

2018 Air Quality Annual Status Report (ASR)

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

September 2018

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Executive Summary: Air Quality in Our Area

Air Quality in Thurrock

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 billion³.

Thurrock currently has 18 Air Quality Management Areas (AQMA's); these are a result of traffic related pollution along busy roads. Many of these roads are the main commuter routes or used for logistical purposes. They are often saturated with traffic during peak hours and in many of these areas there is relevant public exposure, predominantly in the form of residential dwellings which are in relatively close proximity to these roads. A full list of the AQMA's can be found on the Defra Air Quality website via this web-link: - https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=282

The main pollutant of concern in Thurrock is nitrogen dioxide (NO₂) and to a lesser extent particulate matter (PM₁₀); both of these pollutants arise from road traffic emissions. Thurrock only has AQMA's which are declared for road traffic based emissions, there are no industrial based AQMA's. The AQMA's are primarily related to NO₂ and the long-term objective or annual mean 40 µg/m³ objectives, which is the principal issue in all 18 AQMA's. Out of these AQMA's there are currently four declared for PM₁₀, for the short-term objective or daily mean objective of 35 permitted exceedances of >50 µg/m³.

In 2016 two AQMA's were declared in Thurrock for breaching the annual mean objective for NO₂; one in Aveley High Street and Ship Lane, Aveley and a second declared along the Purfleet By-pass, north of Purfleet. Air Quality Action Plans

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

(AQAPs) along with a new Air Quality & Health Strategy Document (AQHSD) have already been devised and can be viewed via the Thurrock Council Website links here:- <https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy>
[thurrock.gov.uk/air-quality](https://www.thurrock.gov.uk/air-quality)

The Council works in collaboration with the Environment Agency (EA) on any air quality issues from industrial activities within the borough, consulting as necessary on these industrial activities, that is permitting variations/applications which the EA are responsible for under the Integrated Pollution Prevention & Control Directive (IPPC). The Council also carries out its statutory duties under Local Authority integrated Pollution & Prevention Control Regime (LA-IPPC).

In 2016 the council undertook a detailed modelling assessment to re-determine the extent of NO₂ & PM₁₀ exceedances over most of the borough and including all 18 AQMA's. The report found that 8 AQMA's should be revoked for NO₂ and all four for PM₁₀ should also be revoked. However on submission of the report to Defra they did not agree with the method the council had used in the model, as it did not strictly follow the procedures laid out in the Defra Local Air Quality Management (LAQM) Technical Guidance (TG16).

The Council had manually adjusted emission rates on the roads modelled until it got agreement with nearby monitoring results in order to validate the model against. In many cases increasing them drastically to account for the discrepancies within the in-built emission factors which grossly under-estimate real world emissions. The Council did this as it wanted to avoid using any correction factors applied to the results which would not be representative across all the monitoring locations.

The modelling had to be done differently in order to generate a valid exceedance line over a geographical area, something which the TG16 guidance does not take into account at present. Also the current emission factor toolkit and previous versions used in the base model runs is not fit for purpose within the current Atmospheric Dispersion Model System (ADMS) model and does not represent real world driving emissions.

Even though the report was not accepted, the modelling did highlight that many of these AQMAs are no longer likely to be in exceedance. Based on the feedback given by the LAQM Helpdesk from the modelling assessment, the Council has therefore set up 12 additional monitoring locations from 2017 using NO₂ diffusion tubes within many of these locations. It is hoped that these areas in the future will be revoked. The Council will monitor at these locations for at least three years to get a trend and will make a determination in 2020 as to whether these AQMAs can be revoked for NO₂ on the back of monitoring results instead of modelling.

Thurrock Council as of 2018 has recently joined the AirTEXT service which is provided by Cambridge Environmental Research Consultants (CERC). This service will allow members of the public to see air pollution forecasting based on detailed dispersion modelling for the area in which they live. They can also sign up to AirTEXT pollution alerts and receive voice, email or text messages when air pollution is forecast to be moderate or higher. This service is aimed to provide people who suffer with respiratory illnesses, as well as those which suffer with heart problems, detailed information about air quality on a given day, and alert them when not to go outside. Further information can be found at: <http://www.airtext.info> & <http://www.cerc.co.uk/forecasting/air-quality/united-kingdom.html>

Actions to Improve Air Quality

In 2016, the council, in consultation with stakeholders, produced a strategy that frames its approach to tackling poor air quality and reducing exposure to safe levels across the borough. The Health and Air Quality Strategy sets out the council's overarching objectives for air quality and contains policies and actions that the council will take to improve air quality.

The actions contained in the Health and Air Quality Strategy consists of borough-wide actions and specific actions to improve air quality in prioritised AQMAs in the borough. The creation of the Congestion Task Force (CTF), which brings together stakeholders with a major stake in the strategic road network, such as Highways England, Kent County Council, Essex County Council and Thurrock Council and the Police collaborate together to formulate and implement actions to better manage the

road network following incidents at Dartford Crossing. This engagement is on-going and seeking to eliminate other pinch-points which contribute to poor air quality, such as devolving powers to enforce yellow box junctions at Junctions of the M25, which cause significant congestion. Additional measures to be implemented by the Council include investment in new technologies to help dynamically tackle congestion, limiting the impact of traffic on air quality.

In 2016, a review of HGV routing in Thurrock was undertaken. This review identified areas where specific actions need to be taken to reduce the air quality impacts of the HGVs. To date, the council has implemented width and weight restrictions, camera enforcement, parking restrictions and other measures that seek to reduce the air quality issues created by HGVs.

As part of the South Essex Active Travel (SEAT) Programme the council continues to work with people in a transitional stage of life to encourage sustainable travel options prior to behavioural decision-making processes e.g. commencing new employment/education. These measures are to continue until March 2020. Other actions aimed at encouraging a shift towards sustainable modes of travel include the Cycle Infrastructure Programme that seeks to deliver new and improved cycle infrastructure to encourage a mode shift towards cycling, and consequently a reduction in car trips and reduced air pollution. The Council continues to invest in its cycle infrastructure, and seeking additional funds to create new and enhanced cycle paths and priority crossings.

The Council continues to engage with Highways England in discussions regarding the air quality and other environmental and social impacts of the long-proposed Lower Thames Crossing, as well as other schemes which will help to alleviate traffic, including new slip roads linking the A13 with the A126, helping to mitigate traffic at J30 and J31 of the M25.

Conclusions and Priorities

This year's ASR report has not identified any new areas of exceedance of the Air Quality Objectives (AQOs). The air quality objectives continue to be breached in

most of the council's AQMA's with only slight decreases or no change in pollution concentrations in most of these.

However there are some AQMA's in which monitoring is below the AQOs and has been for some time, this was also verified by the Council's own air quality modelling conducted in 2016, which concluded that 8 AQMA's would be revoked for NO₂ and PM₁₀, however Defra did not agree with the Council's approach to this modelling work due to not following the guidelines of the TG16 guidance on emission factors used within the modelling, and thus these AQMA's still remain in place.

The Council will in 2020 review and decide whether these AQMA's are still valid or not, and subsequently revoke those that have shown levels to be below the air quality objective for NO₂. The Council has therefore decided to continue monitoring at these locations and will in the future revoke some of these AQMA's if the monitoring data shows them to be below the AQOs. It will make a judgement in some of its AQMA's where there are multiple monitoring locations where there is exceedance in part of an AQMA and not an exceedance in another part of the AQMA, and will redefine the AQMA's boundary, based on the monitoring data. In addition the Council in 2017 setup more passive NO₂ diffusion tube sites in AQMA's 3,4,5,8,9 & 12. The Council will continue monitoring at these locations for the next few years to establish a trend and based on these results, and will review these in 2020 and decide if these AQMA's should be revoked or not?.

Local Engagement and How to get Involved

The public can assist in air pollution matters by continuing to address concerns when they think there is an air quality issue in the borough by reporting it via the web: <https://www.thurrock.gov.uk/report> or by contacting our contact centre Tel: 01375 652955. The Environmental Health Team will continue to assist and address any such concerns as necessary.

The public can keep informed on local air quality matters from accessing a wealth of information, firstly from the Council's air quality webpage:

<https://www.thurrock.gov.uk/air-quality/air-quality-monitoring>

They can find out what air quality is in there region from the London Air Quality Network (LAQN):

http://www.londonair.org.uk/london/asp/publicbulletin.asp?la_id=34&MapType=Google or from the EssexAir website: <http://www.essexair.org.uk/>

The Public can also keep informed on the latest air quality forecasting from the Defra UK-AIR website: <https://uk-air.defra.gov.uk/>

The public can now access the latest forecasting information for air quality which uses detailed dispersion modelling to predict air quality in near real-time using the newly subscribed AirTEXT service for Thurrock. www.airtext.info

The public can also subscribe free to an AirTEXT alert service using a free mobile app. www.airtext.info/signup

Table of Contents

| | |
|---|-----------|
| Executive Summary: Air Quality in Our Area | i |
| Air Quality in Thurrock | i |
| Actions to Improve Air Quality | iii |
| Conclusions and Priorities | iv |
| Local Engagement and How to get Involved | v |
| 1 Local Air Quality Management | 1 |
| 2 Actions to Improve Air Quality | 2 |
| 2.1 Air Quality Management Areas | 2 |
| 2.2 Progress and Impact of Measures to address Air Quality in Thurrock Council | 9 |
| 2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations | 28 |
| 3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance | 30 |
| 3.1 Summary of Monitoring Undertaken | 30 |
| 3.1.1 Non-Automatic Monitoring Sites | 30 |
| 3.2 Individual Pollutants | 31 |
| 3.2.1 Nitrogen Dioxide (NO ₂) | 31 |
| 3.2.2 Particulate Matter (PM ₁₀) | 31 |
| 3.2.3 Particulate Matter (PM _{2.5}) | 32 |
| 3.2.4 Sulphur Dioxide (SO ₂) | 32 |
| Appendix A: Monitoring Results | 33 |
| Appendix B: Full Monthly Diffusion Tube Results for 2017 | 63 |
| Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC | 68 |
| Appendix D: Map(s) of Monitoring Locations and AQMAs | 70 |
| Appendix E: Summary of Air Quality Objectives in England | 73 |
| Glossary of Terms | 74 |
| References | 76 |

List of Tables

| | |
|--|----|
| Table 2.1 – Declared Air Quality Management Areas | 3 |
| Table 2.2 – Progress on Measures to Improve Air Quality | 18 |
| Table 2.3 - Additional more generalised Measures & Progress on Measures to Improve Air Quality | 21 |
| Table A.1 - Details of Automatic Monitoring Sites | 33 |
| Table A.2 - Details of Non-Automatic Monitoring Sites | 34 |

| | |
|--|----|
| Table A.3 - Annual Mean NO ₂ Monitoring Results..... | 44 |
| Table A.4 - 1-Hour Mean NO ₂ Monitoring Results..... | 52 |
| Table A.5 - Annual Mean PM ₁₀ Monitoring Results..... | 54 |
| Table A.6 - 24-Hour Mean PM ₁₀ Monitoring Results..... | 56 |
| Table A.7 - Annual Mean PM _{2.5} monitoring Results..... | 58 |
| Table A.8 - SO ₂ Monitoring..... | 60 |
| Table B.1 - NO ₂ Monthly Diffusion Tube Results - 2017..... | 63 |
| Table E.1 - Air Quality Objectives in England..... | 73 |

List of Figures

| | |
|--|----|
| Figure A.1 – Trends in Annual Mean NO ₂ Concentrations..... | 49 |
| Figure A.2 – Rolling Annual Mean for NO _x (automatic monitoring sites)..... | 50 |
| Figure A.3 - Rolling Annual Mean for % NO ₂ of NO _x (automatic monitoring sites)..... | 51 |
| Figure A.4 - Trends in Number of NO ₂ 1-Hour Means > 200µg/m ³ | 53 |
| Figure A.5 - Trends in Annual Mean PM ₁₀ Concentrations..... | 55 |
| Figure A.6 - Trends in the Number of 24-Hour Mean PM ₁₀ Results >50µg/m ³ | 57 |
| Figure A.7 - Trends in Annual Mean PM _{2.5} Concentrations..... | 59 |
| Figure A.8 - Trends in SO ₂ Concentrations..... | 61 |
| Figure A.9 - Long-Term Historical Trends in SO ₂ & Black Smoke Concentrations for Thurrock (1963 - 2017)..... | 62 |
| Figure A.10 - Long-Term Ozone (O ₃) Rolling Annual Mean for Thurrock 1 Grays AURN Site..... | 68 |
| Figure D.1 - NO ₂ Diffusion Tube Locations (West Thurrock)..... | 70 |
| Figure D.2 - NO ₂ Diffusion Tube Locations (East Thurrock)..... | 71 |
| Figure D.3 - NO ₂ Diffusion Tube Locations (Tilbury)..... | 71 |
| Figure D.4 - Automatic Monitoring sites location (Thurrock)..... | 72 |
| Figure D.5 - Map of AQMA locations in Thurrock..... | 72 |

1 Local Air Quality Management

This report provides an overview of air quality in Thurrock Council during 2017. 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 Thurrock 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 Table E.1 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 AQMAs declared by Thurrock 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=282

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 AQMA(s).

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 (inc. date of publication) |
|-----------|---------------------|---------------------------------------|-----------------------|---|--|---|--|--|
| | | | | | | At Declaration | Now | |
| AQMA 1 | 2004 | NO2 Annual Mean | Grays Town Centre | An area encompassing a number of properties along London Road Grays, Orsett Road & Stanley Road Grays | NO | 48.8 µg/m ³ (NAS1) | 33.7 µg/m ³ (NAS1) 39.2 µg/m ³ (LRG) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 2 | 2004 | NO2 Annual Mean | Grays, South Stifford | An area encompassing Residential properties along London Road South Stifford. | NO | 48 µg/m ³ (LRSS) | 42.8 µg/m ³ (LRSS) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 3 | 2004 | NO2 Annual Mean | Grays | An area encompassing Residential properties along Hogg Lane & Elizabeth Road. | NO | 49 µg/m ³ (ER)* | 50.8 µg/m ³ (ER)* new monitoring has been setup at façade level to determine if there is exceedance 36.7 µg/m ³ (ERFA) & 35.6 µg/m ³ (ERFB) **annualised data based on 6 months only | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 4 | 2004 | NO2 Annual Mean | Grays, Chafford | An area encompassing Residential properties along A1306 west of Chafford Hundred Visitor | NO | No Data in AQMA 4 use (NAS2 AQMA 5 as proxy 65.5 | New monitoring has been setup to determine exceedance or | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |

Thurrock Council

| 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 (inc. date of publication) |
|-----------|---------------------|---------------------------------------|--|--|--|---|---|--|
| | | | | | | At Declaration | Now | |
| | | | Hundred | Centre | | µg/m3) | not? 23.5 µg/m3 (CC) **annualised data based on 6 months only | |
| AQMA 5 | 2004 | NO2 Annual Mean | Grays, Chafford Hundred & North Stifford | An area encompassing Residential properties along Warren Terrace A1306 & A13 | NO | 65.5 µg/m3 (NAS2)* | 54 µg/m3 (NAS2)* new monitoring has been setup at façade level to determine if there is exceedance or not? 36.1 µg/m3 (HD) & 34 µg/m3 (GRPL) **annualised data based on 6 months only | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 7 | 2004 | NO2 Annual Mean | West Thurrock | A Hotel (IBIS) near to M25 north of the Dartford Crossing | YES | 52 µg/m3 (IBIS) | 47.5 µg/m3 (IBIS) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 8 | 2004 | NO2 Annual Mean | West Thurrock / Purfleet | A Hotel next to Jct 31 of the M25 | YES | No Data exceedance was based on 2004 modelling only | (New monitoring has been setup to determine exceedance or not? 33.1 µg/m3 | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |

Thurrock Council

| 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 (inc. date of publication) |
|-----------|---------------------|---------------------------------------|------------------------|--|--|---|---|--|
| | | | | | | At Declaration | Now | |
| | | | | | | | (PIH) **annualised data based on 6 months only | |
| AQMA 9 | 2004 | NO2 Annual Mean | West Thurrock / Aveley | A Hotel next to Jct 31 of the M25 | YES | No Data exceedance was based on 2004 modelling only | New monitoring has been setup to determine exceedance or not? 31.8 µg/m3 (THA) & 31.2 µg/m3 (THB) **annualised data based on 6 months only | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 10 | 2004 | NO2 Annual Mean | Purfleet | An area encompassing Residential properties along London Road Purfleet near to Jarrah Cottages | NO | 69.8 µg/m3 (TK2 automatic site)* | 51.4 µg/m3 (TK8 automatic site)* ***Council modelling in 2016 confirmed still exceedance at relevant public exposure | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 12 | 2004 | NO2 Annual Mean | Purfleet | An area encompassing Residential properties along A1306 on the Watts Wood Estate | NO | 50.5 µg/m3 (WC)* | 41 µg/m3 (WC)* new monitoring has been setup at façade level to determine if there is exceedance or not? | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |

Thurrock Council

| 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 (inc. date of publication) |
|-----------|---------------------|---------------------------------------|---------------------|--|--|---|--|--|
| | | | | | | At Declaration | Now | |
| | | | | | | | 32.1 µg/m ³ (WCF)**annualised data based on 6 months only | |
| AQMA 13 | 2004 | NO ₂ Annual Mean | Purfleet / Aveley | An area encompassing Residential properties along A1306 London Road Aveley Arterial Road | NO | 55.2 µg/m ³ (LRAR)* | 59.5 µg/m ³ (LRAR)* at places of relevant public exposure 34 µg/m ³ (LRARN) & 31.4 µg/m ³ (LRARS) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 15 | 2004 | NO ₂ Annual Mean | South Ockendon | 1 residential dwelling near the M25 on the edge of Irvine Gardens | YES | 40 µg/m ³ (GDSO) | 28.1 µg/m ³ (GDSO) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 16 | 2004 | NO ₂ Annual Mean | Near North Ockendon | 1 residential dwelling near the M25 off Dennis Road | YES | 42.6 µg/m ³ (KCNO) | 34.3 µg/m ³ (KCNO) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 21 | 2004 | NO ₂ Annual Mean | Purfleet | A former Hotel on Stonehouse Lane | NO | [44.6 µg/m ³ in 2005] (STON) | No longer relevant public exposure / no monitoring since 2013 | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 23 | 2004 | NO ₂ Annual Mean | West | An area encompassing Residential properties along London Road West Thurrock | NO | 55.1 µg/m ³ (WT)* | 40 µg/m ³ (WT)* | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |

Thurrock Council

| 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 (inc. date of publication) |
|-----------|---------------------|---------------------------------------|--|--|--|---|---|--|
| | | | | | | At Declaration | Now | |
| | | | Thurrock | | | | | |
| AQMA 24 | 2012 | NO2 Annual Mean | Tilbury | An area encompassing Residential properties along Calcutta Road, Dock Road & St Chads Road | NO | 40.5 µg/m3 (TL)* | 35.8µg/m3 (TL)* 38.5 µg/m3 (TILB) & 41.9 µg/m3 (TILA) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 25 | 2016 | NO2 Annual Mean | Aveley | An area encompassing Residential properties along Aveley High St & Ship Lane | NO | 41.9 µg/m3 (AVSL) | 43 µg/m3 (AVSL) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 26 | 2016 | NO2 Annual Mean | Purfleet | An area encompassing Residential properties along the Purfleet By-pass | NO | 38.6 µg/m3 (PBP) | 37.6 µg/m3 (PBP) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 5 | 2004 | PM10 24 Hour Mean | Grays, Chafford Hundred & North Stifford | An area encompassing Residential properties along Warren Terrace A1306 & A13 | NO | No Data exceedance was based on 2004 modelling only | No Data *** (although modelling work in 2016 which was rejected by Defra shows no exceedance) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 7 | 2004 | PM10 24 Hour Mean | West Thurrock | A Hotel (IBIS) near to M25 north of the Dartford Crossing | YES | No Data exceedance was based on 2004 modelling only | No Data *** (although modelling work in 2016 which was rejected by Defra shows no exceedance) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |

Thurrock Council

| 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 (inc. date of publication) |
|-----------|---------------------|---------------------------------------|--------------------------|--|--|---|--|--|
| | | | | | | At Declaration | Now | |
| AQMA 8 | 2004 | PM10 24 Hour Mean | West Thurrock / Purfleet | A Hotel next to Jct 31 of the M25 | YES | No Data exceedance was based on 2004 modelling only | No Data *** (although modelling work in 2016 which was rejected by Defra shows no exceedance) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |
| AQMA 10 | 2004 | PM10 24 Hour Mean | Purfleet | An area encompassing Residential properties along London Road Purfleet near to Jarrah Cottages | NO | No Data exceedance was based on 2004 modelling only | 12 Days of 35 permitted (TK8) automatic & *** (modelling work in 2016 which was rejected by Defra shows no exceedance) | https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy 2016 |

☒ **Thurrock Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

(*) Represents a location in the AQMA but is not relevant public exposure

(**) Represents annualised data only based on 6 months or less of data

(***) Represents where modelling work was undertaken recently instead of actual monitoring

PLEASE NOTE: The council data shows that some monitoring at places of relevant public exposure falls under the objective in some AQMA's however most of these sites have less than 12 months data and have annualised results. These will be looked at more closely in the next ASR report.

In addition it is the Council do not normally revoke AQMA's solely based on diffusion tube data alone as the results are not very reliable. For any such revocation the data would have to fall below 10% of the objective level i.e. ($<36 \mu\text{g}/\text{m}^3$), and would need to consistently stay below this level for some years before it was decided to revoke any AQMA's based on diffusion tube results. Alternatively the council may look into doing detailed dispersion modelling to assess whether any exceedance of the air quality objectives is still likely at a given location.

2.2 Progress and Impact of Measures to address Air Quality in Thurrock Council

Defra's appraisal of last year's ASR concluded:-

The report is well structured, and provides the information specified in the Guidance, using the latest template. The following comments are designed to assist in the production of future reports.

1. The current ASR highlights some areas that should be given further consideration in future reports.
2. The Council has established a policy of declaring a large number of AQMAs throughout the Borough which require detailed review in relation to the status of each AQMA.
3. Some of the AQMA's were apparently designated on the basis of modelling, and there is no current evidence that current AQMA status is justified. This has been taken up in previous discussions following the detailed assessments that were carried out in 2016.
4. The Council are at liberty to maintain separate AQMAs, but may still wish to consider, when there are a relatively large number of AQMAs, many of which are only a small distance apart, that a single area wide AQMA may provide a greater degree of flexibility.
5. There also appears to be a degree of inconsistency in the way monitoring results are being recorded in relation to reporting against air quality objectives. For instance, in Table 2.1 requests results to be presented to represent the level of exceedance at a location of relevant exposure.
6. Table A.3 lists annual monitoring results for the last 5 years, and Table B1 in Appendix B shows results for 2016 including corrections for distance.
7. The Council should be clear in how monitoring results are presented and interpreted.
8. Monitoring results for comparison to air quality objectives, and hence also for reviewing the status of AQMAs should be presented as results that have had all appropriate corrections applied.
9. Results in Table 2.1 are clearly not all presented as results of relevant exposure, where distance corrections are required. This gives a false impression in relation to exceedance of objectives in AQMA, when this is largely not the case.

10. The results that are fully corrected, including corrected for distance show that there are now only two AQMAs, AQMA 2 (NAS2), and AQMA 13 (LRAR, LRARMN) with monitoring results above objective levels.
11. Future reports must be consistent in the way results are presented.
12. There appears to also be a question in relation to the relevance of many of the monitoring locations as listed in Table A2. There are large numbers of sites listed as "N" under distance to relevant exposure, suggesting they are not representative.
13. The value of these sites may be limited in relation to designating AQMAs and making assessments in relation to meeting air quality objectives.

In this instance we suggest that the current monitoring regime should be reviewed, in order that an adequate number of monitoring sites are chosen that are representative of relevant exposure within each AQMA.

Thurrock Council has taken forward a number of direct measures during the current reporting year of 2017/18 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2 & Table 2.3.

More detail on these measures can be found in their respective Action Plans, Details of the Council's latest Air Quality Health Strategy can be found via this link:- thurrock.gov.uk/air-quality and the council's latest AQAPs can be found via this link:- <https://consult.thurrock.gov.uk/portal/tc/pt/transport/aqstrategy>

Key completed measures are:-

The following action specific to AQMAs were taken during 2017/18:

AQMA 25 – Aveley High Street: the council introduced westbound width restrictions on Aveley High Street in 2016/17. These restrictions were intended to ameliorate some of the air quality issues that arise from HGVs in the area. Furthermore, the Council is investigating measures to prevent HGV traffic movements along Ship Lane, Aveley from being undertaken

AQMA 26 – Purfleet Bypass: the council continues to develop plans to deliver cycleway improvements as part of the Cycle Infrastructure Programme. A new cycle

path and two new Toucan crossings are expected to be completed along Purfleet Bypass prior to April 2019.

AQMA 23 – London Road, Grays: the council is continues to investigate measures to control HGV movement on London Road, however these works have been interrupted as the Council awaits the completion of a private development. These works are expected to commence in 2019.

AQMA 2 – London Road, Grays: the council is progressing bus lane camera enforcement in London Road. “Go-live” date scheduled for 1st March 2019 with full enforcement and issue of PCNs from 1st April 2019.

AQMA 10 – London Road, Purfleet: the council introduced width restrictions to the west of AQMA 10 and east of Botany Way. As part of port enhancements at CRO Ports Purfleet, the main port entrance is to be moved away from the AQMA with a new dedicated port entrance preventing HGV's from idling along London Road awaiting entry to the port. Additionally, the Council is investigating measures to control HGV movements along London Road within the AQMA to control transient movements.

AQMA 3 – Hogg Lane/Elizabeth Road: the council is considering options to widen parts of the A1306 to improve traffic flows. This is the subject of VISSIM modelling work, which is being jointly undertaken with Highways England.

AQMA 24 – Calcutta Road, Tilbury: The council is progressing a scheme as part of the Cycle Infrastructure Programme. This is expected to commence in April 2019, with a new off-road cycle path running along Calcutta Road and Dock Road. Construction is scheduled for three months. Additionally, the Council is launching a new Cycle hub on Calcutta Road in November/December 2018, to help further encourage cycling and modal shift..

HGV parking enforcement activities in the area continue with increased activity in order to address the current issues related to roadside HGV parking.

In addition to the AQMA-specific actions detailed above, the council has taken the following borough-wide actions to address poor air quality:

Variable Message Signing (VMS): the council has acquired three (3) VMS signs that can be deployed in locations across its road network as needed, towards minimising traffic impacts arising from incidents across the road network. These have now been deployed on numerous occasions, most notably when an incident occurs at the Dartford Crossing or within its vicinity. Additionally, the Council continues to explore opportunities to invest and implement new “SMART” technology to help manage traffic flows, and dynamically tackling congestion.

Weight Restrictions and HGV Management Schemes: The council continually reviews current HGV routing options and the introduction of measures to minimise air pollution from HGVs, such as weight restrictions and turning bans through dynamic engagement with the local residents and the community.

Improvements to Walking and Cycling: these include the walking and cycle infrastructure improvements secured as part of planning consents; and the Cycle Infrastructure Programme. The £5m Cycle Infrastructure Programme is currently in process of delivery and will be completed by March 2019. To support the successful investments the Council has made to date, there is a push to seek additional funds to expand the cycle infrastructure programme across the Borough, and to deliver schemes which were planned but were a lower priority and not able to be funded by the initial Cycle Infrastructure Programme. Softer measures are also being implemented, with the Council employing a new Walking and Cycling Co-ordinators to engage with residents and local businesses to encourage active and sustainable travel across the borough, enabling travel behaviour change and modal shift.

School and Workplace Travel Plans: the council secures travel plans and monitoring provisions as part of development consents. Schools currently monitor their travel plans via Modeshift STARS web-tool which provides a national framework for the implementation of sustainable and active school travel activities. This is the only national accreditation scheme for rewarding sustainable School Travel Plans (STP) and 35 out of 51 schools in the borough are actively working on their School Travel Plans and many have achieved a Bronze Accreditation for their STP. Arthur Bugler has joined the Woodside Academy in achieving Gold accreditation in their STP.

Freight Quality Partnership (FQP): the council re-established its Freight Quality Partnership to work collaboratively with freight and logistics operators to jointly formulate actions aimed at managing and mitigating the air quality impacts of HGVs in Thurrock. The Council is using the meetings to help develop a new Freight and Logistics Strategy for the borough.

South Essex Active Travel (SEAT): the council, along with Southend-on-Sea and Essex County Council was successfully awarded approximately £3.3 million in 2017/18 to deliver this programme, which targets people in a transitional stage of life to encourage sustainable travel options prior to key behavioural decision-making processes, such as commencing new employment or education.

Since the early achievements of the project working with Amazon to help influence travel behaviour of staff at its new Fulfilment Centre in Tilbury, the SEAT project is continuing to support a range of projects across the borough. As part of the project, the Council will deliver a new cycle hub in Tilbury, which will provide opportunities for people to purchased low-cost new and refurbished cycles, to access training and sign post residents to support programmes to encourage modal shift. The cycle hub will also support a programme of up-skilling local volunteers in cycle repairs, to encourage enterprise and reemployment, as well as offering a community space,

cycle recycling and cycle exchange programme for families (i.e. as a child grows older, a smaller cycle can be exchanged for a more suitable bike). Additionally, the SEAT programme will provide a cycle loan opportunity to encourage cycle ownership at a low monthly rate. Similar to the programme implemented at Amazon, SEAT engagement offices continue to work with key business, colleges and sixth forms to provide travel planning advice, as well as hosting road shows at key locations, such as intu Lakeside.

The SEAT project has also provided a substantial grant to support the delivery of a new bus service linking London Gateway Port and Park development with the local residential community of Stanford le Hope and the nearby station – a link which didn't exist.

The programme also includes a range of other measures, including a target to provide adult cycle training to 200 people over the three years to encourage cycling to work.

The South Essex Active Travel (SEAT) programme offers a range of benefits to residents by providing improved travel information and advice on travel to the workplace, not just within Thurrock, but across the south Essex corridor, the promotion of lifelong skills in cycling and cycle confidence, and cycle repairs and maintenance, as well as cycle loans to new job seekers who do not have access to their own transport. The SEAT programme has also engaged with public transport operators to provide free travel tickets to job seekers or new employees to help them commence employment using public transport at a low cost which may otherwise be unaffordable in the first few weeks of employment. The scheme will result in approximately £400,000 worth of investment per annum in Thurrock over three years.

Electric Vehicle Charging – the council has been out to tender on a new contract for electrical charging infrastructure. New EV charging points will be introduced where demand justifies, and will aim to consolidate the market for charging infrastructure in the borough, reducing barriers for residents. We are aiming to have an approved contract set up for December 2018.

Car Club – The Council is exploring the opportunity of launching a car club within the borough, primarily located within new developments and expanded across the borough. The Council is seeking to appoint a single contract for all cars across Thurrock, tackling the potential issue on interoperability between different providers, which can create a barrier for users. A car club will be seeking to launch in 2019/20.

Impacts of Actions

The strategy sets out the need to monitor and measure air pollution levels in AQMAs where actions are focussed, in order to determine whether the actions being implemented are achieving success in terms of a reducing NO_x levels. We currently monitor air quality in all AQMAs in the borough. As NO_x is measured and reported on an annual basis, the monitoring data for 2018 will not be available until 2019. However, since traffic emissions, especially from HGVs, are a major source of air pollution in the borough, we can make some assumptions that some improvements have been realised in those AQMAs where actions such as weight restrictions were introduced. We expect the data for 2017 and 2018 to support these assumptions.

Thurrock Council expects the following measures to be completed over the course of the next reporting year:

South Essex Active Travel (SEAT): this programme continues for a further two (2) years and it is envisioned that a mode shift from car to more sustainable modes of travel will be achieved, and consequently a reduction in vehicle emissions, almost a modest reduction. These will be measured through monitoring and evaluation reports of the scheme, which is a mandatory requirement of the DfT. First year progress reports are showing good progress, taking into consideration the mobilisation effort required in the first year of the project.

Freight Strategy: Thurrock Council are seeing to develop a new freight strategy, which will provide a relevant and up-to-date policy framework to promote the

movement of goods and freight within and beyond the borough boundary. This strategy will set out how the council proposes to support and manage freight and industry in Thurrock, whilst promoting measures to address air quality issues arising from these activities. The projected adoption of this strategy is expected to be in 2019.

Electric Vehicle Charging – Following the tender process for a new borough-wide EV Charging Infrastructure contract, new electric vehicle charging points will be introduced where demand justifies. The council have an approved contract set up for December 2018. The introduction of electric vehicle charging infrastructure is expected to promote the use of electric vehicles in Thurrock, which will have positive impacts on air quality.

Urban Traffic Management Control: Thurrock Council is engaging with Highways England to implement new technologies on the road network to help improve traffic flows and minimise the impact on air quality through congestion. As part of our collaborative working, the Council is seeking to establish a new suite of Intelligent Transport Systems infrastructure, including a new UTMC which will help this objective to creating better and more reliable journeys. The key objective of this new UTMC is to integrate with the systems of adjoining highway authorities (incl. Highways England, Kent County Council and Essex County Council) in order to better manage the local road network, particularly in response to incidents at Dartford Crossing, with the aim of minimising traffic congestion and associated air pollution. One specific example the Council is working with Highways England is on Junction 31 of the M25, which regularly sees congestion, due to traffic flows and a lack of adherence to yellow box junction markings. The two authorities will aim to develop plans which will help clear the junction immediately, via dynamic management of traffic signals, rather than relying on manual intervention on site or awaiting for traffic flows to decrease.

Thurrock Council's priorities for the coming year are to ensure delivery of these proposed action measures, and review post implementation whether they have

delivered noticeable improvements in air quality, if not then additional measures may need to be required in due course.

The principal challenges and barriers to implementation that Thurrock Council anticipates facing are: - Challenges in identifying funding sources, and lack of resources to plan and implement measures.

Progress on the measures which may have rolled over from previous years has been slower than expected due to challenges in securing identified funding resources from external partners. Additionally, due to the increasing demands on Council resources, there has been the risk of some schemes slipping in previous years, however the Council expects to target delivery on its action plan measures in this year.

Whilst the measures stated above and in Table 2.2 and Table 2.3 will help to contribute towards compliance, Thurrock Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of AQMA's 1,2,3,4,5,10,13,23,24,25 in particular, the other remaining AQMAs may be revoked due to monitoring data falling below the objectives, if this trend continues, the council will revoke them.

Table 2.2 – Progress on Measures to Improve Air Quality

| | No. | Action | Lead Authority | Outcome | Delivery Date | Reference to existing strategy or plan |
|---------------------------------|-----|--|-------------------------------|--|---|--|
| AQMA 10 – London Road, Purfleet | 1 | Engine Switch-Off Switch Zone | Highways / Strategic Planning | 0.5 – 1.0 $\mu\text{g}/\text{m}^3$ (Actions 1 and 2 combined) | Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 2 | Roadside Emissions Testing | Highways / Strategic Planning | | Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 3 | HGV Distributor Road/ Duelling | Highways / Strategic Planning | 15.0+ $\mu\text{g}/\text{m}^3$ (Actions 3 and 4 combined) | 2021 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 4 | Weight Restriction | Highways / Strategic Planning | | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 5 | Land Use Planning | Highways / Strategic Planning | No increase | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 6 | Freight Quality Partnership | Highways / Strategic Planning | Inform routing strategies, awareness and liaison | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 7 | Eco-Driver Training | Highways / Strategic Planning | 0.5 $\mu\text{g}/\text{m}^3$ | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 8 | Pollution Retrofit Equipment | Highways / Strategic Planning | 15.0+ $\mu\text{g}/\text{m}^3$ (Actions 8 and 9 combined) | TBD – Dependent on availability of external funding | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 9 | Clean Air Zone | Highways / Strategic Planning | | TBD – Monitoring of AQ and with regard to updated national policy | |
| | 10 | Personalised Journey Planning | Highways / Strategic Planning | 3.0 $\mu\text{g}/\text{m}^3$ overall | TBD – Subject to outcome of volunteer recruitment | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 11 | Business Travel Plans | Highways / Strategic Planning | 1.0 $\mu\text{g}/\text{m}^3$ | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| AQMA 3 – Hogg Lane/El | 12 | Investigate Mature Landscaping Barrier | Highways / Strategic Planning | 5.0+ $\mu\text{g}/\text{m}^3$ * | Nov 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |

Thurrock Council

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| I | 13 | 30 mph limit | Highways / Strategic Planning | 5.0+ $\mu\text{g}/\text{m}^3$ * | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 14 | School Travel Plans (modeshift) | Highways / Strategic Planning | 0.5 $\mu\text{g}/\text{m}^3$ | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans, Sustainable Modes of travel to Schools strategy (SMOTS) |
| | 15 | A1012/A1306 Priority 'hamburger' roundabout feasibility | Highways / Strategic Planning | 5.0+ $\mu\text{g}/\text{m}^3$ * | Sep 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| AQMA 5 – A1306 (Pilgrims roundabout) | 16 | Investigate Mature Landscaping Barrier | Highways / Strategic Planning | 5.0+ $\mu\text{g}/\text{m}^3$ * | Nov 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 17 | Variable Message Signing for Lakeside | Highways / Strategic Planning | 1.0 $\mu\text{g}/\text{m}^3$ | 2021 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 18 | Business Travel Plans | Highways / Strategic Planning | 1.0 $\mu\text{g}/\text{m}^3$ | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 19 | Pilgrims Roundabout Signalisation | Highways / Strategic Planning | 5.0+ $\mu\text{g}/\text{m}^3$ * | Sep 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| AQMA 24 – Tilbury (Calcutta Road) | 20 | Engine Switch Off Zone | Highways / Strategic Planning | 3.0+ $\mu\text{g}/\text{m}^3$ * | Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 21 | School Travel Plans (modeshift) | Highways / Strategic Planning | 3.0 $\mu\text{g}/\text{m}^3$ overall | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans, Sustainable Modes of travel to Schools strategy (SMOTS) |

Thurrock Council

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| | 22 | Improved Walking and Cycling Infrastructure and marketing and promotion campaign | Highways / Strategic Planning | 3.0 µg/m3 overall | April 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 23 | Personalised Journey Planning | Highways / Strategic Planning | 3.0 µg/m3 overall | Apr 2017-Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 24 | Eco Driving | Highways / Strategic Planning | 3.0 µg/m3 overall | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 25 | AQ Mitigation in new developments | Highways / Strategic Planning | No increase in at risk population | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 26 | Personalised Journey Planning | Highways / Strategic Planning | 3.0 µg/m3 overall | Apr 2017-Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 27 | Business Travel Plans | Highways / Strategic Planning | 1.0 µg/m3 | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| AQMA 25 - Aveley | 28 | HGV Traffic Management Scheme: Stifford Road | Highways / Strategic Planning | 8.0 µg/m3 (Actions 24 and 25 combined) | April 2017 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 29 | HGV Traffic Management Scheme: Ship Lane | Highways / Strategic Planning | | April 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 30 | Engine Switch Off Zone | Highways / Strategic Planning | 3.0+ µg/m3* | Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 31 | School Travel Plans | Highways / Strategic Planning | 3.0 µg/m3 overall | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans, , Sustainable Modes of travel to Schools strategy (SMOTS) |
| AQMA 26 – Purfleet Bypass | 32 | Mature Landscaping Barrier | Highways / Strategic Planning | 2.0+ µg/m3* | Nov 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 33 | Land Use Planning | Highways / Strategic Planning | No further increases | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |

Thurrock Council

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| | 34 | Eco-Driver Training | Highways / Strategic Planning | 0.5 µg/m3 | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| AQMA 1, 2, 23 Grays (London Road) | 35 | Engine Switch Off Zone | Highways / Strategic Planning | 0.5 µg/m3 | Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 36 | School Travel Plans | Highways / Strategic Planning | 0.5 µg/m3 | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans, Sustainable Modes of travel to Schools strategy (SMOTS) |
| | 37 | Enforcement of Weight Restriction | Highways / Strategic Planning | 3.0 µg/m3 | April 2019 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 38 | Land Use Planning (Gumley Road and Askey Farm Lane) | Highways / Strategic Planning | No increase | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 39 | Eco-Driver Training | Highways / Strategic Planning | 0.5 µg/m3 | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 40 | Personalised Journey Planning | Highways / Strategic Planning | 3.0 µg/m3 overall | Apr 2017-Mar 2020 | Thurrock Air Quality and Health Strategy and AQMA Action Plans |
| | 41 | Business Travel Plans | Highways / Strategic Planning | 1.0 µg/m3 | Ongoing | Thurrock Air Quality and Health Strategy and AQMA Action Plans |

Table 2.3 – Additional more generalised Measures & 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 | Public Awareness Raising & Education | Public Information | via the Internet | Env Protection Team/ Highways & Public Health | Date | Ongoing | N/A | N/A | Effects not quantifiable but may encourage modal shift and | Ongoing | To Inform the Public of the state of Air Quality dissemination of |

Thurrock Council

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| | | | | | | | | | lead to long-term improvements | | air quality reports and download of AQ data from Thurrock Council website/ LAQN, EssexAir & Defra |
| 2 | Smarter Choices-Work Place Travel Planning : Action to road vehicle emissions | Promoting Travel Alternatives | Workplace Travel Planning | Strategic Planning | | 2012/13 | N/A | <1% | | Ongoing | Encourage modal shift (13 organisations supported since beginning of Local Sustainable Transport Fund (LSTF)) |
| 3 | Action to road vehicle emissions | Promoting Travel Alternatives | Promotion of cycling | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Encourage modal shift |
| 4 | Action to road vehicle emissions | Promoting Travel Alternatives | School Travel Plans | Highways / Strategic Planning | | 2004 | N/A | <1% | | Complete | Encourage modal shift |
| 5 | Action to road vehicle emissions | Promoting Travel Alternatives | Promotion of walking | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Encourage modal shift |
| 6 | Action to road vehicle emissions Public Transport (Metrorail) | Promoting Travel Alternatives | Promote use of rail and inland waterways | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Encourage modal shift |
| 7 | Action to road vehicle emissions | Promoting Travel Alternatives | Personalise d Travel Planning | Highways / Strategic Planning | | 2010/11 | N/A | <1% | | 2015/16 | Encourage modal shift |

Thurrock Council

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| 8 | Action to road vehicle emissions | Promoting Travel Alternatives | Intensive active travel campaign & infrastructure | Highways / Strategic Planning | | 2010/11 | N/A | <1% | | Ongoing | Encourage modal shift |
| 9 | Action to road vehicle emissions | Transport Planning and Infrastructure | Cycle network | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Encourage modal shift |
| 10 | Action to road vehicle emissions | Transport Planning and Infrastructure | Public transport improvements - interchange stations and services | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Encourage modal shift |
| 11 | Action to road vehicle emissions | Transport Planning and Infrastructure | Bus route improvements | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Encourage modal shift |
| 12 | LAPC Inspections, of local industry | Environmental Permits | Other | Environmental Protection team | | 1990 | N/A | N/A | Effects not quantifiable, but probably limits local component of background pollution | Ongoing | Prevention of Pollution & Nuisance |
| 13 | Action to road vehicle emissions (116 drivers trained by SAFED up to March 2013) | Vehicle Fleet Efficiency | Driver training and ECO driving aids | Highways / Strategic Planning | | 2010/11 | N/A | <1% | | 2014/15 | Improve HGV driving efficiency to improve vehicle emissions |

Thurrock Council

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| 14 | Action to road vehicle emissions (ECO Stars Freight Accreditation Scheme, 42 businesses currently have accreditation from the scheme) | Vehicle Fleet Efficiency | Fleet efficiency and recognition schemes | Highways / Strategic Planning | | 2010/11 | N/A | <1% | | 2014/15 | Improve HGV driving efficiency to improve vehicle emissions (funding available until March 2015) |
| 15 | Enforcement of local Taxi licencing | Promoting Low Emission Transport | Taxi Licencing conditions | Licencing | | Ongoing | N/A | <1% | Effects not quantifiable | Ongoing | Ensure that Road vehicles are road worthy and EU compliant vehicles |
| 16 | Provision of Electric vehicle car charging points around the borough | Promoting Low Emission Transport | Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging | Highways / Strategic Planning | | 2009 | N/A | <1% | | Ongoing | Alternative fuelled vehicles |
| 17 | Council Introduced Home working / flexible working hours | Promoting Travel Alternatives | Encourage / Facilitate home-working | TBC | | 2014 | N/A | N/A | | Ongoing | To reduce and save money on unnecessary vehicle journeys |
| 18 | Introduction of Hybrid Buses into the fleet | Alternatives to private vehicle use | Other | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Switch from Diesel to less polluting alternatives |

Thurrock Council

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| 19 | Cycle Parking for AQMA 5 | Transport Planning and Infrastructure | Other | Highways / Strategic Planning | | 2013/2014 | N/A | <1% | | Completed | Increase capacity for cycle network |
| 20 | Local Sustainable Transport Fund (LSTF) Improvement of Transport infrastructure (Boroughwide) Initiative | Transport Planning and Infrastructure | Other | Highways / Strategic Planning | | 2010/2014 | N/A | <1% | | Completed | Improvement of Transport Infrastructure |
| 21 | Freight Quality Partnership (FQP) Expansion of FQP (as of 2014 were 45 members in the FQP in Thurrock (AQMA 23)) | Freight and Delivery Management | Freight Partnerships for city centre deliveries | Highways / Strategic Planning | | 2010/11 | N/A | <1% | | 2015/16 | Partnership with local freight and logistic industry to provide discussion platform around freight issues. |
| 22 | Pollution absorbent paint barrier (AQMA 13) | Transport Planning and Infrastructure | Other | Environmental Protection Team /Highways / Strategic Planning | | 2013 | Monitor NO2 diffusion tube results, see if there is an improvement | 1-2% | No noticeable improvement | Complete | Experimental mitigation measure to attempt to reduce NO2 pollution within AQMA 13 |
| 23 | Public Transport - Eco driver training | Transport Planning and Infrastructure | Public transport improvements-interchange stations | Highways / Strategic Planning | | 2014 | N/A | <1% | | ongoing | Improve driver efficiency in the bus fleet (limited application only 16 drivers trained, Ensign bus fleet |

Thurrock Council

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| | | | and services | | | | | | | | operators) |
| 24 | Improve traffic signalling at traffic light junction within (AQMA 13) | Traffic Management | Other | Highways / Strategic Planning | | 2013 | N/A | <1% | | 2013 | Improve flow of stationary traffic for smoother driving, hence attempt to lower emissions |
| 25 | SCOOT/ UTM (AQMA 1 & AQMA 5) | Traffic Management | UTC, Congestion management, traffic reduction | Highways / Strategic Planning | | 2014 | N/A | <1% | | 2014 | |
| 26 | HGV weight restriction (AQMA 1, 2) | Traffic Management | Other | Highways / Strategic Planning | | 2013 | N/A | <1% | | 2013 / 2014 | Divert HGVs away from AQMA along Devonshire road, to alleviate London Road from HGVs & Congestion |
| 27 | Improve Bus / Rail interchange (AQMA 5) | Transport Planning and Infrastructure | Public transport improvements- interchange stations and services | Highways / Strategic Planning | | Ongoing | N/A | <1% | | Ongoing | Improve accessibility of public transport :Completed scheme, but will make future improvements as part of the Masterplan for Thurrock |
| 28 | Road layout review - future bus priority measures (AQMA 23) | Transport Planning and Infrastructure | Other | Highways / Strategic Planning | | ? | | | | ? Future | |

Thurrock Council

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| 29 | Air Quality Officer Working Group | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | Environmental Protection Team | | 2014/15 | n/a | n/a | | 2015/16 | To coordinate action between council departments (Health, Transport & Environment) and determine focus areas/initiatives |
| 30 | Air Quality Study | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | Highways / Strategic Planning | | 2014/15 | n/a | n/a | | 2015/16 | To investigate improvement options in AQMA 3, 4 and 5. |

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.

Thurrock Council is taking the following measures to address PM_{2.5}: As set out previously, the Council has been working on a new integrated Health and Air Quality Strategy to renew its approach to addressing poor air quality and reduce exposure across its area. The focus of the air quality policies and actions are targeted at exceedances of NO₂ in individual AQMAs, however it is acknowledged that many of the interventions proposed will also have beneficial reductions in PM_{2.5} also. The following measures are examples of interventions proposed to also address PM_{2.5} (see Table 2.2 for full list of interventions proposed):

- Land Use Planning (no increase): Policies focusing on avoiding exacerbating existing AQMAs such as car free developments and promoting sustainable transport.
- HGV Traffic Management (10.0+ µg/m³): Introduction of weight restrictions/enforcement to discourage HGVs
- Engine Switch-off Zones (3.0+ µg/m³): Traffic orders and publicity to reduce idling at level crossings e.tc
- Speed limit reduction (5.0+ µg/m³): Localised traffic enforcement and speed reductions
- Clean Air Zone (15.0 µg/m³): Traffic enforcement/management to prevent or charge high polluting vehicles for using certain roads.

The Council also has a number of Smoke Control Areas, in order to prevent any use of unauthorised domestic heating appliances and fuel substances within residential buildings within these areas. The Council's Environmental Protection Team can provide details on Smoke Control Areas via its email address Air.Quality@thurrock.gov.uk Additional information on Smoke Control Areas i.e.

registered appliances & fuels e.tc can be found at:- <https://www.gov.uk/smoke-control-area-rules>

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.

Thurrock Council undertook automatic (continuous) monitoring at four sites during 2017. Table A.1 in Appendix A shows the details of the sites and also provides the latest monitoring results for these sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem, these pollutants have been screened out in previous reports as the levels were low or non-existent within the borough, and no new sources have been identified since for these pollutants so they are no longer deemed as being an issue. National monitoring results are available at <https://uk-air.defra.gov.uk/data/>

The Council does at currently operate a Heavy Metals Partisol Monitor on behalf of Defra, as part of Defra's Heavy Metals Monitoring Network. The current monitoring site is located in Chadwell St Mary. Monitoring results from this site can be downloaded via the UK-Air website: - <https://uk-air.defra.gov.uk/data/metals-data>

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.1 Non-Automatic Monitoring Sites

Thurrock Council undertook non- automatic (passive) monitoring of NO₂ at 58 sites during 2017 Table A.2 in Appendix A shows the details of the 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.

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 (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

All of Thurrock’s AQMA’s are declared for the annual mean objective for NO₂ recent monitoring suggests that this is still the case in most of these AQMA’s however for the last few years there has been slight reductions in concentrations in most of these AQMA’s and some have been consistently below the objectives for a number of years now. 12 new monitoring sites were setup in 2017 to further assess whether these AQMA’s still warrant this status or not, this will likely be reviewed in 2020 once a firm baseline trend has been established at these sites.

The highest recorded 1-hour concentration in 2017 for NO₂ was at Thurrock 8 at 218 µg/m³ there were a total of 2 exceedences above the 200 µg/m³ limit of 18 permitted exceedences annually at this site over 2017. There are no diffusion tube measurements above 60 µg/m³ where there is relevant public exposure. It is therefore unlikely that the 1-hour objective is being breached currently within the borough.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

2017 monitoring confirms that there are currently no areas breaching the air quality objectives for PM₁₀. However there are some exceedences from automatic monitoring stations over 2017. Thurrock 8 had (12 exceedences of the permitted 35 exceedences), Thurrock 1 had (5 exceedences of the permitted 35 exceedences), and Thurrock 3 had (5 exceedences of the permitted 35 exceedences).

3.2.3 Particulate Matter (PM_{2.5})

Table A.7 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years.

Thurrock Council currently has one automatic monitoring station (Thurrock 3; Stanford Le-Hope), which is a roadside site that monitors PM_{2.5}. The site has seen a year on year decrease in concentrations of PM_{2.5} since it first started operating. PM_{2.5} concentrations have reduced from: 17.93 µg/m³ in 2011, and decreased to 9.84 µg/m³ in 2015, however this increased slightly in 2016 to 13.41 µg/m³ and decreased once more over 2017 to 11.05 µg/m³.

3.2.4 Sulphur Dioxide (SO₂)

Table A.8 in Appendix A compares the ratified continuous monitored SO₂ concentrations for year 2016 with the air quality objectives for SO₂.

There is currently one location monitoring SO₂ within the borough, Thurrock 1, Grays. The council has monitored for SO₂ at other locations in recent years, most recently in Tilbury at the Thurrock 4 site. As of early 2017 monitoring ceased due to there being no exceedances reported at this location. There have been no pollution incidences regarding this pollutant since monitoring began back in 1996 at Thurrock 1, SO₂ concentrations fall year on year and remain very low, well below the air quality objectives.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Inlet Height (m) |
|---|----------------------------|------------------|---------------------|---------------------|--|----------|---|--|---|------------------|
| Thurrock 1 (TK1) | Thurrock, Grays AURN | Urban Background | 561066 | 177894 | NO ₂ PM ₁₀ O ₃ SO ₂ | No | Chemiluminescent TEOM FDMS UV absorption UV Fluorescence | 38 | Y | 3.5 |
| Thurrock 8 (TK8) & Formerly *(TK2) | Purfleet, London Road | Roadside | 556701 *(556737) | 177937 *(177928) | NO ₂ PM ₁₀ | Yes | Chemiluminescent Beta Attenuated Mass | 2.6 | Y | 1.5 |
| Thurrock 3 (TK3) | Stanford-le-Hope, Manorway | Roadside | 569358 | 182736 | NO ₂ PM ₁₀ PM _{2.5} | No | Chemiluminescent TEOM FDMS TEOM FDMS | 3 | Y | 2.8 |
| Thurrock 4 (TK4) | Tilbury, Calcutta Road | Roadside | 563900 | 176282 | NO ₂ | Yes | Chemiluminescent UV Fluorescence | 5.5 | Y | 1.5 |

Notes:

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

(2) N/A if not applicable.

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

| 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) |
|---------|---------------------------|-----------|---------------|---------------|----------------------|----------|--|---|---|------------|
| LRAR | London Road Arterial Road | R | 555301 | 179438 | NO ₂ | 13 | N | 0.5 | N | 1.5 |
| PRS | Purfleet Rail Station | R | 555389 | 178145 | NO ₂ | No | N | 1.5 | N | 2 |
| WC | Watts Crescent | R | 556314 | 178765 | NO ₂ | 12 | N | 2 | N | 2 |
| JC | Jarrah Cottages | R | 556701 | 177937 | NO ₂ | 10 | N | 2.6 | Y (TK8) | 1.5 |
| STON | Stonehouse Lane | R | 557132 | 177970 | NO ₂ | 21 | N | 30 | N | 1.5 |

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|------|---------------------------|----|--------|--------|-----------------|----|---------|-----|---|------|
| IBIS | Ibis Hotel | UB | 557570 | 177789 | NO ₂ | 7 | Y (0m) | 52 | N | 2 |
| GDSO | Gatehope Drive | UB | 557595 | 181060 | NO ₂ | 15 | Y (23m) | 105 | N | 1.25 |
| LT | Lakeside Tesco Roundabout | R | 557981 | 178700 | NO ₂ | No | N | 1 | N | 2 |
| KCNO | Kemps Cottage | UB | 558148 | 183532 | NO ₂ | 16 | Y (10m) | 57 | N | 2 |
| WT | London Road W Thurrock | R | 558483 | 177678 | NO ₂ | 23 | N | 4 | N | 1.5 |
| HR | Howard Road | R | 559118 | 179462 | NO ₂ | 5 | Y (0m) | 29 | N | 1.5 |

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|------|-------------------------------|----|--------|--------|-----|----|---|-----|---------|-----|
| NAS2 | A1306 | R | 559720 | 179630 | NO2 | 5 | N | 4.5 | N | 2 |
| LRSS | London Road South Stifford | R | 559785 | 177910 | NO2 | 2 | N | 3.5 | N | 2 |
| LRG | London Road Grays | R | 560624 | 177811 | NO2 | 1 | N | 2.5 | N | 2 |
| NAS4 | Wingfield Grays | UB | 560772 | 178434 | NO2 | No | Y | N/A | N | 1.5 |
| ER | Elizabeth Road | R | 560954 | 179535 | NO2 | 3 | N | 0.5 | N | 2 |
| PS | Poison Store AURN Site | UB | 561066 | 177894 | NO2 | 1 | N | 38 | Y (TK1) | 3.5 |

Thurrock Council

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|------|------------------------------|----|--------|--------|-----|----|----------|-----|---|-----|
| HL | Hogg Lane | R | 561108 | 178922 | NO2 | 3 | N | 1.2 | N | 2 |
| NAS1 | Queensgate Centre Grays | R | 561469 | 178063 | NO2 | 1 | Y (0m) | 5 | N | 2 |
| CR | Cromwell Road Grays | I | 561572 | 178154 | NO2 | 1 | N | 0.5 | N | 2 |
| SRG | Stanley Road Grays | R | 561685 | 177833 | NO2 | 1 | Y (2.5m) | 5 | N | 2 |
| NAS3 | Chestnut Avenue Grays | UB | 561830 | 179878 | NO2 | No | Y | N/A | N | 1.5 |
| WES | William Edwards School | R | 561958 | 180967 | NO2 | No | N | N/A | N | 2 |

Thurrock Council

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|------|------------------------------------|----|--------|--------|-----|----|---------|-----|---------|------|
| B | Bulphan | RB | 563855 | 184772 | NO2 | No | N | N/A | N | 2 |
| TL | Calcutta Road Tilbury | R | 563867 | 176293 | NO2 | No | N | 0.5 | N | 2 |
| PKSL | Park Road | R | 567781 | 182400 | NO2 | No | Y (24m) | 9 | N | 2 |
| SL | Stanford Library | UB | 568501 | 182459 | NO2 | No | N | N/A | N | 2 |
| M | Manorway Monitoring Station | R | 569357 | 182737 | NO2 | No | N | 3 | Y (TK3) | 2.75 |
| FRC | Francisco Close (Chafford Hundred) | I | 559136 | 179084 | NO2 | No | Y (10m) | 17 | N | 2 |

Thurrock Council

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|-------|----------------------------------|---|--------|--------|-----|--------|---|-----|---|-----|
| SLHRS | Stanford-le-Hope Railway Station | R | 568162 | 182296 | NO2 | No | N | 4.5 | N | 2 |
| ETRS | East Tilbury Rail Station | R | 567655 | 179003 | NO2 | No | Y | 2.5 | N | 1.5 |
| TILA | Dock Road (Tilbury) | R | 563498 | 176483 | NO2 | { 24 } | N | 2.5 | N | 2 |
| TILB | Broadway Intersection (Tilbury) | R | 563645 | 176348 | NO2 | { 24 } | N | 2.5 | N | 2 |
| TILC | St Andrews Road (Tilbury) | R | 563600 | 176321 | NO2 | No | N | 2.5 | N | 1.5 |
| TILD | Calcutta Road East (Tilbury) | R | 563995 | 176291 | NO2 | { 24 } | N | 0.5 | N | 2 |

Thurrock Council

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|-----------|---|----|--------|--------|-----|--------|----------|-----|---------|-----|
| TILE | Calcutta Road North (Tilbury) | R | 563870 | 176305 | NO2 | { 24 } | N | 2 | N | 2 |
| TK4 (A&B) | Thurrock 4 (co-located duplicated site) | R | 563900 | 176282 | NO2 | { 24 } | Y | 5.5 | Y (TK4) | 1.5 |
| PBP | Purfleet Bypass | R | 556257 | 178438 | NO2 | No | Y (5.5m) | 9.5 | N | 1.5 |
| PBPA | Purfleet Bypass | R | 556221 | 178461 | NO2 | No | Y (3.2m) | 9.5 | N | 1.5 |
| LYD | Lydden | UB | 560057 | 179873 | NO2 | 4 | Y (26m) | 18 | N | 2 |
| AVSL | Aveley Ship Lane | R | 556713 | 180167 | NO2 | No | Y (1m) | 2 | N | 2 |

Thurrock Council

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|-------|--------------------------------|----|--------|--------|-----|----|-----------|------|---|-----|
| AVHS | Aveley High Street | R | 556661 | 180180 | NO2 | No | N | 0.75 | N | 2 |
| SOAA | South Ockendon Arisdale Avenue | R | 558785 | 182323 | NO2 | No | Y (6 m) | 7 | N | 2 |
| TSR | Tilbury Sydney Road | UB | 564122 | 176152 | NO2 | No | N | N/A | N | 2 |
| DR | Devonshire Road | R | 560279 | 178944 | NO2 | No | Y (10.5m) | 6 | N | 1.5 |
| LRARN | London Road Art Road (North) | R | 555286 | 179501 | NO2 | 13 | Y (0.5m) | 19.5 | N | 2 |
| LRARS | London Road Art Road (South) | R | 555357 | 179362 | NO2 | 13 | Y (40m) | 15 | N | 1 |

Thurrock Council

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|--------|---|----|--------|--------|-----|----|----------|------|---|-----|
| LRARMN | London Road Art Road (Mid-North) | R | 555299 | 179453 | NO2 | 13 | N | 8 | N | 2 |
| LRARMS | London Road Art Road (Mid-South) | R | 555329 | 179397 | NO2 | 13 | N | 7 | N | 2 |
| JRP | Joslin Road Purfleet | UB | 556395 | 178002 | NO2 | No | N | N/A | N | 2 |
| ACHL | Armada Court, Hogg Lane | R | 561093 | 178974 | NO2 | 3 | Y (9m) | 8 | N | 1.5 |
| CC | Catherine Close | I | 560770 | 179866 | NO2 | 4 | Y (32m) | 20 | N | 1.5 |
| ERFA | Elizabeth Road, (Façade A) | R | 560962 | 179527 | NO2 | 3 | Y (32m) | 8.2 | N | 1.5 |
| ERFB | Elizabeth Road (Façade B) | R | 560963 | 179558 | NO2 | 3 | Y (0.5m) | 8 | N | 1.5 |
| ERTM | Elizabeth Road, Treaclemine Roundabout | R | 560965 | 179796 | NO2 | No | Y (0.5m) | 8.5 | N | 1.5 |
| NC | Nutberry Close | I | 561077 | 179912 | NO2 | No | Y (6.6m) | 19.5 | N | 1.5 |
| HD | Hawkins Drive (A1306) | R | 560003 | 179694 | NO2 | 5 | Y (8.4m) | 9 | N | 1.5 |
| GRPL | Grifon Road, Pilgrims Lane Roundabout | I | 559551 | 179547 | NO2 | 5 | Y (5.6m) | 19.5 | N | 1.5 |

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|------|-------------------------|----|--------|--------|-----|----|----------|----|---|-----|
| PIH | Premier Inn Hotel, WT | I | 557299 | 178802 | NO2 | 8 | Y (6.6m) | 21 | N | 1.5 |
| WCFA | Watts Crescent (Façade) | I | 556290 | 178749 | NO2 | 12 | Y (7.5m) | 17 | N | 1.5 |
| THA | Thurrock Hotel (A) | UB | 557386 | 179065 | NO2 | 9 | Y (0m) | 78 | N | 1.5 |
| THB | Thurrock Hotel (B) | UB | 557437 | 179099 | NO2 | 9 | Y (0m) | 39 | N | 1.5 |

Notes:

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

(2) N/A if not applicable.

(3) New diffusion tube sites in 2017 marked in (Blue)

Table A.3 – Annual Mean NO₂ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2017 (%) ⁽²⁾ | NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | |
|------------|------------------|-----------------|---|--|---|---------------------------|---------------------------|---------------------------|-----------------------------|
| | | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| Thurrock 1 | Urban Background | Automatic | 97.7% | 97.7% | 27.46 | 26.46 | 25.6 | 27.9 | 28.2 |
| Thurrock 3 | Roadside | Automatic | 98.9% | 98.9% | 30.04 | 25.07 | 23.6 | 26.9 | 27.5 |
| Thurrock 4 | Roadside | Automatic | 96.8% | 96.8% | 34.55 | 32.77 | 31.1 | 33.46 | 33.4 |
| Thurrock 8 | Roadside | Automatic | 97.9% | 97.9% | 62.84 | 61.04 | 56.1 | 55.02 | 51.4 |
| LRAR | Roadside | Diffusion Tube | 75% | 75% | 58.28 | 59.16 | 49.86 | 62.52 | 59.54 |
| PRS | Roadside | Diffusion Tube | 92% | 92% | 35.26 | 35.08 | 32.02 | 35 | 32.24 |
| WC | Roadside | Diffusion Tube | 92% | 92% | 43.43 | 41.12 | 36.89 | 50.18 | 41.02 |
| JC | Roadside | Diffusion Tube | 100% | 100% | 58.84 | 57.39 | 51.08 | 48.55 | 47.81 |
| STON | Roadside | Diffusion Tube | N/A | N/A | 41.38 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 |
| IBIS | Urban Background | Diffusion Tube | 100% | 100% | 46.25 | 49.66 | 50.34 | 49.1 | 47.47 |
| GDSO | Urban Background | Diffusion Tube | 100% | 100% | 28.46 | 28.9 | 26.59 | 28.92 | 28.12 |
| LT | Roadside | Diffusion Tube | 50% | 50% | 61.99 | 50.6 | 50.09 | 53.73 | 57.25 ⁽³⁾ |
| KCNO | Urban Background | Diffusion Tube | 100% | 100% | 35.21 | 34.63 | 32.69 | 32.81 | 34.31 |
| WT | Roadside | Diffusion Tube | 100% | 100% | 40.13 | 39.1 | 37 | 41.14 | 39.99 |
| HR | Roadside | Diffusion Tube | 100% | 100% | 31.41 | 31.35 | 28.9 | 31.51 | 32.8 |
| NAS2 | Roadside | Diffusion | 75% | 75% | 51.69 | 50.57 | 48.06 | 55.99 | 53.97 |

Thurrock Council

| | | Tube | | | | | | | |
|------|------------------|----------------|------|------|--------------|---------------------------|---------------------------|---------------------------|---------------------------|
| LRSS | Roadside | Diffusion Tube | 75% | 75% | 44.76 | 41.07 | 38.7 | 39.64 | 42.82 |
| LRG | Roadside | Diffusion Tube | 75% | 75% | 39.74 | 38.15 | 35.9 | 38.85 | 39.17 |
| NAS4 | Urban Background | Diffusion Tube | N/A | N/A | 20.88 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 |
| ER | Roadside | Diffusion Tube | 100% | 100% | 56.68 | 53.27 | 50.61 | 51.81 | 50.83 |
| PS | Urban Background | Diffusion Tube | 92% | 92% | 27.72 | 26.51 | 23.31 | 25.73 | 26.74 |
| HL | Roadside | Diffusion Tube | 100% | 100% | 33.3 | 35.48 | 29.95 | 33.93 | 35.06 |
| NAS1 | Roadside | Diffusion Tube | 75% | 75% | 35.01 | 33.22 | 28.74 | 33.52 | 33.67 |
| CR | Intermediate | Diffusion Tube | 100% | 100% | 31.95 | 33.36 | 31.3 | 32.61 | 32.55 |
| SRG | Roadside | Diffusion Tube | 100% | 100% | 33.09 | 30.85 | 26.67 | 30.88 | 29.4 |
| NAS3 | Urban Background | Diffusion Tube | 75% | 75% | 22.67 | 21.95 | 20.12 | 22.02 | 23.74 |
| WES | Roadside | Diffusion Tube | 100% | 100% | 31.38 | 30.61 | 28.54 | 31.84 | 30.67 |
| B | Rural Background | Diffusion Tube | 92% | 92% | 18.44 | 17.7 | 15.54 | 17.19 | 16.66 |
| TL | Roadside | Diffusion Tube | 100% | 100% | 37.13 | 35.56 | 30.55 | 35.68 | 35.81 |
| PKSL | Roadside | Diffusion Tube | 100% | 100% | 31.01 | 28.93 | 26.79 | 28.98 | 28.47 |
| SL | Urban Background | Diffusion Tube | 100% | 100% | 27.34 | 25.83 | 23.82 | 27.01 | 26.52 |
| M | Roadside | Diffusion Tube | 75% | 75% | 32.74 | 25.72 | 24.57 | 26.97 | 28.3 |
| FRC | Intermediate | Diffusion Tube | 100% | 100% | 34.34 | 34.03 | 30.51 | 33.17 | 32.48 |

Thurrock Council

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|-----------|------------------|----------------|------|------|--------------|--------------------|--------------------|--------------------|--------------------|
| SLHRS | Roadside | Diffusion Tube | N/A | N/A | 29.45 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 |
| ETRS | Roadside | Diffusion Tube | N/A | N/A | 28.35 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 | Site Ended 12/2013 |
| TILA | Roadside | Diffusion Tube | 92% | 92% | 40.32 | 40.23 | 36.09 | 40.76 | 41.86 |
| TILB | Roadside | Diffusion Tube | 100% | 100% | 42.03 | 39.68 | 36.29 | 39.73 | 38.5 |
| TILC | Roadside | Diffusion Tube | 92% | 92% | 40.39 | 37.86 | 32.63 | 39.02 | 41.12 |
| TILD | Roadside | Diffusion Tube | 100% | 100% | 38.08 | 33.9 | 31.12 | 36.85 | 37.15 |
| TILE | Roadside | Diffusion Tube | 100% | 100% | 35.26 | 35.85 | 31.68 | 34.92 | 36.18 |
| TK4 (A&B) | Roadside | Diffusion Tube | 100% | 100% | 32.79 | 31.05 | 29.5 | 31.51 | 30.1 |
| PBP | Roadside | Diffusion Tube | 75% | 75% | 40.69 | 38.51 | 35.37 | 37.8 | 37.64 |
| PBPA | Roadside | Diffusion Tube | 75% | 75% | No Data | 36.06 | 31.48 | 34.7 | 34.1 |
| LYD | Urban Background | Diffusion Tube | 75% | 75% | 34.42 | 34.48 | 29.58 | 30.77 | 32.16 |
| AVSL | Roadside | Diffusion Tube | 100% | 100% | 45.15 | 45.92 | 40.41 | 41.01 | 43.02 |
| AVHS | Roadside | Diffusion Tube | 100% | 100% | 39.41 | 38.92 | 35.86 | 37.27 | 35.98 |
| SOAA | Roadside | Diffusion Tube | 100% | 100% | 33.03 | 33.04 | 29.94 | 30.29 | 28.72 |
| TSR | Urban Background | Diffusion Tube | 100% | 100% | 31.88 | 27.17 | 27.39 | 28.05 | 29.02 |
| DR | Roadside | Diffusion Tube | 100% | 100% | 29.79 | 33.27 | 28.69 | 30.05 | 28.67 |
| LRARN | Roadside | Diffusion Tube | 75% | 75% | 33.93 | 35.12 | 31.37 | 32.02 | 33.97 |
| LRARS | Roadside | Diffusion Tube | 75% | 75% | 30 | 32.96 | 26.51 | 31.11 | 31.39 |

Thurrock Council

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|--------|------------------|----------------|------|------|--------------|--------------|---------|--------------|----------------------|
| LRARMN | Roadside | Diffusion Tube | 75% | 75% | 44.51 | 43.87 | 36.43 | 45.63 | 41.82 |
| LRARMS | Roadside | Diffusion Tube | 75% | 75% | 38.79 | 40.11 | 32.38 | 43.62 | 40.1 |
| JRP | Urban Background | Diffusion Tube | 100% | 100% | No Data | No Data | 26.05 | 27.6 | 25.93 |
| ACHL | Roadside | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 36.99 ⁽³⁾ |
| CC | Intermediate | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 23.52 ⁽³⁾ |
| ERFA | Roadside | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 34.92 ⁽³⁾ |
| ERFB | Roadside | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 35.63 ⁽³⁾ |
| ERTM | Roadside | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 36.7 ⁽³⁾ |
| NC | Intermediate | Diffusion Tube | 50% | 50% | No Data | No Data | No Data | No Data | 37.75 ⁽³⁾ |
| HD | Roadside | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 36.06 ⁽³⁾ |
| GRPL | Intermediate | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 34.07 ⁽³⁾ |
| PIH | Intermediate | Diffusion Tube | 50% | 50% | No Data | No Data | No Data | No Data | 33.11 ⁽³⁾ |
| WCFA | Intermediate | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 32.06 ⁽³⁾ |
| THA | Urban Background | Diffusion Tube | 50% | 50% | No Data | No Data | No Data | No Data | 31.8 ⁽³⁾ |
| THB | Urban Background | Diffusion Tube | 67% | 67% | No Data | No Data | No Data | No Data | 31.19 ⁽³⁾ |

☒ Diffusion tube data has been bias corrected

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

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**.

(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 NO₂ Concentrations (automatic monitoring sites)

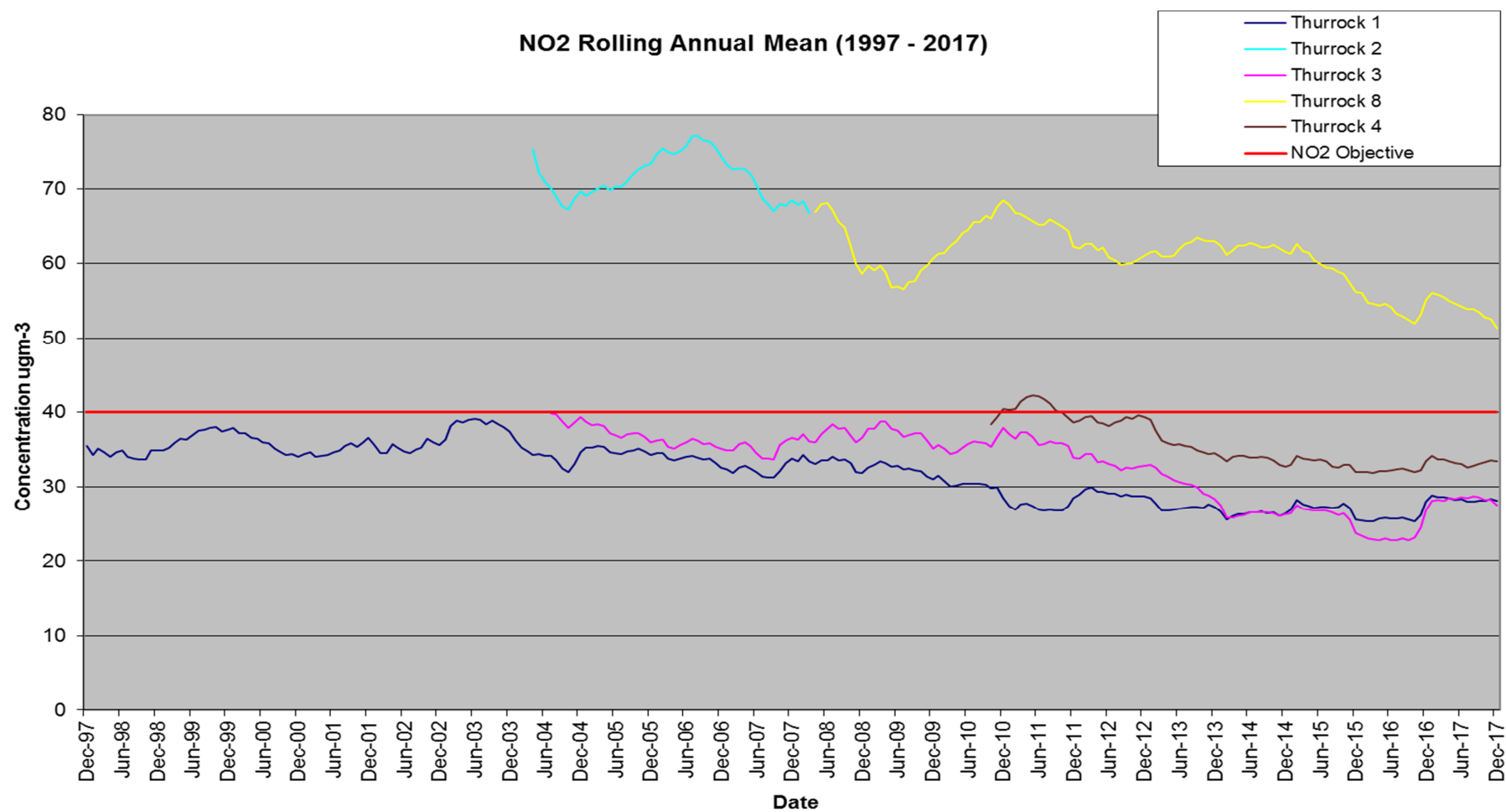


Figure A.2 – Trends in Annual Mean NO_x Concentrations (automatic monitoring sites)

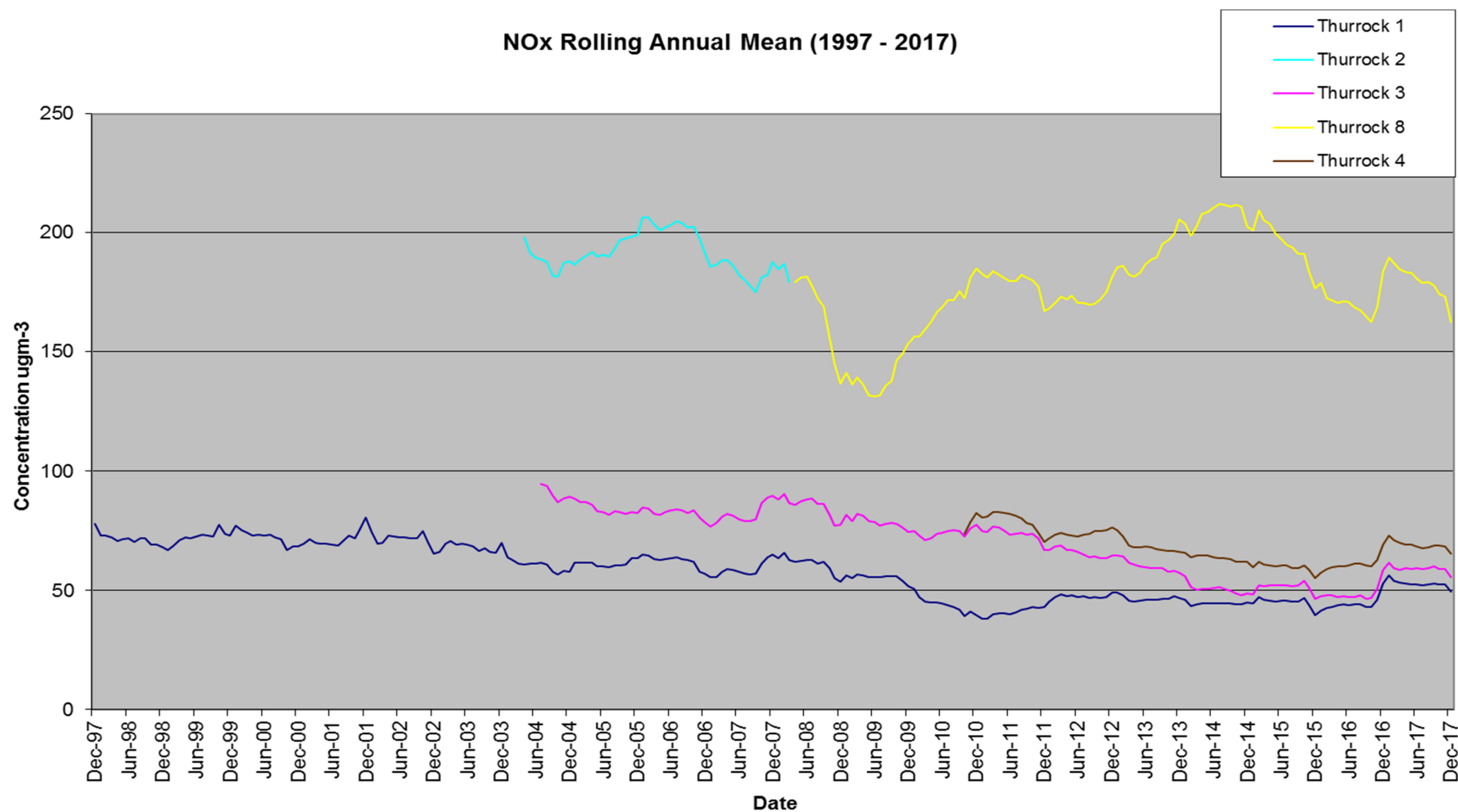


Figure A.3 – Rolling Annual Mean for % NO₂ of NO_x (automatic monitoring sites)

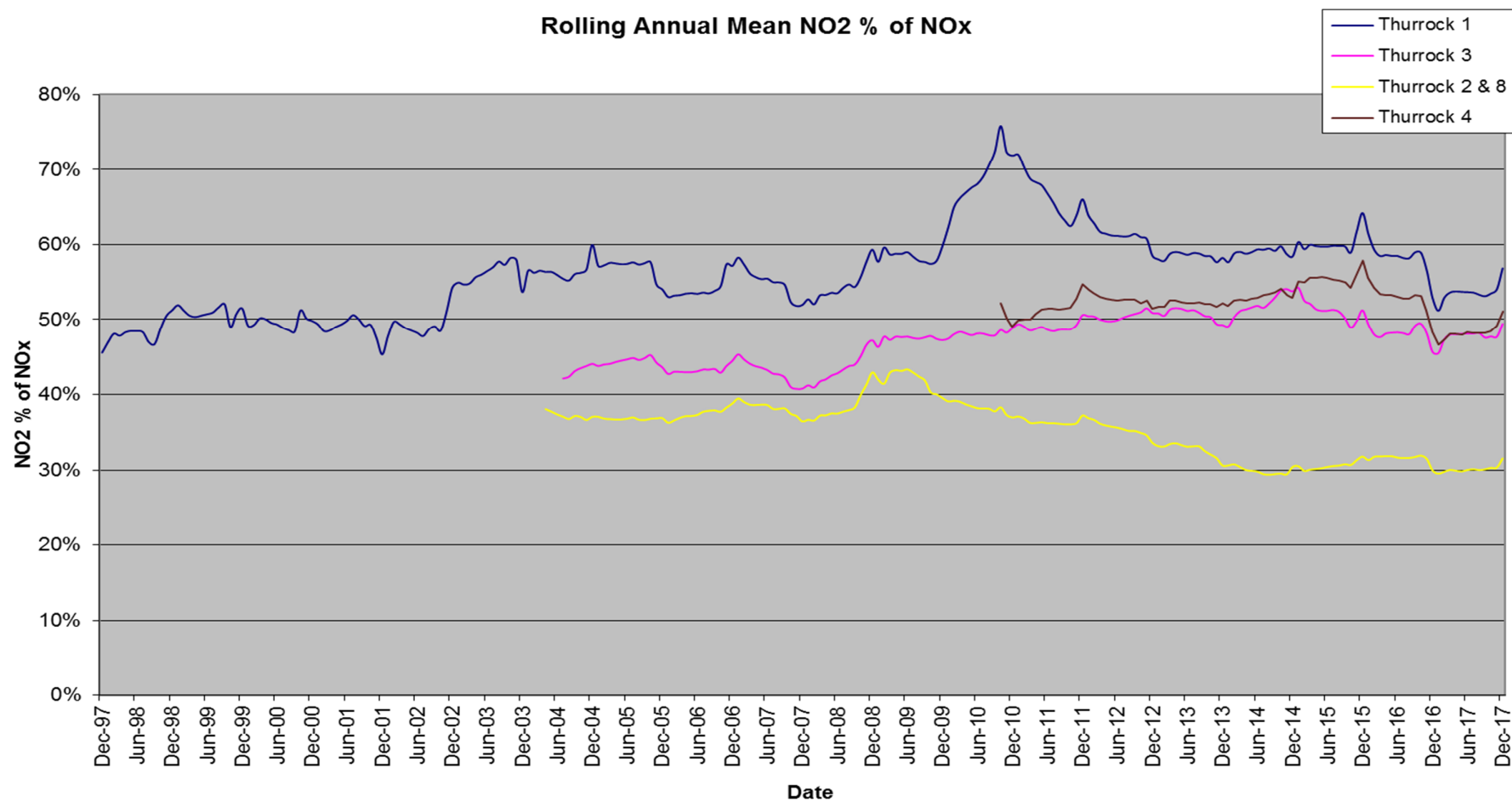


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2017 (%) ⁽²⁾ | NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾ | | | | |
|------------|------------------|-----------------|---|--|--|------|------|------|------|
| | | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| Thurrock 1 | Urban Background | Automatic | 97.7 | 97.7 | 0 | 0 | 0 | 0 | 0 |
| Thurrock 3 | Roadside | Automatic | 98.9 | 98.9 | 0 | 0 | 0 | 0 | 0 |
| Thurrock 4 | Roadside | Automatic | 96.8 | 96.8 | 0 | 0 | 0 | 0 | 0 |
| Thurrock 8 | Roadside | Automatic | 97.9 | 97.9 | 5 | 5 | 0 | 1 | 2 |

Notes:

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

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

Figure A.4 – Trends in Number of NO₂ 1-Hour Means > 200µg/m³

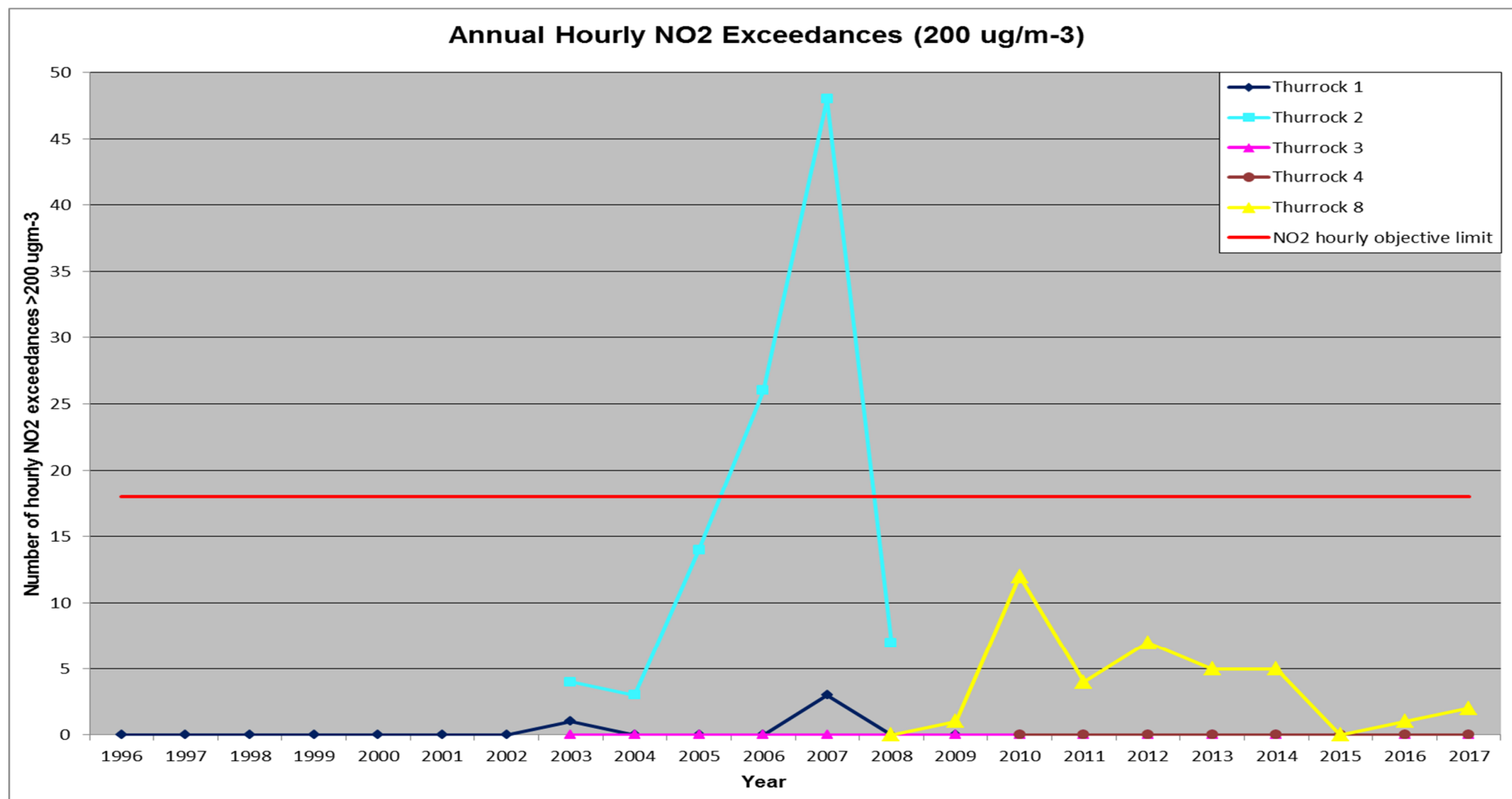


Table A.5 – Annual Mean PM₁₀ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2017 (%) ⁽²⁾ | PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | |
|------------|------------------|---|--|--|-------|----------------------|---------------------|---------------------|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| Thurrock 1 | Urban Background | 98.3 | 98.3 | 19.16 | 19.28 | 17.08 | 17.27 | 18.21 |
| Thurrock 3 | Roadside | 66.59 | 66.59 | 24.33 | 19.76 | 17.14 ⁽³⁾ | 20.1 ⁽¹⁾ | 20.3 ⁽³⁾ |
| Thurrock 8 | Roadside | 98.85 | 98.85 | 27.43 | 26.83 | 24.87 | 24.75 | 25.1 |

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

Notes:

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

(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) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.5 – Trends in Annual Mean PM₁₀ Concentrations

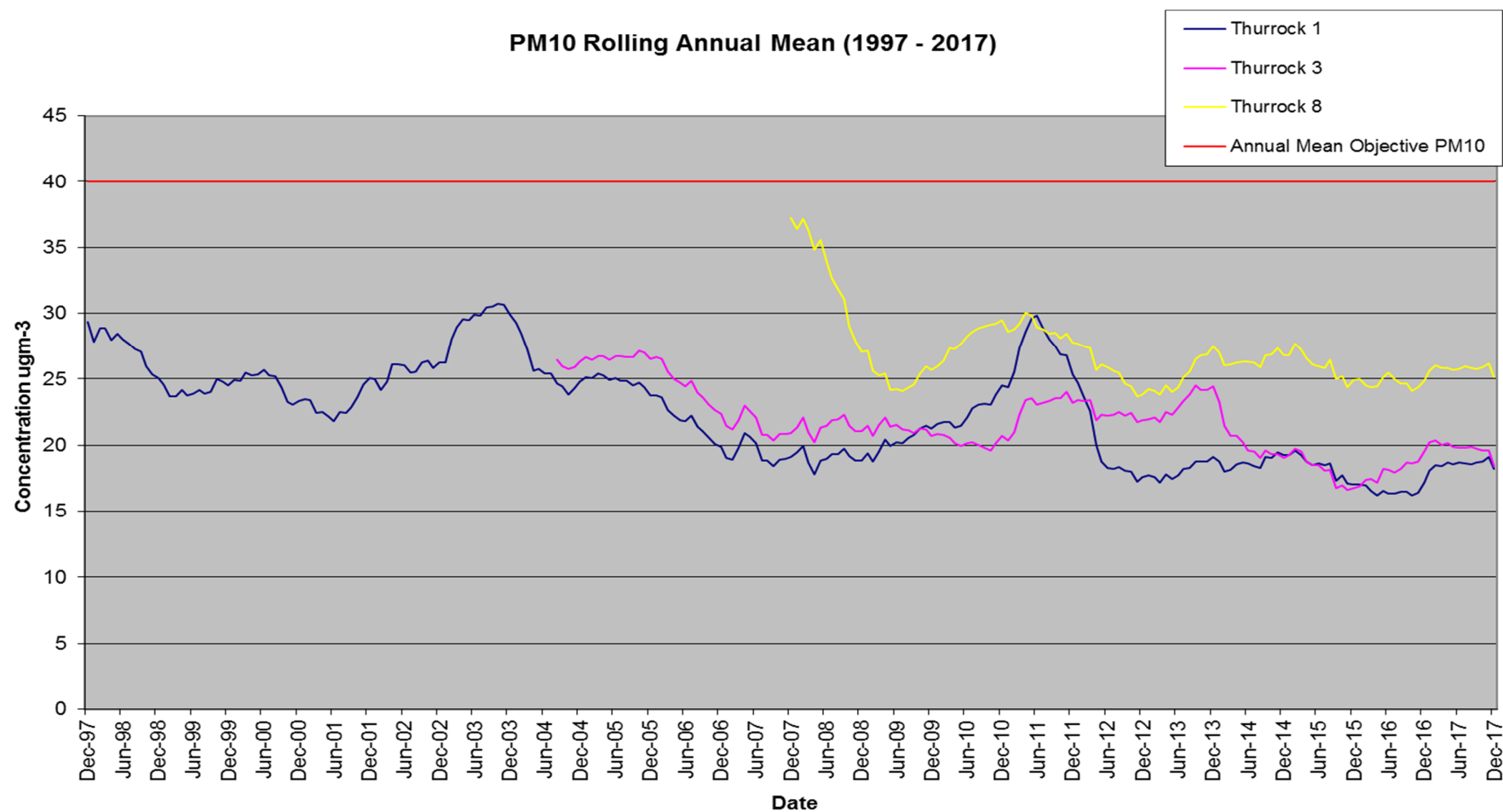


Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2017 (%) ⁽²⁾ | PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾ | | | | |
|------------|------------------|---|--|---|------|--------------------------------------|--------------------------------------|---------------------------------------|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| Thurrock 1 | Urban Background | 98.3 | 98.3 | 4 | 11 | 2 | 4 | 5 |
| Thurrock 3 | Roadside | 66.59 | 66.59 | 16 | 9 | [2]* (29.5) ⁽³⁾ | [4]* (38.8) ⁽³⁾ | [5]* (39.03) ⁽³⁾ |
| Thurrock 8 | Roadside | 98.85 | 98.85 | 21 | 22 | 22 | 11 | 12 |

Notes:

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

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

[]* indicates number of daily exceedances [but is below level of data capture required]

() indicates 90.41th percentile values

Figure A.6 – Trends in the Number of 24-Hour Mean PM₁₀ Results >50µg/m³

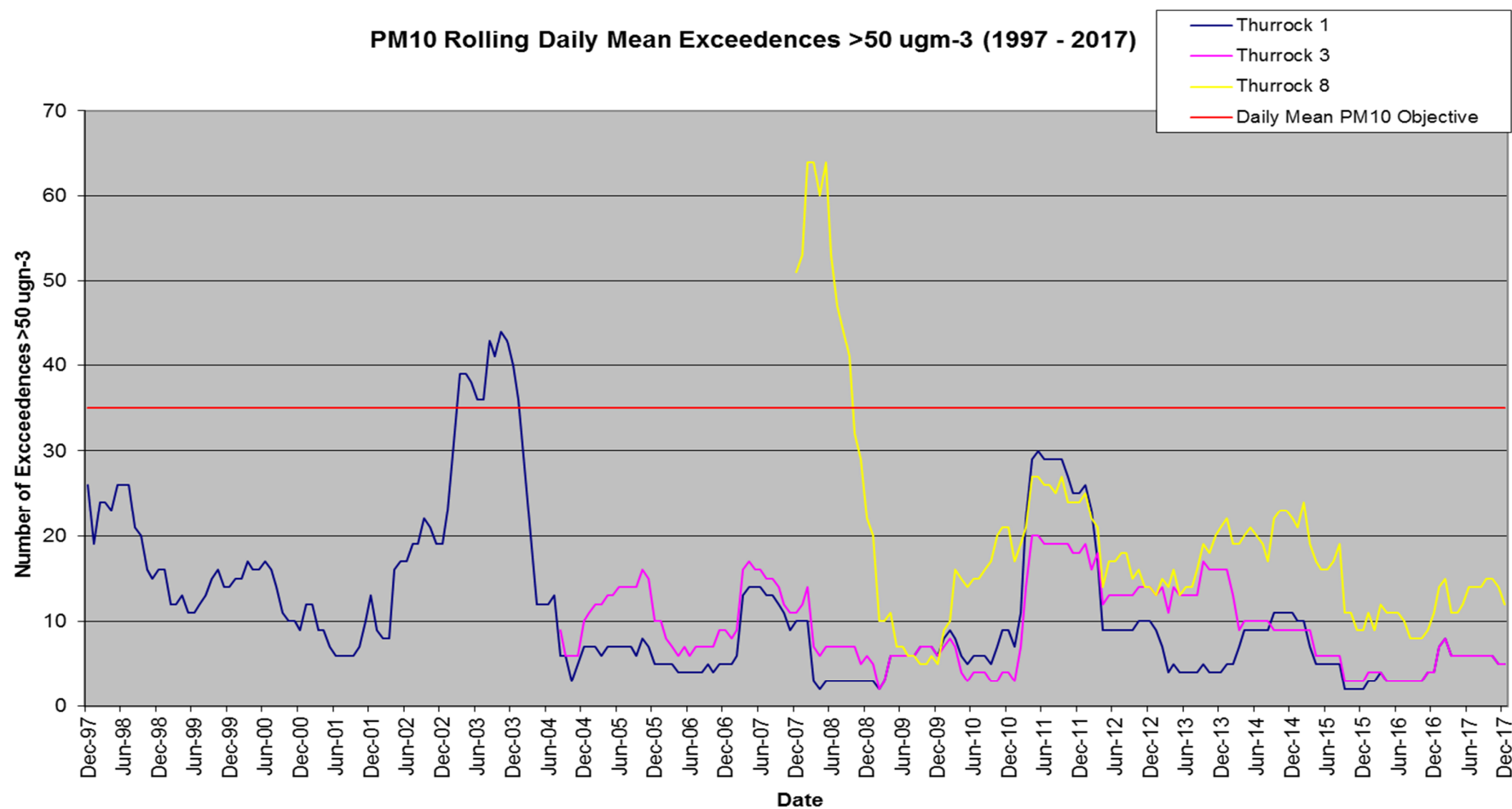


Table A.7 – Annual Mean PM_{2.5} Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2017 (%) ⁽²⁾ | PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | |
|------------|-----------|---|--|---|-------|------|-------|-------|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| Thurrock 3 | Roadside | 90.48 | 90.48 | 14.07 | 14.23 | 9.84 | 13.41 | 11.05 |

☐ Annualisation has been conducted where data capture is <75

Notes:

(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) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.7 – Trends in Annual Mean PM_{2.5} Concentrations

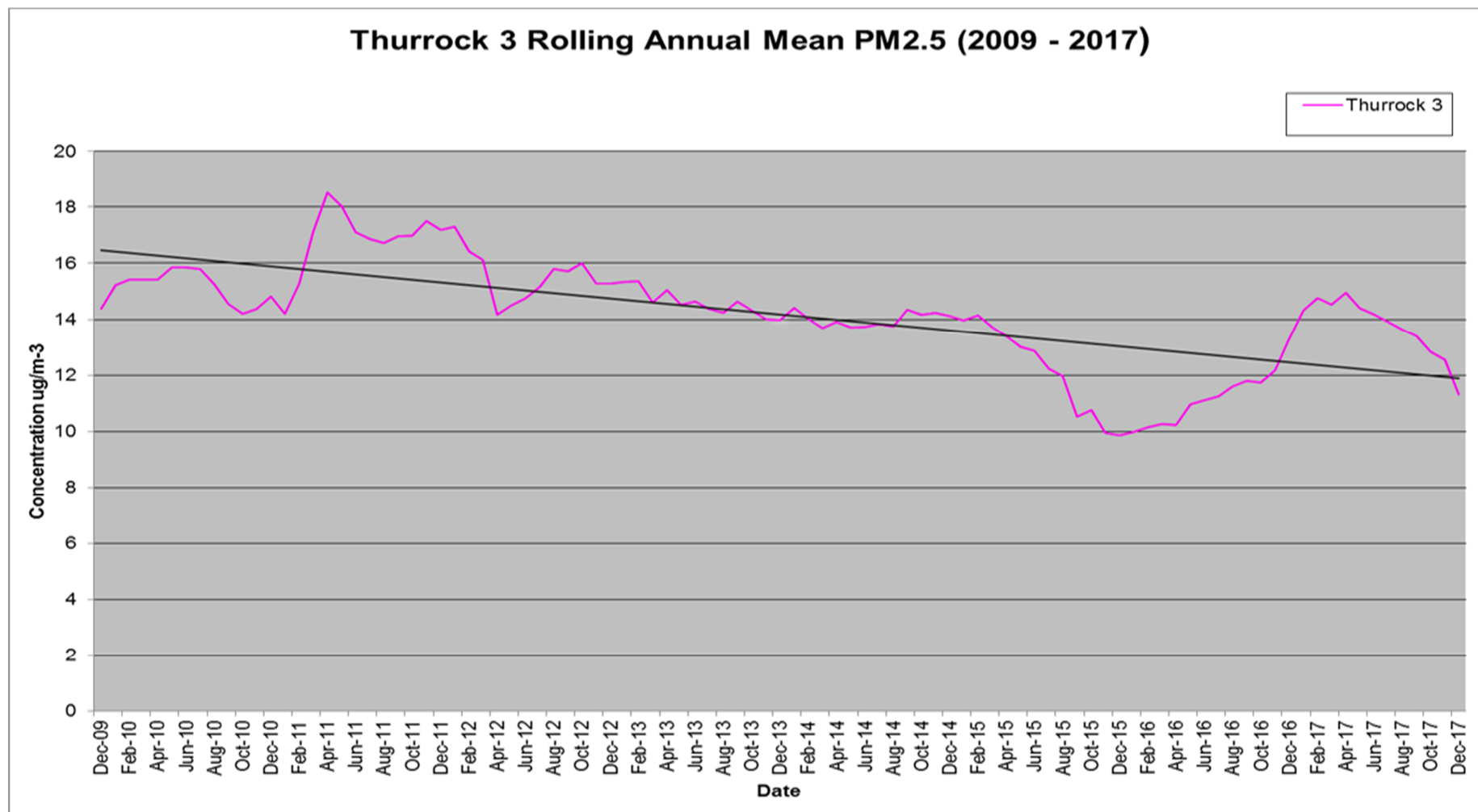


Table A.8 – SO₂ Monitoring Results

| Site ID | Site Type | Valid Data Capture for monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2017 (%) ⁽²⁾ | Number of Exceedances 2017 (percentile in bracket) ⁽³⁾ | | |
|------------|------------------|---|--|--|--|---|
| | | | | 15-minute Objective (266 µg/m ³) | 1-hour Objective (350 µg/m ³) | 24-hour Objective (125 µg/m ³) |
| Thurrock 1 | Urban Background | 96.24 | 96.24 | 0 | 0 | 0 |

Notes:

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(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) If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

Figure A.8 – Trends in SO₂ Concentrations

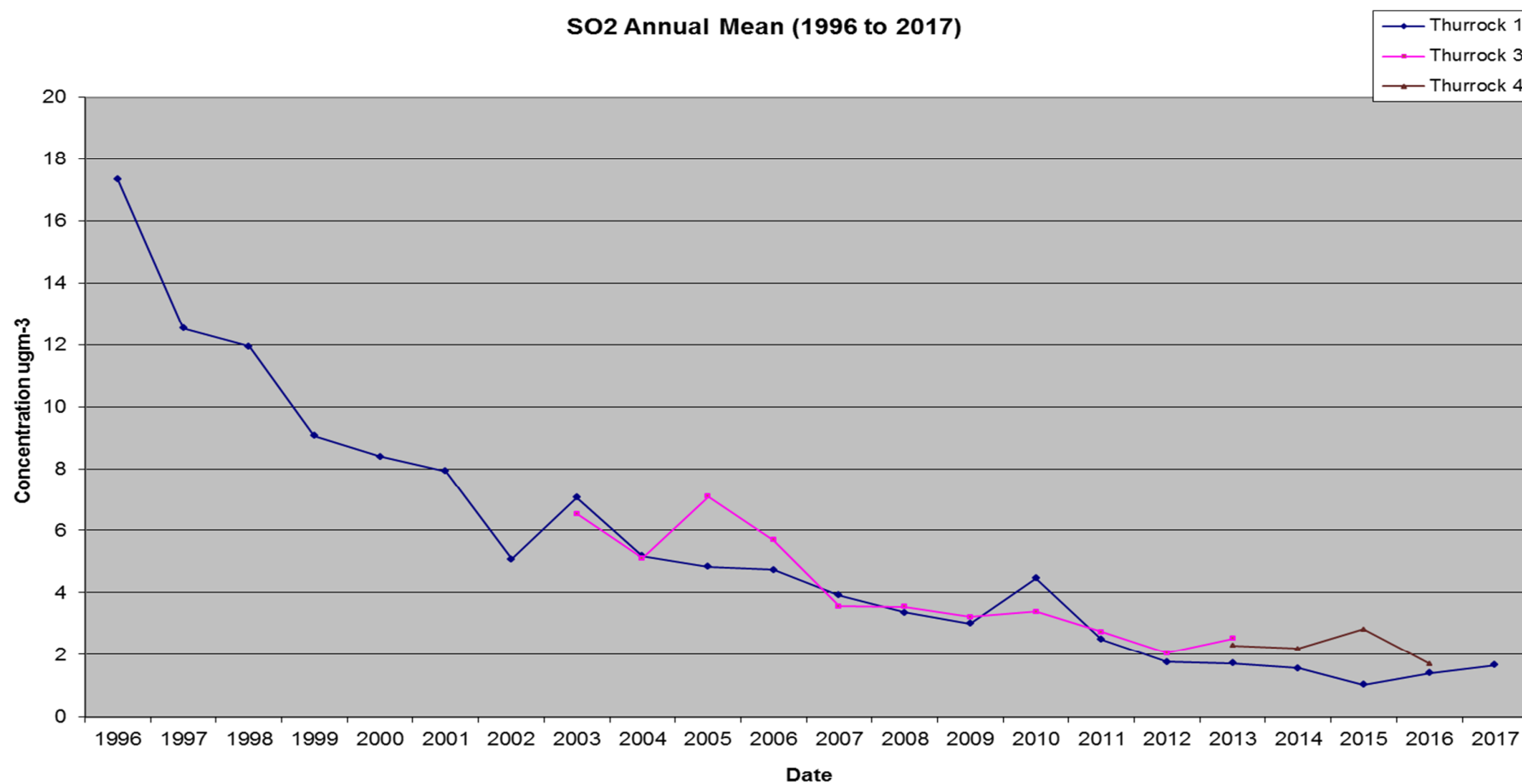
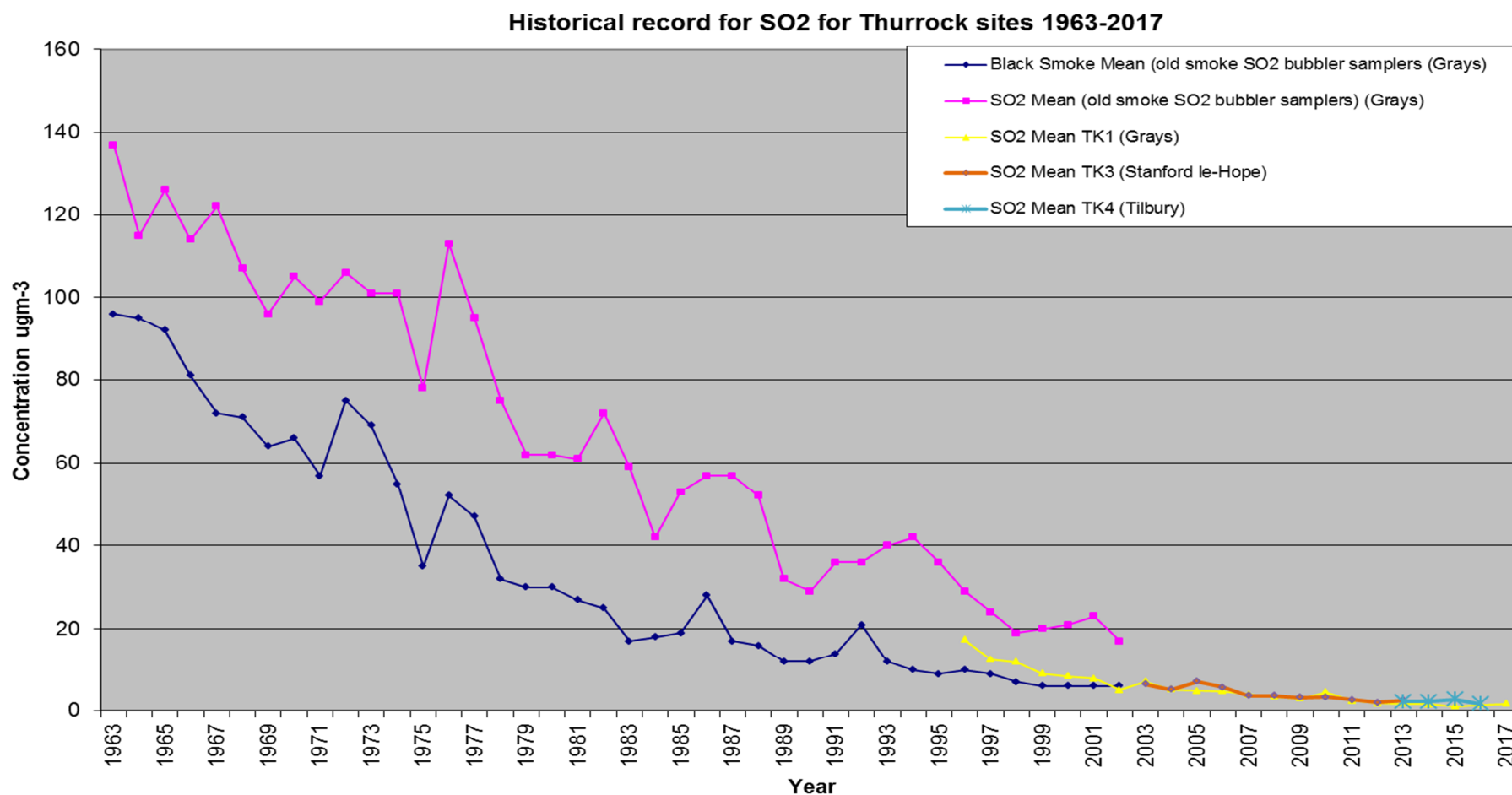


Figure A.9 – Long-Term Historical Trends in SO₂ & Black Smoke Concentrations for Thurrock (1963 – 2017)



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

| 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 (factor) = 0.89 and Annualised ⁽¹⁾ | Distance Corrected to Nearest Exposure ⁽²⁾ |
| LRAR | 92.05 | 70.69 | 73.23 | 71.12 | 56.19 | 57.17 | 57.26 | BAD DATA | BAD DATA | BAD DATA | 65.96 | 58.47 | 66.90 | 59.54 | 40.5 |
| PRS | 47.55 | 41.69 | 39.70 | 36.39 | 37.54 | 34.15 | 29.16 | BAD DATA | 33.80 | 27.87 | 38.10 | 32.52 | 36.22 | 32.24 | 27.4 |
| WC | 77.64 | 53.96 | 48.96 | 49.63 | 35.97 | 32.18 | 25.92 | 45.67 | 46.02 | MISSING | 48.32 | 42.73 | 46.09 | 41.02 | 29.7 |
| JC | 73.00 | 52.75 | 50.22 | 56.64 | 54.60 | 54.44 | 50.23 | 48.27 | 49.71 | 49.09 | 59.01 | 46.69 | 53.72 | 47.81 | 38.5 |
| IBIS | 65.68 | 59.90 | 47.03 | 58.88 | 42.71 | 55.85 | 55.31 | 48.75 | 49.98 | 53.49 | 53.57 | 48.91 | 53.34 | 47.47 | location is classed as R.P.E |
| GDSO | 40.49 | 33.14 | 33.19 | 30.86 | 25.19 | 27.40 | 26.20 | 27.56 | 27.62 | 30.49 | 38.06 | 38.89 | 31.59 | 28.12 | location is classed as R.P.E |
| LT | 76.99 | 71.13 | 77.57 | 76.75 | 42.05 | MISSING | MISSING | MISSING | BAD DATA | BAD DATA | 84.07 | 80.92 | 72.78 | 57.25 ⁽³⁾ | 32.2 |
| KCNO | 48.67 | 43.51 | 38.47 | 40.13 | 27.45 | 33.40 | 32.78 | 36.33 | 37.05 | 35.73 | 43.35 | 45.67 | 38.55 | 34.31 | location is classed as R.P.E |
| WT | 58.08 | 50.18 | 48.50 | 45.18 | 37.20 | 41.07 | 36.58 | 37.05 | 44.40 | 38.72 | 52.83 | 49.44 | 44.94 | 39.99 | 35.7 |
| HR | 49.85 | 39.15 | 37.27 | 33.13 | 27.80 | 27.49 | 29.36 | 33.59 | 31.89 | 35.54 | 52.96 | 44.21 | 36.85 | 32.8 | location is classed as |

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| | | | | | | | | | | | | | | | |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|----------|----------|----------|-------|---------|--------------|--------------|------------------------------|
| | | | | | | | | | | | | | | | R.P.E |
| NAS2 | 70.09 | 60.40 | 59.33 | 52.33 | 44.82 | 58.65 | 53.54 | BAD DATA | BAD DATA | BAD DATA | 69.50 | 77.10 | 60.64 | 53.97 | 46.1 |
| LRSS | 57.16 | 50.50 | 46.16 | 43.07 | 43.98 | 43.00 | 37.59 | BAD DATA | BAD DATA | BAD DATA | 60.87 | 50.68 | 48.11 | 42.82 | 37.8 |
| LRG | 57.48 | 43.04 | 41.67 | 44.96 | 38.06 | 40.47 | 35.49 | BAD DATA | BAD DATA | BAD DATA | 47.08 | 47.83 | 44.01 | 39.17 | 32.50 |
| ER | 80.13 | 56.77 | 52.53 | 55.30 | 52.25 | 49.74 | 55.93 | 50.86 | 53.06 | 52.92 | 69.44 | 56.47 | 57.12 | 50.83 | 35.8 |
| PS | 41.51 | 35.65 | 33.94 | 27.54 | 22.20 | 22.42 | 22.02 | 25.11 | 27.67 | BAD DATA | 35.82 | 36.56 | 30.04 | 26.74 | n/a |
| HL | 59.91 | 40.95 | 38.93 | 37.67 | 31.98 | 26.71 | 27.93 | 32.34 | 34.81 | 38.13 | 51.67 | 51.67 | 39.39 | 35.06 | 30 |
| NAS1 | 51.61 | 36.78 | 38.23 | 34.19 | 30.67 | 35.35 | 28.84 | BAD DATA | BAD DATA | BAD DATA | 41.84 | 42.98 | 37.83 | 33.67 | location is classed as R.P.E |
| CR | 54.02 | 40.29 | 39.59 | 34.72 | 30.79 | 32.77 | 27.11 | 30.96 | 34.11 | 31.45 | 40.06 | 43.04 | 36.58 | 32.55 | n/a |
| SRG | 53.09 | 33.88 | 32.42 | 30.83 | 30.49 | 27.91 | 23.17 | 26.96 | 30.01 | 27.19 | 41.75 | 38.67 | 33.03 | 29.4 | 28.1 |
| NAS3 | 40.65 | 25.92 | 25.05 | 20.57 | 16.66 | 18.10 | 15.23 | BAD DATA | BAD DATA | BAD DATA | 43.54 | 34.37 | 26.68 | 23.74 | location is classed as R.P.E |
| WES | 52.26 | 37.75 | 37.29 | 30.36 | 29.89 | 29.26 | 27.63 | 31.56 | 32.53 | 32.48 | 37.36 | 35.20 | 34.46 | 30.67 | 23 |
| B | 33.69 | 23.13 | 19.84 | 14.01 | 15.58 | 14.81 | 12.37 | 15.01 | MISSING | 16.64 | 19.81 | 21.04 | 18.72 | 16.66 | n/a |
| TL | 56.93 | 41.96 | 39.66 | 38.19 | 31.40 | 35.74 | 37.22 | 35.22 | 38.53 | 37.45 | 48.17 | 42.37 | 40.24 | 35.81 | 29.7 |
| PKSL | 45.46 | 33.49 | 33.54 | 34.54 | 27.42 | 28.97 | 24.55 | 25.48 | 29.54 | 31.13 | 39.01 | 30.68 | 31.98 | 28.47 | n/a |
| SL | 46.30 | 33.77 | 30.03 | 24.88 | 22.42 | 22.79 | 21.36 | 26.45 | 28.10 | 29.17 | 37.68 | 34.66 | 29.80 | 26.52 | n/a |
| M (triplicate average) | 47.11 | 31.67 | 30.72 | 31.17 | 26.38 | 27.96 | 22.91 | BAD DATA | BAD DATA | BAD DATA | 40.25 | 36.71 | 32.76 | 28.3 | 24.8 |
| FRC | 56.27 | 42.76 | 38.08 | 32.75 | 30.15 | 32.81 | 26.07 | 31.32 | 33.03 | 29.66 | 42.31 | 42.78 | 36.50 | 32.48 | location is classed as R.P.E |
| TILA | 70.12 | 46.01 | 43.98 | 44.75 | 31.40 | 35.74 | 37.22 | MISSING | 43.72 | 46.34 | 62.90 | 55.15 | 47.03 | 41.86 | 33.6 |
| TILB | 61.55 | 51.81 | 50.29 | 41.95 | 35.01 | 41.03 | 36.51 | 40.84 | 45.94 | 46.92 | 67.28 | MISSING | 47.19 | 38.5 | 37 |

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| | | | | | | | | | | | | | | | |
|--------------------------------------|-------|-------|-------|---------|-------|-------|-------|-------------|-------------|-------------|-------|-------|--------------|--------------|------------------------------------|
| TILC | 68.97 | 49.19 | 47.25 | MISSING | 34.70 | 36.46 | 38.60 | 32.48 | 39.04 | 44.75 | 64.70 | 52.09 | 46.20 | 41.12 | 24.1 |
| TILD | 55.91 | 41.94 | 42.00 | 37.12 | 34.05 | 35.67 | 32.21 | 32.65 | 41.86 | 35.96 | 58.85 | 52.73 | 41.75 | 37.15 | 30.3 |
| TILE | 56.76 | 39.88 | 43.02 | 35.75 | 31.10 | 35.07 | 34.46 | 34.75 | 34.68 | 41.42 | 53.24 | 47.75 | 40.66 | 36.18 | 30.8 |
| TK4 (A&B) duplicate average | 51.00 | 37.75 | 38.68 | 33.94 | 29.13 | 31.78 | 29.76 | 33.30 | 32.17 | 34.54 | 36.49 | 36.49 | 35.42 | 30.1 | location is classed as R.P.E |
| PBP | 52.97 | 47.93 | 45.44 | 41.09 | 33.87 | 36.99 | 30.99 | BAD DATA | BAD DATA | BAD DATA | 48.15 | 43.23 | 42.30 | 37.64 | location is classed as R.P.E |
| PBPA | 53.06 | 44.11 | 36.62 | 40.60 | 31.03 | 30.48 | 31.40 | BAD DATA | BAD DATA | BAD DATA | 36.71 | 40.80 | 38.31 | 34.1 | location is classed as R.P.E |
| LYD | 50.20 | 40.12 | 38.54 | 21.02 | 33.96 | 33.68 | 28.09 | BAD DATA | BAD DATA | BAD DATA | 43.15 | 36.48 | 36.14 | 32.16 | location is classed as R.P.E |
| AVSL | 62.95 | 49.44 | 47.60 | 51.59 | 50.62 | 46.49 | 42.78 | 36.74 | 36.61 | 47.06 | 56.40 | 51.73 | 48.33 | 43.02 | location is classed as R.P.E |
| AVHS | 64.83 | 41.89 | 42.29 | 38.52 | 42.96 | 39.00 | 31.11 | 32.36 | 36.58 | 36.39 | 44.00 | 35.18 | 40.43 | 35.98 | 35.4 |
| SOAA | 46.19 | 40.92 | 34.16 | 30.97 | 30.98 | 26.06 | 23.88 | 29.10 | 19.63 | 29.73 | 37.45 | 38.15 | 32.27 | 28.72 | location is classed as R.P.E |
| TSR | 48.03 | 34.65 | 35.70 | 29.64 | 30.49 | 27.91 | 23.17 | 27.35 | 27.22 | 32.59 | 37.73 | 36.83 | 32.61 | 29.02 | n/a |
| DR | 45.01 | 38.68 | 33.73 | 31.80 | 25.74 | 24.91 | 23.39 | 26.23 | 33.65 | 28.72 | 37.59 | 37.14 | 32.22 | 28.67 | location is classed as R.P.E |
| LRARN | 47.56 | 41.18 | 40.44 | 41.67 | 32.89 | 29.53 | 33.68 | BAD DATA | BAD DATA | BAD DATA | 38.06 | 38.53 | 38.17 | 33.97 | location is classed as R.P.E |
| LRARS | 48.31 | 38.33 | 36.53 | 34.81 | 30.92 | 29.33 | 26.65 | BAD DATA | BAD DATA | BAD DATA | 37.17 | 35.40 | 35.27 | 31.39 | location is classed as R.P.E |
| LRARMN | 61.78 | 49.09 | 48.70 | 50.56 | 43.29 | 38.67 | 36.45 | BAD DATA | BAD DATA | BAD DATA | 47.99 | 46.39 | 46.99 | 41.82 | 37.3 |

Thurrock Council

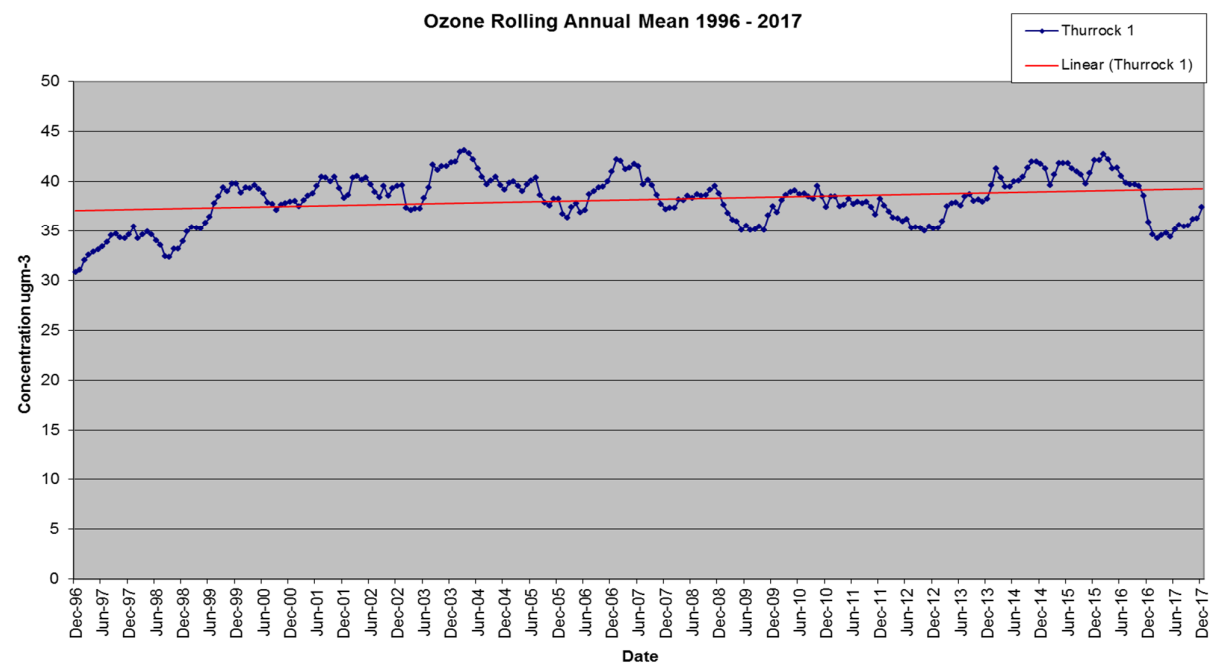
| | | | | | | | | | | | | | | | |
|--------|---------|---------|---------|---------|----------|-------|----------|----------|----------|----------|-------|-------|-------|----------------------|------------------------------|
| LRARMS | 61.98 | 48.32 | 43.74 | 51.73 | 34.30 | 39.16 | 35.18 | BAD DATA | BAD DATA | BAD DATA | 47.02 | 44.06 | 45.05 | 40.1 | 35.5 |
| JRP | 49.72 | 33.10 | 29.96 | 28.28 | 24.89 | 25.83 | 22.18 | 21.31 | 26.14 | 29.18 | 30.07 | 28.92 | 29.13 | 25.93 | n/a |
| ACHL | NO DATA | NO DATA | NO DATA | NO DATA | 31.34 | 31.96 | 26.63 | 30.33 | 36.24 | 37.58 | 55.78 | 55.88 | 38.22 | 36.99 ⁽³⁾ | 38.2 |
| CC | NO DATA | NO DATA | NO DATA | NO DATA | 25.06 | 15.01 | 17.30 | 18.35 | 26.48 | 27.27 | 32.54 | 32.33 | 24.29 | 23.52 ⁽³⁾ | location is classed as R.P.E |
| ERFA | NO DATA | NO DATA | NO DATA | NO DATA | 32.41 | 35.93 | 31.25 | 30.61 | 28.03 | 40.61 | 47.49 | 42.24 | 36.07 | 34.92 ⁽³⁾ | location is classed as R.P.E |
| ERFB | NO DATA | NO DATA | NO DATA | NO DATA | 35.29 | 35.35 | 34.12 | 34.25 | 36.98 | 36.13 | 44.20 | 38.13 | 36.81 | 35.63 ⁽³⁾ | location is classed as R.P.E |
| ERTM | NO DATA | NO DATA | NO DATA | NO DATA | 39.69 | 36.91 | 34.60 | 31.32 | 36.50 | 36.96 | 44.56 | 42.75 | 37.91 | 36.7 ⁽³⁾ | location is classed as R.P.E |
| NC | NO DATA | NO DATA | NO DATA | NO DATA | 32.33 | 38.98 | 33.50 | BAD DATA | BAD DATA | BAD DATA | 46.80 | 43.69 | 39.06 | 37.75 ⁽³⁾ | location is classed as R.P.E |
| HD | NO DATA | NO DATA | NO DATA | NO DATA | 32.34 | 34.06 | 30.97 | 34.59 | 33.22 | 31.34 | 52.70 | 48.83 | 37.26 | 36.06 ⁽³⁾ | location is classed as R.P.E |
| GRPL | NO DATA | NO DATA | NO DATA | NO DATA | 30.73 | 31.40 | 31.56 | 29.19 | 31.29 | 36.52 | 46.98 | 43.87 | 35.19 | 34.07 ⁽³⁾ | location is classed as R.P.E |
| PIH | NO DATA | NO DATA | NO DATA | NO DATA | 41.04 | 33.38 | 27.00 | BAD DATA | BAD DATA | BAD DATA | 35.80 | 34.11 | 34.27 | 33.11 ⁽³⁾ | location is classed as R.P.E |
| WCFA | NO DATA | NO DATA | NO DATA | NO DATA | 35.97 | 32.18 | 25.92 | 30.13 | 33.57 | 33.36 | 37.31 | 36.53 | 33.12 | 32.06 ⁽³⁾ | location is classed as R.P.E |
| THA | NO DATA | NO DATA | NO DATA | NO DATA | BAD DATA | 39.50 | BAD DATA | 35.89 | 32.76 | MISSING | 34.60 | 35.12 | 35.57 | 31.8 ⁽³⁾ | location is classed as R.P.E |
| THB | NO DATA | NO DATA | NO DATA | NO DATA | 35.49 | 34.28 | 27.43 | 30.20 | 30.28 | 30.04 | 34.07 | 36.00 | 32.22 | 31.19 ⁽³⁾ | location is classed as |

| | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------|
| | | | | | | | | | | | | | | | R.P.E |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------|

- ☒ Local bias adjustment factor used
- ☒ National bias adjustment factor used
- ☒ Annualisation has been conducted where data capture is <75%
- ☒ Where applicable, data has been distance corrected for relevant exposure

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**.
 (1) See Appendix C for details on bias adjustment and annualisation.
 (2) Distance corrected to nearest relevant public exposure.
 (Yellow) low data capture less than 75%
 R.P.E = Relevant Public Exposure

Figure A.10 – Long –Term Ozone (O₃) Rolling Annual Mean for Thurrock 1
Grays AURN Site



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

There are a number of different organisations responsible for carrying out QA/QC at various stations and equipment at Thurrock's automatic monitoring sites.

For Thurrock 1, Grays AURN site, the QA/QC is managed by Bureau Veritas (BV) and by Ricardo AEA, the site Audits are conducted by Ricardo AEA. Service contracts do vary, all the gas analysers are maintained by Enviro Technology, and the PM₁₀ FDMs is maintained by Air Quality Monitors.

For Thurrock 3, Stanford-le-Hope site, this is an affiliated site on the AURN network and is also part of the London Air Quality Network (LAQN). The QA/QC is managed by Environmental Research Group (ERG) at King College London (KCL), the site Audits are conducted by Ricardo AEA. The Service contracts are managed by Enviro Technology.

For Thurrock 4, Tilbury site, this is also part of the London Air Quality Network (LAQN). The QA/QC is managed by Environmental Research Group (ERG) at King College London (KCL). The site Audits are conducted by Ricardo AEA. The Service contracts are managed by Enviro Technology.

For Thurrock 8, Purfleet site, this is also part of the London Air Quality Network (LAQN). The QA/QC is managed by Environmental Research Group (ERG) at King College London (KCL). The site Audits are conducted by the National Physical Laboratory (NPL). The Service contracts are managed by Enviro Technology.

Calibrations for all sites are done every fortnight by Thurrock Council Environmental Health Officers & the Air Quality Officer.

QA/QC of Diffusion Tube Monitoring

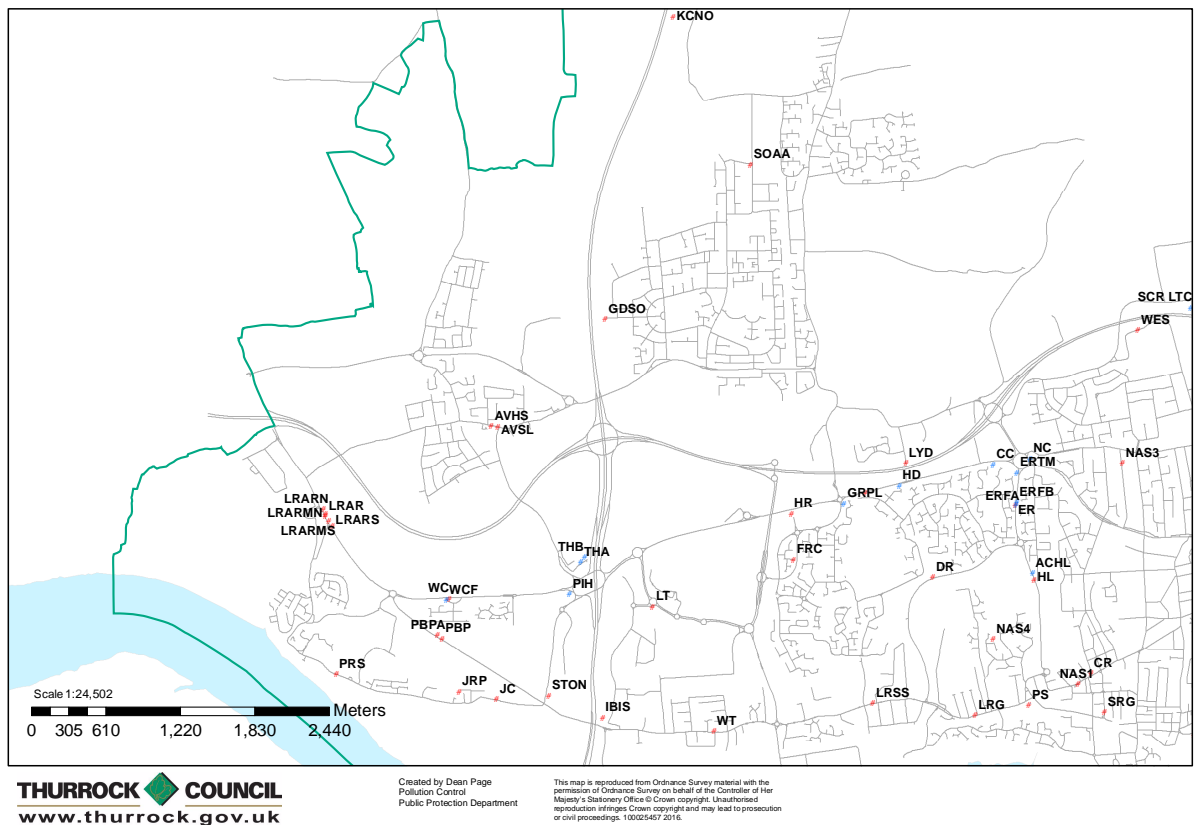
Diffusion Tube studies for Gradko analysis using 20% TEA in water over 2017 demonstrated overall Good Precision

<https://laqm.defra.gov.uk/assets/tubeprecision2017version0618finalreduced.pdf>

<https://laqm.defra.gov.uk/assets/AIR-PT-Rounds-13-to-24-Apr-2016-Feb-2018.pdf>

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

Figure D.1: NO₂ Diffusion Tube Locations (West Thurrock)



*NAS2 site text is not shown as it sits beneath GRPL site on the map only red marker is visible

**New sites marked in (Blue) 2017&18

***Older Long-term sites marked in (Red) Pre-2017

Figure D.2: NO₂ Diffusion Tube Locations (East Thurrock)

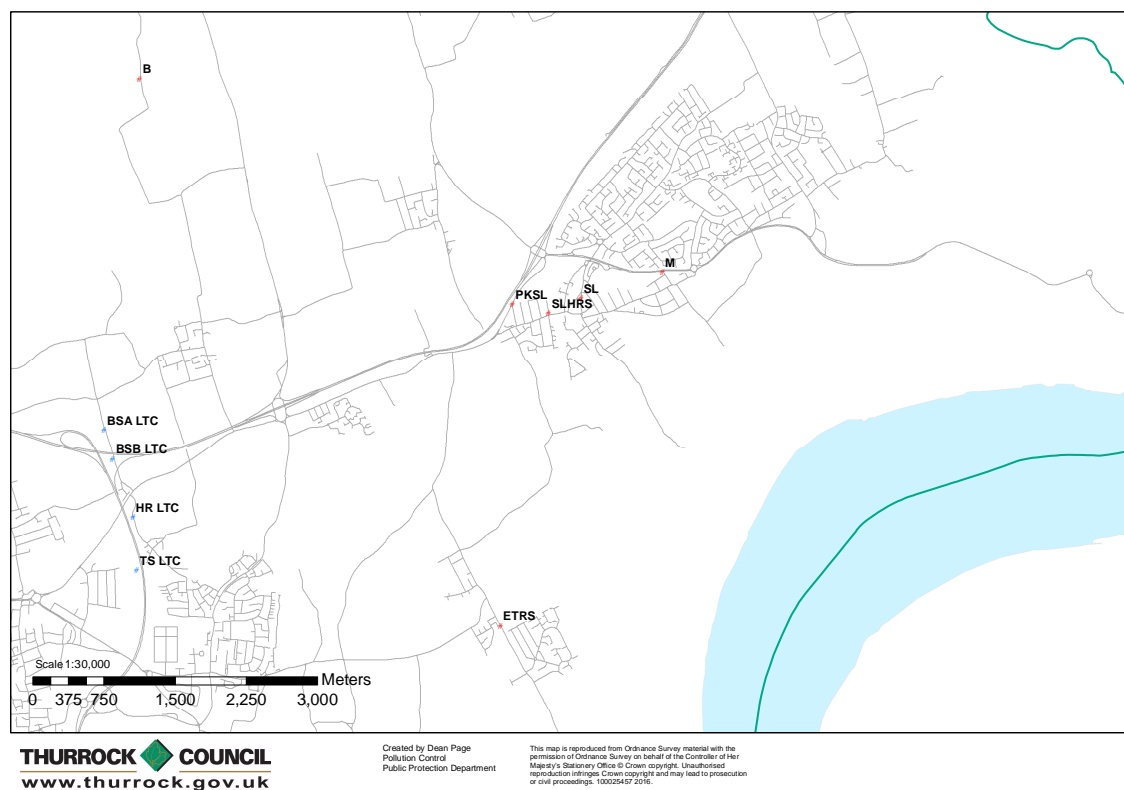


Figure D.3: NO₂ Diffusion Tube Locations (Tilbury)

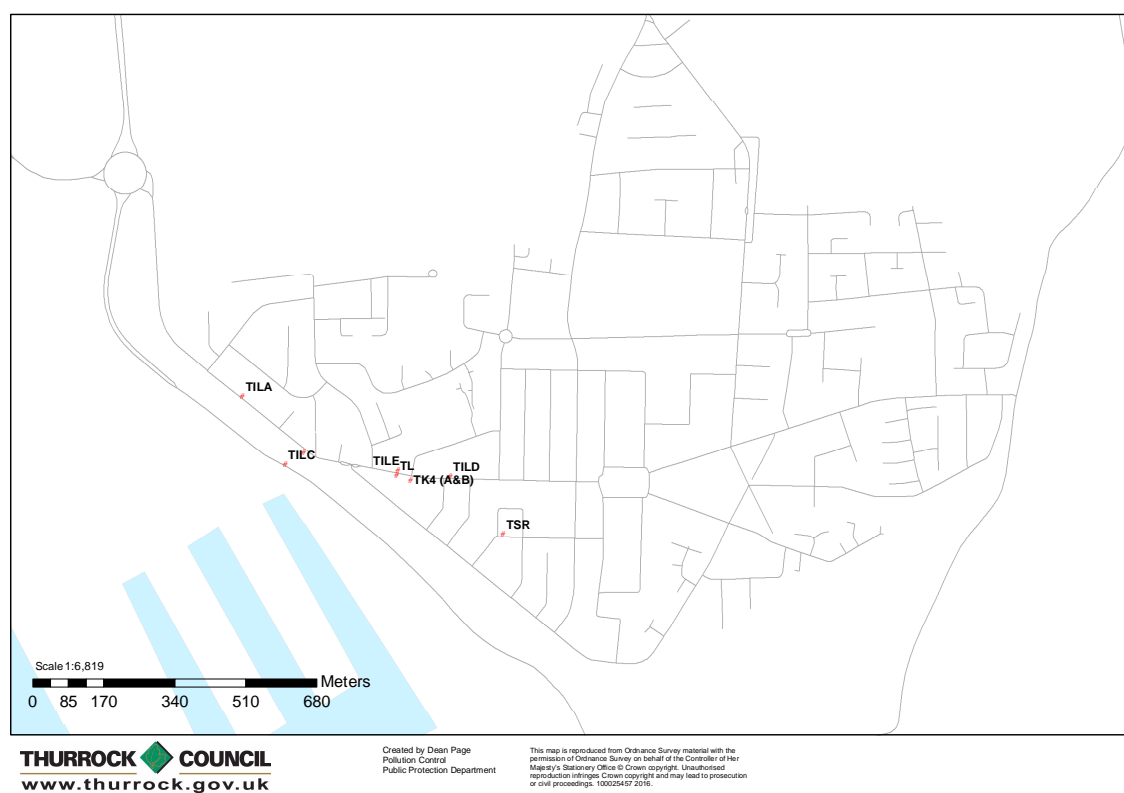


Figure D.4: Automatic Monitoring sites location (Thurrock)

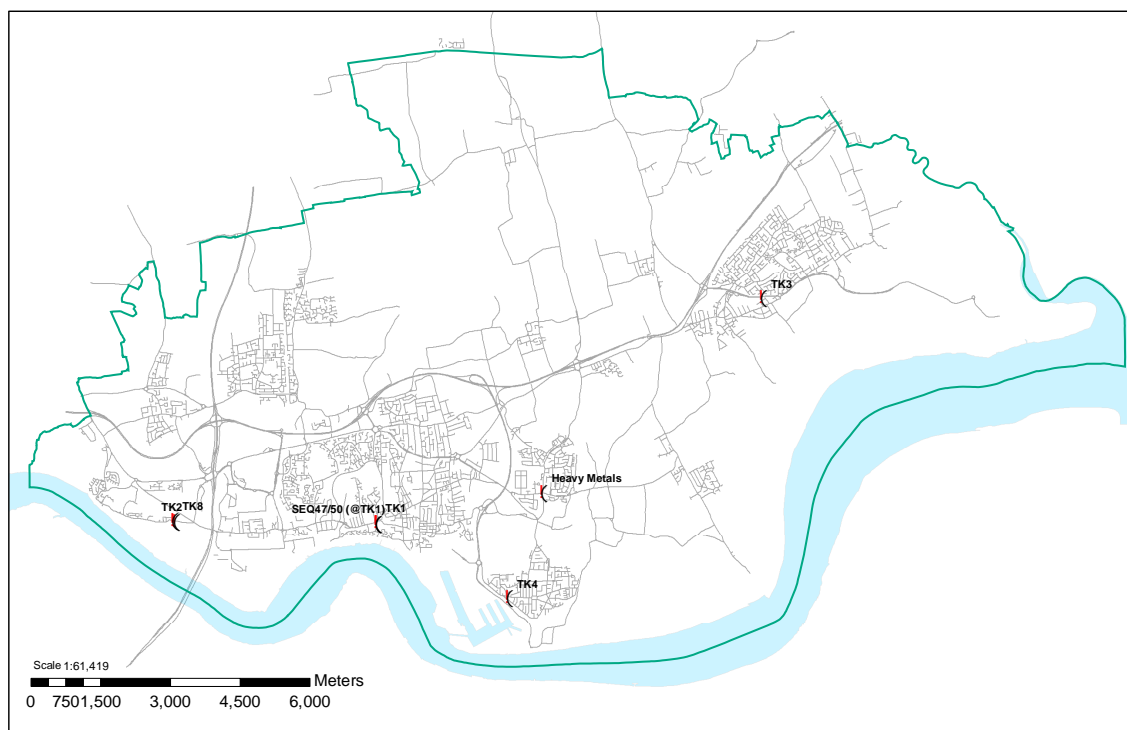
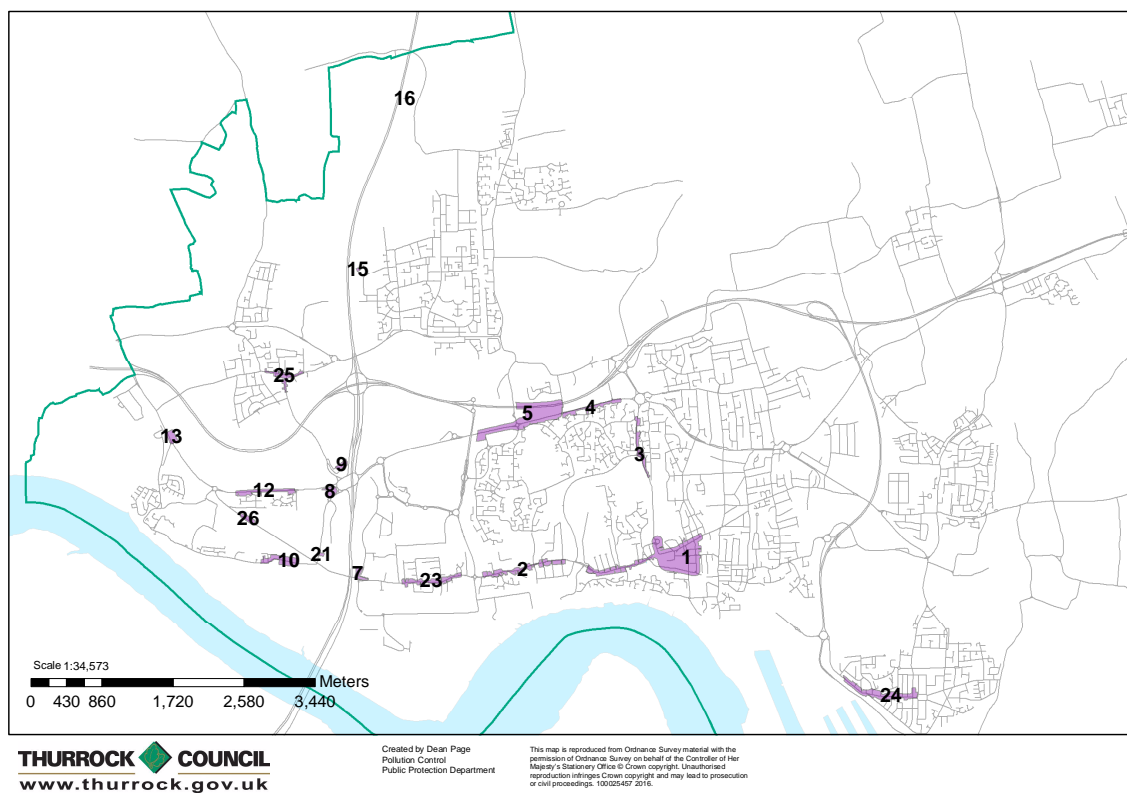


Figure D.5: Map of AQMA locations in Thurrock



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 microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

| Abbreviation | Description |
|---------------|---|
| ADMS | Atmospheric Dispersion Model System |
| 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' |
| AQHSD | Air Quality & Health Strategy Document |
| 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 |
| AQO's | Air Quality Objectives |
| ASR | Air Quality Annual Status Report |
| AURN | Automatic Urban & Rural network |
| BV | Bureau Veritas |
| CERC | Cambridge Environmental Research Consultants |
| CPZ | Controlled Parking Zone |
| CTF | Congestion Task Force |
| Defra / DEFRA | Department for Environment, Food and Rural Affairs |
| DfT | Department for Transport |
| DMRB | Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England |
| EA | Environment Agency |
| ERG | Environmental Research Group |
| EU | European Union |
| FDMS | Filter Dynamics Measurement System |
| FQP | Freight Quality Partnership |
| HGV | Heavy Goods Vehicles |

| | |
|-------------------|---|
| IPPC | Integrated Pollution Prevention & Control |
| KCL | Kings College London |
| LAQM | Local Air Quality Management |
| LAQM.PG16 | Local Air Quality Management – Policy Guidance 2016 |
| LAQM.TG16 | Local Air Quality Management – Technical Guidance 2016 |
| LAQN | London Air Quality Network |
| LAPC | Local Air Pollution Control |
| LA-IPPC | Local Authority - Integrated Pollution Prevention & Control |
| NCAD | National Clean Air Day |
| NO ₂ | Nitrogen Dioxide |
| NO _x | Nitrogen Oxides |
| NPL | National Physical Laboratory |
| 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 |
| SEAT | South Essex Active Travel |
| SO ₂ | Sulphur Dioxide |
| STP | School Travel Plan |
| UTMC | Urban Traffic Management Control |
| VMS | Variable Message Signing |

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