2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: October 2022

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Executive Summary: Air Quality in Our Area

Air Quality in South Hams and West Devon

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

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

This Annual Status Report (ASR) on Air Quality serves to provide a picture of air quality in South Hams and West Devon in recent years. Our websites also give information on air quality in our areas see;

www.southhams.gov.uk

www.westdevon.gov.uk

Monitoring of air quality within both Council areas is for Nitrogen Dioxide using diffusion tubes. This is the only monitoring currently undertaken but the aim has always been to select the worst-case relevant locations for monitoring so that officers can screen out areas where necessary and remain attentive to those where there are problems.

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

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2021

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

There are three Air Quality Management Areas (AQMAs) in the South Hams, the first of these was declared in 2005 and constitutes just one residential property which is situated immediately next to the A38 Devon Expressway.

The other two are both in market towns (Ivybridge and Totnes). These were declared in 2009 though the Totnes one was extended due to new monitoring data in 2016.

All of the South Hams AQMAs were declared because of the exceedance of the annual average Nitrogen Dioxide (NO_2) objective of 40ug/m^3 at relevant receptors, and the main source of this pollutant at all locations is road traffic.

In general, Nitrogen Dioxide levels both in AQMAs and in areas outside AQMAs in our council areas have shown a recent, very noticeable decline – particularly in the last three years.

At Dean Prior the appropriately adjusted diffusion tube result from a tube located at the worst (highest NO_2 concentration) position declined from 69ug/m^3 in 2016 to a level of 61ug/m^3 in 2019 and to 48.1ug/m3 in 2021(see Appendix F of this report).

Levels in the original Totnes AQMA had hovered around the 40ug/m^3 level at the original worst case location for many years with no obvious decline until 2019 when they reduced to 37ug/m^3. They were lower again in 2020, which may have been because of Covid and reduced traffic levels. However, in 2021 the appropriately adjusted result for the worst case location was just 29.5 ug/m^3.

When the Totnes AQMA was extended, it was to include a newly found pollution hotspot at True Street junction. Levels there were still exceeding the objective level for annual average NO_2 in recent years; levels of around 48ug/m^3 were monitored there in 2018 and 2019 though this was substantially lower than the 56ug/m^3 monitored in 2017. The appropriately adjusted 2021 level is 33.7 ug/m^3, bringing this location below the annual mean NO_2 objective for the first time since monitoring there began.

The Ivybridge AQMA now has hopefully been resolved because of recently completed changes in the road layout and parking arrangements undertaken by Devon County Council (DCC) in response to the air quality and traffic issues there which had been the subject of discussions between South Hams District Council Environmental Health officers and DCC traffic planners for some time. These changes were only implemented partway through 2020 so it is too early to say for sure but Nitrogen Dioxide levels at receptors

along this road appear to have dropped quite dramatically and are now around 27ug/m^3 (appropriately adjusted 2021 data). Until now, the worst case levels at this AQMA had hovered around the 40ug/m^3 level, with the exception of 2020 when they were lower.

There are no declared AQMAs in the West Devon area. One slight 'hot spot' of pollution at Exeter Road, Okehampton appears to have mainly declining levels of NO_2 since it was first monitored in 2016, (eg from 42.4 ug/m^3 in 2017 to 33 ug/m^3 in 2021) and additional monitoring close to this location has found no further problems there.

There are no other apparent problems in West Devon although monitoring is carried out at locations in Tavistock as well as those in Okehampton noted above. Monitoring results at Tavistock show levels well below the objective; for example at Dolvin Road, Tavistock appropriately adjusted levels in 2021 were 26.0 ug/m^3.

Apart from Nitrogen Dioxide, there are no other pollutants of concern (ie. pollutants at or approaching the objective levels) in the South Hams and West Devon areas. This is known from screening exercises and some limited previous monitoring of PM_{10} and $PM_{2.5}$ undertaken at worst case and background locations in the South Hams area by the Council and by developers (see earlier annual Air Quality Reports, available on request from South Hams District Council, contact environmental.health@swdevon.gov.uk).

In addition to the work on air quality summarised above; the Council is pursuing measures to limit climate change. The councils have declared a Climate Emergency and have appointed a dedicated climate change officer and will be working through partnership with the Devon Climate Emergency as a member of the response group and tactical group. Clearly there may be links between work undertaken to limit global warming emissions and work done to improve air quality and Environmental Health officers will seek to further engage with the climate change officer in order to share and thereby strengthen any measures which may both improve air quality and reduce greenhouse emissions.

The Council also has a commitment to improve biodiversity and Environmental Health will seek to push forward that agenda, particularly where there will also be benefits for air quality.

Actions to Improve Air Quality

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

The 2019 Clean Air Strategy[5] sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

South Hams District and West Devon Borough councils are taking active measures to reduce pollution to below current objective levels. In addition to consultation with Devon County Council over the traffic flow changes in Ivybridge outlined above and now completed, the Councils have also included requirements within their Local Plan (Plymouth and South West Devon 2019) to ensure that a variety of air quality measures are included for any new significant developments that could impact on any of our AQMAs, and in particular for the two AQMAs in market towns (Ivybridge and Totnes). These are detailed in section 2 and include ensuring that greener travel options and the use of Low Emission Vehicles are encouraged. Would-be developers are also asked to help to identify and tackle any air pollution problems that might arise from their proposed development as part of the planning process. All of these measures relate primarily to AQMAs on roads managed by Devon County Council, so we are keen to continue to work with our partners at DCC.

Previously, it was found that reducing speed on the A38 trunk road at Dean Prior (due to lengthy road works and an enforced speed limit) was correlated with a notable decrease in Nitrogen Dioxide levels monitored at the AQMA there. This finding has been discussed with Highways England, but introducing permanent speed limits on this stretch of road was not seen as a realistic solution at that time. However, if as expected Highways England

[5] Defra. Clean Air Strategy, 2019

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

are designated by defra as an Air Quality Partner under the Environment Act 2021, there will be a duty on that organisation to work further with us in resolving the problem at Dean Prior. South Hams District Council will then revisit this issue with Highways England with the aim of working with them to look at all possible ways forward.

Conclusions and Priorities

Levels of Nitrogen Dioxide monitored via diffusion tubes throughout South Hams and West Devon areas continued a downward trend in 2021 with the exception of a slight 'uptick' on Exeter Road, Okehampton (see Appendix A). It is possible that some of the general decline is due to reduced traffic levels because of various Covid restrictions at times throughout 2020 and 2021. However, these restrictions were fewer in 2021 and indeed it is possible that holiday traffic in Devon increased that year due to limitations on overseas travel. If traffic volume did not significantly decrease in 2021, the decline in NO_2 pollution must be seen as attributable to improved emissions controls in the vehicles, or otherwise less polluting vehicles, using Devon's roads.

In 2021 the only location, including the three AQMAs, still showing an exceedance was the one on the A38 Devon Expressway at Dean Prior. It is too early to revoke the other two AQMAs but monitoring will be continued at all of them to see if this is possible in the near future.

The only developments that are known about that might have an impact on air quality in the future are;

- A general increase in house building – there has been a fairly extensive increase in house building over the last few years and this is expected to continue in line with national priorities. South Hams is also the location for the construction of an entire new settlement called Sherford. All substantial new developments are obliged by our Local Plan to undertake air quality assessments and to mitigate any potential impacts (Plymouth and South West Devon, 2019). The Sherford developers have a programme, agreed with the Council, of monitoring Nitrogen Dioxide and particulate matter.

- The possible re-opening of a large open-cast tungsten mine on the edge of Dartmoor. This could result in increases in NO_2 (from increased traffic) and of PM_{10} and $PM_{2.5}$. However, the mine is the subject of intense scrutiny by the Environment Agency, South Hams District Council and Devon County Council via its applications for Environmental Permits and Minerals planning permissions and these issues will be thoroughly checked. The mine company will also be obliged to undertake its own monitoring for particulate matter if and when it re-opens.

Our Air Quality Action Plans will be updated in line with the requirements of the Environment Act 2021 (defra 2022) and this process will begin when the new provisions of the Act are published by the Government. The revised Air Quality Action Plans will be incorporated into a revised Air Quality Strategy which will also include West Devon. We are hopeful that there will continue to be no need to declare any AQMAs in West Devon although the trend in Exeter Road Okehampton will be carefully monitored. Also the new Environment Act requirement to take measures to generally reduce $PM_{2.5}$ levels will apply to *all* areas (whether designated AQMAs or not), and this will be a key part of our revised Air Quality Strategy.

A new strategy should also seek to better understand recent and future traffic levels in Devon. That will be important for all of our AQMAs, including the A38 one which may be the only place still exceeding NO_2 objective levels in future years. We will therefore seek information on traffic levels and trends from Devon County Council and Highways England for our new Air Quality Strategy.

Local Engagement and How to get involved

Officers at the Councils believe that all Nitrogen Dioxide pollutant hot spots throughout South Hams and West Devon areas have been, or are being monitored. However, if you think that your area is suffering from significant Nitrogen Dioxide air pollution, please contact us and we will consider undertaking monitoring at that location. If you are concerned about other types of air pollution, also contact Environmental Health and we will investigate your concerns.

Details of the Councils' policies and previous years' monitoring data can be found on our websites at;

https://www.southhams.gov.uk/article/3902/Air-Quality

https://www.westdevon.gov.uk/article/4594/Air-Quality

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of South Hams and West Devon Councils with the support and agreement of the following officers and departments:

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This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Sarah Harcombe at:

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1 Local Air Quality Management

This report provides an overview of air quality in South Hams and West Devon during 2021. 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 South Hams and West Devon to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

Air Quality Management Areas

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

A summary of AQMAs declared by South Hams District Council can be found in Table 2.1. The table presents a description of the 3 AQMA(s) that are currently designated within South Hams .Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA(s) and also the air quality monitoring locations in relation to the AQMA(s). The air quality objectives pertinent to the current AQMA designation(s) are as follows:

- NO_2 annual mean;

West Devon Borough Council currently does not have any declared AQMAs.

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 National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
A38 Dean Prior AQMA	03/03/2005	NO2 Annual Mean	single residential property immediately adjacent to A38	YES	70	48.1	Clean Air Strategy for South Hams and West Devon, 2019	www.southhams.gov.uk
Ivybridge Western Road AQMA	17/07/2009	NO2 Annual Mean	an area encompassing all properties fronting Western Road, Ivybridge	NO	55	27.3	Clean Air Strategy for South Hams and West Devon, 2019	www.southhams.gov.uk
Totnes AQMA	declared 13/07/2009; amended on 08.06.2016	NO2 Annual Mean	An area encompassing properties fronting a stretch of the A385 in Totnes between True Street junction and the junction of Clay Lane	NO	43	33.7	Clean Air Strategy for South Hams and West Devon, 2019	www.southhams.gov.uk

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

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

Progress and Impact of Measures to address Air Quality in South Hams and West Devon

Defra's appraisal of last year's ASR concluded that the Councils had undertaken all the required steps in submitting the ASR and that they '*should prioritise the implementation of planning measures for new developments going forward, particularly in the vicinity of AQMAs.'* (Annual Status Report Appraisal Report, Oct 2021, defra)

South Hams and West Devon Councils have continued to ensure that relevant planning applications do assess air quality appropriately and take measures to mitigate any foreseen impacts as prescribed in our local development plan entitled 'Plymouth and South West Devon Joint Local Plan 2014-2034'. This requirement is further put into practice via the inclusion of Air Quality Assessment criteria in our planning validation checklist (Appendix F).

The Councils have taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Seven measures are included within Table 2.2, with the type of measure and the progress South Hams and West Devon councils have made during the reporting year of 2021 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 are:

- Changes to parking and road layout in Western Road, Ivybridge
- Requirements for developers' Air Quality Assessments and any necessary mitigation specified in our Local Plan and Planning Validation checklist (Plymouth and South West Devon, 2019, Appendix F).
- Significant new developments which could impact on AQMAs have included measures to improve green travel planning, infrastructure and incentives within their planning applications (eg. planned developments at Dartington, Ivybridge and Sherford). Similar measures have already been implemented where new developments have been built (eg at Steamer Quay, Totnes). At this latter site, a

green travel coordinator has also been appointed via S106 monies. This coordinator is employed by Totnes town council.

- The climate infrastructure fund has been partly used to fund an e-bike trial in Totnes which will include 7 bike stations and 26 bikes.

South Hams and West Devon councils expect the following measures to be completed over the course of the next reporting year:

- A Continuation of planning measures as new developments likely to impact on our AQMAs go through the planning application process, and as developments are actually built.

The two councils' priorities for the coming year

- To implement the requirements of the Environment Act 2021 and then to update our Air Quality Plans and strategy accordingly
- To form and foster partnerships working with bodies such as DCC and strengthen internal working relationships, notably with the climate change work being done within the Councils.
- To continue to monitor any areas where we are concerned about pollution levels and include any new ones that we may become aware of.
- To monitor whether the traffic changes in Ivybridge continue to result in reduced NO_2 levels with a view to revoking the AQMA if the objective continues to be met there.
- To ensure that any new developments that meet the criteria specified in our Local Plan undertake Air Quality Assessments as necessary and, where they may have an impact, that the developers include, and ultimately act upon, mitigation measures with their proposals.
- To review the Air Quality Strategy for both councils when the Government has clarified the details of the requirements of the Environment Act 2021.

The principal challenges and barriers to implementation that the Councils anticipate facing are limited staff resources. However, it is hoped that the Council's stated climate change emergency and biodiversity agendas will allow additional resources that can be used to also improve air quality in future.

We have already implemented a strong policy basis for air quality in our Local Plan, but we would like to develop other low resource options to mainstream air quality improvements elsewhere, such as councillor training and information sessions, raising awareness and behaviour changes via nudges.

South Hams District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in Ivybridge AQMA from now onwards. It is also possible, looking at the 2021 results that the extended Totnes AQMA will be compliant in future years with the measures already undertaken and the continued roll-out, in the national fleet, of low and zero emission vehicles.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, South Hams District Council anticipates that further additional measures agreed with Highways England not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the Dean Prior AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality;

Nb. measure no 2 refers specifically to the work in Western Road, Ivybridge which is discussed elsewhere in this report

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	information/education	Public Information	Via the Internet	2018	2023	Local Authority Environmental Health, climate change officer, Local Authority Transport Dept. (DCC)	s106/CIL monies	NO	Partially Funded	< £10k	Implementation	0.02	not measurable	implementation on-going	limited impact
2	Transport	Transport Planning and Infrastructure	Other	2020	2021	DCC transport section	s106/CIL monies	NO	Funded	£50k - £100k	Implementation	5ug/m3	to meet AQO	completed	done
3	promoting technology	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018	2025	Local Authority Environmental Health and climate change officer, Local	s106/CIL monies	NO	Partially Funded	£1 million - £10 million	Implementation	Reduced vehicle emissions	Measured Concentration at AQMAs within towns- aim to be	Implementation on-going	ongoing as new developments built, new charging points are installed
4	Transport	Promoting Travel Alternatives	Promotion of cycling	2018	2025	Local Authority Environmental Health and climate change officer, Local Authority Transport Dept	s106/CIL monies	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	Measured Concentration at AQMAs within towns- aim to be below AQO	implementation on-going	ongoing as new developments built, cycling initiatives are built in where possible
5	Transport	Promoting Travel Alternatives	Promotion of walking	2018	2025	Local Authority Environmental Health and climate change officer, Local Authority Transport Dept	s106/CIL monies	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	Measured Concentration at AQMAs within towns- aim to be below AQO	implementation on-going	ongoing as new developments built, walking initiatives are built in where possible
6	Transport	Promoting Travel Alternatives	Encourage / Facilitate home-working	2018	2025	Local Authority Environmental Health and climate change officer, Local Authority Transport Dept	s106/CIL monies	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	Measured Concentration at AQMAs within towns- aim to be below AQO	implementation on-going	ongoing as new developments built, facilities for home working are built in where possible
7	Transport	Promoting Travel Alternatives	Workplace Travel Planning	2018	2025	Local Authority Environmental Health and climate change officer, Local Authority Transport Dept	s106/CIL monies	NO	funded	< £10k	Implementation	Reduced vehicle emissions	Measured Concentration at AQMAs within towns- aim to be below AQO	implementation on-going	ongoing as significant new developments built, developers are asked to produce green travel plans

$PM_{2.5}$ – 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.

South Hams District and West Devon Borough councils are taking the following measures to address $PM_{2.5}$;

All measures identified in the section above to reduce Nitrogen Dioxide within AQMAs are aimed at reducing all emissions from transport sources. As these are also a source of PM_{10} and $PM_{2.5,}$ they should also help to reduce levels of these pollutants.

The Councils have drawn up a leaflet on how to use wood burning stoves correctly so as to reduce emissions from them as far as possible. Such stoves are quite popular in our relatively rural districts, so aiming at this source is important. This leaflet will be made available on the website and to any stove owners who are the subject of smoke complaints. The councils will seek to work with others, such as Public Health at DCC, to alert residents to the issues of smoke from any domestic wood burning appliances and bonfires and how best to control emissions. However it is recognised that this may be a problem during this coming winter because of the high cost of energy and people with fire places and solid fuel burners may see the burning of cheap wood as a way to deal with the high costs.

The Councils will control all particulate emissions from building works throughout the areas by ensuring that Construction Environment Management Plans (CEMPs) are drawn up, agreed and implemented for all major developments. These CEMPs will include conditions to ensure that nuisance dust and smaller particulate matter is monitored routinely by the developers and controlled through dampening and other means as necessary.

The Councils will ensure that significant new developments that may increase particulate matter emissions such as the tungsten mine, will have a robust monitoring programme for PM_{10} and $PM_{2.5}$ and will control the emissions of such pollutants carefully.

Complaints of smoke from bonfires or other sources will be investigated under our nuisance procedure and appropriate information provided or enforcement action undertaken where necessary. We will also work closely with our internal partners to encourage recycling and with the Environment Agency in cases of commercial waste burning.

There are a number of permitted processes within the two council areas where the emissions of particulate matter are controlled via permit conditions. These include;

- A clay calcining process (A2 permit)
- A clay drying process
- A powder paint spray process
- Mobile crushing processes
- Cement batching processes
- Non-ferrous foundry process

For all of the above, permit conditions are carefully enforced by regular site visits to check for compliance and (where applicable) emissions tests are undertaken and checked by the Councils.

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

This section sets out the monitoring undertaken within 2021 by South Hams and West Devon councils and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Neither of the councils have any automatic air monitoring sites.

3.1.2 Non-Automatic Monitoring Sites

South Hams and West Devon Councils undertook non- automatic (i.e. passive) monitoring of NO_2 at 19 sites during 2021. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2021 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.

The only exceedance of the Nitrogen Dioxide annual mean objective (the only objective for which the Councils do monitoring) in 2021 was at the Dean Prior AQMA. This has always been our most polluted site as the monitoring tube is located next to a property wall on the verge of the A38 Devon Expressway just where vehicles accelerate to climb a hill. However the level monitored here was less than it has ever been since monitoring began. In recent years (before the Covid pandemic) it was always more than 60ug/m^3 which would also

indicate a breach in the hourly mean objective for NO_2, according to the defra guidance (LAQM 2016). However in 2020, the level recorded was just 53.3ug/m^3 and in 2021 it had reduced further to 46.9ug/m3. Last year it was felt that the 2020 reduction could have been partly due to the impact of the Covid 19 measures and consequent reduced traffic volumes. It is possible that there were still some Covid impacts in 2021 but one would expect these to be fewer, so the reduction in monitored NO_2 is hopefully a robust trend.

3.1.4 Particulate Matter (PM_{10})

Neither of the councils undertakes any monitoring for PM_{10}

3.1.5 Particulate Matter ($PM_{2.5}$)

Neither of the councils undertakes any monitoring for $PM_{2.5}$

3.1.6 Sulphur Dioxide (SO_2)

Neither of the councils undertakes any monitoring for SO_2

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
TSH1	Queens Terrace	Roadside	280085	60765	NO2	Totnes	0.0	3.0	No	2.0
TSH3	Puddavine	Roadside	279612	61407	NO2	Totnes	5.0	1.0	No	2.0
TSH5	Bridgetown Hill Terrace	Roadside	281097	60510	NO2	Totnes	0.0	1.0	No	3.0
TSH6	Bridgetown Hill bottom	Roadside	280920	60387	NO2	Totnes	0.0	1.0	No	3.0
TSH9	Bridgetown Hill busstop	Roadside	281063	60493	NO2	Totnes	0.0	1.0	No	3.0
TSH10	Bridgetown corner	Roadside	280742	60285	NO2	Totnes	0.0	1.0	No	3.0
TSH12	True Street	Kerbside	282103	60609	NO2	Totnes	2.0	1.0	No	1.0
TSH13	Candletree	Kerbside	282066	60579	NO2	Totnes	10.0	1.0	No	2.0
ISH1	End Western Road	Roadside	263192	56011	NO2	Ivybridge	0.0	1.0	No	3.0
ISH5	Western Road Terrace	Roadside	263192	55989	NO2	Ivybridge	0.0	1.0	No	3.0
ISH6	Sportsmans Ivybridge	Roadside	263220	55981	NO2	Ivybridge	0.0	2.0	No	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DPSH1	Dean Prior Farm	Roadside	263784	56276	NO2	Dean Prior	3.0	1.0	No	2.0
DPSH2	Dean Prior Road	Roadside	272956	56273	NO2	Dean Prior	0.0	1.0	No	2.0
DPSH3	Dean Prior Sign	Roadside	272665	63484	NO2	Dean Prior	0.0	5.0	No	2.0
TWD1	Dolvin Road Tavistock	Roadside	273005	63496	NO2	none	0.0	1.0	no	3.0
TWD4	Plymouth Road, Tavistock	Roadside	248421	74556	NO2	none	2.0	1.0	No	2.0
OWD2	Exeter Road Oke 1	Roadside	259066	95233	NO2	none	0.0	1.0	No	3.0
OWD3	Exeter Road Oke 2	Roadside	25906	95222	NO2	none	0.0	1.0	No	2.0
OWD4	Exeter Road Oke opp	Roadside	259196	95213	NO2	none	0.0	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.2 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
TSH1	280085	60765	Roadside	92.0	92.3	32.1	32.7	29.8	24.2	23.7
TSH3	279612	61407	Roadside	100.0	100.0	17.3	21.4	17.6	15.1	15.8
TSH5	281097	60510	Roadside	100.0	100.0	38.1	**41.4**	37.0	30.5	29.5
TSH6	280920	60387	Roadside	100.0	100.0	35.9	37.9	35.7	28.4	26.4
TSH9	281063	60493	Roadside	100.0	100.0	33.3	36.7	28.9	25.1	27.2
TSH10	280742	60285	Roadside	100.0	100.0	21.0	22.8	19.7	15.9	17.4
TSH12	282103	60609	Kerbside	100.0	100.0	**56.2**	**48.7**	**47.7**	38.7	33.7
TSH13	282066	60579	Kerbside	100.0	100.0	21.3	31.2	23.7	22.8	23.8
ISH1	263192	56011	Roadside	83.0	82.7	27.8	31.8	29.5	22.9	20.2
ISH5	263192	55989	Roadside	92.0	90.4	39.4	**41.4**	39.4	31.4	27.3
ISH6	263220	55981	Roadside	100.0	100.0	28.0	27.6	22.0	20.6	19.3

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 2021 (%) [2]	2017	2018	2019	2020	2021
DPSH1	263784	56276	Roadside	100.0	100.0	22.9	28.1	21.7	17.5	17.4
DPSH2	272956	56273	Roadside	100.0	100.0	**66.3**	**64.1**	**61.2**	**53.3**	**48.1**
DPSH3	272665	63484	Roadside	100.0	100.0	**40.6**	37.2	33.9	26.2	26.9
TWD1	273005	63496	Roadside	100.0	100.0	22.9	30.9	31.4	26.1	26.0
TWD4	248421	74556	Roadside	92.0	92.3	18.9	27.6	25.4	21.5	23.3
OWD2	259066	95233	Roadside	100.0	100.0	**42.4**	**41.6**	**39.1**	**28.4**	33.0
OWD3	25906	95222	Roadside	75.0	76.9	31.1	32.1	29.8	19.3	18.2
OWD4	259196	95213	Roadside	100.0	100.0	23.9	24.7	20.7	21.9	23.8

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16nb this has not been necessary as all our data has a data capture of 75% or more.**

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

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

Notes:

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

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

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

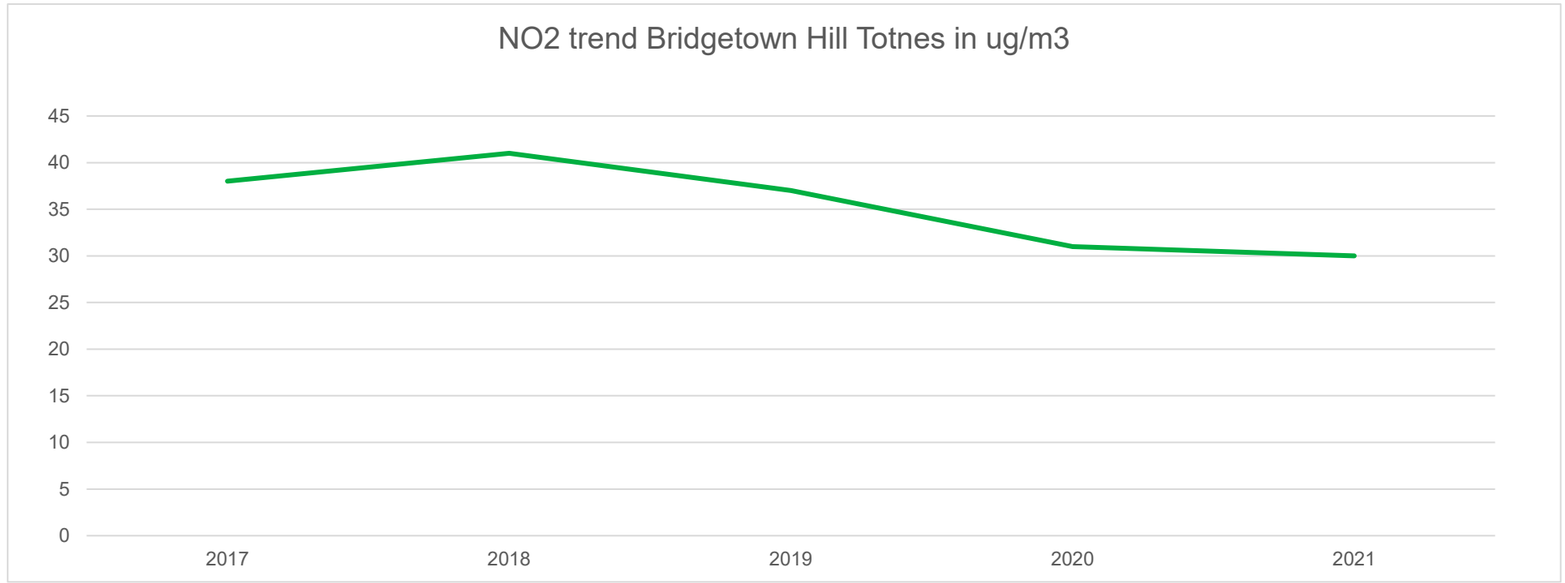
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

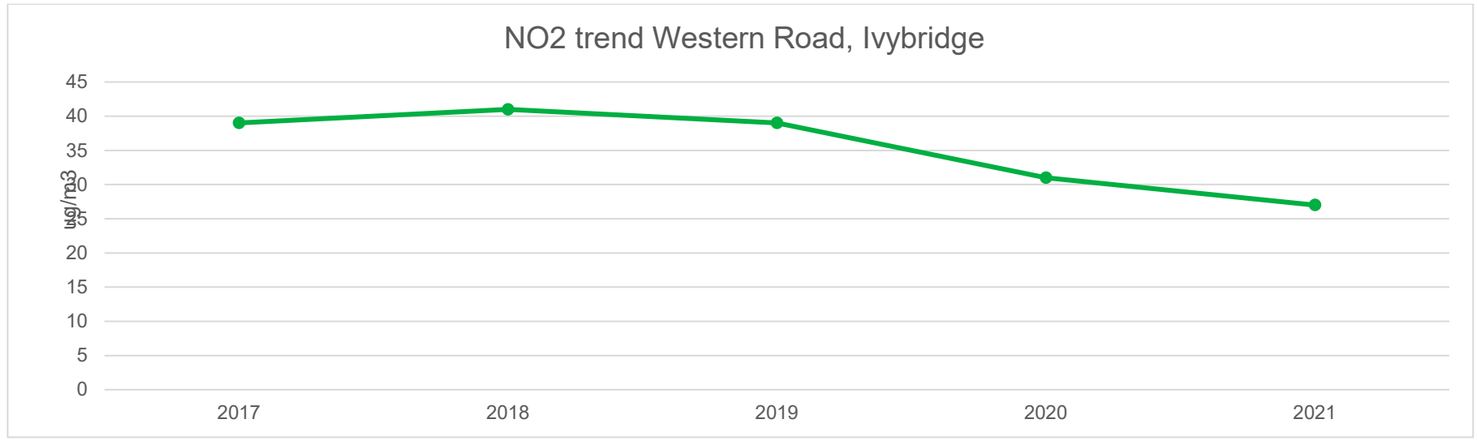
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

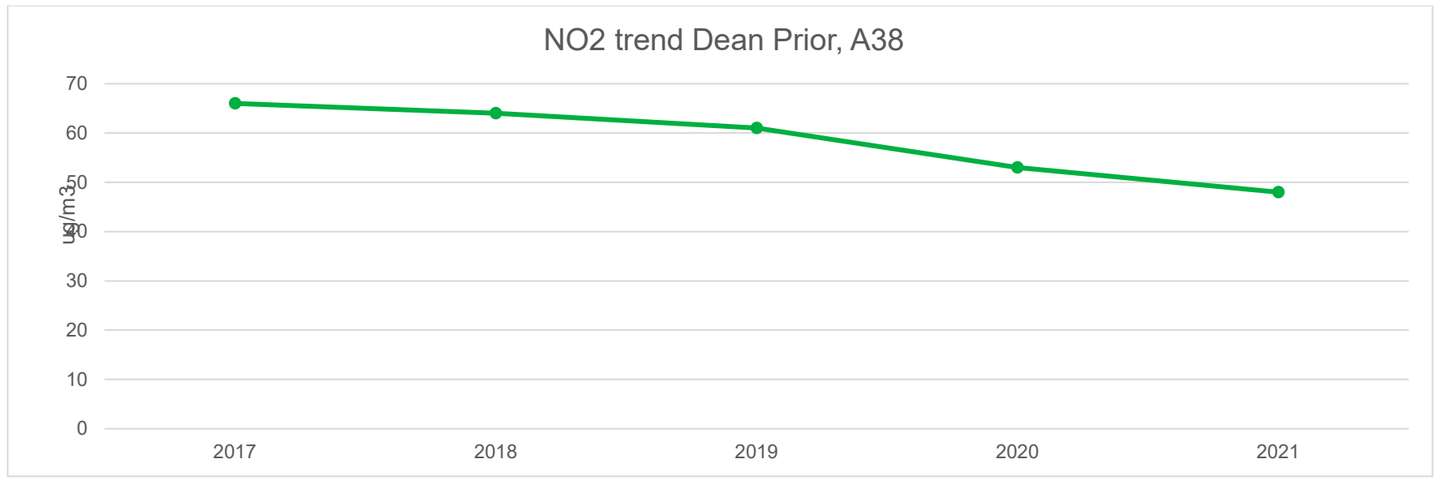
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

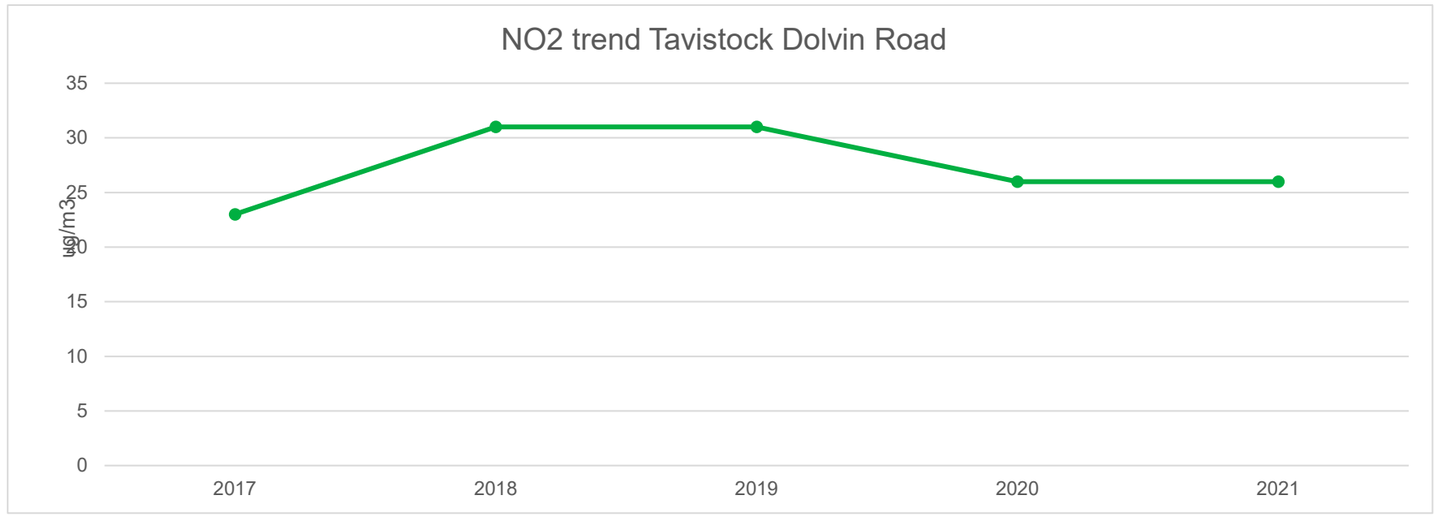
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

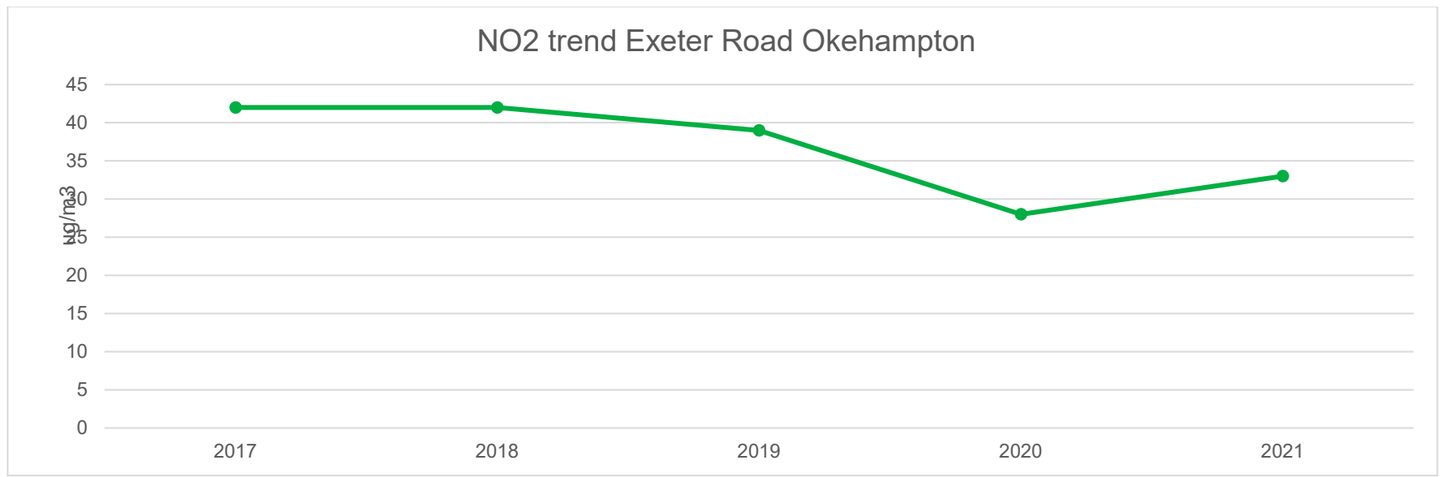
Figure A.1 – Trends in Annual Mean NO_2 Concentrations


NO2 trend Bridgetown Hill Totnes in ug/m3
45
40
35
30
25
20
15
10
5
0
2017
2018
2019
2020
2021


NO2 trend Western Road, Ivybridge
ug/m3
45
40
35
30
25
20
15
10
5
0
2017
2018
2019
2020
2021


NO2 trend Dean Prior, A38
ug/m3
70
60
50
40
30
20
10
0
2017
2018
2019
2020
2021





Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (x.x)	Annual Mean: Distance Corrected to Nearest Exposure
TSH1	280085	60765	27.0	27.0	24.0	31.0		29.0	29.0	15.0	31.0	35.0	33.0	29.0	28.2	23.7	-
TSH3	279612	61407	18.0	18.0	20.0	20.0	25.0	18.0	18.0	12.0	19.0	19.0	23.0	16.0	18.8	15.8	-
TSH5	281097	60510	35.0	38.0	31.0	41.0	40.0	37.0	33.0	21.0	30.0	43.0	39.0	34.0	35.2	29.5	-
TSH6	280920	60387	19.0	27.0	19.0	37.0	34.0	32.0	30.0	32.0	32.0	42.0	42.0	31.0	31.4	26.4	-
TSH9	281063	60493	32.0	34.0	29.0	42.0	33.0	30.0	30.0	28.0	34.0	33.0	35.0	28.0	32.3	27.2	-
TSH10	280742	60285	20.0	21.0	29.0	23.0	21.0	20.0	14.0	14.0	21.0	21.0	26.0	19.0	20.8	17.4	-
TSH12	282103	60609	38.0	39.0	39.0	50.0	48.0	45.0	44.0	22.0	43.0	43.0	44.0	27.0	40.2	33.7	-
TSH13	282066	60579	24.0	27.0	25.0	31.0	29.0	30.0	28.0	32.0	25.0	31.0	32.0	26.0	28.3	23.8	-
ISH1	263192	56011	30.0		22.0	27.0	22.0	23.0	19.0	15.0	27.0		30.0	25.0	24.0	20.2	-
ISH5	263192	55989	47.0	30.0	31.0	33.0	31.0	31.0	28.0	17.0	33.0	39.0	37.0		32.5	27.3	-
ISH6	263220	55981	24.0	23.0	19.0	22.0	23.0	22.0	20.0	19.0	23.0	27.0	31.0	22.0	22.9	19.3	-
DPSH1	263784	56276	19.0	23.0	18.0	25.0	20.0	22.0	21.0	23.0	22.0	22.0	19.0	15.0	20.8	17.4	-
DPSH2	272956	56273	57.0	59.0	48.0	70.0	61.0	60.0	57.0	29.0	51.0	71.0	68.0	56.0	57.3	**48.1**	-
DPSH3	272665	63484	30.0	30.0	25.0	36.0	39.0	34.0	33.0	15.0	28.0	40.0	39.0	35.0	32.0	26.9	-
TWD1	273005	63496	31.0	33.0	26.0	32.0	26.0	26.0	24.0	26.0	29.0	40.0	38.0	40.0	30.9	26.0	-
TWD4	248421	74556	25.0	27.0	22.0	31.0		42.0	24.0	16.0	24.0	30.0	35.0	29.0	27.7	23.3	-
OWD2	259066	95233	32.0	33.0	36.0	51.0	37.0	38.0	45.0	20.0	46.0	45.0	46.0	42.0	39.3	33.0	-
OWD3	25906	95222	20.0	23.0		29.0		20.0	24.0	13.0	22.0	24.0		20.0	21.7	18.2	-
OWD4	259196	95213	28.0	27.0	28.0	32.0	31.0	25.0	32.0	17.0	13.0	36.0	39.0	32.0	28.3	23.8	-

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

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (not been necessary as all data capture at least 75%)

☐ Local bias adjustment factor used – no local bias adjustment factor available

☒ National bias adjustment factor used

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

☒ South Hams District Council and West Devon Borough Council confirm that all 2021 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 South Hams and West Devon council areas during 2021

South Hams and West Devon Councils have not identified any new sources relating to air quality within the reporting year of 2021

Additional Air Quality Works Undertaken by South Hams and West Devon council areas during 2021

South Hams and West Devon Councils have not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

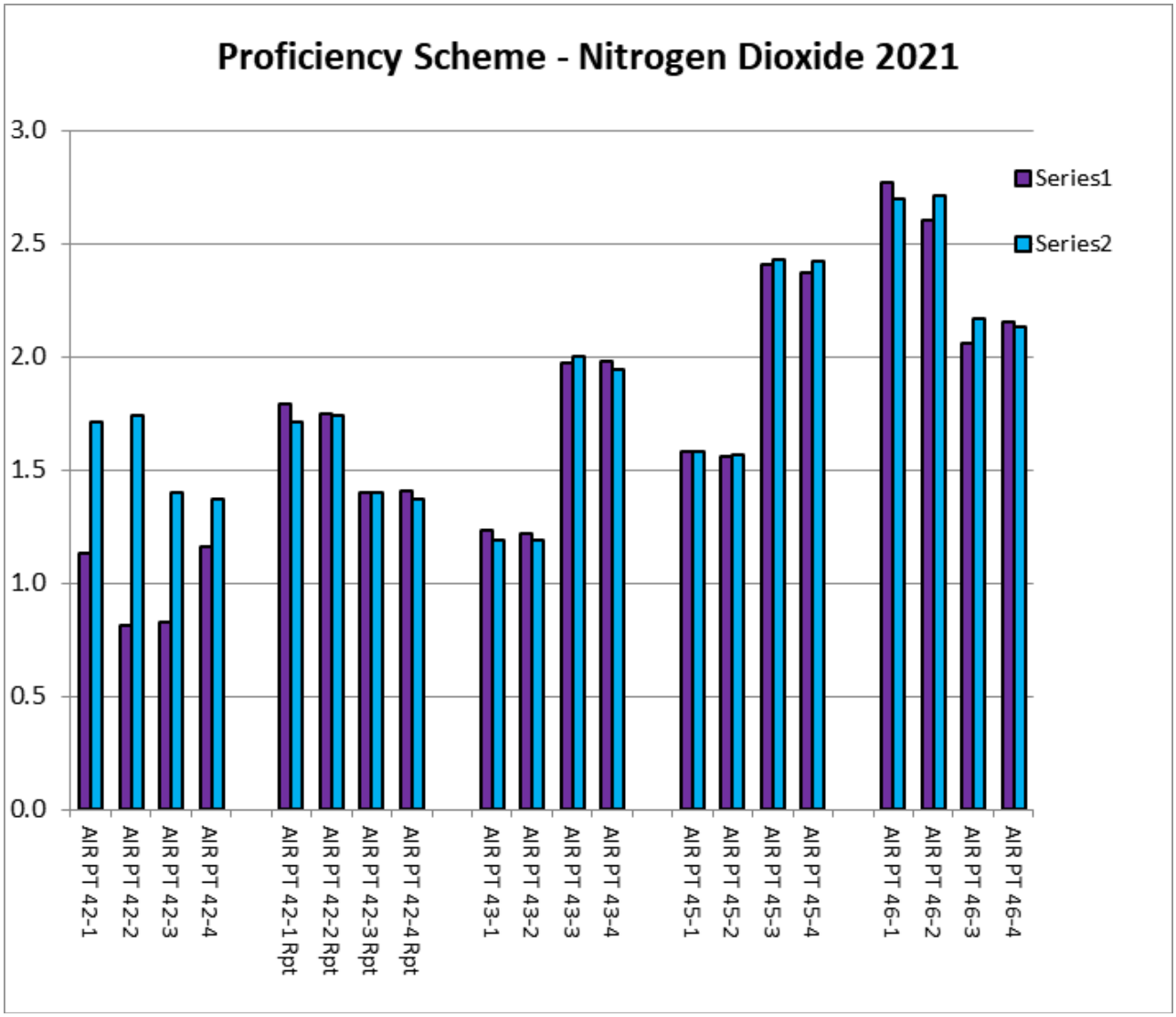
All monitoring is undertaken using Gradko diffusion tubes with 20% Trimethylamine (TEA in water method. The QA provided by Gradko to me in October 2022 for these tubes is as shown below.

AIR PT Nitrogen Dioxide Proficiency Scheme Results 2021

AIR PT Proficiency Scheme - Nitrogen Dioxide 2021

Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-21	AIR PT 42-1	1.71	1.13	-4.17	-33.9%
Feb-21	AIR PT 42-2	1.74	0.81	-6.29	-53.4%
Feb-21	AIR PT 42-3	1.40	0.83	-5.43	-40.7%
Feb-21	AIR PT 42-4	1.37	1.16	-1.91	-15.3%
Mar-21	AIR PT 42-1 Rpt	1.71	1.79	0.62	4.7%
Mar-21	AIR PT 42-2 Rpt	1.74	1.75	0.08	0.6%
Mar-21	AIR PT 42-3 Rpt	1.40	1.40	0	0.0%
Mar-21	AIR PT 42-4 Rpt	1.37	1.41	0.39	2.9%
May-21	AIR PT 43-1	1.19	1.23	0.35	3.4%
May-21	AIR PT 43-2	1.19	1.22	0.26	2.5%
May-21	AIR PT 43-3	2.00	1.97	-0.2	-1.5%
May-21	AIR PT 43-4	1.94	1.98	0.26	2.1%
Aug-21	AIR PT 45-1	1.58	1.58	0	0.0%
Aug-21	AIR PT 45-2	1.57	1.56	-0.08	-0.6%
Aug-21	AIR PT 45-3	2.43	2.41	-0.08	-0.8%
Aug-21	AIR PT 45-4	2.42	2.37	-0.28	-2.1%
Oct-21	AIR PT 46-1	2.7	2.77	0.33	2.6%
Oct-21	AIR PT 46-2	2.71	2.6	-0.49	-4.1%
Oct-21	AIR PT 46-3	2.17	2.06	-0.65	-5.1%
Oct-21	AIR PT 46-4	2.13	2.15	0.13	0.9%

Results from AIR-PT 42 showed a significant negative bias. An investigation was carried out and a repeat set of samples ordered (Mar-21) to confirm results. Results from the investigation showed for AIR PT samples, extraction of nitrite was not complete and required further time on the shaker to extract all nitrite from the tubes. Successful extraction was demonstrated on the
repeat Air PT samples in March 2021.The investigation also showed that for laboratory standards and customer samples, extraction of nitrite from tubes was complete without further shaking, and there was no risk associated with results reported to customers.



Diffusion Tube Annualisation

All diffusion tube monitoring locations within South Hams and West Devon areas recorded data capture of at least 75% therefore it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.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.

South Hams and West Devon Councils have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. As we have no local continuous monitoring, the best option is to use the national figure. A summary of bias adjustment factors used by South Hams and West Devon Councils over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	V09/22	0.84
2020	National	09/19	1.01
2019	National	06/18	1.05
2018	National	09/17	1.07
2017	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.

However, no diffusion tube NO_2 monitoring locations within South Hams or West Devon required distance correction during 2021.

QA/QC of Automatic Monitoring

Automatic Monitoring Annualisation

No automatic monitoring is undertaken by South Hams and West Devon councils

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

Annualisation was not required at any site

Table C.3 – Local Bias Adjustment Calculation

No Local Bias adjustment factors were available to the Councils

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

Distance correction was not needed at any site.

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

Figure D1; Totnes AQMA

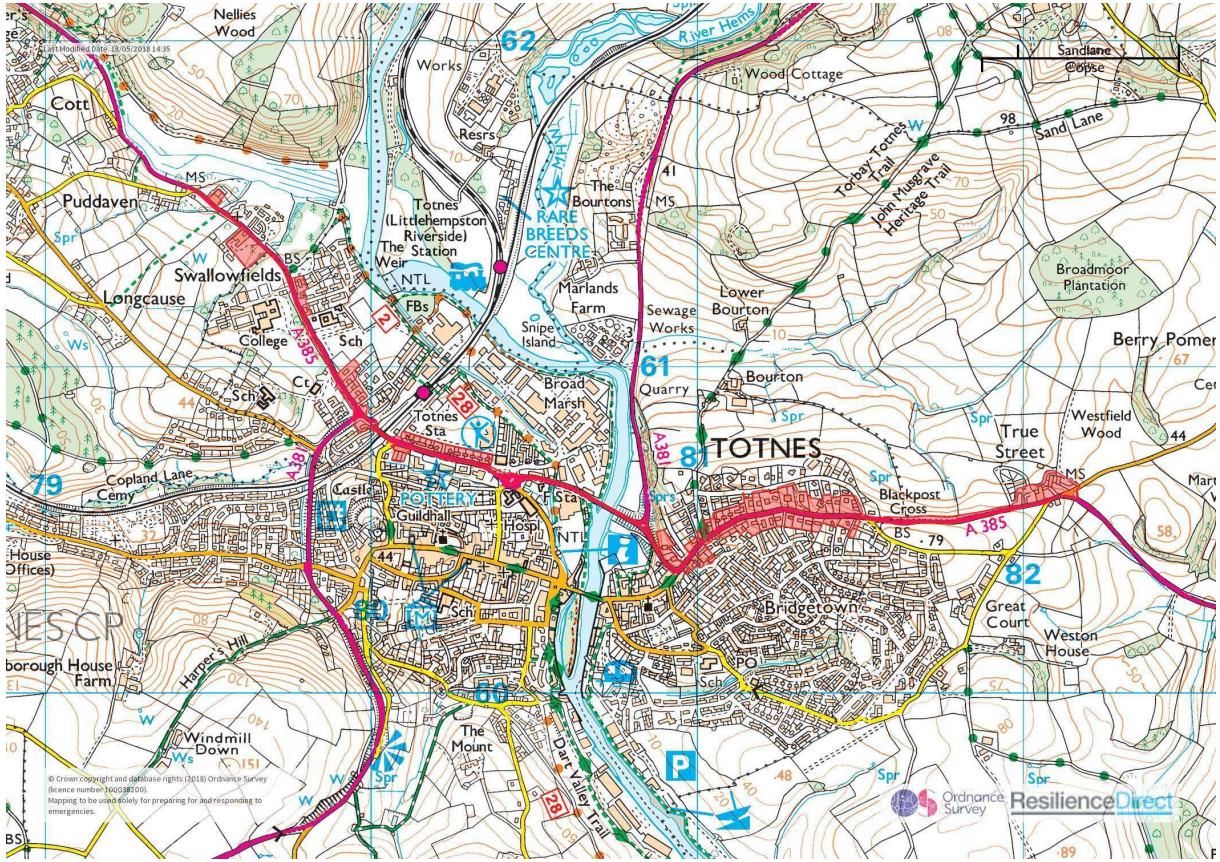


Figure D2; Locations of NO_2 diffusion tubes in Bridgetown, Totnes AQMA

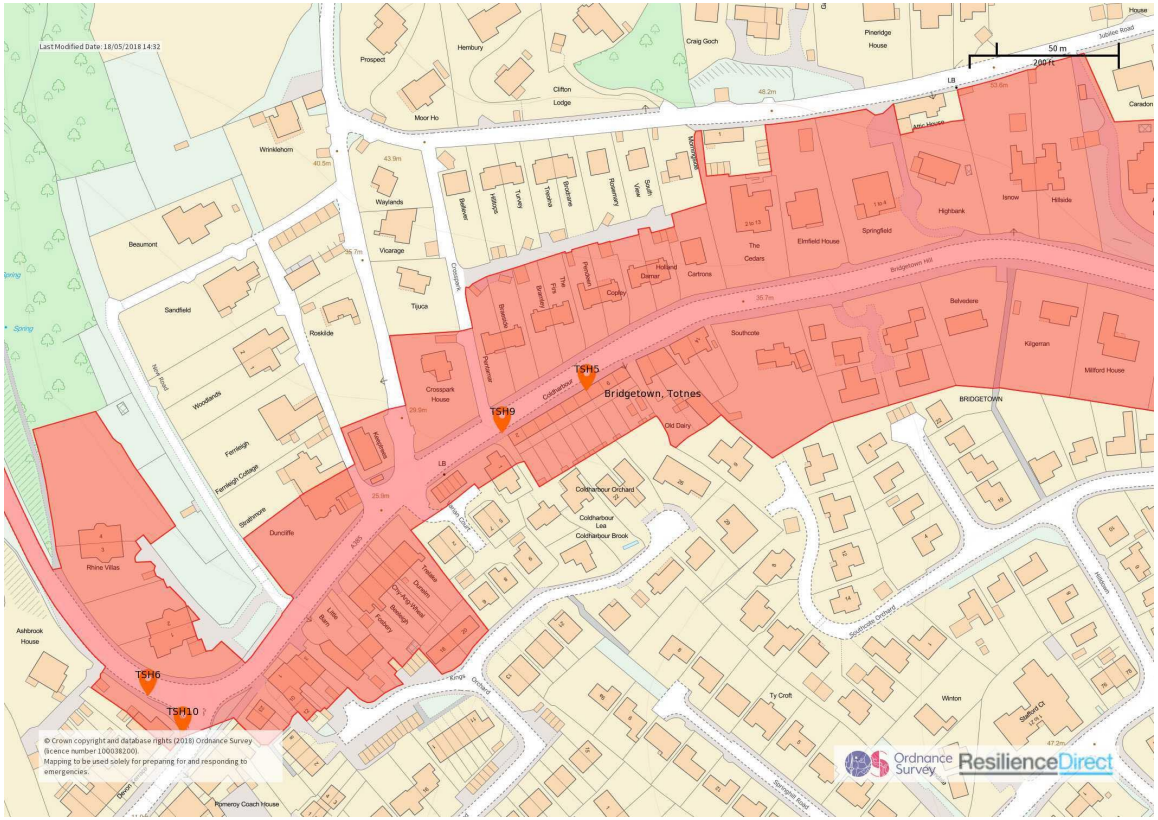


Figure D3: Locations of NO_2 diffusion tubes in True Street, Totnes AQMA

Figure D4; Ivybridge Western Road AQMA

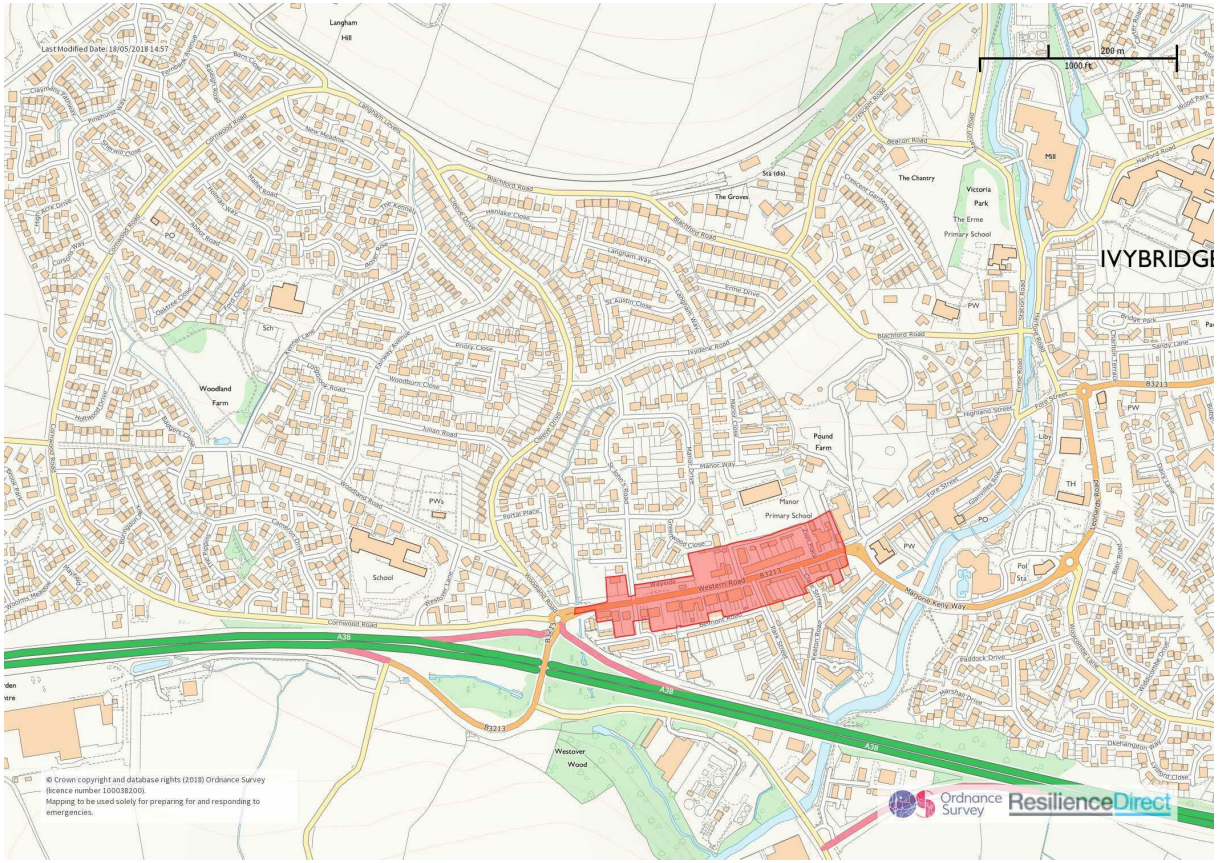

Last Modified Date: 18/05/2018 14:57
1000 ft
200 m
IVYBRIDGE
A38
B3213
Western Road
Woodland Farm
Pound Farm
Manor Primary School
The Erme Primary School
Victoria Park
Westover Wood
© Crown copyright and database rights (2018) Ordnance Survey (licence number 100038200).
Mapping to be used solely for preparing for and responding to emergencies.
Ordnance Survey
ResilienceDirect

Figure D5; Locations of NO_2 diffusion tubes in Ivybridge Western Road AQMA

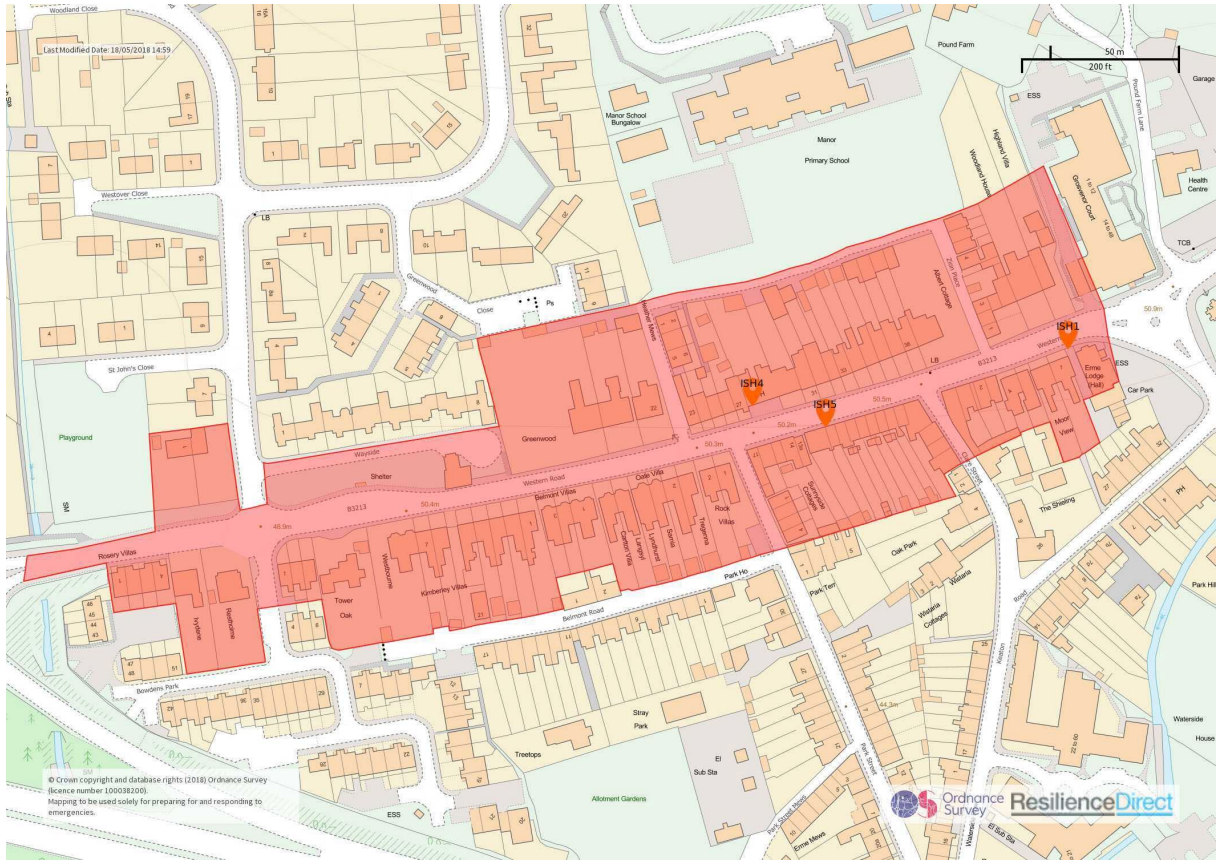
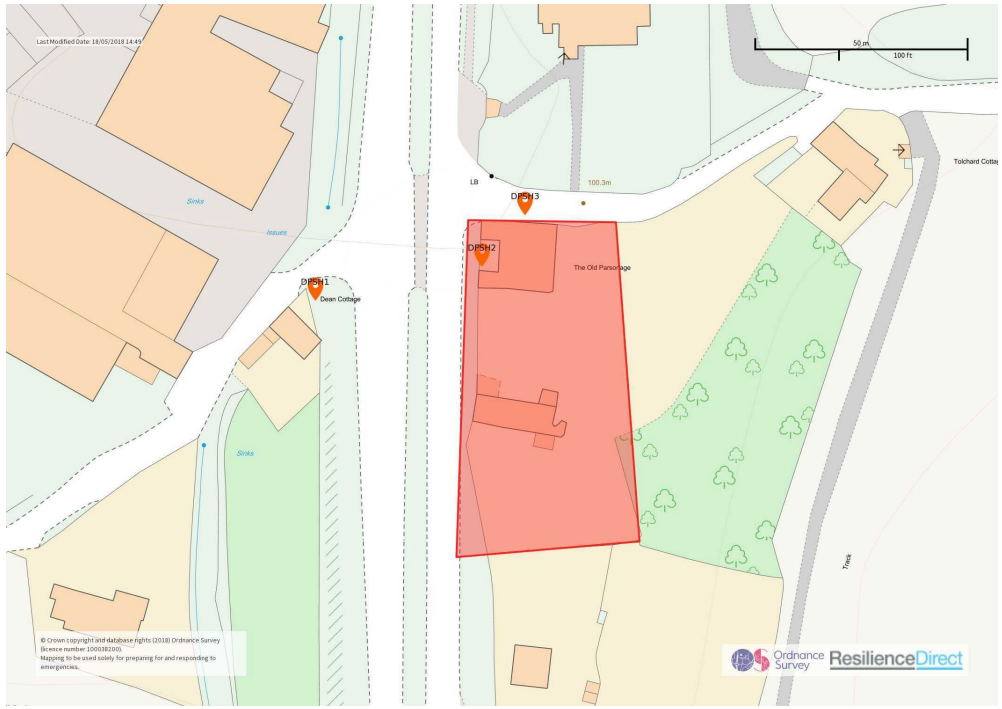


Figure D6; Dean Prior AQMA

Figure D7; Locations of NO_2 diffusion tubes in Dean Prior AQMA


Last Modified Date: 18/05/2018 14:49
Sinks
Issues
DPSH1
Dean Cottage
Sinks
© Crown copyright and database rights (2018) Ordnance Survey
[licence number 100019220].
Mapping to be used solely for preparing for and responding to
emergencies.
LB
100.3m
DPSH3
DPSH2
The Old Parsonage
50 m
100 ft
Tokhard Cottag
Yews
Ordnance Survey
ResilienceDirect

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).

APPENDIX F; Air Quality Assessment Requirements specified in Planning Validation Checklist

Air Quality Assessment

Information required and when required	Information Required/Guidance
Required for: Major dwellings Major heavy industry/ storage/ warehousing Large scale major offices, industry and retail in excess of 10,000m2 Within 1km of a sensitive area, for example an Air Quality Management Area or an Air Quality Area of Concern (AQMA/AQAC) Car parking more than 100 spaces Introduces new exposure to existing sources of air pollutants such as busy roads Will have a significant impact on traffic in terms of volume or change of vehicle composition Will include biomass boilers, combined heat and power plants, short Term Operating Reserve electricity generating systems Major road infrastructure changes Will introduce its own potentially polluting source, for example power plants, mineral sites, spraying processes or manufacturing Will involve significant dust emissions	There are AQMAs within South Hams; Ivybridge, Totnes and Dean Prior. There are none within West Devon. Proposals that impact upon air quality or are potential pollutants must be supported by an air quality assessment. This should indicate the change in air quality resulting from the proposed development and outlining appropriate mitigation measures as necessary. An Air Quality Assessment must be prepared by a suitably qualified expert, in accordance with the latest guidance from the Institute of Air Quality Management available. Development may result in the need for a Section 106 contribution to mitigate impacts and where the presence of a source of odour and/or dust that may affect amenity for future occupants of the development. Pre-application advice should be sought from the Environmental Health Team in order to determine the level of assessment required.

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.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- (Plymouth and South West Devon 2019) Plymouth and South West Devon Joint Local Plan 2014-2034 produced by West Devon Borough Council, South Hams District Council, Plymouth city council.
- Defra 2022 Environment Act 2021: Frequently Asked Questions (Local Authorities)