

Local Authority Officer	Marcus Watts
Department	Environmental Health
Address	Council Offices London Road Saffron Walden CB11 4ER
Telephone	01799 510510
E-mail	mwatts@uttlesford.gov.uk
Report Reference number	UTT/ASR2022
Date	25th July 2022
Written by	Tim Savage
<p>Scientific Team</p> <p>Public Health & Protection Services</p> <p>Chelmsford City Council</p> <p>Duke Street</p> <p>Chelmsford</p> <p>Essex CM1 1JE</p>	 <p>The logo for Chelmsford City Council features a stylized graphic on the left consisting of a green leaf, a yellow sun, and blue waves. To the right of the graphic, the text 'Chelmsford' is written in a large, bold, purple font, and 'City Council' is written in a smaller, purple font below it.</p>

Actions to Improve Air Quality

Air Quality Grant

In September 2021, Uttlesford District Council submitted a successful bid to the Department for Environment, Food and Rural Affairs (Defra) for the 2021 Air Quality Grant.

The successful bid was for more than £500,000 to bring forward a series of projects to tackle air pollution and improve opportunities for sustainable travel.

To support its clean air plans in Saffron Walden, the focus is on schemes to improve traffic management in the town, creating new opportunities for green transport. This includes the trialling of a 'try before you buy' e-bike hire scheme, e-cargo bike hire scheme and an electric vehicle car club. These schemes will initially be piloted in Saffron Walden and, if successful, the intention is to roll out to other areas of the district.

The funding will also support school education and business engagement programmes to raise awareness of pollution and encourage behavioural changes to help improve air quality.

The grant will also cover the costs of increased monitoring capabilities and we will be increasing diffusion tube monitoring coverage for 2022 to cover monitoring at all schools.

Local Engagement and How to get Involved

Uttlesford 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.

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.

Essex County Council has worked closely with [Liftshare](#) to develop the Essex Car Share scheme. This operates across Uttlesford and provides commuters with a car sharing service which could cut congestion and air pollution whilst saving money.

Conclusions

Uttlesford District Council have concluded that:

- There is a downwards trend of monitored NO₂ air pollution
- No air quality exceedances have been identified in 2021
- No air quality exceedances have been identified for five years
- There are no new developments that will have a significant impact on air quality.

Priorities

Uttlesford District Council will prioritise the following air quality measures:

- Implement the air quality projects set out in the successful air quality grant to tackle air pollution and improve opportunities for sustainable travel
- Undertake an assessment to determine whether it is appropriate to revoke the Saffron Walden Air Quality Management Area
- Update the current Air Quality Action Plan which is scheduled to conclude in 2022

Local Responsibilities and Commitment

This ASR was prepared by Public Health and Protection Services of Chelmsford City Council on behalf of Uttlesford District Council.

This ASR has been approved by Marcus Watts Environmental Health Manager.

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

If you have any comments on this ASR please send them to Uttlesford District Council at:

[Contact Us](#) 01709 510510

Uttlesford District Council

Council Offices

London Road

Saffron Walden

CB11 4ER

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Uttlesford	i
Actions to Improve Air Quality	ii
Local Engagement and How to get Involved.....	ii
Conclusions.....	i
Priorities	i
Local Responsibilities and Commitment	i
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
Air Quality Management Areas	2
Progress and Impact of Measures to address Air Quality in Uttlesford	3
PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	6
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	8
Summary of Monitoring Undertaken	8
3.1.1 Automatic Monitoring Sites	8
3.1.2 Non-Automatic Monitoring Sites	9
Individual Pollutants	9
3.1.3 Nitrogen Dioxide (NO ₂)	9
3.1.4 Particulate Matter (PM ₁₀)	10
3.1.5 Particulate Matter (PM _{2.5}).....	10
Appendix A: Monitoring Results	11
Appendix B: Full Monthly Diffusion Tube Results for 2021	21
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	23
New or Changed Sources Identified Within Uttlesford During 2021	23
Additional Air Quality Works Undertaken by Uttlesford District Council During 2021	23
QA/QC of Diffusion Tube Monitoring	23
Diffusion Tube Annualisation	23
Diffusion Tube Bias Adjustment Factors	24
NO ₂ Fall-off with Distance from the Road.....	25
QA/QC of Automatic Monitoring	26
Automatic Monitoring Annualisation	26
NO ₂ Fall-off with Distance from the Road.....	26
Appendix D: Maps of Monitoring Locations and AQMA	27
Appendix E: Summary of Air Quality Objectives in England	33
Appendix F: Non-Reference Air Quality Sensors	34
Glossary of Terms	35
References	36

Figures

Figure 2.1 – Public Health Framework Indicator D01 Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution.....	7
Figure A.1 – Trends in Annual Mean NO ₂ Concentrations in Saffron Walden AQMA.....	18
Figure D.1 – Monitoring Location Map: Saffron Walden AQMA.....	27
Figure D.2 – Monitoring Location Map: Takeley	28
Figure D.3 – Monitoring Location Map: Thaxted	29
Figure D.4 – Monitoring Location Map: Stansted & Elsenham.....	30
Figure D.5 – Monitoring Location Map: Newport.....	31
Figure D.6 – Monitoring Location Map: Great Dunmow & Great Easton.....	32

Tables

Table 2.1 – Declared Air Quality Management Areas	2
Table 2.2 – Progress on Measures to Improve Air Quality.....	3
Table 2.3 – PM _{2.5} Monitoring Locations	6
Table F.1 – Non-Reference Air Quality Sensors.....	34
Table A.1 – Details of Automatic Monitoring Sites	11
Table A.2 – Details of Non-Automatic Monitoring Sites	11
Table A.3 – Annual Mean NO ₂ Monitoring Results: Automatic Monitoring (µg/m ³).....	15
Table A.4 – Annual Mean NO ₂ Monitoring Results: Non-Automatic Monitoring (µg/m ³)	16
Table A.5 – 1-Hour Mean NO ₂ Monitoring Results, Number of 1-Hour Means > 200µg/m ³	19
Table A.6 – Annual Mean PM ₁₀ Monitoring Results (µg/m ³)	19
Table A.7 – 24-Hour Mean PM ₁₀ Monitoring Results, Number of PM ₁₀ 24-Hour Means > 50µg/m ³	20
Table A.8 – Annual Mean PM _{2.5} Monitoring Results (µg/m ³).....	20
Table B.1 – NO ₂ 2021 Diffusion Tube Results (µg/m ³)	21
Table C.1 – AIR PT Results 2021	23
Table C.2 – Bias Adjustment Factor	24
Table C.3 – Local Bias Adjustment Calculation	25
Table E.1 – Air Quality Objectives in England	33

1 Local Air Quality Management

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

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

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Uttlesford District Council can be found in Table 2.1. The table presents a description of the two AQMA(s) that are currently designated within Uttlesford.

Appendix D provides map of the AQMA along with monitoring locations. The air quality objectives pertinent to the current AQMA designation is as follows:

- NO₂ annual mean

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Saffron Walden AQMA	Declared 01/08/2007 Amended 12/09/2012	NO ₂ Annual Mean	Circle of radius 1400m radius centred on Elm Grove in Saffron Walden Town Centre.	No	42.9	No Exceedance	Uttlesford Air Quality Action Plan	https://www.uttlesford.gov.uk/media/7346/Air-Quality-Action-Plan-2017-2022/pdf/AQMA Action Plan Nov 2017 pdfa.pdf?m=636988925812370000

Uttlesford District Council confirm the information on UK-Air regarding their AQMA(s) is up to date

Uttlesford District Council confirm that all current AQAPs have been submitted to Defra

Progress and Impact of Measures to address Air Quality in Uttlesford

Uttlesford District Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	To revise planning policies which will ensure the impact on air quality in the AQMA is given adequate consideration and weight in the decision-making process.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2023	Uttlesford District Council	Uttlesford District Council	NO	Funded	< £10k	Aborted	Low, but potential to mitigate against emission increases associated with future growth.	Policies contained in the Local Plan once adopted. Use of sec 106 funds to implement action plan	Policies have been included in the submitted Regulation 19 Local Plan. Cost: within existing resources.	Following the examination of the proposed Local Plan, it was withdrawn in April 2020. Work has started on a new local plan
2	To produce a planning Technical Guidance document for air quality, to ensure the impacts of new development on the AQMA, new receptors in the AQMA, and the level of mitigation are fully considered in all applications.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2025	Uttlesford District Council	Uttlesford District Council	NO	Funded	< £10k	Planning	Low, but potential to mitigate against emission increases associated with future growth.	Publicly available by December 2017	Technical Guidance document has been completed and included in the Regulation 19 Local Plan. Cost within existing resources	Pending approval of new Local Plan
3	To work with ECC to facilitate the provision of new cycle/pedestrian routes and cycle storage, and promote the routes available.	Transport Planning and Infrastructure	Cycle network	2017		Uttlesford District Council / Essex County Council	Uttlesford District Council / Essex County Council	NO				Low, dependant on reduction in number of vehicles on road network	Number of new routes provided, increase in no of storage facilities per annum and users of facilities year on year	UDC has held meetings with ECC to review existing provisions and work with ECC on an on-going basis to achieve outcomes. Recently gov funding has been released and UDC will be making bids to support the UDC cycle strategy	Outcomes dependent on priorities, funding & developer contributions, which the plan cannot timescale.
4	UDC to increase cycle storage on Council owned sites in Saffron Walden where practical to do so.	Transport Planning and Infrastructure	Cycle network	2017		Uttlesford District Council	Uttlesford District Council	NO				Low, dependant on reduction in number of vehicles on road network	Increase in no of storage facilities and users of facilities from baseline	To link in with the Travel plan. Engage with property services & apply for funding where appropriate where need has been identified.	
5	To assist ECC in working with local schools and businesses in the review and upgrading of existing travel plans or to assist individual schools or businesses to develop and promote plans	Promoting Travel Alternatives	School Travel Plans	2017		Uttlesford District Council / Essex County Council	Uttlesford District Council / Essex County Council	NO				Low, dependant on reduction in number of vehicles on road network	Number of new or upgraded TPs. Increase in walking or cycling to school or workplace from baseline	Cost within existing resources	Reliance on joint working with ECC and other stakeholders to develop new travel plans.
6	To support the extension of phone signal coverage and superfast broadband service to all parts of the district.	Promoting Travel Alternatives	Encourage / Facilitate home-working	2017		Uttlesford District Council / Essex County Council	Uttlesford District Council / Essex County Council	NO				Low, dependant on reduction in number of vehicles on road network	Number of businesses and homes enabled to access superfast broadband by 2019. Increase in no of people regularly working from home	UDC investment of £500k towards inclusion in Superfast Essex broadband procurement to be implemented by end of 2019. This has been delayed until December 2022	
7	To work with ECC Highways to develop a scheme of measures aimed at improving junction capacity within the AQMA identified to be necessary as part of the Local Plan once adopted.	Traffic Management	UTC, Congestion management, traffic reduction	2019		Essex County Council	Essex County Council	NO				Medium, dependant on reduced congestion	Junction capacity improvements at the four key junctions identified in the action plan. Reduction in queue lengths from identified baseline.	UDC has held meetings with ECC to review existing provisions and work with ECC on an on-going basis to achieve outcomes, regular further meetings to be held. Some funding available from sec 106 agreements.	Reliant on ECC work programme following approval of the Local Plan and developer contributions once commenced. Timescale beyond control of UDC. Developer contributions have been diverted to pedestrian safety issues & traffic calming on Debden Road
8	To work with ECC to assess whether changes to junction configurations and signal controls, control	Traffic Management	UTC, Congestion management, traffic reduction	2017		Essex County Council	Essex County Council	NO				Medium, dependant on reduced congestion	Improvements to junctions carried out, improved parking on main routes, restrictions	No progress. To engage with ECC and North Essex Parking Partnership (NEPP)	Reliant on ECC and North Essex Parking Partnership (NEPP) to be in agreement with any changes. No

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	of parking measures on main routes through the town and access to the centre by HGVs which will demonstrably reduce congestion can be identified and implemented ahead of adoption of the local plan												to HGVs. Reduction in queue lengths		realistic target date can be applied
9	To support targeted enforcement of parking restrictions where identified to be an issue, on main routes through the town	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2017		Uttlesford District Council	Uttlesford District Council	NO				Low, dependant on reduced congestion	No of parking penalty notices issued on main routes	Planned work stream delayed. Cost within existing resources.	
10	To provide clear informative signage to Swan Meadow car park, new amenities, leisure centre, food stores, Audley End	Transport Planning and Infrastructure	Other	2017	2019	Uttlesford District Council	Uttlesford District Council	NO				Low, dependant on reduced congestion	No of new signs provided	Appropriate signage on approaches to facilities provided, to be kept under review as new development is delivered	Completed
11	To review UDC travel plan and review opportunities for a shared travel plan with partner organisations using UDC facilities	Promoting Travel Alternatives	Workplace Travel Planning	2017		Uttlesford District Council	Uttlesford District Council	NO				Low, dependant on reduced congestion	Revised UDC TP by end of 2017. Reduction in car travel to work as measured by survey & occupied car spaces, reduction in business mileage of 5% pa	Under review following changes arising from the Covid -19 pandemic. To link in with the Councils Climate Change Strategy. Cost within existing resources	
12	To pursue options to install renewable energy technologies at suitable sites within Saffron Walden, to review UDC fleet procurement and implement changes where identified as practicable, and likely emission reductions justify the capital expenditure	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2017		Uttlesford District Council	Uttlesford District Council	NO				Medium	No kW renewable energy within SW, review of fuel usage and type, no of UDC LEVs	Meetings held with vehicle procurement to consider options for fleet procurement and conversion of existing fleet to low emission fuel, and cost benefit. Uttlesford Norsk partnership replaced 17 older vehicles with Euro 6 complaint fleet. This included 2x electric vehicles	Awaiting resources
13	To encourage ECC to procure bus services with integrated timetables, high quality facilities, and a frequent and reliable service linked to the rail service at Audley End. Information on Public Transport services to be readily available in UDC buildings and via the website.	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2017		Uttlesford District Council / Essex County Council	Uttlesford District Council / Essex County Council	NO				Low	No of new or improved services available, information available in UDC buildings. Increase in bus usage of 5%	No progress	Awaiting resources
14	To identify opportunities to raise public awareness of air quality issues through education initiatives and publicity campaigns	Public Information	Via leaflets	2017		Uttlesford District Council	Uttlesford District Council	NO				Low, dependant on behavioural changes	No of campaigns, target one per annum.	Targeted campaign delivered to schools & the general public, coincided with National Clean Air Day in June 2018 & June 2019 Cost within existing resources. 2020 event delayed due to Covid -19 pandemic	Ongoing, however limited due to resource
15	To provide advice and raise awareness of car sharing and associated database software available to employers	Alternatives to private vehicle use	Car & lift sharing schemes	2017		Uttlesford District Council	Uttlesford District Council	NO				Low dependant on reduced congestion	No of new car sharing schemes set up, target one per annum. Reduction of 1-5% of private car commuter journeys	In house promotion linked to Clean Air Day 2018 & 2019. Project suspended due to Covid-19 pandemic. Cost within existing resources	Scheme uptake outside control of UDC. However, district wide promotion of schemes to take place on an annual basis as part of other awareness linked to measure 14.
16	To consider the provision of preferential charging for UDC controlled parking spaces for vehicles meeting low emission standards	Traffic Management	Emission based parking or permit charges	2017		Uttlesford District Council	Uttlesford District Council	NO				Low, dependant on raised uptake of LEVs	Review of charging policy	Project delayed due to resource issues. Feasibility study delayed until Spring 2021	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
17	To engage with the Uttlesford licensed operators with the aim of introducing emission controls for licensed taxis operating within the AQMA.	Promoting Low Emission Transport	Taxi Licensing conditions	2017	2019	Uttlesford District Council	Uttlesford District Council	NO				Low	Review of licensing policy	Upgraded licensed vehicle emissions policy.	Completed
18	To encourage ECC to set emission standards for new and existing buses under contract operating within the AQMA	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2017		Essex County Council	Essex County Council	NO				Low	Review of contractual arrangements	No progress	Awaiting resources
19	To work with the operators of fleet vehicles within the town to facilitate the introduction of LEV's	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2018		Uttlesford District Council	Uttlesford District Council	NO				Potentially medium, dependant on uptake of vehicles.	No of LEV fleet vehicles on town road network.	No progress	Reliance on engagement with fleet operators to achieve outcome.
20	Provide electric charging points on UDC owned parking spaces in the town where practical and economically feasible to do so, and encourage the provision of points at suitable privately owned sites	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018		Uttlesford District Council	Uttlesford District Council	NO				Potentially medium, dependant on uptake of vehicles.	No of points installed per annum, target 4	Ongoing. Charging points at the Common Car Park have been delivered. Currently there is a £100K bid, plus £40K match funding for additional car parks in place. 4 post at London Road are planned for August	
21	To work with ECC on introducing delivery time restrictions to High Street SW	Freight and Delivery Management	Quiet & out of hours delivery	2017		Essex County Council	Essex County Council	NO				Low	Restrictions in place, reductions in HGV parking	No progress	Awaiting resources
22	To carry out additional monitoring of NO2 within Saffron Walden to inform basis for decision making.	Public Information	Other	2017	2019	Uttlesford District Council	Uttlesford District Council	NO				Low, provides evidence base for actions	Provision of localised data for incorporation into air quality modelling	Permanent Automatic monitoring station at London Road scheduled for 2019. Extension of diffusion tube sites to include co-location.	Completed

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.

Uttlesford District Council monitors PM_{2.5} concentrations at four locations across the district using one BAM 1020 reference monitor, one Osiris particle monitor and two Aeroqual AQY sensors. The table below compares the measured concentrations with Defra background mapping.

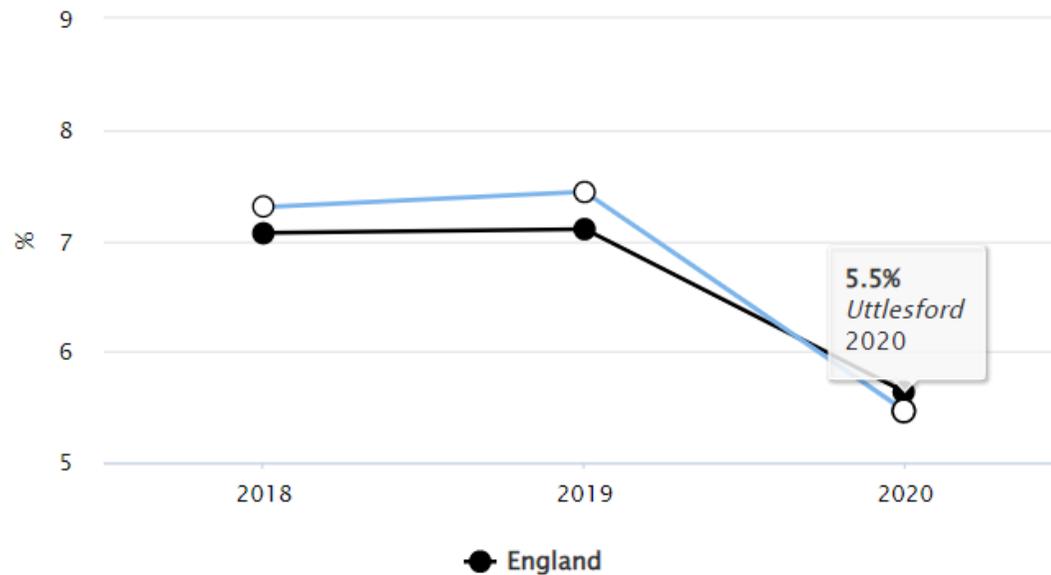
Table 2.3 – PM_{2.5} Monitoring Locations

Monitoring Location	Easting	Northing	Monitoring Method	PM _{2.5} Monitored Concentration (Annual Mean)	Defra 2021 Background Map (2018 Based Map)	Difference	Primary Local Source of PM _{2.5}
Thaxted Road, Saffron Walden	554357	238444	Nephelometer	6.5µg/m ³	9.4µg/m ³	-2.9µg/m ³	Road Traffic
London Road, Saffron Walden	553570	237908	Beta Attenuation	14.4µg/m ³	9.3µg/m ³	5.1µg/m ³	Road Traffic
Hill House near Stansted Airport	555917	223377	Optical Particle Counter	2.5µg/m ³	9.2µg/m ³	-6.7µg/m ³	Agriculture Aviation
Thaxted	561224	230889	Optical Particle Counter	5.8µg/m ³	9.1µg/m ³	-3.3µg/m ³	Road Traffic

The Osiris particle monitor and two Aeroqual sensors are providing air quality data for information only. Only data from the BAM reference monitor is formally reported in Appendix A.

The Public Health Outcomes Framework indicator D01 – Fraction of mortality attributable to particulate (PM_{2.5}) air pollution which for 2020 gave a value of 5.5%. These values are broadly similar to other authorities within the region.

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



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

- Use of Essex Air twitter to encourage the reporting of smoky vehicles through the DVSA reporting service. It is possible to report either heavy goods vehicles or public service vehicles (buses).
- Regular inspections of permitted industry where combustion and non-combustion processes could lead to anthropogenic emissions of PM_{2.5}

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

This section sets out the monitoring undertaken within 2021 by Uttlesford District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

No exceedances of the nitrogen dioxide air quality objectives have been identified and the long-term trend for monitored concentrations is downwards.

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Uttlesford District Council undertook automatic (continuous) monitoring with reference analysers at two sites during 2021.

- Site UTT2 Thaxted Road, Saffron Walden measuring NO₂
- Site UTT3 London Road, Saffron Walden measuring NO₂, PM_{2.5} and PM₁₀

Table A.1 in Appendix A presents detail of these sites.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

In addition, one Osiris particle monitor and two Aeroqual AQY sensors were deployed. The monitoring results are contained in Appendix F.

3.1.2 Non-Automatic Monitoring Sites

Uttlesford District Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 39 sites during 2021. 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

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

3.1.3 Nitrogen Dioxide (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

Both continuous automatic monitoring and diffusion tube results identify a decrease in measured NO₂.

No exceedances of the air quality objectives have been measured. As no measured annual mean concentrations were greater than 60µg/m³, it is unlikely that there has been an exceedance of the 1-hour mean objective.

3.1.4 Particulate Matter (PM₁₀)

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

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

The monitoring results identify an increase in measured PM₁₀.

No exceedances of the air quality objectives have been measured.

3.1.5 Particulate Matter (PM_{2.5})

PM_{2.5} is the pollutant which has the biggest impact on public health and on which the Public Health Outcomes Framework (PHOF) indicator is based. Although not covered by the LAQM regulations, Uttlesford District Council undertakes monitoring of PM_{2.5}.

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

Uttlesfor District Council have not yet collected enough data and monitoring results to determine a trend of measured PM_{2.5} pollution.

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)
UTT2	Junction Thaxted Rd & Radwinter Rd, Saffron Walden	Roadside	554357	238444	NOx, NO, NO2	NO	Chemiluminescent	0	2	1
UTT3	London Road, Saffron Walden	Roadside	553570	237908	NOx, NO, NO2; PM10; PM2.5	NO	Chemiluminescent, BAM, BAM (with Smart Heater)	6	3	2.8

Notes:

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

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
UT001	High Street, Saffron Walden	Urban Centre	553709	238417	NO2	Yes	15.0	1.5	No	2.0
UT003	Gibson Gardens, Saffron Walden	Urban Background	553554	238218	NO2	Yes	5.1	1.5	No	2.0
UT004	YHA, Saffron Walden	Kerbside	553598	238595	NO2	Yes	0.8	0.4	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
UT005	Thaxted Road, Saffron Walden	Kerbside	554336	238454	NO2	Yes	2.4	0.5	No	2.0
UT009	Burton End	Roadside	552403	223965	NO2	No	17.0	27.0	No	2.0
UT010	Newport M11	Kerbside	551246	233649	NO2	No	40.0	0.1	No	2.0
UT011	33 High Street, Saffron Walden	Urban Centre	553697	238452	NO2	Yes	0.0	2.7	No	2.0
UT012	Town Hall, Saffron Walden	Urban Background	553879	238510	NO2	Yes	20.0	0.1	No	2.0
UT015	57 High Street, Saffron Walden	Roadside	553739	238317	NO2	Yes	0.0	4.0	No	2.0
UT016	Radwinter Road, Saffron Walden	Roadside	554413	238474	NO2	Yes	8.0	1.6	No	2.0
UT017	Stortford Rd, Lt Canfield	Roadside	560023	221444	NO2	No	14.0	2.5	No	2.0
UT018	17 Cambridge Road, Stansted	Roadside	551035	225199	NO2	No	3.0	1.5	No	2.0
UT019	Silver Street, Stansted	Roadside	550950	225039	NO2	No	3.5	2.0	No	2.0
UT020	Grove Hill, Stansted	Roadside	551535	225065	NO2	No	0.0	3.3	No	2.0
UT021	41 East Street, Saffron Walden	Roadside	554212	238436	NO2	Yes	0.0	2.0	No	2.0
UT024	Takeley Hill, Hatfield Forest	Rural	554671	221010	NO2	No	N/A	118.0	No	2.0
UT028	London Rd, Saffron Walden	Roadside	553755	238092	NO2	Yes	0.8	2.0	No	2.0
UT029	Debden Road, Saffron Walden	Roadside	553770	238076	NO2	Yes	0.5	0.5	No	2.0
UT030	Friends School, Saffron Walden	Kerbside	553875	237764	NO2	Yes	10.0	0.5	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
UT031	Mount Pleasant Road, Saffron Walden	Roadside	554178	237767	NO2	Yes	2.0	1.5	No	2.0
UT032	Borough Lane, Saffron Walden	Roadside	553625	237856	NO2	Yes	0.0	7.0	No	2.0
UT033	Chapel Hill, Stansted	Roadside	551377	224913	NO2	No	0.0	3.0	No	2.0
UT034	Four Ashes, Takeley	Roadside	556101	221243	NO2	No	8.0	1.5	No	2.0
UT036	Church Street, Saffron Walden	Urban Centre	553718	238530	NO2	Yes	0.0	1.0	No	2.0
UT037	Castle Street, Saffron Walden	Kerbside	553923	238770	NO2	Yes	1.0	1.0	No	2.0
UT039	Newport High Street	Roadside	552156	234034	NO2	No	0.0	1.2	No	2.0
UT040	Wawel Cottage, Newport	Roadside	552113	234505	NO2	No	0.0	6.0	No	2.0
UT041	Rose Cottage, Newport	Roadside	552091	233630	NO2	No	0.0	3.0	No	2.0
UT042	Debden Road, Newport	Roadside	552152	233878	NO2	No	0.5	0.5	No	2.0
UT043	Gaces Acre, Newport	Roadside	552135	234344	NO2	No	1.0	2.0	No	2.0
UT044, UT045, UT046	Thaxted Road Co-located 3	Roadside	554357	238443	NO2	Yes	0.0	2.0	Yes	2.0
UT047, UT048, UT049	London Road Co-located 3	Roadside	553570	237908	NO2	Yes	4.0	2.5	Yes	2.0
UT050	Walden South Road	Roadside	554103	238140	NO2	Yes	4.0	4.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
UT051	Walden Church Street 2	Roadside	553698	238528	NO2	Yes	0.0	2.0	No	2.0
UT052	Great Easton PS	Roadside	561074	225855	NO2	No	3.0	7.0	No	2.0
UT053	Dunmow High Stile	Roadside	562329	221841	NO2	No	4.0	16.0	No	2.0
UT054	Thaxted Bardfield Road	Kerbside	561443	230778	NO2	No	N/A	1.0	No	2.0
UT055	Stansted Hampton Road	Roadside	551347	224229	NO2	No	2.0	2.0	No	2.0
UT056	Elsenham High Street	Kerbside	553765	226322	NO2	No	1.0	1.0	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UTT2	554357	238444	Roadside	90.3	90.3	N/A	35.3	32.7	25	30.9
UTT3	553570	237908	Roadside	85.7	85.7	18.3	21.2	19.6	11.5	12.5

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

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

Notes:

The annual mean concentrations are presented as µg/m³.

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

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

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UT001	553709	238417	Urban Centre	90.4	90.4	34.0	29.8	30.0	23.9	23.1
UT003	553554	238218	Urban Background	90.4	90.4	13.4	12.0	11.1	9.1	8.5
UT004	553598	238595	Kerbside	100	100.0	38.0	35.5	35.1	26.9	27.1
UT005	554336	238454	Kerbside	100	100.0	38.0	36.4	33.9	26.0	26.6
UT009	552403	223965	Roadside	100	100.0	36.8	33.6	30.1	23.5	23.6
UT010	551246	233649	Kerbside	100	100.0	25.0	22.2	21.5	16.3	14.7
UT011	553697	238452	Urban Centre	100	100.0	31.0	29.0	26.3	19.9	21.7
UT012	553879	238510	Urban Background	100	100.0	16.2	15.4	15.5	11.0	10.8
UT015	553739	238317	Roadside	100	100.0	N/A	25.8	24.9	20.7	18.9
UT016	554413	238474	Roadside	100	100.0	N/A	32.1	30.7	23.1	24.7
UT017	560023	221444	Roadside	100	100.0	N/A	14.9	14.6	10.1	10.4
UT018	551035	225199	Roadside	100	100.0	N/A	26.7	24.4	20.0	18.6
UT019	550950	225039	Roadside	100	100.0	N/A	35.0	31.9	22.8	24.8
UT020	551535	225065	Roadside	100	100.0	N/A	35.7	30.7	25.3	25.2
UT021	554212	238436	Roadside	100	100.0	N/A	27.0	24.0	17.6	18.4
UT024	554671	221010	Rural	75	75.0	15.5	13.1	11.4	9.2	8.3
UT028	553755	238092	Roadside	92.3	92.3	37.4	33.4	31.2	24.8	25.0
UT029	553770	238076	Roadside	100	100.0	21.4	20.5	20.1	15.9	15.1
UT030	553875	237764	Kerbside	100	100.0	26.1	27.2	25.0	19.6	19.7
UT031	554178	237767	Roadside	100	100.0	21.4	19.8	20.7	15.2	15.8
UT032	553625	237856	Roadside	100	100.0	17.4	15.2	15.0	11.5	11.1
UT033	551377	224913	Roadside	100	100.0	27.0	26.9	23.8	18.7	20.4
UT034	556101	221243	Roadside	100	100.0	29.8	26.2	24.6	18.0	18.1
UT036	553718	238530	Urban Centre	100	100.0	20.9	19.2	18.4	14.3	13.6
UT037	553923	238770	Kerbside	100	100.0	24.0	22.0	22.4	16.8	15.7
UT039	552156	234034	Roadside	100	100.0	31.3	30.1	27.1	20.7	21.8
UT040	552113	234505	Roadside	92.3	92.3	N/A	19.8	20.5	15.5	15.3
UT041	552091	233630	Roadside	100	100.0	N/A	18.7	19.2	15.5	15.5
UT042	552152	233878	Roadside	100	100.0	N/A	N/A	24.1	18.7	17.2
UT043	552135	234344	Roadside	92.3	92.3	N/A	N/A	22.9	16.4	18.3

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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UT044, UT045, UT046	554357	238443	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	37.0	31.6	30.7
UT047, UT048, UT049	553570	237908	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	13.4
UT050	554103	238140	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	11.2
UT051	553698	238528	Roadside	90.4	90.4	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	21.5
UT052	561074	225855	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	17.4
UT053	562329	221841	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	12.1
UT054	561443	230778	Kerbside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	14.8
UT055	551347	224229	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	11.1
UT056	553765	226322	Kerbside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	16.0

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

Diffusion tube data has been bias adjusted

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

Notes:

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

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations in Saffron Walden AQMA

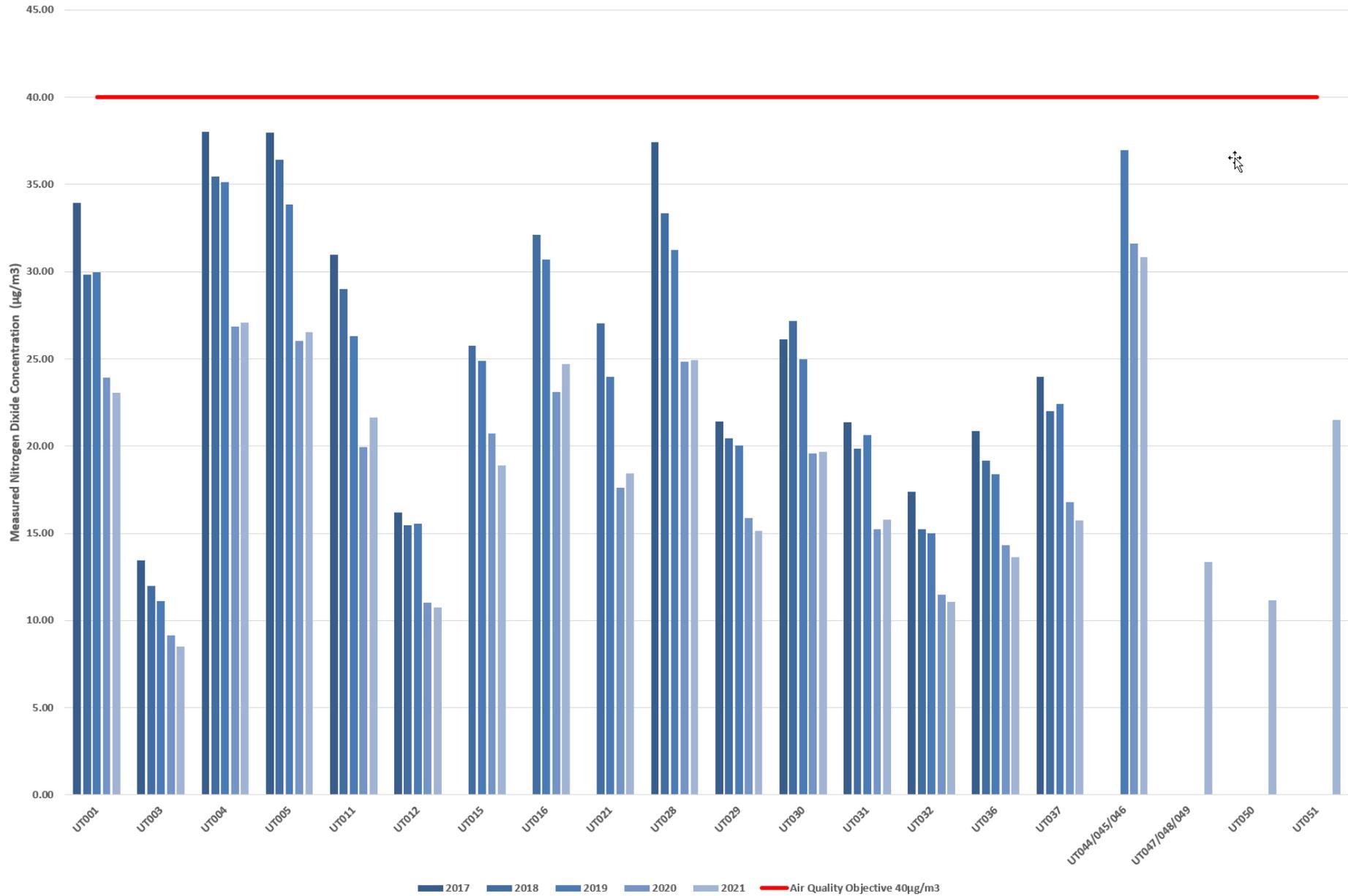


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UTT2	554357	238444	Roadside	90.3	90.3	N/A	0 (139.31)	8	0	0
UTT3	553570	237908	Roadside	85.7	85.7	1	0 (102.71)	0 (89.07)	0	0

Notes:

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

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.6 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UTT3	553570	237908	Roadside	99.2	99.2	24.2	25.5	24.7	27.1	28.1

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

Notes:

The annual mean concentrations are presented as µg/m³.

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

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UTT3	553570	237908	Roadside	99.2	99.2	19	8	16	8	13

Notes:

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

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

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

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

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

Table A.8 – Annual Mean PM_{2.5} Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
UTT3	553570	237908	Roadside	97.8	97.8	N/A	N/A	13.8	15.1	14.4

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

Notes:

The annual mean concentrations are presented as µg/m³.

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2021

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)
UT001	553709	238417	33.3	26.7	31.2	25.8	26.0	24.4	Missing	22.9	29.1	34.1	37.9	33.9	29.6	23.1
UT003	553554	238218	19.8	14.3	12.7	9.6	9.1	6.2	5.9	4.7	8.6	Missing	14.6	14.6	10.9	8.5
UT004	553598	238595	37.9	33.6	34.2	31.0	37.7	29.7	29.2	26.4	34.7	40.6	41.6	40.2	34.7	27.1
UT005	554336	238454	36.8	25.1	36.5	36.0	31.4	34.4	28.2	26.3	37.5	37.0	42.9	36.4	34.0	26.6
UT009	552403	223965	36.0	23.9	32.5	29.3	25.0	24.9	22.5	31.0	29.8	34.0	41.7	32.7	30.3	23.6
UT010	551246	233649	24.0	19.5	17.4	14.8	17.2	11.8	14.4	15.2	20.1	23.2	25.0	23.3	18.8	14.7
UT011	553697	238452	31.4	25.0	29.9	28.2	23.1	22.5	22.5	24.1	27.5	30.2	37.2	31.6	27.8	21.7
UT012	553879	238510	18.0	18.6	14.6	12.6	12.3	8.5	8.3	7.1	13.9	16.4	17.1	18.1	13.8	10.8
UT015	553739	238317	29.2	22.7	27.6	21.3	22.8	19.0	19.4	13.9	25.4	31.1	29.4	28.6	24.2	18.9
UT016	554413	238474	34.6	34.6	28.5	24.9	31.6	26.1	26.8	22.8	34.8	37.1	38.3	39.8	31.7	24.7
UT017	560023	221444	20.5	13.6	18.2	13.7	8.8	7.4	8.6	7.8	12.4	13.9	17.8	17.3	13.3	10.4
UT018	551035	225199	31.5	22.2	24.8	23.6	21.1	18.4	18.5	14.3	25.2	27.1	29.9	29.8	23.9	18.6
UT019	550950	225039	29.9	29.8	35.3	34.5	27.6	25.4	25.7	26.9	36.2	34.3	41.2	34.9	31.8	24.8
UT020	551535	225065	34.1	33.1	30.9	31.3	34.3	28.7	32.4	21.5	39.6	36.0	31.5	34.2	32.3	25.2
UT021	554212	238436	28.6	24.2	24.8	24.1	21.9	13.7	20.1	15.7	26.2	27.1	29.3	28.0	23.6	18.4
UT024	554671	221010	Missing	12.2	11.4	Missing	7.6	7.3	7.7	Missing	9.0	11.5	14.8	14.0	10.6	8.3
UT028	553755	238092	Missing	30.6	36.3	28.2	29.3	31.3	26.4	22.7	35.6	36.7	39.4	35.4	32.0	25.0
UT029	553770	238076	24.7	22.6	19.5	17.3	19.0	14.3	14.5	8.5	20.8	26.7	24.0	20.9	19.4	15.1
UT030	553875	237764	27.8	27.1	25.2	30.1	23.0	22.3	19.1	18.5	27.2	25.2	28.4	29.0	25.2	19.7
UT031	554178	237767	25.6	21.3	19.1	18.2	20.0	16.1	16.0	13.4	21.4	21.3	25.8	24.8	20.3	15.8
UT032	553625	237856	21.3	16.0	16.7	12.9	9.8	10.1	9.8	7.7	13.6	14.9	19.3	18.5	14.2	11.1
UT033	551377	224913	32.3	21.1	29.2	29.9	23.8	24.1	23.0	19.2	26.9	25.1	30.8	29.1	26.2	20.4
UT034	556101	221243	30.6	23.5	24.0	17.1	21.5	16.7	19.5	15.9	25.9	26.1	30.1	27.3	23.2	18.1
UT036	553718	238530	24.5	19.2	19.2	14.9	13.8	11.1	12.7	10.4	18.5	20.2	22.7	22.6	17.5	13.6
UT037	553923	238770	27.4	21.2	22.7	17.8	19.3	12.1	15.5	11.9	21.0	22.8	24.2	26.4	20.2	15.7
UT039	552156	234034	31.8	25.0	31.1	31.8	24.8	25.9	22.8	21.6	29.6	28.1	36.3	26.7	28.0	21.8

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)
UT040	552113	234505	Missing	19.2	19.7	17.3	16.5	17.1	15.4	16.6	21.7	22.3	26.0	23.6	19.6	15.3
UT041	552091	233630	24.7	23.0	20.9	20.6	14.9	15.1	14.1	14.1	21.5	22.1	24.1	24.1	19.9	15.5
UT042	552152	233878	23.9	17.4	23.1	19.7	23.1	17.3	19.0	6.3	27.6	29.4	29.4	28.7	22.1	17.2
UT043	552135	234344	28.1	26.5	Missing	22.4	21.0	18.1	19.0	16.4	23.9	25.1	29.5	28.0	23.5	18.3
UT044, UT045, UT046	554357	238443	34.2	42.2	36.6	35.3	42.1	37.3	36.7	32.9	45.8	44.1	41.9	42.6	39.3	30.7
UT047, UT048, UT049	553570	237908	23.2	19.9	18.5	16.5	15.4	10.6	11.6	9.9	17.4	19.4	20.6	22.6	17.1	13.4
UT050	554103	238140	20.8	16.9	17.1	12.3	10.6	8.7	8.1	9.4	11.6	16.9	20.3	19.1	14.3	11.2
UT051	553698	238528	27.4	27.4	28.4	25.5	26.5	23.2	23.5	24.3	29.1	Missing	34.8	33.1	27.6	21.5
UT052	561074	225855	31.0	19.5	21.3	17.7	21.3	18.1	17.4	16.7	21.9	24.2	29.5	29.7	22.4	17.4
UT053	562329	221841	23.5	14.1	16.9	12.5	9.3	11.8	9.6	10.5	16.3	18.9	23.0	19.8	15.5	12.1
UT054	561443	230778	19.8	19.5	20.6	16.2	17.6	15.4	13.9	14.1	21.6	22.6	23.1	23.7	19.0	14.8
UT055	551347	224229	17.2	16.6	16.7	11.4	10.7	9.1	9.8	8.7	14.2	18.3	19.9	17.7	14.2	11.1
UT056	553765	226322	26.7	18.7	21.2	18.7	17.5	14.7	15.7	14.4	21.5	24.2	28.1	25.3	20.6	16.0

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16
- National bias adjustment factor used
- Where applicable, data has been distance corrected for relevant exposure in the final column
- Uttlesford District Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

Notes:

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

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Uttlesford During 2021

Uttlesford District Council has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by Uttlesford District Council During 2021

Uttlesford District Council have not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

- Uttlesford District Council undertook monitoring at 39 sites in 2021.
- Uttlesford District Council adheres with the Diffusion Tube Monitoring Calendar
- The diffusion tubes were supplied by Socotec Didcot (UKAS Testing Laboratory number 1015) with a preparation method of 50% triethanolamine (TEA) in Acetone.
- The AIR NO₂ proficiency testing scheme found that the laboratory achieved the following percentage of results determined as satisfactory for 2021:

Table C.1 – AIR PT Results 2021

AIR PT Round	AIR PT AR42
Round conducted in the period	January – March 2021
SOCOTEC Didcot	100%

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Uttlesford recorded data capture of 75% therefore it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR has been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Uttlesford District Council have applied a national bias adjustment factor of 0.78 to the 2021 monitoring data. A summary of bias adjustment factors used by Uttlesford District Council the past five years is presented in Table C.3.

Table C.2 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.78
2020	National	05/21	0.77
2019	National	03/20	0.75
2018	National	03/19	0.76
2017	National	03/18	0.77

Uttlesford District Council undertakes co-location studies at two automatic air quality monitoring stations. The data collected at these has been used to calculate a local bias adjustment for comparison.

The local bias adjustment was calculated to be 0.74. However, the continuous monitor data capture for both sites was deemed to be poor.

The national bias adjustment factor of 0.78 has been applied to the 2021 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.

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Periods used to calculate bias	9	8
Bias Factor A		0.71 (0.65 - 0.78)
Bias Factor B		41% (28% - 54%)
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	39.9	17.8
Mean CV (Precision)	3.6%	6.6%
Automatic Mean ($\mu\text{g}/\text{m}^3$)	30.7	12.6
Data Capture	91%	93%
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)		13 (12 - 14)
Overall Diffusion Tube Precision	Good Overall Precision	Good Overall Precision
Overall Continuous Monitor Data Capture	Poor Overall Data Capture	Poor Overall Data Capture
Combined Local Bias Adjustment Factor	0.74	

NO₂ Fall-off with Distance from the Road

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

No diffusion tube NO₂ monitoring locations within Uttlesford required distance correction during 2021.

QA/QC of Automatic Monitoring

Uttlesford District Council operates two automatic monitoring sites measuring NO₂, PM_{2.5} and PM₁₀. Data from these sites is collected by a contractor.

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

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

The nitrogen dioxide analysers are calibrated monthly with a certified reference gas. Particulate monitors have their filter tapes changed every two months. All automatic monitoring sites are colocated with triplicate NO₂ diffusion tubes.

Data ratification for the analyser contains following processes;

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

Automatic Monitoring Annualisation

The automatic monitoring sites within Uttlesford recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

NO₂ Fall-off with Distance from the Road

The automatic monitoring sites within Uttlesford did not require distance correction during 2021.

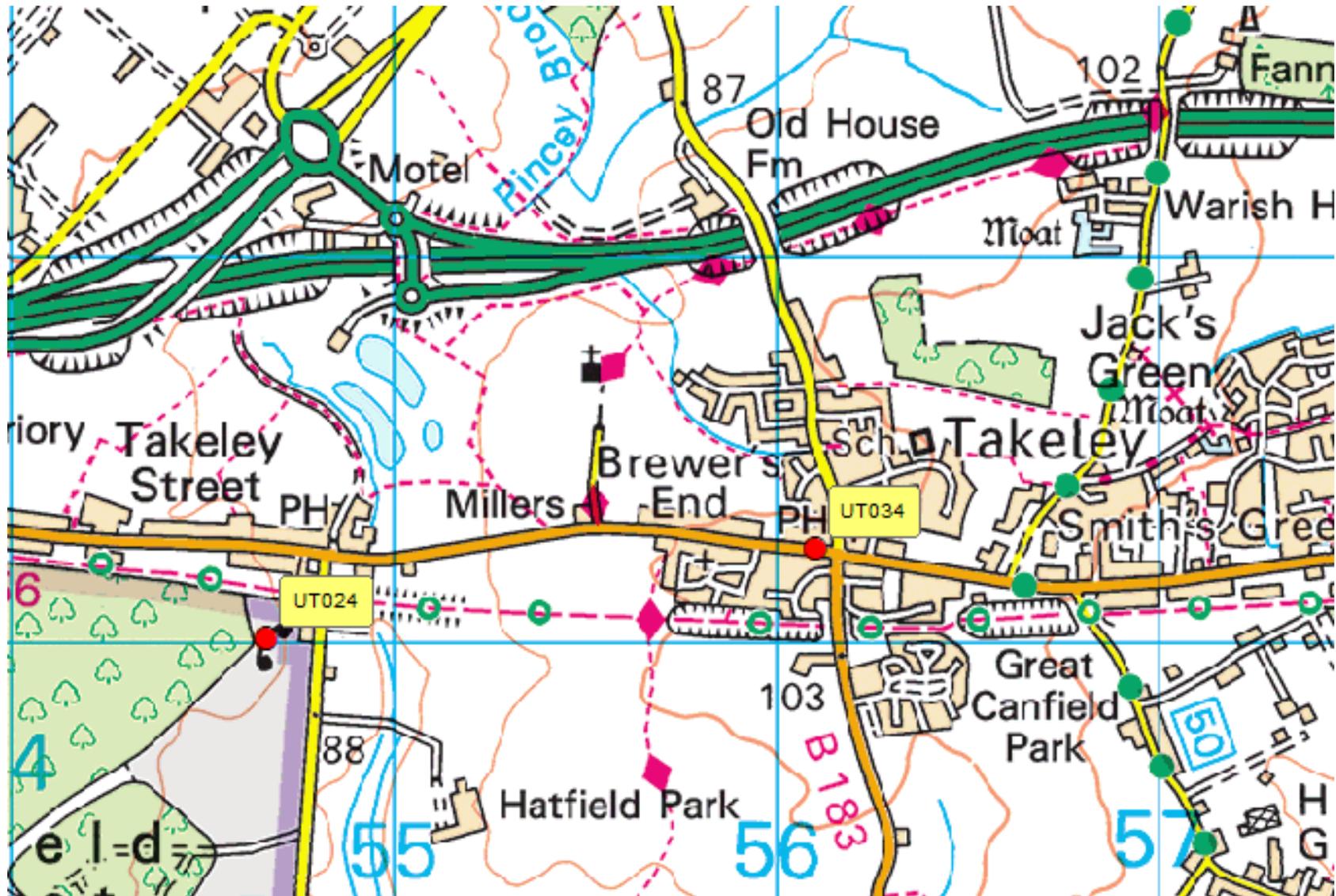
Appendix D: Maps of Monitoring Locations and AQMA

Figure D.1 – Monitoring Location Map: Saffron Walden AQMA



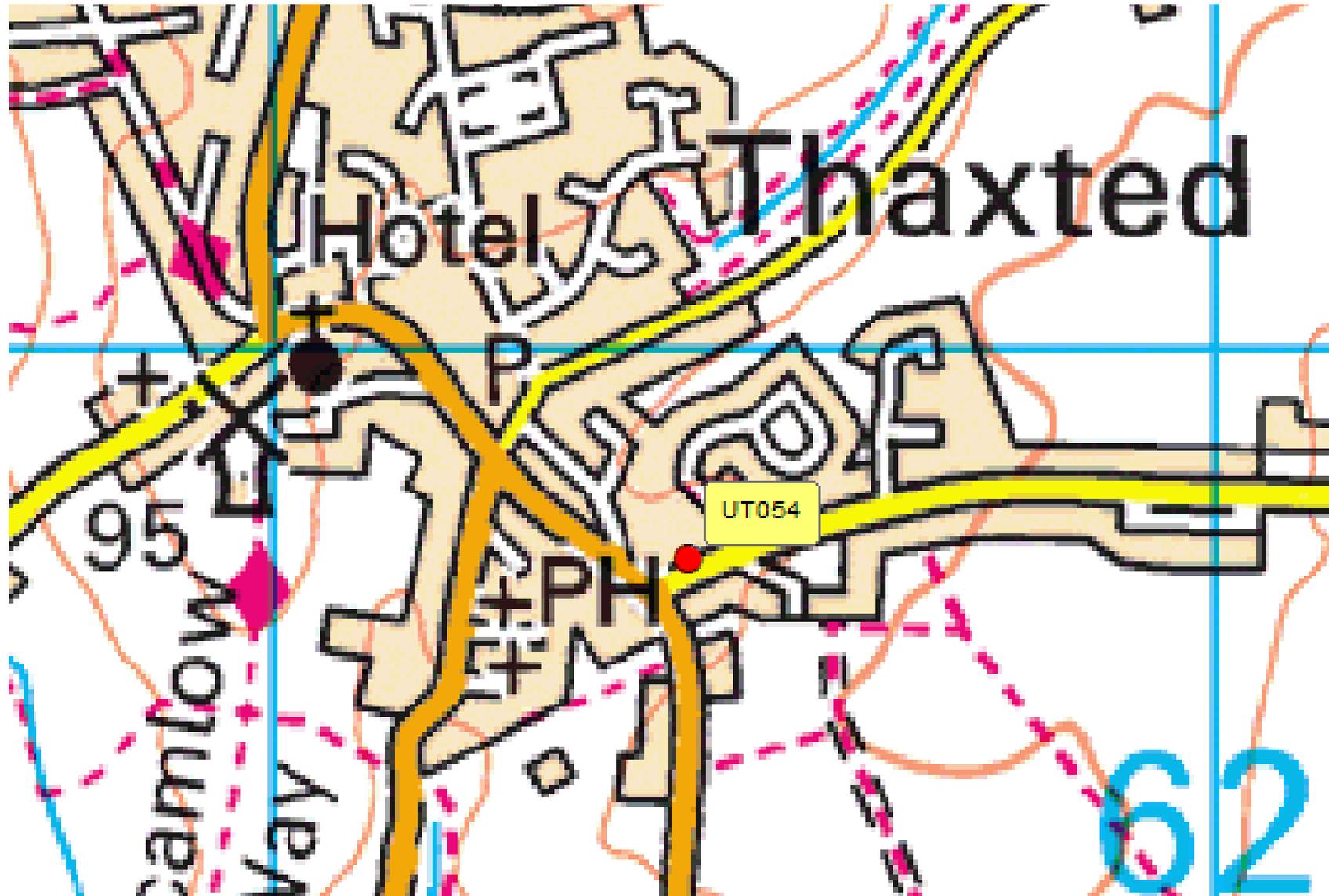
Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure D.2 – Monitoring Location Map: Takeley



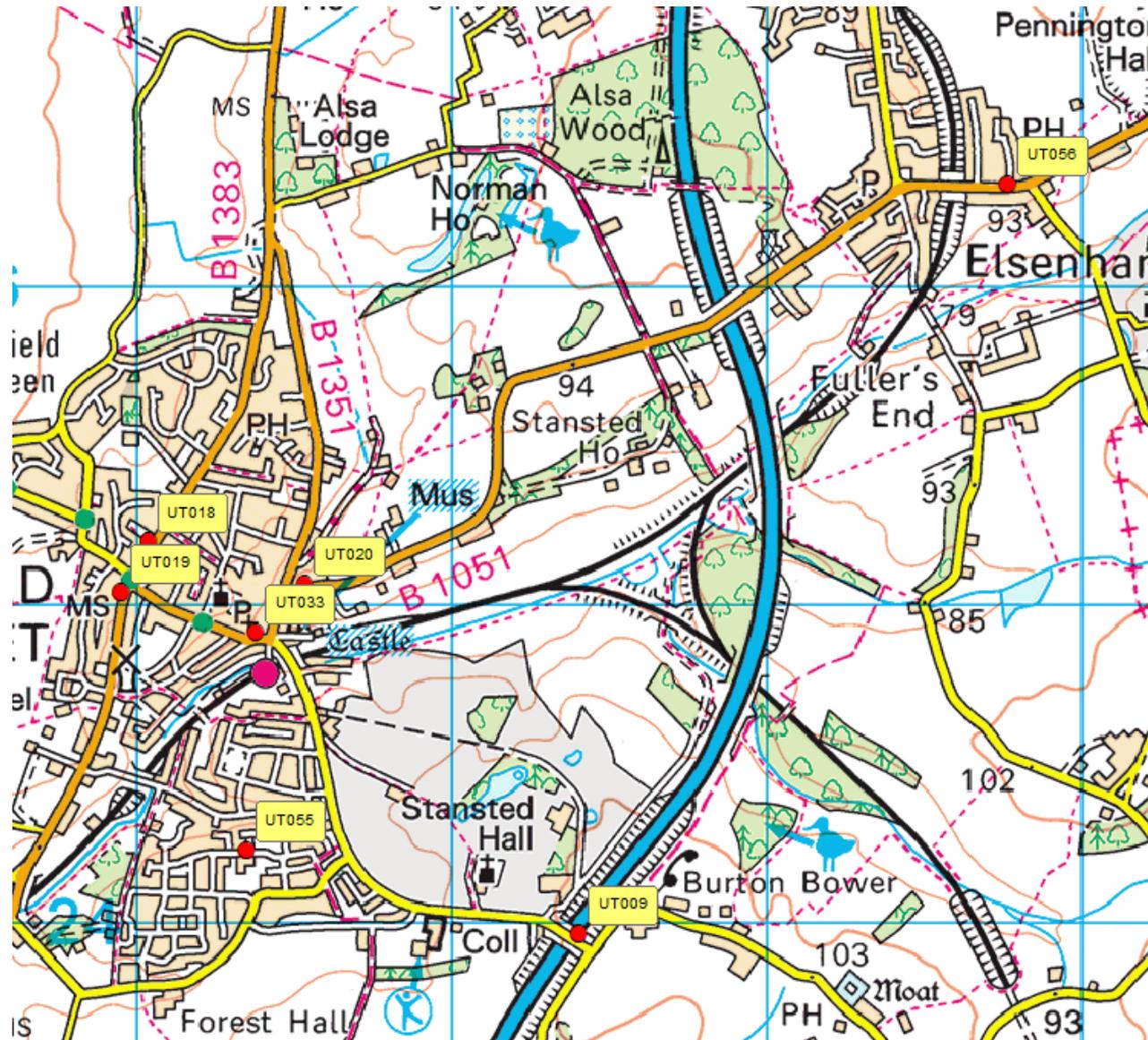
Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure D.3 – Monitoring Location Map: Thaxted



Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure D.4 – Monitoring Location Map: Stansted & Elsenham



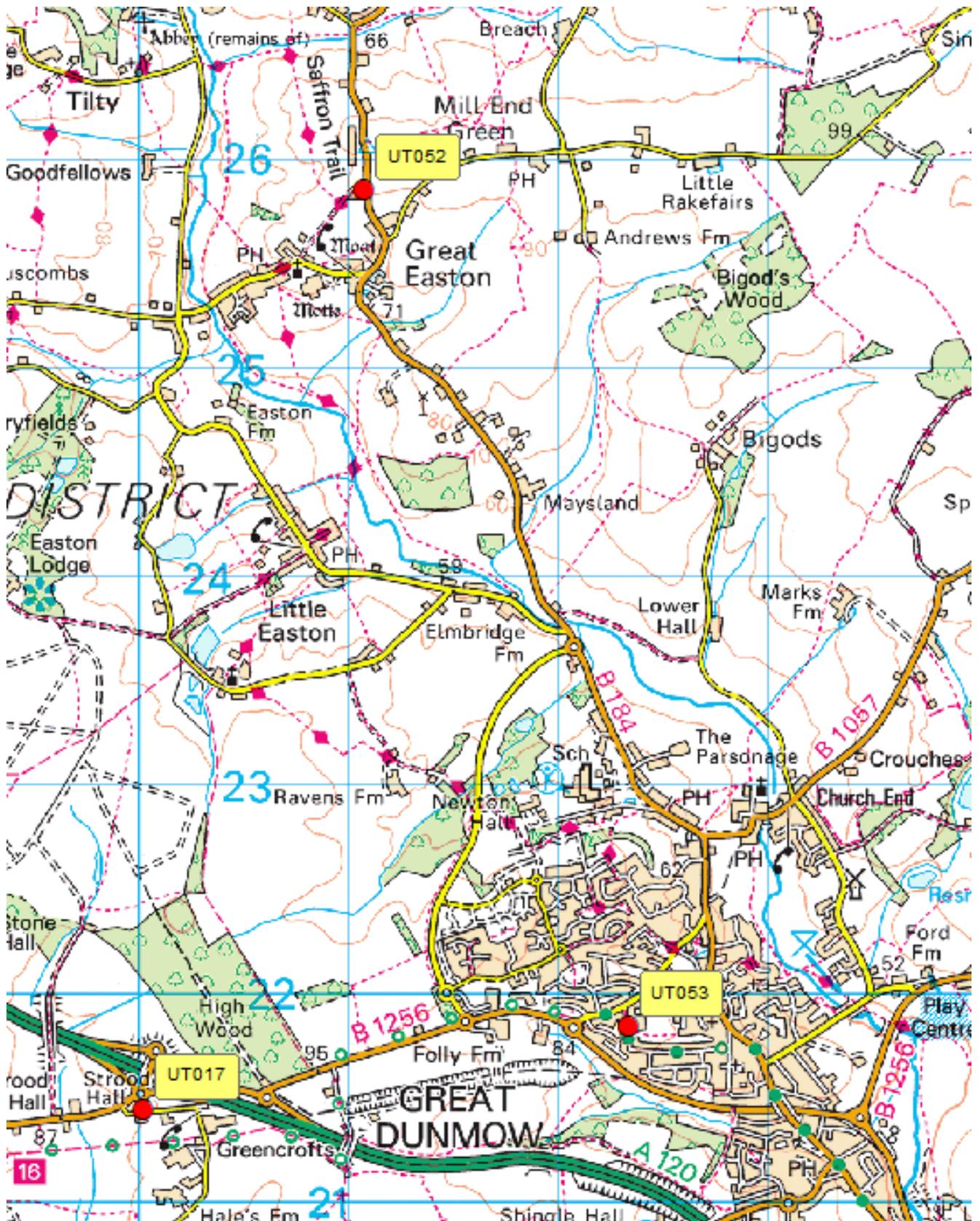
Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure D.5 – Monitoring Location Map: Newport



Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure D.6 – Monitoring Location Map: Great Dunmow & Great Easton



Crown copyright and database rights 2022 Ordnance Survey 100023562

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁵

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

⁵ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Non-Reference Air Quality Sensors

In 2021 Uttlesford District Council employed three low cost sensors to measure pollution within the district. Data analysis has found that some of the datasets should be excluded on quality grounds. The finalised results for 2021 are in the table below:

Table F.1 – Non-Reference Air Quality Sensors

Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Sensor	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			
							NO2	O3	PM2.5	PM10
Hill House	Roadside	555917	223377	NO2 / O3 / PM2.5 / PM10	No	Aeroqual AQY	Poor Data Quality No Results	Poor Data Quality No Results	Poor Data Quality No Results	Poor Data Quality No Results
Thaxted	Roadside	561224	230889	NO2 / O3 / PM2.5 / PM10	No	Aeroqual AQY	21.8	41.8	5.8	10.7
Junction Thaxted Rd & Radwinter Rd, Saffron Walden	Roadside	554357	238444	PM2.5 / PM10	Yes	Osiris Particle Monitor	27.9	N/A	6.5	12.6

The data obtained from non-reference air quality sensors can be useful in determining long term trends however as it is not of reference quality shouldn't be used as evidence for undertaking air quality or planning and development management related decisions.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQIA	Air Quality Impact Assessment – Reports provided in support of planning applications.
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air Quality Annual Status Report
CVTF	Clean Vehicle Technology Fund – A DfT fund that provides grants for upgrading vehicles to reduce emissions in areas of poor air quality
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EU	European Union
Euro Standard	Euro standards define the acceptable limits for exhaust emissions of new vehicles sold in EU and EEA member states.
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SCRT	Selective Catalytic Reduction Technology – Retrofitted equipment to reduce bus emissions
Street Canyon	Road which is flanked by buildings resembling a canyon
TEA	Triethanolamine – substance used in diffusion tubes for absorbing nitrogen dioxide
UK-AIR	An information resource providing in-depth information on air quality and air pollution in the UK. A range of information is available, from the latest pollution levels , pollution forecast information , a data archive , and details of the various monitoring networks .
UKAS	United Kingdom Accreditation Service

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 NO₂ 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>
- Liftshare website available at; <https://liftshare.com/uk/community/uttlesford/register>
- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Public Health Outcomes Framework Indicator D01 available at; <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework>
- Uttlesford Air Quality Action Plan 2017 – 2022 available at; [https://www.uttlesford.gov.uk/media/7346/Air-Quality-Action-Plan-2017-2022/pdf/AQMA Action Plan Nov 2017 pdfa.pdf?m=636988925812370000](https://www.uttlesford.gov.uk/media/7346/Air-Quality-Action-Plan-2017-2022/pdf/AQMA%20Action%20Plan%20Nov%202017%20pdfa.pdf?m=636988925812370000)