2019 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

August 2020

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Executive Summary: Air Quality in Our Area

Air Quality in Teignbridge District 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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Within the District of Teignbridge the local air quality is generally very good. However there are locations where air pollution levels are high – typically along busy congested roads, with the highest levels being experienced where the roads are either narrow and/or have a steep incline and/or have street canyons (ie roads with properties close to the side of the road on both sides). The pollutant of specific concern in these locations is Nitrogen Dioxide. The review and assessment process commenced in 2005 resulting in four Air Quality Management Areas (AQMA's) being declared because it was predicated that the National Air Quality Objective would not be met for Nitrogen Dioxide (NO_2). The original four AQMA's were:-

- Dawlish (Iddesleigh Terrace)
- Teignmouth (A379 along Bitton Park Road)
- Kingskerswell (old A380)
- Newton Abbot (Town Centre).

In 2008 a Detailed Assessment was carried out which results in the boundary of the Newton Abbot Town Centre AQMA being revised and expanded to include Wolborough Street, and in Kingsteignton, Newton Road and Gestridge Road. To

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

date, the geography of the four AQMA's remains unaltered. The four AQMA's to date are:-

- Dawlish (Iddesleigh Terrace)
- Teignmouth (A379 along Bitton Park Road)
- Kingskerswell (old A380)
- Newton Abbot & Kingsteignton

There are two national objectives for levels of Nitrogen Dioxide. These are for the average level over a whole year, which should be below 40 μg/m^3 and the average level for one hour, which should be below 200 μg/m^3.

Teignbridge District Council has a monitoring network that is designed to identify the areas with the highest levels of nitrogen dioxide. This monitoring is carried out in two forms, one being diffusion tube monitoring and the other being continuous monitoring stations. Monitoring has been undertaken for Nitrogen Dioxide (Nox) and Particulate Matter (PM10) both within the Council's AQMA's and outside.

Further details of the Air Quality Management Areas, and the Councils Action Plan are available online at https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/climate-change/air-quality/

The latest ratified Nox data for 2019 shows that, there still remain the certain "hot spots" within two of the declared AQMA's where these levels are exceeding the National Objectives. In 2019 there were 7 diffusion tube results out of 69 monitored locations within the Teignbridge District that exceeded the National Air Quality Objective for Nitrogen Dioxide. These locations are found in the Newton Abbot and Kingsteignton AQMA (4) and the Teignmouth AQMA (3).

Newton Abbot & Kingsteignton

In the course of 2019 Teignbridge District Council monitored 42 locations. Of these:-

- 4 locations exceeded the National Objectives.

- 26 locations got worse.
- 12 locations improved.

However in saying the above, the margins of movement either improving or deteriorating, was not at a significant level of increase or decrease in μg/m^3.

Nox Analyser – Continuous Data.

With reference to continuous data from our Nox Analyser situated at Halcyon Road, Newton Abbot, unfortunately during 2019 the Nox Analyser suffered a catastrophic failure. Following a detailed analysis of this piece of equipment it was decided that owing to the age it was prudent not to replace this analyser. We therefore cannot report a 12 month period of monitoring for the Nox Analyser situation at Halcyon Road. At present there are no plans to replace this Analyser.

Teignmouth

During the course of 2019 Teignbridge District Council continued with diffusion tube monitoring of 9 locations. Of these:-

- 1 new tube location has exceeded the National Objective. This now means that 3 diffusion tube levels are greater than the National Objective. One additional tube is also closer to exceeding the National Objective. Throughout the whole of this AQMA, apart from one site, the levels have increased from the data for 2018. This again is only a marginal difference

With reference to the continuous data site at Bitton Park Road, unfortunately towards the end of 2019 Teignbridge District Council's data capture contractors incurred a significant corrupted database error which resulted in a monthly data loss for the Council since September 2019. This is has resulted in only a 72% data capture for 2019 and an annualised mean of 21.85 μg/m^3. There were no exceedances of over 200 μg/m^3 . It is to be noted that the data capture error has only been highlighted on production of this report so future reports (ASR 2020) will also have a data loss for this site.

With reference to the two continuous monitoring sites at Bitton Park Road, Teignmouth and Halcyon Road, Newton Abbot these were originally purchased over 15 years ago to assist in the Detailed Assessment following declaration of the Air Quality Management Areas of Newton Abbot and Teignmouth. These analysers are

rapidly approaching the point where their performance can no longer be relied upon and are likely to incur significant maintenance costs. As detailed in this report, the Halcyon Road analyser has already had a catastrophic failure, and is beyond repair. In addition and for some time now, we have not been participating in the national bias scheme, and the analysers also do not deliver any additional benefit to our monitoring programme. Given both these points, there is every possibility that they will be decommissioned in the very near future.

Kingskerswell

During the course of 2019 Teignbridge District Council continued to monitor 12 diffusion tube locations. Of these:-

- 1 location remained at the same level.
- 3 locations deteriorated.
- 8 locations improved.

As we now have three years of levels being consistently more than 10% below the National Objective this Council has put in place measures to revoke this AQMA. Details of these actions can be found later in this report.

Please note however that in future reports such as this, the Kingskerswell diffusion tube data will continue to be reported. This is at the request of Devon County Council asking Teignbridge to continue 5 years post opening monitoring of the link road. This monitoring will therefore continue during 2020 and 2021.

Dawlish

During the course of 2019 Teignbridge District Council continued to monitor 6 diffusion tube locations. 4 of which are inside the Dawlish AQMA and 2 location sites are as a results of background levels for a new link road. Of these:-

- 5 tubes slightly increased.
- 1 tube reduced.

However in advising on the above, all the tubes were well within the National Objective. As with Kingskerswell AQMA, we now have three years of levels being consistently more than 10% below the National Objective this Council has put in place measures to revoke this AQMA. Details of these actions can be found later in this report.

Air Quality Data - Old Newton Road, Heathfield, - In the vicinity of British Ceramic Tiles

During 2019 a large company named British Ceramic Tiles unfortunately went into Administration and subsequently ceased trading. In previous years, dust complaints had been received arising from the site and for a number of years, this Authority had placed 5 PM_{10} Osiris monitors within the vicinity to investigate this issue further. Following the closure, and once we were satisfied that decommissioning of all plant on site likely to cause a significant dust issue had taken place, Teignbridge removed these monitors shortly thereafter. You will therefore notice that within this report, and in particular Table A5, PM_{10} data for 2019 remains blank and unreportable.

Actions to Improve Air Quality

Air Quality Action Plan

During 2019 a revised Air Quality Action Plan has been produced. This Authority has received approval of the draft from DEFRA. The draft Air Quality Action Plan had some advisories attached to it:-

- The quantification of impacts of proposed measures.
- The measures must be targeted.
- Quantification of source contributions
- Detailed consideration for pollution hotspots
- Prioritising short time scale measures

The next stage is to revisit the statutory consultees to further develop the action plan along these lines and incorporate local engagement. This is anticipated to take place early 2020.

The Devon & Exeter Low Carbon Energy & Transport Technology (DELETTI)

During 2019 final approval of the funding was confirmed. Subsequently a Project Plan was devised by Devon County Council. Throughout the year numerous DELETTI partnership meetings have taken place to ascertain critical information in order to draft and agree a Collaboration Agreement for the consortium. A letter of intention by all parties has also been agreed and signed. An invitation for tender for Legal support has also been produced with contracts due to be awarded January 2020. Plans have been finalised to deliver a Market Engagement Day for the industry providers of charge points in February 2020.

The Highways England Electric Vehicle Grant (HELA) Application

In the early part of 2019 this Authority had first sight of the proposed format of the lease agreements. Following this, consultation took place with our Car Parks Team to confirm locations. However, we were advised by Highways England that one of the preferred sites that we identified had to be replaced. This was owing to excessive connection charges at the preferred site. At the end of 2019 both sites were agreed and Highways England had procured a supplier. It is therefore anticipated that in the early Spring 2020 installation will take place.

Electric Vehicle Infrastructure and Ultra Low Emission Vehicles Policy

In the early part of 2019 an Electric Vehicles, Infrastructure and Ultra Low emissions Vehicles Policy was drafted. This Policy went to Teignbridge District Council's Overview and Scrutiny Committee on the 4th March 2019. At this time the Policy was agreed by members which then allowed this Authority to engage in a wider public consultation. The Consultation included Devon County Council, all the District's Town and Parish Councils and relevant internal departments. Following full results of the consultation process (late 2019) a final report had to be presented to Executive Committee for final approval. The next Executive Committee is due on of 7th January 2020 when it is anticipated that final approval will be given.

Sustainable Travel to Work Survey (Workplace Travel Plan)

Measures that took place during 2019 towards Agile working included all service managers completing analysis of the work requirements of their teams and determining who is required to be in the office to deliver their role. During 2020 the space requirements for each service area will be assessed. This will then help to determine the workplace travel solutions that will be required to support staff moving to an agile workforce. This will then help to reduce Teignbridge's commute to work mileage.

Old Newton Road, Heathfield – In the vicinity of British Ceramic Tiles.

As reported in the 2018 Annual Status Report, unfortunately on the 30th January 2019 the company named British Ceramic Tiles went into administration. During the early months of 2019 we continued to carry out particulate monitoring within the vicinity of the site prior to confirmation being received of the new plans for the site. It was confirmed in July 2019 that all plant had safely been decommissioned and no further need for our detailed air quality monitoring to be carried out. In view of this all but one of the particulate monitors were removed from site. This authority left the one monitor on a "just in case" basis for any unforeseen circumstances involving demolition works for example.

Cycle Network

Teignbridge has been heavily involved during 2019 supporting the cycle network.

New cycle routes:-

The Wray Valley Trail…

In June 2019, Teignbridge District Council Executive Committee approved a £100,000 contribution towards the completion of the Wray Valley Trail. There are two final stretches to be completed, 3.5km off-road route and signage of a further approximately 2km on quiet roadways through Lustleigh. This will complete the Wray Valley Trail, which spans from Bovey Tracey to Moretonhampstead. It is anticipated that completion date is late December 2019 / January 2020. This will complete the

good-quality Trail between Bovey and Moretonhampstead – an excellent and beneficial provision.

The East-West route

The East-West route recommendation was approved by Executive in late October to provide a contribution of £180,000 to Devon County Council to support this strategic provision. This route is an off-road option alongside the busy A383 Ashburton Road, linking new and existing residential to educational facilities, the centre of Newton Abbot and the wider cycle network. The funding agreement is now being agreed and finalised.

Future High Streets Fund.

Teignbridge are also working on further detail on the bid for the Future High Streets Fund, which includes improvements to the quality of the cycling and walking routes within the central area of Newton Abbot. The final bid is due by June 2020. This offers the potential for some significant gains, including enhanced quality and legibility of the National Cycle Network route 2, to enhance benefits from this important (but largely neglected) town centre route. Options have been reviewed, with input from the Cycle Forum, Cycle Group and other stakeholders, further consultation will be necessary, and costs and benefits will be reviewed.

Teign Estuary Trail.

During the past year, Teignbridge District Council has been sharing regular updates on the Teign Estuary Trail multi-user route project and the Dawlish route with the Sustrans Delivery Manager for the South-west, Iain Stewart. On May 22nd, Iain travelled from their Bristol office to meet with Teignbridge District Council and Devon County Council Officers, and this was an important step in securing the support of Sustrans in recognising the priority for delivery of these routes, to fill the significant gap in the National Cycle Network Route 2. Sustrans Teignbridge District Council

and Devon County Council have since drafted a letter of joint Council support, including relevant town and parish councils also, and this will was sent out this year.

Also on this project, Teignbridge District Council supported this project at the Bishopsteignton Festival (June 2019), alongside the parish council and Devon County Council. Teignbridge District Council and Devon County Council prepared a joint Statement of Support for local community to sign and provide comments / feedback relating to the ongoing TET planning application preparation. The data is now being collated, but at least 100 signatures of support and comments were received. This will be utilised as valuable community engagement towards the planning application. It is anticipated that the planning application will be submitted by Devon County Council during the early part of the 2020/21 financial year.

Cycle parking provision :-

Teignbridge District Council have facilitated with planning for the DCC installation of 19 new Sheffield stands (cycle racks) in Teignmouth, most of the locations are TDC land (except Pellow Arcade & Little Triangle are DCC). This provides for greater visible promotion of active travel across the town and offers convenient cycle parking for residents and visitors travelling via this mode. Locations are provided below:

The Den (close to the Pier) – five Sheffield stands

Eastcliff car park – three Sheffield stands

The Lighthouse – four Sheffield stands

The Promenade (by East Cliff Café) – three Sheffield stands

Pellow Arcade, Teign Street – two Sheffield stands

Little Triangle – two Sheffield stands

Revocation of Kingskerswell Air Quality Management Area and Dawlish Air Quality Management Area

Following ratified 2018 monitoring data in March 2019, this Authority sought legal advice to check our internal procedures regarding report to members on the revocation process.

During 2019 we also consulted with our relevant Portfolio Holder and we then prepared a robust case.

Plans have been put in place to consult and meet local the local Parish Councils (Dawlish and Kingskerswell) in early 2020 to present the report and our plans. Following this it is our vision to take these reports to the Executive Committee and issue the Revocation Orders in April 2020.

Teignbridge District Council Ten Year Strategy (2016 – 2025)

Air Quality features highly in this strategy and involvement in specific projects continued to take place during 2019. Specific details of the projects and actions relating to these projects can be found in Chapter 2.2 and Table 2.2.

Conclusions and Priorities

No exceedances were identified in 2019 outside Teignbridge District Council's current Air Quality Management Areas. Results show some fluctuation from the 2018 results but these fluctuations are negligible. This situation will be closely monitored during 2020 to see if an upward or downward trend happens.

Teignbridge District Council's priorities for 2020 are:-

- Publish an Electric Vehicle Infrastructure and Ultra Low Emission Vehicles Policy.

- Consultation and publication of the Air Quality Action Plan.
- Continue supporting and implementing projects to increase electric vehicles and charge points across Teignbridge.
- Revoke the Dawlish AQMA.
- Revoke the Kingskerswell AQMA.
- Continue to improve the Cycle Network Facility
- Produce an Agile Workplace Plan.

Local Engagement and How to get Involved

Public participation in Air Quality issues are vital to maintaining standards within the objectives. Everyone in Teignbridge can make small changes to their daily routine to improve air quality including:-

- Walking or cycling more
- Using public transport
- Car Sharing
- Not leaving vehicles idling
- Checking that your vehicle is as economic and green as possible. (https://www.greencarguide.co.uk/the-most-economical-cars-on-sale-in-2020-in-the-uk-for-10-different-categories)

Regular involvement takes place with The Leader of the Council - Cllr Gordon Hook, Deputy Leader of the Council & Portfolio Holder for Waste Management & Environmental Health - Cllr Alistair Dewhirst, Portfolio Holder for Climate Change - Cllr Jackie Hook and other Elected Councillors.

Teignbridge District Council does a lot of interacting with the public by means of social media (Facebook & twitter), advising them of Air Quality issues.

In 2019 the Authority also dealt with 26 service requests relating to either planning applications having an impact on air quality or concerns from the public regarding the current air quality levels.

Teignbridge District Council also welcomes proposals from community and interest groups who wish to improve the air quality in their local area.

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1 Local Air Quality Management

This report provides an overview of air quality in Teignbridge District Council during 2019. 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 Teignbridge District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Teignbridge District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/climate-change/air-quality/

In 2020 we propose to revoke the Dawlish AQMA and the Kingskerswell AQMA (see monitoring section).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Iddesleigh Terrace, Dawlish	2005	NO2 annual mean	Dawlish	Small section of road. It is a winding road and forms a street canyon.	No Devon County Council	42.34	µg/m3	33.88	µg/m3	Air Quality Action Plan	2010	https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/land-air-and-water-pollution/air-quality/
Kingskerswell	2005	NO2 annual mean	Kingskerswell	Main route into Torbay and experiences very high traffic flows. A congested route	No Devon County Council	50.88	µg/m3	21.38	µg/m3	Air Quality Action Plan	2010	https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/land-air-and-water-pollution/air-quality/

				with slow moving traffic.								
Newton Abbot & Kingsteignton	2005 amended 2008	NO2 annual mean	Newton Abbot	Congested streets and narrow in places with residential properties within metres of the edge of the roads. The AQMA was further extended in 2008 following a Detailed Assessment.	No Devon County Council	48.82	µg/m3	51.89	µg/m3	Air Quality Action Plan	2010	https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/land-air-and-water-pollution/air-quality/

Teignmouth	2005	NO2 annual mean	Teignmouth	Primary route and main thoroughfare for HGV traffic.	No Devon County Council	56.83	µg/m3	54.85	µg/m3	Air Quality Action Plan	2010	https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/land-air-and-water-pollution/air-quality/

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

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

Defra's appraisal of last year's ASR concluded that "The Council provide a very good executive summary which clearly outlines the status of each AQMA and the progress made within them. It is encouraged that the level of detail provided for each AQMA is continued in future reports".

There were some minor errors Table 2.1 and Table 2.2 and these have now been rectified.

It was also recommended that reference to the Public Health Outcomes Framework (Section 2.3) and the local indicator for PM2.5 in the district should be made in future reporting. It was recommended that the Council may wish to consider comparing the '3.01 - Fraction of mortality attributable to particulate air pollution indicator' value for Teignbridge to nearby LAs and National indicator values.

Minor advice was also given to formatting of graphs and maps in Figure A.1 and Appendix D which has subsequently been actioned.

Teignbridge District Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are:

- Submission of the draft Air Quality Action Plan completed.
- Ongoing involvement within the DELETTI grant application process.
- Ongoing involvement within the Highways England Electric Vehicle grant application process.
- Draft Electric Vehicles, Infrastructure and Ultra Low Emission Vehicle Policy.
- Improvement of the District's Cycle Network.

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

- Approval and implementation of the Air Quality Action Plan.
- Approval and implementation of the Electric Vehicles, Infrastructure and Ultra Lower Emission Vehicle Policy.
- Revoke the Dawlish Air Quality Management Area.
- Revoke the Kingskerswell Air Quality Management Area.
- Continuation of involvement within Air Quality projects within the Teignbridge Council Ten Year Strategy 2016 – 2025.

Teignbridge District Council's priorities for the coming year are:-

- Approval and implementation of the Air Quality Action Plan.
- Approval of an Electric Vehicles, Infrastructure and Ultra Low Emission Vehicle Policy.

The principal challenges and barriers to implementation that Teignbridge District Council anticipates facing are:-

<u>Funding.</u>

Speed of progression of both the DELETTI project and the HELA project will be as a result of available funding.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	TDC Ten Year Strategy 2016 - 2025	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	ongoing	Teignbridge District Council	Local Authority,	NA	NA	Ongoing	ongoing with a completion data of 2025	N/A
2	Air Quality Action Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Proposed start date 2020	Local Authority Environmental Health, Local Authority Transport	Local Authority, Funding: Defra Air Quality Grant	N/A	Unknown	Draft approved, reconsult staturory consultees prior to publishing	ongoing	TDC Committee process and then funding.
3	DELETTI Project (Electric Car Charging Points)	Promoting Low Emission Transport	Other	ongoing	Local Authority Environmental Health Departments and Local Transport Authority	European Structural and Investment Fund	Expand Network of Electric Vehicles and Charging	Reduce vehicle emissions	Implementation on-going (Collaboration Agreement Signed)	ongong (early 2022)	First phase successful, second phase on-going
4	Electric Electric Vehicles, Infrastructure and Ultra Low Emission Vehicle Policy.	Policy Guidance and Development Control	Low Emissions Strategy	early 2020	Teignbridge District Council	Local Authority	N/A		Implementation early 2020	Implementation early 2020	N/A
5	Workplace Travel Plan/Innovative Transport Schemes	Promoting Travel Alternatives	Personalised Travel Planning	ongoing	Teignbridge District Council	Teignbridge District Council	TDC Ten Year Strategy 2016 - 2025	N/A	ongoing	ongoing	N/A
6	Cycle Network	Alternatives to private vehicle use	Other	submitting funding bids	Teignbridge District Council and Devon County Council	Devon County Council	TDC Ten Year Strategy 2016 - 2025		submitting funding bids	subject to fuding	funding
7	Planning Applications	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	ongoing	Teignbridge District Council	Local Developers or Community Infrastructre Levi	Local Plan 2013 - 2033	N/A	ongoing	ongoing	funding
8	HELA	Promoting Low Emission Transport	Other	ongoing	Teignbridge District Council and Highways England	Highways England	Introduce Network of Electric Vehicles	Unknown	Locations identified and approved	01/07/2020	Funding

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Although England has not set air quality objectives for $PM_{2.5}$ to be able to quantify its impact Public Health England has developed a public health outcomes framework data tool. (PHOF indicator). It quantifies the mortality burden of $PM_{2.5}$ fraction within England both at a County and Local Authority scale, thus enabling councils, public health, and environment departments to work together to prioritise action on air quality.

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

In 2019 a full year of monitoring for $PM_{2.5}$ was for the first time captured at a busy urban location from the curb side. Whilst essentially indicative this data nevertheless provides a very good indication of levels of $PM_{2.5}$. A representative sample from this location shows the following;

Average for the year 2019 = 8.66 $\mu g/m^3$

Highest monthly average = 12.64 $\mu g/m^3$

Lowest monthly average = 6.26 $\mu g/m^3$

In addition a further 2 monitoring locations have been established which means that in 2020 we expect to report from an even broader local database.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Teignbridge District Council undertook automatic (continuous) monitoring at 8 sites at the start of 2019. During 2019, Teignbridge District Council ceased monitoring at 7 of these sites. This is one due to a large company ceasing trading resulting in no need for monitoring any longer, and also a catastrophic failure of one of the monitors. Specific details of these incidents can be found earlier in this report. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk

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

Teignbridge District Council undertook non- automatic (passive) monitoring of NO_2 at 69 sites during 2019. Table A.2 in Appendix A shows the details of the 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[4], "annualisation" (where the data capture falls below 75%), and distance correction[5]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.3 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 2019 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.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

The data from 2019 shows that there were 7 roadside locations within the Teignbridge District that exceeded the annual National Air Quality Objective for Nitrogen Dioxide. They are distributed as follows:-

4 locations within the Newton Abbot & Kingsteignton Air Quality Management Area (85 Wolborough Street, 30-34 Bradley Court, LP @ Exeter Road, 79 Wolborough Street).

[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

3 locations within the Teignmouth Air Quality Management Area (96 Bitton Park Road, 1 Reed Vale Lodge, 68 Bitton Park Road).

With regard to the exceedances, the extent of the exceedance of the National Objectives range from 0.21 μgm/^{3} at 30 – 34 Bradley Court, Newton Abbot to 14.85 μgm/^{3} at Reed Vale Lodge, Teignmouth.

There was no annual average over 60 μgm/^{3} which would indicate that an exceedance of the 1 hour mean objective is also not likely.

It is clear to see from the results that "hotspots" of pollution clearly remain. These need to be addressed within the new Air Quality Action Plan. These "hotspot" areas are clearly smaller than the extent of the AQMA's but at present Teignbridge District Council has no plans to amend the AQMA and reduce the area inlcuded.

Also of note is that as expected, there continues to be no more exceedances within the Kingskerswell or Dawlish AQMA and measures have started already with revocation procedures and it is our intention to formally revoke these two AQMA's very early in 2020.

Each year Teigbridge District Council reviews the sites of the diffusion tubes and takes into consideration extending, reducing or revoking an AQMA.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40μg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50μg/m^3, not to be exceeded more than 35 times per year.

Due to reasons previously stated, during 2019 this Authority only had one complete year of PM_{10} monitoring at Queen Street. The data capture for this location for 2019 shows a data capture of 90%. There were no exceedances of the Annual Mean for the Queen Street location and the annual mean was 12 $\mu g/m^3$.

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?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Halcyon Road, Newton Abbot	Roadside	285681	71393	NO2	YES	Chemiluminescent	5	2	1.7
CM2	Bitton Park Road, Teignmouth	Roadside	293363	73094	NO2	YES	Chemiluminescent	8.5	1.73	1.7
CM3	BAM - Magnolia	Roadside	283220	75972	PM10	NO	Absorption of Beta Radiation	14	N/A	1.7
CM4	Queen Street Newton Abbot	Roadside	286617	71332	PM10	YES	Light scattering technique	2.18	2.63	1.7
CM5	11 Brow Hill Heathfield	Other	283149	75937	PM10	NO	Light scattering technique	80	N/A	1.7
CM6	Magnolia Heathfield	Other	283220	75972	PM10	NO	Light scattering technique	14	N/A	1.7
CM7	Battle Road Heathfield	Other	282813	75775	PM10	NO	Light scattering technique	N/A	0	1.7
CM8	A38 Heathfield	Other	283435	75826	PM10	NO	Light scattering technique	N/A	5	1.7

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

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
1	Aller Brake Road N Abbot	Roadside	287396	69902	NO2	NO	1m	5m	NO	1.7
2	DP 155(153) Bitton Park Road, Teignmouth	Kerbside	293277	293277	NO2	YES	0	1m	NO	1.7
3	9 Gestridge Rd, Kingsteignton	Kerbside	286967	73146	NO2	YES	0	1m	NO	1.7
4	DP 85 Wolborough St, Newton Abbot	Kerbside	285526	71010	NO2	YES	0	1m	NO	1.7
5	96 Bitton Park Rd, Teignmouth	Kerbside	293387	73101	NO2	YES	0	1m	NO	1.7
6	157 Queen St, Newton Abbot	Kerbside	286630	71329	NO2	YES	0	1m	NO	1.7
7	54 Newton Rd, Kingsteignton	Roadside	286718	72523	NO2	YES	1m	5m	NO	1.7
8	57 East St, Newton Abbot	Kerbside	285991	71158	NO2	YES	0	1m	NO	1.7
9	Forde House Offices, Newton Abbot	Other	287073	70915	NO2	NO	N/A	N/A	NO	1.7
10	Control	Other	N/A	N/A	N/A	NO	N/A	N/A	NO	N/A
11	12 Torquay Rd, Newton Abbot	Kerbside	286345	71078	NO2	YES	0	1m	NO	1.7
12	Bus Stop/Datal office Torquay	Kerbside	287939	68823	NO2	YES	0	1m	NO	1.7

	Rd, Newton Abbot									
13	22 Courtenay Road, Newton Abbot	Urban Background	286061	70812	NO2	NO	24m	1m	NO	1.7
14	Bus StopWestcombe Caravan Park Torquay Rd, N Abbot	Kerbside	288024	68769	NO2	YES	15m	1m	NO	1.7
15	38 Ashburton Road	Roadside	275659	69917	NO2	NO	2m	2m	NO	2
16	46/48 Newton Rd, Kingsteignton	Roadside	286727	72538	NO2	YES	2m	5m	NO	1.7
17	Whitecourt, Iddesleigh Terrace, Dawlish	Kerbside	296299	76738	NO2	YES	0	1m	NO	1.7
18	DP Flat 2, Birchwood Court, Addison Rd, NA	Roadside	287211	70496	NO2	YES	0	2m	NO	1.7
19	DP 49 The Avenue, Newton Abbot	Roadside	286479	71558	NO2	YES	0	5m	NO	1.7
20	Specsavers 16 Queen Street Ground Floor Newton Abbot	Kerbside	286056	71334	NO2	YES	0	1m	NO	1.7
21	Jetty Marsh Lamp Post no. 28 Westward Traffic Flow	Roadside	285813	72061	NO2	YES	2m	1m	NO	1.7
22	Jetty Marsh Lamp Post no. 29 Eastward Traffic Flow	Roadside	285812	72050	NO2	YES	2m	1m	NO	1.7

23	108-110 Queen St First Floor level Newton Abbot	Kerbside	286519	71344	NO2	YES	0	1m	NO	4
24	87 East St, Newton Abbot	Kerbside	286061	71151	NO2	YES	0	1m	NO	1.7
25	DP 7 Station Rd, Newton Abbot	Roadside	286703	70922	NO2	Y	0	4m	NO	1.7
26	Elm Road/New Link Road, Dawlish	Roadside	296175	77738	NO2	NO	0	1	NO	1.7
27	DP 173 Bitton Park Rd, Teignmouth	Kerbside	293231	73085	NO2	YES	0	1m	NO	1.7
28	Western Cottages 1 Greenhill Road KKwell	Roadside	287671	67405	NO2	NO	5m	3m	NO	1.7
29	Jct of Huxnor Rd and Eddginswell Lane Kkwell	Kerbside	287667	67263	NO2	NO	0	1m	NO	1.7
30	1A Piermont Place, Dawlish	Kersbide	296281	296281	NO2	YES	0	1m	NO	1.7
31	DP 108-110 Queen St, Newton Abbot	Kerbside	286517	71336	NO2	YES	0	1m	NO	1.7
32	21 Oakford, Broadway Rd, Kingsteignton	Kerbside	286957	73112	NO2	YES	0	1m	NO	1.7
33	DP 30-34 Bradley Court, Highweek Street NA	Kerbside	285681	71393	NO2	YES	0	1m	NO	1.7
34	Nox Analyser, Halcyon Road, Newton Abbot	Other	286071	71478	NO2	YES	0	N/A	YES	1.7

35	Lamp post St Mary Church Road Newton Abbot	Roadside	287299	70621	NO2	NO	5m	1m	NO	1.7
36	DP Westhill House, Kingskerswell	Kerbside	288111	67872	NO2	YES	0	1m	NO	1.7
37	Telegraph pole Ringslade, Highweek	Kerbside	284851	72101	NO2	NO	0	1m	NO	1.7
38	DP 26 Newton Road, Kingsteignton	Roadside	286757	72583	NO2	YES	2m	5m	NO	1.7
39	Rock House 1 Maddacombe Rd KKwell	Kerbside	287477	67698	NO2	NO	0	1m	NO	1.7
40	Exeter Road, Newton Abbot	Roadside	285565	71929	NO2	YES	5m	1m	NO	1.7
41	DP Aller Farmhouse, Kingskerswell	Kerbside	288077	68761	NO2	YES	0	1m	NO	1.7
42	Lay By Exeter Rd (opp Vauxhall Garage) Whitehill N Abbot	Kerbside	285477	72510	NO2	NO	N/A – pre planning application.	1m	NO	1.7
43	Nox Analyser, Halcyon Road, Newton Abbot	other	285681	71393	NO2	YES	0	N/A	YES	1.7
44	Nox Analyser, Halcyon Road, Newton Abbot	Other	285681	71393	NO2	YES	0	N/A	YES	1.7
45	DP 4 Commercial Rd, Dawlish	Kerbside	296302	76756	NO2	YES	0	1m	NO	1.7
46	DP 3 Iddesleigh Terrace, Dawlish	Kerbside	296318	76763	NO2	YES	0	1m	NO	1.7

47	DP 114 Bitton Park Rd, Teignmouth	Kerbside	293256	73109	NO2	YES	0	1m	NO	1.7
48	DP 1 Reed Vale Lodge, Teignmouth	Kerbside	293446	73091	NO2	YES	0	1m	NO	2
49	DP 68 Bitton Park Rd, Teignmouth	Kerbside	293541	73083	NO2	YES	0	1m	NO	2
50	L/Post Newton Road (Northbound opp Priory Ave) Kkwell	kerbside	288027	68381	NO2	YES	0	1m	NO	1.7
51	DP St Mary's Court, Highweek St,NA	Roadside	285674	71401	NO2	YES	0m	4m	NO	1.7
52	DP 29 Vicarage Hill, Kingsteignton (Blindwell)	Roadside	287544	73067	NO2	NO	2m	5m	NO	1.7
53	90 Wolborough Street Newton Abbot	Kerbside	285537	71035	NO2	YES	0	1m	NO	1.7
54	DP 3 Gestridge Road, Kingsteignton	Kerbside	286969	73130	NO2	YES	0	1m	NO	1.7
55	DP 79 Wolborough St, Newton Abbot	Kerbside	285554	71043	NO2	YES	0	1m	NO	1.7
56	DP Wywurree Bungalow, Addison Road NA	Roadside	287198	70542	NO2	YES	0	10m	NO	1.7
57	West Golds Way, Newton Abbot	Roadside	285942	72254	NO2	NO	1m	1m	NO	1.7

58	L/Post Level with 28 Water laneTorquay Road (Northbound) Kkwell	Kerbside	288168	67516	NO2	YES	0	1m	NO	1.7
59	LP Newton Road, South of Pottery Road, Kingsteignton	Roadside	286730	72518	NO2	YES	15m	2m	NO	1.7
60	Nox Analyser - Bitton Park Road, Teignmouth	Other	293363	73094	NO2	YES	0	N/A	YES	1.7
61	Nox Analyser - Bitton Park Road, Teignmouth	other	293363	73094	NO2	YES	0	N/A	YES	1.7
62	Nox Analyser - Bitton Park Road, Teignmouth	Other	293363	73094	NO2	YES	0	N/A	YES	1.7
63	DP 3 Gestridge Rd, Kingsteignton (Broadway Rd)	Kerbside	286965	73120	NO2	YES	0	1m	NO	1.7
64	Telegraph Pole, 22 Gestridge Road, Kingsteignton	Kerbside	286985	73111	NO2	NO	0	1m	NO	1.7
65	96 Wolborough St, Newton Abbot	Kerbside	285518	71018	NO2	YES	0	1m	NO	1.7
66	Halfway House Torquay Road (next to Hare +Hound) Kkwell	Kerbside	288339	66936	NO2	YES	0	1m	NO	1.7

67	Coventry Cottage Torquay Road (Southbound)	Kerbside	288487	66690	NO2	YES	0	1m	NO	1.7
68	Shorland House, Elm Grove Road, Dawlish	Kerbside	296485	77134	NO2	NO	5m	1	NO	1.7
69	Highweek Inn crossroad	Kerbside	284813	72062	NO2	NO	0	1m	NO	1.7

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3) (4)				
							2015	2016	2017	2018	2019
1	287396	69902	Roadside	Diffusion Tube	91.66666667	91.66666667	27.66	29.39	32.72	28.46	28.20
2	293277	293277	Kerbside	Diffusion Tube	91.66666667	91.66666667	36.97	38.31	**41.36**	32.62	33.15
3	286967	73146	Kerbside	Diffusion Tube	100	100	37.37	38.19	37.30	32.93	35.34
4	285526	71010	Kerbside	Diffusion Tube	100	100	**50.12**	**51.73**	**47.36**	**44.18**	**42.81**
5	293387	73101	Kerbside	Diffusion Tube	100	100	**42.08**	**46.86**	**42.68**	**42.19**	**40.28**
6	286630	71329	Kerbside	Diffusion Tube	100	100	34.97	39.36	36.12	31.91	31.10
7	286718	72523	Roadside	Diffusion Tube	100	100	30.76	32.37	30.74	27.19	27.80
8	285991	71158	Kerbside	Diffusion Tube	100	100	30.75	34.97	33.21	31.08	31.11
9	287073	70915	Other	Diffusion Tube	100	100	13.84	15.68	15.15	14.43	14.15
10	N/A	N/A	Other	Diffusion Tube	100	100	0.13	0.11	0.33	0.22	0.09
11	286345	71078	Kerbside	Diffusion Tube	100	100	31.46	34.14	31.98	30.57	32.30
12	287939	68823	Kerbside	Diffusion Tube	91.66666667	91.66666667	37.65	25.13	20.87	17.31	17.31
13	286061	70812	Urban Background	Diffusion Tube	100	100	8.33	10.25	8.41	8.56	8.13
14	288024	68769	Kerbside	Diffusion Tube	91.66666667	91.66666667	31.38	19.16	16.97	13.71	14.98

15	275659	69917	Roadside	Diffusion Tube	100	100	27.08	31.78	30.05	25.03	25.70
16	286727	72538	Roadside	Diffusion Tube	91.66666667	91.66666667	36.40	36.72	36.92	31.39	31.34
17	296299	76738	Kerbside	Diffusion Tube	100	100	36.03	37.75	33.57	31.86	33.03
18	287211	70496	Roadside	Diffusion Tube	100	100	22.68	25.07	24.46	21.64	21.48
19	286479	71558	Roadside	Diffusion Tube	100	100	24.19	28.12	26.91	22.14	23.13
20	286056	71334	Kerbside	Diffusion Tube	100	100	19.45	23.67	21.78	18.52	18.34
21	285813	72061	Roadside	Diffusion Tube	100	100	19.39	22.80	**43.13**	37.00	37.32
22	285812	72050	Roadside	Diffusion Tube	83.33333333	83.33333333	25.49	28.21	38.75	33.69	35.41
23	286519	71344	Kerbside	Diffusion Tube	100	100	36.34	39.51	37.28	33.30	32.06
24	286061	71151	Kerbside	Diffusion Tube	91.66666667	91.66666667	39.91	**43.62**	39.95	39.23	39.60
25	286703	70922	Roadside	Diffusion Tube	100	100	36.03	37.57	37.36	33.14	34.07
26	296175	77738	Roadside	Diffusion Tube	100	100				6.49	6.63
27	293231	73085	Kerbside	Diffusion Tube	91.66666667	91.66666667	**40.27**	37.92	**41.11**	35.91	38.26
28	287671	67405	Roadside	Diffusion Tube	100	100	9.72	13.15	12.27	12.00	10.62
29	287667	67263	Kerbside	Diffusion Tube	100	100	11.01	13.59	11.62	11.91	10.47
30	296281	296281	Kersbide	Diffusion Tube	100	100	34.30	38.51	35.74	33.64	33.88
31	286517	71336	Kerbside	Diffusion Tube	100	100	38.09	**41.73**	**41.07**	32.68	33.57
32	286957	73112	Kerbside	Diffusion Tube	100	100	25.12	24.58	26.12	22.63	24.16

33	285681	71393	Kerbside	Diffusion Tube	100	100	**41.28**	**43.69**	**43.77**	38.68	**40.21**
34	286071	71478	Other	Diffusion Tube	100	100	28.11	30.37	28.19	25.66	25.18
35	287299	70621	Roadside	Diffusion Tube	100	100	27.49	30.95	26.48	26.11	26.35
36	288111	67872	Kerbside	Diffusion Tube	100	100	34.18	19.37	15.39	12.66	12.61
37	284851	72101	Kerbside	Diffusion Tube	100	100	17.81	21.01	20.17	20.47	16.13
38	286757	72583	Roadside	Diffusion Tube	100	100	32.90	34.42	32.19	29.27	31.62
39	287477	67698	Kerbside	Diffusion Tube	100	100	14.99	20.21	19.68	18.32	16.91
40	285565	71929	Roadside	Diffusion Tube	91.66666667	91.66666667			**52.84**	**53.70**	**51.89**
41	288077	68761	Kerbside	Diffusion Tube	100	100	24.57	16.25	15.31	12.31	11.26
42	285477	72510	Kerbside	Diffusion Tube	100	100	20.39	25.05	22.79	21.32	23.92
43	285681	71393	other	Diffusion Tube	100	100	27.45	30.97	26.93	25.00	24.83
44	285681	71393	Other	Diffusion Tube	100	100	27.64	30.87	27.60	25.18	25.26
45	296302	76756	Kerbside	Diffusion Tube	100	100	26.35	29.13	24.90	23.79	24.22
46	296318	76763	Kerbside	Diffusion Tube	100	100	32.30	30.84	28.48	24.54	25.50
47	293256	73109	Kerbside	Diffusion Tube	100	100	26.13	28.92	27.17	22.58	23.40
48	293446	73091	Kerbside	Diffusion Tube	83.33333333	83.33333333	**41.35**	**62.02**	**57.99**	**53.59**	**54.85**
49	293541	73083	Kerbside	Diffusion Tube	75	75	**47.25**	**53.93**	**54.04**	39.22	**43.83**
50	288027	68381	kerbside	Diffusion Tube	100	100	**44.73**	24.66	21.25	18.40	17.84

51	285674	71401	Roadside	Diffusion Tube	100	100	26.09	28.86	24.97	25.18	24.05
52	287544	73067	Roadside	Diffusion Tube	100	100	19.92	23.93	25.74	28.00	34.33
53	285537	71035	Kerbside	Diffusion Tube	100	100	**45.89**	**48.31**	**46.46**	38.43	39.19
54	286969	73130	Kerbside	Diffusion Tube	100	100	35.00	36.99	36.29	32.12	34.07
55	285554	71043	Kerbside	Diffusion Tube	100	100	**48.76**	**49.15**	**47.09**	**44.67**	**43.57**
56	287198	70542	Roadside	Diffusion Tube	100	100	25.45	27.84	27.03	23.86	23.90
57	285942	72254	Roadside	Diffusion Tube	91.66666667	91.66666667	32.27	35.22	12.34	12.50	12.57
58	288168	67516	Kerbside	Diffusion Tube	83.33333333	83.33333333	**42.35**	22.38	19.71	16.25	16.96
59	286730	72518	Roadside	Diffusion Tube	91.66666667	91.66666667	29.36	29.96	30.94	27.00	27.87
60	293363	73094	Other	Diffusion Tube	100	100	20.92	24.02	21.69	21.00	21.19
61	293363	73094	other	Diffusion Tube	100	100	21.31	24.15	21.67	20.47	21.03
62	293363	73094	Other	Diffusion Tube	100	100	21.26	23.87	21.13	21.10	19.87
63	286965	73120	Kerbside	Diffusion Tube	100	100	22.28	28.85	28.71	26.68	25.95
64	286985	73111	Kerbside	Diffusion Tube	91.66666667	91.66666667	23.36	21.08	19.93	18.02	18.21
65	285518	71018	Kerbside	Diffusion Tube	100	100	30.76	30.76	29.45	28.19	28.52
66	288339	66936	Kerbside	Diffusion Tube	100	100	39.03	24.37	20.50	18.84	18.17
67	288487	66690	Kerbside	Diffusion Tube	100	100	**41.43**	26.54	23.63	19.67	21.38
68	296485	77134	Kerbside	Diffusion Tube	91.66666667	91.66666667				13.04	13.01

69	284813	72062	Kerbside	Diffusion Tube	100	100	12.86	15.31	14.30	14.35	11.56
BP	Roadside	Automatic	Roadside	Automatic	71.62	71.62	19.82	0.00	11.39	31.90	22.63
HR	Roadside	Automatic	Roadside	Automatic			29.01	0.00	18.51	39.26	

☒ **Diffusion tube data has been bias corrected (confirm by selecting in box)**

☒ **Annualisation has been conducted where data capture is <75% (confirm by selecting in box)**

☒ **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 adjustment (confirm by selecting in box)**

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.**

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

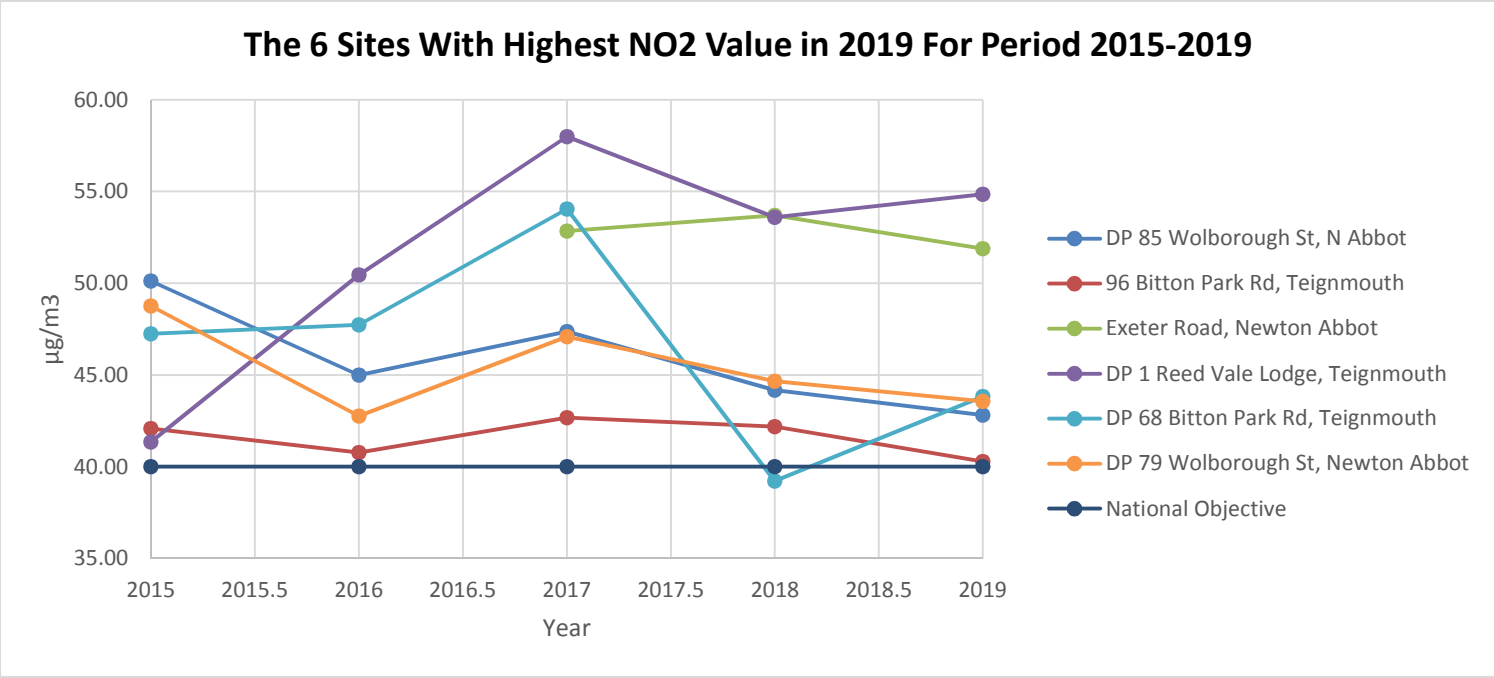


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
							2015	2016	2017	2018	2019
HR	285681	71393	Roadside	Automatic	No data	No data	No data	No data	3	0	no data
BP	293363	73094	Roadside	Automatic	71.62	71.62	No data	No data	0	0	0

Notes:

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.**

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

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

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

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} Annual Mean Concentration (µg/m³) (3)				
						2015	2016	2017	2018	2019
Mag	283220	75972	Roadside			25.79	No Data	26.98	31.87	removed from site
Brow Hill	283149	75937	Special			No Data	No Data	No Data	25.7	removed from site
Magnolia	283220	75972	Special			49.38	No Data	No Data	18.85	removed from site
A38	283435	75826	Special			No Data	No Data	No Data	15.44	removed from site
Queen Street	286617	71332	Roadside	91	91	No Data	No Data	No Data	13.82	11.91
Battle Road	282813	75775	Special			No Data	No Data	No Data	10.89	removed from site

☒ **Annualisation has been conducted where data capture is <75%** **(confirm by selecting in box)**

Notes:

Exceedances of the PM_{10} annual mean objective of 40µg/m³ are shown in **bold.**

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

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

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} 24-Hour Means > 50µg/m³ (3)				
						2015	2016	2017	2018	2019
Mag	283220	75972	Roadside	removed during 2019	removed during 2019	**No Data**	**No Data**	31	**48**	**Removed**
Brow Hill	283149	75937	Special	removed during 2019	removed during 2019	**No Data**	**No Data**	**No Data**	**37**	**Removed**
Magnolia	283220	75972	Special	removed during 2019	removed during 2019	0	**No Data**	**No Data**	12	**Removed**
A38	283435	75826	Special	removed during 2019	removed during 2019	**No Data**	**No Data**	**No Data**	0	**Removed**
Queen Street	286617	71332	Roadside	91%	91%	**No Data**	**No Data**	**No Data**	0	0
Battle Road	282813	75775	Special	removed during 2019	removed during 2019	**No data**	**No Data**	**No Data**	0	**Removed**

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold.**

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.93) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
1	287396	69902	47.05	36.36	27.05	26.78	27.09	28.85	26.65		27.11	28.58	29.20	28.80	30.32	28.20	
2	293277	73095	35.77	48.57	38.74	42.83	30.89		37.15	23.57	33.78	30.79	33.01	37.03	35.65	33.15	
3	286967	73146	53.36	46.42	36.98	35.40	32.33	35.32	31.66	37.16	31.02	33.51	40.17	42.70	38.00	35.34	
4	285526	71010	59.09	58.89	53.54	51.86	44.00	45.88	42.59	43.96	41.09	43.39	37.67	30.48	46.04	**42.81**	
5	293387	73101	49.45	45.95	42.77	60.73	46.80	46.38	42.16	34.48	34.44	35.86	43.71	37.02	43.31	**40.28**	
6	286630	71329	45.41	37.33	34.38	40.66	32.78	29.09	28.96	25.02	29.20	27.58	40.91	30.02	33.45	31.10	
7	286718	72523	42.71	35.75	29.09	27.80	28.62	27.52	26.76	26.74	25.61	27.71	29.95	30.47	29.90	27.80	
8	285991	71158	50.70	37.28	36.71	37.78	29.83	30.36	27.55	26.72	27.23	26.62	37.22	33.40	33.45	31.11	
9	287073	70915	23.96	18.37	14.62	16.99	13.01	11.36	11.66	10.75	12.04	14.74	17.10	18.02	15.22	14.15	
10			0.14	0.25	0.12	0.14	0.11	0.10	0.02	0.00	0.04	0.10	0.10	0.00	0.09	0.09	
11	286345	71078	49.34	40.56	31.82	40.58	32.10	30.08	27.50	29.95	31.00	33.63	35.34	34.91	34.73	32.30	

12	287939	68823	27.27	22.95	17.18	15.23	17.31	16.99	14.37		14.80	17.92	23.26	17.51	18.62	17.31	
13	286061	70812	13.23	12.41	7.21	11.92	6.34	7.31	6.03	4.63	6.65	8.32	12.82	8.03	8.74	8.13	
14	288024	68769	23.20	20.02	15.13	13.43	13.04	13.45	12.37		14.00	16.72	19.16	16.59	16.10	14.98	
15	275659	69917	40.34	35.50	25.98	29.67	21.90	23.50	22.98	21.72	23.61	27.17	28.58	30.66	27.64	25.70	
16	286727	72538	46.62	38.49	34.81	31.84	28.57		28.83	31.47	30.22	32.71	34.52	32.64	33.70	31.34	
17	296299	76738	37.59	42.87	33.27	39.91	35.95	36.24	38.10	35.87	32.49	30.09	30.47	33.40	35.52	33.03	
18	287211	70496	33.27	25.18	22.38	22.01	18.44	19.51	19.69	21.83	21.36	24.78	24.71	24.03	23.10	21.48	
19	286479	71558	32.27	29.38	26.35	22.11	20.08	22.01	19.74	22.50	21.23	24.49	29.46	28.88	24.88	23.13	
20	286056	71334	27.72	25.90	18.67	24.90	14.89	16.24	15.68	14.37	17.83	17.87	22.81	19.80	19.72	18.34	
21	286056	71334	52.42	46.54	38.64	45.41	35.89	42.96	40.70	21.07	33.87	40.54	43.04	40.43	40.12	37.32	33.2
22	297737	81748	57.66	44.63	35.48	32.00	34.27	41.30	30.73		30.40		37.43	36.89	38.08	35.41	
23	286519	71344	42.06	45.09	31.14	36.90	29.19	28.69	33.66	26.06	30.08	33.20	35.32	42.29	34.47	32.06	
24	286061	71151	53.58	48.30	43.90	47.07	38.20	40.60		35.56	35.48	41.34	42.18	42.23	42.59	39.60	
25	286703	70922	50.49	39.23	38.00	36.73	36.48	34.17	37.03	31.39	33.09	33.86	36.18	33.01	36.64	34.07	
26	296175	77738	9.13	11.75	5.94	8.23	5.18	5.63	5.55	4.28	5.47	7.22	9.77	7.47	7.13	6.63	
27	293231	73085	45.97	52.74	44.90	46.52	37.49	36.38		41.63	36.81	33.55	32.66	43.83	41.13	38.26	
28	287671	67405	17.94	15.52	10.46	12.02	8.30	8.37	8.98	7.76	8.72	12.35	14.93	11.65	11.42	10.62	
29	287667	67263	17.36	15.36	9.40	14.41	9.06	9.48	8.66	6.84	8.31	11.60	16.58	8.01	11.26	10.47	

30	296281	76740	37.20	43.67	34.19	39.60	33.30	39.70	41.23	35.77	32.55	30.71	36.12	33.05	36.42	33.88	
31	286517	71336	45.17	48.26	32.51	41.75	33.23	30.90	31.47	31.96	30.96	31.51	34.05	41.41	36.10	33.57	
32	286957	73112	34.58	35.81	23.59	23.79	19.59	19.92	21.47	23.93	23.14	24.16	32.90	28.80	25.97	24.16	
33	285681	71393	50.57	49.73	47.60	36.92	41.00	40.48	39.07	42.51	42.38	41.82	39.66	47.14	43.24	**40.21**	
34	286071	71478	37.24	30.65	28.07	30.10	25.52	24.45	24.83	22.46	25.51	23.44	29.73	22.92	27.08	25.18	
35	287299	70621	43.80	34.40	28.46	29.59	27.52	22.91	23.83	18.49	24.63	24.88	37.16	24.32	28.33	26.35	
36	288111	67872	18.53	17.98	12.63	12.84	11.33	11.51	10.68	9.85	11.28	13.05	18.78	14.18	13.55	12.61	
37	284851	72101	30.73	29.24	25.08	28.21	10.34	8.46	7.49	5.55	7.58	13.07	26.35	16.10	17.35	16.13	
38	286757	72583	45.31	41.85	37.67	29.32	31.37	26.13	30.61	26.27	26.23	42.37	38.00	32.91	34.00	31.62	
39	287477	67698	24.92	20.31	18.98	18.59	17.15	16.24	16.95	15.01	13.35	18.07	21.33	17.25	18.18	16.91	
40	286987	73148	67.94		55.08	72.05	56.59	56.82	62.37	39.78	52.31	47.73	53.66	49.43	55.80	**51.89**	37.7
41	288077	68761	20.33	10.60	12.39	14.46	8.99	7.84	10.09	7.37	9.28	12.02	17.10	14.89	12.11	11.26	
42	285477	72510	30.67	33.76	22.11	29.32	21.34	22.17	24.39	17.63	21.07	26.52	28.03	31.63	25.72	23.92	
43	285681	71393	33.84	30.94	28.15	31.72	25.27	24.57	24.49	21.56	22.67	24.80	29.97	22.44	26.70	24.83	
44	285681	71393	35.89	30.81	27.91	31.57	24.73	23.40	24.80	22.15	24.12	23.95	31.86	24.78	27.16	25.26	
45	296302	76756	27.50	32.15	25.51	31.69	25.90	23.42	28.42	22.44	23.42	23.42	25.82	22.82	26.04	24.22	
46	296318	76763	33.35	31.08	26.51	25.04	26.73	26.58	26.16	26.76	23.46	25.49	29.22	28.68	27.42	25.50	
47	293256	73109	31.16	30.57	25.65	27.56	21.72	24.45	23.59	18.55	21.19	24.49	25.98	27.06	25.16	23.40	

48	293446	73091	65.23	57.74	61.81	73.34	61.54	52.95	59.79	56.76			50.61	50.06	58.98	**54.85**	
49	293541	73083		55.61	46.52	48.79	47.85	40.23	46.75	47.50	42.57		48.32		47.13	**43.83**	
50	288027	68381	31.78	24.96	17.94	18.80	14.33	15.40	14.33	12.31	15.40	20.05	24.88	20.05	19.18	17.84	
51	285674	71401	29.14	29.59	24.08	35.32	25.91	27.19	23.42	18.63	23.57	25.03	26.43	22.03	25.86	24.05	
52	287544	73067	49.26	44.88	41.22	29.71	38.35	32.45	31.02	31.98	33.13	35.15	36.51	39.28	36.91	34.33	
53	285537	71035	50.90	51.45	47.44	47.05	39.69	39.74	40.33	33.19	38.84	38.80	40.52	37.76	42.14	39.19	
54	286969	73130	48.12	45.45	38.51	37.78	29.91	29.61	30.40	31.72	31.45	39.43	37.28	39.92	36.63	34.07	
55	285554	71043	47.89	61.10	47.97	58.33	43.98	45.41	49.57	38.80	37.57	43.11	37.24	51.20	46.85	**43.57**	
56	287198	70542	35.77	30.47	26.88	26.84	23.65	22.73	23.96	23.44	23.98	24.67	23.38	22.64	25.70	23.90	
57	297724	81743	18.92	18.71	10.85	13.96	8.60		8.32	8.23	10.18	16.41	18.78	15.72	13.52	12.57	
58	288168	67516	27.31	24.08	16.71	16.77	13.51	14.05	14.53		14.89		22.28	18.26	18.24	16.96	
59	286730	72518	38.88	40.62	31.63	28.87	26.57		24.41	28.48	18.67	29.35	27.85	34.35	29.97	27.87	
60	293363	73094	24.45	29.07	20.99	28.85	20.44	19.88	23.21	18.53	21.21	21.39	26.17	19.28	22.79	21.19	
61	293363	73094	22.75	28.46	19.51	29.57	21.44	19.39	23.75	17.34	21.21	20.13	28.56	19.28	22.62	21.03	
62	293363	73094	23.05	28.97	19.53	30.81	21.60	19.14	23.16	18.14	19.80	18.97	27.76	5.41	21.36	19.87	
63	286965	73120	40.19	35.38	31.47	30.92	25.04	21.72	25.39	23.63	10.34	27.65	30.26	32.79	27.90	25.95	
64	286985	73111	26.64	26.60	18.98	18.96	13.82	13.53	14.51	13.12		19.02	28.69	21.52	19.58	18.21	
65	285518	71018	39.37	35.36	35.11	31.22	30.52	28.13	28.89	25.33	26.25	27.73	30.96	29.09	30.66	28.52	

66	288339	66936	28.93	24.36	19.21	20.27	16.53	16.05	17.84	16.07	15.83	19.56	18.37	21.41	19.53	18.17	
67	288487	66690	31.51	28.85	20.64	25.74	18.98	18.24	18.87	17.87	19.45	23.70	27.48	24.50	22.99	21.38	
68	296485	77134	18.61	20.43	13.86	15.60	10.50	10.73	11.60	8.85	11.55	13.79	18.35		13.99	13.01	
69	284813	72062	22.01	19.78	17.44	15.03	8.12	8.11	6.62	6.35	7.29	11.29	13.41	13.69	12.43	11.56	

☐ **Local bias adjustment factor used (confirm by selecting in box)**

☒ **National bias adjustment factor used (confirm by selecting in box)**

☒ **Annualisation has been conducted where data capture is <75% (confirm by selecting in box)**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column (confirm by selecting in box)**

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.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

QA/QC of Automatic Monitoring

NO_x Analysers

The guidance contained in Technical Guidance LAQM.TG (09) advises that a well-documented quality assurance and quality control programme must be followed in order to ensure reliable and credible measurements. An ongoing resource commitment to QA/QC is required in any monitoring survey, to ensure that measurements fully comply with the requirements of the air quality review and assessment and are therefore fit for the purpose.

The fundamental aims of the QA/QC programme are as follows:

- Data should be representative of ambient concentrations existing in the area under investigation.
- Measurements need to be sufficiently accurate and precise to meet the defined monitoring requirements.
- Data must be intercomparable and reproducible. Results from multi-site networks need to be internally consistent and comparable with national, international or other acceptable standards.
- Measurements should be consistent over time, particularly if long-term trend analysis is to be undertaken.

QA/QC procedures were applied to both sets of automatic monitoring data throughout the monitoring periods. The Chemiluminescent analysers are continuous automatic real time monitors and are housed in 'M' type purpose built air-conditioned enclosures. In order to minimise measurement uncertainty it is important to apply stringent QA/QC procedures to monitoring programmes. The following procedures were carried out in Teignbridge in order to meet the criteria.

Calibration Checks

The following calibration checks were carried out: -
• Daily 'automatic' calibration
• Fortnightly manual calibrations
• 6 monthly reference calibrations

During the daily automatic calibration, a two point calibration is used to quantify the analyser 'zero' and 'span' response. The 'zero' response is the response of the analyser when the pollutant species being measured is not present in the sample air stream. The 'span' response is the response, of the analyser to a gas mixture of accurately known concentration. In order to ensure reproducible data quality, automatic monitoring instruments must be properly calibrated using reliable and traceable calibration standards.

The gas mixture was of mixture type U, nitric oxide 2.5 and nitrogen 5.0, and was provided by E.T. under the service and maintenance contract. Teignbridge trained staff

carried out the fortnightly calibration checks and the visits included checking the equipment, sampling systems and security of the enclosure and analyser. E.T. carries out the six monthly reference calibrations and the last one was completed on the 3rd/4th June 2009.

Equipment Service and Maintenance

Teignbridge has an ongoing service and maintenance contract with E.T. for the NOx Analysers. The contract provides the following cover:-

- Routine six monthly service visits in accordance with the manufacturers instruction and warranty conditions;
- Guaranteed breakdown call out service;
- Written reports showing work carried out and status of instrumentation;
- All work and documentation is carried out in accordance with BS ISO 9002;
- Dedicated telephone support in normal working hours.

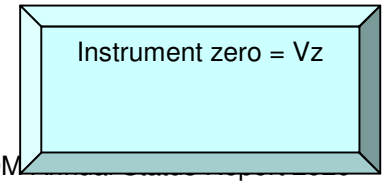
Data Capture

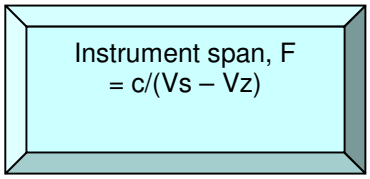
The LAQM.TG(16) recommends a data capture rate of 90% for ratified (usable) data. Teignbridge employs the following methods to ensure maximum data capture: -

- The deployment of a proven NOx analyser;
- Automatic daily data collection using dedicated software (Opis EnviMan using the ComVisioner and Reporter modules). This enabled frequent checks of the data so that on-site problems could be identified quickly;
- M200A in built data storage capability;
- Rapid servicing, maintenance and repair;
- Comprehensive and documented site operational protocols;
- Regular and frequent site visits;
- Trained Teignbridge staff operators.

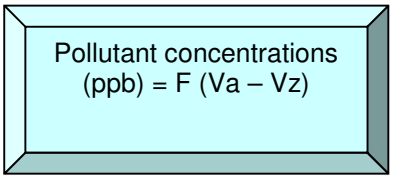
Data Processing

The M200A records the concentration of pollutants as continuous analogue voltage signals.
The signal is averaged over an hour period. An in-built data logger carries out this averaging process and the data is then downloaded via a modem to a computer in the Environment & Safety Services team. The modem is automatically dialled up three times a day at set times. The raw data collected has to be converted to more useful pollutant concentrations and this conversion is achieved using the 'zero' and 'span' calibration factors that are recorded during the manual fortnightly visits. The two-point calibration quantify's the analyser 'zero' and 'span' response. The 'zero' response, Vz, is the response in measurement units of the analyser when the pollutant species being measured is not present in the sample air stream. The 'span' response, Vs, is the response of the analyser to an accurately known concentration, c, in ppb (parts per billion) of the pollutant species. The instrument 'zero' and 'span' factors are then calculated using these data as follows:





Ambient pollution data are then calculated by applying these factors to logged output signals as follows:



Where Va is the recorded signal from the analyser sampling ambient air. The fortnightly calibration factors applied to the raw data are then filed.

Data Ratification

Once the calibration factors have been applied to the raw data, the data is screened, by visual examination to see if they contain any spurious and/or unusual measurements. Any suspicious data, such as large spikes or spurious high concentrations can be 'flagged' and investigated more fully. This process is known as validation. Data validation is followed by data ratification, which is carried out at 3 – 6 month intervals. Steps in the ratification process included: -

- Examination of calibration records to ensure correct application of calibration factors;
- Examination of data for other pollutants and monitoring sites to highlight any anomalies;
- Deletion of data shown i.e. spikes generated by the analyser;
- Correction of any baseline drift as indicated by examination of daily calibration records;
- Examination of any local scale changes to the site environment;
- Application of correction factors from QA/QC audits.

When data verification has been completed then the data is ready for further statistical and critical examination for reporting purposes.

Data Annualisation

The NOx analyser data is annualised where the % data capture for the period is below 75%. The data is annualised by using three representative sites from the AURN which are detailed below (Glazebury, Ladybower, Wicken Fen).

AURN						
Monthly mean $NO_2 \mu g/m^3$						
	Glazebury	Ladybower	Wicken Fen			
January	25.79	8.31	13.74			
February	23.00	9.86	14.86			
March	10.77	5.14	8.48			
April	13.33	8.88	7.90			
May	10.84	5.61	6.23			
June	9.53	4.63	4.80			
July	8.17	4.33	4.81			
August	8.35	3.62	4.29			
September	10.23	4.43	5.37			
October	13.20	5.43	7.55			
November	24.24	9.59	11.47			
December	19.00	5.71	11.68			
ANNUAL MEANS	14.71	6.30	8.43			
PERIOD MEANS	13.72	6.30	8.14			
RATIO	1.07	1.00	1.04		RATIO AVERAGE	1.04

QA/QC of the BAM

The BAM-1020 is a continuous automatic real time analyser with a Graseby Anderson 10 sampling lead. It is housed in an M type purpose built air-conditioned enclosure.

The following procedures were carried out in Teignbridge in order to meet the criteria.

Calibration Checks

The BAM-1020 has a built in Mass Membrane Calibrator. The membrane is automatically moved into the Beta Pathway to determine the mass of the membrane each hour or when the filter tape advances. Each membrane has a factory verified mass and the value is stored in the BAM-1020. When the hourly membrane calibration is made, the computed value is compared to the stored factory value to determine proper operation. Should the instrument fail to perform to specification an error is logged in memory and data is flagged.

Zero testing of blank filter paper is performed at the beginning and end of each sample period to ensure the stability of the measurement system.

E.T. also carries out 6 monthly calibrations under the service and maintenance contract.

Equipment Service and Maintenance

Teignbridge has an ongoing service and maintenance contract with E.T. The contract provides the following cover:-

- Routine six monthly service visits in accordance with the manufacturers instruction and warranty conditions
- Guaranteed breakdown call-out service
- Written reports showing work carried out and status of instrumentation
- All work and documentation is carried out in accordance with BS ISO 9002
- Dedicated telephone support in normal working hours

The monitoring equipment has routine (fortnightly) on site checks and maintenance visits by Teignbridge staff. These routine visits include regular filter changes, sampling head cleaning, filtering tape changes and airflow/analyser test function checks at set intervals.

Non-routine visits, as a result of equipment failure or spurious data, are also carried out. All visits are fully documented and details kept of all works carried out i.e. adjustments, modifications and repairs completed.

BAM Monitoring Adjustment

The un-heated BAM inlet meets the equivalence criteria for PM_{10} monitoring, provided the results are corrected for slope. The measured concentrations have been divided by a factor of 1.21.

QA/QC of Osiris Monitors

The Osiris monitors are real-time, portable particulate matter monitors that use light-scattering technology to measure the concentration of different sized particles (PM_1, $PM_{2.5}$ and PM_{10}). Although Osiris' are not an approved method for measuring PM_{10} levels, as it is not possible to compare directly with the air quality objectives, it does provide indicative levels. The monitors are much easier and cheaper and less labour intensive than gravimetric analysers.

Teignbridge has an ongoing service and maintenance service contract with Turnkey Instruments Ltd for each of the monitors. The monitors are routinely checked every 3 months by trained Teignbridge DC officers. This involves a filter change and air flow test of the pump. The following parameters are also logged in a maintenance book filter minutes, filter weight and pump hours. The monitors are sent back to Turnkey Instruments annually for a complete service and calibration.

The monitors are dialled up weekly by trained Teignbridge DC officers and the data is downloaded onto Air Q for windows software. The data is screened by visual examination.

QA/QC of Diffusion Tube Monitoring

The NO_2 tubes diffusion tubes are analysed by Gradko International Limited in Winchester utilising 20% TEA in water for a 1-month exposure duration. Periodically samples of tubes prepared for exposure are spiked with known concentrations of nitrate solution and measured. Blank tube values are also monitored from each new batch of tubes prepared. Once a month, a stock solution containing a known amount of nitrate is received from AEA Technology and measured. The results are used as part of the UK NO_2 Survey QA/QC scheme. This stock solution is used by Gradko to check the ultra-violet spectrophotometer calibration graph. Gradko also participate in the inter-laboratory round robin exercise via the WASP scheme. The performance of the laboratory is rated as satisfactory in the centralised AIR NO_2 PT scheme for quality assurance and quality control.

Gerry Stuchbury of Gradko International also sits on the Working Group on the Harmonisation of Diffusion Tubes. The Working Group's aim was to harmonise the methodology used in preparing, utilising and analysing diffusion tubes.

Diffusion Tube Bias Adjustment

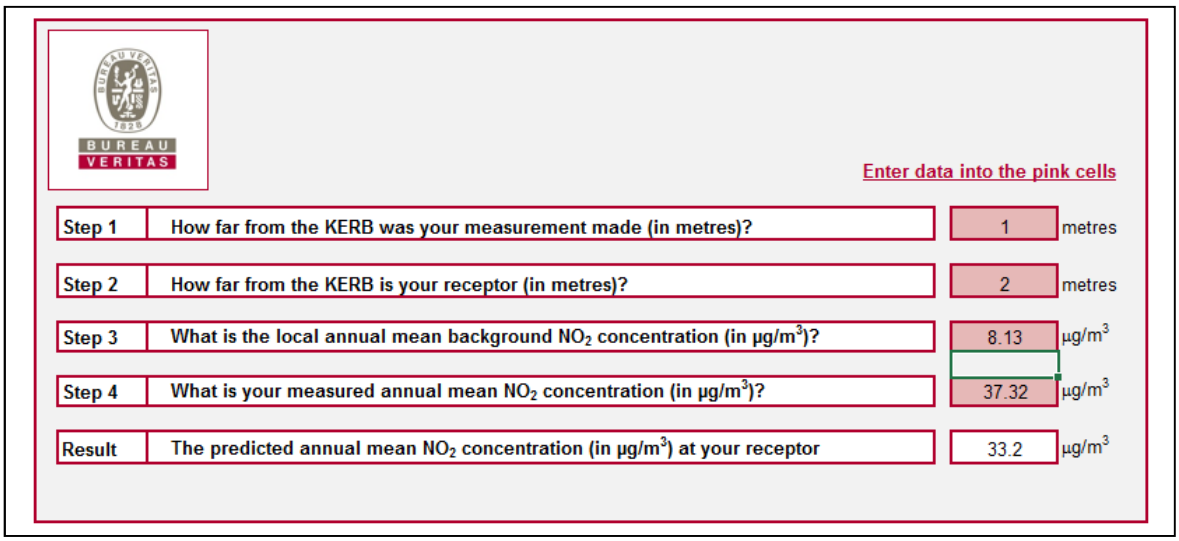
This authority uses a national bias adjustment figure. The diffusion tube bias adjustment factor is found from the DEFRA spreadsheet provided at https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. The March 2020 spreadsheet was used, providing a bias adjustment figure for 2019 for Gradko diffusion tubes using a 20% TEA in water analysis method of 0.93.

Diffusion Tube Distance Adjustment

The diffusion tube results which are from tubes which have an bias adjusted mean of >36µg/m^3 and which have a relevant exposure which is not collocated with the tubes require distance adjustment for the nearest relevant exposure.

This is achieved using the DEFRA tool for distance adjustment found at https://laqm.defra.gov.uk/review-and-assessment/tools/tools.html.

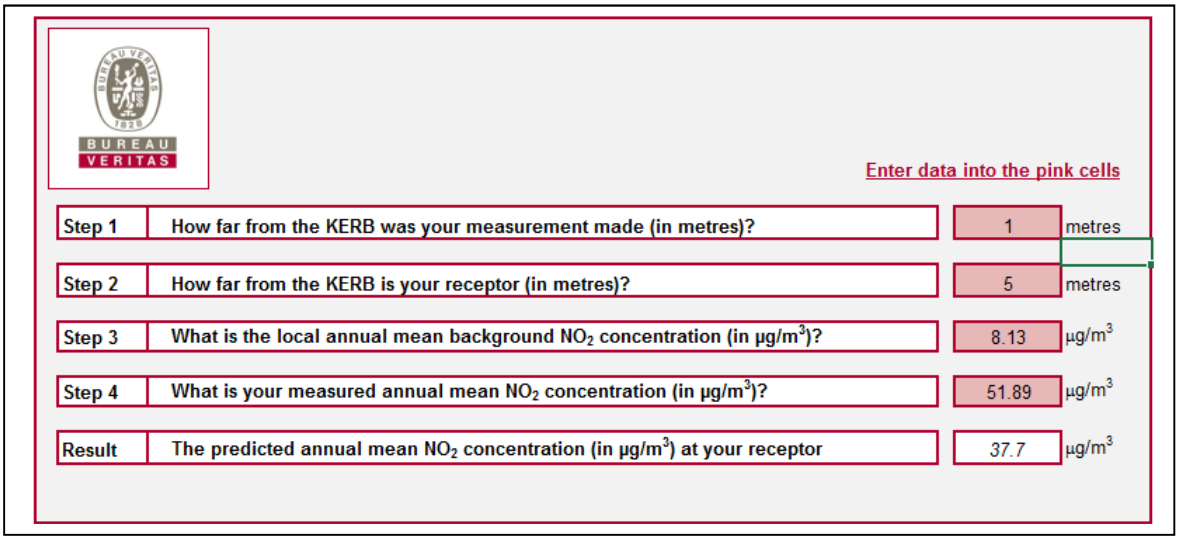
The two sites which required distance adjustment were sites 21 and 40. Site 13 is our urban background site for Newton Abbot and so the bias adjusted mean for this site was used for the 'local annual mean background NO_2' figure. Below are the calculations for each site.



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1	metres
Step 2	How far from the KERB is your receptor (in metres)?	2	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	8.13	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	37.32	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	33.2	µg/m^3

Calculations for site 21.



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1	metres
Step 2	How far from the KERB is your receptor (in metres)?	5	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	8.13	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	51.89	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	37.7	µg/m^3

Calculations for site 40.

NO_2 Diffusion Tube Handling Procedures

Teignbridge District Council's NO_2 diffusion tube monitoring is carried out in full accordance with the site quality assurance procedures contained in the UK Automatic Network Site Operator's Manual. Teignbridge also participates in the NO_2 UK Network.

Data Quality Objective and Roles

Adopted within our Policy and Strategy are our Council's Data Quality Objectives which have been drafted to create a memorable acronym **(HEART).** The objectives embrace the Audit Commissions data quality guidance and encompass the six characteristics that they use to define quality data as data that is: accurate, valid, reliable, timely, relevant and complete. These six characteristics are incorporated into our data quality objectives which we use throughout the year to test compliance and help us ascertain any likely risk.

Held by	**who has responsibility for specific data**
Evidenced	**audit trail or work complaint with good data quality procedures**
Accurate	**decision-makers should be clear about their information requirements for accuracy**
Relevant	**must be sure that it describes the actual state under discussion (doesn't mislead).**
Timely	**Data captured is reported yearly using an Annual Status Report format set out by central government**

Tubes received / stored / put out following current NOx route / recovered / and sent to Gradko in accordance with nationally approved handling procedure. In March 2018 procedure reviewed via webinar to ensure methodology is consistently applied. Results come back and are screened by Technical Officers for obvious anomalies. Technical Support Officers enter data into spreadsheet. Random checks carried out by BW to verify data received with data inputted.

Spreadsheet has inbuilt conditional format which is designed by Data Officer who applies current government guidance to do so. Spreadsheet has been set to show all exceedances over N/Objective.

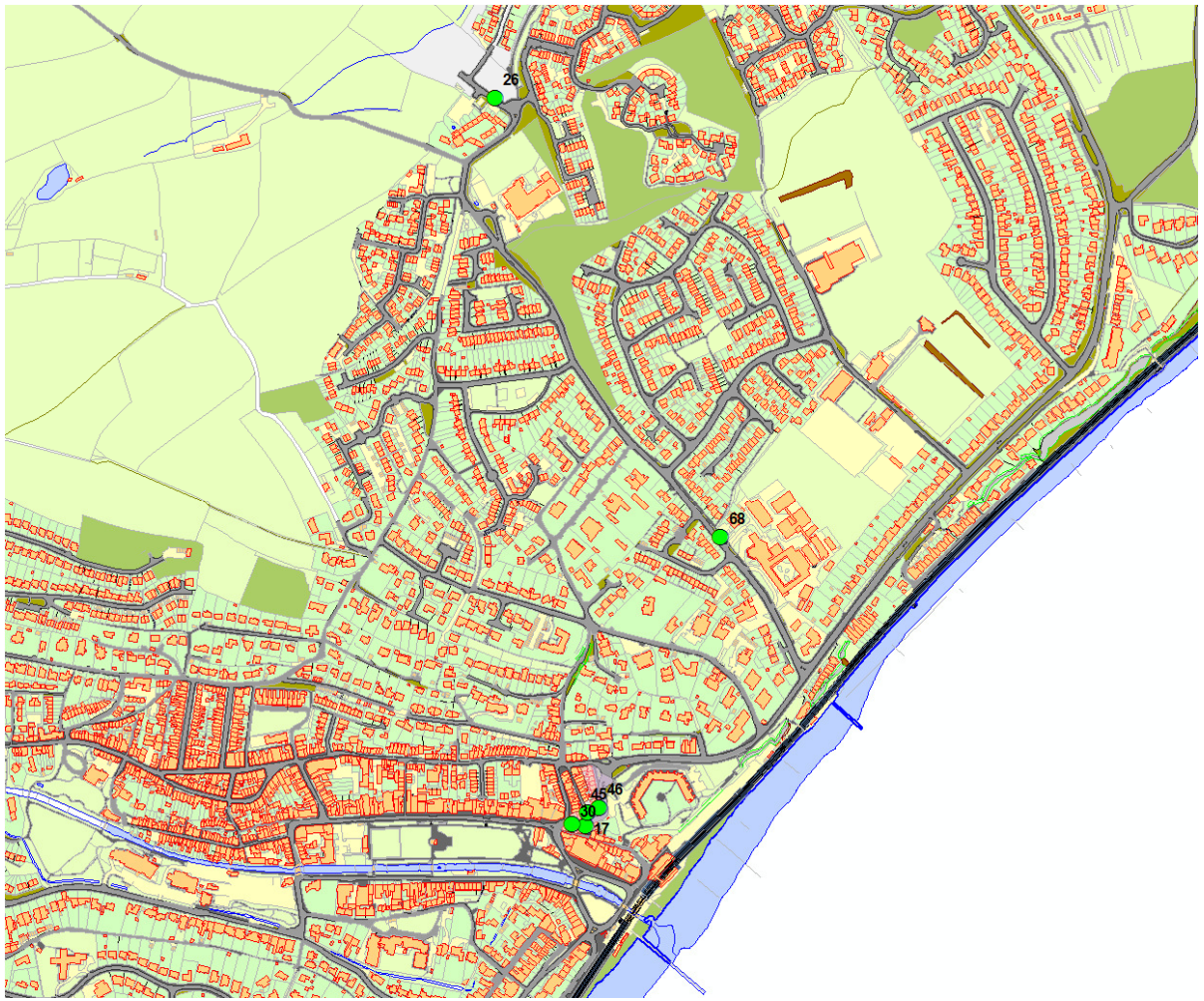
Data captured is reported yearly using an Annual Status Report format set out by central government

ROLE/PROMPT	DETAIL OF TASK (With links)	OFFICER	FREQUENCY
New Tubes received through the post	Tubes placed in refrigerator storage	Any	monthly
New Tubes numbered up	New tubes are numbered up based on current location sheet and returned to refrigerator storage asap G:\Environment & Safety Service\Environmental Control\92NOISE&AIRPOLLUTION\922AIRPOLLUTION\9226Air Quality Review\Monitoring\NOX TUBE Info about\TUBE Collection Routes and Calendars	Technical Officer	monthly
Tubes put out and old tubes recovered	Gather in the old tubes and install the new tubes. Complete the "Current NOx location sheet" using waterproof marker pen.	See rota for the year	monthly
Old Tubes placed in fridge	On return to office old Tubes placed in fridge asap, and completed the current NOx location sheet put into Ian Roberts IN tray	See rota for the year	

Package and return Old Tubes to Gradko	Carried out within 2 days of recovering tubes, package and return "old tubes" to Gradko following "Procedure for sending off Diffusion Tubes 2013" G:\Environment & Safety Service\Environmental Control\92NOISE&AIRPOLLUTION\922AIRPOLLUTION\9226Air Quality Review\Monitoring\NOX TUBE Info about	Technical Officer	Within 2 days Monthly
Notify any missing tubes	Email to Becky W and Colin B about any missing tubes, any observations.	Technical Officer	
data entry to spreadsheet.	Up to 3 weeks after postage results email is sent from Gradko to Ian R and they are copied and saved to excel spreadsheet "NOx Tubes 2018" Z:\Environment & Safety Service\Environmental Control\92NOISE&AIRPOLLUTION\922AIRPOLLUTION\9226Air Quality Review\POLLUTANT DATA\Nitrogen Dioxide\2018	Technical Officer	monthly
Random checks of data received against data inputted to excel Spreadsheet	Check to verify that data received has been accurately transposed to the spread sheet. Also to identify emerging issues e.g. repeated missing tubes, random outlier results, significant variations between reference monitors and co-located tubes.	Technical Officer	Quarterly Minimum
Review of in built conditional format	Excel spreadsheet "NOx Tubes 2018"has an inbuilt conditional format designed to process the raw data. The design applies current government guidance (LAQM T G 16*) to highlight all exceedances over the current National Objective *See…… Z:\Environment & Safety Service\Environmental Control\92NOISE&AIRPOLLUTION\922AIRPOLLUTION\9226Air Quality Review\GUIDANCE Defra GOV.UK LAQM Technical Guidance 2016	Data Officer	Yearly
Calculate yearly Annual Bias adjustment	Calculate yearly Annual Bias adjustment factor using National figure issued by Defra (usually announced in March). to show no of tubes exceeding in the year	Data Officer	Yearly
Apply Annual Bias adjustment	Apply Annual Bias adjustment factor to the Excel spreadsheet "NOx Tubes 2018" and calculate and complete the Annualised Bias Adjusted Mean for each tube location	Data Officer	Yearly

Review of processed Data	Review data processing to make sure it satisfies the validation and ratification criteria of current government guidance (LAQM T G 16*)	Technical Officer	
Annual Status Report	Data reported yearly using an Annual Status Report format set out by central government	Technical Officer	By the end of the following June
Review of NOx tube locations	Yearly Screening Review of results from current NOx tube locations (in context of current guidance (LAQM T G 16*) and identify any locations that should be made redundant and any new locations needed to be established to better inform about potentially emerging local air quality issues	Technical Officer	Yearly
Review all procedures for the capture and reporting of air quality data	Carry out review by applying the **H.E.A.R.T.** principles of the Council's Data Quality Objectives…. **H**eld by Who has responsibility for specific data **E**videnced Audit trail or work complaint with good data quality procedures **A**ccurate Decision-makers should be clear about their information requirements for accuracy. **R**elevant Must be sure that it describes the actual state under discussion (doesn't mislead). **T**imely Data captured is reported yearly using an Annual Status Report format set out by central government.	Technical Officer	Yearly

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



LEGEND

AQMA area

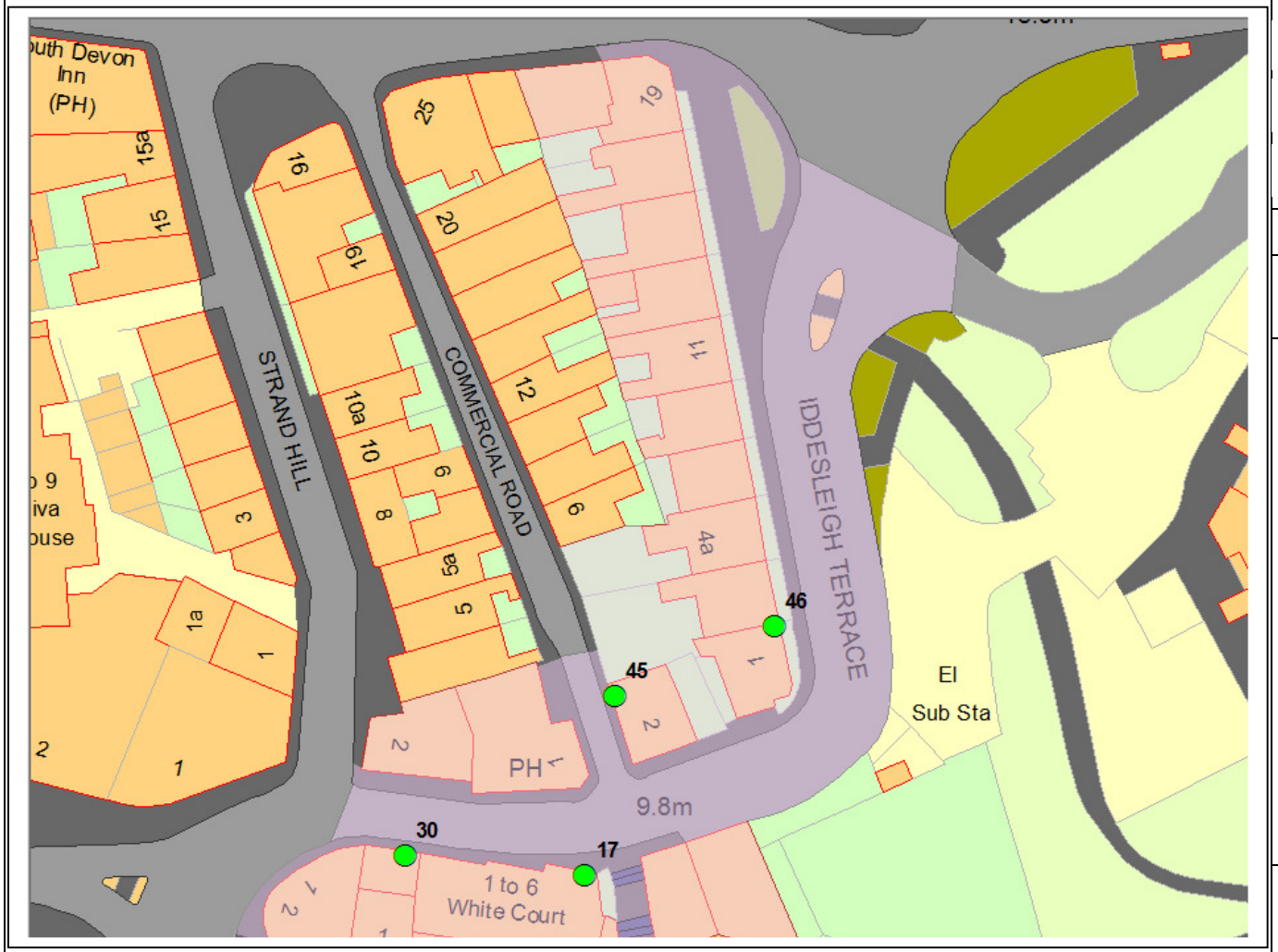
NO_2 Tubes

Continuous Monitoring Sites

Location: **Dawlish AQMA and Surroundings**

Dawlish AQMA and Surroundings, including NO_2 Diffusion Tube Locations

29/07/2020	**Figure No. 1**



LEGEND

- **AQMA area**
- **NO_2 Tubes**
- **Continuous Monitoring Sites**

Contains Ordnance Survey Data Crown Copyright and Database Right [2020]

Location: **Dawlish AQMA**

Dawlish AQMA, including NO_2 Diffusion Tube Locations

29/07/2020	**Figure No. 2**

LEGEND

- **AQMA area**
- **NO_2 Tubes**
- **Continuous Monitoring Sites**

Location: **Heathfield**

Heathfield continuous monitoring sites.

29/07/2020	**Figure No. 3**

LEGEND

AQMA area

NO_2 Tubes

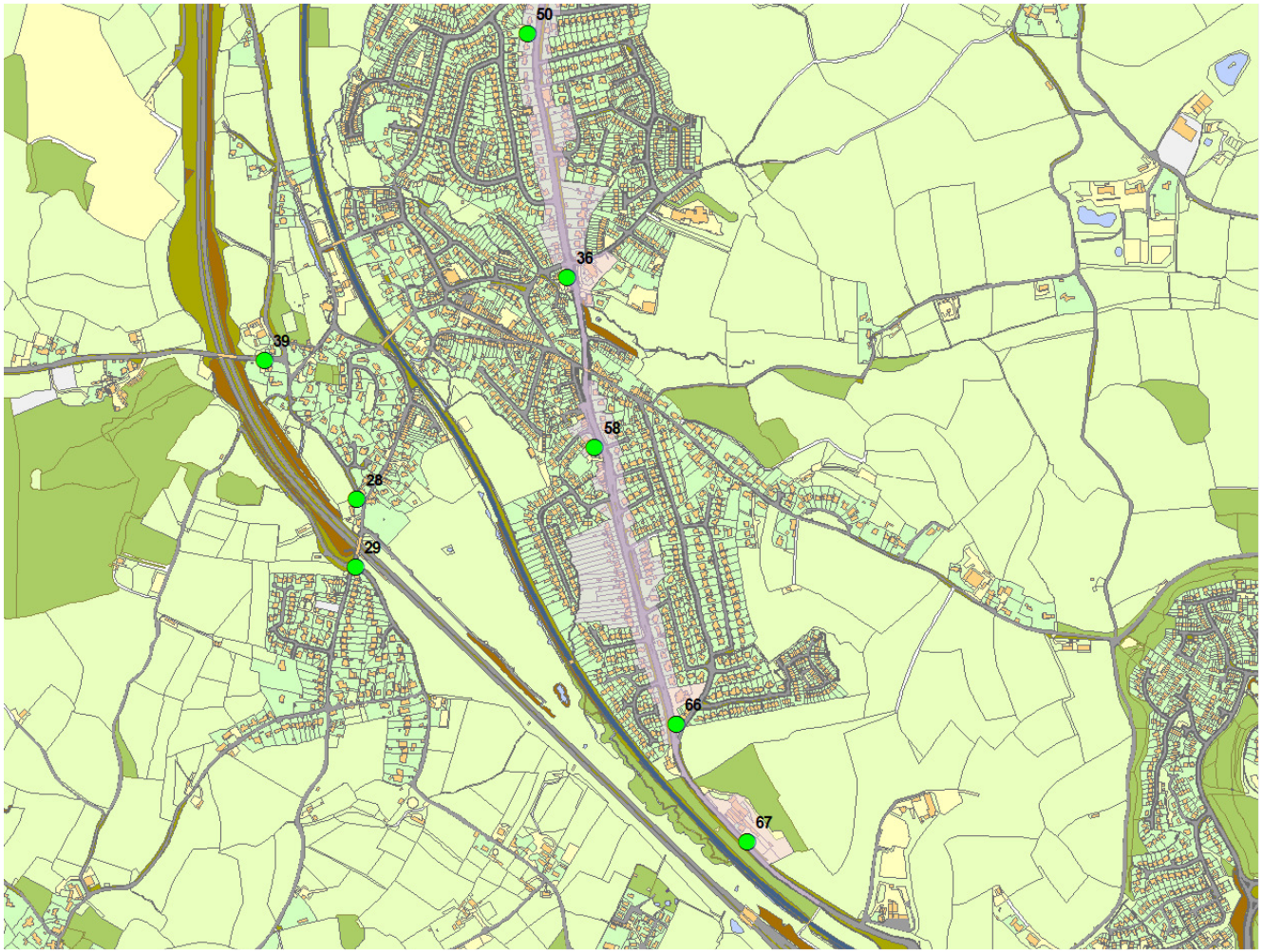
Continuous Monitoring Sites

Location: **Kingskerswell AQMA North**

Kingskerswell AQMA North, including NO_2 Diffusion Tube Locations

29/07/2020

Figure No. 4



LEGEND

AQMA area

NO_2 Tubes

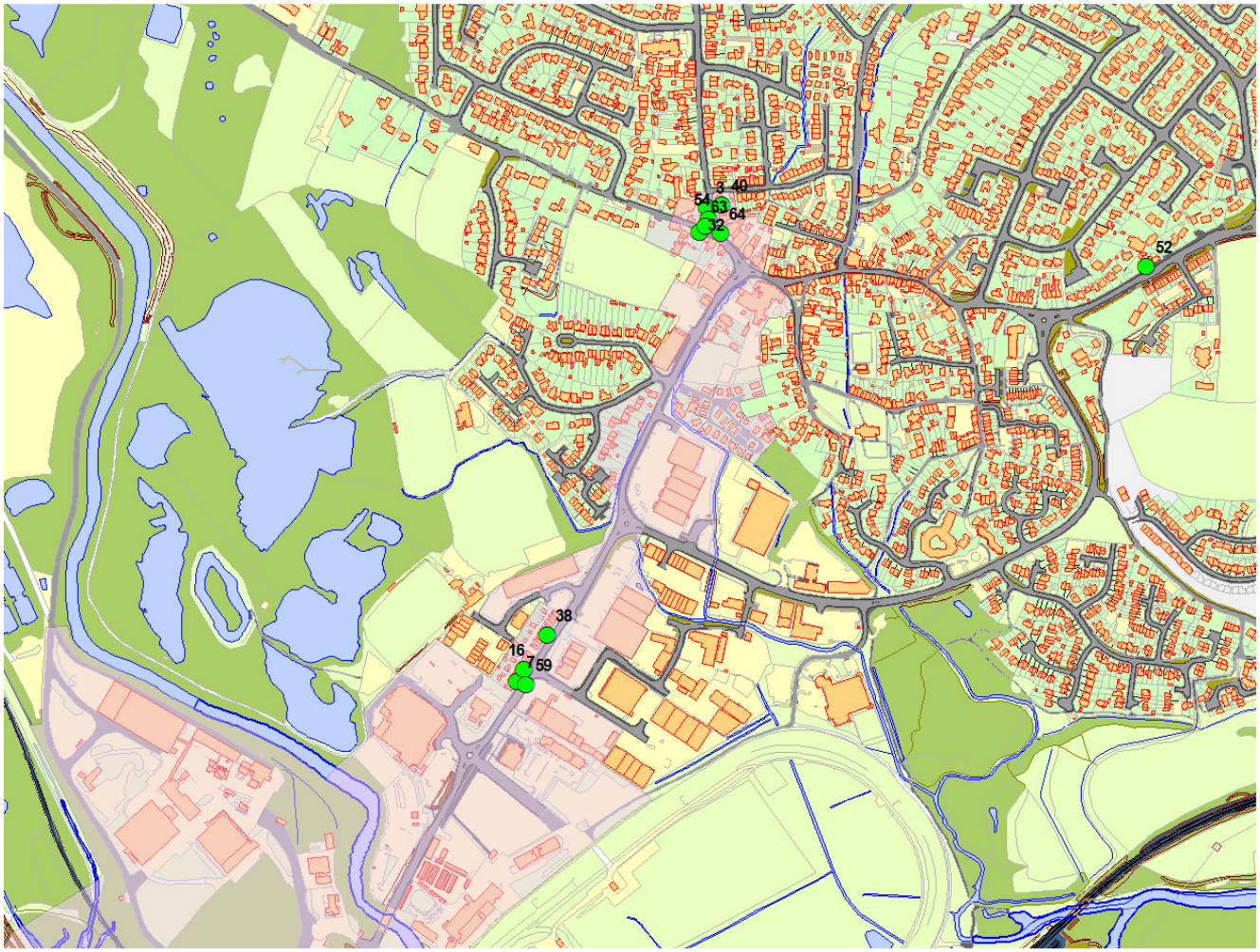
Continuous Monitoring Sites

Location: Kingskerswell AQMA South

Kingskerswell AQMA South, including NO_2 Diffusion Tube Locations

29/07/2020

Figure No. 5



LEGEND

AQMA area

NO_2 Tubes

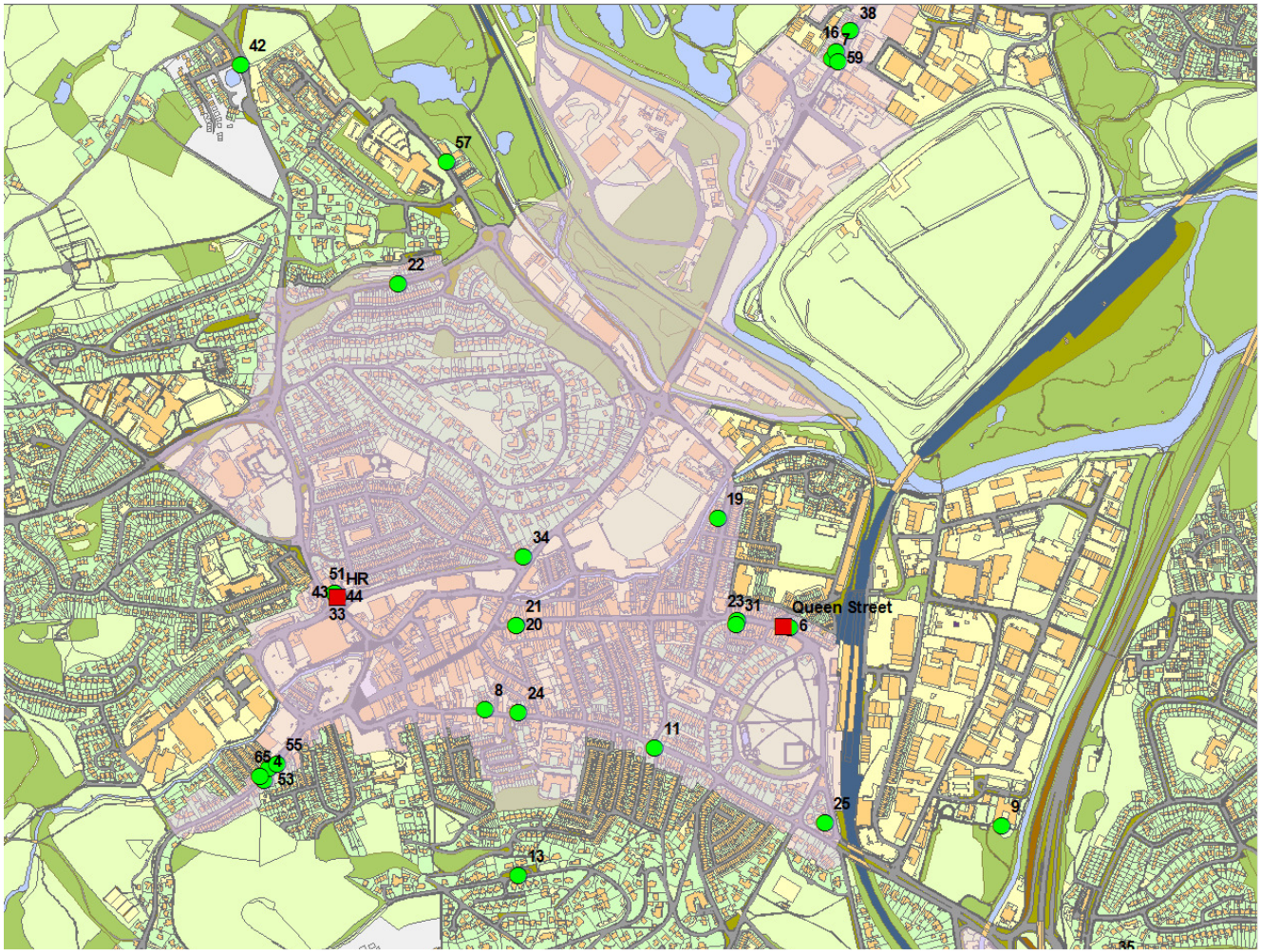
Continuous Monitoring Sites

Location: **Kingsteignton AQMA**

Kingsteignton AQMA, including NO_2 Diffusion Tube Locations

29/07/2020

Figure No. 6



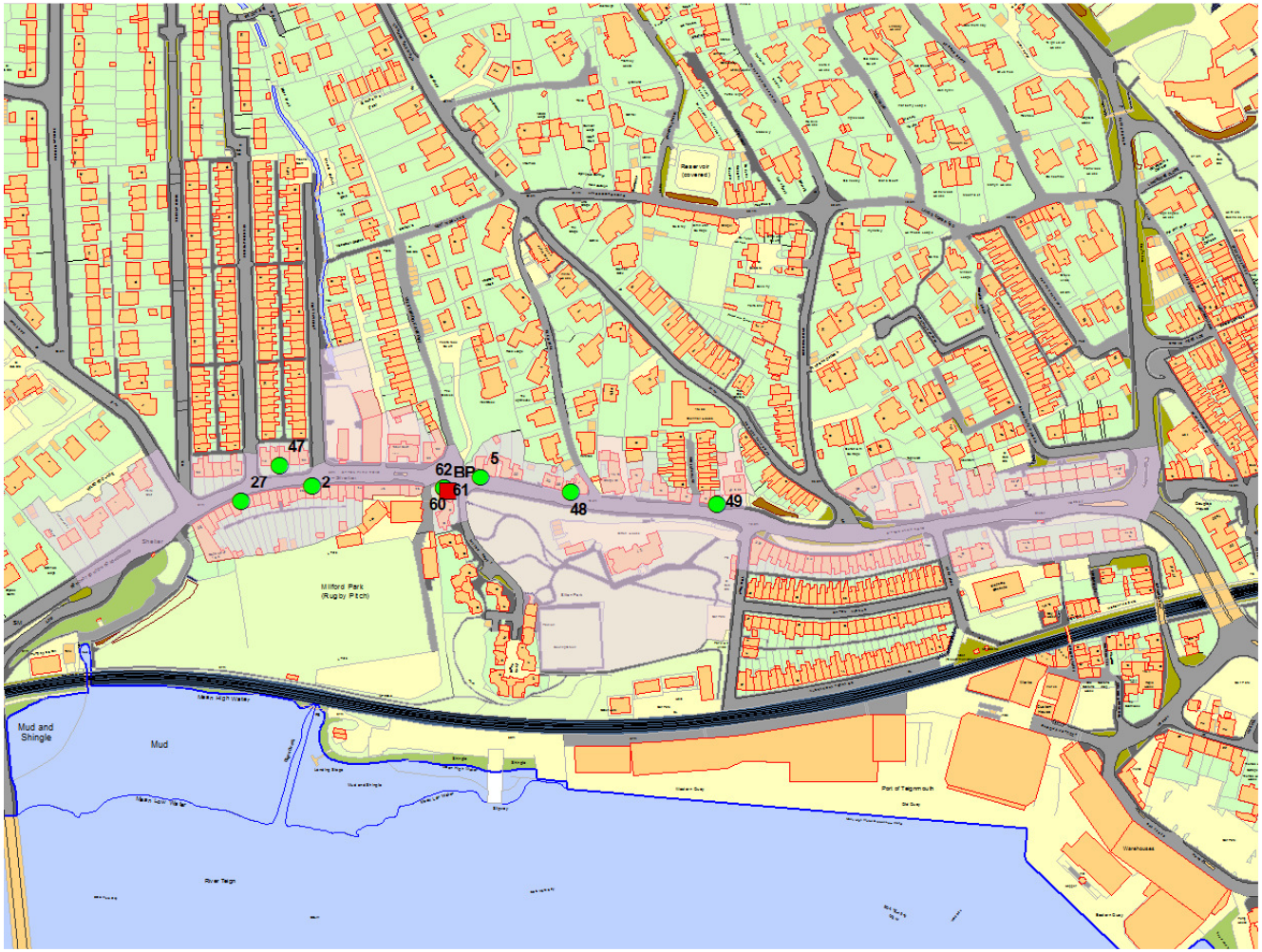
LEGEND

- **AQMA area**
- **NO_2 Tubes**
- **Continuous Monitoring Sites**

Location: **Newton Abbot AQMA**

Newton Abbot AQMA, including NO_2 Diffusion Tube Locations and continuous monitoring site locations.

29/07/2020	**Figure No. 7**



LEGEND

AQMA area

NO_2 Tubes

Continuous Monitoring Sites

Location: **Teignmouth AQMA**

Teignmouth AQMA, including NO_2 Diffusion Tube Locations and continuous monitoring locations.

29/07/2020

Figure No. 8

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[6]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[6] 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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) 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
TDC	Teignbridge District Council

References

Teignbridge District Council website www.teignbridge.gov.uk

Teignbridge District Council Action Plan 2010 https://www.teignbridge.gov.uk/environmental-health-and-wellbeing/climate-change/air-quality/

National bias adjustment factor spreadsheet https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

Local Air Quality Management Technical Guidance 2016 – LAQM.TG (16)