TORBAY COUNCIL

2024 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: June 2024

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Report Reference Number	<Enter Report Reference>
Date	June 2024

Executive Summary: Air Quality in Our Area

Air Quality in Torbay

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Following a series of Local Air Quality assessments, Torbay Council declared an Air Quality Management Area (AQMA) around Hele Road in 2005. Further, in 2006, Torbay Council declared a second Air Quality Management Area (AQMA) by Brixham Town Hall. In both cases the subsequent investigations confirmed that the pollution was from road transport. The main pollutant being nitrogen dioxide, caused by emissions from road transport, due to low vehicle speeds and, as a result of localised congestion within both AQMA's. A number of actions have been put in place along Hele Road such as changing the parking layout at the bottom end to try and ease the flow of traffic. Signage has been increased and further signage put up diverting HGVs along an alternative route. Since the implementation of the AQMA pollution levels have steadily improved and the majority of the area has met the required objective for nitrogen dioxide over the last few years. Community Safety has worked closely with Highways to achieve the reduction in pollution.

The AQMA in Brixham was also due to road transport. The junction within the Brixham AQMA has been realigned, this was originally due to coincide with the development of a large retail complex and car park. However, the planning application was withdrawn and

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

the development has not taken place. There is no current plan for the car park to be developed. However, we continue to monitor the development proposals for the area and provide consultation responses to the Planning process.

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

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[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air

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

Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel, and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The pollution levels have continued to fall year on year within both the AQMA's in Torbay. Therefore, the actions carried out by Torbay Council have been minimal. Within the Hele AQMA the undergrowth at the bottom of the road continues to be cleared. This is to allow better air flow. The road realignment within the Brixham AQMA has meant that the area has been opened up and that the increased air flow has improved the air quality. One further positive development in Brixham has been the conversion of the local iron foundry which lies outside the AQMA to electric induction furnaces which has negated the need to burn coke and will further improve air quality for the local community.

Conclusions and Priorities

There were no exceedances of the air quality objectives identified within Torbay, either within or outside the current AQMA's. However, it was noted that the level of NO_2 at DT11 182 Kings Ash Hill was again elevated. The raw result was 41.3 µgm-3 – however using the National Bias Adjustment factor this figure was corrected to 33.4 µgm-3 which is within the air quality objective for NO2. As such, this site will continue to be monitored closely over the next 12 months to determine if the annual average air quality objective of 40µgm^{-3} is indeed likely to be exceeded going forwards. However, the overall trend has been that the air quality within Torbay has improved continually year on year. Since the air quality

[4] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

within Torbay has now met the objectives for a number of years, it would be Torbay Councils intention to revoke the Brixham AQMA and reconsider the relevance of the Hele Rd AQMA in the near future.

(Note – Since the end of 2023 the decision has been taken to revoke both these AQMAs and DEFRA has been advised that a revocation order is now in place.)

Torbay Council's priority for the coming year will be to continue air quality monitoring within the former AQMAs in Hele and Brixham, and to ensure that the air quality objectives across Torbay continue to be met

Local Engagement and How to get Involved

Torbay Council would like to ensure that the air quality continues to improve within the bay and therefore any small changes that residents can make to help with this helps. For example, walking or taking the bus instead of using the car for short journeys. Finding alternative routes when cycling and walking away from busy roads can help reduce the pollution that is breathed in.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Torbay Council and has not yet been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Chris Widdecombe at:

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1 Local Air Quality Management

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

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Torbay 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.2.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas

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

A summary of AQMAs declared by Torbay Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within Torbay. 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 objective pertinent to the current AQMA designations is as follows:

- NO_2 annual mean

Torbay Council propose to revoke both the Brixham and Hele AQMAs (see monitoring section)

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA Hele Road	Declared April 2005	NO2 annual mean	An area of Hele Road, between junctions with Teignmouth Road and Barton Road including residential properties and part of Orchard road.	No	58µg/m3	22.3µg/m^3		Action Plan for AQMA Hele Road (2006)	See Appendix F
AQMA Brixham Town Hall	Declared May 2006	NO2 annual mean	An area of Brixham Town Centre,centred around the Town Hall.	No	48µg/m3	22.0 µg/m^3		Action Plan for AQMA Brixham (2007)	

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

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

2.2 Progress and Impact of Measures to address Air Quality in Torbay

Torbay 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. Four measures are included within Table 2.2, with the type of measure and the progress Torbay 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 their respective Action Plans. Key completed measures include:

- An on-street parking assessment undertaken at Hele Road with the parking location relocated to the other side of the road to ease traffic movement.
- Torbay Council has also made amendments to the local signing strategy to divert unnecessary traffic away from the Hele Road, including HGVs.

Due to the fact that the objective has been met within both AQMA's Torbay Council's priorities for the coming year is to continue monitoring within the AQMAs and to ensure that the air quality objectives continue to be met.

Progress on the following measures at the Hele AQMA has been slower than expected and unlikely to be fulfilled due to financial and officer time restraints.

- Torbay Council shall consider a review of the potential for restrictions on types of vehicle based upon emission standards
- Torbay Council shall consider assessing the potential of junction design and management, to enable easier traffic flows out of Hele Road at each end of the critical eastern half of the road.
- Undertake vehicle emissions testing.

As most of the measures within the Action Plan have been implemented and that the objectives have been met Torbay Council anticipates that no further measures will be implemented at this stage.

Some of the measures stated above and will continue to be implemented to ensure continued compliance.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	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	School Travel Plans	**Promoting Travel Alternatives**	School travel plans	2012	2015	NO	Fully funded	–	Completed	N/A	completed	NO2	–	Travel plans updated 2014	–
2	**Signage for HGVs**	**Traffic Management**	Other	2012	2015	NO	Funded	–	Completed	N/A	completed	NO2	–	**Signs have been changed.**	–
3	**Vegetation clearance**	–	–	2012	ongoing	NO	Funded	–	Completed	N/A	annual	NO2	–	–	–
4	Reduction in HGVs	**Traffic Management**	Other	2012	2015	NO	Funded	–	Completed	N/A	completed	NO2	–	**Coach companies and hauliers using route contacted**	–

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[6], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

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

Torbay Council have as part of the measures to reduce other pollutants already progressed reducing $PM_{2.5s}$. Initiatives such as green travel plans for schools, park and ride schemes, cleaner vehicle technology and road realignments to ease traffic flow and reduce congestion have been implemented in regard to reducing other pollutants.

[6] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

This section sets out the monitoring undertaken within 2023 by Torbay Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Due to a number of problems with the continuous analysers in both Hele and Brixham, Torbay Council have ceased continuous monitoring in these areas.

3.1.2 Non-Automatic Monitoring Sites

Torbay Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 15 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

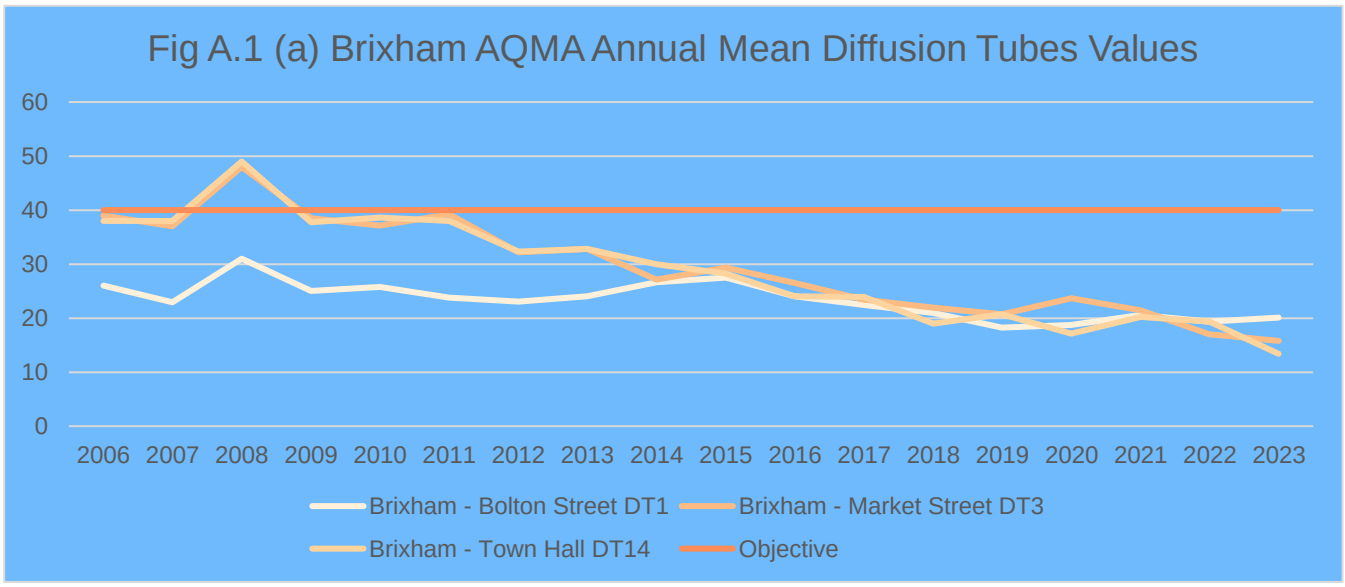
The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (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 2023 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.



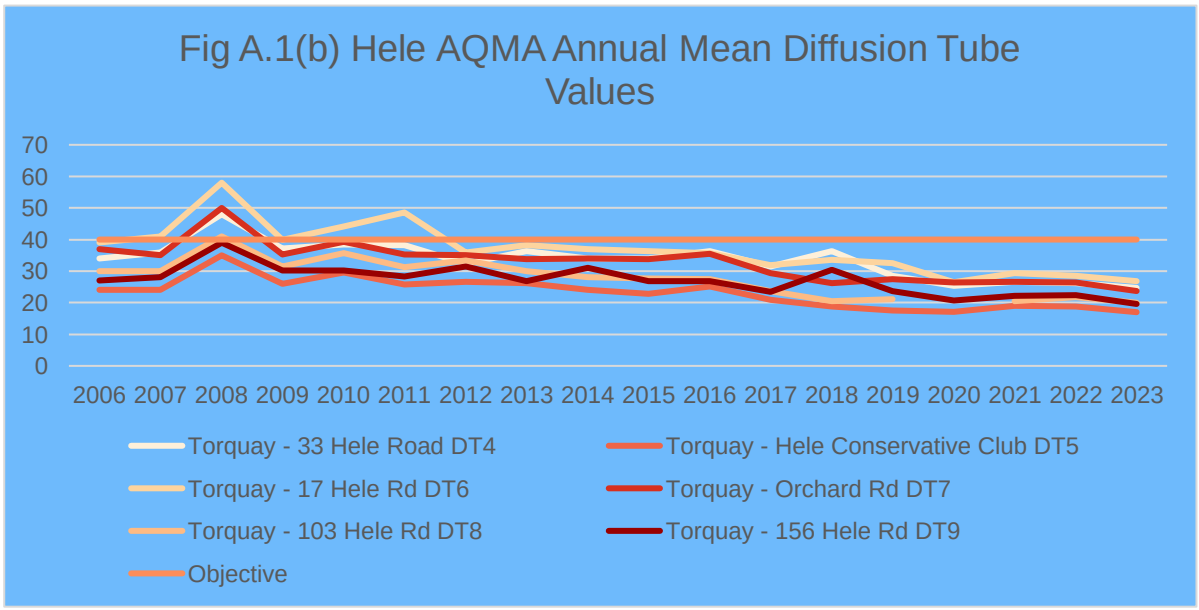


Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

3.2.2 Particulate Matter (PM_{10})

PM10 is not monitored in Torbay.

3.2.3 Particulate Matter ($PM_{2.5}$)

PM2.5 is not monitored in Torbay

3.2.4 Sulphur Dioxide (SO_2)

SO2 is not monitored in Torbay

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

There are currently no automatic monitoring sites in Torbay.

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)
DT1	Bolton St Brixham	Roadside	292418	55814	NO2	Brixham AQMA	2.0	1.0	No	1.5
DT4	33 Hele Rd Torquay	Roadside	292335	66003	NO2	Hele AQMA	0.0	6.0	No	2.0
DT5	Conservative club - Hele Rd Torquay	Roadside	290995	66080	NO2	Hele AQMA	0.0	6.0	No	2.0
DT6	17 Hele Rd Torquay	Roadside	291198	65972	NO2	Hele AQMA	0.0	5.0	No	2.0
DT7	Orchard Rd Hele Torquay	Roadside	290870	66135	NO2	Hele AQMA	2.0	2.0	No	2.2
DT8	103 Hele Rd Torquay	Roadside	290987	66170	NO2	Hele AQMA	0.0	4.0	No	2.0
DT9	156 Hele Rd Torquay	Roadside	290708	66133	NO2	Hele AQMA	0.0	6.0	No	2.0
DT 10	Baptist Church Hele Rd Torquay	Roadside	291118	66018	NO2	Hele AQMA	2.0	4.0	No	2.0
DT 11	182 Kings Ash Hill Paignton	Roadside	287289	60824	NO2	No	1.0	8.0	No	1.5
DT12	194 Kings Ash Hill Paignton	Roadside	287237	60891	NO2	No	2.0	11.0	No	1.5
DT 14	Brixham Town Hall	Roadside	292335	56040	NO2	Brixham AQMA	4.0	2.0	No	1.6
DT15	Tweenaway Junction Paignton	Roadside	287241	59923	NO2	No	2.0	2.0	No	1.5
DT17	Bookers Brixham	Roadside	287239	59941	NO2	No	3.0	2.0	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)
DT 18	Middle St Brixham	Roadside	292455	56170	NO2	Brixham AQMA	6.0	1.5	No	2.2
DT 19	Old Mill Rd Torquay	Roadside	290477	64187	NO2	No	15.0	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)

Automatic monitoring of NO2 is not undertaken in Torbay.

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 2023 (%) (2)	2019	2020	2021	2022	2023
DT1 29241855814	292418	55814	Roadside	75	83.8	18.3	18.7	20.6	19.4	20.1
DT4 29233566003	292335	66003	Roadside	91.6	103.8	28.5	25.3	26.7	26.1	24.7
DT5 29099566080	290995	66080	Roadside	91.6	103.8	17.5	17.2	19.0	18.9	17.1
DT6 29119865972	291198	65972	Roadside	91.6	103.8	32.6	26.5	29.4	28.5	26.9
DT7 29087066135	290870	66135	Roadside	75	77.0	27.4	26.4	26.6	26.3	23.7
DT8 29098766170	290987	66170	Roadside	91.6	103.8	21.1	-	20.5	21.8	20.0
DT9 29070866133	290708	66133	Roadside	91.6	103.8	23.6	20.7	22.2	22.4	19.6
DT 10 29111866018	291118	66018	Roadside	91.6	103.8	25.7	22.6	23.1	23.2	21.2
DT 11 28728960824	287289	60824	Roadside	91.6	103.8		35.3	**40.6**	37.3	33.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
DT12 28723760891	287237	60891	Roadside	83.3	87.6	38.7	22.4	27.4	26.1	23.8
DT 14 29233556040	292335	56040	Roadside	83.3	82.4	17.1	17.1	20.2	19.4	13.4
DT15 28724159923	287241	59923	Roadside	83.3	94.1	20.8	24.5	23.8	24.2	22.4
DT 18 29245556170	292455	56170	Roadside	83.3	87.6	19.1	18.1	21.5	17.0	15.8
DT 19 29047764187	290477	64187	Roadside	91.6	103.8	18.4	16.4	17.8	17.0	15.2

☒ **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 NO_2 Concentration

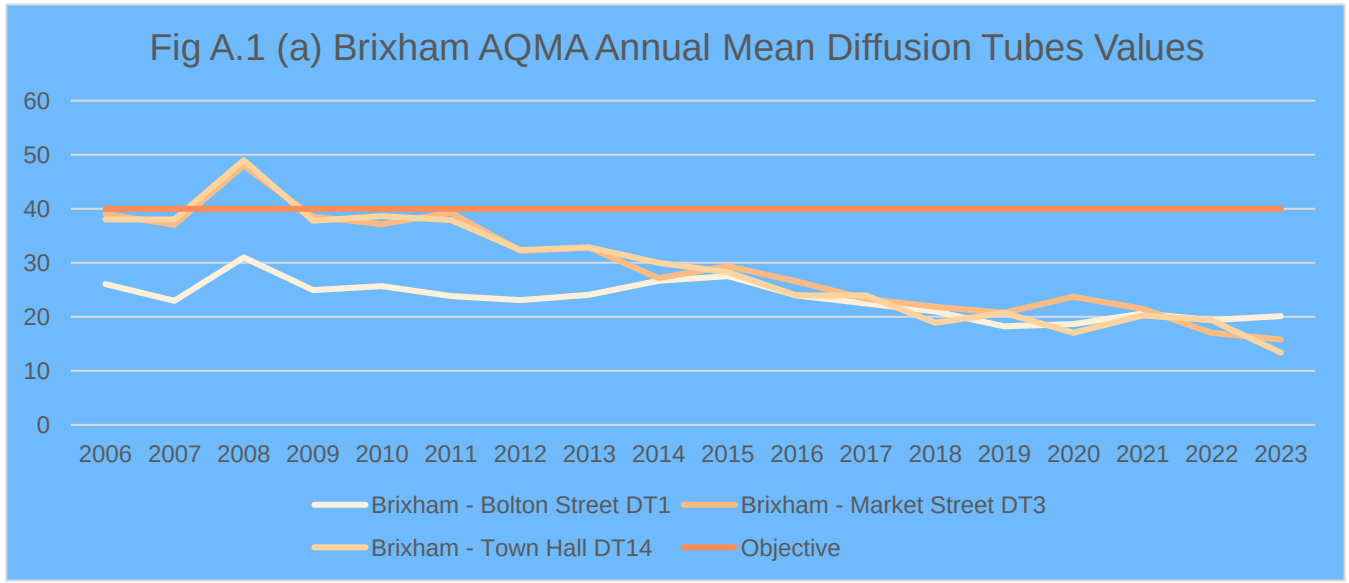


Fig A.1 (a) Brixham AQMA Annual Mean Diffusion Tubes Values
60
50
40
30
20
10
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023
Brixham - Bolton Street DT1
Brixham - Market Street DT3
Brixham - Town Hall DT14
Objective

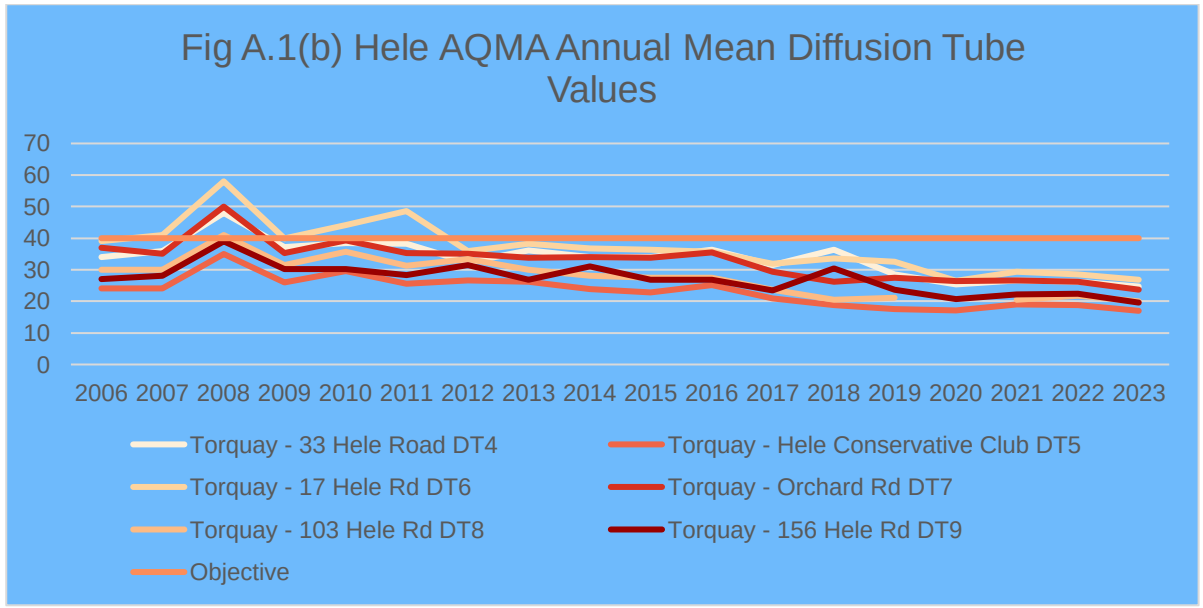


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

There are currently no automatic monitoring site in Torbay

(

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

There is currently no PM_{10} monitoring carried out in Torbay

Table A.7 – SO_2 2023 Monitoring Results, Number of Relevant Instances

There is currently no SO_2 monitoring carried out in Torbay

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1 292418 55814	292418	55814	29.4	25.0	25.2	24.9	25.9	22.4		26.4			24.3	16.8	24.8	20.1	-	
DT4 292335 66003	292335	66003	35.9	32.1	30.8	31.9	34.3	26.5	21.9	32.5		31.3	31.2	25.5	30.5	24.7	-	
DT5 290995 66080	290995	66080	28.8	23.8	20.2	22.8	24.7	17.1	12.6	21.9		20.9	22.8	15.7	21.2	17.1	-	
DT6 291198 65972	291198	65972	37.3	34.0	31.4	35.6	40.3	31.6	25.1	34.8		33.5	32.8	27.1	33.2	26.9	-	
DT7 290870 66135	290870	66135	34.5	31.8	27.8	31.5	30.0	28.2	21.7				33.1	24.0	29.2	23.7	-	
DT8 290987 66170	290987	66170	32.1	27.8	24.2	27.5	30.6	19.7	16.1	25.0		23.3	26.1	18.7	24.6	20.0	-	
DT9 290708 66133	290708	66133	31.8	24.3	23.4	22.8	20.2	24.4	19.4	24.8		24.7	26.5	20.1	24.2	19.6	-	
DT10 291118 66018	291118	66018	34.6	27.7	25.1	23.7	27.7	22.8	18.8	26.9		25.9	30.3	22.4	26.2	21.2	-	
DT11 287289 60824	287289	60824	43.0	42.1	38.3	44.4	27.8	43.6	41.1	45.4		43.5	40.1	37.6	41.3	33.4	-	
DT12 287237 60891	287237	60891	32.9	25.6	22.8	29.3	42.4	27.8	23.9			26.7	33.4	29.6	29.3	23.8	-	
DT14 292335 56040	292335	56040		18.3	16.1	17.3	23.4		13.9	23.9		7.0	14.3	11.0	16.5	13.4	-	
DT15 287241 59923	287241	59923	32.2	27.7	25.7	24.9	22.6		24.0	29.9		31.5	29.1	23.7	27.7	22.4	-	
DT18 292455 56170	292455	56170	24.8	21.1	17.4	18.9	20.2	16.1	16.2			20.2	23.0	16.0	19.5	15.8	-	
DT19 290477 64187	290477	64187	28.9	19.5	16.0	16.9	16.6	14.2	12.8	18.9		19.7	22.5	16.4	18.7	15.2	-	

☒ **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.**

☒ **Torbay Council confirm that all 2023 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 Torbay Council During 2023

Torbay Council has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Torbay Council During 2023

Torbay Council has not undertaken any additional works in the year 2023

QA/QC of Diffusion Tube Monitoring

All tubes used in the monitoring of Nitrogen Dioxide supplied and analysed by Gradko international (20% TEA in water) who operate a Workplace Analysis Scheme for Proficiency (WASP). All tubes deployed in the monitoring surveys undertaken by Torbay Council are currently done so following guidance in chapter 3 of TG (09). As Torbay Council no longer have continuous analysers the bias adjustment factor used was the national value.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Torbay recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 20233 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Torbay Council have applied a national bias adjustment factor of 0.83 to the 2021 monitoring data. A summary of bias adjustment factors used by Torbay over the past five years is presented in Table C.2.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	09/19	1.01
2020	National	06/18	1.05
2019	National	09/17	1.07
2018	National	06/16	1.08

NO_2 Fall-off with Distance from the Road

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

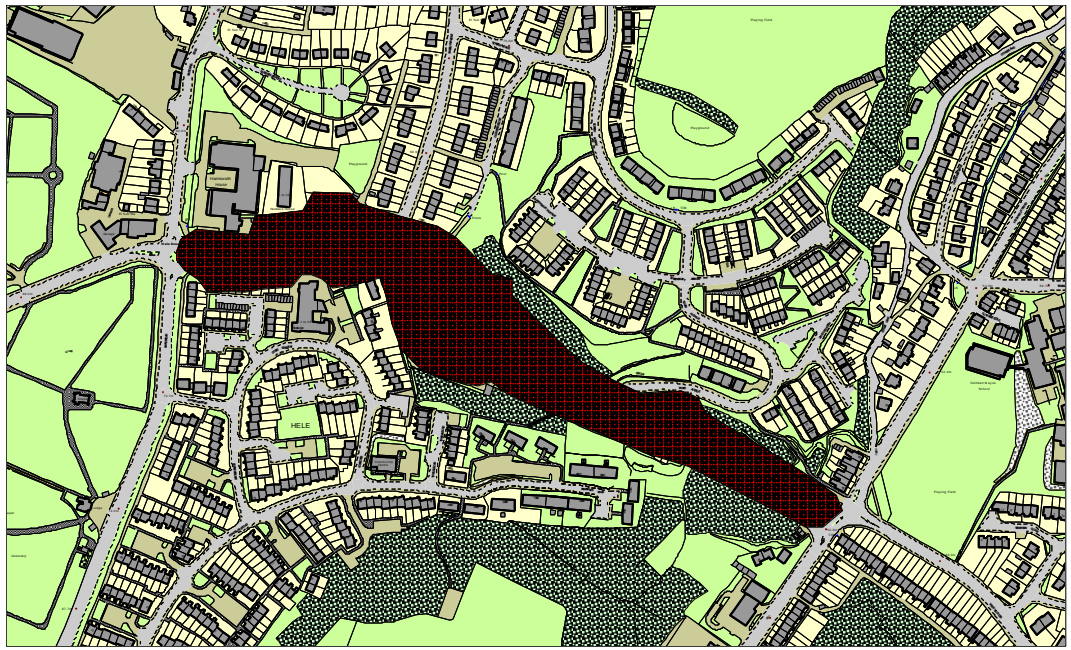
Table C.2 – NO_2 Fall off With Distance Calculations (concentrations presented in $\mu g/m^3$)

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

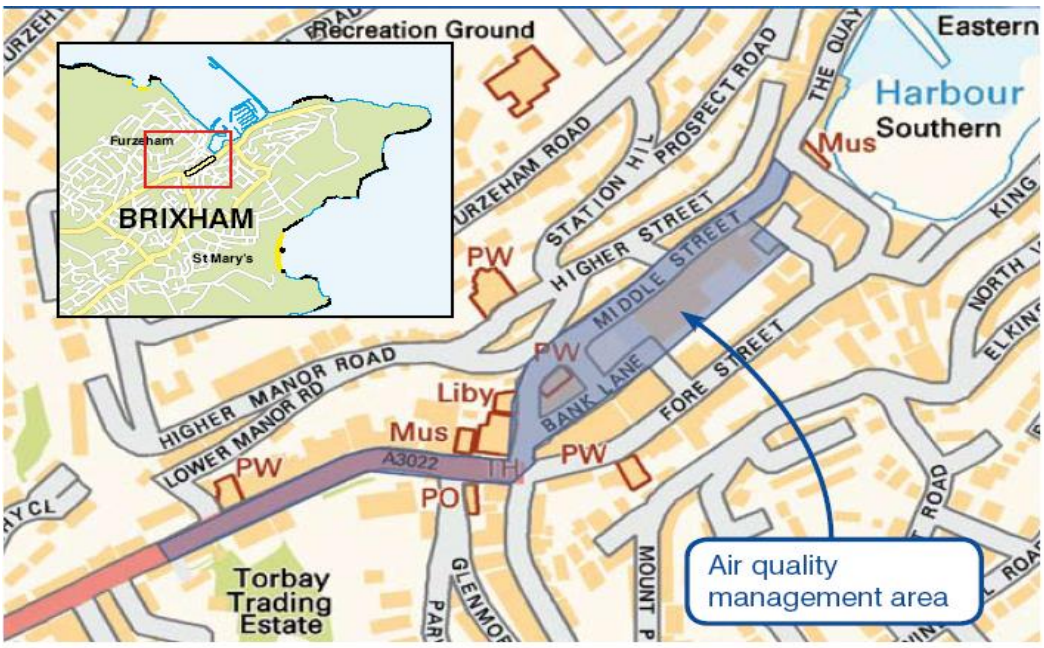
Appendix D: Map(s) of Monitoring Locations and AQMAs

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

Map to the show the extent of AQMA at Hele Road:

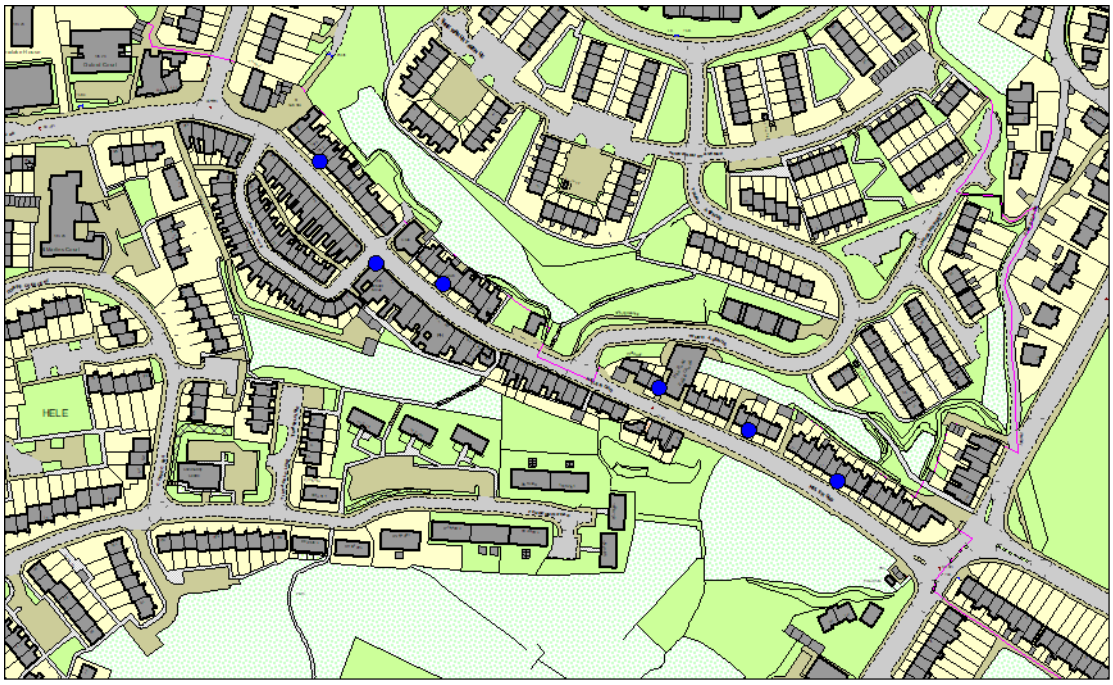


Location and extent of the AQMA in Brixham:



This map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of HMSOffice ©Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Torbay Council LA079782. 2006.

Location of diffusion tube monitoring at Hele 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.

INSTRUCTIONS

Please include here any additional information required to support the ASR. Subheadings have been provided as prompts for which information may be required. This may include:

- Indication, if necessary, of any significant changes to sources, and therefore any screening assessment of identified new or changed sources of pollution based on LAQM screening tools, etc (see Chapter 7: Screening Tools and Methodology in Technical Guidance LAQM.TG22). Outline whether this has resulted / will result in any change to monitoring or an AQMA declaration.
- A summary of any additional studies/evidence for support of action plan measures, detailed dispersion modelling of emissions, or results of monitoring campaigns carried out to determine whether an AQMA needs to be declared, amended or revoked. Any additional studies should be included as a further Appendix to the annual report.
- QA/QC on monitoring data, including bias adjustments, annualisation and fall-off with distance correction, as appropriate:
    - Discussion and justification on the choice of bias adjustment factor applied for diffusion tubes (i.e. local vs national), with reference to previous years' choices of bias factors, giving due consideration to the discussion in Chapter 7 of Technical Guidance LAQM.TG22.
    - Discussion on the annualisation process, which is provided in Chapter 7 of Technical Guidance LAQM.TG22.

- Details of distance correction using the diffusion tube data processing/ NO_2 fall off with distance calculator as discussed in Chapter 7 of Technical Guidance LAQM.TG22. **Distance correction is an important point to consider if your monitoring sites are not representative of public exposure, e.g. if located at roadside or kerbside, but with façades of nearest properties set back further from the road.**

- Please include calculations within the tables provided as found within the relevant LAQM tools; particularly regarding bias adjustments, annualisation and fall-off with distance correction, where appropriate. **Failure to provide clear and auditable details is likely to result in the rejection of the report.**

Delete this box when the document is finished

New or Changed Sources Identified Within <Local Authority Name> During <Year>

INSTRUCTIONS

Detail any new sources within your authority that have been identified with a potential to impact air quality. This may include sources that are operational, have planning permission granted or have been identified at an earlier stage of the planning process. Sources may include additional road traffic, static or standby plant, biomass or industrial processes, etc.

Or:

<Local Authority Name> has not identified any new sources relating to air quality within the reporting year of <Year>.

Delete this box when the document is finished

Additional Air Quality Works Undertaken by <Local Authority Name> During <Year>

INSTRUCTIONS

Provide a summary of any supporting evidence or additional studies that has been completed during the reporting year relating to the development of action plan measures

or the declaration, amendment or revocation of an AQMA. If an additional study has been completed, please provide the report as an additional appendix.

Or:

<Local Authority Name> has not completed any additional works within the reporting year of <Year>.

Delete this box when the document is finished

QA/QC of Diffusion Tube Monitoring

INSTRUCTIONS

Within this section provide details relating to the following aspects of non-automatic (i.e. passive) monitoring using diffusion tubes:

- The supplier used for diffusion tubes within 2023 and the method of preparation, e.g. 20% TEA in water;
- Information on the diffusion tube supplier; any accreditation held, analysis procedure followed, participation in analysis schemes (e.g. AIR-PT) and most recent results, inclusion in the annual field inter-comparison exercise and associated result;
- If the diffusion tube supplier has been changed part way through the year (if so provide the previous two points for both suppliers);
- State whether or not the monitoring has been completed in adherence with the 2023 Diffusion Tube Monitoring Calendar, providing commentary of any divergences as necessary.

The additional subsections should be used to provide QA/QC details of the data processing methodologies applied to diffusion tube monitoring data, specifically in relation to annualisation, bias adjustment and fall-off-with-distance calculations.

If you do not undertake diffusion tube monitoring, please delete this section.

Delete this box when the document is finished

Diffusion Tube Annualisation

INSTRUCTIONS

If annualisation was required for any non-automatic monitoring sites, the sites requiring annualisation should be clearly defined along with details of the calculation method undertaken provided in Table C.3. Annualisation is required for any site with data capture less than 75% but greater than 25%.

Or:

All diffusion tube monitoring locations within <Local Authority Name> recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Delete this box when the document is finished

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

INSTRUCTIONS

Both automatic and non-automatic annualisation results should be included within Table C.3.

For diffusion tube annualisation the Annualisation Tool or the Diffusion Tube Data Processing Tool can be used to complete annualisation. Either tool should be used to ensure the correct methodology for annualisation is utilised. Table C.3 has the same structure as the **Annualisation Summary** tab within both tools, therefore the required data can easily be copied.

If a LAQM tool has not been used for diffusion tube annualisation, please enter the relevant data into the table below or replace this table with one presenting the relevant details for annualisation.

Currently there is no LAQM tool to process annualisation for automatic monitoring, therefore guidance as per Chapter 7: NO_x and NO_2 Monitoring of the Technical Guidance LAQM.TG22 should be followed and the results presented within Table C.3.

If less than four background sites have been used to annualise, the relevant boxes can be left blank or a dash added (-). Any relevant comments should be added within the Comments column.

This table should be deleted if annualisation has not been required at any site.

Delete this box when the document is finished

Site ID	Annualisation Factor <Site 1 Name>	Annualisation Factor <Site 2 Name>	Annualisation Factor <Site 3 Name>	Annualisation Factor <Site 4 Name>	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
<DT1>							
<DT2>							

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the <Year> 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.

<Local Authority Name> have applied a <national/local> bias adjustment factor of <insert factor> to the <Year> monitoring data. A summary of bias adjustment factors used by <Local Authority Name> over the past five years is presented in Table C.4.

INSTRUCTIONS

Provide discussion in relation to the bias adjustment factor chosen; a national factor or a local factor.

- If a national factor has been used, please state as per Table C.4 which version of the national spreadsheet the factor has been taken from and also the number of studies applicable to the factor.
- If a local factor has been used, please advise at which site(s) the co-location study has been completed at and present the details in Table C.5.
- If more than one co-location study has been utilised to derive a local factor, please provide the calculations that have been completed within the body of text.

These should be completed in line with guidance provided within LAQM.TG22 Chapter 7: NO_x and NO_2 Monitoring, NO_2 by Diffusion Tubes.

Delete this box when the document is finished

Table C.4 – Bias Adjustment Factor

INSTRUCTIONS

Please complete the following table detailing the bias adjustment factors used to adjust the data presented in Table A.4 and Table B.1. If a national factor has been used, please detail the version of the National Bias Adjustment Factor Spreadsheet that has been used (detailed in the top-right corner of each revision of the spreadsheet). If a local factor has been derived, please leave this column blank or insert a dash (-).

Delete this box when the document is finished

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	<Local>	<->	<0.88>
2022	<National>	<09/19>	<1.01>
2021	<National>	<06/18>	<1.05>
2020	<National>	<09/17>	<1.07>
2019	<National>	<06/16>	<1.08>

Table C.5 – Local Bias Adjustment Calculation

INSTRUCTIONS

Please complete Table C.5 if a local bias adjustment factor has been calculated.

For the calculation of a local bias adjustment factor the Diffusion Tube Precision Accuracy Bias Spreadsheet or the Diffusion Tube Data Processing Tool can be used to complete the calculations. Either tool should be used to ensure the correct methodology for bias calculation is utilised. Table C.3 has the same structure as the **Local Bias Adjustment Outputs** tab within the LAQM Diffusion Tube Data Processing Tool, therefore the required data can be easily copied. If the Diffusion Tube Precision Accuracy Bias Spreadsheet has been utilised, please enter the relevant data into Table

C.3. Alternatively, replace this table with one presenting the equivalent data of the local bias calculation and consider adding a screenshot of the completed **Precision & Accuracy** tab for clarity.

If a local factor from more than one local co-location study has been calculated without utilising the Diffusion Tube Data Processing Tool, guidance to average the bias B values as per Chapter 7: NO_x and NO_2 Monitoring of the Technical Guidance LAQM.TG22 should be followed.

The table has been set up to take account of a maximum of five local co-location studies. If less than five sites have been utilised the relevant boxes can be left blank or a dash added (-). If more than five sites have been utilised, please add any additional columns to the table.

This table should be deleted if a local bias adjustment factor has not been calculated.

Delete this box when the document is finished

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12				
Bias Factor A	1.13 (1.06 – 1.21)				
Bias Factor B	-12% (-17% - -6%)				
Diffusion Tube Mean (µg/m^3)	30.9				
Mean CV (Precision)	0.0%				
Automatic Mean (µg/m^3)	35.0				
Data Capture	100%				
Adjusted Tube Mean (µg/m^3)	35 (33 – 37)				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2023 diffusion tube results.

Or:

A combined local bias adjustment factor of <enter combined factor> has been used to bias adjust the 2023 diffusion tube results.

NO_2 Fall-off with Distance from the Road

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

INSTRUCTIONS

If fall-off-with-distance calculations were required for any non-automatic monitoring sites, a summary of the sites should be provided here and the output data from the LAQM NO_2 fall-off with distance calculator, or output from the Diffusion Tube Data Processing Tool should be presented in Table C.6. Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account).

Or:

No diffusion tube NO_2 monitoring locations within <Local Authority Name> required distance correction during <Year>.

Delete this box when the document is finished

Table C.6 – Non-Automatic NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

INSTRUCTIONS

Non-automatic distance corrected results should be included within Table C.6.

For distance correction of NO_2 monitoring the NO_2 Fall-Off with Distance Calculator or the Diffusion Tube Data Processing Tool can be used to complete the calculations. Either tool should be used to ensure the correct methodology for NO_2 concentration fall off is utilised Table C.6 has the same structure as the output tabs as follows, therefore the required data can easily be copied:

- NO_2 Fall-Off with Distance Calculator – **Calculator - Multiple Tubes**
- Diffusion Tube Data Processing Tool – **Step 4 - Fall off with Distance**

The Limitations / Important Notes tab within the calculator should be referred to ensure only relevant sites are included within the calculator.

Please ensure the correct distances are utilised within the calculator:

- The distance from monitoring site to kerb is presented within Table A.1 and Table A.2 (Distance to kerb of nearest road)
- The distance from receptor to kerb is the sum of Distance to kerb of nearest road and Distance to Relevant Exposure from Table A.1 and/or Table A.2

Any comments output from the calculator should be added within the Comments column.

This table should be deleted if distance correction has not been completed at any site.

Delete this box when the document is finished

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
<DT1>						
<DT2>						

QA/QC of Automatic Monitoring

INSTRUCTIONS

Within this section details relating to the following should be included:

- Who completes the data management and Local Site Operator (LSO) duties for any automatic monitoring sites within the authority;
- Details on the frequency of calibrations, audit/servicing;
- Ratification process, and if the monitoring data presented within the ASR is provisional or ratified;
- If live/historic data is available through a website.

Delete this box when the document is finished

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

INSTRUCTIONS

If PM_{10}/$PM_{2.5}$ monitoring is completed within your authority, where applicable please detail any correction factors applied to the data before it is published (e.g. using the Volatile Correction Model (VCM) or a specific correction factor). Correction factors as detailed within LAQM.TG22 Chapter 7: Particulate Matter Monitoring.

Or:

The type of <PM_{10}/$PM_{2.5}$> monitor(s) utilised within <Local Authority Name> do not required the application of a correction factor.

Please delete this section if no PM_{10}/$PM_{2.5}$ monitoring is not completed within your authority.

Delete this box when the document is finished

Automatic Monitoring Annualisation

INSTRUCTIONS

If annualisation was required for any automatic monitoring sites a summary of the sites should be provided here and the annualisation data should be presented in Table C.3. Annualisation is required for any site with data capture less than 75% but greater than 25%.

Or:

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

Please delete this section if no automatic monitoring is completed within your authority.

Delete this box when the document is finished

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure

has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

INSTRUCTIONS

If fall-off-with-distance calculations were required for automatic monitoring sites, a summary of the sites should be provided here and the output data from the LAQM NO_2 fall-off with distance calculator should be presented in Table C.5. Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 40µg/m^3 and the monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account).>

Or:

No automatic NO_2 monitoring locations within <Local Authority Name> required distance correction during <Year>.

The structure of the above and following QA/QC tables are consistent with those output by the NO_2 Fall-Off with Distance Calculator. It is therefore recommended that this tool is used to aid transparency of calculations and associated QA/QC pertaining to the processing of automatic data.

However, it is acknowledged that not all local authorities will initially use the NO_2 Fall-Off with Distance Calculator due to having many years of experience in processing the data within their authority using existing LAQM tools and methods. Therefore, in these instances please align these tables to present equivalent details, text and/or tabulated data, to support any calculations completed.

If you have any queries relating to the data that you should present, please contact the LAQM Helpdesk.

Delete this box when the document is finished

Table C.7 – Automatic 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
<CM1>						
<CM2>						

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

INSTRUCTIONS

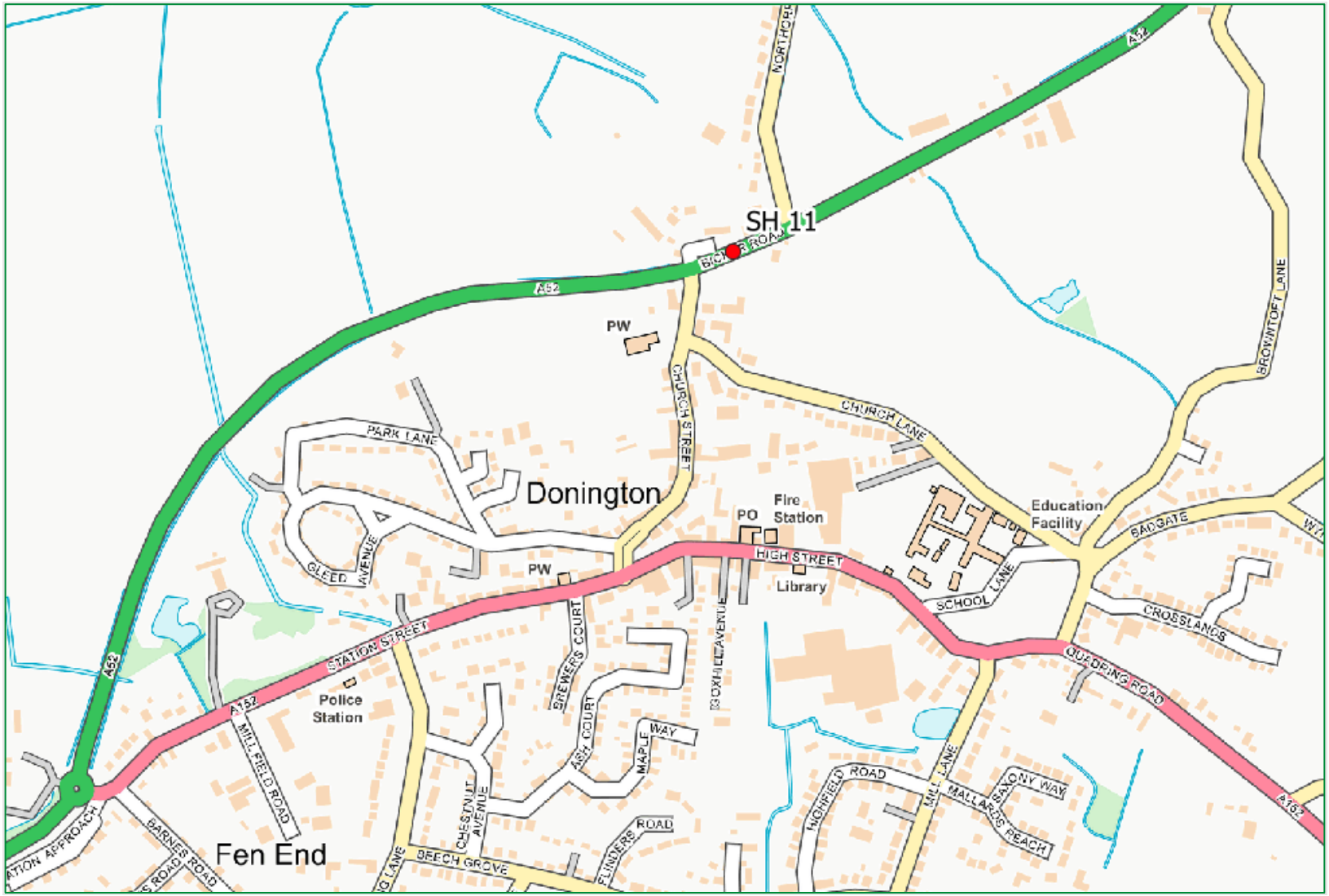
Please include here one or more clear map(s) that show the location of all monitoring sites in relation to any AQMA(s) and, if appropriate, the local authority boundary, ensuring that monitoring positions are clearly labelled using the Site IDs and the mapped coordinates correspond to those presented in Table A.1 and in Table A.2 of Appendix A.

As for all charts within the annual report alt text should be added to comply with accessibility regulations.

Delete this box when the document is finished

Figure D.2 – Map of Non-Automatic Monitoring Site

<Add required maps here. Example map template provided below>


SH 11
A52
PW
CHURCH STREET
CHURCH LANE
PARK LANE
Donington
PO
Fire Station
Education Facility
BADGATE
HIGH STREET
Library
SCHOOL LANE
CROSSLANDS
QUADRING ROAD
GLEED AVENUE
STATION STREET
A152
Police Station
MILL FIELD ROAD
BREWERS COURT
ASH COURT
MAPLE WAY
BOXHILL AVENUE
CHESTNUT AVENUE
BEECH GROVE
FLINDERS ROAD
HIGHFIELD ROAD
MILL LANE
MALLARDS REACH
SAXONY WAY
BARNES ROAD
Fen End
BROWNTOFT LANE

Appendix E: Summary of Air Quality Objectives in England

Table E.2 – Air Quality Objectives in England[8]

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

[8] 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

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<Add additional references here>