Harlow Council

Working together for Harlow

2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June, 2022

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Executive Summary: Air Quality in Our Area

The 2022 Annual Status Report is designed to provide the public with information relating to local air quality in Harlow, to fulfil Harlow Council's statutory duty to review and assess air quality within its area, and to determine whether or not the air quality objectives are likely to be achieved.

In 2021, Harlow Council measured **no** exceedances of the Air Quality Objectives.

Air Quality in Harlow

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

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Traffic emissions are the most significant source of air pollution in Harlow. The main roads in the District are the M11 and the A414. In addition, there a number of industrial processes. The majority of these are located in the two main industrial areas of the town: Templefields (to the north) and the Pinnacles (to the north west).

The Council recognises the importance of working with partnering Authorities such as with Essex County Council to make improvements to local transport infrastructure and also to fulfil its own regulatory responsibility towards industrial processes.

Air pollution is considered to be generally low in Harlow and monitoring of local Air Quality has measured no exceedances of air quality objective at relevant exposure. The trend of results across all monitored sites indicates that Air Quality is improving. A graph can be found in Appendix A that shows monitoring results from 2017 to 2021.

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017
[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Air quality appraisal: damage cost guidance, July 2020
[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Air quality in Harlow meets the Air Quality Objectives. However, significant development around the Harlow means that investment in the town's infrastructure is required to manage congestion, maintain good air quality and support future local economic growth.

Conclusions and Priorities

Harlow Council have concluded that:

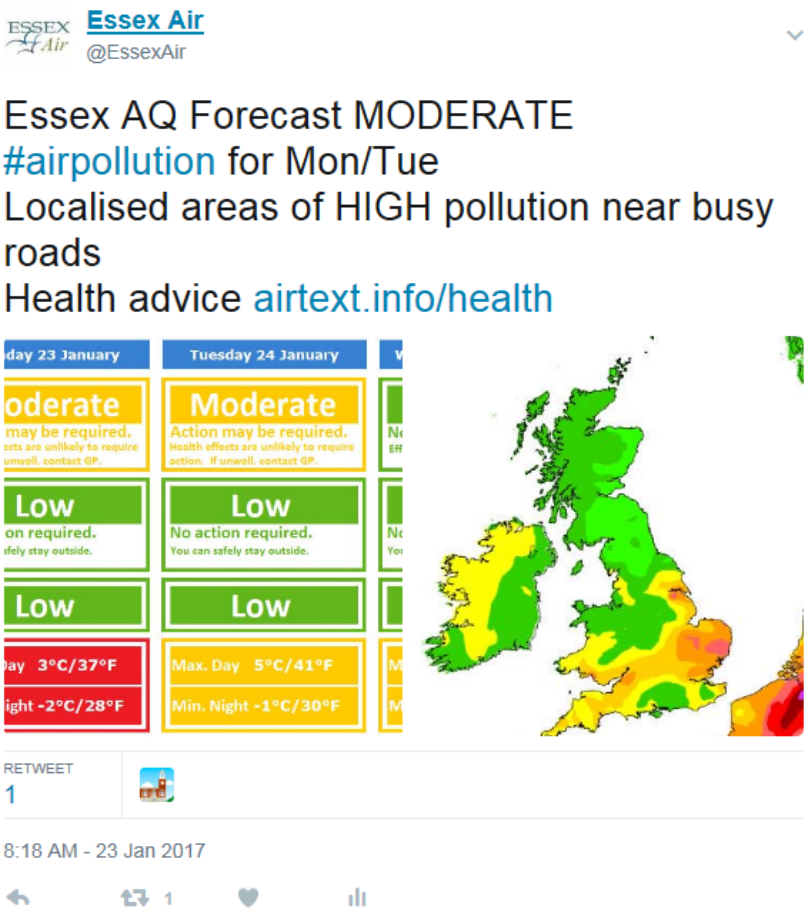
- No air quality exceedances have been identified in 2021.
- There are no new developments that will have an impact on air quality.

5 Defra. Clean Air Strategy, 2019
6 DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

Local Engagement and How to get Involved

Harlow 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 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

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

Local Responsibilities and Commitment

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

This ASR has been approved by:

Michael Pitt – Assistant Director Communities and Environment, Harlow Council

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

If you have any comments on this ASR please send them to Norah Nolan 01279 446655

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Harlow Council

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1 Local Air Quality Management

This report provides an overview of air quality in Harlow 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 Harlow 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..

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

Harlow Council currently does not have any declared AQMAs.

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

Defra's appraisal of last year's ASR concluded that the report is detailed, concise and satisfies the criteria of relevant standards and that the Council should continue their good and thorough work.

Harlow Council and Essex County Council have a number of ongoing measures to improve air quality in Harlow. These are detailed in Table 2.1 below.

Table 2.1 – 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	Essex Carshare	Alternatives to private vehicle use	Car & lift sharing schemes	2014	Ongoing	Essex County Council	Essex County Council	NO	Funded	< £10k	Implementation	Not quantified	N/A	Ongoing	
2	Travel Budi	Alternatives to private vehicle use	Car & lift sharing schemes	2007	Ongoing	Harlow Council	Harlow Council	NO	Funded	< £10k	Implementation	Not quantified	N/A	Ongoing	
3	Member of Essex air	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	N/A	Ongoing	County Council / District & Borough Councils	N/A	NO	Funded	< £10k	Implementation	Not quantified	N/A	Ongoing	
4	Environmental Permit Inspection & Enforcement	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	N/A	Ongoing	Harlow Council	Harlow Council	NO	Funded	< £10k	Implementation	Not quantified	N/A	Ongoing	
5	M11 J7a and associated improvements	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2016	2022	Essex County Council	Essex County Council	NO	Funded	£1 million - £10 million	Implementation	Not quantified	N/A	Construction has commenced	Opening of the junction due in June 2022

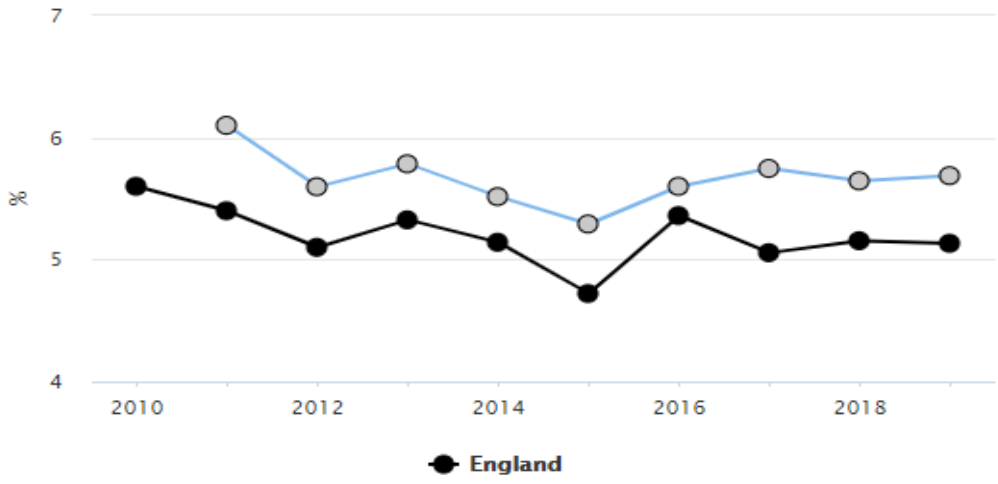
2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

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.

Harlow Council does not monitor $PM_{2.5}$ concentrations however notes the Defra background mapping resource which for $PM_{2.5}$ in 2021 models a maximum annual mean concentration of 10.8µg/m^3 in the Local Authority area.

The Public Health Outcomes Framework indicator D01 – Fraction of mortality attributable to particulate ($PM_{2.5}$) air pollution which for 2019 gave a value of 5.7% which has improved from 6.1% in 2011. 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



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

- Regular inspections of permitted industry where combustion and non-combustion processes could lead to anthropogenic emissions of $PM_{2.5}$
- Working with Essex County Council (highway authority) to deliver Major Transport improvement schemes to alleviate congestion. In addition to reduced exhaust emissions, these schemes will reduce non-exhaust emissions from brake and tyre wear by making traffic flows smoother.

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

This section sets out the monitoring undertaken within 2021 by Harlow 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.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Harlow Council does not undertake automatic continuous monitoring.

3.1.2 Non-Automatic Monitoring Sites

Harlow Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 13 sites during 2021. **Error! Reference source not found.** in Appendix A presents the details of the non-a utomatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.1 and **Error! Reference source not found.** in Appendix A compare the ratified and a djusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in **Error! Reference source not found.** includes d istance corrected values, only where relevant.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HAR8	East Park	Suburban	546942	211186	NO_2	No	11.0	23.2	No	2.0
HAR9	Gardiners	Urban Background	546888	209435	NO_2	No	7.6	1.2	No	2.0
HAR10	Dadds Wood	Urban Background	544434	209709	NO_2	No	12.5	33.4	No	2.0
HAR11	Town Centre	Kerbside	544680	210016	NO_2	No	13.2	6.3	No	2.0
HAR13	Guilfords	Suburban	547524	212479	NO_2	No	14.2	1.0	No	2.0
HAR16	Chalk Lane	Rural	549472	211594	NO_2	No	14.0	1.5	No	2.0
HAR17	Rivermill	Kerbside	544297	210988	NO_2	No	20.0	0.8	No	2.0
HAR18	Station Approach	Urban Background	544640	211192	NO_2	No	0.0	4.7	No	2.0
HAR19	Finchmoor	Roadside	544498.974	208325.59	NO_2	No	8.0	0.0	No	2.0
HAR20	Broadley Road	Roadside	543084.64	207700.97	NO_2	No	2.0	1.0	No	2.0
HAR21	Commonside Road	Roadside	546031.33	208039.17	NO_2	No	13.0	1.5	No	2.0
HAR22	Challinor	Roadside	548307.03	209702.15	NO_2	No	8.0	1.5	No	2.0
HAR23	Sheering Road	Roadside	548711	211990	NO_2	No	9.0	0.5	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.2 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
HAR8	546942	211186	Suburban	100	100.0	25.2	21.9	22.6	17.4	16.8
HAR9	546888	209435	Urban Background	100	100.0	30.0	24.2	24.5	19.6	18.7
HAR10	544434	209709	Urban Background	100	100.0	27.5	24.6	24.4	19.5	18.7
HAR11	544680	210016	Kerbside	67.3	67.3	29.8	27.5	25.1	19.4	19.9
HAR13	547524	212479	Suburban	75.0	75.0	16.6	13.7	14.9	11.3	12.4
HAR16	549472	211594	Rural	100	100.0	18.9	18.7	17.3	12.4	12.3
HAR17	544297	210988	Kerbside	100	100.0	26.0	23.9	21.9	17.3	17.9
HAR18	544640	211192	Urban Background	100	100.0	30.8	24.4	27.5	20.8	20.4
HAR19	544498.974	208325.59	Roadside	84.6	84.6	N/A	N/A	19.4	14.0	14.3
HAR20	543084.64	207700.97	Roadside	84.6	84.6	N/A	N/A	18.1	14.5	14.6
HAR21	546031.33	208039.17	Roadside	75.0	75.0	N/A	N/A	23.3	18.7	17.6
HAR22	548307.03	209702.15	Roadside	100	100.0	N/A	N/A	21.5	18.0	16.6
HAR23	548711	211990	Roadside	100	100.0	N/A	N/A	N/A	N/A	13.7

☒ **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 µg/m^3.

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

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

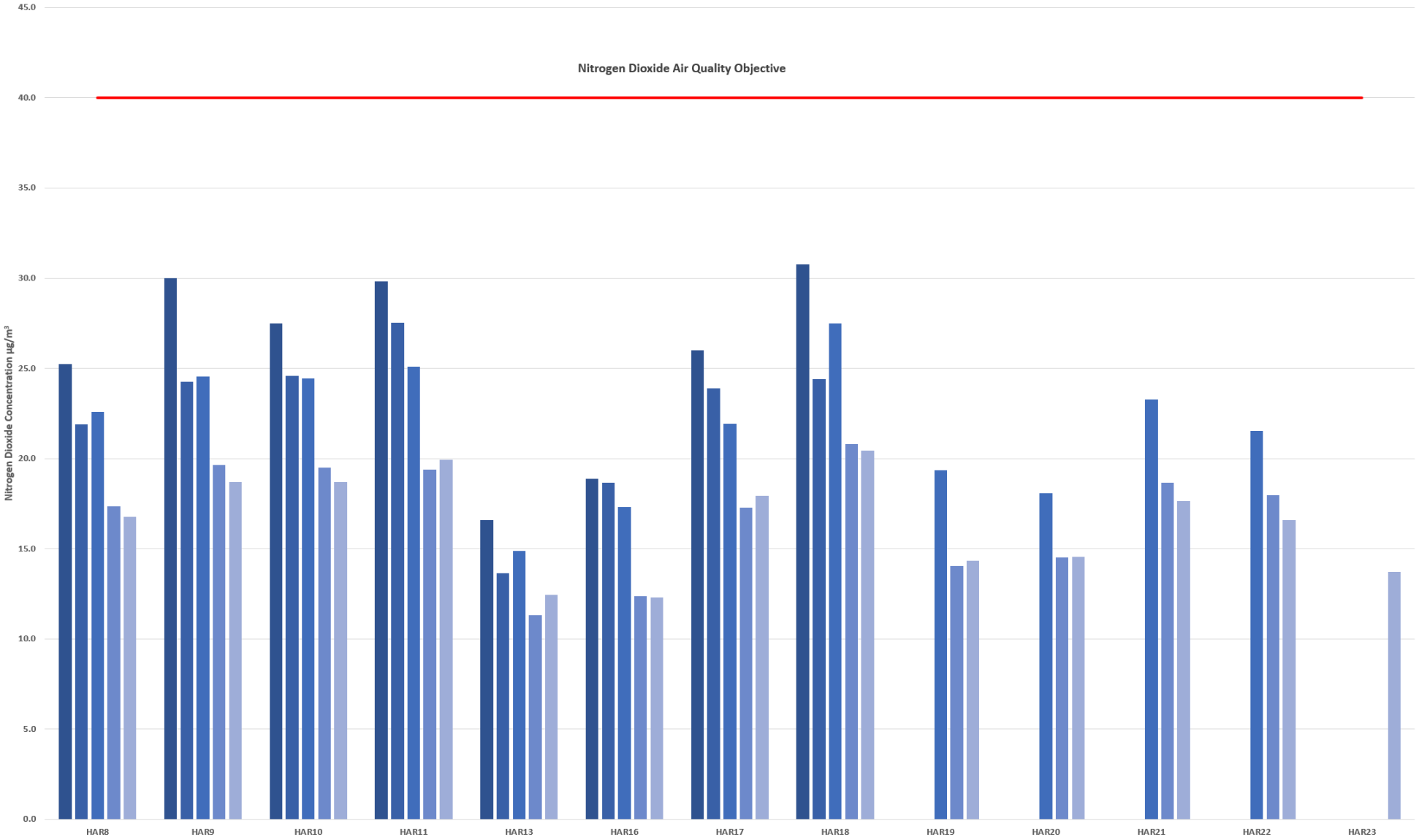
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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 NO_2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)	Annual Mean: Distance Corrected to Nearest Exposure
HAR8	546942	211186	29.3	24.6	18.7	14.6	18.2	15.3	16.4	16.5	24.3	24.2	28.2	27.9	21.5	16.8	N/A
HAR9	546888	209435	31.6	25.1	29.4	18.5	18.2	8.9	17.6	19.4	24.1	29.0	34.5	31.4	24.0	18.7	N/A
HAR10	544434	209709	30.4	27.6	27.4	19.0	20.4	19.1	17.5	12.3	24.4	29.1	32.7	27.9	24.0	18.7	N/A
HAR11	544680	210016	29.3	27.6	25.8	Missing	No Access	Missing	24.6	18.4	25.8	28.8	Missing	35.2	26.9	19.9	N/A
HAR13	547524	212479	22.0	17.1	14.9	9.6	11.9	8.5	Missing	Missing	Missing	19.4	22.1	18.0	15.9	12.4	N/A
HAR16	549472	211594	20.5	21.2	18.1	13.1	11.5	10.9	12.1	7.9	17.8	17.2	18.8	20.2	15.8	12.3	N/A
HAR17	544297	210988	27.4	23.1	26.4	16.6	20.4	21.1	18.0	17.8	25.5	23.1	29.7	26.9	23.0	17.9	N/A
HAR18	544640	211192	31.2	29.2	23.8	18.5	22.2	20.0	20.7	19.2	28.5	33.4	35.8	31.9	26.2	20.4	N/A
HAR19	544499	208326	Missing	Missing	21.7	14.2	16.6	13.5	15.0	12.5	22.6	27.0	14.2	26.3	18.4	14.3	N/A
HAR20	543085	207701	26.1	21.4	22.3	14.8	15.9	13.6	14.1	Missing	18.4	18.2	Missing	21.9	18.7	14.6	N/A
HAR21	546031	208039	28.5	27.7	22.4	17.5	17.1	15.1	Missing	Missing	21.7	27.5	Missing	26.0	22.6	17.6	N/A
HAR22	548307	209702	30.8	15.5	24.1	17.0	15.4	16.0	14.3	15.3	23.6	25.8	28.2	29.1	21.3	16.6	N/A
HAR23	548711	211990	24.5	19.7	19.0	12.9	12.2	11.7	11.8	13.7	17.8	21.2	23.7	22.7	17.6	13.7	N/A

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

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

☒ **National bias adjustment factor used**

It has not been necessary to distance corrected the data for relevant exposure

☒ **Harlow Council confirms that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Harlow During 2021

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

Additional Air Quality Works Undertaken by Harlow During 2021

Harlow Council has not completed any additional air quality works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

- Harlow Council undertook monitoring at 13 sites in 2021.
- Harlow Council adheres with the Diffusion Tube Monitoring Calendar.
- The diffusion tubes were supplied by Socotec (UKAS Testing Laboratory number 1015) with a preparation method of 50% triethanolamine (TEA) in Acetone.
- The AIR NO_2 proficiency testing scheme found that the laboratory achieved the following percentage of results determined as satisfactory for 2021:

Table C.1 – AIR PT Results 2021

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

Diffusion Tube Annualisation

Diffusion tube HAR 11 had a valid data capture of less than 75%. Data annualisation was undertaken using the Defra Diffusion Tube Processing Tool with calculations shown in Table C.2

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Chignal St James	Annualisation Factor Rochester Stoke	Annualisation Factor St Osyth	Annualisation Factor Wicken Fen	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
HAR 11	0.9676	0.9650	0.9181	0.9425	0.9483	26.9	25.5

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Harlow Council have applied a national bias adjustment factor of 0.78 to the 2021 monitoring data. A summary of bias adjustment factors used by Harlow Council over the past five years is presented in Table C.2.

Table C.3 – Bias Adjustment Factor

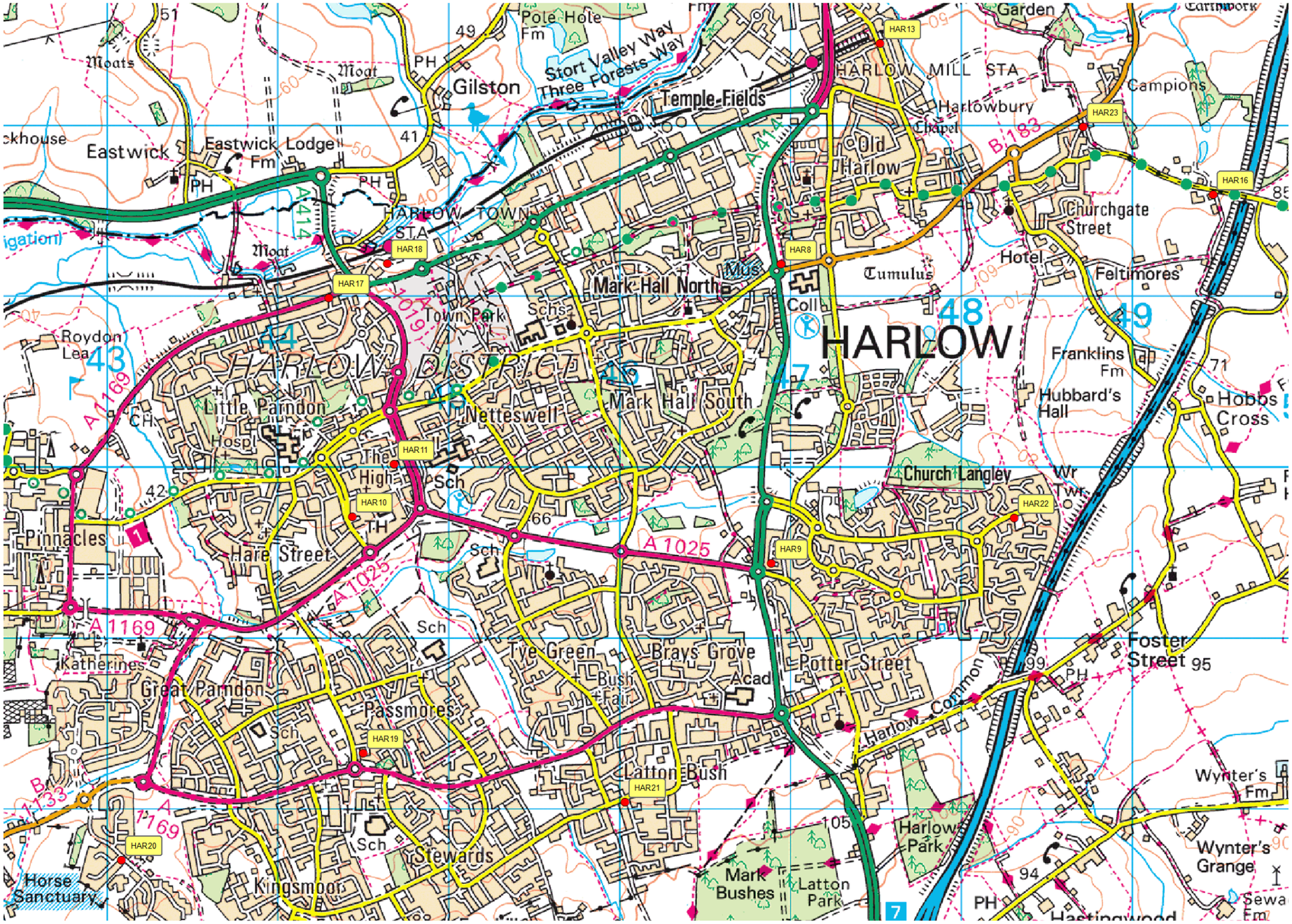
Monitoring Year	**Local or National**	**Diffusion Tube**	**Version of National Spreadsheet**	Adjustment Factor
2021	National	Socotec 50% TEA in Acetone	03/22	0.78
2020	National	Socotec 50% TEA in Acetone	03/21	0.77
2019	National	Socotec 50% TEA in Acetone	03/20	0.75
2018	National	ESG Didcot 50% TEA in Acetone	03/19	0.76
2017	National	ESG Didcot 50% TEA in Acetone	03/18	0.77

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Harlow required distance correction during 2021.

Appendix D: Map of Monitoring Locations

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



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Appendix E: Summary of Air Quality Objectives in England

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

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

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

Glossary of Terms

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

References

- Defra Diffusion Tube Bias Adjustment Factors Spreadsheet available at; https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
- Defra LAQM Summary of Laboratory Performance in AIR NO_2 PT Scheme available at; https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html
- Essex Air Quality Consortium available at; http://www.essexair.org.uk
- EssexCarShare.com available at; https://liftshare.com/uk/community/essex
- Essex Air Twitter Feed available at; https://twitter.com/essexair
- 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 available at; https://laqm.defra.gov.uk/technical-guidance/
- 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 available at; https://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf
- Public Health Outcomes Framework Indicator D01 available at; https://fingertips.phe.org.uk/profile/public-health-outcomes-framework