Halton Borough Council

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: 2nd November 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Halton Borough Council

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

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

Halton Borough Council is a largely urban area that straddles the river Mersey and consists of two main centres, Runcorn and Widnes. The Borough's history is strongly linked to the chemical industries of the early and mid-20th Century and continues to play host to large industrial complexes. Regeneration over the past 20 years has seen new industry and commerce move into the Borough; in particular, the waste and haulage sectors have replaced some of the more traditional industries. In addition, housing developments have started to spread across the more rural fringes of the Borough.

In 2011, Halton Borough Council declared 2 air quality management areas in Widnes Town Centre due to minor exceedances of the annual air quality objective for NO2 on some of the diffusion tube data. The diffusion tubes are at roadside locations and the exceedances were in relation to local traffic congestion at road junctions.

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

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

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

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

The Borough is home to The Silver Jubilee Bridge, (SJB) which is one of the major crossings of the river Mersey. Historically this resulted in congestion at the access points to the SJB. However, in 2017 the second Mersey crossing was opened which has greatly improved the flow of traffic throughout the Borough.

Environmental Health works closely with the Planning and Development and the Highways Divisions of the Council in relation to new developments and transport schemes. There is also close working with local officers of the Environmental Agency with regards some of the larger industries in the Borough. Sitting within the Public Health Department and reporting to the Director for Public Health the Environmental Health has a clear and ongoing relationship with the wider public health objectives in relation to air quality.

Halton is a member of the Merseyside and Cheshire Air Quality Technical Group, which reports to the Environmental Health Chief Officers

Since the declaration of the AQMAs in Widnes 2011, the levels of NO2 have consistently fallen to below the air quality objective levels and the Council is revoking of the AQMAs in the next 12 months. (At the time of writing the Air Quality Management Areas have now been revoked)

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.

[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

The Council has introduced several measures aimed at improving air quality. The two air quality management areas were declared in relation to traffic emissions and therefore the actions identified to improve air quality are mostly related to transport.

Sustainable modal shifts in transport – HBC continues to work on a number of projects designed to influence residents' choice of transport across the Borough and beyond. The Council has been working in partnership with the Department for Transport (DfT) and British Cycling to secure funding for projects that encourage travel by alternatives to the car. Money has been invested in extending cycle routes along key corridors, promoting travel alternatives and bus route improvements to reduce congestion.

Cycling and Walking Activities Active Halton campaign

This public health campaign aims to encourage people who live, work and study in Halton to be more active. The campaign promotes cycling, walking, and running.

https://activehalton.co.uk/what-is-active-halton/

Improvement of road network – the junction at Milton Road and Kingsway was widened for the inclusion of a second lane. This has allowed a better flow of traffic and data indicates that this, together with more strategic actions an improvements in engine technology, has had the intended impact of reducing the levels of NO_2 in Air Quality Management (AQMA) 2 to the point where the Council is intending to revoke the AQMA.

Liverpool City Region (LCR) – Halton Borough Council continues to work within the wider city region to assess challenges across boundaries.

Liverpool City Region Air Quality

Halton Borough Council is working with the other Councils in the Liverpool City Region to assess and react to Air Quality. The main output was the combined authority action plan

https://www.liverpoolcityregion-ca.gov.uk/improving-our-air-quality

The Objectives of the Action Plan are:

1. To support the Liverpool City Region's local authorities in their mandate to reduce harmful atmospheric emissions to within statutory levels in the shortest possible time, as a minimum, and preferably, to better and exceed these minimum target standards. This is in tandem to achieving the net zero carbon target by 2040.

2. To support the local authorities in the revocation of Air Quality Management Areas in the shortest possible time.

3. To avoid the need to declare new Air Quality Management Areas across the city region in respect of nitrogen dioxide emissions or any other harmful pollutants.

The action plan is divided into four main sections:-

1. Actions by the Combined Authority
2. Recommended actions to local authorities and our partners
3. Actions for the LCR's residents, communities and businesses;
4. Recommended actions to Central Government and its agencies.

Liverpool City Region Hydrogen Bus Project

The Liverpool City Region Combined Authority is part of a consortium that has been awarded £6.4m from the Office for Low Emission Vehicles to trial hydrogen buses. The bid includes the creation of a new hydrogen refuelling station at the BOC plant in St Helens, which produces hydrogen for industrial customers in the region and further afield. Up to 25 hydrogen-powered, buses to be funded with the first trial. The buses emit nothing but water, so will contribute to improving air quality and a zero carbon economy.

https://www.liverpoolcityregion-ca.gov.uk/liverpool-city-region-launches-6-4m-hydrogen-bus-project/

Public Information

Air Quality website continues after its launch in November 2019. It is a public information website for the Liverpool City Region

https://letscleartheairlcr.co.uk/

Conclusions and Priorities

As part of the Liverpool City Region (LCR) Halton Borough Council recognises the need to address air quality beyond borough boundaries. Halton Council is therefore committed to working with the other LCR authorities to address emissions across the region with particular reference to transport and travel planning. We are working with LCR to maintain a regional emission inventory to better understand the sources of pollution and how to reduce it, improves emissions from buses and increase the number of electric vehicle charging points.

Halton Council within its Delivery and Allocations Local Plan has included sections on

Sustainable Development and Climate Change

Managing Pollution and Risk.

https://www3.halton.gov.uk/Documents/planning/planning%20policy/newdalp/DALP%20Adopted.pdf

The AQMAs were declared on the basis of small exceedances in the diffusion tube data. The exceedances were not consistently replicated by the real time analysers that had been located in the AQMAs.

The indication is that Halton Borough Council is in compliance with all the air quality objectives. Monitoring of the air quality in the AQMAs demonstrates that the drop in NO_2 concentrations identified prior to the Covid pandemic has continued, and none of the diffusion tubes demonstrate a continued exceedance of the air quality objective in the annual concentration of NO_2. It is therefore a priority for 2023 that Halton Borough Council formally revokes both AQMAs.

By revoking the AQMAs resources can be freed for the assessment $PM_{2.5}$ concentrations and the their impact on public health.

Local Engagement and How to get Involved

As the two Air Quality Management Areas in the Borough relate to emissions from road vehicles, everyone is able to contribute to improvements, simple actions that all can take to help reduce air pollution.

There are a number of things the public can do to help improve air quality in their area.

These include:

- Not burning garden or domestic waste. This not only releases pollutants into the atmosphere, it can also cause a nuisance to neighbours. All waste should be either disposed of correctly or recycled. haltoncouncilwaste
- Reducing the use of cars and consideration of cycling, walking or using public transport more. 55% of car journeys are less than five miles, many of these trips could be walked or made by bike or public transport.
- Car sharing. When two or more people share a car and travel together, it allows people to benefit from the convenience of the car, sharing travel costs, whilst helping to reduce congestion and air pollution
- Taking an 'eco-driving' approach when driving. This can save money in reduced fuel costs as well as reduce emissions of air pollutants and influence climate change.

Examples of 'eco-driving' approach:

- Regular maintenance and servicing of vehicle according to the manufacturers schedule to maintain the engine's efficiency.
- Making sure tyres are inflated to the manufacturer's recommended pressures. Under-inflated tyres create more rolling resistance and so use more fuel.
- Removing unused roof racks or roof boxes to reduce wind resistance and not overloading vehicle or carrying unnecessary weight. Reducing use of air conditioning which increases fuel consumption.
- Avoid warming up the car while stationary this can consume more fuel and increase pollution. By starting to drive immediately, the engine will reach its working temperature quicker.
- Avoiding unnecessary idling of car engine when in traffic or waiting to pick up people.
- Driving smoothly and avoiding sharp acceleration and harsh braking.
- Maintaining a steady speed, using the highest gear possible as soon as possible (between 2000rpm and 2500rpm) to keep the engine working most efficiently. The greater the speed, the greater the fuel consumption and pollution. For example, driving at 70mph uses up to 9% more fuel than at 60mph and up to 15% more than at 50mph.

- Using a lower emissions, hybrid or electric vehicle or high efficiency petrol vehicle.
- Avoid driving during the morning and evening peak times as levels of congestion and therefore air pollution will be highest.
- If stationary in a traffic jam, traffic lights or at a pelican crossing for example for over 30 seconds, switch off engine to reduce air pollution.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection Team of Halton Council with the support and agreement of the following officers and departments:

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Liverpool City Region & Cheshire Air Quality Technical Group

This ASR has been signed off by Ifeoma Onyia (Director of Public Health)

If you have any comments on this ASR please send them to

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1 Local Air Quality Management

This report provides an overview of air quality in Halton Borough Council during 2023. 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 Halton Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. 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 Halton Borough Council can be found in Table 2.1. The table presents a description of both the AQMAs that are currently designated within Halton Borough Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designation(s) are as follows:

- NO_2 annual mean;

We propose to revoke AQMA 1 and AQMA 2 (see monitoring/additional information).

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
Widnes No1	01/03/2011	NO2 Annual Mean	Roadside Residential Properties	NO	49	26	5 years	Widnes Air Quality Action Plan 2014	HaltonAQactionplan
WidnesNo2	01/03/2011	NO2 Annual Mean	Roadside Residential Properties	NO	49	29	5 years	Widnes Air Quality Action Plan 2014	HaltonAQactionplan

☒ **Halton Borough Council confirms the information on UK-Air regarding their AQMA(s) is up to date**

☒ **Halton Borough Council confirms that all current AQAPs have been submitted to Defra**

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

Defra's appraisal of last year's ASR concluded

Table 2.2a

	Comments from 2022 ASR Appraisal	HBC Response
1	Detailed maps included which show the location of all diffusion tube monitoring sites, automatic monitoring sites and the two AQMAs.	Noted
2	The AQAP has not been updated since 2014. AQAPs should be updated every five years.	Noted – AQ Strategy is being updated in line with the revocation of the AQMAs and the change of focus to PM2.5
3	The trends of pollutant concentrations are presented in multiple figures, however limited discussion is included to accompany these figures.	Noted & addressed in the 2023 ASR.
4	The Public Health Outcomes Framework was discussed, in particular the fraction of mortality of adults over the age of 30 attributable to particulate air pollution. This is welcomed.	Noted
5	The 03/22 national bias adjustment factor sheet has been used, given the submission date of this ASR, the 09/22 national bias adjustment factor sheet should have been used instead.	Noted & addressed in the 2023 ASR
6	The "Local Engagement and How to Get Involved" section is detailed and provides lots of suggestions for the public to consider.	Noted
7	Comments from the 2020 ASR appraisal have been included within the 2021 ASR, however these have not been responded to.	Noted & addressed in the 2023 ASR

8	Details of measures to address $PM_{2.5}$ as well as the priorities for the upcoming year should be included.	Noted – to be addressed through 2023 ASR and AQ Strategy

Halton Borough Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 2022 measures are included within Table 2.2, with the type of measure and the progress Halton Borough Council has 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 their respective Action Plans and Local Transport Plan. Key completed measures are:

- Continuation of Connective EV Charging placed within areas of terraced properties
- Electric Vehicle Charging Strategy Halton Borough Council in draft form.

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

- Local Walking and Cycling Infrastructure Plan (LCWIP) which provides a plan of more granular, local links to feed the regional network and to facilitate more everyday trips to school, work and local services
- Halton Electric Vehicle Strategy and Action Plan is currently in draft. The document outlines key areas of work that will help support the rollout of charging infrastructure for electric vehicles across our borough.

Halton's priorities for the coming year are:

- Revoking AQM's
- Developing Air Quality Strategy for Halton
- Research into $PM_{2.5}$ within Halton

worked to implement these measures in partnership with the following stakeholders during 2022:

- Neighbouring local authorities
- Local Universities

- Environment Agency
- Liverpool City Region & Cheshire Air Quality Technical Group (AQTECH).

The principal challenges and barriers to implementation that Halton Council anticipates are facing are funding and resource challenges.

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

Staffing issues

Halton Council anticipates that the measures stated above and in Table 2.2 will achieve Revoking AQMA1 and AQMA2.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Halton Council anticipates that further additional measures not yet prescribed will be required in subsequent years to maintain compliance and this will be addressed within the Air Quality Strategy.

Table 2.2 – Progress on Measures to Improve Air Quality

	Measure	Policy	Target Area	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Highway Improvements Around AQMA	Transport Planning And Infrastructure	Other	HBC	2016	Ongoing	Reduction in NO2 levels to below objective standards	NO2 Particulates	Levels of NO2 Reduced	Ongoing	Continued monitoring area
2	Travel Plans	Promoting Travel Alternatives	Workplace Travel Plans	HBC	Annual Programme	Ongoing	Sustainable modal shift	NO2 Particulates	Levels of NO2 Reduced	Ongoing	General benefit in air quality and health
3	Improvement Of Cycle Network	Promotion Of Travel Alternatives	Promoting Cycling	HBC	2016	Ongoing	Sustainable modal shift	NO2 Particulates	Levels of NO2 Reduced	Ongoing	General benefit in air quality and health
4	Low Emission Strategy	Policy Guidance	Low Emissions Strategy	HBC/LCR	Ongoing	Ongoing	Number of Bus conversion	NO2 Particulates	Levels of NO2 Reduced	Ongoing	Bus Company investment/Govt funding
5	Private Sector Ev Investment	Policy Guidance	Low Emission Strategy	HBC/LCR	Ongoing	Ongoing	Sustainable modal shift	NO2 Particulates	29 residential charging points installed	Ongoing	Privately Funded via Planning Conditions
6	Lcr Air Quality Task Group	Transport Planning And Infrastructure	Other	LCR	Ongoing	Ongoing	Reduction in NO2 PM10 across City Region	NO2 Particulates	Ongoing	Ongoing	Hydrogen Bus Project
7	Sustainable Travel Promotions	Promoting Travel Alternatives	Promoting of cycling/walking bike use	HBC	2016	Ongoing	Reduction in car reliance/modal shift	Across the Borough	Ongoing	Ongoing	Travel guidance for access to employment and skills
8	Improve Council Fleet	Vehicle Fleet Efficiency	HBC	HBC	2015	Ongoing	Improved efficiency of Council vehicles	Across the Borough	Ongoing	Ongoing improvements	All HBC Fleet is now Euro 6
9	Promotion Of Travel Alternatives	Promoting Cycling	Community	HBC	2019	Ongoing	Reduction in trips under 5 miles	Across Borough	Ongoing	Partner with LCR	Cycle Promoting

	Measure	Policy	Target Area	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
10	Better Buses Area	Promoting Travel Alternatives	Bus route improvements	HBC	2019	Ongoing	Reduce journey times and relieve congestion	Across Borough	Ongoing	2024	

$PM_{2.5}$ – 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.

Halton Council is taking the following measures to address $PM_{2.5}$

Although $PM_{2.5}$ is not included in the Local Air Quality (England) Regulations 2000 ("the Regs") Halton Borough Council has in the past monitored $PM_{2.5}$. The monitor was located downwind of energy from waste plant and was installed in compliance with planning consent for the plant. It was located on Runcorn Hill to the south west of the Borough. The data from this station indicated that the annual average was 10µg/m^3, and below the objective (sees Table A.7) and hence the monitoring has been discontinued.

Halton Council measure The Public Health Outcome Framework for $PM_{2.5,}$ within Public Health. This outcome indicator is the percentage of mortality in adults over 30 attributed to particulate air pollution (new method). The attributable fraction in England in 2021 was 5.50%, whilst for the North West this is lower, at 5.30% and in Halton at 5.46%.

It is anticipated that the measures outlined in Table 2.2 above will contribute to the management of $PM_{2.5}$ within the Borough. The fact that the Environmental Health Team sits within the Director of Public Health's Directorate at Halton Borough Council means the dialogue regarding health and particulate matter is ongoing and policies relating to air quality are fully co-ordinated with the related health planning.

The entire Borough is designated as a Smoke Control area. Environmental Protection Officers give out advice and information to residents on DEFRA approved exempt appliances and the correct fuels to use. Environmental Health respond to complaints about commercial premises using burning as a method of waste disposal and respond to nuisance complaints about neighbours' consistently burning waste under the Environmental Protection Act 1990.

All permitted premises and planning applications are encouraged to utilise gas-fired boilers instead of diesel-powered boilers to reduce the $PM_{2.5}$ and PM_{10} emissions. As a statutory

consultee on planning applications we ask for dust management plans to limit the amount of dust on site, and to stop burning of any waste arising.

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

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Halton Council did not undertake automatic (continuous) monitoring at any sites during 2022 due to equipment malfunction. However, Table A.1 in Appendix A shows the details of the automatic monitoring sites in previous years. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem.

NO_2 monitor at one site (Milton Road) transferred to the Environment Agency within their national network defra.gov.uk/interactive-map

Halton Borough Council publishes information about the monitors and data within the website airqualityengland

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

3.1.2 Non-Automatic Monitoring Sites

Halton Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 15 sites during 2022. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO_2)

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

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

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

All diffusion tubes monitoring results were below the annual mean for nitrogen dioxide, unfortunately, there are no results for Halton's automatic monitoring stations due to equipment failure. The automatic monitoring stations are under review and being considered for decommissioning due to their age and revoking of AQM's. The last five years diffusion tube results indicate a reduction in levels, with a large reduction 2020 due to Covid, as there was less car use within Halton. A similar trend can be noted with automatic monitoring as consistently over the previous five years levels are well below air quality objectives both the annual , hourly mean.

3.1.4 Particulate Matter (PM_{10})

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

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

Unfortunately, there are no results for Halton's automatic monitoring PM_{10} stations due to equipment failure. The automatic monitoring stations are under review and being considered for decommissioning due to their age and revoking of AQM's. Levels of the annual mean have remained consistent low 20's µg/m^3 with a greater reduction in 2020 due to Covid, as there was less car use within Halton. The rise in the daily mean in 2021 due to an increase in home burning and a period of dry weather.

3.1.5 Particulate Matter ($PM_{2.5}$)

No monitoring undertaken.

Using DEFRA background maps the average $PM_{2.5}$ in Halton is 8.2 µg/m^3

However, the projections in the 2018 reference year background maps and associated tools are based on assumptions, which were current before the Covid-19 outbreak in the UK. In consequence, these tools do not reflect short or longer-term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.

3.1.6 Sulphur Dioxide (SO_2)

No monitoring undertaken

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
HBC1	Marzahn Way	Roadside	352042	386285	NO_2, PM_{10}	AMQA1	Chemiluminescent; Beta Attenuation	8	1	2
HBC2	Milton Road	Roadside	351358	385621	PM10	AMQA2	Beta Attenuation	15	2	2

Notes:

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
4	Milton Road4	Roadside	351343	385625	NO2	In AQMA ..AMAQNo2	4.0	2.0	No	2.0
5	Milton Road5	Roadside	351382	385648	NO2	In AQMA ..AMAQNo2	3.0	2.0	No	2.0
6	Milton Road6	Roadside	351418	385661	NO2	In AQMA ..AMAQNo2	3.0	2.5	No	2.0
9	Peelhouse Lane9	Roadside	352078	386306	NO2	In AQMA ..AMAQNo1	2.0	1.0	No	2.0
10	Peelhouse Lane 10	Kerbside	352044	386290	NO2	In AQMA ..AMAQNo1	2.0	1.0	No	2.0
11	Clifton Road	Urban Background	352038	386316	NO2	no	10.0	1.0	No	2.0
12	Deacon Road12	Roadside	351748	386112	NO2	In AQMA ..AMAQNo1	6.0	1.0	No	2.0
13	Deacon Road13	Roadside	351767	386088	NO2	In AQMA ..AMAQNo1	3.0	2.0	No	2.0
2	Clifton Rd	Urban Background	350896	380810	NO2	no	20.0	1.0	No	2.0
3	Cronton Lane3	Roadside	351042	380684	NO2	no	10.0	1.0	No	2.0
1	Cronton Lane1	Roadside	351054	385388	NO2	no	20.0	20.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
8	Birchfield Rd	Roadside	351379	381458	NO2	no	3.0	2.0	No	2.0
16	Highfield Road	Roadside	351079	385438	NO2	no	2.0	2.0	No	2.0
14	Northwich Rd	Roadside	357051	379435	NO2	no	10.0	1.0	No	2.0
15	Northwich Rd	Roadside	356996	379449	NO2	no	10.0	1.0	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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
HBC1	352042	386285	Roadside	N/A	N/A	29	27	24	31.2	**N/A**

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

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

Notes:

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

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

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

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
4	351343	385625	Roadside	90.4	90.4	35.0	31.3	25.1	30.1	29.8
5	351382	385648	Roadside	100	100.0	35.0	32.5	26.2	32.5	31.9
6	351418	385661	Roadside	100	100.0	32.0	26.4	23.7	29.5	27.1
9	352078	386306	Roadside	100	100.0	33.0	30.0	23.8	26.2	24.9
10	352044	386290	Kerbside	100	100.0	38.0	37.5	30.9	34.8	33.4
11	352038	386316	Urban Background	90.7	90.7				23.6	16.8
12	351748	386112	Roadside	91.2	91.2	30.0	27.2	21.2	23.8	23.5
13	351767	386088	Roadside	100	100.0	28.0	28.1	22.0	24.8	23.2
2	350896	380810	Urban Background	100	100.0				24.7	17.2
3	351042	380684	Roadside	100	100.0			22.8	26.5	23.0
1	351054	385388	Roadside	93.7	93.7			20.2	23.9	18.7
8	351379	381458	Roadside	100	100.0		21.8	18.2	21.0	20.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
16	351079	385438	Roadside	100	100.0		22.9	17.3	23.0	20.8
14	357051	379435	Roadside	100	90.4					17.7
15	356996	379449	Roadside	80.5	80.5					18.9

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

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

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

Notes:

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

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

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO2 Concentration

Air Quality Objective Nitrogen Dioxide (NO2) annual mean 40µg/m^3

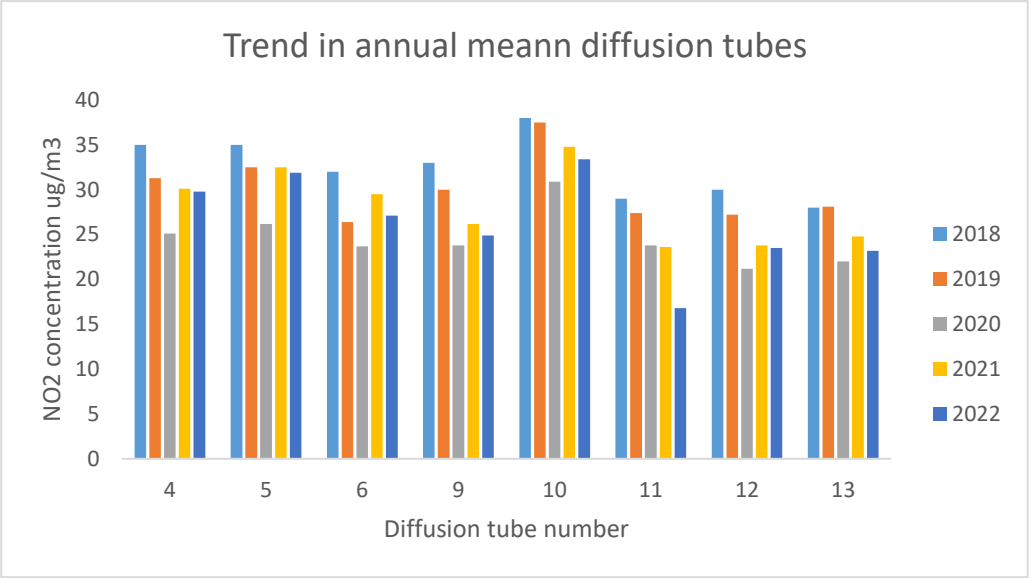

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
HBC1	352042	386285	Roadside	N/A	N/A	0	0	0	2	N/A
HBC2	351358	385621	Roadside	N/A	N/A	0	0	0	N/A	N/A

Notes:

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

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

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

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

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

Figure A.2 – Trends in Number of NO2 1-Hour Means > 200µg/m3

Air Quality Objective Nitrogen Dioxide (NO2) 1 hour mean 200µg/m3 not to be exceeded more than 18 times a year

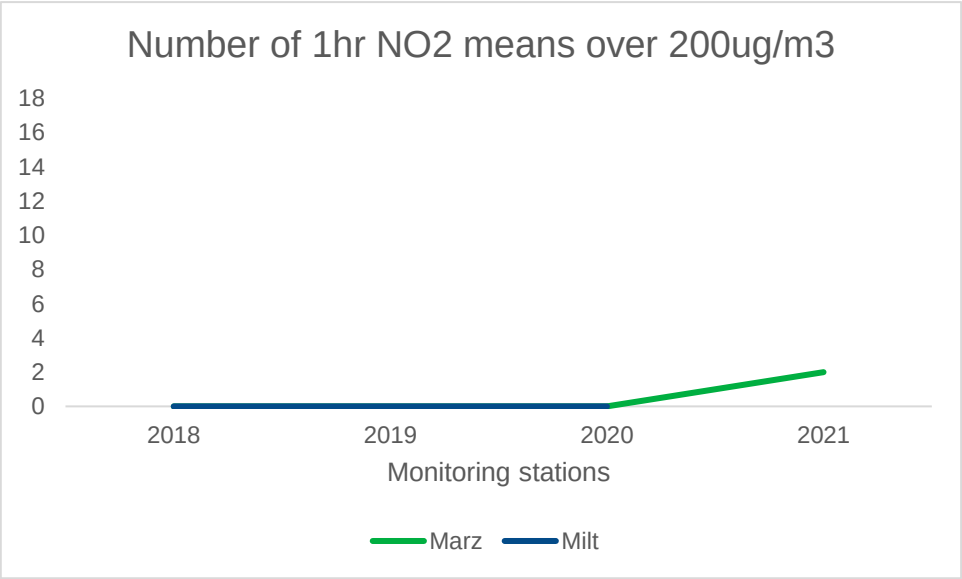

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
HBC1	352042	386285	Roadside	N/A	N/A	22	22	22	23.06	N/A
HBC2	351358	385621	Roadside	N/A	N/A	23(3)	18	21	23.64	N/A

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

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

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

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

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

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

Figure A.3 – Trends in Annual Mean PM10 Concentrations at Milton Road and Marzahn Way monitors (µg/m3)

Air Quality Objective Particulate Matter (PM10) Annual Mean 40µg/m3

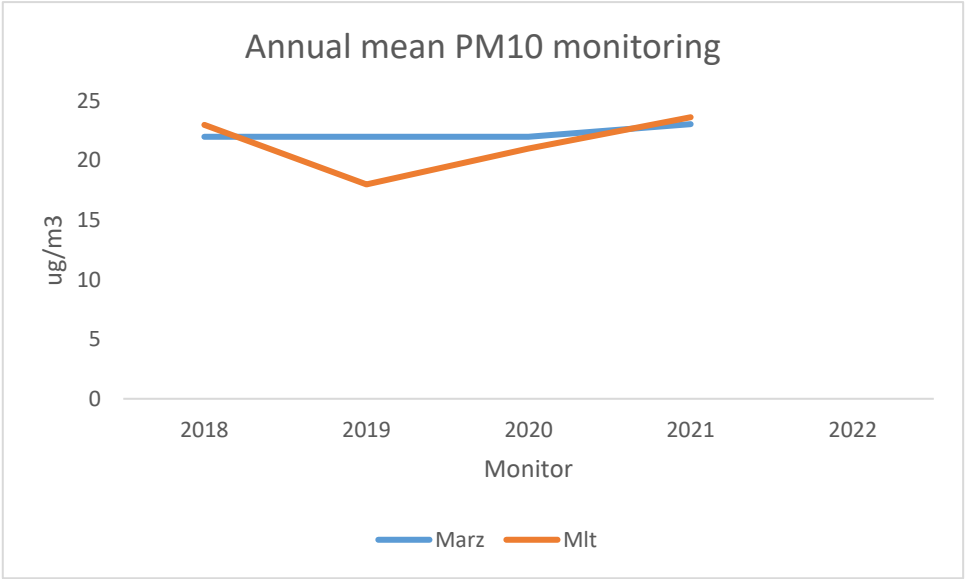

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
HBC1	352042	386285	Roadside	N/A	N/A	3(34)	9	6(34)	24	N/A
HBC2	351358	385621	Roadside	N/A	N/A	0(23)	5	4(34)	22	N/A

Notes:

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

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

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

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

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

Figure A.4 – Trends in Number of 24-Hour Mean PM10 Results > 50µg/m3 at Milton Road and Marzahn Way monitors (µg/m3)

Air Quality Objective: Concentration 50µg/m3, not to be exceeded more than 35 times a year

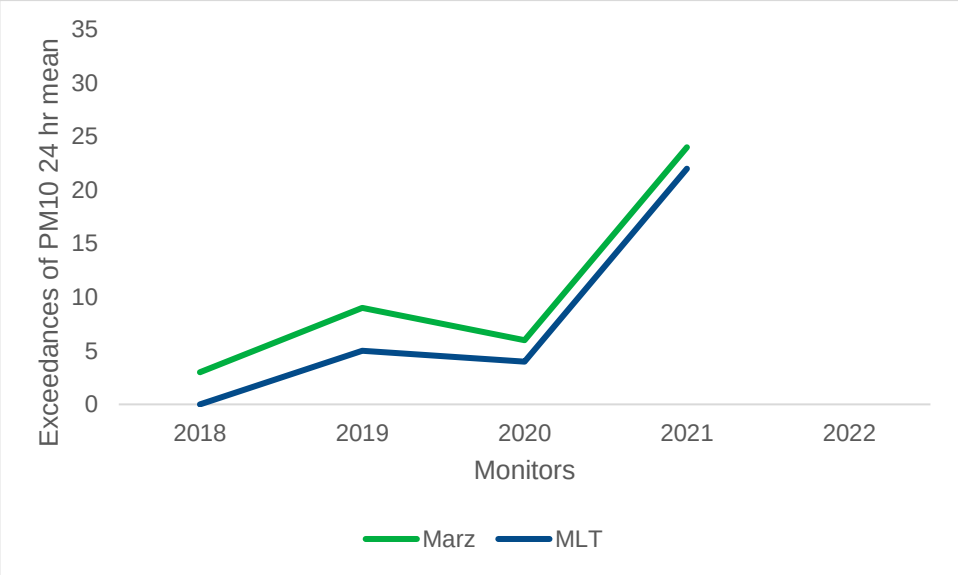

Table A.8 – Annual Mean PM2.5 Monitoring Results (µg/m3)

No monitoring undertaken

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022

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

Notes:

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

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

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

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

Figure A.5 – Trends in Annual Mean PM2.5 Concentrations

No monitoring undertaken

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

No monitoring undertaken

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of 15-minute Means > 266µg/m^3	Number of 1-hour Means > 350µg/m^3	Number of 24-hour Means > 125µg/m^3

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results ($\mu g/m^3$)

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	Annual Mean Distance Corrected to nearest exposure
4	351343	385625		43.3	42.6	39.6	40.1	32.5	32.7	30.3	39.0	42.3	41.5	48.0	39.3	29.8	-
5	351382	385648	49.9	46.9	43.3	40.3	39.9	35.5	37.5	30.7	41.3	44.3	44.2	50.2	42.0	31.9	-
6	351418	385661	37.7	35.4	42.4	39.3	33.1	28.6	28.4	28.4	35.4	41.0	35.5	40.9	35.7	27.1	-
9	352078	386306	42.7	32.7	42.1	32.2	28.0	25.9	16.6	24.1	37.5	32.3	31.6	46.0	32.8	24.9	-
10	352044	386290	54.5	46.9	47.9	44.1	33.2	31.3	22.1	33.9	46.4	52.3	50.3	61.9	43.9	33.4	-
11	352038	386316	44.8	1.3	25.1	19.6	17.4	14.1	19.9		22.6	17.7	24.4	27.6	22.1	16.8	-
12	351748	386112	40.4	27.1	38.1	29.0	21.6	16.0	30.0	22.4	37.3	34.3		42.8	30.9	23.5	-
13	351767	386088	38.6	26.2	38.5	30.0	22.6	24.9	37.2	24.0	38.5	33.1	11.1	43.6	30.5	23.2	-

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted	Annual Mean Distance Corrected to nearest exposure
2	350896	380810	57.5	0.9	26.5	20.3	17.7	15.7	15.2	15.9	23.5	18.8	22.5	27.8	22.7	17.2	-
3	351042	380684	40.9	31.0	39.8	33.5	23.9	19.5	23.9	23.1	34.0	29.6	23.1	41.4	30.3	23.0	-
1	351054	385388	35.7		0.5	23.8	23.2	19.6	26.1	20.2	28.1	28.6	33.6	33.1	24.5	18.7	-
8	351379	381458	34.1	29.4	30.7	24.4	20.8	18.0	18.8	18.1	27.6	28.8	31.3	33.4	26.4	20.0	-
16	351079	385438	28.6	20.2	35.6	26.1	21.5	21.4	22.7	22.0	35.1	27.7	27.7	39.3	27.4	20.8	-
14	357051	379435		0.9	38.5	24.3	24.3	19.6	21.2	22.3	31.3	21.2	19.7	28.1	23.3	17.7	-
15	356996	379449		29.4	27.8	25.5	25.5	16.2	18.3	24.0	26.2		24.3	31.6	24.9	18.9	-

☒ **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**

☒ **Halton Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

Exceedances of the NO_2 annual mean objective of 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 Halton Council During 2022

Halton Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by Halton Council During 2022

Halton Council has not completed any additional works within the reporting year of 2022

QA/QC of Diffusion Tube Monitoring

Diffusion Tubes

Diffusion Tube monitoring is carried out as required by;

Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance for Laboratories

and Users issued by DEFRA.

The monitoring has been completed in adherence with the 2022 Diffusion Tube Monitoring Calendar.

Further guidance and adjustment factor is also used

LAQM Support Pages provided by Defra and the Devolved Administrations.

laqm.defra.gov.uk

The complete data sets of the NO_2 diffusion tube survey undertaken by Halton

Borough Council in 2022 is provided in Appendix B, Table B1.

SOCOTEC Didcot was used as both supplier and laboratory to analyse the diffusion tubes, which were 50% TEA in acetone.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Halton 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 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.

Halton Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by Halton Council over the past five years is presented below

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	09/23	0.76
2021	National	03/21	0.78
2020	National	10/21	0.76
2019	National	10/18	0.75
2018	National	06/19	0.76

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Halton Council required distance correction during 2022.

QA/QC of Automatic Monitoring

All of the Council's automatic continuous analysers are of the approved type as recommended in LAQM TG1 (00) Review and Assessment; Monitoring Air Quality and LAQM TG4 (00) Review and Assessment; Pollutant specific Guidance.

The Council's automatic monitoring stations are operated and run by officers trained in all aspects of the monitoring processes including routine site operations, field calibrations and data ratification. All instruments used have a daily automatic calibration within the operating system, which is serviced every six months under a contract from ESU 1 to ensure correct operation.

Routine Site Operations

The Council's monitoring sites have a programme of routine operational checks and programmed fortnightly site visits which include: -

- Daily communications checks on lines, data transfer and analyser operation;
- Daily checks of data quality; Repairs of faulty equipment under arrangements with the equipment suppliers;
- Fortnightly site inspections of the equipment's operational status, site safety, security and calibration checks;
- Planned six monthly servicing and re-calibration of all analysers by equipment suppliers under contract to the council.

All analysers are maintained in accordance with the manufacturers' instructions. The six monthly full service and re-calibration is conducted under servicing contracts with ESU 1. Results of the servicing, calibrations and repairs are fully documented and stored centrally. Routine maintenance of equipment is also conducted during regular two-weekly site visits where all associated equipment such as sample lines, modem, and the electrical system are examined and sample inlet filters are changed. Any faults, repairs or changes made to the equipment are also recorded and stored centrally.

Calibration Methods

The calibration procedures for the councils NO2, continuous analysers include a two point zero/span calibration check being performed at regular fortnightly intervals. The methodology for the calibration procedure is derived from the

suppliers and manufactures handbooks and is as follows:

Pre-calibration check – the site condition and status of the analyser is recorded prior to the zero/span check being conducted;

Zero check – the response of the analyser to the absence of the gas being monitored;

Span check – the response of the analyser to the presence of the gas of a known concentration;

Post calibration check – the site condition and status of the analyser upon completion of all checks.

Each analyser's zero/span check is fully documented with records being kept centrally. The documentation then forms a record of analyser response over time and is used for data ratification and for scaling the data gathered for zero and span drift

The gases used for calibration checks are purchased from Air Liquide UK which is traceable through European Accreditation DIN EN 45001 & DIN EN ISO 9001. The tolerances of the nitrogen dioxide and nitric oxide mixes being typically + or – 5%. Due to high usage rates it is normal for the gases to be exhausted well before their respective stability time limits are reached, the bottles being changed when pressure falls below 300 psi. The BAM analyser is operated and calibrated in accordance with the manufacturers and suppliers information.

Data Validation and Ratification

All data collected is thoroughly scrutinised by visual examination to ensure that there is no spurious and unusual measurements. The dedicated software used for handling the data allows data to be edited but ensures that raw data is always maintained. Air Quality Data Management team also check the information to ensure no errors occur.

PM10 and PM2.5 Monitoring Adjustment

The type of PM10 monitors utilised within Halton Council do not required the application of adjustment factor.

NO2 Fall-off with Distance from the Road

No automatic NO2 monitoring locations within Halton Council required distance correction during 2021

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

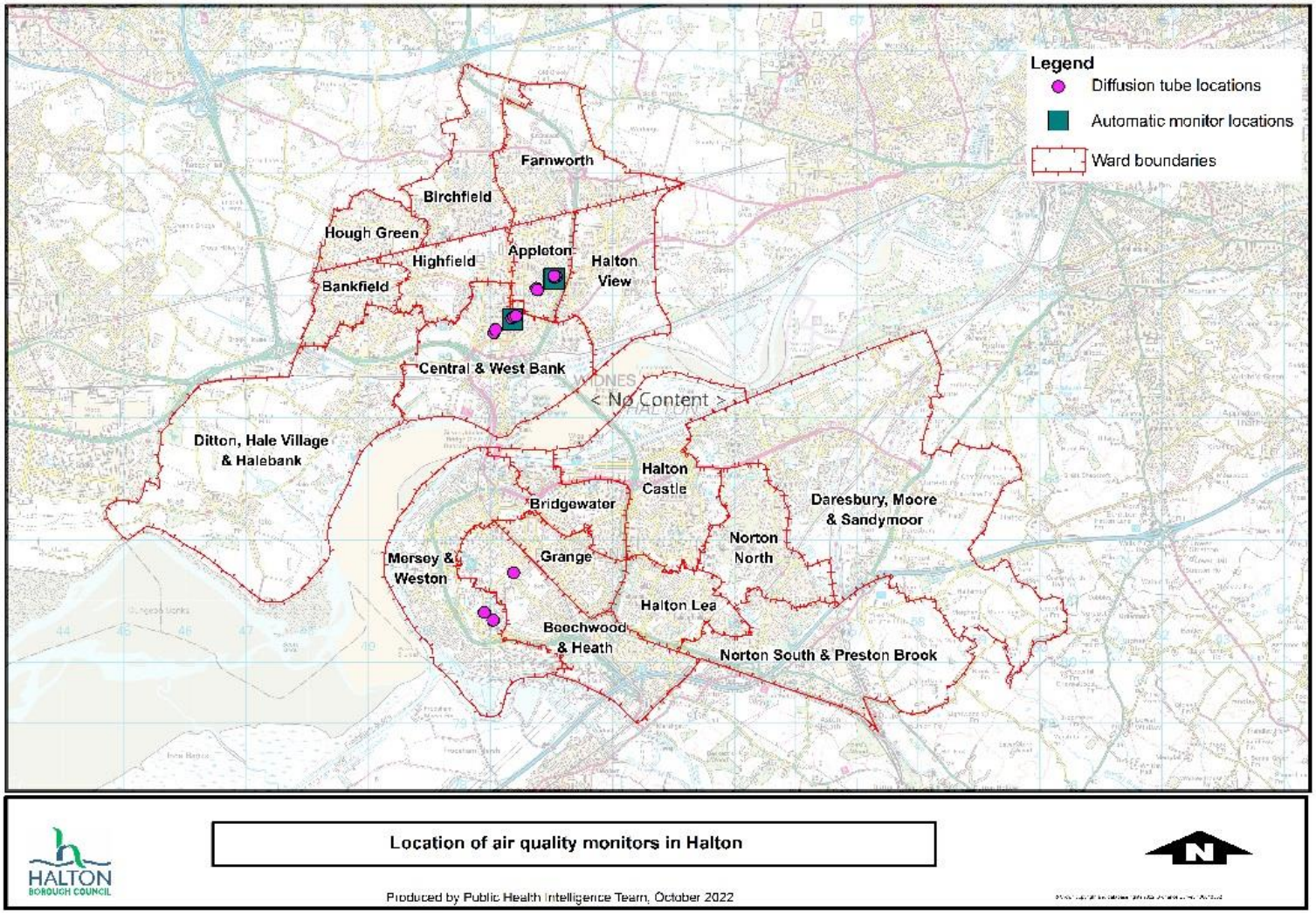

Figure D.1 – Map of Monitoring Sites

Figure D.2 Milton Road Analyser Location (PM_{10})

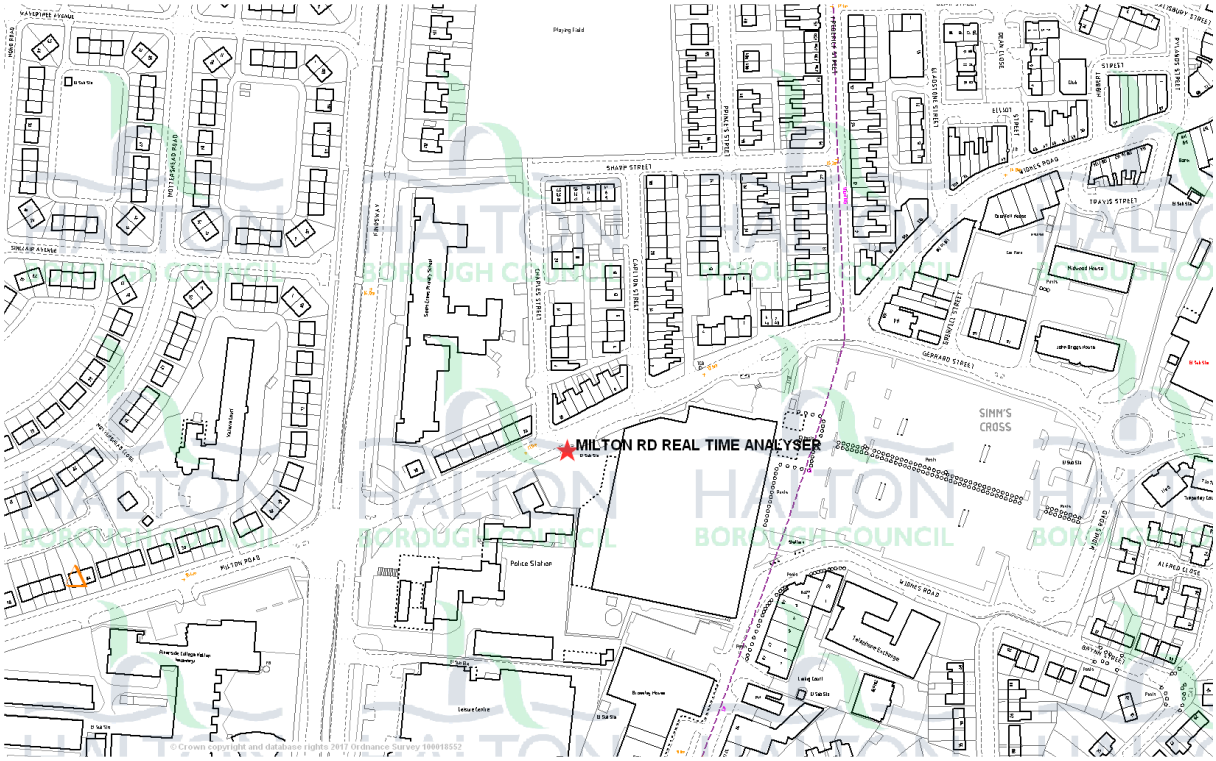

Figure D.3 Marzahn Way Analyser Location (NO_2 & PM_{10})

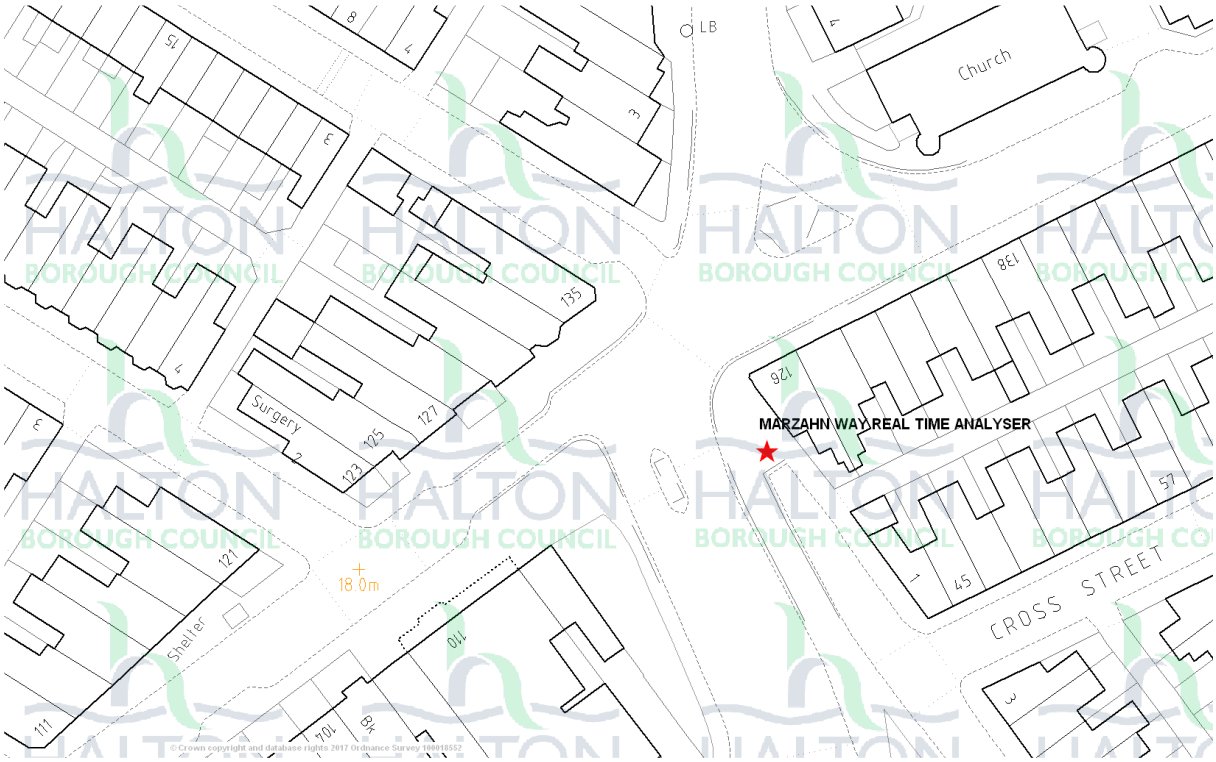

Figure D.4 Runcorn Hill Analyser Location (NO_2, PM_{10} & $PM_{2.5}$)

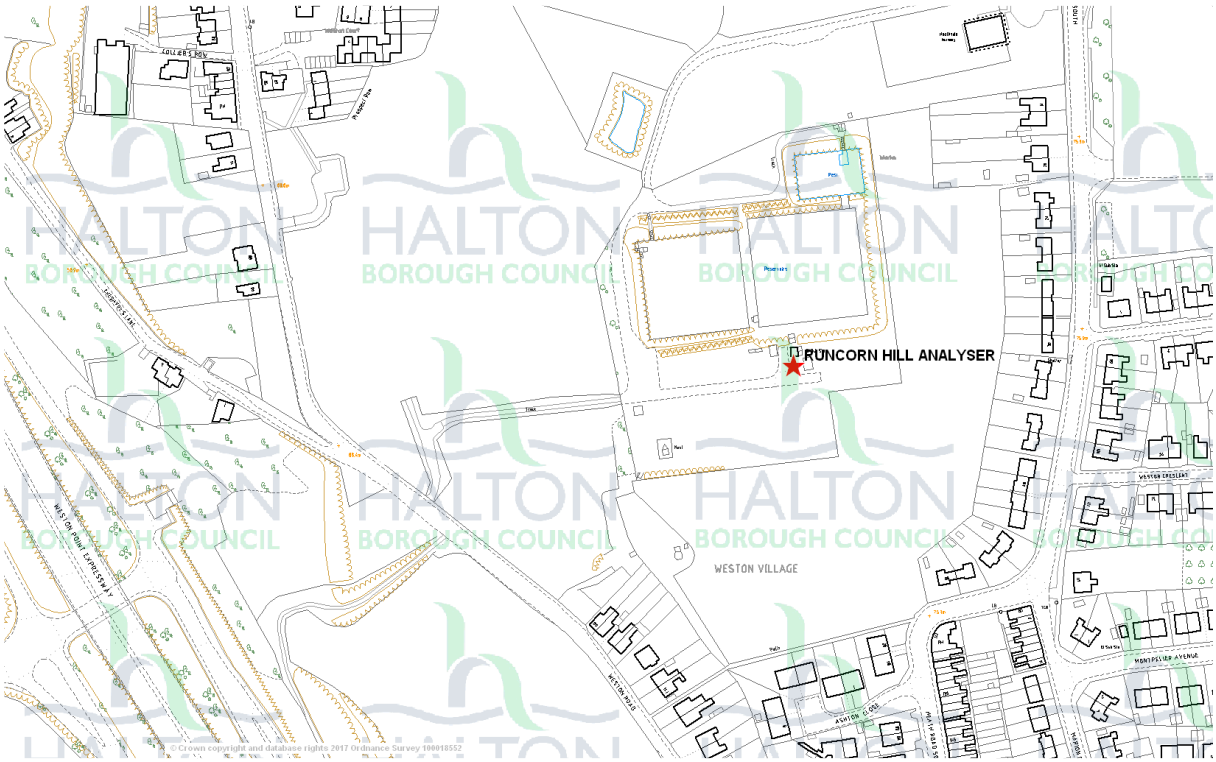

Figure D.5 Diffusion Tube Locations on Deacon Road

Figure D.4- Diffusion Tube Location on Deacon Road

Figure D.6 Diffusion Tube Locations on Milton Road

Figure D.7 Diffusion Tube Locations on Peelhouse Lane

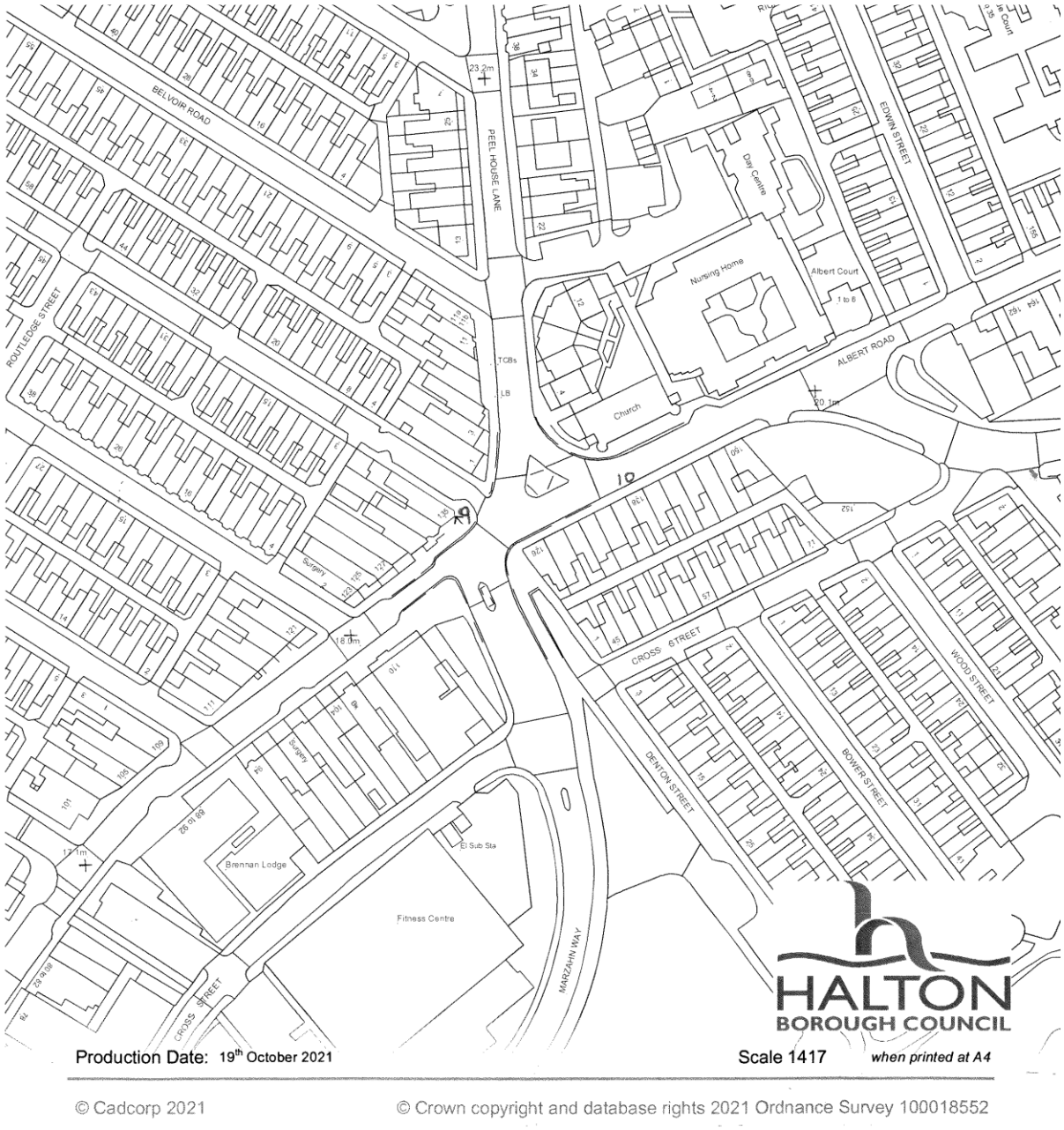

Figure D.8 Diffusion Tube Cronton Lane

Figure D.9 Diffusion Tube Highfield Road

Figure D.10 Diffusion Tube Location Northwich Road

Figure D.11 Diffusion Tube Locations on Clifton Road

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

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- DEFRA Air Quality https://laqm.defra.gov.uk/
- Liverpool City Region Office https://www.liverpoolcityregion-ca.gov.uk/
- Clean Air Strategy 2019 UK
- https://www.gov.uk/government/publications/clean-air-strategy-2019
- https://www.merseytravel.gov.uk/
- https://www.airqualityengland.co.uk/
- Background Maps | LAQM (defra.gov.uk)