2022 Air Quality Annual Status Report (ASR)

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

Date: June 2022

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Executive Summary: Air Quality in Our Area

Air Quality in Vale of White Horse District Council

Air pollution is associated with several 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].

Vale of White Horse District Council (the council) has declared Air Quality Management Areas (AQMA's) in three areas within the district: Abingdon, Botley and Marcham, all due to high annual average levels of NO_2 from traffic emissions. These can be viewed at the following link: https://oxfordshire.air-quality.info/

The maps of the AQMAs are also included in Appendix D of this report.

The monitoring results for NO_2 recorded across the district in 2021 are lower than 2019 in general but higher than 2020 in most areas. Levels in 2020 were heavily influenced by the behavioural impacts of lockdowns due to Covid 19, with significant falls in traffic volumes and a resultant fall in emissions and levels of NO_2. Further Covid 19 lockdowns in 2021 may also have had a significant impact and may account for the recorded NO_2 levels remaining well below the levels recorded pre-Covid19. Exceedances of the air quality

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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

objective are still being recorded at one site in Botley alongside the A34, albeit at lower levels than 2019. Correction for fall off with distance was undertaken at the two sites in Botley where levels exceeded 36µg/m^3. NO_2 levels at the facades of the houses nearest to the recorded exceedances, were calculated to have been above the objective at one of these properties. However, façade monitoring at that property was below the objective level. So, there was no actual recorded exceedance of the annual air quality objective for NO_2 in the Vale of White Horse District in 2021.

In Abingdon annual levels of NO_2 continue to be below 36µg/m^3 at all monitoring sites and it is anticipated that the evidence supporting the revocation of the Abingdon AQMA will be submitted to Defra in the next 12 months with a view to revoking the Abingdon AQMA.

In order to improve air pollution across the district, the council works in collaboration with partners like Oxfordshire County Council (OCC), bus companies operating in the district and other local authorities within Oxfordshire, putting in place some measures to reduce NO_2 and particulate matter (PM) levels further, both in the AQMAs and also across the entire district. The best example of joint working in 2021 was the progress made on phase one of our joint work on developing a new website for the Oxfordshire Air Quality Group. This involved a public consultation on what information and accessibility the community wanted from an air quality website. The website is being developed following a successful joint bid to Defra's AQ Grant Scheme. (More information on this and other measures can be found on Table 2.2 below).

Meetings of the Oxfordshire Air Quality Group are held quarterly and include representatives from Oxfordshire County Council's Public Health Team, enabling joint working and a more comprehensive approach to our future projects. In 2021, these meetings focused on the development of the countywide AQ website, identifying the features that would make the new website most useful to members of the public. The specification for developing the website has now been put out to tender and the group is now at the stage of selecting a supplier to develop the website. Oxfordshire Air Quality Group's work will focus on this project over the coming year, and it is hoped that the development of the new website will be sufficiently advanced for the new version to be launched next year to coincide with Clean Air Day 2023.

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 several mechanisms; this is extremely important given that most Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

A Climate Emergency was declared by the Vale of White Horse District Council in 2019 and, following this declaration, the council's Climate Emergency Advisory Committee (CEAC) has set ambitious targets to:

- reduce the council's carbon emissions by 75% by 2025 and become a carbon neutral council by 2030
- reduce carbon emissions by 75% in Vale of White Horse District by 2030 and aspire to become a carbon neutral district by 2045

These targets and associated policies will consider the desire to reduce NO_2 in the district, as well as carbon emissions.

The councils' Corporate Plan 2020 – 2024 was formally adopted in October 2020, and we will be working to ensure the new Air Quality Action Plan (AQAP) builds on and reflects these corporate targets.

Core actions in 2021 include progress with OCC in initiating an 'optioneering' exercise to review options for the A415 in the Marcham and Frilford area, to address traffic issues and air quality in the Marcham AQMA. It is anticipated that the exercise will be concluded by the end of 2022. This will hopefully provide a basis for moving towards a solution to the traffic and air quality issues in Marcham and provide capacity for further development.

The levels of NO_2 in Abingdon remained below the air quality objective in 2021 and we will now work towards revoking the AQMA. This will be one of the ideas explored when producing the new AQAP later this year.

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5 Defra. Clean Air Strategy, 2019

The principal impact on air quality in 2021 was the reduction in traffic emissions associated with the behaviour change associated with various Covid19 restrictions. In 2021, the levels were generally slightly higher than 2020 but remain well below pre-Covid19 levels. The only exceedances recorded were near the roadside of the A34 in Botley at the same roadside sites that exceeded the objective last year. Following correction for distance, only one of these sites predicted a façade level above the objective. However, like last year the monitoring during 2021 at that nearest façade recorded a level below the objective. So, in 2021 there were no measured breaches of the annual average NO_2 objective at any of the monitoring sites in Vale of White Horse District.

Monitoring of air quality has continued at a total of 50 sites and 3 diffusion tubes were re-allocated to new sites in Shippon near Abingdon airfield in early 2021. Significant development is planned in this area and these tubes were re-allocated at the request of the parish council to provide baseline air quality data.

A new 'low-cost automatic analyser was installed in Marcham at the end of 2021. It records real-time data, and this data can be accessed via the Air Quality England website

https://www.airqualityengland.co.uk/local-authority/?la_id=372

The site was installed in December 2021 and the full dataset will be reported in the next ASR.

Conclusions and Priorities

- Exceedances were only identified alongside the A34 in Botley. No exceedances were recorded at places of relevant exposure.
- Overall, there was a static, or gently falling, trend in NO_2 levels until 2019. In 2020 there was a massive fall in monitored levels. The 2020 results should not be relied upon because they are atypical, recorded over a particularly exceptional year due to the impacts Covid19. Levels in 2021 were slight elevated compared to 2020 but remain below levels recorded in 2019 before the pandemic.
- The results in the Abingdon AQMA have been below the objective now for several years and we will now collate the evidence to support the revocation of the Abingdon AQMA.

- No exceedances of the objective were recorded outside the existing AQMAs, so there is no need to consider either extending or creating new AQMAs.

In 2021 no exceedances were recorded at the facades of any sensitive properties. The only exceedances recorded were at roadside locations close to the heavily trafficked A34. However, monitoring at the facades of nearby properties indicated that levels remain below the objective.

- There are planned developments which could increase traffic through Marcham and have a negative impact on air quality in the Marcham AQMA. The council has been resisting these proposed developments and objecting to them where necessary. Oxfordshire County Council is undertaking an 'optioneering' exercise to assess the best way of addressing the traffic and air quality issues along the A415 through Marcham AQMA and at Frilford. The A415 is an important link in this area between the A34 and the A420. We expect to receive the results from this study later this year.
- In terms of the Local Air Quality Management (LAQM), the council's priority for the following reporting year (2022) will be commencing work on the new Air Quality Action Plan by setting up the steering groups that will inform the potential options to be considered when developing the AQAP. The council is about to let the contract to an AQ consultancy firm to undertake the project and ensure that dispersion modelling is incorporated in the production of the new document.

Work on the production of the new Action Plan has commenced in accordance with the council's Corporate Plan. In terms of the Local Air Quality Management (LAQM), the council's priority for the following reporting year (2022) will be the preparatory work for this project.

Another priority will be continuing to work on the development of the new Oxfordshire Air Quality Website in collaboration with other Oxfordshire local authorities. Evidence will also be collated and forwarded to Defra with a view to revoking the Abingdon AQMA.

Local Engagement and How to get Involved

There are many ways in which the public can get involved in helping to improve air quality in their area; from using your car less and increasing active travel, driving more efficiently

when you do have to drive or considering a low emission vehicle when you choose to upgrade your car.

Many smart travel choices and other tips to reduce air pollution and details of local air pollution monitoring can be found in the links below:

- https://www.traveline.info/
- https://oxfordshire.air-quality.info/what-can-you-do-to-improve-air-quality
- https://www.southandvale.gov.uk/turnitoff

Local Responsibilities and Commitment

This ASR was prepared by the Housing and Health of Vale of White Horse District Council with the support and agreement of the following officers and departments:

List officers involved in the preparation of the ASR:

- Tim Williams, Air Quality Officer
- Simon Hill, Environmental Protection Team Leader

This ASR has been approved by:

- Suzanne Malcolm, Deputy Chief Executive-Place
- Cllr Sally Povolotsky (Vale of White Horse District Council's Cabinet Member for Climate Emergency and Environment)
- Rosie Rowe (Healthy Place Shaping Lead for Oxfordshire County Council with the responsibility within the Public Health Team for Air Quality).

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

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1 Local Air Quality Management

This report provides an overview of air quality in Vale of White Horse District Council 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 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 Vale of White Horse District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in **Error! Reference source not found.**.

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 Vale of White Horse District Council can be found in **Error! Reference source not found.**. The table presents a description of the three AQMAs that are currently designated within Vale of White Horse District Council.

Appendix D: Map(s) of Monitoring Locations and AQMA, provides maps of AQMAs and the air quality monitoring locations in relation to the AQMAs. The air quality objective pertinent to the current AQMA designations is the NO_2 annual mean.

Table 2. 1 Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Abingdon	23/08/2006	NO_2 Annual Mean	Major town centre roads	No	63.2	35.3	District wide AQAP 2015	2015 Air Quality Action Plan
Botley	29/04/2008	NO_2 Annual Mean	Residential properties close to the A34	Yes	58.8	55.1	District wide AQAP 2015	2015 Air Quality Action Plan
Marcham	15/06/2006	NO_2 Annual Mean	Residential properties near A415	No	53.9	31.3	District wide AQAP 2015	2015 Air Quality Action Plan

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

☒ **Vale of White Horse District Council confirm that all current AQAPs have been submitted to Defra**

Progress and Impact of Measures to address Air Quality in Vale of White Horse District Council

Defra's appraisal of last year's ASR concluded

1. Annual mean NO_2 concentrations at relevant exposure within the Abingdon AQMA continue to be below the AQO. The Council therefore intend to consider this AQMA for revocation over the course of the current reporting year. This action will be supported provided the Council are satisfied that exceedances will not recur following revocation, and that measures are implemented to prevent a subsequent increase in concentrations; these should be detailed within the Council's updated AQAP.

This shall be included in our updated AQAP.

2. The Council have introduced 6 new monitoring locations in response to requests for monitoring and to provide baseline data where significant development is planned. Furthermore, in early 2021 the Council made changes to their monitoring network. They relocated diffusion tubes to provide baseline monitoring data for Shippon, an area where significant development is planned. It is encouraging to see that the Council are continually reviewing their network and making amendments where they deem appropriate, this is sign of good practice and the Council are encouraged to continue reviewing their network.

3. The Council have provided a section (2.2) which discusses the measures completed in the current reporting year. It is clear that the Council have been active in the last reporting year and have implemented many measures to improve AQ within the district.

4. Concentrations in Table 1 should be representative of relevant exposure. For Botley AQMA, the max NO_2 concentration is 50.9 µg/m^3, but once distance correction is applied it is 34.6 µg/m^3 (shown in Table B.1). Therefore, the correct concentration that should be inputted into Table 1 is for S30, where the concentration is 42.9 µg/m^3 at a site of relevant exposure.

Vale of White Horse District Council has taken forward several 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 **Error! Reference source not found.**.2. Twenty-seven measures are included within **Error! Reference source not found.**.2, with the type of measure and the progress the council and Oxfordshire County Council 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 **Error! Reference source not found.**.2.

More detail on these measures can be found in the VOWH Air Quality Action Plan 2015.

Key completed measures are:

- The **Oxfordshire County Council 'optioneering'** exercise to consider options for addressing traffic issues and air quality in the Marcham/Frilford is still ongoing. It is anticipated that this will be concluded towards the end of 2022.
- The **third stage of the anti-idling campaign "Turn it Off",** which targeted pollution at school gates by encouraging parents and students to travel to school by sustainable means such as walking, cycling or scooting. This was launched in May 2021 and the winner of the superhero artwork competition was announced in September 2021 and the promotional materials produced (see Figure 1 below for the promotional poster). This stage of the campaign targeted pollution emissions at school gates by means of an artwork competition for primary school students who submitted entries with their Air Quality Superhero designs. The creator of the best poster of an air quality superhero, with superpowers to travel sustainably and improve air quality, won a scooter and their school received banners and other promotional materials incorporating the winning design.

Figure 1 Promotional poster for the third stage of the Turn it Off campaign: a superhero artwork competition

- In 2021 a **new Taxi Licensing Policy** was adopted by the Council. This will result in further reduced emissions from the taxi fleet in future years and addresses the issue of engine idling at taxi ranks.

- Another completed measure was **Phase 1 of the project to update the Oxfordshire Air Quality Website**. Following the successful bid to Defra's AQ Grant Programme, a social research exercise was carried out in 2021 to understand what information members of the public would like to find in the Oxfordshire AQ Website and what tools would make this information easily accessible. The research consisted of a public consultation in Oxford City, including telephone interviews to different groups of the population. The outcomes of this research informed the features that will be included in the new website, that will be developed in Phase 2 of the project.

Vale of White Horse Council expects the following measures to be completed over the course of the next reporting year:

- Production and adoption of the Council's new AQAP.
- Installation of 62 new EV charging points in council run car parks across the district, as part of the Oxfordshire EV Charging Project. These charging points will be available in Abingdon (Audlett Drive, Cattle Market and West St Helen car parks), Wantage (Portway car park) and Faringdon (Southampton Street car park) and will give residents with no off-street parking the ability to park for free overnight and charge their electric vehicles with competitive prices.
- Phase 2 of the project to update the Oxfordshire Air Quality Website, in partnership with other LAs in Oxfordshire.
- St Nicholas Primary School, Abingdon to be provided with a Zephyr sensor as part of the Active Travel to Schools pilot.
- Sustained lower levels of NO_2 in Abingdon mean that we can now seek the revocation of the Abingdon AQMA following the recording of levels of NO_2 below the AQO for several years.

Vale of White Horse District Council's priority for the coming year is the production and adoption of the new AQAP and starting to implement the measures outlined in the document. In 2021 the production and adoption of a new AQ Action Plan was included in the Council's Corporate Plan and declared one of the Council's priorities for 2022 in terms of LAQM.

Following the internal preparatory work to support this project and the allocation of funds and resources to ensure its delivery, it has been decided that the production of the new AQAP will be aided by commissioning an experienced air quality consultancy.

A transport survey will also be commissioned prior to the production of the AQAP. This survey will be carried out in 2022 and will focus on traffic within the three AQMAs in the district to ensure the data used for the source apportionment is representative of the current situation.

The procurement for these two contracts will start in June 2022, with the traffic survey taking place in the summer and being followed by the production of the AQAP. The Council will work closely with the appointed consultant and community groups, Town and Parish Councils in the district and Oxfordshire County Council to ensure the measures

considered, and especially those finally shortlisted, don't just target air pollution efficiently and cost effectively but are also feasible within reasonable timescales.

It is estimated that the new AQAP will be adopted following the public consultation stage, by the end of 2022.

Progress on the production and adoption of the new AQAP has been slower than expected due to internal pressures and staffing issues that have delayed the procurement stage of the project.

The principal challenge and barriers to implementation that the council anticipates facing is that some of the action's progress depend on third parties, changing policies, or lack of resources.

Whilst the measures stated above and in **Error! Reference source not found.**.2 will help to contribute towards compliance, Vale of White Horse District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the Botley and Marcham AQMAs.

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	Marcham Weight Restriction Limit	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2019							**Aborted**			Being reviewed as part of Marcham & Frilford study	
2	Marcham By-pass	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2015							**Aborted**			Being reviewed as part of Marcham & Frilford study	
3	Frilford & Marcham Transport Study	Other	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2021	2021/22	OCC VOWH Highways England	Optioneering funded by Housing & Growth Deal Implementation funding TBC	None	Optioneering - fully funded Implementation - not yet funded	£>10m	Planning	Not quantified	Successful identification of deliverable preferred option	Work underway; long list options developed; early stakeholder engagement underway	Funding for large infrastructure options uncertain

4	Low Emission Strategy (LES)	Alternatives to private vehicle use	Car & lift sharing schemes	2020	2025	OCC, LiftShare	County Council funded	None	Fully funded	£0-10k	Implementation	Not quantified	Delivery of various initiatives including LiftShare	Oxfordshire LiftShare still in operation; not being actively promoted due to COVID-19	
5	Low Emission Strategy (LES)	Alternatives to private vehicle use	Car Clubs								**Aborted**			Not being progressed - found not to be commercially viable following discussions with potential operators	
6	Low Emission Strategy (LES)	Promoting Travel Alternatives	Personalised Travel Planning								**Aborted**			Activity limited to new developments only - will not affect AQMAs	
7	Low Emission Strategy (LES)	Promoting Travel Alternatives	Promotion of cycling	2014	Ongoing	OCC Developers VOWH	Development OCC	None	Partially funded	£1m-£10m including infrastructure costs	Planning	Not quantified	Promotion of walking & cycling through development travel plans; adoption of LCWIP	Developer funded schemes approved; Abingdon LCWIP development well underway, working closely with steering group formed of local stakeholders (to be completed in 22/23); £1m available for development of schemes identified through Abingdon LCWIP; other LCWIPs TBC; £120k ATT3 funding for active travel scheme development on Ock St, Abingdon (22/23)	
8	Low Emission Strategy (LES)	Promoting Travel Alternatives	Promotion of walking	2014	Ongoing	OCC Developers VOWH	Development OCC	None	Partially funded	£1m-£10m including infrastructure costs	Planning	Not quantified	Promotion of walking & cycling through development travel plans; adoption of LCWIP	Developer funded schemes approved; Abingdon LCWIP development well underway, working closely with steering group formed of local stakeholders (to be completed in 22/23); £1m available for development of schemes identified through Abingdon LCWIP; other LCWIPs TBC; £120k ATT3 funding for active travel scheme development on Ock St, Abingdon (22/23) Street Tag initiative underway countywide to promote walking; in VOWH there were 108 users of the app with participation peaking in October. More than half of participants walked at least 1.5 miles/week every month	
9	Low Emission Strategy (LES)	Promoting Travel Alternatives	School Travel Plans	2020	Ongoing	OCC Schools	OCC DfT Active Travel Fund Tranche 2	None	Fully funded	£0-£10k	Implementation	Not quantified	Development of voluntary school travel plans	School travel plans developed through Modeshift Stars programme	

10	Low Emission Strategy (LES)	Promoting Travel Alternatives	Workplace Travel Planning	2014	Ongoing	OCC Developers VOWH	Development OCC	None	Fully funded	£100k-£500k	Implementation	Not quantified	Development of workplace travel plans for new employment sites	Workplace travel plans secured on all new developments above size threshold	
11	South & Vale Active Travel Phase 2	Promoting Travel Alternatives	Cycling and walking schemes	2021	2022-25	OCC	OCC		Partially funded	£1m-£10m	Feasibility	Not quantified	Delivery of walking and cycling improvements	Scoping of feasibility work underway; work underway to identify gaps in the network and high priority schemes. £1m available, split across 3 years 22/23-24/25	
12	Active Travel to School including School Streets	Traffic Management	Behaviour-change interventions that promote active travel and modal shift to walking and cycling to school and work	2021	2021	OCC	OCC	N/A	Funding for 1 pilot site	£50k-£100k	Implementation	Not quantified	Roll out of Active Travel to School programme and pilot of Active Travel to Work scheme	School street currently being piloted at - St Nicholas Primary School l, Abingdon. Work underway to make this measure permanently enforced	
13	Low Emission Bus Strategy	Transport Planning and Infrastructure	Vehicle Retrofitting programmes	2017		VOWH, Oxford Bus Company,	VOWH, Oxford Bus Company,	NO	Funded	£50k - £100k	Implementation	Not quantified	% of Euro VI buses	Thames Travel fleet is currently 56% EuroVI and 42% Euro V. Oxford Bus Company is 100% EuroVI. In the past year an additional 5 EuroVI buses have been purchased.	The successful bid to the DfT's ZEBRA fund for up to 159 zero-emission buses for Oxford city will likely result 100 zero emission buses being introduced to OxfordBus/ThamesTravel fleet in 2023
14	AQ Planning Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2020	VOWH	VOWH	NO	Funded	£10k - 50k	Completed	Not quantified	Guidance available to the public. All developments adhering to guidance	Published guidance including most up to date best practice design published and available to the public	
15	Review of Council and contractors' fleet	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	-	2019	VOWH, Biffa	Biffa	NO	Funded	£10k - 50k	Implementation	Not quantified	New Policies in Place; Greener Vehicles Procured	Our waste contractor (Biffa) updated its fleet to Euro 6 vehicles in October 2017. Council vehicles being purchased include an emission levels appraisal as part of the selection process.	
16	Taxi incentives for LEVs	Promoting Low Emission Transport	Taxi Licensing conditions	2015	2015	VOWH	VOWH	NO	Funded	< £10k	Completed	Not quantified	Full sliding scale for fees	Current taxi licensing policy promotes the uptake of LEV, offers reduced licence fees for LEV/EV. The current policy also addresses engine idling, with idling for more than a minute constituting a breach licensing conditions.	

17	Promoting the installation of EV charging points	Transport Planning and Infrastructure	Other	2017	2022	VOWH	Developer funded	NO	Funded	£10k - 50k	Implementation	Not quantified	EV infrastructure in place for new developments	Encouragement through the planning process, best practice design outlined on the councils Developers Guidance states that, where on-site parking is provided in new developments, electric vehicle charging points of suitable kW/h charging rate should be installed. A minimum of: o 1 per household for each of the houses; o 1 per every 10 flats (with unallocated parking, or 1 for every dwelling if there are allocated spaces or garages); o 1 ‘rapid charge’ per 1000m2 of commercial/retail/industrial floorspace (or 10% of parking spaces with electric vehicle charging8 , whichever is greater).	
18	Parking permit incentives for green vehicles	Promoting Low Emission Transport	Priority parking for LEV's	2015	2021	VOWH	VOWH	NO	Funded		Implementation	Not quantified	Policy in place	New off-street parking places order introduced in April 2021, which includes the following provision: To introduce spaces (bays) reserved for electric vehicles whilst charging, and enforcement for unauthorised parking in those spaces in respect of i) non-electric vehicles parked in those spaces, and ii) electric vehicles parked in those spaces but not for the purpose of charging	
19	Anti-idling Campaign: "Turn it Off"	Public Information	Via other mechanisms	2019	2019	VOWH	SODC	NO	Funded	< £10k	Implementation	Not quantified	Campaign launched. Number of projects launched.	First stage: shared information on the impacts of engine idling during a series of promotional events, provided promotional materials (car stickers, key rings) for member of the public and advertised the campaign on council car parks and in the nozzles of petrol stations. Second stage (May 2021): targeted idling at school gates by launching an artwork competition where children designed an air quality superhero. The creator of the best superhero won a scooter and their school received banners including the winning design (see Figure 1).	

20	Awareness campaigns: Oxfordshire Air Quality Website	Public Information	Other	2009	2015	VOWH, Other LAs in Oxfordshire	VOWH, Other LAs in Oxfordshire, Defra grant	YES	Funded	£50k - £100k	Completed	Not quantified	Website available	Original website launched in 2009. funding to update it secured in 2021 and followed shortly by Phase 1 of the updating project. This included a social research exercise to understand the public's needs which will inform the development of the new website.	Phase 2 (procurement of the contract) launches May 2022
21	Scheme to promote sustainable travel to the workplace	Promoting Travel Alternatives	Workplace Travel Planning	2014	Ongoing	OCC Developers VOWH	Developers, OCC	None	Fully funded	£100k-£500k	Implementation	Not quantified	Development of workplace travel plans for new employment sites	Workplace travel plans secured on all new developments above size threshold	
22	School Streets	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2021	2021	OCC	OCC	N/A	Fully funded	£50k-£100k	Implementation	Not quantified	Roll out of School Streets programme	Design and consultation completed; implementation scheduled	
23	Scheme to promote sustainable school travel	Promoting Travel Alternatives	School Travel Plans	2020	Ongoing	OCC Schools	OCC DfT Active Travel Fund Tranche 2	None	Fully funded	£0-£10k	Implementation	Not quantified	Development of voluntary school travel plans	School travel plans developed through Modeshift Stars programme	
24	"Park and Stride" Campaign	Promoting Travel Alternatives	Promotion of walking	-	2021	OCC	OCC	NO	Funded	< £10k	Planning	Not quantified	Scheme in place, number of schools that have participated	County wide scheme to encourage parents not to park at the school gate but to either walk from home or park a short distance away and walk. Pilot (mid 2021) will focus on 4 schools	

25	Promotion of car & lift sharing schemes	Alternatives to private vehicle use	Car & lift sharing schemes	2020	2025	OCC, LiftShare	OCC	None	Fully funded	£0-10k	Implementation	Not quantified	Delivery of various initiatives including LiftShare	Oxfordshire LiftShare still in operation; not being actively promoted due to COVID-19	
26	Low Emission Strategy (LES)	Promoting Travel Alternatives	Promotion of walking	2014		VOWH OCC	SODC OCC	NO	Developer funding available for some projects	£10k - £50k	Implementation	Not quantified	Delivery of various behavioural change projects	Street Tag initiative underway countywide to promote walking. Street Tag is a smartphone app that offers rewards for exercise, turning physical activity into a game. Other developer-funded schemes now approved	
27	Eco-driver training	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2020	2020	VOWH	SODC	NO	Funded	< £10k	Completed	Not quantified	Training Complete	Eco-driving workshop took place in December 2020 with 80 officers taking part	

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

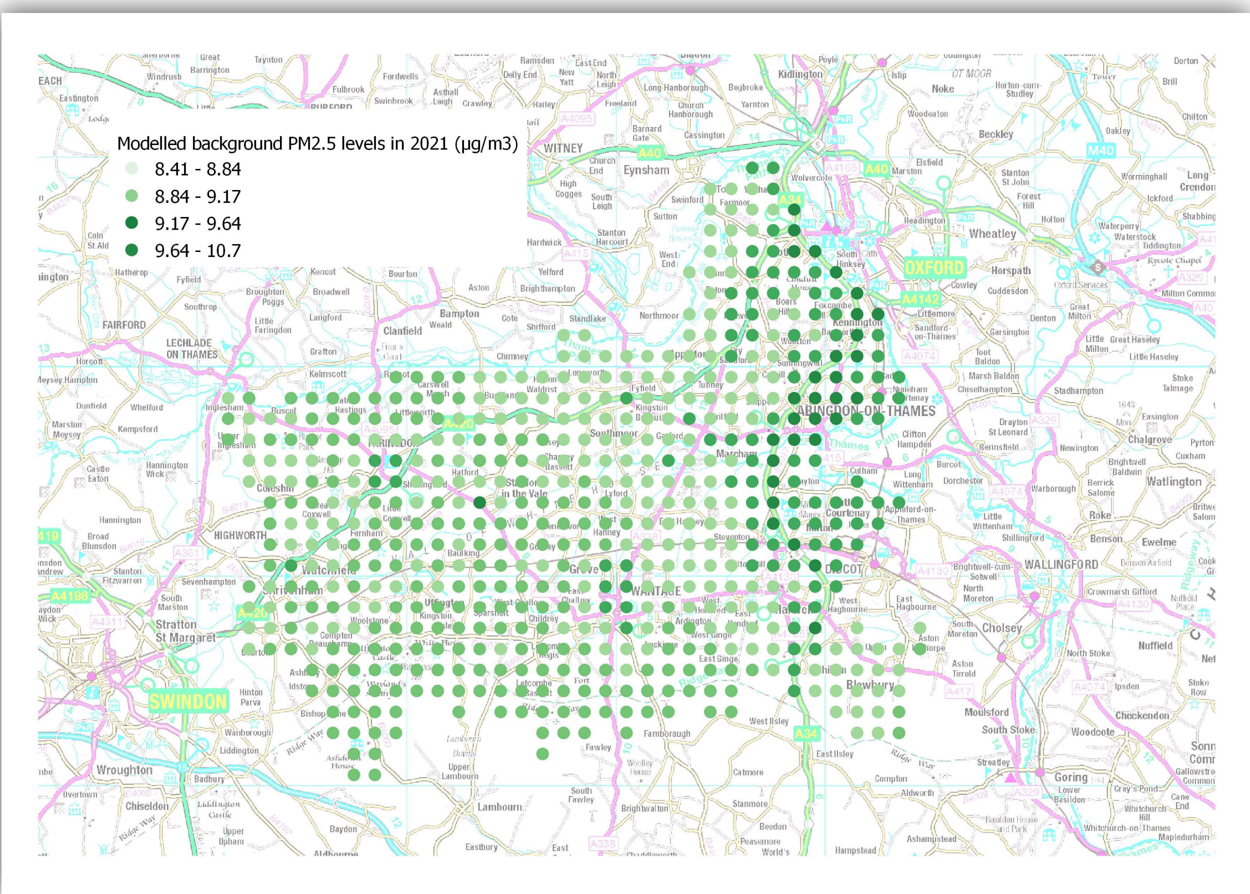
As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health,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

In respect of particulate matter levels in the district; examples from councils across the country which have traffic related AQMA's, highlight that where NO_2 levels are typically around 60-70 µg/m^3, measured particulate matter (PM_{10}) levels at the same location remain below 25 µg/m^3, which is well below the national objective level of 40 µg/m^3.

Although there are both primary and secondary traffic related PM_{10} sources, the majority of the PM_{10} and $PM_{2.5}$ fractions in the district are made up from background sources. No other significant PM sources have been identified in the district (see below Appendix F). As such, the DEFRA background maps of PM are believed to be accurate with $PM_{2.5}$ levels predicted to be mostly below 11 µg/m^3 in 2020 (see Figure 2) for an illustration of Defra's $PM_{2.5}$ modelled levels in the district), which is just half that of the national objective level.

There is a direct relationship between PM and NO_2 when the major source is road traffic. Based on this, the council does not monitor PM, but we are confident that PM falls below objective levels at all locations throughout the district. There was one exception, alongside the A34 in Botley, where monitoring close to the kerbside has in the past indicated very high levels of NO_2, and where PM could be greater than predictions indicate. Recent monitoring shows NO_2 levels below 60 µg/m^3 at this site. It may therefore be useful to undertake PM monitoring if NO_2 levels rise in future years. Highways England have recently installed a continuous NO_x/NO_2 monitor near the A34 in Botley. We have not yet received any monitoring results from Highways England, but the results of this monitoring will be of interest, as currently we rely only on diffusion tube monitoring in this area.

Figure 2 Modelled background $PM_{2.5}$ levels in Vale of White Horse in 2020



Although current PM levels are predicted to meet the national objective, long-term exposure to PM can still have a detrimental impact on the health of the community. The Public Health Outcomes Framework seeks to improve and protect the nation's health, and to improve the health of the poorest fastest. They have developed a set of supporting indicators that help focus our understanding of how well we are doing, one of them being the fraction of mortality attributable to particulate air pollution.

Indicator D01 represents the fraction of annual all-cause adult mortality attributable to human-made particulate air pollution ($PM_{2.5}$).

The Public Health Outcomes Framework research, (Figures 3 and 4), has determined that, in the VOWH district, 5.7 per cent of deaths from all causes in those aged 30+ are attributable to long-term exposure to $PM_{2.5}$. This figure puts the VOWH district at a similar level to the national and county average fraction of mortality attributable to $PM_{2.5}$ as shown in Table 2.3 below.

Figure 3 Public Health Outcomes Framework: Fraction of male mortality attributable to PM2.5 in Vale of White Horse

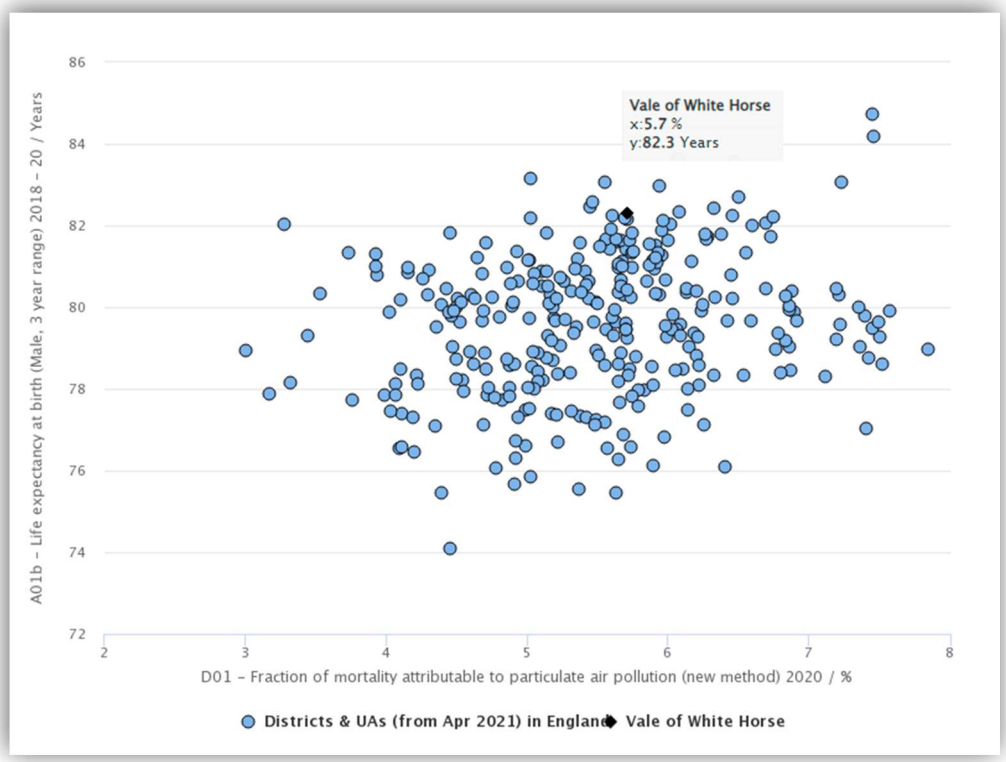


Figure 4 Public Health Outcomes Framework: Fraction of female mortality attributable to PM2.5 in the Vale of White Horse district

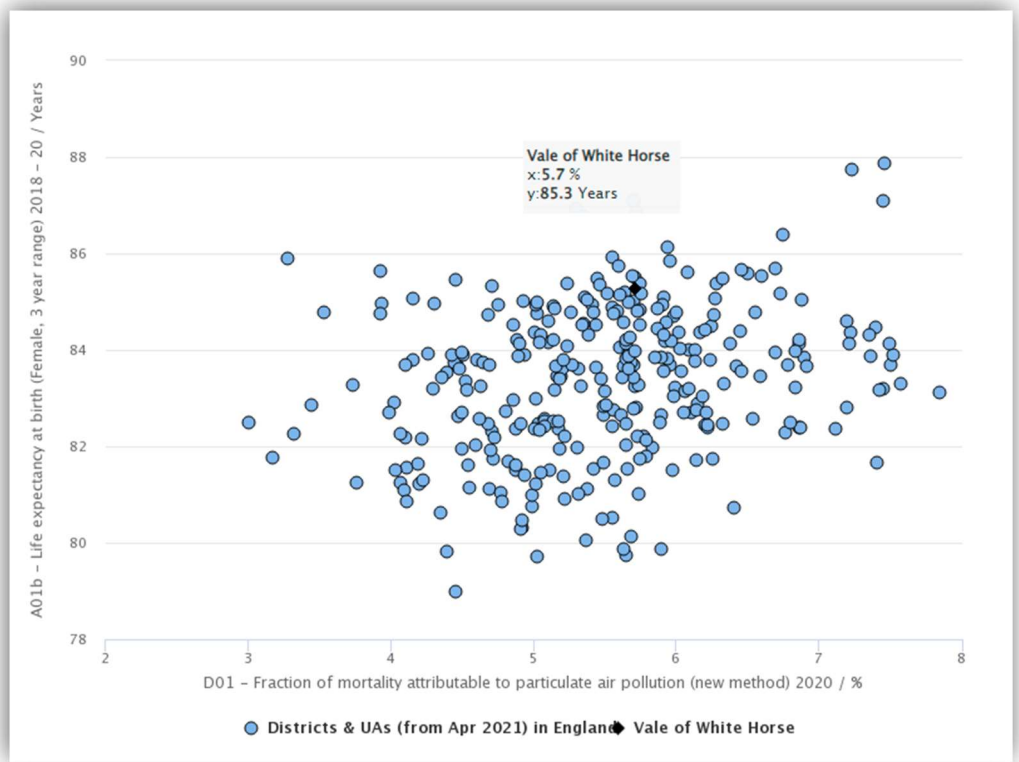


Table 2.1 Fraction of mortality attributable to $PM_{2.5}$: an overview

Indicator	England	Oxfordshire	South Oxfordshire District Council	Vale of White Horse District Council
D01 - Fraction of mortality attributable to particulate air pollution (new method)	5.6%	5.8%	5.7%	5.7%

To reduce PM levels further, some of the measures proposed and taken by the council to mitigate NO_x emissions will also reduce $PM_{2.5}$ emissions. Table 2.4, below, shows which of the council's actions also target the reduction of the existing $PM_{2.5}$ levels in the district. There are no smoke control areas in the district, and smoke emissions are currently not perceived to be a significant issue.

Table 2.2 List of measures in VOWH's 2015 Action Plan that target $PM_{2.5}$ reduction according to LAQM.TG16 Action Toolbox

Measure	Results in $PM_{2.5}$ emissions reduction
Installation of EV charging points	✔
Parking permit incentives for green vehicles	✔
Taxi incentives for LEVs	✔
Review of Council and contractors' fleet	✔
Eco-driver training	✔
Anti-idling Campaigns	✔

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

This section sets out the monitoring undertaken within 2021 by Vale of White Horse District Council 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

Vale of White Horse District Council undertook automatic (continuous) monitoring at 1 site during 2021. **Error! Reference source not found.** in Appendix A shows the details of the automatic monitoring site. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. Page 28 presents automatic monitoring results for Vale of White Horse District Council, with automatic monitoring results also available through the UK-Air website.

In addition to the above the council has arranged the installation of a indicative monitor at the heart of the Marcham AQMA. This site began collecting data at the beginning of 2022. This monitoring will be reported in in the next ASR. Highways England have also installed an automatic air quality monitor near the A34 in Botley and we are awaiting receipt of monitoring results.

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

3.1.2 Non-Automatic Monitoring Sites

Vale of White Horse District Council undertook non-automatic (i.e., passive) monitoring of NO_2 at 50 sites during 2021 **Error! Reference source not found.** in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D and the Oxfordshire Air Quality Website: https://oxfordshire.air-quality.info. 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.1 and Table A.2 in Appendix A compare the annual mean NO_2 concentrations for the past five years with the air quality objective of 40µg/m^3. All results have been ratified and bias adjusted. 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 **Error! Reference source not found.** includes distance corrected values, only where relevant.

Error! Reference source not found. 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.

As in previous years no exceedance of the one-hour NO_2 objective was recorded in the district. Using the fall off with distance calculation, the annual objective was predicted to have exceeded the objective at one site close to the A34 in the Botley AQMA (S.25). Monitoring at the nearest façade however (S.27), indicated that there was no exceedance at the nearest sensitive receptor. There were no other exceedances recorded in 2021. During 2021 the behavioural changes resulting from Covid 19 restrictions continued, and so 2021 cannot be relied upon as a typical year. It is difficult to draw any distinction

between how these behavioural changes have impacted on the improvements in air quality, and the benefits from improvements in traffic emissions overall.

In 2020 six new monitoring sites were introduced in response to requests for monitoring and to provide baseline data where significant development is planned. The sites are at Botley Primary School and North Hinksey Lane Botley to measure levels near to schools close to the A34, at South Hinksey to provide baseline data prior to the commencement of a flood alleviation scheme, at Dunmore Road Abingdon to provide baseline data prior major developments and at Rockley where there are cottages close to the A420. This monitoring has continued through 2021.

There were some further changes to the monitoring network in early 2021 when some diffusion tubes were relocated from sites from Abingdon, to provide baseline monitoring data for Shippon, an area where significant development is planned. In addition, National Highways (NH) has recently installed a continuous NO_2 near the A34 in the Botley AQMA. This is a road which is operated by NH. The continuous monitoring will be a useful addition to the diffusion tube monitoring currently undertaken.

Appendix A: Monitoring Results

Table A. 1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
Masons	Masons 39 Stert St Abingdon	Roadside	449790	197180	NOx/NO2	Abingdon AQMA	Chemiluminescent	0	3.6	3

Notes:

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

(2) N/A if not applicable

Table A. 2 Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
S01 S02 S03	Co-location, Masons Stert Street, Abingdon	Roadside	449794	197176	NO2	Abingdon AQMA	0.0	3.6	Yes	3.0
S04	High Street, Abingdon	Roadside	449695	197049	NO2	Abingdon AQMA	4.0	1.0		2.5
S05	Ock Street Baptist Church, Abingdon	Roadside	449452	197047	NO2	Abingdon AQMA	1.0	2.0		2.5
S06	Stratton Way, Abingdon	Roadside	449697	197343	NO2	Abingdon AQMA	1.0	8.0		2.5
S07	Barrow Road, Shippon	Roadside	448092	198055	NO2		4.0	2.0		2.5
S08	Turner Road, Abingdon	Urban Background	448869	196180	NO2		2.0	4.0		2.5
S09	Drayton Road LP 7, Abingdon	Roadside	448791	196725	NO2		2.5	5.0		2.5
S10	Ock Street Drama Club, Abingdon	Roadside	448828	196966	NO2		1.5	2.0		2.5
S11	Marcham Road LP 5, Abingdon	Roadside	448738	196967	NO2		3.5	2.0		2.5
S12	97 Ock Street LP 12, Abingdon	Roadside	449225	196992	NO2		0.0	5.0		2.5

S13	Whitehorse Close, Shippon	Urban Background	448150	198190	NO2		3.0	5.0		2.5
S14	Faringdon Road, Shippon	Roadside	448349	198086	NO2		0.0	1.0		2.5
S15	24 Mill Road, Marcham	Urban Background	445522	196470	NO2		32.0	6.0		1.8
S16	10 Packhorse Lane, Marcham	Kerbside	445552	196639	NO2	Marcham AQMA	0.0	0.5		2.5
S17	4 Frilford Road, Marcham	Roadside	445456	196623	NO2	Marcham AQMA	1.0	1.5		2.5
S18	4 Packhorse Lane, Marcham	Kerbside	445528	196628	NO2	Marcham AQMA	16.0	1.0		2.5
S19	13 Packhorse Lane, Marcham	Roadside	445571	196675	NO2	Marcham AQMA	13.0	1.5		2.5
S20	Rafters B&B Abingdon Road, Marcham	Kerbside	445875	196657	NO2	Marcham AQMA	18.0	1.0		2.5
S21	Stanley Close, Botley	Kerbside	448913	205813	NO2	Botley AQMA	2.0	8.0		2.5
S22	Westminster Way, Botley	Roadside	448866	205807	NO2	Botley AQMA	5.0	2.0		2.5
S23	Hutchcomb Road, Botley	Urban Background	448403	205709	NO2		11.0	2.0		2.5
S24	S24: 4 Yarnells Road, The Willows Downpipe, Botley	Roadside	449008	205729	NO2	Botley AQMA	0.0	11.0		2.5
S25	4 Yarnells Road, The Willows Fence, Botley	Roadside	449003	205724	NO2	Botley AQMA	10.0	3.0		2

S26	61 Southern Bypass, Botley	Roadside	448894	205826	NO2	Botley AQMA	0.0	8.0		2
S27	63 Southern Bypass, Botley	Roadside	448917	205804	NO2	Botley AQMA	0.0	10.0		2
S28	71 Southern Bypass (Flats), Botley	Roadside	448991	205745	NO2	Botley AQMA	0.0	16.0		2.5
S29	65 Southern Bypass (Timbers), Botley	Roadside	448946	205780	NO2	Botley AQMA	0.0	10.0		2
S30	63 Southern Bypass (fence), Botley	Roadside	448914	205798	NO2	Botley AQMA	2.0	8.0		2.5
S31	Bath Street, Abingdon	Kerbside	449585	197273	NO2	Abingdon AQMA	1.0	1.0		2.5
S32	Folly View Road, Faringdon	Urban Background	428682	194571	NO2		8.0	1.0		2.5
S33	Town Hall / Central Faringdon	Kerbside	428823	195554	NO2		0.0	1.0		2.5
S34	Sutton Courtenay Junction	Kerbside	450886	194359	NO2		13.0	1.0		2
S35	Sutton Courtenay Mill House downpipe,	Kerbside	450588	194391	NO2		1.0	1.0		2.5
S36	Watchfield / Shrivenham, Watchfield	Kerbside	424275	190640	NO2		33.0	4.0		2.5
S37	Copenhagen Drive, Abingdon	Kerbside	448364	197836	NO2		42.0	0.0		2.5
S38	Market Square / Central Wantage	Kerbside	439807	187941	NO2		0.0	1.0		2.5

S39	Hampden Road, Wantage	Urban Background	440409	188319	NO2		14.0	3.5		2.1
S40	Fyfield A420, Fyfield & Tubney	Roadside	442239	198622	NO2		42.0	11.0		2.5
S41	Tubney bus stop A420, Fyfield & Tubney	Kerbside	443526	199184	NO2		3.0	2.0		2
S42	St Swithun Church Kennington Post 35	Kerbside	452253	202255	NO2		7.0	1.0		2.5
S43	St Swithun School Kennington LP68,	Kerbside	452290	201912	NO2		0.0	2.0		2.5
S44	Grove Rd/ Wolage Dr, Wantage	Roadside	440068	189087	NO2		3.0	2.0		2.5
S45	Henry Liddon House, Abingdon	Roadside	448442	196953	NO2		0.0	14.0		2.5
S46	CYPS (Stratton Way), Abingdon	Roadside	449518	197160	NO2	Abingdon AQMA	1.0	6.0		2.5
NWCS1	Manor Rd S. Hinksey	Kerbside	450764	204105	NO2		17.0	5.4		2.0
NWCS2	N. Hinksey La speed sign, Botley	Roadside	449404	205422	NO2		15.0	4.0		2.5
NWCS3	Lamppost 35 Dunmore Rd, Abingdon	Kerbside	449558	199016	NO2		19.0	0.0		2.5
NWCS4	Lamppost 9 Dunmore Rd, Abingdon	Kerbside	450222	199464	NO2		19.0	2.0		2.5
NWCS5	Botley Primary School, Botley	Roadside	448610	206289	NO2		0.0	20.0		2.5

NWCS6	Rockley Cottages A420, Botley	Kerbside	446273	202333	NO2		5.0	3.5		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.1 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
Masons	449790	197180	Roadside	95.54	95.54	25	28.0	22	16	17

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

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

Notes:

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

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

All means have been "annualised" as per LAQM.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%).

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
S01 S02 S03	449794	197176	Roadside	100	100.0	24.4	28.7	25.0	15.4	17.6
S04	449695	197049	Roadside	100	100.0	37.1	41.5	36.5	21.8	23.2
S05	449452	197047	Roadside	100	100.0	29.8	27.7	29.9	17.9	21.2
S06	449697	197343	Roadside	80.8	80.8	38.2	46.3	41.3	27.6	27.2
S07	448092	198055	Roadside	84.6	84.6					12.9
S08	448869	196180	Urban Background	100	100.0	13.8	14.8	14.4	8.4	9.2
S09	448791	196725	Roadside	100	100.0	28.6	36.7	30.8	18.7	22.5
S10	448828	196966	Roadside	90.4	90.4	32.6	33.1	32.6	20.8	22.5
S11	448738	196967	Roadside	65.4	65.4	40.1	40.9	38.9	25.6	30.1
S12	449225	196992	Roadside	100	100.0	25.7	29.6	29.4	16.0	20.3
S13	448150	198190	Urban Background	92.3	92.3					8.4
S14	448349	198086	Roadside	92.3	92.3					17.5
S15	445522	196470	Urban Background	90.4	92.3	10.8	11.6	10.6	6.7	7.9

S16	445552	196639	Kerbside	90.4	90.4	42.7	50.9	41.4	24.3	31.3
S17	445456	196623	Roadside	100	100.0	37.8	40.4	35.6	22.5	26.5
S18	445528	196628	Kerbside	100	100.0	25.9	29.4	26.3	16.6	20.2
S19	445571	196675	Roadside	100	100.0	34.8	40.1	33.3	20.8	25.6
S20	445875	196657	Kerbside	100	100.0	30.6	31.4	28.9	18.2	21.2
S21	448913	205813	Kerbside	100	100.0	46.2	46.2	44.3	27.8	29.4
S22	448866	205807	Roadside	100	100.0	31.7	38.5	30.9	19.8	22.4
S23	448403	205709	Urban Background	100	100.0	11.8	15.5	13.4	8.0	10.0
S24	449008	205729	Roadside	100	100.0	41.0	38.2	34.7	21.9	23.1
S25	449003	205724	Roadside	92.3	92.3	89.6	87.5	80.0	50.9	55.1
S26	448894	205826	Roadside	100	100.0	38.8	37.9	35.2	22.3	24.7
S27	448917	205804	Roadside	100	100.0	36.0	34.7	33.3	22.2	22.6
S28	448991	205745	Roadside	100	100.0	34.7	35.5	31.4	20.0	21.7
S29	448946	205780	Roadside	100	100.0	32.9	34.2	32.2	20.4	22.2
S30	448914	205798	Roadside	100	100.0	72.2	76.5	73.7	44.7	48.3

S31	449585	197273	Kerbside	100	100.0	24.0	26.0	25.4	15.1	17.6
S32	428682	194571	Urban Background	100	100.0	11.6	12.3	11.2	6.8	7.7
S33	428823	195554	Kerbside	92.3	92.3	23.7	25.2	20.7	13.9	14.1
S34	450886	194359	Kerbside	92.3	92.3	22.5	26.6	25.6	14.8	14.5
S35	450588	194391	Kerbside	100	100.0	24.0	27.4	24.5	14.4	16.2
S36	424275	190640	Kerbside	100	100.0	25.3	26.9	23.9	14.5	16.2
S37	448364	197836	Kerbside	100	100.0	31.0	33.7	29.1	18.9	21.3
S38	439807	187941	Kerbside	100	100.0	24.2	26.3	25.6	15.1	15.2
S39	440409	188319	Urban Background	100	100.0	10.0	10.3	10.5	6.5	9.3
S40	442239	198622	Roadside	100	100.0			18.6	11.6	12.0
S41	443526	199184	Kerbside	100	100.0			18.9	13.6	15.1
S42	452253	202255	Kerbside	100	100.0			20.0	12.0	13.2
S43	452290	201912	Urban Background	100	100.0			10.2	11.1	13.3
S44	440068	189087	Roadside	90.4	90.4			15.1	16.2	20.6
S45	448442	196953	Roadside	100	100.0		25.7	35.8	23.0	25.3

S46	449518	197160	Roadside	100	100.0		34.8	20.7	13.1	13.3
NWCS1	450764	204105	Kerbside	100	100.0				15.6	18.2
NWCS2	449404	205422	Roadside	100	100.0				16.2	15.4
NWCS3	449558	199016	Kerbside	100	100.0				14.9	18.3
NWCS4	450222	199464	Roadside	100	100.0				17.2	19.1
NWCS5	448610	206289	Roadside	88.6	84.6				12.8	18.6
NWCS6	446273	202333	Kerbside	100	100.0				17.7	19.9

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **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**.

Annual 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 NO2 Concentrations in Abingdon and Shippon

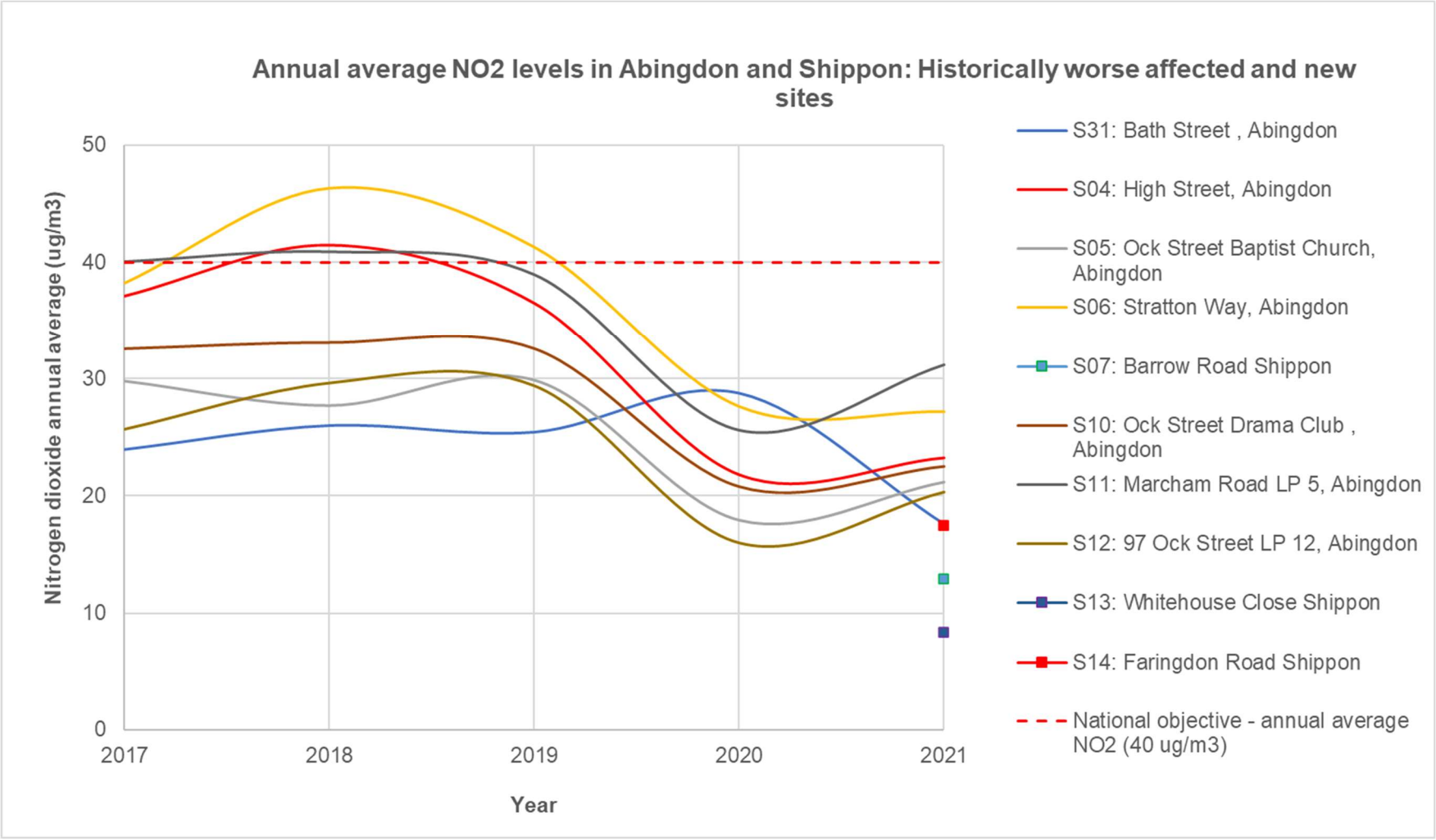


Figure A. 2 Trends in Annual Mean NO2 Concentrations in Botley and Rockley

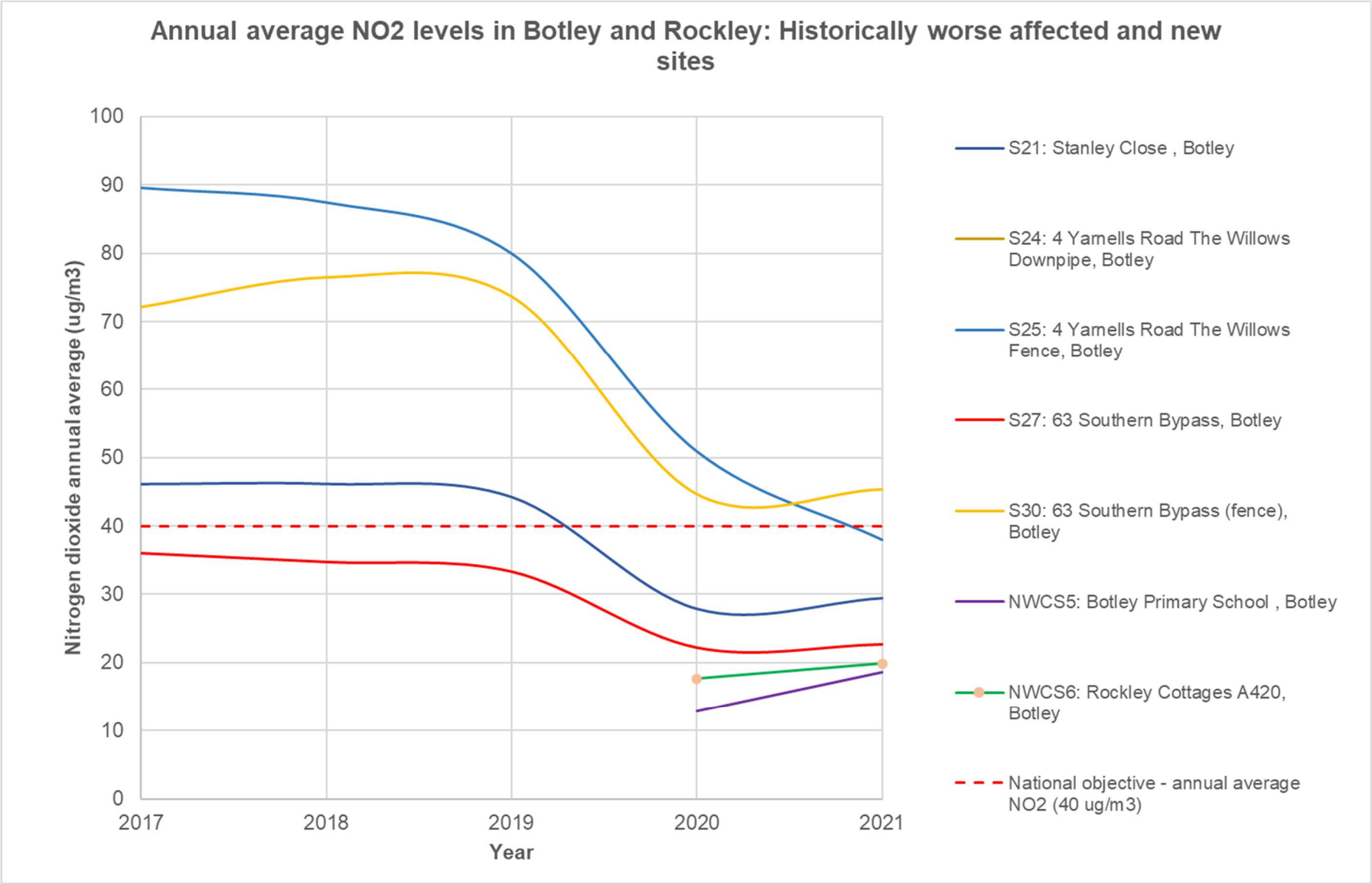


Figure A. 3 Trends in Annual Mean NO2 Concentrations in Marcham and Faringdon

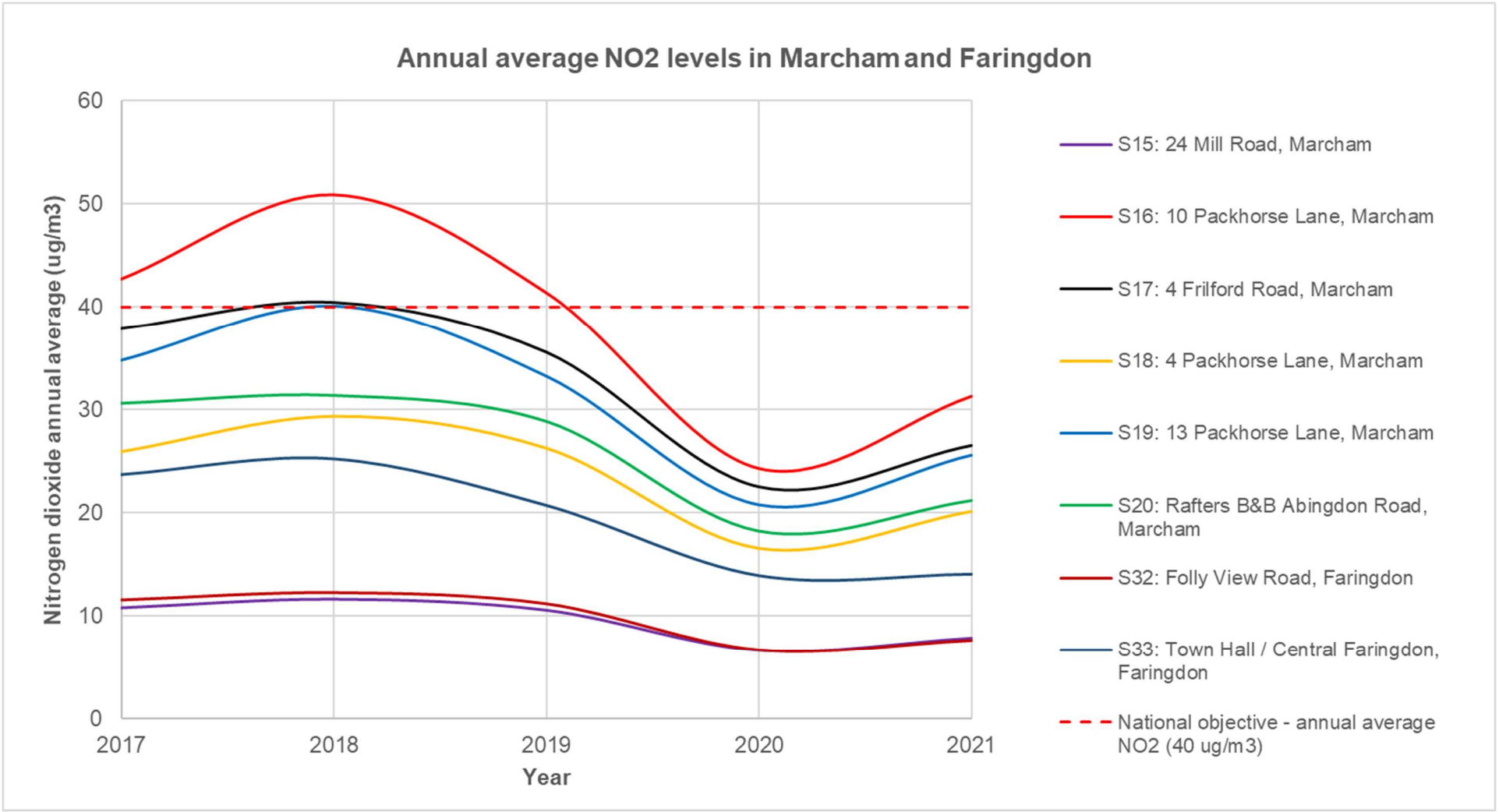


Figure A. 4 Trends in Annual Mean NO2 Concentrations in Kennington, South Hinksey and Watchfield

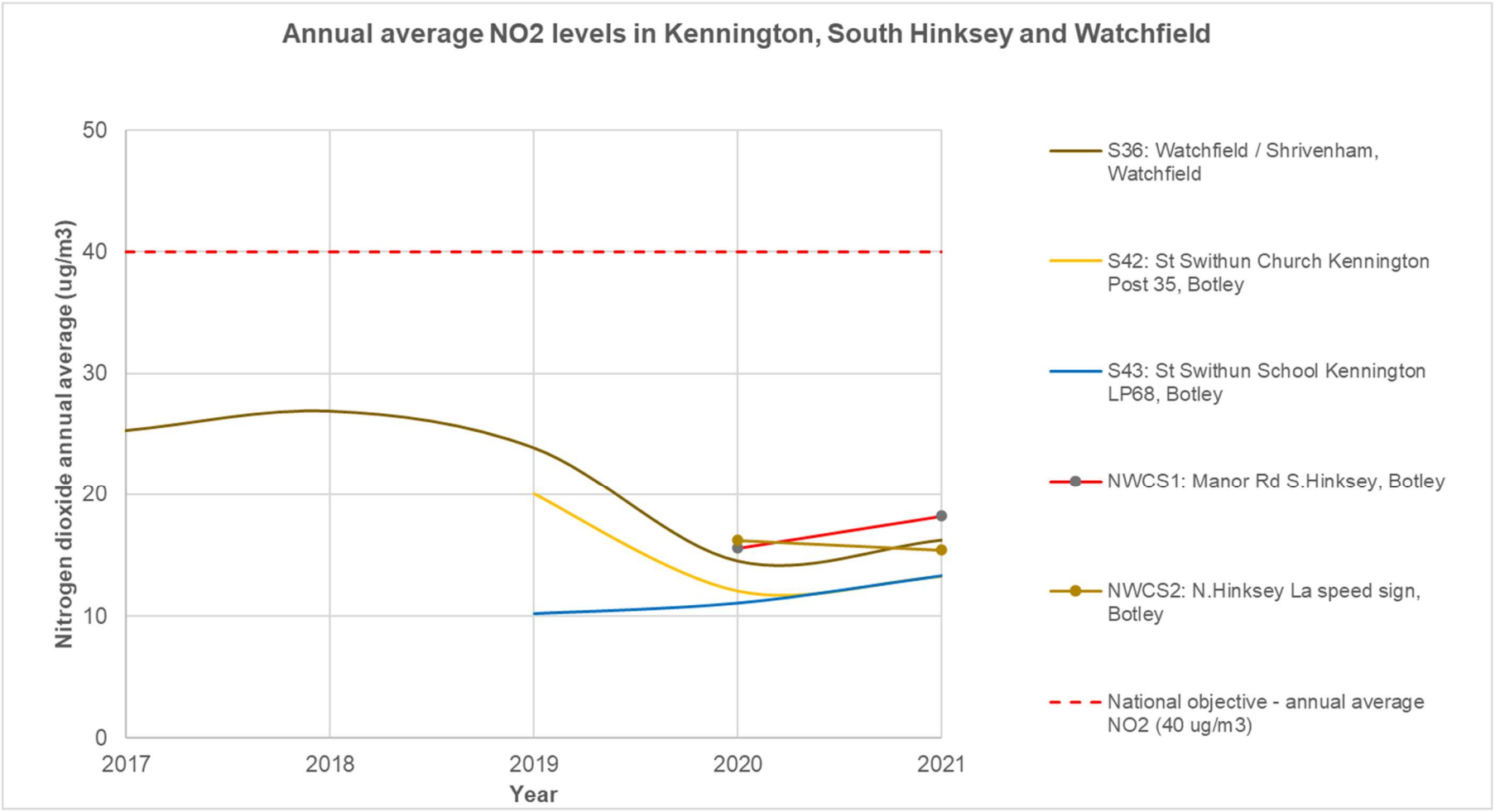


Figure A. 5 Trends in Annual Mean NO2 Concentrations in Wantage, Fyfield and Sutton Courtenay

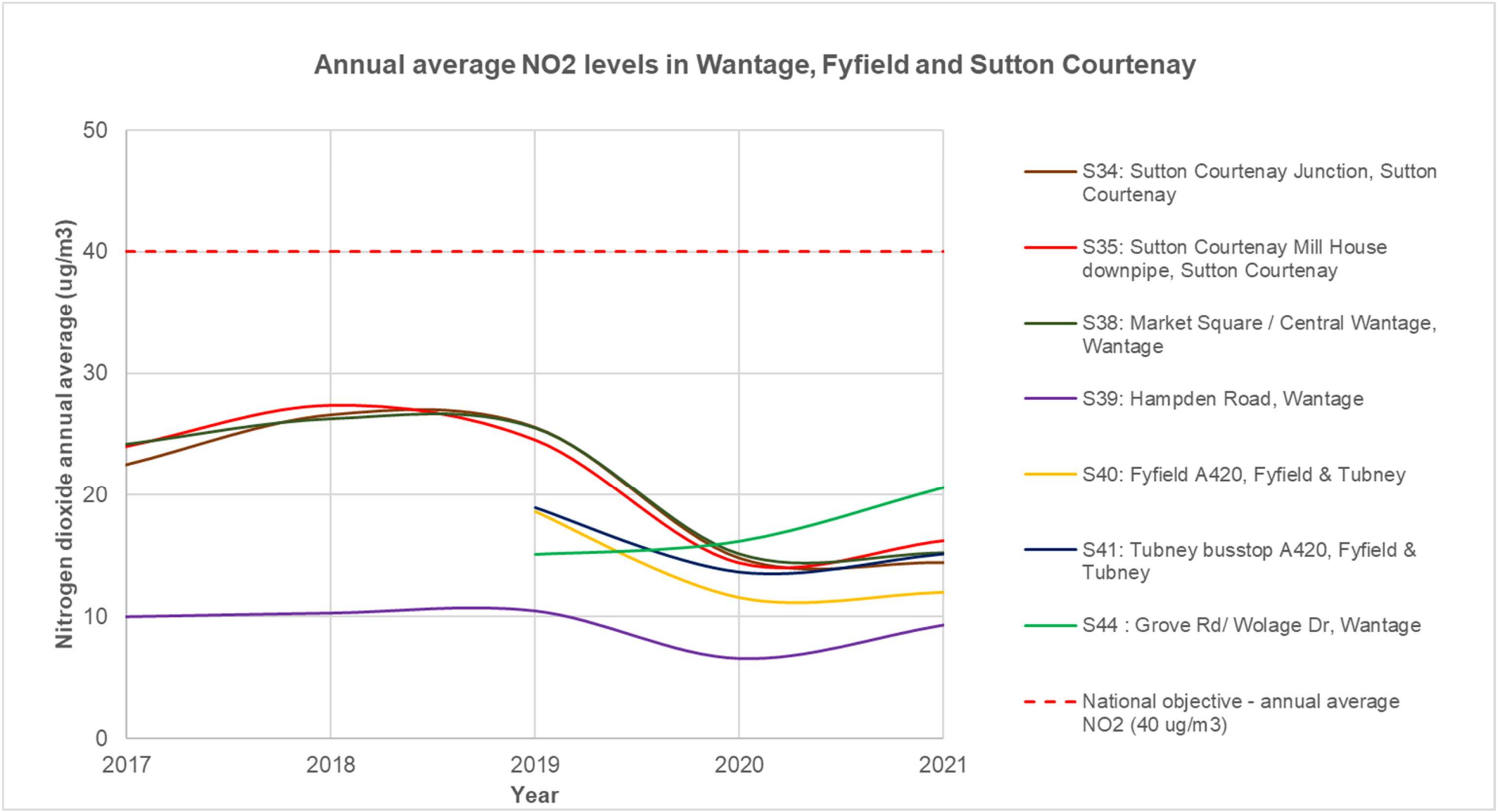


Table A. 3: 1-Hour Mean NO2 Monitoring Results, Number of 1-Hour Means > 200µg/m3

Site 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
Masons Stert St	449794	197176	Roadside	-	95.54	0	0	0	0	0

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B. 1 – NO2 2021 Diffusion Tube Results (µg/m3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S01	449794	197176	24.0	28.4	22.6	24.8	17.7	17.8	18.8	19.8	22.3	21.9	26.8	26.1	-	-	-	Triplicate Site with S01, S02 and S03 - Annual average data provided for S03 only
S02	449794	197176	25.4	30.8	22.0	24.9	20.0	18.0	16.7	16.1	26.4	22.6	29.4	27.6	-	-	-	Triplicate Site with S01, S02 and S03 - Annual average data provided for S03 only
S03	449794	197176	26.0	27.5	22.4	21.9	19.1	18.6	17.7	19.0	26.9	21.6	26.9	25.5	22.9	17.6	-	Triplicate Site with S01, S02 and S03 - Annual average data provided for S03 only
S04	449695	197049	34.6	29.1	31.5	29.4	29.6	24.1	22.6	19.2	36.8	33.6	38.5	32.9	30.2	23.2	-	
S05	449452	197047	29.4	29.4	26.8	31.0	24.0	22.7	22.2	21.5	31.6	27.0	36.8	27.4	27.5	21.2	-	
S06	449697	197343	39.7	35.8	34.8	33.6	34.0	28.2	30.8	25.3	41.4	missing	49.6	missing	35.3	27.2	-	
S07	448092	198055		18.5	16.9	15.9	15.2	12.4	17.3	missing	18.3	12.2	22.7	18.2	16.8	12.9	-	
S08	448869	196180	16.4	15.1	13.2	11.7	7.6	8.3	6.9	8.9	12.1	10.7	17.4	14.3	11.9	9.2	-	
S09	448791	196725	26.6	35.6	29.6	37.3	26.5	28.2	22.9	25.2	32.9	24.6	33.7	27.5	29.2	22.5	-	
S10	448828	196966	28.5	31.6	30.6	26.3	28.3	19.4	25.2	22.6	35.6	missing	42.2	31.1	29.2	22.5	-	
S11	448738	196967	39.8	46.0	37.6	42.3	39.2	34.0	missing	missing	46.7	missing	missing	38.3	40.5	30.1	-	
S12	449225	196992	29.2	31.1	26.7	32.4	21.5	22.0	18.7	22.8	28.4	23.9	32.5	27.5	26.4	20.3	-	
S13	448150	198190		14.3	11.3	10.8	9.1	7.2	7.3	6.7	13.2	11.9	14.6	13.6	10.9	8.4	-	
S14	448349	198086		23.9	22.9	23.2	20.0	19.8	16.3	19.6	25.0	25.3	30.7	23.4	22.7	17.5	-	
S15	445522	196470	13.3	16.0	11.6	8.4	missing	7.4	6.0	6.4	9.9	7.3	12.2	14.0	10.2	7.9	-	
S16	445552	196639	40.0	44.5	42.1	40.6	44.5	36.1	31.3	37.2	49.8	37.9	43.2	missing	40.7	31.3	-	
S17	445456	196623	38.3	34.9	36.1	38.6	31.3	31.0	28.4	27.3	39.1	30.2	42.2	36.2	34.5	26.5	-	

S18	445528	196628	26.5	26.8	27.5	26.6	25.0	25.6	22.0	22.5	26.1	24.7	30.3	30.5	26.2	20.2	-	
S19	445571	196675	35.3	31.5	32.8	30.6	33.6	28.6	28.3	27.3	43.2	33.3	40.2	34.4	33.3	25.6	-	
S20	445875	196657	29.5	27.4	29.0	29.0	26.1	23.6	23.6	20.8	30.0	24.4	37.8	28.9	27.5	21.2	-	
S21	448913	205813	42.8	32.5	44.0	31.9	38.0	28.8	38.1	19.0	46.2	45.5	49.3	42.3	38.2	29.4	-	
S22	448866	205807	28.5	35.4	29.4	33.2	33.9	25.6	13.9	26.4	39.2	24.7	29.8	28.5	29.0	22.4	-	
S23	448403	205709	14.3	18.5	13.1	13.8	9.8	11.2	9.0	8.9	12.3	10.2	16.9	17.7	13.0	10.0	-	
S24	449008	205729	32.7	29.5	35.4	25.9	30.8	22.3	27.1	18.9	34.5	37.3	38.1	27.7	30.0	23.1	-	
S25	449003	205724	62.9	68.2	missing	74.3	84.8	59.7	70.7	57.8	89.5	75.1	72.7	71.2	71.5	**55.1**	38.0	
S26	448894	205826	32.7	31.7	36.7	30.2	33.2	24.1	28.7	22.5	36.7	36.4	39.3	33.0	32.1	24.7	-	
S27	448917	205804	32.3	26.9	34.9	24.9	28.2	22.2	25.0	17.6	34.2	32.9	39.8	34.0	29.4	22.6	-	
S28	448991	205745	25.3	30.6	30.9	24.1	29.3	18.9	23.0	18.1	32.4	33.2	36.2	36.0	28.2	21.7	-	
S29	448946	205780	29.8	31.8	31.6	25.5	28.5	21.6	25.0	20.3	33.8	31.8	35.9	30.4	28.8	22.2	-	
S30	448914	205798	74.7	59.9	58.5	56.9	71.2	48.7	59.0	42.8	75.3	72.8	67.8	65.6	62.8	**48.3**	**45.4**	
S31	449585	197273	22.1	26.1	22.9	27.6	21.3	18.1	19.0	15.3	26.8	22.2	31.2	22.2	22.9	17.6	-	
S32	428682	194571	13.9	14.1	10.5	10.2	5.9	7.1	6.1	6.2	8.8	8.3	17.4	11.1	10.0	7.7	-	
S33	428823	195554	20.9	missing	20.5	18.1	17.4	13.1	13.4	13.3	19.0	19.5	24.9	21.1	18.3	14.1	-	
S34	450886	194359	19.4	22.3	21.5	16.3	15.1	16.6	18.1	missing	1.2	24.2	28.6	23.3	18.8	14.5	-	
S35	450588	194391	22.8	24.8	18.1	27.6	15.7	16.7	18.8	17.0	24.0	20.8	26.9	19.2	21.0	16.2	-	
S36	424275	190640	24.4	21.4	23.3	28.1	17.2	22.6	16.6	19.1	12.7	18.0	27.6	22.1	21.1	16.2	-	
S37	448364	197836	29.6	30.4	29.3	23.0	23.3	27.0	20.4	28.3	31.6	25.5	35.0	27.8	27.6	21.3	-	
S38	439807	187941	23.3	26.8	22.2	10.0	18.7	18.4	19.4	18.9	22.5	20.0	14.5	22.6	19.8	15.2	-	
S39	440409	188319	13.3	13.1	9.7	27.2	5.7	6.8	4.7	6.1	8.4	9.5	30.8	9.9	12.1	9.3	-	
S40	442239	198622	19.6	18.0	16.0	12.4	14.1	11.4	14.3	9.5	16.3	16.7	19.7	19.2	15.6	12.0	-	

S41	443526	199184	22.5	23.1	17.2	19.1	13.3	15.8	18.6	15.4	20.7	20.2	28.9	20.9	19.6	15.1	-	
S42	452253	202255	20.0	20.3	17.9	18.1	14.9	14.0	12.5	12.4	19.2	16.3	23.4	17.3	17.2	13.2	-	
S43	452290	201912	19.1	22.3	17.7	17.8	13.2	14.9	12.8	12.4	19.4	17.4	23.4	17.0	17.3	13.3	-	
S44	440068	189087	28.6	21.9	26.5	26.7	20.4	20.4	missing	19.6	39.1	26.4	39.1	25.8	26.8	20.6	-	
S45	448442	196953	31.8	38.3	34.1	33.0	35.6	31.6	28.5	25.1	29.3	34.6	35.9	36.3	32.8	25.3	-	
S46	449518	197160	17.8	22.6	17.6	16.6	16.2	14.2	12.9	11.3	19.5	20.2	19.8	18.6	17.3	13.3	-	
NWCS1	450764	204105	25.2	26.6	26.2	20.9	24.3	16.5	21.1	16.7	26.3	24.4	28.9	26.9	23.7	18.2	-	
NWCS2	449404	205422	22.2	21.3	20.6	17.1	17.8	14.8	15.8	14.1	22.4	21.3	23.7	29.1	20.0	15.4	-	
NWCS3	449558	199016	27.3	27.9	25.5	22.9	21.0	21.0	17.6	18.3	24.6	24.8	32.2	21.5	23.7	18.3	-	
NWCS4	450222	199464	27.9	27.3	26.7	20.2	22.8	20.2	18.9	15.8	28.5	27.9	34.8	26.2	24.8	19.1	-	
NWCS5	448610	206289	19.2	27.2	16.9	16.0	missing	21.8	28.6	missing	26.5	16.2	17.5	51.3	24.1	18.6	-	
NWCS6	446273	202333	26.6	25.0	24.3	26.8	24.5	24.5	22.5	22.5	26.3	24.6	34.3	27.7	25.8	19.9	-	

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

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Local bias adjustment factor used.**

☐ **National bias adjustment factor used.**

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

☒ **Vale of White Horse District 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 Vale of White Horse District Council During 2021:

Vale of White Horse District Council has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by Vale of White Horse District Council During 2021

Vale of White Horse District Council has installed a new continuous monitor in Marcham within the reporting year of 2021.It was installed in December and data from has been collected since January 2022 this monitoring will be reported in the ASR for the 2022 reporting year and is currently accessible via the UK-Air website.

https://www.airqualityengland.co.uk/local-authority/index-bands?la_id=372&data=link

QA/QC of Diffusion Tube Monitoring

The diffusion tubes deployed by Vale of White Horse District Council are 20% TEA in water and they provided and analysed by Socotec Didcot. Please see below the QA/QC data forwarded by the supplier.

Diffusion Tube Performance Summary 2021:

20% TEA : 80% Water or 50% Acetone : 50% TEA

- Uncertainty: "Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance" categorises diffusion tubes as an indicative method, and as such the uncertainty is defined as ± 25%.
- During in field intercomparisons, SOCOTEC's diffusion tubes perform at ±10% uncertainty.

- Quality Control: A quality control (QC) sample of known concentration is run with the samples. The data generated is then assessed using a Shewhart control chart to determine the process is under statistical control.
- Analytical Repeatability: In 2021 ~8500 QC samples were analysed, achieving a relative standard deviation of 0.93%
- Confidence Intervals: 2σ ±1.86%; 3σ ±3.72%

- Limit of Detection: The analytical limit of detection is 0.03µg NO2. Over a 4-week exposure this would equate to 0.6µg/m3, or 0.3ppb
- Quality Assurance: The manufacture and analysis of NO2 diffusion tubes is covered by our UKAS accreditation.
  The laboratory has taken part in the AIR (previously WASP) proficiency scheme since its inception. To achieve the highest ranking of "Satisfactory" a laboratory must achieve a z-score of <2. For 2020, SOCOTEC had an average z-score of 0.60
  Bought in ISO Guide 34 and ISO/IEC 17025 certified standards are used to prepare calibration and QC standards.
  2% of tubes are checked for blankness during manufacture, to ensure there is no contamination introduced during the manufacturing process.
  The method meets the requirements laid out in DEFRA's "Diffusion Tubes for Ambient NO2 Monitoring: A Practical Guidance."

Diffusion Tube Annualisation

The following non-automatic sites required annualisation since their data capture less than 75% but greater than 33%:

- S11 Marcham Road LP5

Details of the calculation method undertaken (using the DT Data Processing Tool) are provided in Error! Reference source not found..

Diffusion Tube Bias Adjustment Factors

The diffusion tube data for 2021 presented within the 2022 ASR has 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 about 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.

Vale of White Horse District Council have applied a local bias adjustment factor of 0.77 to the 2021 monitoring data. A summary of bias adjustment factors used by Vale of White Horse District Council over the past five years is presented in **Error! Reference source not found.**.

The local bias adjustment has been calculated from the co-location of triplicate tubes with an automatic continuous analyser located in Stert Street Abingdon. The details of the co-location are tabulated in Table C.2. The national bias adjustment factor for the same preparation method and lab is 0.76. The locally derived bias adjustment factor is 0.77. The local bias adjustment is the more conservative of these values, so this was selected.

Table C. 1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	Local	-	0.77
2020	National and local factors the same.	03/21	0.74
2019	Local	-	0.86
2018	Local	-	0.89
2017	Local	-	0.78

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 **Error! Reference source not found.**.

Distance corrections were applied to two sites, S24 and S.30. Both sites have diffusion tubes located on fences close to the A34. At both sites there is façade monitoring at the nearest sensitive properties. Whilst the fall of with distance calculation indicates that at site S.25 the level exceeds the annual objective for NO_2 at the nearest facade. Façade monitoring at S.24 indicates that the level is below the objective. Likewise, the fall off with distance calculation for S.30 indicates a much higher façade level, than the level monitored at the nearest façade S.27.

This correction was carried out by means of the DT Data Processing Tool. The details are provided in Table C.4.

QA/QC of Automatic Monitoring

Ricardo Energy & Environment currently provide independent UKAS accredited quality control audits (biannual) and data management services to the single automatic monitoring station in the district. Their data management process includes:

- Scaling data based on routine instrument calibrations. These calibrations are carried out by the Local Site Operator (Air Quality Officer at VOWH) on a regular basis
- Instrument and site infrastructure service and maintenance records obtained from the biannual servicing visits
- Local meteorological data where possible
- Results of quality control audits
- Comparisons with other nearby site concentrations to help ensure data integrity

Figure C1 shows the annual data recorded at the councils continuous monitoring sites in 2021. Further historical data can be accessed on the Oxfordshire AQ Website or the AQE website.

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,

Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	D Hector	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green
☐	S Copsey		

Signed:

Date of issue: 22 Nov 21

Certificate Number: 5618

Customer Name and Address:

Environmental Protection Team
South Oxfordshire and Vale of White Horse District Councils
135 Eastern Avenue
Milton Park, Milton
Abingdon
OX14 4SB

Description: Calibration factors for the air monitoring station at Abingdon Stert St 2

Ricardo Energy & Environment ID: ED79001123/November 2021

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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VAT Registration No.
GB 212 8365 24

0401

CERTIFICATE OF CALIBRATION

Date of issue: 22 Nov 21

Certificate Number: 5618

Ricardo Energy & Environment ID: ED79001123/November 2021

Abingdon Stert St 2
Date of audit: 16 Nov 2021

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty ppb	Calibration Factor[2]	Factor uncertainty %	Converter eff. (%)[3]
NOx	617B-275	7.0	2.7	1.0000	3.7798	98.7
NO	617B-275	2.0	2.6	0.9872	3.8427	n/a

0401

CERTIFICATE OF CALIBRATION

Date of issue: 22 Nov 21

Certificate Number: 5618

Ricardo Energy & Environment ID: ED79001123/November 2021

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NOx, SO_2, O_3 and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Air Pollution Report

1st January to 31st December 2021

Air Quality England

VofWH Abingdon Stert St 2 (Site ID: AB001)

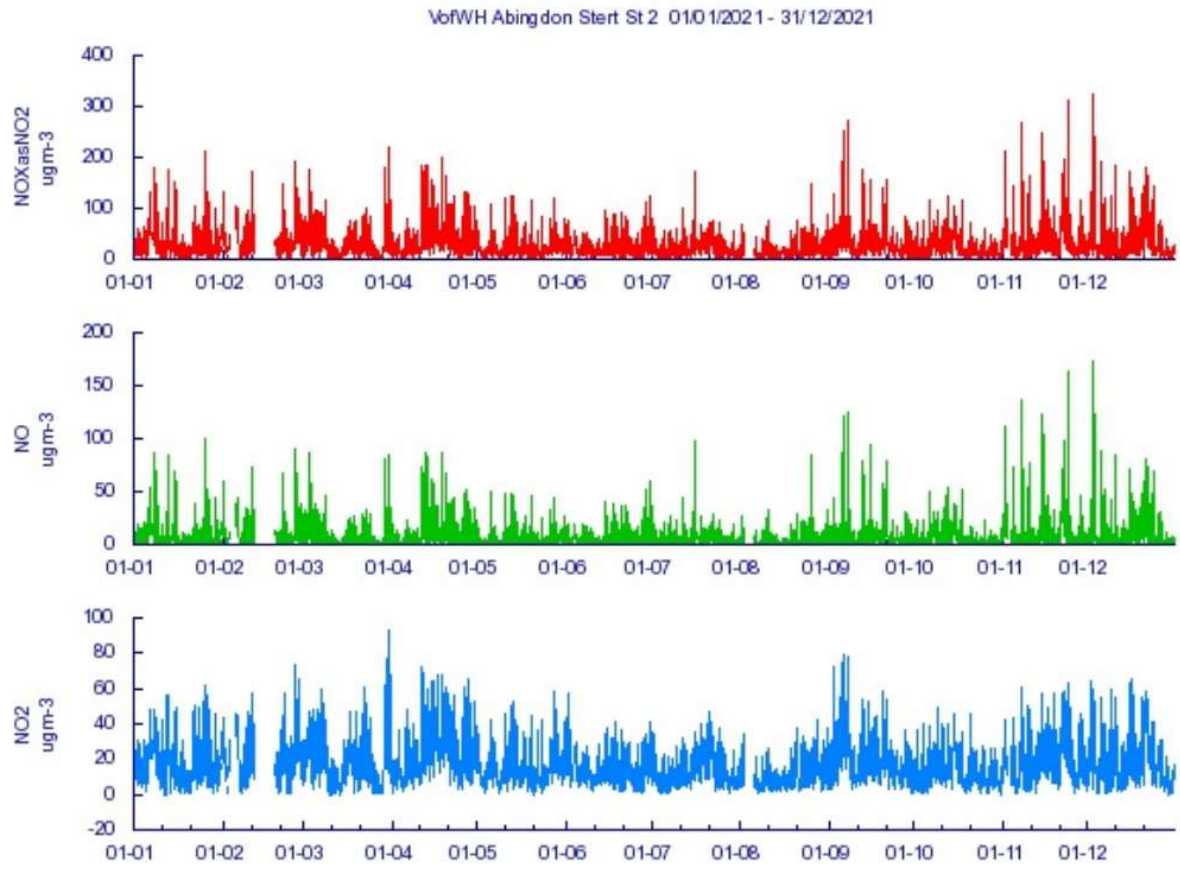
Note: These data are provisional
Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	356	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	45	50	103
Annual Max	173	93	324
Annual Mean	9	17	31
99.8th Percentile of hourly mean	-	65	-
98th Percentile of hourly mean	49	50	123
95th Percentile of hourly mean	30	42	86
50th Percentile of hourly mean	5	14	22
% Annual data capture	**95.54**	**95.54**	**95.54**

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µgm-3

Pollutant	Air Quality Standards regulations 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 micrograms per metre cubed	0	0
Nitrogen dioxide	**Annual Mean > 40 micrograms per metre cubed**	**0**	**-**

Annual Graph



Automatic Monitoring Annualisation

All automatic monitoring locations within Vale of White Horse District Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Vale of White Horse District Council required distance correction during 2021.

Table C. 2 – Annualisation Summary (concentrations presented in µg/m3)

Diffusion Tube ID	Annualisation Factor Henley	Annualisation Factor Wallingford	Annualisation Factor Watlington	Annualisation Factor Abingdon	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)	Comments
S11	0.9637	0.9883	0.9742	0.9418	0.9670	40.5	39.2	Bias adjusted annual mean 30.1

NO_2 Hourly Concentrations (µg/m^3)			
Sufficient (>85%) annual data capture	Sufficient (>85%) annual data capture	Sufficient (>85%) annual data capture	Sufficient (>85%) annual data capture

Table C. 3 – Local Bias Adjustment Calculation

Local Bias Adjustment Outputs	
Periods used to calculate bias	11
Bias Adjustment Factor A	0.77 (0.73 - 0.82)
Diffusion Tube Bias B	30% (22% - 37%)
Diffusion Tube Mean (µg/m^3)	22.3
Mean CV (Precision)	5.4%
Automatic Mean (µg/m^3)	17.2
Data Capture	97%
Adjusted Tube Mean (µg/m^3)	17 (16 - 18)
Overall Diffusion Tube Precision	**Good Overall Precision**
Overall Continuous Monitor Data Capture	**Good Overall Data Capture**
Local Bias Adjustment Factor	**0.77**

Notes: A single local bias adjustment factor has been used to bias adjust the 2021 diffusion tube results.

Table C. 4 – NO2 Fall off With Distance Calculations (concentrations presented in µg/m3)

Diffusion Tube ID	Distance (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)			
	Monitoring Site to Kerb	Receptor to Kerb	Bias Adjusted and Annualised	Background	Predicted at Receptor	Comment
S25	3.0	13.0	55.1	10.0	38.0	Calculation predicted within 10% of AQO Measured Façade level at S.24 23.1
S30	8.0	10.0	48.3	10.0	**45.4**	Calculation predicted above AQO Measured Façade level at S.27 22.6

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

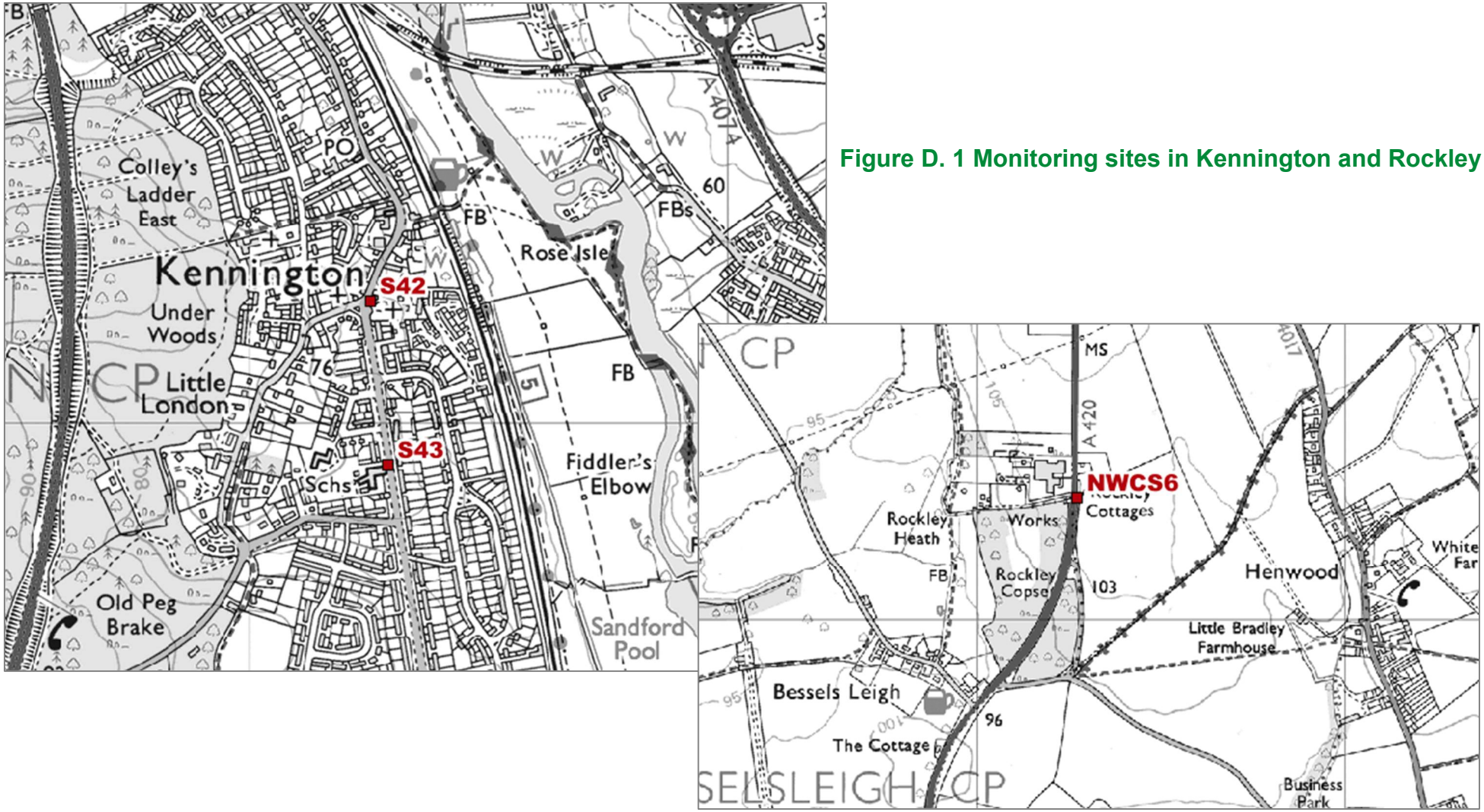


Figure D. 1 Monitoring sites in Kennington and Rockley (A420)

Figure D. 2 Monitoring sites in Fyfield, Tubney and Sutton Courtenay

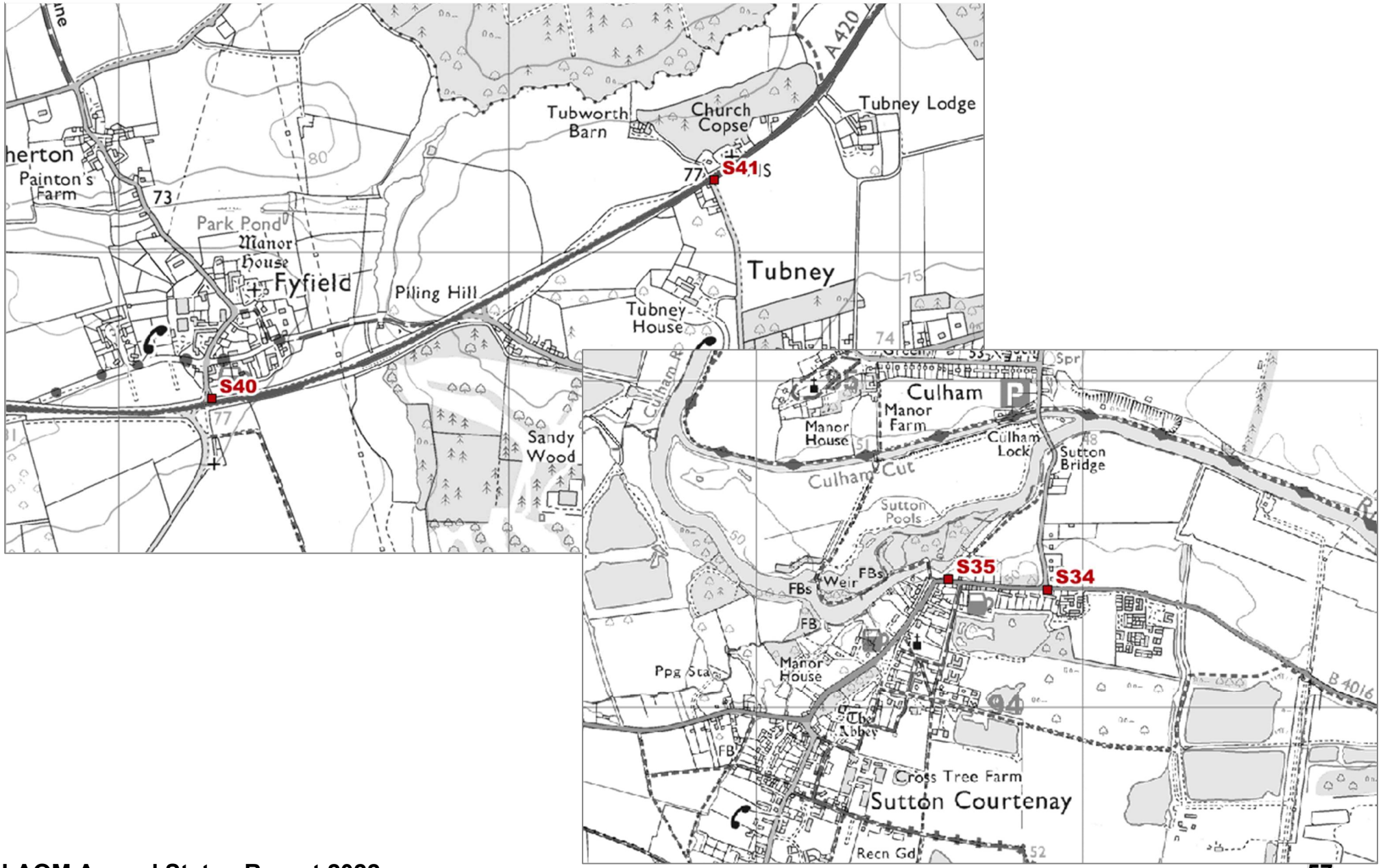


Figure D. 3 Marcham AQMA monitoring sites

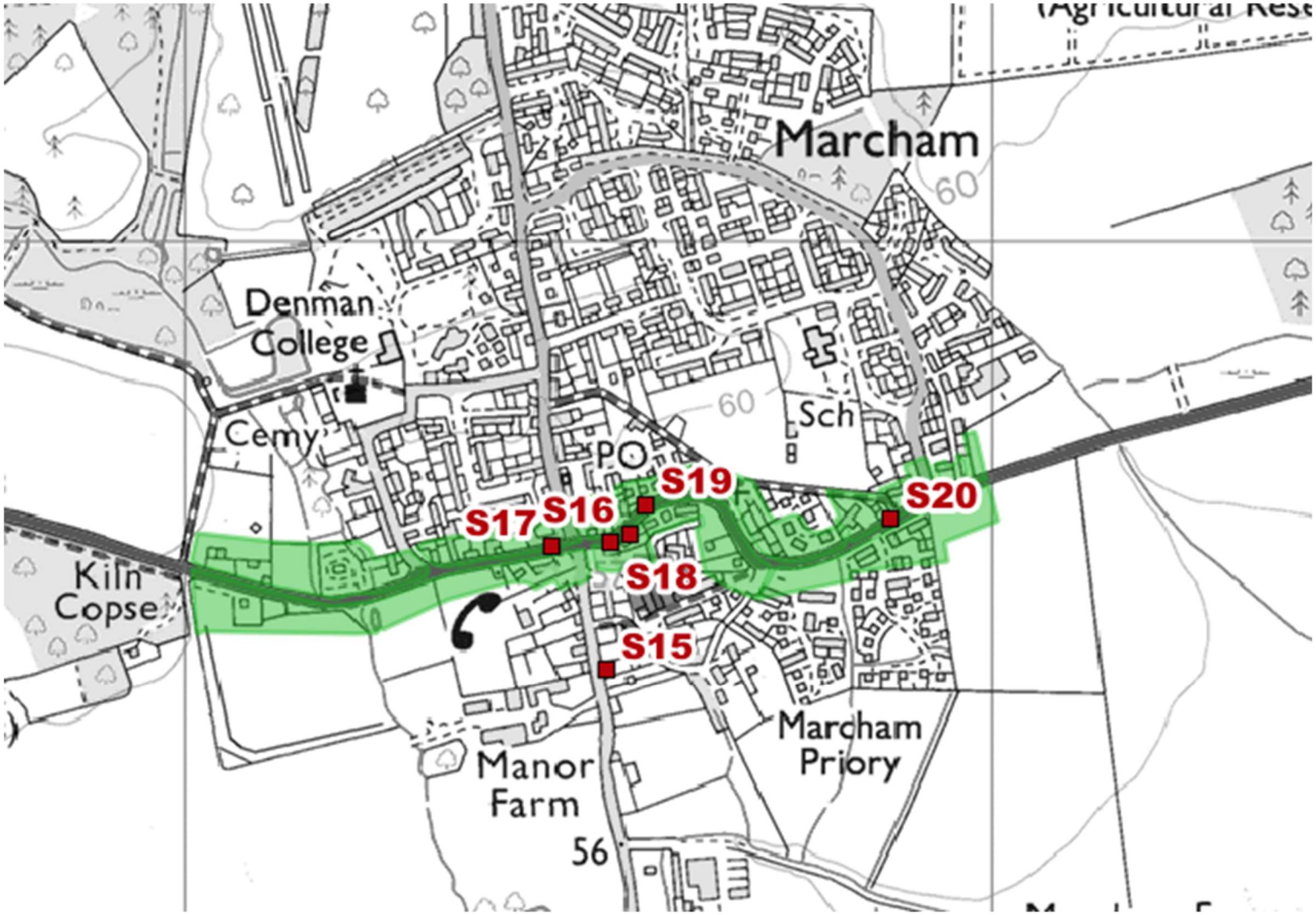


Figure D. 4 Monitoring sites in Wantage and Faringdon

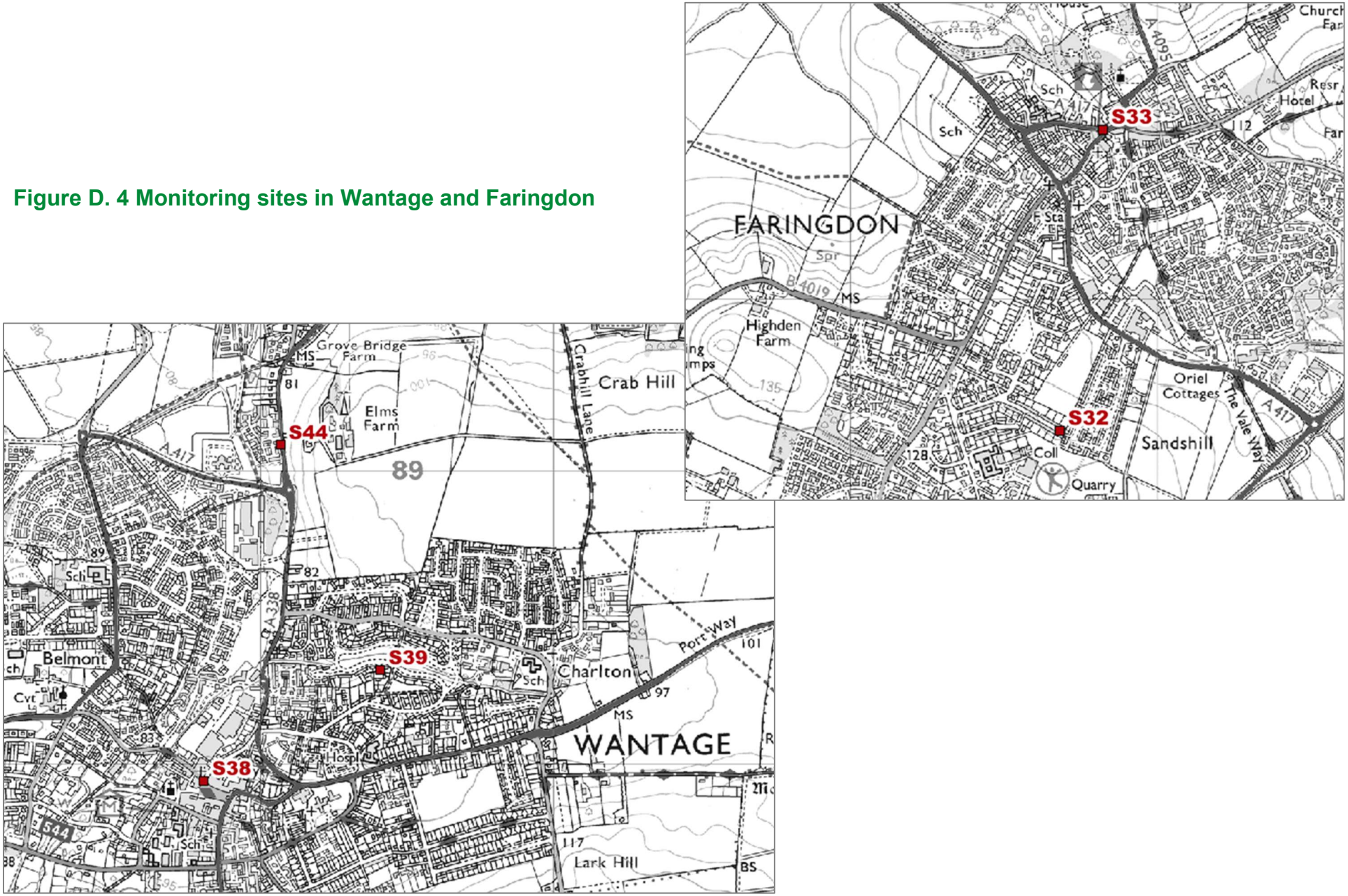


Figure D. 5 Abingdon non-AQMA monitoring sites

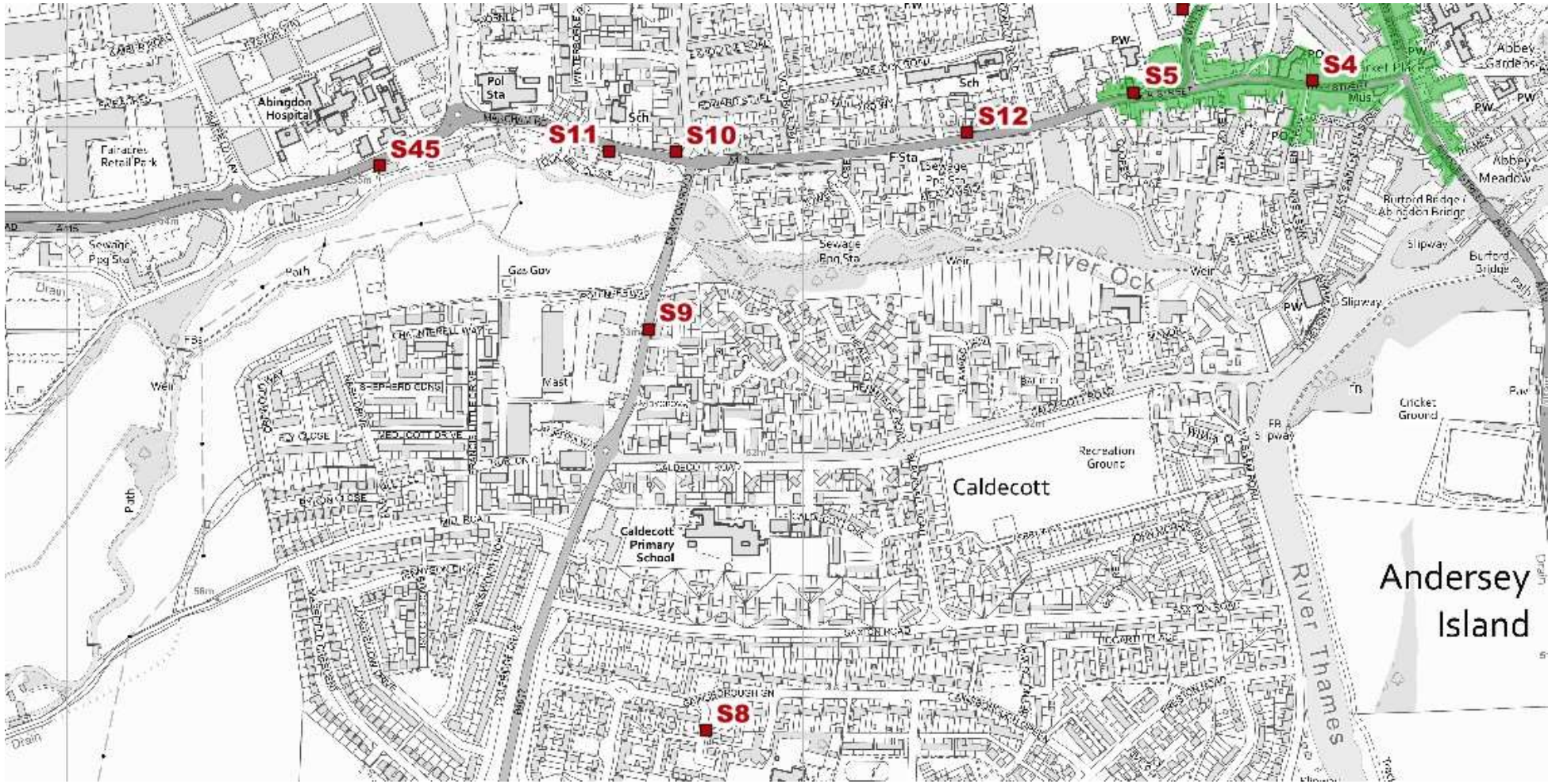


Figure D. 6 Abingdon AQMA and monitoring sites

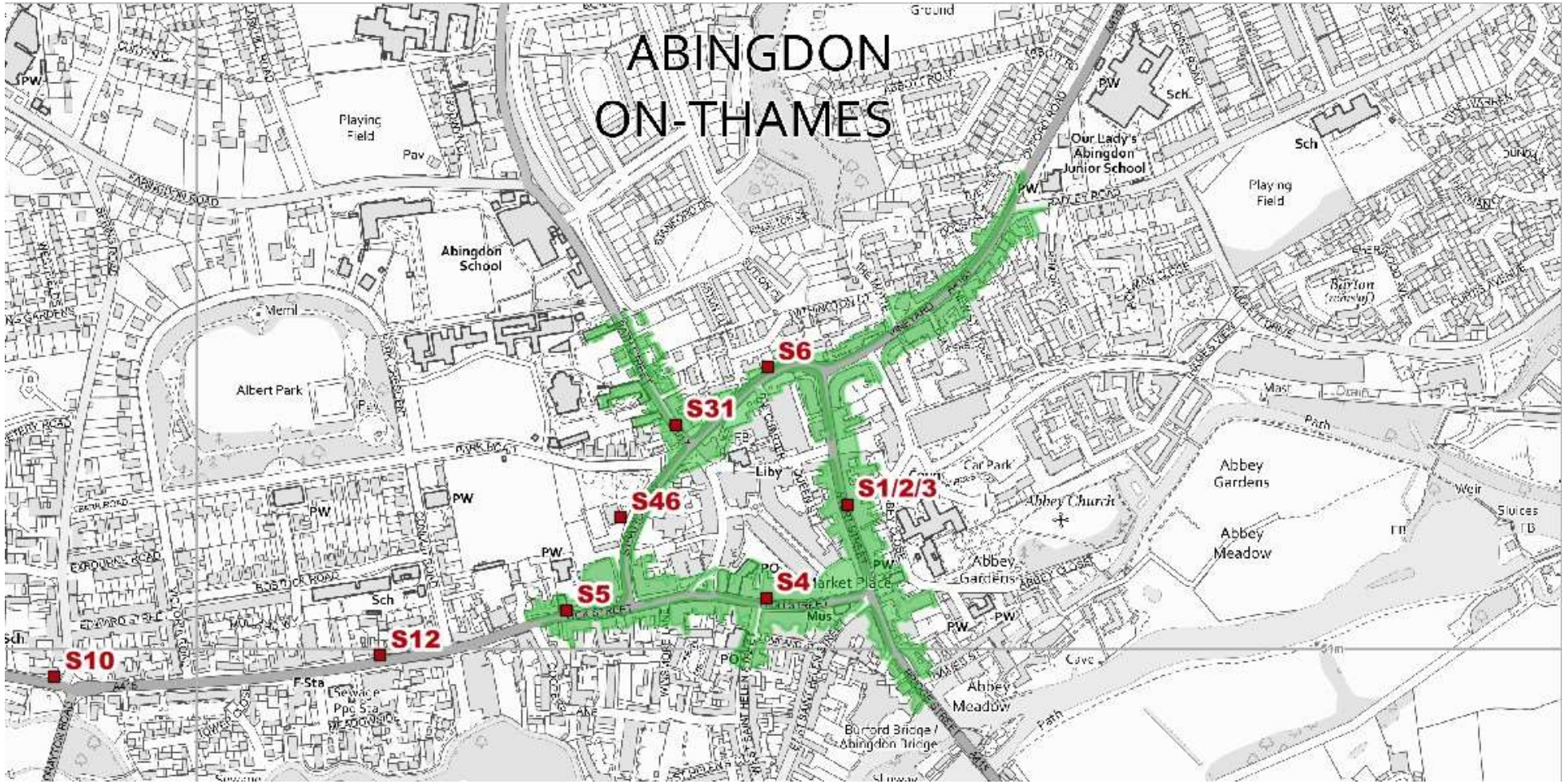


Figure D. 7 Shippon monitoring sites

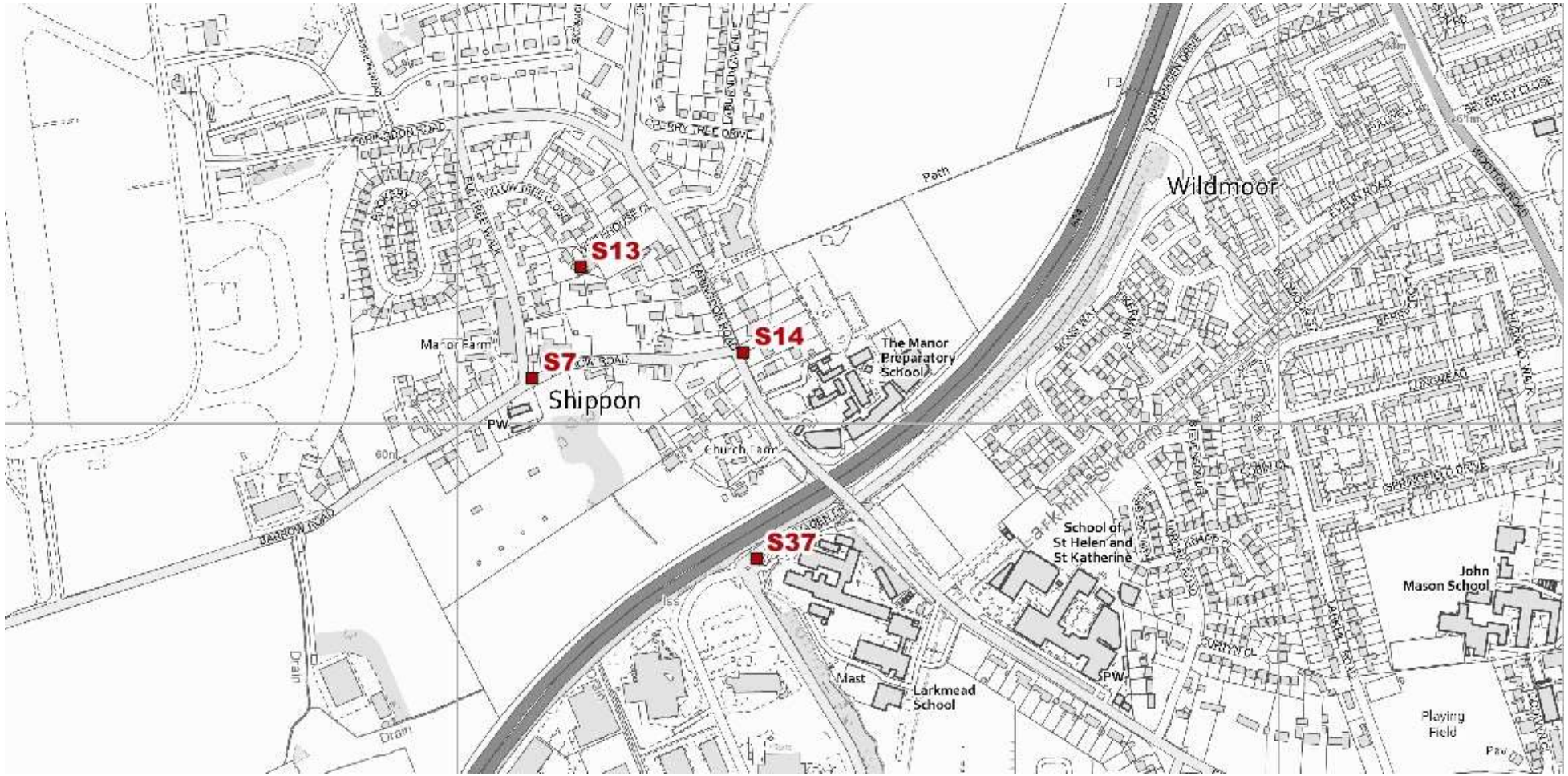


Figure D. 8 Botley AQMA and monitoring sites

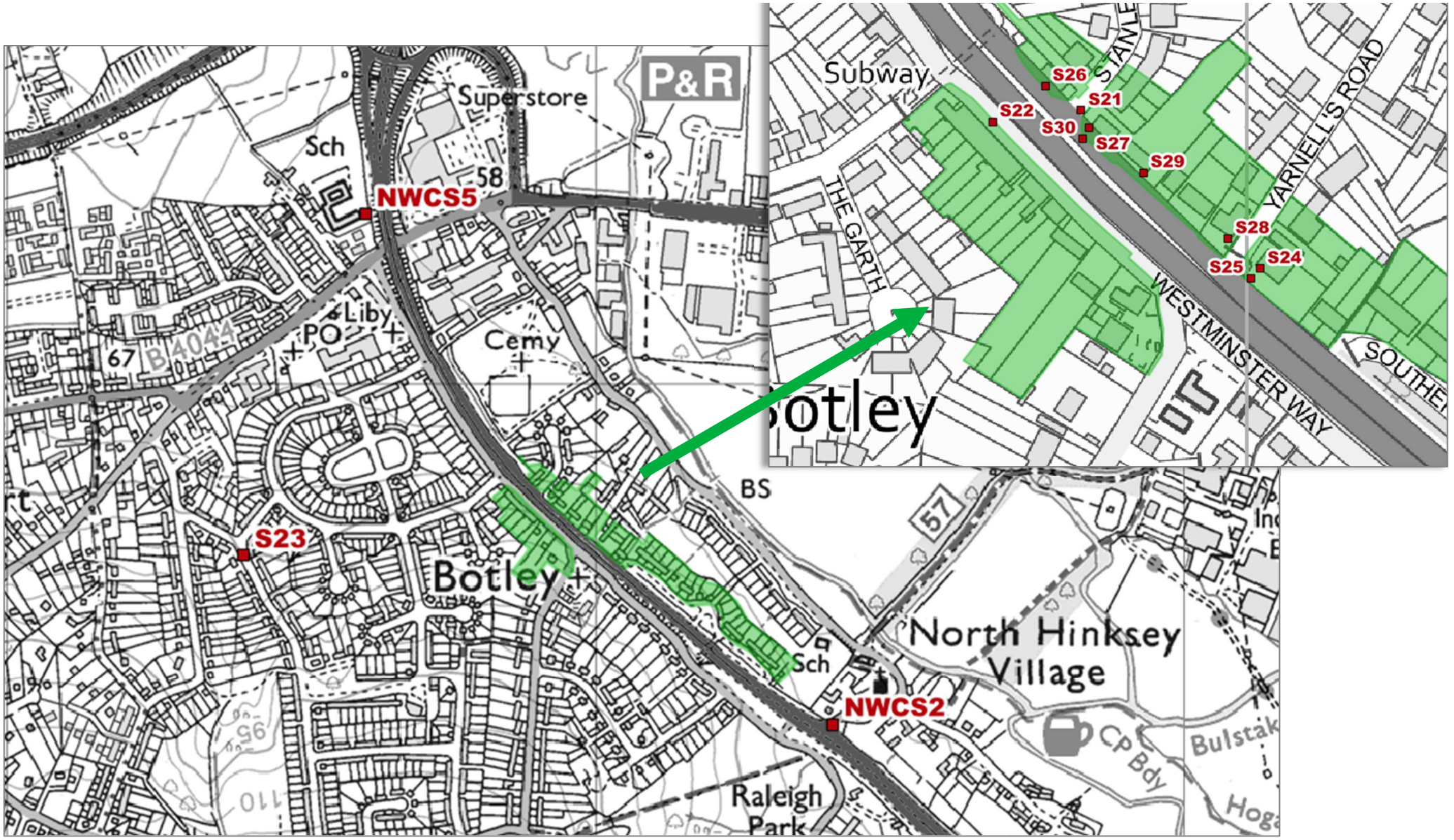
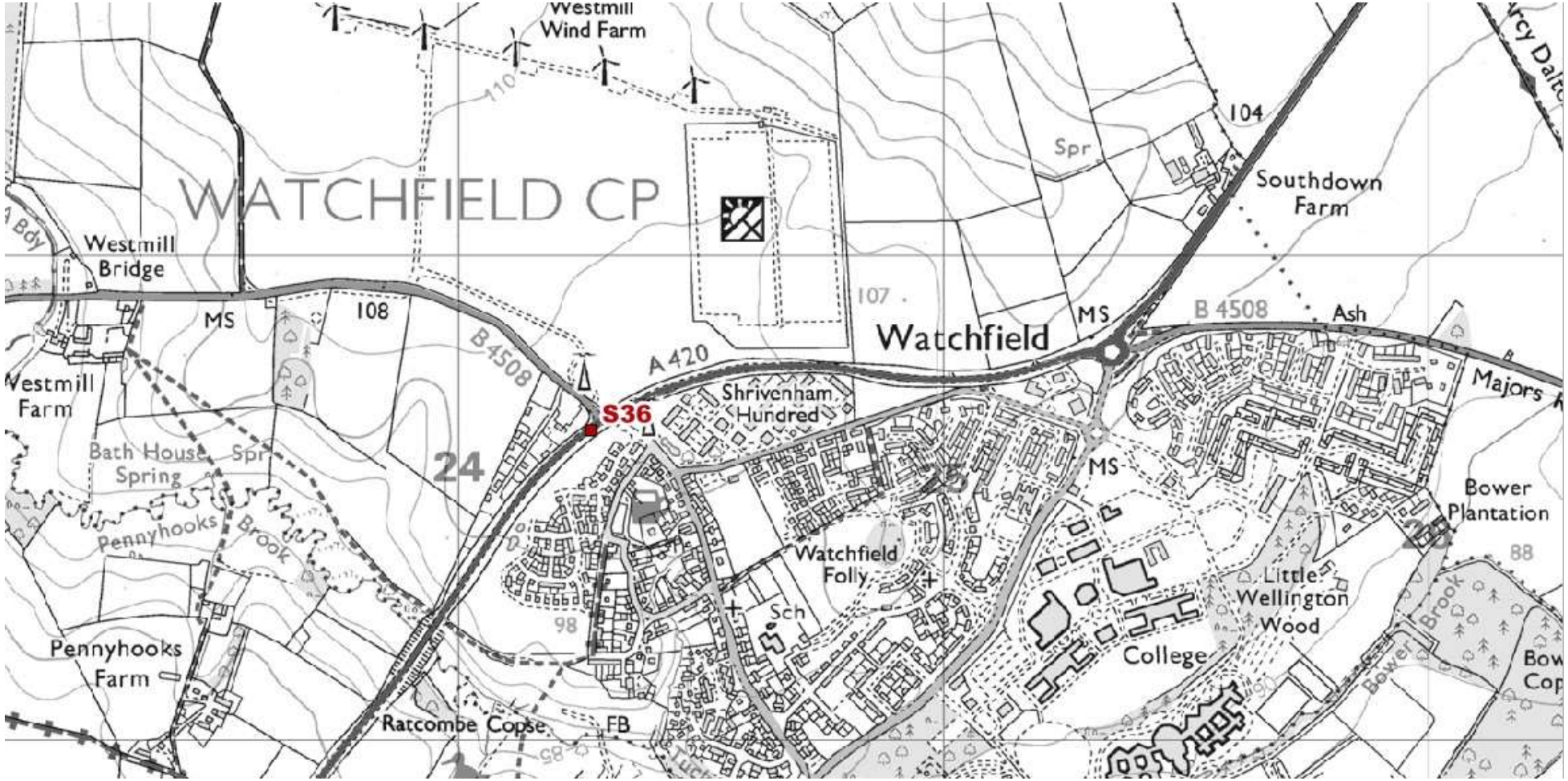


Figure D. 9 Watchfield monitoring sites



Appendix E: Summary of Air Quality Objectives in England

Table E. 1 – Air Quality Objectives in England

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

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 NH	Local Air Quality Management National Highways
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.