Sevenoaks District Council

Air Quality Annual Status Report

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

June 2023

Sevenoaks
DISTRICT COUNCIL

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Report Reference Number	SDC/ASR/2023
Date	June 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Sevenoaks District Council

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

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

The primary source of air pollution within the Sevenoaks district is from Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10} & $PM_{2.5}$), predominantly stemming from road traffic. The district has three major motorways running through it, the M25, M26 and M20. These major roads connect London and the north of the UK to the port at Dover and the Channel Tunnel, and as such has a continual flow of continental HGVs. Additionally commuter traffic either directly into, or connecting to, London and local journeys such as school runs contribute significantly to a number of 'hot spots' in Sevenoaks, Swanley, and a number of small towns located along the A25.

At all monitoring locations in 2022, annual mean NO_2 concentrations were reported to be below the annual mean Air Quality Strategy (AQS) objective of 40µg/m3. The maximum reported concentration was 35.2µg/m³ at DT42, located at the London Road, Riverhead. This site is located at a site of relevant exposure. The second highest concentration (34.2

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

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

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

[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

μg/m^3) was reported at DT87 in Bradbourne Vale Road South, Sevenoaks. As this site is not located as a site of relevant exposure and as the result does not exceed 36.0μg/m^3 it is not required to be distance corrected. In general, across the Sevenoaks District, concentrations have decreased slightly from what was reported in 2021. This continues the overall trend of decreasing annual mean NO_2 concentrations over the past 5 years within the district.

All diffusion tubes within AQMA's 8 and 14 showed an annual decline in average concentrations. AQMA 13, one of the twenty six tubes present (DT36) showed an increase in annual average, with no clear identifiable cause for the increase could be identified. AQMA 10 showed the highest increase in tube averages, with four of the nine tubes increasing. These were DT28, DT51, DT81 and DT90, it should be noted these are located on Sevenoaks High Street, however there is no clear cause identified for the increases. Of the twelve tubes located outside of the AQMA's, only one showed an increase.

In addition, no breaches of the NO_2 hourly, PM_{10} annual, or PM_{10} daily AQS objectives were reported at any of the relevant monitoring locations within the district.

In April 2022 Sevenoaks District Council adopted a new Air Quality Action Plan (AQAP). The measures included within this action plan are detailed within this report.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and

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[5] Defra. Environmental Improvement Plan 2023, January 2023

reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

As detailed within the Sevenoaks District Council Air Quality Action Plan 2022 the key planned measures include:

- Improvements to the road and junction at Bat & Ball, Sevenoaks High Street, Seal, Riverhead and Brasted. Implementation of measures to encourage active travel including the development of new walking and cycling routes, introducing bike rental schemes and the advertisement of active travel schemes.
- Introducing various behavioural campaigns to reduce single use occupancy car journeys and vehicle idling.
- Exchanging the council's fleet, and the local bus fleet, to low emission and ultra-low emission vehicles.
- Developing and upgrading the districts electric vehicle infrastructure.
- Education of the public to discourage the use of bonfires as a method of waste disposal.
- Assisting businesses with identifying ways in which they can reduce their emissions and convert to low emission vehicles within their fleets.
- Reducing emissions from activities with Environmental Permits
- Working alongside Highways England to reduce the requirement for LGV & HGV vehicles to use the A25.

Due to the nature of the emission sources (a notable amount of HGV through traffic on the major road network and a large proportion of commuter traffic) it is difficult to target specific 'hot spot' areas within the district so the council is looking to carry out a number of measures that will target road user behaviours. And although these will not be entirely focused on specific areas it is the belief that these will help to significantly improve pollution throughout the district to ensure that residents are not exposed to high pollution

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

levels. In addition to these, further measures which are detailed within the Air Quality Action Plan will also target and encourage the reduction of emissions of PM_{10} & $PM_{2.5}$.

The Air Quality Promotions Officer has facilitated the ongoing implementation of the actions and measures set out within the AQAP and has been involved in an electric vehicle study as well as working alongside schools within the county to publish a number of resources involving tackling air pollution, reduction of vehicle idling and walk to school incentives.

Conclusions and Priorities

The following conclusions can be made from this year's ASR:

- Annual mean NO_2 concentrations at all monitoring sites are below the AQS objective of 40ug/m^3. This is also the case for NO_2 hourly, PM_{10} and PM_{10} daily AQS objectives.

- There continues to be an overall downward trend in annual mean NO_2 concentrations across all monitoring sites, with the exception of 4 tubes within AQMA 10.

- There are 4 tubes (DT28, DT51, DT81 and DT90) in AQMA 10, located within Sevenoaks which have increased however the overall trend shows a light increase in NO_2 concentrations over the previous year from 21.5 to 21.8 ug/m^3. Although there is no clear reason as to why NO_2 may be increasing in these particular areas, Sevenoaks District Council will continue to monitor these locations closely.

- There has been a rebound in annual mean NO_2 concentrations following the end of Covid-19 pandemic restrictions, however whilst emissions are higher than those witnessed during the monitoring years impacted by imposed lockdowns, they are broadly in line with the overall downwards 5-10 year trend.

- The highest monitored concentration within the district was measured at DT42, which is located at London Road, Riverhead along the A25. This maximum concentration (35.2ug/m^3) was still below the national objective level.

The District Council has revoked the following AQMAs in 2022:

- AQMA 1 - Declared for NO_2 - Junction 3 of the M25 to the district boundary with Tonbridge and Malling Borough Council including part of the A20 at Farningham.
- AQMA 2 - Declared for NO_2 - County border with Surrey to district border with Dartford, including Junctions 3, 4 and 5 and the extension of Junction 5 to connect with the A25 at Bessel's Green.
- AQMA 3 - Declared for NO_2 - M26 - from Junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council.
- AQMA 4 - Declared for NO_2 - Swanley Bypass - from Junction 3 of the M25 to the district boundary with the London Borough of Bromley.
- AQMA 6 - Declared for PM_{10} - Junction 5 to Kent / Surrey border.

Sevenoaks District Council has the following priorities for the coming year:

- Continue to promote the AQAP and deliver measures identified.
- Investigate and report on the future demand for EV infrastructure within Sevenoaks District and work towards meeting the needs of residents without access to off-road parking.
- Continue to develop the Local Cycling and Walking Infrastructure Plan (LCWIP) for Sevenoaks urban area and develop an LCWIP for Swanley.
- Develop a protocol with our Development Management Team for the implementation of Air Quality mitigation measures on developments within/adjacent to an AQMA.
- To undertake a best value review of our existing Air Quality Stations and air quality monitoring.
- To develop projects to address emissions of $PM_{2.5}$, particularly those that are associated with domestic burning.

Local Engagement and How to get Involved

Members of the public can help to improve air quality by making small changes to their everyday lives.

- Finding alternative methods to making car journeys, such as walking or cycling, will help to reduce local traffic, improve congestion and reduce vehicle emissions.

- When vehicles are stationary; such as if you are in a traffic jam, are waiting at traffic lights or at level crossings do not allow car engines to idle. Instead turn off your vehicle to reduce emissions which will also save fuel.

- By anticipating the flow of traffic, remaining in a higher gear and maintaining a continuous speed at low revs per minute (RPM), this helps to reduce pollution from your vehicle whilst also saving on fuel consumption.

- Research alternative vehicle types such as electric, hybrid or ULEZ compliant cars which produce lower emissions and help to improve local air quality.

- Ensure that vehicles are regularly maintained, making sure that filters and oil are inspected and replaced regularly to support optimum performance. If sooty exhaust emissions are coming from your vehicle, take it to a garage for servicing as this will be significantly be contributing to poor air quality. Regular tyre maintenance and pressure checks are important to achieve your vehicles optimum fuel consumption, consequently also saving you money.

- Avoid making short journeys by car as to work effectively engines need to reach a high temperature to work at optimal performance. Walking, cycling or use of public transport will produce much lower emissions, if any, than using a car for short trips and will usually be the cheaper option.

- For shorter journeys, walking cycling or using public transport can often be a cheaper and more environmentally conscious option.

- Find alternatives to using wood burners, burning solid fuels and having garden bonfires as they produce harmful toxins, and contribute a significant amount to particulate pollution.

Further details on air quality monitoring carried out by Sevenoaks District Council can be found on the London Air Quality Network website.

Sevenoaks District Council has one Smoke Control Order in place under the Clean Air Act 1993. To check if their property is subject to a Smoke Control Order residents can visit the Council's website.

Within a Smoke Controlled Area only authorised fuels, or any of the below 'smokeless' fuels can be burnt, unless an exempt appliance is used.

- Gas
- Low volatile steam coal
- Anthracite
- Semi-anthracite

If your property does not fall within a Smoke Control Area, you should still be aware that appliances that burn solid fuel will contribute to local air pollution, evidence shows that these contributions are increasing due to gaining popularity for occasional heating requirements, particularly during the winter months. The council have noted a rise in complaints concerning smoke emissions from domestic properties, as burning solid fuels can generate significant levels of particulate pollution. Non-compliance with the smoke control legislation can result in a fine of up to £1,000.

The Department for Environmental Food and Rural Affairs have produced guidance should residents still wish to use solid fuels or solid fuel appliances.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Sevenoaks District Council with the support and agreement of the following officers and departments:

- Nick Chapman, Environmental Health Manager
- Colin Alden, Environmental Protection Team Leader
- Holly Harris, Air Quality Promotions Officer
- Sian May, Environmental Protection Officer
- Sevenoaks District Councils Development Management
- Sevenoaks District Councils Licencing
- Sevenoaks District Councils Direct Services

This ASR has been approved by:

Colin Alden Environmental Protection Team Leader

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

If you have any comments on this ASR please send them to Sian May at:

air.quality@sevenoaks.gov.uk

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1 Local Air Quality Management

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

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Sevenoaks District Council to improve air quality and any progress s 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 Sevenoaks District Council can be found in Table 2.1. The table presents a description of the 4 AQMAs that are currently designated within Sevenoaks District Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. Additional information on the AQMAs can be found on **Defra's UK-Air**. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean

As detailed in the 2022 ASR Sevenoaks District Council has revoked the following AQMAs:

- AQMA 1 – Declared for NO_2 – Junction 3 of the M25 to the district boundary with Tonbridge and Malling Borough Council including part of the A20 at Farningham.
- AQMA 2 – Declared for NO_2 – County border with Surrey to district border with Dartford, including Junctions 3, 4 and 5 and the extension of Junction 5 to connect with the A25 at Bessel's Green.
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- AQMA 6 – Declared for PM_{10} – Junction 5 to Kent/Surrey border.

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
AQMA 8	01/09/2006	NO$_2$ Annual Mean	Swanley - London Road (East); High Street; Bartholomew Way and parts of Central town area	NO	56.7µg/m3	Not Applicable	4	Sevenoaks Air Quality Action Plan 2022	Sevenoaks Air Quality Action Plan 2022
AQMA 10	10/01/2008	NO$_2$ Annual Mean	Swanley - London Road (East); High Street; Bartholomew Way and parts of Central town area	NO	46.5µg/m3	Not Applicable	3	Sevenoaks Air Quality Action Plan 2022	Sevenoaks Air Quality Action Plan 2022
AQMA 13	14/01/2014	NO$_2$ Annual Mean	The entire length of the A25 from the border with Tonbridge and Malling in the east to the border with Tandridge in the west.	NO	55.3µg/m3	Not Applicable	3	Sevenoaks Air Quality Action Plan 2022	Sevenoaks Air Quality Action Plan 2022
AQMA 14	14/01/2014	NO$_2$ Annual Mean	The junction of London Road and Birchwood Road, Swanley.	NO	48.8µg/m3	Not Applicable	3	Sevenoaks Air Quality Action Plan 2022	Sevenoaks Air Quality Action Plan 2022

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

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

2.2 Progress and Impact of Measures to address Air Quality in Sevenoaks District Council

Defra's appraisal of last year's ASR concluded that the report was detailed and well presented with clear and consistent figures and labels. Defra also noted that it was clear from the report that Sevenoaks District Council is committed to ensuring good air quality within the district. The following comments are designed to help inform future reports.

1.1 Figures are clear and consistent, with all AQMAs and monitoring sites labelled clearly. A scale has also been included for completeness. The colours chosen to distinguish between automatic and passive monitoring sites are quite similar, and it can therefore be difficult to determine whether a site is automatic or passive. A different colour choice may be beneficial for the reader.

2.1 QA/QC measures have been discussed, along with details of how the diffusion tubes are analysed in the laboratory. Good reasoning for the chosen bias adjustment factor has been given, and calculations for appropriate local bias and adjustment factor and distance calculations have been provided. For completeness, the Council could include an image of the appropriate national bias adjustment factor spreadsheet in future reports.

3.1 Only 12 of the 51 monitoring locations, including one co-location, are located outside of AQMAs. The Council could expand this monitoring to ensure that any new areas of concern are highlighted, particularly as revocation of current AQMAs is undertaken.

4.1 Measures to address $PM_{2.5}$ concentrations have been provided. The Council have also included the fraction of mortality attributable to particulate matter and have compared this to local and national statistics. The Council should continue these discussions in future reports.

5.1 The Council have discussed the trends in the monitoring data over the past five years and have included detailed and well-presented graphs to support this. It is clear that the Council is committed to ensuring good air quality within the District, and should continue the good work in future years.

Sevenoaks District Council welcomes these comments to help improve future reports and will continue to include detailed supporting graphs and discussions surrounding the Fraction of Mortality Attributable to Particulate Air Pollution. It was noted that the colours chosen to distinguish between the automatic and passive monitoring sites were similar, so clearer distinguishing colours have been chosen going forwards for reader convenience. Following a clear discussion of the QA/QC measures, additional information has been provided on the analysis methods used as well as a detailed explanations for the chosen bias adjustment factor, calculations for the local bias adjustment factor and distance calculations, including an image of the national bias adjustment factor spreadsheet.

Sevenoaks District Council continues to regularly review the locations and positions of the air quality monitoring devices, and where traffic congestion or development (existing or proposed) is identified as a potential area of concern, additional monitoring will be installed.

Sevenoaks District Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 32 measures are included within Table 2.2, with the type of measure and the progress Sevenoaks District Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the respective Action Plan, the Net Zero Action Plan 2022/23, the Movement Strategy, Low Emission and Electric Vehicle Strategy, and the Local Walking and Cycling Infrastructure Plan.

Key completed measures are:

- Measure 11- Reduction in vehicle idling through the promotion of health impacts at primary and secondary schools
- Measure 12- Educational Campaigns for schools- including attendance at assembly and delivery of key messages
- Measure 21- Implementation of flexible/ hybrid working arrangements for District Council staff
- Measure 23- Complete a detailed modelling assessment of the Swanley Area to quantify the local air quality

- Measure 24- Hire an Air Quality Promotions Officer

Sevenoaks District Council expects the following measures to be completed over the course of the next reporting year:

- Measure 1- Development of Local Plan Policy and guidance to ensure developers take account of onsite and offsite air quality.
- Measure 8- Development of new walking and cycle routes
- Measure 15- Improving and developing the EV infrastructure within the district including the completion of a study identifying future EV infrastructure demand within the District.
- Measure 16- Installing EV charging points within all Council owned carparks

Sevenoaks District Council's priorities for the coming year are:

- To progress actions within the 2022 AQAP
- Align air quality work with the District Council's Climate Change Strategy whenever possible
- Identify additional resource for promotion of measures to reduce emissions of PM2.5 including targeted actions regarding domestic combustion and burning.

Sevenoaks District Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Neighbouring local authorities
- Highways England
- Local businesses and fleet operators

The principal challenges and barriers to implementation that Sevenoaks District Council anticipates facing are constraints on funding available to execute some of the proposed measures. Some of these measures set out may not be viable at this time, however due to the amount of measures set out it is hoped that some of these may become more viable in due course.

Progress on the following measures has been slower than expected due to:

- Measure 2 - Junction improvements at Bat & Ball Junction (A25/ A225 Junction) - Progress on this measure is dependent on funding associated with a proposed

nearby local development and delivery is subject to appropriate consents being granted.

- Measure 6 - Bike rental schemes - The Council continues to undertake feasibility studies but at present such a scheme appears not to be commercially viable within the Sevenoaks District.

- Measure 14 - Transitioning the Council's fleet to low emission vehicles- Substantial progress has been made but transition is subject to financial constraints and procurement difficulties (i.e. replacement of the animal welfare vehicle with an EV alternative has taken 8 months).

Sevenoaks District Council anticipates that the measures stated above and in Table 2.2 will help maintain compliance in all AQMAs across the district.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	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	Local Plan policy and guidance – Ensure that developers take account of onsite and offsite air quality when assessing the environmental impact of their proposals. That suitable onsite and offsite air quality mitigation measures are included (including financial contributions to strategic air quality improvement measures) as part of a proposal such that future air quality is either improved or sustained at a level that would be achieved without the development.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2022	Ongoing	SDC/ KCC	Internal/ Existing	No	Funded	Low	Implementation	NO_2, Whilst guidance already exists, it is important to keep these up-to-date as policies and strategies evolve.	Implementation of policy.	Draft policies. Second Regulation 18 consultation in Autumn 2023	The emerging Local Plan (Plan 2040) will include more detailed policy for Air Quality. Air Quality will be considered in the site selection for emerging allocations.
2	Junction improvements at Bat & Ball Junction (A25/ A225 Junction)	Traffic Management	UTC, Congestion management, traffic reduction	2022	2030	SDC/ KCC/ STC	CIL / KCC / S106 Funding	No	Not Funded	Very High	Planning	NO_2, To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO_2 concentrations (amount to be determined by scenario testing once suitable scheme is identified) / Reduced congestion and journey times.	Junction improvements are proposed as part of the Quarry planning application (22/00512/OUT) which is pending decision. An Initial Baseline Transport Assessment was completed in August 2022. It aims to understand the baseline data and identify potential transport challenges and opportunities that could help inform future decision making.	The Local Plan will consider the impact of development on these junctions and potential improvements. Evidence base documents are being updated to support the Local Plan. Cost of works likely to be significant and to cause significant disruption during implementation phase. Funding not secured.
3	Junction improvements at A224/A25 in Riverhead	Traffic Management	UTC, Congestion management, traffic reduction	2022	2030	SDC/ KCC/ STC	CIL / KCC / S106 Funding	NO	Not Funded	Very High	Planning	NO_2, To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO_2 concentrations (amount to be determined by scenario testing once suitable scheme is identified) / Reduced congestion and journey times.	An Initial Baseline Transport Assessment was completed in August 2022. It aims to understand the baseline data and identify potential transport challenges and opportunities that could help inform future decision making.	The Local Plan will consider the impact of development on these junctions and potential improvements. Evidence base documents are being updated to support the Local Plan. Cost of works likely to be significant and to cause significant disruption during implementation phase. Funding not secured.

Measure No.	Measure	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
4	Road/ Junction improvements along A225 Sevenoaks High Street	Traffic Management	UTC, Congestion management, traffic reduction	2022	2030	SDC/ KCC/ STC	CIL / KCC / S106 Funding	NO	Not Funded	Medium to high	Planning	NO_2, To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO_2 concentrations (amount to be determined by scenario testing once suitable scheme is identified)/ Reduced congestion and journey times.	A Sevenoaks Town wide 20mph speed limit is proposed. A revised scheme was put before Sevenoaks Joint Transport Board in March 2023.It was recommended to KCC that the scheme proceed to an informal consultation with due consideration to the emerging LCWIP for the revised 20mph speed limit area in Sevenoaks Town and pedestrian crossing on the A225.	There is no KCC funding currently identified to progress these proposals. Full funding is required to cover further detailed design work and eventual construction.
5	Road improvements along the A25 in Seal, and the A25 in Brasted	Traffic Management	UTC, Congestion management, traffic reduction	2022	2030	SDC/ KCC/ STC/ SPC/ WTC/ BPC	CIL / KCC / S106 Funding	NO	Not Funded	Medium to high	Planning	NO_2, To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO_2 concentrations (amount to be determined by scenario testing once suitable scheme is identified)/ Reduced congestion and journey times.	An Initial Baseline Transport Assessment was completed in August 2022. It aims to understand the baseline data and identify potential transport challenges and opportunities that could help inform future decision making.	The Local Plan will consider the impact of development on these junctions and potential improvements. Evidence base documents are being updated to support the Local Plan. Cost of works likely to be significant and to cause significant disruption during implementation phase. Funding not secured.
6	Bike rental schemes	Promoting Travel Alternatives	Promotion of cycling	2022	Ongoing	SDC	CIL / Grant/ Commercial Income	NO	Not Funded	Medium	Planning	NO_2, Small impact upon NO_2 concentrations from measure individually, estimated to be less than 1μg/m3 based upon a low to medium uptake.	Number of bikes available and rentals.	Draft feasibility for e-bikes hire for Sevenoaks Urban Area.	Cycling infrastructure identified as significant barrier to bike hire schemes.
7	Promotion of active travel schemes	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2022	Ongoing	SDC/ KCC	Internal/ Existing	NO	Funded	Low	Implementation	NO_2, Measure is more an awareness raising tool to encourage uptake and use of existing schemes.	Movement Strategy to be adopted Spring 2022. Recruitment of an Air Quality Promotions Officer.	Movement strategy adopted in April 2022.	Promotion of measures to wider audience using dedicated AQPO Resource. Focus on replacing private vehicle movements (38.1% NO2 Emissions) with sustainable alternatives.

Measure No.	Measure	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
8	Development of new walking and cycle routes	Transport Planning and Infrastructure	Cycle network	2022	2027	SDC/ KCC	Internal/Existing to develop plan + CIL/ grant to develop infrastructure	NO	Partially Funded	Medium/ High. LCWIP – approx. £25-30k each	Implementation	NO$_2$. Small impact upon NO$_2$ concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Development of the Local Cycling and Walking Strategy. Completion of cycle routes.	The Sevenoaks Urban Area LCWIP completed in January 2023. In May 2022 a funding bid to Central Government for the delivery of the prioritised route of the LCWIP (East to West Sevenoaks, route 3) was successful. £1.2 million was awarded. Work is ongoing in partnership with KCC for the route's delivery with a public consultation on the proposed route taking place Summer 2023. Funding has been secured from Central Government for the creation of a further LCWIP for Swanley. This is due to be completed in January 2024. Funding has been secured from Central Government for feasibility studies for 2 further routes from the Sevenoaks Urban Area LCWIP (routes 1 and 6). These are due to be completed in January 2024.	It is intended on further LCWIPs to be carried out in the district subject to external funding opportunities.
9	District wide promotion of active travel	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2022	2027	SDC	Internal/ Existing	NO	Funded	Low	Planning	NO$_2$. Measure to increase public awareness.	Number of promotion events.	Sevenoaks Urban Area LCWIP was completed in January 2023 and was promoted in February 2023.	Focus on replacing private vehicle movements (38.1% NO$_2$ emissions) with sustainable alternatives.
10	Behavioural change campaigns to reduce single use occupancy car journeys	Alternatives to private vehicle use	Other	2023	2027	SDC	Internal/ Existing	NO	Funded	Low	Planning	NO$_2$. Measure to increase public awareness.	Number of campaigns.	Being considered by the Net Zero team and AQPO.	Part of the Net Zero 2030 work. Would need to consider how best to reach audience. Focus on reducing the number of private vehicle movements within the AQMAs (38.1% NO$_2$ emissions).
11	Reducing vehicle idling	Traffic Management	Anti-idling enforcement	2022	2025	SDC	Internal/ Existing	NO	Funded	Low	Implementation	NO$_2$. Measure largely to increase public awareness, but will help reduce pollutant levels in key hotspot areas.	Reduction in NO$_2$ concentrations. Quantitative assessments undertaken before and after initiatives.	Idling campaign was started in 2022. Children across district designed posters for idling banners. Currently finalising designs of posters/banners internally and will shortly be sending these out to schools.	School engagement has been difficult to establish. Phase one of design has been implemented. Phase two will begin Summer 2023.

Measure No.	Measure	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
12	Educational campaigns for schools	Public Information	Other	2022	2027	SDC	Internal/ Existing	YES	Funded	Low	Implementation	NO_2. Measure to increase public awareness.	Number of campaigns.	Schools have engaged with presentations and resources offered so far. Idling campaign was started in 2022. Children across district designed posters for idling banners. Currently finalising designs of posters/banners internally and will shortly be sending these out to schools.	School engagement has been difficult to establish. Phase one of design has been implemented. Phase two will begin Summer 2023 for idling project
13	Collaboration with bus operators to introduce ultra-low emission vehicles into the fleets	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2022	2027	SDC/ KCC/ Private Operators	Internal/ Existing + CIL/ Grant as necessary	NO	Partially Funded	High	Planning	NO_2. Value to be confirmed by scenario testing.	Fleet Composition (% using LEV).	Initial discussions with KCC following the national bus strategy. Proposal for scenario testing being developed.	Working with KCC to consider how we can work together to bring forward low Emission schemes. Cost likely to be significant for bus operators. SDC unlikely to be able to fund initiatives without CIL/ developer contributions or Grants. AQPO to promote benefits to bus operators of sustainable Technologies. Reduce emissions of Busses 4.7% within AQMAs
14	Transitioning the Council's fleet to low emission vehicles	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2030	SDC	Internal	NO	Funded	High	Implementation	NO_2. Scenario Testing to be undertaken to assess the impact of the measure on NO_2 depending on fleet composition.	Change in fleet composition to less polluting vehicles.	Fleet composition considered by SDC Low Emission and Electric Vehicle Strategy.	A 5 year Vehicle Replacement Plan was approved by members on 10th November 2022, Cabinet Minute 57. Reduce of HGVs 4.9% within AQMAs.
15	Improving and developing the EV infrastructure within the district	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022	2030	SDC/ KCC	Internal/ Existing to initiate study of probable EV Charging Locations. External funding to be identified for installation/ working with district partners.	NO	Partially Funded	Medium / Very High	Implementation	NO_2. Small impact upon NO_2 concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Undertake a study to identify suitable locations (demand and infrastructure) for the installation of EV Charging Points. Number of EV charging points.	EV Technical Study began in 2022 and funded from appropriate s106 money (Already held by SDC). Due to be completed Autumn 2023.	Part of the recently published Low Emission and Electric Vehicle Strategy. Reduce % NO2 emissions from private vehicles (38%).
16	Installing EV charging points within all Council owned carparks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022	2027	SDC/ KCC	Internal	NO	Funded	High	Completed	NO_2. Small impact upon NO_2 concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Number of EV charging points within District Area.	Operational.	UKPN and grid reinforcement.
17	Improving public transport infrastructure	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2022	2027	SDC/ KCC	External	NO	Not Funded	Very High	Planning	NO_2. Small impact upon NO_2 concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Increased use of Public transport. Additional routes public transport facilities.	Movement Strategy adopted April 2022. Draft policies in the Regulation 18 Local Plan encourage strengthening transport interchanges.	Additional routes for public transport are unlikely to be viable unless commercially sustainable. Numerous bus route services, particularly school routes, have been withdrawn Summer/Autumn 2022.

Measure No.	Measure	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
18	Promote the use of public transport	Promoting Travel Alternatives	Promote use of rail and inland waterways	2022	2027	SDC/ KCC/ Rail Operators	Internal/ External	NO	Partially Funded	Medium	Implementation	NO_2. Measure is more an awareness raising tool to encourage uptake and use of available infrastructure.	Number of promotional events. Number of passengers on public transport.	DVCRP has implemented several improvements to stations, created new publicity material and in process of implementing new projects.	Obtaining approvals from Network Rail.
19	On and off-street parking charges linked to vehicle emissions standards	Promoting Low Emission Transport	Priority parking for LEV's	2021	Ongoing	SDC	Internal/ External	NO	Funded	Very High	Implementation	NO_2. Small impact upon NO_2 concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Number of discounted permits.	Residential on street permits are already discounted for hybrid vehicles. Review of the impact if changed to EV only.	New parking fees and charges increase approved by Members on 7th July 2022. The agreed proposals were developed to advance the District Council's move to Net Zero 2030. Part of the Net Zero 2030 work. Reduce % NO_2 emissions from private vehicles (38%) by encouraging LEV.
20	Car Club / Sharing schemes	Alternatives to private vehicle use	Car Clubs	2022	2027	SDC	External funding/ CIL	NO	Not Funded	Medium	Planning	NO_2. Small impact upon NO_2 concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Number of car sharing individuals.	Car Club schemes encouraged in new development thorough Regulation 18 Local Plan. Included within the Movement Strategy.	Car club schemes be further encouraged in new developments in the second Regulation 18 Local Plan in Autumn 2023.
21	Exploring flexible working and home working	Promoting Travel Alternatives	Encourage / Facilitate home-working	2022	Ongoing	SDC/ KCC	Internal	NO	Funded	Low	Implementation	NO_2. Measure to increase public awareness.	Levels of home working/ number of vehicle journeys removed from road network.	Local Plan to facilitate flexible working options. Working with businesses to explore how flexible working Can contribute to reducing emissions. Hybrid working policy developed and implemented for SDC staff.	Reduce % NO_2 emissions from private vehicles (38%) by reducing number within AQMAs.
22	Walking to school incentives/ encouragement	Promoting Travel Alternatives	School Travel Plans	2022	2027	SDC	Internal/ Existing Budgets + External funding	NO	Partially Funded	Low	Planning	NO_2. Measure to increase public awareness.	Reduction in school vehicle drop-offs / pick-ups. Reduced congestion around school opening and closing times.	Employed an AQPO to develop and undertake initiatives.	Could have a big impact and is supported by Councillors. Reduce % NO_2 emissions from private vehicles (38%) by reducing number within AQMAs
23	Complete a detailed modelling assessment of the Swanley Area to quantify the local air quality	Traffic Management	Other	2022	2027	SDC	Integral/ Existing Budgets	NO	Funded	Low	Completed	TBC	Completion of the report.	Report completed in 2022.	A number of developments are due to take place in and near to Swanley, therefore understanding the Existing air quality will help inform planning decision making. Survey to be funded from existing budgets within Environmental Health.
24	Hire an Air Quality Promotions Officer	Public Information	Other	2022	2022	SDC	Integral/ Existing Budgets	NO	Funded	Medium	Completed	N/A	Recruitment of AQPO.	Officer was successfully appointed in Jan 2022.	Increasing demand on EH workloads result in AQPO being deployed on other statutory duties.

Measure No.	Measure	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
25	To provide information and education in respect of personal emissions and how they may be reduced	Public Information	Other	2022	2027	SDC	Integral/ Existing Budgets	NO	Funded	Low	Implementation	NO_2 & $PM_{2.5}$	Number of educational campaigns.	Two articles within district wide magazine on air quality, reducing emissions and vehicle idling. Publicising events such as clean air day and Kent air week. Eco fairs attended in the district, to promote how to improve emissions.	Action to form part of the AQPO duties And role. Initiatives may include reducing emissions from home heating etc.
26	To work with businesses to identify ways to reduce emissions from their activities	Public Information	Other	2022	2027	SDC	Integral/ Existing Budgets	NO	Funded	Low	Planning	N/A	Number of educational campaigns.	Discussions held with businesses as part of business forums run by NetZero Team.	Action to form part of the AQPO duties And role. Part of the Net Zero 2030 work. Promote Laccase funding and training to businesses in SDC which will enable businesses in SDC to move to lower carbon and low pollution activities.
27	To discourage the use of bonfires as a means of waste disposal.	Public Information	Other	2022	Ongoing	SDC	Integral/ Existing Budgets	NO	Funded	Low	Implementation	PM_{10} & $PM_{2.5}$	Number of interventions to provide advice and information to residents. Total number of enforcement actions undertaken.	Forms part of current statutory duties. Advice provided via social media.	Environmental Health have an enforcement role for bonfires that constitute a statutory nuisance And offences under s2 Clean Air Act.
28	To reduce emissions from activities with Environmental Permits	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2022	Ongoing	SDC	Integral/ Existing Budgets	NO	Funded	Low	Implementation	NO_2, PM_{10}, $PM_{2.5}$	Increased compliance with Environmental Permitting Regulations. Number of premises identified as 'low risk; (%).	All relevant activities hold relevant permits. Worked to permit a number of businesses identified as not holding correct permits.	EH regulate activities that pollute to air. Risk based regime.
29	To work with Highways England to identify measures which will reduce the need for HGV and LGV vehicles to use the A25	Traffic Management	UTC, Congestion management, traffic reduction	2024	Ongoing	SDC/ KCC/ Highways England	External	NO	Funded	Very High	Planning	NO_2, PM_{10}, $PM_{2.5}$	Identification of schemes that may have AQ benefit along the A25 (AQMA 13).	Previous discussions held.	Focus on reducing emissions from LGV/ HGV along A25.
30	To review the effectiveness of introducing 20mph zones within areas where AQS objective levels are highest (Sevenoaks High Street, A25 Seal, Bat & Ball Junction, Riverhead, Westerham)	Traffic Management	Reduction of speed limits, 20mph zones	2023	2025	SDC/ KCC	Internal	NO	Funded	Low	Planning	NO_2, PM_{10}, $PM_{2.5}$	Undertake scenario testing to assess impact of measure.	Parish and Town Councils independently Seeking 20mph zones.	Focus on reducing emissions of all sources within AQMAs.
31	To work with business operators to increase the % composition of LEV within private fleets	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2023	2027	SDC/ KCC	Internal	NO	Funded	Low	Planning	NO_2	Number of businesses approached by AQPO. Update of LEVs by businesses	Work aligns with EV Infrastructure study which forms an evidence base	Reduction of emissions from HGV and LGV within AQMA 13. Promotion of the Kent REVs scheme and the buying of the Kent REVs electric vehicles.

Measure No.	Measure	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
32	To increase the number of Taxi operators using LEV and EV vehicles	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2023	2027	SDC	Internal/ External	NO	Not Funded	Low	Planning	NO_2	Number of vehicles within the taxi fleet changing to LEV/EV alternatives.	Report being taken to next Licensing Committee for agreement to consult on extension of EV and hybrid vehicles to 15 year licence rather than 10 as possible incentive.	Kent wide survey carried out directed to all licensed drivers for response on moving over to EV's. Survey highlighted barriers: High cost of vehicles Lack of infrastructure Unable to fit home charger as no drive Faulty public charge-points Public charging takes too long Cost of insurance Cannot do long impromptu trips Need to take time out working day to re-charge.

2.3 Progress and Impact of Measures to address Air Quality in Sevenoaks District Council

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

No monitoring of $PM_{2.5}$ is currently conducted within the Sevenoaks District, however the two automatic monitoring site located at Greatness and Bat & Ball monitor PM_{10} concentrations.

In addition to this, the current Defra 2022 background maps (based on 2018 monitored concentrations) for Sevenoaks District Council estimates that all background concentrations of $PM_{2.5}$ are well below the indicative annual mean limit value for $PM_{2.5}$.

The Public Health Outcomes Framework data tool compiled by Public Health England and The Department of Health has a number of public health indicators that are used to focus public health action, identify areas of health inequality and concern and monitor the differences in health impacts across regions in the UK. This framework includes an indicator "D01- Fraction of Mortality Attributable to Particulate Air Pollution" which is calculated using background annual average $PM_{2.5}$ concentrations, modelled at a $1km^2$ resolution based on measured concentrations from the AURN. As such, this quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2021 fraction of mortality attributable to $PM_{2.5}$ pollution across England is 5.5%, and the fraction within the South East region is lower than this at 5.4%. The fraction reported within Sevenoaks specifically is lower than the national and regional average, at 5.2%.

Measures to improve air quality often have shared wins with other public health indicators, a good example being the encouragement of active travel and commuting leading to increased physical activity and increased wellbeing. A number of the measures set out in the new AQAP aim to reduce vehicular travel frequency and time via means such as encouraging active travel and reducing single occupancy journeys. In addition, some of the measures are specifically targeted at reducing $PM_{2.5}$ concentrations, such as controlling the use of bonfires as a means of waste disposal and reducing emissions from activities with

environmental permits. These are all expected to have a positive impact on reducing PM$_{2.5}$ concentrations.

Sevenoaks District Council currently has a smoke control area that encompasses the Swanley urban area and land to the west of Crockenhill. Within this area, emissions of smoke from a chimney are forbidden unless authorised fuels or exempt appliances are being used.

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

This section sets out the monitoring undertaken within 2022 by Sevenoaks District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Sevenoaks District Council undertook automatic (continuous) monitoring at 2 sites during 2022. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The **LAQN website** presents automatic monitoring results for Sevenoaks District Council with automatic monitoring results also available through the **UK-Air website**.

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

Sevenoaks District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 53 sites during 2022, including two triplicate co-locations. Table A.2 in Appendix A presents the details of the non-automatic sites. There has been no changes to the non-automatic monitoring network in 2022.

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

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

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of $200\mu g/m^3$, not to be exceeded more than 18 times per year.

No exceedances of the annual mean NO_2 Air Quality Strategy (AQS) objective ($40\mu g/m^3$) have been reported at any monitoring location operated by Sevenoaks District Council in 2022. The maximum reported concentration is $35.2\mu g/m^3$, within 10% of the AQS objective ($36\mu g/m^{3)}$), reported at DT42 located on London Road, Riverhead next to the A25 and A224 which is not located at a site of relevant exposure. No other site reported an annual mean concentration $>36\mu g/m^3$.

Annual mean NO_2 concentrations have shown a trending decrease at the majority of monitoring locations from 2021 to 2022.

Annual mean NO_2 concentrations at all monitoring sites are below the AQS objective of $40ug/m^3$. This is also the case for NO_2 hourly, PM_{10} and PM_{10} daily AQS objectives. There continues to be an overall downward trend in annual mean NO_2 concentrations across all monitoring sites, with the exception of 4 tubes within AQMA 10. There are 4 tubes (DT28, DT51, DT81 and DT90) in AQMA 10, located within Sevenoaks which have increased however the overall trend shows a light increase in NO_2 concentrations over the previous year from 21.5 to 21.8 up/m^3. Although there is no clear reason as to why NO_2 may be

increasing in these particular areas, Sevenoaks District Council will continue to monitor these locations closely. There has been a rebound in annual mean NO_2 concentrations following the end of Covid-19 pandemic restrictions, however whilst emissions are higher than those witnessed during the monitoring years impacted by imposed lockdowns, they are broadly in line with the overall downwards 5-10 year trend. The highest monitored concentration within the district was measured at DT42, which is located at London Road, Riverhead along the A25. This maximum concentration ($35.2ug/m^3$) was still below the national objective level.

In 2021 the annual mean NO_2 concentrations reported for monitoring locations DT25 and DT42 was at the greatest it had been at these locations over the past 5 years (2017-2021) with a $14.0\mu g/m^3$ increase reported at site DT42. In 2022 these sites have both shown a decrease, although they are still higher than the results between 2017 and 2020 but still remain below the AQS objective.

3.2.2 Particulate Matter (PM10)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of $40\mu g/m^3$.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of $50\mu g/m^3$, not to be exceeded more than 35 times per year.

Both continuous monitoring locations reported annual mean PM_{10} concentrations below the annual mean objective of $40\mu g/m^3$. Greatness (CM1) reported a concentration of $16.0\mu g/m^3$, whereas Bat & Ball (CM2) reported a concentration of $18.0\mu g/m^3$. There is little change to what was reported in 2021 ($-0.2\mu g/m^3$ at CM2), and longer term trends the concentrations at both sites appear to be relatively stable.

With respect to the 24-hour objective, where there should be no more than 35 24-hour averages which exceed $50\mu g/m^3$, CM1 reported1 period and CM2 reported 3 periods where this was the case. The maximum number reported over the past 5 years was 9 at CM1 in 2019.

3.2.3 O-zone (O3)

The continuous monitor CM1 also monitors and reports concentrations of ozone. The AQS objective for this is that the 8-hour running mean should not exceed $100\mu g/m^3$ more than 10 times a year. CM1 reported 32 hour mean periods where this is the case. It should be noted that ozone is a difficult pollutant to control, due to its natural formation in absence of NO_x within the atmosphere.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Inlet Height (m)
CM1	Greatness	Urban Background	553603	156774	NOx, NO, NO_2, PM_{10}, O_3	NO	Chemiluminescent / Teom	Y	46m	1.8
CM2	Bat & Ball	Roadside	553044	156690	NOx, NO, NO_2, PM_{10}	YES AQMA13	Chemiluminescent / Teom	N - (30m)	8m	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 – 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)
DT02	Sevenoaks, High St South 1	Roadside	553157	154416	NO2	Y - AQMA No.10	0.0	2.0	No	2.0
DT03	Sevenoaks, Garvock Drive	Urban Background	552465	154165	NO2	N	0.0	2.0	No	2.0
DT05	Riverhead, Riverhead 2	Roadside	551414	156196	NO2	Y - AQMA No.13	0.0	2.5	No	2.5
DT06	Riverhead, Riverhead 3	Kerbside	551442	156159	NO2	Y - AQMA No.13	2.0	2.5	No	2.5
DT07	Seal, High St East 1	Roadside	555096	156692	NO2	Y - AQMA No.13	3.0	2.5	No	2.5
DT08	Seal, High St West 1	Roadside	554991	156728	NO2	Y - AQMA No.13	0.0	2.0	No	2.0
DT12	Brasted, Station Rd	Roadside	546813	155850	NO2	Y - AQMA No.2	0.0	2.0	No	2.0
DT13	Swanley, London Rd /Wested Lane	Kerbside	552510	167704	NO2	Y - AQMA No.2	3.0	2.5	No	2.5
DT14	Swanley, Wadard Terrace (Button St)	Roadside	553107	167868	NO2	Y - AQMA No.2	6.0	2.5	No	2.5
DT23	Sevenoaks, Bat & Ball 1	Roadside	553050	156625	NO2	Y - AQMA No.13	4.0	2.5	No	2.5
DT24	Westerham, High St	Roadside	544418	153918	NO2	Y - AQMA No.13	10.0	2.5	No	2.5

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)
DT25	Westerham, Vicarage Hill	Roadside	544638	154041	NO2	Y - AQMA No.13	20.0	2.5	No	2.5
DT26	Farningham, Farningham Hill	Roadside	554218	167252	NO2	N	4.0	2.5	No	2.5
DT27	Sevenoaks, High St South 2	Roadside	553138	154260	NO2	Y - AQMA No.10	0.0	2.5	No	2.5
DT28	Sevenoaks, High St North 2	Roadside	553044	154889	NO2	Y - AQMA No.10	7.0	2.5	No	2.5
DT29	Sevenoaks, High St North 3	Roadside	553073	155030	NO2	Y - AQMA No.10	1.5	2.5	No	2.5
DT30	Sevenoaks, Bat & Ball 2	Roadside	553019	156692	NO2	Y - AQMA No.13	0.0	2.5	No	2.5
DT31	Sevenoaks, Bat & Ball 3	Kerbside	553165	156686	NO2	Y - AQMA No.13	1.5	2.5	No	2.5
DT32	Sevenoaks, Bat & Ball 4	Roadside	553147	156563	NO2	Y - AQMA No.13	6.0	2.5	No	2.5
DT33	Seal, High St East 2	Roadside	555069	156709	NO2	Y - AQMA No.13	2.0	2.5	No	2.5
DT34	16 Main Road, Sundridge Dunbrik	Roadside	544802	154895	NO2	Y - AQMA No.2	36.0	2.5	No	2.5
DT35	Sevenoaks, Seal Hollow Rd	Roadside	554092	156797	NO2	Y - AQMA No.13	0.0	2.5	No	2.5
DT36	Westerham, Market Sq	Roadside	544598	154021	NO2	Y - AQMA No.13	3.0	2.5	No	2.5

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)
DT39	Swanley, Bartholomew Way2, opposite ASDA delivery	Roadside	551492	168695	NO2	Y - AQMA No.8	0.0	2.0	No	2.0
DT40	Swanley, London Rd 1	Roadside	551579	168507	NO2	Y - AQMA No.8	0.0	0.0	No	2.5
DT41	Swanley, London Rd 2	Roadside	552175	168162	NO2	Y - AQMA No.8	18.0	2.5	No	2.5
DT42	Riverhead, London Rd	Roadside	551383	156064	NO2	Y - AQMA No.13	2.5	2.5	No	2.5
DT43	Dunton Green, London Rd	Roadside	551315	156381	NO2	Y - AQMA No.13	8.0	2.5	No	2.5
DT48	Sevenoaks, 73 London Rd	Roadside	552867	154858	NO2	Y - AQMA No.10	8.0	2.5	No	2.5
DT49	Sevenoaks, 20 London Rd	Roadside	553018	154655	NO2	Y - AQMA No.10	0.0	2.0	No	2.0
DT51	Sevenoaks, 130 London Rd	Roadside	552761	155050	NO2	Y - AQMA No.10	1.5	2.5	No	2.5
DT52	Sevenoaks, 142 London Rd	Roadside	552504	155271	NO2	N	42.0	2.0	No	2.0
DT54	Dunton Green, 57 London Rd	Roadside	551224	156975	NO2	Y - AQMA No.13	0.0	2.5	No	2.5
DT71	Sundridge, 204 Main Rd	Roadside	548239	155355	NO2	Y - AQMA No.13	0.0	2.5	No	2.5

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)
DT74	Bessels Green, (A25) Westerham Rd	Roadside	550768	155584	NO2	Y - AQMA No.13	3.0	2.5	No	2.5
DT76	Worships Hill, Witches Lane	Roadside	551019	155714	NO2	Y - AQMA No.13	3.0	2.5	No	2.5
DT77	Sevenoaks, London Rd/Montreal Av	Kerbside	551528	155967	NO2	Y - AQMA No.13	3.0	2.5	No	2.5
DT81	Swanley, Farningham Hill Rd	Urban Background	553419	167614	NO2	Y - AQMA No.1	14.0	2.5	No	2.5
DT83	Swanley,Birchwood Rd, Jessamine Terrace	Roadside	550298	169627	NO2	Y - AQMA No.14	15.0	2.5	No	2.5
DT84	Brasted, West End	Roadside	546803	154999	NO2	Y - AQMA No.13	13.0	2.5	No	2.5
DT85	Brasted, Chart Lane	Kerbside	547094	155099	NO2	Y - AQMA No.13	2.0	2.5	No	2.5
DT86	Bessels Green,(A25) 59 Westerham Rd	Roadside	550306	155595	NO2	Y - AQMA No.13	6.0	2.5	No	2.5
DT87	Sevenoaks, Bradbourne Vale Rd South	Roadside	551639	156334	NO2	Y - AQMA No.13	17.0	2.5	No	2.5
DT88	Sevenoaks, Bradbourne Vale Rd North	Roadside	552950	156578	NO2	Y - AQMA No.13	0.5	2.5	No	2.5

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)
DT90	Sevenoaks St Johns, A4 St Johns Hill	Roadside	553053	154708	NO2	Y - AQMA No.10	10.0	2.5	No	2.5
DT93	Swanley, Birchwood Rd, end of Pucknells Close	Roadside	550284	169743	NO2	N	10.0	2.0	No	2.0
DT94	Swanley, Birchwood Rd, Beefeater Restaurant	Roadside	550249	169573	NO2	Y - AQMA No.14	20.0	2.5	No	2.5
DT95	Swanley, Birchwood Rd, London Rd opposite Malvern	Roadside	550351	169490	NO2	Y - AQMA No.14	0.0	2.0	No	2.0
DT96	Sevenoaks STN 1	Roadside	552371	155346	NO2	N	1.8	2.5	No	2.5
DT97	Ellis Close	Urban Background	550555	168253	NO2	Y - AQMA No.4	35.0	14.0	No	2.5
DT98	Dunton Green M26	Roadside	550962	157662	NO2	Y - AQMA No.3	16.0	2.0	No	2.5
BC01, BC02, BC03	Sevenoaks, Greatness 3	Urban Background	553607	156776	NO2	N	39.0	2.0	Yes	1.8
BC04, BC05, BC06	Sevenoaks, Bat & Ball AQ Station	Roadside	553045	156690	NO2	Y - AQMA No.13	30.0	2.0	Yes	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.3 – Annual Mean NO2 Monitoring Results: Automatic Monitoring (µg/m3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CM1	553603	156774	Urban Background	99%	99%	15.00	14.00	12.00	11.60	12.00
CM2	553044	156690	Roadside	77%	77%	25.00	23.00	18.00	20.10	20.00

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

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

Notes:

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

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

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

Table A.4 – 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 2022 (%) [2]	2018	2019	2020	2021	2022
DT02	553157	154416	Roadside	91.7	91.7	**49.9**	**40.4**	29.6	31.8	30.9
DT03	552465	154165	Urban Background	83.3	83.3	11.8	9.9	8.0	8.0	8.4
DT05	551414	156196	Roadside	83.3	83.3	39.3	34.4	30.3	30.6	29.8
DT06	551442	156159	Kerbside	91.7	91.7	**41.7**	34.8	27.3	30.0	29.2
DT07	555096	156692	Roadside	100	100	**41.3**	36.6	26.2	29.3	28.6
DT08	554991	156728	Roadside	100	100	28.3	23.7	19.2	20.3	18.4
DT12	546813	155850	Roadside	91.7	91.7	39.8	33.2	26.6	25.5	24.2
DT13	552510	167704	Kerbside	100	100	32.9	27.7	21.7	23.1	19.5
DT14	553107	167868	Roadside	100	100	27.6	25.2	20.9	20.7	18.7
DT23	553050	156625	Roadside	100	100	39.2	33.0	26.6	28.9	26.0
DT24	544418	153918	Roadside	100	100	35.8	28.2	23.0	24.9	22.3
DT25	544638	154041	Roadside	91.7	91.7	26.1	23.5	18.4	30.6	27.6
DT26	554218	167252	Roadside	100	100	**42.7**	34.8	29.6	28.9	28.3
DT27	553138	154260	Roadside	83.3	83.3	37.7	33.2	21.6	24.3	23.0
DT28	553044	154889	Roadside	91.7	91.7	36.8	31.5	23.5	23.6	25.2
DT29	553073	155030	Roadside	91.7	91.7	28.2	23.7	17.6	19.9	19.0
DT30	553019	156692	Roadside	100	100	35.1	30.8	24.2	25.4	24.3
DT31	553165	156686	Kerbside	100	100	**51.1**	**43.6**	35.0	36.3	32.6
DT32	553147	156563	Roadside	100	100	**51.9**	**40.7**	32.5	34.1	30.6
DT33	555069	156709	Roadside	91.7	91.7	**40.5**	34.6	26.3	29.8	26.8
DT34	544802	154895	Roadside	100	100	26.1	23.5	18.3	18.6	18.3
DT35	554092	156797	Roadside	83.3	83.3	33.7	30.0	24.3	26.5	24.5
DT36	544598	154021	Roadside	91.7	91.7	**40.1**	33.5	28.2	28.1	30.0
DT39	551492	168695	Roadside	100	100	36.4	34.8	28.1	29.4	26.8

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 2022 (%) [2]	2018	2019	2020	2021	2022
DT40	551579	168507	Roadside	91.7	91.7	**45.6**	37.5	28.4	34.1	32.4
DT41	552175	168162	Roadside	91.7	91.7	38.6	32.6	27.2	29.5	27.2
DT42	551383	156064	Roadside	100	100	34.5	27.4	23.6	37.5	35.2
DT43	551315	156381	Roadside	100	100	28.5	26.5	19.3	24.9	22.2
DT48	552867	154858	Roadside	91.7	91.7	23.9	20.0	13.6	15.9	14.7
DT49	553018	154655	Roadside	100	100	29.1	25.1	17.2	18.6	18.1
DT51	552761	155050	Roadside	100	100	39.0	30.2	22.3	18.1	20.7
DT52	552504	155271	Roadside	83.3	83.3	34.0	29.5	21.8	21.8	20.8
DT54	551224	156975	Roadside	91.7	91.7	32.7	28.8	24.8	24.1	23.5
DT71	548239	155355	Roadside	91.7	91.7	31.3	25.6	22.5	23.6	22.8
DT74	550768	155584	Roadside	100	100	35.9	30.7	22.2	25.5	21.9
DT76	551019	155714	Roadside	100	100	37.9	33.3	27.4	29.0	26.3
DT77	551528	155967	Kerbside	100	100	38.7	31.6	25.0	26.5	26.4
DT81	553419	167614	Urban Background	75	75	28.6	25.7	20.7	19.6	21.4
DT83	550298	169627	Roadside	91.7	91.7	**46.7**	**42.4**	33.3	33.1	31.7
DT84	546803	154999	Roadside	83.3	83.3	32.5	26.5	23.0	25.1	21.8
DT85	547094	155099	Kerbside	100	100	**43.7**	35.7	31.5	30.1	28.0
DT86	550306	155595	Roadside	91.7	91.7	34.7	30.7	21.1	24.3	23.3
DT87	551639	156334	Roadside	100	100	**47.0**	**42.3**	35.7	37.5	34.2
DT88	552950	156578	Roadside	100	100	30.3	28.1	20.7	21.5	20.2
DT90	553053	154708	Roadside	91.7	91.7	34.5	29.5	21.1	21.4	23.0
DT93	550284	169743	Roadside	100	100	28.8	25.9	19.5	20.2	17.4
DT94	550249	169573	Roadside	91.7	91.7	33.8	28.6	22.8	22.7	21.4
DT95	550351	169490	Roadside	100	100	33.0	30.2	25.0	25.3	23.3
DT96	552371	155346	Roadside	100	100	34.5	30.5	21.2	22.4	22.4
DT97	550555	168253	Urban Background	100	100			17.7	16.9	15.1
DT98	550962	157662	Roadside	83.3	83.3			22.8	24.7	21.9

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 2022 (%) [2]	2018	2019	2020	2021	2022
BC01			Urban Background	100	100	13.9	13.0	10.8	11.0	9.8
BC02			Roadside	100	100	26.9	24.9	19.6	20.3	19.6

☒ **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 $\mu g/m^3$.

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

NO_2 annual means exceeding $60\mu g/m^3$, 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: AQMA No. 8

Trends in Annual Mean NO$_2$ Concentrations for AQMA NO.8
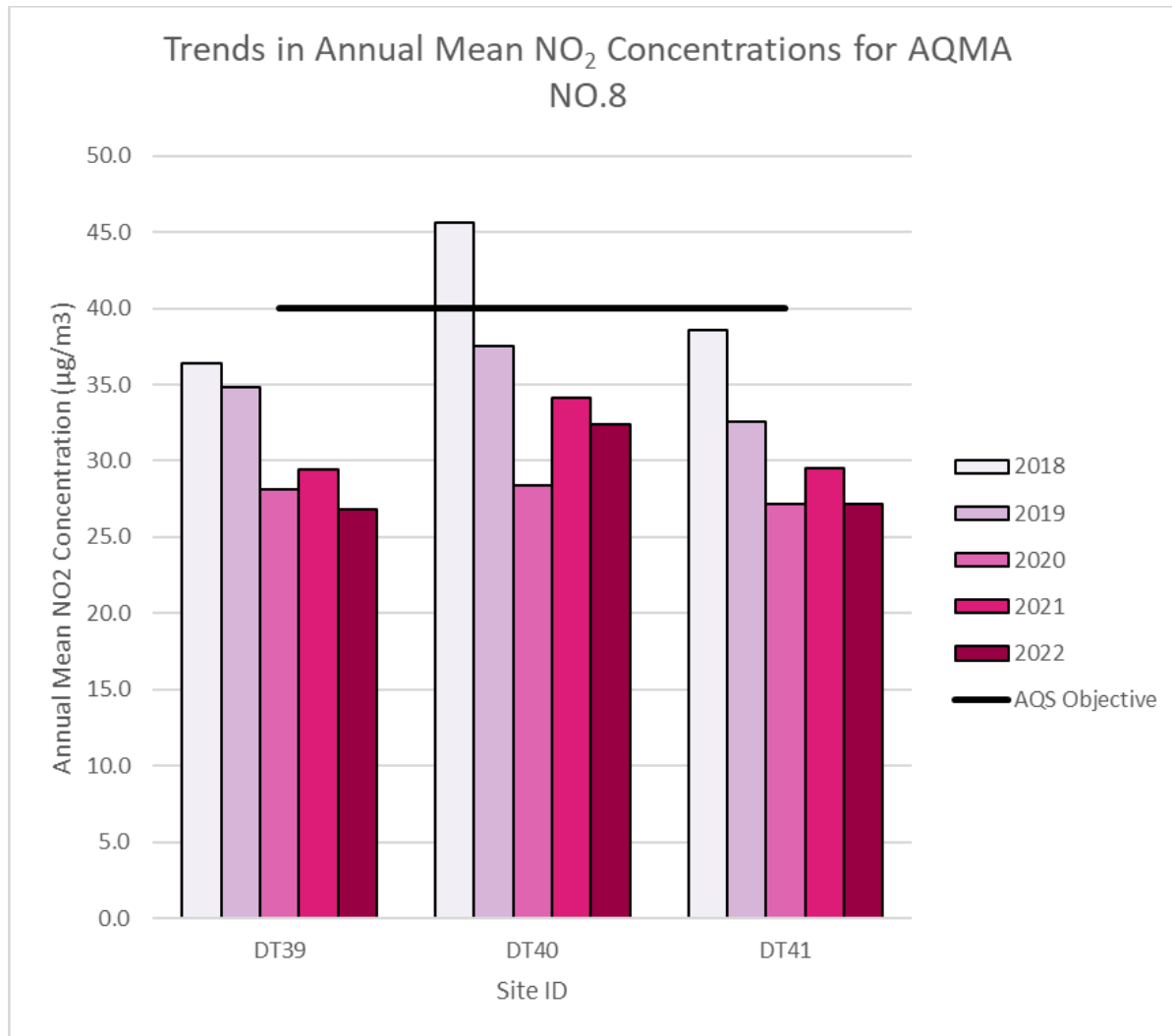
Figure A.2 – Trends in Annual Mean NO2 Concentrations: AQMA No. 10

Trends in Annual Mean NO$_2$ Concentrations for AQMA NO.10
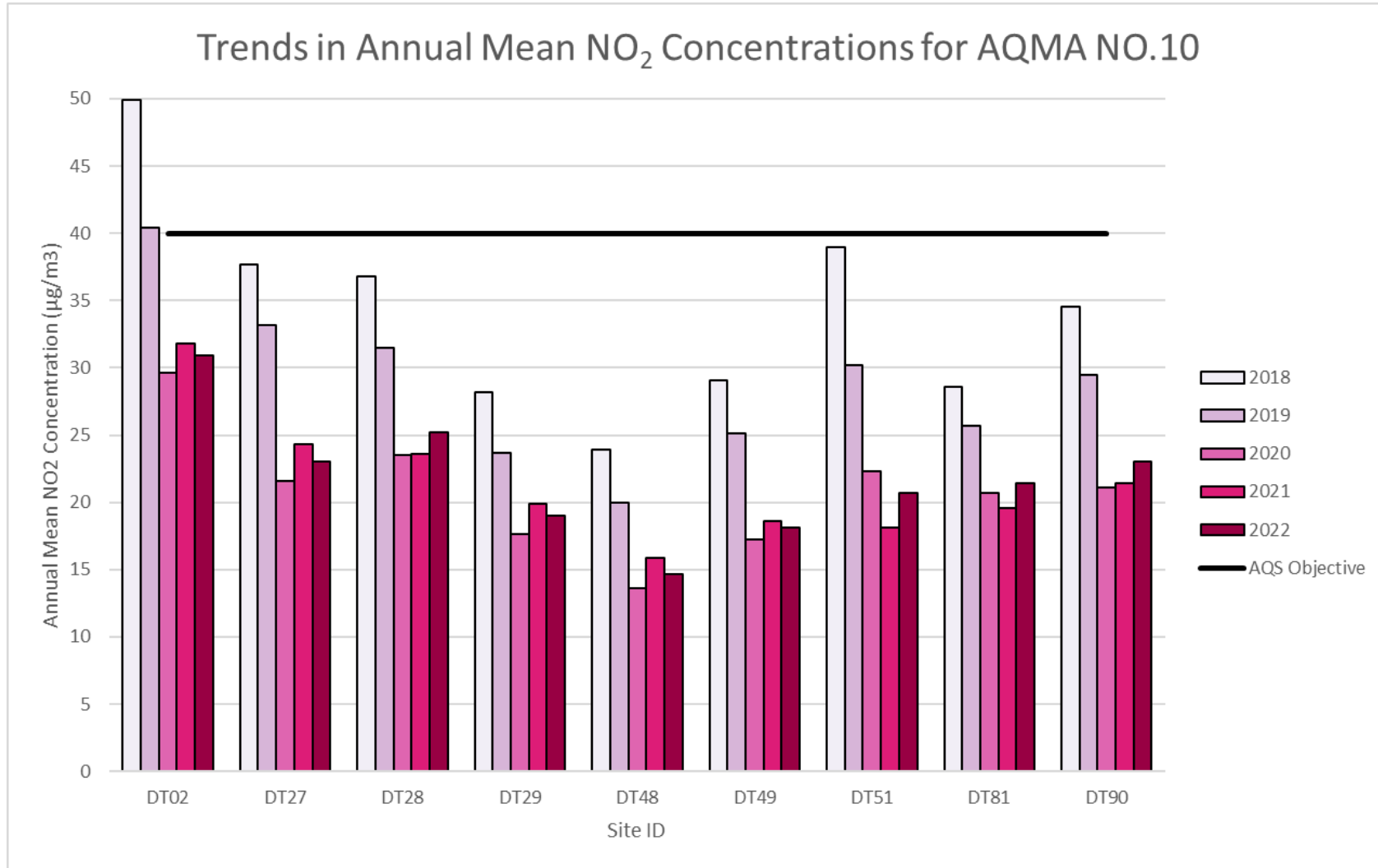
Figure A.3 – Trends in Annual Mean NO2 Concentrations: AQMA No. 13

Trends in Annual Mean NO$_2$ Concentrations for AQMA NO.13
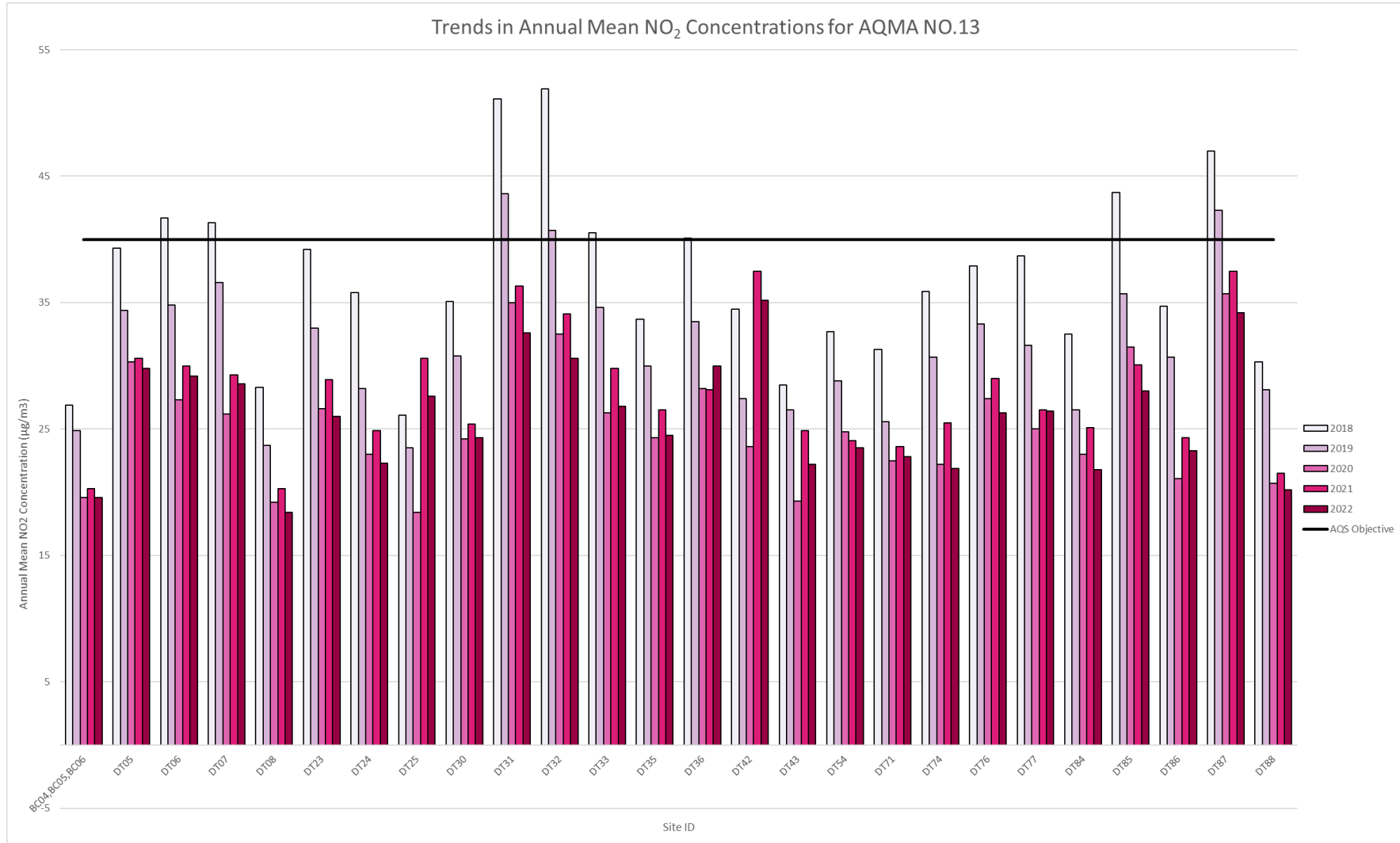
Figure A.4 – Trends in Annual Mean NO2 Concentrations: AQMA No. 14

Trends in Annual Mean NO$_2$ Concentrations for AQMA NO.14
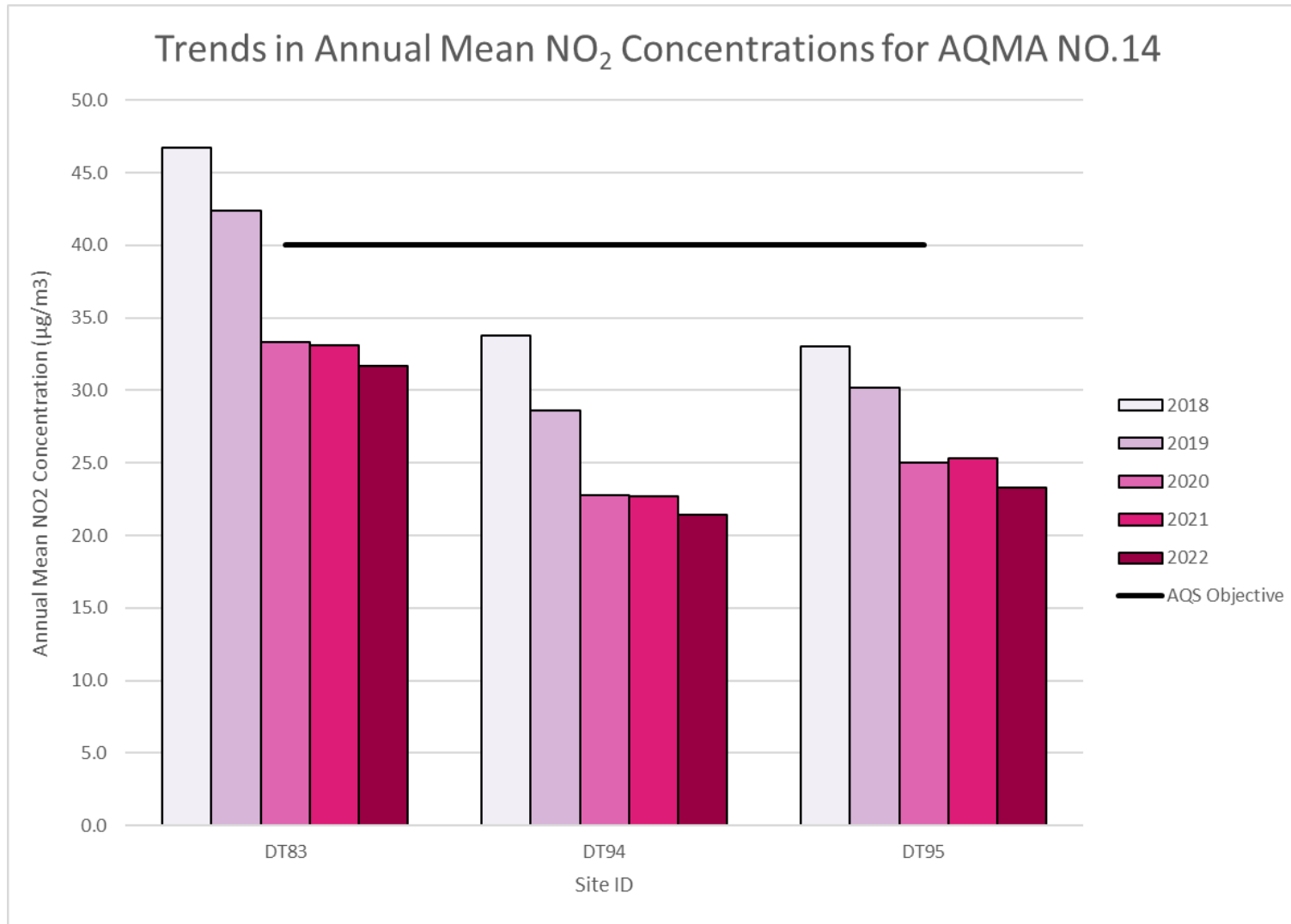
Table A.5 – 1-Hour Mean NO2 Monitoring Results, Number of 1-Hour Means > 200μg/m3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CM1	553603	156774	Urban Background	99%	99%	0	0	0	0	0
CM2	553044	156690	Roadside	77%	77%	0	0	0	0	0

Notes:

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

Exceedances of the NO$_2$ 1-hour mean objective (200μg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.6 – Annual Mean PM10 Monitoring Results (µg/m3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CM1	553603	156774	Urban Background	89%	89%	19.00	20.00	17.00	17.00	17.00
CM2	553044	156690	Roadside	86%	86%	21.00	20.00	18.00	18.20	18.00

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

Notes:

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

Exceedances of the PM$_{10}$ annual mean objective of 40µg/m^3 are shown in **bold**.

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.

(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.5 – Trends in Annual Mean PM10 Concentrations

Trends in Annual Mean PM10 Concentrations
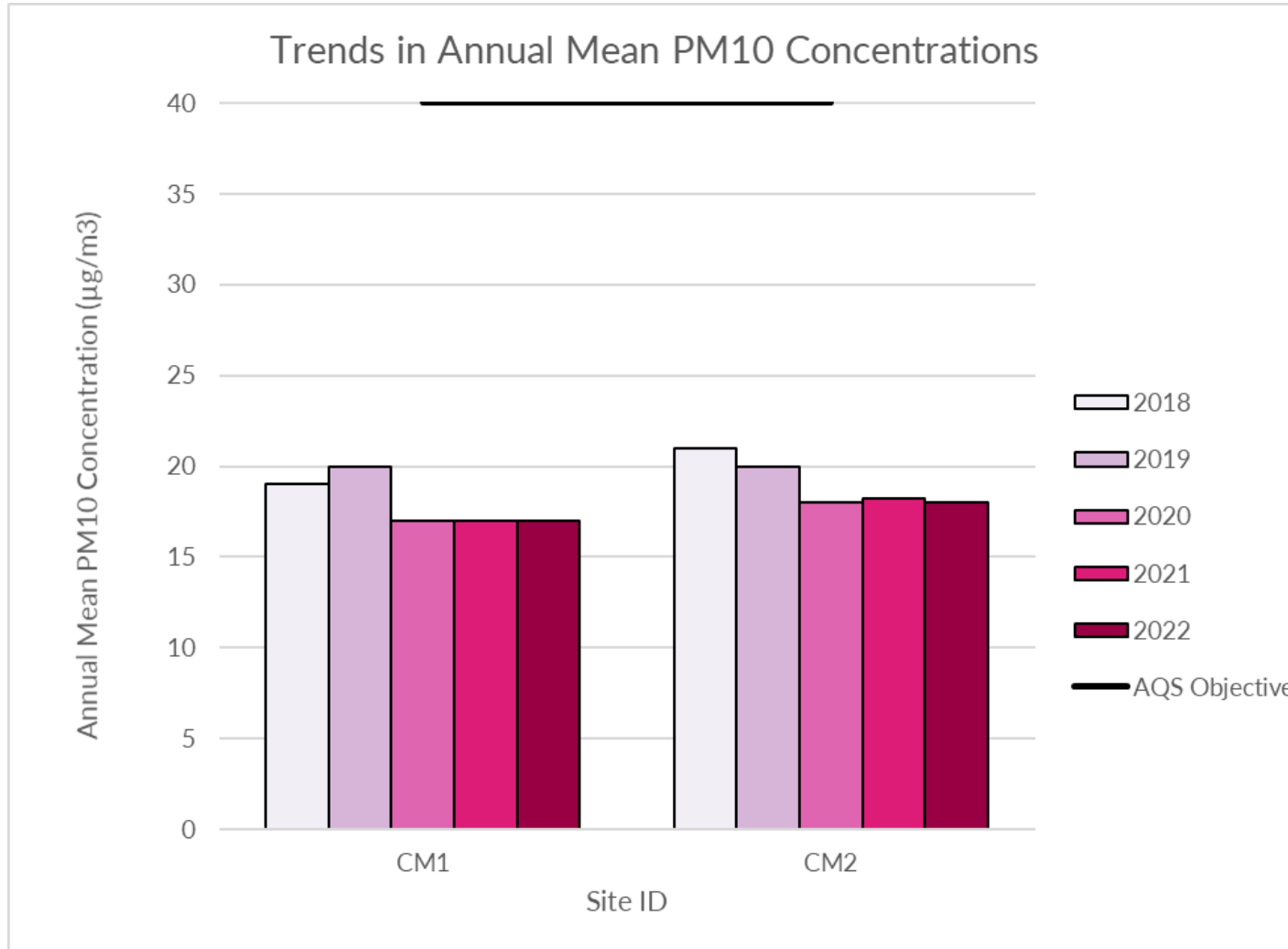
Table A.7 – 24-Hour Mean PM10 Monitoring Results, Number of PM10 24-Hour Means > 50µg/m3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CM1	553603	156774	Urban Background	89%	89%	1	9	3	2	2
CM2	553044	156690	Roadside	86%	86%	8	8	4	2	3

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

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**.

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

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

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

Figure A.6 – Trends in Number of 24-Hour Mean PM10 Results > 50µg/m3

Trends in Number of 24-Hour Mean PM10 Results > 50µg/m3
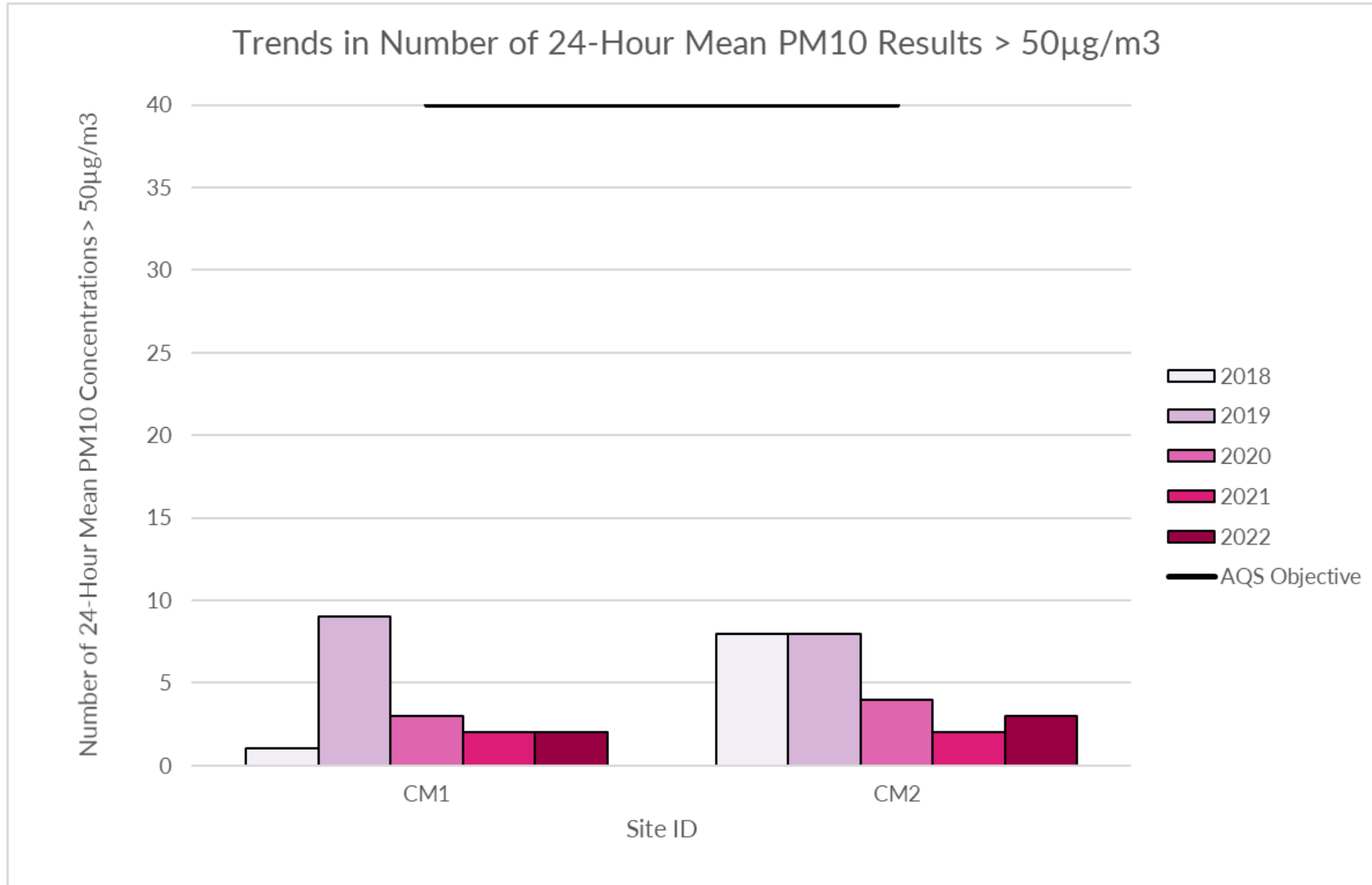
Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO2 2022 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	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT02	553157	154416	63.3	37.4	51.6	34.3	33.2	-	34.5	25.0	36.1	39.9	43.7	47.7	40.6	30.9	-	
DT03	552465	154165	17.0	-	12.9	9.7	7.3	6.0	7.4	5.2	21.5	-	9.3	14.5	11.1	8.4	-	
DT05	551414	156196	53.6	-	45.4	38.0	-	35.9	37.1	34.5	32.9	37.2	35.9	41.6	39.2	29.8	-	
DT06	551442	156159	40.9	-	53.5	42.7	33.6	34.7	41.2	25.7	36.6	35.9	37.7	40.8	38.5	29.2	-	
DT07	555096	156692	52.8	37.8	46.2	36.3	34.0	32.6	36.0	23.0	33.8	38.5	41.6	38.6	37.6	28.6	-	
DT08	554991	156728	35.0	25.5	29.3	23.8	20.6	17.1	23.0	19.8	23.8	20.5	24.6	27.9	24.2	18.4	-	
DT12	546813	155850	40.5	32.9	34.7	37.3	32.0	22.5	27.8	28.7	30.2	-	27.8	36.0	31.9	24.2	-	
DT13	552510	167704	42.4	2.9	38.3	28.9	21.2	19.7	25.3	20.9	27.5	24.9	22.1	33.7	25.7	19.5	-	
DT14	553107	167868	38.6	29.2	26.9	18.9	20.8	18.5	18.8	18.5	21.8	28.0	30.3	25.2	24.6	18.7	-	
DT23	553050	156625	50.7	33.0	44.0	34.9	30.6	26.5	33.0	23.9	32.7	30.6	32.9	37.5	34.2	26.0	-	
DT24	544418	153918	40.0	28.0	42.1	34.1	25.5	21.8	29.9	13.6	28.0	27.8	27.9	33.7	29.4	22.3	-	
DT25	544638	154041	52.2	33.2	53.7	-	30.4	29.2	36.0	28.7	33.8	34.4	33.0	34.8	36.3	27.6	-	
DT26	554218	167252	51.7	34.4	45.7	40.8	32.7	30.0	34.4	29.1	36.4	37.9	35.5	38.3	37.2	28.3	-	
DT27	553138	154260	45.6	-	31.0	27.5	26.2	-	26.8	23.2	29.4	27.5	29.7	35.3	30.2	23.0	-	
DT28	553044	154889	47.7	31.7	35.2	28.6	29.0	-	33.7	23.6	34.0	28.5	30.5	42.3	33.2	25.2	-	
DT29	553073	155030	36.5	-	32.4	21.4	21.0	19.6	21.6	16.4	24.6	23.3	25.2	33.7	25.1	19.0	-	
DT30	553019	156692	39.0	32.2	39.7	30.9	28.1	27.5	30.7	27.9	30.3	30.1	30.3	36.2	31.9	24.3	-	
DT31	553165	156686	47.8	43.2	46.2	40.0	42.0	32.1	44.0	36.3	44.0	43.7	44.0	50.7	42.8	32.6	33.4	
DT32	553147	156563	51.5	36.4	54.7	43.5	35.0	28.2	40.8	34.9	39.9	39.4	42.8	35.7	40.2	30.6	-	
DT33	555069	156709	46.7	-	41.3	40.3	29.7	29.9	34.0	27.5	36.8	31.0	33.3	37.2	35.2	26.8	-	
DT34	544802	154895	36.3	22.2	31.2	26.6	19.2	18.2	23.2	17.8	22.9	19.9	22.3	28.9	24.1	18.3	-	
DT35	554092	156797	26.5	31.7	35.8	-	-	31.7	35.5	26.7	32.3	36.1	31.3	34.9	32.3	24.5	-	
DT36	544598	154021	53.5	45.4	40.7	35.6	40.0	37.2	38.5	27.8	34.5	-	44.2	36.5	39.4	30.0	-	
DT39	551492	168695	52.7	34.6	43.6	33.6	30.6	27.9	33.3	29.6	34.0	33.2	35.2	35.2	35.3	26.8	-	
DT40	551579	168507	54.9	35.7	62.2	47.1	34.8	33.1	-	36.7	45.1	39.3	37.1	43.2	42.7	32.4	-	
DT41	552175	168162	55.2	-	37.2	33.6	28.7	27.5	30.8	25.2	33.6	39.8	38.6	42.9	35.7	27.2	-	

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	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT42	551383	156064	62.9	26.4	49.9	43.2	47.5	44.8	51.3	40.8	42.8	45.3	49.2	52.0	46.3	35.2	33.1	
DT43	551315	156381	36.3	34.5	35.1	26.3	26.7	24.3	28.6	21.8	26.6	30.6	35.1	25.0	29.2	22.2	-	
DT48	552867	154858	32.5	-	24.9	17.6	15.2	14.9	16.8	12.7	16.4	14.1	20.0	27.3	19.3	14.7	-	
DT49	553018	154655	37.0	19.4	34.7	23.9	18.7	17.4	21.4	15.4	25.5	20.6	21.8	30.1	23.8	18.1	-	
DT51	552761	155050	41.4	20.3	34.4	23.7	15.0	15.8	20.5	16.3	59.4	20.0	26.4	34.3	27.3	20.7	-	
DT52	552504	155271	43.3	-	38.3	23.6	23.5	23.1	26.9	17.1	26.3	-	21.3	30.0	27.3	20.8	-	
DT54	551224	156975	45.3	33.4	35.8	25.8	25.3	23.9	-	21.2	25.8	32.4	32.7	39.0	31.0	23.5	-	
DT71	548239	155355	41.5	30.9	33.1	25.1	22.5	21.1	24.7	20.7	50.6	-	28.9	31.4	30.0	22.8	-	
DT74	550768	155584	43.9	29.5	34.8	24.4	23.3	23.5	28.2	23.5	26.3	25.2	30.0	32.8	28.8	21.9	-	
DT76	551019	155714	51.7	33.1	36.4	35.9	33.2	28.3	33.3	31.0	33.2	28.5	33.1	36.8	34.5	26.3	-	
DT77	551528	155967	45.5	31.0	45.8	39.0	32.7	28.7	34.0	25.5	35.4	34.6	34.0	30.4	34.7	26.4	-	
DT81	553419	167614	43.3	28.0	31.1	21.5	20.5	18.8	-	-	22.4	29.3	38.1	-	28.1	21.4	-	
DT83	550298	169627	67.5	44.4	37.0	-	38.2	35.6	37.5	36.1	35.2	45.1	41.0	41.7	41.8	31.7	-	
DT84	546803	154999	36.8	27.8	33.7	-	24.0	25.4	-	23.5	24.7	28.3	28.5	33.6	28.6	21.8	-	
DT85	547094	155099	56.3	38.7	41.2	35.7	33.6	30.3	34.8	27.7	34.2	33.2	36.2	40.6	36.9	28.0	-	
DT86	550306	155595	50.7	-	37.9	27.7	24.6	23.2	27.0	20.9	27.5	29.2	32.1	36.0	30.6	23.3	-	
DT87	551639	156334	59.4	46.0	46.0	40.4	43.0	41.0	43.8	38.0	47.0	41.9	48.8	44.1	45.0	34.2	-	
DT88	552950	156578	36.7	26.5	34.8	26.6	22.8	22.3	25.3	19.7	24.6	24.4	26.1	28.5	26.5	20.2	24.5	
DT90	553053	154708	43.0	25.5	46.4	29.6	22.1	20.8	30.1	21.5	31.5	28.5	-	34.2	30.3	23.0	-	
DT93	550284	169743	38.6	20.9	33.4	24.0	16.9	16.8	19.3	18.0	23.5	19.3	21.3	22.3	22.9	17.4	-	
DT94	550249	169573	41.3	-	38.9	27.3	22.2	21.5	22.8	17.8	25.7	30.7	29.1	32.9	28.2	21.4	-	
DT95	550351	169490	46.5	29.6	38.9	31.4	26.4	23.6	26.2	20.9	28.3	30.4	29.1	37.2	30.7	23.3	-	
DT96	552371	155346	36.8	31.6	36.0	23.9	25.3	26.7	29.1	16.7	27.7	31.3	33.2	35.1	29.5	22.4	-	
DT97	550555	168253	29.6	17.0	27.1	16.6	17.1	15.8	14.6	13.7	17.3	22.0	25.0	23.0	19.9	15.1	-	
DT98	550962	157662	44.8	29.6	-	28.9	25.4	21.0	24.2	22.8	25.5	29.9	-	36.5	28.9	21.9	-	
BC01	553607	156776	23.8	5.2	16.5	11.5	9.8	7.7	9.7	8.2	12.6	12.6	14.7	18.7	12.6	9.6	-	Triplicate site with BC01, BC02 and BC03
BC02	553045	156690	25.8	10.0	16.1	12.0	9.9	8.2	9.6	7.6	13.2	12.0	14.5	19.6	13.2	10.0	-	Triplicate site with BC01, BC02 and BC03
BC03	553157	154416	25.1	6.9	15.8	11.7	9.2	8.5	9.8	8.3	12.9	11.8	14.7	20.3	12.9	9.8	-	Triplicate site with BC01, BC02 and BC03
BC04	552465	154165	36.2	29.5	28.1	23.1	23.1	21.5	22.8	16.5	21.4	26.8	25.6	30.3	25.4	19.3	-	Triplicate site with BC04, BC05 and BC06

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	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BC05	551414	156196	39.3	28.3	28.8	21.9	24.7	20.2	24.2	18.9	22.8	27.8	24.8	29.9	26.0	19.7	-	Triplicate site with BC04, BC05 and BC06
BC06	551442	156159	38.2	28.9	28.5	22.2	22.5	22.2	23.0	17.5	21.2	26.0	30.5	30.6	25.9	19.7	-	Triplicate site with BC04, BC05 and BC06

☒ **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.**

☒ **Sevenoaks District Council confirms that all 2022 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 Sevenoaks District Council During 2022

Sevenoaks District Council have identified five proposed developments as potentially having an impact on air quality within the district. These are:

- Development of Sevenoaks Quarry; including 950 residential dwellings, 200 residential institutional units, business, retail, leisure and sports uses, as well as a new primary school.
- Development of a Lidl store including a new roundabout at the Broomhill site in Swanley.
- Development of a new roundabout at Bat & Ball, which will include replacing existing junction and requiring the removal of the automatic monitoring station.
- A proposed residential development at Bevan Place, Swanley, located at an area identified as a street canyon.
- A proposed development of social housing flats at the Bat & Ball junction, near Seal.

Additional Air Quality Works Undertaken Sevenoaks District Council During 2022

Sevenoaks District Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

Sevenoaks District Council's diffusion tubes were supplied and analysed by SOCOTEC Didcot during 2022, using the 50% Triethanolamine (TEA) in acetone preparation method. SOCOTEC's laboratory is UKAS accredited, participating in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations

reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance.

In the latest available AIR-PT results, AIR PT AR042 (January – March 2021), SOCOTEC scored 100%. Currently no additional results have been published for 2022. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ± 2. 20 of the 23 local authority co-location studies which use tubes supplied by SOCOTEC

Didcot with the 50% TEA in acetone preparation method in 2021 were rated as 'good', with 3 being rated as 'poor', as shown by the precision summary results. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Monitoring in 2022 had been largely completed in adherence with the 2022 Diffusion Tube Monitoring Calendar, whereby most changeovers were completed within ±2 days of the specified date.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Sevenoaks District Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Sevenoaks District Council have applied a National bias adjustment factor of 0.76 to the 2022 monitoring data (from the National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/23). A summary of bias adjustment factors used by Sevenoaks District Council over the past five years is presented in Table C.2. Sevenoaks District Council operates two continuous monitoring co-location sites at Greatness Park and Bat & Ball, part of the London Air Quality Network. In previous years a combined local bias adjustment factor has been utilised however in 2022, due to a system malfunction at the Bat & Ball site, it was decided that due to the potential unreliability of these results that a co-location combined factor would not be used. The overall data capture at Bat & Ball was 77% and the overall data capture at Greatness Park was 99%.

Figure C.1 – National Diffusion Tube Bias Adjustment Factor Spreadsheet - Partial Image

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	Local	-	0.78
2019	National	06/20	0.75
2018	Local	-	0.80

NO2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1. No diffusion tube NO_2 monitoring locations within Sevenoaks District Council required distance correction during 2022.

QA/QC of Automatic Monitoring

Data management and local site operator (LSO) duties for both the automatic monitoring locations within Sevenoaks are carried out by the Environmental Research Group at Imperial College London. As part of this, routine calibrations of instruments are carried out every two weeks.

The data presented within the ASR for the 2022 monitoring year is fully ratified, and both live and historic data is available through the LAQN website.

PM10 and PM2.5 Monitoring Adjustment

The TEOM PM_{10} analysers utilised at both Greatness Park and Bat & Ball have been converted to reference equivalence using the volatile correction method. This is carried out by the data managers prior to being presented on the LAQN website.

Automatic Monitoring Annualisation

All automatic monitoring locations within Sevenoaks District Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO2 Fall-off with distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No automatic NO_2 monitoring locations within Sevenoaks District Council required distance correction during 2022.

Appendix D: Maps of Monitoring Locations and AQMA

Figure D.1 – Map of AQMA's within Sevenoaks District
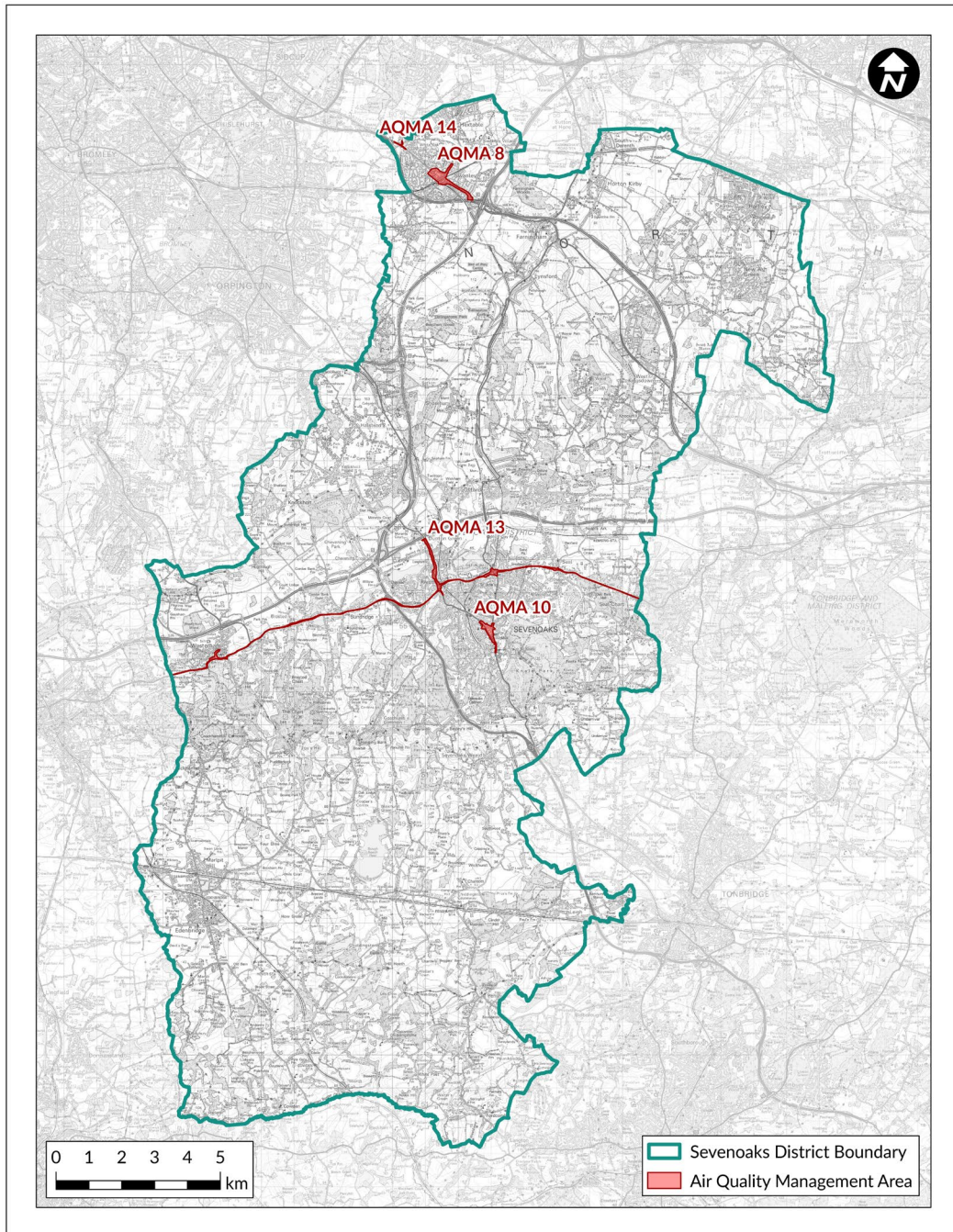
AQMA 14
AQMA 8
AQMA 13
AQMA 10

	Sevenoaks District Boundary
	Air Quality Management Area

0 1 2 3 4 5 km

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AQMAs Declared by Sevenoaks District Council

	Scale: 1:148,000 @ A4 Date: April 2023

Produced by the GIS Team, Sevenoaks District Council

Figure D.2 – Map of Monitoring Locations and AQMAs near Swanley
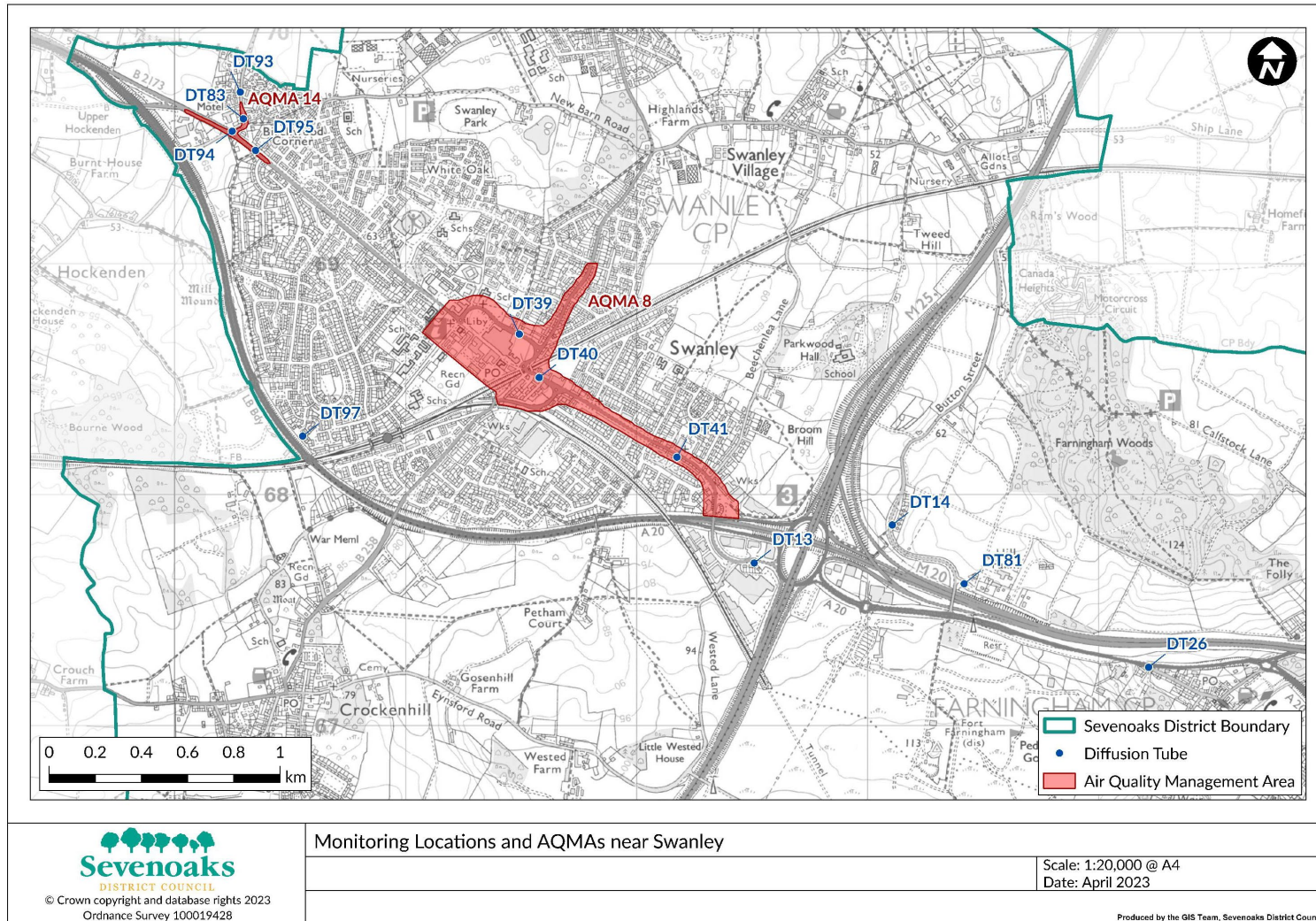
Monitoring Locations and AQMAs near Swanley

Scale: 1:20,000 @ A4
Date: April 2023

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Legend:
- Sevenoaks District Boundary
- Diffusion Tube
- Air Quality Management Area

Figure D.3 – Map of Monitoring Locations and AQMAs near Sevenoaks

Monitoring Locations and AQMAs near Sevenoaks

Scale: 1:9,000 @ A4
Date: April 2023

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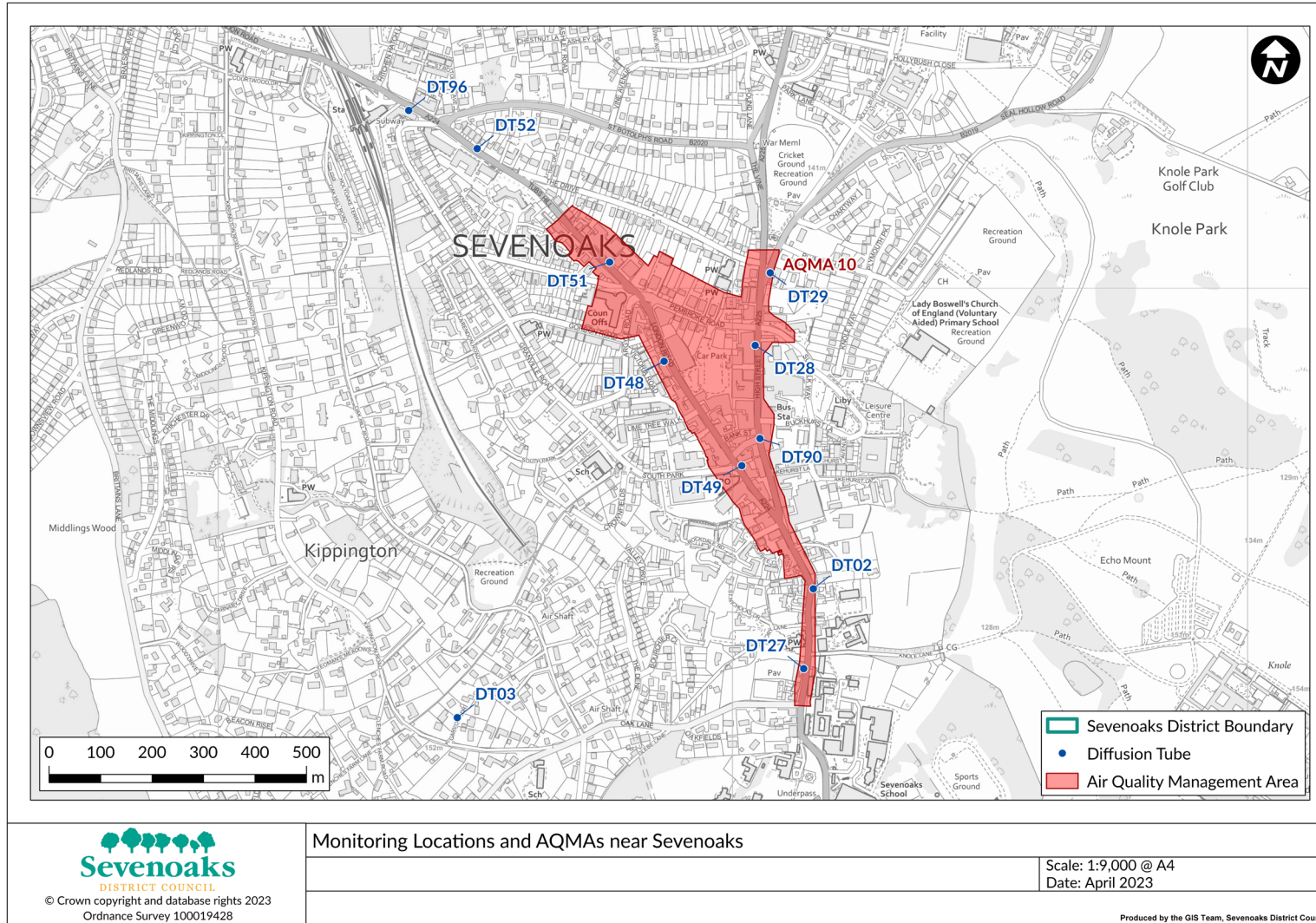# Figure D.4 – Map of Monitoring Locations and AQMAs near Seal
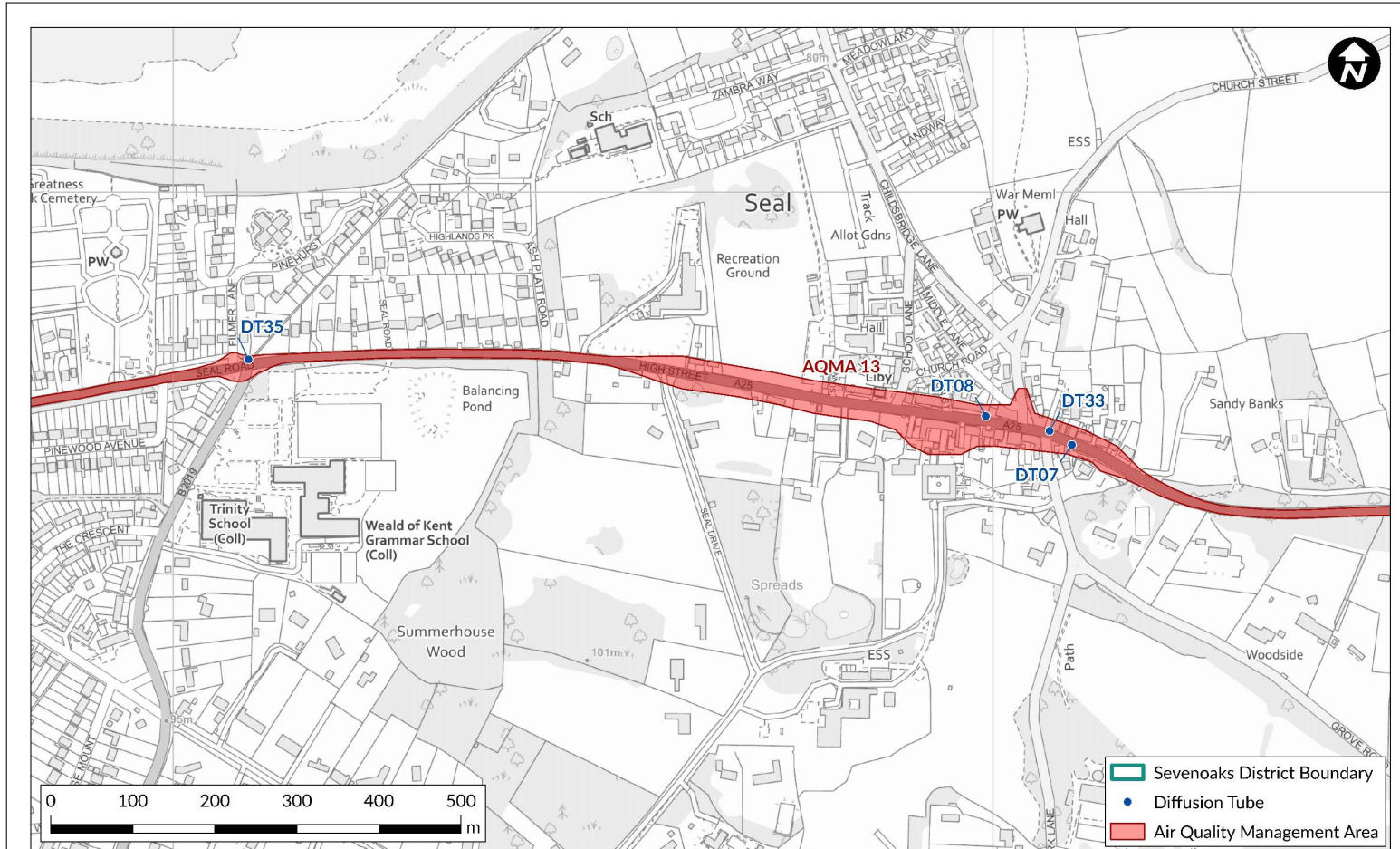
Monitoring Locations and AQMAs near Seal

Scale: 1:6,000 @ A4
Date: April 2023

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Figure D.5 – Map of Monitoring Locations and AQMAs near Riverhead and Bat & Ball

Monitoring Locations and AQMAs near Riverhead and Bat & Ball

Scale: 1:16,000 @ A4
Date: May 2023

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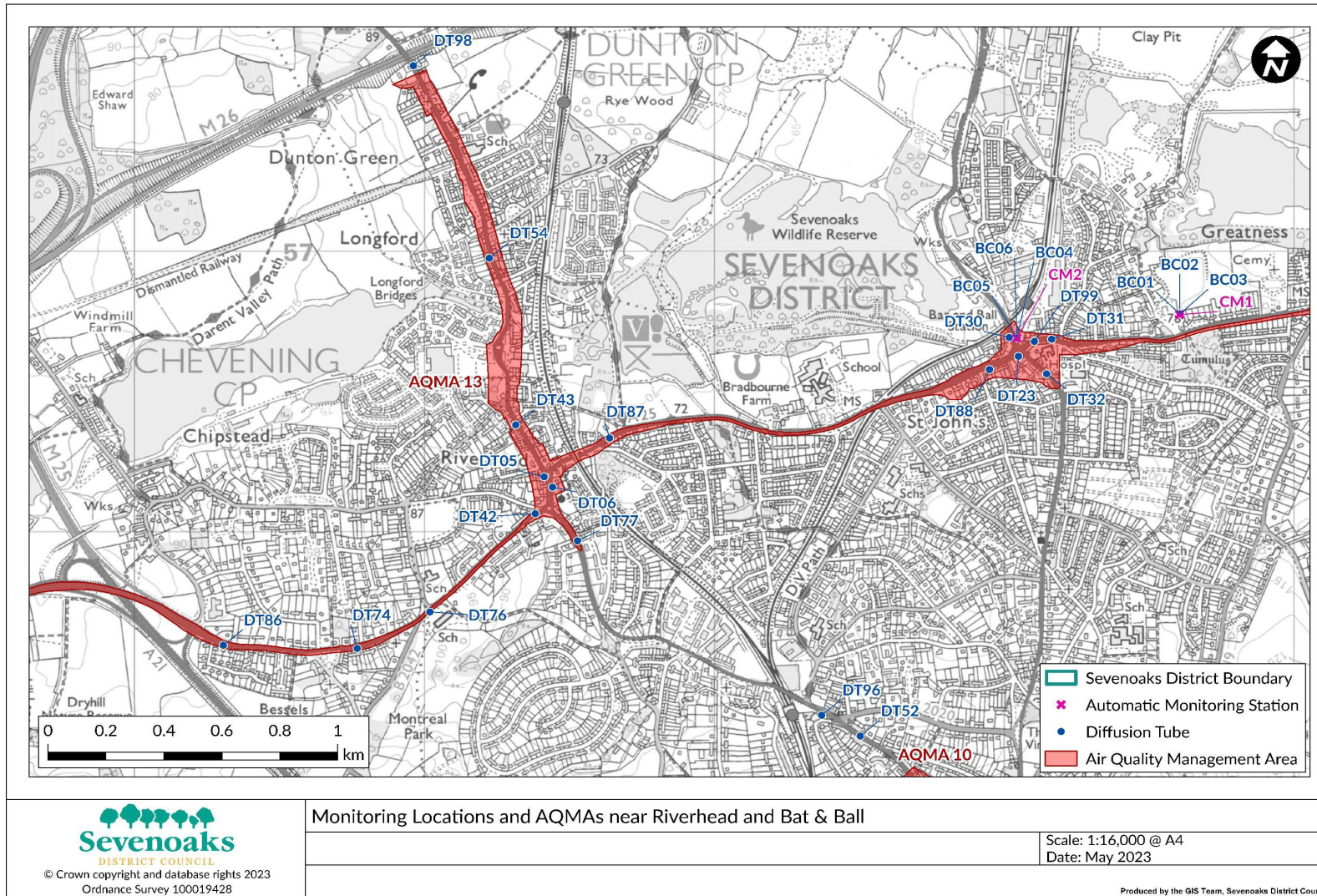
Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	$200\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	$40\mu g/m^3$	Annual mean
Particulate Matter (PM_{10})	$50\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	$40\mu g/m^3$	Annual mean
Sulphur Dioxide (SO_2)	$350\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	$125\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	$266\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean

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[7] The units are in microgrammes of pollutant per cubic metre of air ($\mu g/m^3$).

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	Annual Status Report
BAT	Best Available Techniques
BPC	Brasted Parish Council
CO_2	Carbon Dioxide
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
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
HGV	Heavy Goods Vehicle
IPPC	Integrated Pollution Prevention and Control
KCC	Kent County Council
LAQM	Local Air Quality Management
LEV	Low Emission Vehicle
LGV	Light Goods Vehicle
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
O_3	Ozone
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less

Abbreviation	Description
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
SDC	Sevenoaks District Council
SPC	Seal Parish Council
STC	Sevenoaks Town Council
TEOM	Tapered Element Oscillating Microbalance
UTC	Urban Traffic Control
WTC	Westerham Town Council

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.

- Sevenoaks District Council AQAP 2022
- Sevenoaks District Council 2022 Annual Status Report

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