2019 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

June 2019

Local Authority Officer	Martin Howlett
Department	Environmental Health
Address	Rochford District Council
Telephone	01702 318049
E-mail	martin.howlett@rochford.gov.uk
Report Reference number	RDC/ASR2019
Date	19th June 2019
Written by	Tim Savage
Scientific Team Public Health & Protection Services Chelmsford City Council Duke Street Chelmsford Essex CM1 1JE	

Executive Summary: Air Quality in Our Area

The 2019 Annual Status Report is designed to provide the public with information relating to local air quality in the district of 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.

The report reviews Rochford District Council's air quality monitoring from 2018 and although one exceedance of the air quality objectives was measured, there have been no exceedances of the annual mean objective for Nitrogen Dioxide at relevant exposure.

Air Quality in Rochford

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Rayleigh Town Centre 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 encompassing the Rayleigh Town Centre one-way system where congestion in the Town Centre and surrounding roads has long been an issue. In 2018, no exceedances of the annual mean objective for Nitrogen Dioxide have been measured.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

A127

For the purposes of the UK Air Quality Plan for nitrogen dioxide (NO_2), the Department for Environment, Food & Rural Affairs (Defra) undertook modelling to estimate NO_2 concentrations on major roads along which the public had access.

The modelling predicted that in Basildon and Rochford districts, EU limit values were being exceeded on the A127. In Rochford, this exceedance was forecast to be at the Rayleigh Weir junction.

In 2017, a Ministerial Direction was issued to both Basildon Borough Council and Rochford District Council to implement actions to bring these levels into compliance in the shortest possible time. Grant funding was awarded to jointly develop a business case for specific actions to tackle roadside levels of NO_2 by the end of 2018.

Air quality monitoring, traffic analysis and dispersion modelling carried out on behalf of Rochford District Council has determined that EU limit values for NO_2 are not being exceeded on the stretch of A127 within Rochford district. An independent panel convened by the Joint Air Quality Unit (JAQU) has accepted these findings and Rochford District Council has recently been released from the Ministerial Direction.

Actions to Improve Air Quality

Rochford District Council - working in partnership with Basildon Borough Council and Essex County Council - submitted a successful application to JAQU for a grant of £1,258,000 for the installation of a cycle route (in Basildon) and charging points for electric vehicles across the authorities.

Following the successful 2017 Clean Bus Technology Fund (CBTF) bid for retrofitting buses with pollution reducing technology, Defra extended the grant and a successful bid will fund a further five buses to be retrofitted. These buses will operate on routes along the A127 corridor and within the Rayleigh Town Centre AQMA.

Further information about the progress of air quality actions can be found in Table 2.2.

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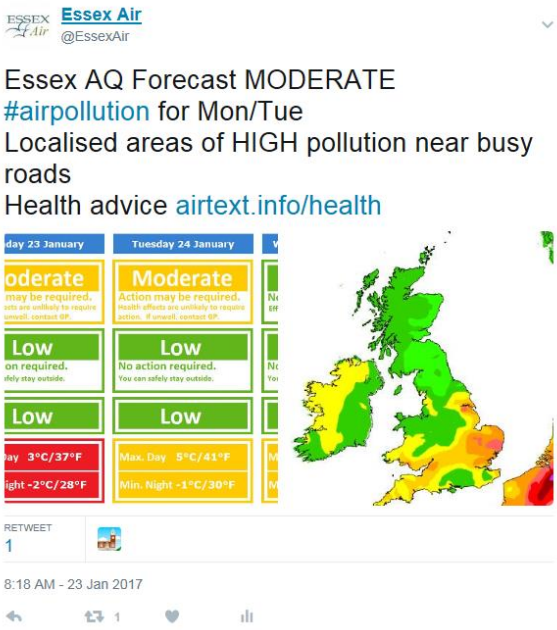
Local Engagement and How to get Involved

Rochford District 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.

Figure i.1 Essex Air Twitter Air Quality Notifications



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.

The Essex Air twitter account also promotes the DVSA service for reporting smoky lorries or buses. Particulate matter is usually not visible but when poorly maintained diesel engines can produce visible particles, appearing as smoke. Fine particles have an adverse effect on human health, particularly among those with respiratory and cardiovascular problem.

Figure i.2 - Essex Air Reporting Smoky Vehicle Tweets

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1 Local Air Quality Management

This report provides an overview of air quality in the district of Rochford during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England can be found in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of the Rayleigh Town Centre AQMA declared by Rochford District Council can be found in

Table **2.1**. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=210

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of 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	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Rayleigh AQMA	30/01/2015	NO_2 Annual Mean	Rayleigh	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	NO	41.4	µg/m^3	34.78	µg/m^3	Rayleigh Town Centre Action Plan	2017	http://www.essexair.org.uk/Reports/Rayleigh_Town_Centre_Air_Quality_Action_Plan_2017.pdf

				Arterial Road, Websters Way								

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

In 2017, Rochford District Council adopted an ambitious Air Quality Action Plan. Details of all measures and current progress has been set out in **Error! Reference source not found.**2.

Rochford District Council anticipates that the measures stated in **Error! Reference source not found.** will achieve compliance in the Rayleigh Town Centre AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Amend Monitoring Programme	Other	Other	RDC	End 2016	2017 – 2020	AQMA revoked	No impact on concentrations	New Measure	2020 at earliest	Complete. Monitoring locations revised January 2017 and automatic analyser decommissioned.
2	Rayleigh Weir (A127) Major Scheme - signals upgrade installation of SCOOT/MOVA	Traffic Management	UTC, Congestion management, traffic reduction	ECC	Early/mid 2016	Completed End March 2017	Reduction in measured NO2 concentrations at sites affected by current queues	Up to 2 µg/m3	Complete	Complete	Rayleigh Weir upgrade completed in May 2017 (with some data-cabling and footway reinstatement outstanding). Once complete the signals will operate dynamically and there will be a remote control link with the Traffic Control Centre for incident management. Following this, once the signals have settled / calibrated, a 6 month BR will be undertaken. Current estimate for Benefits Realisation is summer 2018.

3	Changes to pedestrian crossing points	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	ECC	2016	Dependant on funding	Puffin crossings installed to replace zebra crossings	>0.2 µg/m3	Proposed	Dependant on funding	Funding for conversion of zebra crossings to Puffin – High Road/Eastwood Road and High Road North (nr Castle Road) rejected by Local Highway Panel in September 2016. The cost benefit is low, however additional funding opportunities will continue to be sought as and when funding options emerge.
4	Use cleaner buses through AQMA	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	RDC	2016/2017	2017	RDC held discussions with all relevant operators	<0.2 µg/m3	New measure	2017	RDC has jointly bid with ECC and SBC to the Clean Bus Technology Fund for £1.2M to retrofit Arriva and First buses using routes through AQMA to Euro VI standard.
5	Minimise bus waiting times in AQMA	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	RDC	2016/2017	2017	RDC held discussions with all relevant operators	<0.2 µg/m3	New Measure	2017	No Update
6	Retain appropriate off road space for freight deliveries and investigat	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access	ECC/RDC	On-going	On-going	Freight delivery space retained	Avoid worsening pollution	New measures	On-going	Most deliveries at rear (Websters Way) and off road, so do not cause obstructions in AQMA. Probably no scope for improvement in terms of location or hours. AAP and

	e issues with existing loading bays		management, Selective vehicle priority, bus priority, high vehicle occupancy lane								planning policy needs to protect space for deliveries at rear.
7	Ensure south Essex Strategic Signing review takes impact on AQMA into account	Policy Guidance and Development Control	Other policy	ECC	On-going	On-going	Reduction in through traffic in AQMA	<0.2 µg/m3	Proposed	On-going	A review of strategic signage is currently being undertaken. This will set the requirements for signing upgrades/changes to be undertaken as highway schemes come on stream. Scope to avoid AQMA will be limited because A129 is a “Priority 1” route.
8	A127 / A130 Fairglen Interchange short term scheme improvements	Traffic Management	UTC, Congestion management, traffic reduction	ECC	2015 to 2020	2021/2023	Reduction in through traffic in AQMA	>2 µg/m3	Proposed	2023	Major scheme to improve journey times and manage congestion. Improvements on the A127 corridor will reduce traffic through AQMA which re-route to avoid congestion on the A127. Launch of Public Consultation in February 2018. Latest at http://www.essexhighways.org/highway-schemes-and-developments/major-schemes/a127-a130-fairglen-interchange.aspx
9	A127 Corridor for Growth route strategy review	Traffic Management	UTC, Congestion management, traffic reduction	ECC	Mid/end 2016	2017/18	Reduction in measured NO2 concentrations at sites affected by	Up to 2 µg/m3	Proposed	2018	Winter 17/18 distribution following update of maps. The Strategy identifies the issues and solutions for the A127 Corridor

							current queues				to support and enable economic growth across south Essex. Improvements on the A127 corridor will take into consideration and aid the reduction of traffic through AQMA which re-route to avoid congestion on the A127. Need to ensure air quality impacts on AQMA are given adequate consideration and weight in decision making progress.
10	Route based strategies B1013 and A1015	Traffic Management	UTC, Congestion management, traffic reduction	ECC	Yet to be funded	No funding allocation at this time	Route management measures to reduce congestion and improve journey times	<0.2 µg/m3	Proposed	Yet to be determined	Included in Rochford Integrated Transport Package. ECC estimate circulation Summer 2018.
11	Eco Race Essex. Target Rayleigh Schools	Promoting Travel Alternatives	School Travel Plans	Sustrans/ ECC	2016/17	2017/2018	Increase number of schools participating	<0.2 µg/m3	New measure	2017/2018	Wyburns, Riverside and Westerings schools involved.
12	Quiet Routes	Alternatives to private vehicle use	Other	ECC/ RDC/ Sustrans	2017	2017/2018	Quiet routes identified and publicised	<0.2 µg/m3	New measure	2018	No Update
13	The Cake Escape	Promoting Travel Alternatives	Promotion of cycling	Sustrans/RDC	End 2016/beg 2017	2017	At least 1 café in Rayleigh joined scheme	<0.2 µg/m3	New measure	2017	Rayleigh, Hockley and Rochford Chambers of Commerce collaboratively working. Note – Sustrans / RDC remit. Loyalty scheme for cyclists to get free cake at participating cafes. No cafes in Rayleigh at present. http://www.thecakeescape.org.uk/cafe-sign-up

14	Secure cycling parking local schools	Promoting Travel Alternatives	Promoting Travel Alternatives	School Travel Plans	2017	Dependent of funding	Increase number of secure cycle stands at schools	<0.2 µg/m3	New measure	Dependant on funding	Experience in Essex demonstrates that provision of secure cycle parking can increase cycle numbers. Funding sources to be identified.
15	Enhanced cycle parking facilities	Promoting Travel Alternatives	Promotion of cycling	RDC / ECC	2016	2017/18	Increase in cycle parking facilities	<0.2 µg/m3	Proposed	2018	Policy in Area Action Plan to provide enhanced cycle parking facilities at suitable locations throughout the centre. Additional cycle parking with CCTV cameras installed at Rayleigh Rail Station in partnership with Greater Anglia in 2016.
16	New and improved pedestrian and cycle routes	Promoting Travel Alternatives	Promotion of cycling	ECC / RDC	2016	2017/18	Inclusion of appropriate measures in Cycle Action Plan	<0.2 µg/m3	Proposed	2018	Draft Rochford Cycle Action Plan to be issued imminently. New and improved pedestrian and cycle routes and links to the railway station included in AAP. Likely to be implemented as part of local Cycle Action Plan
17	Cycle Action Plan	Promoting Travel Alternatives	Promotion of cycling	ECC / RDC	2016	2017/18	Appropriate routes identified and publicised	<0.2 µg/m3	Proposed	2018	See 15 & 16 above. Local improvements also considered as part of Rayleigh Town Centre Action Plan. Likely to include cycle maps, parking and signage of alternative routes. Funding yet to be secured for implementation. Development of Action Plan funded by ECC. National Cycle Network to also be promoted. £100k secured from s106 agreement for

											Hullbridge housing development.
18	Marketing of Rail/bus/cycle improvements	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	ECC	2016/2017	Dependant on funding	Will be identified as part of funding process	<0.2 µg/m3	Proposed	Dependant on funding	Marketing of Rail/bus/cycle improvements installed using previous LTSF funding. Sustainable Transition Fund bid marketing was not successful. Will look to identify and apply for alternative funding.
19	Home to Rail Station travel plans	Promoting Travel Alternatives	Personalised Travel Planning	ECC/train operator	2017	2018	Plans implemented	<0.2 µg/m3	New measures	2019	Personalised home to station travel plans have been carried out at two stations in Essex. This could be effective for Rayleigh passengers to minimise car trips through the AQMA. Will be looked into with new rail franchise operator Abellio Greater Anglia. A new Travel Plan Officer has been appointed at Greater Anglia, Essex County Council to seek expansion of this initiative in conjunction with operator.
20	Rayleigh School Travel Plans	Promoting Travel Alternatives	School Travel Plans	ECC	2017	2017/2018	Implemented at least one new school travel plan in Rayleigh	<0.2 µg/m3	New measure	2018	2 secondary schools and up to 4 primary schools near AQMA. Targeted travel planning in schools in conjunction with raising awareness air quality has potential to reduce number of trips through AQMA. Needs to include information about in-car exposure.

21	New Business Travel Plans in Rayleigh	Promoting Travel Alternatives	Workplace Travel Planning	ECC	2016/2017	2017/2018	At least one business travel plan implemented (if Suitable business identified)	<0.2 µg/m3	New measure	2018	No large employers in Rayleigh identified by Steering Group. ECC have indicated that they have a list of potential targets in Rochford, which could be pursued.
22	New and improved pedestrian signage	Transport Planning and Infrastructure	Other	RDC	2017/18	2018/19	New Signage	<0.2 µg/m3	Pr0posed	2020	New and improved pedestrian signage should be introduced for key destinations and attractions, including the rail station, the town centre, the mount, the windmill, Holly Trinity Church and the Dutch Cottage. Policy in AAP.
23	Ensure air quality impacts on and in AQMA considered in development plan evidence base (South Essex)	Policy Guidance and Development Control	Other policy	RDC / ECC	2016	2016/2017	Impacts on AQM considered in Local Plan	Avoid worsening pollution in AQMA	New measure	2017	ECC transport department attends fortnightly meetings. Ensure RDC AQ officer copied into minutes.
24	Formalise Communication between Environmental Health and Planning	Policy Guidance and Development Control	Other policy	RDC / ECC	2017	2017/2018	Implement and appropriate communications framework	Avoid worsening pollution in AQMA or introducing new receptors into AQMA without mitigation	New measure	2018	Need to ensure the impacts of new developments upon AQMA and appropriate mitigation measures are considered consistently in all applications. ECC review applications with Transport Assessments using a checklist. Now prioritising measures to maximise sustainable transport 1st, infrastructure 2nd.

											Alternative approach could be to add air quality considerations to this checklist, although this wouldn't include smaller applications
25	Ensure All new receptors introduced in AQMA are considered, where possible	Policy Guidance and Development Control	Other policy	RDC	End 2016/early 2017	2017	AQ assessments for all relevant permitted development applications	No additional receptors introduced in AQMA without appropriate mitigation	New measures	2017 and beyond	Investigate mechanism for ensuring that new sensitive receptors introduced in the AQMA via permitted development have appropriate air quality assessments and mitigation. Update planning officers on AQMA and Action Plan
26	Promote Electric Vehicles in new developments	Promoting Low Emission Transport		RDC/ ECC	2016/2017	2017	Policy requiring EV included in Local Plan	Avoid worsening pollution in AQMA	New measure	2018	Include appropriate policy in emerging Local Plan
27	Travel Plans – new developments	Promoting Travel Alternatives	Personalised Travel Planning	RDC	2017	2017/2018	All new developments required to implement residential travel plans	<0.2 µg/m3	New measure	On-going	Large developments permitted to west and north of Rayleigh. Potential for targeted travel plans or packs for new residents. May need to include requirement in Local Plan. £100k for cycling obtained from s106 agreement for Hullbridge housing development.
28	Consider viability of bypass as highways mitigation for planned developments as part of	Policy Guidance and Development Control	Other policy	RDC/ ECC	2017/18	2020	Requirement included in Local Plan	>2 µg/m3	New measure	2020	Quantum of development in next Local Plan could justify a bypass as mitigation for highway impacts, and decision made by Essex County not to pursue the scheme previously. Any resurrection of a bypass proposals

	Local Plan process										would need to be considered carefully as part of the Local Plan process and A127 Corridor for Growth Strategy http://www.essexhighways.org/uploads/Nevendon-A127-Corridor-for-Growth-Paper.pdf.
29	Lower Parking fees for EV	Promoting Low Emission Transport	Priority parking for LEV's	RDC	2017	2017/2018	Scheme introduced	<0.2 µg/m3	New measure	2018	To be started. Investigate for potential lower parking fees or season ticket fees for EV. Season tickets may be easier to enforce than day tickets which are pay and display. ECC to liaise with Greater Anglia re: Rayleigh Station.
30	EV grants	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	RDC/ ECC	2016/2017	2017	Grants identified and applied for	<0.2 µg/m3	New measure	2017/18	Investigate grants for Council and other vehicles, including taxis, from OLEV and communicate to relevant groups. Apply for any directly relevant to RDC or ECC that could impact upon AQMA.
31	Prioritise parking provision for EV	Promoting Low Emission Transport	Priority parking for LEV's	RDC	2016/2017	2017	Priority spaces implemented	<0.2 µg/m3	New measure	2018	Investigate potential for priority parking for EV – at station and high street (season ticket holders already given priority spaces nearest to station). See point 29.
32	Install EV charging at council car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging,	RDC	Early 2017	2017	At least 1 charge point installed in a Rayleigh car park	<0.2 µg/m3	New measure	2017/18	To be started. Install EV at least one group of charging points at Council car park

			Gas fuel recharging								
33	Additional EV points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	RDC/ ECC	2017	2018	Additional EV points installed	<0.2 µg/m3	New measure	2018	Currently no public charging points in Rayleigh. ECC group aiming for provision of at least 1 point per district. See points 29 and 32.
34	Promote LPG	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	RDC	2016/2017	2017/2018	LPG station promoted in all relevant communicatio ns	<0.2 µg/m3	New measure	2017/2018	1 petrol station in AQMA has LPG refuelling infrastructure. Promotion not yet started.
35	Taxi Emission incentives	Promoting Low Emission Transport	Taxi emission incentives	RDC	2016/2017	2017	Increase in low emission taxis	<0.2 µg/m3	New measure	2018	See 15 & 16 above. Local improvements also considered as part of Rayleigh Town Centre Action Plan. Likely to include cycle maps, parking and signage of alternative routes. Funding yet to be secured for implementation. Development of Action Plan funded by
36	Taxi Licensing	Promoting Low Emission Transport	Taxi Licensing conditions	RDC	2016/2017	2017	Licence conditions that encourage low emission vehicles	<0.2 µg/m3	New measure	2019/20	Current conditions (January 2016) maximum age 6 years when first licenced and not re-licenced if more than 10 years old. Not appropriate to reduce that age limit at this time. Officers to keep

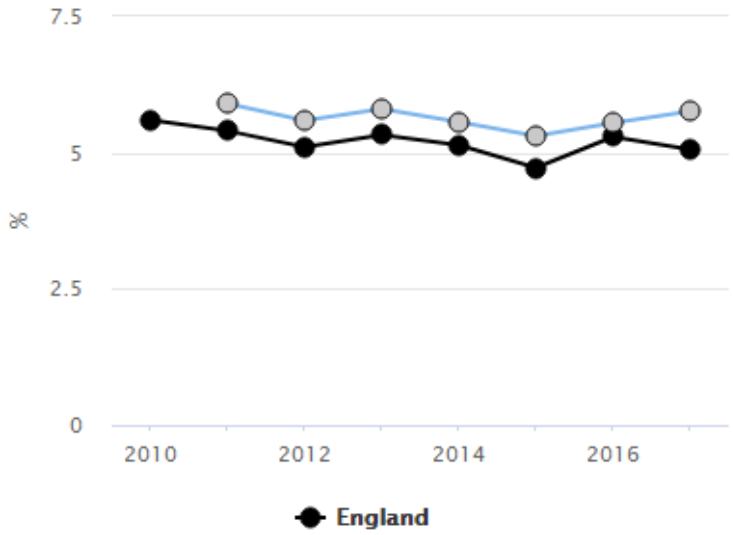
											discussing with Licensing colleagues.
37	Promote Essex Liftshare	Alternatives to private vehicle use	Car & lift sharing schemes	ECC	2016/2017	2017/2018	Increase in number of users travelling through Rayleigh	<0.2 µg/m3	New measure	2017/18	Established Liftshare website for Essex. Promote locally as part of other awareness-raising. Investigate addition of Rochford group under the Essex umbrella. https://liftshare.com/uk link to be added to RDC website and promoted in interim.
38	Set up Rochford Liftshare group	Alternatives to private vehicle use	Car & lift sharing schemes	ECC	2016/2017	2017	Rochford group set up	<0.2 µg/m3	New measure	2017	Private group for Rochford can be set up under Essex umbrella free of charge.
39	Promote Active Essex	Promoting Travel Alternatives	Other	ECC	2016/2017	2017/2018	Active Essex promoted in all relevant communications	<0.2 µg/m3	New measure	2017/2018	Promoted since 2017. https://www.rochford.gov.uk/leisure-and-tourism/sport-and-physical-activity/active-rochford
40	Engage Public Health colleagues at district and county level	Other	Other	RDC	End 2016	2016/17	Briefing completed	<0.2 µg/m3	New measure	2017	ECC Public Health representative on RDC officer attending Health & Wellbeing board meeting March 2018.
41	Promote Air Quality Action Plan and awareness in Rayleigh	Public Information	Via other mechanisms	RDC	2016/2017	2017/2018	Increase in comms related to air quality	Raise awareness of AQMA and Action Plan	New measure	When AQMA revoked	Make RDC comms aware of AQAP and any updates, to allow them to distribute information via existing channels. Consider an event or awareness campaign using existing channels

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

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

Rochford District Council does not monitor $PM_{2.5}$ concentrations however notes the Public Health Outcomes Framework indicator 3.01 – Fraction of mortality attributable to particulate ($PM_{2.5}$) air pollution which for 2017 gave a value of 5.5%. This value is broadly similar to other authorities within the region.

Figure 2.1 - Public Health Framework Indicator 3.01 Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution



Rochford District Council is taking the following measures to address $PM_{2.5}$:

- Air quality measures from the forthcoming Air Quality Action Plan designed to reduce nitrogen dioxide may have the complementary effect of reducing $PM_{2.5}$.
- 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 improve infrastructure, reduce personal car use and 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

3.1 Summary of Monitoring Undertaken

This section sets out what monitoring has taken place and how it compares with objectives.

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 (passive) monitoring of NO_2 at 10 sites during 2018. **Error! Reference source not found.** in Appendix A shows the details of the sites.

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.

Maps showing the location of the monitoring sites and their relation to AQMA are provided in Appendix D.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A. in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the annual mean air quality objective of 40µg/m^3.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Monitoring has identified one location (diffusion tube site ID ABSR) in 2018 where the annual mean air quality objective of 40µg/m^3 was exceeded. The monitoring location is located on the Sutton Road in Rochford and is a roadside location.

Figure 3.1 – Examples of where Air Quality Objectives should apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour mean and 8-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties[10].	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and: 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

The annual mean Air Quality Objective does not apply at this location and using the methodology explained in Appendix C to estimate the concentrations at relevant exposure, the estimated concentration is significantly below the Air Quality Objectives.

Table 3.1 – Estimated Concentration at Monitoring Site ABSR

Site ID	Measured Concentration	Estimated Concentration at Relevant Exposure
ABSR	40.08µg/m^3	25.86µg/m^3

Appendix A: Monitoring Results

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
SS	South Street	Kerbside	587670	190352	NO_2	NO	2	1	NO	2.4
ABSR	Anne Boleyn Sutton Road	Roadside	587733	189667	NO_2	NO	13	1	NO	2.4
HOG	18 Hollytree Gardens, Rayleigh	Suburban	580004	189899	NO_2	NO	0	14.45	NO	2.4
HOR	22a Hockley Road	Roadside	580881	190916	NO_2	YES	0	2.4	NO	2.4
CRH	Crown Heights, Crown Hill	Roadside	580546	190735	NO_2	YES	0	6.9	NO	2.4
KGC	King Georges Court, Eastwood Road	Roadside	580778	190462	NO_2	YES	0	8.7	NO	2.4
HRA	4 High Road, Rayleigh	Roadside	580320	190429	NO_2	YES	0	11.3	NO	2.4
HRB	7 High Road, Rayleigh	Roadside	580337	190415	NO_2	YES	0	4.6	NO	2.4
HRC	71 High Road, Rayleigh	Roadside	580217	190140	NO_2	YES	0	10.8	NO	2.4
HRD	109 High Road, Rayleigh	Roadside	580217	189850	NO_2	YES	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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
SS	Kerbside	Diffusion Tube	91.67	91.67	35.7	34.08	32.82	30.75	30.93
ABSR	Roadside	Diffusion Tube	100.00	100	39.7	39.74	**42.09**	**42.44**	**40.08**
HOG	Suburban	Diffusion Tube	100.00	100	N/A	N/A	N/A	17.68	16.44
HOR	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	36.53	34.78
CRH	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	28.87	27.62
KGC	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	26.43	23.41
HRA	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	25.65	23.73
HRB	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	26.27	26.29
HRC	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	26.19	24.28
HRD	Roadside	Diffusion Tube	100.00	100	N/A	N/A	N/A	28.57	28.86

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

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

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

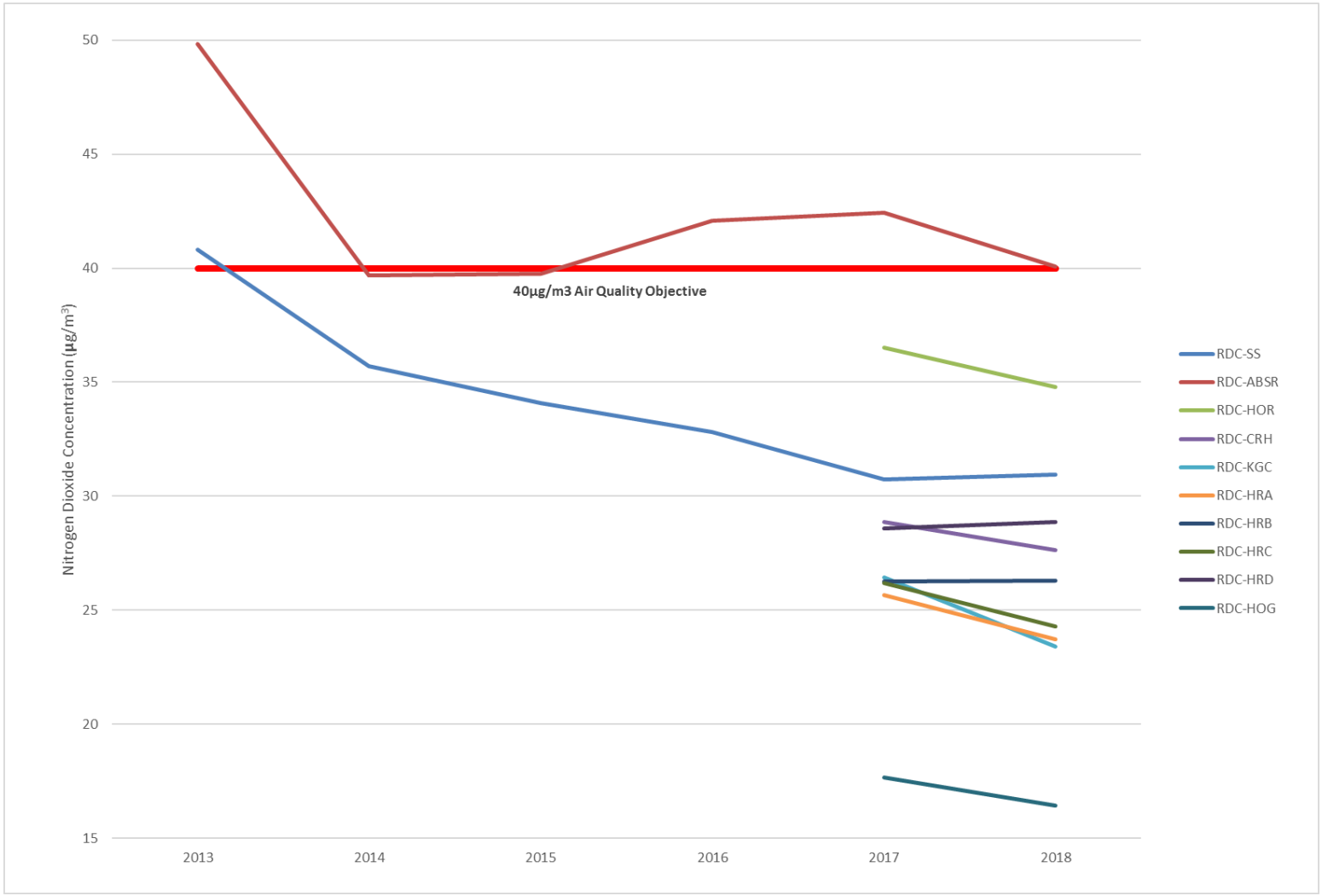
NO_2 annual means exceeding $60\mu g/m^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean NO_2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SS	42.2	40.2	Missing	40	46.3	37.2	43.5	36.2	33.9	43.2	45.4	39.6	40.70	30.93	26.77
ABSR	59.2	50	51.4	51	50.2	53	54.1	52.3	55.6	55.3	51.4	49.3	52.73	**40.08**	25.86
HOG	26.2	27	22.4	19.4	15	12	17.7	20.9	21	25.6	25.1	27.2	21.63	16.44	16.44
HOR	42.4	44	45	45.6	48.8	40	52.6	49.8	44.6	50.9	41.8	43.7	45.77	34.78	34.78
CRH	38.2	40	37	34.5	34.4	28	35.7	31.4	37.3	44.9	38.9	35.8	36.34	27.62	27.62
KGC	32.3	34.5	34	27	28	24.6	27.3	27.6	32.8	37.3	30.9	33.3	30.80	23.41	23.41
HRA	37.1	35.5	39.9	30.2	23.8	22.1	25.6	26	28.7	35.9	31.3	38.6	31.23	23.73	23.73
HRB	39.1	38.2	40.6	32.2	34	31.1	32.5	28.6	31	38.2	35.8	33.8	34.59	26.29	26.29
HRC	35	34.5	35.5	30.2	24.5	21.5	28.7	28.2	33.6	40.6	34.5	36.5	31.94	24.28	24.28
HRD	35.1	43.4	40.7	38.5	34.2	33.7	38.9	34	36.7	43.9	37.2	39.4	37.98	28.86	28.86

☒ **National bias adjustment factor used**

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

Annualisation was not required

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.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tubes QA/QC

Rochford District Council undertook monitoring at 10 nitrogen dioxide diffusion tubes sites in 2018.

The diffusion tubes were supplied and analysed by Socotec (formerly ESG, Didcot) 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 2018:

Table C.1 – AIR PT Results 2018

AIR PT Round	AIR PT AR024	AIR PT AR025	AIR PT AR027	AIR PT AR028
Round conducted in the period	January – February 2018	April – May 2018	July – August 2018	September – October 2018
ESG Didcot	100%	100%	100%	100%

Diffusion Tube Bias Adjustment Factors

Rochford District Council uses the national bias adjustment figure for calculating diffusion tubes results.

The Diffusion Tube Bias Adjustment Factors Spreadsheet 03/18 identified that for Socotec 50% TEA in acetone diffusion tubes in 2018, a bias adjustment factor of 0.76 should be used. This was derived from orthogonal regression analysis of 21 studies.

NO_2 Fall Off Estimation

Using the equation from the Bureau Veritas NO_2 Fall Off with Distance Calculator (version 4.2), a custom Excel spreadsheet has been developed to derive the NO_2 concentrations for multiple diffusion tubes from measured annual mean concentrations 2018 NO_2 background maps.

Estimated Annual Mean at Relevant Exposure:

=IF(AC>0,(((AB-AC)/(-0.5476*LN(J)+2.7171))*(-0.5476*LN(H)+2.7171)+AC),"")

AB = Bias Adjusted Mean

AC = Annual Mean Background NO_2

J = Distance: diffusion tube to kerb of nearest road (m)

H = Distance: relevant exposure to kerb of nearest road (m)

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Monitoring Locations in Rayleigh & AQMA Boundary

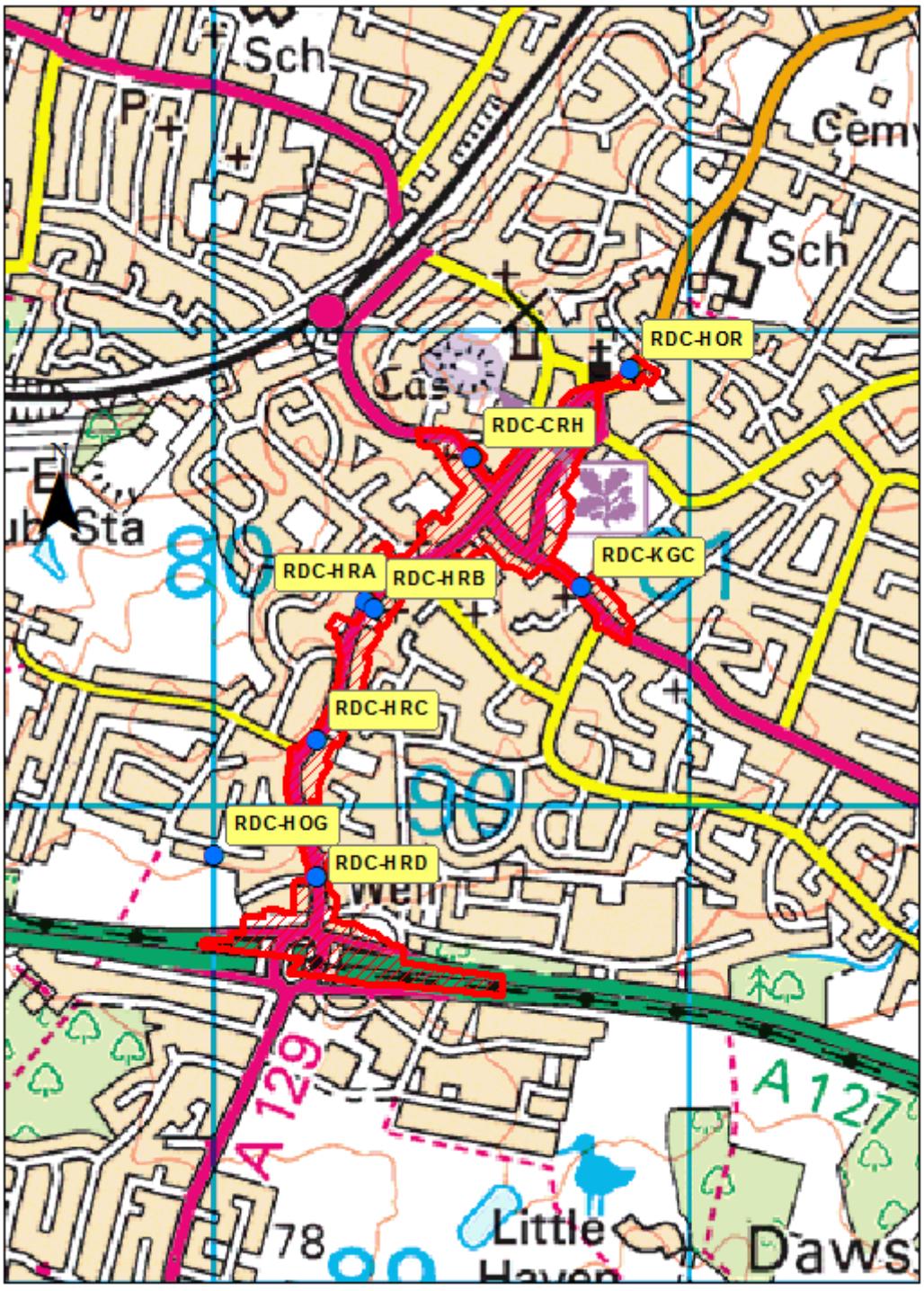
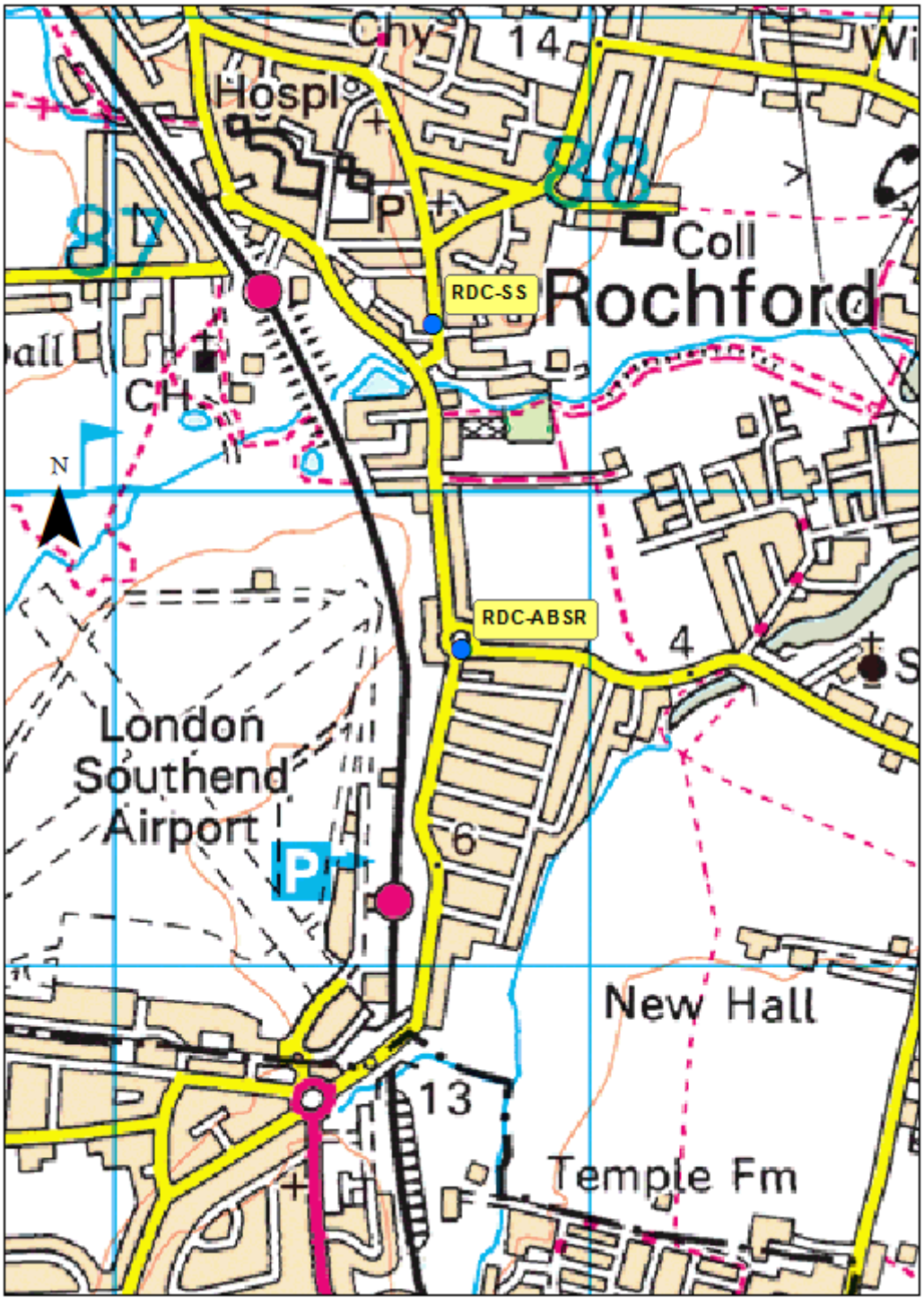


Figure D.2 – Monitoring Locations in Rochford



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
µg/m^3	Micrograms per cubic metre
AIR-PT	An independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL)
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	Air Quality Annual Status Report
Bias Adjustment	For NO_2 diffusion tubes, bias represents the overall tendency of the tubes to under or over-read relative to the reference chemiluminescence analyser. This should not be confused with precision, which is an indication of how similar the results of duplicate or triplicate tubes are to each other. It is necessary to calculate a bias factor and adjust monitored results accordingly
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
EV	Electric Vehicle
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SCRT	Selective Catalytic Reduction Technology – retrofit emissions system that can be fitted to older heavy-duty vehicles to achieve emissions equivalent to Euro VI.
TEA	Triethanolamine. The absorbing substance used in diffusion tubes measuring Nitrogen Dioxide

References

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/assets/tubeprecision2019version0319finalfull.pdf

Defra LAQM Policy Guidance LAQM.PG16 available at; https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

Defra LAQM Technical Guidance LAQM.TG16 available at; http://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf

Defra Nitrogen Dioxide Fall Off With Distance Calculator

https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Defra NO_2 Background Maps available at; https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017

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

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

Public Health Outcomes Framework Indicator 3.01 available at; http://www.phoutcomes.info/

Rochford District Council Air Quality Annual Status Report 2018 available at; http://www.essexair.org.uk/Reports/RochfordDistrictCouncil2018ASR.pdf

Rochford District Council Rayleigh Town Centre Air Quality Action Plan available at; http://www.essexair.org.uk/Reports/Rayleigh_Town_Centre_Air_Quality_Action_Plan_2017.pdf

UK Air Quality Plan for tackling roadside NO_2 concentrations available at

https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017