



# 2023 Air Quality Annual Status Report (ASR)

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

Date: June, 2023

Information	Test Valley Borough Council Details
Local Authority Officer	Sean Feist
Department	Housing and Environmental Health Service (Environmental Protection)
Address	Test Valley Borough Council Beech Hurst Weyhill Road Andover SP10 3AJ
Telephone	01264 368000
E-mail	<a href="mailto:envhealth@testvalley.gov.uk">envhealth@testvalley.gov.uk</a>
Report Reference Number	TVBC/ASR2023
Date	June 2023

## Executive Summary: Air Quality in Our Area

### Air Quality in Test Valley Borough Council

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

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

Due to the importance of the potential impact of poor air quality on health, Test Valley Borough Council (TVBC) is required to review and assess air quality within the Borough on a regular basis. This involves the production of an Annual Status Report by the end of June each year and is intended to maintain continuity in the Local Air Quality Management process. This report includes the results of on-going monitoring of Nitrogen Dioxide (NO<sub>2</sub>) within the Borough where emissions from a range of sources could adversely impact sensitive receptors.

This Annual Status Report includes the results of Nitrogen Dioxide (NO<sub>2</sub>) diffusion tube monitoring carried out in 2022, with exceptional data recovery achieved throughout the report period and an overall data capture rate of 98%. Monitoring shows a negligible decrease of 0.3 µg/m<sup>3</sup> in the average NO<sub>2</sub> levels at 17 established sites monitored by TVBC, from 25.5 µg/m<sup>3</sup> in 2021 to 25.2 µg/m<sup>3</sup> in 2022. This is comparable to national trends, which show levels of NO<sub>2</sub> stabilising and a slight decrease at roadside localities after a rapid drop during 2020 (Defra, 2023<sup>a</sup>). These 17 established monitoring sites

---

<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, January 2023

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

operated by TVBC, show slightly variable trends between each locality, however the levels of NO<sub>2</sub> remain significantly decreased when compared to 2019, the most recent period not subject to disruption associated with the Covid-19 pandemic.

A total of 19 sites were monitored during the 2022 monitoring period in Test Valley Borough, with two new locations added. The 19.9 µg/m<sup>3</sup> annual mean concentration of NO<sub>2</sub> recorded in 2022 at these locations (Table A.4 – mean for 2022) is lower than the mean roadside background levels in England of 23.6 µg/m<sup>3</sup> (Defra, 2023<sup>a</sup>). Whilst continued and targeted monitoring will be carried out in the TVBC area, there is no evidence that the annual mean concentration of NO<sub>2</sub> is likely to exceed the specific Air Quality Objective of 40 µg/m<sup>3</sup>.

The relatively low concentrations of NO<sub>2</sub> shown in the results from 2022, have occurred despite provisional estimated UK-wide increases in all motor vehicle traffic of 29.7% between March 2021 and March 2022 (DfT, 2022). However, traffic volume is still estimated at 5.9% below that experienced pre-pandemic (year ending December 2019, DfT, 2022).

Combined with monitoring for NO<sub>2</sub>, air quality is also addressed across the TVBC area through Environmental Permitting of processes which may have the potential to cause pollution to the atmosphere, and engagement with the Environment Agency where such sites fall within their remit.

Through strategic planning TVBC are also working towards accessible and connected communities, in partnership with Hampshire County Council (HCC), who manage local highways infrastructure. TVBC also engages with HCC on air quality issues, with events such as the Clean Air Day and The Clean Air Project being promoted through HCC's My Journey Hampshire website (<https://myjourneyhampshire.com/education/air-quality-for-schools/>). TVBC also works with other organisations, such as Sustrans, on sustainable transport and infrastructure planning.

Based on the findings of this report, TVBC has found no evidence that the levels of any other relevant pollutants are likely to exceed the specific Air Quality Objectives and therefore has not identified the need to designate any Air Quality Management Areas.

## Actions to Improve Air Quality

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

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

TVBC takes its responsibilities for air quality very seriously and proposals within the Borough are carefully assessed in accordance with the Local Plan. Development that would or could generate potentially significant levels of pollution will only be permitted if it can be demonstrated that there would not be any adverse impact on human health, the natural environment or general amenity. Following national guidance on air quality in relation to land-use planning & development control (IAQM, 2017), an air quality assessment, including modelling of air quality, is required where infrastructure planning may lead to increased traffic flow or new sources of emissions (e.g. biomass boilers). TVBC is conscious of the need to keep air quality issues in mind when looking at development within the Borough over time.

Sustainable transport and improved cycling infrastructure is key to promoting a reduction in motor vehicle use, a key source of NO<sub>2</sub> within the TVBC area. Through Transport Development and Infrastructure planning in association with Hampshire County Council, TVBC have implemented a Local Cycling & Walking Infrastructure Plan (LCWIP) for the southern part of the borough during the current reporting year (2022), with a plan for the northern area under development. Funding for active travel, in the form of cycle discount vouchers provided by Persimmon Homes, were available for residents of Picket Twenty

---

<sup>5</sup> Defra. Environmental Improvement Plan 2023, January 2023

<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

with the Get Cycling event held on Saturday 18<sup>th</sup> June 2022 to promote cycling through guided rides between Picket Twenty and Andover town centre. Community travel plans can be a key requirement for larger developments within the Borough and can help offset or prevent potential increases in motor vehicle traffic.

TVBC will continue to explore with HCC potential strategies to reduce PM<sub>2.5</sub> and how to target these and measure any associated impact on public health. Where complaints are made in relation to domestic solid fuel burning, or other smoke associated nuisance, TVBC will investigate and provide information and guidance to those involved, with the potential for further action where required.

The southern part of the Test Valley Borough is encompassed by the Partnership for Urban South Hampshire (PUSH) Air Quality Impact Assessment, and we will continue to work with our neighbouring authorities on projects, such as the University Hospital Southampton (Bargain Farm) Park and Ride – completed in 2022, to improve air quality for urban south Hampshire.

## Conclusions and Priorities

In summary the 2023 Air Quality Status Report highlights that:

- Monitoring of NO<sub>2</sub> within the TVBC area continues to indicate that the current Air Quality Objectives have been met, with no current requirement to implement AQMA's.
- The overall trends in the data indicate an improvement in air quality within the region compared to 2019, with relatively stable levels of NO<sub>2</sub> between 2021 and 2022 (please refer to Figure A.2).
- Planning applications with the potential to impact air quality in Test Valley and within the vicinity of the Southampton Urban Area will continue to be carefully considered.
- Monitoring will continue to be directed to areas identified as at risk from poor air quality, or where residents raise concerns, with regular review of monitoring sites.
- TVBC will respond and investigate potential statutory nuisance issues associated with smoke/emissions in order to address particulate emissions.

There was a rapid drop off in NO<sub>2</sub> experienced during the 2020 monitoring period associated with a decrease in traffic volume linked to shifts in working patterns during the Covid-19 pandemic. This has been followed by a gradual increase in 2021 and 2022 as

traffic volumes have rebounded. This highlights the value of targeting transport methods in order to improve local air quality within the TVBC area, with monitoring focused on areas of high traffic volume/flow and major routes within the Borough.

There is the potential to sustain the reduction in NO<sub>2</sub> within the TVBC area through the increased use of electric vehicles and if increased home working arrangements, reducing the need for work-based travel, are sustained. Electric vehicle uptake is increasing across the UK, with sales of Battery Electric Vehicles increasing by 40.1% from 2021 to 2022 and comprising 16.6% of registrations in 2022 (SMMT, 2023).

Challenges to air quality in the TVBC area will remain as a result of climate change, potential increases in domestic solid fuel burning and the increase in traffic volume in relation to more personnel returning to office based working. Inflationary challenges may also influence uptake of EV's, with relatively high energy prices potentially increasing the popularity of solid fuel burning.

## Local Engagement and How to get involved

TVBC is actively promoting sustainable travel which will help improve air quality. The 2022 Climate Day of Action held on the 30<sup>th</sup> September, run in partnership with Andover Vision, was supported by TVBC and ran alongside the Great Big Green Week which was held between September 24<sup>th</sup> and October 2<sup>nd</sup> 2022. The guided cycling and walking events promoting active travel which were open to residents of Picket Twenty and run in conjunction with Persimmon homes and promoted by British Cycling, also took place on June 18<sup>th</sup> 2022.

Information on wood burning stoves and open fires, which have grown in popularity in recent years and can have an impact on air quality in built up areas relating to particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), is available on the TVBC website on the dedicated Air Quality page:

<https://www.testvalley.gov.uk/housingandenvironmentalhealth/environmentalprotection/air-quality>

In order to decrease emissions through reducing the burning of garden waste, TVBC encourages residents to consider home composting:

<https://www.testvalley.gov.uk/wasteandrecycling/recycling/homecomposting>

Alternatively a garden waste collection service is available through an annual subscription service:

<https://www.testvalley.gov.uk/wasteandrecycling/garden-waste-info>

Garden waste recycling facilities are also available at Hampshire County Councils Household Waste Recycling Centres:

<https://www.hants.gov.uk/wasteandrecycling>

Further information on aspects relating to air quality and sustainable transport for TVBC, including links to EV charging locations within the TVBC area, are available on the Council's website:

Air Quality:

<https://www.testvalley.gov.uk/housingandenvironmentalhealth/environmentalprotection/air-quality>

Sustainability:

<https://www.testvalley.gov.uk/aboutyourcouncil/corporatedirection/environmentandsustainability>

Travel Planning:

<https://www.testvalley.gov.uk/transportparkingandstreets/traffic-management/travelplans>

Cycling and Walking:

<https://www.testvalley.gov.uk/communityandleisure/cyclingwalking>

With updates for new sustainable travel initiatives such as, bus services, walking and cycling provision and residents travel plans:

<https://www.testvalley.gov.uk/communityandleisure/my-local-area-new/andover-romans/augusta-park/east-anton-augusta-park-community-travel-plan>

and through the My Journey link on the following TVBC webpage

<http://testvalley.gov.uk/transportparkingandstreets>

Useful information on air quality at home can also be found on the Hampshire County Council Clean Air at Home webpage:

<https://myjourneyhampshire.com/air-quality/clean-air-at-home/>



## **Local Responsibilities and Commitment**

This ASR was prepared by the Environmental Health Service of Test Valley Borough Council with the support and agreement of the following officers and departments:

Sean Feist – Housing and Environmental Health Service

Lorna Taylor - Housing and Environmental Health Service

This ASR has been approved by:

Mark Lee – Environmental Health Manager

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

If you have any comments on this ASR please send them to Sean Feist at:

Housing and Environmental Health Service

Test Valley Borough Council

Beech Hurst

Weyhill Road

Andover

SP10 3AJ

Telephone: 01264 368000

Email: [envhealth@testvalley.gov.uk](mailto:envhealth@testvalley.gov.uk)

## Table of Contents

<b>Executive Summary: Air Quality in Our Area</b> .....	<b>i</b>
Air Quality in Test Valley Borough Council .....	i
Actions to Improve Air Quality .....	iii
Conclusions and Priorities .....	iv
Local Engagement and How to get involved .....	v
Local Responsibilities and Commitment .....	vii
<b>1 Local Air Quality Management</b> .....	<b>1</b>
<b>2 Actions to Improve Air Quality</b> .....	<b>2</b>
Air Quality Management Areas .....	2
Progress and Impact of Measures to address Air Quality in Test Valley Borough Council .....	4
PM <sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations .....	9
<b>3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance</b> .....	<b>12</b>
Summary of Monitoring Undertaken .....	12
3.1.1 Automatic Monitoring Sites .....	12
3.1.2 Non-Automatic Monitoring Sites .....	12
Individual Pollutants .....	13
3.1.3 Nitrogen Dioxide (NO <sub>2</sub> ) .....	13
<b>Appendix A: Monitoring Results</b> .....	<b>15</b>
<b>Appendix B: Full Monthly Diffusion Tube Results for 2022</b> .....	<b>23</b>
<b>Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC</b> .....	<b>25</b>
New or Changed Sources Identified Within Test Valley Borough Council During 2022 .....	25
Additional Air Quality Works Undertaken by Test Valley Borough Council During 2022 .....	25
QA/QC of Diffusion Tube Monitoring .....	25
Diffusion Tube Annualisation .....	26
Diffusion Tube Bias Adjustment Factors .....	26
NO <sub>2</sub> Fall-off with Distance from the Road .....	27
<b>Appendix D: Map(s) of Monitoring Locations and AQMAs</b> .....	<b>28</b>
<b>Appendix E: Summary of Air Quality Objectives in England</b> .....	<b>46</b>
<b>Glossary of Terms</b> .....	<b>47</b>
<b>References</b> .....	<b>48</b>

## Figures

Figure A.1 – Trends in Annual Mean NO <sub>2</sub> Concentrations.....	21
Figure A.2 – Annual Mean NO <sub>2</sub> Concentrations 2019 to 2022.....	22
Figure D.1 – Maps of Non-Automatic Monitoring Site .....	28

## Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality.....	8
Table A.1 – Details of Automatic Monitoring Sites .....	15
Table A.2 – Details of Non-Automatic Monitoring Sites .....	16
Table A.3 – Annual Mean NO <sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m <sup>3</sup> ) .....	18
Table A.4 – Annual Mean NO <sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m <sup>3</sup> ) ....	19
Table B.1 – NO <sub>2</sub> 2022 Diffusion Tube Results (µg/m <sup>3</sup> ) .....	23
Table C.1 – Annualisation Summary (concentrations presented in µg/m <sup>3</sup> ).....	26
Table C.2 – Bias Adjustment Factor .....	27
Table E.1 – Air Quality Objectives in England .....	46

# 1 Local Air Quality Management

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

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

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

## 2 Actions to Improve Air Quality

### Air Quality Management Areas

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

Test Valley Borough Council does not have any declared AQMAs. A local Air Quality Strategy is not currently in place, however the Council utilises a number of local and regional plans and strategies in order to minimise and/or reduce potential impacts on air quality within the Borough and to prevent and reduce polluting activities. Monitoring data for 2022 indicates continued compliance with the Air Quality Objective of 40.0 µg/m<sup>3</sup> with no evidence that this will be exceeded.

Examples of the management strategies utilised are listed below:

- Hampshire Local Plan (2011- 2031)
- Hampshire Local Plan ( Draft LTP – 4)  
<https://www.hants.gov.uk/transport/localtransportplan>
- Test Valley Borough Council Local Plan (2011 – 2029)  
[Local Plan | Test Valley Borough Council](#)
- Partnership for Urban South Hampshire Air Quality Impact Assessment (PUSH)  
[Home - Partnership for South Hampshire \(push.gov.uk\)](#)

For reference, maps of TVBC's monitoring locations are available in Appendix D.

**Table 2.1 – Declared Air Quality Management Areas**

Test Valley Borough Council has not declared any Air Quality Management Areas.

## Progress and Impact of Measures to address Air Quality in Test Valley Borough Council

Defra's appraisal of last year's ASR concluded: The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

1. Comments from last year's ASR have been mentioned and addressed, which is welcomed, and it is encouraged that this continues with future ASRs.
2. The Council have provided a good discussion regarding the measures to reduce PM<sub>2.5</sub> emissions. The fraction of mortality attributable to particulate air pollution has been provided and has been compared with both national and local averages. This should be continued in future ASRs.
3. A number of priorities have been set for the upcoming year, and it is clear that the Council are committed to reducing emissions in the area.
4. All graphs are well presented and are clear to read, with the addition of the AQO allowing for visual analysis of the monitoring data. Formatting is consistent between all charts.
5. The Council should consider the relocation of some monitoring sites where there has been continuously low concentrations for a number of years, for example site S12.
6. Overall, the report is detailed and provides great insight into the work that Test Valley Borough Council are doing within its area, and all of the measures it has put in place to improve air quality.

Test Valley Borough Council will continue to review publically available data and information on PM<sub>2.5</sub> emissions along with local trends in NO<sub>2</sub>. Relocation of monitoring sites, where low concentrations of NO<sub>2</sub> have been measured for a prolonged period, have been considered and will continue to be reviewed. However, where these site are located on major routes within Test Valley Borough and where future development and expansion of housing may impact on those routes, it is considered advantageous to retain these for long term trend monitoring to help inform the local plan and Council Officers. To address potential air quality issues and assess new locations for monitoring, short term

deployments have been carried out at 3 locations in the 2022 reporting year (S18A, S18B & S18C), with a further location to be added in 2023.

Test Valley Borough Council has proceeded with a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 17 measures are included within Table 2.2, with the type of measure and the progress TVBC have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Copies of the main reference plans/strategies can be found via the web-links listed below:

Local Transport Plan (LTP – 4) – Draft

<https://www.hants.gov.uk/transport/localtransportplan>

Test Valley Borough Council's Local Plan (2011 – 2029)

<https://www.testvalley.gov.uk/planning-and-building/planningpolicy/local-development-framework/dpd>

Test Valley Borough Council's Draft Local Plan (2040)

<https://www.testvalley.gov.uk/planning-and-building/planningpolicy/local-development-framework/draft-local-plan-2040>

Test Valley Borough Council's Climate Emergency Action Plan

<http://www.testvalley.gov.uk/aboutyourcouncil/corporatedirection/environmentandsustainability/climate-emergency-action-plan>

Test Valley Borough Council's Sustainability Framework

<http://www.testvalley.gov.uk/aboutyourcouncil/corporatedirection/environmentandsustainability/sustainability-framework>

Environmental Health website information

<https://www.testvalley.gov.uk/housingandenvironmentalhealth/environmentalprotection/air-quality>

TVBC expects the following measures to be completed over the course of the next reporting year:



- Northern Test Valley Local Cycling & Walking Infrastructure Plans – reduced traffic in line with increased uptake of active travel.

TVBC's priorities for the coming year are:

- Working with HCC and Sustrans on the Northern Test Valley Local Cycling & Walking Infrastructure Plan;
- Continued focus on the monitoring of NO<sub>2</sub> within the borough, reviewing and adapting the monitoring network where appropriate;
- Working with local businesses to ensure compliance with environmental permits;
- responding to reports of smoke related issues, such as bonfires and domestic solid fuel burning, with the provision of information on related air quality issues to those involved;
- Ensuring that all proposed development is subject to scrutiny and is compliant with Policy E8 of the Council's Local Plan;
- Working with our neighbouring local authorities with regards to the non-compliance for NO<sub>2</sub> in the Southampton Urban Area Clean Air Zone.

Key completed measures are:

- University Hospital Southampton (Bargain Farm) Park and Ride which is anticipated to reduce traffic within the Southampton Urban Area Clean Air Zone and neighbouring areas;
- Southern Test Valley Local Cycling & Walking Infrastructure Plans – reduced traffic in line with increased uptake of active travel.

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

- Southampton City Council
- PUSH
- Hampshire County Council
- Sustrans

TVBC continues to work on decreasing the impact on air quality from its own transport fleet through the modernisation and, where possible, electrification of vehicles and powered equipment. During 2022 five new dustcarts compliant with Euro 6 emissions standards were purchased, replacing older diesel vehicles only compliant with Euro 5 standards. The remaining Euro 5 category Heavy Goods Vehicles are scheduled for

replacement within the 2023/24 financial year. Another Battery Electric light goods vehicle was added to the fleet during 2022, bringing the total number of battery powered Light Goods Vehicles to 12. A further 3 are scheduled to replace older diesel vehicles during the 2023/24 financial year. In a drive to decarbonise the Council's activities and address the declared Climate Emergency, TVBC has switched fuels for its vehicle fleet from Diesel to Hydrotreated Vegetable Oil (HVO – a diesel alternative). An additional beneficial impact may also be the reduction of NO<sub>2</sub> and fine particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) associated with vehicle exhaust emissions. Manufacturers of these fuels (e.g. Neste, 2016) report an approximate 10% decrease in Nitrogen Oxides (a combination of Nitrogen Oxide - NO<sub>x</sub>, and NO<sub>2</sub>) combined with a 30% decrease in fine particulate matter exhaust emissions. Whilst the results of independent emissions monitoring from real world operation show less conclusive results, this shift could provide further incentive for adoption of diesel alternatives. TVBC aims to be an effective demonstrator for the adoption of new technology to reduce emissions, with the aim to encourage local businesses to adopt strategies and procedures that could help improve air quality.

The principal challenges and barriers to implementation that TVBC anticipates facing are that the main driver for air quality in the borough continues to be associated with vehicular traffic. With regional background monitoring data confirming higher levels of NO<sub>2</sub> and PM<sub>2.5</sub> along major roads, such as the A303 and M27, along with urban areas (DEFRA, 2018). The road network, particularly within the historic settlements of Andover and Romsey, also poses additional challenges for traffic management, which is largely beyond the control of TVBC, and is the responsibility of Hampshire County Council and Highways England.

The rate of technological development may also impact the uptake of alternatively powered vehicles and plant. Currently, electrification of the dustcart fleet is not viable, not only due to cost (with electric dustcarts approximately twice the price as Euro 6 vehicles), but also due to performance issues. The currently available electric options are unfortunately not sufficiently suitable to meet the operational requirements within the Test Valley Borough Council area.

TVBC anticipates that the measures stated above and in Table 2.2 will help maintain compliance within the Test Valley area and TVBC will continue to work with partners in neighbouring authorities, Highways England and Hampshire County Council to monitor and achieve the required Air Quality Objectives.

Table 2.2 – Progress on Measures to Improve Air Quality

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	Pocket Park	Traffic Management	Re-prioritising road space away from cars	2019	2020	Local Authority County Council	Developers & highway infrastructure funding	No	Funded	£500k - £1M	Completed	Reduced Vehicle Emissions	-	Work completed	-
2	Bargain Farm / Nursling Park and Ride	Alternatives to Private Vehicle Use	Bus based park and ride	2021	2022	Local Authority	Developers	No	Funded	Unknown	Completed	Reduced Vehicle Emissions	-	Opened October 2022	Currently operated for NHS staff
3	Home Working/Agile Working	Promoting Travel Alternatives	Encourage/Facilitate Homeworking	2020	Ongoing	Local Authority	N/A	No	N/A	Savings	Completed	Reduced Vehicle Emissions	-	Agile Working policy finalised January 2022	-
4	Andover Airfield Business Park	Freight and Delivery Management	Route Management Plans/Strategic Routing	2010	Ongoing	Local Authority	Developers / Operators	No	Funded	Unknown	Implementation	Reduced Vehicle Emissions	TRO	Ongoing	-
5	King Alfreds Cycleway	Transport Planning and Infrastructure	Cycle Network	2020	2020	Local Authorities (Wessex Region)	Mixed	No	Funded	Unknown	Completed	Reduced Vehicle Emissions	-	-	-
6	Environmental Permits	Environmental Permits	Introduction/Increase of environment charges through permit systems and economic instruments	Ongoing	Ongoing	Local Authority	Self-funding	No	Funded	Unknown	Implementation	Reduction in Pollutants/Emissions	Permit compliance	Ongoing	-
7	Electric Vehicles and Plant	Policy Guidance and Development Control	Sustainable Procurement Guidance	2015	Ongoing	Local Authority	Budgets	No	Funded	Unknown	Implementation	Reduction in Pollutants/Emissions	-	12 electric vehicles, 25 electric plant items and 3 dustcarts with electric bin lifts	High costs / Availability of suitable alternatives
8	Community travel plans for new neighbourhoods	Transport Planning and Infrastructure	Public transport improvements – interchanges stations and services	2001	Ongoing	Local Authority Developers County Council	Developers	No	Funded	Unknown	Implementation	Reduction in Pollutants/Emissions	-	Services in place for Picket Twenty, Picket Piece and Abbotswood	Phased development
9	Renewable and low carbon energy study	Policy Guidance and Development Control	Other Policy	2019	2020	Local Authority	Local Authority	No	Funded	£37000	Completed	Reduction in Pollutants/Emissions	-	Study completed to highlight capacity in the area and assist sustainable development	-
10	Southern Test Valley Local Cycling & Walking Infrastructure Plans	Transport Planning and Infrastructure	Cycle Network	2020	2022	Local Authority County Council Sustrans	Shared	No	Unknown	Unknown	Planning	Reduced Vehicle Emissions	-	Completed	-
11	Northern Test Valley Local Cycling & Walking Infrastructure Plans	Transport Planning and Infrastructure	Cycle Network	2020	2023	Local Authority County Council Sustrans	Shared	No	Unknown	Unknown	Planning	Reduced Vehicle Emissions	-	In planning and preparation stage	-
12	Salary Sacrifice for Bicycles	Promoting Travel Alternatives	Promotion of Cycling	2012	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Implementation	Reduced Vehicle Emissions	-	Available on website	-
13	Walking and Cycling Guides	Promoting Travel Alternatives	Promotion of Cycling/Walking	2010	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Implementation	Reduced Vehicle Emissions	-	Available on website, promoted via social media and paper guides	-
14	Travel Plan	Promoting Travel Alternatives	Promote use of rail and inland waterways	2015	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Implementation	Reduction in Pollutants/Emissions	-	Ongoing	-
15	Taxi Licensing	Promoting Low Emission Transport	Taxi Licensing Conditions	2014	Ongoing	Local Authority	Licence Fee	No	Funded	Unknown	Implementation	Reduced Vehicle Emissions	-	Reviewed regularly	-
16	Green Waste Recycling	Other	Other	2004	Ongoing	Local Authority	Local Authority & Subscribers	No	Funded	Unknown	Implementation	Reduction in Pollutants/Emissions	Number of Subscribers	Ongoing	Subscription fee and space for waste bin
17	Alternative Low Carbon Fuel Adoption	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2022	Ongoing	Local Authority	Local Authority	No	Funded	Unknown	Implementation	Reduced Vehicle Emissions	Fuel consumption / emissions tests	Implementation ongoing	-

## PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations

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

As part of the Air Quality Annual Summary Report, Test Valley Borough Council reviews the latest air quality data on particulates available from the Office for Health Improvement & Disparities (OHID - previously Public Health England). According to the latest data available for 2021, the fraction of mortality attributable to particulate air pollution in the Test Valley area was 5.4%, a decrease of 0.2% since 2020\* (OHID, 2023<sup>a</sup>). This fraction of mortality is comparable to that within the South East region (5.4%) and slightly lower than the average for England (5.5%). This also reflects a decreasing trend in the fraction of mortality attributable to particulate air pollution in TVBC, down from 7.1% in 2018.

Concentrations of total PM<sub>2.5</sub> estimated for the Test Valley in 2021 was 7.2 µg/m<sup>3</sup>, a decrease from the 7.5 µg/m<sup>3</sup> reported for 2020\* (OHID, 2023<sup>b</sup>). This shows a continuation of a decreasing trend, down from 9.6 µg/m<sup>3</sup> in 2018. The value is also slightly lower than the average concentration of total PM<sub>2.5</sub> for Hampshire and England of 7.4 µg/m<sup>3</sup> and the South East region of 7.3 µg/m<sup>3</sup>.

**[\* please note that new methods for calculating both the fraction of mortality and concentrations of particulate matter have been employed since 2022. Data from 2021 is no longer available for comparison utilising the old methods and new method data is therefore presented in this report for both categories].**

The latest data for the UK in 2022 indicates that average roadside PM<sub>2.5</sub> levels are 8.7 µg/m<sup>3</sup>, with urban background levels at the same concentration (Defra 2023<sup>b</sup>). Background mapping data from 2018 for the Test Valley Borough area (Defra, 2018)) indicates that the maximum concentration of PM<sub>2.5</sub> was estimated at 11.0 µg/m<sup>3</sup> with an average of 8.8 µg/m<sup>3</sup> and minimum of 8.1 µg/m<sup>3</sup>. The highest concentrations >10 µg/m<sup>3</sup> are located along major highways such as the M27, A303, A34 and A343. With background levels between 9.0 and 10.0 µg/m<sup>3</sup> predominantly associated with the urban areas centred on Andover,

Romsey, Nursling and Chilworth. The majority of the TVBC area has background concentrations of PM<sub>2.5</sub> estimated between 8.0 and 9.0 µg/m<sup>3</sup>.

The modelled data for PM<sub>2.5</sub> in 2022, based on projections from the 2018 data, predicted an average PM<sub>2.5</sub> concentration of 8.2 µg/m<sup>3</sup> within the TVBC area, with a range from 7.5 to 10.3 µg/m<sup>3</sup>. It should be noted that uncertainty of the predicted values for PM<sub>2.5</sub> is relatively high due to impacts on air quality in relation to the Covid-19 pandemic. Further review of this data will be undertaken when updates are available.

Further information on particulate matter can be found on the following websites:

- Department for Environment, Food & Rural Affairs - National Statistics Air quality statistics in the UK, 1987 to 2022 - Particulate matter (PM10/PM2.5)  
<https://www.gov.uk/government/statistics/air-quality-statistics/concentrations-of-particulate-matter-pm10-and-pm25#trends-in-concentrations-of-pm10-in-the-uk-1992-to-2022>
- Department for Environment, Food & Rural Affairs – Air Information Resource, Data Archive – UK Ambient AQ Map. <https://uk-air.defra.gov.uk/data/gis-mapping/>

Test Valley Borough Council is taking the following measures to address PM<sub>2.5</sub>. Publicly available data for PM<sub>2.5</sub> is monitored to determine any changes in background and roadside annual mean concentrations. Key sources of PM<sub>2.5</sub> include road traffic, industrial emissions and wood burning stoves. Whilst TVBC only has a limited role in road traffic management it will continue to work with Hampshire County Council and Highways England in addition to Hampshire County Council's Public Health team and the Office for Health Improvement & Disparities/UK Health Security Agency to reduce PM<sub>2.5</sub> emissions wherever possible.

Where permitted activities relate to the emissions of fine particulate matter TVBC will ensure remediation is carried out where any exceedance of the permitted limits are detected and work with the relevant operators to ensure best practice is followed to minimise emissions. Where complaints are received relating to potential statutory nuisance from domestic solid fuel burning, TVBC will investigate and where the type of fuel is suspected to be supplied contrary to The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020 this will be reported to the regulator (Hampshire Trading Standards). Guidance on the use of wood burning stoves, particularly relevant to urban areas, is provided on the TVBC website. The garden waste recycling scheme is also promoted by TVBC, with the potential impact of reducing bonfires and associated

particulate matter. The scheme has been a success with increased numbers of subscribers from 11,000 in 2016 to 19,018 in 2022.

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

This section sets out the monitoring undertaken within 2022 by Test Valley Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a seven-year period between 2016 and 2022 to allow monitoring trends to be identified and discussed (Appendix A, figure A.1).

### Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

TVBC does not currently have any automatic (continuous) monitoring sites.

#### 3.1.2 Non-Automatic Monitoring Sites

Test Valley Borough Council undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at a total of 19 sites during 2022. Table A.2 in Appendix A presents the details of the non-automatic sites. 17 of the monitoring sites have also been in-situ since 2019, providing the opportunity to compare data over a 4 year period (please refer to Appendix 2, figure A.2), with longer term comparisons over a 7 year period available at 6 localities since 2016 (Appendix A figure A.1).

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.

Following feedback from DEFRA on the TVBC 2022 Annual Summary Report consideration has been given to the re-siting of monitoring tubes, particularly where low concentrations of NO<sub>2</sub> have been recorded over an extended period. Deployment sites for air quality monitoring are regularly reviewed by TVBC, with consideration given to concerns or information provided by the public. Monitoring sites are also retained in specific locations in order to establish long term trends, particularly on major roads through the Test Valley Borough where future development may impact traffic volume. The three sites at S11, S12 and S13 have currently been retained to ensure coverage in semi-rural

areas where relatively high traffic flow occurs through, or close to, residential areas. At the same time, extra monitoring equipment has been assigned to areas where traffic flows are known to be relatively high, regularly delayed or where there is restricted air movement. This also provides the capacity to undertake short term screening for NO<sub>2</sub> in areas previously not monitored. Results from screening exercises have so far identified low levels of NO<sub>2</sub>, with 2 locations monitored in 2022 showing NO<sub>2</sub> concentrations at less than 25% of the 40 µg/m<sup>3</sup> air quality objective. Data at a third site (S18C) did not meet the specific data quality requirements for the 2022 period due to the date of deployment (November) and cannot be included within a discussion on annual mean concentrations. However, it is notable that the raw/uncorrected monthly data shows relatively low values in comparison to the nearby sites S1 and S6 (please refer to Appendix B, Table B1).

## 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<sub>2</sub>)

Table A.4 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past seven years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

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

Annual mean raw and bias corrected NO<sub>2</sub> concentrations at the 19 monitoring stations within the TVBC area did not exceed the air quality monitoring objectives of 40 µg/m<sup>3</sup> during the 2022 monitoring period. Mean annual bias corrected NO<sub>2</sub> concentrations of 19.9 µg/m<sup>3</sup> are calculated for the 19 locations with viable data, with a range from 7.0 to 32.1 µg/m<sup>3</sup>. A bias correction factor of 0.76 has been applied for 2022 in line with the appropriate technical guidance. To place the TVBC results in context, a comparison is made with the national roadside average for England of 23.6 µg/m<sup>3</sup> (Defra, 2023<sup>a</sup>).



A negligible overall decrease of 0.3  $\mu\text{g}/\text{m}^3$  in average annual  $\text{NO}_2$  concentrations is observed at the 17 established monitoring locations, from 21.5  $\mu\text{g}/\text{m}^3$  in 2021 to 21.2  $\mu\text{g}/\text{m}^3$  in 2022. Eleven of the monitoring sites show relatively stable or minor increasing trends when compared to 2021, with an average increase at these location of 0.9  $\mu\text{g}/\text{m}^3$ . Six localities show a decrease between 2021 and 2022 with an average drop in  $\text{NO}_2$  concentrations at these locations of 2.5  $\mu\text{g}/\text{m}^3$ .

Location S6 on Winchester Road, Romsey, shows an increase in  $\text{NO}_2$  to levels above concentrations observed prior to 2020, from 27.9  $\mu\text{g}/\text{m}^3$  in 2019 to 31.1  $\mu\text{g}/\text{m}^3$  in 2022. This occurs in a position in relative close proximity to a second monitoring location, approximately 20m to the east (S1), where a significant decrease has been observed from 35.3  $\mu\text{g}/\text{m}^3$  in 2019 to 20.6  $\mu\text{g}/\text{m}^3$  in 2022. The average concentrations of  $\text{NO}_2$  at the two locations have shown an overall decrease from 31.6  $\mu\text{g}/\text{m}^3$  in 2019 to 25.8  $\mu\text{g}/\text{m}^3$  in 2022. The cause of the change in distribution of  $\text{NO}_2$  in this area is not yet known, however this may be related to shifts in the direction of traffic flow relating to construction activities in the wider area. Short term monitoring, utilising Diffusion Tube S18C, combined with plans for further short term deployments in the vicinity are being carried out to aid in understanding air quality in this area. Changes to the location of monitoring site S18C along with the addition of a further site S19, in Andover, are planned for the 2023 monitoring year.

The results from monitoring carried out in 2022 indicates that air quality within Test Valley Borough complies with the relevant air quality objective for  $\text{NO}_2$ , and are below the threshold (36  $\mu\text{g}/\text{m}^3$ ) where distance correction to the nearest receptor is necessary. Combined with the absence of consistent trends that may indicate a future breach of the air quality objective this information indicates that no action to declare an AQMA is required at this time.

## Appendix A: Monitoring Results

### Table A.1 – Details of Automatic Monitoring Sites

Test Valley Borough Council does not have any Automatic Monitoring Sites.

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
S1	Winchester Road - East	Roadside	436129	121398	NO <sub>2</sub>	No	0.0	1.0	No	1.5
S2	Duttons Road	Roadside	435376	121786	NO <sub>2</sub>	No	0.0	1.5	No	2.0
S3	Palmerstons Street - West	Roadside	435474	121089	NO <sub>2</sub>	No	0.0	1.3	No	2.0
S4	Romsey (A27) Bypass	Roadside	434927	120689	NO <sub>2</sub>	No	0.0	3.0	No	2.0
S5	Palmerstons Street - East	Roadside	435473	121125	NO <sub>2</sub>	No	0.0	2.0	No	1.8
S6	Winchester Road - West	Roadside	436079	121388	NO <sub>2</sub>	No	0.0	1.5	No	2.0
S7	Alma Road - South	Roadside	435696	121245	NO <sub>2</sub>	No	0.0	2.0	No	2.0
S8	Alma Road - North	Roadside	435630	121403	NO <sub>2</sub>	No	0.0	2.6	No	2.0
S9	Chilworth Road	Roadside	441760	118091	NO <sub>2</sub>	No	0.0	1.0	No	2.0
S10	Nursling Street, Nursling	Roadside	436991	116319	NO <sub>2</sub>	No	0.0	0.5	No	2.0
S11	North Baddesley	Roadside	439617	119978	NO <sub>2</sub>	No	0.0	2.0	No	1.5
S12	Kings Somborne	Roadside	435869	130958	NO <sub>2</sub>	No	0.0	1.5	No	1.5
S13	Weyhill (A342), Andover	Roadside	432084	146585	NO <sub>2</sub>	No	0.0	2.5	No	1.5
S14	Humberstone Road (East)	Roadside	436498	144936	NO <sub>2</sub>	No	0.0	1.5	No	2.0
S15	Little Ann (A343)	Roadside	433514	143078	NO <sub>2</sub>	No	0.0	2.0	No	2.0
S16	Nursling (A3057)	Roadside	437747	116652	NO <sub>2</sub>	No	0.0	1.5	No	1.5
S17	New Street, Andover	Roadside	436682	146683	NO <sub>2</sub>	No	0.0	1.5	No	2.4
S18A	Floral Way, Andover	Suburban	434723	145058	NO <sub>2</sub>	No	0.0	7.5	No	1.8
S18B	High Street, Stockbridge	Roadside	435418	135124	NO <sub>2</sub>	No	0.0	4.3	No	2.0
S18C	Winchester Road - South	Suburban	436105	121382	NO <sub>2</sub>	No	0.0	7.4	No	2.2

**Notes:**

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
- (2) N/A if not applicable.

**Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

Test Valley Borough Council does not have any Automatic Monitoring Sites.

**Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2018	2019	2020	2021	2022
S1	436129	121398	Roadside	100	100.0		35.3	32.2	28.3	20.6
S2	435376	121786	Roadside	92	92.3		24.5	21.8	21.9	22.3
S3	435474	121089	Roadside	100	100.0	29.3	30.1	23.9	23.2	23.3
S4	434927	120689	Roadside	92	92.3		22.5	18.6	17.8	17.5
S5	435473	121125	Roadside	100	100.0		25.4	21.8	19.6	20.5
S6	436079	121388	Roadside	92	92.3	26.6	27.9	21.8	26.3	31.1
S7	435696	121245	Roadside	100	100.0	26.6	24.4	18.8	19.6	18.2
S8	435630	121403	Roadside	100	100.0	25.9	25.1	18.9	19.2	19.8
S9	441760	118091	Roadside	100	100.0	30.0	30.3	22.3	24.6	23.2
S10	436991	116319	Roadside	92	92.3		29.1	26.4	26.2	26.3
S11	439617	119978	Roadside	100	100.0		30.6	25.4	24.0	24.6
S12	435869	130958	Roadside	100	100.0		16.5	11.8	12.0	12.2
S13	432084	146585	Roadside	100	100.0	26.6	16.8	15.4	18.0	14.7
S14	436498	144936	Roadside	100	100.0		16.5	14.1	13.9	14.0
S15	433514	143078	Roadside	100	100.0		24.3	18.7	19.0	18.1
S16	437747	116652	Roadside	100	100.0		26.8	21.3	21.8	21.9
S17	436682	146683	Roadside	100	100.0		35.4	30.2	30.2	32.1
S18A	434723	145058	Suburban	100	42.3					10.0
S18B	435418	135124	Roadside	100	32.7					7.0
S18C	436105	121382	Roadside	100	17.3					-

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

☒ Diffusion tube data has been bias adjusted.

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

#### Notes:

The annual mean concentrations are presented as µg/m<sup>3</sup>.

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

**Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations**

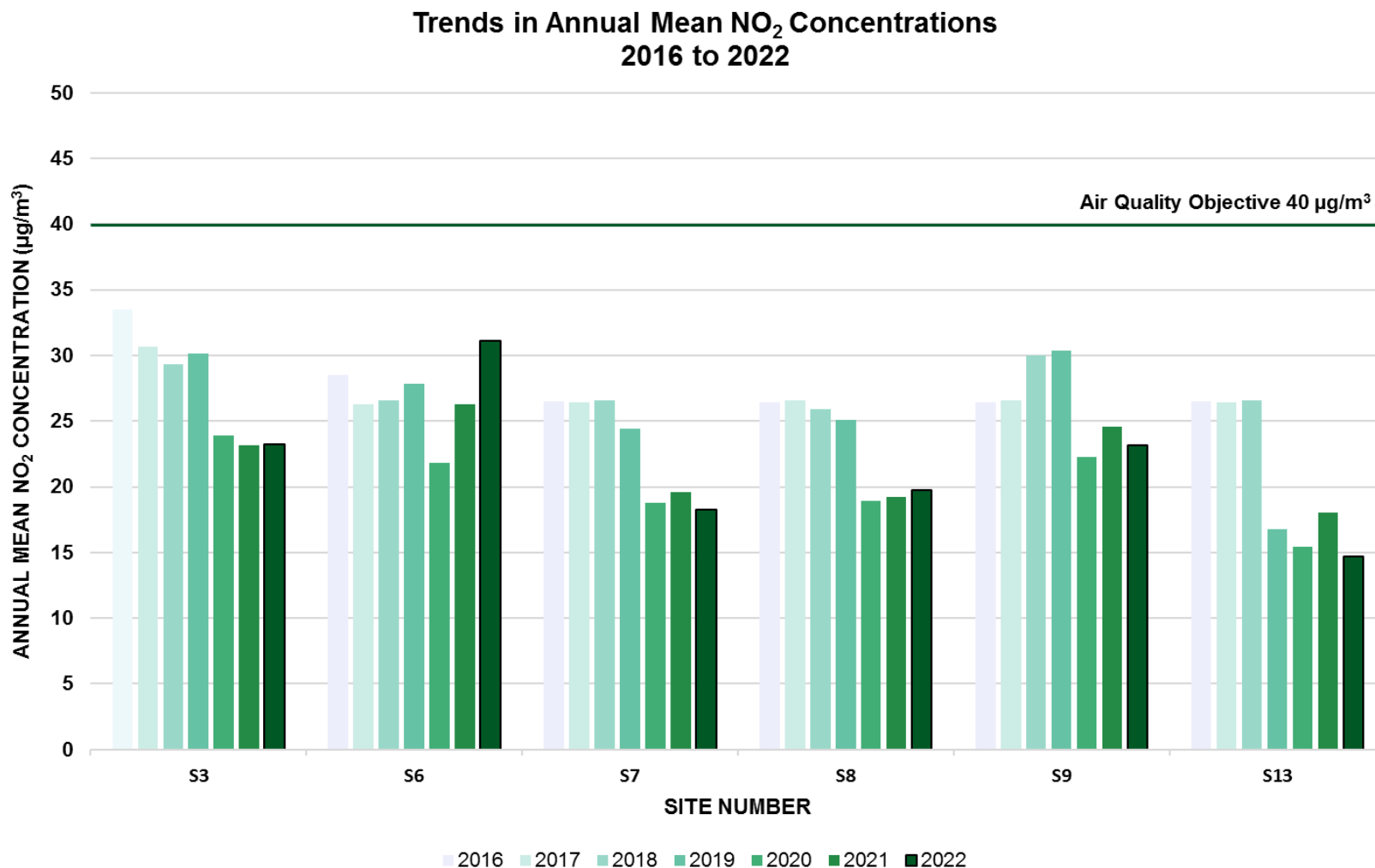


Figure A.1. Annual mean concentrations of NO<sub>2</sub> (in µg/m<sup>3</sup>) for the 7 year period 2016 to 2022 at 6 monitoring sites where data is available for trend analysis. 5 of the sites show relatively stable concentrations of NO<sub>2</sub> after the drop off in 2020, with a single site, S6 showing an increase in average NO<sub>2</sub> at this location.



Figure A.2 – Annual Mean NO<sub>2</sub> Concentrations 2019 to 2022

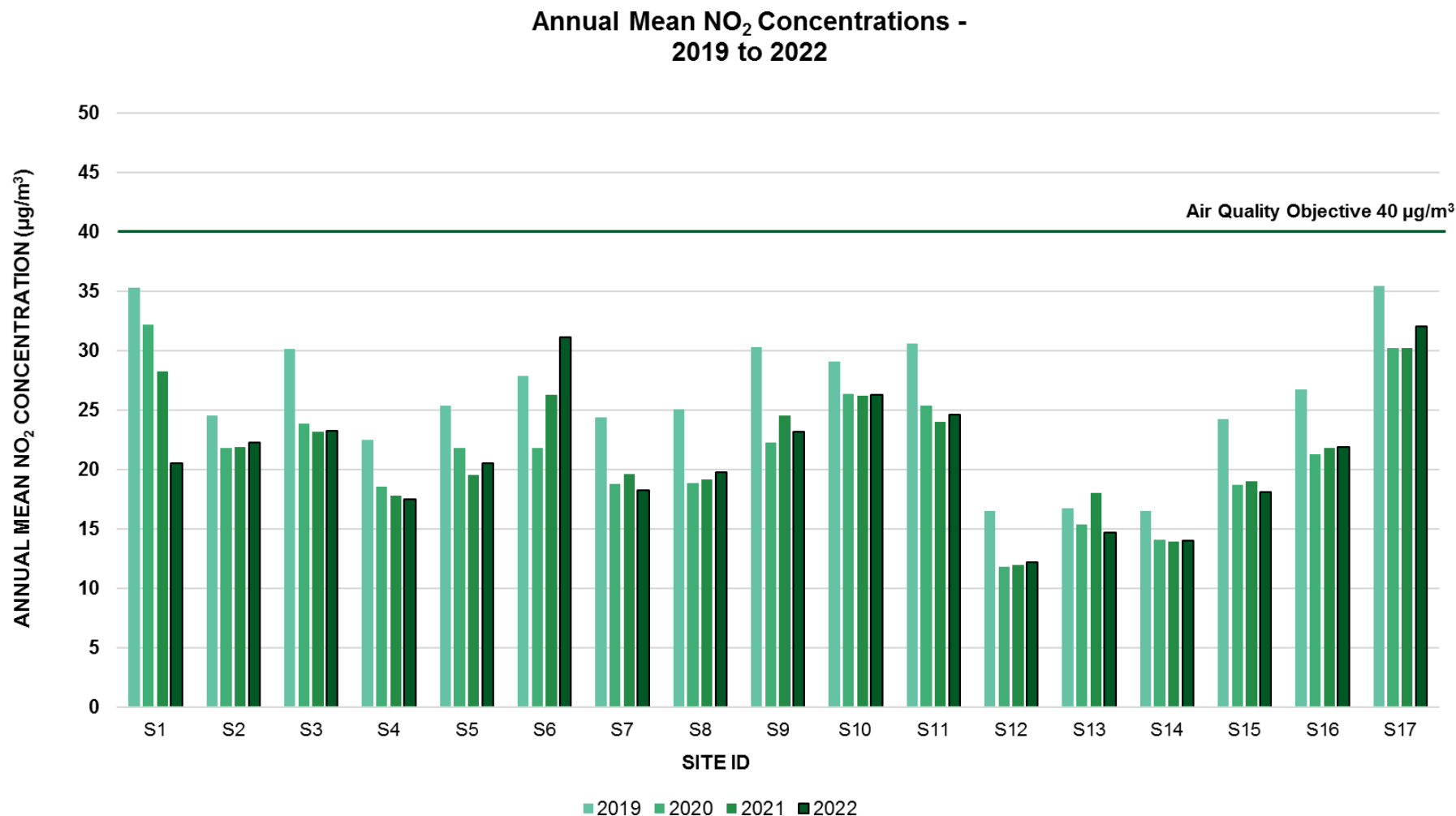


Figure A.2. Annual mean concentrations of NO<sub>2</sub> (in µg/m<sup>3</sup>) for the 4 year period 2019 to 2022 at 17 monitoring sites where data is available for trend analysis. The majority of sites show relatively stable concentrations of NO<sub>2</sub> after the drop off in 2020, with two sites, S6 and S17 showing an increase in average NO<sub>2</sub>. All sites are within the air quality objective of 40 µg/m<sup>3</sup>.

## Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO<sub>2</sub> 2022 Diffusion Tube Results (µg/m<sup>3</sup>)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S1	436129	121398	38.9	28.5	30.1	22.4	23.2	22.7	22.8	23.0	25.1	27.1	29.6	31.4	27.1	20.6	-	
S2	435376	121786	37.3	21.3	36.3	28.0	23.5		28.5	31.6	32.5	27.1	27.5	28.8	29.3	22.3	-	
S3	435474	121089	40.8	31.1	33.7	25.0	22.1	27.6	29.9	29.4	25.9	33.9	33.6	34.4	30.6	23.3	-	
S4	434927	120689	27.9	19.9	25.9	18.8		22.5	21.7	22.6	20.1	23.8	28.2	22.0	23.0	17.5	-	
S5	435473	121125	34.8	19.6	36.5	25.9	20.9	22.3	23.9	29.6	24.8	26.6	28.3	30.7	27.0	20.5	-	
S6	436075	121387	43.5	40.4	40.8	38.7		38.8	35.9	42.7	42.8	40.5	44.9	41.2	40.9	31.1	-	
S7	435597	121244	32.8	21.7	30.5	22.2	19.2	18.1	21.3	22.5	22.1	25.1	26.4	26.0	24.0	18.2	-	
S8	435630	121403	39.0	22.6	31.6	23.1	19.0	20.8	24.8	24.9	24.5	24.5	27.6	29.5	26.0	19.8	-	
S9	441760	118091	38.0	30.3	36.9	21.6	27.3	27.9	28.3	27.0	25.9	32.4	35.7	34.7	30.5	23.2	-	
S10	436991	116319		43.2	34.3	32.9	34.2	31.4	33.2	32.6	35.1	32.0	36.6	35.3	34.6	26.3	-	
S11	439617	119978	45.1	34.3	32.2	25.3	30.4	29.8	30.8	30.5	28.3	32.1	34.5	35.1	32.4	24.6	-	
S12	435869	130958	25.5	15.9	17.8	13.7	11.5	12.7	12.9	15.1	14.3	16.2	17.4	19.1	16.0	12.2	-	
S13	432084	146585	31.0	17.2	21.1	20.8	16.3	16.3	16.9	19.4	16.8	14.2	18.4	23.8	19.4	14.7	-	
S14	436498	144936	31.7	16.0	25.7	18.5	11.7	11.6	13.3	16.0	16.8	16.4	16.6	27.1	18.5	14.0	-	
S15	433514	143078	38.2	23.1	29.3	22.3	19.7	21.0	24.9	26.0	23.7	16.1	20.4	20.7	23.8	18.1	-	
S16	437747	116652	41.5	26.0	34.2	29.4	25.2	22.4	22.7	27.4	32.4	24.9	25.2	34.6	28.8	21.9	-	
S17	436682	146683	52.1	30.6	53.3	43.0	34.8	36.1	40.4	52.2	50.2	35.6	34.2	43.9	42.2	32.1	-	
S18A	434723	145058		13.4	16.3	11.8	10.1	11.3							12.6	10.0	-	
S18B	435418	121382							6.6	8.2	8.2	8.6			7.9	7.0	-	
S18C	436105	121382											22.4	26.3	-	-	-	<25% data available during reporting period due to date of deployment in the 2022 monitoring year

- All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Test Valley Borough Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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 Test Valley Borough Council During 2022**

TVBC has not identified any significant new sources relating to air quality within the reporting year of 2022. Road traffic volumes, which were relatively low during 2020 and 2021, resulted in a noticeable drop in NO<sub>2</sub> concentrations during this period. Data from some locations during 2022 indicates that road traffic is increasing, however monthly recorded NO<sub>2</sub> levels at the majority of sites have not returned to pre-pandemic levels.

### **Additional Air Quality Works Undertaken by Test Valley Borough Council During 2022**

TVBC has not completed any additional works within the reporting year of 2022.

### **QA/QC of Diffusion Tube Monitoring**

The diffusion tubes used by TVBC are supplied and analysed (50% TEA in Acetone) by Socotec Laboratories, Didcot, Oxfordshire. The laboratory is UKAS accredited in accordance with International Standard ISO/IEC 17025:2017, with a score of 100% and the highest ranking of satisfactory from the Laboratory Performance in AIR NO<sub>2</sub> Proficiency Testing Scheme (AIR-PT) for the January to February 2022 (AR049) and May to June 2022 (AR050) rounds of performance testing.

Monitoring within TVBC has been completed in adherence to the 2022 Diffusion Tube Monitoring Calendar ( $\pm$  2Days). Missing data within table B2 are due to loss of tubes during the monitoring period, with a total of 4 missing tubes recorded at locations S2 (June), S4 (May), S6 (May) and S10 (January). Data recovery for the 2022 monitoring period is very good, with 100% valid data capture during monitoring periods at 16 locations and 92% at the 4 remaining locations (Table A4). A single location, S18C, did not have enough data during the monitoring period to be included within the report.

Data quality is interpreted as good, with no erroneous results reported. Some monthly variation can be observed within the data, however where a shift is noted, for example during February 2022, this occurred across the majority of monitoring sites and could result from predominant weather patterns or other regional factors affecting air quality.

### Diffusion Tube Annualisation

Two diffusion tube monitoring sites required annualisation for data collected during the 2022 monitoring period. Diffusion tube S18A was deployed for 5 months at Floral Way, Andover, with 42% data capture during the 2022 period. Diffusion tube S18B was deployed for 4 months at High Street, Stockbridge, with 33% data capture for the 2022 period. These relatively short deployment were carried out in response to information/concerns at specific localities.

Four sites with the required >85% data recovery and within closest proximity to the relevant exposure locations were selected for calibration: Chilbolton Observatory, Southampton (A33), Southampton (Centre) and Reading (London Road). Results from monitoring at these locations indicated compliance with the national air quality objective for NO<sub>2</sub> of 40 µg/m<sup>3</sup>, with annualised annual means of 13.1 µg/m<sup>3</sup> and 9.2 µg/m<sup>3</sup> at sites S18A (Andover) and S18B (Stockbridge) respectively. Data at a third site, S18C located in Romsey, spanned the 2022 and 2023 monitoring periods and fell below the 25% threshold for annualisation during 2022.

**Table C.1 – Annualisation Summary (concentrations presented in µg/m<sup>3</sup>)**

Site ID	Annualisation Factor Chilbolton Observatory	Annualisation Factor Southampton A33	Annualisation Factor Southampton Centre	Annualisation Factor Reading London Road	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
S18A	1.0563	1.0371	1.0785	0.9921	1.0410	12.6	13.1
S18B	1.2500	1.0856	1.1546	1.1757	1.1665	7.9	9.2

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub>

continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Test Valley Borough Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by TVBC over the past five years is presented in Table C.2.

The national bias adjustment factor has been derived from the March 2023 version of the National Diffusion Tube Bias Adjustment Factor Spreadsheet. This utilised a total of 26 studies employing ESG (50% TEA in Acetone) diffusion tubes analysed at the SOCOTEC laboratory in Didcot during 2022. All studies indicated 'Good' precision, with individual study locations yielding a range of bias factors from 0.66 to 0.96, with the mean from 26 studies of 0.76 utilised for the TVBC data adjustment.

**Table C.2 – Bias Adjustment Factor**

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	09/20	0.77
2018	National	06/19	0.77

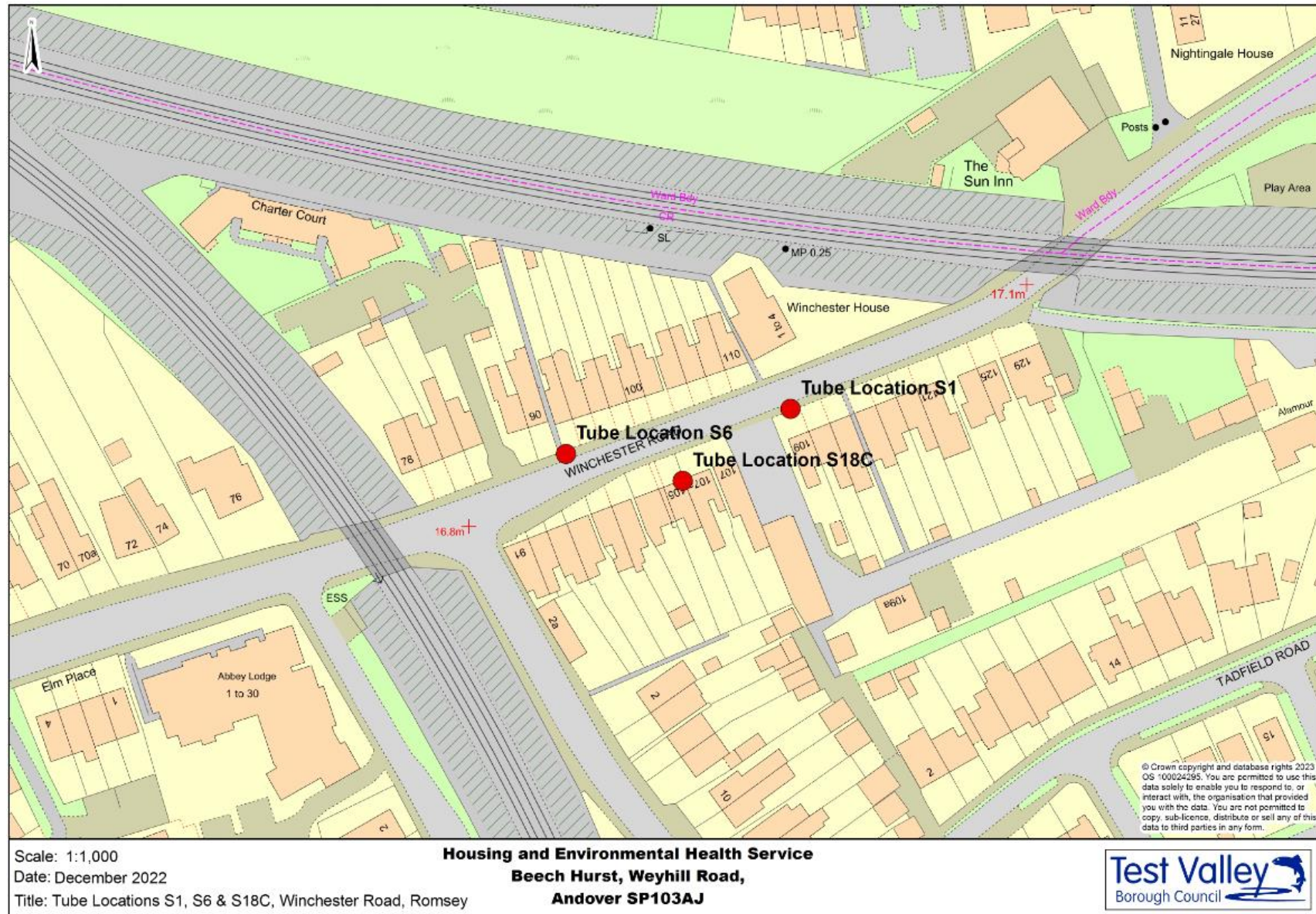
### **NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO<sub>2</sub> monitoring locations within Test Valley Borough Council required distance correction during 2022.

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

### Figure D.1 – Maps of Non-Automatic Monitoring Site

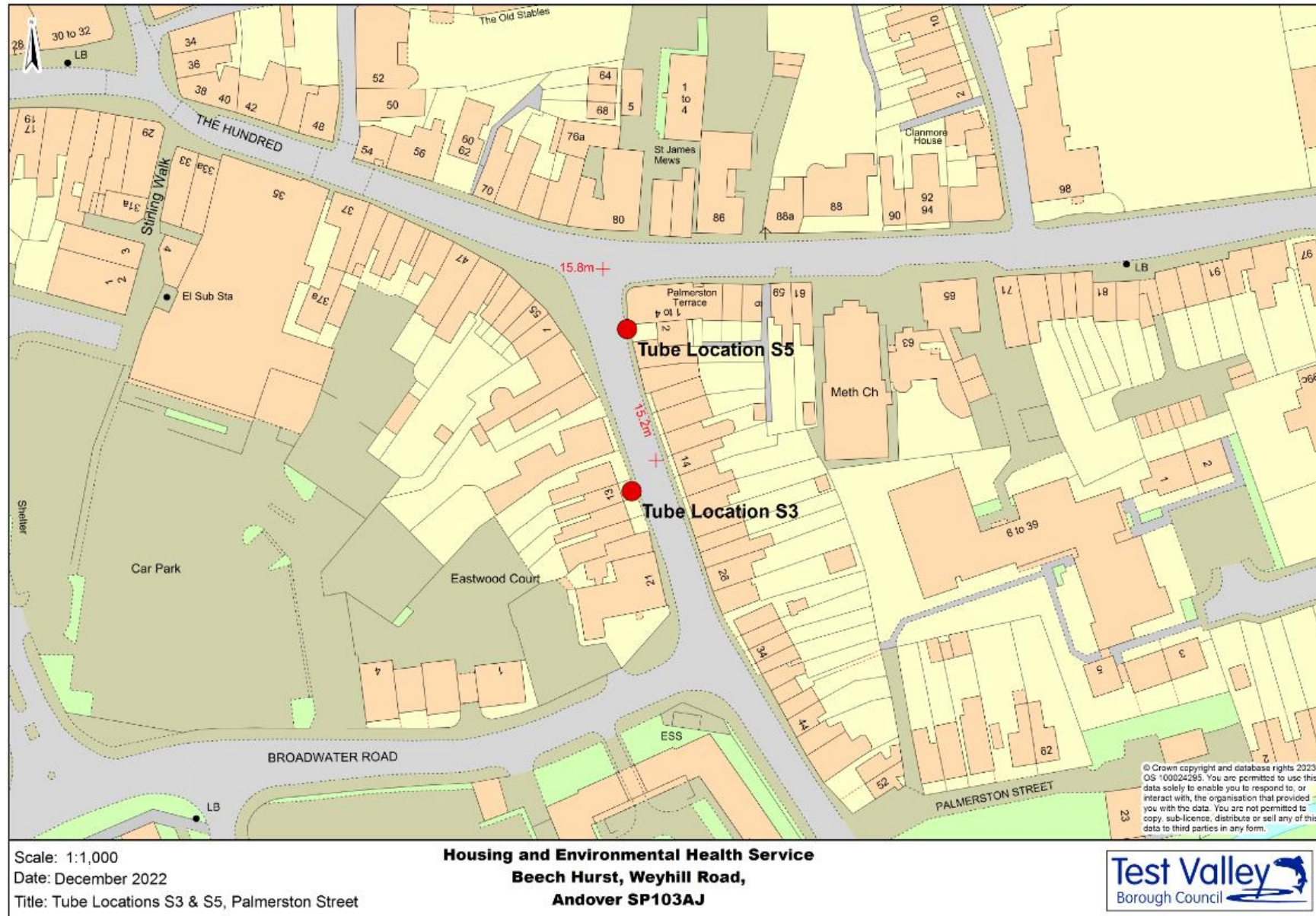


Non-Automatic Monitoring Sites: Numbers S1, S6 & S18C, Winchester Road, Romsey

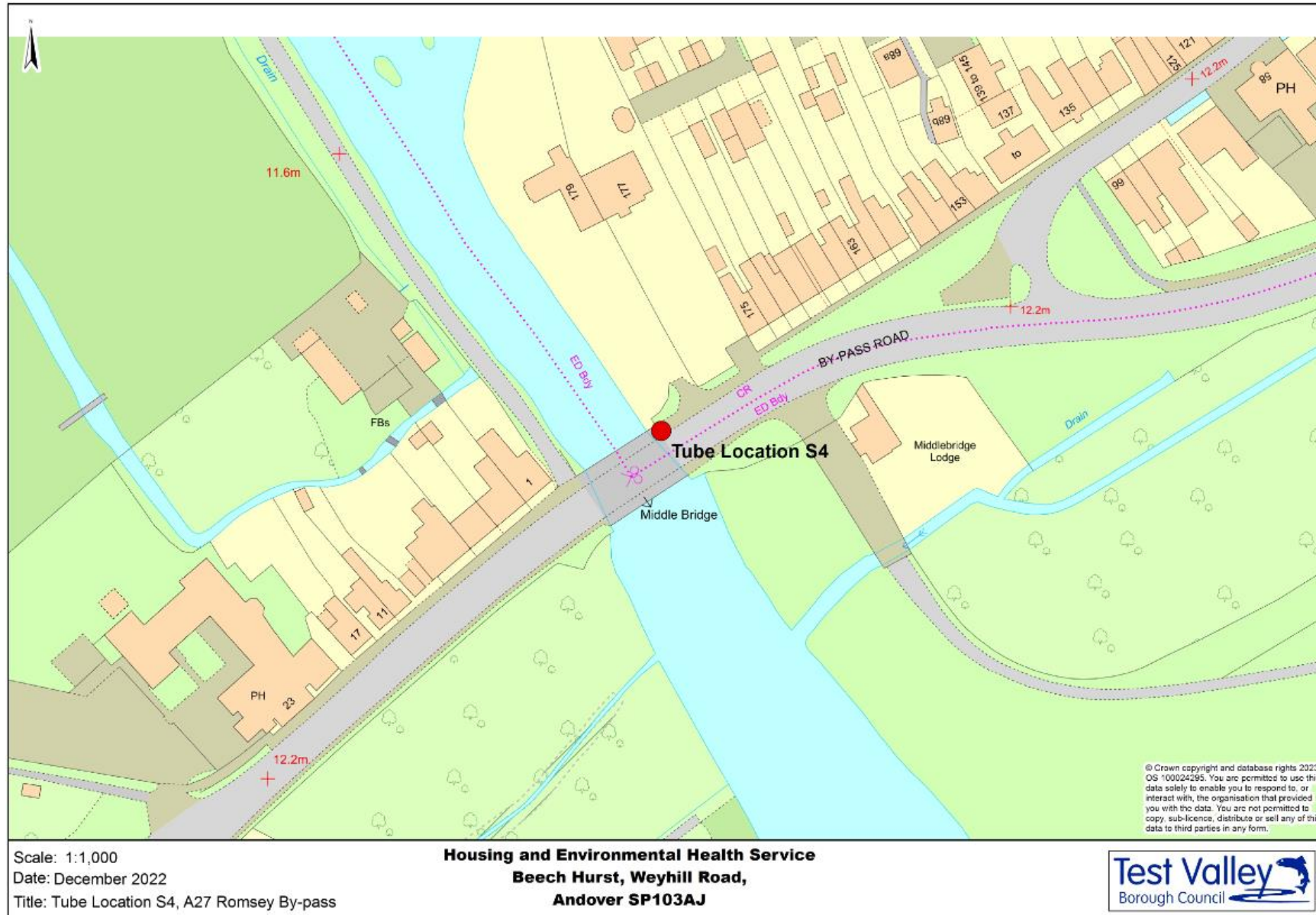




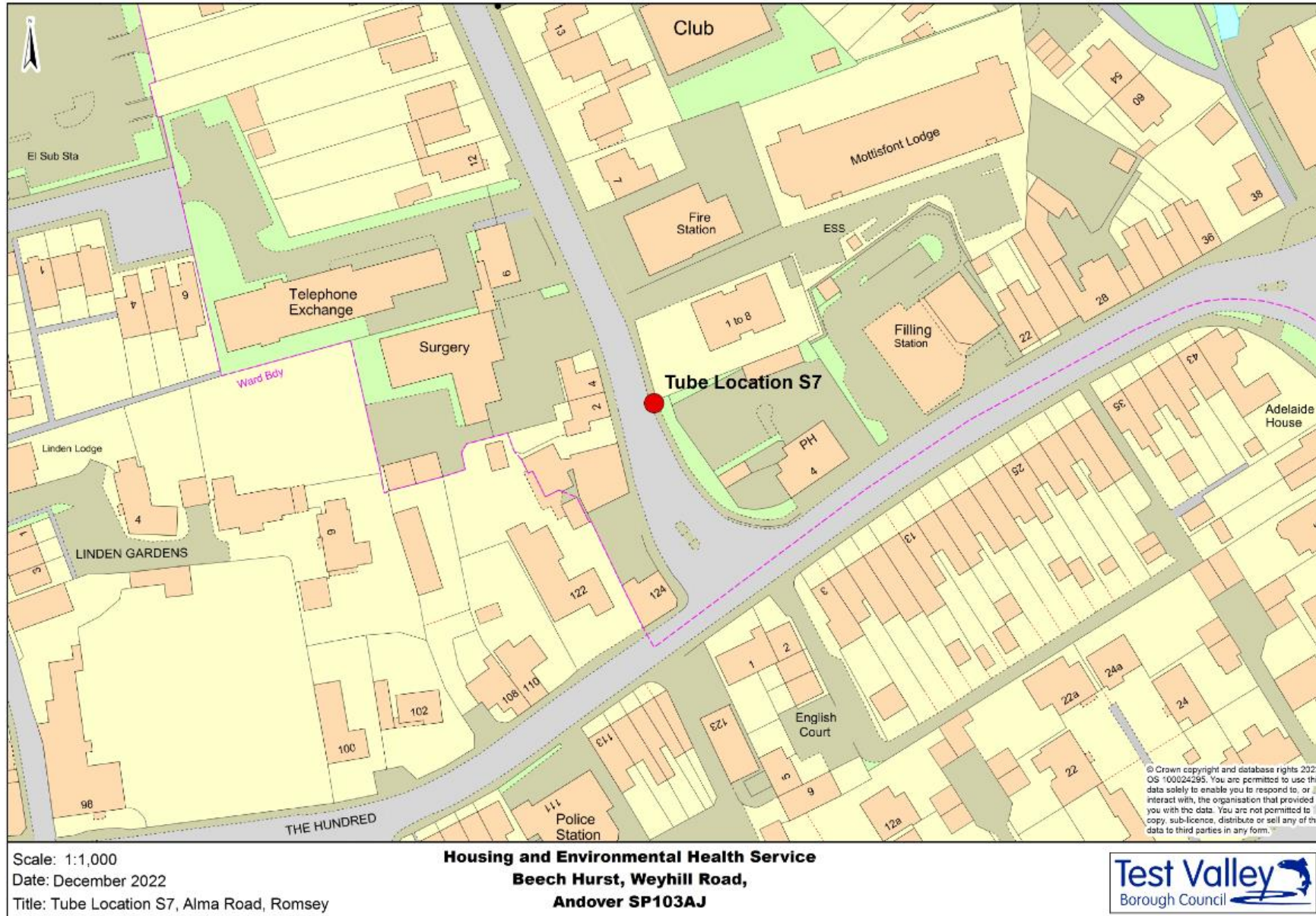
Non-Automatic Monitoring Sites: Number S2, Duttons Road, Romsey



Non-Automatic Monitoring Sites: Numbers S3 & S5, Palmerston Street, Romsey



Non-Automatic Monitoring Sites: Number S4, A27 Romsey By-pass



Non-Automatic Monitoring Sites: Number S7, Alma Road, Romsey



Non-Automatic Monitoring Sites: Number S8, Alma Road, Romsey



Non-Automatic Monitoring Sites: Number S9, Chilworth Road, Chilworth



Non-Automatic Monitoring Sites: Number S10, Nursling Street, Nursling

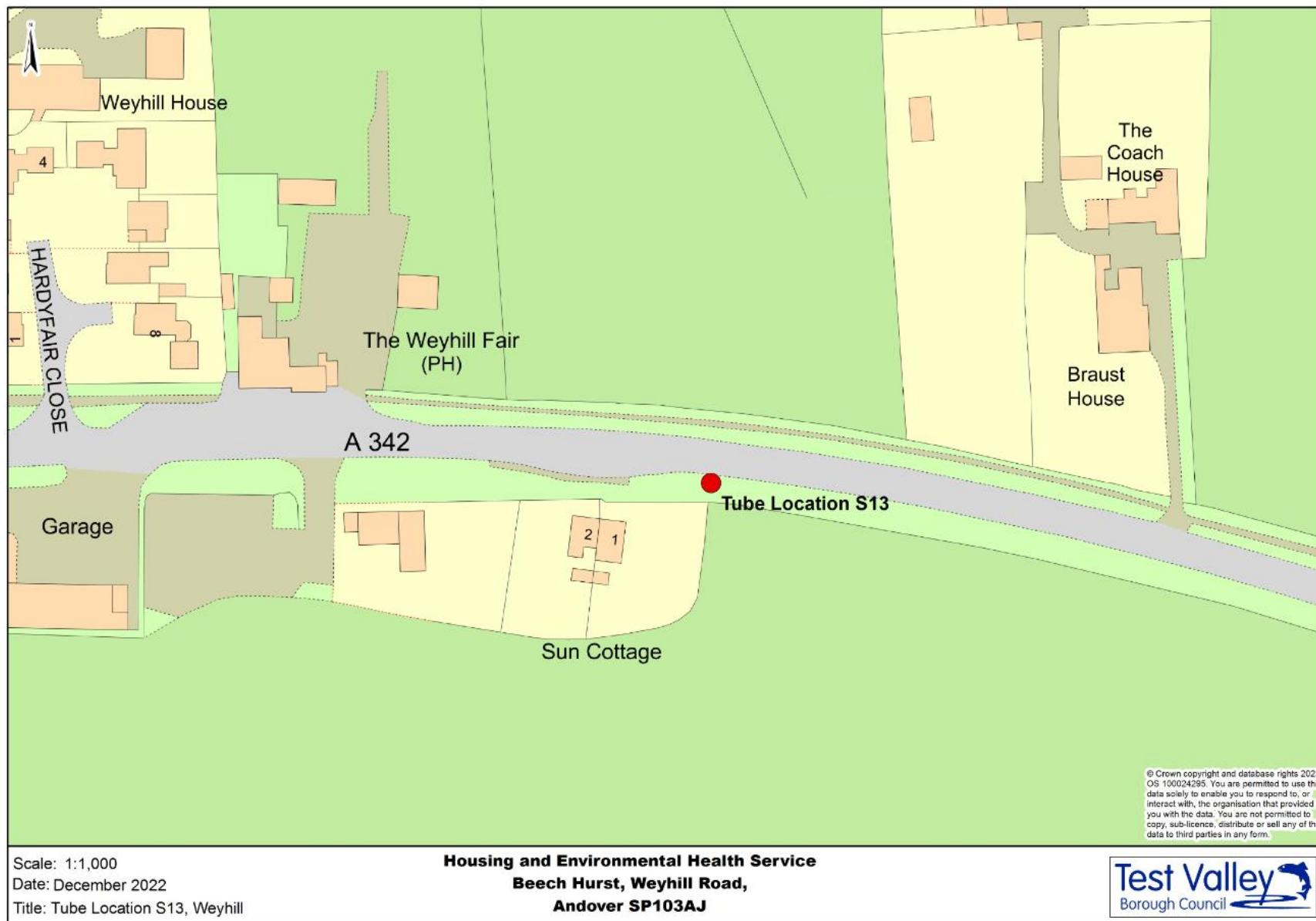


Non-Automatic Monitoring Sites: Number S11, Botley Road, North Baddesley





Non-Automatic Monitoring Sites: Number S12, A3057, Kings Somborne



Non-Automatic Monitoring Sites: Number S13, A342, Weyhill



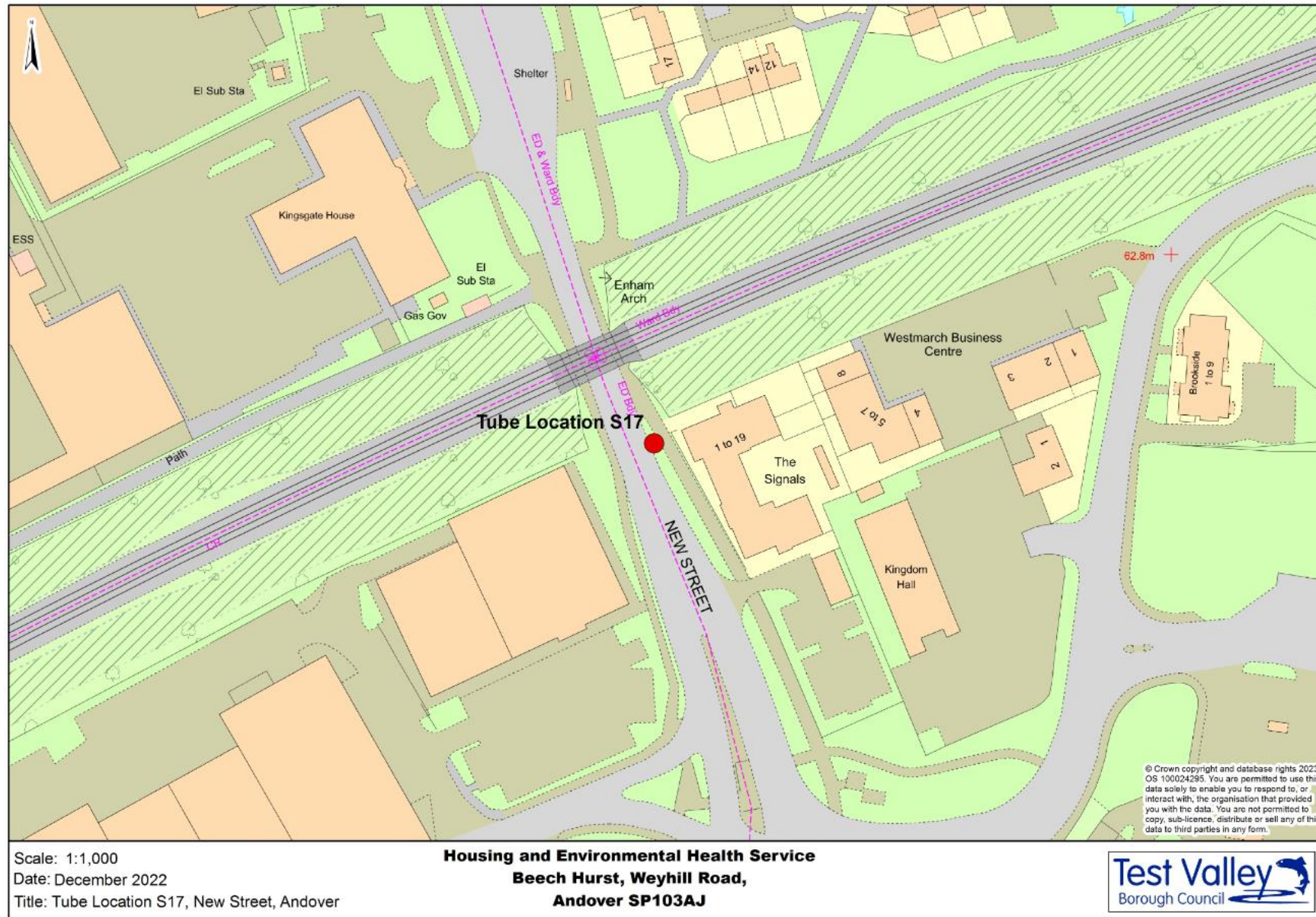
Non-Automatic Monitoring Sites: Number S14, Humberstone Road, Andover



Non-Automatic Monitoring Sites: Number S15, A343, Little Ann



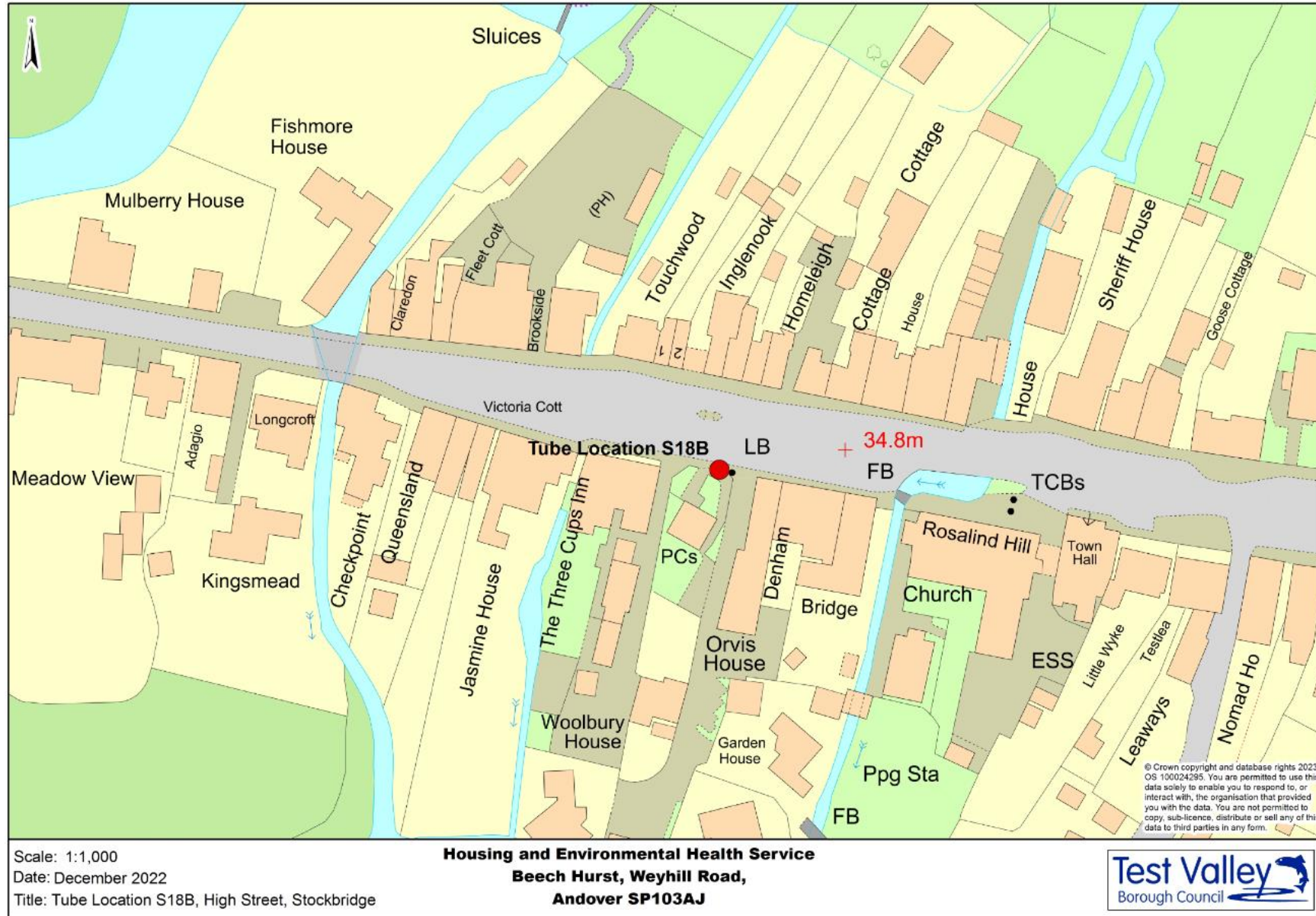
Non-Automatic Monitoring Sites: Number S16, Romsey Road, Nursling



Non-Automatic Monitoring Sites: Number S17, New Street, Andover



Non-Automatic Monitoring Sites: Number S18A, Floral Way, Andover



Non-Automatic Monitoring Sites: Number S18B, High Street, Stockbridge



## Appendix E: Summary of Air Quality Objectives in England

**Table E.1 – Air Quality Objectives in England<sup>7</sup>**

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO <sub>2</sub> )	40µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM <sub>10</sub> )	40µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>7</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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
HCC	Hampshire County Council
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
OHID	Office for Health Improvement & Disparities
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PUSH	Partnership for Urban South Hampshire
QA/QC	Quality Assurance and Quality Control
SMMT	Society of Motor Manufacturers and Traders
SO <sub>2</sub>	Sulphur Dioxide
TEA	tri-ethanolamine
TVBC	Test Valley Borough Council

## References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Defra, 2018. Background mapping data for local authorities – 2018. <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>
- Defra, 2023<sup>a</sup>. National Statistics, Air quality statistics in the UK, 1987 to 2022 - Nitrogen dioxide (NO<sub>2</sub>), 27 April 2023. <https://www.gov.uk/government/statistics/air-quality-statistics/nitrogen-dioxide>
- Defra, 2023<sup>b</sup>. National Statistics Air quality statistics in the UK, 1987 to 2022 - Particulate matter (PM<sub>10</sub>/PM<sub>2.5</sub>), 27 April 2023. <https://www.gov.uk/government/statistics/air-quality-statistics/concentrations-of-particulate-matter-pm10-and-pm25#trends-in-concentrations-of-pm10-in-the-uk-1992-to-2022>
- DfT, 2022. Department for Transport, National Statistics, Provisional road traffic estimates, Great Britain: April 2021 to March 2022. <https://www.gov.uk/government/statistics/provisional-road-traffic-estimates-great-britain-april-2021-to-march-2022/provisional-road-traffic-estimates-great-britain-april-2021-to-march-2022>
- IAQM, 2017. Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London. <https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>
- OHID, 2023<sup>a</sup>. Fingertips: public Health Data, Public health profiles, Fraction of mortality attributable to particulate air pollution (new method) <https://fingertips.phe.org.uk/search/fraction%20of%20mortality%20due%20to%20particulate%20air%20pollution#page/4/gid/1/ati/401/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yr/1/cid/4/tbm/1>
- OHID, 2023<sup>b</sup>. Fingertips: public Health Data, Public Health Profiles, Public health profiles, Air Pollution: fine particulate matter (new method – concentrations of total

PM2.5)<https://fingertips.phe.org.uk/search/particulate%20matter#page/4/gid/1/pat/6/ati/401/are/E07000093/iid/93867/age/-1/sex/-1/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1>

- SMMT, 2023. Chip crisis subdues new car market but EVs now second only to petrol, 5<sup>th</sup> January 2023. <https://www.smmt.co.uk/2023/01/chip-crisis-subdues-new-car-market-but-evs-now-second-only-to-petrol/>