Colchester City Council

2023 Air Quality Annual Status Report (ASR)

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

Date: August 2023

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Executive Summary: Air Quality in Our Area

The 2023 Annual Status Report is designed to provide the public with information relating to local air quality in Colchester, to fulfil Colchester 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 2022, Colchester City Council measured **one** marginal exceedance of the Air Quality Objectives at relevant exposure. This exceedance is located at site CBC3 Mersea Road within the existing Air Quality Management Area (AQMA) 1 Central Corridors.

Air Quality in Colchester

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

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

The main source of air pollution in the Colchester is road traffic emissions from major roads, notably the A12, A120, A133, A134, A1232, Brook Street and Mersea Road. Significant traffic congestion can occur during peak times within Colchester causing high emissions of pollution such as nitrogen dioxide and particulate matter.

As the oldest recorded Roman town in Britain, Colchester has many narrow roads within the town centre and surrounding areas buildings flank to form a canyon like environment. Street canyons act to reduce dispersal of pollutants which can significantly worsen air quality.

Colchester City Council has three Air Quality Management Areas (AQMAs) which are detailed in Table 2.1. These air pollution hotspots have been declared due to emissions from road traffic causing exceedances of Nitrogen Dioxide concentrations at relevant exposure. The Air Quality Objectives and examples of where they apply are described in Appendix E.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017
[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Air quality appraisal: damage cost guidance, January 2023
[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Actions to Improve Air Quality

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

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Defra funded air quality behavioural change projects

CAReless Pollution is a Colchester-wide campaign that launched in October 2020. It encourages drivers to switch off their engines when stationary to help improve air quality in the town and to reduce the amount of polluted air that people breathe inside their cars.

A toolkit has been produced to provide schools in Colchester with ideas for involving and inspiring young people to understand more about the air quality around them and encouraging everyone to take action to help improve air quality in Colchester.

The roadside signage trial (funded by the 2nd successful Defra bid) has come to an end, but has led to a 11% increase in engine switch offs on Brook Street and at East Gates. At East Gates alone approximately 260 additional vehicles were switching off their engines every week preventing an estimated 91g of Nitrogen Dioxide per week entering the air (based on a 5-minute wait). The findings mirror the results of short-term trials in Kent where signage has now been made permanent.

Following the study, the Council are making a recommendation to apply for planning permission to have the signage on Brook Street and East Gates put up permanently and to use the remainder of the DEFRA budget to identify and fund further locations within our AQMA's for signage.

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

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

The Home Burning campaign ran for four months from December '21 through to March '22. The aim was to raise awareness of the health impacts of pollution generated by home fires and log burners, specifically Particulate Matter (PM2.5) and provide information to help local 'burners' take positive action to reduce these risks and 'burn safe', 'burn better', 'burn clean' and 'burn less'. The campaign included public engagement events, social media, a home burning web page, and the development of resources including an information leaflet, posters, infographics and pull up banner. Through the course of the campaign there was:

- Over 900 face to face home burning conversations with local residents
- 10 home burning events delivered across 5 locations
- 178 visits to the Colchester.gov.uk/home burning webpage
- 8 posts were shared across the Eco Colchester and Enjoy Colchester Facebook and Twitter pages with the potential of each post being seen by 26,500 residents
- 1 online article published
- Over 1200 materials distributed

Prior to the launch of the campaign, polls were held to identify the awareness that open fires and log burners generated pollution that could damage their health. At the conclusion of the project, further polls identified that the awareness of generated pollution from open fires and log burners had increased.

The Careless Pollution campaign was nationally recognised and was awarded Highly Commended in Edie's National Sustainability Leaders Awards 2022.

2022 Air Quality Grant

In 2022, Colchester City Council submitted a successful bid for £301,000 for projects to improve air quality in Colchester and will fill the gaps in resources and support for Active Travel and engaging the community.

The project will deliver:

- Full time dedicated sustainable travel business engagement officer
- Care for your Air business e learning module
- Full time dedicated community engagement officer to focus on schools and residents
- Further school support for CAReless Pollution campaign and to support walking and cycling
- Further development work on strengthening partnerships with health and community groups

- A complete revamp of the Cycle Colchester Website with content informed by community engagement
- A new up to date Cycle Colchester map, with input from community engagement
- A new eCargo Bike short term loan scheme for residents

Air Quality Sensor Monitoring Data

Essex Highways have installed nine air quality sensors within the city centre AQMAs 1 and 2. These sensors are colocated with Vivacity traffic monitoring sensors which can detect and classify a wide range of transport modes, from pedestrians, cyclists and e-scooters to cars, buses and HGVs. The air quality data, combined with traffic data and meteorological data will enable advanced air quality analysis using the OpenAir software package to identify potential traffic management interventions.

Table i.1 – Air Quality Sensor Monitoring

Metric	North Hill	Head Street	St John's Street	High Street	East Hill	Mersea Road	Brook Street	East Street	Oaks Drive (Background)
Annual Mean (µg/m3)	24.7	33.0	31.4	20.6	21.4	30.7	**45.0**	28.0	15.5
Max Hourly Concentration (µg/m3)	102.5	187.2	142.8	106.7	119.9	119.7	175.5	113.4	100.1
Valid Data Capture (%) (from installation)	63.7	99.8	100.0	100.0	99.6	100.0	55.7	100.0	45.8
Valid Data Capture Annual (%)	52.8	84.6	85.2	85.3	82.6	79.8	44.4	81.8	39.1

Only the Brook Street sensor identified an exceedance of the air quality objectives however for context, issues with the operation of the sensor meant there was low data capture for the site. All nine of the sensors will continue to operate in 2023.

Figure i.1 – Air Quality Sensor Monitoring Locations
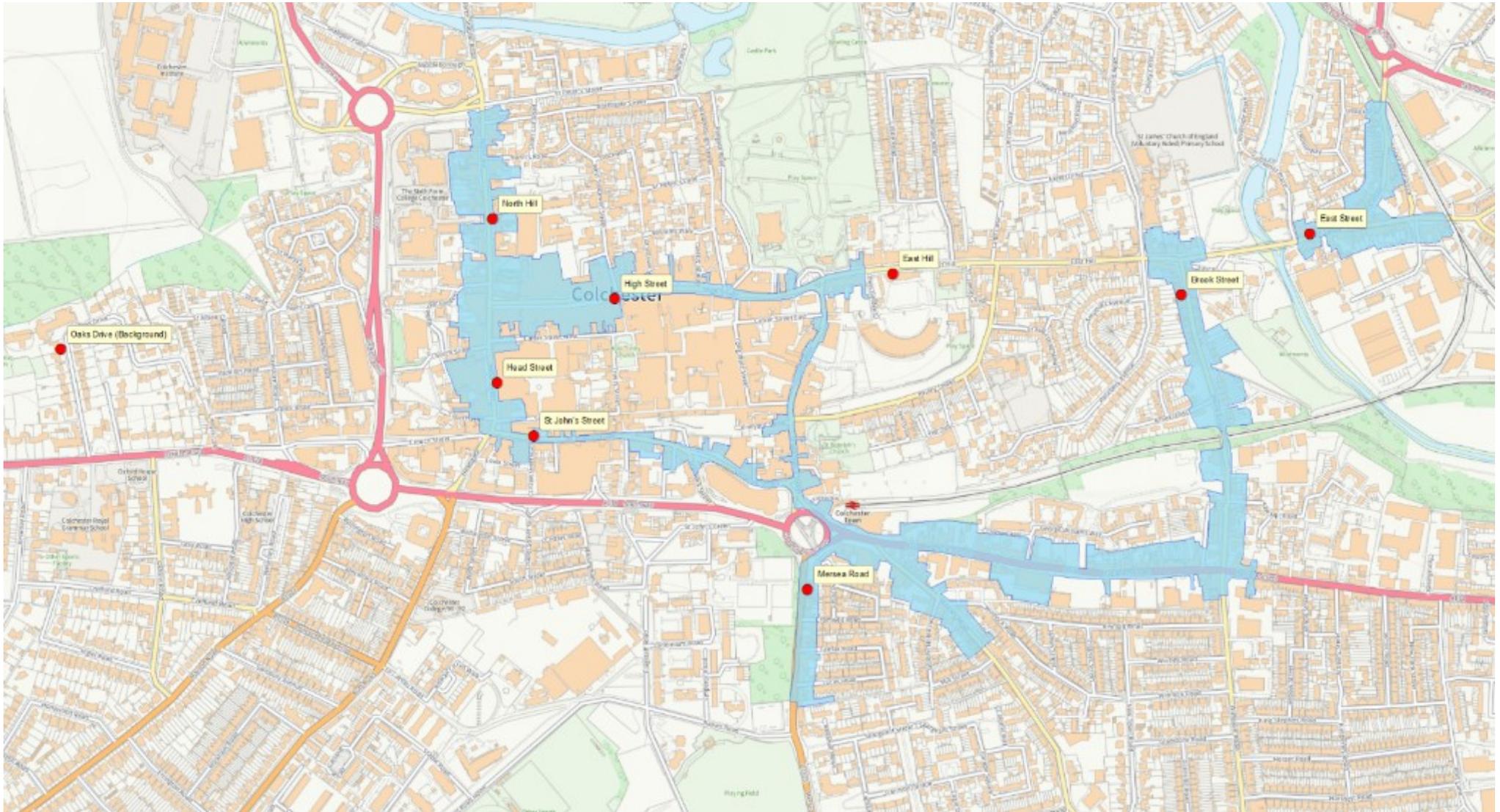
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Essex County Council Active Travel Fund Measures

In March 2022, the Department for Transport (DfT) announced that they will be awarding Essex County Council (ECC) £1.3M to improve walking and cycling in Colchester, specifically LCWIP route 4 which is an east-west walking and cycling corridor crossing the city including through AQMA1. A north-south scheme is also being created.

Travelling from north to south and east to west, these two routes cross in the city centre, enabling a safe and easy access to the high street and key destinations such as the station and hospital.

Air Quality Backpack Monitoring

Essex County Council commissioned an air quality monitoring project focusing on schools within or near to designated Air Quality Management Areas (AQMAs). This supports Essex County Council's objective of improving knowledge and awareness of air quality within the county and forms part of a larger Defra funded project through the 2021/2022 Air Quality Grant scheme.

Monitoring was carried out using backpack mounted air quality sensors to map air pollutant concentrations, specifically concentrations of nitrogen dioxide (NO_2) and fine particulate matter ($PM_{2.5}$), along key routes that pupils are likely to use on their journeys to and from school. Concentrations of NO_2 are heavily influenced by emissions from road traffic, whilst road traffic emissions also contribute to concentrations of $PM_{2.5}$.

The area surrounding St James' CofE Primary School located on Guildford Road in Colchester was travelled around over the course of a single day to cover different time periods, in particular the peak morning and afternoon traffic hours when children would be travelling to and from school. The routes were travelled by walking and within a car.

It is hoped that the data collected from this monitoring can be used to highlight the local air pollutant concentrations to which children are potentially exposed. This will allow children, parents and carers understand how road traffic contributes to local air pollution on a day-to-day basis and how they could make simple behavioural changes such as choosing an alternative route or changing their mode of travel to make a difference. The aim of this project is to raise awareness and achieve lasting behavioural change in areas of poor air quality around Essex.

Local Engagement and How to get Involved

Pollution Forecasts and Alerts

Colchester City Council is a member of the Essex Air Quality consortium. The Essex Air web site provides a daily forecast of air pollution which is based off UK-AIR data feeds. Also, the @EssexAir twitter feed provides localised weekly air pollution forecasts.

Links to Defra recommended actions and health advice are provided when air pollution is likely to be moderate or higher. This will enable those with heart or lung conditions, or other breathing problems to make informed judgements about their levels of activity or exposure.

All-Electric Car Club

Colchester City Council and Enterprise Car Club have launched a new service in the City giving people the opportunity to hire pay-as-you-go electric vehicles. By signing up to the Car Club, people can hire a car on an hourly basis, providing a convenient, environmentally friendly way of travelling in and around the City.

The Car Club offers drivers an alternative way to access personal transport, or to replace or reduce first or second car ownership, without the costs and hassle of insurance, tax and basic maintenance, as everything is included in the hire cost. Cars will be bookable online, via an app and by phone, and can be paid by the hour or by the mile.

To find out more about the scheme please visit:

www.enterprisecarclub.co.uk

Loveurcar Colchester Car Sharing Scheme

Colchester City Council is encouraging everyone to car share. Dedicated car share parking spaces have been provided at several town centre car parks in Colchester and at Colchester North station. These are located in preferential locations near the entrance or exit of each car park, giving you easy access in and out of the car park.

More information can be found at the following link:

https://www.colchester.gov.uk/loveurcarcolchester/carsharingscheme/

Conclusions & Priorities

Colchester City Council have concluded that:

- Traffic movements have almost returned to pre Covid-19 volumes, however only one marginal air quality exceedance has been identified. This was in the existing Mersea Road air pollution hotspot (AQMA1).

- No exceedance was measured in Brook Street. This area has exceeded the air quality objectives since the area was originally declared an AQMA in 2006.

- Annual means greater than 60µg/m^3 indicates that an exceedance of the 1-hour mean objective is possible. No annual mean concentrations in excess of 60µg/m3 have been monitored for 8 years. and it would be appropriate to examine revocation of the 1-hour NO2 designation of AQMA1.

- No exceedances have been measured in AQMA 2 for three years. The measured concentrations are below the borderline threshold (36µg/m3) and it would be appropriate to examine revocation of the AQMA2.

- No exceedances have been measured in AQMA 4 for three years. The measured concentrations are below the borderline threshold (36µg/m3) and it would be appropriate to examine revocation of the AQMA4.

- Evidence documents detailing National Highways proposed widening of the A12 identify that the works will lead to an exceedance at one dwelling on Halstead Road adjacent to the A12 and increased concentrations in AQMA4. National Highways have classified these changes as imperceptible based on DMRB LA105 guidance. Colchester City Council are working with National Highways via their consultants to examine current air quality baseline conditions and potential mitigations.

- No new developments have been identified to have a significant impact on air quality.

For 2023, Colchester City Councils priority will be to finalise the Air Quality Action Plan (AQAP) which will focus on sustainable transport applications across the city and direct interventions to improve air quality at air pollution hotspots.

This will involve partnership working with Essex County Council and Essex Highways whom are developing The Colchester Future Transport Strategy which has an objective of reducing air pollution.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection team of Colchester City Council.

This ASR has been approved by:

Lucie Breadman – Assistant Director of Communities, Colchester City Council

This ASR was sent to the Director of Public Health at Essex County Council on 15th May 2023.

If you have any comments on this ASR please send them to the Environmental Protection team at:

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1 Local Air Quality Management

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

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

Air Quality Management Areas

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

A summary of AQMAs declared by Colchester City Council can be found in Table 2.1. The table presents a description of the three AQMAs that are currently designated within Colchester. Appendix D: Maps of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration (μg/m³)	Level of Exceedance: Current Year (μg/m³)	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Area 1 - Central Corridors	Declared May 2001 Amended February 2013 Amended June 2018	NO₂ Annual Mean	High Street, Head Street, North Hill, Queen Street, St Botolph's Street, St Botolph's Circus, Osborne Street, Magdalen Street, Military Road, Mersea Road, Brook Street, East Street and St Johns Street	NO	65.9	40.3	Not Compliant	Healthier Air for Colchester – Air Quality Action Plan 2016-2021	http://www.essexair.org.uk/ Reports/Colchester_AQ_Act ion_Plan.pdf
Area 1 - Central Corridors	Declared May 2001 Amended February 2013 Amended June 2018	NO₂ 1 Hour Mean	High Street, Head Street, North Hill, Queen Street, St Botolph's Street, St Botolph's Circus, Osborne Street, Magdalen Street, Military Road, Mersea Road, Brook Street, East Street and St Johns Street	NO	Annual Mean > 60(μg/m³)	No Exceedance	8	Healthier Air for Colchester – Air Quality Action Plan 2016-2021	http://www.essexair.org.uk/ Reports/Colchester_AQ_Act ion_Plan.pdf
Area 2 - East Street and the adjoining lower end of Ipswich Road	Amended June 2018	NO₂ Annual Mean	East Street and Ipswich Road	NO	45.2	No Exceedance	3	Healthier Air for Colchester – Air Quality Action Plan 2016-2021	http://www.essexair.org.uk/ Reports/Colchester_AQ_Act ion_Plan.pdf
Area 4 - Lucy Lane North, Stanway	Declared January 2012, Amended February 2013	NO₂ Annual Mean	Lucy Lane North, Stanway	YES	55.3	No Exceedance	3	Healthier Air for Colchester – Air Quality Action Plan 2016-2021	http://www.essexair.org.uk/ Reports/Colchester_AQ_Act ion_Plan.pdf

☒ **Colchester City Council confirms the information on UK-Air regarding their AQMA(s) is up to date**

Progress and Impact of Measures to address Air Quality in Colchester City Council

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

Colchester City Council has worked in partnership with the following stakeholders during 2022:

- Essex County Council, Essex Highways and their air quality consultants to assist with development of the Colchester Future Transport Strategy and corresponding development of the forthcoming Colchester City Council Air Quality Action Plan
- National Highways and their consultants in respect of the proposed A12 widening scheme

Colchester City Council and Essex County Council have a number of ongoing measures to improve air quality in Colchester. These are detailed in Table 2.2 below.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Development of a new Air Quality Action Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2022	2023	Colchester City Council	Colchester City Council	NO	Funded	< £10k	Planning	Not quantified		Baseline Air Quality & Traffic Data being collected in AQMA	
2	Collection and analysis of Air Quality and transport data to develop traffic management measures	Traffic Management	UTC, Congestion management, traffic reduction	2016	2023	Essex County Council	Essex County Council / March 2021 Defra Air Quality Grant Funding	YES	Funded	£100k - £500k	Implementation	Not quantified	Data Capture	Air quality and vehicle movement sensors have been installed at strategic locations to enable combined traffic flow and pollution monitoring to be undertaken	Installation complete and data capture in progress
3	Clean Air for Colchester Community Engagement	Public Information	Via other mechanisms	2019	2020	Colchester City Council	Colchester City Council / Defra Air Quality Grant Funding	YES	Funded	< £10k	Completed	Not quantified	N/A	Completed	From October 2019 to January 2020 Colchester City Council spoke to over 3,000 residents, schools and businesses about pollution as part of a two-year behaviour change project, Clean Air for Colchester, which aims to reduce pollution levels across the City.
4	CAReless Pollution Campaign	Public Information	Other	2019	2023	Colchester City Council	Colchester City Council / Defra Air Quality Grant Funding	YES	Funded	< £10k	Implementation	Not quantified	N/A	Ongoing	CAReless Pollution is a Colchester-wide campaign urging drivers to adopt better driving habits and switch off their engines while they wait at traffic

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
															lights, level crossings or outside schools. This is to improve their own health and help reduce air pollution in the town.
5	Door to Door Engagement	Public Information	Via other mechanisms	2019	2020	Colchester City Council	Colchester City Council / Defra Air Quality Grant Funding	YES	Funded	< £10k	Completed	Not quantified	N/A	Completed	Door to door engagement was conducted in Brook Street, East Street, East Hill and the lower end of Ipswich Road (part of our Air Quality Management Area's) and over 200 households were visited. This gave us valuable insight into resident's perceptions of air quality and enabled us to provide households with information about the project and how to get involved.
5	Engine Switch Off Campaign	Public Information	Other	2020	2021	Colchester City Council	Colchester City Council / Defra Air Quality Grant Funding	YES	Funded	< £10k	Completed	Not quantified	N/A	Completed	We worked with a marketing partner to launch a Switch Off awareness campaign starting in September 2020. The campaign and its resources will be created in partnership with the local community and will aim to raise awareness of the effects of pollution on health and get more people switching off their engine when stationary in a bid to cut pollution.
6	No Idling Roadside Reminders	Public Information	Other	2020	2021	Colchester City Council	Colchester City Council / Defra Air Quality Grant Funding	YES	Funded	< £10k	Completed	Not quantified	N/A	Completed	The roadsigns could be seen by all road users at the traffic lights on Brook Street, in both directions, and at the East Gates rail crossing. To evaluate the effectiveness of each sign the Council is working in partnership with the University of Essex.
7	Traffic Light Feasibility Study	Other	Other	2020	2021	Colchester City Council	Colchester City Council /	YES	Funded	< £10k	Completed	Not quantified	N/A	Completed	A feasibility study was undertaken to explore the economic

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
							Defra Air Quality Grant Funding								cost and technicalities of installing the timers to encourage drivers to switch off their engines at red lights in Colchester. This study will not result in the installation of countdown timers, but instead assessed the effectiveness of the use of such technologies.
8	Active Travel Project	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2021	2023	Colchester City Council	Colchester City Council	NO	Funded	< £10k	Implementation	Not quantified	N/A	The first phase of this work is an evaluation of Bikeability which is offered in schools. We will be looking at how it currently works and exploring ways to enhance it so we can get more children cycling and cycling more often.	A key objective of the clean air project is to get people walking and cycling short journeys. We know that a quarter of all car journeys in Colchester are under 2 miles and the most common journey people said they make in their cars is to the shops. Through this project we will be working closely with a resident area which has good walking and cycling infrastructure, somewhere in which we know people are driving short distances through the air quality management areas. We will also be working closely with 4 schools to explore ways to encourage an increase in active travel.
9	2021 Clean Air Day Promotion	Public Information	Other	2021	2021	Colchester City Council	Colchester City Council	NO	Funded	< £10k	Completed	Not quantified	N/A	Completed. The event was featured on regional television news.	On national Clean Air Day, pupils from St James' Primary School in Colchester published an open letter to their parents, relatives and other carers setting out why clean air is important for young lungs. They are urging adults to adopt better driving habits by switching off the car engine while stationary

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
															outside their school, to stop children having to breath polluted air. A CAReless Pollution Zorb-ball is on display at the school to help highlight the poor quality air that children have to breath when they are sat inside a stationary car with the engine running. The Zorb-ball will then be visiting other events this summer.
10	Colchester Future Transport Strategy	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane			Essex County Council	Essex County Council	NO		£500k - £1 million		Not quantified		Public Engagement	Creating a long-term transport plan for Colchester
11	Implement vehicle emissions requirements within Taxi licensing conditions	Promoting Low Emission Transport	Taxi Licensing conditions	2016	2019	Colchester City Council	Colchester City Council	NO	Funded	< £10k	Complete	Not quantified	Reduced emissions	Complete	
12	Require taxis to turn off engines when idling in the AQMAs	Promoting Low Emission Transport	Taxi Licensing conditions	2016	2019	Colchester City Council	Colchester City Council	NO	Funded	< £10k	Complete	Not quantified	Reduced emissions within AQMAs	Complete	
13	No Idling Policy	Traffic Management	Anti-idling enforcement	2018	2019	Colchester City Council & Colchester Borough Homes	Colchester City Council & Colchester Borough Homes	NO	Funded	< £10k	Completed	Not quantified	N/A	Complete	Drivers of CBC and CBH vehicles (except for recycling and rubbish collection vehicles when collecting refuse and street cleaning vehicles) and all staff using their own vehicles for business travel, are required to adopt the 'No Idling' policy and switch off their vehicle engines when stationary. This also applies to

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
															vehicles on Council office premises. A no idling requirement for AQMAs has been introduced into the Taxi Licensing policy.
14	St Botolphs Circus Roundabout	Transport Planning and Infrastructure	Other	2019		Essex County Council	Essex County Council	NO	Funded	£1 million - £10 million	Autumn 2021	Not quantified	Reduced Congestion	Consultation complete. Further works likely to be included within Colchester Future Transport Strategy	

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM$_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM$_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Colchester City Council does not monitor PM$_{2.5}$ concentrations using a reference analyser however notes the Defra background mapping resource which for PM$_{2.5}$ in 2022 models a maximum annual mean concentration of 11.7µg/m^3 in the Local Authority area.

The Public Health Outcomes Framework indicator D01 – Fraction of mortality attributable to particulate (PM$_{2.5}$) air pollution which for 2021 gave a value of 5.4% which is down from 7.1% in 2018 and below the national (5.5%) and regional (5.5%) average.

Figure 2.1 – Public Health Framework Indicator D01 Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution
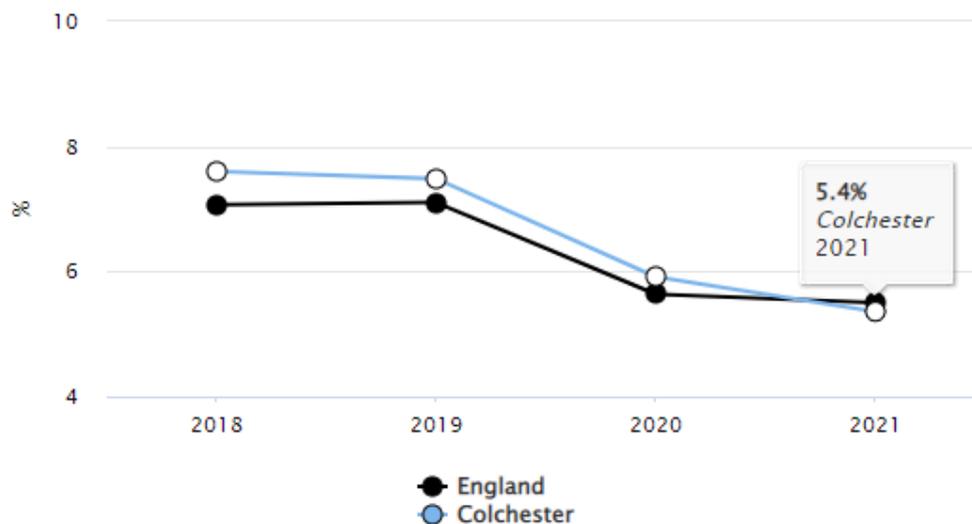
Colchester City Council is taking the following measures to address PM$_{2.5}$:

- Regular inspections of permitted industry where combustion and non-combustion processes could lead to anthropogenic emissions of PM$_{2.5}$

- Working with Essex County Council (highway authority) to deliver Major Transport improvement schemes to alleviate congestion. In addition to reduced exhaust emissions, these schemes will reduce non-exhaust emissions from brake and tyre wear by making traffic flows smoother

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

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Colchester City Council undertook automatic (continuous) monitoring at one site during 2022. 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

Colchester City Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 63 sites during 2022. 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.

Individual Pollutants

3.1.3 Nitrogen Dioxide (NO2)

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.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.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. No hourly exceedances of 200µg/m^3 have been measured in the past five years.

In 2022, Colchester City Council measured **one** marginal exceedance of the annual mean Air Quality Objective at relevant exposure. This exceedance is located at site CBC3 Mersea Road within the existing Air Quality Management Area (AQMA) 1 Central Corridors.

No exceedances have been measured in AQMA 2 and AQMA 4. The measured concentrations are below the borderline threshold (36µg/m3).

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)
CBC Auto1	Brook Street	Roadside	600571	225141	NOx, NO, NO$_2$	Yes AQMA 1	Chemiluminescent	0	3	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)
CBC2	Fairfax Road, 21	Urban Background	599981	224633	NO2	NO	2.0	1.1	No	2.5
CBC3A, CBC3B, CBC3C	Mersea Road, 21	Roadside	599914	224643	NO2	YES AQMA1	0.3	1.9	No	2.5
CBC8	Shrub End Road, 105/107	Roadside	597640	223661	NO2	NO	17.0	1.2	No	2.5
CBC20	Papillon Road	Urban Background	599063	225097	NO2	NO	4.0	1.2	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)
CBC43	Magdalen Street	Roadside	600356	224763	NO2	YES AQMA1	9.0	0.4	No	2.5
CBC45A, CBC45B, CBC45C	Brook Street, 28/30	Roadside	600560	225181	NO2	YES AQMA1	0.0	1.0	No	2.5
CBC48	33 St Botolphs Street	Roadside	599908	224942	NO2	YES AQMA1	0.0	1.5	No	2.5
CBC49	High Street - Brighthouse	Kerbside	599720	225217	NO2	YES AQMA1	4.0	3.5	No	2.5
CBC54	Mersea Road, 10	Roadside	599922	224728	NO2	YES AQMA1	1.6	1.8	No	2.5
CBC62, CBC62A, CBC62B	Mersea Road, 9	Roadside	599923	224738	NO2	YES AQMA1	0.0	2.9	No	2.5
CBC63	Mersea Road, 12	Roadside	599921	224711	NO2	YES AQMA1	0.0	1.8	No	2.5
CBC65	Maldon Road, 99	Roadside	598797	224489	NO2	NO	8.0	0.4	No	2.5
CBC66	Brook Street RAB	Roadside	600622	224881	NO2	YES AQMA1	16.0	1.2	No	2.5
CBC68	Brook Street 56	Roadside	600589	225113	NO2	YES AQMA1	0.0	10.4	No	2.5
CBC69, CBC69A, CBC69B	Brook Street 23	Roadside	600545	225205	NO2	YES AQMA1	0.0	1.1	No	2.5
CBC71	Osborne Street, 6	Roadside	599818	224924	NO2	YES AQMA1	0.0	2.1	No	2.5
CBC72	Ipswich Road. Old Coach House.	Roadside	600885	225441	NO2	YES AQMA2	9.0	1.9	No	2.5
CBC76	Harwich Road, 53	Roadside	601162	225471	NO2	NO	2.0	2.0	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)
CBC88, CBC88A, CBC88B	Brook Street 48 (Auto Monitor)	Roadside	600571	225151	NO2	YES AQMA1	0.0	2.6	Yes	2.5
CBC90	London Rd 170 Marks Tey	Roadside	591312	223431	NO2	NO	12.0	2.0	No	2.5
CBC91	Blackberry Rd 2	Urban Background	595239	223936	NO2	NO	3.0	2.0	No	2.5
CBC93	Butt Road 129	Roadside	599031	224427	NO2	NO	5.0	1.5	No	2.5
CBC94	Elmstead Rd 6	Roadside	601925	224652	NO2	NO	11.0	2.5	No	2.5
CBC96	Mill Rd 239	Roadside	599909	228288	NO2	NO	7.0	1.2	No	2.5
CBC97	Mill Rd 87	Roadside	599452	227884	NO2	NO	6.0	1.2	No	2.5
CBC98	Cowdray Av 154	Roadside	600086	226157	NO2	NO	4.0	1.0	No	2.5
CBC99	Ipswich Rd 130	Roadside	600891	225956	NO2	NO	0.0	15.5	No	2.5
CBC100	Harwich Road 175	Roadside	601252	225627	NO2	NO	12.0	1.5	No	2.5
CBC101	Ipswich Rd 50	Roadside	600868	225452	NO2	YES AQMA2	2.0	1.3	No	2.5
CBC102	East St 72	Roadside	600752	225313	NO2	YES AQMA2	0.0	1.0	No	2.5
CBC103	Brook St 74	Roadside	600607	225049	NO2	YES AQMA1	6.0	2.0	No	2.5
CBC104	Military Rd 37	Roadside	600193	224653	NO2	YES AQMA1	0.0	4.5	No	2.5
CBC105	East Hill 4A	Roadside	600224	225255	NO2	NO	1.0	1.0	No	2.5
CBC106	Mersea Rd 30	Roadside	599911	224558	NO2	YES AQMA1	1.5	0.1	No	2.5
CBC107	North Hill 49	Roadside	599389	225373	NO2	YES AQMA1	2.3	0.1	No	2.5
CBC108	North Station Rd 39	Roadside	599354	225802	NO2	NO	2.5	0.1	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)
CBC109	North Hill, Strada	Roadside	599398	225432	NO2	YES AQMA1	0.0	1.5	No	2.5
CBC110	1A St Botolphs Street	Roadside	599891	225021	NO2	YES AQMA1	0.0	2.0	No	2.5
CBC111	St John's Street, Lemon Tree	Urban Centre	599473	224982	NO2	YES AQMA1	0.0	1.5	No	2.5
CBC112	High St George Hotel	Urban Centre	599730	225232	NO2	YES AQMA1	0.0	2.5	No	2.5
CBC113	Orchard Gardens	Roadside	600845	225671	NO2	NO	15.0	3.0	No	2.5
CBC115	Harwich Road 18	Roadside	601083	225387	NO2	NO	0.0	7.0	No	2.5
CBC116	Harwich Road 19	Roadside	601115	225355	NO2	NO	0.0	12.0	No	2.5
CBC117	High Street 71	Roadside	599984	225238	NO2	NO	0.0	2.0	No	2.5
CBC118	North Station Road 120	Roadside	599269	226122	NO2	NO	0.0	2.0	No	2.5
CBC119	Claremont Heights	Roadside	599230	226272	NO2	NO	0.0	2.0	No	2.5
CBC123	131 Bergholt Road	Roadside	598938	226707	NO2	NO	0.0	3.8	No	2.5
CBC124	58 East Hill	Roadside	600516	225277	NO2	YES AQMA1	0.0	2.0	No	2.5
CBC125	6 Bergholt Road	Roadside	599226	226508	NO2	NO	0.0	1.0	No	2.5
CBC127	West Side Brook Street Junction w/ East Hill	Roadside	600537	225241	NO2	YES AQMA1	0.0	1.0	No	2.5
CBC128	East Side Brook Street Junction w/ East Street	Roadside	600546	225244	NO2	YES AQMA1	0.0	1.0	No	2.5
CBC129	37 Brook Street	Roadside	600550	225183	NO2	YES AQMA1	0.0	1.0	No	2.5
CBC130	Osbourne Street 43 (Taxi)	Roadside	599701	224964	NO2	YES AQMA1	0.0	1.0	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)
CBC131	Lucy Lane North	Roadside	595025	225166	NO2	YES AQMA4	0.0	12.0	No	2.5
CBC132	Lucy Lane South	Roadside	595106.06	225123	NO2	NO	0.0	15.0	No	2.5
CBC135	11 Bridge Farm Coggeshall Road	Roadside	591366	223679	NO2	NO	0.0	9.0	No	2.5
CBC136	85 Coggeshall Road	Roadside	590444	223502	NO2	NO	1.0	1.0	No	2.5
CBC137	93B Coggeshall Road	Roadside	590325	223495	NO2	NO	0.0	3.0	No	2.5
CBC21, CBC138, CBC139	Head Street	Roadside	599413	225056	NO2	YES AQMA1	2.0	0.6	No	2.5
CBC140	Colchester Road Wivenhoe	Roadside	603496	224190	NO2	NO	N/A	1.0	No	2.5
CBC141	The Cross Wivenhoe	Roadside	604045	222827	NO2	NO	0.0	1.5	No	2.5
CBC142	Colchester Crematorium	Urban Background	600253	223411	NO2	NO	N/A	N/A	No	2.5
CBC143	The Willows	Roadside	600056	223156	NO2	NO	5.0	5.0	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 NO2 Monitoring Results: Automatic Monitoring (µg/m3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CBC Auto1	600571	225141	Roadside	94.1	94.1	25.84	26.44	21.76	23	23

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

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

Notes:

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

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

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

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

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

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

Table A.4 – Annual Mean NO2 Monitoring Results: Non-Automatic Monitoring (µg/m3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CBC2	599981	224633	Urban Background	100.0	100.0	28.0	30.0	24.3	23.6	19.8
CBC3A, CBC3B, CBC3C	599914	224643	Roadside	100.0	100.0	**54.5**	**55.4**	**43.9**	**46.4**	**41.3**
CBC8	597640	223661	Roadside	100.0	100.0	22.5	22.1	15.5	16.8	15.3
CBC20	599063	225097	Urban Background	100.0	100.0	21.7	19.5	14.1	17.1	11.9
CBC43	600356	224763	Roadside	100.0	100.0	32.8	32.5	25.4	25.0	22.1
CBC45A, CBC45B, CBC45C	600560	225181	Roadside	100.0	100.0	**50.5**	**44.0**	35.3	38.4	35.5
CBC48	599908	224942	Roadside	100.0	100.0	**42.5**	39.9	30.3	30.9	26.3
CBC49	599720	225217	Kerbside	42.3	42.3	38.8	**40.4**	32.2	28.5	21.9
CBC54	599922	224728	Roadside	100.0	100.0	**47.1**	**42.8**	35.1	37.8	33.0
CBC62, CBC62A, CBC62B	599923	224738	Roadside	100.0	100.0	**42.9**	**40.7**	31.8	35.2	30.8
CBC63	599921	224711	Roadside	100.0	100.0	**48.6**	**45.0**	37.4	39.7	35.5
CBC65	598797	224489	Roadside	100.0	100.0	24.3	23.4	17.6	18.3	16.0
CBC66	600622	224881	Roadside	100.0	100.0	25.7	25.6	19.5	18.7	16.2
CBC68	600589	225113	Roadside	100.0	100.0	23.2	26.8	19.1	21.8	17.1
CBC69, CBC69A, CBC69B	600545	225205	Roadside	100.0	100.0	**46.9**	**45.0**	38.3	34.5	33.5
CBC71	599818	224924	Roadside	100.0	100.0	**51.6**	**46.5**	37.8	**40.2**	36.2
CBC72	600885	225441	Roadside	100.0	100.0	34.7	29.2	21.4	24.3	22.7
CBC76	601162	225471	Roadside	100.0	100.0	31.4	30.6	23.8	25.9	21.0
CBC88, CBC88A, CBC88B	600571	225151	Roadside	100.0	100.0	27.7	25.9	22.2	20.7	18.2
CBC90	591312	223431	Roadside	100.0	100.0	27.1	26.7	17.5	17.5	16.3

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 2022 (%) [2]	2018	2019	2020	2021	2022
CBC91	595239	223936	Urban Background	100.0	100.0	21.7	21.2	16.6	15.9	14.1
CBC93	599031	224427	Roadside	100.0	100.0	20.4	20.4	14.4	14.5	12.6
CBC94	601925	224652	Roadside	100.0	100.0	25.8	26.8	20.3	21.1	17.2
CBC96	599909	228288	Roadside	73.1	73.1	18.4	19.9	14.4	13.8	10.6
CBC97	599452	227884	Roadside	100.0	100.0	26.0	26.8	19.8	19.3	16.7
CBC98	600086	226157	Roadside	100.0	100.0	21.8	21.9	16.7	18.7	16.0
CBC99	600891.32	225956.98	Roadside	100.0	100.0	22.4	22.7	16.5	15.3	15.7
CBC100	601252	225627	Roadside	100.0	100.0	28.4	28.5	22.0	20.3	17.8
CBC101	600868	225452	Roadside	100.0	100.0	34.9	32.7	24.5	28.0	25.3
CBC102	600752	225313	Roadside	100.0	100.0	**41.2**	**40.8**	31.3	36.2	29.0
CBC103	600607	225049	Roadside	100.0	100.0	27.8	26.8	20.3	23.6	18.1
CBC104	600193	224653	Roadside	100.0	100.0	29.0	29.7	22.9	21.9	20.0
CBC105	600224	225255	Roadside	100.0	100.0	34.1	34.0	26.0	26.1	23.1
CBC106	599911	224558	Roadside	100.0	100.0	36.4	35.9	34.2	33.4	29.8
CBC107	599389	225373	Roadside	100.0	100.0	30.9	32.3	28.3	24.1	22.6
CBC108	599354	225802	Roadside	100.0	100.0	32.4	29.9	23.5	25.0	21.2
CBC109	599398	225432	Roadside	100.0	100.0	33.3	34.5	29.9	29.6	25.1
CBC110	599891	225021	Roadside	100.0	100.0	32.2	32.4	24.2	26.7	20.9
CBC111	599473	224982	Urban Centre	100.0	100.0	**42.3**	**44.2**	37.3	37.3	30.7
CBC112	599730	225232	Urban Centre	100.0	100.0	32.3	30.4	19.2	19.9	22.2
CBC113	600845	225671	Roadside	100.0	100.0	27.9	26.2	19.2	21.0	19.5
CBC115	601083	225387	Roadside	100.0	100.0	27.2	27.5	20.4	20.1	19.4
CBC116	601115	225355	Roadside	92.3	92.3	21.5	21.1	16.2	14.5	13.1
CBC117	599984	225238	Roadside	100.0	100.0	39.8	**41.7**	33.5	31.8	30.3
CBC118	599269	226122	Roadside	100.0	100.0	28.5	30.1	25.2	23.6	20.2
CBC119	599230	226272	Roadside	100.0	100.0	21.9	22.1	15.6	15.7	13.7
CBC123	598938	226707	Roadside	92.3	92.3	24.7	22.0	17.0	16.3	13.9
CBC124	600516	225277	Roadside	100.0	100.0	39.8	39.0	28.4	32.1	29.2
CBC125	599226.52	226508.71	Roadside	100.0	100.0	30.2	34.7	26.8	26.6	24.5
CBC127	600537.22	225241.99	Roadside	100.0	100.0	**N/A**	**43.2**	35.1	32.9	32.0
CBC128	600546.54	225244.33	Roadside	92.3	92.3	**N/A**	31.4	24.4	25.7	20.8
CBC129	600550	225183	Roadside	100.0	100.0	**N/A**	**45.3**	**40.0**	**41.3**	36.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CBC130	599701	224964	Roadside	92.3	92.3	**N/A**	**41.0**	34.2	**N/A**	30.3
CBC131	595025	225166	Roadside	100.0	100.0	**N/A**	**41.0**	34.2	27.6	24.5
CBC132	595106.06	225123	Roadside	100.0	100.0	**N/A**	39.8	31.7	26.9	22.6
CBC135	591366	223679	Roadside	100.0	100.0	**N/A**	32.5	25.6	23.8	19.6
CBC136	590444	223502	Roadside	100.0	100.0	**N/A**	30.6	22.2	24.4	23.2
CBC137	590325	223495	Roadside	100.0	100.0	**N/A**	37.9	28.5	33.3	22.4
CBC21, CBC138, CBC139	599413	225056	Roadside	100.0	100.0	**N/A**	**44.6**	32.4	39.1	33.0
CBC140	603496	224190	Roadside	100.0	100.0	**N/A**	**N/A**	**N/A**	24.1	23.1
CBC141	604045	222827	Roadside	100.0	100.0	**N/A**	**N/A**	**N/A**	17.9	14.7
CBC142	600253	223411	Urban Background	92.3	92.3	**N/A**	**N/A**	**N/A**	10.9	10.3
CBC143	600056	223156	Roadside	100.0	100.0	**N/A**	**N/A**	**N/A**	9.8	9.4

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

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

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

Notes:

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

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

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

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

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

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

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

Figure A.2 – Trends in Annual Mean NO2 Concentrations (Mersea Road Air Quality Hotspot)
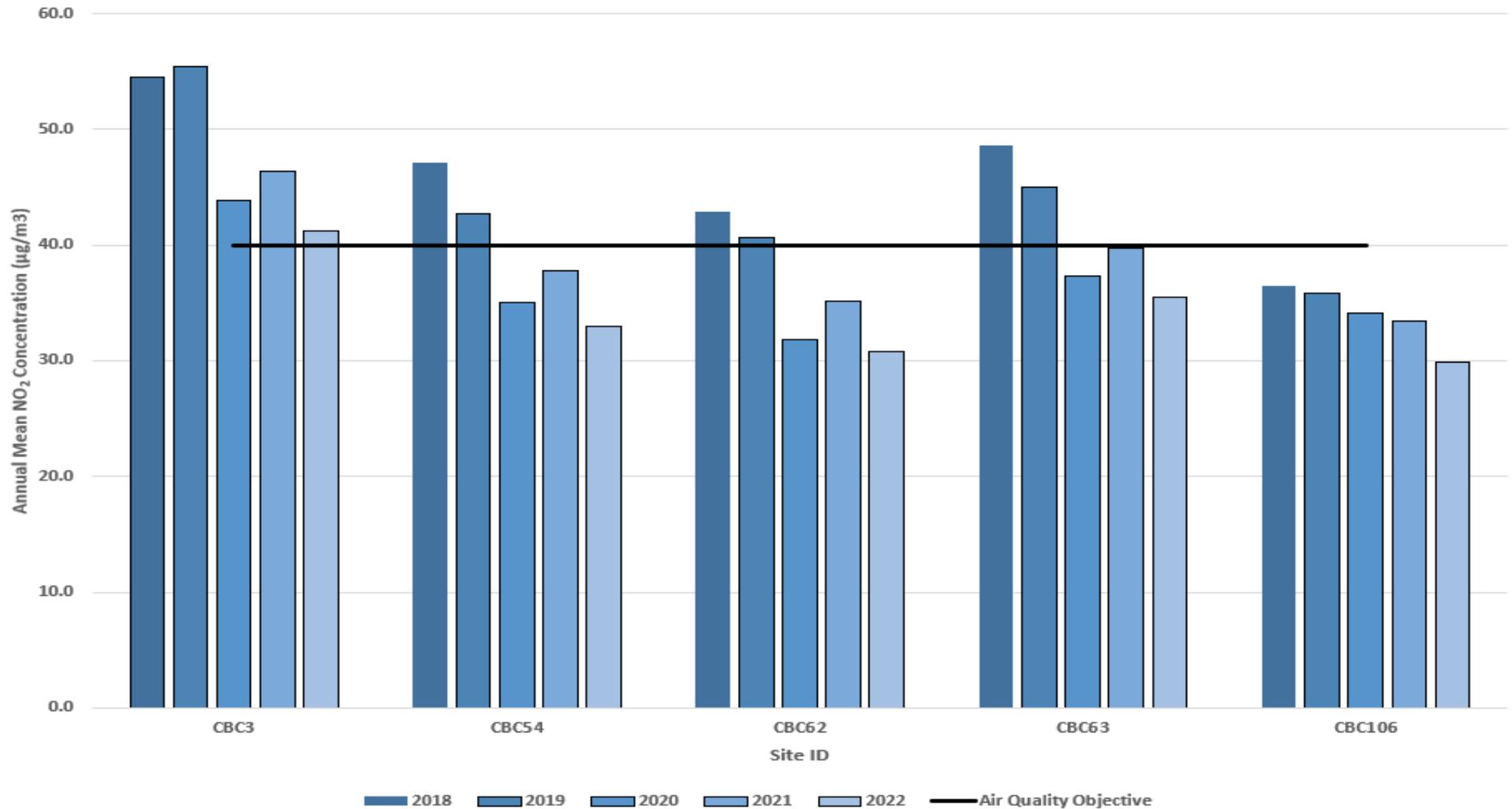
Figure A.3 – Trends in Annual Mean NO2 Concentrations (Brook Street Air Quality Hotspot)
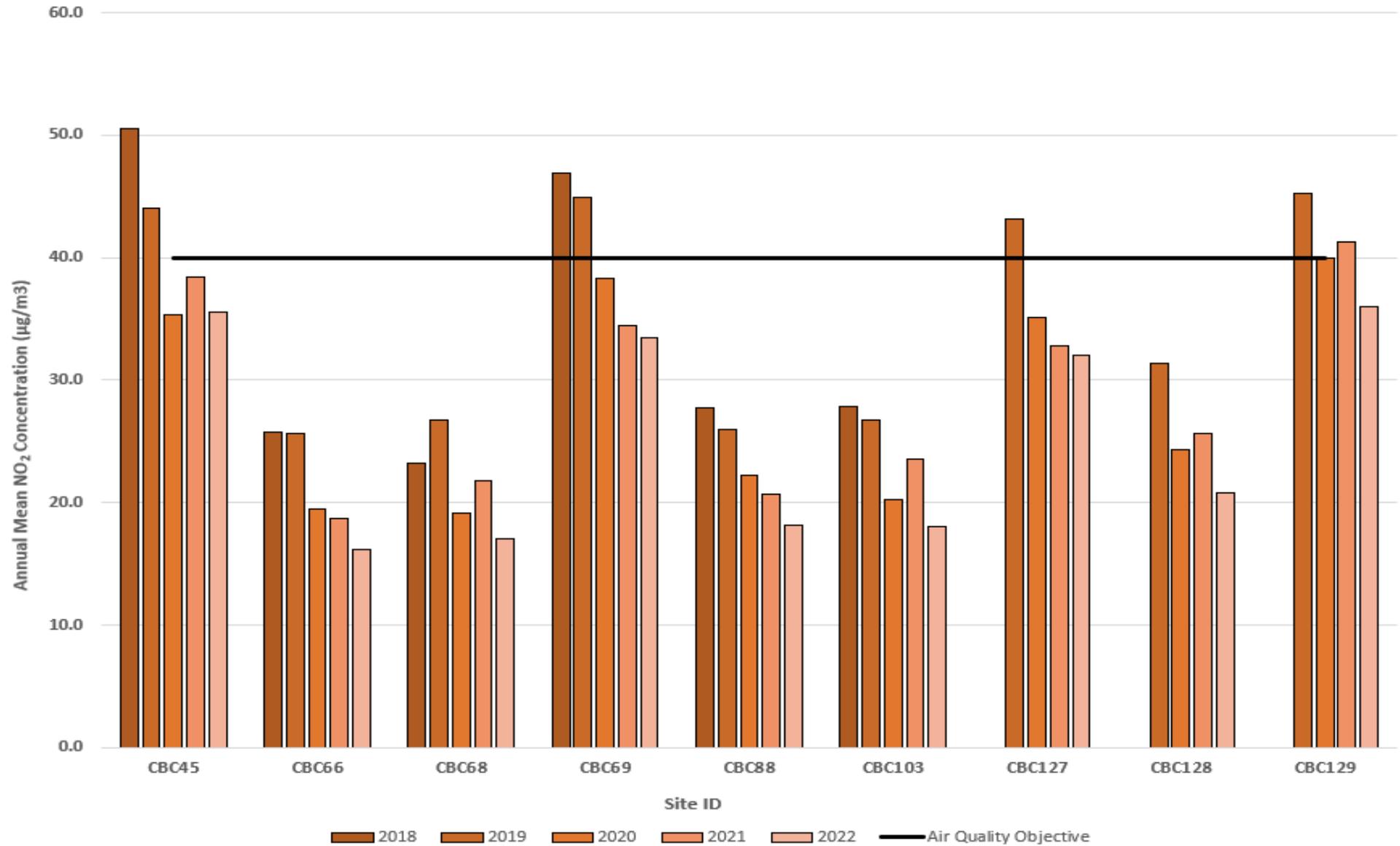
Table A.5 – 1-Hour Mean NO2 Monitoring Results, Number of 1-Hour Means > 200µg/m3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
CBC Auto1	600571	225141	Roadside	94.1	94.1	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%).

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO2 2022 Diffusion Tube Results (µg/m3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CBC2	599981	224633	27.3	38.1	15.9	12.5	30.0	24.1	19.8	22.1	27.1	32.4	30.2	32.4	26.0	19.8		
CBC3A , CBC3B , CBC3C	599914	224643	36.5	50.3	32.7	31.0	63.5	63.7	66.0	70.4	65.9	67.0	61.6	43.4	54.3	41.3	40.3	
CBC8	597640	223661	16.8	28.0	16.8	11.4	16.9	15.5	15.3	17.9	18.1	28.6	27.5	29.0	20.2	15.3		
CBC20	599063	225097	16.3	21.6	15.5	9.3	13.6	11.8	13.4	14.5	14.5	15.9	17.8	23.0	15.6	11.9		
CBC43	600356	224763	25.6	35.5	21.4	16.7	29.3	26.7	29.6	29.2	31.9	33.5	35.4	33.8	29.1	22.1		
CBC45 A, CBC45 B, CBC45 C	600560	225181	31.2	42.9	40.4	32.5	48.9	43.4	52.9	66.0	55.2	49.0	48.7	50.0	46.8	35.5		
CBC48	599908	224942	26.1	39.1	25.8	21.7	37.2	35.6	35.7	40.9	40.5	39.7	47.4	25.7	34.6	26.3		
CBC49	599720	225217	27.4	51.7	22.5	17.6	38.3	Missing	Missing	Missing	Missing	Missing	Missing	Missing	31.5	21.9		
CBC54	599922	224728	28.7	41.5	33.8	25.1	46.1	41.7	52.8	54.9	54.5	47.7	46.9	47.8	43.5	33.0		
CBC62 , CBC62 A, CBC62 B	599923	224738	25.4	34.1	30.5	24.2	44.1	45.1	50.8	52.8	50.1	43.2	44.6	41.9	40.6	30.8		
CBC63	599921	224711	27.2	41.7	37.0	28.7	50.3	52.2	55.2	57.4	54.1	53.4	53.9	49.1	46.7	35.5		
CBC65	598797	224489	20.0	27.9	14.7	13.0	19.9	17.4	18.1	20.8	21.5	25.1	23.8	30.8	21.1	16.0		
CBC66	600622	224881	20.3	28.2	17.5	11.0	20.2	18.1	18.2	20.3	23.4	28.4	32.1	17.7	21.3	16.2		
CBC68	600589	225113	18.2	25.0	18.2	14.6	23.5	18.9	22.6	26.6	24.0	23.3	26.9	27.6	22.5	17.1		
CBC69 , CBC69 A, CBC69 B	600545	225205	33.9	55.9	22.7	23.8	48.4	48.4	46.0	47.7	48.2	50.4	52.7	50.4	44.0	33.5		
CBC71	599818	224924	35.2	50.1	33.7	51.1	45.8	46.9	48.1	47.4	53.1	51.1	51.3	57.4	47.6	36.2		
CBC72	600885	225441	22.0	32.2	23.1	17.6	30.3	28.9	30.6	35.4	32.2	34.5	38.2	33.6	29.9	22.7		

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 (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CBC76	601162	225471	25.0	32.2	19.8	15.6	26.7	24.1	26.0	29.6	30.6	31.6	34.4	36.2	27.7	21.0		
CBC88, CBC88A, CBC88B	600571	225151	21.2	30.9	17.3	13.2	24.2	22.6	23.3	24.8	26.7	26.9	29.0	27.1	23.9	18.2		
CBC90	591312	223431	14.3	23.1	17.1	11.7	20.8	22.9	24.9	24.9	19.6	26.8	26.9	25.1	21.5	16.3		
CBC91	595239	223936	18.7	24.0	12.9	9.6	18.8	15.8	14.9	14.4	18.4	22.7	24.0	28.0	18.5	14.1		
CBC93	599031	224427	16.6	22.1	14.5	9.2	15.6	13.3	13.2	14.6	15.2	18.5	22.3	23.8	16.6	12.6		
CBC94	601925	224652	21.3	25.6	15.8	11.9	21.4	21.7	20.2	25.0	23.3	33.5	27.7	24.4	22.7	17.2		
CBC96	599909	228288	13.2	20.7	13.3	8.8	14.9	11.6	12.6	15.2	15.8	Missing	Missing	Missing	14.0	10.6		
CBC97	599452	227884	19.5	26.1	18.0	12.2	18.8	19.6	20.1	22.8	21.5	26.6	29.3	29.7	22.0	16.7		
CBC98	600086	226157	16.4	26.7	14.4	9.9	21.1	23.0	18.8	20.4	18.9	28.9	28.1	25.7	21.0	16.0		
CBC99	600891	225957	19.6	26.3	15.5	10.9	21.3	19.0	17.2	21.1	20.6	25.9	25.8	24.7	20.7	15.7		
CBC100	601252	225627	20.2	30.6	15.8	11.7	23.5	22.3	20.7	20.7	20.3	28.1	33.2	34.5	23.5	17.8		
CBC101	600868	225452	27.1	37.9	18.5	20.5	36.2	33.8	33.1	29.6	39.7	39.0	42.0	42.6	33.3	25.3		
CBC102	600752	225313	29.7	43.0	23.1	25.5	44.0	33.0	37.7	51.2	40.6	39.5	43.8	47.4	38.2	29.0		
CBC103	600607	225049	21.6	27.1	18.7	13.7	24.5	21.2	22.2	28.0	23.6	31.7	23.5	29.8	23.8	18.1		
CBC104	600193	224653	24.2	32.1	17.8	12.8	28.0	27.1	24.1	24.9	23.4	33.5	34.7	33.9	26.4	20.0		
CBC105	600224	225255	23.0	40.1	22.6	17.3	34.1	33.3	30.7	34.0	27.0	37.2	36.6	28.7	30.4	23.1		
CBC106	599911	224558	33.0	48.0	20.9	18.2	44.2	45.8	37.7	37.2	41.7	47.2	51.4	46.0	39.3	29.8		
CBC107	599389	225373	25.9	37.2	17.7	13.5	27.5	30.4	27.1	34.0	30.7	36.1	39.6	36.9	29.7	22.6		
CBC108	599354	225802	21.1	28.5	22.7	18.0	27.5	26.6	26.9	33.8	33.2	27.7	32.8	35.3	27.8	21.2		
CBC109	599398	225432	26.3	38.2	27.4	19.6	32.4	32.1	35.7	37.9	38.1	44.5	31.9	32.4	33.0	25.1		
CBC110	599891	225021	23.7	30.6	19.0	14.3	29.1	25.8	25.4	30.3	26.2	36.9	34.4	34.4	27.5	20.9		
CBC111	599473	224982	31.7	53.2	28.9	24.8	44.0	42.3	39.7	42.2	44.1	42.9	42.7	48.1	40.4	30.7		
CBC112	599730	225232	27.8	37.0	19.1	16.4	28.7	28.3	24.8	32.3	33.3	32.4	32.3	38.0	29.2	22.2		
CBC113	600845	225671	17.2	31.3	21.5	9.0	26.1	29.5	30.3	27.8	26.5	30.6	29.8	27.9	25.6	19.5		

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 (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CBC115	601083	225387	24.9	33.8	17.3	15.0	28.9	23.6	22.4	26.6	27.0	28.9	31.7	26.3	25.5	19.4		
CBC116	601115	225355	19.9	21.7	14.8	10.4	18.6	Missing	14.3	16.6	15.7	19.4	15.6	22.7	17.2	13.1		
CBC117	599984	225238	28.7	49.1	34.3	19.8	40.9	42.4	43.9	43.2	36.4	49.6	48.1	41.5	39.8	30.3		
CBC118	599269	226122	22.9	36.3	17.3	14.7	28.3	28.3	25.6	26.6	32.2	33.6	21.7	31.8	26.6	20.2		
CBC119	599230	226272	14.4	20.7	13.2	9.9	17.2	17.0	17.3	19.3	17.5	23.0	23.1	23.1	18.0	13.7		
CBC123	598938	226707	16.7	21.9	8.0	11.0	18.1	16.3	Missing	19.3	19.3	22.4	23.1	24.4	18.2	13.9		
CBC124	600516	225277	28.5	40.0	31.0	26.0	38.9	36.9	34.7	54.1	45.4	41.5	42.6	40.9	38.4	29.2		
CBC125	599227	226509	24.9	35.9	26.2	18.6	32.7	30.6	33.8	36.9	33.6	38.1	42.2	33.7	32.3	24.5		
CBC127	600537	225242	32.4	54.1	28.8	24.8	41.6	47.2	22.3	46.8	45.1	51.7	57.4	53.4	42.1	32.0		
CBC128	600547	225244	19.2	38.2	19.2	14.9	25.8	22.8	44.9	29.9	26.0	28.5	Missing	31.1	27.3	20.8		
CBC129	600550	225183	38.0	57.6	27.7	25.7	53.0	51.6	48.2	46.6	53.9	55.2	55.9	55.6	47.4	36.0		
CBC130	599701	224964	32.2	51.5	28.1	23.0	38.6	39.0	43.1	46.3	Missing	48.3	46.9	41.6	39.9	30.3		
CBC131	595025	225166	25.4	43.0	21.9	17.4	37.1	29.0	28.2	25.0	29.9	42.6	47.0	40.9	32.3	24.5		
CBC132	595106	225123	24.7	35.1	21.7	21.9	29.6	25.6	23.1	32.5	39.3	27.4	33.1	42.9	29.7	22.6		
CBC135	591366	223679	17.8	29.6	20.2	13.7	27.5	28.0	29.0	30.3	25.5	31.9	32.1	23.3	25.7	19.6		
CBC136	590444	223502	23.6	34.8	23.4	17.9	30.4	28.6	29.5	36.7	32.5	35.9	37.7	35.8	30.6	23.2		
CBC137	590325	223495	34.4	34.2	19.5	14.3	30.0	31.7	31.6	32.1	26.0	35.0	36.2	28.4	29.5	22.4		
CBC21, CBC138, CBC139	599413	225056	26.2	42.3	41.5	30.6	43.5	42.7	47.3	60.3	49.2	45.1	46.6	45.8	43.4	33.0		
CBC140	603496	224190	22.4	37.4	16.2	14.5	38.1	38.2	33.7	28.0	27.7	35.8	34.5	38.4	30.4	23.1		
CBC141	604045	222827	18.2	22.1	15.6	11.2	17.6	19.2	17.9	19.8	19.0	23.1	19.6	29.4	19.4	14.7		
CBC142	600253	223411	13.0	16.7	11.9	8.2	12.4	10.3	11.8	Tube Damaged	13.4	14.9	16.0	19.8	13.5	10.3		
CBC143	600056	223156	12.7	16.9	10.8	6.6	11.6	8.3	9.3	11.3	10.8	13.9	14.9	21.5	12.4	9.4		

☒ **All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1**

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

☒ **National bias adjustment factor used**

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

☒ **Colchester City Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m^3 are shown in **bold**.

NO₂ annual means exceeding 60µg/m^3, 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 Colchester City Council During 2022

Colchester City Council has not identified any new sources relating to air quality within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

- Colchester City Council undertook monitoring at 63 sites in 2022.

- Colchester City Council adheres with the Diffusion Tube Monitoring Calendar

- The diffusion tubes were supplied by Socotec (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 2022:

Diffusion Tube Annualisation

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

Site ID	Annualisation Factor Chignal St James	Annualisation Factor Rochester Stoke	Annualisation Factor St Osyth	Annualisation Factor Wicken Fen>	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)
CBC49	1.0590	0.8441	0.8627	0.8934	0.9148	31.5	28.8

Diffusion Tube Bias Adjustment Factors

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

Colchester City Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data to maintain consistency with other Councils in Essex and to exclude issues where poor data capture from the automatic analysers may affect the overall bias

adjustment figure. A summary of bias adjustment factors used by Colchester City Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	Diffusion Tube	If National, Version of National Spreadsheet	Adjustment Factor
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	Gradko 20% TEA in Water	03/20	0.93
2018	National	Gradko 20% TEA in Water	03/19	0.92

NO2 Fall-off with Distance from the Road

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

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	Comments
CBC3A, CBC3B, CBC3C	1.9	2.2	41.3	13.7	**40.3**	*Predicted concentration at Receptor above AQS objective.*

QA/QC of Automatic Monitoring

Air quality measurements taken at the Brook Street air quality monitoring station undergo validation and ratification by the Air Quality Data Management (AQDM), adhering to the

standards outlined in the Local Air Quality Management – Technical Guidance LAQM (TG16).

Validation Process

During the data collection stage, the validation process involves continuous algorithmic and manual screening of data for anomalies. Various techniques are employed to detect unusual or spurious measurements within large datasets. Anomalies may arise from equipment malfunctions, human error, power outages, interference, or other disruptions. Automatic screening can only reliably identify questionable results that warrant further manual investigation.

Analyser-generated raw data is converted into concentration values using the most recent values obtained from manual and automatic calibrations. As these instruments are not absolute and are prone to drift, both the zero baseline (background) and sensitivity can change over time. Regular calibrations with certified gas standards are used to determine the zero and sensitivity, but these calibrations only remain valid for a brief period as the instrument continues to drift.

Several types of additional information can be crucial for accurately understanding and addressing data anomalies, such as:

• Proper data scaling

• Disregarding poor calibrations, e.g., a depleted zero scrubber

• Closely monitoring rapid drifts or discarding the data

• Comparing measurements with other pollutants and nearby sites

• Adjustments for span cylinder drift

• Adjustments for flow drifts in particulate instruments

• Corrections for ozone instrument sensitivity drifts

• Exclusion of measurements for NO2 conversion inefficiencies

• Removal of periods with calibration gas in the ambient dataset

• Identification of periods with instruments warming up after a power outage

• Detection of anomalies due to mains power surges

• Fixing issues with date and time stamps

• Observations made during site visits and services

Ratification Process

Ratification finalizes data to produce measurements appropriate for reporting. All accessible information is thoroughly evaluated to ensure the best data scaling is used, and all anomalies are suitably addressed.

Typically, ratification is conducted at three, six, or twelve-month intervals. However, unforeseen issues may be identified during instrument routine services or independent audits, which often occur at six-month intervals. Consequently, data can only be fully ratified in 12-month or annual periods. Data processing performed during the three and six-month cycles contributes to building a dependable dataset that is finalised at the end of the year.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Sites: Central Colchester including AQMA1


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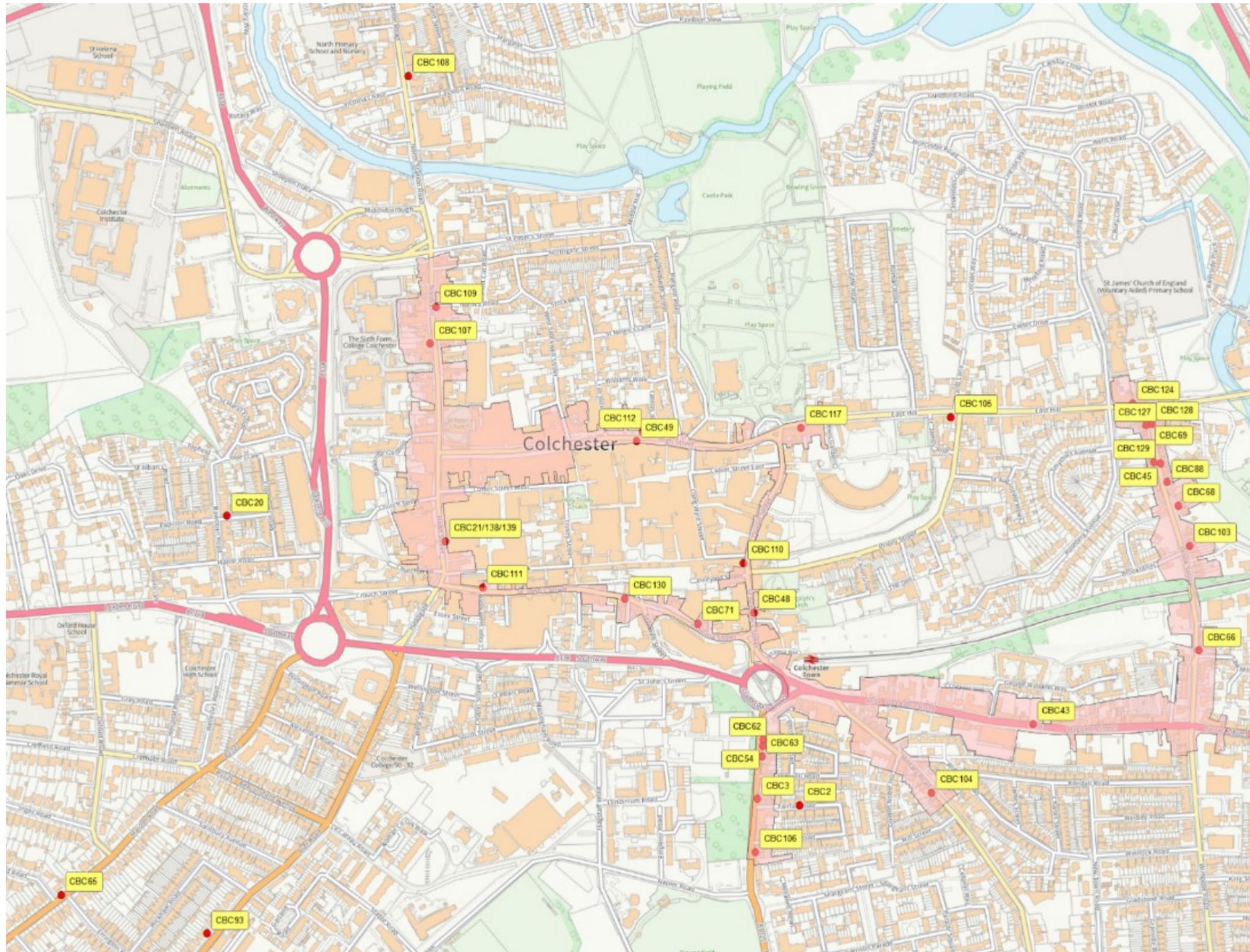
Figure D.2 – Map of Non-Automatic Monitoring Sites: Eastern Colchester including AQMA2

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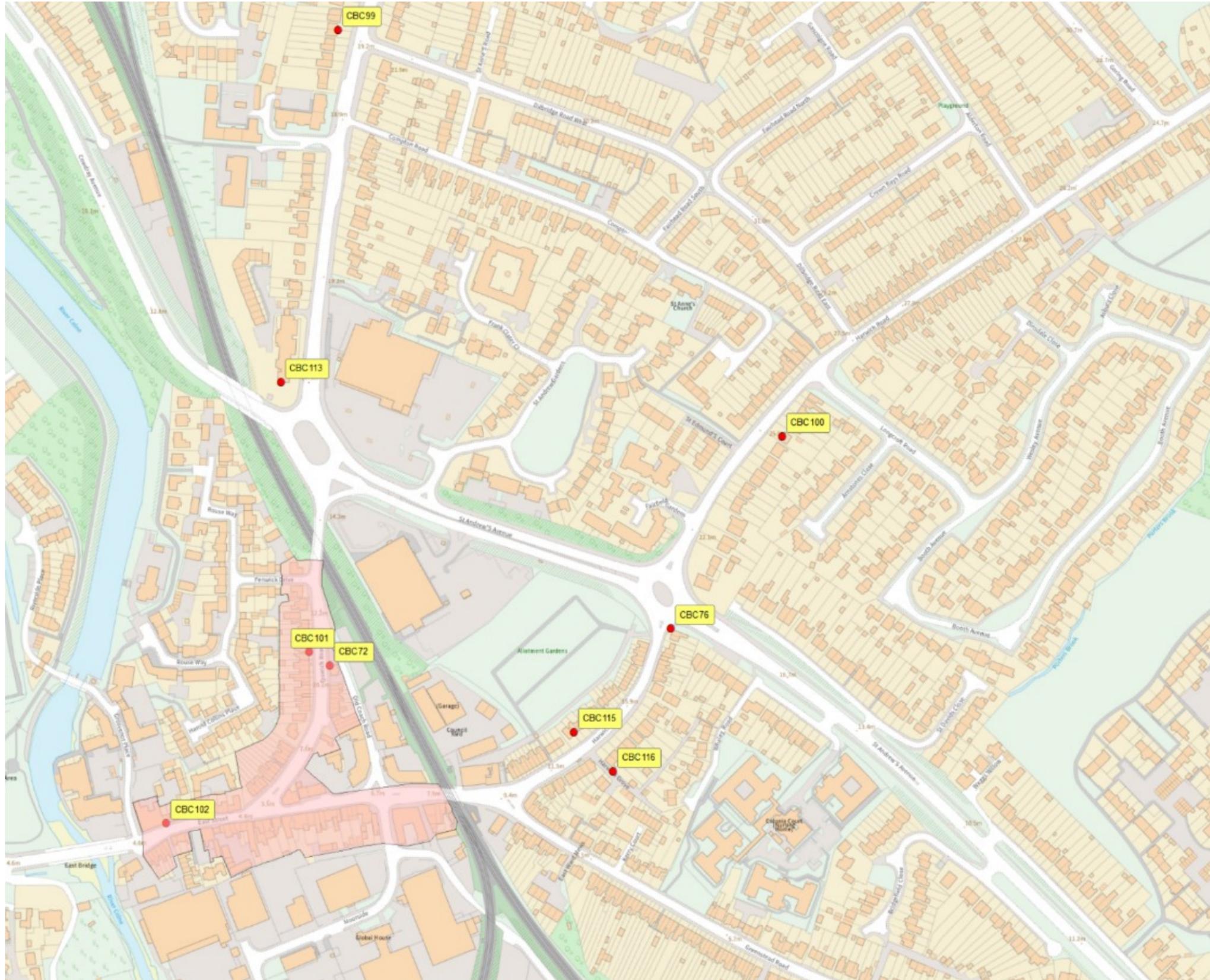
Figure D.3 – Map of Non-Automatic Monitoring Sites: Northern Colchester


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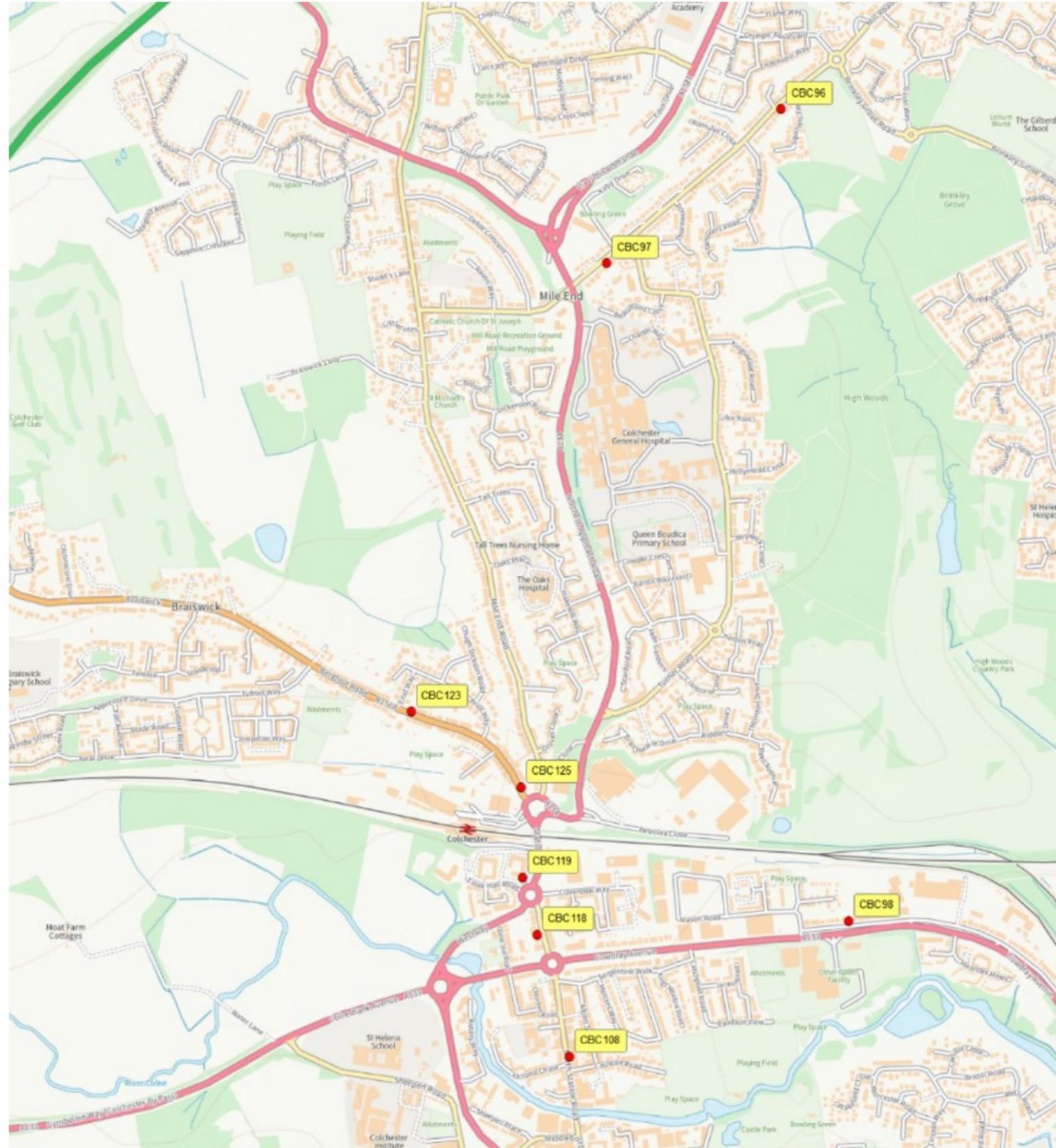
Figure D.4 – Map of Non-Automatic Monitoring Sites: Stanway & Lexden
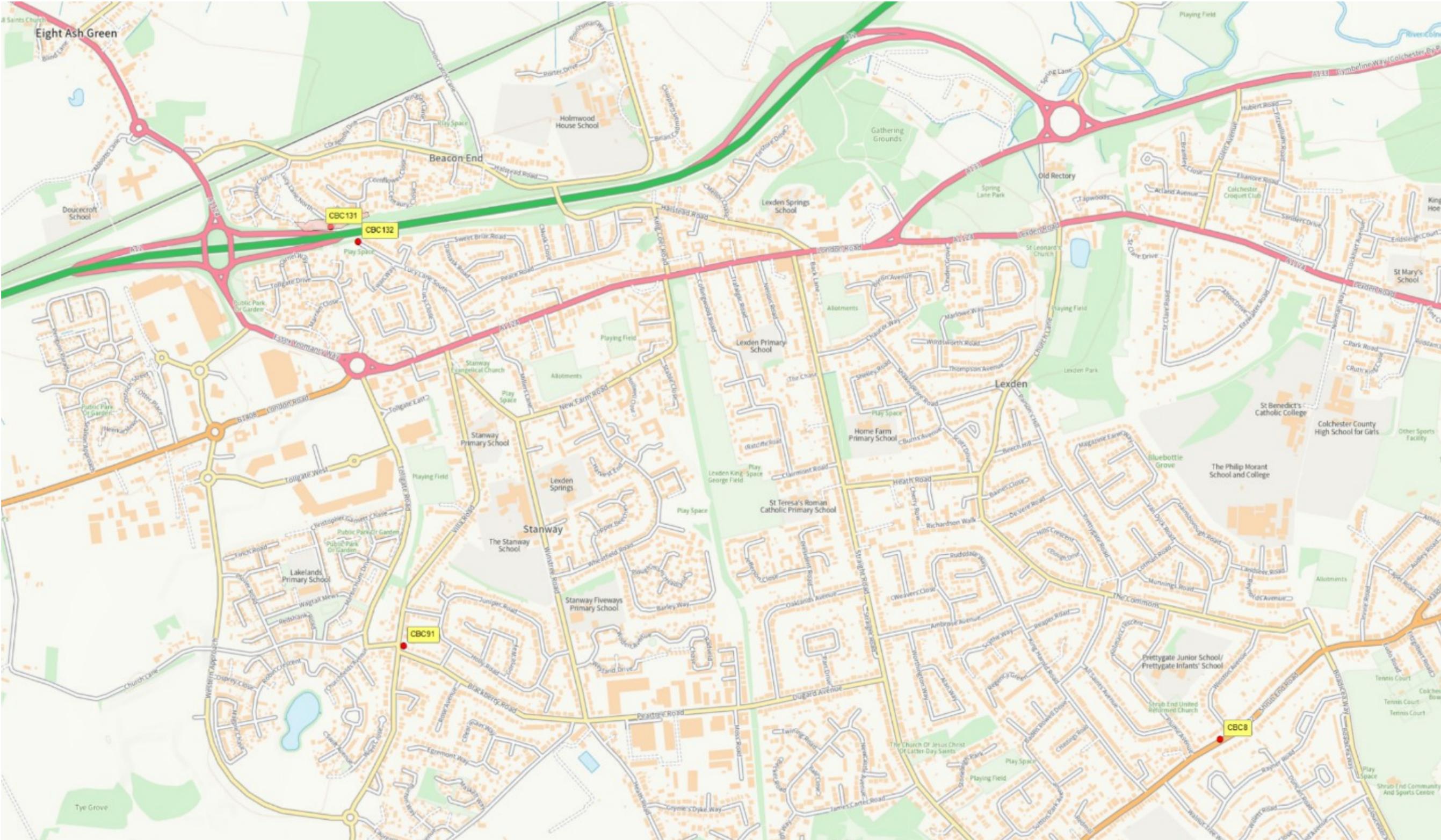
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Figure D.5 – Map of Non-Automatic Monitoring Sites: Marks Tey
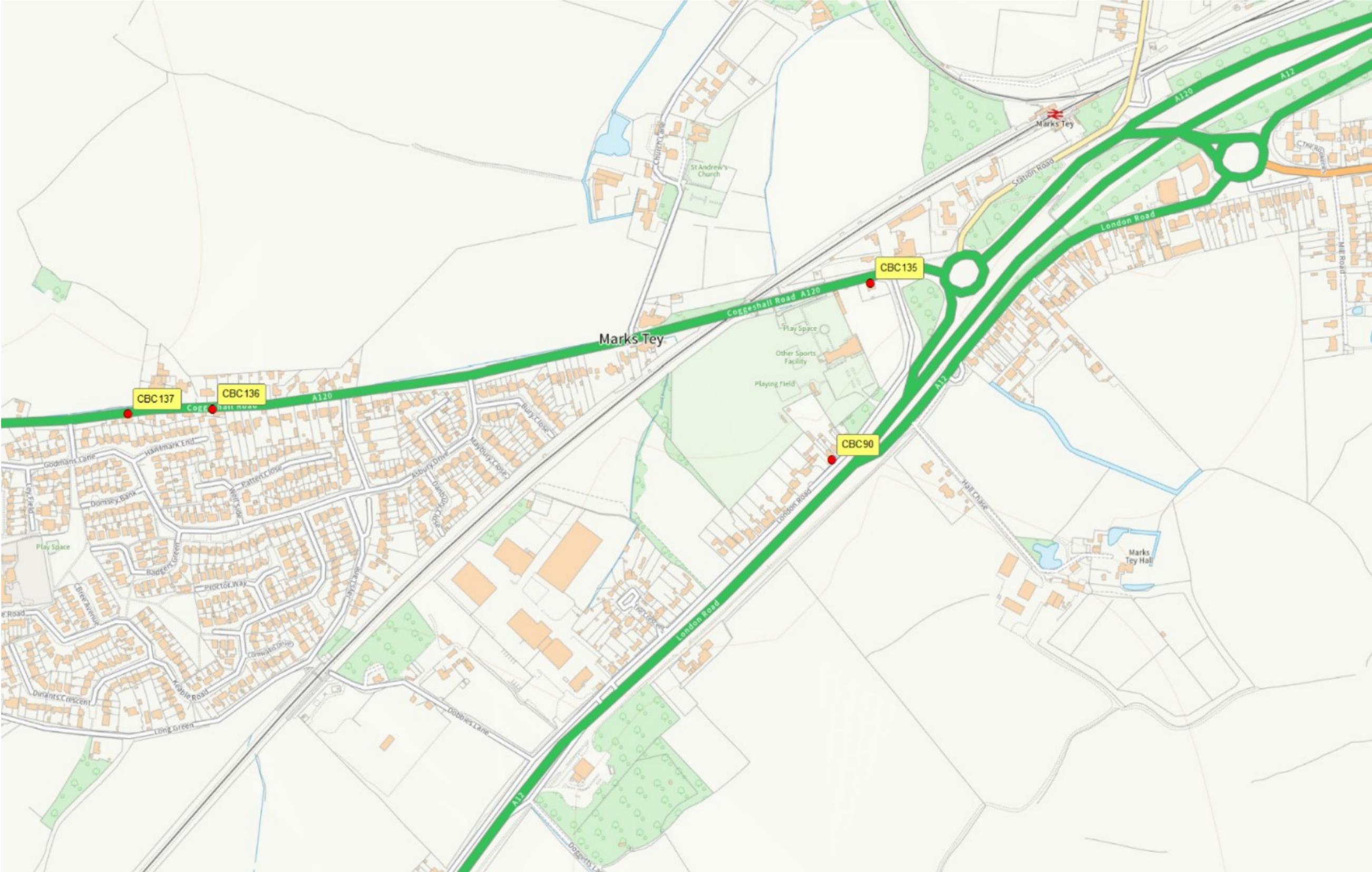

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Figure D.6 – Map of Non-Automatic Monitoring Sites: Hythe & Wivenhoe

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Figure D.7 – Map of Non-Automatic Monitoring Sites: South Colchester

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Appendix E: Summary of Air Quality Objectives in England

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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	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 microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
airTEXT	airTEXT is 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
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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- Colchester City Council CAReless Pollution Campaign available at; https://www.colchester.gov.uk/environmental-protection/clean-air-for-colchester-project/careless-pollution-campaign-be-part/

- Defra Diffusion Tube Bias Adjustment Factors Spreadsheet available at; https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

- Defra LAQM Summary of Laboratory Performance in AIR NO_2 PT Scheme available at; https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

- Essex Air Quality Consortium available at; http://www.essexair.org.uk

- Essex Air Twitter Feed available at; https://twitter.com/essexair

- EssexCarShare.com available at; https://liftshare.com/uk/community/essex

- Essex Highways Colchester Schemes available at; https://www.essexhighways.org/highway-schemes-and-developments/highway-schemes/colchester-schemes

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- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland available at; https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-Policy-Guidance-2022.pdf

- Openair Open Source Tools for Air Quality Data Analysis (Carslaw, D. C. and K. Ropkins, (2012) available at: https://davidcarslaw.github.io/openair/

- Public Health Outcomes Framework Indicator D01 available at; https://fingertips.phe.org.uk/profile/public-health-outcomes-framework