2020 Air Quality Annual Status Report (ASR)

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

June 2020

Local Authority Officer	Isabel Hessey
Department	Environment
Address	Eastleigh House, Upper Market Street, Eastleigh, Hampshire, SO50 9YN
Telephone	02380 683356
E-mail	isabel.hessey@eastleigh.gov.uk
Report Reference number	EBCASR2020/01
Date	30 June 2020

Executive Summary: Air Quality in Our Area

Air Quality in Eastleigh Borough

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

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

As part of the Council's responsibility to review and assess air quality across the Borough there is a long history of monitoring and delivering initiatives to tackle air quality issues. Air pollution levels are compared to objective levels set by the government, and where pollutant concentrations exceed these levels an Air Quality Management Area (AQMA) must be declared and an Air Quality Action Plan (AQAP) produced. AQAPs detail actions aimed at reducing pollutant levels to below the objective.

In Eastleigh Borough there are four AQMAs, all of which were declared due to the levels of nitrogen dioxide (NO_2) exceeding the annual objective of 40µg/m³. Two of these AQMAs have been subsequently extended since declaration and the current details of all can be found at http://uk-air.defra.gov.uk/aqma/local-authorities?la_id=95. Due to these declarations the main pollutant of concern in the borough is NO_2, although particulate matter (PM) is related and is also monitored by the Council. This is split further by size, PM_{10} was measured throughout 2019 and measurements of the smaller fraction $PM_{2.5}$ were started in early 2020.

During 2019 Eastleigh Borough Council's Air Quality Action Plans (AQAPs) were reviewed, updated and reissued as a single Borough-wide Action Plan. This work was completed in partnership with key stakeholders and the community, including undertaking a public consultation. The new AQAP was finalised and published in

---

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

February 2020. It contains actions aiming to improve air quality in Eastleigh Borough from 2020 to 2025 and will be kept updated and progress reported to the Department for the Environment, Food and Rural Affairs (DEFRA) on a regular basis throughout this period before undergoing a full review when it comes to an end. The main source of pollution in Eastleigh Borough is transport, in particular road transport, which is a significant contributor to poor air quality in the area. Eastleigh's position at the heart of major transport routes through Hampshire contributes to this problem as many businesses are attracted to the area, including manufacturing and distribution. To recognise this, actions are mainly based around reducing vehicle emissions and encouraging other methods of travel.

Actions to Improve Air Quality

Key actions which have been progressed in pursuit of improving local air quality include:

Upgrade of Continuous Monitoring Equipment

Funding has been secured to replace all existing continuous analysers, add new analysers to expand the range of pollutants monitored, relocate one monitoring station and install one new location. Implementation is planned for several phases from 2020 to 2023 and to date three replacement analysers have been installed with monitoring expanded to include $PM_{2.5}$.

DEFRA AQ Grant Project

Funded by the DEFRA Air Quality Grant Scheme 2018-19, the aim of this project is to use an innovative low cost monitoring system to link vehicle movements to air quality in real time. Ongoing work on this, with a series of upgrades to the equipment, has resulted in significant improvements to the reliability and standard of data captured. The original study is in a position to be expanded and more units have been ordered. Trials of alternative monitoring options are also being carried out to contribute towards a comparison study and provide more rigorous testing of the equipment.

Public Information

As part of formulating and publishing the new AQAP there was a widespread consultation from September – October 2019, including six drop in sessions across all local areas, communications in the Borough newsletter and on social media. The new

AQAP comprises of both the technical document, for submission to DEFRA, and a public facing summary document designed to be more accessible to read and understand. Both versions are available on the Council website (www.eastleigh.gov.uk/airquality) along with maps of the AQMAs and the latest Annual Status Report (ASR).

Schools Projects

Eastleigh Borough Council continues to work with the Hampshire County Council school travel planning officer on their projects, as well as other projects with Hampshire and Southampton City Council which are part of the Access fund. These have included clean air projects run at a number of schools and 'School Streets' events which organise temporary road closures outside schools.

EBC Travel

Progress on shifting Council staff travel to lower emission options has included the addition of two electric bikes to the available pool bikes, the installation of two electric vehicle charge points at Eastleigh House and the purchase of two electric vans for Council use.

Air Quality Trends

Considering trends in NO_2 levels at monitoring stations over the last eight years, concentrations are decreasing at the majority of sites, although fluctuations are seen from year to year which are often caused by meteorological conditions. However, exceedances of the annual average were measured at four locations in 2019. One of these was within the Eastleigh AQMA No.1 (A335) and three were within the newly extended Hamble Lane Area AQMA. In both of these AQMAs there is evidence that the fall in concentrations is slowing in more recent years and at some sites the decreasing trend cannot be identified. The fall in NO_2 concentrations is generally clearer at sites in the Eastleigh AQMA No.2 (M3) and High Street Botley AQMA and no recent exceedances have been measured in these areas.

Four years of data are available for PM_{10} and all annual averages have been significantly below the objective level in this time. A long term trend cannot be identified in this data with comparable results seen each year.

Conclusions and Priorities

At the majority of locations annual mean NO_2 concentrations are falling in the long term. However, exceedances are still measured in the Eastleigh AQMA No.1 (A335) and in the Hamble Lane Area AQMA which was extended in 2019 in response to these findings. There is also concern that the trend of decreasing concentrations may be slowing at some sites.

A new Borough-wide AQAP was adopted in February 2020 and contains actions aimed at improving air quality across the Borough as well as targeted actions for individual locations. The AQMAs where exceedances have been measured in 2019 are a priority for action and the new AQAP reflects this. The AQAP is for the time period 2020 – 2025 and will be kept updated on a regular basis throughout this period.

Local Engagement and How to get Involved

A consultation was carried out from September – October 2019 as part of formulating the new AQAP, this included public events and promotion as well as directly contacting relevant stakeholders. People were asked to fill out a questionnaire rating their level of support for each proposed action as well as being given the opportunity to leave further comments.   Responses were generally positive with support outweighing opposition across the board. A high level of engagement was also seen with a large majority of the people who filled out the multi-choice section also leaving further thoughts and comments in the free text questions. The consultation findings resulted in some actions being changed or added to reflect public views and a full analysis is included as an appendix to the AQAP.

Local engagement is important as to effectively tackle air pollution the Council, residents, businesses and other local groups and organisations all have a role to play. Everyone can help to improve air quality with their actions, including:

> **Leave your car at home.** Use your car less by choosing to walk, cycle or use public transport for some journeys.

> **Reduce your vehicle emissions.** Minimise the emissions from your car by driving efficiently and turning your engine of when stationary. Consider going electric when you upgrade your car or join a car club to use a low emission vehicle.

Help to reduce congestion. Reduce the number of single occupancy cars on the road by arranging a car share.

Burn less wood. Minimise use of wood burning stoves and bonfires. Follow the DEFRA guide on appropriate appliances and fuel to reduce your emissions.

Reduce your exposure to air pollution. Plan your routes to use side streets and avoid heavily congested areas. Sign up to airAlert to receive pollution forecasts.

Useful Websites

www.eastleigh.gov.uk/airquality - Eastleigh Borough Council's air quality website

www.eastleigh.my-air.uk - Air quality monitoring data from the Borough

www.co-wheels.org.uk - Car club operating in the Borough

www.myjourneyhampshire.com - Information on sustainable transport options and journey planning

www.airalert.info/Hants/Default.aspx - airAlert pollution warning system

www.readytoburn.org/defra-wood-burning-guide/ - DEFRA guidance on wood burning

Table of Contents

List of Tables

List of Figures

1   Local Air Quality Management

This report provides an overview of air quality in Eastleigh Borough during 2019. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Eastleigh Borough Council can be found in Table 2-1. This includes an amendment to the Hamble Lane AQMA which was extended in 2019 and renamed the Hamble Lane Area AQMA. See Appendix C for further details and the evidence collected for this declaration. Maps of all AQMAs, and air quality monitoring locations in relation to these, are shown in Appendix D and information is also available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=95.

Table 2-1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Eastleigh AQMA No.1 (A335)	Declared 16/02/2005 Amended 03/02/2015	NO$_2$ Annual Mean	Eastleigh / Chandler's Ford	Follows the A335 Southampton Rd, Romsey Rd & Leigh Rd. Amended to extend a short way along Woodside Ave, Twyford Rd & Bishopstoke Rd. It includes a number of properties on all of these.	YES	>40	µg/m^3	36.7	µg/m^3	Eastleigh Borough Council Air Quality Action Plan 2020 – 2025	Feb-20	https://www.eastleigh.gov.uk/media/7200/ebc1-aqap-2020-2025.pdf
Eastleigh AQMA No.2 (M3)	Declared 03/07/2006	NO$_2$ Annual Mean	Eastleigh / Chandler's Ford	An area extending either side of the M3 motorway from junctions 12 to 14.	YES	>40	µg/m^3	26.0 (at monitoring location)	µg/m^3	Eastleigh Borough Council Air Quality Action Plan 2020 – 2025	Feb-20	https://www.eastleigh.gov.uk/media/7200/ebc1-aqap-2020-2025.pdf
Hamble Lane Area AQMA	Declared 03/07/2006 Amended 20/06/2011 Amended 30/08/2019	NO$_2$ Annual Mean	Bursledon	Follows the B3397 Hamble Lane from its junction with the A3025 Portsmouth Road to the Windhover roundabout, encompasses the roundabout and follows the A27 south east to the Borough boundary with a 30m corridor either side.	NO	>40	µg/m^3	45.6	µg/m^3	Eastleigh Borough Council Air Quality Action Plan 2020 – 2025	Feb-20	https://www.eastleigh.gov.uk/media/7200/ebc1-aqap-2020-2025.pdf
High Street Botley AQMA	Declared 20/06/2011	NO$_2$ Annual Mean	Botley	An area encompassing a number of properties along High Street from Maypole roundabout to the Winchester Street junction.	NO	>40	µg/m^3	32.7	µg/m^3	Eastleigh Borough Council Air Quality Action Plan 2020 – 2025	Feb-20	https://www.eastleigh.gov.uk/media/7200/ebc1-aqap-2020-2025.pdf

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

2.2 Progress and Impact of Measures to address Air Quality in Eastleigh Borough

The main comments from DEFRA's appraisal of last year's ASR are listed below, with explanation on how Eastleigh Borough Council has addressed these in the 2020 report.

1- 'The report is thorough, comprehensive and follows the most recent template.'

2- It was noted that the Council's AQAPs were out of date, and work on updating and consolidating these into one document was in process. It was expected that the new measures, which should incorporate particulate-specific actions, and any progress would be reported in the 2020 ASR.

The Council has completed a new Borough-wide AQAP to cover 2020 – 2025, which was adopted by Cabinet in February 2020 and subsequently approved by DEFRA. The measures contained in this are outlined in Table 2-2 along with progress reports. Section 2.3 highlights those measures which are particularly aimed at reducing particulate concentrations.

3- An exceedance was recorded at the site OH2 which was not within a designated AQMA. It was acknowledged that further investigation of this was being carried out and advised that declaration of a new AQMA would be required if the exceedance persists.

Further monitoring work was carried out at the area in question in 2019, and as a result the Hamble Lane AQMA was extended to include this area of exceedance in August 2019. A map of the newly amended Hamble Lane Area AQMA is included in Appendix D and details of the evidence collected and decision making process for this amendment are shown in Appendix C.

4- While QA/QC of monitoring data using the national bias factor was appropriate, the Council were encouraged to consider using a local factor from a co-location study in future.

The Council have calculated local bias adjustment factors for 2019 and provided information and discussion on the use of national and local factors in Appendix C.

5- No supporting evidence was provided for distance correction of NO_2 monitoring results and example calculations should be included in future.

Details of the calculations carried out and an example calculation sheet are shown in Appendix C.

6- While $PM_{2.5}$ was briefly discussed, the Council is encouraged to link with the Public Health Outcomes Framework and include the fraction of mortality attributable to $PM_{2.5}$ as well as measurement trends and comparisons to neighbouring authorities and England as a whole.

A more detailed discussion of $PM_{2.5}$ in relation to the Public Health Outcomes Framework has been included in Section 2.3, with further information and analysis on particulate monitoring data in Section 3.2.2.

7- 'The Council has listed a number of priorities for the next year and should provide an update on the progress of these in the next reporting year. These priorities are appropriate.'

During the period covered by this ASR, Eastleigh Borough Council have reviewed and reissued its AQAPs, consolidating them into a single document to cover all four AQMAs. This new AQAP identifies both overarching Borough-wide actions, grouped by Council theme, and targeted actions for individual locations which are grouped by area. All measures are set out in Table 2-2 showing progress made, any challenges and barriers faced and expected completion dates. Where indicated further detail is included in the text below the table.

Table 2-2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
ENV1.1	Monitor pollutant concentrations across the Borough within AQMAs, including NO$_2$ and PM	Other	Other	Carried forward	EBC	EBC / Developer Contributions / DEFRA AQ Grant 2010-11	>85% data capture for each calendar year	-	Monitoring ongoing, both with automatic analysers and diffusion tubes. See Section 3 for details and results.	-	Data available at www.eastleigh.my-air.uk
ENV1.2	Undertake focussed sampling exercises to monitor pollutant concentrations across the Borough in areas of community concern	Other	Other	2020	EBC	EBC / Developer Contributions	Establish prioritisation process for study areas Complete 3 studies	-	Sampling started at 2 study areas March 2020, in response to community requests.	June 2020 March 2022	-
ENV1.3	Complete an upgrade of monitoring equipment, to include: - replacement of existing analysers - addition of analysers to expand range of pollutants monitored - relocation of monitoring stations - installation of new monitoring locations	Other	Other	2019	EBC	EBC / Developer Contributions	Increase data capture for each calendar year Increase range of pollutants monitored to include PM$_{2.5}$ and ozone Add 1 new continuous monitoring location	-	Funding secured and implementation planned for several phases from 2020 - 2023. See text below Table 2.2 for more detail.	June 2023	-
ENV1.4	Carry out trial of equipment linking air quality and traffic data	Other	Other	2018	EBC / External Partners	EBC / DEFRA AQ Grant 2018-19	Trial completed and findings reported to DEFRA	-	Project ongoing throughout 2019 - 2020, see text below Table 2.2 for more detail.	December 2020	-
ENV2	Work in partnership with other Councils and key groups	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Carried forward	EBC / other Hampshire authorities	EBC	Attend 4 meetings per year of the Hampshire Air Quality sub-group	-	Hants AQ sub-group meetings attended (Sep 19, Nov 19 & Jan 20). Meeting with Public Health and Highways at HCC about the AQAP December 2019.	-	March 2020 sub-group meeting postponed
ENV3	Promote the use of electric vehicles by investigating incentives and developing a network of publicly available electric vehicle charge points across the Borough in both public and business locations	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Carried forward	EBC / External Partners / Developers	EBC / External Partners / Developer Contributions	Increase number of publicly available EV charging points Collect data on total number of kWh used	Reduced vehicle emissions	A supplier has been identified and public EV charging point locations specified at 3 EBC owned sites and 1 privately owned site.	-	-
ENV4	Consider the use of green infrastructure and planting to improve the local environment	Other	Other	Carried forward	EBC / Developers	EBC / Developer Contributions	Planting considered in associated with public realm improvements	Reduced pollutant concentrations	-	-	-
TR1	Create a walking and cycling strategy to promote and encourage travel by these methods	Promoting Travel Alternatives	Other	2019	EBC	EBC	Completion of strategy	-	Work has begun, including a workshop session with local Councillors	June 2020	-
TR2.1	Continue to improve and extend the walking network in line with the new walking and cycling strategy, including running pedestrianisation events	Promoting Travel Alternatives	Promotion of walking	Carried forward	EBC / HCC / Developers	EBC / HCC / Developer Contributions	Increase number of pedestrian improvement schemes completed	Reduced vehicle emissions	Initial agreement secured in January 2020 for temporary pedestrianisation event on Clean Air Day. Initial meeting for arrangements March 2020.	First pedestrianisation event June 2020	Clean Air Day postponed

TR2.2	Improve and extend the cycle network in line with the new walking and cycling strategy, including: - maintenance of existing cycle paths - addition of new cycle routes - promotion of electric bicycles	Transport Planning and Infrastructure	Cycle network	Carried forward	EBC / SCC / HCC / Developers / Transforming Cities	EBC / SCC / HCC / Developer Contributions / Transforming Cities Fund	Increase length of cycle path available Add publicly available charging points for electric bikes	Reduced vehicle emissions	Transforming Cities funding received March 2020 covers a variety of cycle infrastructure, see CFH2 and BIFOHH1 for more details.	-	-
TR3	Run campaigns aimed at reducing vehicle emissions, including: - reducing the number of single occupancy cars - reducing idling of stationary vehicles	Public Information	Other	Planned for 2021	EBC	EBC	Run 2 campaigns Increase number of people engaged	Reduced vehicle emissions	-	First campaign by December 2021	-
TR4.1	Work in partnership with bus companies to: - improve routes and services - increase patronage - develop a multi operator ticketing system	Transport Planning and Infrastructure	Bus route improvements	Carried forward	EBC / HCC / Bus Service Operators Grant / Bus Companies / Transforming Cities	EBC / HCC	Maintain number of supported services Increase bus patronage	Reduced vehicle emissions	Transforming Cities funding received March 2020 includes provision of bus infrastructure, see BIFOHH1 for more details.	Supported routes and services finalised by December 2022	-
TR4.2	Work with rail operators, network rail and the community rail partnership to: - improve routes and services - improve facilities for multi modal journeys - increase patronage - minimise the impact of emissions from rail transport	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Carried forward	EBC / Rail Operators / SWR Customer & Communities Improvement Fund 2020-22	EBC	Increase train patronage	Reduced vehicle emissions	SWR Customer & Communities Funding received March 2020 to improve station access, see BHH4.1 for more details.	-	-
TR4.3	Monitor progress of Clean Bus Technology Fund and implications for EBC	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Carried forward	SCC	OLEV Clean Bus Technology Funding	Increase proportion of buses classed as EURO VI or better to 100%	Reduced vehicle emissions	Information not yet available	March 2020	-
TR5.1	Promote the Low Emission Taxi Incentive scheme to encourage uptake	Promoting Low Emission Transport	Taxi emission incentives	Carried forward	EBC / SCC / External Partners	DEFRA AQ Grant 2018-19	Increase number of grants awarded	Reduced vehicle emissions	Discussions with SCC and Electric Blue in March 2020 to involve EBC taxis in an EV trial scheme.	March 2021	-
TR5.2	Implement a requirement for taxis to meet specified EURO standards in order to be licensed in EBC	Promoting Low Emission Transport	Taxi Licensing conditions	Planned for 2025	EBC / SCC	EBC	100% of taxis meet specified EURO standards	Reduced vehicle emissions	This measure will follow TR5.1.	March 2025	-
TR6	Promote and expand car clubs	Alternatives to private vehicle use	Car Clubs	2020	EBC / External Partners	EBC / Developer Contributions	Increase number of car club locations to 6	Reduced vehicle emissions	-	-	-
TR7	Increase availability of bicycle hire schemes	Promoting Travel Alternatives	Promotion of cycling	Planned for 2022	EBC / External Partners	EBC / External Partners / Transforming Cities	Increase availability of hire schemes	Reduced vehicle emissions	Projects funded by Transforming Cities likely to include some element of bike hire	April 2023	Scheme arranged with Yo Bikes in 2019 but they pulled out of the area in August 2019.
TR8	Consult on incentivising ownership of low emission vehicles through differential parking charges	Traffic Management	Emission based parking or permit charges	Planned for 2022	EBC	EBC	Consultation completed	Reduced vehicle emissions	-	September 2022	-
TR9	Use low cost sensor study to understand relationships between traffic movements and air quality to influence future road design	Traffic Management	UTC, Congestion management, traffic reduction	2019	EBC	EBC / DEFRA AQ Grant 2018-19	Availability of air quality and traffic data in 4 locations to be used as evidence	Reduced vehicle emissions	Further work on measure ENV1.4 required first.	June 2022	-
TR10	Engage with HCC and HE on their highways improvements schemes, such as the SMART motorways project, to ensure they support our work on air quality	Traffic Management	UTC, Congestion management, traffic reduction	Carried forward	HCC / HE	EBC / HCC / HE	2 meetings per year with highways authorities	Reduced vehicle emissions	Meeting with HE about M27 jnct. 8 in July 2019. Meeting with HCC about AQAP in December 2019.	-	-

HS1.1	Improve public awareness of air pollution levels and air quality issues through the EBC website	Public Information	Via the Internet	Carried forward	EBC	EBC	Increase availability of information on website Increase webpage hits	-	Website improvements, see text below Table 2.2 for more details.	December 2020	-
HS1.2	Increase uptake of the airAlert service to help people manage their health in relation to air pollution	Public Information	Other	Carried forward	EBC / SCC	EBC / SCC	Increase number of airAlert subscriptions	-	-	May 2022	-
HS1.3	Run regular public awareness campaigns to provide information and advice, and to promote services available	Public Information	Other	Carried forward	EBC	EBC	Campaigns run annually	-	Clean Air Day planning with other Hampshire authorities to ensure consistent messaging across the area.	Clean Air Day event June 2020	Clean Air Day postponed
HS1.4	Integrate AQ into our Health & Wellbeing engagement campaigns	Public Information	Via the Internet	2020	EBC	EBC	Increase number of people reached by campaigns	-	-	-	-
HS1.5	Work with local health professionals, health awareness groups and social prescribers to disseminate air quality information, particularly about airAlert	Public Information	Other	2020	EBC	EBC	Increase number of people reached Increase number of airAlert subscriptions	-	-	-	-
HS2.1	Annually engage with schools in the borough for travel planning and to run clean air campaigns and local monitoring exercises	Promoting Travel Alternatives	School Travel Plans	Carried forward	EBC / SCC	EBC / SCC / Access Fund	Increase number of schools participating per year	Reduced vehicle emissions	Clean air projects run at 3 schools, see text below Table 2.2 for more details.	Numbers reviewed annually	-
HS2.2	Facilitate at least three 'School Streets' events per year, organising temporary road closures outside schools	Traffic Management	Other	2020	EBC	EBC	3 events held per year	Reduced vehicle emissions	1 event held in 2019 with 2 planned for 2020, see text below Table 2.2 for more details.	First event by June 2020	Events postoned due to school closures
HS3	Provide information and advice on the use of solid fuel burners through joint project with neighbouring authorities	Public Information	Other	2020	EBC / SCC / NFDC / WCC	DEFRA AQ Grant 2019-20	Funding for project secured Project completed and findings reported to DEFRA	Reduced emissions from burning	Joint DEFRA bid entered in November 2019, notified of success in March 2020.	Funding secured by March 2020 Project completed by June 2023	-
HOU1.1	Update planning guidance to require EV charging in new developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	EBC	EBC	Updated planning SPD for air quality produced	Reduced vehicle emissions	-	December 2021	Delayed adoption of Local Plan
HOU1.2	Update resident parking policies to incentivise low emission vehicles	Promoting Low Emission Transport	Priority parking for LEV's	Planned for 2022	EBC	EBC	Parking policies updated	Reduced vehicle emissions	-	September 2022	Delayed adoption of Local Plan
HOU1.3	Update planning guidance to require low NOx boilers to be installed in new developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	EBC	EBC	Updated planning SPD for air quality produced	Reduced emissions from boilers	-	December 2021	Delayed adoption of Local Plan
HOU1.4	Update planning guidance to require new developments to employ use of green infrastructure to mitigate air quality impacts	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	EBC	EBC	Updated planning SPD for air quality produced	Reduced pollutant concentrations	-	December 2021	Delayed adoption of Local Plan
HOU1.5	Update planning guidance to require new developments are well served with sustainable transport facilities, to include walking, cycling and public transport	Transport Planning and Infrastructure	Other	2020	EBC	EBC	Updated planning SPD for air quality produced	Reduced vehicle emissions	-	December 2021	Delayed adoption of Local Plan

Ref	Measure	Category	Classification	Year	Lead / Partners	Funding Source	Indicator	Key Performance	Progress	Milestone	Comments
EC1.1	Update the EBC travel plan annually	Promoting Travel Alternatives	Workplace Travel Planning	2020	EBC	EBC	Annual travel survey completed and plan updated	Reduced vehicle emissions	Survey delayed but travel plan will still be updated to reflect changes in facilities	Next survey completed by June 2020; Next update completed by August 2020	-
EC1.2	Increase use of EBC pool bikes for staff travel	Promoting Travel Alternatives	Promotion of cycling	Planned for 2022	EBC	EBC	Increase number of pool bike users	Reduced vehicle emissions	Improved pool bike facilities and promotion, see text below Table 2.2 for more details.	Numbers reviewed annually	-
EC1.3	Update EBCs purchasing and contractor policies to ensure low emission options are used	Policy Guidance and Development Control	Sustainable Procurement Guidance	2020	EBC	EBC	Procurement policy and guidance updated	Reduced vehicle emissions	-	June 2020	Delayed
EC1.4	Upgrade EBC's internal fleet to low emissions vehicles	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2020	EBC	EBC / Low Emission Grant	Increase proportion of fleet made up of LEVs	Reduced vehicle emissions	EV infrastructure and vans introduced at Eastleigh House, see text below Table 2.2 for more details.	Car derived vans to be electric by 2025	-
EC2.1	Engage with businesses in the borough to do travel planning	Promoting Travel Alternatives	Workplace Travel Planning	Carried forward	EBC / SCC / Local Businesses	Developer Contributions	Increase number of businesses engaged with; Appointment of new Travel Planner post	Reduced vehicle emissions	Funding secured for Travel Planner post and agreement with SCC in place.	Numbers reviewed annually; Travel Planner in post by October 2020	-
EC2.2	Investigate adopting and promoting the ECO Stars Fleet Recognition Scheme to encourage local businesses to upgrade fleets	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	Planned for 2022	EBC	EBC	Increase number of businesses with ECO Stars accreditation	Reduced vehicle emissions	-	Numbers reviewed annually	-
EC2.3	Work with local businesses to encourage use of last mile electric scheme	Freight and Delivery Management	Other	2020	EBC / External Partners / Local Businesses	EBC	Increase use of scheme	Reduced vehicle emissions	-	Scheme usage reviewed annually	-
EC3	Support and encourage businesses to adopt flexible working practices	Promoting Travel Alternatives	Encourage / Facilitate home-working	Carried forward	EBC / Local Businesses	EBC	Increase number of businesses engaged with	Reduced vehicle emissions	-	Numbers reviewed annually	-
EC4	Work with Southampton Airport to minimise the impact of their ground operations on air quality	Promoting Low Emission Transport	Other	2020	EBC / Southampton Airport	EBC	Updated surface access strategy in place	Reduced vehicle emissions	Work with Southampton Airport ongoing in relation to their planning application.	New strategy in place by 2021; Travel patterns monitored annually	-
CFH1.1	Move location of continuous monitoring station currently at Steele Close and upgrade equipment	Other	Other	2019	EBC	EBC	Site move completed	-	Arrangements for site move started, see text below Table 2.2 for more details.	Site moved by December 2021	Land owner permission has not yet been granted for the identified location.
CFH1.2	Carry out focussed sampling exercises targeted at areas of local community concern	Other	Other	Planned for 2021	EBC	EBC	Better coverage of diffusion tube data and improved representation of exposure	-	-	Sampling study completed by March 2022	-
CFH2	Provide an off road cycle/pedestrian route along Hut Hill, linking Chandler's Ford with Chilworth	Transport Planning and Infrastructure	Cycle network	2019	HCC	HCC / Transforming Cities	Scheme completed	Reduced vehicle emissions	Hut Hill was due for completion March 2020, but has been delayed. Transforming Cities funding includes work on the cycle route Southampton - Chilworth, improving access onto the Chandler's Ford route.	May 2020	-

CFH3	Consider potential locations and funding sources to install electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Planned for 2022	EBC / External Partners / Developers	EBC / External Partners / Developers	Increase number of available EV charging points	Reduced vehicle emissions	-	Numbers reviewed annually	-
CFH4	Investigate expanding Co-Wheels electric vehicle locations to Chandler's Ford	Alternatives to private vehicle use	Car Clubs	Planned for 2022	EBC / External Partners	EBC / External Partners	Add 1 new Co-Wheels location	Reduced vehicle emissions	-	September 2023	-
ELAC1	Upgrade analysers at Southampton Road and The Point monitoring sites	Other	Other	2019	EBC	EBC	Equipment replaced	-	New analysers installed at Southampton Road and ordered for The Point. See text below Table 2.2 for more details.	December 2020	-
ELAC2	Conduct further studies of fleet make up and source apportionment for Eastleigh	Other	Other	Carried forward	EBC / External Consultants	EBC / Developer Contributions	Completion of study	-	Consultant identified and quote received, in process of agreeing funding.	January 2022	-
ELAC3	Carry out trial of innovative monitoring equipment	Other	Other	2018	EBC / External Partners	EBC / DEFRA AQ Grant 2018-19	Data collected for 1 key junction in Eastleigh	-	Project ongoing throughout 2019 - 2020, see text below Table 2.2 for more detail.	December 2020	-
ELAC4	Consider pedestrianisation of Market Street, initially as a temporary event	Traffic Management	Other	2019	EBC	EBC	Temporary closure event organised and impact assessed	Reduced vehicle emissions	Initial agreement secured in January 2020 for temporary pedestrianisation event on Clean Air Day. Initial meeting for arrangements March 2020.	Pedestrianisation event by June 2020 Impact assessed by December 2020	Clean Air Day postponed
ELAC5	Install electric vehicle charge points to include: - Aldi, Chestnut Retail Park - Romsey Road Car Park, Upper Market Street	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Carried forward	EBC / External Partners	EBC / External Partners / Developer Contributions	Increase number of available EV charging points	Reduced vehicle emissions	A supplier has been identified and public EV charging point locations specified at Places Leisure, the Stoneham Development, Woodside Lane and Aldi.	February 2021	-
ELAC6	Continue to seek approval and funding for the Chickenhall Lane Link Road	Transport Planning and Infrastructure	Other	Long term aspiration	EBC / HCC	Not Identified	Delivery of link road	Reduced vehicle emissions	-	Long term aspiration	-
BIFOHH1	Improve traffic flow and increase facilities for active travel along Bishopstoke Road	Transport Planning and Infrastructure	Other	2019	EBC / HCC	EBC / HCC / Transforming Cities / New Homes Bonus	Completed traffic study Improvements implemented	Reduced vehicle emissions	Cycleway Phase II completed. Transforming Cities funding received March 2020 includes improvements to the Bishopstoke Road corridor, to facilitate active travel and bus travel.	Cycleway Phase II completed by March 2020	-
BIFOHH2	Consider potential locations and funding sources to install electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Planned for 2023	EBC / External Partners / Developers	EBC / External Partners / Developers	Increase number of available EV charging points	Reduced vehicle emissions	-	Numbers reviewed annually	-
BIFOHH3	Use the development at Horton Heath as an opportunity to promote sustainable practices	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	EBC	EBC	Maximise sustainable initiatives implemented in development	Reduced vehicle emissions	Work has begun to embed sustainable principles into the development, currently an outline application is being written for the whole site and a detailed application for the first 500 homes.	December 2025	-

HEWEB1	Investigate expanding Co-Wheels electric vehicle locations to Botley	Alternatives to private vehicle use	Car Clubs	Planned for 2022	EBC / External Partners	EBC / External Partners	Add 1 new Co-Wheels location	Reduced vehicle emissions	-	September 2022	-
HEWEB2	Consider potential locations and funding sources to install electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Planned for 2022	EBC / External Partners / Developers	EBC / External Partners / Developers	Increase number of available EV charging points	Reduced vehicle emissions	-	Numbers reviewed annually	-
HEWEB3	Delivery of Botley Bypass scheme	Transport Planning and Infrastructure	Other	Carried forward	HCC	HCC	Completion of bypass	Reduced vehicle emissions	Associated development and school granted planning permissions September 2019. Preparation work on Woodhouse Land carried out January 2020.	December 2023	-
HEWEB4	Following completion of Botley Bypass, reduce HGVs using High Street	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Following completion of measure HEWEB3	EBC / HCC	EBC / HCC	Reduce number of HGVs using Botley High Street	Reduced vehicle emissions	Requires completion of measure HEWEB3.	Following completion of measure HEWEB3	-
BHH1.1	Install new continuous analyser to monitor NO2 in the AQMA	Other	Other	Planned for 2022	EBC	EBC	New site installed	-	-	June 2023	-
BHH1.2	Carry out focussed sampling exercises targeted at areas of local community concern	Other	Other	2020	EBC	EBC	Better coverage of diffusion tube data and improved representation of exposure	-	Sampling started at 3 new locations in March 2019: Hound, Hamble and Netley.	Sampling study completed by February 2021	-
BHH2	Further study to learn more about the proportion of different vehicles by age and type on Hamble Lane and the A27	Other	Other	2020	EBC / External Consultants	EBC / Developer Contributions	Completion of study	-	Consultant identified and quote received, in process of agreeing funding.	January 2022	-
BHH3	Liaise with neighbouring authorities on their activities on the A27	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	EBC / FBC / SCC	EBC / FBC / SCC	Information sharing	-	-	-	-
BHH4.1	Work to increase patronage at Hamble, Netley and Bursledon railway stations	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Carried forward	EBC	EBC / SWR Communities Funding Grant	Increase patronage at stations	Reduced vehicle emissions	SWR Customer & Communities Funding received March 2020 for a public art wayfinding project at Hamble & Netley stations, to improve access and direct to key locations.	SWR Communities Funding grant application determined by February 2020 Patronage reviewed annually	-
BHH4.2	Provide a car park at Hamble Station	Alternatives to private vehicle use	Rail based Park & Ride	Carried forward	EBC / HCC	Transforming Cities fund	Car park completed	Reduced vehicle emissions	Included in Transforming Cities funding bid but unsuccessful.	Funding secured by June 2020	Funding not available

BHH5	Investigate expanding Co-Wheels electric vehicle locations to the local area	Alternatives to private vehicle use	Car Clubs	Planned for 2021	EBC / External Partners	EBC / External Partners	Add 1 new Co-Wheels location	Reduced vehicle emissions	-	September 2022	-
BHH6	Engage with HCC on the Hamble Lane improvement scheme to ensure it supports our objectives	Traffic Management	UTC, Congestion management, traffic reduction	Carried forward	HCC	EBC / HCC	Completion of scheme	Reduced vehicle emissions	Meeting with HCC in December 2019 to cover schemes in AQAP.	-	Funding not yet identified
BHH7	Engage with HE on the M3 Junction 8 / Windhover Roundabout improvements to ensure our objectives are supported	Traffic Management	UTC, Congestion management, traffic reduction	Carried forward	HE	EBC / HE	Completion of scheme	Reduced vehicle emissions	Meeting with HE about M27 jnct. 8 in July 2019.	-	-
BHH8	Consider potential locations and funding sources to install electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Planned for 2021	EBC / External Partners / Developers	EBC / External Partners / Developers	Increase number of available EV charging points	Reduced vehicle emissions	-	Numbers reviewed annually	-
BHH9	Improve air circulation along Hamble Lane and the A27 through the management of trees	Other	Other	Planned for 2024	EBC / HCC	EBC / HCC	Completion of scheme	Reduced pollutant concentrations	-	March 2025	-

2.2.1 Key Actions Progressed 2019 – 2020

Upgrade of Continuous Monitoring Equipment

This project is to include replacement of all existing continuous analysers, the addition of new analysers to expand the range of pollutants monitored, the relocation of one monitoring station and the installation of one new location. Funding for all stages was secured by a Cabinet decision in July 2019 and implementation is planned for several phases from 2020 to 2023. Progress to date:

- New NOx and PM analysers ordered for Southampton Road in October 2019, installed in February 2020. This site now measures NO_2 with a Serinus 40, and both PM_{10} and $PM_{2.5}$ with a Palas FIDAS. The addition of $PM_{2.5}$ recognises the importance of this pollutant while still monitoring PM_{10} ensures the consistency of results to analyse a longer time period.

- New NOx T200 analyser installed at The Point in May 2020.

- A full quote has been received from the contractor for the relocation of the Steele Close site and installation of a new NOx T200 analyser. Discussions with the landowner have been started to gain approval for the move and finalise the new location.

DEFRA AQ Grant Project

Funded by the DEFRA Air Quality Grant Scheme 2018-19, the aim of this work is to use an innovative low cost monitoring system to link vehicles movements to air quality in real time. The system is designed to complement existing monitoring and provide a further evidence base for traffic related actions. A summary of progress made since the 2019 ASR:

- A series of upgrades to the equipment has resulted in significant improvements to the reliability and standard of data captured. While a change in supplier has been considered and some issues still need to be resolved; further units of the original equipment have been ordered, one in December 2019 and a further ten in February 2020.

- A trial of alternative air quality monitoring equipment was carried out in November – December 2019 and a trial of alternative traffic monitoring equipment has been agreed and ordered in February 2020. These trials will

contribute towards a comparison study and provide more rigorous testing of the equipment.

- Data management and improvements to the website interface. Work on website, data interface, including discussion with HCC on their monitoring and how this could be integrated.

Public Information

As part of formulating and publishing the new AQAP the Council has carried out significant public engagement over the last year as well as making improvements to the information available on the website. A summary of activities:

- Widespread public consultation on the draft AQAP from September – October 2019, including six drop in sessions across all local areas, communications in the Borough newsletter and on social media.

- The new AQAP, published February 2020, comprises of both the technical document, for submission to DEFRA, and a public facing summary document. This is designed to be more accessible to read and understand and both versions are available on the Council website.

- Website text has been updated for clarity and information added on the AQAP in several stages, with the latest update in March 2020. Maps of the AQMAs, the latest ASR and the AQAP are all now available to the public.

- The format of reporting diffusion tube results monthly has been updated to make it more user friendly from March 2020.

Schools Projects

Eastleigh Borough Council continues to work with the Hampshire County Council school travel planning officer on their projects, as well as other projects with Hampshire and Southampton City Council which are part of the Access fund. These have included:

- Clean air projects run at Botley Primary in the autumn term 2019 and St James' Primary and Shakespeare Juniors in the spring term 2020.

- Clean Air Day packs with resources and information for schools prepared.

- Following a successful School Streets event at Shakespeare Juniors in July 2019 a repeat was planned for June 2020, as well as a first event at Chandler's Ford Infants planned for July 2020.

EBC Travel

Progress on shifting Council staff travel to lower emission options has included:

- The addition of two electric bikes to the available pool bikes in February 2020. A trial session for staff was held to promote use of the bikes with 18 attending for a test ride. A new pool bike booking scheme was also launched and can be used to track the usage of all pool bikes.

- A bid for funding to purchase some electric cargo bikes for use by staff transporting equipment between sites has been submitted to the Department for Transport E-Cargo Bike Grant Fund. The bid was joint with Southampton City Council and entered in March 2020, with results initially expected by the end of May 2020.

- Installation of two electric vehicle charge points at Eastleigh House in February 2020 for use by Council vehicles.

- Purchase of two electric vans, based at Eastleigh House since March 2020.

2.2.2   Barriers to Implementation

Covid-19 Pandemic

The widespread effects of the Covid-19 pandemic will impact on many of the measures with implementation postponed or slowed during 2020. This is relevant to:

- Activities which cannot be carried out during lockdown or with appropriate social distancing, such as deploying monitoring equipment and work with local businesses and schools.

- Planned events which have been postponed or cancelled such as Clean Air Day.

- Projects involving external partners who are not currently operating as normal, such as promoting the Low Emission Taxi Incentive scheme.

- Work which will be affected by reallocation of Council resources to pandemic response, such as relocation of automatic monitoring equipment and alterations to procurement policy.

All measures will continue to be progressed where possible, focussing on tasks which can be completed remotely, with an aim to have projects prepared to implement as soon as this is possible. However, there will be some delays to completion dates as a result of this.

Funding

Insufficient funding is a common barrier to implementation, one example being measure BHH4.2 which was included in the bid to the Transforming Cities fund. Unfortunately while some funding was received the bid was only successful at a lower level and this project is not included. Eastleigh Borough Council will continue to work in partnership with other organisations and take every opportunity to secure additional funding to allow as many measures to be progressed as possible.

Local Plan

Following the examination of Eastleigh Borough Council's Local Plan in 2019 – 2020, the Council has been asked for some further information prior to adoption. This will cause some delays to measures which are dependent on the Adopted Local Plan such as changes to planning guidance.

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM$_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5μm or less). There is clear evidence that PM$_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. Information from the Public Health Outcomes Framework[4] shows that in Hampshire the fraction of mortality attributable to particulate air pollution is 5.4. This is similar to the figure for both England and the South East region, at 5.2 and 5.6 respectively. In context with neighbouring areas cities are generally higher, for example 6.1 for Southampton and 6.7 for Portsmouth, neighbouring counties are comparable to the north and east but lower to the west at 4.3 in Dorset.

Eastleigh Borough Council started monitoring PM$_{2.5}$ in 2020, see more details below and in Table 2-2, but does not yet have enough data to draw conclusions from. However PM$_{10}$ concentrations can be used to estimate PM$_{2.5}$ and some analysis of this along with comparisons to neighbouring authorities and national levels is included in Section 3.2.2.

In recognition of the growing interest in PM$_{2.5}$, including its prominence in the Government's Clean Air Strategy 2019, Eastleigh Borough Council's Action Plan contains some measures focussed on this pollutant. Measures ENV1.3 and ELAC1 involve expanding and upgrading monitoring equipment to include PM$_{2.5}$ measurements in addition to PM$_{10}$. This will provide an evidence base for concentrations in the Borough and allow the impact of measures on this pollutant to be assessed. It also puts the Council in a good position to report on any new requirements in relation to PM$_{2.5}$ concentrations.

Measure HS3 is targeted at solid fuel burning, which is the biggest source of PM$_{2.5}$ and aims directly to reduce emissions of this pollutant. The other measures in the Action Plan are targeted at vehicle emissions as the major source of NO$_2$. However as PM$_{2.5}$ is also emitted by road transport other measures will contribute towards reducing PM$_{2.5}$, particularly those listed in Table 2-3. These have been taken from the Technical Guidance LAQM TG16 action toolbox, which lists actions that are expected to reduce

---

[4] https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

PM$_{2.5}$ emissions. Other work being undertaken by Eastleigh Borough Council will also have a positive influence on exposure to PM$_{2.5}$, such as the airAlert scheme.

Table 2-3 – Measures which will contribute towards reduction of PM$_{2.5}$ emissions

Group	Measure No.	Measure Summary
Environment	ENV3	Promote the use of electric vehicles
Transport	TR2.1	Improve and extend the walking network
	TR2.2	Improve and extend the cycle network
	TR4.1	Improve bus services
	TR4.2	Improve rail services
	TR4.3	Low emission buses
	TR5.1	Low emission taxis
	TR5.2	Taxi licensing conditions
	TR6	Promote and expand car club
	TR7	Bicycle hire schemes
	TR9	Influence future road design
	TR10	Highways improvement schemes
Health & Social Policy	HS2.1	School travel planning
Housing	HOU1.2	Resident parking policies
Economy & Regeneration	EC1.1	EBC travel planning
	EC1.2	EBC pool bikes
	EC1.4	Upgrade EBC fleet to low emission vehicles
	EC2.1	Workplace travel planning
	EC2.2	ECO Stars fleet recognition scheme
	EC3	Support and encourage flexible working
Local Area: Chandler's Ford & Hiltingbury	CFH2	Hut Hill cycle route
	CFH3	Electric vehicle charging points
	CFH4	Expand car club locations
Local Area: Eastleigh	ELAC5	Electric vehicle charging points
Local Area: Bishopstoke, Fair Oak & Horton Heath	BIFOHH2	Electric vehicle charging points
Local Area: Hedge End, West End & Botley	HEWEB1	Expand car club locations
	HEWEB2	Electric vehicle charging points
Local Area: Bursledon, Hamble-le-Rice & Hound	BHH4.1	Railway station improvements
	BHH5	Expand car club locations
	BHH6	Hamble Lane highways improvements
	BHH7	Junction 8 / Windhover highways improvements
	BHH8	Electric vehicle charging points

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

Eastleigh Borough Council undertook automatic (continuous) monitoring at 3 sites during 2019. Table A-1 in Appendix A shows the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk/networks/network-info?view=aurn.

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

3.1.2 Non-Automatic Monitoring Sites

Eastleigh Borough Council undertook non- automatic (passive) monitoring of NO_2 at 53 sites during 2019. Table A-2 in Appendix A shows the details of the sites. To collect evidence for the AQMA declaration being considered around the A27 in Bursledon 9 new sites were added in this area during 2019. Results from these sites are included with the other tubes and details of how they were used to inform the AQMA extension are in Appendix C.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[5], "annualisation" (where the data capture falls below 75%), and distance correction[6]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO$_2$)

Annual Means

Table A-3 in Appendix A compares the ratified and adjusted monitored NO$_2$ annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. The annual mean objective was exceeded at four diffusion tube monitoring locations in the Borough, although it should be noted that this concentration data applies to the location of the monitoring site not at points of relevant exposure and so has not been adjusted for fall-off with distance. Concentrations have been distance corrected for the nearest exposure where appropriate, this is included in the discussion and the results are shown in Appendix B along with the full 2019 dataset of monthly mean values. Of those sites which exceeded the annual objective for NO$_2$ in 2019, one is within the Eastleigh AQMA No.1 (A335) and 3 are within the Hamble Lane Area AQMA. In discussion of potential exceedances, those sites which measured within 10% of the objective level (>36µg/m^3) have been highlighted and are considered to be at risk of exceeding due to the uncertainties associated with diffusion tube monitoring.

Concentrations and trends at key monitoring locations within each AQMA are shown in Figures 3-1 to 3-4. To assess long term trends focus has been on sites with more than 5 years of data available and it is recognised that some annual fluctuations will be caused by factors such as meteorological conditions. When considering the 2019 results in this context they have been compared to the average concentration measured at the site over the previous five years (2014 – 2018). Some analysis has also been done looking at the rate of change in measured levels to estimate the significance of trends. A substantial drop in concentrations in 2015 was seen across the Borough which can skew the data, therefore how trends have changed more recently was estimated by comparing the change from 2016 – 2019 to the overall trend from 2012 – 2019.

---

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

Figure 3-1 – Annual average NO$_2$ at diffusion tube locations in Eastleigh AQMA No.1 (A335)
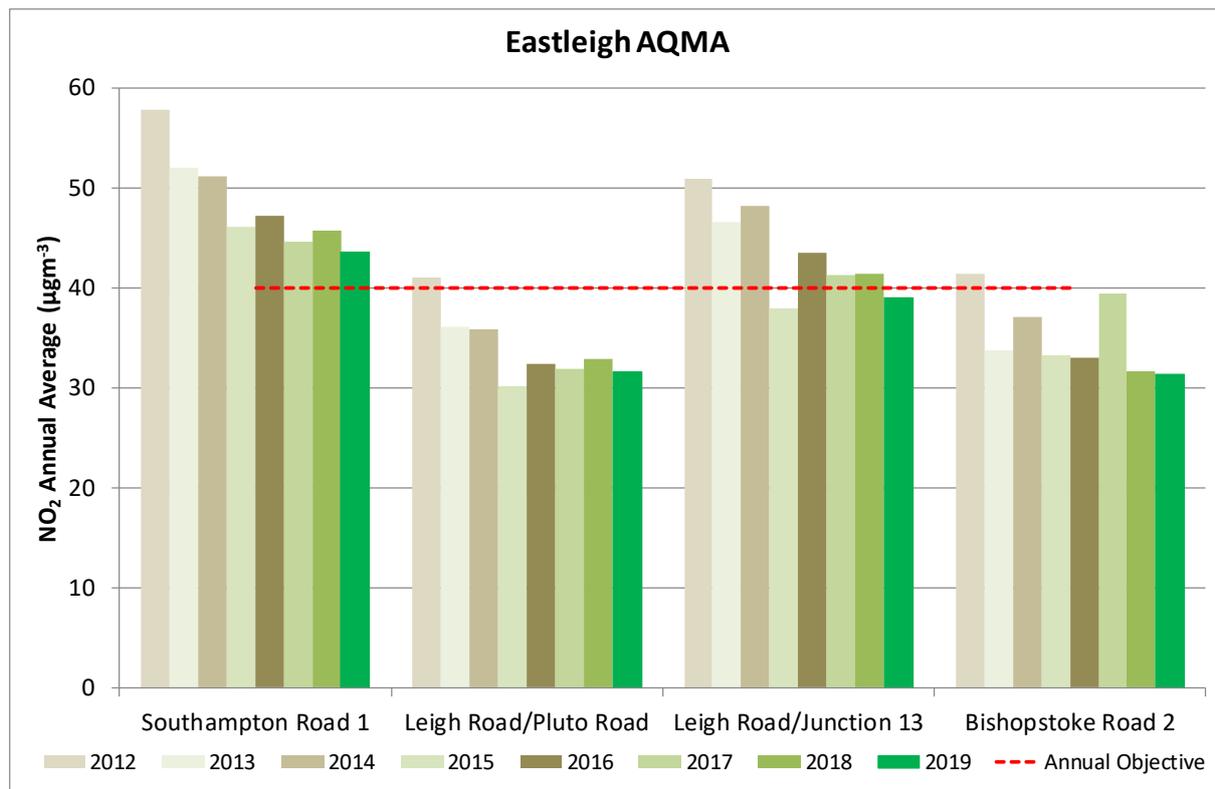
In the Eastleigh AQMA No.1 (A335) an overall falling trend is seen over the time period shown, supported by the 2019 concentrations which at all sites in the AQMA are lower than the average of the previous five years. However, the decrease over the last four years has slowed compared to the overall trend from 2012, most significantly at Leigh Road / Pluto Road. One exceedance was measured in 2019, at Southampton Road 1 which has exceeded the annual objective value every year since 2012. This site shows the trend in falling concentrations as discussed; but using the trend over the last four years as a guide it is not expected to be under the objective level until at least 2023. Although only one exceedance was measured in 2019 several other sites were within 10% of the objective level: Southampton Road Analyser, Leigh Road / Junction 13 and Southampton Road 2. An exceedance has been measured at Leigh Road / Junction 13 in three out of the last five years and this site is still considered particularly at risk. The persistent exceedances and risk of exceedance at several sites, along with the slowing decrease in concentrations and lack of a significant drop in some locations means this is still a key AQMA.

It should be noted that when calculating the annual average for Campbell Road one month's result has been discounted due to an error with the diffusion tube. In April a

concentration of 150.34µg/m^3 was returned which is more than two times the highest monthly value measured across all sites in 2019. The maximum monthly value seen at Campbell Road apart from this was 50.88µg/m^3. The April result is most likely an error and is not representative of the site, so has not be included when calculating the annual average. While there is currently no evidence for a sustained exceedance in this location it will continue to be monitored and further tubes have been added to the area as part of measure ENV1.2.

Figure 3-2 – Annual average NO$_2$ at selected diffusion tube locations in Hamble Lane Area AQMA
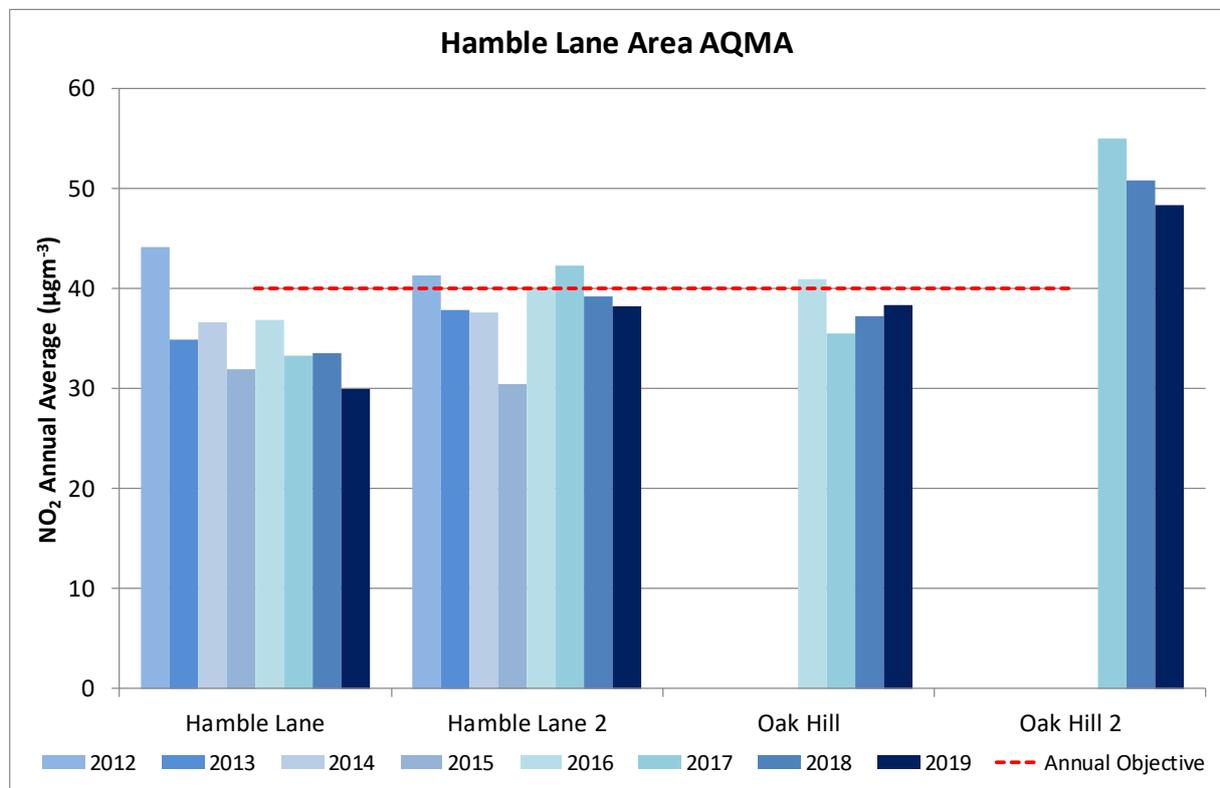
The other exceedances measured in 2019 are located in the Hamble Lane Area AQMA, which was extended in August 2019 in response to exceedances found on the A27 in Bursledon. The extent of the new AQMA is shown in Appendix D and an explanation of the evidence base and decision process for this extension is included in Appendix C. As many sites have been added to this area in recent years there is not such a strong basis to use when assessing long term trends but some comparisons can still be made. In contrast to the other AQMAs, a trend of falling concentrations is not clear here and sites in this area show the least clear drop when comparing 2019 results to previous years. Particularly at Hamble Lane 2, where data is available since 2012, the 2019 measurement is higher than the average of the previous five years and

a long term decrease cannot be clearly identified. At the sites where exceedances were measured in 2019- Oak Hill 2, Providence Hill 2 and Bridge Road 2- there is limited data to assess long term trends and although concentrations at Oak Hill 2 appear to be falling this will be revisited in future reports. At Oak Hill 2 and Providence Hill 2 distance correction for the nearest relevant receptor is possible and at both sites the measured exceedance extended to a point of exposure. Three other sites- Hamble Lane 2, Oak Hill and Providence Hill 1- are considered at risk of exceeding as they reported concentrations within 10% of the annual objective level. The number of sites exceeding, or at risk of exceeding, in this area and the lack of confidence in a long term decreasing trend means this is still an priority AQMA, as also highlighted by the recent extension.

Figure 3-3 – Annual average NO$_2$ at selected diffusion tube locations in Eastleigh AQMA No.2 (M3)
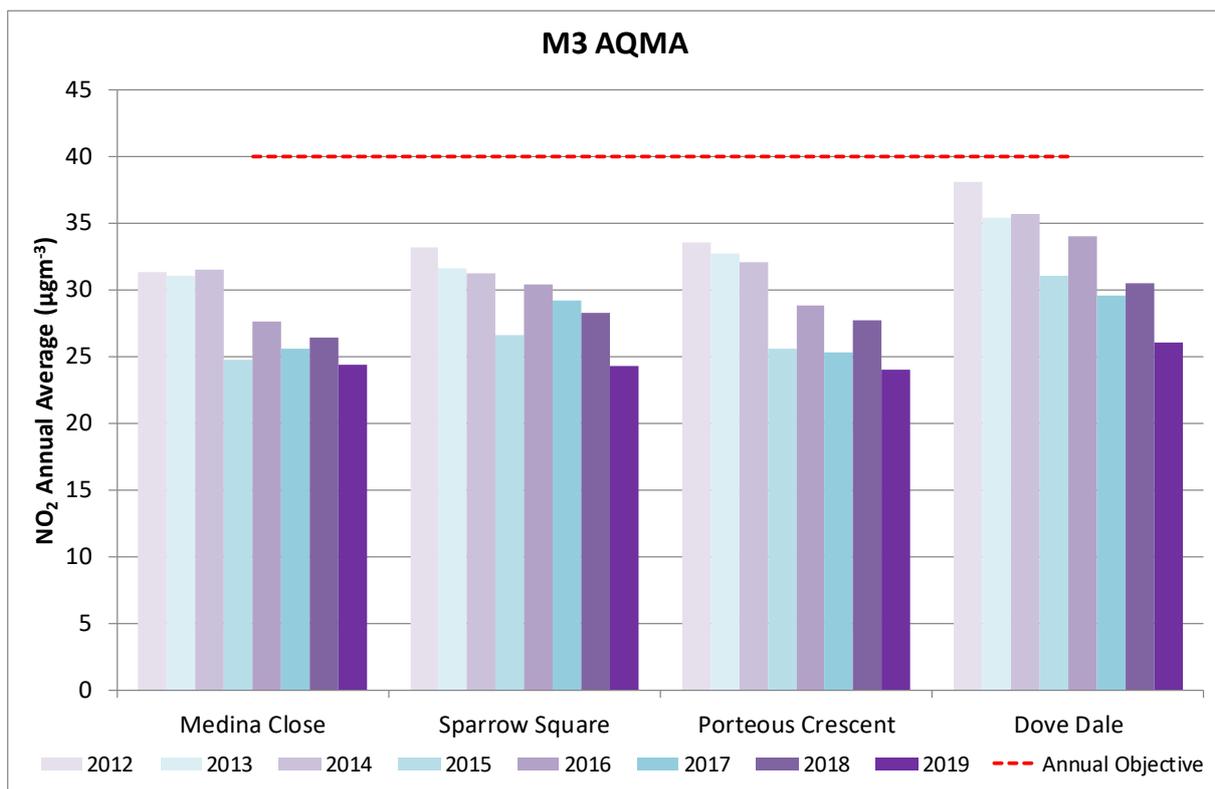
Figure 3-4 – Annual average NO₂ at diffusion tube locations in High Street Botley AQMA
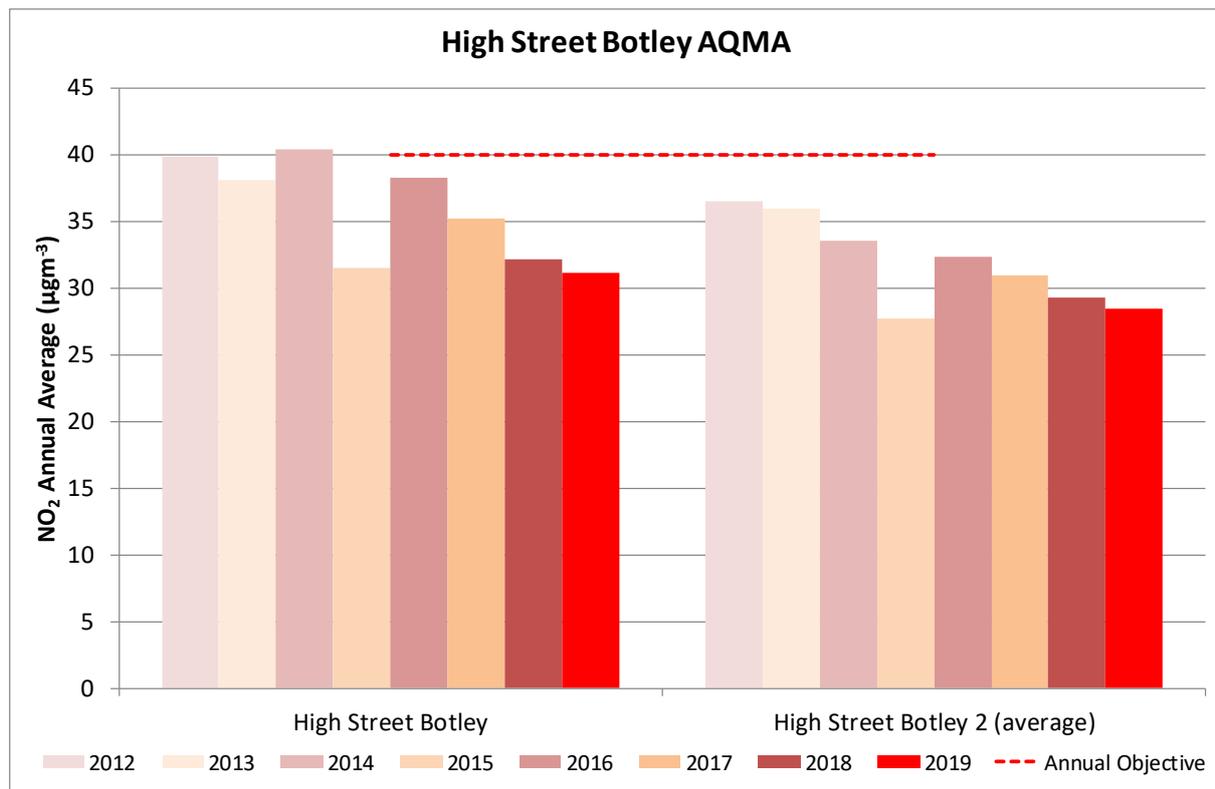
In Eastleigh AQMA No.2 (M3) and High Street Botley AQMA no exceedances have been measured for at least five years, including 2019 when no results were within 10% of the objective level. A clear downward trend is seen in both AQMAs, supported by 2019 data where all tubes are lower than the previous 5 years average. A trend of decreasing concentrations is clear when looking at the last four years and the gradient is similar to, or in some cases steeper, than the downward trend over the whole period since 2012. Along with the lack of measured exceedances for an extended period of time this suggests both of these AQMAs could be considered for revocation. However, as both areas have nearby large scale and long term projects, the M3 Smart Motorway and the Botley Bypass, the AQMAs will remain in place while the effects of these are assessed.

Hourly Means

Table A-4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. There were no occasions when the hourly mean NO₂ was above 200µg/m³ at any of the continuous monitoring stations in Eastleigh Borough, shown in Figures 3-5 to 3-7. There were also no annual mean NO₂

concentrations about 60µg/m^3 at any of the diffusion tube sites, indicating that any hourly means about 200µg/m^3 are also unlikely at these locations. Therefore, the 1-hour mean NO$_2$ objective was not exceeded at monitored locations within the Borough.

Figure 3-5 – Hourly average NO₂ at Southampton Road
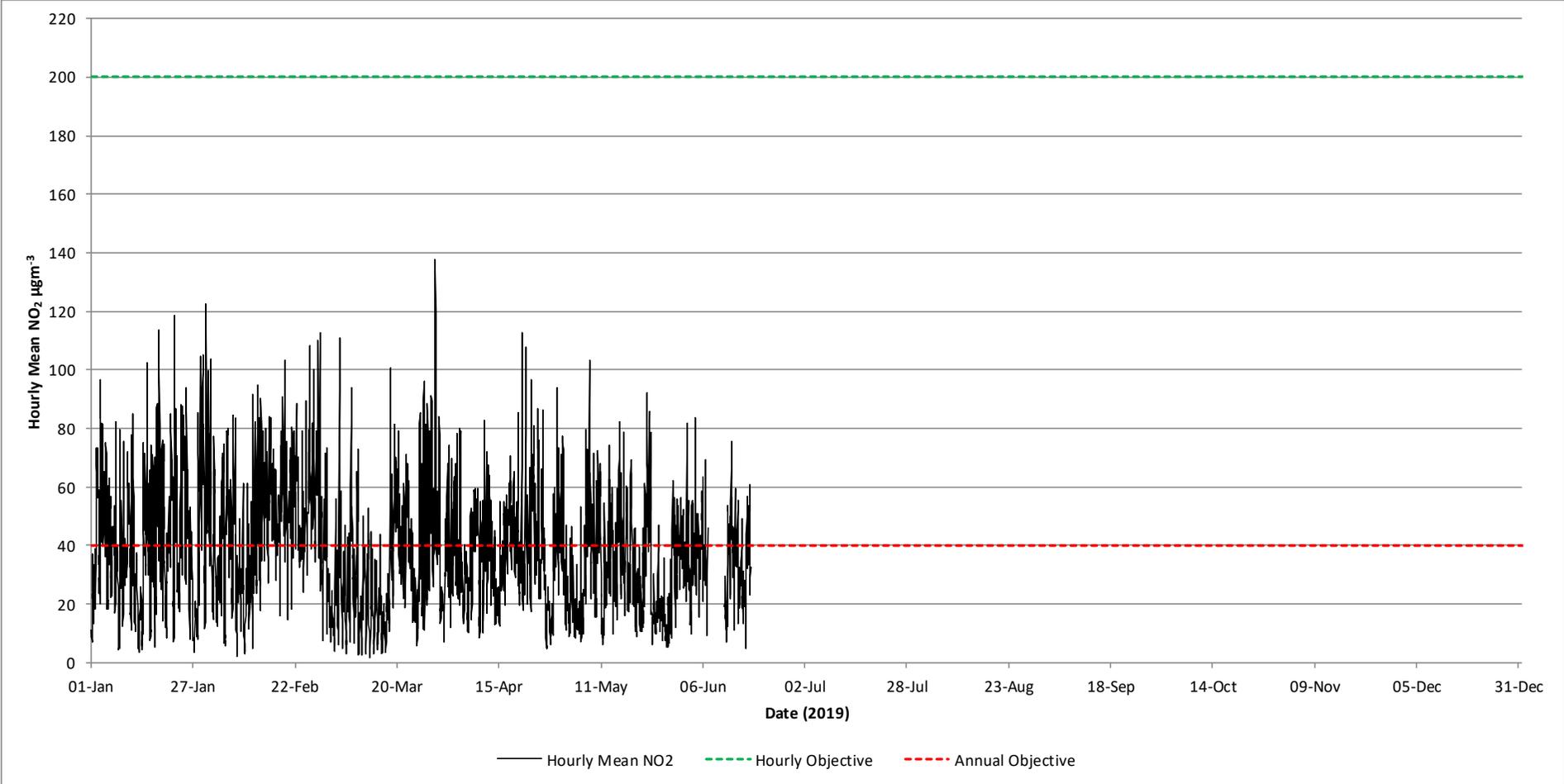
Figure 3-6 – Hourly average NO₂ at Steele Close
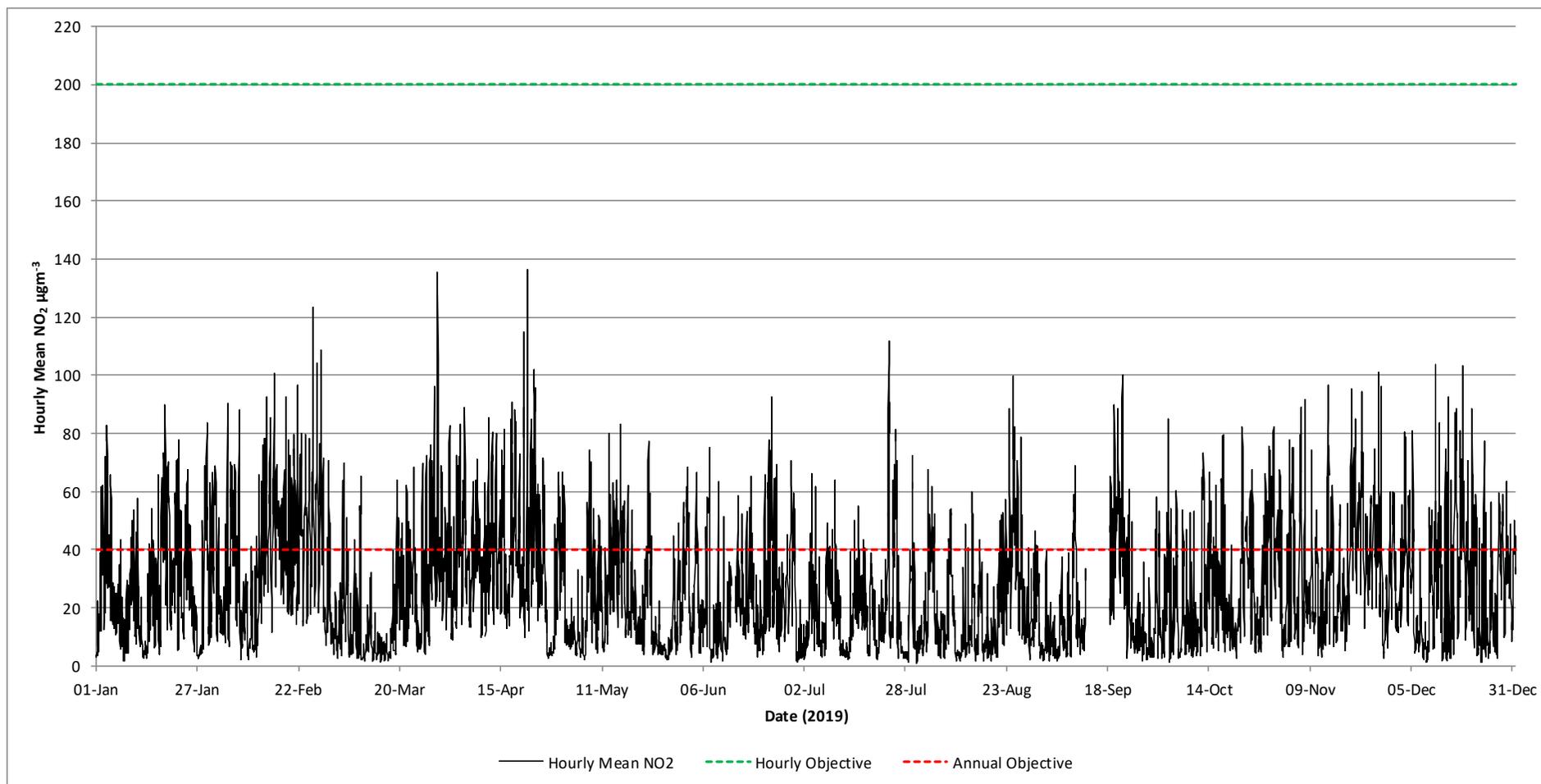
Figure 3-7 – Hourly average NO₂ at The Point
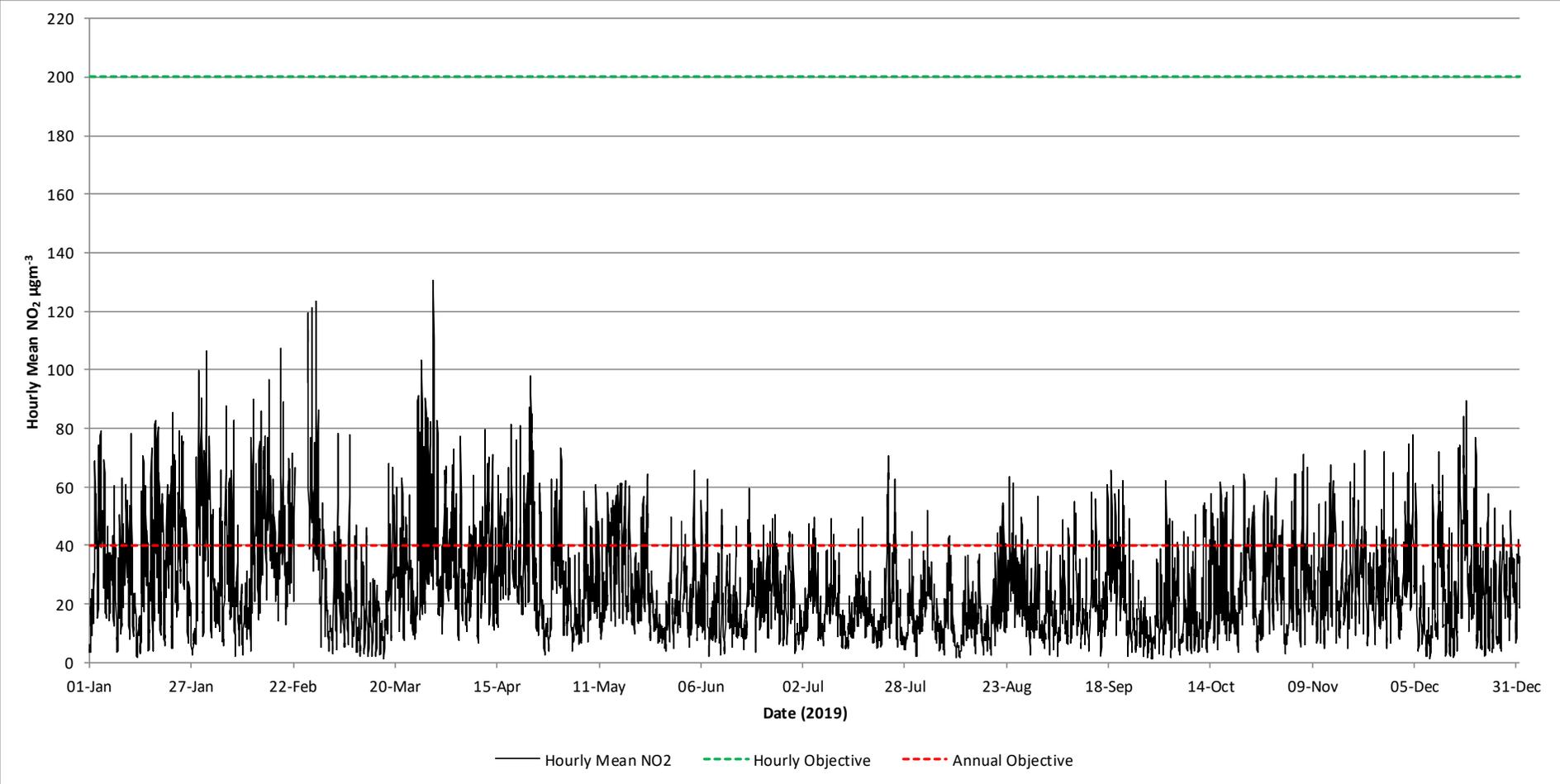
3.2.2 Particulate Matter (PM₁₀)

Annual Mean

Table A-5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³. The annual mean objective was not exceeded in 2019 and measurements have been below the objective every year since 2016. Only four years of data are available to assess long term trends, and no clear pattern is seen from these with concentrations remaining roughly constant.

As $PM_{2.5}$ was not monitored in Eastleigh Borough in 2019, the PM_{10} concentrations can be used to estimate $PM_{2.5}$ levels as described in Technical Guidance LAQM TG16 (7.107 – 7.111). Both a local ratio, from the AURN site at Southampton Centre, and a national one have been used for comparison as shown in Table 3-1.

Table 3-1 – PM₂.₅ levels estimated from measured PM₁₀

PM₁₀ Measured	21.1	
	Local	**National**
PM₂.₅/PM₁₀ Ratio	0.5	0.7
PM₂.₅ Estimated	11.1	14.8

Both estimated $PM_{2.5}$ annual averages are significantly below the current objective level of 25µg/m³, indicating that it's unlikely this was exceeded in 2019. However, the National Clean Air Strategy published in January 2019 states an aim to meet the World Health Organisation guideline for $PM_{2.5}$ of 10µg/m³ and both estimated values would exceed this. The value estimated for Eastleigh from a local factor is comparable to both the 2019 national average[7] and the annual average reported at the Southampton Centre AURN site, which are both 10µg/m³. $PM_{2.5}$ measurements for Eastleigh started at Southampton Road in February 2020 and will be available for future reports.

Daily Mean

Table A-6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year. In 2019 4 exceedances of the daily mean objective, shown in Figure 3-8. The number of daily exceedances has been below the limit every year since 2016, with no long term trend identified.

---

[7] www.uk-air.defra.gov.uk. Average is taken using 62 sites at a range of locations across England.

Figure 3-8 – Daily average PM10 at Southampton Road
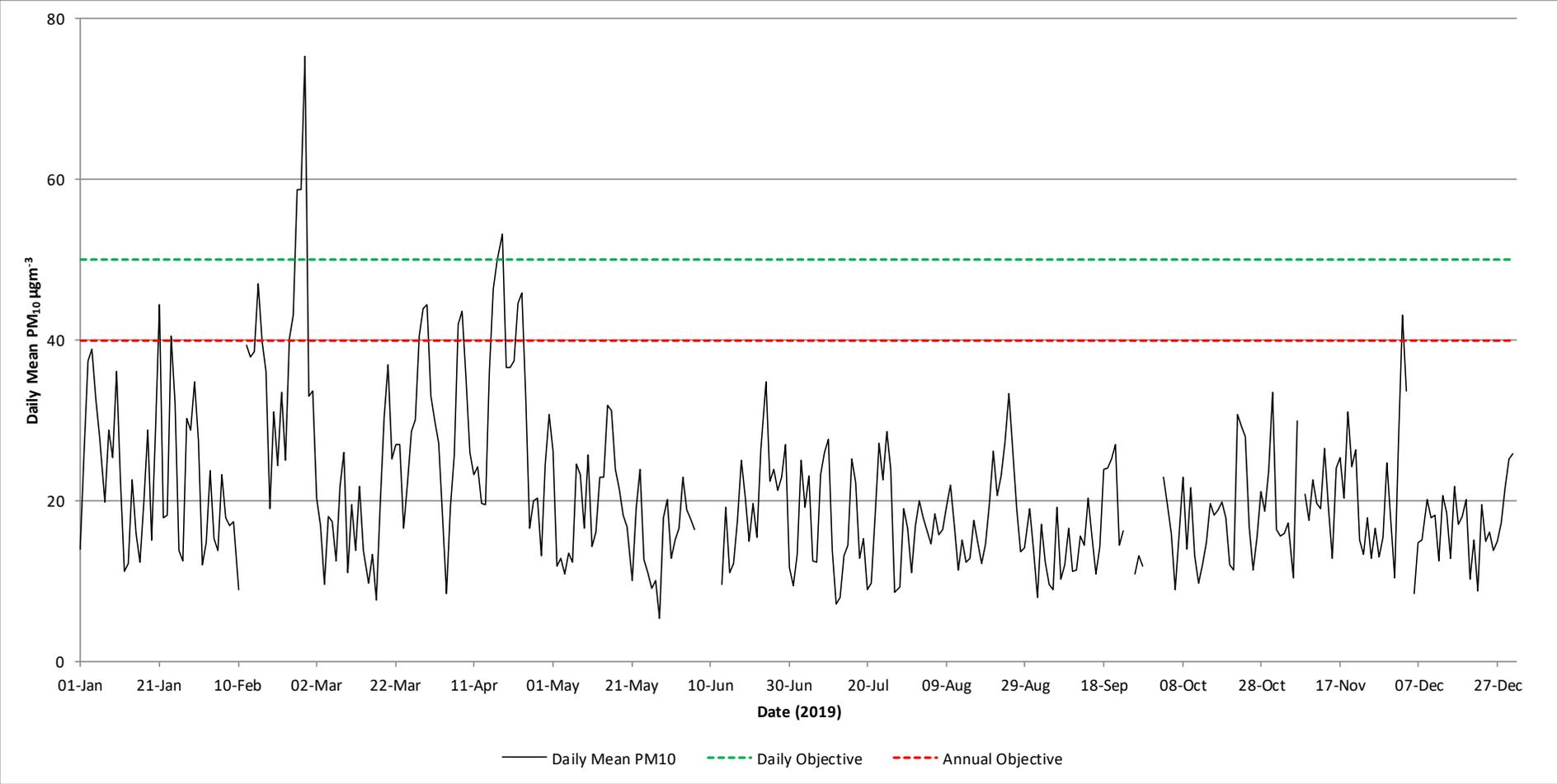
Appendix A: Monitoring Results

Table A-1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Inlet Height (m)
ES1	Southampton Road	Roadside	445495	118237	NO_2; PM_{10}	YES *(Eastleigh AQMA No.1 (A335))*	Chemiluminescent; TEOM	17.6	2	1.9
ES2	Steele Close	Urban Background	443959	119673	NO_2	NO	Chemiluminescent	16	2.4	2.2
ES3	The Point	Roadside	445310	119148	NO_2	YES *(Eastleigh AQMA No.1 (A335))*	Chemiluminescent	42.8	8.2	3.6

Notes:

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

(2) N/A if not applicable

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

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?	Height (m)
HL	Hamble Lane	Roadside	447717	110359	NO$_2$	YES *(Hamble Lane Area)*	38	1.7	NO	2.3
HL2	Hamble Lane 2	Roadside	447745	110478	NO$_2$	YES *(Hamble Lane Area)*	9.9	1.4	NO	2.3
OH	Oak Hill	Roadside	448653	110280	NO$_2$	YES *(Hamble Lane Area)*	9.4	1.9	NO	2.3
OH2	Oak Hill 2	Roadside	448736	110213	NO$_2$	YES *(Hamble Lane Area)*	4.6	1.2	NO	2.3
BDG	Bridge Road	Roadside	449099	109864	NO$_2$	YES *(Hamble Lane Area)*	2.2	1.7	NO	2.5
HSB	High Street Botley	Roadside	451431	113025	NO$_2$	YES *(High Street Botley)*	4.8	2.1	NO	2.3
HSB2	High Street Botley 2	Roadside	451184	113030	NO$_2$	YES *(High Street Botley)*	5.7	1.25	NO	2.45
KCA(18)	Kings Copse Avenue (18)	Roadside	449935	113146	NO$_2$	NO	0.45	1.55	NO	2.4
GR	Grange Road	Roadside	449867	113250	NO$_2$	NO	10	1.7	NO	2.45
UNC	Upper Northam Close	Urban Background	448090	112635	NO$_2$	NO	12.9	2.45	NO	2.2
JW	Jukes Walk	Roadside	447690	114912	NO$_2$	NO	19	1.6	NO	1.5
SWA	Swaythling Road	Roadside	446170	114603	NO$_2$	NO	4.1	2.7	NO	2.4
AL	Allington Lane	Roadside	445908	115544	NO$_2$	NO	55.7	2.6	NO	2.4
BOT	Botley Road	Roadside	449634	117382	NO$_2$	NO	4.5	1.9	NO	2.4
WYV	Wyvern School	Roadside	449577	118165	NO$_2$	NO	4.5	1.9	NO	2.3
FORSL	Fair Oak Road / Sandy Lane	Roadside	448788	118553	NO$_2$	NO	33	1	NO	1.5
FOR	Fair Oak Road	Roadside	447427	118780	NO$_2$	NO	5.8	5.6	NO	2.45

BR	Bishopstoke Road	Roadside	446604	119149	NO$_2$	NO	11.5	1.8	NO	2.4
BR2	Bishopstoke Road 2	Roadside	446051	119171	NO$_2$	NO	0.3	2.2	NO	2.1
TW	Twyford Road	Roadside	445739	119856	NO$_2$	NO	3.6	1.5	NO	2.05
MS	Mill Street	Roadside	445707	119619	NO$_2$	NO	2.1	1.5	NO	2.75
SRAN(17)	Southampton Road Analyser (17)	Roadside	445495	118237	NO$_2$	YES *(Eastleigh No.1 A335)*	17.6	1.6	YES	1.85
SR1	Southampton Road 1	Roadside	445450	118144	NO$_2$	YES *(Eastleigh No.1 A335)*	4.3	2	NO	2.35
CA(15)	Chestnut Avenue (15)	Roadside	445339	118111	NO$_2$	NO	3.8	2.65	NO	2.35
TP	The Point (A)	Roadside	445310	119148	NO$_2$	YES *(Eastleigh No.1 A335)*	42.8	8.1	YES	2.3
LRPR	Leigh Road / Pluto Road	Roadside	444864	119174	NO$_2$	YES *(Eastleigh No.1 A335)*	7.3	1.7	NO	2.2
OX	Oxburgh Close	Urban Background	444543	120187	NO$_2$	NO	11.4	1.9	NO	2.3
HG	Hadleigh Gardens	Urban Background	445347	120367	NO$_2$	NO	5.9	1.9	NO	2.7
WA	Woodside Avenue	Roadside	444483	119443	NO$_2$	NO	7.15	1.85	NO	2.2
SC	Steele Close	Urban Background	443959	119673	NO$_2$	NO	16	2.1	YES	1.95
BEL	Belmont Road	Urban Background	443778	119303	NO$_2$	YES *(Eastleigh No.2 M3)*	10.7	2.1	NO	2.2
LR13	Leigh Road / J13	Roadside	443842	119526	NO$_2$	YES *(Eastleigh No.1 A335)*	7.5	1.7	NO	2.45
MC	Medina Close	Urban Background	444239	120060	NO$_2$	YES *(Eastleigh No.2 M3)*	7.6	1.5	NO	1.5
PC	Porteous Crescent	Urban Background	444656	120775	NO$_2$	YES *(Eastleigh No.2 M3)*	13.8	1	NO	2.5
NH	Nuffield Hospital	Urban Background	445121	122183	NO$_2$	NO	10.1	1	NO	2.2
AR	Ashdown Road	Urban Background	443291	122842	NO$_2$	NO	9.6	1.3	NO	1.5
CC	Chestnut Close	Roadside	443054	118962	NO$_2$	NO	9.9	1.5	NO	2.1
SSQ	Sparrow Square	Urban Background	443483	118612	NO$_2$	YES *(Eastleigh No.2 M3)*	9	1.7	NO	2.6
DD	Dove Dale (A)	Urban Background	443559	118751	NO$_2$	YES *(Eastleigh No.2 M3)*	7.7	2.9	NO	2.7
CR	Campbell Road	Industrial	445750	118111	NO$_2$	NO	12.9	2.2	NO	2.1

PA	Passfield Avenue	Roadside	444340	118696	NO₂	NO	24.7	1.4	NO	1.5
WHL	Woodhouse Lane	Roadside	450422	113751	NO₂	NO	30.7	0.75	NO	2
SR2	Southampton Road 3	Roadside	445651	118634	NO₂	YES *(Eastleigh No.1 A335)*	5.2	1.7	NO	2.5
HL3	Hamble Lane 3	Roadside	447638	110071	NO₂	NO	0	6	NO	2.3
PH1	Providence Hill 1	Roadside	448237	110610	NO₂	YES *(Hamble Lane Area)*	14.82	3.4	NO	2.3
PH2	Providence Hill 2	Roadside	448330	110532	NO₂	YES *(Hamble Lane Area)*	2.9	2.4	NO	2.3
PMR	Portsmouth Road	Roadside	448510	110371	NO₂	NO	14.8	1.9	NO	2.3
OH3	Oak Hill 3	Roadside	448552	110362	NO₂	YES *(Hamble Lane Area)*	27.5	2.1	NO	2.3
DOD	Dodwell Lane	Roadside	448693	110280	NO₂	NO	18.8	1.1	NO	2.3
BDG2	Bridge Road 2	Roadside	448914	110033	NO₂	YES *(Hamble Lane Area)*	32.2	1.1	NO	2.3
PH3	Providence Hill 3	Roadside	448249	110627	NO₂	YES *(Hamble Lane Area)*	29.2	1.1	NO	2.3
OH4	Oak Hill 4	Roadside	448864	110109	NO₂	YES *(Hamble Lane Area)*	20.1	0.8	NO	2.2
CHR	Church Lane	Roadside	449143	109798	NO₂	YES *(Hamble Lane Area)*	23	1.5	NO	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 NO₂ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO₂ Annual Mean Concentration (µg/m³) (3) (4)				
							2015	2016	2017	2018	2019
ES1	445495	118237	Roadside	Automatic	45	45		**40.8**	37.4	37.8	34.1
ES2	443959	119673	Urban Background	Automatic	97	97		29.3	27.0	28.5	26.1
ES3	445310	119148	Roadside	Automatic	98	98		37.0	33.0	31.0	25.6
HL	447717	110359	Roadside	Diffusion Tube	100	100	32.0	36.9	33.3	33.6	29.9
HL2	447745	110478	Roadside	Diffusion Tube	92	92	30.5	**40.0**	**42.3**	39.2	38.2
OH	448653	110280	Roadside	Diffusion Tube	100	100		**41.0**	35.6	37.2	38.3
OH2	448736	110213	Roadside	Diffusion Tube	92	92			**55.0**	**50.9**	**48.4**
BDG	449099	109864	Roadside	Diffusion Tube	92	92		30.6	26.7	27.8	26.4
HSB	451431	113025	Roadside	Diffusion Tube	100	100	31.5	38.3	35.2	32.2	31.2
HSB2 (average of duplicate)	451184	113030	Roadside	Diffusion Tube	-	-	27.7				
HSB2(A)	451184	113030	Roadside	Diffusion Tube	100	100		31.5	31.3	29.7	28.5
HSB2(B)	451184	113030	Roadside	Diffusion Tube	-	-		33.1	30.5	28.8	
KCA(18)	449935	113146	Roadside	Diffusion Tube	100	100				30.7	28.1
GR	449867	113250	Roadside	Diffusion Tube	100	100		30.2	31.3	28.7	26.6
UNC	448090	112635	Urban Background	Diffusion Tube	92	92	28.3	34.6	29.5	27.7	24.8
JW	447690	114912	Roadside	Diffusion Tube	92	92		27.9	24.8	24.7	21.3
SWA	446170	114603	Roadside	Diffusion Tube	100	100		31.7	29.5	27.7	28.6
AL	445908	115544	Roadside	Diffusion Tube	100	100	26.1	28.0	25.2	25.1	23.5
BOT	449634	117382	Roadside	Diffusion Tube	100	100		36.5	34.4	32.5	31.9
WYV	449577	118165	Roadside	Diffusion Tube	92	92		32.2	25.0	29.5	24.1

Site	X	Y	Location	Type							
FORSL	448788	118553	Roadside	Diffusion Tube	92	92		33.2	30.2	28.0	28.0
FOR	447427	118780	Roadside	Diffusion Tube	100	100	21.7	23.5	22.9	21.9	20.1
BR	446604	119149	Roadside	Diffusion Tube	75	75	33.0	34.5	33.0	33.4	33.8
BR2	446051	119171	Roadside	Diffusion Tube	83	83	33.3	33.0	39.5	31.7	31.3
TW	445739	119856	Roadside	Diffusion Tube	83	83	25.2	28.3	26.5	27.5	24.7
MS	445707	119619	Roadside	Diffusion Tube	100	100	28.6	31.2	28.9	32.1	26.4
SRAN(17) (average of triplicate)	445495	118237	Roadside	Diffusion Tube	-	-	34.0				
SRAN(A)	445495	118237	Roadside	Diffusion Tube	-	-		39.4	34.2		
SRAN(B)	445495	118237	Roadside	Diffusion Tube	-	-		**41.4**	34.4		
SRAN(C)	445495	118237	Roadside	Diffusion Tube	-	-		39.6	34.3		
SRAN(17)(A)	445495	118237	Roadside	Diffusion Tube	100	100			**43.4**	38.3	36.8
SRAN(17)(B)	445495	118237	Roadside	Diffusion Tube	100	100			**41.8**	38.5	36.4
SRAN(17)(C)	445495	118237	Roadside	Diffusion Tube	100	100			**43.7**	39.7	36.7
SR1	445450	118144	Roadside	Diffusion Tube	100	100	**46.2**	**47.3**	**44.7**	**45.7**	**43.6**
CA(15)	445339	118111	Roadside	Diffusion Tube	100	100	24.7	28.6	24.5	25.8	23.9
TP (average of triplicate)	445310	119148	Roadside	Diffusion Tube	-	-	23.5				
TP(A)	445310	119148	Roadside	Diffusion Tube	100	100		27.9	25.6	26.0	23.0
TP(B)	445310	119148	Roadside	Diffusion Tube	92	92		26.7	24.8	25.1	22.3
TP(C)	445310	119148	Roadside	Diffusion Tube	100	100		26.7	24.5	25.4	23.5
LRPR	444864	119174	Roadside	Diffusion Tube	75	75	30.2	32.4	31.9	32.9	31.6
OX	444543	120187	Urban Background	Diffusion Tube	92	92	19.9	22.0	20.8	20.1	18.6
HG	445347	120367	Urban Background	Diffusion Tube	83	83	18.8	20.6	19.2	19.0	17.1
WA	444483	119443	Roadside	Diffusion Tube	92	92	34.1	35.9	34.0	35.0	31.5
SC (average of triplicate)	443959	119673	Urban Background	Diffusion Tube	-	-	26.6				

SC(A)	443959	119673	Urban Background	Diffusion Tube	100	100		25.8	23.3	24.1	22.6
SC(B)	443959	119673	Urban Background	Diffusion Tube	100	100		25.2	23.4	25.7	23.0
SC(C)	443959	119673	Urban Background	Diffusion Tube	100	100		26.0	22.9	25.4	22.5
BEL	443778	119303	Urban Background	Diffusion Tube	83	83	24.7	26.5	23.5	26.0	24.4
LR13	443842	119526	Roadside	Diffusion Tube	92	92	38.0	**43.6**	**41.3**	**41.4**	39.0
MC	444239	120060	Urban Background	Diffusion Tube	100	100	24.7	27.6	25.5	26.4	24.4
PC (average of duplicate)	444656	120775	Urban Background	Diffusion Tube	-	-	25.5				
PC(A)	444656	120775	Urban Background	Diffusion Tube	100	100		27.5	25.7	27.7	24.0
PC(B)	444656	120775	Urban Background	Diffusion Tube	-	-		30.1	24.9	27.7	
NH	445121	122183	Urban Background	Diffusion Tube	100	100	23.7	28.4	22.3	26.0	26.0
AR	443291	122842	Urban Background	Diffusion Tube	100	100	10.5	11.6	10.7	11.6	10.2
CC	443054	118962	Roadside	Diffusion Tube	100	100	26.5	29.9	29.4	28.2	28.0
SSQ	443483	118612	Urban Background	Diffusion Tube	100	100	26.6	30.4	29.2	28.2	24.3
DD (average of duplicate)	443559	118751	Urban Background	Diffusion Tube	-	-	31.0				
DD(A)	443559	118751	Urban Background	Diffusion Tube	100	100		33.9	31.5	31.2	25.7
DD(B)	443559	118751	Urban Background	Diffusion Tube	100	100		33.3	31.0	29.8	26.4
DD(C)	443559	118751	Urban Background	Diffusion Tube	-	-		34.8	26.3		
CR	445750	118111	Industrial	Diffusion Tube	92	92	34.7	33.0	35.0	35.1	32.3
PA	444340	118696	Roadside	Diffusion Tube	100	100		31.5	27.5	30.0	26.1
WHL	450422	113751	Roadside	Diffusion Tube	92	92			19.1	20.3	17.5
SR2	445651	118634	Roadside	Diffusion Tube	100	100				42.7	37.6
HL3	447638	110071	Roadside	Diffusion Tube	92	92				22.1	21.7
PH1	448237	110610	Roadside	Diffusion Tube	100	67					38.8

Site						(1)	(2)					(3)
PH2	448330	110532	Roadside	Diffusion Tube	75	50					**51.6**
PMR	448510	110371	Roadside	Diffusion Tube	100	67					32.6
OH3	448552	110362	Roadside	Diffusion Tube	100	67					25.6
DOD	448693	110280	Roadside	Diffusion Tube	100	67					30.7
BDG2	448914	110033	Roadside	Diffusion Tube	88	58					**54.1**
PH3	448249	110627	Roadside	Diffusion Tube	100	50					29.6
OH4	448864	110109	Roadside	Diffusion Tube	100	50					29.5
CHR	449143	109798	Roadside	Diffusion Tube	100	50					31.0

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

☒ **Annualisation has been conducted where data capture is <75%**

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

Notes:

Exceedances of the NO$_2$ annual mean objective of 40µg/m^3 are shown in **bold**.

NO$_2$ annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO$_2$ 1-hour mean objective are shown in **bold and underlined.**

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

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

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

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

Table A-4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO₂ 1-Hour Means > 200µg/m³ [3]				
							2015	2016	2017	2018	2019
ES1	445495	118237	Roadside	Automatic	45	45		4	0	0	0
ES2	443959	119673	Urban Background	Automatic	97	97		0	0	0	0
ES3	445310	119148	Roadside	Automatic	98	98		0	0	0	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold.**

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

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

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

Table A-5 – Annual Mean PM₁₀ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM₁₀ Annual Mean Concentration (µg/m³) (3)				
						2015	2016	2017	2018	2019
ES1	445495	118237	Roadside	Automatic	97		22.2	20.9	22.5	21.1

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold.**

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

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

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

Table A-6 – 24-Hour Mean PM$_{10}$ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	PM$_{10}$ 24-Hour Means > 50µg/m^3 [3]				
						2015	2016	2017	2018	2019
ES1	445495	118237	Roadside	Automatic	96		7	7	0	4

Notes:

Exceedances of the PM$_{10}$ 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold.**

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B-1 – NO₂ Monthly Diffusion Tube Results – 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
HL	447717	110359	37.3	44.7	18.1	23.2	31.1	34.5	42.9	21.9	28.6	29.9	40.0	34.1	32.2	29.9	-
HL2	447745	110478	51.9	47.6	27.6	39.5	39.5	40.6	30.8	Missing	37.3	43.2	48.2	45.6	**41.1**	38.2	28.5
OH	448653	110280	51.5	57.5	20.0	42.2	35.4	40.3	36.4	31.5	32.9	42.5	62.4	42.2	**41.2**	38.3	31.0
OH2	448736	110213	62.8	74.6	25.6	45.5	Missing	52.1	48.0	46.3	48.4	53.2	57.6	58.3	**52.0**	**48.4**	**42.3**
BDG	449099	109864	37.9	39.6	12.8	28.7	Missing	23.0	24.4	25.3	25.9	26.6	35.0	33.4	28.4	26.4	24.4
HSB	451431	113025	41.4	43.4	19.6	31.9	29.2	35.3	32.3	26.4	32.4	32.1	42.6	35.4	33.5	31.2	32.7
HSB2	451184	113030	39.2	38.0	16.4	30.4	25.3	30.0	27.6	25.2	28.8	28.4	43.3	34.9	30.6	28.5	26.5
KCA(18)	449935	113146	42.3	41.7	13.8	22.2	24.5	24.8	24.7	25.9	27.2	34.8	43.2	37.6	30.2	28.1	27.6
GR	449867	113250	41.2	38.9	17.3	24.6	28.3	22.8	22.5	23.8	24.0	28.1	37.9	33.9	28.6	26.6	23.0
UNC	448090	112635	37.2	40.9	23.0	16.8	20.7	19.8	20.1	24.3	Error	26.5	30.2	34.4	26.7	24.8	22.7
JW	447690	114912	34.7	27.9	12.3	20.7	19.2	20.4	20.1	18.4	Error	26.1	30.2	22.5	22.9	21.3	-
SWA	446170	114603	44.0	47.0	12.7	23.7	25.2	24.1	26.3	28.4	29.0	31.9	40.5	36.2	30.8	28.6	26.1
AL	445908	115544	32.1	38.1	13.7	24.9	21.7	22.2	16.5	22.7	21.0	27.3	32.2	31.5	25.3	23.5	-
BOT	449634	117382	46.3	45.8	22.6	31.0	30.0	33.1	32.7	31.1	31.1	34.5	33.7	39.7	34.3	31.9	27.1
WYV	449577	118165	Error	42.0	17.1	23.6	28.5	30.5	8.8	23.5	30.0	27.5	20.4	33.5	25.9	24.1	21.6

FORSL	448788	118553	Error	45.2	17.6	21.7	28.2	27.9	29.5	30.6	27.3	27.7	39.1	36.5	30.1	28.0	-
FOR	447427	118780	30.4	31.5	12.4	15.6	19.5	18.8	17.9	18.7	20.8	23.4	23.1	26.6	21.6	20.1	19.0
BR	446604	119149	39.3	48.4	19.1	Missing	Missing	36.4	27.5	Missing	37.7	34.3	39.1	44.9	36.3	33.8	25.8
BR2	446051	119171	45.5	42.4	20.1	22.1	28.0	Missing	29.5	Missing	31.9	34.0	40.5	42.9	33.7	31.3	30.9
TW	445739	119856	40.0	40.7	18.5	20.1	24.6	24.6	23.4	22.3	23.1	Missing	28.3	Missing	26.6	24.7	23.1
MS	445707	119619	39.0	40.8	16.9	24.2	22.1	28.5	23.5	21.1	28.1	30.7	33.4	32.4	28.4	26.4	26.4
SRAN (17)(A)	445495	118237	50.6	57.3	18.8	40.1	32.2	37.9	35.5	34.7	31.3	38.8	53.6	44.0	39.6	36.8	26.4
SRAN (17)(B)	445495	118237	51.6	54.2	16.6	38.9	33.6	39.0	39.0	32.5	37.4	39.5	41.8	45.4	39.1	36.4	26.2
SRAN (17)(C)	445495	118237	51.9	55.6	21.4	37.4	31.6	37.5	39.1	37.1	34.1	40.5	42.4	44.6	39.4	36.7	26.3
SR1	445450	118144	62.3	71.7	24.0	36.6	42.1	41.6	44.5	39.8	45.4	49.3	52.1	52.7	**46.8**	**43.6**	36.7
CA(15)	445339	118111	32.1	35.9	15.7	23.7	23.5	21.4	22.1	20.9	25.6	25.3	32.2	30.5	25.7	23.9	22.6
TP(A)	445310	119148	29.3	33.5	13.3	20.0	21.1	21.7	18.4	21.9	22.4	28.5	35.3	30.7	24.7	23.0	-
TP(B)	445310	119148	32.2	Missing	16.7	25.5	22.2	21.5	21.2	20.1	23.0	25.6	31.1	24.5	24.0	22.3	-
TP(C)	445310	119148	32.7	32.7	19.9	24.3	18.0	21.5	21.6	18.4	24.2	26.5	34.5	28.5	25.2	23.5	-
LRPR	444864	119174	47.3	Missing	Missing	34.2	Missing	24.4	27.8	24.5	27.6	34.4	48.0	37.4	34.0	31.6	27.4
OX	444543	120187	29.7	30.1	11.1	17.8	16.2	16.4	15.9	18.6	19.6	Error	23.5	21.6	20.0	18.6	-
HG	445347	120367	27.5	29.9	10.6	15.1	12.8	12.5	15.0	15.1	18.8	Error	26.3	Error	18.4	17.1	-
WA	444483	119443	43.5	47.5	24.1	24.5	31.4	28.3	30.6	32.0	32.3	35.4	42.4	Error	33.8	31.5	27.4
SC(A)	443959	119673	28.7	36.0	10.0	26.0	20.2	22.7	20.0	20.1	21.1	24.9	33.1	28.5	24.3	22.6	-
SC(B)	443959	119673	25.5	35.4	12.5	29.4	18.0	21.8	20.8	20.6	22.6	26.6	33.3	30.1	24.7	23.0	-
SC(C)	443959	119673	30.4	37.4	11.7	25.7	20.8	21.5	18.6	21.1	20.6	27.4	28.0	26.8	24.2	22.5	-
BEL	443778	119303	31.0	37.1	13.5	23.8	19.6	Missing	Missing	20.0	23.5	28.8	35.2	29.4	26.2	24.4	-
LR13	443842	119526	50.0	57.9	19.3	43.3	35.1	39.6	38.2	37.2	39.9	Missing	50.6	50.5	**42.0**	39.0	31.7
MC	444239	120060	30.7	39.6	12.6	30.1	22.8	25.9	23.4	21.4	23.1	25.3	29.6	30.1	26.2	24.4	-
PC	444656	120775	29.1	38.0	10.3	25.0	23.5	26.3	24.5	20.8	22.7	26.2	34.6	28.8	25.8	24.0	-
NH	445121	122183	30.3	39.2	12.3	35.3	22.8	24.2	25.8	24.4	27.9	28.0	35.8	28.9	27.9	26.0	-
AR	443291	122842	16.3	17.6	7.8	11.6	7.4	8.1	7.7	5.9	8.3	11.8	16.1	12.5	10.9	10.2	-
CC	443054	118962	35.5	39.3	12.1	24.7	25.8	25.3	28.6	30.2	28.7	45.0	32.8	33.6	30.1	28.0	25.0
SSQ	443483	118612	34.1	33.0	16.3	22.4	22.9	22.3	22.3	24.8	24.9	24.5	33.5	32.2	26.1	24.3	-

Site	X	Y															
DD(A)	443559	118751	36.0	37.0	16.8	24.2	21.9	25.1	24.6	27.3	29.1	28.9	25.9	34.6	27.6	25.7	-
DD(B)	443559	118751	37.8	38.5	14.8	24.4	26.8	22.8	24.5	26.8	26.8	27.9	35.0	34.3	28.4	26.4	-
CR	445750	118111	33.7	22.0	7.7	Error	30.3	33.4	39.0	48.2	37.8	43.4	35.7	50.9	34.7	32.3	-
PA	444340	118696	34.9	40.7	14.7	31.6	22.0	23.5	25.0	20.3	26.5	29.1	38.4	30.7	28.1	26.1	-
WHL	450422	113751	24.2	29.5	10.4	18.2	5.9	15.7	17.5	18.6	16.7	Missing	27.5	23.3	18.9	17.5	-
SR2	445651	118634	52.0	55.9	25.6	42.4	37.6	36.2	34.6	35.8	39.0	36.1	48.0	42.4	**40.5**	37.6	31.4
HL3	447638	110071	30.6	30.0	11.0	23.8	Error	34.3	18.9	16.8	19.1	21.9	28.6	21.6	23.3	21.7	21.7
PH1	448237	110610	-	-	-	-	32.8	32.1	37.9	33.1	32.7	39.4	41.7	34.9	35.6	38.8	30.7
PH2	448330	110532	-	-	-	-	39.9	45.3	Missing	38.9	44.3	43.5	Missing	47.5	**43.2**	**51.6**	**45.6**
PMR	448510	110371	-	-	-	-	24.5	30.2	29.8	20.1	28.0	42.1	32.5	31.3	29.8	32.6	-
OH3	448552	110362	-	-	-	-	23.1	20.3	22.1	19.6	21.8	27.8	28.7	24.3	23.4	25.6	-
DOD	448693	110280	-	-	-	-	25.5	25.5	26.3	24.4	25.6	26.8	34.8	36.2	28.1	30.7	24.7
BDG2	448914	110033	-	-	-	-	50.5	47.6	51.3	42.7	47.1	Missing	49.8	47.7	**48.1**	**54.1**	-
PH3	448249	110627	-	-	-	-	-	-	25.6	25.1	23.7	29.8	33.3	33.5	28.5	29.6	-
OH4	448864	110109	-	-	-	-	-	-	25.5	25.3	25.3	29.1	33.8	31.3	28.4	29.5	-
CHR	449143	109798	-	-	-	-	-	-	32.3	24.8	26.5	32.2	33.2	30.0	29.8	31.0	-

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

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

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 **<u>bold and underlined.</u>**

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

(2) Distance corrected to nearest relevant public exposure.

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

C.1 Hamble Lane AQMA Extension

C.1.1   Background Information

The Hamble Lane AQMA was declared on 03/07/2006, based on likely exceedances of the nitrogen dioxide (NO_2) annual average objective of $40\mu gm^{-3}$. It initially covered a portion of Hamble Lane and focussed on likely exposure at properties between Jurd Way and Portsmouth Road. The AQMA was then amended on 20/06/2011 to extend further north to the Windhover roundabout.

C.1.2   Monitoring on Hamble Lane

NO_2 concentrations in the area are measured using diffusion tubes.   Original monitoring sites Hamble Lane (HL) and Hamble Lane 2 (HL2) are located within the AQMA and have long term data available as shown in Table A-3. In 2018 a new site was added just south of the AQMA at Hamble Lane 3 (HL3) in response to a resident's concerns but this recorded an annual average well below the objective level, also shown in Table A-3. While concentrations measured on Hamble Lane decreased over 2012-2015, this trend appears to have slowed and in the case of Hamble Lane 2 a potential increase is seen. Exceedances of the annual objective were recorded in 2016 and 2017.

C.1.3   Monitoring on the A27

As part of a 2016 expansion of the network the sites Oak Hill (OH) and Bridge Road (BDG) were added nearby on the A27 and a significant exceedance was shown at OH. To investigate further a site was added at Oak Hill 2 (OH2) which is more representative of a relevant receptor.   Results from OH2 have also shown exceedances of the annual average objective level, and when distance corrected to the nearest relevant receptor this exceedance remains.   Figure D-7 shows the locations of these monitoring points and annual averages are shown in Table A-3. The consistent measurement of NO_2 concentrations above the annual objective levels, with this exceedance extending to the nearest relevant receptor, means this area should be included in an AQMA.

C.1.4   Extent of AQMA

The proximity to an existing AQMA and the links that will exist between them means it was decided to extend the Hamble Lane AQMA rather than declare a new one. In order to determine the extent of the AQMA further monitoring was carried out. In May 2019 new diffusion tubes were placed along the A27 and into the side roads at key junctions. Figure C-1 shows these new tube locations and the annual averages recorded for 2019. As all tubes were exposed for less than 75% of the year, annualisation has been carried out as detail in Section C.3.1.

Figure C-1 – Diffusion tube monitoring locations and 2019 annual averages on the A27 in Bursledon
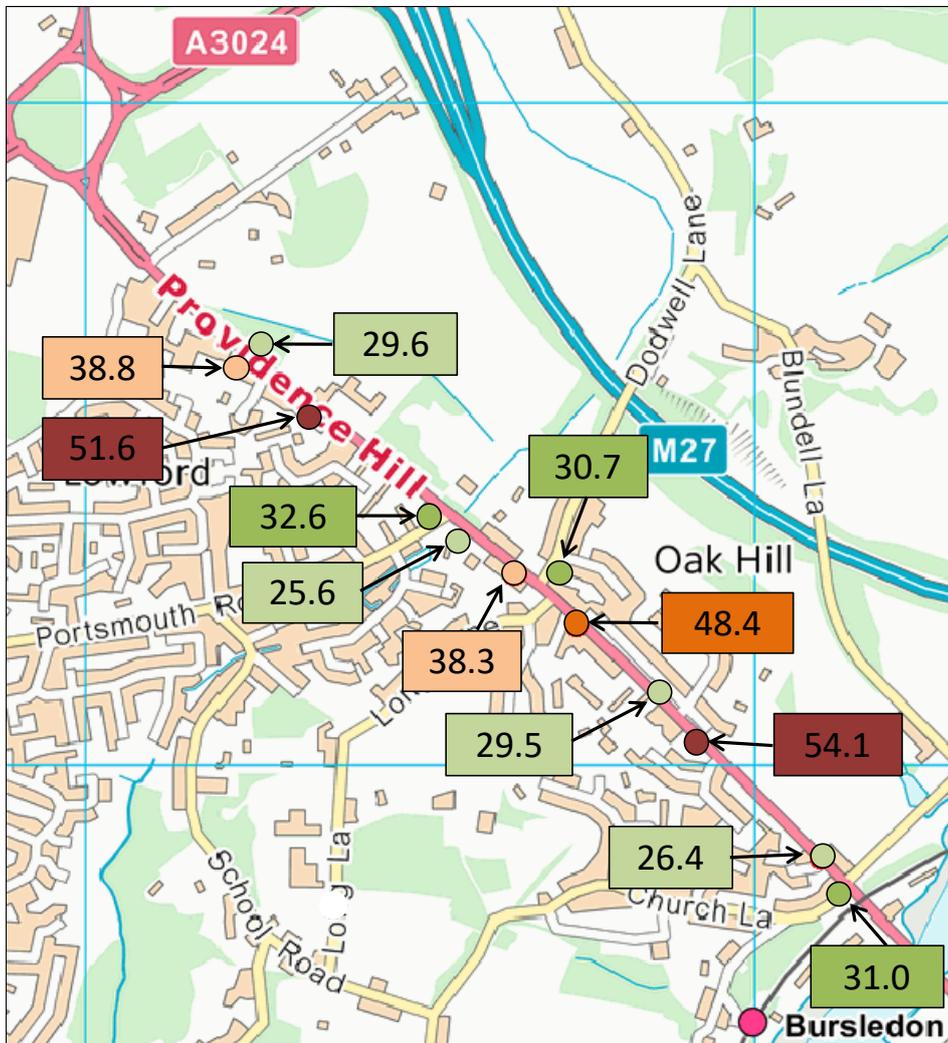
These results clearly show that the original exceedance identified is not an isolated area and further exceedances are measures at locations along the road in both directions from the original site. This evidence is sufficient to show that a declaration should cover the length of the A27, to the borough boundary. Concentrations

measured in Dodwell Lane and Portsmouth Road did not raise concerns about these roads and were not included, but the Windhover Roundabout was covered as it is an important link between the two areas and traffic movement here will affect the whole AQMA. The final area for the new Hamble Lane Area AQMA is shown in Figure D-7.

C.2 Automatic Monitoring QA/QC

Air quality measurements from automatic instruments are validated and ratified to the standards described in the Technical Guidance LAQM TG16. Automatic monitoring sites are visited fortnightly by a trained officer to calibrate the instrument reading against gas standards of a known concentration obtained from a certified supplier. A comprehensive service and maintenance contract is maintained with an external organisation. Data from the analysers has been validated and ratified by King's College London's Environmental Research Group as part of a data management contract. This has been in place for Southampton Road and Steele Close for several years and was extended to cover The Point in June 2019, with King's College London retrospectively ratifying the data for the first half of 2019. The contract includes annual site audits by the National Physical Laboratory.

During data ratification a problem was identified with the NO_2 results at Southampton Road. This was an incremental drift in the measurements which only became visible when analysing the data for this period as a whole. The issue is present from the June 2019 service to the January 2020 service and the data between these cannot be reliably adjusted so has been discounted. As the data capture for NO_2 at this site is below 75% the annual average has been annualised as detailed in Table C-1.

Table C-1– Annualisation for continuous NO$_2$ data at Southampton Road

Site Name	Southampton Road	Bournemouth	Portsmouth	Chilbolton Observatory
Site Classification[8]	Roadside	Urban Background	Urban Background	Rural Background
Data Capture	45%	99%	100%	87%
Annual Mean µg/m^3 (A$_m$)	38.2	11.5	17.5	8.9
Period Mean[9] µg/m^3 (P$_m$)	38.2	13.9	19.6	9.2
Ratio (A$_m$/P$_m$)	-	0.83	0.89	0.96
Average Ratio	-		0.89	
Annualised Annual Mean µg/m^3	34.1			

---

[8] As specified in Box 7.9 of the Technical Guidance LAQM TG16, background AURN sites within 50 miles have been used.
[9] 01/01/2019 – 18/06/2019

C.3 Diffusion Tube Monitoring Data QA/QC

C.3.1   Annualisation

Sites with below the required 75% data capture in 2019 were annualised in accordance with Box 7.10 of the Technical Guidance LAQM TG16. The same AURN sites were used as for annualisation of the continuous monitoring data at Southampton Road, and the process is shown in Tables C-2 to C-4. The results after annualisation went on to be bias adjusted.

Table C-2 – AURN sites average for each DEFRA diffusion tube period

Start Date	End Date	Bournemouth (B1) µg/m³	Portsmouth (B2) µg/m³	Chilbolton Observatory (B3) µg/m³
09/01/2019	06/02/2019	18.4	26.0	13.2
06/02/2019	06/03/2019	17.7	24.7	13.6
06/03/2019	03/04/2019	10.8	18.2	5.9
03/04/2019	01/05/2019	16.3	18.1	10.3
01/05/2019	05/06/2019	8.9	14.5	7.1
05/06/2019	03/07/2019	6.6	12.2	5.2
03/07/2019	07/08/2019	6.5	12.4	6.9
07/08/2019	04/09/2019	4.9	11.8	5.7
04/09/2019	02/10/2019	7.7	12.6	6.4
02/10/2019	06/11/2019	11.0	18.0	9.3
06/11/2019	04/12/2019	16.6	22.4	13.8
04/12/2019	08/01/2020	10.4	18.1	6.9
Annual Mean (A_m)		11.3	17.4	8.7

Table C-3 – AURN period means corresponding to each diffusion tube site

Diffusion Tube	Unadjusted Mean	B1 Period Mean	B2 Period Mean	B3 Period Mean
PH1	35.6	9.1	15.3	7.7
PH2	43.2	8.2	14.5	6.8
PMR	29.8	9.1	15.3	7.7
OH3	23.4	9.1	15.3	7.7
DOD	28.1	9.1	15.3	7.7
BDG2	48.1	8.8	14.9	7.4
PH3	28.5	9.5	15.9	8.2
OH4	28.4	9.5	15.9	8.2
CHR	29.8	9.5	15.9	8.2

Table C-4 – Annualisation ratios and final results

	Ratio (A_m/P_m)			Average Ratio	Annualised Annual Mean µg/m³
	B1	B2	B3		
PH1	1.2	1.1	1.1	1.2	41.8
PH2	1.4	1.2	1.3	1.3	55.5
PMR	1.2	1.1	1.1	1.2	35.0
OH3	1.2	1.1	1.1	1.2	27.5
DOD	1.2	1.1	1.1	1.2	33.1
BDG2	1.3	1.2	1.2	1.2	58.2
PH3	1.2	1.1	1.1	1.1	31.9
OH4	1.2	1.1	1.1	1.1	31.7
CHR	1.2	1.1	1.1	1.1	33.3

C.3.2 Bias Adjustment

Eastleigh Borough Council co-locates a triplicate of diffusion tubes with automatic analysers at three different locations. Results from these are submitted for inclusion in the National Diffusion Tube Bias Adjustment Factor spreadsheet[10]. Details of the locally derived bias adjustment factors are shown in Figure C-2 and Table C-5, and the relevant National Bias Adjustment Factor in Figure C-3.

Figure C-2 – Example of local bias adjustment factor, using Steele Close co-location site

Checking Precision and Accuracy of Triplicate Tubes — AEA Energy & Environment (From the AEA group)

| Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	09/01/2019	06/02/2019	28.7	25.5	30.4	28	2.5	9	6.1	28.9	99.3	Good	Good
2	06/02/2019	06/03/2019	36.0	35.4	37.4	36	1.0	3	2.5	36.2	99.1	Good	Good
3	06/03/2019	03/04/2019	9.9	12.5	11.6	11	1.3	11	3.2	21.7	99.9	Good	Good
4	03/04/2019	01/05/2019	26.0	29.4	25.7	27	2.1	8	5.1	37.7	99.3	Good	Good
5	01/05/2019	05/06/2019	20.2	18.0	20.8	20	1.4	7	3.6	21.8	99.6	Good	Good
6	05/06/2019	03/07/2019	22.7	21.8	21.5	22	0.6	3	1.5	21.7	95.4	Good	Good
7	03/07/2019	07/08/2019	20.0	20.8	18.6	20	1.1	6	2.8	19.7	98.0	Good	Good
8	07/08/2019	04/09/2019	20.1	20.6	21.1	21	0.5	2	1.2	18.9	99.6	Good	Good
9	04/09/2019	02/10/2019	21.1	22.6	20.6	21	1.0	5	2.6	21.3	77.8	Good	Good
10	02/10/2019	06/11/2019	24.9	26.6	27.4	26	1.3	5	3.2	26.0	99.6	Good	Good
11	06/11/2019	04/12/2019	33.1	33.3	28.0	31	3.0	10	7.5	33.9	99.6	Good	Good
12	04/12/2019	08/01/2020	28.5	30.1	26.8	28	1.7	6	4.1	27.3	99.3	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision / Good Overall

Site Name/ ID: **ES2 Steele Close**

Precision: **12 out of 12 periods have a CV smaller than 20%**

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 12 periods of data
Bias factor A 1.08 (0.97 - 1.21)
Bias B -7% (-17% - 3%)
Diffusion Tubes Mean: 24 μgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 26 μgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 26 (24 - 30) μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 12 periods of data
Bias factor A 1.08 (0.97 - 1.21)
Bias B -7% (-17% - 3%)
Diffusion Tubes Mean: 24 μgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 26 μgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 26 (24 - 30) μgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

---

[10] National Bias Adjustment spreadsheet

Table C-5 – Locally obtained bias adjustment factors

Site	Classification	Data Capture	Bias Factor A	Bias Factor B
Southampton Road	Roadside	45%	0.98	2%
Steele Close	Urban Background	97%	1.08	-7%
The Point	Roadside	98%	1.00	0%
			Average Bias Factor[11]	1.02

Figure C-3 – National Diffusion Tube Bias Adjustment Factor Spreadsheet 03/20

From consultation with Box 7.11 of the Technical Guidance LAQM TG16, Eastleigh Borough Council has chosen the nation bias adjustment factor of 0.93 to apply to the annual mean NO_2 diffusion tube survey results. A summary of the factors in this decision are listed below:

- Diffusion tubes have been exposed in accordance with the DEFRA monthly calendar, meaning the national bias adjustment factor is applicable to these results.

- The diffusion tube study covers the whole calendar year of 2019.

- While data from the automatic monitoring sites is of high quality and QA/QC has been carried out to national AURN standards, a problem at Southampton Road

---

[11] Calculated as specified by guidance

has resulted in less than 9 months of data at this site. Another automatic monitoring site, The Point, had a change in data management provider part way through the year.

- Gradko participated in four rounds of the AIR-PT laboratory proficiency testing scheme during 2019, with an average of 94% of their results determined to be satisfactory[12]. 27 different co-location studies using this analysis technique were used to input to the National Bias Adjustment factor.

- Eastleigh's co-location sites cover both roadside and urban background locations, although the roadside site at The Point is not typical of this classification as it is significantly further from the kerb than the majority of diffusion tubes. Additionally, problems with the automatic analyser at Southampton Road resulted in low data capture and mean results from this site may not be representative for the year. This only leaves Steele Close as an urban background site and applying this factor to roadside tubes in the Borough may not be representative.

- Tubes across Eastleigh Borough are deployed at a range of locations but have similar pollution sources and are not affected by specific, local sources. However given the variety of settings, such as open areas compared to building facades, and the problems with local co-location studies at roadside sites in this year, it has been decided the national factor is most applicable.

C.3.3   Distance Correction

All 2019 results have, where appropriate, undergone correction for distance to the nearest relevant receptor in accordance with the Technical Guidance LAQM TG16 and results of this are shown in Table B-1. Calculations were carried out using the NO_2 fall-off with distance calculator[13] and an example of this for the site HL2 is shown in Figure C-4. When assessing if sites are suitable for distance correction the following factors were considered:

- The distance from the monitoring point to the nearest receptor. Distance correction was only carried out where this is less than 20m.

---

[12] https://laqm.defra.gov.uk/assets/laqmno2performancedatauptonovember2019v1.pdf
[13] https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

- How comparable the nearest receptor is to the monitoring location. For example, in situations where the nearest receptor is on the opposite side of the road to the monitoring point distance correction was not carried out.

- The measured concentrations, those recording levels close to the background were not distance corrected.

- Site classification, with roadside sites most likely to measure high levels.

Figure C-4 – Screenshot showing example of an NO_2 fall-off with distance calculation

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	11.3	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	16.60994	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	38.2071387	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	28.5	$\mu g/m^3$

Expected Reduction in Annual Mean Nitrogen Dioxide Concentration with Distance from the Kerb

- Your Measurement
- Your Prediction
- Typical Reduction with Distance

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

Maps showing all monitoring locations and AQMAs in Eastleigh Borough are shown in figures D-1 to D-7. The site IDs correspond to those listed in Table A-2. AQMAs are shown as shaded areas.

**Figure D-1 – Eastleigh AQMA No.1 (A335) in green shading and Eastleigh AQMA No.2 (M3) in purple shading**

Figure D-2 – Eastleigh/Chandler's Ford (north) diffusion tube locations, Eastleigh AQMA No.1 (A335) in green shading and Eastleigh AQMA No.2 (M3) in purple shading
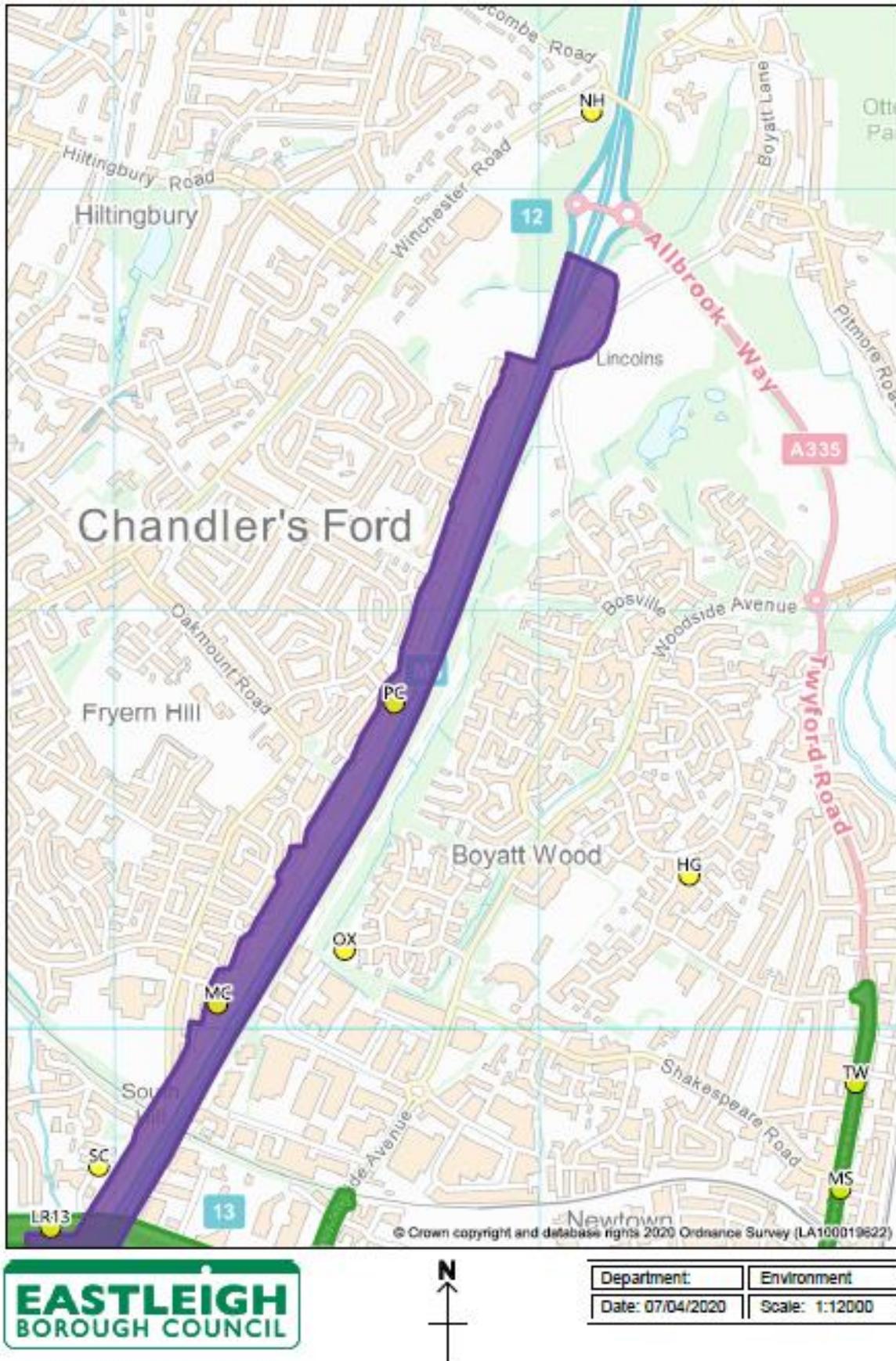
Figure D-3 – Eastleigh/Chandler's Ford (south) diffusion tube locations, Eastleigh AQMA No.1 (A335) in green shading and Eastleigh AQMA No.2 (M3) in purple shading
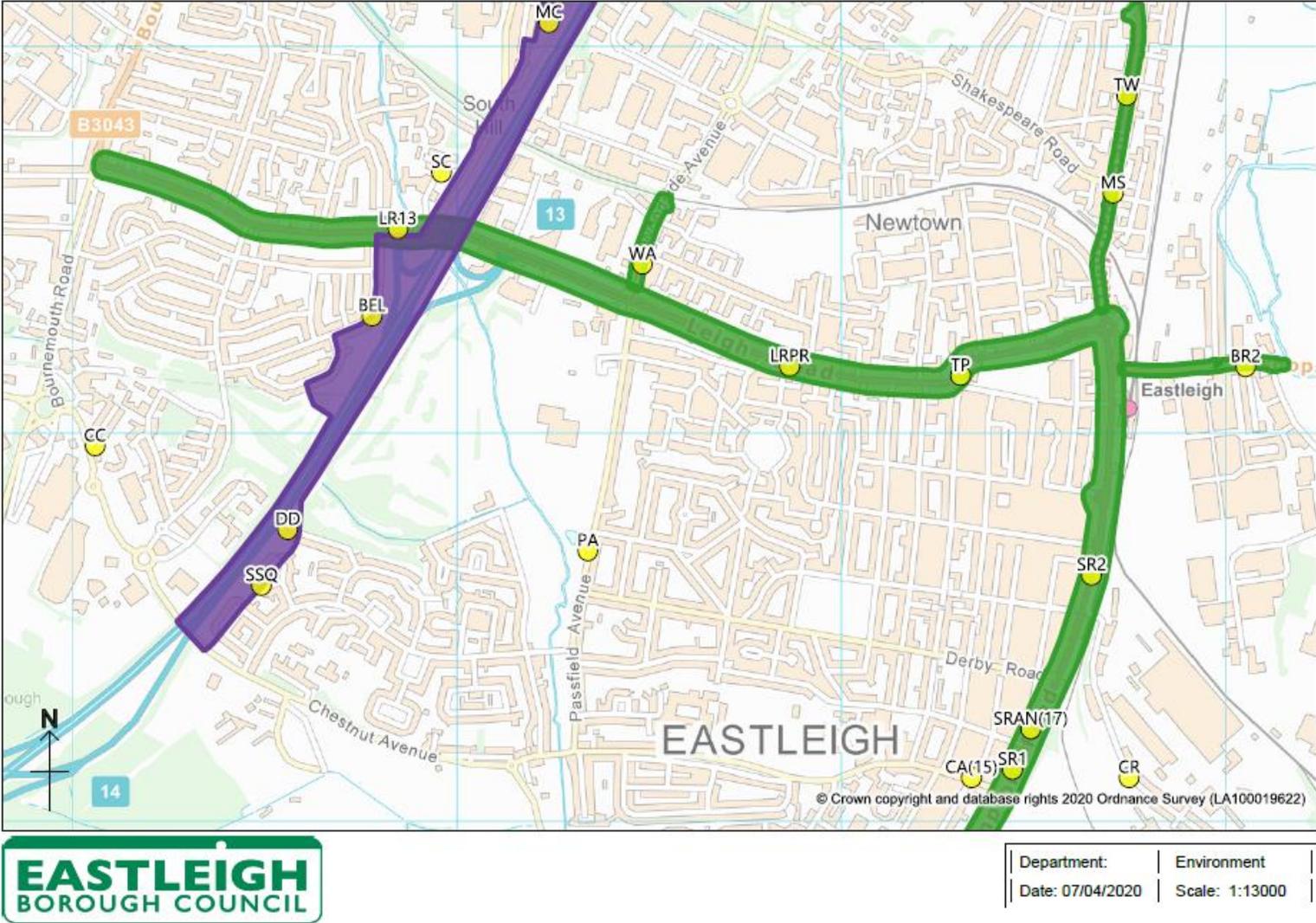
Figure D-4 – Bishopstoke, Fair Oak and Horton Heath diffusion tube locations
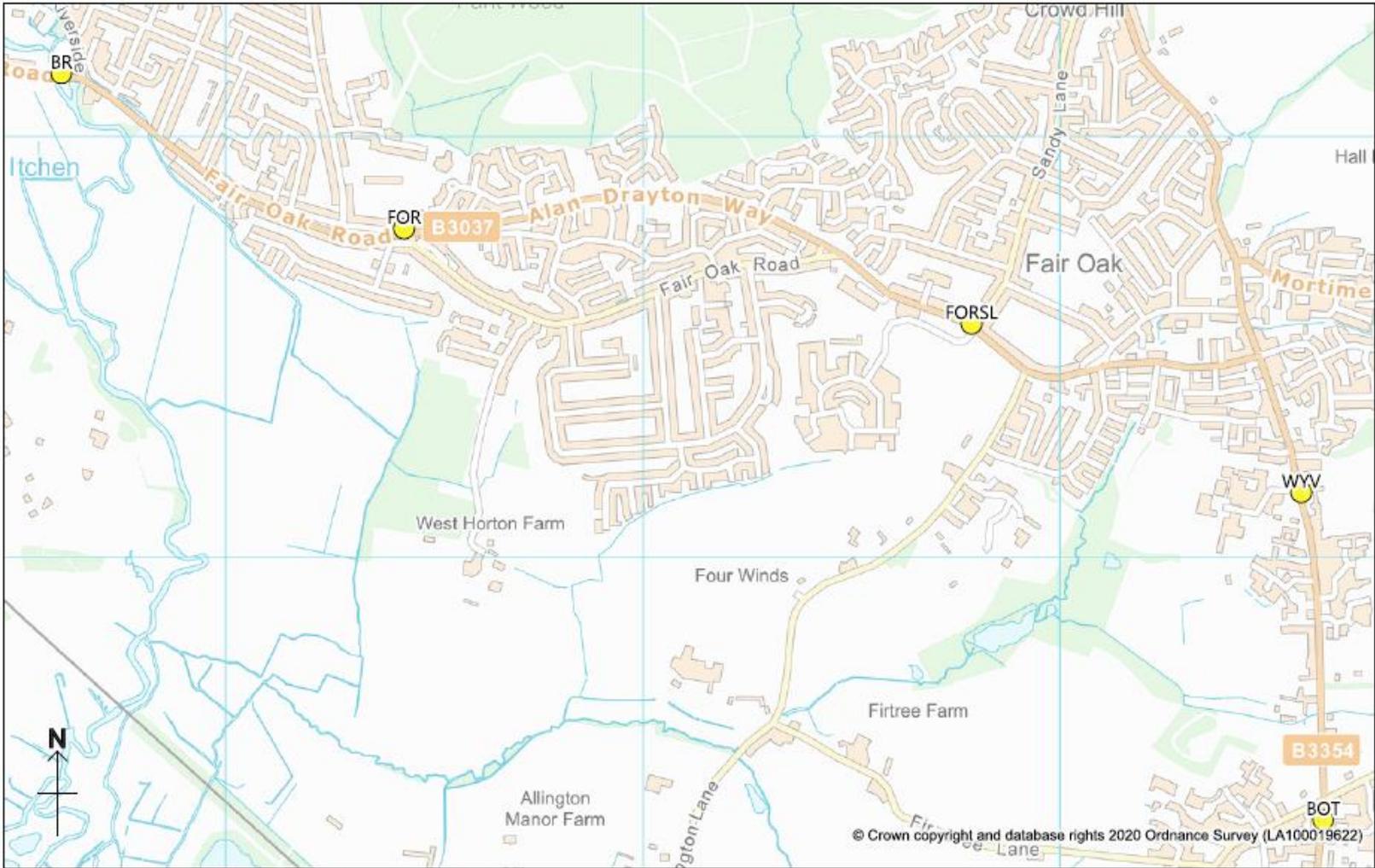
Figure D-5 – Hedge End/West End diffusion tube locations
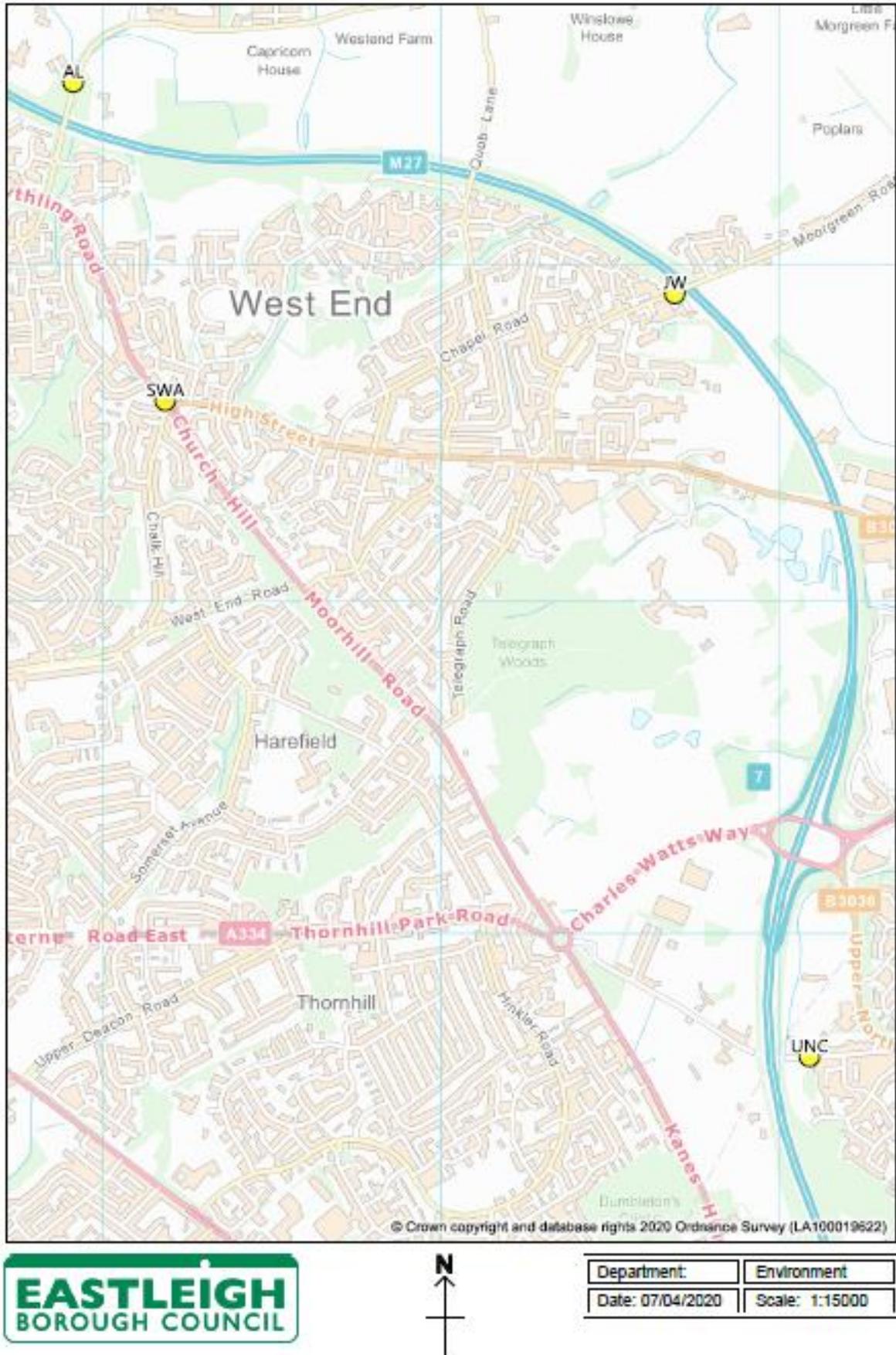
**Figure D-6 – Botley diffusion tube locations and High Street Botley AQMA in red shading**

Figure D-7 – Bursledon/Hamble diffusion tube locations and Hamble Lane Area AQMA in blue shading
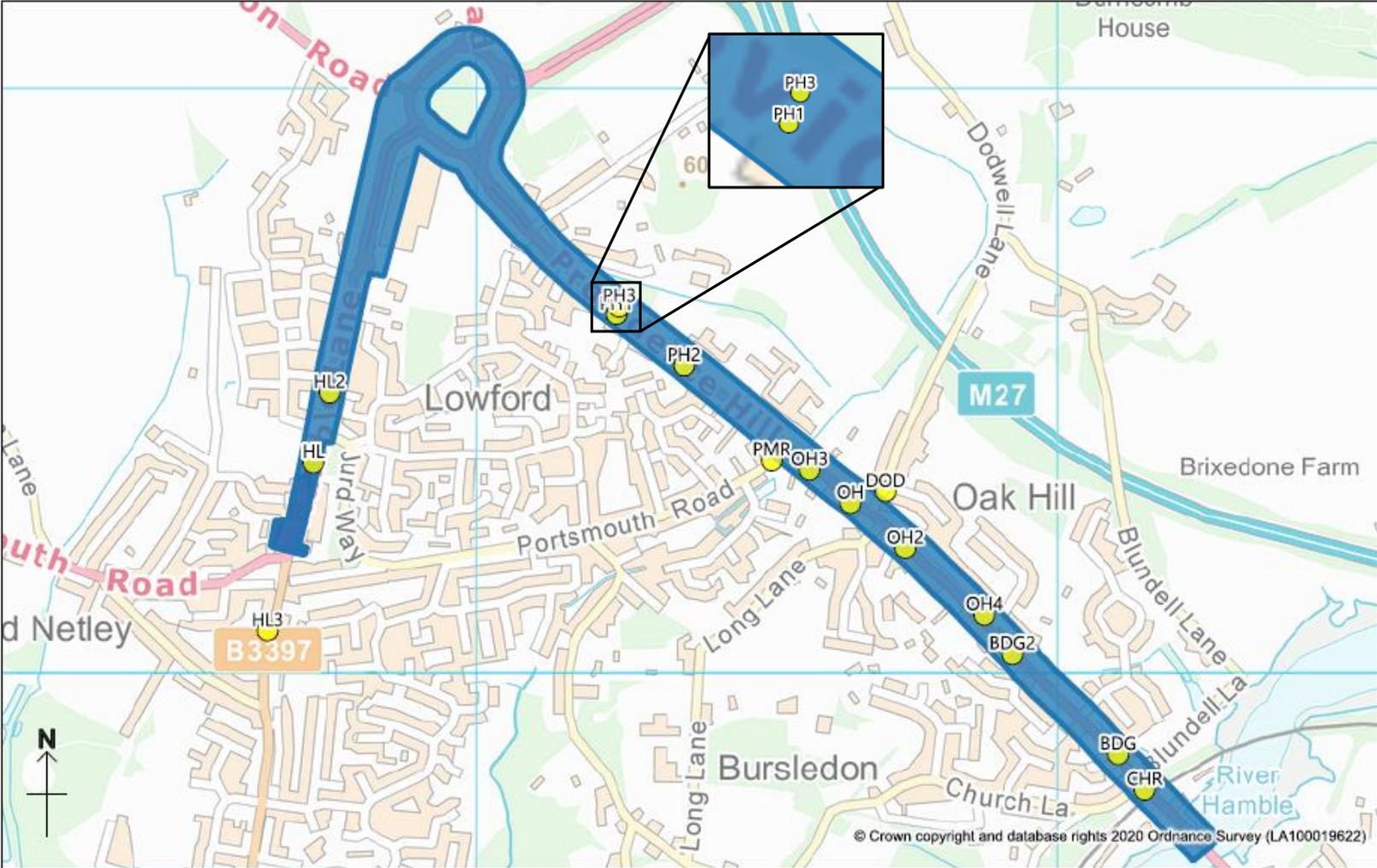
Appendix E: Summary of Air Quality Objectives in England

Table E-1 – Air Quality Objectives in England

| Pollutant | Air Quality Objective[14] | |
	Concentration	Measured as
Nitrogen Dioxide (NO$_2$)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM$_{10}$)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO$_2$)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[14] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
BIFOHH	Bishopstoke, Fair Oak and Horton Heath
BHH	Bursledon, Hamble-le-Rice and Hound
CFH	Chandler's Ford and Hiltingbury
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EBC	Eastleigh Borough Council
ELAC	Eastleigh Local Area
EU	European Union
EV	Electric Vehicle
FBC	Fareham Borough Council
FDMS	Filter Dynamics Measurement System
HCC	Hampshire County Council
HEWEB	Hedge End, West End and Botley
LAQM	Local Air Quality Management
NFDC	New Forest District Council
NO$_2$	Nitrogen Dioxide

NOₓ	Nitrogen Oxides
PM₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM₂.₅	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SCC	Southampton City Council
SO₂	Sulphur Dioxide
SWR	South Western Railway
WCC	Winchester City Council