c - Annual data provided for DT124c only |
| DT124c | 385019 | 353832 | | | | | | 32.2 | 29.7 | 34.2 | 37.9 | 39.6 | 29.8 | 35.4 | 38.0 | 32.3 | | Triplicate Site with DT124a, DT124b and DT124c - Annual data provided for DT124c only |
| DT125a | 385387 | 348389 | 34.9 | 34.3 | 15.4 | | | 22.4 | 22.4 | 22.1 | 27.4 | 28.0 | 27.9 | 26.3 | - | - | | Triplicate Site with DT125a, DT125b and DT125c - Annual data provided for DT125c only |
| DT125b | 385387 | 348389 | | | | | | 21.6 | 22.9 | 23.3 | 26.9 | 27.4 | 23.3 | 31.2 | - | - | | Triplicate Site with DT125a, DT125b and DT125c - Annual data provided for DT125c only |
| DT125c | 385387 | 348389 | | | | | | 22.3 | 22.4 | 22.9 | 26.2 | 24.7 | 32.7 | 19.3 | 24.1 | 20.5 | | Triplicate Site with DT125a, DT125b and DT125c - Annual data provided for DT125c only |
| DT126a | 385556 | 348224 | 29.6 | 28.1 | 13.3 | | | 19.7 | 17.7 | 21.3 | 22.0 | 24.4 | 30.6 | 26.6 | - | - | | Triplicate Site with DT126a, DT126b and DT126c - Annual data provided for DT126c only |
| DT126b | 385556 | 348224 | | | | | | 19.0 | 17.7 | 21.0 | 20.9 | 24.8 | 32.1 | 22.8 | - | - | | Triplicate Site with DT126a, DT126b and DT126c - Annual data provided for DT126c only |
| DT126c | 385556 | 348224 | | | | | | 19.2 | 17.0 | 21.6 | 23.3 | 23.9 | 25.9 | 31.6 | 21.6 | 18.3 | | Triplicate Site with DT126a, DT126b and DT126c - Annual data provided for DT126c only |
| DT127a | 385416 | 347424 | 27.9 | 24.5 | 14.5 | | | 20.9 | 15.9 | 23.4 | 24.2 | | 24.8 | 27.5 | - | - | | Triplicate Site with DT127a, DT127b and DT127c - Annual data provided for DT127c only |
| DT127b | 385416 | 347424 | | | | | | 18.8 | 15.4 | 23.8 | 23.7 | | 28.4 | 27.2 | - | - | | Triplicate Site with DT127a, DT127b and DT127c - Annual data provided for DT127c only |
| DT127c | 385416 | 347424 | | | | | | 20.4 | 15.7 | 22.7 | 25.9 | | 26.3 | 16.6 | 20.9 | 17.7 | | Triplicate Site with DT127a, DT127b and DT127c - Annual data provided for DT127c only |
| DT128a | 385512 | 347373 | 33.9 | 30.2 | 18.9 | | | 28.0 | 17.1 | 31.0 | 29.5 | | 32.6 | 32.3 | - | - | | Triplicate Site with DT128a, DT128b and DT128c - Annual data provided for DT128c only |
| DT128b | 385512 | 347373 | | | | | | | 16.9 | 33.2 | 29.8 | | 31.6 | 31.3 | - | - | | Triplicate Site with DT128a, DT128b and DT128c - Annual data provided for DT128c only |
| DT128c | 385512 | 347373 | | | | | | | 17.1 | 30.6 | | | 36.8 | 33.6 | 26.7 | 22.7 | | Triplicate Site with DT128a, DT128b and DT128c - Annual data provided for DT128c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT129a | 384968 | 346228 | 31.3 | I/S | 15.3 | | | 20.9 | 16.2 | 25.8 | 27.3 | 25.9 | 30.1 | 30.7 | - | - | | Triplicate Site with DT129a, DT129b and DT129c - Annual data provided for DT129c only |
| DT129b | 384968 | 346228 | | | | | | 20.6 | 16.8 | 25.5 | 27.3 | 26.4 | 32.2 | 30.5 | - | - | | Triplicate Site with DT129a, DT129b and DT129c - Annual data provided for DT129c only |
| DT129c | 384968 | 346228 | | | | | | 21.2 | 16.0 | 25.1 | 27.5 | 25.8 | 32.4 | | 23.3 | 19.8 | | Triplicate Site with DT129a, DT129b and DT129c - Annual data provided for DT129c only |
| DT130a | 385098 | 346395 | 37.5 | 33.7 | 20.4 | | | 27.2 | 19.0 | 33.5 | 31.1 | 31.7 | 36.8 | 39.8 | - | - | | Triplicate Site with DT130a, DT130b and DT130c - Annual data provided for DT130c only |
| DT130b | 385098 | 346395 | | | | | | 26.4 | 20.6 | 33.5 | 31.3 | 30.4 | 39.1 | 35.7 | - | - | | Triplicate Site with DT130a, DT130b and DT130c - Annual data provided for DT130c only |
| DT130c | 385098 | 346395 | | | | | | 27.7 | 21.2 | 32.9 | 30.2 | 31.7 | 37.3 | 37.1 | 29.3 | 24.9 | | Triplicate Site with DT130a, DT130b and DT130c - Annual data provided for DT130c only |
| DT131a | 385463 | 346374 | 40.4 | 38.0 | | | | 26.0 | 25.3 | 30.2 | 35.5 | 34.2 | 36.2 | 36.7 | - | - | | Triplicate Site with DT131a, DT131b and DT131c - Annual data provided for DT131c only |
| DT131b | 385463 | 346374 | | | | | | 27.0 | 25.7 | 31.5 | 37.2 | 36.5 | 38.8 | 34.0 | - | - | | Triplicate Site with DT131a, DT131b and DT131c - Annual data provided for DT131c only |
| DT131c | 385463 | 346374 | | | | | | 26.2 | 25.1 | 30.9 | 36.4 | | 38.7 | 36.8 | 34.0 | 28.9 | | Triplicate Site with DT131a, DT131b and DT131c - Annual data provided for DT131c only |
| DT132a | 385612 | 346436 | 40.8 | 39.1 | 18.4 | | | 26.7 | 28.2 | 28.3 | 36.7 | 38.9 | 37.4 | 33.7 | - | - | | Triplicate Site with DT132a, DT132b and DT132c - Annual data provided for DT132c only |
| DT132b | 385612 | 346436 | | | | | | 25.3 | 27.8 | 28.1 | 37.9 | 36.7 | 35.3 | 27.1 | - | - | | Triplicate Site with DT132a, DT132b and DT132c - Annual data provided for DT132c only |
| DT132c | 385612 | 346436 | | | | | | 25.7 | 30.3 | 26.4 | | 32.3 | 35.6 | 29.9 | 29.6 | 25.2 | | Triplicate Site with DT132a, DT132b and DT132c - Annual data provided for DT132c only |
| DT133a | 385926 | 346580 | 47.0 | 44.6 | | | | 30.7 | 22.8 | 36.6 | 37.6 | 38.2 | 43.5 | 38.4 | - | - | | Triplicate Site with DT133a, DT133b and DT133c - Annual data provided for DT133c only |
| DT133b | 385926 | 346580 | | | | | | 28.4 | 22.9 | 35.6 | 36.6 | 37.6 | 57.0 | 39.1 | - | - | | Triplicate Site with DT133a, DT133b and DT133c - Annual data provided for DT133c only |
| DT133c | 385926 | 346580 | | | | | | 30.9 | 20.7 | 35.0 | 37.0 | 34.7 | 37.4 | 38.8 | 37.5 | 31.9 | | Triplicate Site with DT133a, DT133b and DT133c - Annual data provided for DT133c only |
| DT134a | 386009 | 346600 | 37.6 | 37.1 | 18.1 | | | 26.2 | 21.6 | 28.9 | 32.6 | 32.9 | 35.8 | 32.7 | - | - | | Triplicate Site with DT134a, DT134b and DT134c - Annual data provided for DT134c only |
| DT134b | 386009 | 346600 | | | | | | 25.9 | 22.5 | 29.8 | 32.5 | 30.1 | 36.4 | 32.1 | - | - | | Triplicate Site with DT134a, DT134b and DT134c - Annual data provided for DT134c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT134c | 386009 | 346600 | | | | | | 26.2 | 23.1 | 28.0 | 34.3 | 33.0 | 33.6 | 33.1 | 28.3 | 24.0 | | Triplicate Site with DT134a, DT134b and DT134c - Annual data provided for DT134c only |
| DT135a | 385518 | 346128 | I/S | 36.7 | 17.3 | | | 23.1 | 23.5 | 27.9 | 33.1 | 31.1 | 35.1 | 34.4 | - | - | | Triplicate Site with DT135a, DT135b and DT135c - Annual data provided for DT135c only |
| DT135b | 385518 | 346128 | | | | | | 23.4 | 22.4 | 28.4 | 34.9 | 35.5 | 35.3 | 31.8 | - | - | | Triplicate Site with DT135a, DT135b and DT135c - Annual data provided for DT135c only |
| DT135c | 385518 | 346128 | | | | | | 23.0 | 25.5 | 28.4 | 33.0 | 31.3 | 33.2 | 23.1 | 26.8 | 22.8 | | Triplicate Site with DT135a, DT135b and DT135c - Annual data provided for DT135c only |
| DT136a | 385078 | 345687 | 40.7 | | 16.9 | | | 20.6 | 23.7 | 26.5 | 29.9 | 31.1 | 35.1 | 33.7 | - | - | | Triplicate Site with DT136a, DT136b and DT136c - Annual data provided for DT136c only |
| DT136b | 385078 | 345687 | | | | | | 20.0 | 22.5 | 25.3 | 29.9 | 33.1 | 32.9 | 29.9 | - | - | | Triplicate Site with DT136a, DT136b and DT136c - Annual data provided for DT136c only |
| DT136c | 385078 | 345687 | | | | | | 21.4 | 22.6 | 26.7 | 30.6 | 33.3 | 34.9 | 22.9 | 26.1 | 22.2 | | Triplicate Site with DT136a, DT136b and DT136c - Annual data provided for DT136c only |
| DT137a | 382795 | 346011 | 20.0 | 19.9 | 13.6 | | | 20.1 | 13.0 | 19.9 | 19.6 | 20.1 | 26.2 | 20.5 | - | - | | Triplicate Site with DT137a, DT137b and DT137c - Annual data provided for DT137c only |
| DT137b | 382795 | 346011 | | | | | | 20.8 | 12.6 | 20.6 | 19.7 | 20.7 | 25.7 | 23.4 | - | - | | Triplicate Site with DT137a, DT137b and DT137c - Annual data provided for DT137c only |
| DT137c | 382795 | 346011 | | | | | | 20.5 | 11.8 | 20.1 | 20.4 | 20.7 | 20.4 | 25.9 | 18.6 | 15.8 | | Triplicate Site with DT137a, DT137b and DT137c - Annual data provided for DT137c only |
| DT138a | 383113 | 346592 | 36.6 | 33.0 | 14.6 | | | 19.8 | 16.1 | 22.5 | 21.4 | 25.8 | 29.6 | 27.6 | - | - | | Triplicate Site with DT138a, DT138b and DT138c - Annual data provided for DT138c only |
| DT138b | 383113 | 346592 | | | | | | 19.8 | 16.4 | 21.5 | 23.5 | 23.8 | 27.5 | 28.9 | - | - | | Triplicate Site with DT138a, DT138b and DT138c - Annual data provided for DT138c only |
| DT138c | 383113 | 346592 | | | | | | 21.4 | | 22.7 | 22.4 | 25.0 | 27.4 | 27.8 | 23.0 | 19.5 | | Triplicate Site with DT138a, DT138b and DT138c - Annual data provided for DT138c only |
| DT139a | 383302 | 346727 | 22.5 | 23.3 | 10.9 | | | 13.3 | 9.2 | 13.1 | 16.0 | 17.3 | 22.9 | 21.9 | - | - | | Triplicate Site with DT139a, DT139b and DT139c - Annual data provided for DT139c only |
| DT139b | 383302 | 346727 | | | | | | 13.4 | 10.5 | 14.8 | 14.8 | 17.7 | 23.2 | 22.2 | - | - | | Triplicate Site with DT139a, DT139b and DT139c - Annual data provided for DT139c only |
| DT139c | 383302 | 346727 | | | | | | 12.8 | 9.8 | 15.0 | 14.7 | 16.9 | 23.8 | 22.9 | 16.2 | 13.7 | | Triplicate Site with DT139a, DT139b and DT139c - Annual data provided for DT139c only |
| DT140a | 383930 | 347273 | 32.9 | 31.8 | 18.4 | | | 25.0 | 20.5 | 27.4 | 30.2 | 27.6 | 31.9 | 30.9 | - | - | | Triplicate Site with DT140a, DT140b and DT140c - Annual data provided for DT140c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT140b | 383930 | 347273 | | | | | | 23.7 | 19.5 | 27.6 | 28.0 | 24.4 | 33.0 | 28.3 | - | - | | Triplicate Site with DT140a, DT140b and DT140c - Annual data provided for DT140c only |
| DT140c | 383930 | 347273 | | | | | | 25.7 | 19.6 | 28.3 | 27.6 | 25.1 | 32.5 | 30.7 | 25.7 | 21.9 | | Triplicate Site with DT140a, DT140b and DT140c - Annual data provided for DT140c only |
| DT141a | 384337 | 347534 | 38.6 | 37.7 | 21.5 | | | 29.1 | 22.1 | 29.7 | 36.4 | 35.1 | 39.0 | 36.8 | - | - | | Triplicate Site with DT141a, DT141b and DT141c - Annual data provided for DT141c only |
| DT141b | 384337 | 347534 | | | | | | 29.2 | 27.2 | 29.1 | 34.4 | 31.2 | 40.2 | 36.9 | - | - | | Triplicate Site with DT141a, DT141b and DT141c - Annual data provided for DT141c only |
| DT141c | 384337 | 347534 | | | | | | 30.9 | 23.5 | 31.9 | 34.9 | 30.8 | 35.6 | 38.0 | 30.7 | 26.1 | | Triplicate Site with DT141a, DT141b and DT141c - Annual data provided for DT141c only |
| DT142a | 384207 | 347915 | 30.7 | 32.2 | 16.8 | | | 23.4 | 19.1 | 25.8 | 26.6 | 27.6 | 33.7 | 31.6 | - | - | | Triplicate Site with DT142a, DT142b and DT142c - Annual data provided for DT142c only |
| DT142b | 384207 | 347915 | | | | | | 22.9 | 18.4 | 25.3 | 26.0 | 26.1 | 32.1 | 30.4 | - | - | | Triplicate Site with DT142a, DT142b and DT142c - Annual data provided for DT142c only |
| DT142c | 384207 | 347915 | | | | | | 23.1 | 18.1 | 15.7 | 26.6 | 25.3 | 32.2 | I/S | 24.5 | 20.8 | | Triplicate Site with DT142a, DT142b and DT142c - Annual data provided for DT142c only |
| DT143a | 384021 | 348925 | 43.9 | 38.7 | 24.1 | | | 39.1 | 32.1 | 39.7 | 45.1 | 38.9 | 40.9 | 39.0 | - | - | | Triplicate Site with DT143a, DT143b and DT143c - Annual data provided for DT143c only |
| DT143b | 384021 | 348925 | | | | | | 38.6 | 33.3 | 41.4 | 43.8 | 41.9 | 44.9 | 39.9 | - | - | | Triplicate Site with DT143a, DT143b and DT143c - Annual data provided for DT143c only |
| DT143c | 384021 | 348925 | | | | | | 39.6 | 31.2 | 41.6 | 44.1 | 43.1 | 35.7 | 37.8 | 36.1 | 30.7 | | Triplicate Site with DT143a, DT143b and DT143c - Annual data provided for DT143c only |
| DT144a | 383764 | 349912 | 20.9 | 20.3 | 14.1 | | | 23.7 | 12.7 | 24.9 | | 21.6 | 26.5 | 24.0 | - | - | | Triplicate Site with DT144a, DT144b and DT144c - Annual data provided for DT144c only |
| DT144b | 383764 | 349912 | | | | | | 24.4 | 13.2 | 25.4 | | 21.9 | 25.6 | 24.8 | - | - | | Triplicate Site with DT144a, DT144b and DT144c - Annual data provided for DT144c only |
| DT144c | 383764 | 349912 | | | | | | 22.8 | 12.9 | | | 17.7 | 20.5 | 26.3 | 19.7 | 16.7 | | Triplicate Site with DT144a, DT144b and DT144c - Annual data provided for DT144c only |
| DT145a | 383670 | 350326 | 49.3 | 42.0 | | | | 45.0 | 38.7 | 46.2 | 49.4 | 46.7 | 45.1 | 34.6 | - | - | | Triplicate Site with DT145a, DT145b and DT145c - Annual data provided for DT145c only |
| DT145b | 383670 | 350326 | | | | | | 48.8 | 39.8 | 47.0 | 50.5 | 45.2 | 46.2 | 38.0 | - | - | | Triplicate Site with DT145a, DT145b and DT145c - Annual data provided for DT145c only |
| DT145c | 383670 | 350326 | | | | | | 50.8 | 37.7 | 44.1 | 50.2 | 50.2 | 42.2 | 39.9 | 44.7 | 38.0 | | Triplicate Site with DT145a, DT145b and DT145c - Annual data provided for DT145c only |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Easting) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT146a | 383587 | 350790 | 35.8 | 29.7 | 15.9 | | | 23.8 | 23.7 | 26.8 | 30.6 | 29.9 | 31.4 | 30.4 | - | - | | Triplicate Site with DT146a, DT146b and DT146c - Annual data provided for DT146c only |
| DT146b | 383587 | 350790 | | | | | | 24.6 | 26.2 | 28.1 | 29.2 | 29.0 | 31.1 | 29.9 | - | - | | Triplicate Site with DT146a, DT146b and DT146c - Annual data provided for DT146c only |
| DT146c | 383587 | 350790 | | | | | | 24.2 | 25.3 | 26.4 | 31.3 | 27.9 | 28.6 | 29.9 | 25.8 | 21.9 | | Triplicate Site with DT146a, DT146b and DT146c - Annual data provided for DT146c only |

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

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Newcastle under Lyme Borough Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

**Notes:**

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

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

See Appendix C for details on bias adjustment and annualisation.

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

## New or Changed Sources Identified Within Newcastle under Lyme Borough During 2020

Intensive work has been carried out by Newcastle under Lyme Borough Council in conjunction with the Environment Agency, UK Health Security Agency, Staffordshire County Council Public Health and other bodies, to look into complaints concerning gaseous emissions from a landfill situated approximately 1.3 Kilometres outside of AQMA 2: Newcastle-under-Lyme Town Centre, regulated by the Environment Agency in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (18)

The Committee on Climate Change, has called for a ban on all biodegradable waste sent to landfill by 2025, if the UK is to reach 'net zero emissions' by 2050. It is hoped that through improvements in the management of the site in conjunction with the ban on biodegradable waste by 2025, levels of gaseous emissions, including nitric oxides, will decrease from this site.

Newcastle-under-Lyme Borough Council has not identified any additional new sources relating to air quality within the reporting year of 2020.

## Additional Air Quality Works Undertaken by Newcastle under Lyme Borough Council During 2020

Newcastle-under-Lyme Borough Council has not completed any additional works within the reporting year of 2020.

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18 The Environmental Permitting (England and Wales) Regulations 2016 (legislation.gov.uk)

## QA/QC of Diffusion Tube Monitoring

Staffordshire Scientific Services Laboratory supplied and analysed diffused tubes for Newcastle under Lyme Borough Council using the 20% TEA in water preparation method. The laboratory is UKAS accredited to ISO/IEC 17025:2017 (19) and participates in the AIR-PT scheme run by LGC (20) and the Field Intercomparison Scheme run by NPL (21)

Monitoring has been completed in accordance with the 2020 Diffusion Tube Calendar (22), with the exception of March to May dates.

Collection and deployment of diffusion tubes was disrupted by travel restrictions imposed during the Covid-19 pandemic. Diffusion tubes that were put out at the beginning of March were not collected and analysed until the beginning of June. In accordance with LAQM TG(16) guidance regarding tubes that are left out for significantly longer or shorter periods than the four and five weeks recommended, advice was sought from Staffordshire Scientific Services Laboratory on the likely stability and reliability of diffusion tube results for this period. The laboratory confirmed that TEA is stable for up to four months and was, therefore, within the acceptable shelf-life. The results also confirmed that the samples did not need to be diluted and therefore it was very unlikely that the tubes had not become saturated. It was decided to include the results for that period. The subsequent valid data capture for the whole monitoring period was 100%.



19 https://www.ukas.com/wp-content/uploads/schedule_uploads/00002/0719Testing-Multiple.pdf

20 https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

21 https://laqm.defra.gov.uk/documents/Tube_Precision_2020_version_06_21%20Final%20FULL%20FINAL.pdf

22 https://laqm.defra.gov.uk/assets/2020laqmcalendar1.pdf

## Diffusion Tube Annualisation

Annualisation was carried out at sites DT73, DT74, DT100, DT106 and DT109 as data capture less than 75% but greater than 25%. The process was completed using the Diffusion Tube Data Processing Tool version 1.2.

## Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 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.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from $NO_x/NO_2$ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Newcastle under Lyme Borough Council applied a national bias adjustment factor of 0.85 to the 2020 diffusion tube monitoring data. The factor was taken from version 09/21 and resulted from 15 studies. A summary of bias adjustment factors used by Newcastle under Lyme Borough Council over the past five years is presented in Table C.1.

A local bias adjustment factor was calculated using triplicate diffusion tube site DT89 co-located with CM1. The calculation was completed using the Diffusion Tube Data Processing Tool version 1.2. The local bias adjustment factor was not used, as the Data Quality Check on the calculation spreadsheet resulted in “Poor Overall Data Capture”.

### Table C.1 – Bias Adjustment Factor

| Year | **Local or National** | **If National, Version of National Spreadsheet** | Adjustment Factor |
|---|---|---|---|
| **2020** | National | 09/21 | 0.85 |
| **2019** | National | 03/20 | 0.93 |
| **2018** | National | 03/18 | 0.93 |
| **2017** | National | 03/18 | 0.89 |

| | | | |
|---|---|---|---|
| **2016** | National | 03/17 v2 | 0.94 |

### $NO_2$ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the $NO_2$ concentration at the nearest location relevant for exposure should be 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 Newcastle under Lyme Borough required distance correction during 2020, as all results were less than 36µg/m³ (within 10% of the objective).

## QA/QC of Automatic Monitoring

Local Site Operator (LSO) duties for the nitrogen dioxide analyser is carried out fortnightly by Newcastle under Lyme Borough Council personnel in accordance with Defra Local Authority Technical Guidance (LAQM (TG16) (23).

Service of the monitor was completed every 6-months.

Data management was carried out by Air Quality Data Management (AQDM) (24) in accordance with Defra Local Authority Technical Guidance (LAQM (TG16). Monitored data was continually screened algorithmically and manually for anomalies at the data collection stage. Several techniques are designed to discover spurious and unusual measurements within a very large dataset. Anomalies may be due to equipment failure, human error, power failures, interference or other disturbances. Additional manual investigation was used when spurious results were identified.

23 UK Regions (exc. London) Technical Guidance | LAQM (defra.gov.uk)

24 Air Quality Data Management (aqdm.co.uk)

Raw data from the gaseous instruments were scaled into concentrations using the latest values derived from the manual and automatic calibrations, to correct for instrument drift. Both the zero baseline (background) and sensitivity may change over time. The data was rescaled using regular calibration data obtained by introducing certified gas into the monitor and comparing the output to the certified gas value.

The 2020 data was ratified.

Live and historical data for CM1 is available online at Air Quality in the United Kingdom (ukairquality.net)

### Automatic Monitoring Annualisation

The automatic monitor located within Newcastle under Lyme Borough recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

### $NO_2$ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the $NO_2$ concentration at the nearest location relevant for exposure should be 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.

The automatic $NO_2$ monitor within Newcastle under Lyme Borough did not require distance correction during 2020.

## Table C.2 – Annualisation Summary (concentrations presented in µg/m$^3$)

| Site ID | Annualisation Factor Crewe Coppenhall | Annualisation Factor Glazebury | Annualisation Factor Stoke-on-Trent Centre | Annualisation Factor Telford Hollinswood | Average Annualisation Factor | Raw Data Annual Mean | Annualised Annual Mean | Comments |
|---|---|---|---|---|---|---|---|---|
| DT73 | 0.9360 | 0.9972 | 0.9696 | 0.9674 | 0.9676 | 33.7 | 32.6 | |
| DT74 | 0.8904 | 0.8880 | 0.8589 | 0.9172 | 0.8886 | 30.0 | 26.6 | |
| DT100 | 1.0458 | 1.0248 | 1.0587 | 1.0529 | 1.0456 | 22.6 | 23.6 | |
| DT106 | 0.8961 | 0.9047 | 0.8602 | 0.9263 | 0.8968 | 39.7 | 35.6 | |
| DT119a | 0.9660 | 1.0267 | 1.0642 | 0.9975 | 1.0136 | - | - | Triplicate Site with DT119a, DT119b and DT119c - Annual data provided for DT119c only |
| DT119b | 0.9660 | 1.0267 | 1.0642 | 0.9975 | 1.0136 | - | - | Triplicate Site with DT119a, DT119b and DT119c - Annual data provided for DT119c only |
| DT119c | 0.9660 | 1.0267 | 1.0642 | 0.9975 | 1.0136 | 20.9 | 21.2 | Triplicate Site with DT119a, DT119b and DT119c - Annual data provided for DT119c only |

## Table C.3 – Local Bias Adjustment Calculation

| | Local Bias Adjustment Input 1 | Local Bias Adjustment Input 2 | Local Bias Adjustment Input 3 | Local Bias Adjustment Input 4 | Local Bias Adjustment Input 5 |
|---|---|---|---|---|---|
| **Periods used to calculate bias** | 7 | | | | |
| **Bias Factor A** | 0.69 (0.57 - 0.87) | | | | |
| **Bias Factor B** | 45% (15% - 75%) | | | | |
| **Diffusion Tube Mean (µg/m$^3$)** | 27.1 | | | | |
| **Mean CV (Precision)** | 6.5% | | | | |
| **Automatic Mean (µg/m$^3$)** | 18.7 | | | | |
| **Data Capture** | 100% | | | | |
| **Adjusted Tube Mean (µg/m$^3$)** | 19 (15 - 24) | | | | |

**Notes:**

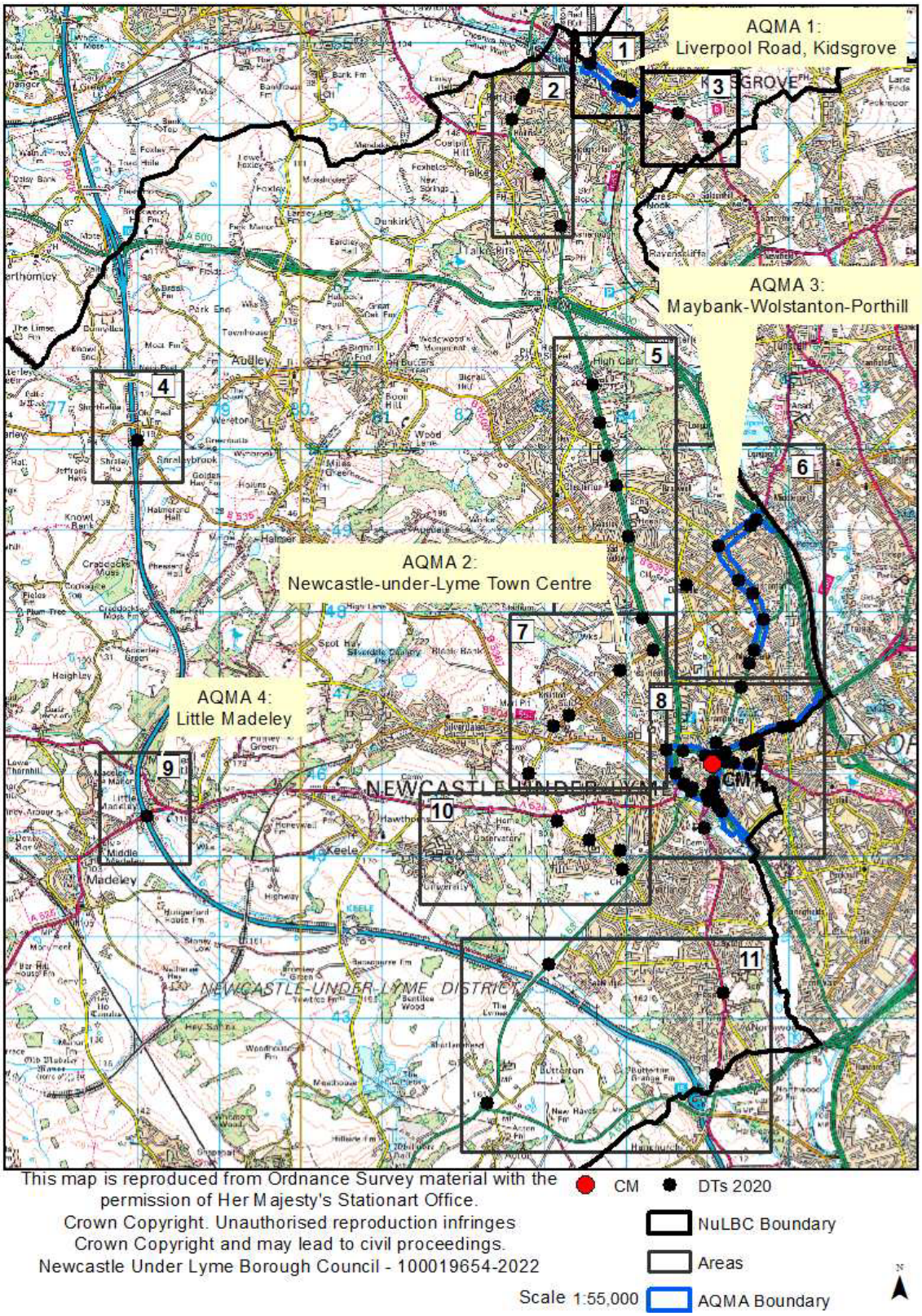
A single local bias adjustment factor has been used to calculate the local bias adjustment factor. However, the national bias adjustment factor was used to adjust the 2020 diffusion tube results.

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

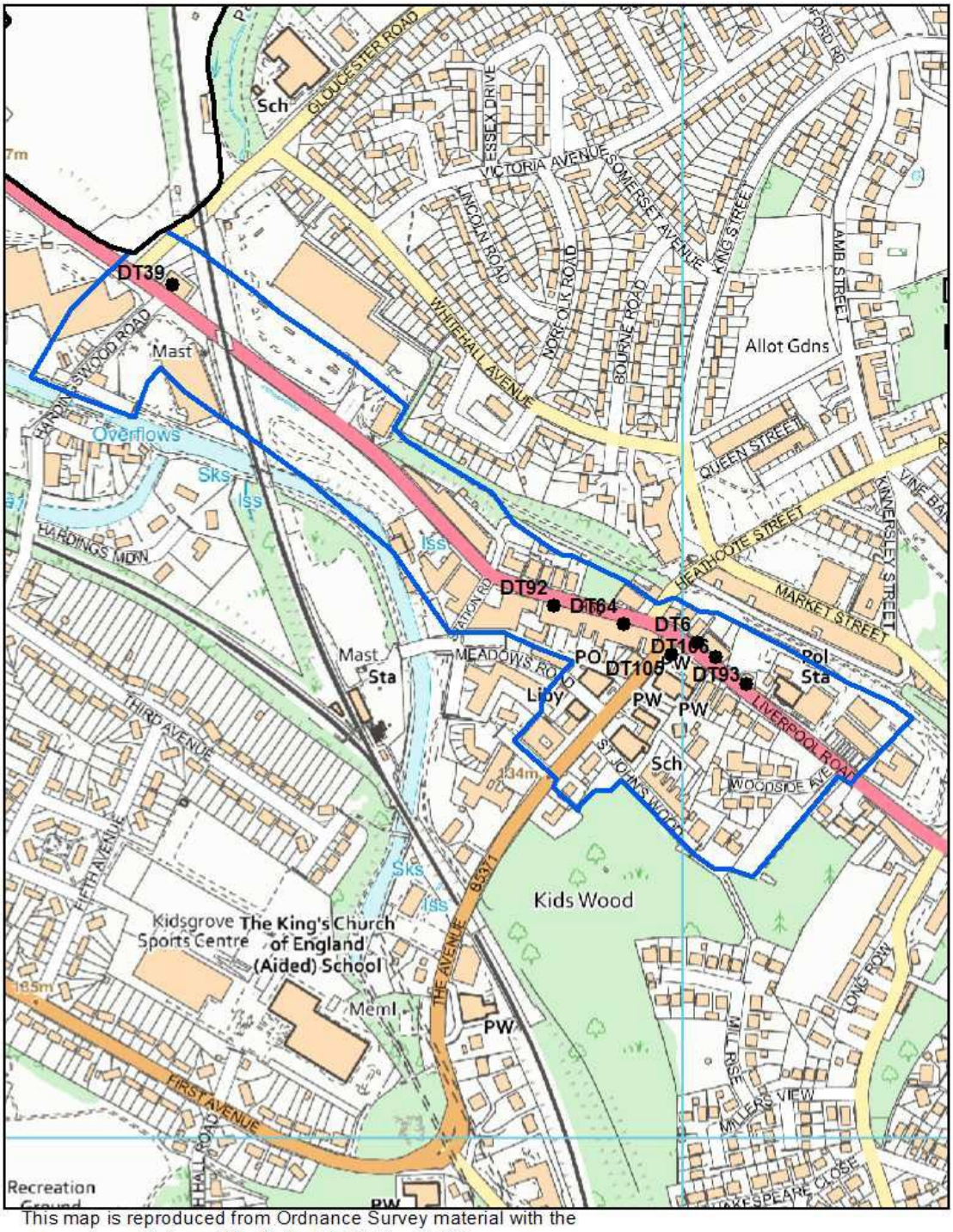
Distance correction was not required at any site.

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

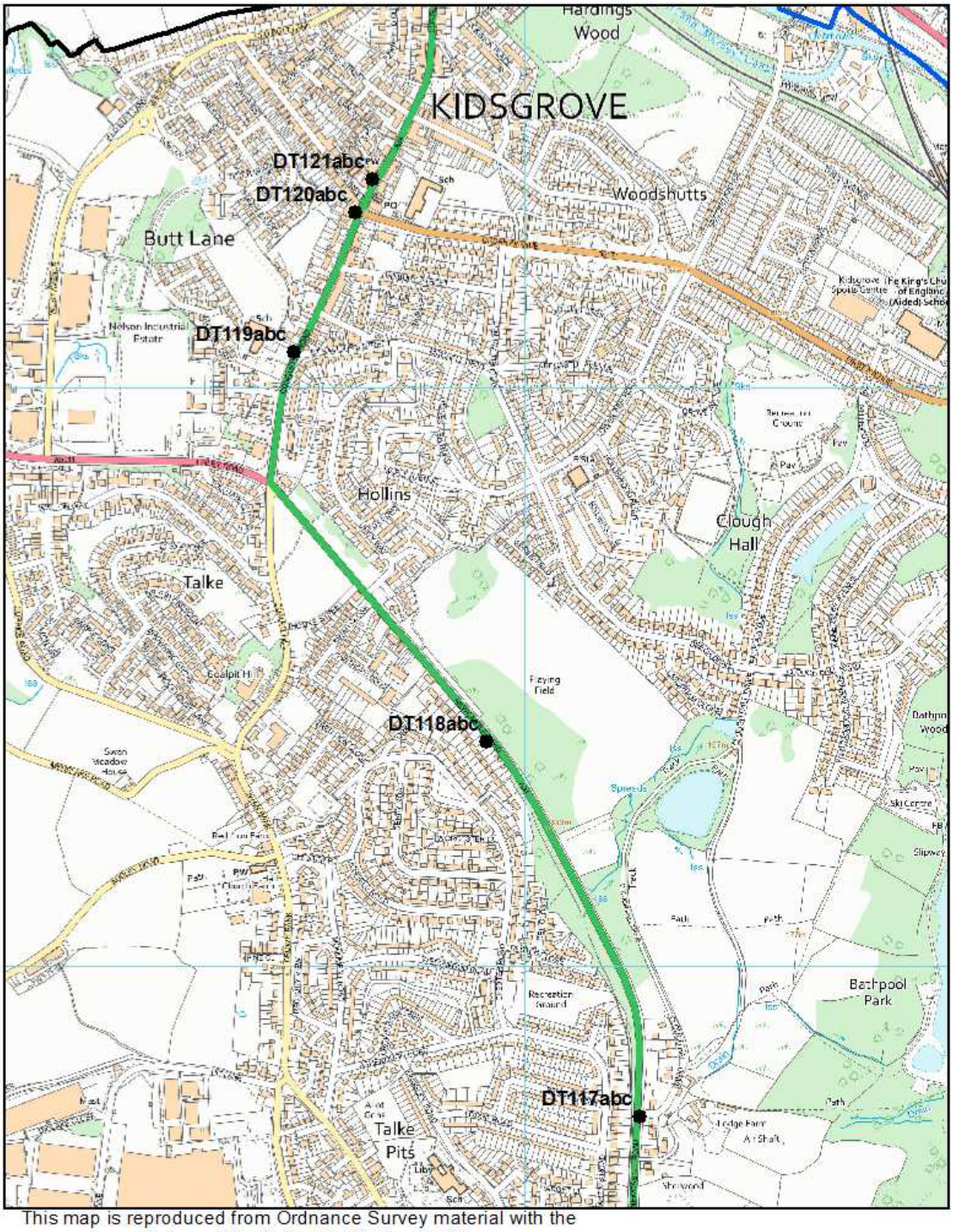
## Figure D 1 – Map of AQMAs plus Automatic and Non-Automatic Monitoring Sites



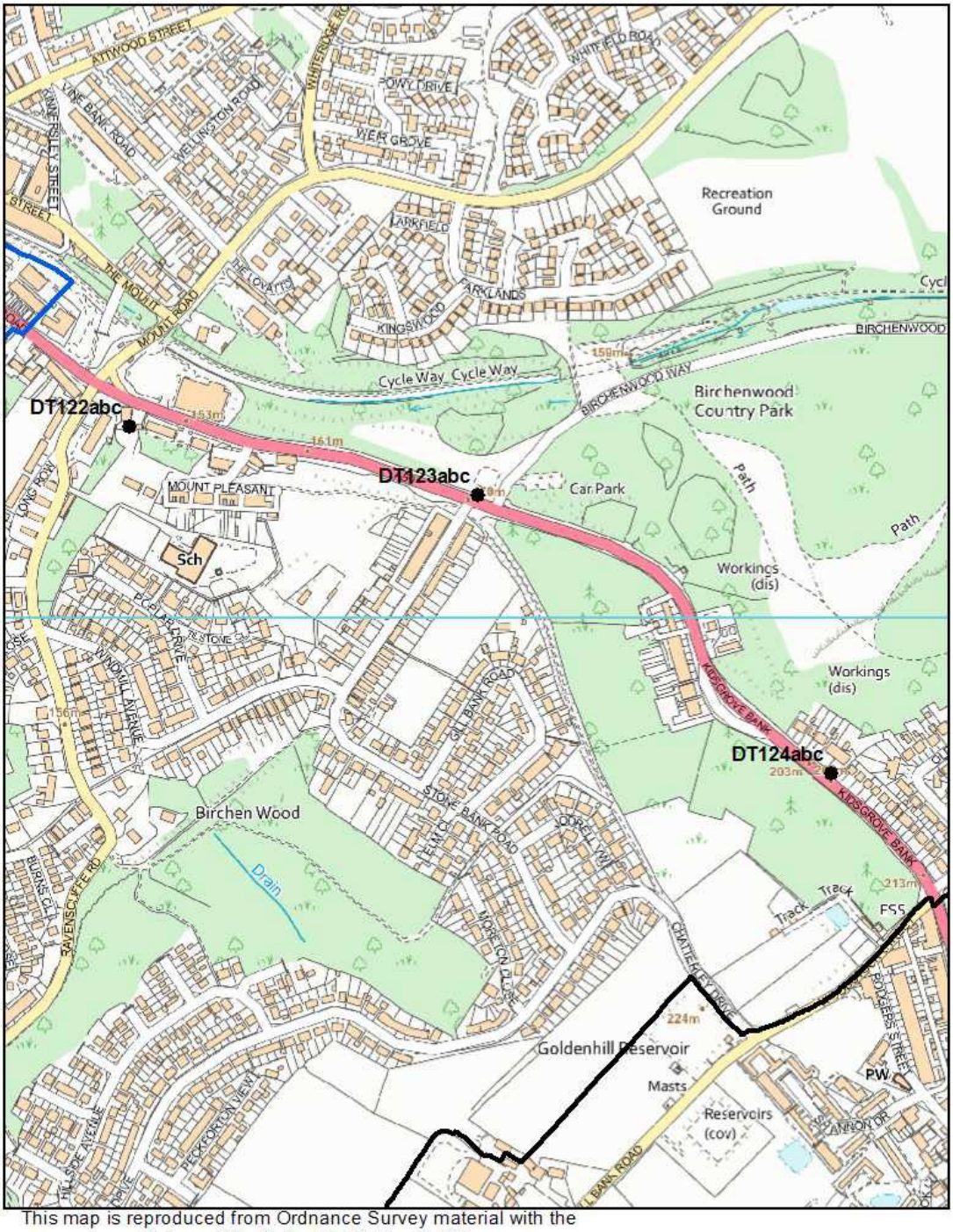
## Figure D 2 – Map of monitoring Area 1 – AQMA 1: Liverpool Road, Kidsgrove



## Figure D 3 – Map of monitoring Area 2



## Figure D 4 - Map of monitoring Area 3

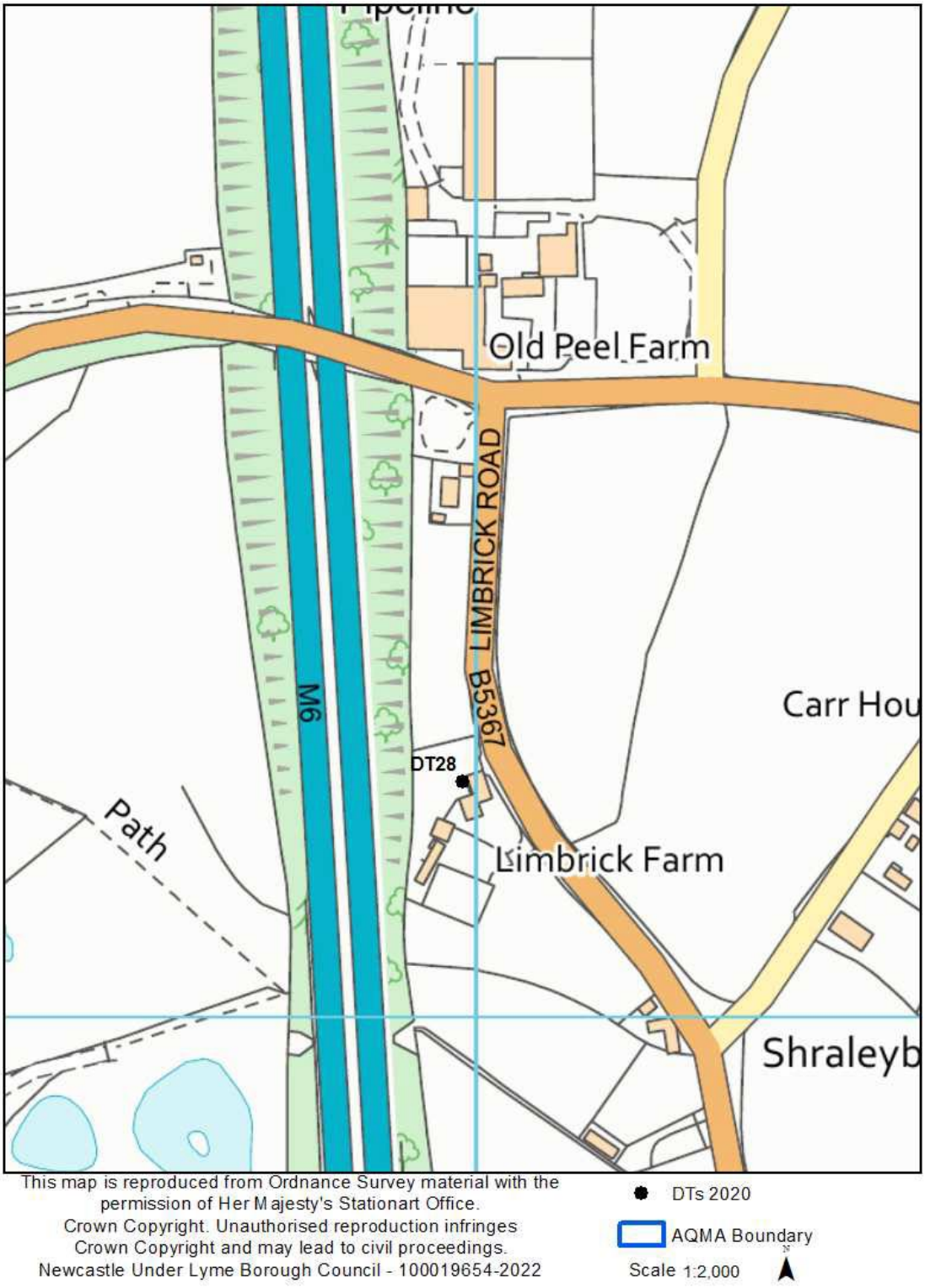





DTs 2020
NuLBC Boundary
AQMA Boundary

Scale 1:5,000

## Figure D 5 - Map of monitoring Area 4



## Figure D 6 - Map of monitoring Area 5

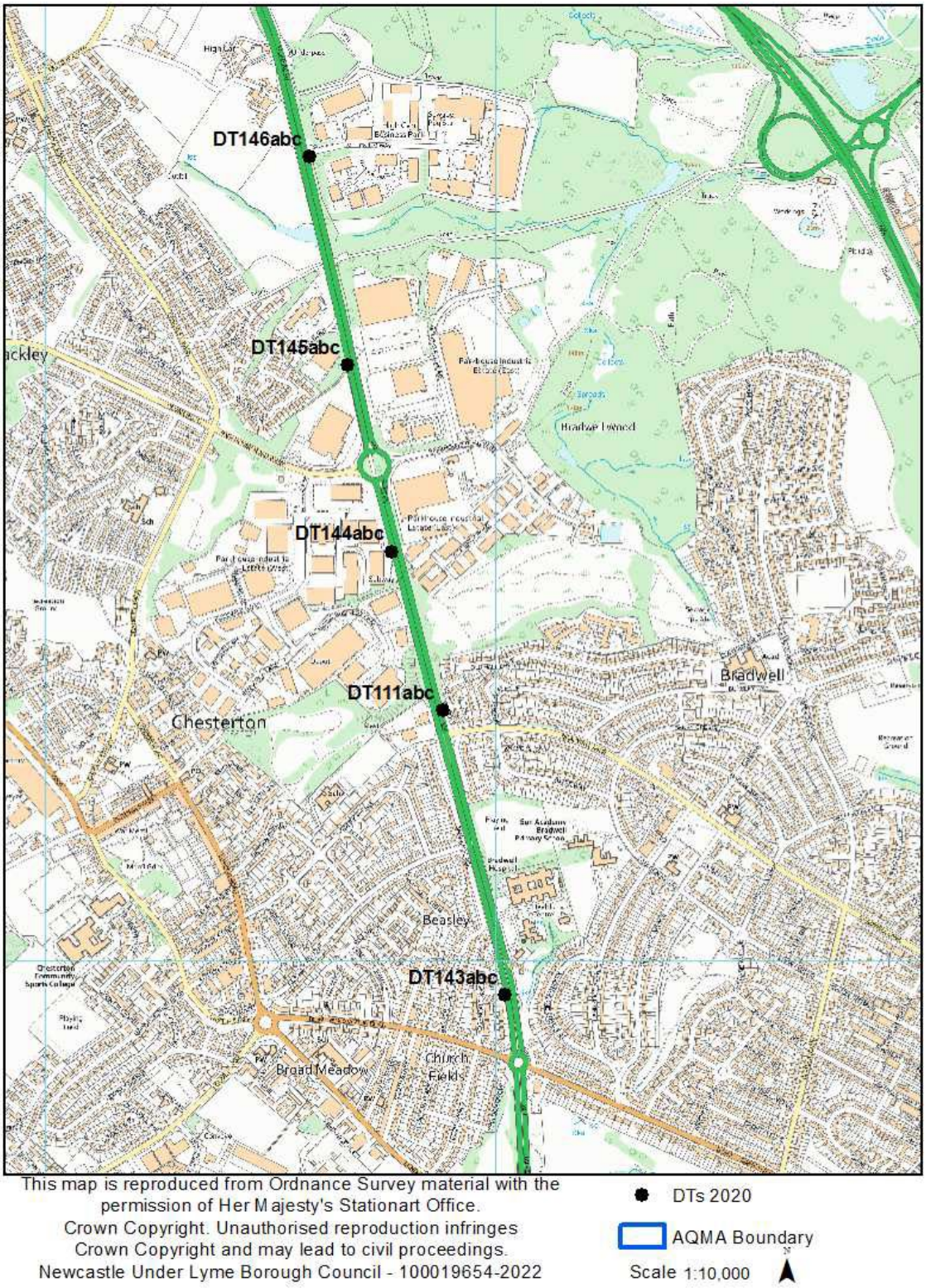
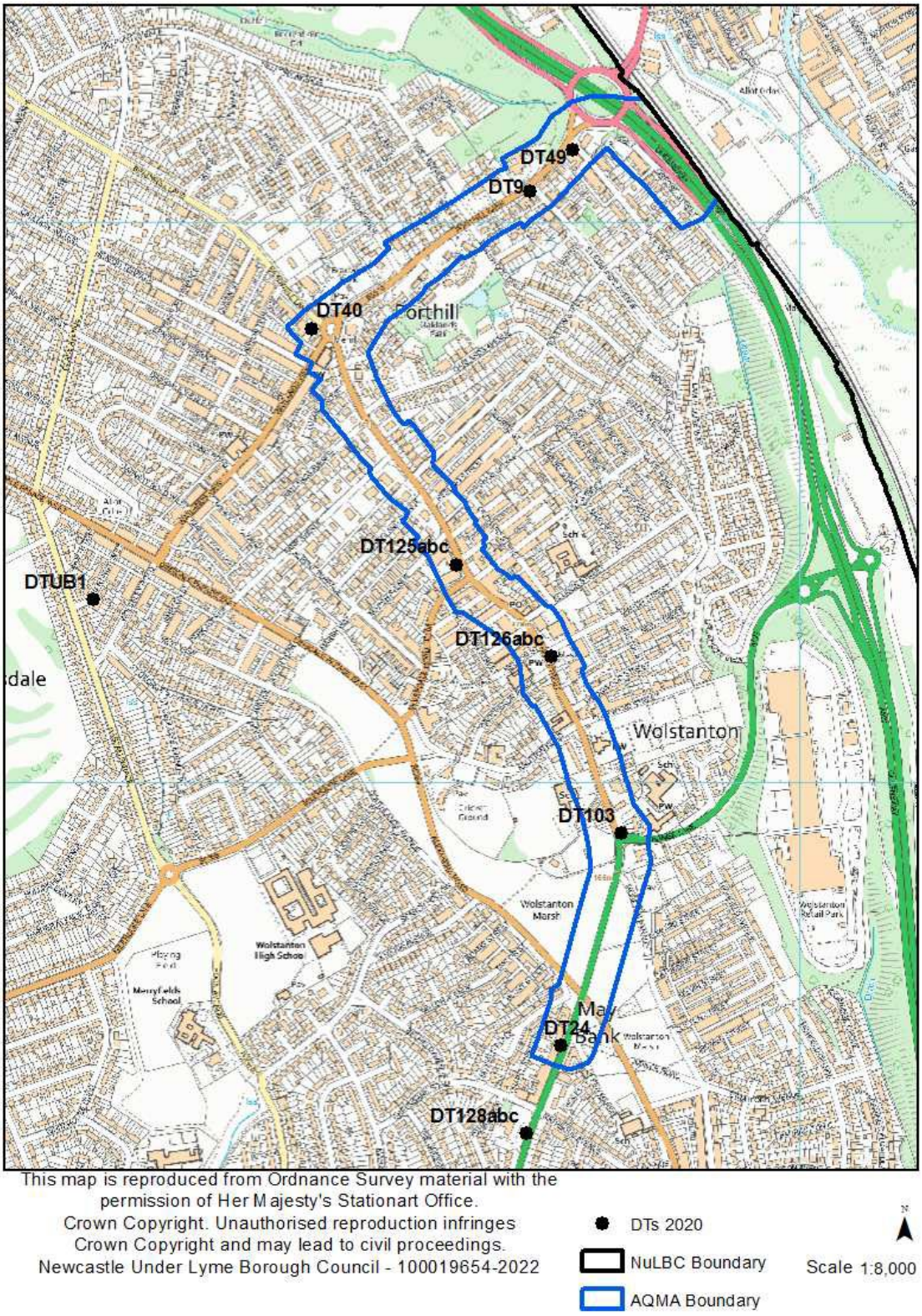


**Figure D 7 - Map of monitoring Area 6 - AQMA 3: Maybank-Wolstanton-Porthill**



## Figure D 8 - Map of monitoring Area 7

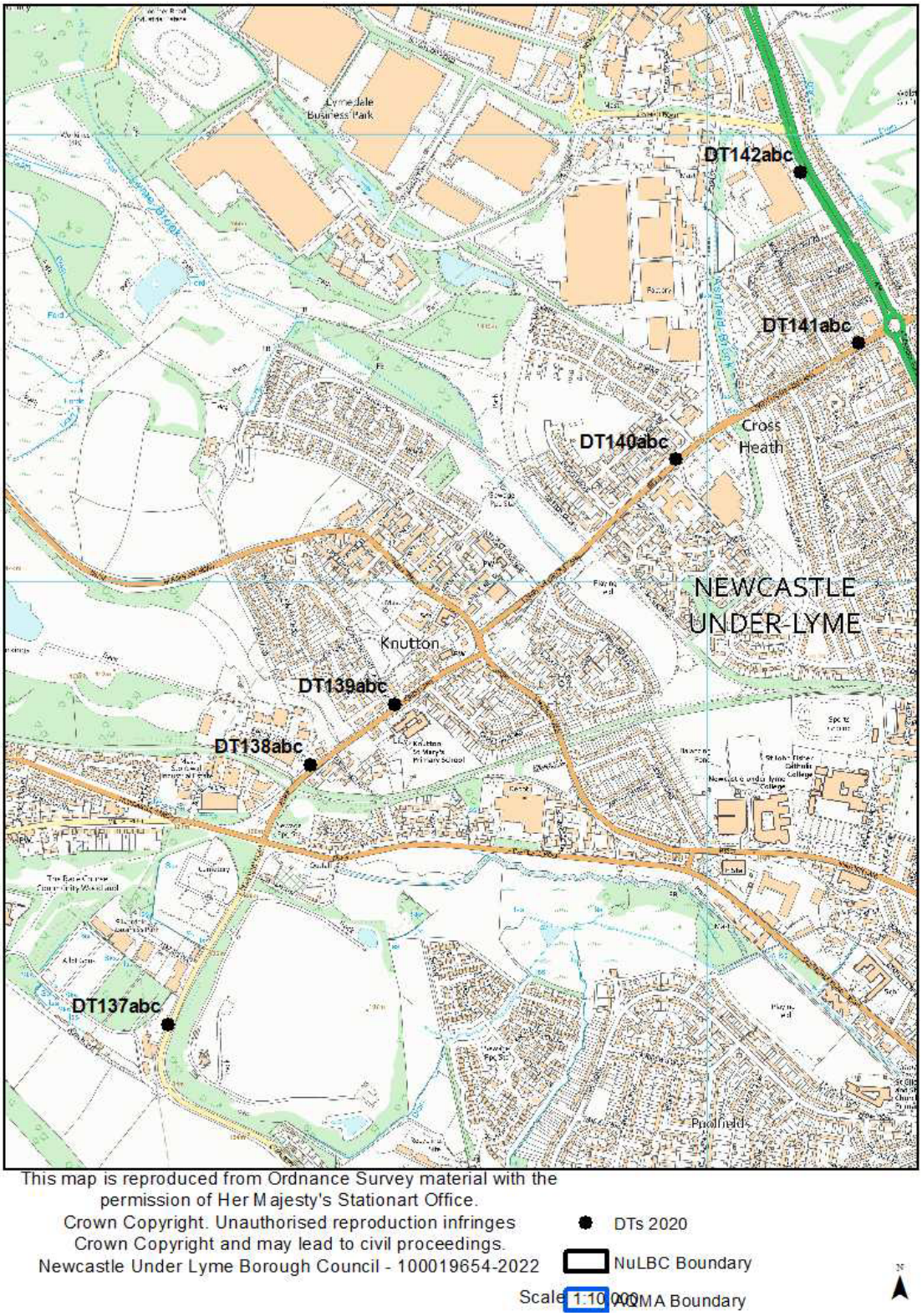
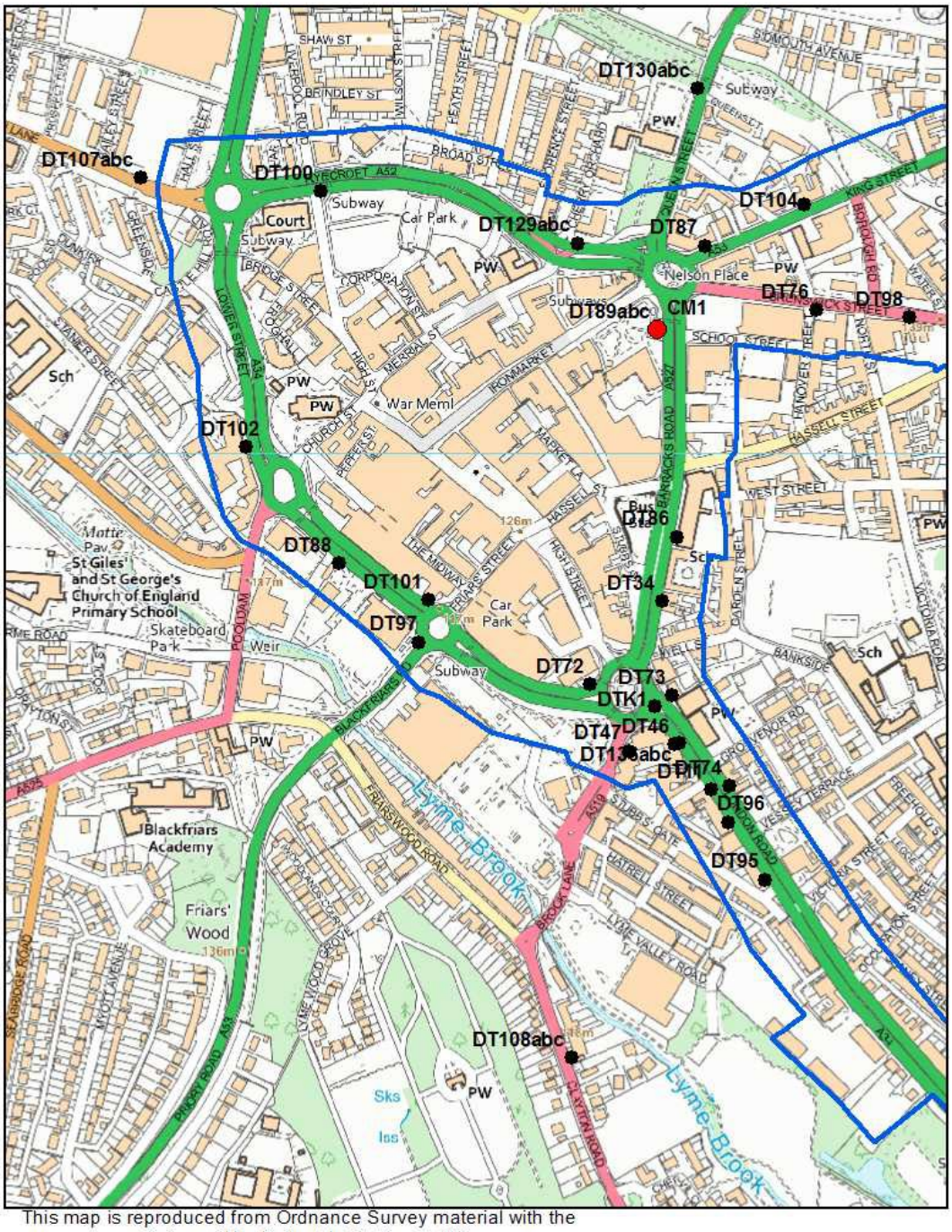


**Figure D 9 Map of monitoring Area 8 - AQMA 2: Newcastle-under-Lyme Town Centre (west)**



## Figure D 10 - Map of monitoring Area 8 - AQMA 2: Newcastle-under-Lyme Town

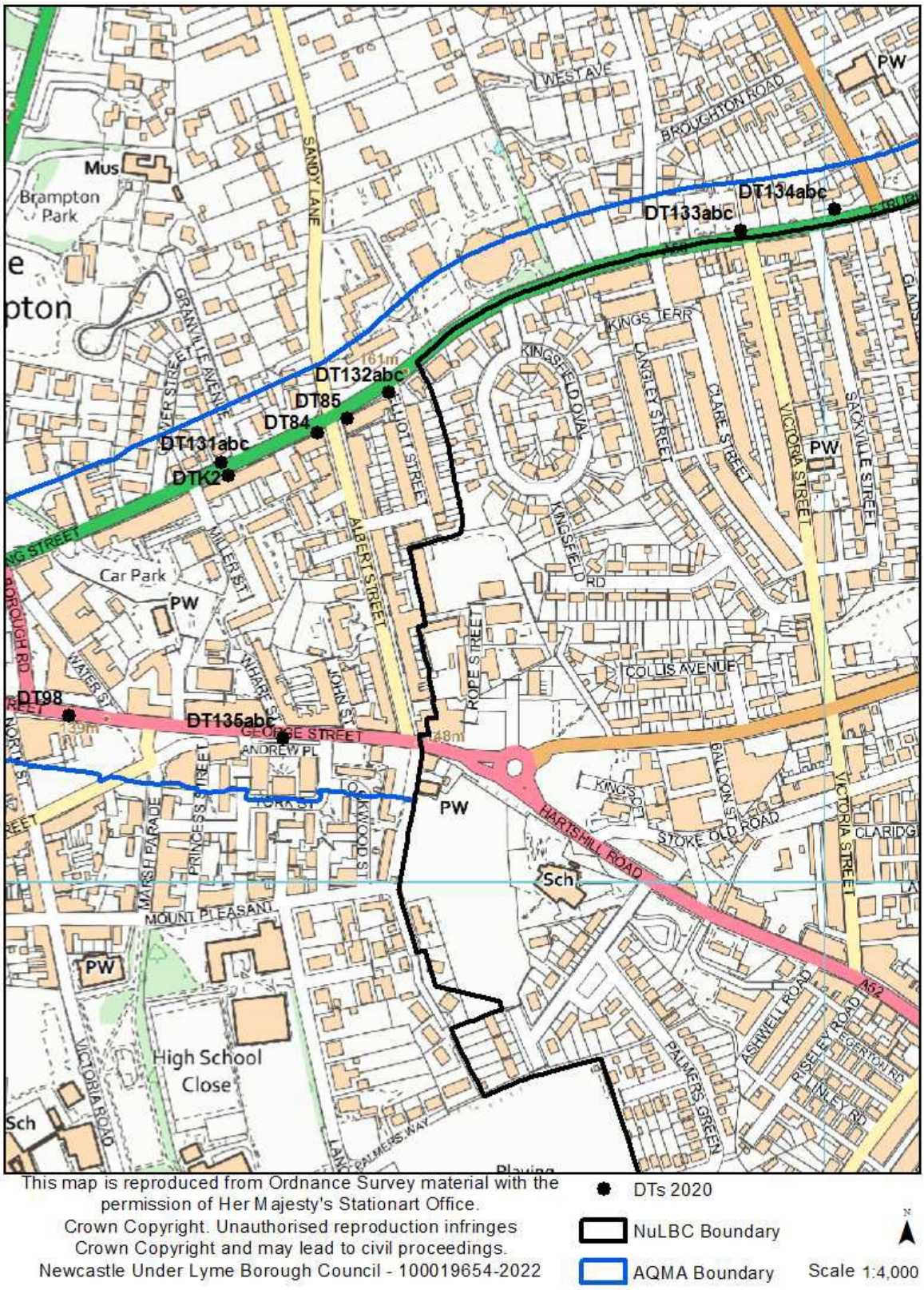
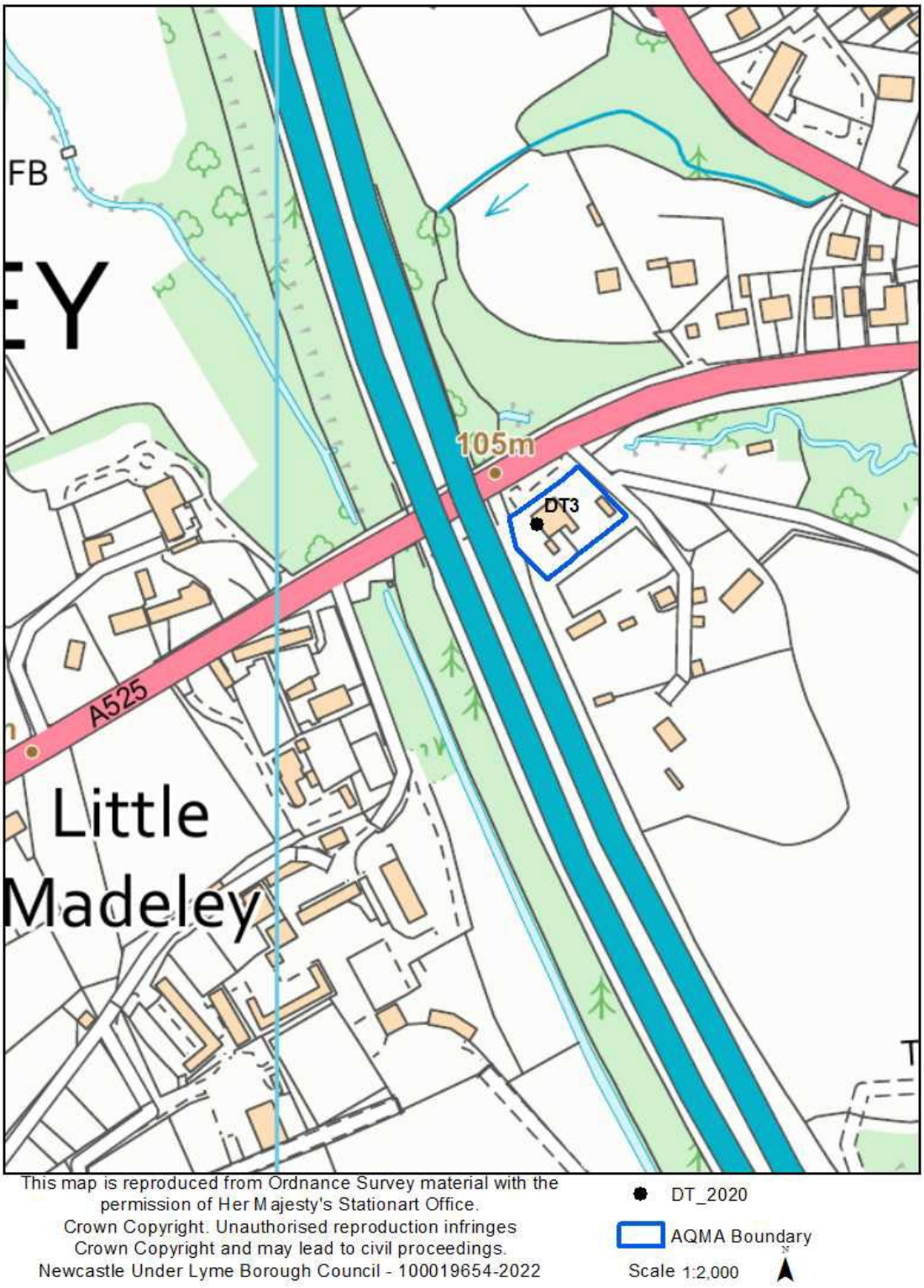
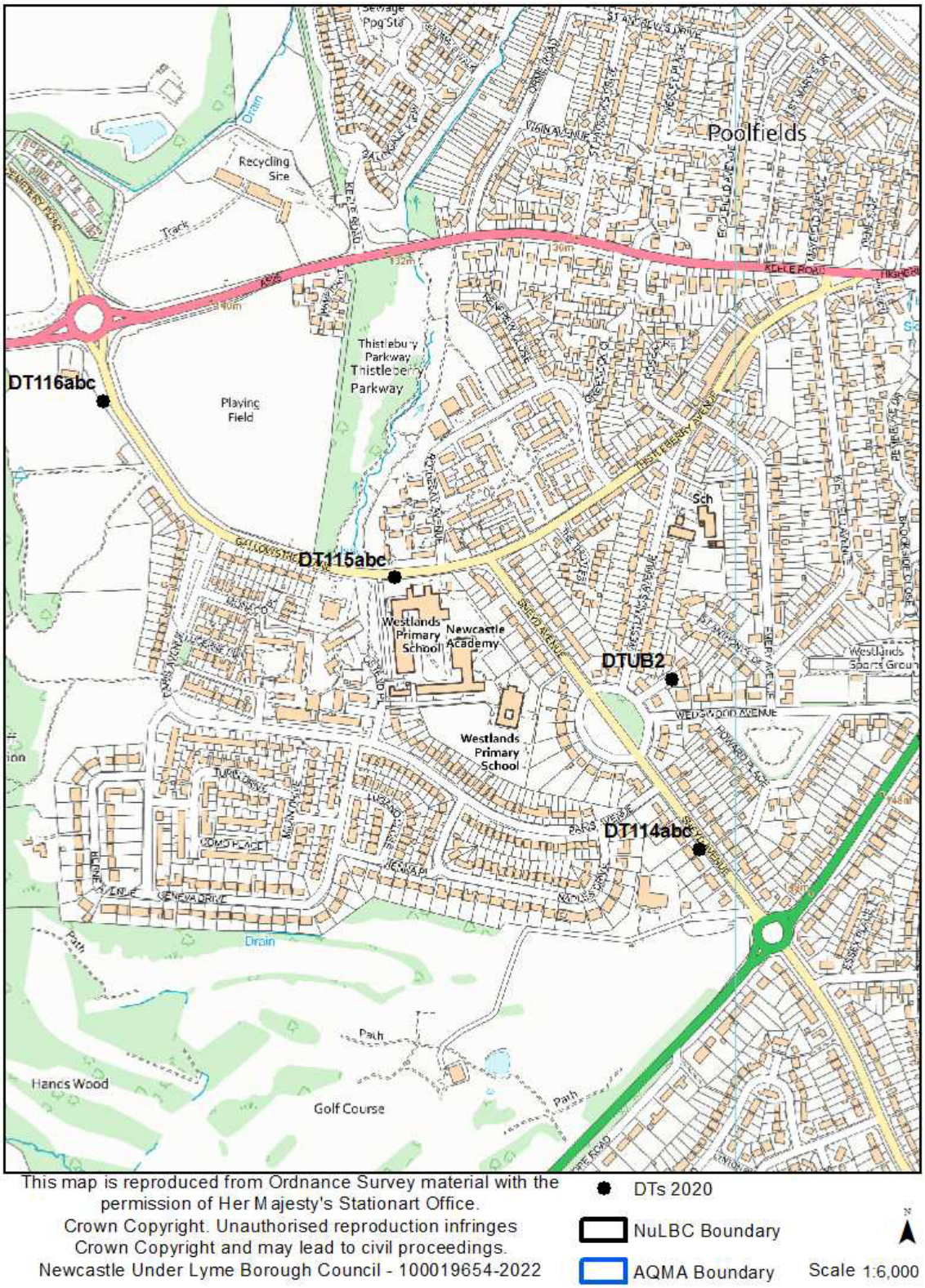


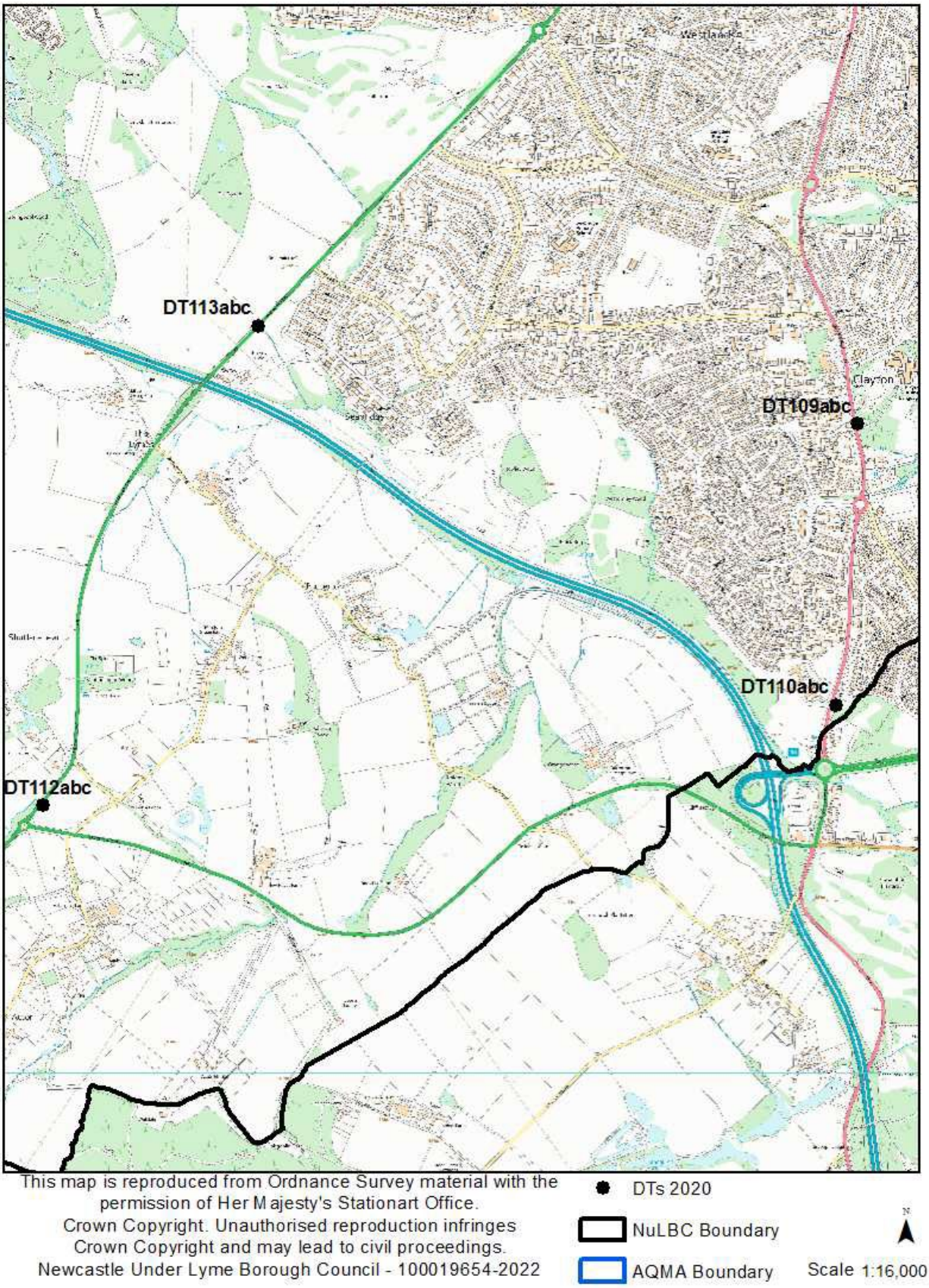
**Figure D 11 - Map of monitoring Area 9 - AQMA 4: Little Madeley**



## Figure D 12 - Map of monitoring Area 10



## Figure D 13 - Map of monitoring Area 11



# Appendix E: Summary of Air Quality Objectives in England

### Table E.1 – Air Quality Objectives in England

| 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 |

# Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide ($NO_2$) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data (25) suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-May, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides ($NO_x$), and exhaust and non-exhaust particulates (PM).

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25 Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

The Air Quality Expert Group (AQEG) (26) has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in $NO_2$ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/$m^3$ if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of $NO_2$. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/$m^3$ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

## Impacts of COVID-19 on Air Quality within Newcastle under

**Reduced measured N02 levels**

A reduction in $NO_2$ concentration of 34% was seen at automatic monitoring site CM1 within AQMA 1 between May and June; and of 31% between July and September 2020. This equated to a 30% reduction in annual mean concentration relative to 2019.

At diffusion tube sites, a reduction of 43% was seen when comparing 2020 data with the previous year. It is believed that levels fell dramatically due to significant reductions in road traffic, mainly cars, brought about by the Government instructions to “Work from home” and the associated national lockdown restrictions which occurred during 2020. It remains to be seen what post pandemic recovery levels will be locally, however the temporary easing of restrictions in 2020 saw road traffic levels rise dramatically.

**Increase in reports of garden bonfires**

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26 Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

The first round of lockdown restrictions coincided with a period of relatively good weather and restrictions on travel and the disposal of household and garden waste to civic amenity sites. There was a 200% increase in complaints to the Council about smoke from garden bonfires between 1st March 2020 and 30th May 2020 when compared to the same time the year before. Staffordshire Fire and Rescue Service also attended a greater number of complaints about garden bonfires during the same period.

## Opportunities Presented by COVID-19 upon LAQM within Newcastle under Lyme Borough council.

### Working from home

The majority of Council employees were encouraged to work from home during the lockdown and a number of colleagues were able to do this without any negative effects on services or productivity. In common with a number of other similar employers, this demonstrates that remote working has the potential to significantly reduce the need to travel into a workplace with consequent benefits for local air quality.

### E-scooter trials

The Borough Council area has been selected for inclusion in the national DFT funded E-Scooter hire trials. The initiative runs from summer 2020 to Autumn 2021, with the success of the scheme due to be evaluated by DFT before deciding whether this form of transport ought to be supported moving forward as a potential alternative to hydrocarbon based short journeys.

# Challenges and Constraints Imposed by COVID-19 upon LAQM within Newcastle under Lyme Borough council

**Automatic monitoring data capture** -This was over 75% for the 2020 calendar year. **NO IMPACT.**

**Automatic Monitoring – QA/QC Regime.** The AQ station was fully maintained and calibrated in accordance with established procedures. **NO IMPACT.**

**Passive monitoring data capture 75% -** During 2020, there was limited access to diffusion tube monitoring sites due to travel restrictions. Therefore diffusion tubes were not deployed for three months from March to May. Exposure was in line with the national monitoring calendar for all sites for all other months. **MEDIUM IMPACT.**

**Passive Monitoring – Bias Adjustment Factor** – The national bias adjustment was used for all sites with the exception of one where a local factor was used. The results for this single site were also annualised. **NO IMPACT**

**Passive Monitoring – Adherence to Changeover Dates.** With the exception of the period March to May 2020, changeover dates adhered to the national calendar. **SMALL IMPACT**

**Passive Monitoring – Storage of Tubes.** Diffusion tubes were handled and transported in accordance with established procedures. **NO IMPACT**

**AQAP Measure Implementation -** Owing to the reallocation of Council resources during 2020, the development and implementation of the AQAP has been delayed. **LARGE IMPACT**

**AQAP – New AQAP Development –** New measures have been included in the current AQAP. Progress on developing a new AQAP will be made once Covid related work ceases to have a significant impact on the Environmental Health Services and work of partners. **LARGE IMPACT**

**Table F 1 – Impact Matrix**

| Category | Impact Rating: None | Impact Rating: Small | Impact Rating: Medium | Impact Rating: Large |
|---|---|---|---|---|
| Automatic Monitoring – Data Capture (%) | More than 75% data capture | 50 to 75% data capture | 25 to 50% data capture | Less than 25% data capture |
| Automatic Monitoring – QA/QC Regime | Adherence to requirements as defined in LAQM.TG16 | Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes | Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved | Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved |
| Passive Monitoring – Data Capture (%) | More than 75% data capture | 50 to 75% data capture | 25 to 50% data capture | Less than 25% data capture |
| Passive Monitoring – Bias Adjustment Factor | Bias adjustment undertaken as normal | <25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019) | 25-50% impact on normal number of available bias adjustment studies (2020 vs 2019) | >50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime |
| Passive Monitoring – Adherence to Changeover Dates | Defra diffusion tube exposure calendar adhered to | Tubes left out for two exposure periods | Tubes left out for three exposure periods | Tubes left out for more than three exposure periods |

| Category | Impact Rating: None | Impact Rating: Small | Impact Rating: Medium | Impact Rating: Large |
|---|---|---|---|---|
| Passive Monitoring – Storage of Tubes | Tubes stored in accordance with laboratory guidance and analysed promptly. | Tubes stored for longer than normal but adhering to laboratory guidance | Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date | Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used |
| AQAP – Measure Implementation | Unaffected | Short delay (<6 months) in development of a new AQAP, but is on-going | Long delay (>6 months) in development of a new AQAP, but is on-going | No progression in development of a new AQAP |
| AQAP – New AQAP Development | Unaffected | Short delay (<6 months) in development of a new AQAP, but is on-going | Long delay (>6 months) in development of a new AQAP, but is on-going | No progression in development of a new AQAP |

# Glossary of Terms

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

# References


- Local Air Quality Management Technical Guidance LAQM.TG16. May 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.