2024 Air Quality Annual Status Report (ASR)

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

Date: June 2024

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Executive Summary: Air Quality in Our Area

The 2024 Annual Status Report is designed to provide the public with information relating to local air quality in Chelmsford, to fulfil Chelmsford City Council's statutory duty to review and assess air quality within its area, and to determine whether or not the air quality objectives are likely to be achieved.

In 2023, Chelmsford City Council measured **no** exceedances of the Air Quality Objectives at relevant exposure.

Air Quality in Chelmsford

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

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

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Chelmsford is located in mid Essex, thirty-one miles from London and has a population of over 181,500 (2021 census), largely living in the main urban areas of Chelmsford and South Woodham Ferrers. The City of Chelmsford comprises of a number of suburban areas surrounding the main urban areas and the larger rural villages of Danbury, East and West Hanningfield, Great Leighs, Little Waltham and Little Baddow.

In Chelmsford there have been two declared Air Quality Management Areas (AQMA) due to emissions from road traffic causing exceedances of the nitrogen dioxide annual mean air quality objective. Table ES2 provides details of the revoked AQMAs.

In November 2023, Chelmsford City Council began the process of revoking these AQMA. A technical study was produced to collate evidence for revocation. Following Cabinet approval, the AQMAs were formally revoked.

Table ES 2 - Revoked AQMAs

AQMA	Description	Date Declared	Date Amended	Date Revoked	Pollutant
Chelmsford Army and Navy AQMA	Incorporating several roads leading into the Army and Navy roundabout and the Baddow Road roundabout in Chelmsford.	01/12/2005	01/10/2012	14/03/2024	NO2 Annual Mean
A414 Maldon Road, Danbury	The designated area incorporates the stretch of road between Gay Bowers Lane and Danbury village green and adjacent properties.	08/10/2018		14/03/2024	NO2 Annual Mean

Actions to Improve Air Quality

Extending the PM2.5 Monitoring Network

The Environment Act 2021 set two new PM2.5 air quality targets:

- Annual Mean Concentration Target - a maximum concentration of 10µg/m³ to be met across England by 2040.
- Population Exposure Reduction Target - a 35% reduction in population exposure by 2040 (compared to a base year of 2018).

Chelmsford City Council has been monitoring PM10 for approximately 20 years and PM2.5 for 4 years. PM10 monitors track larger particles, PM2.5 analysers delve deeper, measuring finer particulate matter with a diameter of 2.5 micrometres or less. These tiny particles can penetrate deep into the lungs, posing a greater health risk.

In 2023, the PM10 analyser at the Chignal St James rural background monitoring site was converted to monitor PM2.5 extending the monitoring coverage of this pollutant.

In Chelmsford, PM2.5 is now monitored at a rural background and a busy roadside location giving a better understanding how the pollutant affects the city.

This upgrade signifies a significant enhancement in Chelmsford's air quality monitoring capabilities. By capturing a more comprehensive picture of air pollution, the Council can gain valuable insights into the presence of these potentially harmful PM2.5 particles.

Chelmsford City Council have never measured an exceedance of PM10 and concentrations are generally declining. As such, the Council are to consider converting a PM10 analyser to measure PM2.5 at a third site.

AQMA Revocations

In 2023, Chelmsford City Council produced the 2023 Air Quality AQMA Revocation Report. The report considered the LAQM TG.22 technical guidance and PG.22 policy guidance, air quality monitoring data and data from air quality impact assessments for proposed developments within the vicinity of the AQMAs.

The report recommended that the Army & Navy AQMA and the A414 Maldon Road, Danbury AQMA should be revoked.

Further information can be found in Appendix C.

Both AQMAs were revoked in March 2024.

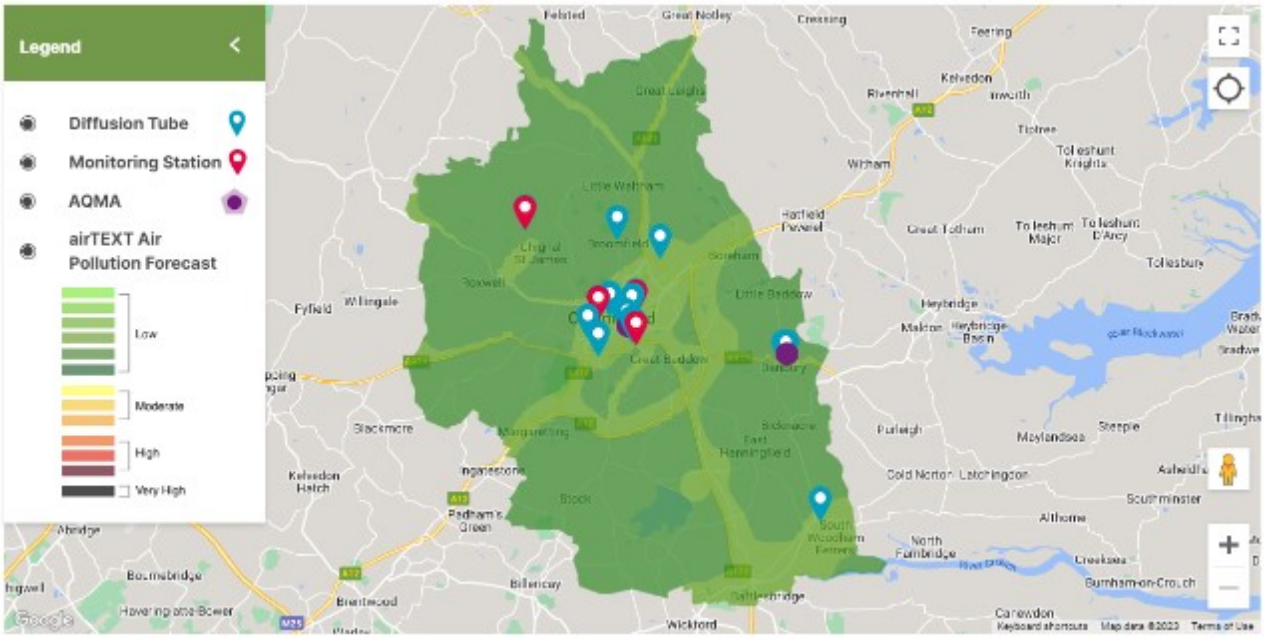
Local Engagement and How to get Involved

Air Quality Dashboard

The Chelmsford City Council air quality dashboard is located online at the Love Your Chelmsford website https://loveyourchelmsford.co.uk/air-quality-dashboard/

The dashboard contains the following information:

- Annual mean measurement at each diffusion tube site
- Rolling annual average diffusion tube concentrations
- Most recent measurement from each automatic monitoring station
- Quarterly summaries of the years automatic monitoring data
- AQMAs
- *air*TEXT air pollution forecast



In addition to the dashboard, there is an webpage summarising air quality in Chelmsford, a webpage providing do's and don'ts for domestic burning and a webpage giving information about sustainable travel.

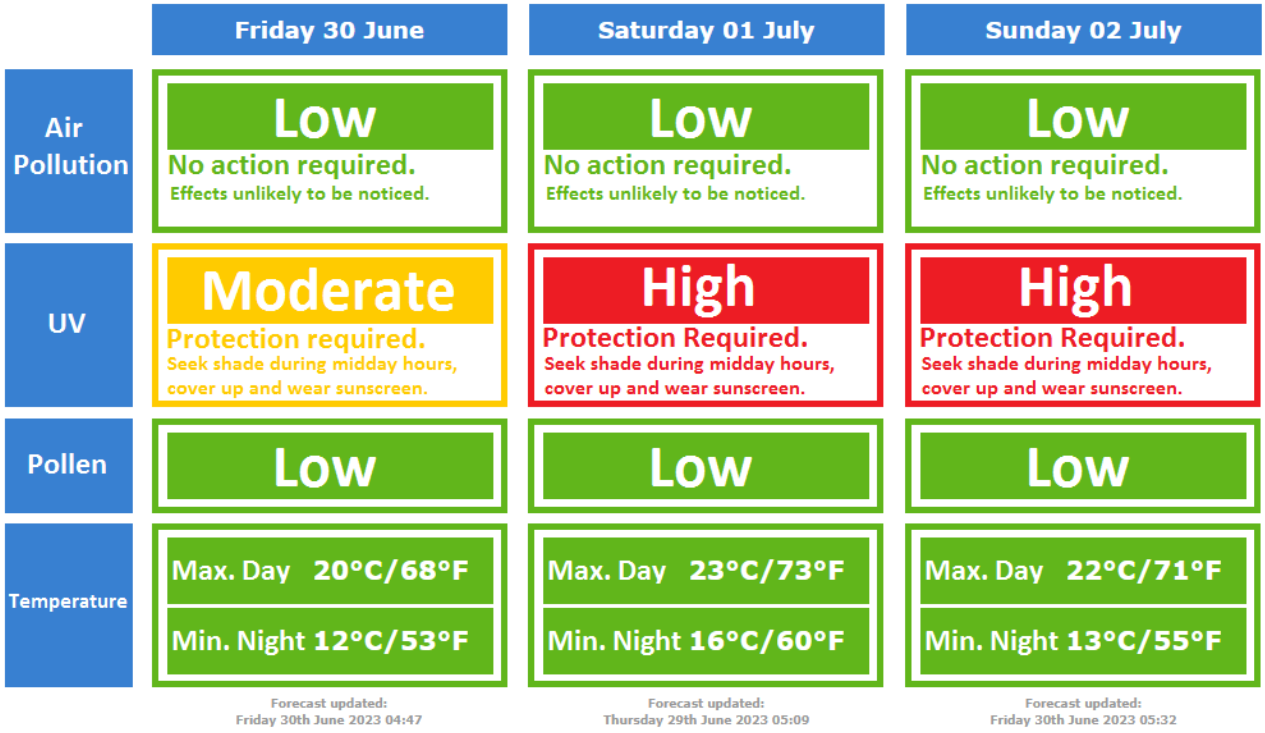
airTEXT

Chelmsford City Council is a member of the *air*TEXT consortium that operates a free service for the public providing air quality alerts by SMS text message, email and voicemail, and 3-day forecasts of air quality, pollen, UV and temperature are available online.

The hourly concentrations of four pollutants are calculated: nitrogen dioxide (NO2), particulates (PM10 and PM2.5) and ozone (O3). From the hourly concentrations the daily air quality index (DAQI) of each pollutant is derived. The overall air quality index is determined by the highest index for any of these pollutants.

Residents and visitors to Chelmsford can sign up at the following link https://www.airtext.info/signupemail to receive the free *air*TEXT alerts and health advice by email, text message or voicemail alerts.

An example of a local bulletin displayed on the *air*TEXT website and @essexair social media is shown below:



airTEXT issues an alert for a local authority or region if at least 10% of the geographical area is predicted to reach MODERATE or above.

Forecast values of UV, grass pollen and temperature are supplied by DTN.

Conclusions

Chelmsford City Council have concluded that:

- There is a long term downwards trend of monitored NO2 air pollution.
- No exceedances of the air quality objectives have been identified in 2023
- No exceedances of the air quality objectives at relevant exposure have occurred within the last four years
- There are no new developments that will have a significant impact on air quality

Priorities

As set out in the Chelmsford City Council Air Quality Strategy the following measures will be considered:

- Explore whether the creation of Smoke Controlled Areas in Chelmsford would improve local air quality
- Undertake research into air quality sensor nodes and determine whether extension of the monitoring network with this type of device would provide meaningful data.
- If it is deemed appropriate, provision of air quality sensor nodes to complement the existing monitoring network

Local Responsibilities and Commitment

This ASR was prepared by Public Health and Protection Services of Chelmsford City Council.

This ASR has been approved by:

Lewis Mould – Public Health and Protection Services Manager, Chelmsford City Council

This ASR has been sent to the Director of Public Health at Essex County Council.

If you have any comments on this ASR please send them to Tim Savage at:

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1 Local Air Quality Management

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

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

Chelmsford City Council currently does not have any declared AQMAs. A local Air Quality Strategy is in place to prevent and reduce polluting activities. The Chelmsford City Council adopted Air Quality Strategy is available at https://www.chelmsford.gov.uk/media/rgfpehvc/ccc-air-quality-strategy.pdf

2.2 Progress and Impact of Measures to address Air Quality in Chelmsford

Defra's appraisal of last year's ASR concluded the report is well structured, detailed, and provides the information specified in the Guidance.

Details of all current measures completed, in progress or planned are set out in Table 2.1. Six measures are included within Table 2.1, with the type of measure and the progress Chelmsford City Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Army & Navy Sustainable Transport Package	Transport Planning and Infrastructure	2019	2019	2025	DfT	DfT	NO	Not Funded	> £10 million	Planning		A new 'hamburger' junction has been formally approved	Funding proposal to be submitted to DfT. Three separate planning applications – one for the Army and Navy junction and one each for the Park and Ride expansions – were submitted for the project. A final business case to be submitted to the Department for Transport in autumn 2024	
2	Assessment of Smoke Controlled Areas	Policy Guidance and Development Control	Other policy	2023	2024	Chelmsford City Council	Chelmsford City Council	NO	Not Funded	< £10k	Planning				
3	Use of Air Quality Sensor Nodes to Extend Monitoring Network	Other	Other	2023	2025	Chelmsford City Council	Chelmsford City Council	NO	Funded	£10k - 50k	Planning			Initial assessment of air quality sensor nodes is taking place	
4	Member of Essex Air	Policy Guidance and Development Control	N/A	N/A	N/A	N/A	N/A	NO	Funded	< £10k	Implementation				
5	Environmental Permit Inspection & Enforcement	Environmental Permits	N/A	N/A	N/A	Chelmsford City Council	Chelmsford City Council	NO	Funded	< £10k	Implementation				
6	Essex Liftshare	Alternatives to private vehicle use	N/A	N/A	N/A	Essex County Council	Essex County Council	NO	Funded	< £10k	Implementation				

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[3], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Chelmsford City Council monitors $PM_{2.5}$ concentrations using two BAM 1020 reference monitor. For 2023, the highest measured annual mean concentration of PM2.5 was 10.5µg/m^3 which is marginally above the Environment Act PM2.5 2040 annual mean concentration target of 10µg/m^3.

Table 2.2 – Measured $PM_{2.5}$ Concentrations

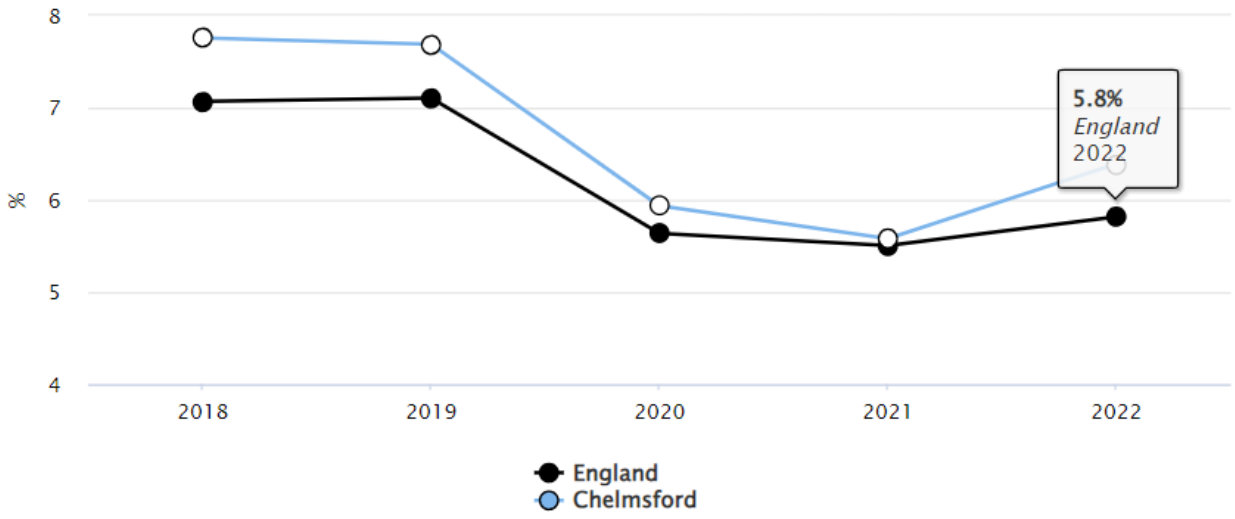
Monitoring Site	$PM_{2.5}$ Annual Mean Concentration				
	2019	2020	2021	2022	2023
CM1 Chignal St James	N/A	N/A	N/A	N/A	10.5µg/m^3
CM2 Springfield Road	11.4µg/m^3	10.2µg/m^3	10.9µg/m^3	10.5µg/m^3	9µg/m^3

The Local Air Quality Management background maps identify that in 2023 the maximum $PM_{2.5}$ background concentration within the Chelmsford City Council area is 12µg/m^3.

[3] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

The Public Health Outcomes Framework indicator D01 – Fraction of mortality attributable to particulate ($PM_{2.5}$) air pollution which for 2022 gave a value of 5.8%.

Figure 2.1 – Public Health Framework Indicator D01 Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution



- Use of Essex Air twitter to encourage the reporting of smoky vehicles through the DVSA reporting service. It is possible to report either heavy goods vehicles or public service vehicles (buses)
- Regular inspections of permitted industry where combustion and non-combustion processes could lead to anthropogenic emissions of PM2.5
- Chelmsford City Council has provided an information webpage regarding domestic burning https://loveyourchelmsford.co.uk/air-quality-dashboard/domestic-burning/
- In 2024, we will explore whether the creation of Smoke Controlled Areas would improve local air quality.
- In 2024, we will consider converting a PM10 analyser at a third site to measure PM2.5.

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

This section sets out the monitoring undertaken within 2023 by Chelmsford City Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

In 2023, no exceedances of the air quality objectives have been measured.

The general trend for monitored NO2 is downwards across automatic monitoring stations and diffusion tubes. However, the CM2 Springfield Road monitoring station showed a sharp rise in the annual mean concentration in 2023. This is shown in Table A.3. The cause of this is due to high measured concentrations in November.

The QA/QC process which is described in Appendix C has not identified any issues that would determine the data to be erroneous so the data has been left in the main data set. It should be noted that the co-located diffusion tubes did not have a smiliar rise in measured pollution across the same time period.

As no actionable decisions are needed to be made based on this data, this issue will not be investigated any further.

No exceedances of the PM10 have been identified and the general long-term trend for monitored PM10 is down.

No exceedances of the PM10 have been identified and the general long-term trend for monitored PM10 is down.

Quality assurance and quality control information for the automatic analysers, diffusion tubes bias adjustments and other adjustments applied (e.g. annualisation and/or distance correction) are presented in Appendix C. Maps showing the location of the monitoring sites are presented in Appendix D.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Chelmsford City Council undertook automatic (continuous) monitoring with reference analysers at four sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

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

Chelmsford City Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 30 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

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.

Table A.1 and Table A.2 presents details of the NO2 monitoring sites. Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B. includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. As no measured annual mean concentrations were greater than 60µg/m^3, it is unlikely that there has been an exceedance of the 1-hour mean objective.

3.2.2 Particulate Matter (PM_{10})

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

The results show that no exceedances of the annual mean Air Quality Objective have been measured and that there is no clear trend.

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

The results show that no exceedances of the 1-hour Air Quality Objective have been measured.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

Figure A.2 sets out this information in a chart.

One monitoring location achieves the Annual Mean Concentration Target ('concentration target') - a maximum concentration of 10µg/m3 to be met across England by 2040 as set out by the Environment Act 2021.

One monitoring locations marginally exceeds the Annual Mean Concentration Target.

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	Chignal St James	Rural	566463	210830	NO, NOx, NO2, PM2.5, O3	NO	Chemiluminescent / Heated BAM / UV Photometry	40	43	4
CM2	Springfield Road (Prison)	Roadside	571640	207179	NO, NOx, NO2, PM10, PM2.5	NO	Chemiluminescent / Unheated BAM / Heated BAM	29.2	2.8	2.5
CM3	Rainsford Lane (Fire Station)	Roadside	569912	206881	NO, NOx, NO2, PM10	NO	Chemiluminescent / Unheated BAM	20	2.5	2.5
CM4	Baddow Road	Roadside	571654	205798	NO, NOx, NO2	NO	Chemiluminescent	12	5.1	1.5

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)
CB01	12 Van Diemans Road	Roadside	571421	205963	NO2	No	0.0	12.0	No	2.5
CB22, CB22B, CB22C	95 Baddow Road	Roadside	571505	205968	NO2	No	0.0	8.0	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)
CB26	214 Baddow Road	Roadside	571614	205812	NO2	No	0.0	5.0	No	2.5
CB38, CB39, CB40	Prison 3	Roadside	571640	207179	NO2	No	14.0	3.0	Yes	2.5
CB49	26 Rochford Road	Roadside	571104	206262	NO2	No	0.0	5.0	No	2.5
CB58	148 Baddow Road	Roadside	571476	205964	NO2	No	0.0	12.0	No	2.5
CB62, CB63, CB64	Chignal 3	Rural	566463	210830	NO2	No	40.0	43.0	Yes	4.0
CB65, CB66, CB67	Fire Station 3	Roadside	569912	206881	NO2	No	20.0	2.5	Yes	2.5
CB76	5/7 Maldon Road, Danbury	Roadside	578506	205122	NO2	No	0.0	1.0	No	2.5
CB79	10 Waterhouse Lane	Roadside	569480	206009	NO2	No	2.0	1.0	No	2.5
CB82	122 Springfield Road	Roadside	571438	206966	NO2	No	0.0	4.0	No	2.5
CB83	134/136 Springfield Road	Roadside	571462	206999	NO2	No	0.0	3.0	No	2.5
CB84, CB85, CB86	Baddow Road AQMS 3	Roadside	571653	205800	NO2	No	12.0	5.1	Yes	2.5
CB87	Bus Station	Urban Centre	570444	207044	NO2	No	4.0	3.0	No	2.5
CB89	135 Springfield Road	Roadside	571426	206979	NO2	No	2.0	0.5	No	2.5
CB90	144 Springfield Road	Roadside	571480	207019	NO2	No	2.0	2.0	No	2.5
CB91, CB92, CB93	26 Maldon Road, Danbury	Roadside	578539	205113	NO2	No	0.0	1.0	No	2.5
CB94	Copt Hill, Danbury	Roadside	578571	205108	NO2	No	-1.4	2.8	No	2.5
CB95	Eves Corner, Danbury	Roadside	578415	205106	NO2	No	3.0	2.0	No	2.5
CB96	Heathcote School, Main Road, Danbury	Kerbside	578359	205120	NO2	No	3.0	0.3	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)
CB98A, CB98B, CB98C	Rear of 66 Baddow Road (Dentists)	Roadside	571148	206324	NO2	No	2.0	3.0	No	2.5
CB99A, CB99B, CB99C	Rear of 74 Baddow Road (Aga Shop)	Roadside	571211	206274	NO2	No	3.4	1.3	No	2.5
CB103	Opposite Myra Cottage Maldon Road, Danbury	Roadside	578476	205110	NO2	No	8.0	1.0	No	2.5
CB108	Blacksmiths Cottage, Maldon Road, Danbury	Urban Background	578487	205139	NO2	No	0.0	19.0	No	2.5
CB109	Adjacent to Anytime Fitness, Viaduct Road	Roadside	570456	207024	NO2	No	0.0	1.0	No	2.5
CB110	Adjacent to 25 Wood Street	Roadside	569982	205263	NO2	No	0.0	1.0	No	2.5
CB111	Wood Street adjacent to Bruce Grove	Roadside	569996	205198	NO2	No	0.0	1.0	No	2.5
CB112	Burnham Road / Greenwood Surgery	Roadside	580275	198121	NO2	No	10.8	1.0	No	2.5
CB113	Broomfield Road	Roadside	570669	210486	NO2	No	0.0	1.0	No	2.5
CB117	White Hart Lane adjacent to Centenary Way	Kerbside	572642	209674	NO2	No	N/A	1.0	No	2.5

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 NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM1	566463	210830	Rural	55.7	55.7	11.9	9.3	8.9	12.9	11.1
CM2	571640	207179	Roadside	99.8	99.8	34.5	31.4	28.2	28.4	33.8
CM3	569912	206881	Roadside	99.8	99.8	19.9	18.8	19.7	20.3	18.7
CM4	571654	205798	Roadside	97.2	97.2	27	20.7	20.1	22	18.9

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

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

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023**

Notes:

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

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

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
CB01	571421	205963	Roadside	92.3	92.3	30.2	24.4	25.6	26.4	22.8
CB22, CB22B, CB22C	571505	205968	Roadside	100.0	100.0	29.6	23.6	26.1	24.6	23.6
CB26	571614	205812	Roadside	100.0	100.0	28.0	24.8	24.0	21.8	22.0
CB38, CB39, CB40	571640	207179	Roadside	100.0	100.0	28.0	23.6	22.0	21.5	20.7
CB49	571104	206262	Roadside	100.0	100.0	24.2	20.1	17.3	16.8	17.4
CB58	571476	205964	Roadside	92.3	92.3	35.1	31.3	31.7	31.0	29.9
CB62, CB63, CB64	566463	210830	Rural	92.3	92.3	11.6	9.2	9.0	9.0	7.3
CB65, CB66, CB67	569912	206881	Roadside	100.0	100.0	21.4	19.2	18.7	18.0	16.9
CB76	578506	205122	Roadside	100.0	100.0	36.3	27.6	31.5	31.0	28.0
CB79	569480	206009	Roadside	90.4	90.4	39.0	32.5	32.4	32.2	29.4
CB82	571438	206966	Roadside	92.3	92.3	31.5	23.9	25.6	25.9	24.1
CB83	571462	206999	Roadside	84.6	84.6	35.8	30.9	31.9	30.4	30.7
CB84, CB85, CB86	571653	205800	Roadside	100.0	100.0	26.4	22.0	21.0	21.0	19.3
CB87	570444	207044	Urban Centre	73.1	73.1	39.6	30.6	30.4	32.8	30.7
CB89	571426	206979	Roadside	90.4	90.4	37.4	31.8	31.3	33.1	28.7
CB90	571480	207019	Roadside	100.0	100.0	26.1	23.1	21.9	21.1	22.7
CB91, CB92, CB93	578539	205113	Roadside	100.0	100.0	**42.8**	33.9	34.6	34.8	29.5
CB94	578571	205108	Roadside	100.0	100.0	25.0	19.7	21.6	22.3	19.9
CB95	578415	205106	Roadside	92.3	92.3	27.5	20.3	23.4	23.0	19.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CB96	578359	205120	Kerbside	100.0	100.0	29.8	23.8	22.7	22.4	20.0
CB98A, CB98B, CB98C	571148	206324	Roadside	100.0	100.0	**45.8**	38.3	36.8	35.9	34.5
CB99A, CB99B, CB99C	571211	206274	Roadside	100.0	100.0	**45.4**	**40.2**	37.5	37.8	33.5
CB103	578476	205110	Roadside	100.0	100.0	36.9	29.6	30.7	30.8	28.1
CB108	578487	205139	Urban Background	100.0	100.0	17.8	14.8	14.4	14.5	13.2
CB109	570456	207024	Roadside	82.7	82.7	33.7	24.8	24.4	25.0	24.2
CB110	569982	205263	Roadside	84.6	84.6	25.4	24.3	21.6	23.0	20.1
CB111	569996	205198	Roadside	82.7	82.7	N/A	25.9	29.2	33.1	27.1
CB112	580275	198121	Roadside	100.0	100.0	N/A	N/A	26.3	28.4	25.8
CB113	570669	210486	Roadside	92.3	92.3	N/A	N/A	25.1	23.6	21.8
CB117	572642	209674	Kerbside	100.0	100.0	N/A	N/A	29.9	33.0	28.8

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

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

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

Notes:

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

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM1	566463	210830	Rural	55.7	55.7	0	**0 (57.73)**	0	0	0
CM2	571640	207179	Roadside	99.8	99.8	0	**0 (74.56)**	0	0	0
CM3	569912	206881	Roadside	99.8	99.8	0	0	0	0	0
CM4	571654	205798	Roadside	97.2	97.2	0	0	0	0	0

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM2	571640	207179	Roadside	99.5	99.5	25.3	21.9	24.7	19.3	20.6
CM3	569912	206881	Roadside	97.5	97.5	18.7	21.4	24	25	23.5

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

Notes:

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

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

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

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

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

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM2	571640	207179	Roadside	99.5	99.5	13	2	5	3	5
CM3	569912	206881	Roadside	97.5	97.5	2	2	3	3	4

Notes:

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

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

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

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

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

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
CM1	566463	210830	Rural	98.63	98.63	N/A	N/A	N/A	N/A	10.5
CM2	571640	207179	Roadside	96.18	96.18	11.4	10.2	10.9	10.5	9

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

Notes:

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

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

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

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

Figure A.1 – Trends in Automatic Monitoring Station Annual Mean NO2 Concentrations

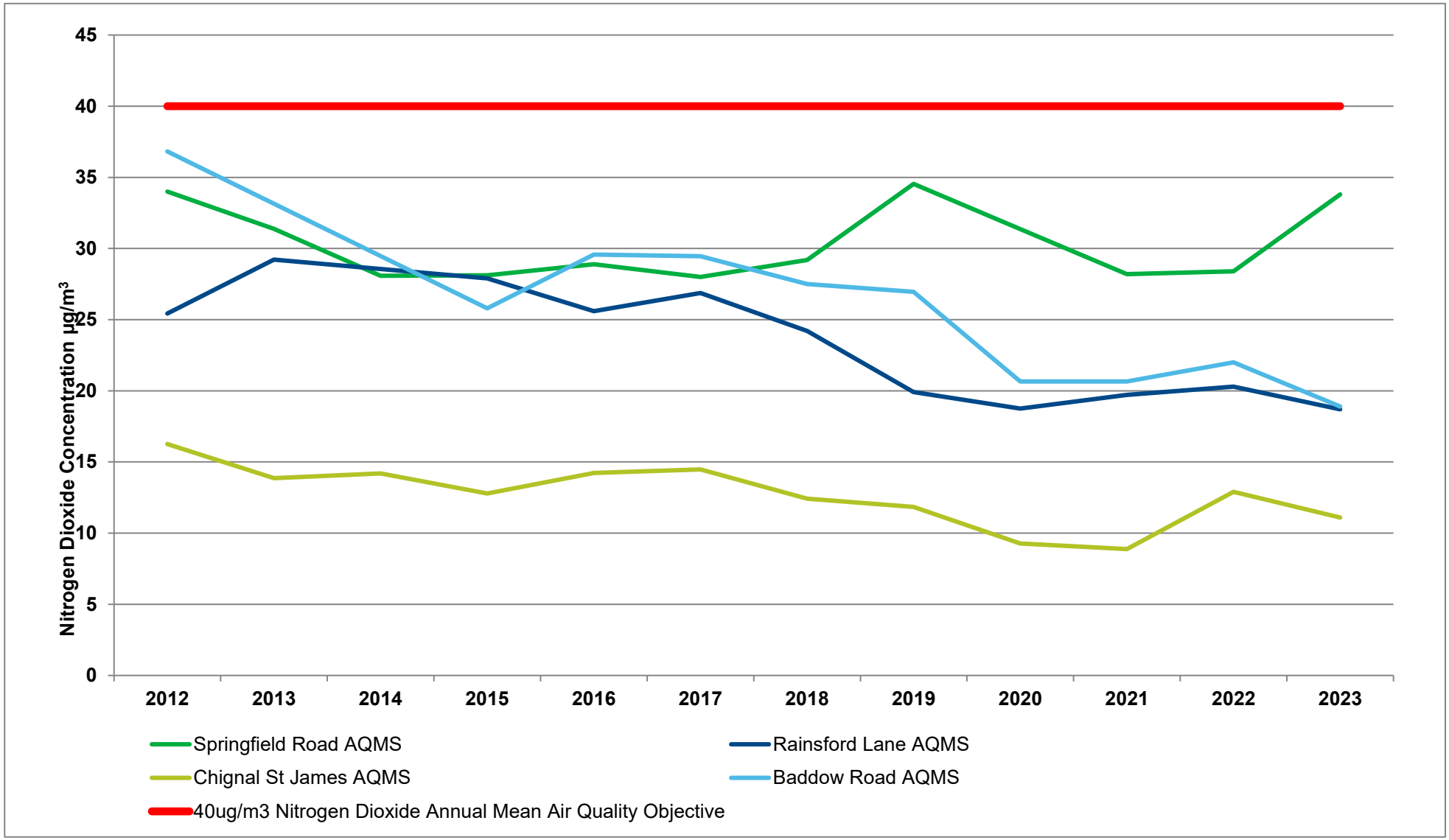
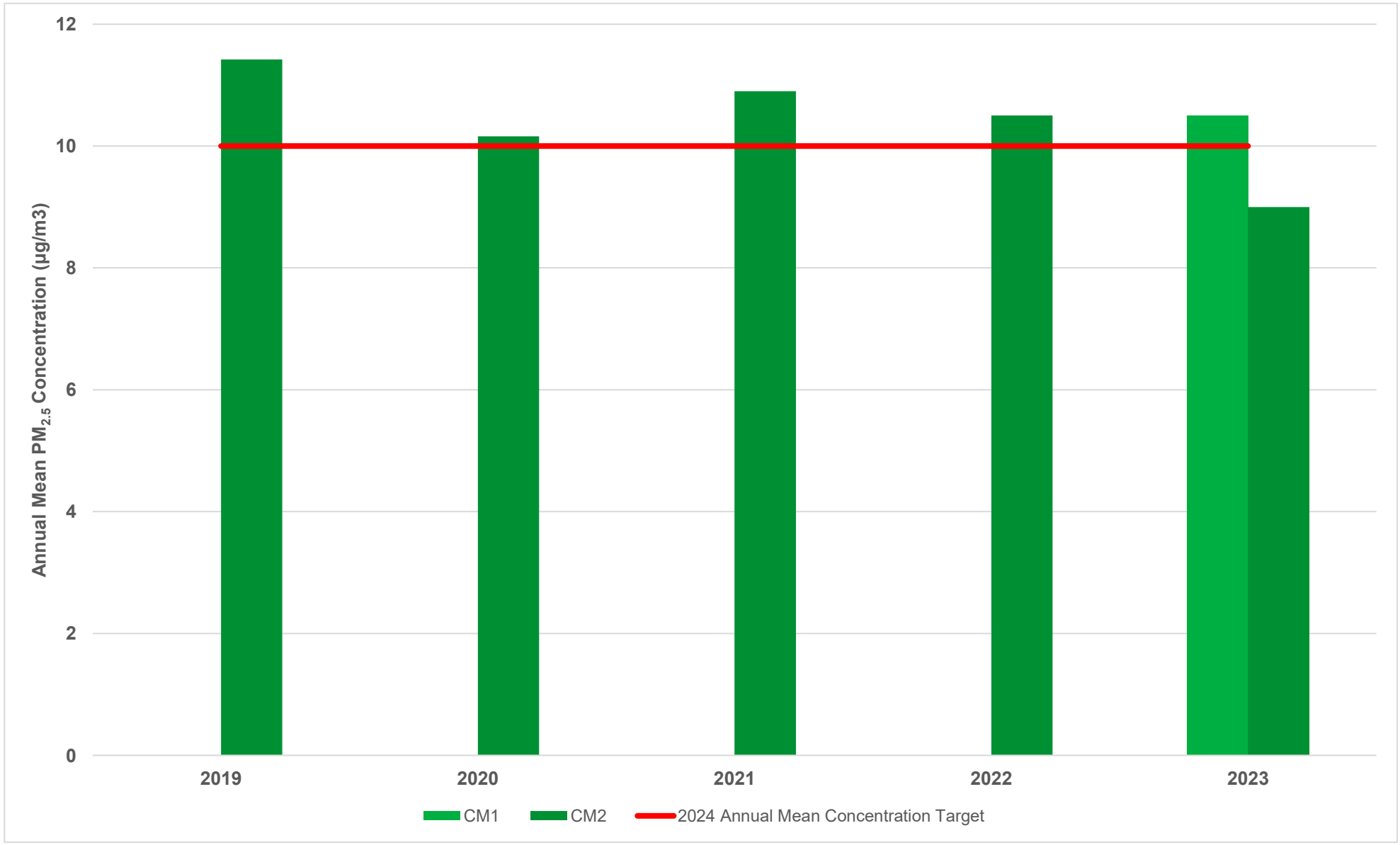


Figure A.2 – Trends in Automatic Monitoring Station Annual Mean PM2.5 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

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 (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comments
CB01	571421	205963	31.6	37.6	28.4	34.7	Marked As Missing By Lab	32.1	23.2	36.5	29.4	31.1	18.5	23.2	29.7	22.8	-	
CB22	571505	205968	Missing	34.4	26.5	31.8	31.7	Missing	23.4	33.2	27.2	29.2	36.1	25.1	-	-	-	Triplicate Site with CB22, CB22B and CB22C - Annual data provided for CB22C only
CB22B	571505	205968	38.4	26.5	Missing	30.3	28.1	Missing	23.4	28.5	28.2	30.0	38.8	26.5	-	-	-	Triplicate Site with CB22, CB22B and CB22C - Annual data provided for CB22C only
CB22C	571505	205968	Missing	44.9	Missing	33.5	32.2	32.8	24.4	32.2	Missing	28.6	29.6	23.1	30.6	23.6	-	Triplicate Site with CB22, CB22B and CB22C - Annual data provided for CB22C only
CB26	571614	205812	35.2	30.3	32.1	26.7	24.5	25.6	24.5	30.6	32.5	23.1	35.0	23.4	28.6	22.0	-	
CB38	571640	207179	36.0	42.0	26.7	22.5	22.7	23.7	20.6	23.3	25.0	22.3	24.7	31.0	-	-	-	Triplicate Site with CB38, CB39 and CB40 - Annual data provided for CB40 only
CB39	571640	207179	31.9	34.1	26.9	23.0	Marked As Missing By Lab	23.8	18.4	24.4	22.4	29.4	33.3	Not Exposed	-	-	-	Triplicate Site with CB38, CB39 and CB40 - Annual data provided for CB40 only
CB40	571640	207179	34.3	38.9	24.7	24.1	22.6	22.3	19.1	25.7	24.4	27.7	29.2	Not Exposed	26.8	20.7	-	Triplicate Site with CB38, CB39 and CB40 - Annual data provided for CB40 only
CB49	571104	206262	26.2	31.1	20.5	20.5	17.7	14.6	13.9	18.4	16.1	49.9	26.7	16.1	22.6	17.4	-	
CB58	571476	205964	42.4	49.0	38.7	33.3	Marked As Missing By Lab	36.5	32.8	43.1	38.8	37.6	41.6	33.5	38.8	29.9	-	
CB62	566463	210830	12.7	13.9	Missing	8.0	Marked As Missing By Lab	5.7	6.8	6.6	9.1	11.8	14.1	Not Exposed	-	-	-	Triplicate Site with CB62, CB63 and CB64 - Annual data provided for CB64 only
CB63	566463	210830	14.0	13.3	9.1	7.2	4.5	5.4	7.2	7.3	8.5	12.6	14.8	Marked As Missing By Lab	-	-	-	Triplicate Site with CB62, CB63 and CB64 - Annual data provided for CB64 only

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 (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comments
CB64	566463	210830	13.0	10.9	9.9	8.5	5.0	5.3	7.5	6.5	9.5	13.4	15.3	Not Exposed	9.4	7.3	-	Triplicate Site with CB62, CB63 and CB64 - Annual data provided for CB64 only
CB65	569912	206881	26.7	23.3	22.2	17.9	17.9	18.5	15.2	17.8	21.5	25.3	26.4	24.9	-	-	-	Triplicate Site with CB65, CB66 and CB67 - Annual data provided for CB67 only
CB66	569912	206881	26.8	29.2	21.0	18.0	16.4	19.7	13.6	16.4	21.3	28.4	23.9	19.3	-	-	-	Triplicate Site with CB65, CB66 and CB67 - Annual data provided for CB67 only
CB67	569912	206881	25.8	30.7	19.8	18.3	18.0	20.2	14.5	17.3	41.8	29.3	19.5	22.4	21.9	16.9	-	Triplicate Site with CB65, CB66 and CB67 - Annual data provided for CB67 only
CB76	578506	205122	52.3	51.7	33.0	35.1	29.9	32.4	13.8	36.5	38.8	36.4	46.0	30.3	36.4	28.0	-	
CB79	569480	206009	45.3	50.0	40.4	42.6	37.8	34.0	28.0	29.3	37.1	39.8	Missing	35.2	38.1	29.4	-	
CB82	571438	206966	30.6	40.6	34.0	33.1	Marked As Missing By Lab	30.8	19.1	37.6	26.9	30.2	33.7	27.2	31.3	24.1	-	
CB83	571462	206999	41.2	47.0	37.3	Missing	Marked As Missing By Lab	33.2	32.8	43.9	39.3	42.7	39.8	41.6	39.9	30.7	-	
CB84	571653	205800	34.6	30.1	24.0	23.1	Marked As Missing By Lab	26.0	20.7	26.3	25.1	24.3	36.4	19.5	-	-	-	Triplicate Site with CB84, CB85 and CB86 - Annual data provided for CB86 only
CB85	571653	205800	31.0	34.9	23.6	21.5	17.3	18.5	22.8	23.5	24.4	22.5	33.2	26.0	-	-	-	Triplicate Site with CB84, CB85 and CB86 - Annual data provided for CB86 only
CB86	571653	205800	27.9	38.2	26.2	20.1	19.0	18.5	17.2	27.6	23.4	23.7	31.8	21.3	25.1	19.3	-	Triplicate Site with CB84, CB85 and CB86 - Annual data provided for CB86 only
CB87	570444	207044	47.7	34.8	Missing	Missing	26.4	34.9	38.0	47.0	42.5	42.6	Missing	44.4	39.8	30.7	-	
CB89	571426	206979	45.2	51.1	34.8	25.1	35.0	Missing	31.0	37.1	34.9	37.1	40.6	37.7	37.2	28.7	-	
CB90	571480	207019	34.0	37.5	25.7	39.3	22.0	23.2	19.4	31.3	27.5	27.2	34.7	32.6	29.5	22.7	-	
CB91	578539	205113	40.6	41.7	41.4	36.7	27.0	34.8	34.1	36.4	42.9	49.4	48.4	31.9	-	-	-	Triplicate Site with CB91, CB92 and CB93 - Annual data provided for CB93 only

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 (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comments
CB92	578539	205113	46.1	38.3	39.3	35.9	28.0	37.7	36.1	38.3	44.8	42.5	37.6	32.2	-	-	-	Triplicate Site with CB91, CB92 and CB93 - Annual data provided for CB93 only
CB93	578539	205113	43.6	51.9	42.2	37.5	Marked As Missing By Lab	37.1	18.6	33.5	44.6	54.9	37.7	29.0	38.3	29.5	-	Triplicate Site with CB91, CB92 and CB93 - Annual data provided for CB93 only
CB94	578571	205108	33.8	37.1	24.5	23.0	25.0	23.5	34.3	23.9	24.8	23.5	23.8	12.2	25.8	19.9	21.7	
CB95	578415	205106	26.5	35.4	23.5	25.4	Missing	20.3	18.0	21.8	27.5	27.0	31.7	19.7	25.2	19.4	-	
CB96	578359	205120	33.8	36.5	24.5	21.5	16.8	20.4	23.9	23.9	28.0	25.1	33.4	24.3	26.0	20.0	-	
CB98A	571148	206324	45.5	51.0	42.3	42.6	44.8	46.7	34.9	51.1	44.9	49.9	47.7	38.5	-	-	-	Triplicate Site with CB98A, CB98B and CB98C - Annual data provided for CB98C only
CB98B	571148	206324	46.2	54.0	44.4	48.8	Marked As Missing By Lab	36.8	35.3	51.4	42.8	45.5	53.6	35.7	-	-	-	Triplicate Site with CB98A, CB98B and CB98C - Annual data provided for CB98C only
CB98C	571148	206324	49.4	53.4	38.8	45.9	43.3	49.5	33.1	54.3	45.5	46.1	44.1	32.9	44.9	34.5	-	Triplicate Site with CB98A, CB98B and CB98C - Annual data provided for CB98C only
CB99A	571211	206274	54.4	55.3	42.7	40.6	33.3	34.2	42.0	50.2	46.4	45.3	35.3	40.3	-	-	-	Triplicate Site with CB99A, CB99B and CB99C - Annual data provided for CB99C only
CB99B	571211	206274	50.3	53.4	40.7	39.3	33.8	36.9	38.2	52.2	49.7	48.3	35.5	35.8	-	-	-	Triplicate Site with CB99A, CB99B and CB99C - Annual data provided for CB99C only
CB99C	571211	206274	50.1	54.1	42.6	41.6	Marked As Missing By Lab	42.6	37.9	51.8	46.0	47.3	48.5	Not Exposed	43.6	33.5	-	Triplicate Site with CB99A, CB99B and CB99C - Annual data provided for CB99C only
CB103	578477	205111	39.5	48.8	42.1	32.8	32.5	31.9	31.4	34.0	39.2	35.2	41.9	29.4	36.6	28.1	-	
CB108	578488	205139	22.5	19.8	13.7	10.3	8.6	12.3	33.0	13.5	15.0	19.1	21.4	16.5	17.1	13.2	-	
CB109	570456	207025	41.7	39.1	Missing	26.0	Missing	22.7	21.4	26.6	27.4	32.9	39.9	36.0	31.4	24.2	-	
CB110	569982	205264	Missing	36.1	26.1	38.1	Missing	20.5	19.4	22.0	25.0	26.4	27.8	19.4	26.1	20.1	-	
CB111	569996	205199	43.4	34.1	33.3	26.0	Marked As Missing By Lab	Vandalised	38.1	35.1	43.9	21.3	40.7	36.2	35.2	27.1	-	

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 (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comments
CB112	580275	198121	36.2	35.1	32.9	32.1	27.0	35.3	29.6	32.0	41.0	38.9	31.6	30.1	33.5	25.8	-	
CB113	570669	210486	33.2	39.4	30.2	28.7	Marked As Missing By Lab	26.3	20.0	30.1	20.6	31.6	31.8	19.9	28.3	21.8	-	
CB117	572642	209674	41.5	47.4	40.7	36.9	27.3	32.2	32.2	42.3	42.8	43.6	30.5	30.9	37.4	28.8	-	

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

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

☒ **National bias adjustment factor used**

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

☒ **Chelmsford City Council confirms that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Chelmsford 2023

Chelmsford City Council confirms that in 2023, no new or changed sources that significantly affect air quality have been identified.

Additional Air Quality Works Undertaken by Chelmsford City Council During 2023

In 2023, Chelmsford City Council produced the 2023 Air Quality AQMA Revocation Report.

The report considered the LAQM TG.22 technical guidance and PG.22 policy guidance, air quality monitoring data and data from air quality impact assessments for proposed developments within the vicinity of the AQMAs.

The report identified that:

- Within the last three years, all concentrations at relevant exposure have been below the borderline (10%) threshold with the air quality objectives
- At the time of writing the report, the provisional air quality monitoring data for 2023 suggested that further reductions in NO2 will be measured in 2023
- The effects of the proposed developments within the Army & Navy AQMA (Army & Navy Sustainable Transport Package and the Chelmer Waterside Access Road and Bridge) have been modelled to range from imperceptible to a small improvement and as such will have no negative impact upon the compliance with the air quality objectives
- These factors provide justification for doing revoking the AQMAs

The report recommended that the Army & Navy AQMA and the A414 Maldon Road, Danbury AQMA should be revoked.

Chelmsford City Council revoked the Army & Navy AQMA and the A414 Maldon Road, Danbury AQMA in March 2024.

QA/QC of Diffusion Tube Monitoring

- Chelmsford City Council undertook monitoring at 30 sites in 2023.
- Chelmsford City Council adheres with the Diffusion Tube Monitoring Calendar
- The diffusion tubes were supplied by Socotec Didcot (UKAS Testing Laboratory number 1015) with a preparation method of 50% triethanolamine (TEA) in Acetone.
- The AIR NO_2 proficiency testing scheme found that the laboratory achieved the following percentage of results determined as satisfactory for 2023.

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%.

In 2023, no diffusion tube monitoring site required annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring.

Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Chelmsford City Council have applied the national bias adjustment factor of 0.77 to the 2023 monitoring data to maintain consistency with Councils in Essex. A summary of bias adjustment factors used by Chelmsford City Council over the past five years is in

Table C..

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	Diffusion Tube Preparation	Version of National Spreadsheet	Adjustment Factor
2023	National	Socotec 50% TEA in Acetone	03/24	0.77
2022	National	Socotec 50% TEA in Acetone	03/23	0.76
2021	National	Socotec 50% TEA in Acetone	03/22	0.78
2020	National	Socotec 50% TEA in Acetone	03/21	0.77
2019	National	Socotec 50% TEA in Acetone	03/20	0.75

NO_2 Fall-off with Distance from the Road

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

No diffusion tube sites within Chelmsford required distance correction during 2023.

QA/QC of Automatic Monitoring

Chelmsford City Council operates four automatic monitoring sites measuring NO_2, $PM_{2.5}$ and PM_{10}. Data from these sites is collected by a contractor.

Daily data validation checks are made to ensure the analysers are working correctly and to identify any abnormal readings that may occur. Monitoring data is forwarded to the Council.

The automatic monitoring station equipment is serviced every six months by a contractor who also carries out maintenance callouts when faults are identified.

The nitrogen dioxide analysers are calibrated monthly with a certified reference gas. Particulate monitors have their filter tapes changed every two months. All automatic monitoring sites are colocated with triplicate NO_2 diffusion tubes.

Data ratification for the analyser contains following processes;

- Applying the scaling factors derived from calibrations, maintenance visits and servicing
- Checking for equipment drift with adjustments made where detected
- Comparison with datasets from other appropriate Essex Air monitoring sites
- Checking for and deletion of erroneous data that can be linked to analyser fault or failure.

Monitoring Adjustment

When undertaking data ratification, there are some calculations necessary for ensuring accurate and precise data:

- The Met One PM_{10} monitors are unheated and require a correction for slope by dividing the raw data by 1.2.
- The Met One PM2.5 monitor has a smart heater and does not require correction for slope and/or intercept.
- It has not been necessary to undertake distance correction for any automatic monitoring stations.
- The data from the NO2 analyser at the CM1 Chignal St James site recorded data capture of less than 75% therefore it was required to annualise the monitoring data. The process set out in the TG.22 technical guidance was used, and the calculation is shown in the table below.

Table C.2 – Automatic Analyser Data Annualisation

AURN Background Site	Automatic Mean (Am)	Period Mean (Pm)	Ratio Am / Pm
Rochester Stoke	9.01	10.27	0.88
St Osyth	7.35	7.79	0.94
Wicken Fen	5.46	6.91	0.79
Average (Ra)			0.87
CM1 Chignal St James Annual Mean			12.80µg/m^3
CM1 Chignal St James Annualised Mean		12.80 x 0.87 =	11.1µg/m^3

Appendix D: Maps of Monitoring Locations

Figure D.1 – Map of Non-Automatic Monitoring Sites: Chelmsford

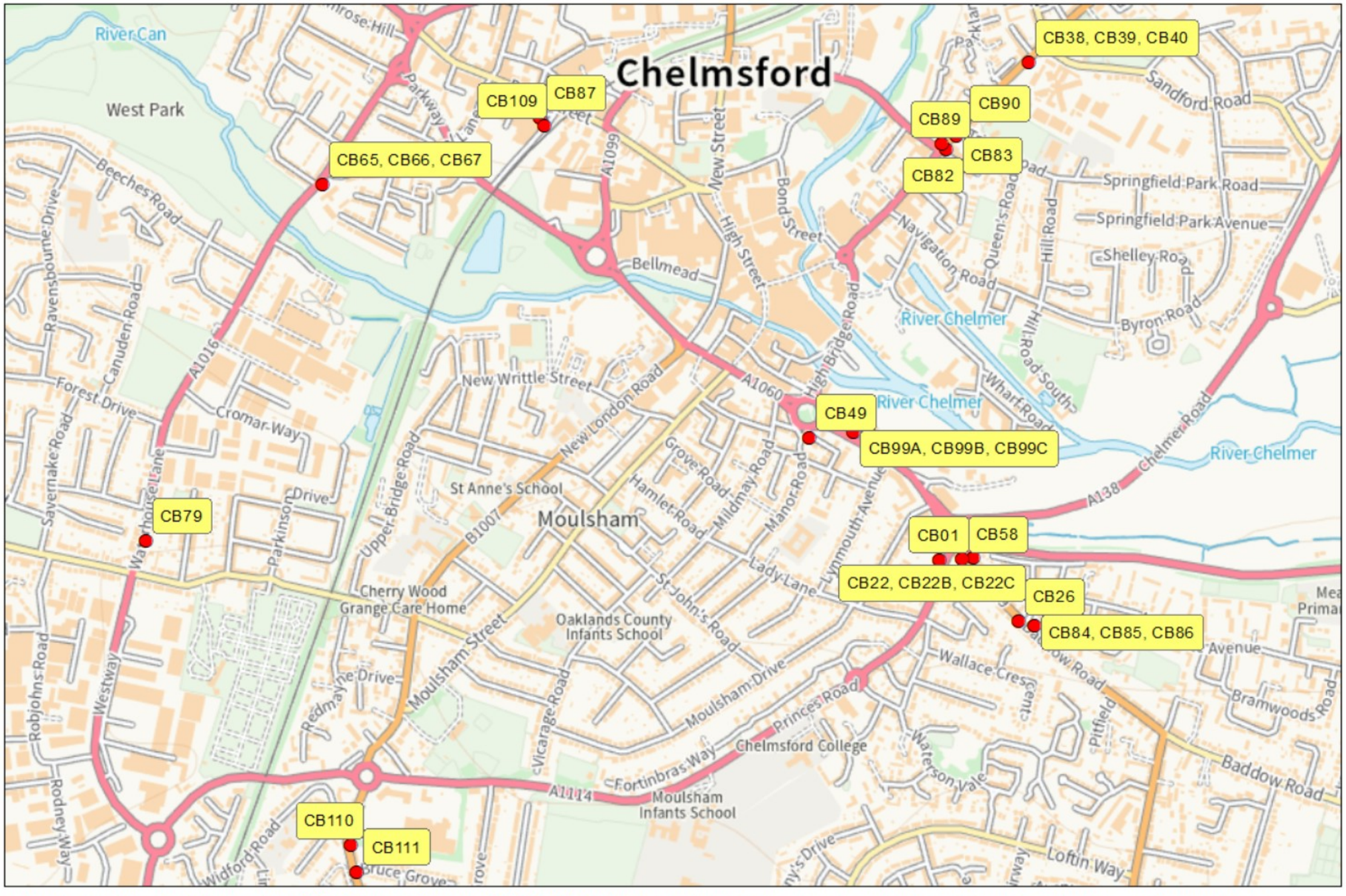


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Figure D.2 – Map of Non-Automatic Monitoring Sites: North Chelmsford

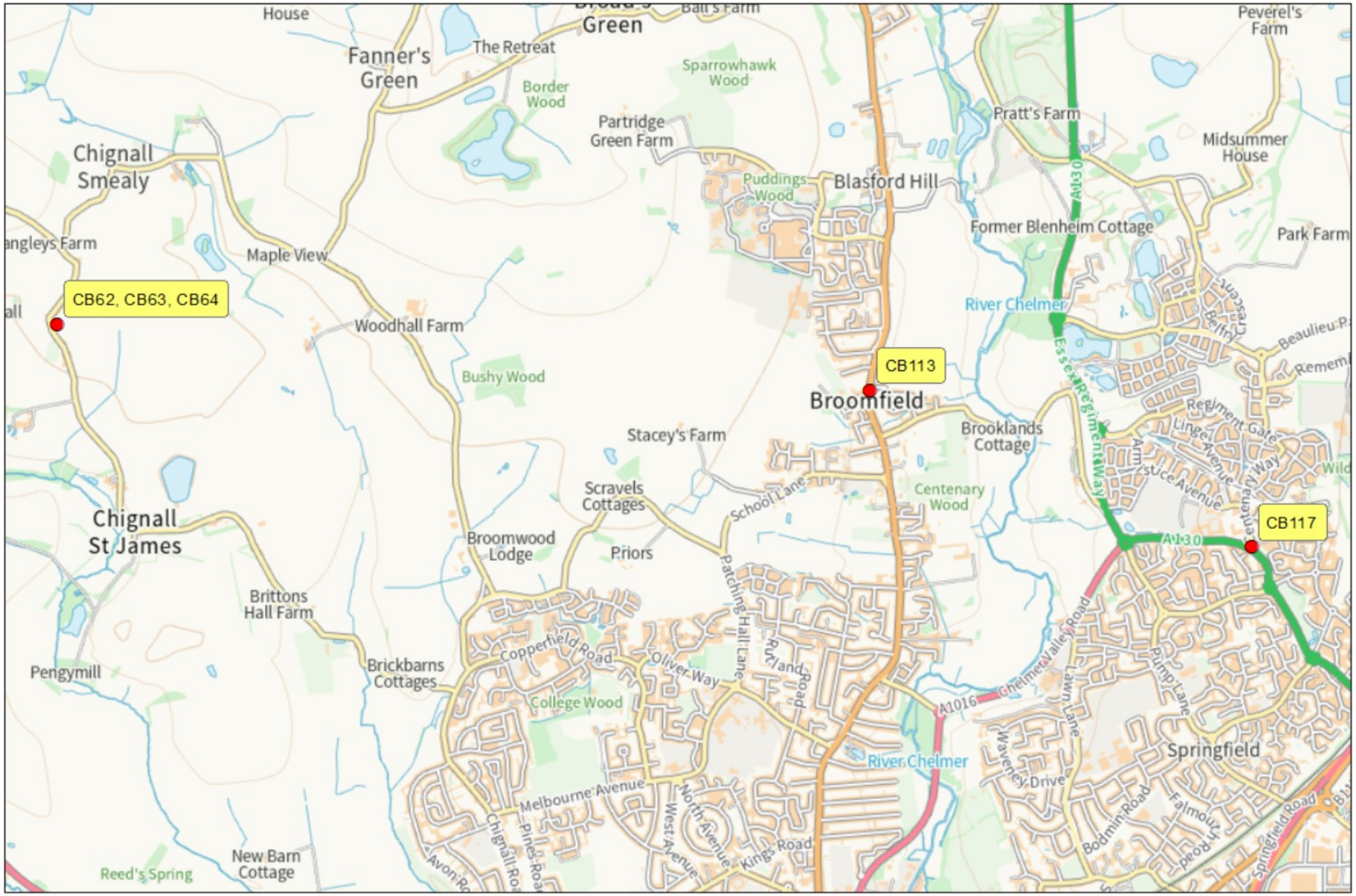


Figure D.3 – Map of Non-Automatic Monitoring Sites: Map of Non-Automatic Monitoring Sites: Danbury

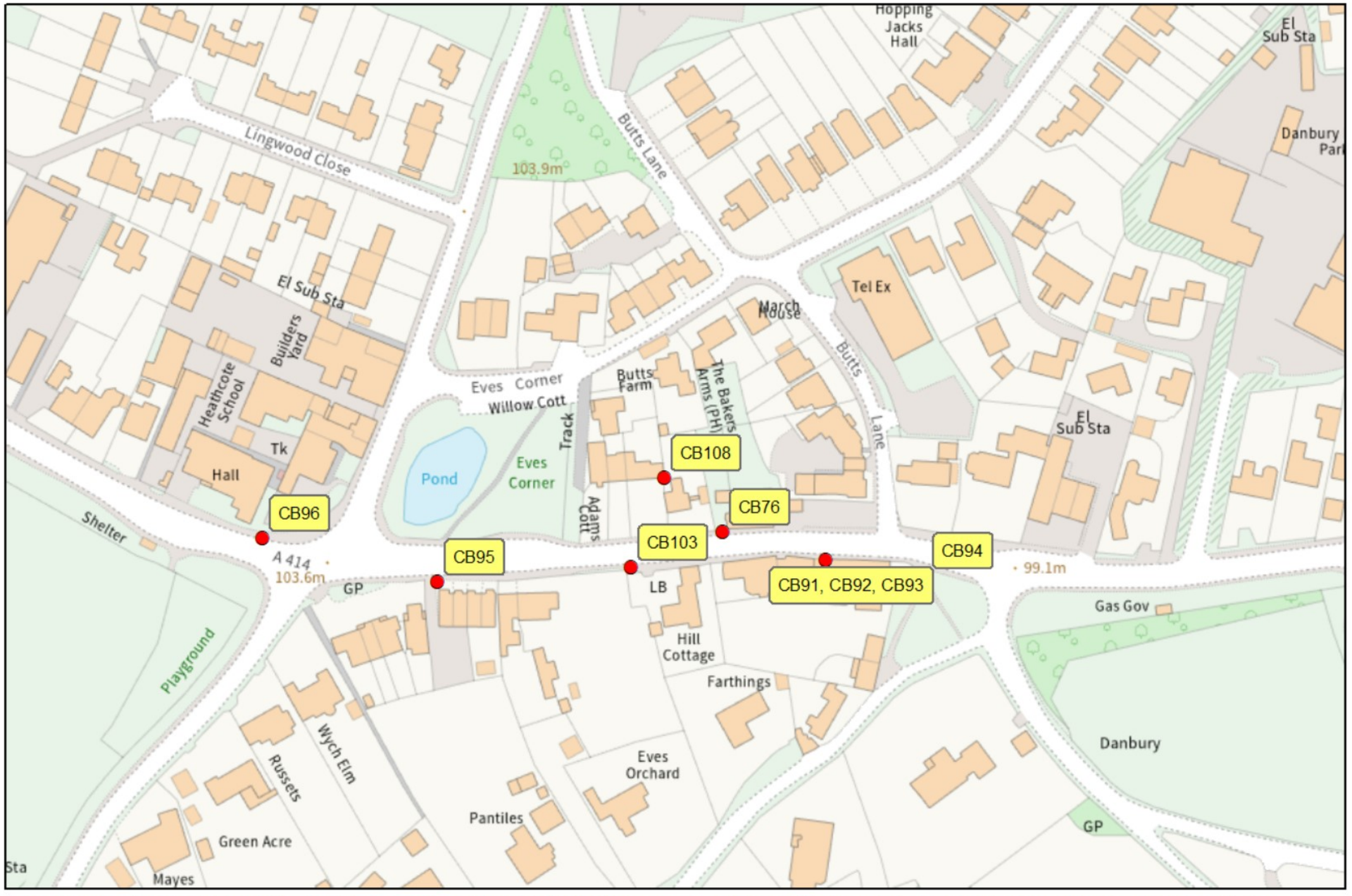


Figure D.4 – Map of Non-Automatic Monitoring Sites: Map of Non-Automatic Monitoring Sites: South Woodham Ferrers

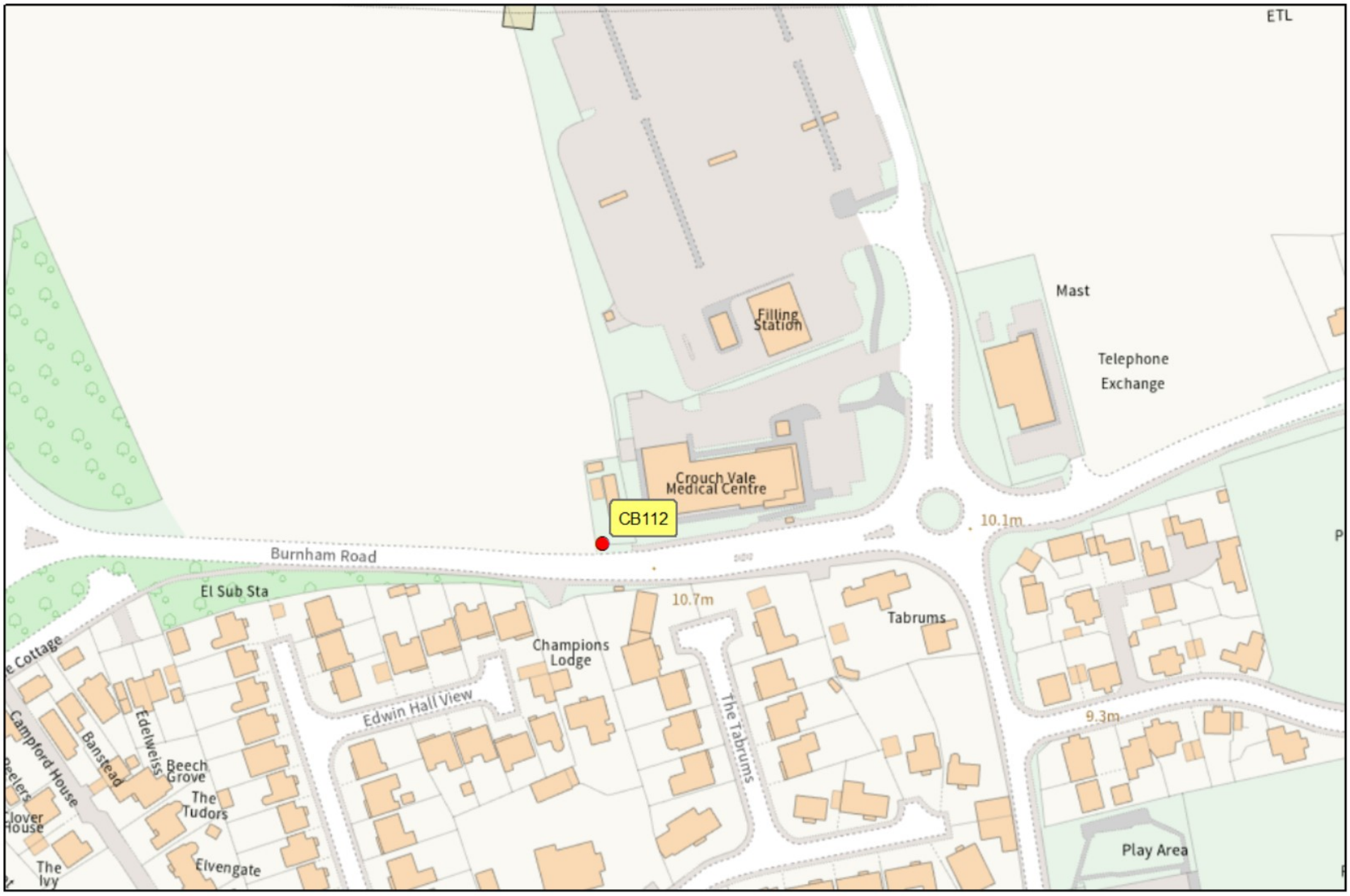


Figure D.5 – Map of Automatic Monitoring Sites

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[4]

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

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

Appendix F: Army & Navy AQMA Revocation Order

Environment Act 1995 Part IV Section 83(2)(b)

Chelmsford City Council

Air Quality Management Area Revocation Order

Chelmsford City Council in exercise of the powers conferred upon it by Section 83(2)(b) of the Environment Act 1995, hereby makes the following Order.

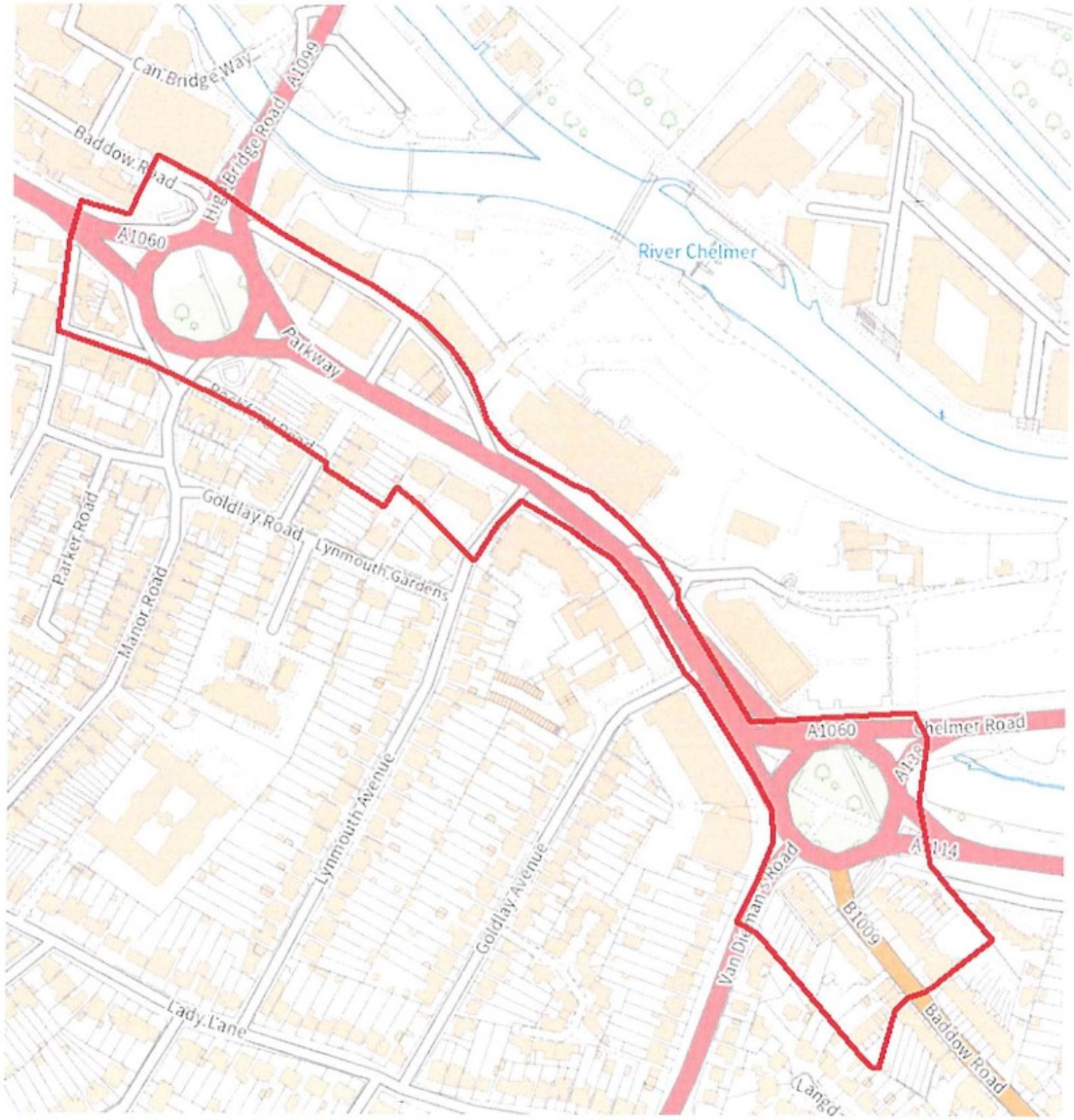
1. This Order may be cited/referred to as the Air Quality Management Area (Chelmsford City Council) Revocation Order 2024 No.1 and shall come into effect on 14th March 2024.
2. This Order revokes the Air Quality Management Area (AQMA) *the Chelmsford City Council Air Quality Management Area (Amendment) Order 2012* which was made on 1st October 2012.
3. The effect of this is to revoke as an AQMA, the area shown outlined in red on the plan in Schedule 1 which incorporates several roads leading into the Army and Navy roundabout and the Odeon roundabout.

The Common Seal of
Chelmsford City Council was
hereunto affixed in the presence of:

W. W Butcher
(WILLIAM BUTCHER)
Authorised signatory

SEALING REGISTER
REFERENCE
34/24

Schedule 1



W. Butcher

(WILLIAM BUTCHER)

Appendix G: A414, Maldon Road, Danbury AQMA Revocation Order

Environment Act 1995 Part IV Section 83(2)(b)

Chelmsford City Council

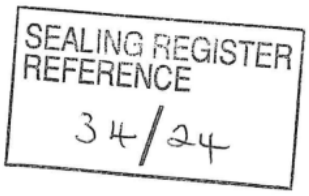
Air Quality Management Area Revocation Order

Chelmsford City Council in exercise of the powers conferred upon it by Section 83(2)(b) of the Environment Act 1995, hereby makes the following Order.

1. This Order may be cited/referred to as the Air Quality Management Area (Chelmsford City Council) Revocation Order 2024 No. 2 and shall come into effect on 14th March 2024.
2. This Order revokes the Air Quality Management Area (AQMA) *the Chelmsford City Council A414 Maldon Road, Danbury Air Quality Management Area Order 2018* which was made on 8th October 2018.
3. The effect of this is to revoke as an AQMA, the area shown outlined in red on the plan in Schedule 1 which incorporates the stretch of road between Gay Bowers Lane and Danbury Village Green and adjacent properties.

The Common Seal of
Chelmsford City Council was
hereunto affixed in the presence of:

(WILLIAM BUTCHER)
Authorised signatory



Schedule 1

W. Butler
(WILLIAM BUTCHER)

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'
AQIA	Air Quality Impact Assessment – Reports provided in support of planning applications.
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air Quality Annual Status Report
CVTF	Clean Vehicle Technology Fund – A DfT fund that provides grants for upgrading vehicles to reduce emissions in areas of poor air quality
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EU	European Union
Euro Standard	Euro standards define the acceptable limits for exhaust emissions of new vehicles sold in EU and EEA member states.
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SCRT	Selective Catalytic Reduction Technology – Retrofitted equipment to reduce bus emissions
Street Canyon	Road which is flanked by buildings resembling a canyon
TEA	Triethanolamine – substance used in diffusion tubes for absorbing nitrogen dioxide
UK-AIR	An information resource providing in-depth information on air quality and air pollution in the UK. A range of information is available, from the latest pollution levels, pollution forecast information, a data archive, and details of the various monitoring networks.
UKAS	United Kingdom Accreditation Service

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