



2024 Air Quality Annual Status Report (ASR)

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

Date: August, 2024

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Executive Summary: Air Quality in Our Area

Epsom & Ewell in Surrey is one of the UK's smallest districts at only 34km², much of which is open green space, with a local population of just under 81,000, per the 2021 Census¹. Bordered by Reigate & Banstead and Mole Valley, Greater London's Kingston upon Thames and Sutton districts and the borough is located within the M25.

Historically Epsom is known for its horse racing, which continues today at Epsom Downs Racecourse; as the origin of Epsom Salts, and was more generally a market town with links to London, Dorking and Guildford.

Today the towns of Epsom and Ewell and their surrounding areas are considered commuter belt, with direct train links to central London. Epsom being the last station traveling Southwest out of London, towards Guildford and Dorking, to be included in Transport for London's (TfL) Oyster Card scheme, as well as being part of several TfL bus routes. In August 2023 Greater London's Ultra Low Emission Zone (ULEZ) was expanded to follow Epsom & Ewell's Northern edge, bordering 8 of the 13 wards that make up the borough.²³

The borough is predominantly residential with no large-scale manufacturing or agriculture. Because of this, locally, air pollution is predominantly associated with emissions from road vehicles and residential living.

Air Quality in Epsom & Ewell Borough Council

Breathing in polluted air affects health and costs the NHS and our society billions of pounds each year.⁴ Air pollution has been recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on

¹ Office of National Statistics. How the population changed in Epsom and Ewell: Census 2021, 28 June 2022.

² Transport for London. Ultra Low Emission Zone.

³ Epsom & Ewell Borough Council. Epsom & Ewell Borough Council responds to ULEZ consultation, 2 Aug 2022.

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

lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year⁵.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution⁶.

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO ₂)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO ₂)	Sulphur dioxide (SO ₂) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM ₁₀ and PM _{2.5})	<p>Particulate matter is everything in the air that is not a gas.</p> <p>Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes.</p> <p>PM₁₀ refers to particles under 10 micrometres. Fine particulate matter or PM_{2.5} are particles under 2.5 micrometres.</p>

Because of the nature of the locality, as Epsom & Ewell do not have any large industrial or agricultural emitters, the Council have focused on the reduction of nitrogen dioxide (NO₂) from road traffic in areas of residential occupation across the borough.

Over the last 7 years of data collected by the Council we can see a downward trend across all monitoring sites (data from the year 2020 is considered erroneous due to the national impact of Covid-19 and associated lockdowns).

⁵ UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

⁶ Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

Epsom & Ewell has one Air Quality Management Area (AQMA), Ewell High Street AQMA was designated in July 2007, the boundary of which was amended in January 2011 to reflect area development and monitoring data. Full details of which can be found at: https://uk-air.defra.gov.uk/aqma/details?aqma_ref=508.

Actions to Improve Air Quality

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

The Environmental Improvement Plan⁷ sets out actions that drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter (PM_{2.5}), the pollutant most harmful to human health. The Air Quality Strategy⁸ provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero⁹ details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMA) are designated due to elevated concentrations heavily influenced by transport emissions.

Epsom & Ewell Borough Council consider air quality as a portion of the wider issue of climate change and have taken a wider, more holistic approach on the improvement of air quality locally, aiming to reduce emissions both locally and from national grid energy generation.

In 2020 the Council set the ambitious target to reduce the Council's own emissions to carbon neutral by 2035,¹⁰ and has to date successfully reduced carbon emissions from

⁷ Defra. Environmental Improvement Plan 2023, January 2023

⁸ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

⁹ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

¹⁰ Epsom & Ewell Borough Council. Climate Change Action Plan. 2020.

1,464.36tCO₂e (tonnes of carbon emissions) in 2019/2020 to 1,263.87tCO₂e in 2022/2023 – a 200 tonne reduction¹¹.

The Council is currently, at time of writing, developing its next 5 year Climate Change Action Plan for 2025 – 2030, where the continued improvement of air quality is expected to factor significantly.

Epsom & Ewell Borough Council is a member of Surrey Air Alliance, a partnership that works across the 11 Surrey borough and district councils and Surrey County Council, to work as a unified group tackling air quality across the county. Supporting awareness and education campaigns and engagement with local transport, education, and healthcare.

Annually the Council has also promoted Clean Air Night via social media, part of the public information campaign led by Global Action Plan centred around domestic burning and the Air Quality (Domestic Solid Fuels Standards) Regulations 2020.

Conclusions and Priorities

In 2023 air quality across Epsom & Ewell has continued to follow improvement trends, with all monitoring showing NO₂ decreases across the borough and all areas below national objective levels.

In accordance with the Local Air Quality Management (LAQM) Technical Guidance 2022¹² the Council will assess the steps to revoke the Ewell High Street AQMA, subject to 2024 monitoring showing ongoing compliance. Epsom & Ewell hope to have carried out a assessment to that end within the next 12 months.

The Council is continuing to work to its target of carbon neutral by 2035, having made changes that have shown a marked improvement in regard to its carbon footprint to date.

Local Engagement and How to get Involved

The Council endeavours to work with local businesses and residents to improve air quality and reduce emissions across the borough, and is enrolled with the AirAlert warning service, which provides warnings about predicted poor air quality,

¹¹ Epsom & Ewell Borough Council. Climate Change.

¹² Department for Environment Food & rural Affairs. Local Air Quality Management Technical Guidance (TG22). August 2022.

<https://airalert.info/Surrey/Default.aspx>. This service works by sending texts or alerts through the AirAlert app free to any user signed up to receive them.

There are several volunteer action groups in the borough that the Council engage with to support wider improvement, such as Sustainable Epsom & Ewell, the Epsom & Ewell Cycling Action Group and the Epsom Common Association.

Epsom & Ewell Borough Council regularly update its Climate Change website, <https://www.epsom-ewell.gov.uk/residents/climate-change>, showing all the actions the Council has taken, and provides guidance and signposting for residents who want to take action themselves. The Council's full Climate Change Action Plan is also accessible through the Council website.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Epsom & Ewell Borough Council with the support and agreement of the following officers and departments:

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Air Quality forms part of the portfolio of the Council's Environment Committee whose Chair has been briefed on the contents of this report.

If you have any comments on this ASR please send them to Rebecca Richards at:

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1 Local Air Quality Management

This report provides an overview of air quality in Epsom & Ewell during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

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

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

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 should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by Epsom & Ewell Borough Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Epsom and Ewell. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation is NO₂ annual mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Ewell High Street Air Quality Management Area	09/07/2007 Amended area: 01/01/2011	NO2 Annual Mean	Ewell High Street (B2200) between Spring Street and Cheam Road junctions extending 30 metres South on High Street, Ewell	NO	63	No exceedance	3 years	Ewell High Street Air Quality Action Plan 2010	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=100

- Epsom & Ewell Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.
- Epsom & Ewell Borough Council confirm that all current AQAPs have been submitted to Defra.

2.2 Progress and Impact of Measures to address Air Quality in Epsom & Ewell Borough Council

Defra's appraisal of last year's ASR described the report as "well structured, detailed and [provided] the information specified in the Guidance".¹³

The Defra made several recommendations:

- The Council update its AQAP as it is now out of date. However it was recognised that the Council have intention to rescind the AQMA area it relates to.
- To include further detail regarding Progress on Measures to Improve Air Quality, highlighting any key performance indicators.
- Update any out-of-date hyperlinks included within the report.
- And minor report structure and formatting issues.

The responding Appraisal Report also commended the standard of mapping evidence and extensive trend graphs for all monitoring data.

Epsom & Ewell Borough Council has taken several measures during the current reporting year of 2023 in pursuit of improving local air quality and reduce emissions more widely across the Borough. Details of measures completed, in progress or planned are set out in Table 2.2.

Following the historically implemented actions, which have shown a longstanding downward trend, 2023 was the third full year of Ewell High Street AQMA within compliance and has indicated the trend is continuing. Subject to ongoing compliance through 2024 Epsom & Ewell Borough Council intend, following LAQM Technical Guidance 2022, to action the rescinding of the AQMA.

¹³ Annual Status Report Appraisal Report: Epsom and Ewell Borough Council, ASR23-1847 (August 2023).

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Remove the formally marked parking bays from 53 to 67 High Street, Ewell	Transport, Planning and Infrastructure	Other	Jun-14	2015	Surrey County Council	Surrey County Council	NO	Funded	<£10k	Completed	5 µg/m3	Complete Y/N	Completed	Historic AQMA area actions
2	Widen the road at 76 to 62 High Street, Ewell	Transport, Planning and Infrastructure	Other	Jun-14	2015	Surrey County Council	Surrey County Council	NO	Funded	£10k - £50k	Completed	5 µg/m3	Complete Y/N	Completed	Historic AQMA area actions
3	Remove on-street car parking on Church Street junction, Ewell	Transport, Planning and Infrastructure	Other	-	2015	Surrey County Council	Surrey County Council	NO	Funded	<£10k	Completed	5 µg/m3	Complete Y/N	Completed	Historic AQMA area actions
4	Alter the junction of Cheam Road . High Street, Ewell	Transport, Planning and Infrastructure	Other	2015	2015	Surrey County Council	Surrey County Council	NO	Funded	£50k - £100k	Completed	5 µg/m3	Complete Y/N	Completed	Historic AQMA area actions
5	Place restrictions on delivery times and stopping on High Street, Ewell between Cheam Road and Spring Street junctions	Traffic Management	Workplace parking levy, Parking enforcement on highway	2015	2015	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Funded	<£10k	Completed	-	-	Completed	Historic AQMA area actions
6	Social media local engagement (Eg. Clean Air Night)	Public Information	Via Internet	-	Ongoing	Epsom & Ewell Borough Council, Surrey County Council, Surrey Air Alliance, Global Action Plan	Epsom & Ewell Borough Council, Surrey County Council	NO	Ongoing funding	<£10k	Ongoing	-	-	Ongoing	
7	Anti-Idling policy and enforcement	Traffic Management	Parking enforcement on highway	2022	Ongoing	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Funded	<£10k	Ongoing	NO ₂	-	Ongoing	
8	Taxi Licencing emissions Policy	Vehicle Fleet Efficiency	Other	2022	Ongoing	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Funded	<£10k	Ongoing	NO ₂	Taxi licencing uptake of incentives for low emissions vehicles	Ongoing	
9	Installing Photovoltaic (PV) cells to Council Owned Properties	Promoting Low Emission Plant	Shift to installations using low emissions fuels for stationary and mobile sources	2023	Ongoing	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Ongoing funding	£50k - £100k	Ongoing	-	Completed installation of PV cells to properties owned by the Council	Solar panels installed at Operational Depot. 90 PV solar panels installed on Epsom Play House	PV panels estimated to save 40+ tonnes of carbon a year
10	EEBC Fleet upgrade	Vehicle Fleet Efficiency / Promoting Low Emission Transport	Other / Company Vehicle Procurement – Prioritising uptake of low emission vehicles	2023	Ongoing	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Ongoing funding	£50k - £100k+	Ongoing	-	Replacement of EEBC fleet vehicles with electric or hybrid equivalent	Staff pool car electric replacement, 3 Meals-on-Wheels vans electric replacement	Currently large fleet vehicles (HGVs) cannot be affordably/efficiently replaced

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	Planning policy related to climate change updates	Policy Guidance and Development Control	Other	2023	Ongoing	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Funded	<£10k	Ongoing	-	Planning applications for climate change related technology – e.g. ASHPs, photovoltaic panels, residential electric car chargers	Ongoing	Improved awareness of technology and wider climate change has increased planning applications for residential and commercial premises. Planning policy has been updated to support efforts by residents and businesses where appropriate.
12	Housing Grant/ Energy Efficiency Upgrade Support Scheme	Public Information	Other	2023	Ongoing	Epsom & Ewell Borough Council, Citizens Advice Bureau, Action Surrey	Epsom & Ewell Borough Council, Surrey County Council	NO	Funded	<£10k	Ongoing	-	Uptake of housing related grants for residential energy efficiency improvements	Ongoing	Housing officers working with CAB to support residents applying for government grants to improve their homes.
13	Town Hall and Council Offices renovation and move	Policy Guidance and Development Control	Other policy	2023	Sep 2025	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Ongoing funding	>£100k	Confirmed ongoing	-	Council office move	Consultation period completed. Renovations of properties facilities and electrical systems in progress. Final floor plans to be approved est. August 2024. Planned move in date confirmed September 2025	Town Hall and Council offices move to a more efficient Council owned property. Planned green energy production and improved services to encourage/facilitate home-working
14	Installation of EV charging points in EEBC car parks	Promoting Low Emission Transport	Procuring alternate refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2023	Ongoing	Epsom & Ewell Borough Council, Joju Solar	Epsom & Ewell Borough Council	NO	Ongoing funding	£50k - £100k	Ongoing	-	Installation of EV charging points	16 Installed charging points in EEBC owned car parks	Continual review of EV charging point usage and consideration of additional sites.
15	Installation of on street EV charging points	Promoting Low Emission Transport	Procuring alternate refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2023	Ongoing	Epsom & Ewell Borough Council, Surrey County Council	Epsom & Ewell Borough Council, Surrey County Council	NO	Ongoing funding	£50k - £100k	Ongoing	-	Installation of on street EV charging points	10 Installed on street charging points	Continual review of EV charging point usage and consideration of addition sites.

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy¹⁴, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM_{2.5}). There is clear evidence that PM_{2.5} (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

In 2017 Epsom & Ewell Borough Council undertook high resolution modelling in efforts to understand the fundamental nature of PM_{2.5} in the locality, identify any major sources and to determine appropriate action to undertake to lower exposure to residents.

This modelling data showed a baseline of 1.8% to 5.6% in 1km² particulate dispersion across Epsom & Ewell.

Modelling indicated no considerable sources of PM_{2.5} in the Epsom & Ewell area, and that while transport and combustion are both contributory, primarily PM_{2.5} is of a background nature wider than the district area alone.

As part of tackling PM_{2.5} across the area, Epsom & Ewell are members of the Surrey Air Alliance, working in partnership with the 10 other districts across Surrey to improve air quality, by increasing awareness, engaging with partners in transport, education and health care and supporting each Council to improve air quality across the entire county.

¹⁴ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

This section sets out the monitoring undertaken within 2023 by Epsom & Ewell Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a seven-year period between 2017 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Epsom & Ewell Borough Council did not undertake any automated monitoring in 2023.

3.1.2 Non-Automatic Monitoring Sites

Epsom & Ewell Borough Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 25 sites during 2023. Table A.1 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the

monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

In the year 2023, monitoring performed by Epsom & Ewell Borough Council did not show any exceedance of air quality objectives, neither within the AQMA area or across the borough as a whole. In fact, averages across all monitoring sites have continued the downward trend, shown in Figure A.1.

2023 marks the third year that all monitoring sites within the Ewell High Street AQMA area have returned NO₂ results below the air quality objective of 40µg/m³. Because of these results Epsom & Ewell Borough Council are hopeful to revoke the AQMA area status in the coming year.

3.2.2 Particulate Matter (PM₁₀)

Epsom & Ewell Borough Council did not carry out monitoring for particulate matter in 2023.

3.2.3 Particulate Matter (PM_{2.5})

Epsom & Ewell Borough Council did not carry out monitoring for particulate matter in 2023.

3.2.4 Sulphur Dioxide (SO₂)

Epsom & Ewell Borough Council did not carry out monitoring for sulphur dioxide in 2023.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
EE1	EE1 The Clocktower	Roadside	520732	160762	NO ₂	No	13.0	2.5	No	2.1
EE3	EE3 26 The Crescent	Urban Background	519293	160026	NO ₂	No	9.0	2.0	No	2.0
EE6	EE6 Junction Kingston Road / Worcester Park Road	Kerbside	520525	165040	NO ₂	No	8.2	6.8	No	2.1
EE7	EE7 Junction Ruxley Lane / Kingston Road	Kerbside	520916	164636	NO ₂	No	4.2	6.8	No	2.3
EE9	EE9 Chessington Road, Ewell	Roadside	519830	163740	NO ₂	No	2.4	3.2	No	2.4
EE10	EE10 High Street, Ewell	Kerbside	521998	162633	NO ₂	Yes – Ewell High Street AQMA	0.5	1.3	No	2.1
EE14	EE14 – Hook Road, Epsom	Roadside	520885	161308	NO ₂	No	3.4	1.6	No	2.0
EE16	EE16 Church Street / High Street, Ewell	Roadside	522026	162624	NO ₂	Yes – Ewell High Street AQMA	0.1	1.1	No	1.7
EE17	EE17 40A High Street, Ewell	Roadside	522025	162563	NO ₂	Yes – Ewell High Street AQMA	0.1	2.0	No	2.2
EE22	EE22 High Street, Epsom	Roadside	520965	160871	NO ₂	No	3.0	0.5	No	2.3
EE36	EE36 Capitol Square, Church Street	Urban Centre	521069	160817	NO ₂	No	0.2	9.2	No	2.1
EE37	EE37 British Heart Foundation, High Street	Roadside	520726	160857	NO ₂	No	0.6	4.5	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
EE38	EE38 Station Approach South	Roadside	520726	160857	NO ₂	No	0.1	2.8	No	1.8
EE39	EE39 The Parade	Roadside	520844	160729	NO ₂	No	0.2	3.3	No	2.1
EE42	EE42 High Street / East Street	Roadside	521004	160901	NO ₂	No	0.0	7.7	No	2.1
EE43	EE43 Kiln Lane	Roadside	521478	161447	NO ₂	No	0.3	5.5	No	2.3
EE45	EE45 Castle Parade	Roadside	522211	163103	NO ₂	No	0.4	8.3	No	2.1
EE46	EE46 Waterloo Road	Kerbside	520724	161027	NO ₂	No	4.6	0.6	No	2.1
EE47	EE47 Chessington Road	Roadside	520713	162968	NO ₂	No	0.2	4.7	No	1.9
EE48	EE48 Ewell High Street South	Roadside	522022	162502	NO ₂	Yes – Ewell High Street AQMA	0.4	1.7	No	2.1
EE49	EE49 37 South Street, Epsom	Roadside	520580	160586	NO ₂	No	0.2	3.5	No	2.2
EE50	EE50 Major Plaice, Ewell High Street	Kerbside	521975	162677	NO ₂	Yes – Ewell High Street AQMA	7.5	0.9	No	2.1
EE51	EE51 Station Approach North	Roadside	520702	160872	NO ₂	No	3.0	3.3	No	1.8
EE52	EE52 77 London Road, Ewell	Roadside	522303	163213	NO ₂	No	0.5	4.6	No	1.8
EE53	EE53 115 London Road, Ewell	Roadside	522369	163289	NO ₂	No	0.0	14.5	No	1.8

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
EE1	520732	160762	Roadside	100	90.4	26.5	23.0	22.2	24.1	19.5
EE3	519293	160026	Urban Background	100	100.0	15.0	14.1	13.6	14.0	11.2
EE6	520525	165040	Kerbside	100	100.0	33.0	27.8	27.6	28.4	20.4
EE7	520916	164636	Kerbside	100	92.3	34.2	28.0	29.7	29.7	22.1
EE9	519830	163740	Roadside	100	82.7	24.4	20.6	21.2	22.2	17.4
EE10	521998	162633	Kerbside	100	84.6	46.3	44.0	32.3	34.9	26.5
EE14	520885	161308	Roadside	100	92.3	25.3	20.8	21.5	21.9	17.4
EE16	522026	162624	Roadside	100	90.4	27.8	22.4	22.6	23.8	17.9
EE17	522025	162563	Roadside	100	100.0	31.4	29.1	26.3	25.7	20.7
EE22	520965	160871	Roadside	100	100.0	35.4	31.3	31.5	26.6	24.0
EE36	521069	160817	Urban Centre	100	100.0	23.3	19.9	20.6	20.6	17.0
EE37	520726	160857	Roadside	100	65.4	32.7	25.4	26.5	28.2	21.9
EE38	520726	160857	Roadside	100	84.6	24.2	16.2	17.8	20.0	15.6
EE39	520844	160729	Roadside	100	92.3	24.6	21.5	23.0	24.3	19.3
EE42	521004	160901	Roadside	100	90.4	24.5	20.1	19.4	19.1	18.5
EE43	521478	161447	Roadside	100	100.0	25.5	21.7	22.6	23.2	19.3
EE45	522211	163103	Roadside	100	100.0	21.3	17.7	19.0	21.2	15.7
EE46	520724	161027	Kerbside	100	100.0	27.9	21.5	22.5	22.2	19.8
EE47	520713	162968	Roadside	100	100.0	25.1	19.2	21.2	21.9	17.9
EE48	522022	162502	Roadside	100	84.6	28.4	22.1	23.5	24.4	22.2
EE49	520580	160586	Roadside	100	100.0	34.2	25.5	28.6	30.9	25.0
EE50	521975	162677	Kerbside	100	100.0	35.7	33.6	31.1	32.1	25.3
EE51	520702	160872	Roadside	100	92.3	25.0	21.0	23.2	25.6	19.6
EE52	522303	163213	Roadside	100	100.0	40.0	30.3	34.3	32.1	27.5
EE53	522369	163289	Roadside	100	100.0	23.0	16.0	18.2	18.4	15.1

- ☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- ☒ Diffusion tube data has been bias adjusted.
- ☒ Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

Exceedances of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

Trend charts have been grouped by locality of monitoring site. Objective line indicates air quality objective of 40µg/m³.

Figure A.1.1 – NO₂ Trends in Epsom 2017 - 2023

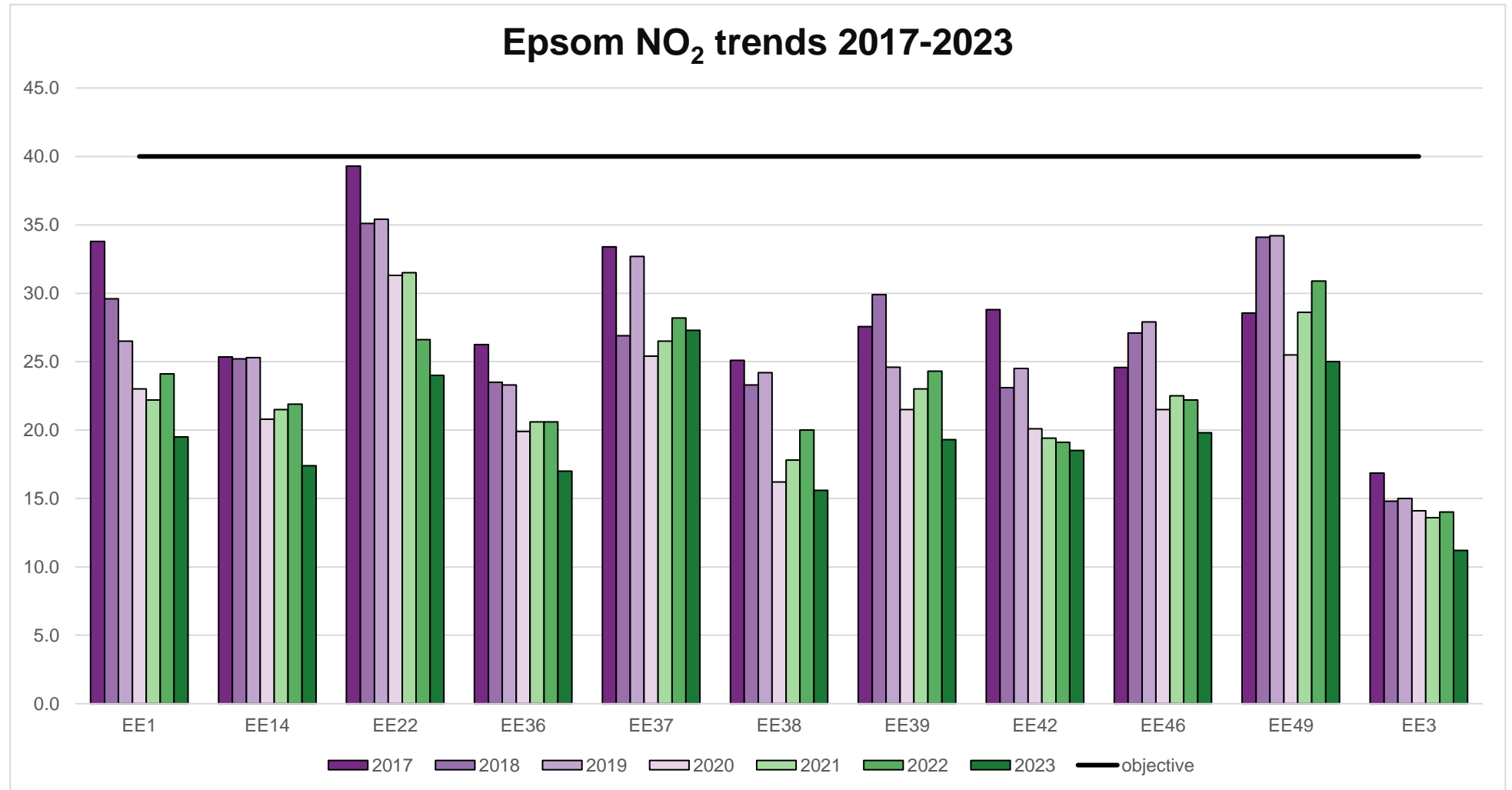


Figure A.1.2 – NO₂ Trends in Ewell Village 2017 – 2023

All monitoring sites shown are within the Ewell High Street AQMA area.

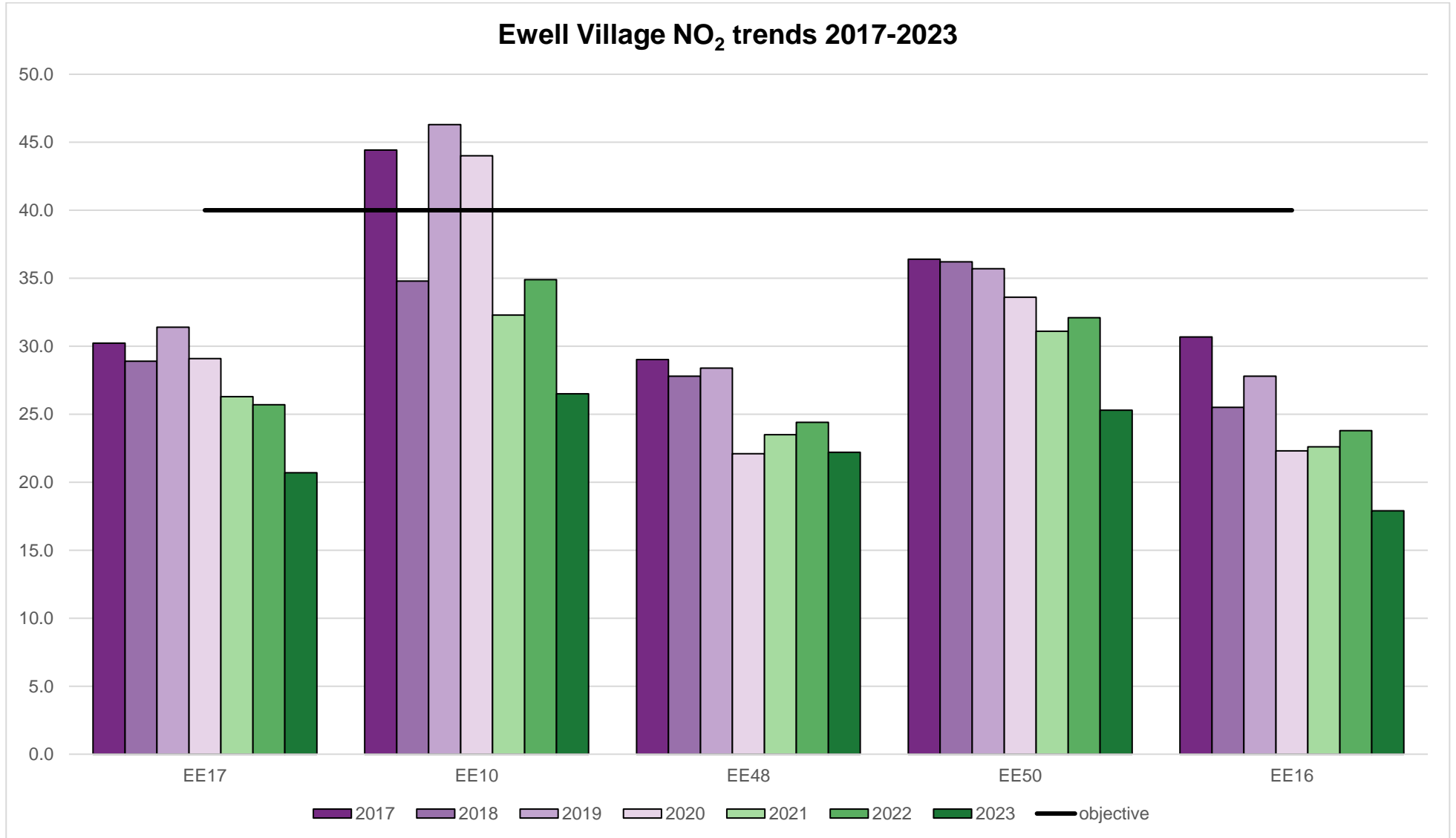
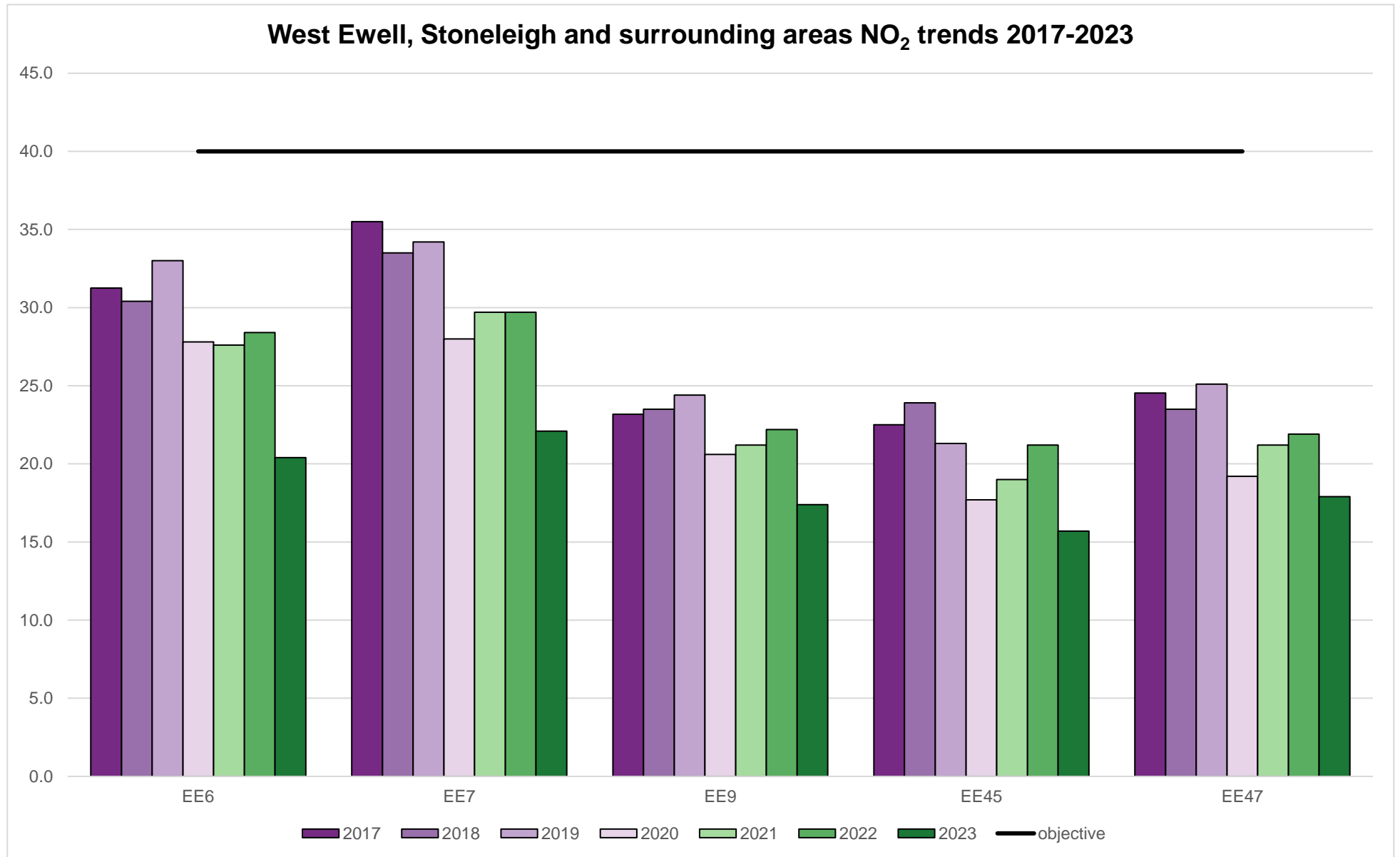


Figure A.1.3 – NO₂ Trends in West Ewell, Stoneleigh and surrounding areas 2017 – 2023



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EE1	520732	160762	33.0	30.0	25.0	25.0	18.0		17.0	18.0	30.0	29.0	27.0	16.0	24.4	19.5	-	
EE3	519293	160026	22.0	19.0	13.0	13.0	11.0	13.0	10.0	8.0	15.0	14.0	18.0	12.0	14.0	11.2	-	
EE6	520525	165040	35.0	36.0	26.0	27.0	17.0	21.0	17.0	18.0	30.0	28.0	31.0	20.0	25.5	20.4	-	
EE7	520916	164636	42.0	33.0	28.0	28.0	21.0	24.0	24.0	19.0		30.0	31.0	24.0	27.6	22.1	-	
EE9	519830	163740	32.0	24.0	24.0	23.0		17.0	14.0	15.0	27.0	22.0		19.0	21.7	17.4	-	
EE10	521998	162633	44.0	38.0	35.0	32.0		28.0	32.0	23.0	33.0		39.0	27.0	33.1	26.5	-	
EE14	520885	161308	30.0		21.0	22.0	18.0	17.0	22.0	13.0	24.0	25.0	27.0	20.0	21.7	17.4	-	
EE16	522026	162624	32.0	29.0		23.0	16.0	15.0	19.0	17.0	27.0	28.0	20.0	20.0	22.4	17.9	-	
EE17	522025	162563	36.0	32.0	24.0	31.0	20.0	23.0	19.0	18.0	30.0	27.0	30.0	21.0	25.9	20.7	-	
EE22	520965	160871	31.0	36.0	33.0	29.0	29.0	26.0	21.0	24.0	33.0	37.0	36.0	25.0	30.0	24.0	-	
EE36	521069	160817	23.0	31.0	21.0	20.0	15.0	20.0	18.0	16.0	24.0	25.0	24.0	18.0	21.3	17.0	-	
EE37	520726	160857	30.0	31.0		30.0				21.0	36.0	34.0	33.0	26.0	30.1	27.3	-	
EE38	520726	160857	27.0	25.0	19.0	19.0	18.0	19.0	17.0	13.0			23.0	15.0	19.5	15.6	-	
EE39	520844	160729	23.0	32.0	24.0	25.0		21.0	22.0	17.0	26.0	26.0	27.0	22.0	24.1	19.3	-	
EE42	521004	160901	27.0	27.0	21.0	22.0	17.0		21.0	18.0	28.0	27.0	26.0	21.0	23.2	18.5	-	
EE43	521478	161447	30.0	35.0	31.0	22.0	15.0	20.0	19.0	20.0	27.0	20.0	28.0	22.0	24.1	19.3	-	
EE45	522211	163103	27.0	21.0	20.0	20.0	19.0	21.0	18.0	14.0	12.0	28.0	23.0	13.0	19.7	15.7	-	
EE46	520724	161027	31.0	35.0	26.0	25.0	19.0	23.0	19.0	13.0	29.0	28.0	29.0	20.0	24.8	19.8	-	
EE47	520713	162968	30.0	24.0	23.0	26.0	19.0	21.0	18.0	17.0	26.0	26.0	26.0	13.0	22.4	17.9	-	
EE48	522022	162502	33.0	35.0	25.0			26.0	21.0	21.0	38.0	28.0	30.0	20.0	27.7	22.2	-	
EE49	520580	160586	36.0	37.0	31.0	29.0	25.0	33.0	23.0	28.0	38.0	36.0	35.0	24.0	31.3	25.0	-	
EE50	521975	162677	42.0	41.0	34.0	30.0	25.0	24.0	23.0	18.0	40.0	39.0	37.0	26.0	31.6	25.3	-	
EE51	520702	160872	38.0		23.0	26.0	24.0	25.0	19.0	17.0	29.0	20.0	29.0	19.0	24.5	19.6	-	
EE52	522303	163213	45.0	47.0	34.0	33.0	29.0	38.0	24.0	35.0	37.0	28.0	36.0	26.0	34.3	27.5	-	
EE53	522369	163289	26.0	25.0	20.0	17.0	14.0	18.0	16.0	15.0	22.0	20.0	20.0	14.0	18.9	15.1	-	

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Epsom & Ewell Borough Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Epsom & Ewell During 2023

Epsom & Ewell Borough Council has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Epsom & Ewell Borough Council During 2023

Epsom & Ewell Borough Council has not completed any additional works within the reporting year of 2023.

QA/QC of Diffusion Tube Monitoring

Epsom & Ewell Borough Council utilise diffusion tubes supplied and analysed by Lambeth Scientific Services, who use a 50% TEA in acetone method of preparation, following procedures in accordance with the Practical Guidance Documents.

The analysing laboratory participates in the AIR NO₂ Proficiency Testing Scheme for diffusion tubes with provides Quality Assurance / Quality Control (QA/QC).

Diffusion tube monitoring was completed in compliance with the 2023 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

Due to theft or tampering EE37 British Heart Foundation, High Street data capture was 66.67%, thus falling below the 75% minimum and required annualisation.

Following the guidance of the LAQM Technical Guidance (TG22)¹⁵ urban background automatic monitoring data was sourced from DEFRA AURN sites located within 50 miles (measured linearly) from the monitoring site.

London Hillingdon (monitoring site 22.59km / 14.03 miles from EE37 location) and Brighton Preston Park (monitoring site 55.54km / 34.44miles from EE37 location) were identified and annualisation calculations were performed by the Diffusion Tube Data Processing Tool.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisation Factor London Hillingdon	Annualisation Factor Brighton Preston Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
EE37	0.9123	0.9015	0.9069	30.1	27.3

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Epsom & Ewell Borough Council have applied a national bias adjustment factor of 0.8 to the 2023 monitoring data. A summary of bias adjustment factors used by Epsom & Ewell Borough Council over the past five years is presented in Table C.2.

¹⁵ Department for Environment Food & Rural Affairs. Local Air Quality Management Technical Guidance (TG22), August 2022.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	06/24	0.8
2022	National	03/23	0.95
2021	County	-	0.94
2020	County	-	0.97
2019	County	-	1.03

NO₂ Fall-off with Distance from the Road

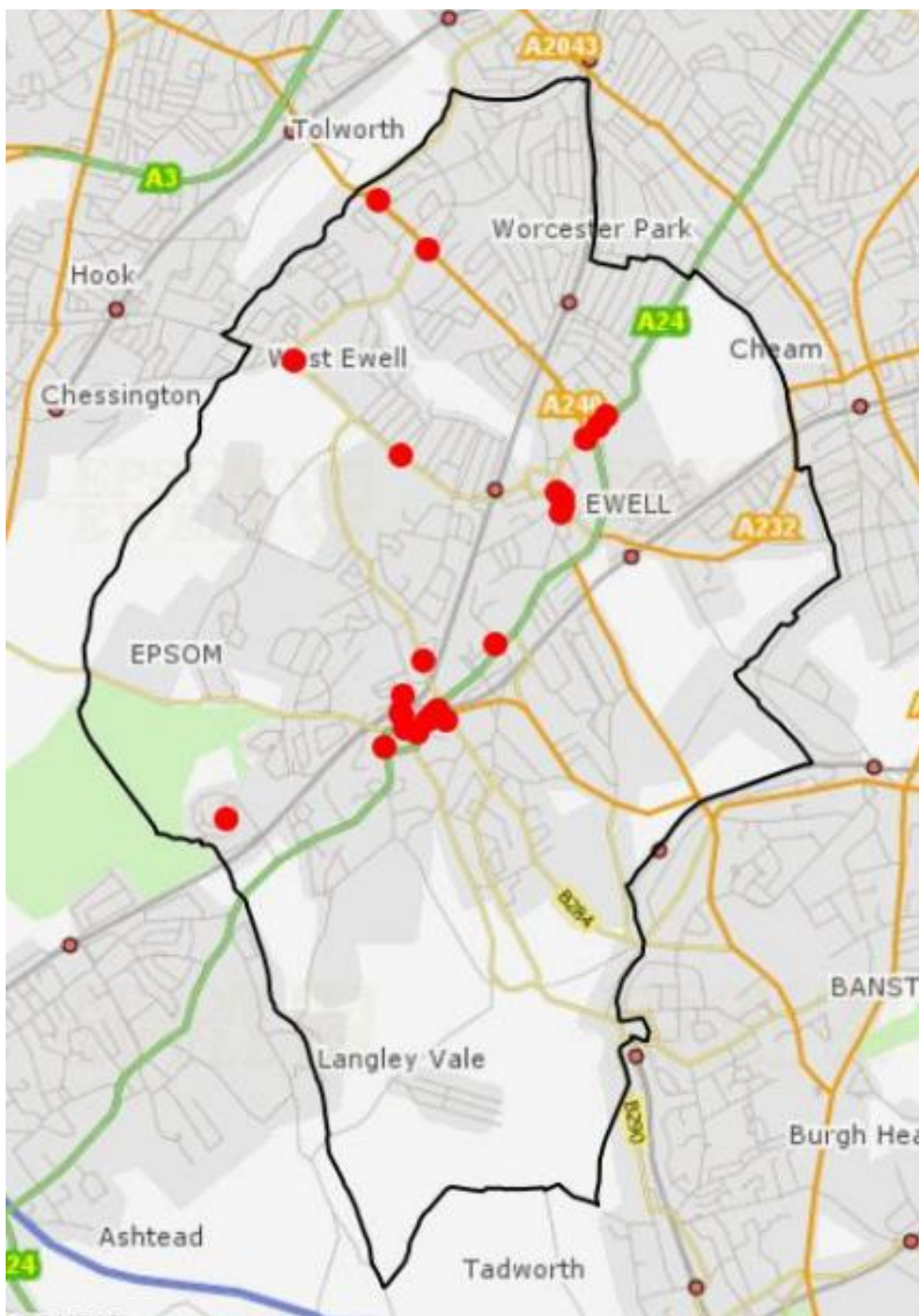
Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website.

No diffusion tube NO₂ monitoring locations within Epsom & Ewell required distance correction during 2023.

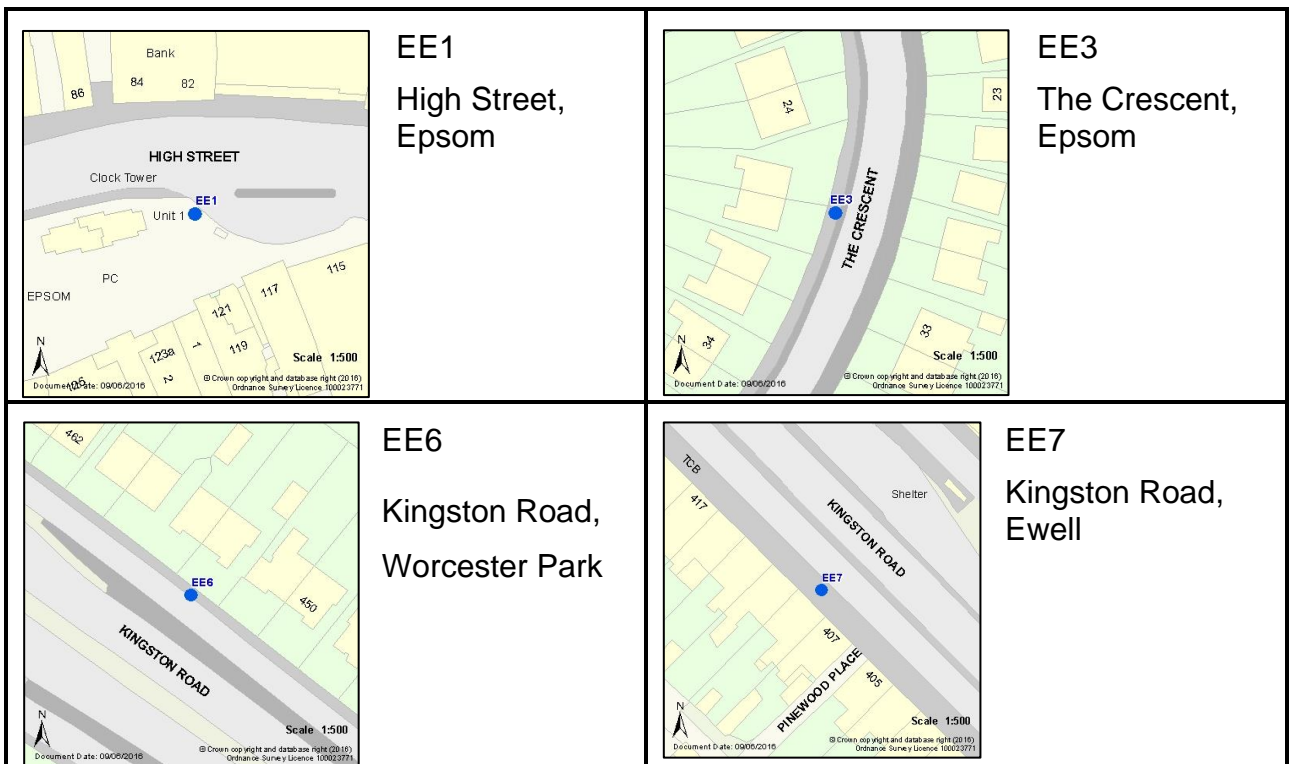
Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Site

Map of non-automatic monitoring sites across Epsom & Ewell Borough Council area



Map of non-automatic monitoring sites within Ewell High Street Air Quality Management Area



	<p>EE9</p> <p>Chessington Road, Ewell</p>		<p>EE10</p> <p>High Street, Ewell</p>
	<p>EE14</p> <p>Hook Road, Epsom</p>		<p>EE16</p> <p>Church Street, Epsom</p>
	<p>EE17</p> <p>Junction High Street and Cheam Road, Ewell</p>		<p>EE22</p> <p>High Street, Epsom</p>
	<p>EE36</p> <p>Church Street, Epsom</p>		<p>EE 37</p> <p>High Street, Epsom</p>
	<p>EE38</p> <p>Station Approach South, Epsom</p>		<p>EE39</p> <p>The Parade, Epsom</p>

	<p>EE42</p> <p>East Street, Epsom</p>		<p>EE43</p> <p>Kiln Lane, Epsom</p>
	<p>EE45</p> <p>Castle Parade, Ewell</p>		<p>EE46</p> <p>Waterloo Road, Epsom</p>
	<p>EE47</p> <p>Chessington Road, Ewell</p>		<p>EE48</p> <p>High Street, Ewell</p>
	<p>EE49</p> <p>South Street, Epsom</p>		<p>EE50</p> <p>High Street, Ewell</p>
	<p>EE51</p> <p>Station Approach North, Epsom</p>		<p>EE52</p> <p>London Road, Ewell</p>
	<p>EE53</p> <p>London Road, Ewell</p>		

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹⁶

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

¹⁶ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

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- Epsom & Ewell Borough Council Climate Change Action Plan. (Accessible at: [Climate Change Action Plan - Annex 1 \(epsom-ewell.gov.uk\).](https://www.epsom-ewell.gov.uk/news/2022/08/02/epsom-ewell-responds-to-ulex-consultation))

