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: May, 2024

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Executive Summary: Air Quality in Our Area

The 2024 Annual Status Report (ASR) is designed to provide the public with information relating to local air quality in Rochford, to fulfil Rochford District 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, Rochford District Council measured **no** exceedances of the Air Quality Objectives.

Air Quality in Rochford

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

Table ES1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	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.

[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

	PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Rayleigh AQMA

In 2015, Rochford District Council declared an Air Quality Management Area (AQMA) in Rayleigh due to exceedances of Nitrogen Dioxide (NO_2) from road traffic. This area extends from the Rayleigh Weir junction to and encompasses the Rayleigh Town Centre one-way system.

In the past seven years between 2017 and 2023, there have been no exceedances of the annual mean objective for Nitrogen Dioxide within the AQMA and Rochford District Council proposed to revoke the AQMA in Rayleigh.

No exceedances at relevant exposure have been measured and Rochford District Council proposes to revoke the AQMA.

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[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

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

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

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

Air Quality Monitoring at Schools within the District of Rochford

Rochford District Council has undertaken a short-term air quality monitoring study at schools within the district. Diffusion tubes were exposed between June and December 2023.

Table ES2 below provides the school, addresses, grid references and final annual mean concentrations which have been annualised and bias adjusted using the processes described in Appendix C. Figure D.3 provides a map of the monitoring sites. Measured monthly diffusion tube values are provided in Appendix C.

The highest NO2 annual mean figure measured was 27.3µg/m^3 and all but two locations were well below 20µg/m^3. The results show that all locations are well within the NO2 annual mean air quality objective.

Table ES2 – School Diffusion Tube Monitoring Programme Data

DT ID	School & Address	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Annual Mean: Annualised and Bias Adjusted (0.77)
ARA #2	Rochford Day Nursery 2 Ashingdon Road SS4 1NJ	587255	190621	27.3
HRR	The Fitzwimarc School Hockley Road Rayleigh SS6 8EB	581066	191262	20.2
FAR	Ashingdon School Fambridge Road SS4 3LN	585935	194036	14.1
GRL	Greensward Academy Greensward Lane Hockley SS5 5HG	584584	193059	15.9
CHG	Hockley Primary School Chevening Gardens SS5 4UR	578690	192538	12.3
HAG	Plumberow Primary Academy Hamilton Gardens Hockley SS5 5BX	584457	193364	13.0
SUR	The Westerlings Primary School Sunny Road Hawkwell SS5 4NZ	584835	191986	10.6
GWH	Great Wakering Primary School High Street Great Wakering SS3 0EJ	590191	194535	16.4
LWR	Barling Magna Community Primary School Little Wakering Road SS3 0LN	593007	189352	10.2
CHS	Canewdon Endowed Primary School High Street Canewdon SS4 3QA	590191	194535	12.6
VAC	The King Edmund School Vaughan Close SS4 1TL	587046	194535	13.9
ARA #201	Holt Farm Infants School Ashingdon Road Rochford SS4 1RS	587026	192098	15.4
CRA	Glebe Primary School Creswick Avenue Rayleigh SS6 9HG	580254	191356	12.2
LWC	Our Lady of Ransom Catholic Primary School Little Wheatley Chase SS6 9EH	579108	191625	15.5
GRR	Grove Wood Primary School Grove Road Rayleigh SS6 8UA	582332	190348	12.7
NER	Wyburns Primary School Nevern Road Rayleigh SS6 7PE	581677	189799	13.4

Local Engagement and How to get Involved

Rochford District Council is a member of the Essex Air Quality consortium which along with Essex County Council launched the new Essex Air website on 28th November 2023 to raise awareness about air pollution in Essex. The website provides a pollution monitoring map and highlights simple actions that people can take to reduce emissions.

The website features a dedicated school zone with resources, activities, and games, an air pollution map, tips to reduce exposure to air pollution, and advice on changing travel habits to lessen exposure to pollution.

The @EssexAir feed provides localised weekly air pollution forecasts.

Conclusions and Priorities

Rochford District Council have concluded that:

- No air quality exceedances have been identified in 2023.
- No annual mean air quality exceedances at relevant exposure have been measured for seven years.
- Rochford District Council proposes to revoke the Rayleigh AQMA.
- As set out in the LAQM Policy guidance, it is necessary for Rochford District Council to develop and adopt an Air Quality Strategy (AQS).
- There are no new developments that will have a significant impact on air quality.

Local Responsibilities and Commitment

This ASR was prepared by Public Health and Protection Services of Chelmsford City Council on behalf of Rochford District Council's Environmental Health & Licensing Service.

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

This ASR has been approved by:

Tracey Lilley – Director of Communities & Health, Rochford District Council

If you have any comments on this ASR please send them to Andrew Paddon at:

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1 Local Air Quality Management

This report provides an overview of air quality in Rochford 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 Rochford District Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 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 Rochford District Council can be found in Table 2.. The table presents a description of the three AQMAs that are currently designated within Rochford. Appendix D: Maps of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- <Nitrogen Dioxide (NO_2) annual mean

This Annual Status Report identifies that pollutant concentrations are well below the Air Quality Objectives (at relevant exposure) and that it is appropriate to revoke the remaining AQMAs. It is Rochford District Councils intention to revoke these 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	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Rayleigh AQMA	30/01/2015	NO2 Annual Mean	Rayleigh Town Centre incorporating some premises in each of the following streets: Brook Road, Crown Hill, Eastwood Road, High Road, High Street, Hockley Road, Southend Arterial Road, Websters Way	NO	41.8	No Exceedance	7	Rayleigh Town Centre Action Plan 2017	https://www.rochford.gov.uk/aqmaAP

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

☒ **Rochford District Council confirms that all current AQAPs have been submitted to Defra**

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

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

Rochford District Council have a number of ongoing measures to improve air quality in Rochford. These are detailed in Table 2.2 below.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Revoke AQMA	Other	Other	2023	2024	Rochford District Council	Rochford District Council	NO	Funded	< £10k	Planning	N/A	Revocation of AQMA	Assessment of Current & Historical Air Quality Monitoring Data	
2	Develop & Adopt a Local Air Quality Strategy (AQS)	Policy Guidance and Development Control	Other policy	2023	2026	Rochford District Council	Rochford District Council	NO	Funded	< £10k	Planning	Not quantified	Adoption of AQS	None	
3	Environmental Permit Inspection & Enforcement	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2010	2032	Rochford District Council	Rochford District Council	NO	Funded	< £10k	Implementation	N/A	No Exceedances of ELVs at Permitted Sites	Implementation on-going	
4	Member of Essex Air	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2010	2032	County Council / District & Borough Councils	Member Organisations	NO	Funded	< £10k	Implementation	N/A	N/A	Implementation on-going	

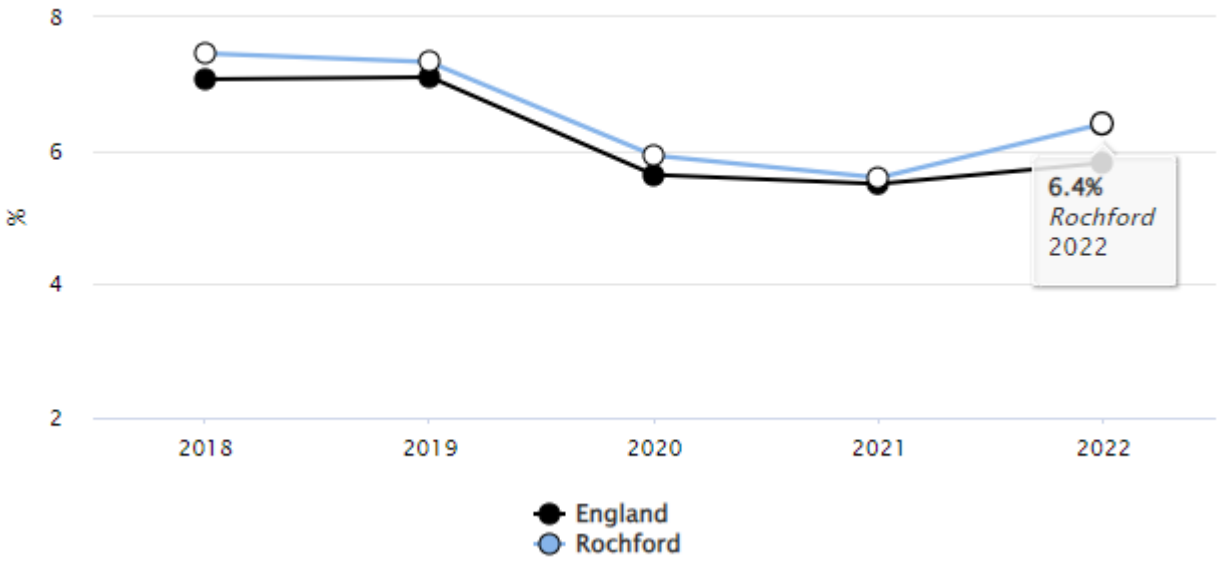
2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[6], 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.

Rochford District Council does not monitor $PM_{2.5}$ concentrations however notes the Defra background mapping resource which for $PM_{2.5}$ in 2023 models a maximum annual mean concentration of 10.7µg/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 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



Rochford 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 $PM_{2.5}$

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

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

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

In 2023, Rochford District Council measured **no** exceedances of the Air Quality Objectives. Despite a strong trend of improved air quality, in 2023 some sites measured small increases.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Rochford District Council does not undertake automatic continuous monitoring.

3.1.2 Non-Automatic Monitoring Sites

Rochford District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 10 permanent sites during 2023 using diffusion tubes.

In addition, 16 temporary sites were monitored. The results of this are in Appendix C.

3.2 Individual Pollutants

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 in Appendix A provides the details of the diffusion tube monitoring sites. Table A.2 compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

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

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.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
SS	South Street	Kerbside	587670	190352	NO2	No	2.0	1.0	No	2.4
ABSR	Anne Boleyn Sutton Road	Roadside	587733	189667	NO2	No	13.0	1.0	No	2.4
HOG	18 Hollytree Gardens, Rayleigh	U/Background	580004	189899	NO2	No	0.0	14.5	No	2.4
HOR	22a Hockley Road	Receptor	580881	190916	NO2	Rayleigh AQMA	0.0	2.4	No	2.4
CRH	Crown Heights, Crown Hill	Receptor	580546	190735	NO2	Rayleigh AQMA	0.0	6.9	No	2.4
KGC	King Georges Court, Eastwood Road	Receptor	580778	190462	NO2	Rayleigh AQMA	0.0	8.7	No	2.4
HRA	4 High Road, Rayleigh	Receptor	580320	190429	NO2	Rayleigh AQMA	0.0	11.3	No	2.4
HRB	7 High Road, Rayleigh	Receptor	580337	190415	NO2	Rayleigh AQMA	0.0	4.6	No	2.4
HRC	71 High Road, Rayleigh	Receptor	580217	190140	NO2	Rayleigh AQMA	0.0	10.8	No	2.4
HRD	109 High Road, Rayleigh	Receptor	580217	189850	NO2	Rayleigh AQMA	0.0	6.3	No	2.4

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results: Diffusion Tube 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
SS	587670	190352	Kerbside	100.0	100.0	31.2	26.1	26.0	22.5	25.3
ABSR	587733	189667	Roadside	92.3	92.3	38.8	31.4	31.2	27.4	32.9
HOG	580004	189899	U/Background	100.0	100.0	16.8	13.5	12.6	12.0	11.3
HOR	580881	190916	Receptor	100.0	100.0	32.8	27.5	26.7	23.6	25.8
CRH	580546	190735	Receptor	100.0	100.0	26.1	21.9	22.5	20.4	19.8
KGC	580778	190462	Receptor	84.6	84.6	23.0	18.7	18.7	17.3	18.9
HRA	580320	190429	Receptor	100.0	100.0	24.6	19.4	19.1	14.7	16.8
HRB	580337	190415	Receptor	100.0	100.0	25.2	20.0	18.8	18.1	19.2
HRC	580217	190140	Receptor	100.0	100.0	22.2	19.4	19.3	17.7	16.3
HRD	580217	189850	Receptor	100.0	100.0	27.9	23.3	23.7	20.1	20.3

☒ **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**.

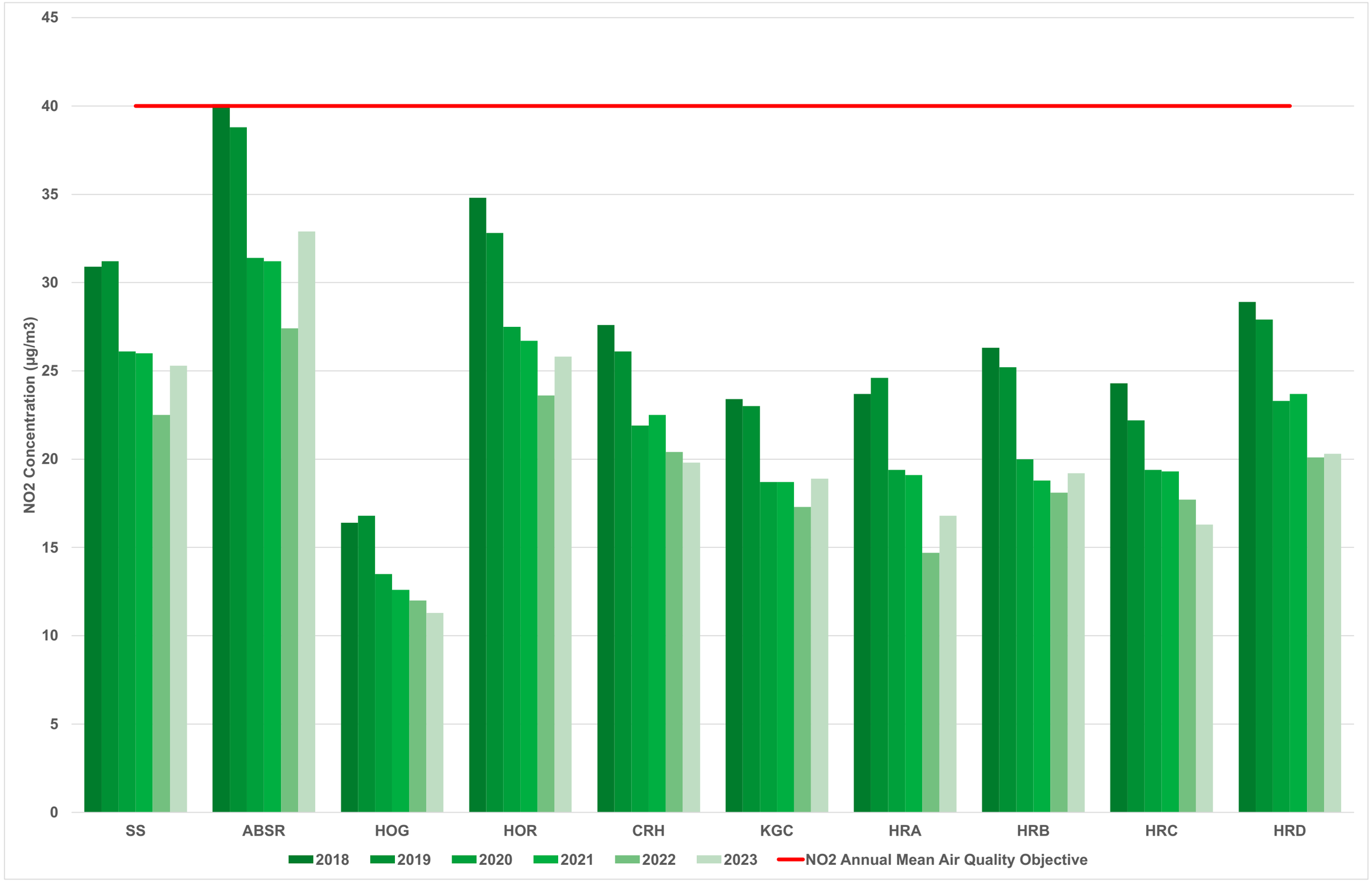
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations 2018 - 2023



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results (µg/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
SS	587670	190352	38.4	63.0	26.1	36.1	27.7	33.7	21.7	27.4	28.9	34.5	30.4	26.0	32.8	25.3	N/A
ABSR	587733	189667	44.7	95.6	34.9	Missing	32.9	38.3	28.7	39.8	40.4	39.7	39.2	35.4	42.7	32.9	N/A
HOG	580004	189899	24.6	17.4	14.0	12.8	8.0	12.4	10.0	13.4	12.9	18.8	18.5	13.2	14.7	11.3	N/A
HOR	580881	190916	43.9	85.3	30.4	31.3	23.5	32.0	25.9	34.8	35.5	34.5	8.1	17.0	33.5	25.8	N/A
CRH	580546	190735	40.8	28.9	25.3	26.4	21.4	18.4	17.3	23.5	25.6	33.0	29.3	18.7	25.7	19.8	N/A
KGC	580778	190462	28.5	27.0	18.9	45.0	Erroneous Datapoint Removed	20.4	15.8	18.8	20.3	24.3	26.2	Erroneous Datapoint Removed	24.5	18.9	N/A
HRA	580320	190429	34.5	24.5	20.5	22.4	14.3	20.8	14.0	20.1	20.4	27.2	25.8	16.9	21.8	16.8	N/A
HRB	580337	190415	33.7	26.2	22.8	27.9	22.9	26.2	16.6	24.7	20.8	28.7	27.2	21.4	24.9	19.2	N/A
HRC	580217	190140	33.2	7.0	21.1	20.5	14.0	20.5	17.2	21.5	23.5	27.3	28.5	20.0	21.2	16.3	N/A
HRD	580217	189850	35.8	24.6	25.6	29.9	22.8	25.8	20.7	21.8	26.8	30.5	30.4	21.8	26.4	20.3	N/A

☒ **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 has been used**

☒ **Where applicable, data has been distance corrected for relevant exposure**

☒ **Rochford District Council confirm 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 Rochford During 2023

Rochford District Council has not identified any significant new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Rochford District Council During 2023

Table C.1 provides monthly diffusion tube data, the raw annual mean concentration, and the final annual mean concentration which has been annualised and bias adjusted using the processes described in Appendix C below. Figure D.3 provides a map of the monitoring sites.

The highest NO2 annual mean figure measured was 27.3µg/m^3 and all but two locations were well below 20µg/m^3. The results show that all locations are well within the NO2 annual mean air quality objective.

Table C.1 – School Diffusion Tube Monitoring Programme Data

DT ID	School & Address	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Average Annualisation Factor	Annual Mean: Annualised and Bias Adjusted (0.77)
ARA #2	Rochford Day Nursery 2 Ashingdon Road SS4 1NJ	587255	190621	38.1	24.7	36	32	37.7	34.5	25.6	32.7	1.0875	27.3
HRR	The Fitzwimarc School Hockley Road Rayleigh SS6 8EB	581066	191262	21.8	17.4	20.7	25.4	30	27.1	26.5	24.1	1.0875	20.2
FAR	Ashingdon School Fambridge Road SS4 3LN	585935	194036	17.4	13.5	15	18.6	18.8	18.5	15.7	16.8	1.0875	14.1
GRL	Greensward Academy Greensward Lane Hockley SS5 5HG	584584	193059	17	16.8	15	20.3	23.1	27	13.9	19.0	1.0875	15.9
CHG	Hockley Primary School Chevening Gardens SS5 4UR	578690	192538	11.6	8.7	11.8	14.1	20.2	22.6	14	14.7	1.0875	12.3
HAG	Plumberow Primary Academy Hamilton Gardens Hockley SS5 5BX	584457	193364	13.4	9.4	10.8	13.8	20.7	22.1	18.5	15.5	1.0875	13.0
SUR	The Westerlings Primary School Sunny Road Hawkwell SS5 4NZ	584835	191986	11.4	8.3	9.7	13	13.5	20.1	13	12.7	1.0875	10.6

DT ID	School & Address	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Average Annualisation Factor	Annual Mean: Annualised and Bias Adjusted (0.77)
GWH	Great Wakering Primary School High Street Great Wakering SS3 0EJ	590191	194535	22.7	12	17.5	19.8	20	26.1	Missing	19.7	1.0808	16.4
LWR	Barling Magna Community Primary School Little Wakering Road SS3 0LN	593007	189352	12.5	8.9	10.1	10.8	13.9	15.2	13.9	12.2	1.0875	10.2
CHS	Canewdon Endowed Primary School High Street Canewdon SS4 3QA	590191	194535	13.8	11.1	14.7	14.9	18.8	20.9	11	15.0	1.0875	12.6
VAC	The King Edmund School Vaughan Close SS4 1TL	587046	194535	14.1	10.8	12.4	15.4	21.1	23.1	18.9	16.5	1.0875	13.9
ARA #201	Holt Farm Infants School Ashingdon Road Rochford SS4 1RS	587026	192098	19.9	12.1	19.4	17.9	21.1	20.3	17.9	18.4	1.0875	15.4
CRA	Glebe Primary School Creswick Avenue Rayleigh SS6 9HG	580254	191356	11.8	9.3	12.7	12.8	18.4	20.2	16.4	14.5	1.0875	12.2
LWC	Our Lady of Ransom Catholic Primary School Little Wheatley Chase SS6 9EH	579108	191625	14.2	12.9	15	17.9	23.2	26.4	20.3	18.6	1.0875	15.5
GRR	Grove Wood Primary School Grove Road Rayleigh SS6 8UA	582332	190348	13.2	9.9	13.5	14.5	15.8	20.8	18.5	15.2	1.0875	12.7
NER	Wyburns Primary School Nevern Road Rayleigh SS6 7PE	581677	189799	14.4	11.7	14	15.9	19.8	18.6	18	16.1	1.0875	13.4

QA/QC of Diffusion Tube Monitoring

- Rochford District Council undertook monitoring at 10 permanent sites in 2023
- Rochford District Council undertook monitoring at 16 temporary sites in 2023
- Rochford District 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 for 2023, 100% of the results submitted were subsequently determined as satisfactory

Diffusion Tube Annualisation

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

The diffusion tube processing tool is used to complete the annualisation process using background data sourced from regional AURN sites.

No permanent diffusion tube monitoring sites required annualisation.

Table C.1 includes the average annualisation factor calculated for the school diffusion tube monitoring programme.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within this 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.

Rochford District 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 Rochford District 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 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.1.

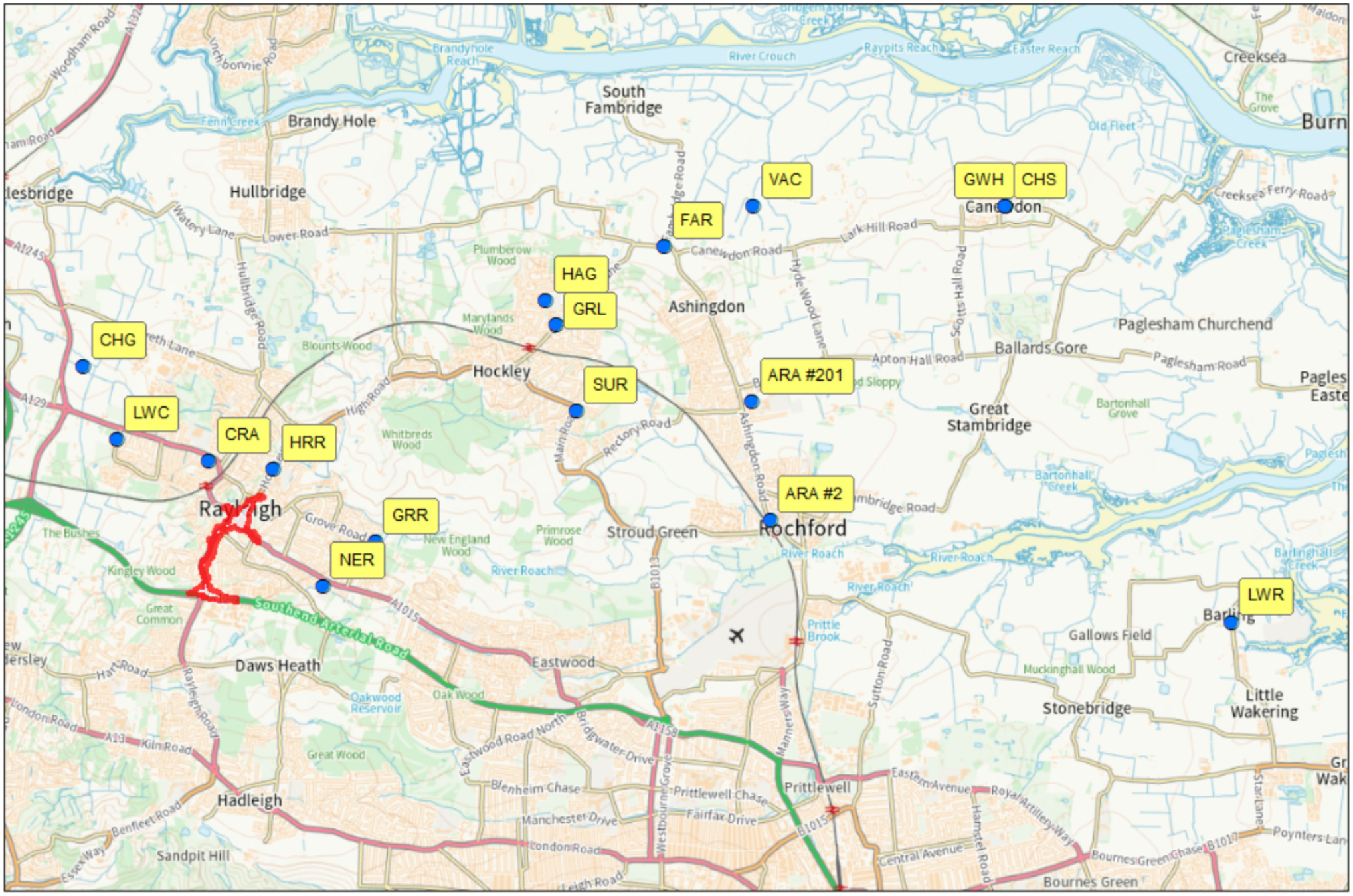
No diffusion tube NO_2 monitoring locations within Rochford required distance correction during 2023.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Map of Diffusion Tube Monitoring Sites: Rayleigh AQMA

Figure D.2 – Map of Diffusion Tube Monitoring Sites: Rochford

Figure D.3 – Map of Diffusion Tube Monitoring Sites: School Diffusion Tube Monitoring Programme & Rayleigh AQMA



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
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

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- Rochford District Council 2023 Air Quality Annual Status Report available at; https://cdn.cms42.com/essexair/rochford/Files/Reports/Rochford_2023_Annual_Status_Report.pdf
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency available at; https://www.gov.uk/government/publications/chemical-hazards-and-poisons-report-issue-28
- Essex Air website available at; https://essexair.org.uk/
- Local Air Quality Management Background Maps available at; https://laqm.defra.gov.uk/air-quality/air-quality-assessment/background-maps/
- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland available at; https://laqm.defra.gov.uk/air-quality/featured/uk-regions-exc-london-technical-guidance/
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- Local Air Quality Management NO2 Proficiency Scheme available at; https://laqm.defra.gov.uk/wp-content/uploads/2023/11/LAQM-NO2-Performance-data_Up-to-Oct-2023_V1_Final.pdf
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