2019 Air Quality Annual Status Report (ASR)

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

November 2019

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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 billion[3].

Thurrock currently has 18 Air Quality Management Areas (AQMAs); 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 AQMAs 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 (NO_2) and to a lesser extent particulate matter (PM_{10}); both of these pollutants arise from road traffic emissions. Thurrock only has AQMAs which are declared for road traffic based emissions, there are no industrial based AQMAs. The AQMAs are primarily related to NO_2 and the long-term objective or annual mean 40 $\mu g/m^{-3}$ objectives, which is the principal issue in all 18 AQMAs. Out of these AQMAs there are currently four declared for PM_{10}, for the short-term objective or daily mean objective of 35 permitted exceedances of >50 $\mu g/m^{-3}$.

In 2016 two AQMAs were declared in Thurrock for breaching the annual mean objective for NO_2; 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

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 NO_2 & PM_{10} exceedances over most of the borough and including all 18 AQMA's. The report found that 8 AQMA's should be revoked for NO_2 and all four for PM_{10} 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 NO_2 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 NO_2 on the back of monitoring results instead of modelling.

In addition the Council in 2016 published an integrated Health & Air Quality Strategy document. The aim of this is to provide an approach for the council to manage air quality within its 18 AQMA's, ensure compliance with established regulatory thresholds and also prevent new AQMA's arising in the future. https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

Thurrock Council as of 2018 has 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. The Council will re-evaluate its Air Quality and Health Strategy to take into consideration new opportunities and develop additional and improved policies and actions. This will be developed over the 2019/20 and 20/21 financial years

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. 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.

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. this programme continues for a further two (2) years until March 2021 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. 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 Cycle hub which has been launched as part of the project show promising progress, and the community is proud such a facility has been launched within its area.

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.

Electric Vehicle Charging – The Council will continue to explore and install Electric Vehicle Charging points where demand justifies.

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

In Autumn 2019, the Council received consent from the Secretary of State to enforce idling of vehicles on the highway

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.

As stated in previous reports there are a number of AQMA's which have been below the objectives for a number of years now. Defra has advised us the review these and possibly revoke where necessary. In response the council has carried out additional monitoring in some of these AQMA's to identify more closely as to whether this is the case. It has also put in monitoring at some AQMA's where there once previously was

no monitoring to see if they are below the air quality objectives for nitrogen dioxide (NO_2).

Once sufficient long-term trend data has been gathered at these locations, the council intends, next year (2020) to carry out a detailed assessment to review this data and hence put forward recommendations to revoke some of these AQMA's. The monitoring data will need demonstrate it is sufficiently below the annual mean air quality objective for NO_2 of 40 µg/m^3 by a 10% margin of uncertainty i.e. <36 µg/m^3. If so the council will state its intentions to revoke these AQMA's.

In addition to this the council is looking in 2020 to undertake a borough-wide air quality modelling assessment. It will focus looking at the extent of exceedance across the borough for NO_2, PM_{10} & $PM_{2.5}$, this will validate and confirm where we need to revoke or re-structure our current AQMA's along with identify if there are any new areas of exceedance, this will ultimately form the basis of a Detailed Assessment which will then be submitted to Defra, once Defra verifies our findings we will then revoke these AQMA's if required.

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

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1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of 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		
						At Declaration		Now		Name	Date of Publication	Link
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 (NAS1) 40.9 (LRG)	µg/m3	32.87 µg/m3 (NAS1) 36.22 µg/m3 (LRG)	µg/m3	Action Plan for AQMA 1	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 2	2004	NO2 Annual Mean	Grays, South Stifford	An area encompassing Residential properties along London Road South Stifford.	NO	48 (LRSS)	µg/m3	39.23 µg/m3 (LRSS)	µg/m3	Action Plan for AQMA 2	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 3	2004	NO2 Annual Mean	Grays	An area encompassing Residential properties along Hogg Lane & Elizabeth Road.	NO	49 (ER)	µg/m3	49.76 (ER) * new monitoring has been setup at façade level to determine if there is exceedence 32.45 ug/m3	µg/m3	Action Plan for AQMA 3	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

								(ERFA) & 31.4 ugm/3 (ERFB) 32.65 µg/m3 (ACHL)				
AQMA 4	2004	NO2 Annual Mean	Grays, Chafford Hundred	An area encompassing Residential properties along A1306 west of Chafford Hundred Visitor Centre	NO	65.5 (NAS2)* proxy AQMA 5	µg/m3	New monitoring has been setup to determine exceedence or not? 25.59 µg/m3 (CC)	µg/m3	Action Plan for AQMA 4	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 5	2004	NO2 Annual Mean	Grays, Chafford Hundred, North Stifford	An area encompassing Residential properties along Warren Terrace A1306 & A13	NO	65.5 (NAS2)	µg/m3	51.28 µg/m3 (NAS2)* new monitoring has been setup at façade level to determine if there is exceedence or not? 32.69 µg/m3 (HD) & 32.53 µg/m3 (GRPL)	µg/m3	Action Plan for AQMA 5	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 7	2004	NO2 Annual Mean	West Thurrock	A Hotel (IBIS) near to M25 north of the Dartford Crossing	YES	52 (IBIS)	µg/m3	45.29 µg/m3 (IBIS)	µg/m3	Action Plan for AQMA 7	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

AQMA 8	2004	NO2 Annual Mean	West Thurrock / Purfleet	A Hotel next to Jct 31 of the M25	YES	No Data exceedence was based on 2004 modelling only	µg/m3	(New monitoring has been setup to determine exceedence or not? 35.14 µg/m3 (PIH)	µg/m3	Action Plan for AQMA 8	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 9	2004	NO2 Annual Mean	West Thurrock / Aveley	A Hotel next to Jct 31 of the M25	YES	No Data exceedence was based on 2004 modelling only	µg/m3	New monitoring has been setup to determine exceedence or not? 34.32 µg/m3 (THA) & 35.69 µg/m3 (THB)	µg/m3	Action Plan for AQMA 9	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 10	2004	NO2 Annual Mean	Purfleet	An area encompassing Residential properties along London Road Purfleet near to Jarrah Cottages	NO	69.8 (TK2) automatic site	µg/m3	50.69 µg/m3 (TK8 automatic site)* ***Council modelling in 2016 confirmed still exceedence at relevant public exposure	µg/m3	Action Plan for AQMA 10	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 12	2004	NO2 Annual Mean	Purfleet	An area encompassing Residential properties along A1306 on the Watts Wood Estate	NO	50.5 (WC)	µg/m3	41.08 µg/m3 (WC)* new monitoring has been setup at façade level to determine if there is exceedence or not? 32.69 µg/m3 (WCF)	µg/m3	Action Plan for AQMA 12	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

AQMA 13	2004	NO2 Annual Mean	Purfleet / Aveley	An area encompassing Residential properties along A1306 London Road Aveley Arterial Road	NO	55.2 (LRAR)	µg/m3	51.19 µg/m3 (LRAR)* at places of relevant public exposure 31.42 µg/m3 (LRARN) & 25.78 µg/m3 (LRARS)	µg/m3	Action Plan for AQMA 13	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 15	2004	NO2 Annual Mean	South Ockendon	1 residential dwelling near the M25 on the edge of Irvine Gardens	YES	40 (GDSO)	µg/m3	25.31 µg/m3 (GDSO)	µg/m3	Action Plan for AQMA 15	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 16	2004	NO2 Annual Mean	Near North Ockendon	1 residential dwelling near the M25 off Dennis Road	YES	42.6 (KCNO)	µg/m3	29.36 µg/m3 (KCNO)	µg/m3	Action Plan for AQMA 16	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 21	2004	NO2 Annual Mean	Purfleet	A former Hotel on Stonehouse Lane	NO	44.6 (STON)	µg/m3	site currently does not represent relevant public exposure as it is derelict / no monitoring since 2013	µg/m3	Action Plan for AQMA 21	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 23	2004	NO2 Annual Mean	West Thurrock	An area encompassing Residential properties along London Road West Thurrock	NO	55.1 (WT)	µg/m3	38.19 µg/m3 (WT)*	µg/m3	Action Plan for AQMA 23	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

AQMA 24	2012	NO2 Annual Mean	Tilbury	An area encompassing Residential properties along Calcutta Road, Dock Road & St Chads Road	NO	40.5 (TL) 39.3 (TK4)	µg/m3	32.88 µg/m3 (TL)* 42.39 µg/m3 (TILB) & 37.99 µg/m3 (TILA)	µg/m3	Action Plan for AQMA 24	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 25	2016	NO2 Annual Mean	Aveley	An area encompassing Residential properties along Aveley High St & Ship Lane	NO	41 (AVSL)	µg/m3	40.71 µg/m3 (AVSL)	µg/m3	Action Plan for AQMA 25	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 26	2016	NO2 Annual Mean	Purfleet	An area encompassing Residential properties along the Purfleet By-pass	NO	37.8 (PBP)	µg/m3	33.08 µg/m3 (PBP)	µg/m3	Action Plan for AQMA 26	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
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 exceedence was based on 2004 modelling only	Exceedances	No Data ***(although modelling work in 2016 which was rejected by Defra shows no exceedence)	Exceedances	Action Plan for AQMA 5	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 7	2004	PM10 24 Hour Mean	West Thurrock	A Hotel (IBIS) near to M25 north of the Dartford Crossing	YES	No Data exceedence was based on 2004 modelling only	Exceedances	No Data ***(although modelling work in 2016 which was rejected by Defra shows no exceedence)	Exceedances	Action Plan for AQMA 7	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

AQMA 8	2004	PM10 24 Hour Mean	West Thurrock / Purfleet	A Hotel next to Jct 31 of the M25	YES	No Data exceedence was based on 2004 modelling only	Exceedances	No Data ***(although modelling work in 2016 which was rejected by Defra shows no exceedence)	Exceedances	Action Plan for AQMA 8	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring
AQMA 10	2004	PM10 24 Hour Mean	Purfleet	An area encompassing Residential properties along London Road Purfleet near to Jarrah Cottages	NO	No Data exceedence was based on 2004 modelling only	Exceedances	12 Days of 35 permitted (TK8) automatic & ***(modelling work in 2016 which was rejected by Defra shows no exceedence)	Exceedances	Action Plan for AQMA 10	2016	https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

☒ **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 a Detailed Assessment Report in order to re-determine the status of the council's AQMA's.

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 µg/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, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

1. The council are encouraged to develop measures specific to $PM_{2.5}$. Furthermore future reports should reference the Public Health Outcomes Framework. For further guidance please refer to LAQM Technical Guidance 16 (TG16).
2. It is recommended that AQMA 4 and 15 be revoked for NO_2 due to compliance for the last 5 years. For further guidance please refer to TG16.
3. Furthermore, the Council should consider the status of AQMAs declared for PM10 24-hour mean. Although some sites have shown a small number of exceedances, these are all within limits, and have been so for the past 5 years. For further guidance please refer to TG16.
4. While the report provides good discussion of progress towards each mitigation measure, there is limited discussion of barriers to implementation. Furthermore it is not immediately which measures are funded and those that are not. The Council is advised to reflect on these points for future reports.
5. No example calculations have been provided for distance corrections and annualisation. Please include calculations/screenshots in future reports.
6. Maps included are good, however their scale makes them difficult to interpret. It is advised that the Council include clearer maps that highlight the sites within each AQMA (instead of cross referring between maps and data tables).
7. The report provides limited discussion of recent developments, or planning applications that may impact future air quality. While it may be the case that the Council does not anticipate such developments some reflection on this would provide clarity. For further guidance please refer to TG16.
8. Please ensure all AQAP tables resented within the report follow the standard template format.

9. Although the Council recently updated their monitoring strategy, it is recommended that further alterations be made. There are still AQMAs that have no monitoring present. There are a number of sites that have continuously recorded low concentrations. The Council may wish to redeploy some of these resources to use within AQMAs or to identify new hotspots.
10. Generally the report is very good and it is clear the Councils actions are resulting in improved local air quality. The Council should continue to implement their measures and monitoring programme, paying close attention as to the suitability of AQMA statuses.

Thurrock Council has taken forward a number of direct measures during the current reporting year of 2018/19 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

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. To support this action, the Council consulted with residents to identify what were the problems they perceived with HGV movements within Aveley, and what could be the potential solutions. One outcome has been an improved signage strategy to encourage more sustainable movements of HGV's through the AQMA. These and other bespoke measures are due to be implemented by March 2020. As a result of the success of this strategy, the Council is intending to implement a similar approach elsewhere across the Borough. Within

AQMA 25, the Council is also investigating an additional width restriction on northbound HGV movements along Ship Lane.

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 have been constructed alongside Purfleet Bypass. The toucan crossings have been built across Botony Way and at Meads Roundabout, creating two full segregated routes, one via the Bypass to London Road, and a second via A1306 Arterial Road to J31 of the M25. These were completed in December 2018 with the wider Cycle Infrastructure Programme completed in March 2019.

AQMA 2 – London Road, Grays: the council is progressing bus lane camera enforcement in London Road. To date, the Council has engaged the support of Essex County Council to administer any enforcement of the bus lane. The "Go-live" date has been delayed while the Council continues its engagement with Essex County Council but hope for full enforcement and issue of PCNs from 1st April 2020.

AQMA 10 – London Road, Purfleet: the council introduced width restrictions to the west of AQMA 10 and east of Botany Way. Further works are proposed once these have been secured from developer contributions. 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. Design work has been completed and construction of the route commenced in the summer of 2019. The project is in the final stages of construction with completion expected shortly, creating a new off-road cycle path running along Calcutta Road and Dock Road. Additionally, the Council has launched a new Cycle hub on Calcutta Road in June 2019 in collaboration with Southend Council and Essex County Council. The project is funded by the DfT's Access Fund, and is expected to remain open until at least March 2021 and will be seeking to become financially secure going forward. The cycle hub is helping to further encourage cycling and modal shift away from cars, providing an opportunity for those on low incomes to access transport into employment and training opportunities.

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

The Council has now also now been given delegated powers to enforce against idling vehicles within the borough. A £20 fine can be enforced against drivers who chose keep their engine idling when requested to turn them off by an enforcement officer. The Council intends to use a targeted approach where there are Air Quality Management Areas declared, or where there are significant levels of traffic, such as at level crossings.

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 five (5) 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. These leased VMS signs will be replaced in

2020 with new signs purchased by the Council, having formally undertaken a procurement process. 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. This has recently been undertaken in South Ockendon with a new weight limit, and Little Thurrock parking restrictions. As implemented in AQMA 25 Aveley, the Council will also be engaging with residents in Horndon on the Hill to identify measures which will help reduce freight vehicles inappropriately moving through the village. This will also include lobbying by the Portfolio Holder for Transport to DfT to create a trial area for enforcement of HGV's in the area, preventing the "rat-running" by large commercial vehicles along inappropriate routes. Parking bans for HGV's and weight limits will also be sought, after the Council has received several representations from residents in the area.

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 was completed with full delivery 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. To date, representation to both the South East Local Enterprise Fund and to Highways England have been made to seek additional funding to extend the programme, however neither of these have been successful, and therefore the Council will continue to explore additional sources of funding. 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. To further support walking, the Council is looking to install a programme of wayfinding across the various communities in Thurrock, to help enable more people to walk local journeys, and have a greater understanding of the relative distance and journey time by foot and walking. The first scheme is due to be installed in Stanford le Hope by March 2020, and a second scheme in Tilbury in Spring/Summer 2020.

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 thirteen schools now have an accredited travel plan. Arthur Bugler has joined the Woodside Academy in achieving Gold accreditation in their STP. St Cleres Secondary School has also been recognised for the School Travel Plan and the efforts to promote sustainable travel by being awarded the best Secondary School for Sustainable Travel in the East of England Region by Modeshift. This is a great achievement, given the difficulty often experienced in getting secondary schools to participate in school travel planning. To further encourage participation by schools in the Modeshift programme, the Council agreed a five year programme to provide a variety of improvements outside schools to help encourage modal shift, improve safety, and reduce congestion. Priority will be given to schools who have travel plans, or participate in the process and engage with the Council.

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. The Council also hosts a Congestion Task Force

and Road User Group meetings, and in the interest of efficiency and engaging with the largest group of people, all three meetings will potentially be condensed into one.

ForwardMotion / 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. This programme was scheduled to end in March 2020, but the Council are expecting a further twelve month extension by the DfT, and the funding extension is expected to be finalised in January 2020 to extend the project to March 2021. In the initial years, the programme was called South Essex Active Travel, however it is now publically branded as ForwardMotion when engaging with the public and businesses.

Since the early achievements of the project working with Amazon to help influence travel behaviour of staff at its new Fulfilment Centre in Tilbury, ForwardMotion is continuing to support a range of projects across the borough. As part of the project, the Council has opened 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 also supports 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 ForwardMotion programme offers a cycle loan opportunity to encourage cycle ownership at a low monthly rate (£10). Similar to the programme implemented at Amazon, ForwardMotion 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 and Grays town centre.

The ForwardMotion 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 previously 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. In this past year, a grant scheme within the project has also been offered to local community groups to help promote active and sustainable travel.

The South Essex Active Travel (SEAT) / ForwardMotion 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 ForwardMotion 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. An initial tender exercise did not prove fruitful, but the Council is continuing to explore new opportunities, and are engaging with operators to provide a bespoke solution for Thurrock.

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. Funding has been secured for a five car scheme in Purfleet as part of that communities major redevelopment programme, and further funding is being sought for other new developments. A car club will be seeking to launch in 2020/21, and the Council has commenced an engagement process with potential suppliers to help shape any potential procurement contract.

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 2019 will not be available until 2020. 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 until March 2021 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 and second year progress reports are showing good progress, taking into consideration the mobilisation effort required in the first year of the project. The Cycle hub which has been launched as part of the project show promising progress, and the community is proud such a facility has been launched within its area.

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 2020.

Electric Vehicle Charging – The Council will continue to explore and install Electric Vehicle Charging points where demand justifies. When a new contract is approved, further expansion of the network will be expected.

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. Plans are also being progressed to enable enforcement of the yellow-box junctions at J31 of the M25.

The Council is also intending to expand its Real Time Passenger Information boards at Public Transport stops, particularly in Tilbury, with an additional sign located in Gravesend to help promote the ferry. This will offer a more visual display of ferry

operations, and can potentially attract passengers away from driving across the river. The Council is also exploring replacing existing signs which have come to the end of their life and increasingly out of action. The Real Time Signs in Tilbury should be implemented in summer 2020 ahead of the opening of the Tilbury2 Port development, as instructed by the corresponding Development Consent Order.

In Autumn 2019, the Council received consent from the Secretary of State to enforce idling of vehicles on the highway. The Council has started to promote this measure, and will be looking to act in a targeted fashion at key locations – outside schools, taxi ranks and town centres, and level crossings to help encourage vehicles to switch off their vehicles when waiting. V This will begin in spring 2020.

Finally, the Council will re-evaluate its Air Quality and Health Strategy to take into consideration new opportunities and develop additional and improved policies and actions. This will be developed over the 2019/20 and 20/21 financial years.

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. The proposed review of the Air Quality and Health Strategy will help improve the focus on schemes to address air quality, by developing new actions and policies, and set in place a formal process for progressing these actions. Existing projects will continue to commence and the Council expects to target delivery on its proposed 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 Zone	Highways / Strategic Planning	0.5 – 1.0 µg/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 2022	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	3	HGV Distributor Road/ Duelling	Highways / Strategic Planning	15.0+ µg/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 µg/m^3	Ongoing	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	8	Pollution Retrofit Equipment	Highways / Strategic Planning	15.0+ µg/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 µg/m3 overall	Ongoing	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	11	Business Travel Plans	Highways / Strategic Planning	1.0 µg/m3	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+ µg/m3*	Mar 2021	Thurrock Air Quality and Health Strategy and AQMA Action Plans

—	13	30 mph limit	Highways / Strategic Planning	5.0+ µg/m3*	Ongoing	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	14	School Travel Plans (modeshift)	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)
	15	A1012/A1306 Priority 'hamburger' roundabout feasibility	Highways / Strategic Planning	5.0+ µg/m3*	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+ µg/m3*	Mar 2021	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	17	Variable Message Signing for Lakeside	Highways / Strategic Planning	1.0 µg/m3	2021	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	18	Business Travel Plans	Highways / Strategic Planning	1.0 µg/m3	Ongoing	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	19	Pilgrims Roundabout Signalisation	Highways / Strategic Planning	5.0+ µg/m3*	Mar 2021	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+ µg/m3*	Mar 2020	Thurrock Air Quality and Health Strategy and AQMA Action Plans
	21	School Travel Plans (modeshift)	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)

	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	Ongoing	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	Ongoing	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*	Mar 2021	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

	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	Ongoing	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

									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	Personalised Travel Planning	Highways / Strategic Planning		2010/11	N/A	<1%		2015/16	Encourage modal shift

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- interchanges 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

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 Licensing 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

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- interchanges 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

			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/ UTMC (AQMA 1 & AQMA 5)	Traffic Management	UTC, Congestion management, traffic reduction	Highways / Strategic Planning		2014	N/A	<1%		2014	
26	HGV weight restriction (AQMAs 1, 2)	Traffic Management	Other	Highways / Strategic Planning		2013	N/A	<1%		2013 / 2014	Divert HGVs away from AQMAs along Devonshire road, to alleviate London Road from HGVs & Congestion
27	Improve Bus / Rail interchange (AQMA 5)	Transport Planning and Infrastructure	Public transport improvements- interchanges 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	

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/m^3): Introduction of weight restrictions/enforcement to discourage HGVs
- Engine Switch-off Zones (3.0+ µg/m^3): Traffic orders and publicity to reduce idling at level crossings e.tc
- Speed limit reduction (5.0+ µg/m^3): Localised traffic enforcement and speed reductions
- Clean Air Zone (15.0 µg/m^3): 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

3.1.1 Automatic Monitoring Sites

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 2018. 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/

In addition the Council currently operates 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.

3.1.2 Non-Automatic Monitoring Sites

Thurrock Council undertook non- automatic (passive) monitoring of NO_2 at 64 sites during 2018 Table A.2 in Appendix A shows the details of the sites. 6 new sites were added in 2018 in order to assess baseline conditions prior to the proposed Lower Thames Crossing (LTC) Scheme from Highways England which is a major national infrastructure project which will go through Thurrock's Borough.

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 (NO_2)

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

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

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

All of Thurrock’s AQMA’s are declared for the annual mean objective for NO_2 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 AQMAs still warrant this status or not, this will be reviewed in 2020 once a firm baseline trend has been established at these sites. As mentioned previously 6 new sites were added in 2018 in order to assess baseline conditions prior to the proposed Lower Thames Crossing (LTC).

The highest recorded 1-hour concentration in 2018 for NO_2 was at Thurrock 8 at 173.8 µg/m^3 there were a total of 0 exceedences above the 200 µg/m^3 limit of 18 permitted exceedences annually at this site over 2018. There are no diffusion tube

measurements above 60 µg/m^3 for the annual mean where there is relevant public expousre. So it is therefore unlikely that the 1-hour objective is being breached currently within the borough.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

2018 monitoring confirms that there are currently no areas breaching the air quality objectives for PM_{10}. However there are some exceedences from automatic monitoring stations over 2018. Thurrock 8 had (16 exceedences of the permitted 35 exceedences), Thurrock 1 had (4 exceedences of the permitted 35 exceedences), and Thurrock 3 had (3 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 on average in concentrations of $PM_{2.5}$ since it first stared operating. However they do not decline every year, $PM_{2.5}$ concentrations have reduced from: 17.93 µg/m^3 in 2011, and decreased to 9.84 µg/m^3 in 2015, however this increased in 2016 to 13.41 µg/m^3 and decreased again over 2017 to 11.06 µg/m^3 and during 2018 further reduced to 10.1 µg/m^3.

3.2.4 Sulphur Dioxide (SO_2)

Table A.8 in Appendix A compares the ratified continuous monitored SO_2 concentrations for year 2018 with the air quality objectives for SO_2.

There is currently one location monitoring SO_2 within the borough, Thurrock 1, Grays. The council has monitored for SO_2 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, SO_2 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
LRAR	London Road Arterial Road	R	555301	179438	NO2	13	N	0.5	N	1.5
PRS	Purfleet Rail Station	R	555389	178145	NO2	No	N	1.5	N	2
WC	Watts Crescent	R	556314	178765	NO2	12	N	2	N	2
JC	Jarrah Cottages	R	556701	177937	NO2	10	N	2.6	Y (TK8)	1.5
STON	Stonehouse Lane	R	557132	177970	NO2	21	N	30	N	1.5
IBIS	Ibis Hotel	UB	557570	177789	NO2	7	Y (0m)	52	N	2
GDSO	Gatehope Drive	UB	557595	181060	NO2	15	Y (23m)	105	N	1.25
LT	Lakeside Tesco Roundabout	R	557981	178700	NO2	No	N	1	N	2
KCNO	Kemps Cottage	UB	558148	183532	NO2	16	Y (10m)	57	N	2
WT	London Road W Thurrock	R	558483	177678	NO2	23	N	4	N	1.5
HR	Howard Road	R	559118	179462	NO2	5	Y (0m)	29	N	1.5

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
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
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
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
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 By-pass	R	556257	178438	NO2	No	Y (5.5m)	9.5	N	1.5
PBPA	Purfleet By-pass	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
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
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	R	560962	179527	NO2	3	Y (32m)	8.2	N	1.5

	Road, (Façade A)									
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
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
SCR LTC	Stifford Clays Road (Lower Thames Crossing site)	UB	562380	181156	NO2	No	Y (29m)	55.5	Y	1.5
BSA LTC	Baker Street (A) (Lower	R	563483	181069	NO2	No	N (9m)	1.5	Y	1.5

	Thames Crossing site)									
BSB LTC	Baker Street (B) (Lower Thames Crossing site)	R	563572	180770	NO2	No	N (7.2m)	1.3	Y	1.5
HR LTC	Heath Road (Lower Thames Crossing site)	R	563782	180155	NO2	No	N (6.5m)	0.9	Y	1.5
SR LTC	Station Road (Lower Thames Crossing site)	I	567349	177552	NO2	No	N	1.5	N	1.5
TTS LTC	Treetops School (Lower Thames Crossing site)	UB	563825	179595	NO2	No	N	38	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 setup in 2017 marked in (Blue)

(4) Additional new diffusion tube sites setup in 2018 for potential major infrastructure project:- Lower Thames Crossing (LTC) Scheme marked in (Orange)

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3] National BIA's adjustment applied to all diffusion tubes (0.93)				
					2014	2015	2016	2017	2018
Thurrock 1	Urban Background	Automatic	96.65%	96.65%	26.46	25.6	27.9	28.2	24.8
Thurrock 3	Roadside	Automatic	99.04%	99.04%	25.07	23.6	26.9	28.3	23.4
Thurrock 4	Roadside	Automatic	98.40%	98.40%	32.77	31.1	33.46	33.8	29.28
Thurrock 8	Roadside	Automatic	96.71%	96.71%	**61.04**	**56.1**	**55.02**	**52.1**	**50.69**
LRAR	Roadside	Diffusion Tube	92%	92%	**59.16**	**49.86**	**62.52**	**58.21**	**51.19**
PRS	Roadside	Diffusion Tube	100%	100%	35.08	32.02	35	31.52	34.44
WC	Roadside	Diffusion Tube	100%	100%	**41.12**	36.89	**50.18**	**40.1**	**41.08**
JC	Roadside	Diffusion Tube	100%	100%	**57.39**	**51.08**	**48.55**	**46.74**	**49.5**
IBIS	Urban Background	Diffusion Tube	92%	92%	**49.66**	**50.34**	**49.1**	**46.4**	**45.29**
GDSO	Urban Background	Diffusion Tube	100%	100%	28.9	26.59	28.92	27.48	25.31
LT	Roadside	Diffusion Tube	100%	100%	**50.6**	**50.09**	**53.73**	**55.98** [3]	**54.7**
KCNO	Urban Background	Diffusion Tube	100%	100%	34.63	32.69	32.81	33.53	29.36
WT	Roadside	Diffusion Tube	100%	100%	39.1	37	**41.14**	39.09	38.19
HR	Roadside	Diffusion Tube	100%	100%	31.35	28.9	31.51	32.06	30.28
NAS2	Roadside	Diffusion Tube	100%	100%	**50.57**	**48.06**	**55.99**	**52.76**	**51.28**
LRSS	Roadside	Diffusion	100%	100%	**41.07**	38.7	39.64	**41.86**	39.23

		Tube							
LRG	Roadside	Diffusion Tube	100%	100%	38.15	35.9	38.85	38.29	36.22
ER	Roadside	Diffusion Tube	100%	100%	**53.27**	**50.61**	**51.81**	**49.69**	**49.76**
PS	Urban Background	Diffusion Tube	100%	100%	26.51	23.31	25.73	26.13	25.4
HL	Roadside	Diffusion Tube	92%	92%	35.48	29.95	33.93	34.27	33.66
NAS1	Roadside	Diffusion Tube	100%	100%	33.22	28.74	33.52	32.91	32.87
CR	Intermediate	Diffusion Tube	100%	100%	33.36	31.3	32.61	31.82	30.87
SRG	Roadside	Diffusion Tube	100%	100%	30.85	26.67	30.88	28.74	29.56
NAS3	Urban Background	Diffusion Tube	92%	92%	21.95	20.12	22.02	23.21	23.85
WES	Roadside	Diffusion Tube	100%	100%	30.61	28.54	31.84	29.98	29.48
B	Rural Background	Diffusion Tube	92%	92%	17.7	15.54	17.19	16.29	15.17
TL	Roadside	Diffusion Tube	100%	100%	35.56	30.55	35.68	35.01	32.88
PKSL	Roadside	Diffusion Tube	92%	92%	28.93	26.79	28.98	27.83	29.35
SL	Urban Background	Diffusion Tube	100%	100%	25.83	23.82	27.01	25.93	26.22
M	Roadside	Diffusion Tube	100%	100%	25.72	24.57	26.97	27.81	28.52
FRC	Intermediate	Diffusion Tube	100%	100%	34.03	30.51	33.17	31.75	30.55
TILA	Roadside	Diffusion Tube	92%	92%	**40.23**	36.09	**40.76**	**40.92**	37.99
TILB	Roadside	Diffusion Tube	100%	100%	39.68	36.29	39.73	37.64	**42.39**

TILC	Roadside	Diffusion Tube	67%	67%	37.86	32.63	39.02	**40.2**	37.84 (3)
TILD	Roadside	Diffusion Tube	100%	100%	33.9	31.12	36.85	36.32	35.01
TILE	Roadside	Diffusion Tube	100%	100%	35.85	31.68	34.92	35.37	33.39
TK4 (A&B)	Roadside	Diffusion Tube	100%	100%	31.05	29.5	31.51	28.96	31.68
PBP	Roadside	Diffusion Tube	100%	100%	38.51	35.37	37.8	36.8	33.08
PBPA	Roadside	Diffusion Tube	83%	83%	36.06	31.48	34.7	33.33	33.07
LYD	Urban Background	Diffusion Tube	100%	100%	34.48	29.58	30.77	31.44	29.88
AVSL	Roadside	Diffusion Tube	100%	100%	**45.92**	**40.41**	**41.01**	**42.05**	**40.71**
AVHS	Roadside	Diffusion Tube	100%	100%	38.92	35.86	37.27	35.17	35.62
SOAA	Roadside	Diffusion Tube	83%	83%	33.04	29.94	30.29	28.07	32.46
TSR	Urban Background	Diffusion Tube	100%	100%	27.17	27.39	28.05	28.37	26.78
DR	Roadside	Diffusion Tube	100%	100%	33.27	28.69	30.05	28.03	26.47
LRARN	Roadside	Diffusion Tube	92%	92%	35.12	31.37	32.02	33.21	31.42
LRARS	Roadside	Diffusion Tube	100%	100%	32.96	26.51	31.11	30.69	25.78
LRARMN	Roadside	Diffusion Tube	100%	100%	**43.87**	36.43	**45.63**	**40.88**	39.55
LRARMS	Roadside	Diffusion Tube	100%	100%	**40.11**	32.38	**43.62**	39.2	37.45
JRP	Urban Background	Diffusion Tube	100%	100%	No Data	26.05	27.6	25.34	26.38
ACHL	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	35.79 (3)	32.65

CC	Intermediate	Diffusion Tube	100%	100%	No Data	No Data	No Data	22.75 (3)	25.59
ERFA	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	33.78 (3)	32.45
ERFB	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	34.47 (3)	31.4
ERTM	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	35.51 (3)	37.54
NC	Intermediate	Diffusion Tube	100%	100%	No Data	No Data	No Data	36.48 (3)	33.8
HD	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	34.89 (3)	32.69
GRPL	Intermediate	Diffusion Tube	100%	100%	No Data	No Data	No Data	32.96 (3)	32.53
PIH	Intermediate	Diffusion Tube	92%	92%	No Data	No Data	No Data	32 (3)	35.14
WCFA	Intermediate	Diffusion Tube	92%	92%	No Data	No Data	No Data	31.02 (3)	32.69
THA	Urban Background	Diffusion Tube	100%	100%	No Data	No Data	No Data	30.8 (3)	34.32
THB	Urban Background	Diffusion Tube	100%	100%	No Data	No Data	No Data	30.18 (3)	35.69
SCR LTC	Urban Background	Diffusion Tube	100%	100%	No Data	No Data	No Data	No Data	32.38
BSA LTC	Roadside	Diffusion Tube	92%	92%	No Data	No Data	No Data	No Data	23.97
BSB LTC	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	No Data	30.16
HR LTC	Roadside	Diffusion Tube	100%	100%	No Data	No Data	No Data	No Data	27.31
SR LTC	Intermediate	Diffusion Tube	100%	100%	No Data	No Data	No Data	No Data	18.67
TTS LTC	Urban Background	Diffusion Tube	92%	92%	No Data	No Data	No Data	No Data	23.74

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

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

Notes:

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

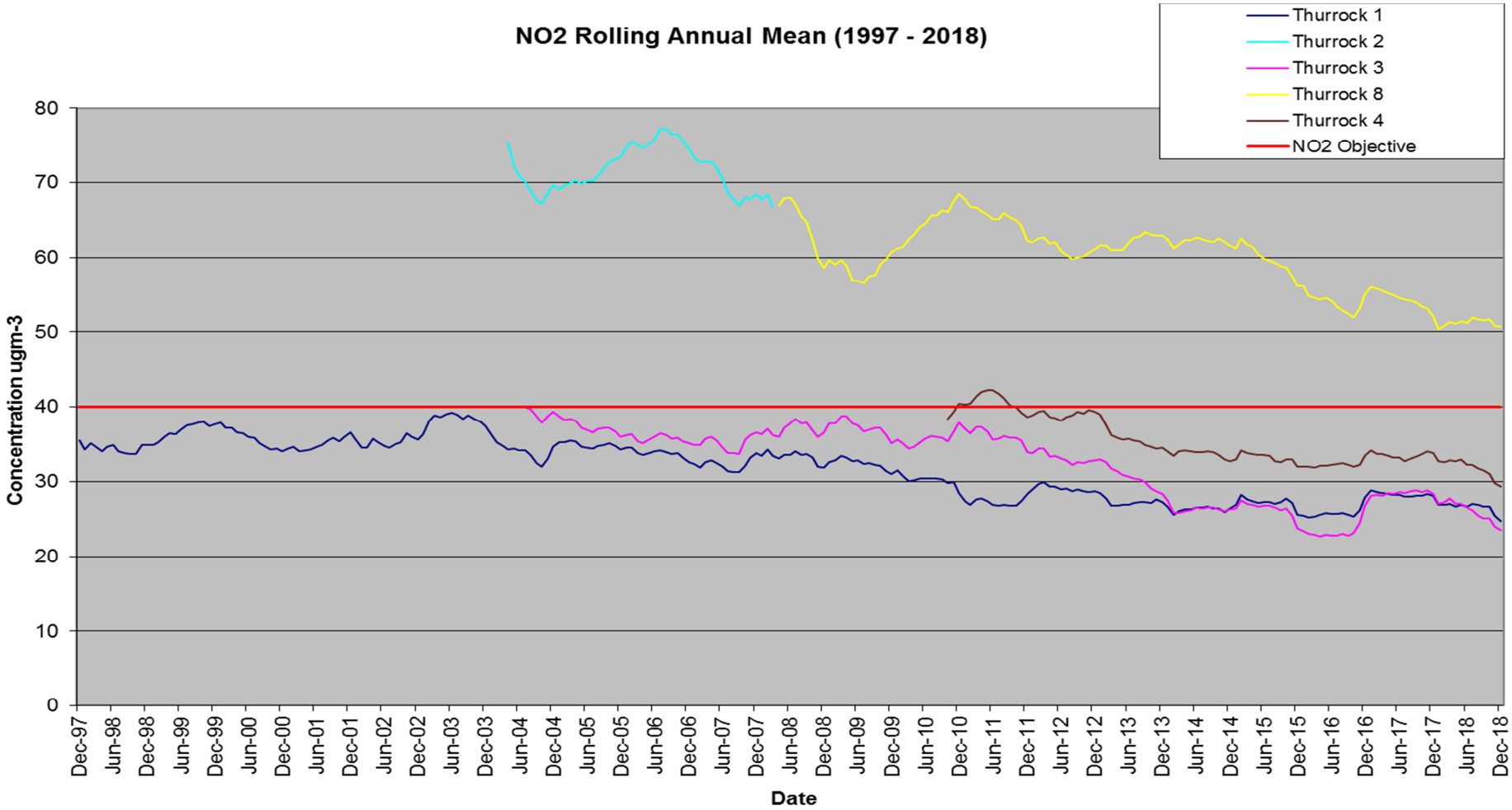


Figure A.2 – Trends in Annual Mean NO_x Concentrations (automatic monitoring sites)

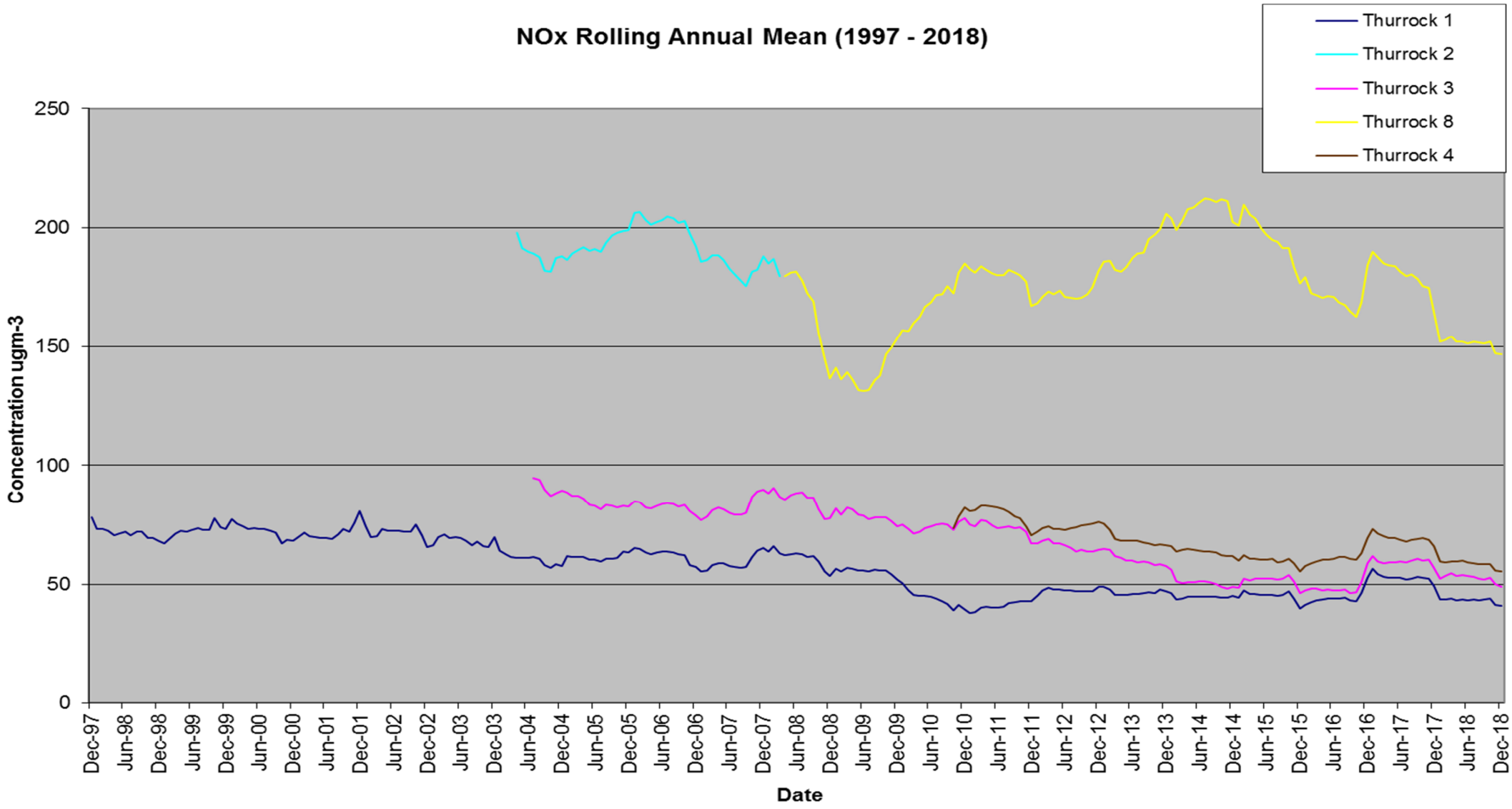


Figure A.3 – Rolling Annual Mean for % NO_2 of NO_x (automatic monitoring sites)

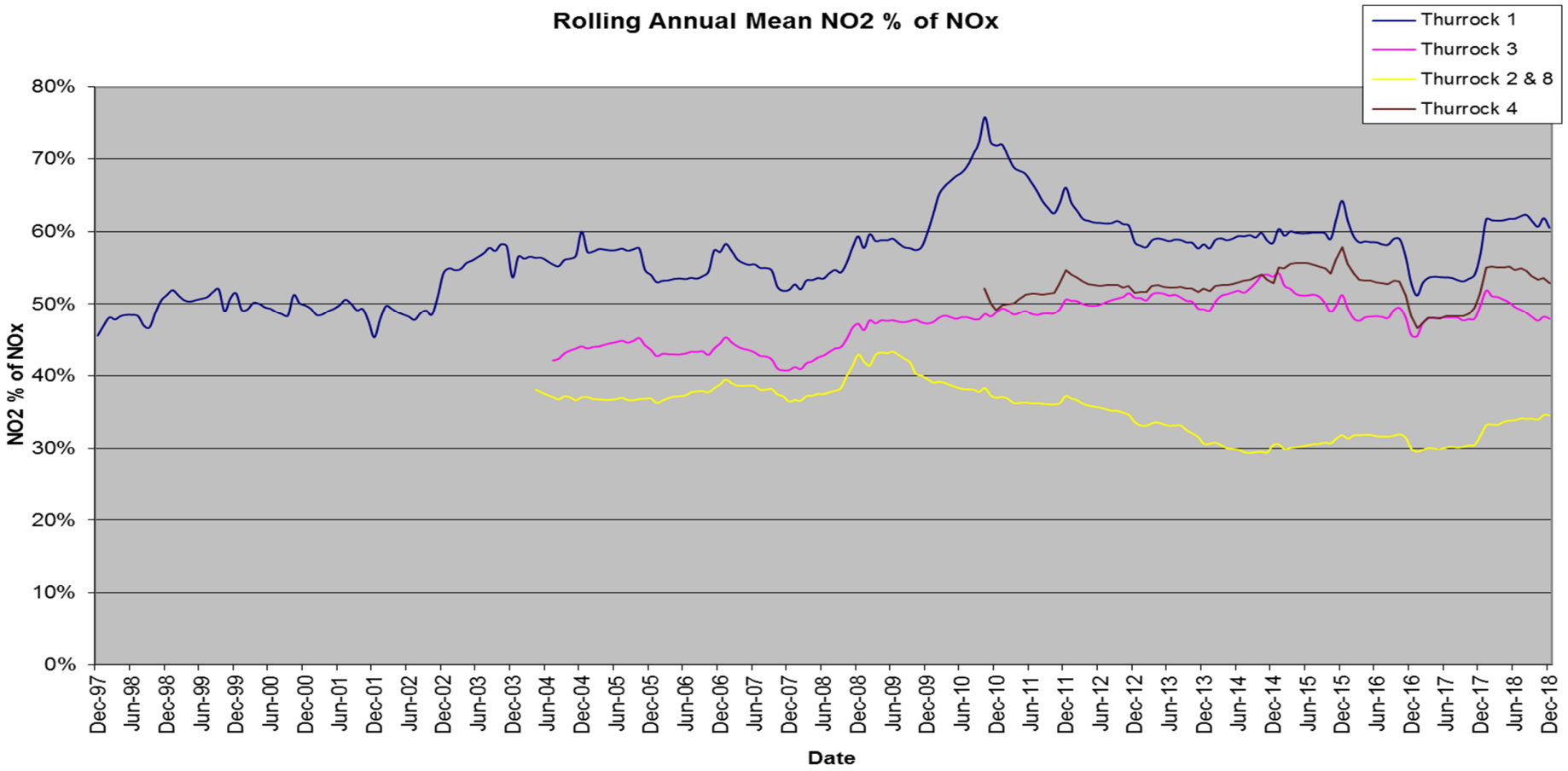


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
Thurrock 1	Urban Background	Automatic	96.96	96.96	0	0	0	0	0
Thurrock 3	Roadside	Automatic	99.04	99.04	0	0	0	0	0
Thurrock 4	Roadside	Automatic	96.71	96.71	0	0	0	0	0
Thurrock 8	Roadside	Automatic	98.4	98.4	5	0	1	2	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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 NO_2 1-Hour Means > 200µg/m^3

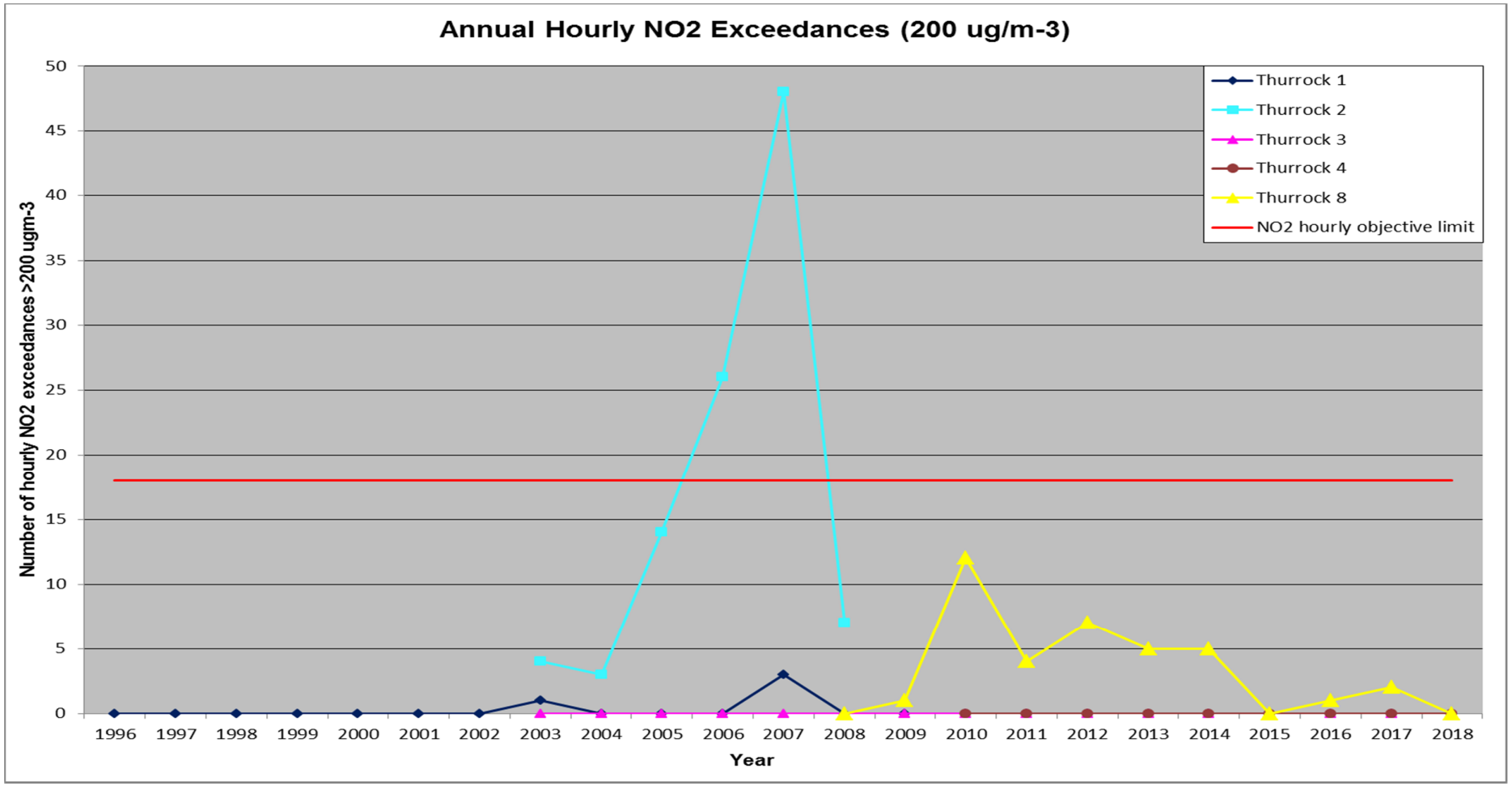


Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2014	2015	2016	2017	2018
Thurrock 1	Urban Background	93.73	93.73	19.28	17.08	17.27	18.13	18.9
Thurrock 3	Roadside	81.03	81.03	19.76	17.43 (3)	19.46 (3)	18.57 (3)	18.41 (3)
Thurrock 8	Roadside	98.34	98.34	26.83	24.87	24.75	24.94	26.69

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

Notes:

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ 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 PM_{10} Concentrations

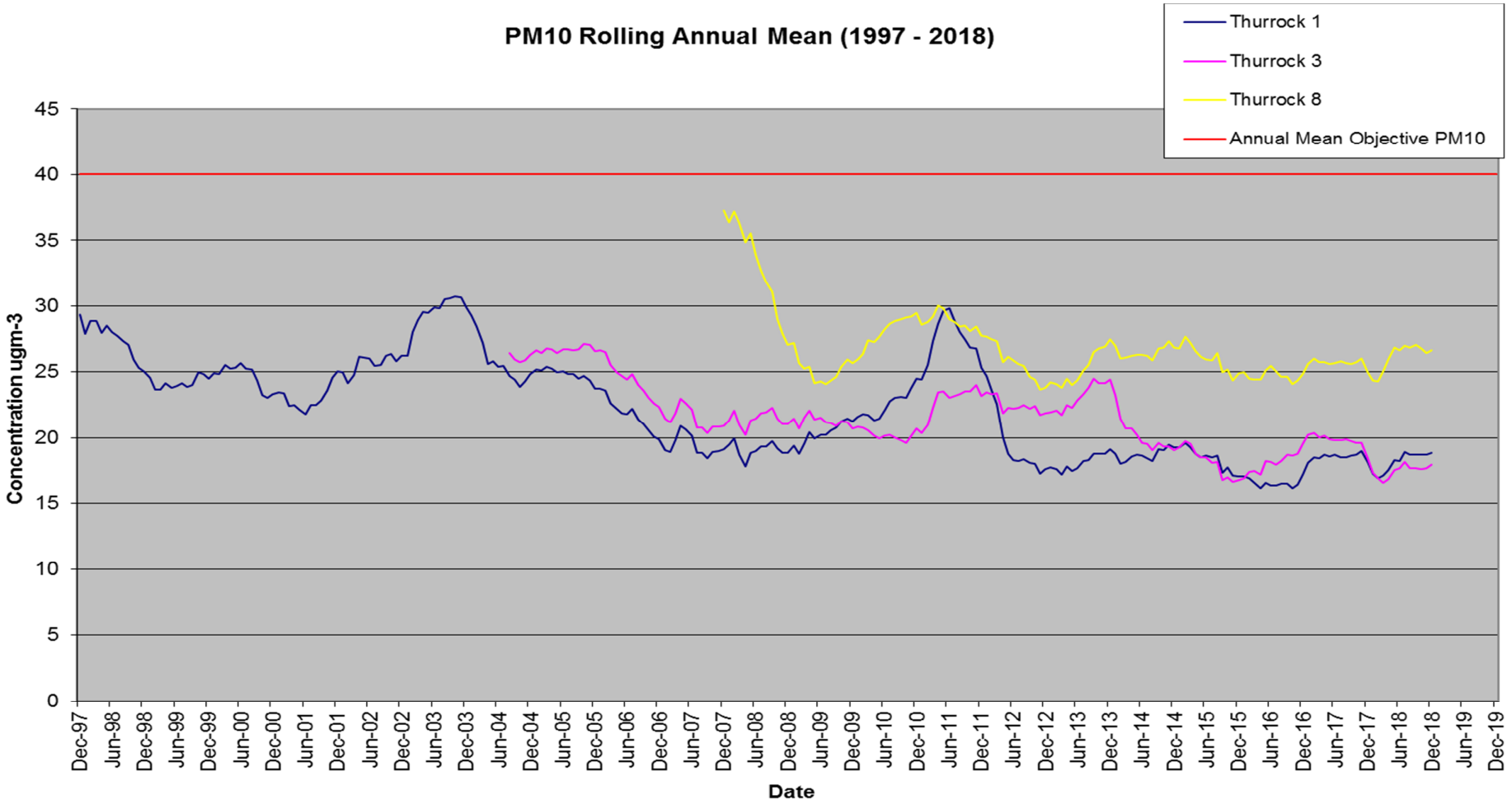


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2014	2015	2016	2017	2018
Thurrock 1	Urban Background	93.73	93.73	11	2	4	5	4
Thurrock 3	Roadside	81.03	81.03	9	[2]* (30) (3)	[4]* (36) (3)	[5]* (35) (3)	[3]* (34) (3)
Thurrock 8	Roadside	98.34	98.34	22	22	11	12	16

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 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 Number of 24-Hour Mean PM_{10} Results >50µg/m^3

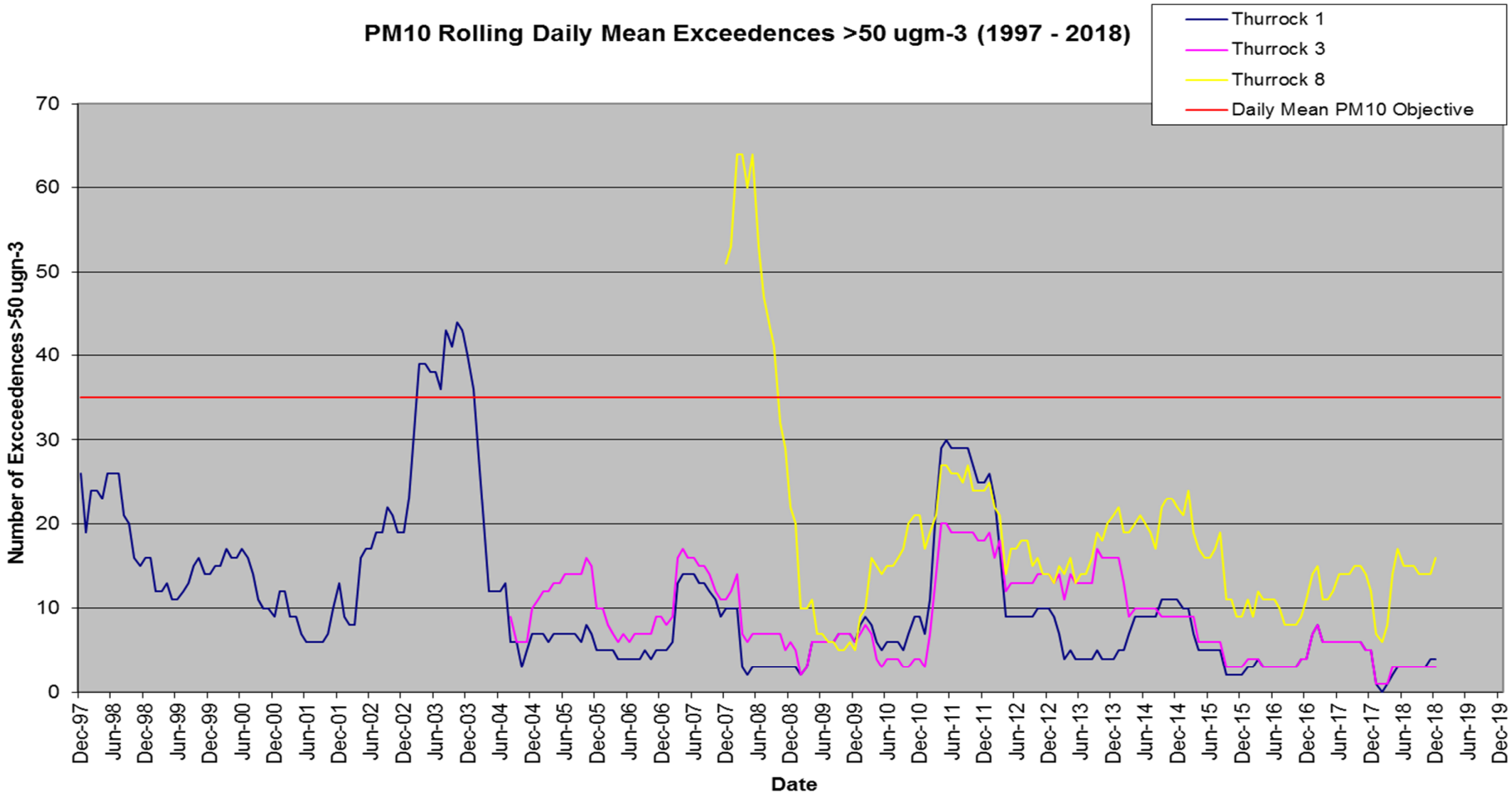


Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) [3]				
				2014	2015	2016	2017	2018
Thurrock 3	Roadside	97.93	97.93	14.23	9.84	13.41	11.06	10.11

☒ **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

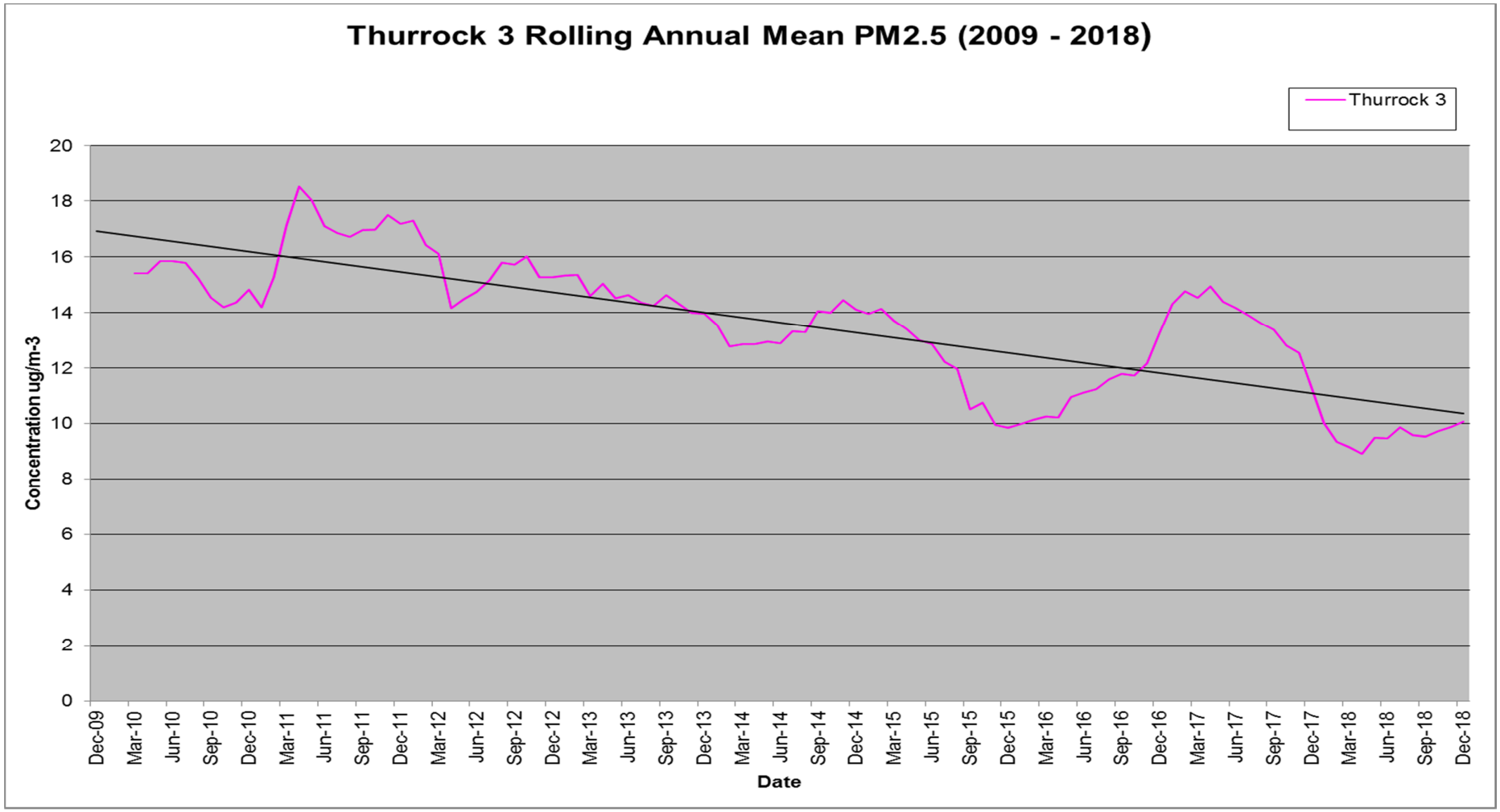


Table A.8 – SO_2 Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	Number of Exceedances 2018 (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	95.89%	95.89%	0	0	0

Notes:

Exceedances of the SO_2 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 SO_2 Concentrations

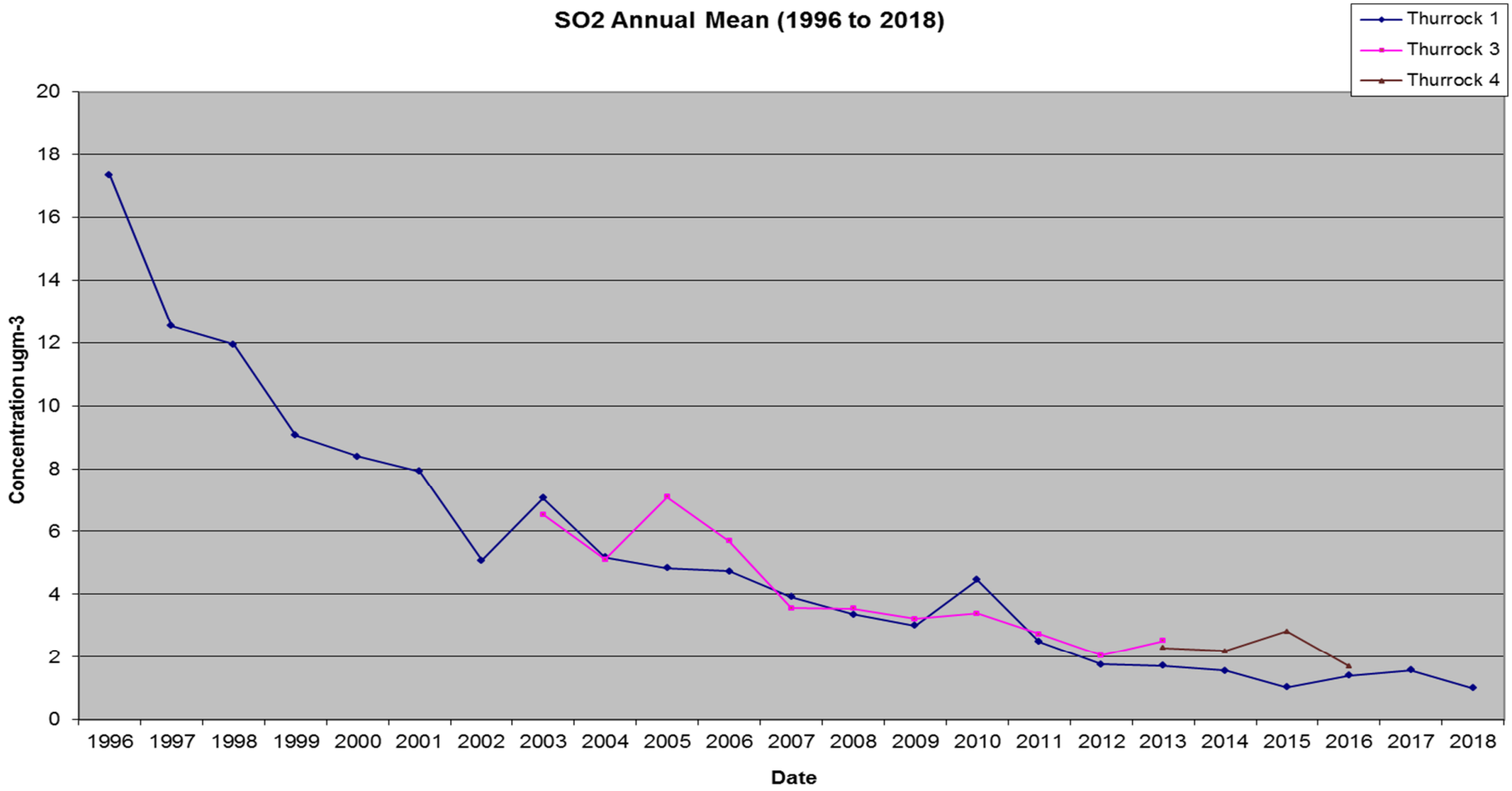
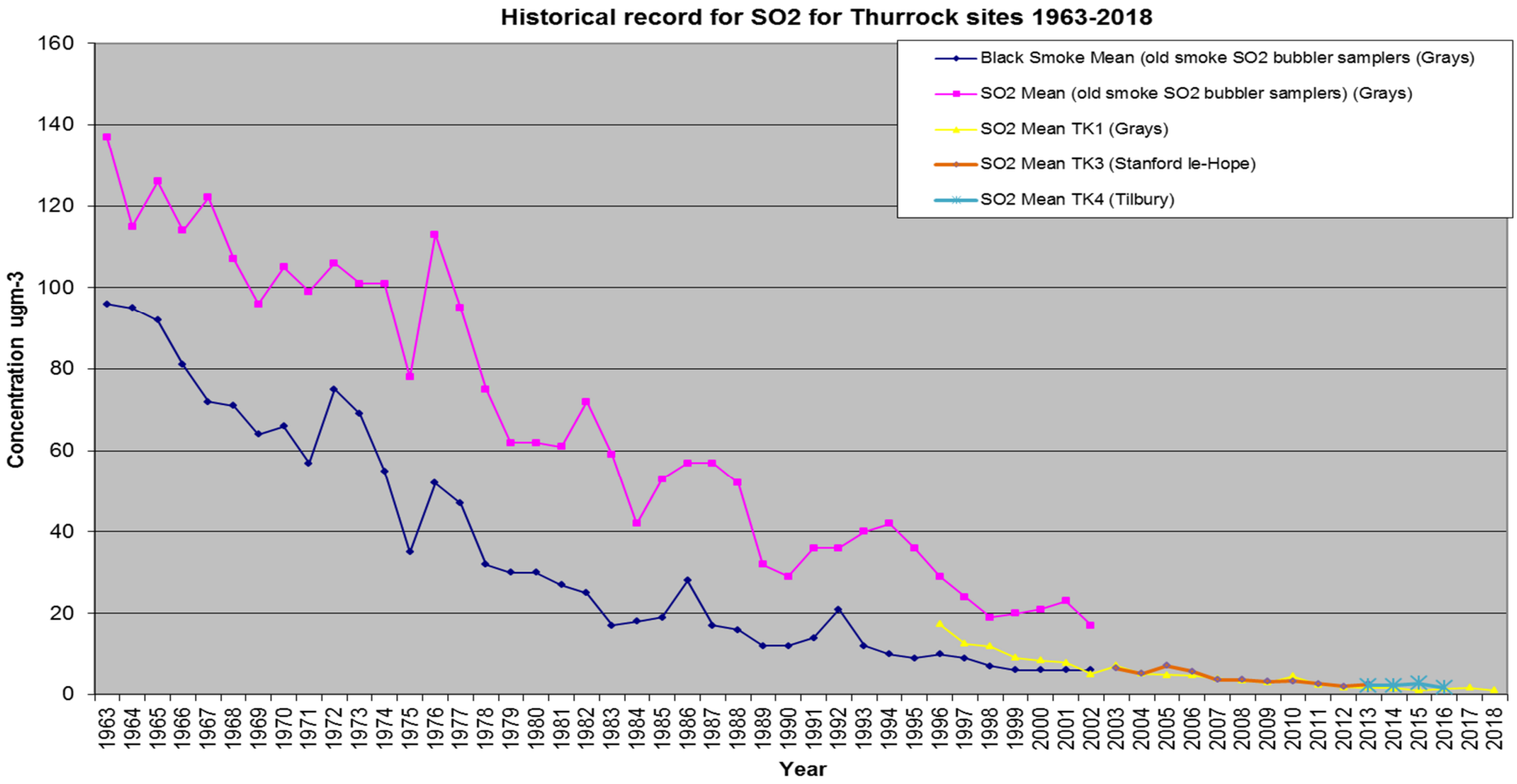


Figure A.9 – Long-Term Historical Trends in SO_2 & Black Smoke Concentrations for Thurrock (1963 – 2018)



Appendix B: Full Monthly Diffusion Tube Results for 2018

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

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor 0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (^{2})
LRAR	**53.31**	**53.24**	**72.48**	**62.72**	**51.17**	**48.16**	BAD DATA	**53.06**	**52.87**	**61.40**	**46.46**	**50.65**	**55.1**	**51.19**	37.3
PRS	32.53	**46.14**	**49.18**	36.85	38.20	29.24	37.28	32.32	33.85	38.97	31.93	37.88	37.0	34.4	30.2
WC	**41.34**	**40.82**	**48.39**	39.53	**48.92**	37.77	39.54	**45.01**	**44.74**	**49.56**	**46.07**	**48.38**	**44.2**	**41.1**	31.5
JC	**49.15**	**57.96**	**70.63**	**59.22**	**54.33**	**46.85**	**60.07**	**47.03**	**50.29**	**50.78**	**45.23**	**47.19**	**53.2**	**49.5**	**43.0**
IBIS	**55.18**	**42.28**	**57.16**	**54.12**	**42.38**	BAD DATA	**52.17**	**47.73**	**53.62**	**42.40**	**44.44**	**44.23**	**48.7**	**45.3**	location classed as R.P.E
GDSO	31.95	26.21	34.01	26.44	23.25	16.99	28.08	25.34	29.65	27.20	23.44	34.06	27.2	25.3	location classed as R.P.E
LT	**75.11**	**48.87**	**60.65**	**52.52**	**59.49**	**50.64**	**58.64**	**62.64**	**68.61**	**56.38**	**49.34**	**62.86**	**58.8**	**54.7**	33.8
KCNO	**40.70**	31.23	**40.61**	33.67	26.45	18.99	29.41	32.64	35.61	24.25	29.13	36.19	31.6	29.4	location classed as R.P.E
WT	**51.10**	36.24	**48.87**	33.33	38.36	26.97	34.91	39.75	**43.90**	**47.35**	38.46	**53.51**	**41.1**	38.2	35.6
HR	**40.89**	33.16	37.56	30.24	30.19	22.42	29.10	31.59	35.16	34.55	26.70	39.14	32.6	30.3	location classed as R.P.E

NAS2	**77.61**	**48.06**	**60.99**	**53.78**	**52.20**	**41.11**	**55.45**	**54.34**	**59.27**	**44.94**	**50.47**	**63.41**	**55.1**	**51.3**	**44.9**
LRSS	**42.48**	**41.45**	**47.87**	**45.44**	**42.99**	32.62	**41.39**	**40.18**	**45.60**	**41.74**	33.59	**50.89**	**42.2**	39.2	36.3
LRG	**41.89**	39.42	**42.84**	37.68	39.72	30.71	**40.43**	37.98	36.84	36.83	37.61	**45.36**	38.9	36.2	33.5
ER	**66.41**	**45.80**	**57.44**	**51.08**	**55.74**	34.80	**58.70**	**52.29**	**56.59**	**52.92**	**51.66**	**58.64**	**53.5**	**49.8**	37.2
PS	34.27	31.20	36.37	27.18	25.80	17.75	21.66	21.47	25.35	28.00	25.23	33.50	27.3	25.4	n/a
HL	**40.60**	37.18	**44.13**	MISSING	32.82	22.15	37.43	23.99	39.26	**41.12**	33.94	**45.50**	36.2	33.7	30.7
NAS1	**40.30**	37.36	**42.70**	35.67	35.46	27.01	**40.15**	29.57	33.03	35.02	34.78	33.02	35.3	32.9	location classed as R.P.E
CR	37.06	33.45	38.37	32.22	30.67	27.09	32.12	29.44	33.32	35.18	31.80	37.54	33.2	30.9	n/a
SRG	37.14	36.28	39.38	32.91	23.65	21.85	29.68	29.33	28.92	38.94	30.65	32.71	31.8	29.6	28.9
NAS3	31.32	27.72	30.82	25.06	21.65	14.86	22.49	23.68	BAD DATA	29.59	24.62	30.29	25.7	23.9	location classed as R.P.E
WES	38.03	29.39	37.22	27.88	35.15	25.72	24.86	28.40	32.23	37.66	28.45	35.35	31.7	29.5	25.0
B	20.33	BAD DATA	21.73	16.01	13.83	9.91	14.45	13.08	14.67	16.90	19.21	19.28	16.3	15.2	n/a
TL	**43.72**	32.40	36.86	31.25	35.58	26.20	31.85	36.19	36.88	**40.58**	32.94	39.81	35.4	32.9	30.5
PKSL	32.53	**46.14**	**49.18**	36.85	38.20	29.24	37.28	32.32	33.85	38.97	31.93	37.88	37.0	29.4	n/a
SL	30.82	30.66	34.23	26.17	26.25	18.25	23.99	25.39	26.56	31.54	28.78	35.64	28.2	26.2	n/a
M (triplicate average)	35.69	36.40	**40.09**	31.42	33.34	24.56	31.04	31.30	32.43	37.03	31.22	37.78	30.7	28.5	25.6
FRC	39.05	32.56	39.73	30.38	27.67	22.30	32.58	29.97	34.34	35.68	31.98	37.95	32.9	30.6	location classed as R.P.E
TILA	**54.86**	29.59	**43.83**	33.78	37.23	22.76	MISSING	**41.92**	**50.44**	**47.97**	37.67	**49.27**	**40.9**	38.0	33.9

TILB	**50.69**	35.34	**44.97**	38.78	**43.15**	32.48	**45.54**	**49.63**	**48.24**	**48.95**	**52.49**	**56.65**	**45.6**	**42.4**	**41.2**
TILC	**55.68**	**42.54**	**46.51**	39.10	39.77	BAD DATA	MISSI NG	**41.86**	36.28	36.30	MISSI NG	MISSI NG	**42.3**	37.84 (3)	29.3
TILD	**47.47**	29.81	**40.73**	34.67	37.75	29.70	36.45	36.37	39.30	**41.10**	32.32	**46.06**	37.6	35.0	31.8
TILE	**41.32**	35.17	39.19	32.61	35.19	27.45	29.90	27.10	35.54	**46.66**	34.81	**45.89**	35.9	33.4	31.2
TK4 (A&B) duplicate average	**44.40**	32.49	39.96	33.64	36.47	28.58	33.18	31.74	37.42	**43.88**	33.57	**45.98**	34.1	31.7	location classed as R.P.E
PBP	**44.54**	36.31	**52.07**	36.90	33.81	26.25	31.90	30.72	29.45	32.63	33.89	38.34	35.6	33.1	location classed as R.P.E
PBPA	34.71	**42.69**	**48.39**	31.17	33.86	23.32	34.56	32.33	33.12	BAD DATA	BAD DATA	**41.42**	35.6	33.1	location classed as R.P.E
LYD	38.89	34.87	**40.12**	28.75	21.08	22.24	32.84	30.27	33.05	32.42	33.41	37.61	32.1	29.9	location classed as R.P.E
AVSL	39.96	39.37	**50.57**	**40.33**	**42.09**	30.95	**50.62**	**44.23**	**44.25**	**42.51**	**48.28**	**52.10**	**43.77**	**40.7**	location classed as R.P.E
AVHS	35.97	38.72	**48.01**	37.12	38.65	29.23	**46.32**	35.35	32.79	38.81	39.98	38.63	38.30	35.6	35.1
SOAA	37.37	37.90	39.87	34.47	28.90	25.61	BAD DATA	BAD DATA	34.32	36.09	32.20	**42.34**	34.91	32.5	location classed as R.P.E
TSR	33.57	26.82	32.91	24.82	23.25	18.78	26.53	27.88	31.80	32.98	29.63	36.64	28.80	26.8	n/a
DR	35.09	26.10	36.44	26.47	24.18	19.61	26.54	25.98	28.82	30.57	28.52	33.21	28.46	26.5	location classed as R.P.E
LRARN	37.03	35.81	**43.71**	MISSI NG	31.12	BAD DATA	38.66	35.62	35.26	37.24	32.18	**44.99**	37.2	31.4	location classed as R.P.E
LRARS	32.48	32.90	38.45	27.73	29.08	20.11	30.95	18.43	27.26	29.30	24.98	20.96	27.7	25.8	location

															classed as R.P.E
LRARMN	**44.08**	**45.52**	**55.80**	**47.10**	**41.07**	35.50	**40.93**	36.03	**40.16**	**43.53**	38.37	**42.23**	**42.5**	39.6	36.0
LRARMS	**42.39**	**46.51**	**42.59**	36.77	**45.28**	32.10	**41.81**	34.27	35.08	**43.86**	**40.21**	**42.31**	**40.3**	37.5	34.0
JRP	29.00	35.96	39.88	24.96	25.53	20.33	26.67	22.51	22.46	31.67	32.79	28.69	28.4	26.4	n/a
ACHL	**45.04**	36.96	**40.32**	35.20	31.84	20.17	36.82	29.45	27.99	38.96	36.66	**41.82**	35.1	32.7	33.6
CC	29.12	19.50	38.70	26.74	25.97	21.46	28.37	27.12	30.71	25.57	25.05	31.91	27.5	25.6	location classed as R.P.E
ERFA	**40.22**	30.15	**43.03**	35.98	31.88	20.99	36.70	32.46	33.76	36.89	33.96	**42.65**	34.9	32.5	location classed as R.P.E
ERFB	35.83	29.64	39.79	32.58	32.11	21.92	39.36	34.97	39.17	34.35	31.34	34.09	33.8	31.4	location classed as R.P.E
ERTM	39.89	39.05	**47.22**	39.69	**44.74**	33.56	**44.45**	36.56	37.05	**41.94**	37.26	**42.99**	**40.4**	37.5	location classed as R.P.E
NC	**42.60**	34.08	**40.84**	37.49	31.98	22.88	31.01	36.46	**47.04**	34.94	37.93	38.92	36.4	33.8	location classed as R.P.E
HD	**40.57**	39.56	38.78	32.86	36.84	27.35	32.99	32.91	33.87	32.85	30.86	**42.36**	35.2	32.7	location classed as R.P.E
GRPL	**42.23**	37.07	39.74	34.23	29.84	22.49	34.24	30.48	**40.13**	35.06	36.48	37.79	35.0	32.5	location classed as R.P.E
PIH	36.41	**42.48**	**44.81**	39.62	38.22	32.51	**40.36**	MISSING	27.25	**40.35**	39.19	34.41	37.8	35.1	location classed as R.P.E
WCFA	32.63	34.87	**42.51**	32.63	36.87	27.73	34.18	33.79	30.65	MISSING	36.61	**44.22**	35.2	32.7	location classed as R.P.E
THA	36.31	**43.55**	**45.84**	**42.48**	38.37	30.90	34.89	30.01	29.62	35.36	39.58	35.96	36.9	34.3	location

															classed as R.P.E
THB	36.72	**47.18**	**49.91**	**44.33**	**41.47**	32.92	37.94	29.40	24.91	38.02	39.81	37.88	38.4	35.7	location classed as R.P.E
SCR LTC	**41.60**	35.58	**46.52**	34.62	29.63	18.64	32.28	31.24	36.57	34.36	35.74	**40.98**	34.8	32.4	n/a
BSA LTC	MISSING	26.32	32.50	26.84	23.90	17.47	25.40	21.92	24.29	25.54	29.92	29.41	25.8	24.0	n/a
BSB LTC	39.89	31.78	39.49	28.79	30.17	26.22	28.63	28.17	32.60	36.07	33.55	33.83	32.4	30.2	n/a
HR LTC	37.42	25.45	34.63	30.06	24.24	17.74	26.08	25.90	32.98	30.07	32.31	35.56	29.4	27.3	n/a
SR LTC	26.18	21.51	24.55	19.74	20.37	12.76	16.48	16.46	18.93	22.35	18.28	23.29	20.1	18.7	n/a
TTS LTC	32.11	23.25	30.56	25.05	24.62	17.64	21.86	19.91	24.12	30.01	BAD DATA	31.66	25.5	23.7	n/a

☐ **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 NO_2 annual mean objective of 40µg/m^3 for (monthly periods) are shown in **bold**.

Exceedences of the NO_2 annual mean objective of 40µg/m^3 for the (whole year) are shown in **bold**

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

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

(2) Distance corrected to nearest relevant public exposure.

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

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 PM_{10} 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.

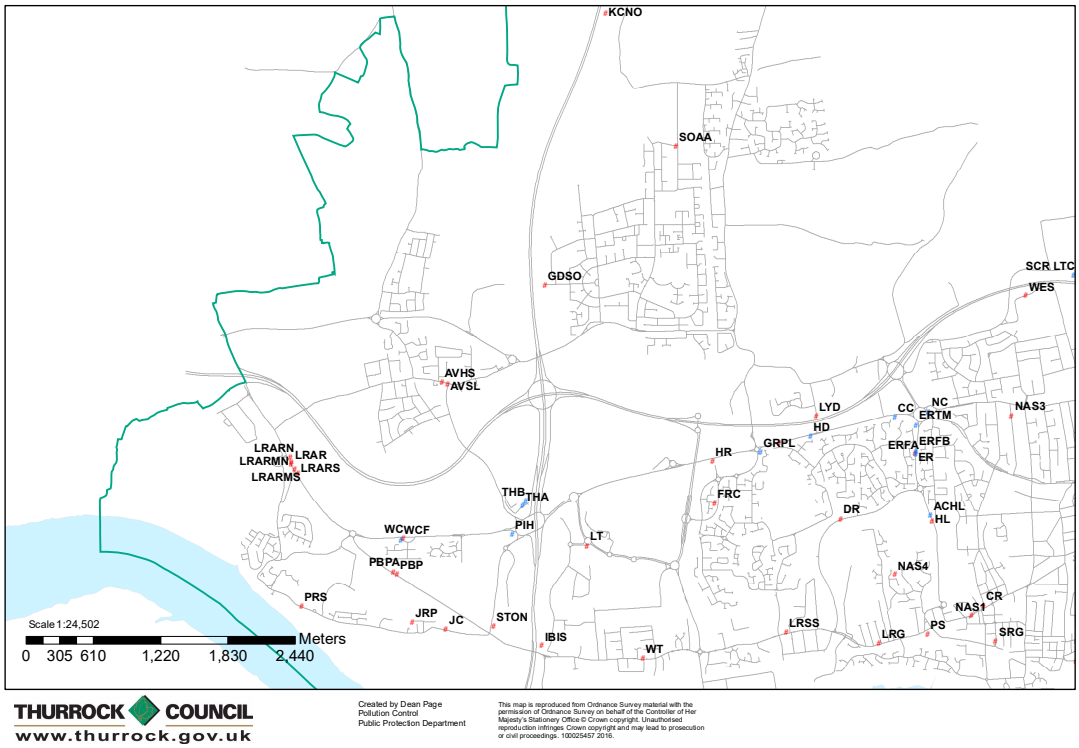
Calibrations for all sites are done every fortnight by Thurrock Council Environmental Health Officers & the Air Quality Officer.

QA/QC of Diffusion Tube Monitoring

Diffusion Tube studies for Gradko analysis using 20% TEA in water over 2018 demonstrated overall Good Precision
https://laqm.defra.gov.uk/assets/tubeprecision2019version0319finalreduced.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: NO_2 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: NO_2 Diffusion Tube Locations (East Thurrock)

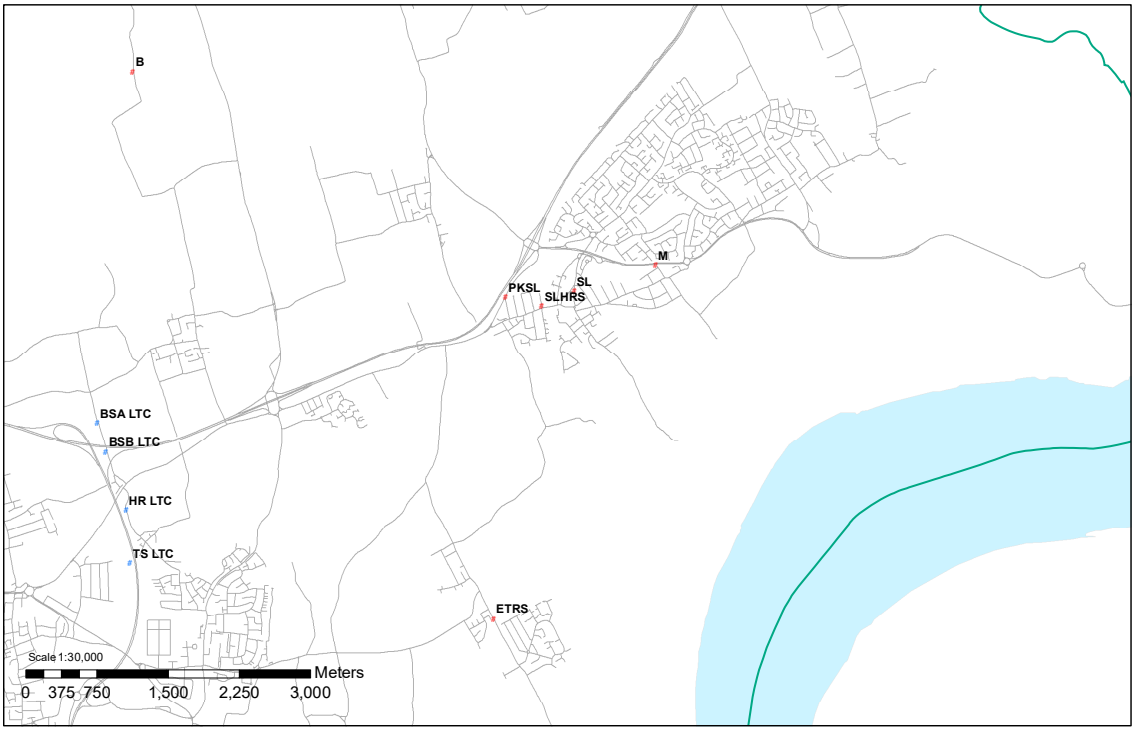


Figure D.3: NO_2 Diffusion Tube Locations (Tilbury)

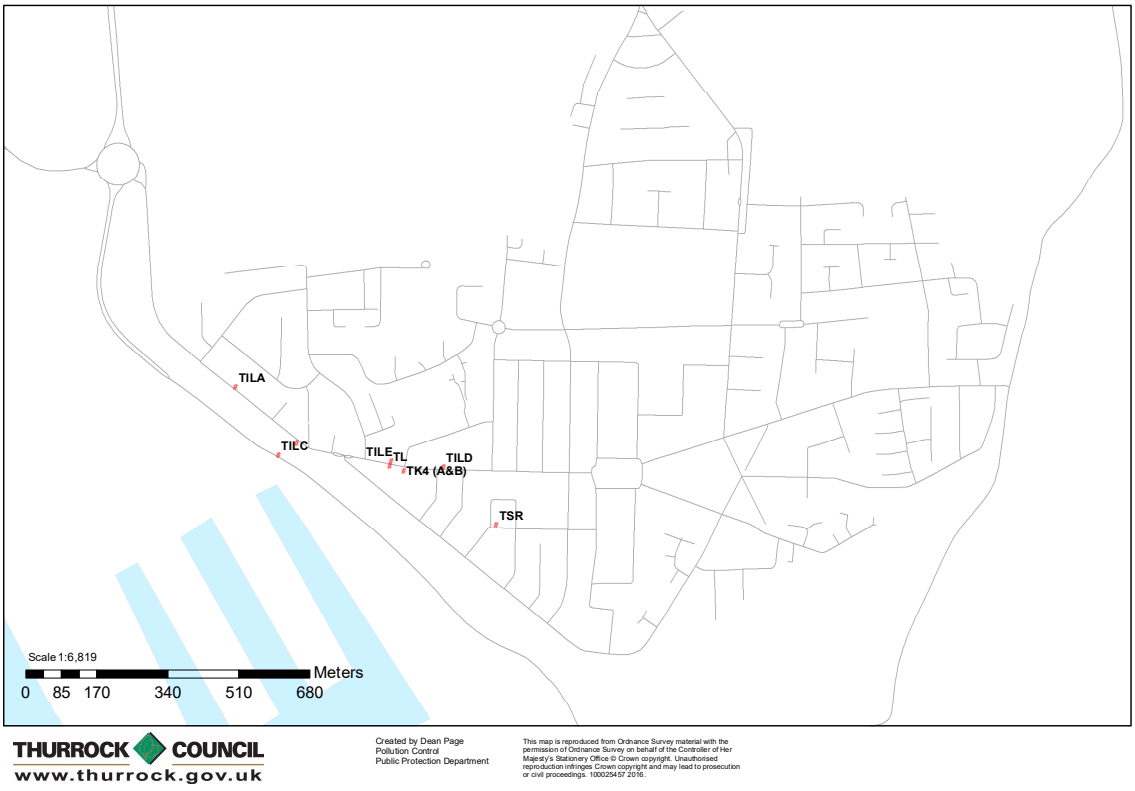


Figure D.4: Automatic Monitoring sites location (Thurrock)

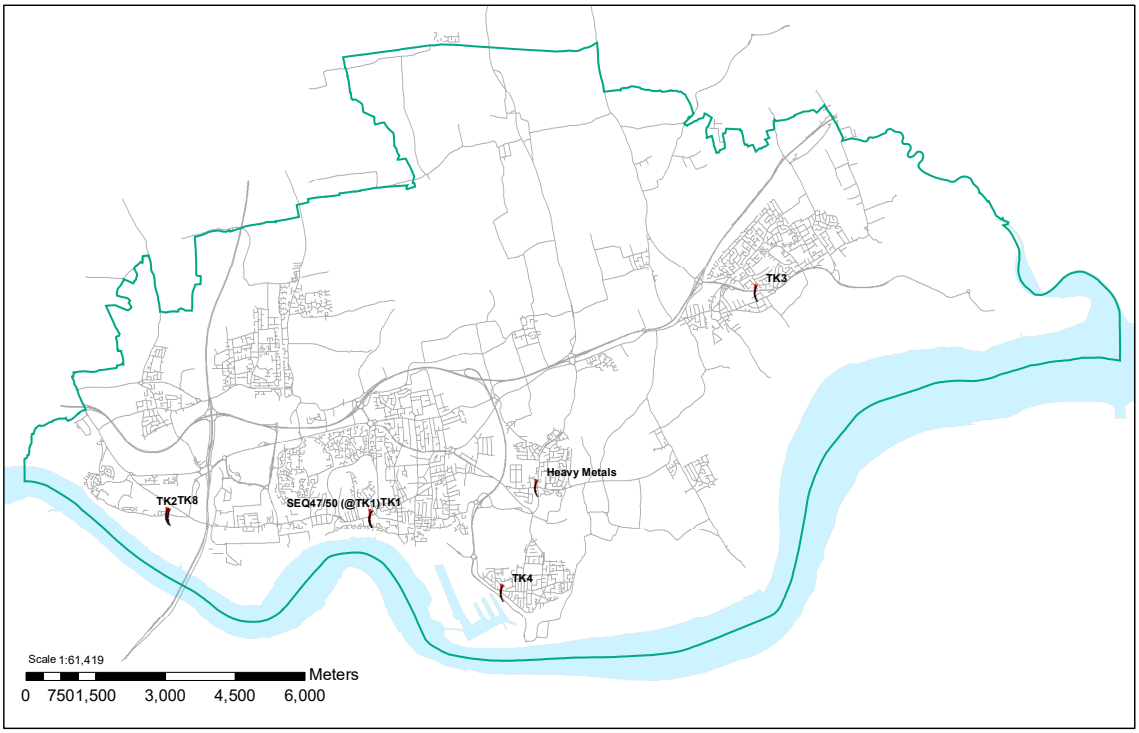
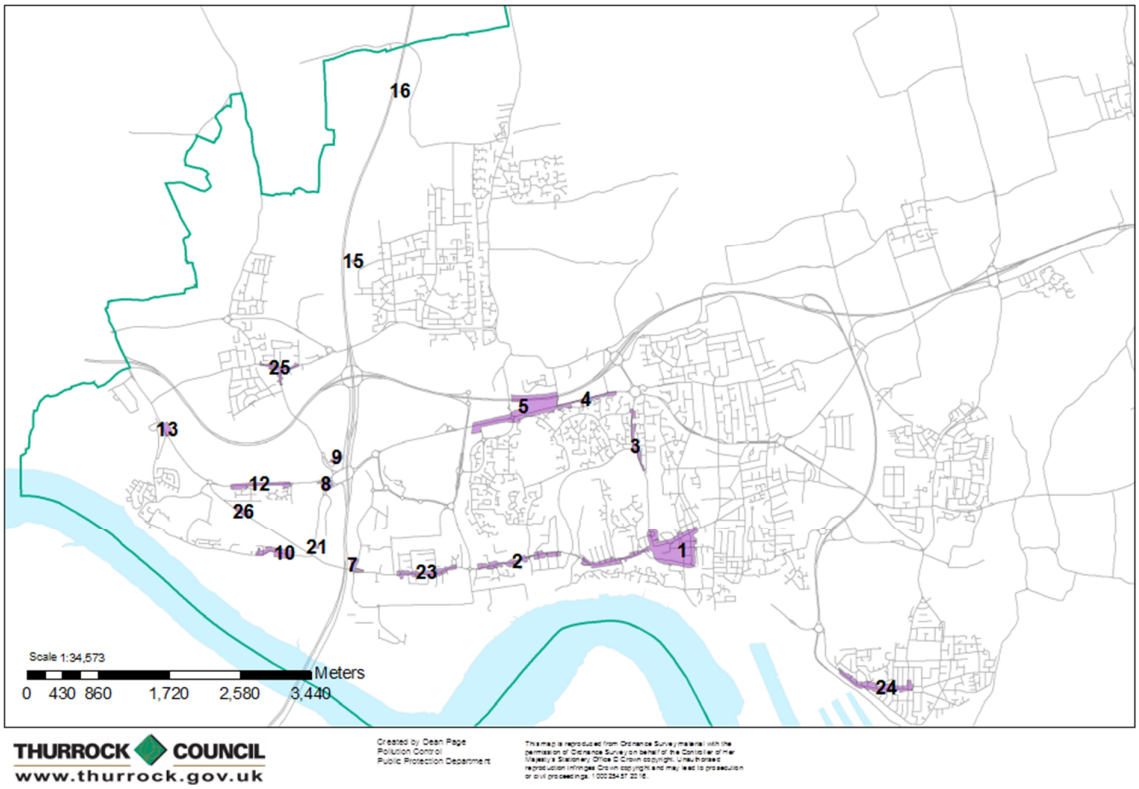


Figure D.5: Map of AQMA locations in Thurrock



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/m^3).

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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