



Sevenoaks
District Council
**Air
Quality
Annual
Status
Report**

In fulfilment of Part IV of
the Environment Act 1995
(as amended)
Local Air Quality
Management

June 2022

Information	Sevenoaks District Council Details
Local Authority Officer	Nick Chapman
Department	Environmental Health
Address	Sevenoaks District Council Argyle Road Sevenoaks TN13 1HG
Telephone	01732 227167
E-mail	nick.chapman@sevenoaks.gov.uk
Report Reference Number	14548499/UK/v1.0
Date	June 2022

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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 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

The primary source of air pollution within the district is from nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}), predominantly originating from road traffic. The district is traversed by three major motorways, the M25, M26, and M20. These are major road links that connect London and the north of the UK to both the port at Dover and the Channel Tunnel, and as such have a considerable flow of continental HGVs. In addition, local journeys such as school runs but also commuter traffic directly to, or connecting to, London contribute significantly to a number of hot spots in Sevenoaks, Swanley, and in several of the small towns that are located along the A25 road.

At all monitoring locations in 2021, annual mean NO₂ concentrations were reported to be below the annual mean Air Quality Strategy (AQS) objective of 40µg/m³. The maximum reported concentration was 37.5µg/m³ at DT42 and DT87, located in Riverhead. Neither of these sites are located at a site of relevant exposure, and once fall-off-with-distance calculations had been carried out, the concentrations predicted at relevant exposure was

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

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

³ Defra. Air quality appraisal: damage cost guidance, July 2021

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

33.1µg/m³ and 24.5µg/m³ respectively. In general, across the Sevenoaks District, concentrations have increased slightly from what was reported in 2020, which is to be expected as the UK Government enforced COVID-19 restrictions were gradually relaxed and traffic flows were observed to have increased relative to that of the first national lockdown. The overall trend over the past 5 years shows that annual mean NO₂ concentrations have been continuing to decrease across the district.

In addition, no breaches of the NO₂ hourly, PM₁₀ annual, or PM₁₀ daily AQS objectives were reported at any of the relevant monitoring locations within the district.

Sevenoaks District Council has recently adopted a new Air Quality Action Plan (AQAP). The AQAP was put out for public consultation during early 2022. 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, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy⁵ sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out 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 Sevenoaks District Council AQAP 2022, key planned measures include:

- Junction and Road improvements at Bat & Ball, in Riverhead, Sevenoaks High Street, Seal and Brasted;

⁵ Defra. Clean Air Strategy, 2019

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

- A number of measures to encourage active travel, such as introducing bike rental schemes, promotion of active travel schemes, developing new walking and cycle routes;
- A number of behavioural change campaigns to reduce single use occupancy car journeys and vehicle idling;
- Transitioning local bus fleets and the Council's fleet to low emission and ultra-low emissions vehicles;
- Improving and developing the EV infrastructure within the district;
- Discouraging the use of bonfires as a means of waste disposal;
- Working with businesses to help identify ways in which they can reduce their emissions and increase proportions of low emissions vehicles within their fleets;
- Reducing emissions from activities with Environmental Permits; and
- Working with Highways England to reduce the need for HGV and LGV vehicles to use the A25.

The Council is looking to carry out a number of measures that target road user behaviours, as it is difficult to target specific hot spot areas within the district due to the nature of the emissions source (significant HGV through traffic on the major road network, large proportion of commuter traffic). Whilst these are not entirely focused on specific areas, it is believed that these will help improve air pollution across the district to help ensure that residents are not exposed to high pollution levels. In addition, some of the measures detailed within the new AQAP will also target and encourage reduction of emissions of PM₁₀ and PM_{2.5}.

At the start of 2022, the Council hired an Air Quality Promotions Officer, whose role is to facilitate the implementation and success of the measures as set out within the AQAP. The Council is also in progress of releasing a County wide school resource for tackling air pollution and is developing the first Local Cycling and Walking Infrastructure Plan (LCWIP). The Council has been involved with Kent Air Week, releasing a number of social media posts referencing different actions across the county. The Council is also looking to improve the accessibility of their air quality webpages, and to publish a number of school resources including anti-idling campaigns and walk to school incentives.

Conclusions and Priorities

The conclusions and priorities for the Council in addressing and managing air quality within Sevenoaks District Council in the coming year includes:

- Annual mean NO₂ concentrations at all monitoring sites operated by Sevenoaks District Council are below the AQS objective of 40µg/m³. This is also the case for the NO₂ hourly, PM₁₀ annual and PM₁₀ daily AQS objectives;
- Generally, there is an overall downward trend in annual mean NO₂ concentrations across all monitoring sites where 2 or more years' worth of monitoring data is available. Concentrations at some sites did increase from 2017 to 2018, however all sites then reported a decrease to 2020.
- The majority of monitoring sites have shown an increase in annual mean concentrations from 2020 to 2021. At DT25 and DT42, the 2021 concentrations are the greatest that has been reported at these sites over the past 5 years (but still below the AQS objective, the maximum being 37.5µg/m³ at DT42 which is not at a site of relevant exposure). All other sites reported an annual mean concentration in 2021 lower than that reported in 2019 where monitoring data is available, which continues to suggest an overall decrease across the past 5 years.
- Careful attention shall be given to the 2022 monitoring data to understand whether there will be a further bounce back following the relaxation of all UK Government enforced COVID-19 restrictions, in particular at DT25 and DT42 which experienced the greatest increase (a maximum of 14.0µg/m³ at DT42);
- Promotion of the new AQAP;
- Progress measures set out within the new AQAP; and
- Revocation of the following AQMAs:
 - AQMA 1- Declared for NO₂-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 NO₂-- 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 NO₂-- M26 - from junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council
- AQMA 4- Declared for NO₂-- Swanley Bypass - from junction 3 of the M25 to the district boundary with the London Borough of Bromley
- AQMA 6- Declared for PM₁₀- Junction 5 to Kent / Surrey border

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.

Walking and cycling instead of making car journeys will reduce the amount of traffic on the local roads and reducing emissions and also helping to improve the congestion. Other small changes include not allowing car engines to idle when vehicles are stationary.

- Anticipate traffic flow, keeping in the highest gear possible and maintaining a steady speed at a low revs per minute (RPM). This will help to reduce pollution from your car, and save on fuel consumption.
- Consider purchasing a cleaner electric, hybrid vehicle or one that meets the euro 6 emission standard.
- Maintain your vehicle regularly, if a diesel, make sure the oil and filters are changed frequently. If you notice sooty emissions from the exhaust, take your vehicle to a servicing garage as soon as possible. Ensure your tyres are maintained at the optimum pressure to achieve the best fuel consumption and save you money.
- Turn off your engine if you are caught in a traffic jam or have to wait at level crossings; not only will this reduce your emissions but you will also save fuel.
- Avoid using your car for short journeys - short trips are very polluting as vehicle engines need to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.
- For short journeys, walking, cycling and public transport can be the best and cheapest option.

- Avoid/reduce the burning of solid fuels and garden bonfires as these produce significant particulate pollution.

Further information on air quality monitoring carried out by Sevenoaks District Council can be found on the [London Air Quality Network website](#).

Some areas of the District are subject to smoke control orders under the Clean Air Act 1993. Residents can check if their property is include by visiting the Council's [website](#).

In a Smoke Control area only fuel on the list of authorised fuels, or any of the following 'smokeless' fuels can be burned, unless an exempt appliance is used.

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

Even if your property is not within a Smoke Control Area, you should be aware that appliances that burn solid fuel contribute to local air pollution and evidence is that their contribution is increasing due to the popularity of solid fuel burning for occasional heating requirements, especially in the wintertime. Domestic solid fuel burning can generate significant levels of particulate pollution, and the council have noted an increase in complaints concerning smoke emitted from domestic properties. Non-compliance with the smoke control rules 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 Bureau Veritas on behalf of the Environmental Health Department of Sevenoaks District Council with the support and agreement of the following officers and departments:

Holly Harris, Air Quality Promotions Officer

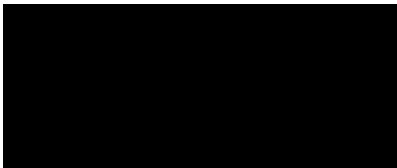
Helen French, Net Zero Project Co-ordinator

Colin Alden, Environmental Protection Team Leader

Nick Chapman, Environmental Health Manager

This ASR has been approved by:

Nick Chapman, Environmental Health manager



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

If you have any comments on this ASR please send them to Holly Harris at:

air.quality@sevenoaks.gov.uk

Sevenoaks District Council, Argyle Road, Sevenoaks, Kent, TN13 1HG

01732 227000

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1 Local Air Quality Management

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

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

The statutory air quality objectives applicable to LAQM in England are presented in 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 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Sevenoaks District Council can be found in Table 2.1. The table presents a description of the 9 AQMAs that are currently designated within Sevenoaks District. Appendix D: Maps 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](#) website. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO₂ annual mean; and
- PM₁₀ 24-hour mean.

As detailed in the 2021 ASR, following the findings of AQMA review carried out by Bureau Veritas on behalf of Sevenoaks District Council, the Council intends to revoke the following AQMAs:

- AQMA 1- Declared for NO₂ - 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 NO₂ - 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 NO₂ - M26 - from junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council
- AQMA 4- Declared for NO₂ - Swanley Bypass - from junction 3 of the M25 to the district boundary with the London Borough of Bromley
- AQMA 6- Declared for PM₁₀ - Junction 5 to Kent / Surrey border

Whilst this has not been completed during 2021, the Council continues with the intention to proceed with these revocations.

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 National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1	01/03/2002 Amended 2005	NO2 Annual Mean	Junction 3 of the M25 to the district boundary with Tonbridge and Malling Borough Council including part of the A20 at Farningham.	YES	45µg/m ³	19.6µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP
AQMA 2	01/03/2002	NO2 Annual Mean	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	YES	55µg/m ³	25.5µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP
AQMA 3	01/03/2002	NO2 Annual Mean	M26 - from junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council.	YES	50µg/m ³	24.7µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP
AQMA 4	01/03/2002	NO2 Annual Mean	Swanley Bypass - from junction 3 of the M25 to the district boundary with the London Borough of Bromley	YES	45µg/m ³	16.9µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP
AQMA 6	01/09/2006	PM10 24 Hour Mean	Junction 5 to Kent / Surrey border	YES	Risk predicted	No current monitoring	Sevenoaks Air Quality Action Plan 2022)	Sevenoaks AQAP
AQMA 8	01/09/2006	NO2 Annual Mean	Swanley – London Road (East); High Street; Bartholomew Way and parts of Central town area	NO	56.7µg/m ³	34.1µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 10	10/01/2008	NO2 Annual Mean	Sevenoaks – High Street & London Road	NO	46.5µg/m ³	31.8µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP
AQMA 13	14/01/2014	NO2 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/m ³	37.5µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP
AQMA 14	14/01/2014	NO2 Annual Mean	The junction of London Road and Birchwood Road, Swanley.	NO	48.8µg/m ³	33.1µg/m ³	Sevenoaks Air Quality Action Plan 2022	Sevenoaks AQAP

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 is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

1. The Council have provided a detailed discussion of air quality measures that have been completed over the reporting year, which include actions to promote low emission and electric vehicles in the District.
2. The 2009 AQAP is over 5 years old and a new AQAP is required. The Council have highlighted their priority to finalise the new AQAP.
3. No PM₁₀ monitoring is being carried out in AQMA 6 which was declared for exceedances of the 24-hour mean AQO for PM₁₀. The Council should consider commissioning PM₁₀ monitoring in this AQMA to determine if exceedances of the AQO are still occurring.
4. It is noted that the new AQAP will include measures to reduce PM_{2.5} and this is encouraging. However, the Council could include information on some of these measures or at the least, refer back to the current AQAP measures that would also result in reduction in PM_{2.5}.
5. The format of the report is generally good, but some template text has been left in near Appendix tables. Annual mean PM₁₀ results for Greatness site are in bold but are not exceeding the objective.
6. The Council have included clear discussion of the QA/QC procedures applied to their monitoring. Further information should be included on the analysis method of diffusion tubes including which lab was used and whether they were deployed in line with Defra Calendar.
7. Overall the report is detailed, concise and mostly satisfies the criteria of the relevant reporting standard.

Sevenoaks District Council welcomes these comments to help improve future reporting. Additional care shall be taken to ensure that the template text is removed and to ensure

that formatting throughout the report is correct. Furthermore, the Council intends to maintain a clear discussion of the QA/QC procedures applied to monitoring, but to provide additional information on the analysis method of the diffusion tubes, the lab used, and whether deployment has aligned with the LAQM calendar.

The Council have adopted a new AQAP in Spring 2022.

Sevenoaks District Council has identified a number of new direct measures within the updated AQAP 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 has 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. Key planned measures are:

- Junction and Road improvements at Bat & Ball, in Riverhead, Sevenoaks High Street, Seal and Brasted;
- A number of measures to encourage active travel, such as introducing bike rental schemes, promotion of active travel schemes, developing new walking and cycle routes;
- A number of behavioural change campaigns to reduce single use occupancy car journeys and vehicle idling;
- Transitioning local bus fleets and the Council's fleet to low emission and ultra-low emissions vehicles;
- Improving and developing the EV infrastructure within the district;
- Discouraging the use of bonfires as a means of waste disposal;
- Working with businesses to help identify ways in which they can reduce their emissions and increase proportions of low emissions vehicles within their fleets;
- Reducing emissions from activities with Environmental Permits; and
- Working with Highways England to reduce the need for HGV and LGV vehicles to use the A25.

Some of these measures have already been completed, or reasonable progression has been made to these in 2021. The Council has formally hired an Air Quality Promotions Officer, whose role is specific to focussing efforts on achieving the measures set out within the AQAP. In addition, the Council has begun progressing a County wide school resource for tackling air pollution and developing the first Local Cycling and Walking Infrastructure Plan. The Council has been involved with Kent Air Week, releasing a number of social media posts referencing different actions across the county. The Council is also looking to improve the accessibility of their air quality webpages, and to publish a number of school resources including anti-idling campaigns and walk to school incentives.

Sevenoaks District Council's priorities for the coming year are to progress a large number of the actions within the new 2022 AQAP to improve air quality within the district.

A number of the measures set out also have joint wins with the Council's Climate Change Strategy as these will also reduce emissions of CO₂ and reduce dependency on fossil fuels.

Sevenoaks District Council is working to implement these measures in partnership with the following stakeholders during 2021:

- 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 implement some of the proposed measures. Some of the measures set out may not be commercially viable currently, however due to the number of measures set out it is hoped that some of these may become more viable in the future once funding is available.

Sevenoaks District Council anticipates that the measures stated above and in Table 2.2 will help achieve and 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	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	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	Fully Funded	Low	Planning	NO2, Whilst guidance already exists, it is important to keep these up-to-date as policies and strategies evolve.	Implementation of policy	Draft policies and allocations	Considering a Supplementary Planning Document on Air Quality to set out how air quality will be assessed and the implementation of existing policy. The emerging Local Plan will include a more detailed policy on Air Quality. Air Quality will be considered in the site selection for allocations.
2	Junction improvements at Bat & Ball Junction (A25/ A225 Junction)	Traffic Management	UTC, Congestion management, traffic reduction	2025	2030	SDC/ KCC/ STC	CIL / KCC / S106 Funding	No	Not Funded	Very High	Planning	NO2. To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO2 concentrations (amount to be determined by scenario testing once suitable scheme is identified) / Reduced congestion and journey times	Initial discussions	The Local Plan will consider the impact of development on these junctions and potential improvements. 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	2025	2030	SDC/ KCC/ STC	CIL / KCC / S106 Funding	No	Not Funded	Very High	Planning	NO2. To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO2 concentrations (amount to be determined by scenario testing once suitable scheme is identified) / Reduced congestion and journey times	Initial discussions	The Local Plan will consider the impact of development on these junctions and potential improvements. 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	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
4	Road/ Junction improvements along A225 Sevenoaks High Street	Traffic Management	UTC, Congestion management, traffic reduction	2025	2030	SDC/ KCC/ STC	CIL / KCC /S106 Funding	No	Not Funded	Medium to high	Planning	NO2. To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO2 concentrations (amount to be determined by scenario testing once suitable scheme is identified) / Reduced congestion and journey times	Initial discussions	Sevenoaks Town centre was previously considered to be made one way however was later discounted. Councillors raised concerns about traffic entering and exiting Knole Park. Possible junction works at entrance to Knole Park + A224/ A225 Junction. Possible introduction of 20mph speed limit in Sevenoaks High Street. / Consideration of removing loading/ parking bays.
5	Road improvements along the A25 in Seal, and the A25 in Brasted	Traffic Management	UTC, Congestion management, traffic reduction	2025	2030	SDC/ KCC/ STC/ SPC/ WTC/ BPC	CIL / KCC /S106 Funding	No	Not Funded	Medium to high	Planning	NO2. To be confirmed by further assessment once appropriate scheme is determined by partners.	Reduction in NO2 concentrations (amount to be determined by scenario testing once suitable scheme is identified) / Reduced congestion and journey times	Initial discussions	No Scheme currently being considered however 20mph zones have been suggested by Town and Parish Councils. Impact to be scenario tested. Costs likely to be significant depending on nature of changes.
6	Bike rental schemes	Promoting Travel Alternatives	Promotion of cycling	2022	Ongoing	SDC	CIL/ Grant/ Commercial Income	No	Not Funded	Medium	Planning and feasibility	NO2. Small impact upon NO2 concentrations from measure individually, estimated to be less than 1µg/m3 based upon a low to medium uptake.	Number of bikes available and rentals	Currently being considered for feasibility	Linked to Net Zero 2030 Ambitions. Focus on replacing private vehicle movements (38.1% NO2 emissions) with sustainable alternatives
7	Promotion of active travel schemes	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2022	Ongoing	SDC/KCC	Internal/ Existing	No	Funded	Low	Planning	No2. 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 is in development for adoption Spring 2022	Promotion of measures to wider audience using dedicated AQPO resource. Focus on replacing private vehicle movements (38.1% NO2 emissions) with sustainable alternatives
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	Planning	NO2. Small impact upon NO2 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 first Local Cycling and Walking Infrastructure Plan for Sevenoaks Urban Area in early stages. Expected to be completed during 2022	LCWIPs will be prepared for other parts of the District. Focus on replacing private vehicle movements (38.1% NO2 emissions) with sustainable alternatives. Some options include adoption of the Liftshare platform, use of Betterpoints behaviour change service, gamification etc.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
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	Part of the Movement Strategy and the Net Zero 2030 work	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	Recruitment of the AQPO to lead on this area	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	Planning	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	Recruitment of the AQPO to lead on this area	Development of program under development. To be primarily used as an educational program around primary schools etc
12	Educational campaigns for schools	Public Information	Other	2022	2027	SDC	Internal/ Existing	Yes	Funded	Low	Planning	NO ₂ . Measure to increase public awareness	Number of campaigns	Recruitment of the AQPO to lead on this area	DEFRA grant has been received in Kent for the production of educational resources. Educate on the alternatives for private vehicle use within AQMAs (38.1% NO ₂ emissions)
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. Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2030	SDC	Internal	No	Partially Secured	High - To be identified through the forthcoming Carbon Reduction Plan	Feasibility and 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.	Vehicle Replacement Plan to be considered by Members in 2022. Reduce emissions of HGVs 4.9% within AQMAs

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
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	Secured for study / Funding for EV sites to be identified	Medium / Very High	Planning	NO ₂ . Small impact upon NO ₂ concentrations from measure individually, estimated to be less than 1µg/m ³ 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 to be undertaken in 2022 and funded from appropriate s106 money (already held by SDC)	Part of the recently published Low Emission and Electric Vehicle Strategy. Reduce % NO ₂ 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	Study of suitable locations ongoing	High	Planning	NO ₂ . Small impact upon NO ₂ concentrations from measure individually, estimated to be less than 1µg/m ³ based upon a low to medium uptake.	Number of EV charging points within District Area	Part of the recently published Low Emission and Electric Vehicle Strategy	Future use of land assets. Issues with Network Power Infrastructure. Reduce % NO ₂ emissions from private vehicles (38%)
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/m ³ based upon a low to medium uptake.	Increased use of Public transport. Additional routes public transport facilities.	Movement Strategy to be adopted Spring 2022	Additional routes for public transport are unlikely to be viable unless commercially sustainable. Reduce % NO ₂ emissions from private vehicles (38%)
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	Rail Projects Community Officer has been employed- funded from existing budgets. Work to improve signage around rural stations.	Public transport within SDC is fragmented, but initiatives are currently underway to encourage use of rail. Reduce % NO ₂ emissions from private vehicles (38%)
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/ Existing	No	Funded	Very High	Implementation	NO ₂ . Small impact upon NO ₂ concentrations from measure individually, estimated to be less than 1µg/m ³ 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.	Part of the Net Zero 2030 work. Reduce % NO ₂ emissions from private vehicles (38%) by encouraging LEV

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
20	Car Club / Sharing schemes	Alternatives to private vehicle use	Car Clubs	2022	2027	SDC	External Funding/ CIL	No	Not funded/ feasibility study	Medium	Planning	NO2. Small impact upon NO2 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 to be encouraged in new development through the Local Plan. Included within the Movement Strategy	Cost of implementation/ May not be commercially viable within Sevenoaks. Reduce % NO2 emissions from private vehicles (38%) by reducing number within AQMAs
21	Exploring flexible working and home working	Promoting Travel Alternatives	Facilitate flexible and home-working	2022	Ongoing	SDC	Internal	No	Funded	Low	Implementation	NO2. 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. Policy developed for SDC staff	Reduce % NO2 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/ KCC	Internal/ Existing Budgets + External funding	No	Partially Funded	Low	Planning	NO2. 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 % NO2 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	Internal/ Existing Budgets	No	Funded	Low	Planning	TBC	Completion of the report	Quote received/ scoping exercise commenced	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	ongoing	SDC	Internal/ Existing Budgets	No	Funded	Medium	Implementation	N/A	Recruitment of AQPO	Suitable candidate identified and employed	This role will be specific to focusing efforts on achieving the measures as set out within this action plan

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
25	To provide information and education in respect of personal emissions and how they may be reduced	Public Information	Other	2022	2027	SDC	Internal/ Existing Budgets	No	Funded	Low	Planning	PM2.5 / NO2	Number of educational campaigns		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	Internal/ Existing Budgets	No	Funded	Low	Planning	N/A	Number of educational campaigns		Action to form part of the AQPO duties and role. Part of the Net Zero 2030 work. Promote LoCASE 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	Regulatory activities / statutory duties r	2022	Ongoing	SDC	Internal/ Existing Budgets	No	Funded	Low	Implementation	PM10/ PM2.5	Number of interventions to provide advice and information to residents. Total number of enforcement actions undertaken	Forms part of current statutory duties	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	Internal/ Existing Budgets	No	Funded	Low	Implementation	NO2 PM10/ PM2.5	Increased compliance with Environmental Permitting Regulations. Number of premises identified as 'low risk; (%)	All relevant activities hold relevant 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	Not-Funded	Very High	Planning	NO2 PM10/ PM2.5	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	NO2 PM10/ PM2.5	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.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
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. Uptake of LEVs by businesses		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.
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. Taxi emission incentives. Taxi Licensing conditions	2023	2027	SDC	Internal/ External	No	TBC	Low	Planning	NO ₂	Number of vehicles within the taxi fleet changing to LEV/ EV alternatives	Promotion of energy saving trust. Electric vehicle (EV) training courses for taxi and private hire drivers	Reduction in emissions of Private diesel and petrol vehicles within AQMAs

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

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

No monitoring of PM_{2.5} is currently conducted within Sevenoaks District, however the two automatic monitoring sites located at Greatness and Bat & Ball monitor PM₁₀ concentrations. As per LAQM.TG (16) guidance, PM_{2.5} concentrations can be estimated from monitored PM₁₀ concentrations. In order to do this, data from the London Air Quality Network (LAQN) monitoring station Harwood Avenue (Roadside) in Bromley (~18km northwest of both monitoring sites) has been used to calculate an estimated PM_{2.5} concentration at both monitoring sites. The Harwood Avenue site was chosen due to it being the closest roadside LAQN site to the automatic monitoring sites within Sevenoaks where both PM₁₀ and PM_{2.5} are measured.

The methodology detailed within Box 7.7 of [LAQM.TG \(16\)](#) has been followed to calculate a locally derived PM_{2.5} / PM₁₀ ratio of 0.626. Applied to the 2021 PM₁₀ annual mean concentrations of 17.0µg/m³ and 18.2µg/m³ at Greatness and Bat & Ball respectively, this gives an estimated PM_{2.5} annual mean of 10.7µg/m³ and 11.4µg/m³. These estimated annual mean concentrations are below to the recommended indicative annual mean limit value for PM_{2.5} (20µg/m³).

LAQM.TG (16) recommends using a national factor of 0.7, which is slightly more conservative than the factor calculated at Harwood Avenue. Comparatively, when applying this the estimated PM_{2.5} concentrations at Greatness and Bat & Ball are 11.9µg/m³ and 12.7µg/m³ respectively, both still below the recommended indicative annual mean limit value.

In addition to this, the current Defra 2021 [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 maximum predicted concentration is 11.1µg/m³ within the 1 x 1km grid square with the centroid grid reference of 552500, 167500. This is an area that contains both the M25 and M20, just southeast of Swanley. The background maps also provide a breakdown of sources. For this grid square, the majority of the PM_{2.5} concentrations is estimated to arise from secondary PM_{2.5} formation, which forms following chemical reactions of other gaseous atmospheric pollutants, such as nitrogen oxides (NO_x), ammonia (NH₃), and volatile organic compounds (VOCs).

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 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 1km² 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 2020 fraction of mortality attributable to PM_{2.5} pollution across England is 5.6%, and the fraction within the Southeast region higher than this at 6.0%. The fraction reported within Sevenoaks specifically is higher than the national average, but equal to the regional average, at 6.0%. The 2020 fraction of mortality has been used as opposed to the 2021 fraction as the latest data has not been made available at the time of writing.

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 [smoke control areas](#) located in Swanley and to the south of Crockenhill. Within these areas, 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 2021 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 2017 and 2021 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 2021. Table A.1 in Appendix A shows the details of the automatic monitoring sites. Tables within Appendix A presents automatic monitoring results for Sevenoaks District Council, with automatic monitoring results also available through the [LAQN 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 NO₂ at 53 sites during 2021, 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 2021.

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 NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 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 NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

No exceedances of the annual mean NO₂ Air Quality Strategy (AQS) objective (40µg/m³) have been reported at any monitoring location operated by Sevenoaks District Council in 2021. The maximum reported concentration is 37.5µg/m³, within 10% of the AQS objective (36µg/m³), reported at both DT42 and DT87, located in Riverhead along Worships Hill and Bradbourne Vale Road respectively. Both of these are within AQMA No.13. One other site reported an annual mean concentration >36µg/m³, DT31 with a concentration of 36.3µg/m³. This site is located along the A25 Seal Road, near the Bat & Ball junction, within AQMA No.13. None of these sites are located at a site of relevant exposure, and once fall-off with distance correction calculations had been carried out the maximum reported concentration of these was 33.4µg/m³ at DT31.

Annual mean NO₂ concentrations have shown an increase at the majority of monitoring locations from 2020 to 2021. At sites DT25 and DT42, the 2021 annual mean concentration reported is the greatest it has been at these sites over the past 5 years, with the maximum being reported at DT42. The greatest increase was 14.0µg/m³ at site DT42, however as stated above this remains to be below the AQS objective and is not at a site of relevant exposure in 2021. All other monitoring sites have reported a lesser increase, or have remained relatively stable. Despite this, with the exception of DT25 and DT42, the 2021 annual mean concentrations remain below that reported in 2019. This may be due to continued impacts of the COVID-19 pandemic, such as UK Government enforced restrictions at the start of the year (January and February), but this may also be due to changes in behaviours and increasing numbers of people working from home. This may have also had an impact on standard rush hour and peak times, meaning that congestion may be diminished when compared to pre-COVID-19. The increases observed at DT 25 and DT42 may be due to localised increases in congestion. If 2022 concentrations show a further increase or remain high, a further investigation into what is causing this shall be carried out.

With respect to the 1-hour mean objective, no diffusion tube monitoring locations have reported a concentration >60µg/m³, which as per LAQM.TG (16), would indicate a potential exceedance of the 1-hour mean objective. Additionally, neither of the continuous monitoring locations reported any period in 2021 where the hourly concentration exceeded 200µg/m³.

3.2.2 Particulate Matter (PM₁₀)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 40µg/m³.

Table A.7 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

Both continuous monitoring locations reported annual mean PM₁₀ concentrations below the annual mean objective of 40µg/m³. Greatness (CM1) reported a concentration of

17.0µg/m³, whereas Bat & Ball (CM2) reported a concentration of 18.2µg/m³. There is little change to what was reported in 2020 (+0.2µg/m³ 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 50µg/m³, both monitoring sites reported 2 periods where this was the case. The maximum number reported over the past 5 years was 9 at CM1 in 2019.

3.2.3 Ozone (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 100µg/m³ more than 10 times a year. CM1 reported 55 8-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	NO _x , NO, NO ₂ , PM ₁₀ , O ₃	NO	Chemiluminescent / Teom	Y	46m	1.8
CM2	Bat & Ball	Roadside	553044	156690	NO _x , NO, NO ₂ , PM ₁₀	YES	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

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)
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
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

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)
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
DT39	Swanley, Bartholomew Way 2, 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

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)
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
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,	Roadside	550298	169627	NO2	Y - AQMA No.14	15.0	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)
	Jessamine Terrace									
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
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

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)
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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
CM1	553603	156774	Urban Background	78%	78%	16.0	15.0	14.0	12.0	11.6
CM2	553044	156690	Roadside	94%	94%	28.0	25.0	23.0	18.0	20.1

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

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

Notes:

The annual mean concentrations are presented as µg/m³.

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

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Table A.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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
DT02	553157	154416	Roadside	100.0	100.0	48.1	49.9	40.4	29.6	31.8
DT03	552465	154165	Urban Background	100.0	100.0	11.1	11.8	9.9	8.0	8.0
DT05	551414	156196	Roadside	84.6	84.6	42.7	39.3	34.4	30.3	30.6
DT06	551442	156159	Kerbside	100.0	100.0	40.2	41.7	34.8	27.3	30.0
DT07	555096	156692	Roadside	100.0	100.0	42.7	41.3	36.6	26.2	29.3
DT08	554991	156728	Roadside	100.0	100.0	26.9	28.3	23.7	19.2	20.3
DT12	546813	155850	Roadside	100.0	100.0	40.0	39.8	33.2	26.6	25.5
DT13	552510	167704	Kerbside	100.0	100.0	30.5	32.9	27.7	21.7	23.1
DT14	553107	167868	Roadside	92.3	92.3	30.1	27.6	25.2	20.9	20.7
DT23	553050	156625	Roadside	100.0	100.0	34.3	39.2	33.0	26.6	28.9
DT24	544418	153918	Roadside	100.0	100.0	30.4	35.8	28.2	23.0	24.9
DT25	544638	154041	Roadside	84.6	84.6	25.9	26.1	23.5	18.4	30.6
DT26	554218	167252	Roadside	92.3	92.3	41.8	42.7	34.8	29.6	28.9
DT27	553138	154260	Roadside	100.0	100.0	38.2	37.7	33.2	21.6	24.3
DT28	553044	154889	Roadside	92.3	92.3	36.7	36.8	31.5	23.5	23.6
DT29	553073	155030	Roadside	92.3	92.3	28.0	28.2	23.7	17.6	19.9
DT30	553019	156692	Roadside	100.0	100.0	32.4	35.1	30.8	24.2	25.4
DT31	553165	156686	Kerbside	100.0	100.0	51.2	51.1	43.6	35.0	36.3
DT32	553147	156563	Roadside	90.4	90.4	47.6	51.9	40.7	32.5	34.1
DT33	555069	156709	Roadside	100.0	100.0	40.5	40.5	34.6	26.3	29.8

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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
DT34	544802	154895	Roadside	100.0	100.0	27.5	26.1	23.5	18.3	18.6
DT35	554092	156797	Roadside	84.6	84.6	32.5	33.7	30.0	24.3	26.5
DT36	544598	154021	Roadside	92.3	92.3	39.6	40.1	33.5	28.2	28.1
DT39	551492	168695	Roadside	92.3	92.3	34.5	36.4	34.8	28.1	29.4
DT40	551579	168507	Roadside	90.4	90.4	40.9	45.6	37.5	28.4	34.1
DT41	552175	168162	Roadside	100.0	100.0	40.1	38.6	32.6	27.2	29.5
DT42	551383	156064	Roadside	92.3	92.3	35.5	34.5	27.4	23.6	37.5
DT43	551315	156381	Roadside	100.0	100.0	29.5	28.5	26.5	19.3	24.9
DT48	552867	154858	Roadside	90.4	90.4	40.7	23.9	20.0	13.6	15.9
DT49	553018	154655	Roadside	100.0	100.0	28.2	29.1	25.1	17.2	18.6
DT51	552761	155050	Roadside	84.6	84.6	35.1	39.0	30.2	22.3	18.1
DT52	552504	155271	Roadside	92.3	92.3	33.1	34.0	29.5	21.8	21.8
DT54	551224	156975	Roadside	100.0	100.0	33.8	32.7	28.8	24.8	24.1
DT71	548239	155355	Roadside	100.0	100.0	30.0	31.3	25.6	22.5	23.6
DT74	550768	155584	Roadside	100.0	100.0	35.4	35.9	30.7	22.2	25.5
DT76	551019	155714	Roadside	100.0	100.0	33.9	37.9	33.3	27.4	29.0
DT77	551528	155967	Kerbside	100.0	100.0	38.8	38.7	31.6	25.0	26.5
DT81	553419	167614	Urban Background	82.7	82.7	30.9	28.6	25.7	20.7	19.6
DT83	550298	169627	Roadside	92.3	92.3	49.8	46.7	42.4	33.3	33.1
DT84	546803	154999	Roadside	92.3	92.3	31.2	32.5	26.5	23.0	25.1
DT85	547094	155099	Kerbside	90.4	90.4	43.9	43.7	35.7	31.5	30.1
DT86	550306	155595	Roadside	90.4	90.4	36.0	34.7	30.7	21.1	24.3
DT87	551639	156334	Roadside	100.0	100.0	45.7	47.0	42.3	35.7	37.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
DT88	552950	156578	Roadside	100.0	100.0	28.7	30.3	28.1	20.7	21.5
DT90	553053	154708	Roadside	84.6	84.6	31.5	34.5	29.5	21.1	21.4
DT93	550284	169743	Roadside	100.0	100.0	27.2	28.8	25.9	19.5	20.2
DT94	550249	169573	Roadside	100.0	100.0	32.2	33.8	28.6	22.8	22.7
DT95	550351	169490	Roadside	100.0	100.0	33.6	33.0	30.2	25.0	25.3
DT96	552371	155346	Roadside	92.3	92.3	-	34.5	30.5	21.2	22.4
DT97	550555	168253	Urban Background	92.3	92.3	-	-	-	17.7	16.9
DT98	550962	157662	Roadside	82.7	82.7	-	-	-	22.8	24.7
BC01, BC02, BC03	553607	156776	Urban Background	100.0	100.0	15.5	13.9	13.0	10.8	11.0
BC04, BC05, BC06	553045	156690	Roadside	100.0	100.0	28.3	26.9	24.9	19.6	20.3

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

Diffusion tube data has been bias adjusted.

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

Notes:

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

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

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A. 1- Trends in Annual Mean NO₂ Concentrations: AQMAs No.1, No.2, No.3, No.4, No.8, No.10, No.14

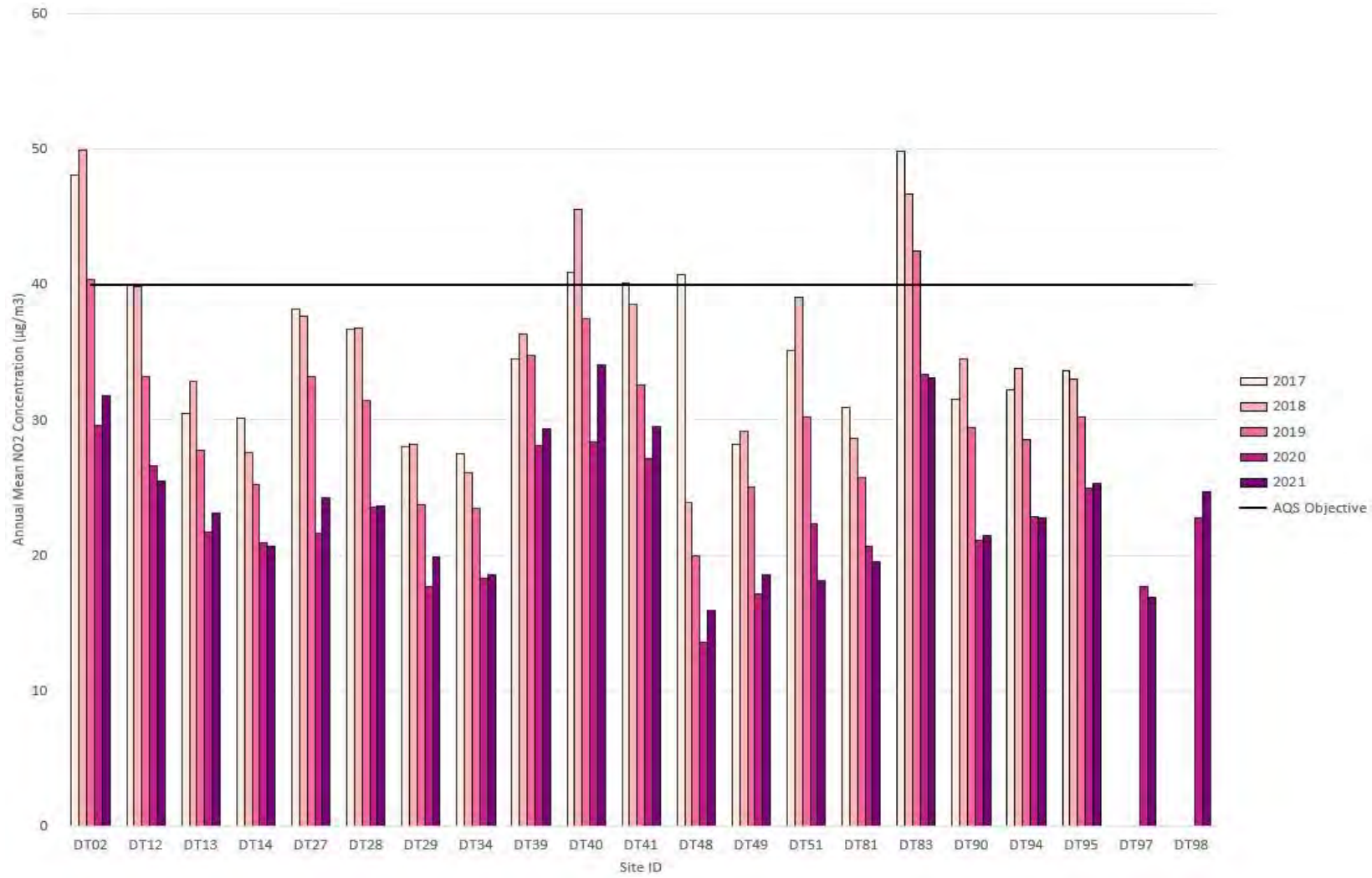


Figure A. 2- Trends in Annual Mean NO₂ Concentrations: AQMA No.

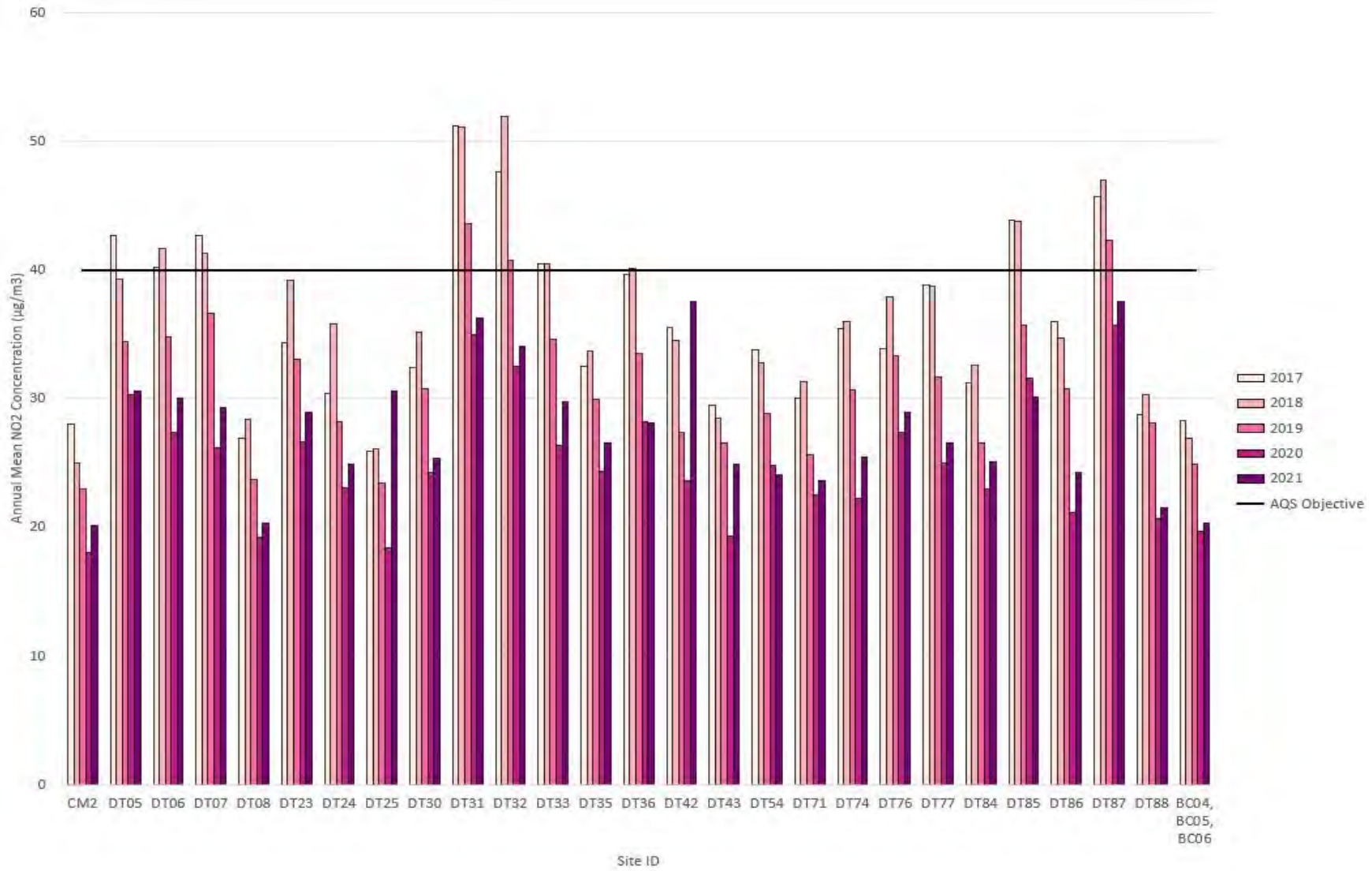


Figure A. 3- Trends in Annual Mean NO₂ Concentrations: Outside AQMA

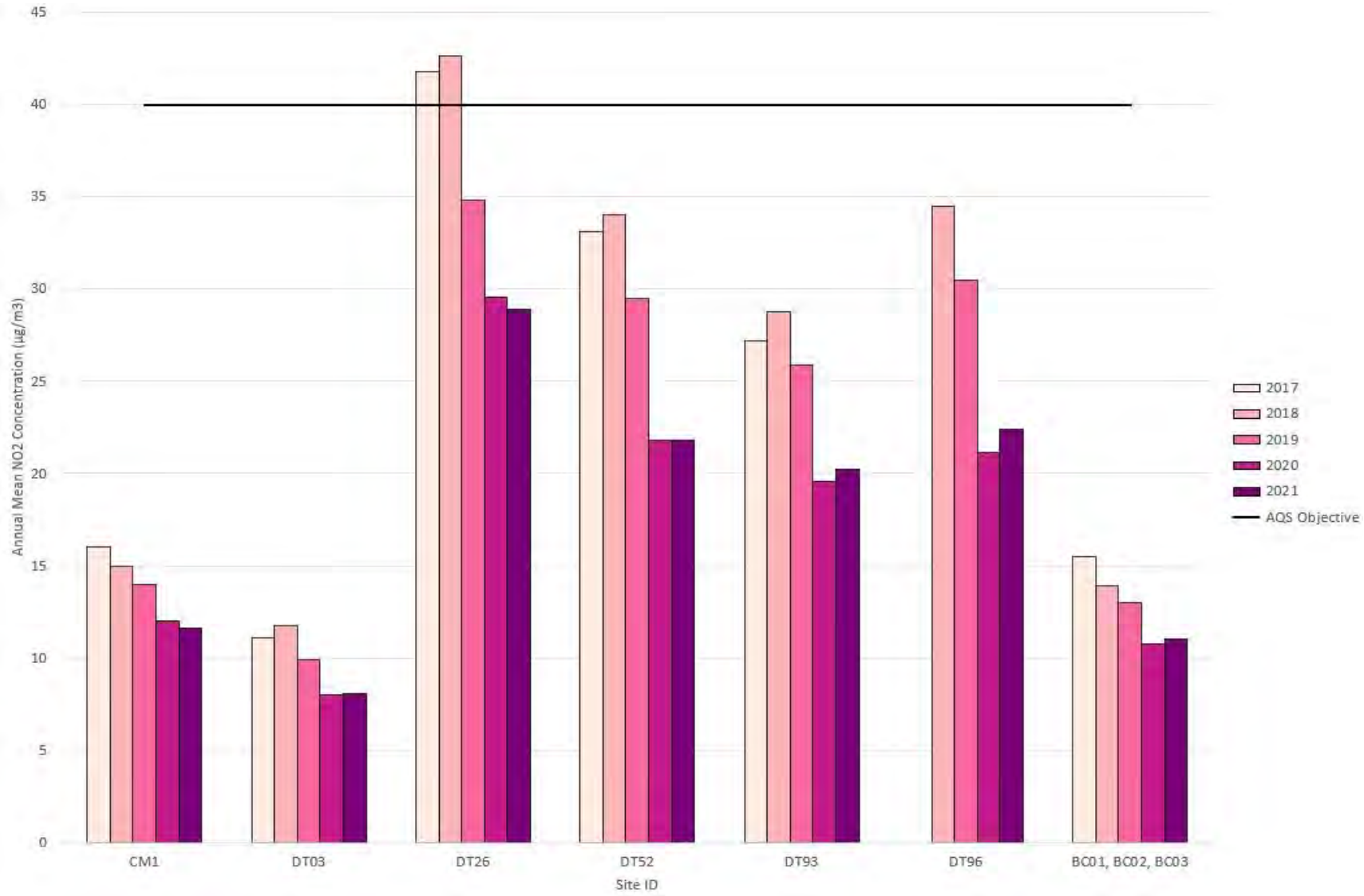


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
CM1	553603	156774	Urban Background	78%	78%	0	0	0	0	0
CM2	553044	156690	Roadside	94%	94%	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
CM1	553603	156774	Urban Background	98%	98%	18.0	19.0	20.0	17.0	17.0
CM2	553044	156690	Roadside	99%	99%	20.0	21.0	20.0	18.0	18.2

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

Notes:

The annual mean concentrations are presented as µg/m³.

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

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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.4 - Trends in Annual Mean PM₁₀ Concentrations

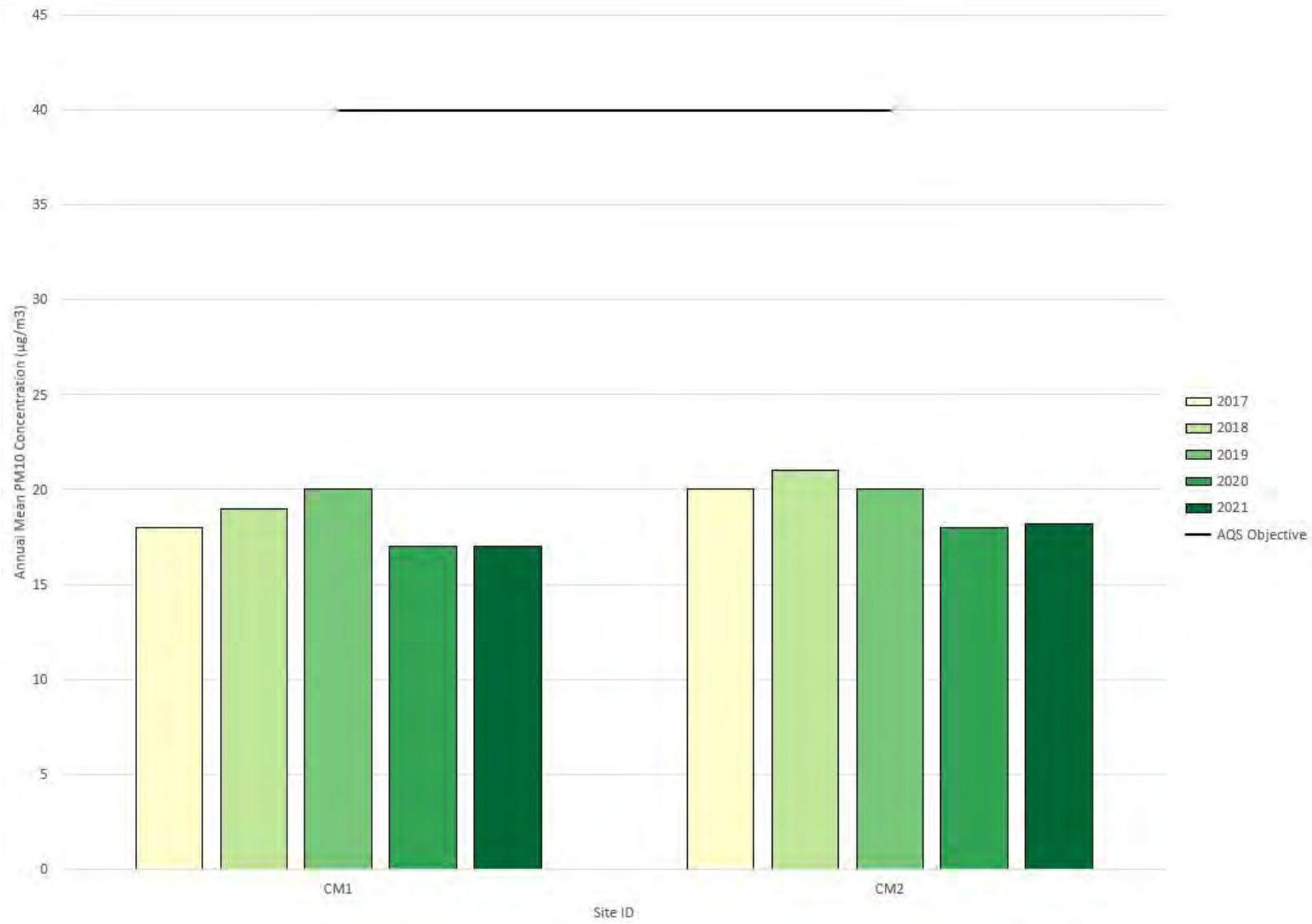


Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
CM1	553603	156774	Urban Background	98%	98%	4	1	9	3	2
CM2	553044	156690	Roadside	99%	99%	5	8	8	4	2

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m³ have been recorded.

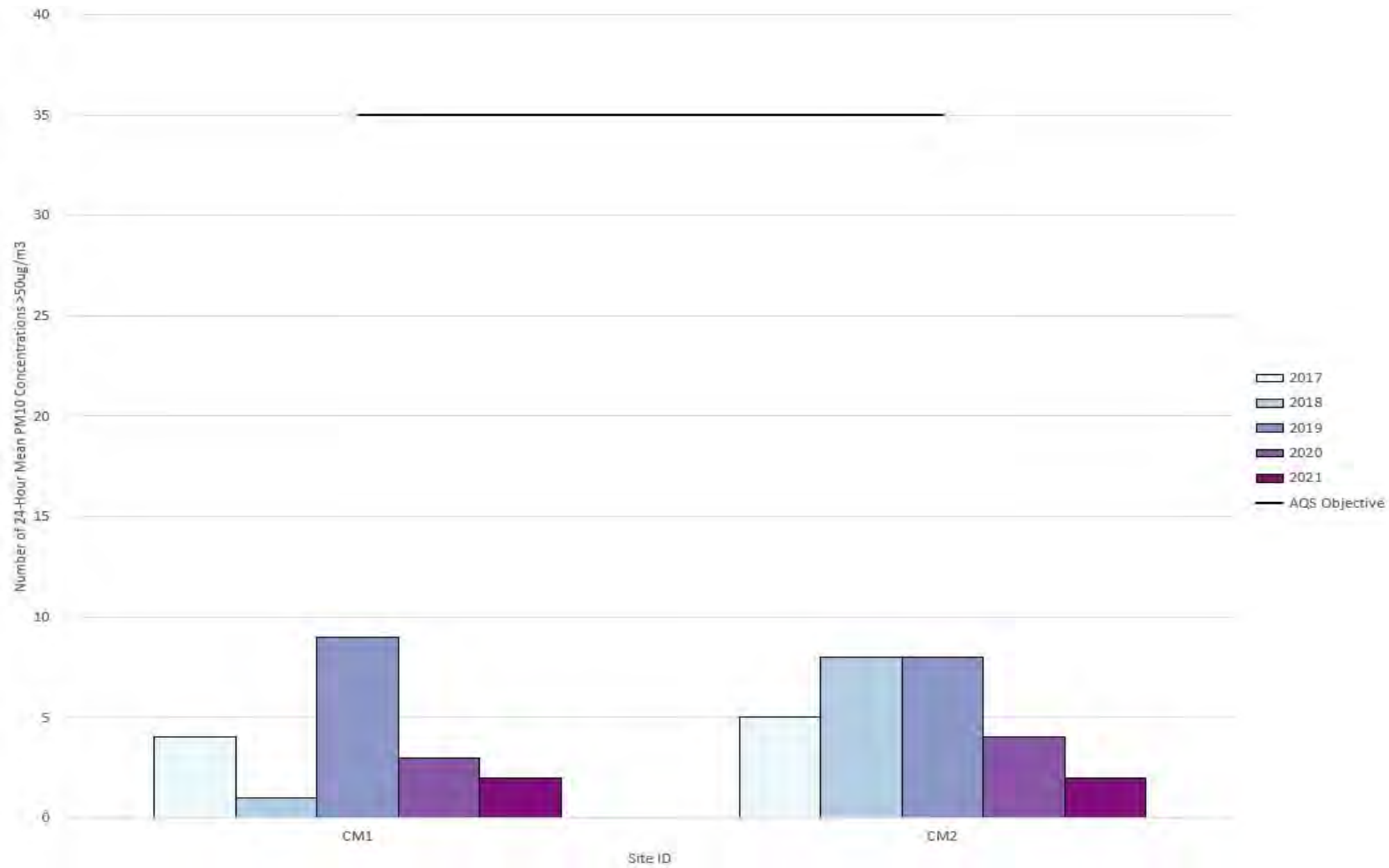
Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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.5 - Trends in Number of 24-Hour Mean PM₁₀ Results > 50µg/m³



Appendix B: Full Monthly Diffusion Tube Results for 2021

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT02	553157	154416	49.9	40.9	39.8	39.7	41.8	36.9	30.5	25.0	46.3	44.4	56.9	36.4	40.7	31.8	-	
DT03	552465	154165	17.4	12.1	10.6	10.0	8.4	7.7	6.9	5.2	9.7	9.8	14.5	11.5	10.3	8.0	-	
DT05	551414	156196	45.1	39.0		37.3	37.1	39.4	34.6	34.5		37.4	49.7	37.6	39.2	30.6	-	
DT06	551442	156159	38.7	37.7	33.3	49.2	34.8	40.5	39.6	25.7	43.5	37.0	43.8	37.8	38.5	30.0	-	
DT07	555096	156692	46.4	40.5	35.0	33.5	35.1	36.8	33.1	23.0	42.9	38.3	46.1	39.4	37.5	29.3	-	
DT08	554991	156728	36.9	27.6	22.6	27.0	23.0	25.5	19.6	19.8	27.0	22.4	36.3	24.8	26.0	20.3	-	
DT12	546813	155850	44.4	27.7	38.2	38.7	25.8	28.2	25.2	28.7	33.4	27.8	46.5	27.6	32.7	25.5	-	
DT13	552510	167704	40.4	26.8	28.5	34.6	30.1	25.0	22.0	20.9	36.1	24.8	36.2	30.1	29.6	23.1	-	
DT14	553107	167868	40.0	26.9	24.1	20.5		21.4	17.8	18.5	27.3	28.1	40.2	26.7	26.5	20.7	-	
DT23	553050	156625	44.5	36.9	36.2	42.5	33.5	38.1	33.2	23.9	43.7	33.0	45.1	34.5	37.1	28.9	-	
DT24	544418	153918	39.0	36.8	30.9	37.2	28.0	32.9	30.6	13.6	35.8	27.0	37.8	33.4	31.9	24.9	-	
DT25	544638	154041	40.9	37.3		47.7		40.3	36.4	28.7	44.8	34.4	43.1	38.1	39.2	30.6	-	
DT26	554218	167252		38.8	36.6	43.3	36.5	37.2	29.9	29.1	40.0	37.8	38.8	39.2	37.0	28.9	-	
DT27	553138	154260	40.3	29.6	35.1	29.6	23.3	26.7	25.4	23.2	31.7	33.0	44.2	31.6	31.1	24.3	-	
DT28	553044	154889	36.1	31.4	35.6	30.5	27.6	32.8	18.7	23.6	35.3	30.2		31.3	30.3	23.6	-	
DT29	553073	155030	33.5	28.2	22.3	26.6		22.0	20.1	16.4	27.1	24.4	31.6	28.7	25.5	19.9	-	
DT30	553019	156692	42.4	32.1	35.7	35.9	27.5	31.3	28.6	27.9	33.7	21.0	41.9	32.1	32.5	25.4	-	
DT31	553165	156686	54.4	43.9	47.3	44.8	39.4	45.9	39.4	36.3	54.0	44.8	62.2	45.6	46.5	36.3	33.4	
DT32	553147	156563	53.7	48.4	45.0		37.0	45.6	42.7	34.9	54.6	38.3	50.0	30.4	43.7	34.1	-	
DT33	555069	156709	45.6	37.9	36.3	46.0	35.8	39.6	34.3	27.5	41.4	32.9	45.8	34.9	38.2	29.8	-	
DT34	544802	154895	31.7	26.0	24.1	29.6	15.1	21.4	21.4	17.8	28.4	21.5	26.1	22.7	23.8	18.6	-	
DT35	554092	156797	36.6	35.5	31.3	27.4			31.5	26.7	40.9	36.7	36.4	36.7	34.0	26.5	-	
DT36	544598	154021	43.0	37.8	34.5	35.4	33.8	35.8	30.5	27.8		36.7	38.9	41.9	36.0	28.1	-	
DT39	551492	168695	44.5	41.1	37.7	40.9	26.7	42.5	33.9	29.6	43.5	37.3		36.6	37.7	29.4	-	
DT40	551579	168507	50.4	48.7	43.2	49.9	25.0	44.4	46.2	36.7	49.5	33.6	52.7		43.7	34.1	-	
DT41	552175	168162	43.8	38.4	33.8	35.0	34.9	35.5	31.5	25.2	44.3	38.3	51.7	41.9	37.9	29.5	-	
DT42	551383	156064	53.7	46.2	47.7	48.2	43.5	50.0	40.6	40.8	55.8	49.2		53.4	48.1	37.5	33.1	
DT43	551315	156381	43.3	31.6	34.2	27.9	28.4	28.0	24.9	21.8	33.5	32.7	42.0	35.0	31.9	24.9	-	
DT48	552867	154858	28.6	23.2	19.9		17.2	17.3	14.4	12.7	21.4	19.3	28.3	21.9	20.4	15.9	-	
DT49	553018	154655	28.8	28.5	22.8	25.6	18.8	22.3	19.2	15.4	28.2	22.5	31.3	22.2	23.8	18.6	-	
DT51	552761	155050			23.9	27.4	19.1	22.4	19.2	16.3	25.5	21.6	31.7	25.2	23.2	18.1	-	
DT52	552504	155271		31.4	30.1	25.7	26.2	31.9	17.7	17.1	35.9	27.9	34.4	29.0	27.9	21.8	-	
DT54	551224	156975	41.0	32.7	32.6	29.9	27.9	28.1	21.5	21.2	30.5	30.8	42.5	31.9	30.9	24.1	-	
DT71	548239	155355	37.3	31.9	32.8	27.6	29.3	29.0	23.9	20.7	31.5	29.9	36.9	32.9	30.3	23.6	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT74	550768	155584	43.3	35.2	31.7	31.8	28.9	31.0	29.4	23.5	34.6	30.3	41.0	31.0	32.6	25.5	-	
DT76	551019	155714	44.4	31.3	36.7	36.5	35.0	36.0	35.9	31.0	40.5	35.6	50.0	32.5	37.1	29.0	-	
DT77	551528	155967	37.7	32.4	28.6	39.7	35.5	34.6	28.2	25.5	40.9	34.9	38.1	32.2	34.0	26.5	-	
DT81	553419	167614	36.3	27.9	26.2	24.3	21.3	21.0			26.5	12.3	30.7	24.4	25.1	19.6	-	
DT83	550298	169627	50.5	33.3	45.9	37.8		44.2	37.8	36.1	33.5	46.4	58.2	42.7	42.4	33.1	-	
DT84	546803	154999	35.9	31.6	33.4	31.8		31.4	35.3	23.5	34.9	31.0	34.8	30.3	32.2	25.1	-	
DT85	547094	155099	47.0	39.1	39.2		34.4	41.5	28.5	27.7	43.9	35.4	51.0	36.9	38.6	30.1	-	
DT86	550306	155595	38.2	33.4	28.8	28.9	28.3	25.1		20.9	36.1	30.6	41.9	30.2	31.1	24.3	-	
DT87	551639	156334	58.7	46.6	47.4	43.6	49.9	51.2	38.6	38.0	52.6	45.9	58.2	46.8	48.1	37.5	24.5	
DT88	552950	156578	35.3	27.1	28.6	29.6	25.4	26.7	24.3	19.7	32.1	26.2	31.4	24.1	27.5	21.5	-	
DT90	553053	154708		33.4	27.3	36.9	29.0	32.8	26.9	21.5		0.6	35.7	30.8	27.5	21.4	-	
DT93	550284	169743	39.0	27.8	22.0	30.7	21.7	24.1	21.1	18.0	28.3	23.3	29.5	26.0	26.0	20.2	-	
DT94	550249	169573	34.7	34.7	29.8	28.8	26.6	28.6	24.9	17.8	33.4	27.7	36.2	26.6	29.2	22.7	-	
DT95	550351	169490	35.4	35.8	34.6	34.4	28.8	30.5	28.0	20.9	37.2	27.8	42.9	33.5	32.5	25.3	-	
DT96	552371	155346		31.9	29.7	27.2	24.6	25.7	24.9	16.7	32.3	32.6	37.2	33.0	28.7	22.4	-	
DT97	550555	168253		25.2	24.3	21.9	19.0	16.3	17.0	13.7	23.2	22.4	30.5	24.7	21.7	16.9	-	
DT98	550962	157662		32.5	34.8	35.5	28.6	32.7		22.8	33.6	28.4	40.8	27.1	31.7	24.7	-	
BC01	553607	156776	23.5	16.6	14.9	13.0	10.2	9.6	9.0	8.2	14.3	12.8	19.1	16.3	-	-	-	Triplicate Site with BC01, BC02 and BC03 - Annual data provided for BC03 only
BC02	553607	156776	24.9	15.8	16.2	11.7	10.4		9.5	7.6	13.6	12.9	22.3	15.6	-	-	-	Triplicate Site with BC01, BC02 and BC03 - Annual data provided for BC03 only
BC03	553607	156776	22.7	16.6	15.8	12.9	10.4	10.7	9.3	8.3	14.3	13.0	21.6	16.0	14.2	11.0	-	Triplicate Site with BC01, BC02 and BC03 - Annual data provided for BC03 only
BC04	553045	156690	33.4	29.1	25.8	24.3	21.8	22.2	19.9	16.5	29.6	30.8	33.4	26.2	-	-	-	Triplicate Site with BC04, BC05 and BC06 - Annual data provided for BC06 only
BC05	553045	156690	29.8	28.9	27.4	24.8	22.6	23.1	21.1	18.9	30.1	27.4	36.5	26.9	-	-	-	Triplicate Site with BC04, BC05 and BC06 - Annual data provided for BC06 only
BC06	553045	156690	31.7	28.3	24.7	23.3	20.1	22.8	22.0	17.5	28.4	27.2	32.7	27.6	26.0	20.3	-	Triplicate Site with BC04, BC05 and BC06 - Annual data provided for BC06 only

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.TG16.

Local bias adjustment factor used.

National bias adjustment factor used.

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

Sevenoaks District Council confirm that all 2021 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 2021

Two large, proposed developments have been identified as potentially having an impact on air quality within the district. These are:

- Development of Sevenoaks Quarry to include 950 residential dwellings, 200 residential institutional units, business, retail, leisure and sports uses, and a new primary school.
- Residential development at Bevan Place, Swanley.

Additional Air Quality Works Undertaken by Sevenoaks District Council During 2021

Sevenoaks District Council has not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

Sevenoaks District Council's diffusion tubes were supplied and analysed by SOCOTEC Didcot during 2021, 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 NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ 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 2021. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

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 2021 had been largely completed in adherence with the [2021 Diffusion Tube Monitoring Calendar](#), whereby most changeovers were completed within ± 2 days of the specified date. The only exception to this is the June monitoring period, whereby the tubes were deployed and collected 6 days early. Despite this, the annual averages have been calculated using the [LAQM Diffusion Tube Data Processing Tool](#) (DTDPT) which calculates a time-weighted average of when the tubes have been exposed rather than being calculated based on the discrete individual monthly periods.

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.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Sevenoaks District Council have applied a national bias adjustment factor of 0.78 to the 2021 monitoring data (from the [National Diffusion Tube Bias Adjustment Factor Spreadsheet](#), version 03/22). This factor is based on 23 co-location studies, whereby 20 were reported to have good data precision. A summary of bias adjustment factors used by Sevenoaks District Council over the past five years is presented in Table C.1.

Sevenoaks District Council operates two continuous monitoring co-location sites at Greatness Park and Bat & Ball, part of the London Air Quality Network. A combined local

bias adjustment factor has been utilised in previous years and has been calculated using the LAQM DTDPT for the 2021 monitoring period (0.81). Details of the combined local factor are presented in Table C.2. In 2021 the continuous monitor at Greatness Park had poor overall data capture due to 5 monthly monitoring periods having <75% data capture. As a result, it was decided to not use the Greatness Park co-location in the combined factor. The local factor calculated at Bat & Ball was 0.77. It was therefore decided that the National Factor of 0.78 should be applied, as this was slightly more conservative than the Bat & Ball factor, whilst remaining in line with the bias adjustment factors applied in previous years.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.78
2020	Local	-	0.78
2019	National	06/20	0.75
2018	Local	-	0.80
2017	Local	-	0.83

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

Fall-off-with-distance calculations were required at 3 monitoring sites in 2021: DT31, DT42 and DT87. This was due to these sites reporting a bias adjusted annual average greater than 36µg/m³ and not being located at sites of relevant exposure, as required per LAQM.TG (16). This was calculated using the LAQM DTDPT, with the details presented in Table C.3. Following fall-off-with-distance calculation it is predicted that concentrations at the nearest relevant exposure to these 3 sites is below 36µg/m³.

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 2021 monitoring year is fully ratified, and both live and historic data is available through the [LAQN website](#).

PM₁₀ and PM_{2.5} Monitoring Adjustment

The TEOM PM₁₀ 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 NO₂ concentration at the nearest location relevant for exposure has been estimated using the NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No automatic NO₂ monitoring locations within Sevenoaks District Council required distance correction during 2021.

Table C.2 - Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 Greatness Park	Local Bias Adjustment Input 2 Bat & Ball
Periods used to calculate bias	7	11
Bias Factor A	0.85 (0.79 - 0.91)	0.77 (0.72 - 0.83)
Bias Factor B	18% (10% - 26%)	30% (21% - 39%)
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	13.2	26.5
Mean CV (Precision)	3.9%	4.4%
Automatic Mean ($\mu\text{g}/\text{m}^3$)	11.2	20.4
Data Capture	96%	98%
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	11 (10 - 12)	20 (19 - 22)
Overall Diffusion Tube Precision	<i>Good Overall Precision</i>	<i>Good Overall Precision</i>
Overall Continuous Monitor Data Capture	<i>Poor Overall Data Capture</i>	<i>Good Overall Data Capture</i>

Table C.3 – NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor
DT31	2.5	4.0	36.3	11.5	33.4
DT42	2.5	5.0	37.5	11.8	33.1
DT87	2.5	19.5	37.5	11.8	24.5

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Map of Monitoring Locations and AQMAs near Swanley

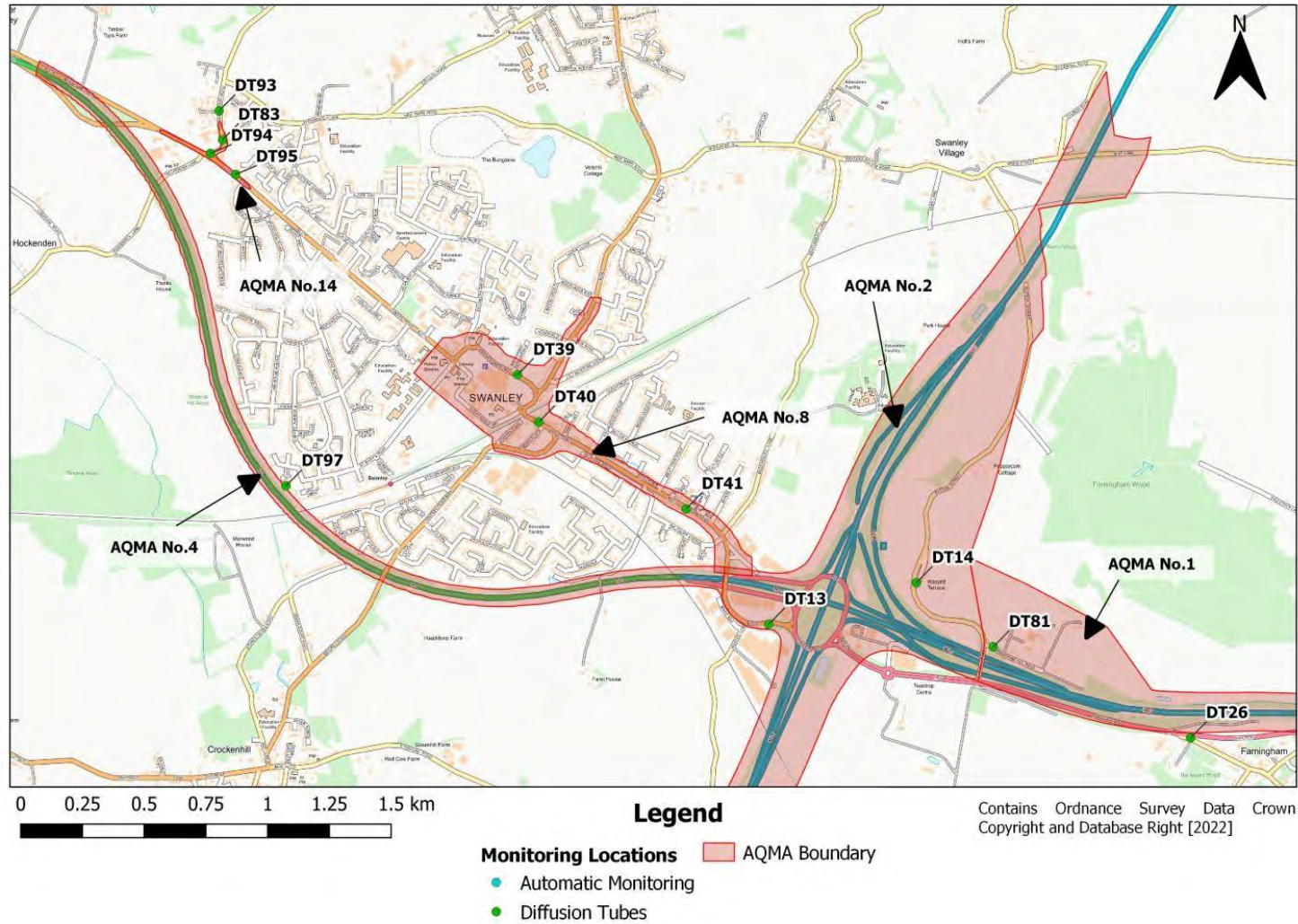


Figure D.2 – Map of Monitoring Locations and AQMAs near Westerham and Brasted

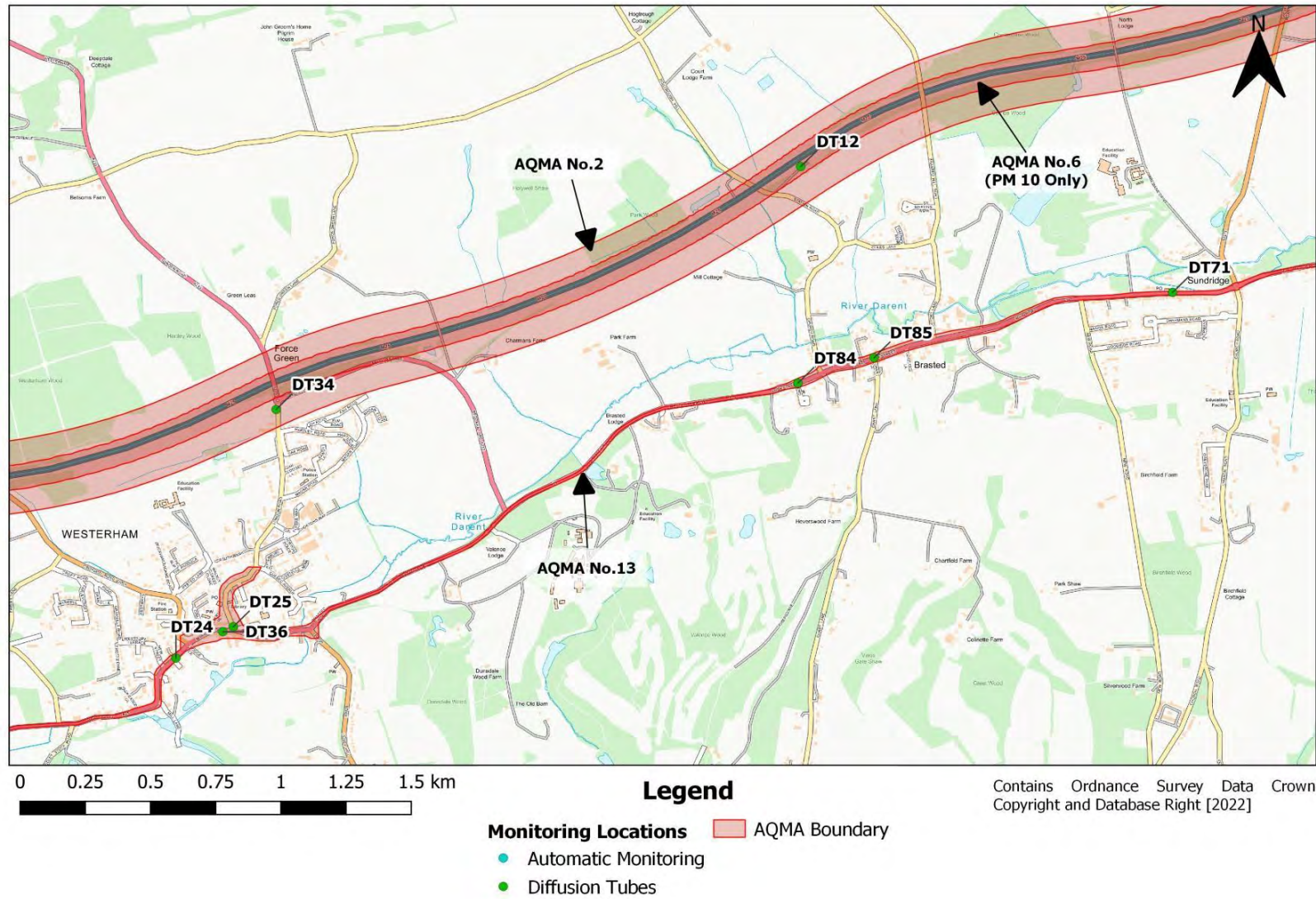


Figure D.3 – Map of Monitoring Locations and AQMAs near Riverhead and Bat & Ball

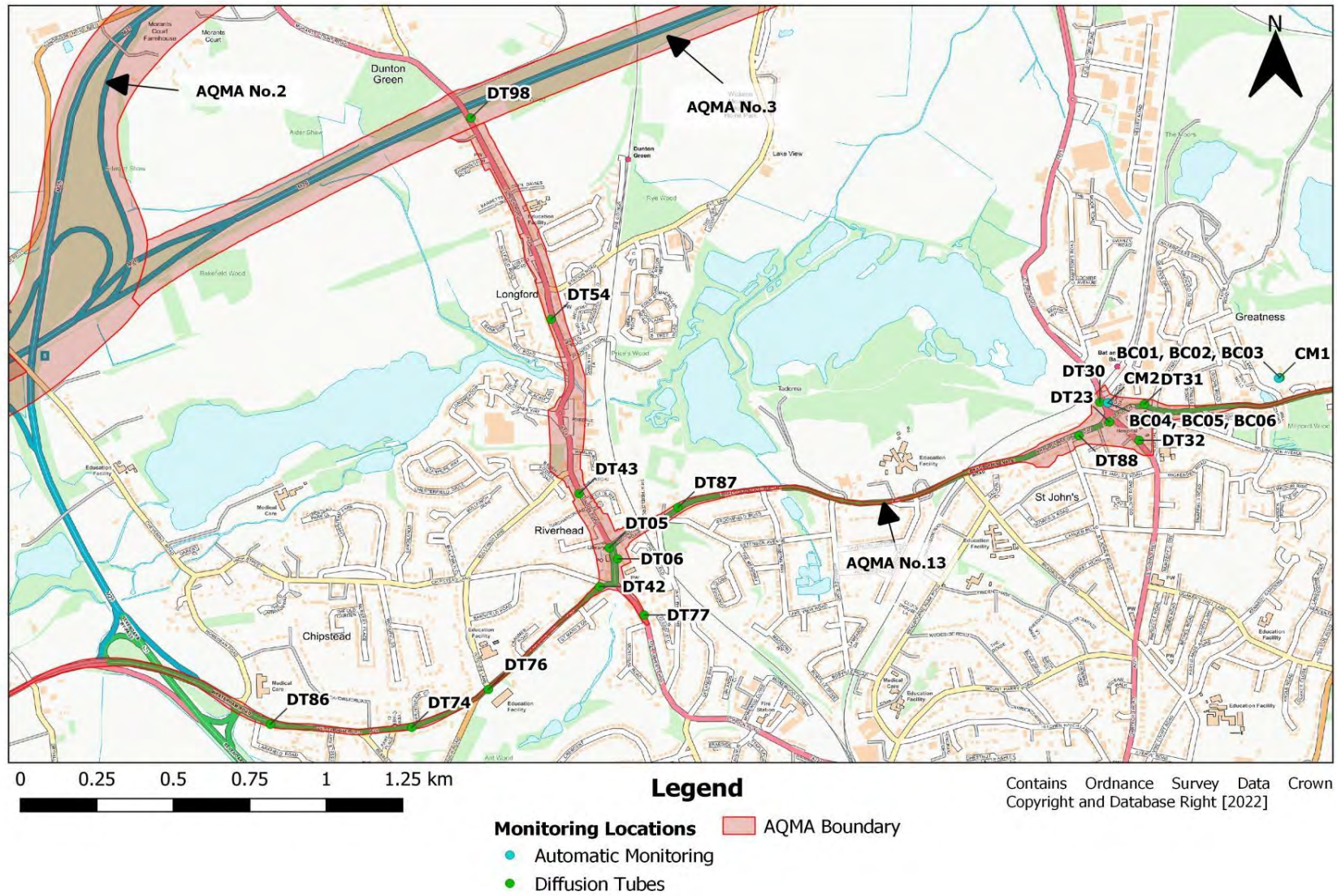


Figure D.4 – Map of Monitoring Locations and AQMAs near Seal

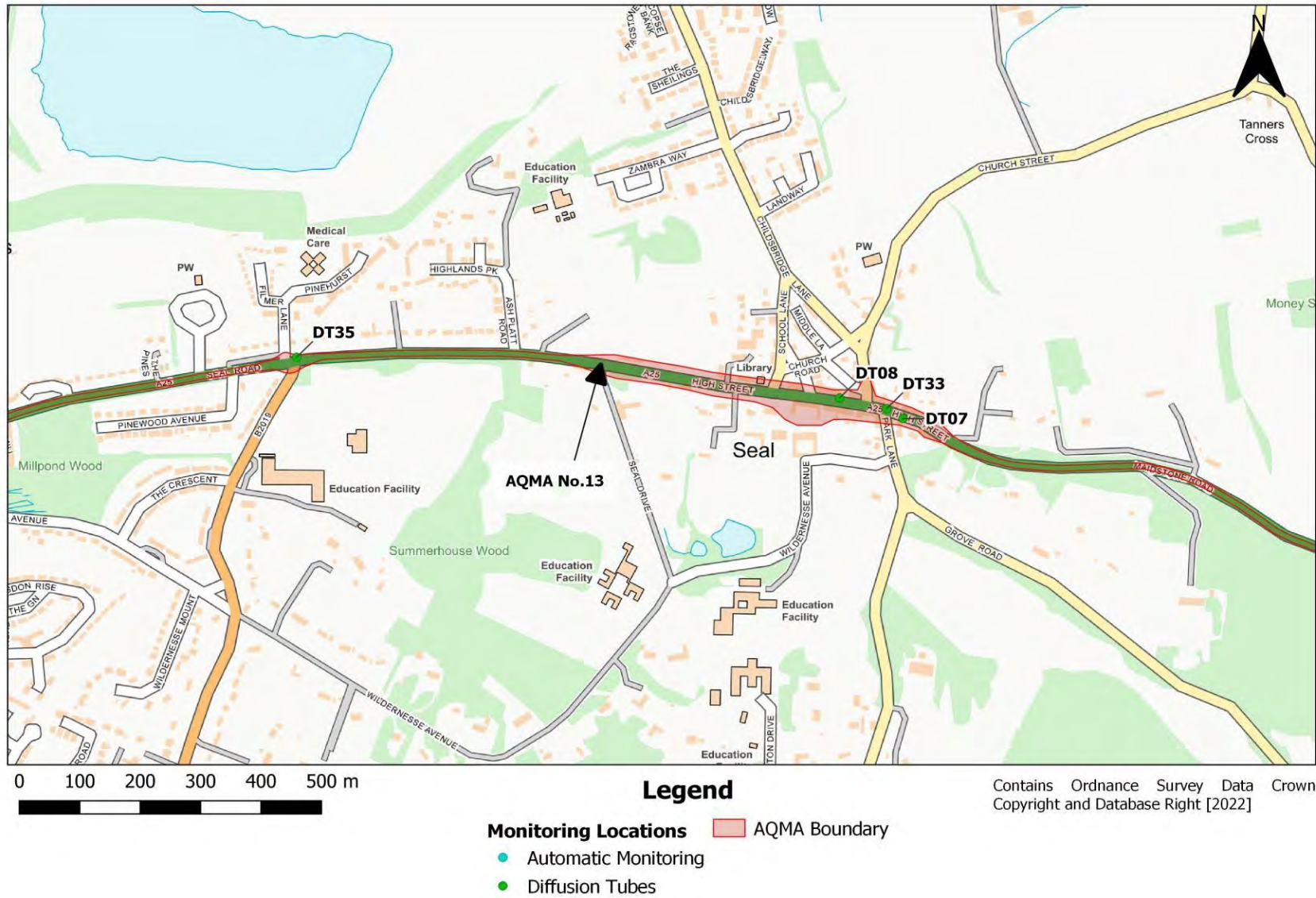
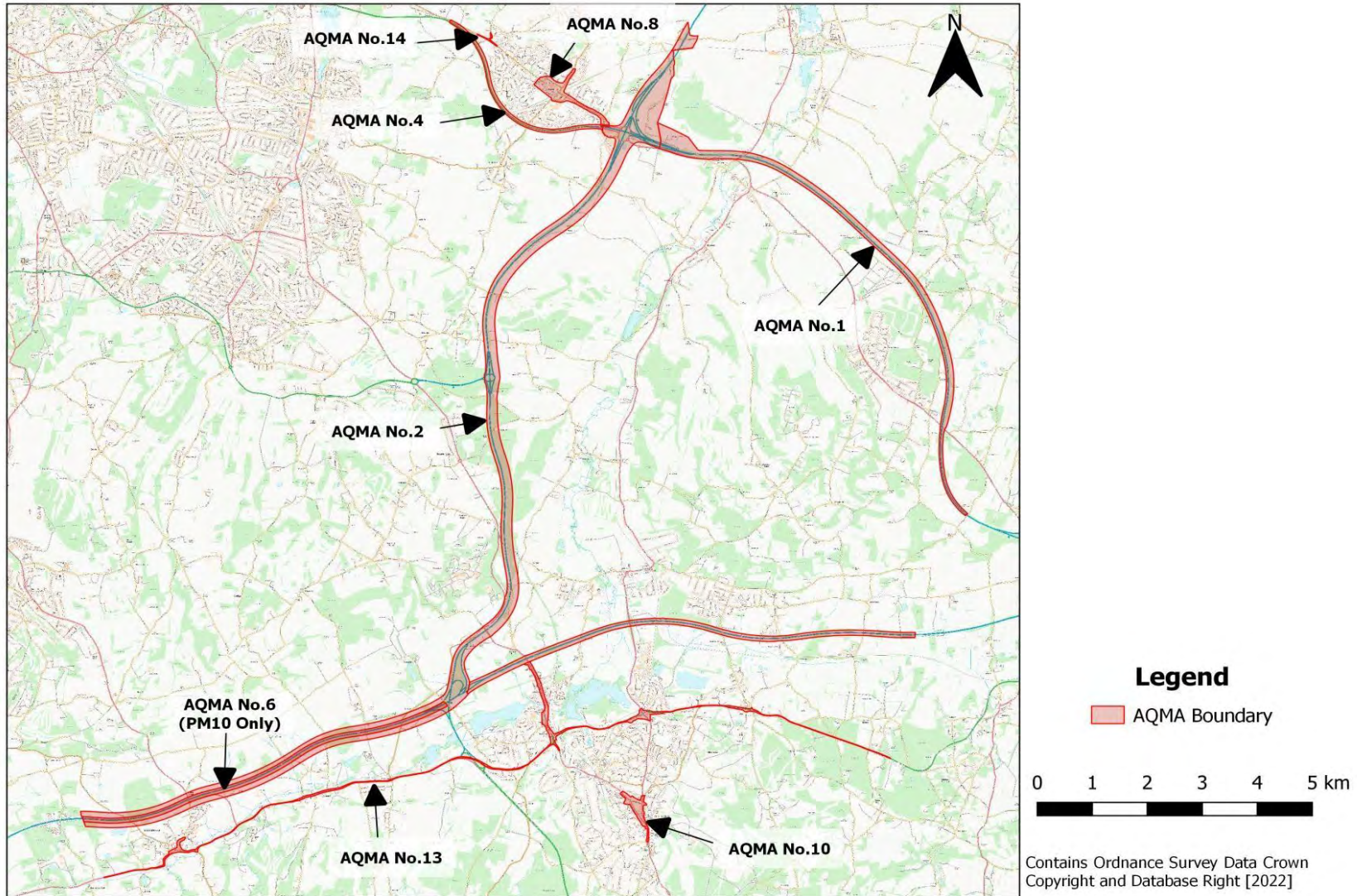


Figure D.5 – Map of Monitoring Locations and AQMAs near Sevenoaks



Figure D.6 – Map of AQMAs Declared by Sevenoaks District Council



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

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

⁷ The units are in micrograms of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
BAT	Best Available Techniques
BPC	Brasted Parish Council
CO ₂	Carbon Dioxide
Defra	Department for Environment, Food and Rural Affairs
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
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SDC	Sevenoaks District Council
SPC	Seal Parish Council
STC	Sevenoaks Town Council

Abbreviation	Description
TEOM	Tapered Element Oscillating Microbalance
UTC	Urban Traffic Control
WTC	Westerham Town Council

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Sevenoaks District Council AQAP 2022
- Sevenoaks District Council 2021 Annual Status Report
- Sevenoaks District Council 2019 Annual Status Report

To find out more,
please contact us:

t 01732 227000

e air.quality@sevenoaks.gov.uk

w sevenoaks.gov.uk/airquality

Sevenoaks District Council, Council Offices,
Argyle Road, Sevenoaks, Kent TN13 1HG

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