Lichfield District Council
2023 Annual Status Report

Bureau Veritas

October 2023

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Document Control Sheet

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Reviewed By	Alicia Dale	Senior Consultant	

2023 Air Quality Annual Status Report (ASR)

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

Date: October 2023

Information	Lichfield District Council Details
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Report Reference Number	AIR19701835
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Executive Summary: Air Quality in Our Area

Air Quality in Lichfield District

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

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

Lichfield District is a local government district in Staffordshire, West Midlands, and is named after its largest settlement, the city of Lichfield. The area is positioned to the north of the metropolitan borough Birmingham, approximately 7.5 miles from Birmingham city centre. The area is one of Britain’s established visitor destinations and includes various historic locations, such as Lichfield Cathedral, Samuel Johnson's Birthplace Museum, Erasmus Darwin House and the Staffordshire Regiment Museum. The location also seeks to encourage tourism by promoting the Drayton Manor Theme Park, Beacon Park and The National Memorial Arboretum, as well as Lichfield Garrick Theatre and which accommodates several productions and shows. The area is also host to music events and festivals and promotes active travel through various integrated cycling routes that connect to the broader West Midlands.

The area occupies a key strategic position in the West Midlands, lying within close proximity to the geographic centre of England, at the crossing points of the national railway and key road systems, such as the M6 Toll, A38, A453, A461, A5, A51, A5127, A515,

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

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

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

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

A5192, and A5195. Thus, the area acts as a gateway for many to major cities within England as well as being recognised as part of the entryway from the North of England to the South, and vice versa. Lichfield District is also approximately 9.5 miles from Birmingham Airport and approximately 17 miles from East Midlands Airport, offering flights for passengers to continental Europe with over 100 journeys per day between mainland England and destinations such as Italy, Poland, France, Germany and Spain. Additionally, the region provides travel to locations in the Middle East such as Dubai that provide onward travel to further locations, for example to Australia.

Lichfield District is approximately 128 square miles and boasts a rich variety of charming landscape, whilst providing access to local Areas of Outstanding Natural Beauty (AONB) such as Cannock Chase AONB, approximately 3.6 miles north-west from Lichfield city centre. There are also 4 Sites of Special Scientific Interest (SSSI) in the Lichfield District: Gentleshaw Common, Stowe Pool and Walkmill Claypit, River Mease, and Chasewater and Southern Staffordshire Coalfields. Lichfield District has a green belt within its boundary, as a part of the wider West Midlands Green Belt to prevent the sprawl of urbanisation and protect green spaces.

The area is predominantly a semi-rural environment, with approximately 106,436 people residing there. The largest urban area is the parish of Lichfield where approximately 32,575 people live, followed by Burntwood with approximately 26,714 people residing there. Other population centres across the District are Shenstone, Armitage with Handsacre, and Fradley and Streethay. The District is the 11th least densely populated area of the West Midlands' 30 local authority areas, as per the Office for National Statistics (ONS).

The main source of pollution with the area is from road traffic emissions originating from the extensive A-road network (A38, A453, A461, A5, A51, A5127, A515, A5192, A5195), and M6 Toll (Junctions T4, T5 and T6), in operation within the Council area. Due to the nature of the road network, the majority of the vehicles are throughflow traffic. Vehicles travelling within Lichfield do not start or end their journeys within the District, with approximately 5.87 billion vehicle miles travelled on roads in Staffordshire in 2022 as per Department for Transport (DfT) statistics, highlighting the extent of influence vehicle emissions have on pollutant concentrations reported in Lichfield District. Car ownership in households in Lichfield has been recorded at 86.4% (RAC Foundation 2011 Statistics), which is higher than the national average of 73.2%, reiterating the contribution to air pollution in the area from the through-flow nature of traffic, as well as major congestion

that occurs on the city roads. Vehicles are the major contributor to air pollution in Lichfield District, which is reiterated by the Local Plan Strategy 2008-2029 (Adopted 17th February 2015) for Lichfield District The Strategy highlights that there is a dire need to minimise the requirement to travel by private car to employment, education and services however, this is challenging due to the lack of convenient public transport and sustainable travel modes available in the District as alternatives. The 2015 Detailed Modelling Assessment conducted on the A38 identified six isolated locations of relevant exposure where Nitrogen Dioxide (NO_2) concentrations exceeded the Annual Mean Air Quality Standard (AQS) from the junction of the A5127 Burton Road to the northern boundary of the District. This reiterates the influence of road traffic vehicle emissions on pollutant concentrations reported by Lichfield District Council. As such, the Council declared an Air Quality Management Area (AQMA), specifically AQMA No.2, which became effective in August 2016. Other pollution sources including commercial, industrial, and domestic sources also contribute to pollutant concentrations in the area.

Due to Lichfield District Council's consistent years of high reported NO_2 concentrations, with some exceedances of the NO_2 Annual Mean AQS of 40µg/m^3, the area is considered to have some areas where the air quality is poor. As a result of this, there are two declared Air Quality Management Areas (AQMAs) for NO_2 Annual Mean within the Council area:

- AQMA No.1 (A5 Muckley Corner) – declared 01/08/2008; and,
- AQMA No.2 – declared 01/08/2016.

The Council continues to review its monitoring network, having identified a hotpot at the Muckley Corner Roundabout between the A5 and A461 dual carriageways, NO_2 diffusion tube site MUC-3 which is in AQMA No.1, in the 2022 monitoring year.

During 2022, there were no reported exceedances of the annual mean NO_2 AQS as following distance correction to the nearest relevant exposure, Site ID MUC-3 original reported concentration of 40.5µg/m^3, which is 0.5µg/m^3 greater than the AQS reduced to 31.6 µg/m^3. It is recommended that Lichfield District Council maintain the current declared AQMA No.1 given the historical exceedances at this location. It is noted that there are no other exceedances of the AQS, or within 10% of the AQS, in 2022 monitoring year.

A decrease in concentrations from 2021 to 2022 is highlighted within this report, including 21 passive monitoring sites recording a decrease (including triplicate site MUC-1A, MUC-1B, and MUC-1C), 18 more sites than the previous reporting year. In comparison to 2021, the reduction in the number of increases reported is likely due to the establishment of a 'new normal' in traffic volumes, with organisations remaining to facilitate 'Working From

Home' (WFH) post COVID-19 pandemic restrictions relieving, thus reducing the number of vehicles comparative to pre-pandemic periods. Despite the overall reduction in the number of sites reporting a concentration increase, there were some identified increases attributable to the 2022 monitoring year experiencing periods reflective of pre-pandemic traffic volumes, with UK COVID-19 restrictions lifting, therefore subject to increases in NO_2 concentrations from 2020 and 2021.

There are no diffusion tube monitoring sites where the NO_2 annual mean is greater than 60µg/m^3, therefore in accordance with Defra LAQM.TG(22) there are no sites likely to be at risk of exceeding the 1-hour mean AQS objective.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Since the initiation of the passive monitoring network within the Lichfield District, there have been sites that have exceeded the AQS annual mean of 40µg/m^3 for NO_2. As a result, there are currently two designated AQMAs that have been declared. As such, an Air Quality Action Plan (AQAP) is required, which has established 11 actions that seek to improve air quality in Lichfield District. It is recognised that the document will soon need to

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

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

be updated, as of 2024. In light of this, there are currently no plans to produce an Air Quality Strategy for the District.

There are certain locations within Lichfield District where the air quality is considered to be historically poor, however air quality in 2022 displays ncompliance with the AQS given following distance correction to the nearest relevant exposure, Site ID MUC-3 reports a reduced concentration below 10% of the AQS.. The Council will continue to monitor and assess the results for the coming year within the NO_2 diffusion tube network and maintain the AQMA No.1.

As part of the Lichfield District Council's commitment to reduce the impacts of climate change, and specifically air pollution, the Council declared a climate emergency in 2019 and continues to progress and aim to hit net-zero carbon emissions for the Council by 2035 and by 2050 for the District, as reported in the Lichfield District Council Organisational Carbon Reduction Plan. The Carbon Reduction Plan sets out various actions with 15 core objectives across 5 themes, inclusive of but not limited to air quality, waste and buildings and transport, to reduce Carbon Dioxide (CO_2) emissions, of which also have shared benefits in improving air quality through reducing both NO_2 and Particulate Matter (PM) emissions.

The Council is developing and has implemented the following measures as part of the discussed climate strategies in 2022 to reduce air pollution concentrations and enable more frequent air pollutant compliance in the District with the required standards:

- Increase energy efficiency of heating, lighting and cooling systems within the Council's estate and assets;
- Implementation of car park and on-street charge points;
- Decarbonise and improve Council Depot to optimise the management of recyclables and prepare for the fleet transition to alternative fuels and/or Electric Vehicles (EVs);
- Renew the existing Council vehicle fleet to a fully Electric Vehicle (EV) fleet by 2030;
- Create a carbon neutral district council house by 2025;
- Promote sustainable options for employees such as walking and cycling;
- Local Walking and Cycling Improvements; and,
- Develop a nature based solutions offsetting strategy for Council assets including carbon sequestration.

Lichfield District Council has established a collaborative relationship with the bicycle charity Lichfield Re:Cycle who host free sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road. These educational and safety opportunities are designed to encourage the uptake of cycling by all whilst providing people with confidence in cycling on the roads. Therefore, seeking to reduce pollutant concentrations imminently and through actions of longevity by targeting future generations too. The charity also has an innovative bike sharing service, with used bikes offered to individuals on free long term hire periods in circumstances where they are unable to financially purchase a bike or require a bike for health reasons. The charity scheme replicates notable cycle sharing schemes found in large metropolitan areas (e.g., Santander Cycles, Mobike, Lime) and compliments the Lichfield city cycling route.

The Council also promotes cycling events hosted by the charity Lichfield Re:Cycle who have affiliations with Cycling UK. The charity organises a series of free volunteer led cycle rides and events, such as a 'Christmas Lights Ride' and 'Halloween Ride', to encourage people to cycle year-round, therefore reducing vehicle uptake and subsequent emission release.

The Council have adopted the Staffordshire County Council Local Cycling and Walking Infrastructure Plan (LCWIP) 2021 - 2031 with the city centre of Lichfield a focus of the LCWIP due to the concentration of population within the District and trip generator that is reflective of the position that the centre has at the top of the district's settlement hierarchy and its associated tourism appeal. The LCWIP provides a strategic approach to identifying cycling and walking improvements required at the local District Council level, and wider Staffordshire region with the shared ambition to improve connectivity to other Districts and population hubs within the Staffordshire region e.g. Cannock, Newcastle-under-Lyme, Stafford, Burton-upon-Trent and Tamworth. Therefore, increasing the number of trips made on foot or by cycle whilst reducing vehicle emissions released.

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

cycle racks that are available to use across the city and published an interactive map on the Council website that enables users to acquire directions to a specific bike rack. More information can be found here: https://www.lichfielddc.gov.uk/homepage/154/bicycle-rack-locations

The District is also keen to implement future cycling events such as a 'Street Velodrome', to promote uptake of sustainable, active transportation methods. The concept would incorporate a track cycling initiative whereby a street velodrome would be constructed inclusive of ramps and races with registration free and safety equipment provided.

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

The Council has encouraged Electric Vehicle (EV), Low Emission Vehicle (LEV) and Ultra Low Emission Vehicle (ULEV) adoption across the city and wider District during the 2022 monitoring year, with infrastructure to support the uptake of EVs, LEVs and ULEVs being implemented. Lichfield District Council confirms the collaborative relationship with Staffordshire County Council to roll out a programme of charging points for Electric Vehicles (EV) across the District, resulting in over 20 EV charging points being implemented already in the District including 2 EV charging points at The Friary car park, with formulation of a strategy to support increased roll-out of infrastructure scheduled to be implemented into 2023 onwards. EV users can view the current charging points in Lichfield and surrounding areas at zap-map.com. The council has also promoted various transport packages to be implemented and/or finalised for Lichfield City Centre, South Lichfield, East Lichfield (including Steethay), and Fradley and Burntwood. Thus, encouraging uptake of sustainable transportation methods to limit pollutant emissions.

Lichfield District Council also promotes its relationship with Staffordshire County Council and neighbouring district and borough councils to enhance the EV uptake throughout the region thus benefiting air quality by a reduction in tailpipe emissions through production of the Public EV Charging Toolkit. This toolkit seeks to encourage residents of Staffordshire region to transition towards EV ownership with supporting documentation and guidance.

Furthermore, Lichfield District Council is working collaboratively with Staffordshire County Council and neighbouring borough and district councils to develop a detailed business plan for submission to the Department for Transport Local Electric Vehicle Infrastructure (LEVI) Fund, prior to December 2023. Approval will facilitate production of an action plan detailing mechanisms to improve EV accessibility within Lichfield District and surrounding

areas as well as providing investment into the District through a UK Government fund to further enhance Lichfield District EV charging network. Lichfield District Council's future adoption of a LEVI Strategy will support accelerated policy framework, incentives and technological advances across the EV sector with a core focus on the ban of UK sales of Internal Combustion Engine (ICE) Petrol/Diesel by 2030, thus promoting a reduction in vehicle emissions.

The >£25 million redevelopment of Lichfield District as per the Lichfield District Council Infrastructure Delivery Plan proposes to improve pedestrian safety, provide new cycle links connecting new developments to the existing cycle network, improve bus connectivity and frequency of services, and construction of a new bus interchange facility and public realm improvements in the main retail areas. Thus, improving air quality by aiming to reduce concentrations and subsequent prevention and revocation of any air quality exceedance areas. This development work was still undergoing construction during the 2022 monitoring year and remains uncompleted.

Lichfield District Council is also a member of the Staffordshire Air Quality Forum (SAQF), which has encouraged partnership working on local air quality management, which is important given the transboundary migrative nature of air pollution. The SAQF comprises of local authority air quality officers, Staffordshire County Council Highways officers, National Highways staff, County Public Health and Public Health England (PHE) staff as necessary. The SAQF group also feeds back to the Central England Environmental Health Chief Officers and engages with other groups such as the Midland Joint Advisory Council. The main joint projects currently within the SAQF are:

- The SAQF group continue to collaborate with local Public Health Departments to review and assess $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less) levels in their Annual Status Reports (ASRs) (see Section 2.3);
- Following on from the Government's Clean Air Strategy, Staffordshire County Council's Director of Public Health presented a report to the Staffordshire Health and Wellbeing Board (HAWB), highlighting the air quality situation across and activities identified as potentially making a positive contribution to air quality. The SAQF group worked with Staffordshire County Council and successfully secured a Defra funded bid to deliver for example, business/school travel plans across the Staffordshire authorities from July 2018 to July 2020. This project focussed primarily on AQMAs affected by roads under Staffordshire County Highways jurisdiction. While Lichfield District Council's AQMAs are under the jurisdiction of National

Highways, formerly known as Highways England, this Authority continues to liaise with the County Council to identify other initiatives or projects that could also benefit the two AQMAs in the Lichfield District and indeed the wider area too, wherever possible;

- Work on a joint Supplementary Planning Guidance for Planners and Consultants was planned in 2020, based on similar guidance produced collaboratively by a number of the East Midlands Authorities. Although implementation has been delayed due to staff turnover and resource constraints primarily from the ongoing COVID-19 pandemic, however, there remains a commitment to see this through, and a template document has been drafted. This measure is also included in Lichfield District Council's Air Quality Action Plan (AQAP); and,
- Lichfield District Council like all other Staffordshire authorities benefits from having an Integrated Transport Strategy (ITS) specific to the District. The measures in the ITS are aimed at transport measures under the County Council's jurisdiction, which for the Lichfield District are outside of the two AQMAs and currently are not included in the AQAP as they are unlikely to significantly benefit the two AQMAs. The ITS measures will nevertheless provide some benefit in easing congestion and improving public transport connectivity to the main settlements in the District and therefore will help maintain concentrations of air pollutants below the objectives outside of the AQMAs.

Conclusions and Priorities

During 2022, the passive monitoring results show that there were no exceedances of the annual mean objective of 40µg/m^3 for NO_2 within the jurisdiction of Lichfield District Council as following distance correction to the nearest relevant exposure at Site ID MUC-3 which was originally 0.5µg/m^3 above the AQS, it reports a reduced concentration of 31.6µg/m^3. However, given the historical exceedances at this location there is a requirement to maintain the designated AQMA No.1 and actions within the current AQAP to be implemented further. The Council will continue to use the passive monitoring network to monitor air quality within the district and ensure compliance is maintained with the AQS.

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

- Continue to review the current monitoring programme, exploring the need to deploy new monitoring locations in areas where monitoring has not previously been

undertaken and where it is believed that there may be elevated concentrations of NO_2 in areas of relevant public exposure, and relocate or remove monitoring tubes where necessary;

- Actively engage with developers at planning application stages to promote the installation of electric vehicle charging or alternatively, provide suitable infrastructure to allow for future cost-efficient installations;
- Implementation of the scheduled EV charging points on streets and in car parks across the District;
- Continue to provide an integrated transport network to facilitate the efficient movement of pedestrian and vehicular traffic, goods, and services across the District;
- Continue to reduce the volume of traffic on the city roads by encouraging effective active transport methods (e.g. public transport, cycling, and walking);
- Continue to improve the existing walking and cycling network by acquiring funding for development;
- Implement measures within the LCWIP and alternate active travel plans; and
- Adopt measures within the Lichfield District Council Organisational Carbon Reduction Plan to further reduce concentrations of NO_2 and PM.

Local Engagement and How to get Involved

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

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

- The collaborative relationship with Staffordshire County Council to roll out a programme of charging points for EV across the Lichfield District, resulting in over 20 EV charging points being implemented on streets and in car parks with scheduled infrastructure planned for 2023 onwards to support further EV charging points being implemented;
- Improving the use of EVs, LEVs and ULEVs across the District through improving infrastructure to support the uptake with a wider extent planned for implementation;
- Promotion of the Public EV Charging Toolkit which seeks to encourage residents of Staffordshire region to transition towards EV ownership with supporting

documentation and guidance, thus aiming to benefit air quality by a reduction in tailpipe emissions;

- Continued investment for the Lichfield District redevelopment to further enhance integration between the active and public transport network;
- Collaboration between local businesses and charities to host events promoting active transport and the benefits;
- Promotion of active transport uptake and sustainable travel through the publication of an interactive map that outlines locations of and subsequent directions to several free cycle racks that are available to use across Lichfield city;
- Established relationships with local active transport charity Lichfield Re:Cycle to offer free bike support for locals to ensure bikes are safe and road worthy, further encouraging active transport and supporting the establishment of a greener, cleaner city; and,
- Enhancement and further endorsement of the charity Lichfield Re:Cycle innovative bike sharing service and maintenance support as well as free volunteer led cycling events, supported by Cycling UK, such as a 'Christmas Lights Ride' and 'Halloween Ride', to encourage people to cycle year-round, therefore reducing vehicle uptake and subsequent emission release.

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

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

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

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

Local Responsibilities and Commitment

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

- Jack Twomey - Environmental Protection and Housing Manager

This ASR has been approved by:

- Jack Twomey - Environmental Protection and Housing Manager

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

If you have any comments on this ASR please send them to Jack Twomey at: Lichfield District Council, District Council House, Frog Lane, Lichfield, Staffordshire, WS13 6YU; Tel: 01543 308734; Email: Jack.Twomey@lichfielddc.gov.uk.

Endorsement from the Director of Health & 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 focusing on human made pollution with particulate matter.

The Air Aware project “phase 2” ran until March 2023 with Defra Funding. The Air Aware project continues with joint funding from Staffordshire Public Health and Connectivity Teams to March 2025. The project delivers behaviour change to increase active travel, decrease car use, and raise awareness of air quality issues through five elements. These are business and school engagement, communications and campaigns, electric vehicles, and air quality monitoring in three targeted locations, Burton, Leek, and Cannock. Campaigns include Anti-Idling, walking and cycle activities and Clean Air Day. These have been countywide engaging a large number of businesses and schools. The programme focuses on reducing levels of NO and PM, which are monitored at key locations.

A number of the Staffordshire Authorities are currently involved in implementing measures to reduce levels of NO_2 within their areas, which are detailed elsewhere in their ASR. Since the update of the Environment Act 2021 there is now a statutory duty imposed on Local Authorities in England to reduce $PM_{2.5}$, a number of the measures are complementary with those being undertaken to reduce NO_x. A mapping exercise completed by the Staffordshire Air Quality Forum members details the measures currently in place which are considered to have an impact in reducing $PM_{2.5}$ within the County.

In addition, Levelling up Fund 2 Schemes will improve a number of major roads around the county, reduce journey times, put greener, cleaner buses on main roads, improve walking and cycling routes and reduce the impact of housing and commercial developments. They

will benefit East Staffordshire, Cannock Chase, and Stafford Borough. Total package cost circa £20m.

Finally, 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.

Dr Richard Harling

Director of Health and Care

Staffordshire County Council

[6th June 2023]

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in Lichfield District Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Lichfield District Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

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

- NO_2 annual mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
A5 Muckley Corner AQMA No.1	01/08/2008	NO_2 Annual Mean	An area encompassing the Muckley Corner Roundabout on the A5 along with a number of surrounding buildings.	Yes	51 µg/m^3	31.6 µg/m^3 (MUC-3)	1 year	Air Quality Action Plan for AQMA 1 & AQMA 2 – Final (09/08/2019)	https://www.lichfielddc.gov.uk/downloads/file/1469/air-quality-action-plan-august-2019
AQMA No.2	01/08/2016	NO_2 Annual Mean	A38 from the junction of the A5127 Streethay north to Alrewas, where isolated properties are located close to the roadside.	Yes	35.7 µg/m^3	27.3 µg/m^3 (A38-2A)	4 Years	Air Quality Action Plan for AQMA 1 & AQMA 2 – Final (09/08/2019)	https://www.lichfielddc.gov.uk/downloads/file/1469/air-quality-action-plan-august-2019

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

☒ **Lichfield District Council confirm that all current AQAPs have been submitted to Defra.**

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

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

*"The report provides some of the information specified in the Guidance. However, the comments in **bold** must be addressed in order for the report to be accepted."*

The following comments are designed to help inform future reports:

- ***There is a discrepancy between tables within the report and spreadsheet. The Level of Exceedance: current year for AQMA 1 in Table 2.1 – Declared Air Quality Management Areas is different, the report the value is stated to be 39.8 µg/m3 in the spreadsheet this value is reported as 34.3 µg/m3. Values must be kept consistent between tables in both documents;***
    - The main text body of the 2023 ASR and 2023 exported data tables have been reviewed to ensure consistency in values reported;
- *The council have not included Funding Status for a lot of the measures in Table 2.2. As well as this the discussion on measures specific to reduction of $PM_{2.5}$ emissions is lacking as the council have not stated what measures are in place to reduce these emissions;*
    - Table 2.2 has been updated for the 2023 ASR submission to include funding sources and the report provides specific measures that seek to reduce $PM_{2.5}$ emissions;
- *The council have stated that the reason for their poor data capture was due to multiple months of under/over exposure of the diffusion tubes. Such clarity is commended but it would be good to include reasoning as to why multiple months of under/over exposure originally occurred;*
    - Greater depth of information has been provided (where applicable) in the 2023 ASR submission with regards to data capture issues;
- *It is encouraging to see that the Council continuously review their monitoring programme decommissioning passive monitoring sites where they are no longer necessary in response to consistently low measured concentrations;*
- *LDC have provided good, detailed figures in Appendix D which clearly show the locations of each monitoring site and boundaries of the current AQMAs; and*

- *The Council have set out a detailed list of measures for to engage the public providing them with measures and alternatives to help contribute to good air quality.*

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

The Council are employing many additional measures to help improve and progress air quality within their respected area. The 2023 ASR outlines the schemes and partnerships that Lichfield District Council are involved in, these measures are still active for the 2022 reporting year.

There have also been additional measures and initiatives implemented in the 2022 reporting year such as the collaborative relationship with the bicycle charity Lichfield Re:Cycle who host free sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road. These educational and safety opportunities are designed to encourage the uptake of cycling by all whilst providing people with confidence in cycling on the roads. Therefore, seeking to reduce pollutant concentrations imminently and through actions of longevity by targeting future generations too. The charity also has an innovative bike sharing service, with used bikes offered to individuals on free long term hire periods in circumstances where they are unable to financially purchase a bike or require a bike for health reasons. The charity scheme replicates notable cycle sharing schemes found in large metropolitan areas (e.g., Santander Cycles, Mobike, Lime) and compliments the Lichfield city cycling route. This relationship seeks to promote alternative and accessible forms of travel between neighbouring towns and cities across Lichfield District, as well as within Lichfield city, to help its residents lead active lifestyles for health benefits whilst limiting vehicular emissions. Thus, encouraging locals to support the establishment of a greener, cleaner District.

The Council also promotes cycling events hosted by the charity Lichfield Re:Cycle who have affiliations with Cycling UK. The charity organises a series of free volunteer led cycle rides and events, such as a ‘Christmas Lights Ride’ and ‘Halloween Ride’, to encourage people to cycle year-round, therefore reducing vehicle uptake and subsequent emission

release. The rides are suited to the abilities of those who attend and are subject to appropriate, rideable weather conditions.

The Council have adopted the Staffordshire County Council Local Cycling and Walking Infrastructure Plan (LCWIP) 2021 - 2031 with the city centre of Lichfield a focus of the LCWIP due to the concentration of population within the District and trip generator that is reflective of the position that the centre has at the top of the district's settlement hierarchy and its associated tourism appeal. The LCWIP provides a strategic approach to identifying cycling and walking improvements required at the local District Council level, and wider Staffordshire region with the shared ambition to improve connectivity to other Districts and population hubs within the Staffordshire region e.g. Cannock, Newcastle-under-Lyme, Stafford, Burton-upon-Trent and Tamworth. LCWIPs enable a long-term approach to developing local cycling and walking networks, ideally over a 10 to 15-year period, and form a vital part of the Government's strategy to increase the number of trips made on foot or by cycle therefore reducing vehicle emissions released. Lichfield District Council acknowledge that they are responsible for implementing actions in the LCWIP and proactively seek funding alongside neighbouring borough and district councils to improve the existing connecting network.

To encourage uptake of sustainable transportation methods and a reduction in dependence on vehicles, therefore reducing pollutant emissions in the District, Lichfield District Council have promoted several cycle racks that are available to use across the city and published an interactive map on the Council website that enables users to acquire directions to a specific bike rack. More information can be found here: https://www.lichfielddc.gov.uk/homepage/154/bicycle-rack-locations

The District is also keen to implement future cycling events such as a 'Street Velodrome', to promote uptake of sustainable, active transportation methods. The concept would incorporate a track cycling initiative whereby a street velodrome would be constructed inclusive of ramps and races with registration free and safety equipment provided. It is acknowledged that this event has occurred in the 2023 monitoring year in partnership with the 'Hello Velo' scheme and more information can be found here: https://lichfieldlive.co.uk/2023/05/19/chance-for-people-to-experience-track-cycling-as-street-velodrome-comes-to-lichfield-and-burntwood/

Lichfield District Council promotes active travel, and the reduction in vehicle usage and subsequent emissions, through walking with established Core Walking Zones (CWZs) across the city and wider Staffordshire region. The CWZs have been assessed and

audited to ensure safety and identify any required interventions along the pedestrian corridors within each CWZ. Interventions proposed include improving existing infrastructure through footway widening and footway maintenance as well as introducing new pedestrian facilities such as wayfinding, new pedestrian crossings and benches to improve the public realm. The CWZs and overall adoption of active travel and encouragement of walking are further supported by the Council's establishment of key historical attractions, such as Lichfield Cathedral, James Bowell Statue, and The Old Guildhall Prison, throughout the city and specifically along walking routes. More information about the locations can be found here: https://www.sstaffs.gov.uk/sites/default/files/2023-03/local_cycling_and_walking_infrastructure_plan.pdf

As part of the Lichfield District Council's commitment to reduce the impacts of climate change, and specifically air pollution, the Council declared a climate emergency in 2019 and continues to progress and aim to hit net-zero carbon emissions for the Council by 2035 and by 2050 for the District, as reported in the Lichfield District Council Organisational Carbon Reduction Plan. It is acknowledged that the Lichfield District Council Organisational Carbon Reduction Plan is currently being revised and a new version will be available before the end of the 2023. The Carbon Reduction Plan sets out various actions with 15 core objectives across 5 themes, inclusive of but not limited to air quality, waste and buildings and transport, to reduce Carbon Dioxide (CO_2) emissions, of which also have shared benefits in improving air quality through reducing both NO_2 and Particulate Matter (PM) emissions.

The Council is developing and has implemented the following measures as part of the discussed climate strategies in 2022 to reduce air pollution concentrations and enable more frequent air pollutant compliance in the District with the required standards:

- Increase energy efficiency of heating, lighting and cooling systems within the Council's estate and assets;
- Implementation of car park and on-street charge points;
- Decarbonise and improve Council Depot to optimise the management of recyclables and prepare for the fleet transition to alternative fuels and/or Electric Vehicles (EVs);
- Renew the existing Council vehicle fleet to a fully Electric Vehicle (EV) fleet by 2030;
- Create a carbon neutral district council house by 2025;

- Promote sustainable options for employees such as walking and cycling;
- Local Walking and Cycling Improvements; and,
- Develop a nature based solutions offsetting strategy for Council assets including carbon sequestration.

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

The Council has encouraged Electric Vehicle (EV), Low Emission Vehicle (LEV) and Ultra Low Emission Vehicle (ULEV) adoption across the city and wider District during the 2022 monitoring year, with infrastructure to support the uptake of EVs, LEVs and ULEVs being implemented. Lichfield District Council confirms the collaborative relationship with Staffordshire County Council to roll out a programme of charging points for Electric Vehicles (EV) across the District, resulting in over 20 EV charging points being implemented already in the District including 2 EV charging points at The Friary car park, with formulation of a strategy to support increased roll-out of infrastructure scheduled to be implemented into 2023 onwards. EV users can view the current charging points in Lichfield and surrounding areas at zap-map.com. The council has also developed the relationship between itself, local residents and businesses to establish a reduction in tailpipe vehicle emissions by promoting the various transport packages to be implemented and/or finalised for Lichfield City Centre, South Lichfield, East Lichfield (including Steethay), and Fradley and Burntwood. Thus, encouraging uptake of sustainable transportation methods to limit pollutant emissions whilst mitigating the impact of the Local Plan Strategy 2008-2029 (Adopted 17th February 2015) and the strategic development allocations highlighted in the Local Plan Allocations 2008 – 2029 (Adopted 16th July 2019).

Lichfield District Council also promotes its relationship with Staffordshire County Council and neighbouring district and borough councils to enhance the EV uptake throughout the region thus benefiting air quality by a reduction in tailpipe emissions through production of the Public EV Charging Toolkit. This toolkit seeks to encourage residents of Staffordshire region to transition towards EV ownership with supporting documentation and guidance.

Furthermore, Lichfield District Council is working collaboratively with Staffordshire County Council and neighbouring borough and district councils to develop a detailed business plan for submission to the Department for Transport Local Electric Vehicle Infrastructure (LEVI) Fund, prior to December 2023. Approval will facilitate production of an action plan detailing mechanisms to improve EV accessibility within Lichfield District and surrounding

areas as well as providing investment into the District through a UK Government fund to further enhance Lichfield District EV charging network. Lichfield District Council's future adoption of a LEVI Strategy will support accelerated policy framework, incentives and technological advances across the EV sector with a core focus on the ban of UK sales of Internal Combustion Engine (ICE) Petrol/Diesel by 2030, thus promoting a reduction in vehicle emissions.

The >£25 million redevelopment of Lichfield District as per the Lichfield District Council Infrastructure Delivery Plan proposes to improve pedestrian safety, provide new cycle links connecting new developments to the existing cycle network, improve bus connectivity and frequency of services, and construction of a new bus interchange facility and public realm improvements in the main retail areas. Thus, improving air quality by aiming to reduce concentrations and subsequent prevention and revocation of any air quality exceedance areas. This development work was still undergoing construction during the 2022 monitoring year and remains uncompleted. The structural amendments to Lichfield District's bus infrastructure seeks to allow easy interchange with other modes of public and active transport, promoting a green, cleaner District.

Lichfield District Council is also a member of the Staffordshire Air Quality Forum (SAQF), which has encouraged partnership working on local air quality management, which is important given the transboundary migrative nature of air pollution. The SAQF comprises of local authority air quality officers, Staffordshire County Council Highways officers, National Highways staff, County Public Health and Public Health England (PHE) staff as necessary. The SAQF group also feeds back to the Central England Environmental Health Chief Officers and engages with other groups such as the Midland Joint Advisory Council. The main joint projects currently within the SAQF are:

- The SAQF group continue to collaborate with local Public Health Departments to review and assess $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less) levels in their Annual Status Reports (ASRs) (see Section 2.3);
- Following on from the Government's Clean Air Strategy, Staffordshire County Council's Director of Public Health presented a report to the Staffordshire Health and Wellbeing Board (HAWB), highlighting the air quality situation across the whole of Staffordshire and activities identified as potentially making a positive contribution to air quality. From this a plan of action was produced for partnership working. The SAQF group subsequently worked with Staffordshire County Council and successfully secured a Defra funded bid to deliver for example business/ school

travel plans across the Staffordshire authorities from July 2018 to July 2020. This project focussed primarily on AQMAs affected by roads under Staffordshire County Highways jurisdiction. While Lichfield District Council's AQMAs are under the jurisdiction of National Highways, formerly known as Highways England, this Authority continues to liaise with the County Council to identify other initiatives or projects that could also benefit the two AQMAs in the Lichfield District and indeed the wider area too, wherever possible;

- Work on a joint Supplementary Planning Guidance for Planners and Consultants was planned in 2020, based on similar guidance produced collaboratively by a number of the East Midlands Authorities. Although implementation has been delayed due to staff turnover and resource constraints primarily from the ongoing COVID-19 pandemic, however, there remains a commitment to see this through, and a template document has been drafted. This measure is also included in Lichfield District Council's Air Quality Action Plan (AQAP); and
- Lichfield District Council like all other Staffordshire authorities benefits from having an Integrated Transport Strategy (ITS) specific to the District. The measures in the ITS are aimed at transport measures under the County Council's jurisdiction, which for the Lichfield District are outside of the two AQMAs and currently are not included in the AQAP as they are unlikely to significantly benefit the two AQMAs. The ITS measures will nevertheless provide some benefit in easing congestion and improving public transport connectivity to the main settlements in the District and therefore will help maintain concentrations of air pollutants below the objectives outside of the AQMAs.

Lichfield District Council has also taken forward a greater number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. A total of 12 measures are included within Table 2.2, with the type of measure and the progress Lichfield District Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the Council's respective Air Quality Action Plan, Organisational Carbon Reduction Plan, and Staffordshire County Council Local Cycling and Walking Infrastructure Plan (LCWIP) 2021 - 2031. Key completed measures are:

- Lichfield Re:Cycle –
    - Established relationships with local active transport charity to offer free bike support for locals to ensure bikes are safe and road worthy, further encouraging active transport and supporting the establishment of a greener, cleaner city; and
    - Enhancement and further endorsement of the charity Lichfield Re:Cycle innovative bike sharing service and maintenance support as well as free volunteer led cycling events, supported by Cycling UK, such as a 'Christmas Lights Ride' and 'Halloween Ride', to encourage people to cycle year-round, therefore reducing vehicle uptake and subsequent emission release.
- Lichfield District Free Cycle Racks – Promotion of active transport uptake and sustainable travel through the publication of an interactive map that outlines locations of and subsequent directions to several free cycle racks that are available to use across Lichfield city.

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

- Staffordshire County Council;
- Zap-map;
- Local businesses;
- Charities; and
- Neighbouring Staffordshire Borough and District Councils.

Lichfield District Council expects the following measures to be somewhat completed if not entirely over the course of the next reporting year:

- EV Charging Infrastructure – The collaborative relationship between the Council and Staffordshire County Council to roll out a programme of EV charging points across the District has been successful in the 2022 monitoring year with over 20 EV charging points being implemented already, although more are required with formulation of a strategy to support increased roll-out of infrastructure that is scheduled to be implemented in 2023;
- Electric Vehicle (EV), Low Emission Vehicle (LEV), and Ultra Low Emission Vehicle (ULEV) Personal Adoption – Improvement in the adoption of EVs, LEVs and ULEVs as private vehicles across the District, to reduce vehicular emissions and overall pollutant concentrations. The Council's collaborative relationship with Staffordshire County Council to produce the Public EV Charging Toolkit seeks to encourage

residents of Staffordshire region to transition towards EV ownership with supporting documentation and guidance;

- Street Velodrome – The District is keen to implement future cycling events such as a 'Street Velodrome', to promote uptake of sustainable, active transportation methods. The concept would incorporate a track cycling initiative whereby a street velodrome would be constructed inclusive of ramps and races with registration free and safety equipment provided;
- Lichfield District Redevelopment - The structural amendments to Lichfield District's footway and bus infrastructure seeks to allow easy interchange with other modes of public and active transport, promoting greener, cleaner areas whilst reducing vehicular traffic volume and pollutant emissions; and
- Organisational Carbon Reduction Plan Updates – It is acknowledged that the existing Lichfield District Council Organisational Carbon Reduction Plan is currently being revised and a new version will be available before the end of the 2023.

Lichfield District Council's priorities for the coming year are:

- Lichfield District Redevelopment – The transport strategies outlined in the Lichfield District Council Infrastructure Delivery Plan propose to improve pedestrian safety, provide new cycle links connecting new developments to the existing cycle network, improve bus connectivity and frequency of services, and construction of a new bus interchange facility and public realm improvements in the main retail areas. Thus, improving air quality by aiming to reduce concentrations and subsequent prevention and revocation of any air quality exceedance areas. Development is planned in phases with construction expected to continue into 2023 and onwards;
- Street Velodrome – To host a cycling event such as a 'Street Velodrome', to promote uptake of sustainable, active transportation methods. The concept would incorporate a track cycling initiative whereby a street velodrome would be constructed inclusive of ramps and races with registration free and safety equipment provided;
- Local Electric Vehicle Infrastructure (LEVI) Fund Document – Lichfield District Council is working collaboratively with Staffordshire County Council and neighbouring borough and district councils to develop a detailed business plan for submission to the Department for Transport Local Electric Vehicle Infrastructure (LEVI) Fund, prior to December 2023. Approval will facilitate production of an action plan detailing mechanisms to improve EV accessibility within Lichfield District and

surrounding areas as well as providing investment into the District through a UK Government fund to further enhance Lichfield District EV charging network; and

- Organisational Carbon Reduction Plan Updates – It is acknowledged that the existing Lichfield District Council Organisational Carbon Reduction Plan is currently being revised and a new version will be available before the end of the 2023.

The principal challenges and barriers to implementation that Lichfield District Council anticipates facing are funding and resource availability.

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

- Lichfield District Redevelopment – Extensive funding, resource availability and phased planning required have slowed progress alongside consultation periods and confirmation with regards to the definitive final design for development;
- Electric Vehicle (EV), Low Emission Vehicle (LEV), and Ultra Low Emission Vehicle (ULEV) Personal Adoption – Requirement for an infrastructure strategy and increased funding to implement a greater volume of EV charging points across the District to support alternative vehicle uptake; and
- Local Electric Vehicle Infrastructure (LEVI) Fund Document – Collaboration and communication issues between parties has slowed progress in developing a detailed business plan for submission to the Department for Transport Local Electric Vehicle Infrastructure (LEVI) Fund, with time constraints causing problems in acknowledging the December 2023 deadline.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Lichfield District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the AQMA No.1 (A5 Muckley Corner).

It is noted that compliance with the NO_2 AQS of 40 µg/m^3 has been achieved since 2019 in the AQMA No.2.. As such, Lichfield District Council should start considering plans to revoke AQMA No.2, given 4-years of compliance has been achieved to date.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Increase the volume of through traffic using M6 Toll	Traffic Management	UTC, Congestion management, traffic reduction	2019	TBC	Lichfield District Council Environmental Health, National Highways, Midlands Connect	Defra and LA	No	-	TBC	Planning	TBC after quantitative appraisal	Reduction in HGV % in AQMAs	Work is ongoing with Midlands Connects. There are no immediate plans for this, but the measure has not been ruled out – pressure continues to be put on Midlands Connect.	-
2	Upgrading Trunk A-Roads to Expressways	Traffic Management	UTC, Congestion management, traffic reduction	2019	TBC	Lichfield District Council Environmental Health, National Highways, Midlands Connect	N/A	No	-	TBC	Amended	TBC after quantitative appraisal	Reduction in traffic congestion	Regular discussions with National Highways / Midlands Connects since June 2019. The A5 corridor had previously been identified as priority for congestion control, but the central section which lies outside of the Lichfield District has been prioritised for transport intervention measures. Junction improvements at Muckley Corner had been considered but as yet are not being prioritised.	Subject to commitment from National Highways to deliver – this measure may never happen but it included as Lichfield DC is committed to maintain pressure for it to happen depending on the ongoing results of air quality monitoring
3	Pollution abatement equipment for HGVs	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2019	2025	Lichfield District Council Environmental Health, OLEV	OLEV or other Defra Funds	Yes (if available)	Partial or Full TBC	£100k -	Planning	Reducing emissions contribution from HGVs TBC	Retrofit vehicles	Planning phase	Consider OLEV or AQ grant application funding

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
4	Replacing older vehicles	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission	2019	Ongoing	Lichfield District Council Environmental Health & Licensing, OLEV	OLEV or other Defra Funds	Yes (if available)		£500k		Reducing emissions from all council owned vehicles TBC	Vehicles replaced (in addition to normal fleet turnover)	Planning phase	Consider OLEV or AQ grant application funding
5	Travel planning amongst Council employees	Promoting Travel Alternatives	Workplace Travel Planning	2019	2021	Lichfield District Council	Internal Lichfield District Council Funds	No	Partial or Full TBC	£100k -	Planning	-	Reducing emissions from Council employees	Coming back under the climate change remit via a separate team	-
6	Education Initiatives inc. website information updates	Public Information	Other	2019	2020	Lichfield District Council Environmental Health	Internal Lichfield District Council Funds	No		£500k		Incremental through public awareness	Public Awareness	Completed early in 2020 although regular updates will be carried out moving forward	None to date
7	Staffordshire Air Quality Forum	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	Ongoing	County-wide	Staffordshire Authorities	No	-	< £10k	Discontinued & replaced with Measure No.	-	Full LA engagement across the group + Regular Meetings	Ongoing	Engagement reduced during the pandemic due to restrictions & resource constraints
8	Use the planning regime to minimise impact of new developments on AQMAs	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	Was 2021 now 2022	Lichfield District Council / Staffordshire AQ Forum	Staffordshire Authorities	No			11	Reducing emissions contribution and restricting impact on AQMAs	Supplementary Planning Guidance implemented	Discussions have already taken place and a general template to the guidance is in draft stages	-
9	Inspect under the Environmental Permit regime and enforce legislation to reduce combustion processes	Environmental	Introduction/ increase of environment charges through permit systems and economic instruments	2019	Ongoing	Lichfield District Council Environmental Health	Internal funds generated through permitting regime	No	-	< £10k	Completed	Installations adhering to permits and enforcement/penalties for breaches	Installations adhering to permits and enforcement/penalties for breaches	Permits inspected	-
10	Air quality monitoring	Permits	Air Quality Planning and Policy Guidance	2019	Ongoing	Lichfield District Council Environmental Health	-	No	-	< £10k	Planning	Will enable any changes in pollution levels to be identified	Monitoring locations and On-time submittal of ASRs	Monitoring to continue both inside and outside of AQMAs	Possibly liaise with Defra regarding need for additional monitoring and/or AURN funding. Consider

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
															continuous monitoring and AQ grant application if available or needed.
11	Homeworking	Public Information	Encourage / Facilitate home-working	2021	2022	Lichfield District Council employees	Internal Funds	No	-	< £10k	Planning	Minimal but shows the Council can lead by example	Reducing emissions from Council employees	Internal building works to reduce number of workstations hence number of staff already commenced late 2021 – council staff work from home commuting to the office once or twice a week, reducing the number of vehicle commutes.	-
12	Increased provision of EV charging infrastructure	Promoting Travel Alternatives	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	TBC	Lichfield District Council Planning Policy & Environmental Health	TBC Through scoping	Unknown at present	-	< £10k	Implementation	Incremental	Reduction in pollutant levels in vicinity of council car parks	Lichfield District Council has started to review its car park strategy for the District in pursuit of increasing the provision of EV charging infrastructure	Funding

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

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

There is not currently any monitoring of PM_{10} (airborne particulate matter with an aerodynamic diameter of 10µm or less) or $PM_{2.5}$ across Lichfield District. As such, no concentration values can be reported or estimated using the method described in Box 7.7 of LAQM.TG(22), which provides a for estimating $PM_{2.5}$ concentrations from PM_{10} measurements.

The current Defra background maps for Lichfield District (2018 reference year) show that all 2022 background concentrations of $PM_{2.5}$ are far below the recommended annual mean AQS objective for $PM_{2.5}$ of 20µg/m^3. The highest concentration is predicted to be 10.5µg/m^3 within the 1km x 1km grid square with the centroid grid reference of 413500, 302500. This is largely an industrial area within Lichfield District and includes many concrete and asphalt plants, with frequent traffic flows, as well as the M6 Toll and A38 roads within approximately 250 metres.

The Public Health Outcomes Framework data tool compiled by Public Heath England (PHE) quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2021 fraction of mortality attributable to $PM_{2.5}$ pollution (indicator D01) within Lichfield District is 5.1%. This is lower than the regional average for the West Midlands (5.5%) and for England as a whole (5.5%).

Lichfield District Council is taking the following measures to address $PM_{2.5}$:

- Actively encouraging developers at the planning stage to install EV charging points or the consideration of suitable infrastructure to allow for future cost efficient installations;
- Implementation of an EV charging programme alongside Staffordshire County Council, with at least 20 charging points active currently in the Lichfield District and more scheduled for implementation to encourage cleaner vehicle adoption;

- Seeking to acquire investment from the Local Electric Vehicle Infrastructure (LEVI) Fund from the UK Government alongside Staffordshire County Council and neighbouring local authorities to further enhance the EV charging network in Lichfield District; and
- Introduction of strategies within the Lichfield District Council Organisational Carbon Reduction Plan to assist achievement of net-zero carbon emissions across the Council by 2035 and District area by 2050 with many of the measures addressing local air quality including $PM_{2.5}$.

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

- Investment into enhancing the existing active travel network for walking and cycling, promoting active travel and supporting the reduction in vehicle volume and associated emission releases;
- Advocacy of the educational and safety opportunities presented by the collaborative relationship with Lichfield Re:Cycle charity which host free sessions for locals to check that their bikes are safe and make minor adjustments to get them on the road, whilst also offering an innovative bike sharing service, with used bikes offered to individuals on free long term hire periods in circumstances where they are unable to financially purchase a bike or require a bike for health reasons. Thus, providing people with confidence in cycling whilst seeking to reduce pollutant concentrations imminently and through actions of longevity by targeting future generations too;
- Promotion of free, volunteer led cycling events hosted by the charity Lichfield Re:Cycle, affiliated with Cycling UK, such as a ‘Christmas Lights Ride’ and ‘Halloween Ride’, to encourage people to cycle year-round, therefore reducing vehicle uptake and subsequent emission release;
- Promotion of its established and well-connected main Cross-City line operated by West Midlands rail network, with 4 commuter and leisure lines per hour in each direction via Lichfield City Railway Station, thus highlighting the benefits of public transport on air quality comparative to private vehicle use to commute; and
- Continual implementation of the Staffordshire County Council Local Cycling and Walking Infrastructure Plan (LCWIP) 2021 - 2031 to reduce the number of vehicle trips generated by Lichfield (and surrounding areas) and subsequent pollutant

emission release, due to its high population concentration and related hierarchical position in the district's settlements as well as its associated tourism appeal.

- Preparation and development of the 'Street Velodrome' that incorporates a track cycling initiative whereby a street velodrome would be constructed inclusive of ramps and races with registration free and safety equipment provided to promote uptake of sustainable, active transportation methods.

The Council is also a member of the established SAQF, which has encouraged partnership working on local air quality management, which is important given the transboundary migrative nature of air pollution. The SAQF comprises of local authority air quality officers, Staffordshire County Council Highways officers, National Highways staff, County Public Health and PHE staff as necessary. The SAQF group also feeds back to the Central England Environmental Health Chief Officers and engages with other groups such as the Midland Joint Advisory Council.

The purposes of the Air Quality Forum are to:

- Coordinate and provide maximum value from initiatives to improve air quality and public health within the Lichfield District by establishing partnerships with other agencies to support changes;
- Coordinate measures to meet UK Government statutory requirements as well as national, sub-regional and local strategies and policies on air quality; and,
- Improve awareness of available funding opportunities and coordinate the submission of bids to maximise exploitation of such opportunities.

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

This section sets out the monitoring undertaken within 2022 by Lichfield District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1. Automatic Monitoring Sites

Lichfield District Council did not undertake automatic (continuous) monitoring during 2022.

3.1.2 Non-Automatic Monitoring Sites

Lichfield District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 30 sites during 2022, one of which is a triplicate site (MUC-1A, MUC-1B, and MUC-1C). Table A. in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the AQS 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 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant. Additionally, the National Bias Adjustment Factor assumes monitoring is undertaken in accordance with the Defra calendar dates. It is noted that the monitoring dates do coincide with the Defra calendar dates during the survey period, whereby all changeovers conducted throughout the monitoring year were in line with Defra guidance. As such, there is a degree of certainty surrounding the monitoring results provided.

Majority of monitoring sites across the Lichfield District continue to report annual mean NO_2 concentrations below the AQS, with the exception of Site ID MUC-3 that exceeded the 40µg/m^3 NO_2 AQS by 0.5µg/m^3. Following bias adjustment and annualisation where necessary, Site ID MUC-3 still reported the maximum concentration in 2022. The site is a roadside site located between the A5 and A461 at Muckley Corner Roundabout, within the designated AQMA No.1.

Site ID MUC-3 reported an NO_2 concentration of 40.5µg/m^3 in 2022, 0.5µg/m^3 above the AQS, yet when distance corrected to the nearest relevant exposure, the concentration reduced to 31.6µg/m^3. As such, there was no exceedance of the AQS. This location is a public footpath with nearby residential activity, with the Muckley Corner Roundabout parallel to the monitoring site that connects five roads, such as the A461 and A5 dual carriageways. Therefore, the area is likely to experience high traffic flow. As such, monitoring should continue at this location into 2023 alongside any possible mitigation to ensure greater compliance with the AQS is achieved and protection of public health.

Figure A.1 presents the 2022 annual mean NO_2 concentrations across Lichfield District Council's monitoring sites. Concentrations at Site IDs LT-1, LT-2, LT-5, LT-7, LT-8, MUC-3, A38-4 (X), A38-6A, and A5-2B all increased slightly during 2022 in comparison to 2021, with the maximum increase recorded between the two reporting years at Site ID LT-7 with 4.1µg/m^3.

The overall decrease in concentrations is most likely attributable to a new norm being established, after the return to business as usual following the COVID-19 pandemic, where Government advice was given to stay at home where possible. This resulted in decreased levels of traffic observed across the UK, and as such, reduced NO_2 concentrations recorded during 2020.

It is possible to infer the risk of exceedances of the 1-hour mean NO_2 AQS objective at diffusion tube monitoring sites. LAQM.TG(22) provides an empirical relationship that states exceedances of the 1-hour objective are unlikely when the annual mean concentration is below 60µg/m^3. Given that the highest recorded annual mean concentration at any of the diffusion tube monitoring sites is 40.5µg/m^3 in 2022, prior to distance correction at the nearest relevant exposure, and 52.5µg/m^3 since 2018, it is possible to conclude that there have been no exceedances of the hourly mean NO_2 objective at all diffusion tube monitoring locations in the last few years.

3.2.2 Particulate Matter (PM_{10})

Particulate Matter (PM_{10}) is not monitored in Lichfield District Council.

3.2.3 Particulate Matter ($PM_{2.5}$)

Particulate Matter ($PM_{2.5}$) is not monitored in Lichfield District Council.

3.2.4 Sulphur Dioxide (SO_2)

Sulphur Dioxide (SO_2) is not monitored in Lichfield District Council.

Appendix A: Monitoring Results

Table A.1 – 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)
LT - 1	Lichfield Town - St John St	Roadside	411792	309161	NO_2	No	N/A	N/A	No	2.0
LT - 2	Lichfield Town Trent Valley Road (2 Lime Grove)	Roadside	412782	309774	NO_2	No	1.3	0.9	No	2.0
LT - 3	Lichfield Town Trent Valley Road (No. 101)	Roadside	412991	309869	NO_2	No	6.2	2.9	No	2.0
LT - 4	Lichfield Town Trent Valley Road (No. 155)	Roadside	413183	309945	NO_2	No	9.0	2.5	No	2.0
LT - 5	Lichfield Town Beacon Street (No. 48)	Roadside	411273	309902	NO_2	No	2.3	1.1	No	2.0
LT - 6	Lichfield Town - Beacon Street (No. 14)	Roadside	411358	309785	NO_2	No	0.2	1.6	No	2.0
LT - 7	Lichfield Town - Upper St John Street (No. 96)	Roadside	411892	308937	NO_2	No	1.4	0.5	No	2.0
LT - 8	Lichfield Town - Upper St John Street (No. 127)	Roadside	411951	308839	NO_2	No	0.2	1.2	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)
LT - 9	71 Walsall Road, Lichfield	Roadside	410898	309085	NO_2	No	5.3	1.5	No	2.5
MUC - 1A	Muckley Corner Hotel First Floor	Roadside	408164	306513	NO_2	Yes - AQMA No.1	0.0	5.0	No	7.0
MUC - 1B	Muckley Corner Hotel First Floor	Roadside	408164	306513	NO_2	Yes - AQMA No.1	0.0	5.0	No	7.0
MUC - 1C	Muckley Corner Hotel First Floor	Roadside	408164	306513	NO_2	Yes - AQMA No.1	9.0	5.0	No	7.0
MUC - 1	Muckley Corner Hotel Ground Floor	Roadside	408164	306513	NO_2	Yes - AQMA No.1	10.0	5.0	No	2.0
MUC - 2	Muckley Corner A5 Westbound	Roadside	408165	306487	NO_2	Yes - AQMA No.1	2.0	4.0	No	2.0
MUC - 3	Muckley Corner A461 Southbound	Roadside	408097	306468	NO_2	Yes - AQMA No.1	5.0	2.0	No	2.0
MUC - 4	Muckley Corner A5 Westbound	Roadside	408029	306501	NO_2	Yes - AQMA No.1	5.0	2.0	No	2.0
MUC - 5	Muckley Corner A5 Eastbound	Roadside	408030	306516	NO_2	Yes - AQMA No.1	9.0	1.0	No	2.0
MUC - 6	Muckley Corner A461 Southbound	Roadside	408161	306556	NO_2	Yes - AQMA No.1	10.0	5.0	No	2.0
A38 - 1	Alrewas	Roadside	417101	314180	NO_2	Yes - AQMA No.2	0.0	6.0	No	2.0
A38 - 2	Fradley	Roadside	416295	313186	NO_2	Yes - AQMA No.2	10.0	6.9	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)
A38-2A	Fradley	Roadside	416290	313175	NO_2	Yes - AQMA No.2	0.0	15.0	No	2.0
A38 - 4 (X)	Canwell	Roadside	413978	300834	NO_2	No	35.0	10.0	No	2.0
A38 - 4A	Canwell	Roadside	413989	300869	NO_2	No	10.0	25.0	No	2.0
A38 - 5A	Canwell	Roadside	413950	300574	NO_2	No	<200	4.0	No	2.0
A38 - 6A	Canwell	Roadside	413961	300539	NO_2	No	6.0	1.0	No	2.0
A5 - 1	A5 West	Roadside	407208	306513	NO_2	No	6.0	2.0	No	2.0
A5 - 1A	Muckley Corner Westbound	Roadside	407895	306516	NO_2	No	29.0	1.4	No	2.0
A5 - 2B	A5 Wall Lane	Roadside	408667	306500	NO_2	No	0.1	2.3	No	2.0
ARM1	A513 Rugeley Road, Armitage	Roadside	406343	316482	NO_2	No	127.0	N/A	No	2.0
FAZE	A40691 Coleshill Road (No. 38)	Roadside	420442	301806	NO_2	No	42.0	N/A	No	2.0
B	Burntwood	Urban Background	405086	309344	NO_2	No	N/A	N/A	No	2.0
L	Lichfield	Urban Background	410544	310760	NO_2	No	1.3	0.9	No	2.0

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
LT - 1	411792	309161	Roadside	100.0	100.0	34.6	36.3	25.6	26.5	27.0
LT - 2	412782	309774	Roadside	100.0	100.0	-	36.2	21.9	20.5	20.7
LT - 3	412991	309869	Roadside	100.0	100.0	-	29.3	23.0	26.9	25.0
LT - 4	413183	309945	Roadside	100.0	100.0	-	31.5	20.5	24.3	23.1
LT - 5	411273	309902	Roadside	91.6	92.3	-	29.5	18.0	19.8	21.7
LT - 6	411358	309785	Roadside	100.0	100.0	-	34.9	23.0	25.1	24.9
LT - 7	411892	308937	Roadside	91.6	92.3	-	29.1	23.0	22.0	26.1
LT - 8	411951	308839	Roadside	91.6	92.3	-	**42.1**	28.9	24.1	25.8
LT - 9	410898	309085	Roadside	83.3	82.7	-	-	-	21.9	20.9
MUC - 1A, MUC - 1B, MUC - 1C	408164	306513	Roadside	91.6	92.0	**42.0**	**42.4**	30.5	33.1	31.6
MUC - 1	408164	306513	Roadside	100.0	100.0	**43.0**	**41.5**	26.3	33.2	31.1
MUC - 2	408165	306487	Roadside	100.0	100.0	37.0	34.6	23.7	27.9	27.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
MUC - 3	408097	306468	Roadside	100.0	100.0	**52.5**	**45.9**	33.5	39.8	**40.5**
MUC - 4	408029	306501	Roadside	100.0	100.0	39.9	33.5	25.8	34.9	31.8
MUC - 5	408030	306516	Roadside	100.0	100.0	**41.8**	38.6	28.5	33.3	30.0
MUC - 6	408161	306556	Roadside	91.6	92.3	37.5	29.7	23.2	27.2	27.0
A38 - 1	417101	314180	Roadside	100.0	100.0	33.9	25.8	24.8	27.2	25.0
A38 - 2	416295	313186	Roadside	91.6	92.0	30.8	28.6	21.2	24.8	22.3
A38-2A	416290	313175	Roadside	100	100.0	38.3	35.3	25.2	28.8	27.3
A38 - 4 (X)	413978	300834	Roadside	100	100.0	27.5	25.1	22.2	31.4	32.3
A38 - 4A	413989	300869	Roadside	75	75.0	**41.7**	39.8	21.7	34.2	29.0
A38 - 5A	413950	300574	Roadside	100	100.0	33.9	26.7	21.9	25.9	25.1
A38 - 6A	413961	300539	Roadside	100	100.0	26.2	27.2	17.8	20.4	22.1
A5 - 1	407208	306513	Roadside	100	100.0	35.8	34.0	23.9	24.0	23.9
A5 - 1A	407895	306516	Roadside	91.6	92.0	32.9	27.6	24.4	28.7	26.6
A5 - 2B	408667	306500	Roadside	100	100.0	37.5	29.6	23.7	25.8	28.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
ARM1	406343	316482	Roadside	100	100.0	-	18.7	21.8	26.0	23.4
FAZE	420442	301806	Roadside	100	100.0	-	39.6	26.3	32.0	30.8
B	405086	309344	Urban Background	100	100.0	15.3	15.4	13.6	14.4	13.8
L	410544	310760	Urban Background	83.3	82.7	15.5	16.3	11.5	11.9	11.6

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

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

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

Notes:

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

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

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

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

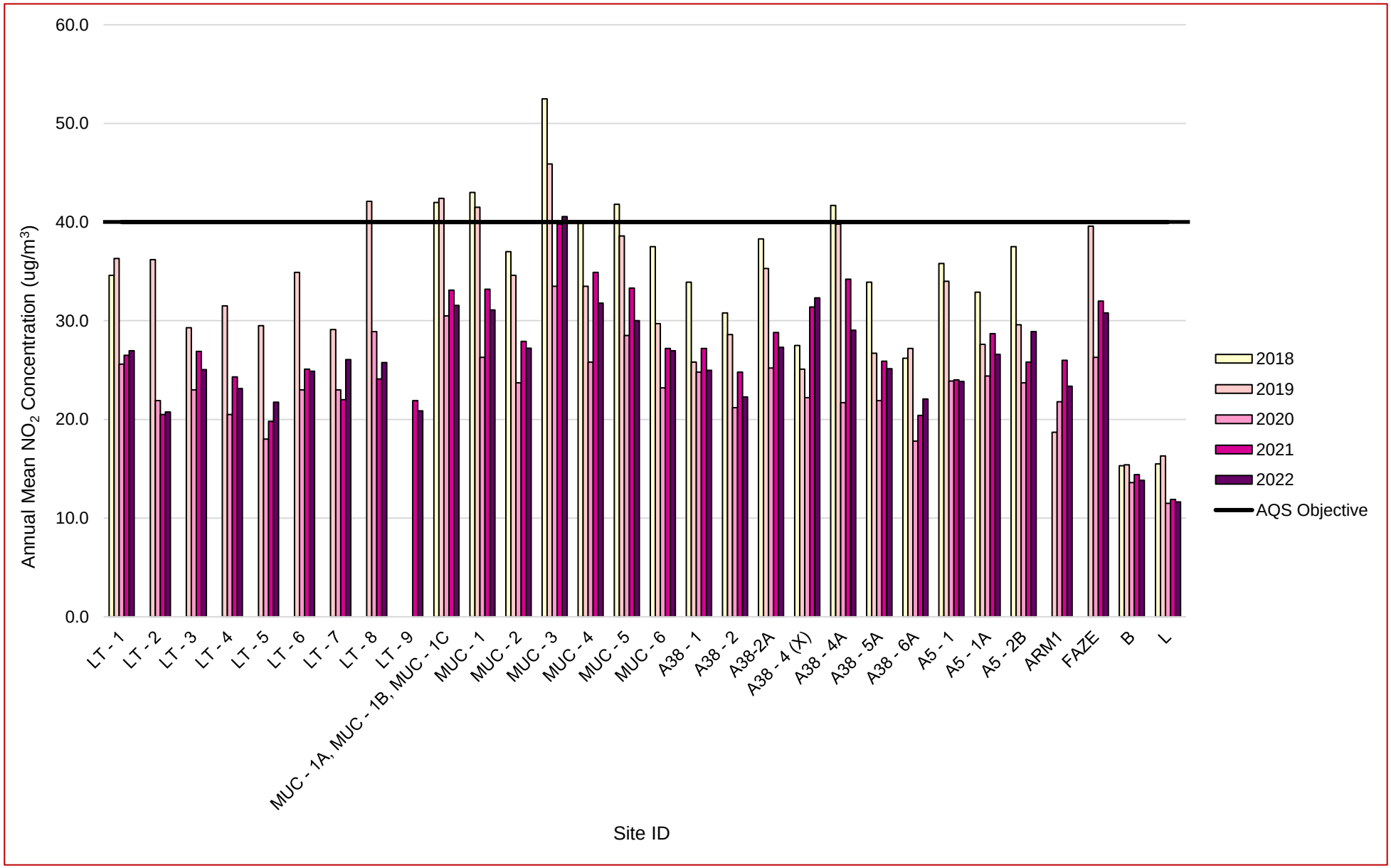
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

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

(3) Data capture columns provide differing values due to months with no reported concentrations.

Figure A.1 – Trends in Annual Mean NO_2 Concentrations – Non-Automatic Locations



Appendix B: Full Monthly Diffusion Tube Results for 2022

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.76	Annual Mean: Distance Corrected to Nearest Exposure	Comment
LT - 1	411792	309161	39.2	35.1	32.5	21.4	24.9	27.4	28.8	32.2	38.2	25.9	34.6	35.9	31.3	27.0		
LT - 2	412782	309774	38.3	32.0	23.0	17.8	17.9	17.2	20.3	21.2	27.0	17.9	29.2	27.7	24.1	20.7		
LT - 3	412991	309869	38.0	35.9	28.7	21.3	20.5	21.6	26.5	35.2	36.9	20.4	31.4	33.0	29.1	25.0		
LT - 4	413183	309945	37.8	34.9	26.0	18.5	22.5	22.1	23.0	24.2	31.1	22.0	31.8	29.0	26.9	23.1		
LT - 5	411273	309902	30.8	26.1	25.4	21.5	18.3	-	20.8	24.8	33.3	18.3	29.4	29.4	25.3	21.7		
LT - 6	411358	309785	36.9	33.6	24.4	24.5	22.7	24.4	23.8	28.2	36.2	23.5	35.5	33.6	28.9	24.9		
LT - 7	411892	308937	31.8	32.6	30.3	21.6	20.6	20.3	-	**50.3**	38.0	23.1	31.9	32.8	30.3	26.1		
LT - 8	411951	308839	38.6	34.3	27.9	21.1	23.9	25.1	27.0	26.5	-	24.8	39.8	**40.5**	30.0	25.8		
LT - 9	410898	309085	33.1	31.1	22.7	16.6	-	13.6	18.6	-	25.7	19.8	28.4	33.2	24.3	20.9		
MUC - 1A	408164	306513	38.6	-	35.8	30.3	32.9	34.8	38.4	**44.8**	**47.8**	28.4	36.1	36.1	-	-		Triplicate Site with MUC - 1A, MUC - 1B and MUC - 1C - Annual data provided for MUC - 1C only
MUC - 1B	408164	306513	38.6	-	37.4	31.9	36.7	33.2	35.5	**48.4**	**48.2**	28.8	35.4	34.4	-	-		Triplicate Site with MUC - 1A, MUC - 1B and MUC - 1C - Annual data provided for MUC - 1C only
MUC - 1C	408164	306513	39.8	-	35.3	33.5	34.5	32.2	36.0	**43.6**	**46.2**	27.2	35.5	34.4	36.7	31.6		Triplicate Site with MUC - 1A, MUC - 1B and MUC - 1C - Annual data provided for MUC - 1C only
MUC - 1	408164	306513	39.6	35.3	37.1	28.2	34.8	30.6	37.1	**44.0**	**44.7**	28.4	36.9	37.2	36.2	31.1		
MUC - 2	408165	306487	38.9	28.5	30.6	27.6	28.2	27.6	31.1	38.7	**43.0**	21.0	30.2	34.3	31.6	27.2		
MUC - 3	408097	306468	**52.5**	**49.1**	**44.2**	39.9	**42.8**	**46.0**	**47.5**	**54.4**	**60.8**	38.6	**45.4**	**44.6**	**47.2**	**40.5**	31.6	
MUC - 4	408029	306501	**40.2**	34.5	**46.8**	30.1	31.0	31.2	37.4	**46.4**	**49.4**	27.7	39.9	28.8	37.0	31.8		
MUC - 5	408030	306516	32.5	**43.6**	34.2	26.5	38.1	**40.7**	**41.5**	35.7	**47.2**	27.2	16.9	34.5	34.9	30.0		
MUC - 6	408161	306556	**43.1**	**41.3**	28.9	20.1	28.1	-	30.2	28.3	34.1	24.8	33.0	32.9	31.3	27.0		
A38 - 1	417101	314180	36.9	33.2	23.5	21.0	25.7	30.7	27.8	30.7	37.5	20.6	28.6	32.4	29.1	25.0		
A38 - 2	416295	313186	27.7	-	24.3	23.7	21.6	17.1	22.1	29.7	29.9	24.0	31.8	33.0	25.9	22.3		
A38-2A	416290	313175	32.8	33.9	31.3	26.2	29.0	27.0	28.7	34.6	39.8	28.9	34.5	34.4	31.8	27.3		
A38 - 4 (X)	413978	300834	**40.5**	39.3	26.7	25.2	38.4	37.8	36.8	**45.6**	**45.5**	31.7	**42.6**	**40.8**	37.6	32.3		
A38 - 4A	413989	300869	-	-	27.1	-	32.0	28.9	34.0	38.9	35.1	29.6	38.3	**40.1**	33.8	29.0		
A38 - 5A	413950	300574	37.8	29.9	20.5	17.1	25.2	29.6	31.4	27.5	38.6	26.1	35.0	32.1	29.2	25.1		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.76	Annual Mean: Distance Corrected to Nearest Exposure	Comment
A38 - 6A	413961	300539	33.0	34.0	17.4	13.7	22.0	21.3	23.7	24.3	30.8	22.8	32.7	32.3	25.7	22.1		
A5 - 1	407208	306513	35.3	32.4	27.0	20.5	25.7	24.7	25.9	24.1	29.6	24.5	34.9	28.2	27.7	23.9		
A5 - 1A	407895	306516	30.3	-	29.7	23.3	30.5	32.1	32.5	28.4	39.9	27.6	38.4	27.4	30.9	26.6		
A5 - 2B	408667	306500	35.1	29.5	37.5	28.3	25.4	30.8	35.8	**43.4**	**49.7**	23.5	29.8	34.5	33.6	28.9		
ARM1	406343	316482	33.2	28.7	24.4	15.8	23.6	28.8	28.5	25.3	37.1	24.7	34.6	21.3	27.2	23.4		
FAZE	420442	301806	**43.6**	**41.4**	29.7	27.8	29.6	31.5	35.0	**40.0**	**44.7**	27.0	37.5	**41.9**	35.8	30.8		
B	405086	309344	28.1	20.8	14.1	10.7	11.6	11.1	10.2	10.2	16.9	14.4	21.8	23.0	16.1	13.8		
L	410544	310760	20.6	20.5	13.0	11.7	9.8	9.6	10.7	11.2	15.4	12.8	-	-	13.5	11.6		

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

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

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

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

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Lichfield District During 2022

Lichfield District Council has identified no new potential developments or biomass plant sources that required an Air Quality Assessment (AQA) within the reporting year of 2022.

Additional Air Quality Works Undertaken by Lichfield District Council During 2022

Lichfield District Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

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

Local authority co-location studies which use tubes supplied by Staffordshire Scientific Services/ Staffordshire Highways Laboratory with the 20% TEA in water preparation method in 2022, with all 13 studies rated as 'good', as shown by the precision summary results. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good" precision where the coefficient of variation of

duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Monitoring in 2022 throughout Lichfield District was completed in adherence with the 2022 Diffusion Tube Monitoring Calendar, whereby all changeovers throughout the monitoring year were completed in line with Defra guidance. As such, there is a degree of certainty surrounding the monitoring results provided.

In Table A.2 there are some discrepancies recorded between the two data capture columns, however, it is acknowledged that in various months data was not reported for the Site IDs: LT-5, LT-7, LT-8, LT-9, MUC-1A, MUC-1B, MUC-1C, MUC-6, A38-2, A38-4A, A5-1A and L. Thus, justifying the different data capture percentages recorded.

Diffusion Tube Annualisation

The LAQM.TG22 states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%, or has 3 months of data collected for the monitoring year in line with the Diffusion Tube Monitoring Calendar.

All diffusion tube monitoring locations within Lichfield District Council recorded data capture of 75% therefore it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

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

Lichfield District Council have applied a national bias adjustment factor of 0.86 to the 2022 monitoring data. A summary of bias adjustment factors used by Lichfield District Council over the past five years is presented in Table C.1.

No co-location studies are carried out by Lichfield District Council therefore only a national factor can be applied. The national factor for Staffordshire Scientific Services/ Staffordshire Highways Laboratory 20% TEA in water, as presented in the Diffusion Tube

Bias Factors Spreadsheet v06_23, was 0.86 based on 13 studies. The National Bias Adjustment Spreadsheet is presented in Figure C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	06/23	0.86 (13 studies)
2021	National	03/23	0.87 (12 studies)
2020	National	09/21	0.85 (15 studies)
2019	National	03/20	0.93 (19 studies)
2018	National	03/19	0.87 (13 studies)

NO_2 Fall-off with Distance from the Road

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

Lichfield District Council required NO_2 fall off distance calculations on Site ID MUC-3 as the annual mean concentration was greater than 36µg/m^3. The calculation data is presented in Table C.2.

Table C.2 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
MUC-3	5.0	15.0	40.5	13.2	31.6	-

Figure C.1 – National Bias Adjustment Factor Spreadsheet (06/23)

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/23

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

This spreadsheet will be updated at the end of September 2023
LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List
If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List
If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List
If a year is not shown, we have no data[2]

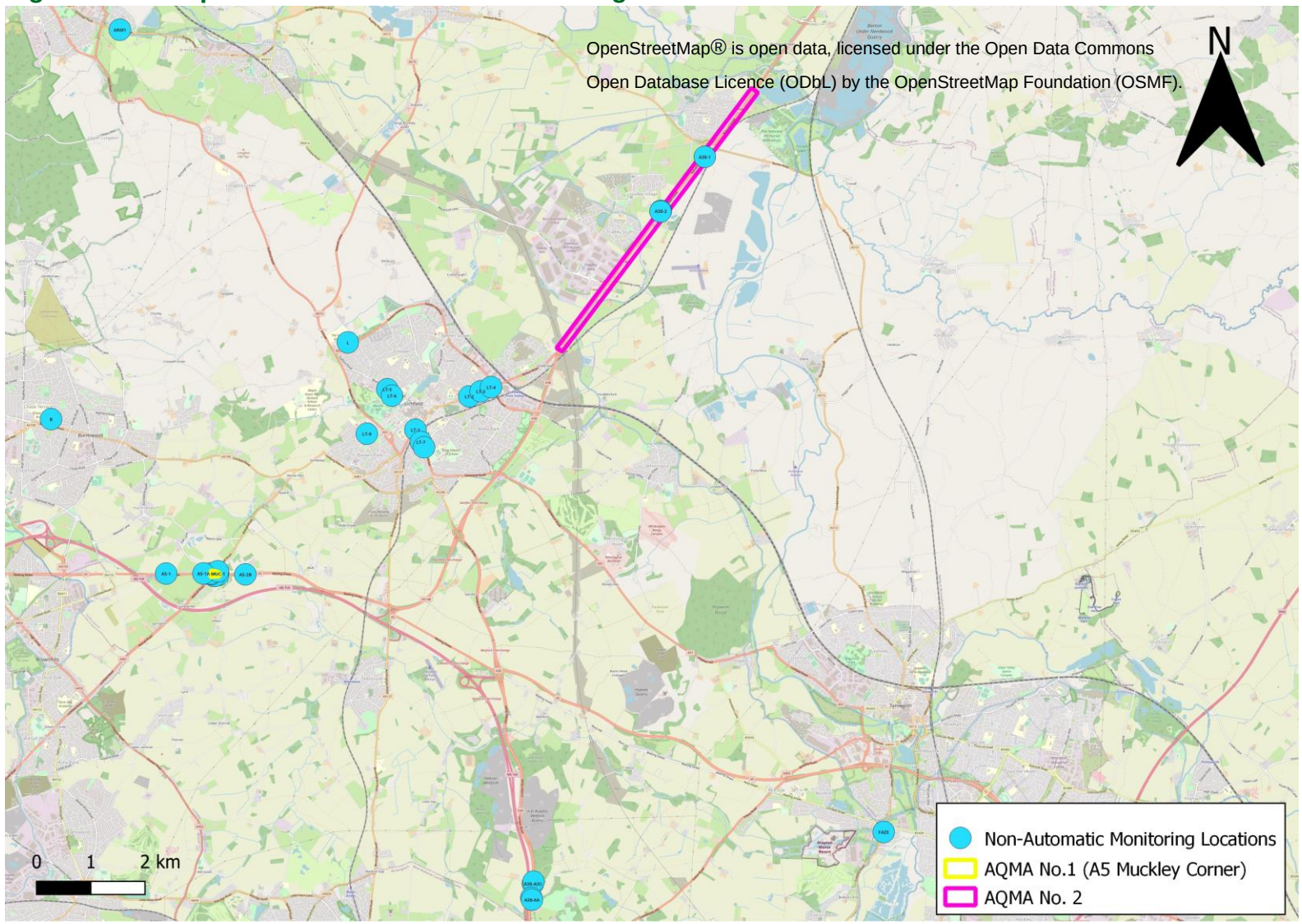
Step 4: **Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.**

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

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Staffordshire Scientific Services	20% TEA in water	2022	KS	Manchester City Council	12	49	43	13.8%	G	**0.88**
Staffordshire Scientific Services	20% TEA in water	2022	UC	Manchester City Council	12	29	29	0.4%	G	**1.00**
Staffordshire Scientific Services	20% TEA in water	2022	SI	Manchester City Council	12	17	16	12.1%	G	**0.89**
Staffordshire Scientific Services	20% TEA in water	2022	KS	Marylebone Road Intercomparison	12	51	42	20.5%	G	**0.83**
Staffordshire Scientific Services	20% TEA in water	2022	UB	Salford City Council	12	23	22	6.9%	G	**0.94**
Staffordshire Scientific Services	20% TEA in water	2022	B	Salford City Council	10	13	11	16.3%	G	**0.86**
Staffordshire Scientific Services	20% TEA in water	2022	R	Salford City Council	12	40	34	17.6%	G	**0.85**
Staffordshire Scientific Services	20% TEA in water	2022	R	Bury Council	11	24	21	16.0%	G	**0.86**
Staffordshire Scientific Services	20% TEA in water	2022	R	East Staffordshire Borough Council	10	39	31	23.9%	G	**0.81**
Staffordshire Scientific Services	20% TEA in water	2022	UB	Stoke-on-Trent City Council	11	23	20	17.1%	G	**0.85**
Staffordshire Scientific Services	20% TEA in water	2022	UB	Wigan Council	12	21	17	21.6%	G	**0.82**
Staffordshire Scientific Services	20% TEA in water	2022	R	Wigan Council	12	27	22	22.6%	G	**0.82**
Staffordshire Scientific Services	20% TEA in Water	2022	R	Bolton Council	9	29	23	25.6%	G	**0.80**
Staffordshire Scientific Services	20% TEA in water	2022		**Overall Factor[3] (13 studies)**				**Use**		**0.86**

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Map of All Non-Automatic Monitoring Locations



NOTE:

- Triplicate Site IDs MUC-1A, MUC-1B, and MUC-1C will only show label MUC-1A;
- Figure D.1 shows Site IDs LT-5 and LT-6, LT-7 and LT-8, A38-2 and A38-2A, A38-6A and A38-5A, A38-4A and A38-4(X), and MUC-1, MUC-2, MUC-3, MUC-4, MUC-5 and MUC-6 overlapping due to close locational proximity.

Figure D.2 – Map of Non-Automatic Monitoring Locations – Lichfield

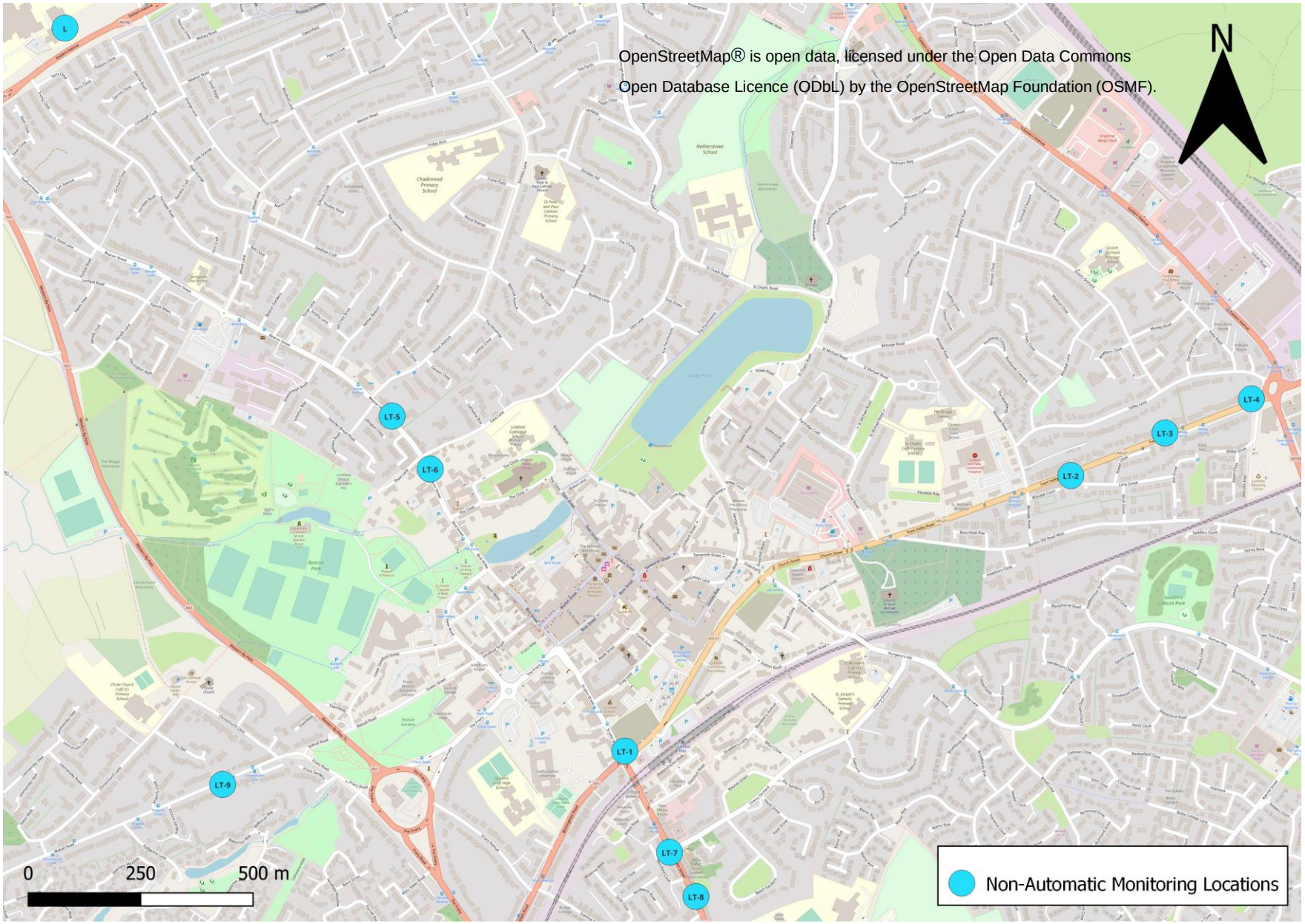


Figure D.3 – Map of Non-Automatic Monitoring Locations - Burntwood

Figure D.4 – Map of Non-Automatic Monitoring Locations – A38

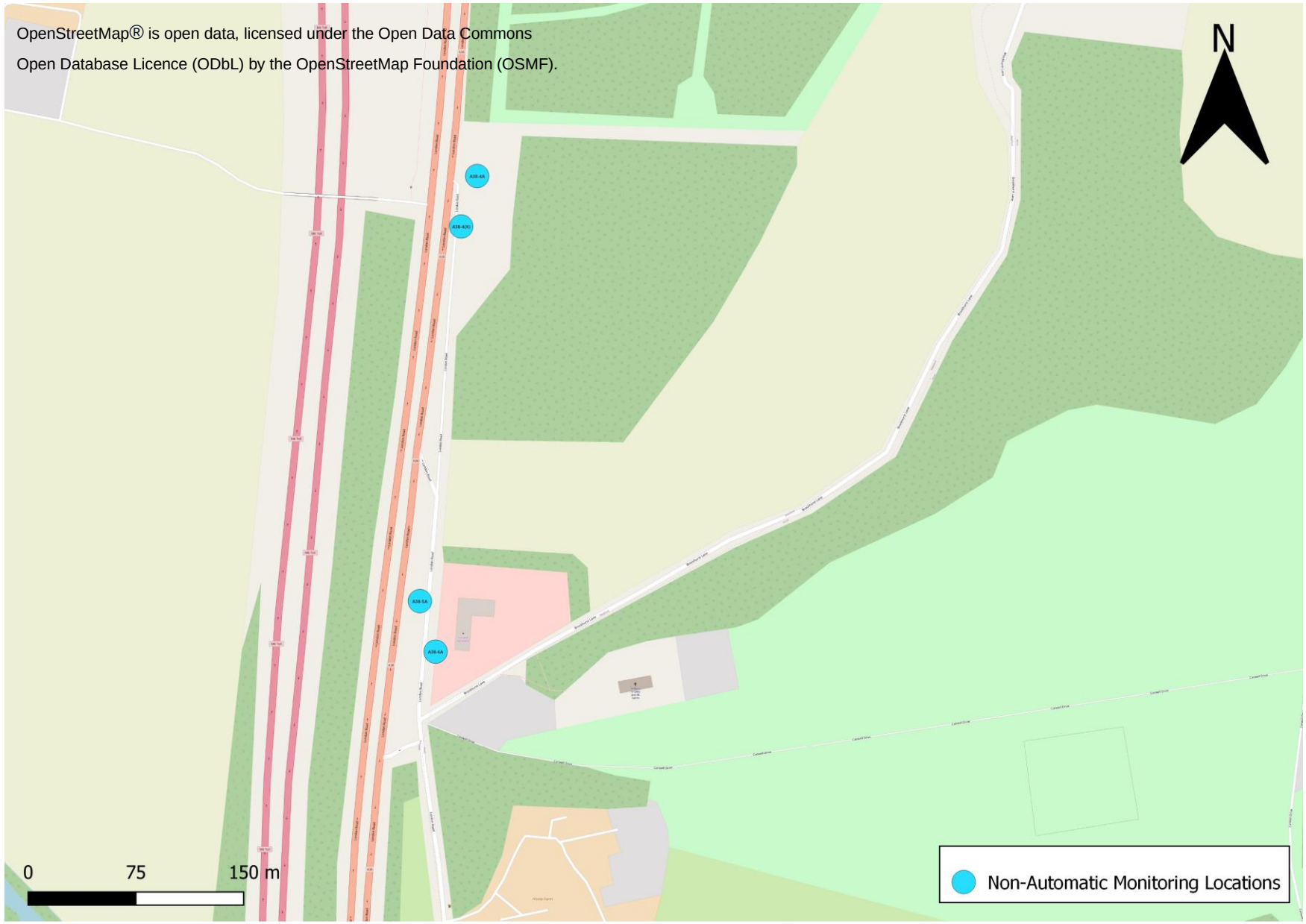


Figure D.5 – Map of Non-Automatic Monitoring Locations – Fazeley

Figure D.6 – Map of Non-Automatic Monitoring Locations – A5 Muckley Corner

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

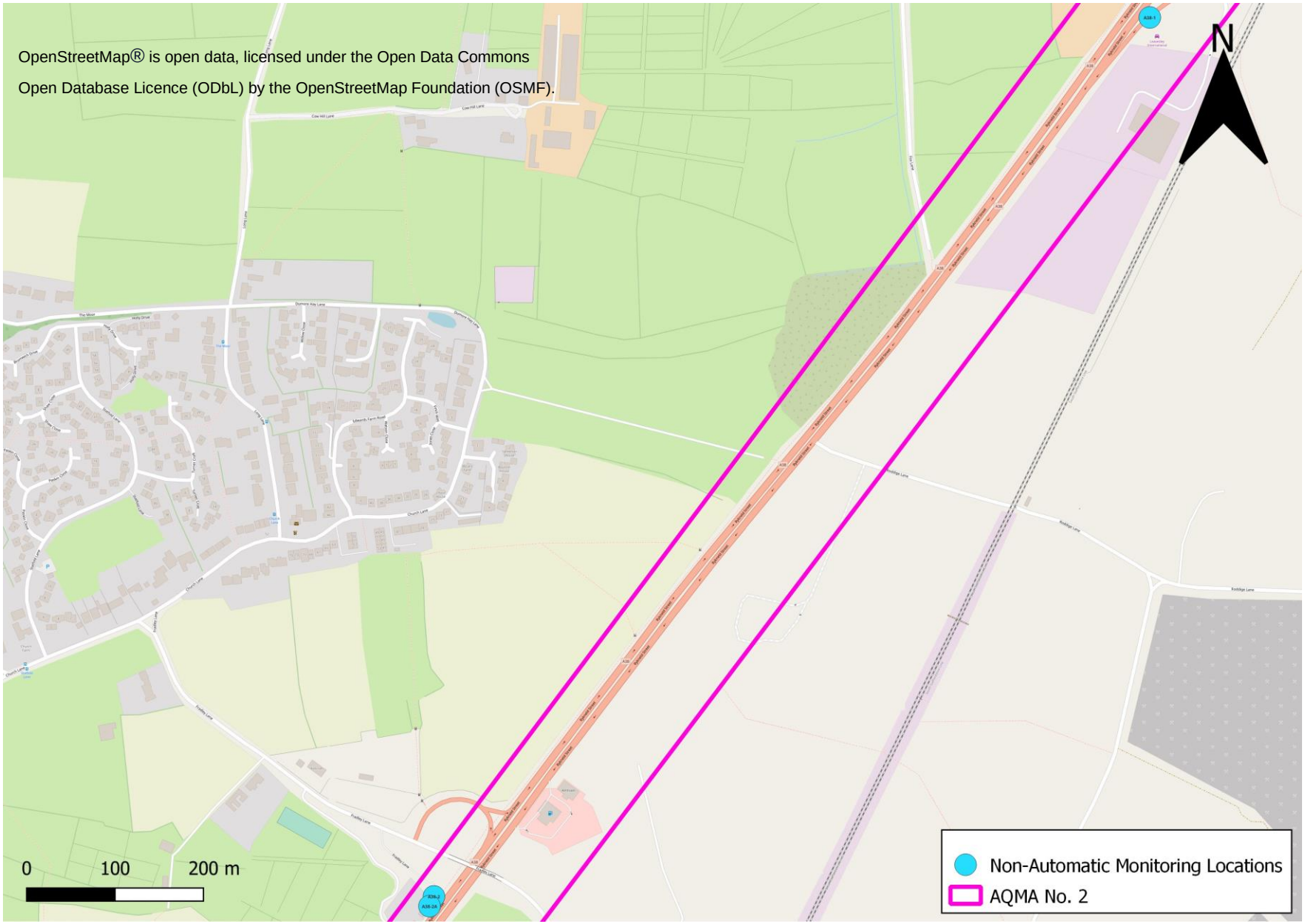
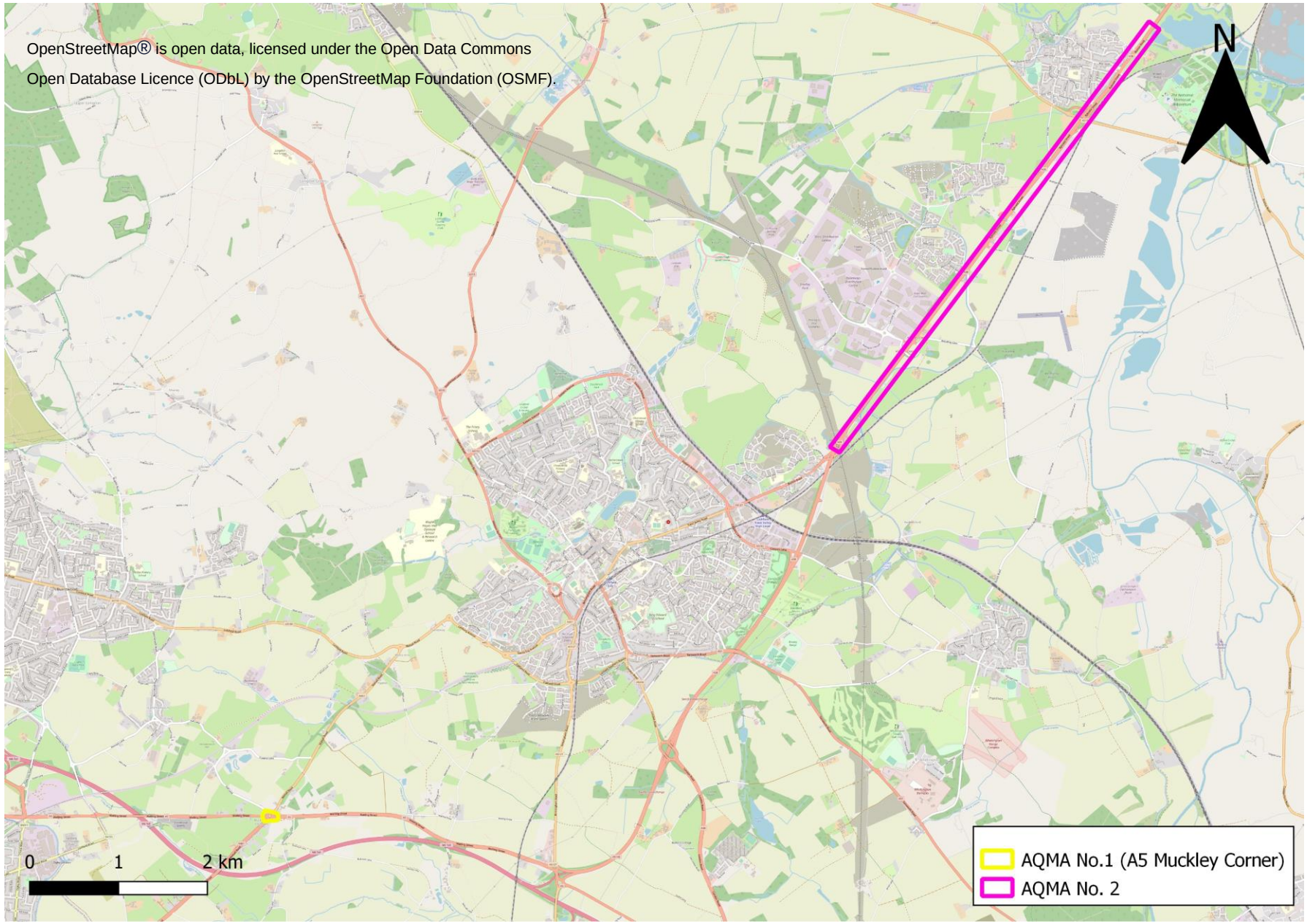


Figure D.8 – Map of Non-Automatic Monitoring Locations – Brereton

Figure D.9 – Map of Lichfield Air Quality Management Areas (AQMAs)



Appendix E: Summary of Air Quality Objectives in England

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

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

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

Glossary of Terms

Abbreviation	Description
AONB	Areas of Outstanding Natural Beauty
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values.'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.
AQS	Air Quality Standard
ASR	Annual Status Report
CO_2	Carbon Dioxide
COVID-19	Coronavirus-19 Pandemic
CWZ	Core Walking Zones
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DTDES	Diffusion Tube Data Entry System
EV	Electric Vehicle
HAWB	Staffordshire Health and Wellbeing Board
ICE	Internal Combustion Engine
ITS	Integrated Transport Strategy
LAQM	Local Air Quality Management
LCWIP	Local Cycling and Walking Infrastructure Plan
LEV	Low Emission Vehicle
LEVI	Local Electric Vehicle Infrastructure
NHS	National Health Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
ONS	Office for National Statistics
PG	Policy Guidance
PHE	Public Health England

Abbreviation	Description
PM	Particulate Matter
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
SAQF	Staffordshire Air Quality Forum
SO_2	Sulphur Dioxide
SSSI	Site of Special Scientific Interest
TEA	Triethanolamine
TG	Technical Guidance
UK	United Kingdom
ULEV	Ultra Low Emission Vehicle
WFH	Working From Home

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Lichfield District Council 2022 ASR Appraisal Letter (ASR22-1891) (August 2023).
- Lichfield District Council ASR 2022.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, published June 2023.
- Diffusion Tube Data Processing Tool version 3.0, published March 2023, Defra.
- Public Health Outcomes Framework, Public Health England (PHE).