



**Gravesham Borough Council**

**2023 Annual Status Report**



June 2023

# Document Control Sheet

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# 2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995  
Local Air Quality Management, as amended by the  
Environment Act 2021

Date: June, 2023

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| Report Reference Number | 2023 ASR   |
| Date                    | June 2023  |

## Executive Summary: Air Quality in Our Area

### Air Quality in Gravesham Borough Council

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

Gravesham Borough Council has two automatic monitoring stations located in AQMA No.1 (Gravesham A2) and AQMA No.2 (adjacent to the Northfleet Industrial Area AQMA). Both automatic monitors demonstrate long-term compliance with the air quality standard (AQS) objective for Nitrogen Dioxide (NO<sub>2</sub>), with regards to annual mean and 1 – hourly exceedance objectives. Particulate Matter (PM<sub>10</sub>) also shows long term compliance, regarding the annual mean and the 24 – hour mean PM<sub>10</sub> AQS objectives (i.e., the principal pollutants of concern for air quality).

During 2022, all passive monitoring locations, except one, were compliant with the NO<sub>2</sub> AQS objective of 40 µg/m<sup>3</sup>, 58 sites reported decreases from 2021, with the remaining 7 sites reporting increases. There was only one reported exceedance of the annual mean NO<sub>2</sub> AQS objective of 40 µg/m<sup>3</sup> within Gravesham, this was at site GR142, situated in Gravesham's A2 AQMA. This site continues to report the highest concentrations within the monitoring network. GR142 (42.9 µg/m<sup>3</sup>) is not at a location of relevant exposure, and once

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<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, January 2023

<sup>4</sup> Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

fall-off with distance calculations have been carried out to predict the concentration at the nearest relevant receptor, the estimated concentration is 32.2 µg/m<sup>3</sup>.

National Highways (NH) has responsibility for the management of the A2 Trunk Road and as such is responsible for any direct actions proposed for the AQMA along the A2 Trunk Road in Gravesham.

Kent County Council (KCC), as the local transport authority, is responsible for the management of the local road network and as such is responsible for any direct actions proposed for the AQMAs in the town centre in order to reduce road traffic emissions. Gravesham Borough Council works together with Kent County Highways to improve air quality within these AQMAs and throughout the Borough.

Gravesham Borough Council is continuing to review their declared AQMAs to ascertain whether any significant improvements to pollution levels have been made to allow for boundary adjustment or removal. A detailed modelling assessment has been commissioned to review the current AQMA boundaries and emission sources contributing to the exceedances. The outcomes of the detailed assessment will inform an update to the now outdated existing AQAPs which were published in 2004 and 2006. Gravesham target the end of February 2024 for a draft AQAP to be submitted to DEFRA.

The Council will revoke the AQMA declarations for nitrogen dioxide when possible, following a suitable sustained reduction in levels however it wishes to keep the Northfleet Industrial Area AQMA declaration for windblown particulate matter (PM<sub>10</sub>) in place in order to ensure PM<sub>10</sub> concentrations are continually monitored. Also, that measures are implemented and maintained to ensure that the construction phases of the significant level of mixed use development in the AQMA, which is planned to take place over at least the next decade, does not cause an increase in PM<sub>10</sub> levels.

## Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan<sup>5</sup> sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM<sub>2.5</sub> targets. The National Air Quality Strategy has been published in 2023, and provides more

<sup>5</sup> Defra. Environmental Improvement Plan 2023, January 2023

information on local authorities' responsibilities to work towards these new targets and reduce PM<sub>2.5</sub> in their areas. The Road to Zero<sup>6</sup> details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The declaration of the existing AQMAs and the adoption of Action Plans and Strategies continue to enable the Council to make progress on improving air quality within the Borough, for residents and visitors. This has been achieved by working with partners, including Kent County Council, Kent County Highways, National Highways Agency, and the Environment Agency.

Whilst there has been significant progress with the measures in the existing action plans, leading to the revocation of three of the seven AQMAs in the borough, major additional work that has been undertaken to assess air quality includes:

- The development of a new AQAP that incorporates all AQMAs into one AQAP; and
- Continued implementation of the Climate Change Management Plan (CCMP) from 2022

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<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018



## Conclusions and Priorities

During 2022, 58 passive monitoring locations reported a decrease in NO<sub>2</sub> concentrations, with the remaining 7 reporting an increase from 2021. GR142 (42.9 µg/m<sup>3</sup>) reported an exceedance of the NO<sub>2</sub> AQS objective, however fall-off with distance calculations were required to predict the concentration to the nearest relevant receptor, the estimated concentration is 32.2 µg/m<sup>3</sup>. The council will continue to use their passive monitoring network to determine whether AQMAs need amending or whether there are any new identifiable areas of concern. Gravesham Borough Council are focused on reducing annual mean NO<sub>2</sub> concentrations via the implementation of currently identified measures, but also through development of new measures as part of the AQAP update. The Council's priorities for the next reporting year are:

- To finalise and complete and implement the new AQAP
- To implement and continue to progress the Climate Change Management Plan 2022
- Continue working with partners in the Kent and Medway Air Quality Partnership (K&MAQP) to improve air quality throughout the area; and
- Continue reviewing the NO<sub>2</sub> passive monitoring network, in order to identify any areas which may require additional monitoring and to identify any potential areas of exceedances.

Gravesham Borough Council are currently in the process of developing a new AQAP to cover all four AQMAs. The existing AQAPs were published in 2004 and 2006 with most of the measures having been significantly progressed or completed and are therefore the AQAPs are considered to be out-of-date. It is the intention of the Council to review and update the existing AQMAs using the most up-to-date information and analysis and to present a combined AQAP to cover all of the declared AQMAs. A modelling assessment was undertaken to review all AQMAs within Gravesham's jurisdiction, to support measures within the updated AQAP.

## Local Engagement and How to get Involved

The main source of air pollution within Gravesham Borough Council is from road traffic emissions. Gravesham currently has local initiatives to inform and educate the public on local air quality, through a number of schemes:

- Pollution Patrol – is a website, which allows access to resources that will help you understand more about air pollution and its effects on your health and the environment. The pollution patrol was jointly financed by several councils and a Department for Environment, Food and Rural Affairs (DEFRA) grant. All schools in Gravesham with kids of the relevant age are being invited to use the website. This can be accessed via <https://pollutionpatrol.org.uk/>
- Social Media Campaign's
  - KentAir Week (Pollution Patrol was launched during KentAir Week in April drawn up as a tool for schools in Kent in addition to Care4Air which is available through KentAir)
  - Clean Air Day (UK's largest air pollution campaign, bringing together communities, businesses, schools, and the health sector)

Further to this, the following are suggested alternatives to private travel that would contribute to improving the air quality in the borough:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the number of vehicles and reducing congestion. The council has supported its staff in increasing their use of public transport by arranging with Arriva, a discount for council employees who use the bus for their commute;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy. The council has supported its staff in increasing their use of cycling to get to work and go out on visits in the borough by providing secure cycle storage, showers and a Cycle to Work scheme with which staff can purchase cycles and cycling equipment at a reduced rate and pay for it through their salaries;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the number of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools. The council encourages staff

to share cars on work business by paying a passenger rate of mileage. They also promote the Kent County Council Car Share scheme to staff;

- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel-efficient cars are available, and all have different levels benefits by reducing the amount of emissions being released. The council has significantly increased the number of electric vehicle charging points in the main town centre car park used by visitors to the town and staff. It has also increased the number of electric vehicles in its own fleet with them being sign written to the public can see which ones are electric;
- Home working – Choosing to work from home can help to alleviate congestion on the roads during peak times and therefore reduce the amount of emissions being released. The council have supported the staff in working from home with those now able to work from home only being required to work in the office a minimum of two days per week. With many of the council's staff having a long commute by car this has significantly reduced the commuting miles; and
- Remote attendance of meetings – most of the council meetings are now attended remotely including those with colleagues off site. Leading to a further reduction in business miles.

## Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of Gravesham Borough Council of Council with the support and agreement of the following officers and departments:

- Planning and Regeneration Services
- Parking Services
- Parks and Open Spaces
- Communication Services
- Climate Change Officer Working Group

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Deborah Wilders at:

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# 1 Local Air Quality Management

This report provides an overview of air quality in Gravesham Borough Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Gravesham Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.



## 2 Actions to Improve Air Quality

### Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

A summary of AQMAs declared by Gravesham Borough Council can be found in Table 2.1. The table presents a description of the 4 AQMAs that are currently designated within Gravesham Borough Council. Appendix D: Maps of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO<sub>2</sub> annual mean;
- PM<sub>10</sub> Annual Mean; and
- PM<sub>10</sub> 24-hour mean

**Table 2.1 – Declared Air Quality Management Areas**

| AQMA Name  | Date of Declaration          | Pollutants and Air Quality Objectives                       | One Line Description  | Is air quality in the AQMA influenced by roads controlled by Highways England? | Level of Exceedance: Declaration | Level of Exceedance: Current Year                | Number of Years Compliant with Air Quality Objective  | Name and Date of AQAP Publication   | Web Link to AQAP  |
|--|------------------------------|---|---|--|----------------------------------|--|---|---|---|
| Gravesham A2 AQMA                                    | Declared 2002, Amended 2012> | NO <sub>2</sub> Annual Mean<br>PM <sub>10</sub> Annual Mean | The A2 Trunk Road AQMA. An area extending either side of the length of the A2 within the borough  | YES  | 50.5 µg/m <sup>3</sup>           | 42.9 µg/m <sup>3</sup> (32.2 µg/m <sup>3</sup> ) | Local Air Quality Management – Final Action Plan 2004 | <a href="#">Visit the AQAP for the A2 Trunk Road AQMA</a>                                 | <a href="#">Visit the AQAP for the A2 Trunk Road AQMA</a>                                 |
| Northfleet Industrial Area AQMA                      | Declared 2005                | PM <sub>10</sub> Annual Mean                                | An area encompassing the Northfleet Industrial Area in Gravesham  | NO   | 40.8 µg/m <sup>3</sup>           | 31.1 µg/m <sup>3</sup>                           | Local Air Quality Management – Final Action Plan 2004 | <a href="#">Visit the AQAP for the Northfleet Industrial Area AQMA</a>                    | <a href="#">Visit the AQAP for the Northfleet Industrial Area AQMA</a>                    |
| Gravesham A226 One-way system AQMA                   | Declared 2005                | NO <sub>2</sub> Annual Mean                                 | An area incorporating the entirety of the A226 One-way system in Gravesend  | NO   | 57.4 µg/m <sup>3</sup>           | 37.4 µg/m <sup>3</sup>                           | Local Air Quality Management – Final Action Plan 2006 | <a href="#">Visit the AQAP for the A226 One-way system in Gravesend AQMA</a>              | <a href="#">Visit the AQAP for the A226 One-way system in Gravesend AQMA</a>              |
| Gravesham A227 Wrotham Road/ B261 Old Road West AQMA | Declared 2005                | NO <sub>2</sub> Annual Mean                                 | An area encompassing the junction of the A227 Wrotham Road and B261 Old Road West extending south to a point just beyond the Woodlands Restaurant | NO   | 47.3 µg/m <sup>3</sup>           | 33.7 µg/m <sup>3</sup>                           | Local Air Quality Management – Final Action Plan 2006 | <a href="#">Visit the AQAP for the A227/B261 Wrotham Road/Old Road West Junction AQMA</a> | <a href="#">Visit the AQAP for the A227/B261 Wrotham Road/Old Road West Junction AQMA</a> |

| AQMA Name   | Date of Declaration | Pollutants and Air Quality Objectives | One Line Description | Is air quality in the AQMA influenced by roads controlled by Highways England? | Level of Exceedance: Declaration | Level of Exceedance: Current Year | Number of Years Compliant with Air Quality Objective | Name and Date of AQAP Publication | Web Link to AQAP |
|---|---------------------|---------------------------------------|----------------------|--|----------------------------------|-----------------------------------|--|-----------------------------------|------------------|
| Note: within brackets reports concentrations subject to fall off with distance calculations |                     |                                       |                      |  |                                  |                                   |  |                                   |                  |

- ☒ Gravesham Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.
- ☒ Gravesham Borough Council confirm that all current AQAPs have been submitted to Defra.

## Progress and Impact of Measures to address Air Quality in Gravesham Borough Council

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

1. *"The Council has included and addressed the comments from last year's report within their ASR this year, which is appreciated and encouraged."*
2. *The Council has provided extensive details of measures they are undertaking to tackle PM<sub>2.5</sub> concentrations/ emissions within its boundaries, particularly it is appreciated the inclusion of discussion surrounding the Public Health Outcomes Framework and the D01 indicator.*
3. *Figure A.4 is rather cluttered, making it difficult to distinguish individual bars, in the future it might be worthwhile separating the diffusion tubes outside of AQMAs into various graphs based on regions.*
4. *The maps of monitoring sites are clear and easy to read, it would be helpful in future if a zoomed-out view is included to help provide context of the greater region.*
5. *All of the relevant sections of the Action Plan Measures table have been completed wherever possible, with extensive level of detail. This is encouraged, and it is hoped that in future reports the council will continue to do this.*
6. *Gravesham Borough Council acknowledges that a new AQAP is required, and their priorities reflect this, it is hoped that progress will be made on the development of the new AQAP in the forthcoming year.*
7. *The detail on the Council's local engagement activities is extensive, this is welcomed, and it is encouraged that this continues in future reports."*

The appraisal comments provided for last year's 2022 annual status report have been actioned with the inclusion of a spatial map of the monitoring network and separate graphical figures for diffusion tubes outside Gravesham's AQMAs.

Gravesham Borough Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Thirty measures are included within Table 2.2, with the type of measure and the progress Gravesham Borough Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans, which can be accessed via KentAir. Key measures progressed in 2022 are:

- The completion of the Traffic Rerouting using Variable Message Signage (VMS) and Traffic Management
- The HGV rerouting - Gravesend Town Centre Road Network AQMA
- New road infrastructure (Rathmore Link Road)

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

- Update of the current AQAP measures and plan, by developing a new AQAP to include all four AQMAs.

Longer term actions that are currently ongoing include:

- Developing emissions standards for council fleet and public, via FastTrack buses. The Thameside Fastrack routes will include 28 single decker electric buses in April 2023.
- Significant roll out of green buses will happen in April 2023 with the introduction of electric buses, for the FastTrack bus route within Gravesend.

Whilst the measures stated above and in Table 2.2 will help continue to main compliance, Gravesham Borough Council anticipates that further additional measures not yet prescribed, to further improve air quality. The development of the new AQAP will provide direct and general measures to further improve air quality for all four AQMAs across the borough.

Table 2.2 – Progress on Measures to Improve Air Quality

| Measure No.      | Measure   | Category                        | Classification   | Year Measure Introduced in AQAP | Estimated / Actual Completion Date | Organisations Involved                        | Funding Source                                | Defra AQ Grant Funding | Funding Status | Estimated Cost of Measure | Measure Status | Reduction in Pollutant / Emission from Measure                 | Key Performance Indicator                          | Progress to Date   | Comments / Barriers to Implementation |
|------------------|---|---------------------------------|--|---------------------------------|------------------------------------|---|---|------------------------|----------------|---------------------------|----------------|--|--|--|---------------------------------------|
| Measures 1 and 4 | Traffic Rerouting using Variable Message Signage (VMS) AND Traffic Management (UTMC and junction improvements) (A226 One way system Gravesend AQMA) | Traffic Management              | UTC, Congestion management, traffic reduction                | 2012                            | COMPLETED                          | Kent County Council/Gravesham Borough Council | Kent County Council/Gravesham Borough Council | -                      | -              | -                         | COMPLETED      | Expected air quality improvement by 0.2 µg/m³ in AQMA          | Reduction in journey time, reduction in congestion | <p>Traffic Rerouting using Variable Message Signage (VMS) scheme has been incorporated into the Urban Traffic Management System (UTMC) and junction improvements scheme.</p> <p>Interlinked with FastTrack Bus priority signal control system refurbished in 2015. This enables it to remain viable.</p> <p>Has reduced congestion in town centre one way system. Likely to be small improvement in levels. Further development will need funding to be secured by Kent County Council, ideally through development.</p> <p>The Fastrack route which uses a combination of designated lanes and shared roadway with preferential use of the junctions using traffic management etc. now passes through land under the planning control of the Ebbsfleet Development Corporation (EDC) rather than GBC.</p> <p>The regeneration of the Northfleet Embankment has enabled the implementation of designated bus routes with associated signage and traffic control.</p> <p>Fastrack route B has been diverted over the new Springhead Park Bridge. This bridge is partially within the borough of Dartford.</p> | COMPLETED                             |
| 2                | HGV rerouting - Gravesend Town Centre Road Network AQMA   | Freight and Delivery Management | Route Management Plans/ Strategic routing strategy for HGV's | -                               | COMPLETED                          | Kent County Council<br>National Highways      | Kent County Council                           | -                      | -              | -                         | COMPLETED      | Expected air quality improvement by at least 0.2 µg/m³ in AQMA | Reduction in journey time, reduction in congestion | <p>West Street Bridge removed to allow HGVs to exit the one-way system and then access the Northfleet</p> <p>Industrial Area or Imperial Business Park without having to go all the way around the one-way system.</p> <p>Other schemes devised by KCC have not been developed however they will reassess if funding becomes available.</p> <p>Springhead Road –narrowing to the middle length of the road to</p>  | COMPLETED                             |

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|             |  |                                       |  |                                 |                                    |                        |                     |                        |                |                           |                |  |  | <p>discourage HGV traffic. HGVs still have access from northern end to Springhead Enterprise \Park and Sainsbury's from the southern end of the road. This narrowing has discouraged /prevented the use of the new Springhead Park Bridge from the estate to Ebbsfleet station area by HGVs.</p> <p>The knock on effects of significant holdups on the A2/M2 through Gravesham is that the traffic rat runs through the residential areas of the borough and town centre AQMA exacerbating the existing traffic congestion.</p> <p>There is significant concern that the approx. 8 years of the construction of the Lower Thames Crossing east of the urban area will create a worsening of traffic congestion on the A2 and within the urban area when drivers try to avoid the holdups on the trunk road. However, the council is trying to negotiate with National Highways on how congestion can be reduced throughout the construction period.</p> <p>KCC and National Highways have undertaken reviews of HGV movements and a consultation in relation to the need for lorry parks and their locations particularly when there are delays at ports within Kent.</p> <p>Operation Brock is part of the product of this review, the implementation of which occurred in February 2019 as part of the Brexit preparations.</p> <p>The impact on the traffic on the A2 Trunk Road in Gravesham from Operations Stack and Brock in the future is unknown.</p> |                                       |
| 3           | New road infrastructure (Rathmore Link Road) | Transport Planning and Infrastructure | Public transport Improvements interchanges stations and services | 2012                            | COMPLETED                          | Kent County Council    | Kent County Council | -                      | -              | -                         | COMPLETED      | Expected air quality improvement by at least 1 µg/m <sup>3</sup> locally | Reduction in journey time, reduction in congestion | <p>This scheme is one of the major strategic schemes in Kent Thameside Home and Roads programme</p> <p>which were funded from various government sources and developer contributions Phase 1 and 2 now completed.</p>  | COMPLETED                             |

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|             |   |                                  |                           |                                 |                                    |   |                |                        |                |                           |                |  |   | <p>Allows two-way traffic to pass south of the railway station thus removing it from the north of the station to improve pedestrian access to public transport and shopping centre.</p> <p>Has benefitted air quality by removing the route of the one-way system to a purpose-built road south of the station.</p> <p>Has delivered medium improvement in levels in some areas, and a slight increase in levels on the new route.</p> <p>KCC purchased land from Network Rail adjacent the railway station for new bus interchange which has now been completed. ANPR enforcement cameras have been installed so as to prevent cars from using the bus lanes in the bus interchange.</p> <p>This has significantly improved public transport access.</p> <p>AQ monitoring at key locations around the new</p> <p>Rathmore Road route have recorded an increase in NO<sub>2</sub> concentrations at some locations as expected however no additional exceedances of the objectives have occurred.</p> |  |
| 6           | Improve emissions standards for Council Fleet and Public Service Vehicles | Promoting Low Emission Transport | Taxi Licensing conditions | -                               | On-going                           | Gravesham Borough Council / Transport operators | -              | -                      | -              | -                         | Implementation | Expected air quality improvement by 0.2 µg/m <sup>3</sup> in all AQMAs | Fleet vehicles replaced by later Euro standards | <p>The council won a bid from central government to set up a new recycling scheme and the fleet was replaced with latest Euro standard vehicles.</p> <p>The council has also trialled various methods of improving fuel consumption of its fleet for example petrol additives and driver training.</p> <p>The council Introduced electric vehicles within its extensive fleet of 110 vans and 25 HGVs. The Council has increased the number of electric vans within its fleet, with this reflecting 16% of the Council's smaller fleet vehicles now being powered by alternative fuels. The Council is also looking at the future of its Heavy Goods Vehicles and has trialled a battery-powered refuse collection vehicle in the past year, in addition to moving to battery-powered equipment such as blowers and strimmers in its operations.</p>  | <p>Taxis - The Council will keep this matter under review and continue to monitor published research, its air quality monitoring results and recommendations, and Government guidelines, etc. with a view to specifying more stringent vehicle emission standards and promoting cleaner fuels in respect of licensed vehicles at the time of the next policy revision, if considered appropriate at that time.</p> |



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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           |                  | <p>Local bus operator has introduced cleaner more efficient buses on some of its routes through the urban area, this was funded in part from a Local Transport Sustainability Fund.</p> <p>Arriva have implemented a discount arrangement for council employees who use the bus for their commute.</p> <p>The Zebra (Zero Emission Bus Regional Areas) scheme bid, by KCC, to introduce a new fleet of electric buses in Gravesham and Dartford was successful and the funding will see 28 single decker fleet being introduced in April 2023.</p> <p>Although the current new Arriva Fastrack buses have lots of features for the customer to encourage use e.g., charging points, Wi-Fi, leather seats etc. The Go-Ahead Group has been awarded a 15-year contract worth £110 million by Kent County Council to operate the county's Fastrack bus rapid transit system. The group's Go-Ahead London division will operate the service from November 2024, and existing buses will be replaced with a zero-emission, electric fleet on the network, which runs in the Dartford, Bluewater, Ebbsfleet and Gravesham area.</p> <p>Through the National Bus Strategy, Kent County Council is working even closer with our bus operators, and it is only through these strong partnerships that we can achieve the bold ambitions that we have set for ourselves. KCC and Gravesham look forward to welcoming Go-Ahead to the Borough.</p> <p>The new taxi policy requires that all new taxis are fully electric and from 2030 all taxis at renewal or on application for a new licence must be fully electric. All new taxis are fully electric and from 2030 all taxis at renewal or on application for a new licence must be fully electric.</p> <p>Emissions from taxis and PHVs can also be further reduced by encouraging better maintenance</p> |

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|             |                                    |                    |   |  |                                    |   |   |                        |                |                           |                |  |   | <p>of vehicles and switching off engines when stationary or idling; particularly at taxi ranks; however, it is proposed that this aspect be tackled through education and promotion.</p> <p>Gravesham are taking part in a joint initiative with Medway and the Energy Savings Trusts (EST) to survey all taxi drivers to ascertain the level of knowledge and possibly take up of electric vehicles, what it would take to convert them and what infrastructure they would want and where to make it viable for them to use EVs.</p> <p>Gravesham have explored opportunities for the provision of on and off street electric vehicle charging points for taxis/ private hire vehicles and implement such charging points where it is feasible to do so. Work has commenced on Bath Street to put in a dedicated bus lane and also charging points for taxis.</p> <p>Gravesham are taking part in the KCC Low Carbon Kent trial <a href="https://lowcarbonkent.com/kent-revs-van-trial/">https://lowcarbonkent.com/kent-revs-van-trial/</a> and promoting it across the borough. Electric vans are being trialled, providing businesses with the opportunity to try an electric van. The aim is that organisation would see the benefits and ease of owning and running an EV van. There can be significant savings on petrol and diesel over the existing fleet which at today's high fuel costs can save significant sums for all sizes of business. Up to the end of April 13 companies include Gravesham have taken part in the trial.</p> <p>Gravesham also want to work with other businesses and service providers in the borough to support the provision of EV charging points within their own facilities.</p> |                                       |
| 7           | Road prioritisation (Bus priority) | Traffic Management | Strategic highway improvements, Re-prioritising road space away from cars, including access management, | 2005 – FastTrack<br>2016 – North Embankment East route | COMPLETED                          | Kent County Council / GBC / Ebbsfleet Development Corporation | Kent County Council / GBC / Ebbsfleet Development Corporation | -                      | -              | -                         | COMPLETED      | -  | Improvements in journey time for public transport users | <p>FastTrack service now in for almost 20 years. The number of customers have surpassed all predictions. Has been reviewed regularly and, new Sapphire buses provided considered a success.</p>   |                                       |

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|             |                               |                                       | Selective vehicle priority, bus priority, high vehicle occupancy lane |                                 |                                    |  |                     |                        |                |                           |                |  |                                     | <p>Springhead bridge between Northfleet and Ebbsfleet station has been completed which enables Fastrack to go through Springhead to Ebbsfleet station direct saving a considerable time on the journey and avoiding residential streets.</p> <p>Fastrack is considered to be an integral and essential part of regeneration of the area.</p> <p>The Go-Ahead Group has been awarded a 15-year contract worth £110 million by Kent County Council to operate the county's Fastrack bus rapid transit system. The group's Go-Ahead London division will operate the service from November 2024, and existing buses will be replaced with a zero-emission, electric fleet on the network, which runs in the Dartford, Bluewater, Ebbsfleet and Gravesham area. The buses will travel on dedicated busways away from traffic congestion.</p> <p>Gravesham have explored opportunities for the provision of on and off street electric vehicle charging points for taxis/ private hire vehicles and implement such charging points where it is feasible to do so. Work has commenced on Bath Street to put in a dedicated bus lane and also charging points for taxis.</p> |   |
| 8           | Public transport improvements | Transport Planning and Infrastructure | Public transport Improvements - interchanges stations and services    | -                               | COMPLETED                          | Kent County Council / Public transport operators / EDC / GBC | Kent County Council | -                      | -              | -                         | COMPLETED      | -  | Reduction in car use and congestion | <p>A dedicated bus route for Fastrack has been created between Gravesend Town Centre, Ebbsfleet International Station along Thames Way, Bluewater and Dartford.</p> <p>The Thameside Fastrack routes will include 28 single decker buses in April 2023. The funding has been awarded by the ZEBRA scheme. This follows an earlier trial in Kent with two electric buses in Kent in 2018A significant roll out of green buses happened in April 2023 with the introduction of electric buses.</p> <p>Kent County Council have won funding to add 28 electric buses to the current high specification buses with electric buses. Across the whole of the Kent Thameside in Gravesham and</p>  | <p>Northfleet Embankment</p> <p>Bulk Aggregate Import Terminal (BAIT) and the Mixed-Use Development (MUD) proposals have planning permission, to outline stage and both sites have been designed to include a predominantly dedicated bus corridor for potential future use.</p> <p>Work will continue on developing and expanding the Fastrack system.</p> |

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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>Dartford a yearlong trial will be done with ultra-quiet electric buses as part of a whole Kent Scheme.</p> <p>The Go-Ahead Group has been awarded a 15-year contract worth £110 million by Kent County Council to operate the county's Fastrack bus rapid transit system. The group's Go-Ahead London division will operate the service from November 2024, and existing buses will be replaced with a zero-emission, electric fleet on the network, which runs in the Dartford, Bluewater, Ebbsfleet and Gravesham area. The buses will travel on dedicated busways away from traffic congestion.</p> <p>.Route C is the protected route across the redevelopment area of Northfleet Embankment.</p> <p>The local operator and current operator of Fastrack - Arriva - has also improved the whole of their fleet on other routes.</p> <p>The council has negotiated a discount for all of GBC staff that use the Arriva buses to commute to work.</p> <p>Rathmore Road improvements were completed in late 2017 which enabled the transport interchange to go ahead and be completed in 2021.</p> <p>Crossrail is being considered for extension to</p> <p>Ebbsfleet. Many of Gravesend trains stop at Ebbsfleet thus allowing easy access to trains to Heathrow and the Western routes.</p> <p>The river bus/ferry routes to Essex and London – the pontoon installed in vicinity of town centre to enable ferry services. Services are now established to London - 55 minutes each way to Greenwich Peninsula and 75mins each way to London Bridge. The ticket permits the holder to make unlimited journeys on any of Uba's River Bus services</p> |                                       |

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|             |                      |                                     |                       |                                 |                                    |                           |                |                        |                |                           |                |  |                                     | <p>between Greenwich and Battersea Power Station as well as the trip up from Gravesend.</p> <p>The ferry to/from Tilbury from pontoon Gravesend recommenced in 2021 and is running 6 days a week throughout year from 5.40am to 19.10pm. During ferry hours a bus service operates from Tilbury landing stage to Tilbury town centre. The Gravesend pontoon is a short walk to the shopping centre.</p> <p>The ferry enhancement to Essex has been explored to make use of labour market for Ebbsfleet developments and South Essex without need to use Dartford Crossing.</p> <p>A Cycle hub has been established at the redeveloped railway station to accommodate the HS1 trains.</p> <p>Cycle route from station to Cyclopark (south of urban area) has been implemented</p> <p>Gravesham have been working with Kent County Council to bring the Mobility as a Service project (MaaS) to residents in the borough (including the Electric Vehicle car club) as an alternative to car ownership.</p> <p>Work has started on the new Fastrack bus lane being installed alongside the taxi rank and feeder lane in the town centre, which supports a reduction in vehicle emissions.</p> <p>New EV charging points are proposed to be used by the Taxis only.</p> |  |
| 9           | Car parking strategy | Alternatives to private vehicle use | Bus based Park & Ride | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | Reduction in car use and congestion | <p>The objectives of the car parking strategy are to have a sufficient supply of well-located safe and clean car parking spaces and to take into account any development opportunities for housing and or regeneration of the town centre.</p> <p>The Parking Manager responsible for devising new</p>  | <p>Any rise in parking fees could encourage the customers to go to Bluewater and other regional shopping centres and retail parks that all offer free parking.</p> |

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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>strategy which will depend on development and the location of parking allocations.</p> <p>Baseline work to inform the work on the new strategy has been completed.</p> <p>There is a distinction between the operational car parking strategy and the Local Plan long term parking provision or what happens to current car parks.</p> <p>Currently car parks are on all sides of town centre including the north between town and river. Planning policy will encourage parking to be moved from northern side so as to avoid need to drive around the one-way system to find a car parking space i.e., will improve access and reduce traffic in the one-way system AQMA.</p> <p>Zoned permit parking has been introduced in the borough. Previously anyone with a permit could park anywhere one was required. This meant that those with a parking permit outside of the town centre could park in a resident's bay in the town centre to work or commute. Now a person receives the permit for a particular zone only.</p> <p>The objectives in the Parking Services Annual Report include:</p> <ul style="list-style-type: none"><li>• maintaining the free flow of traffic across the borough through enforcement of parking restrictions.</li><li>• Effectively manage and maintain on-street and off-street parking spaces throughout the borough.</li><li>• Working with the Highway Authority (Kent County Council), ensure that bus stops are located in the most convenient locations and are enforced efficiently.</li><li>• Maintain the on-street parking signs and lines and repaint or replace any missing signs/lines.</li></ul> | <p>Council needs to encourage shoppers and businesses to the town; affordable and competitive parking tariffs is part of the attraction.</p> |

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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>The rural CPZ review was completed in 2021.</p> <p>The CPZs will better manage the available kerb side parking and have reduce congestion.</p> <p>Ten dual fast chargers (20 connection points) have been installed in the Parrock Street car park, delivered with assistance from the Office for Zero Emissions Vehicles (OZEV). These chargers provide facilities for town centre residents who do not have off-road parking and would find charging at home difficult.</p> <p>The council has commenced a programme that will see twenty-two fast chargers installed in council-owned and maintained car parks, delivered as part of the Kent 600 framework.</p> <p>The council has progressed its project to install EV charging points for Licenced Taxis within the borough, with a proposal for two dedicated ultra-fast chargers to be installed within Gravesend Town Centre that will provide a full charge in 45-60 minutes.</p> <p>The council continues to signpost and promote carbon reduction schemes, such as those available to flat owner-occupiers, tenants and residential landlords to seek grant funding to install Electric Vehicle (EV) charge points. Gravesham will continue to explore opportunities for the provision of electric vehicle charging points within GBC-owned assets and implement</p> |                                       |

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|             |                                    |   |  |                                 |                                    |                           |                |                        |                |                           |                |  |  | <p>actions where a sound business case can be provided.</p> <p>Several large planning permissions have been granted in the town centre to regenerate the town in terms of new housing close to employment and to local amenities to reduce car travel into town and to regenerate commercial areas. Whilst these developments remove old open car parks they bring new parking opportunities with mandatory electric vehicle charging which would be prohibitive in the old set ups.</p> <p>Work on the planning policy for car parking and partnership working with the county is on-going.</p> <p>When development is settled within the town centre, i.e., applications are permitted and or permitted development comes forward the success of the parking strategy will be apparent and adapted going forwards.</p> |                                       |
| 10          | The Council's Travel Plan measures | Alternatives to private vehicle use Promoting Travel Alternatives | Car & lift sharing schemes Encouraging homeworking | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | % modal shift to car share/public transport/walking /cycling | <p>Car sharing has been promoted to as well as a reduction in car business mileage. One of the actions for climate changes is to review the current travel plan.</p> <p>The council's HR service held a "Let's Talk Travel" event, in partnership with Kent County Council, to ask people to consider how they get to work and to rethink their commute to improve the environment, congestion, and the quality of peoples work and lives."</p> <p>The number of business miles the council HGV fleet has recorded has decreased in most years through better management although better record keeping, and the introduction of a recycling collection has increased that figure.</p>   | The Council's Travel Plan measures    |



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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>There has been a significant improvement in emissions from the council's commercial vehicle fleet due to replacement vehicles to Euro 5 this is despite doing more miles due to their being a recycling service/collection.</p> <p>The Council has increased the number of electric vans within its fleet, with this reflecting 16% of the Council's smaller fleet vehicles now being powered by alternative fuels.</p> <p>The council has engaged with Arriva buses to implement an Employer Travel Club intended to promote the use of public transport within its workforce. The council has also commenced activity to research other initiatives to encourage its staff to consider green travel arrangements, including a cycle-to-work scheme and potential car-sharing arrangements.</p> <p>Lockers now provided for cyclists and a shower.</p> <p>Cycle parking has been provided in the Civic Centre's basement car park.</p> <p>Encouragement to not drive in to work on Clean Air Day, and to test other methods of getting to work.</p> <p>The council has formalised its hybrid-working policy, enabling staff to work from home or other council facilities as a means to reducing the number of journeys needed to be undertaken. This objective has been further supported by the adoption by the council of new technology for video conferencing, holding of virtual meetings and the council's telephony solution.</p> <p>More staff are choosing to cycle to avoid the need to use a car. This has given a fresh outlook to staff, with a better work life balance being considered. The senior management team at the council intend to encourage these changes in behaviour.</p> |                                       |

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| 11          | Employer and School Travel Plans               | Promoting Travel Alternatives         | School Travel Plans, workplace travel Planning and encouraging homeworking | -                               | On-going                           | KCC / Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | No. of travel plans in place  | <p>KCC achieved nearly 100% success with school travel plans.</p> <p>On-going - Travel Plans for developments and for Academy Schools still required by the planning process when appropriate.</p> <p>The planning process continues to require travel plans for all large developments and is part of standard S106 agreements.</p> <p>Environmental Health, Parking Services and Public Health teams worked together on Clean Air Day with two schools encompassing Smoke Freedom, Idling of engines and illegal parking outside schools.</p>  | <p>Employee and School journeys create significant peak in traffic for short period.</p> <p>KCC's school travel plans officer post was removed once during cuts following on the success of 100% of schools in the borough implementing school travel plans. Therefore, it is understood that KCC no longer require travel plans for schools etc. due to a lack of staff to work with the schools.</p> |
| 12          | Improve the facilities for cycling and walking | Transport Planning and Infrastructure | Cycle network and other  | -                               | Various and ongoing                | KCC / Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | %modal shift to cycling/walking On-going No. miles new cycle lanes/routes | <p>Working with Kent County Council to implement and publicise cycle lanes in appropriate locations across the borough.</p> <p>Cycling routes are being improved on an ongoing basis and new ones brought forward through development e.g., Station to Cyclopark.</p> <p>Ebbsfleet Development Corporation are requiring developments to enable cycling routes around the Northfleet embankment area.</p> <p>Walking routes along riverside are required within all new developments along Northfleet embankment and the Canal Basin area which have been dominated by industry to date with no access to the public. This creates riverside walks for people to enjoy.</p> <p>GBC has carried out work on a Local Cycling and Walking Infrastructure Plan which was adopted in 2022. It includes information on the existing provision and makes recommendations. The resulting recommended walking network consisted of 11 routes. The recommended cycling network consisted of 7 cycle routes. There is a considerable amount of review the feasibility of these routes and the redesign of junctions, footways, cycling protected routes etc. It is likely</p> | <p>The new transport interchange will make using the trains and buses easier and safer for the public.</p> <p>Delays have been caused by the pandemic.</p>   |

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|             |         |   |  |                                 |                                    |                           |                |                        |                |                           |                |  |   | <p>that these routes will be progressed substantially with partnership work with KCC and development sites.</p> <p>The Cycle Hub at the railway station has been completed as part of the Council's plan for the</p> <p>Transport Quarter redevelopment. It includes storage for 280 cycles with lockers with plans for a cycle shop and maintenance etc. The hubs are fully enclosed and have dedicated lighting and CCTV and a guaranteed space for the cyclist who has subscribed to the service. A small charge is made for those who register for the service to cover the running costs of the cycle hub.</p> <p>Gravesham staff are offered discounts to buy cycles for work and have access to lockers and showers if they cycle to work and secure cycle parking in the basement.</p> <p>Natural England has formally published the coastal path route around Kent as part of their work around the country's coast.</p> <p>Cycle paths and provision of cycles and cycle racks continues to be sought in planning approvals.</p> <p>Regeneration in the borough facilitates significant improvements in cycle ways. Through the pre-application advice service, applicants are encouraged to submit policy compliant schemes which minimise the impacts of new development on the environment</p> <p>Gravesham use planning policy to ensure adequate consideration is given to developments supporting sustainable living and transport infrastructure and solutions for cycling, walking and low/zero-emission vehicles.</p> |  |
| 13          |         | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | No. planning applications consulted on for air quality conditions/assessments | Regular meetings between Planning Officers and Regulatory Services. Development Team Approach (DTA) set up for each development as necessary so meetings with applicant and their consultants commence prior to application being submitted.   | The planning process is the strongest tool we have to implement air quality actions resulting in an effective improvement in AQ - therefore it is considered that the planning process's impact on air quality |

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|             | Environmental and Public Health<br>Services will continue to work closely with the Planning and Regeneration<br>Services to ensure that air quality is taken into account in the planning process |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>Pre-App (Pre application) applications are encouraged by Planning Services so that issues are worked on before the application is submitted formally.</p> <p>Number of planning applications consulted on for Air Quality remains steady at between 800 to 850 /year.</p> <p>Currently being consulted on all routine planning applications including large developments e.g. The</p> <p>Charter which is now permitted as well as many major infrastructure development / projects including the following:</p> <ul style="list-style-type: none"> <li>Northfleet Harbourside</li> <li>Lower Thames Crossing</li> <li>Tilbury3</li> <li>Tilbury Energy Centre</li> </ul> <p>We request financial contributions towards ensuring the continuation of air quality monitoring in the locality of the development using S106 agreements.</p> <p>Air Quality conditions applied to all relevant planning decisions.</p> <p>Planning permissions refused when necessary to prevent the impact affecting public health significantly.</p> <p>Improvements have been significant enough for the council to be able to revoke, with Defra's permission, three AQMAs declared for NO<sub>2</sub> from urban traffic.</p> <p>A fourth AQMA which is declared for PM<sub>10</sub> only, has not exceeded for some years however, with 25 years plus of development to take place within the area, the decision remains to maintain the declaration in order to influence the mitigation measures and type of design in the new developments etc.</p> <p>Gravesham intend to implement planning policy to ensure adequate consideration is given to the impacts on the environment of new development (residential and</p> | <p>is significant to medium in that it helps prevent worsening of air quality and often allows new development that has lower emissions to replace more polluting development e.g., industrial uses.</p> <p>Air Quality Planning Guidance published by Kent and Medway Air Quality Partnership has raised issues with regards to whether the emphasis on Air Quality impact Assessments needs to change to emissions reductions and damage costs.</p> <p>No up-to-date Kent Air Quality Planning Guidance.</p> |

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|             |   |                                       |  |                                 |                                    |                           |                |                        |                |                           |                |  |  | commercial). Ensuring that such developments support sustainable living and transport infrastructure and solutions for cycling, walking and low/zero-emission vehicles.<br><br>Through Planning Services, the council will ensure, in its formal consultee role, that all planning applications and applications for Development Consent Orders, have due consideration to air quality, climate change mitigation and adaption such as EV charging points, traffic management considerations etc   |  |
| 14          | Improve sustainable transport links serving new developments. | Transport Planning and Infrastructure | Public transport Improvements interchanges stations and services | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | No. planning applications where improvements secured | <p>On-going – included in Planning Policy CS12.</p> <p>However, implementation is complex as KCC is the transport authority and the Master Plan for the regeneration of the brown field sites on the</p> <p>The regeneration of the Northfleet Embankment has enabled new transport links including a dedicated Fastrack bus route through the developments.</p> <p>A dedicated bus route for Fastrack has been created between Gravesend Town Centre, Ebbsfleet International Station along Thames Way, Bluewater and Dartford.</p> <p>The Thameside Fastrack routes will include 28 single decker buses in April 2023. The funding has been awarded by the ZEBRA scheme. This follows an earlier trial in Kent with two electric buses in Kent in 2018A significant roll out of green buses happened in April 2023 with the introduction of electric buses.</p> <p>Kent County Council have won funding to add 28 electric buses to the current high specification buses with electric buses. Across the whole of the Kent Thameside in Gravesham and Dartford a yearlong trial will be done with ultra-quiet electric buses as part of a whole Kent Scheme.</p> <p>The Go-Ahead Group has been awarded a 15-year contract</p> | <p>The Ebbsfleet Development Corporation (EDC) Implementation Framework now exists. This includes the master plan for the regeneration of the western and eastern embankment areas as such it includes what sustainable transport links can be planned for and supported.</p> <p>The proposed LTC will introduce traffic into areas previously without any i.e., it will be a new source of air pollution.</p> |

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|             |  |   |  |                                 |                                    |   |                |                        |                |                           |                |  |   | <p>worth £110 million by Kent County Council to operate the county's Fastrack bus rapid transit system. The group's Go-Ahead London division will operate the service from November 2024, and existing buses will be replaced with a zero-emission, electric fleet on the network, which runs in the Dartford, Bluewater, Ebbsfleet and Gravesham area. The buses will travel on dedicated busways away from traffic congestion.</p> <p>If new development is on an existing route, then a bus stop will be installed.</p> <p>New development is required to do highway improvements e.g., junction lights, new lanes etc to ensure the nearby junctions can cope with the development traffic.</p> <p>The proposed Lower Thames Crossing will be a three-lane motorway from the A2 Trunk Road east of Gravesend to M25 junction 29. This will introduce a new route for people to access southern Essex more easily and vice versa and will avoid congestion at the Dartford Crossing.</p> |   |
| 15          | The development of supplementary planning guidance for air quality assessments of developments | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | -                               | COMPLETED                          | Gravesham Borough Council / Kent and Medway Air Quality Partnership | -              | -                      | -              | -                         | COMPLETED      | -  | Completion of a Supplementary Planning Document | <p>The K&amp;MAQ Partnership published the 2015 version of the air quality and planning guidance entitled, "<a href="#">Air Quality Planning Guidance</a>" with two Options A and B relating to a borough wide approach or AQMA only.</p> <p>Due to the complex and lengthy situation with adoption of SPDs Gravesham were not able to adopt this document as an SPD but refer to the document as recommended good practice.</p> <p>The guidance was reviewed at which time the emphasis was changed away from air quality impact assessments – although these still have their place - with the intention of adding information on electric vehicle infrastructure, damage costs,</p>  | <p>K&amp;MAQ Partnership worked with KCC on new regional Energy and Low Emissions Strategy for councils to sign up to.</p> <p>This introduced a stronger stance on emission from new developments. KCC champion ELES in Kent.</p> <p>K&amp;MAQP no longer review the existing planning guidance leaving it up to each authority to do so if they wish to better suit their needs.</p> |

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|             |                                      |   |  |                                 |                                    |                           |                |                        |                |                           |                |  |                                    | <p>emissions reduction etc. The new guidance was published in December 2015. and has emphasis on emissions reduction.</p> <p>Due to the poor formal adoption rate of the new document the Partnership ran a workshop for Planning Officers in Feb 2017. Gravesham's Planners attended and are keen that revised guidance is drawn up as they felt that the published document would soon need reviewing again. A reviewed version may fit GBC better.</p> <p>The K&amp;MAQP is referred to in planning applications made to Gravesham and consideration given to the contents as well as guidance provided by the Institute of AQ Management (IAQM).</p> <p>The ELES (Energy and Low Emission Strategy) that KCC are leading on with the support of the AQ Partnership is completed with county wide buy in.</p> <p>Gravesham Planning Services have consulted on detailed Development Management Policies.</p> <p>Gravesham Planning Services are keen to have policies that cover air quality such that it enables the restriction of in appropriate development, enables electric vehicle infrastructure to be installed and protects Gravesham residents against the impact of developments in neighbouring boroughs or in the area of the borough which comes under the Ebbsfleet Development Corporation.</p> |   |
| 16          | Develop a local air quality strategy | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | -                               | COMPLETION                         | Gravesham Borough Council | -              | -                      | -              | -                         | COMPLETION     | -  | Completion of air quality strategy | <p>The finalised report was adopted by Cabinet in July 2006.</p> <p>The fifteen policies within the Strategy are being progressed details of which are included in this ASR report</p> <p>The review of this will be carried out in parallel with the</p>   | <p>The strategy will remain in place until a review is done at the same time as a review of the two air quality action plans.</p> |



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|             |   |   |  |                                 |                                    |   |                |                        |                |                           |                |  |                                     | two action plans commenced in 2023  |                                       |
| 17          | Local air quality monitoring within the GBC Borough | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | -                               | On-going                           | Gravesham Borough Council / Kent and Medway Air Quality Partnership | -              | -                      | -              | -                         | Implementation | -  | No. monitoring sites % data capture | <p>Gravesham's air quality monitoring network is comprehensive and has been in place since 1993 with two stations installed in 1998. Network of background and hotspot monitoring. The two NO<sub>x</sub> analysers have reached the age of 25 years through dedicated care by the officers and Enviro Technology the provider and service company. One NO<sub>x</sub> analyser was replaced this year not through failure but because the lead time is 3 months and if it had failed it risked the loss of 3 months of data at least. The decision was taken to use S106 funding to replace the analyser.</p> <p>Currently monitoring at two continuous air stations monitoring both PM<sub>10</sub> an NO<sub>2</sub>, including collocation, three background locations and a increase to 71 sites to include areas around potential and existing development sites as well as including hotspots, along the edge of the A2 Trunk Road AQMA in the east of the corridor to help validate the model and around new development sites e.g. Rathmore Road link, locations along the A226 from Gravesend to Strood and near the houses in Thong Lane adjacent the new route of the Lower Thames Crossing.</p> <p>High data capture on diffusion tubes with less than 3 % of tubes missing at time of collection.</p> <p>Continuous data capture remains high (95%+) year on year.</p> <p>Collocation tubes are sited at the two air stations in order for a local bias adjustment to be calculated.</p> <p>Monitoring data plays a large role in determining what planning comments and conditions are required for planning permissions contributing significantly to the improvement in air quality or preventing worsening of air quality across the borough.</p> <p>Passive monitoring in all AQMAs has seen a significant reduction in NO<sub>2</sub> over the last 10 years resulting in the revocation of three AQMAs. The monitoring in these areas will remain to</p> |                                       |



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|             |  |   |   |                                 |                                    |                           |                |                        |                |                           |                |  |   | <p>ensure the quality of the air continues to improve.</p> <p>Additional passive monitoring has gone up in locations relevant to Lower Thames Crossing.</p> <p>Small amounts of money are requested through S106 agreements for contributions towards both passive and continuous monitoring of air quality.</p>   |                                       |
| 18          | Make details of the Action Plan measures and annual progress reports GBC available on the Website to ensure broad access to the consultation and implementation process. | Public Information                      | Via the Internet  | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | Availability of recently published reports on the Website | <p>Gravesham has a <a href="#">webpage</a> for air quality with details of the air quality strategy, action plans and consultations on it with a link to <a href="#">KentAir</a> where all of the council's reports are published as well as the monitoring data.</p> <p>Advice posted on website and available to any caller in person or by telephone/email</p> <p>The council's reports are published on <a href="#">KentAir</a> and the continuous monitoring data is posted daily, and the diffusion tube data is regularly posted.</p> <p>The School Air Quality Toolkit – <a href="#">Care For Air</a> – is available to teachers and parents through the <a href="#">KentAir</a> website, financed by Kent County Public Health.</p> <p>The Pollution Patrol educational toolkit is available at <a href="https://pollutionpatrol.org.uk/">https://pollutionpatrol.org.uk/</a></p> |                                       |
| 19          | Work together the Kent and Medway Air Quality Partnership GBC on promotional activities to raise the profile of air quality in Gravesham                                 | Policy Guidance and Development Control | Regional Groups Coordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | Promotional activities undertaken with the Partnership    | <p>Gravesham take an active role in the air quality partnership. The partnership carries out work with partners e.g., Kent County Public Health.</p> <p>The partnership also delivered, with the finance from Kent Public Health, a school's toolkit – <a href="#">Care For Air</a> - relating to air quality and the co-benefits of exercise, cycling, walking etc. it is available through the KentAir Website <a href="http://www.kentair.org.uk">www.kentair.org.uk</a></p> <p>Gravesham helped to fund, along with a Defra grant, the partnership creates a second educational toolkit called the Pollution Patrol which was launched during KentAir week in April 2022.<br/><a href="https://pollutionpatrol.org.uk/">https://pollutionpatrol.org.uk/</a></p> <p>The projects run by the AQ Partnership provide each</p>   |                                       |

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|             |  |   |                |                                 |                                    |                           |                |                        |                |                           |                |  |   | member with social media content to post with a recognisable branding and message to spread a consistent message. This was funded to a significant extent by Defra Grants with match funding and staff resource provided by each member authority. Materials were provided for each member to do a social media campaign on Clean Air Day.  |                                       |
| 20          | Promote and implement energy efficiency measures | Policy Guidance and Development Control | Other policy   | -                               | On-going                           | Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | % improvement in energy efficiency SAP rating | <p>Gravesham is actively involved in giving advice, support and funding for energy efficient schemes in the borough.</p> <p>Works to install loft and cavity wall insulation in just under 500 council-owned properties commenced during the year, supported by funding from the Social Housing Decarbonisation Fund (SHDF) Wave 1. To date works to 120 homes have improved EPC ratings to C.</p> <p>Ground Source Heat Pumps (GSHP) have been installed at Merston Court and properties at 62 Hermitage Road, expected to reduce emissions.</p> <p>Whole-house retrofits have been undertaken of 10 non-traditional, low energy-efficient council owned homes using the "Energiesprong" model.</p> <p>Two Net Zero Homes trials have been completed for properties previously on electric storage heating, bringing both properties to a net-zero carbon level and delivering EPC ratings of A.</p> <p>LED lighting has been installed in eight housing blocks, equating to 413 new LED fittings.</p> <p>Solar Photovoltaic (PV) panels have been installed at Carl Ekman House, generating 3.97 megawatts-hour (MWh) of electricity since being commissioned in July 2022. A similar project has commenced at Chantry Court which, once operational, is intended to power the communal electric requirements of the entire block.</p> <p>All 27 parking bays at the council's new Bishops Court development have been installed with passive EV charging, with a further three bays provided with above-</p> |                                       |

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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>ground electric charging capability. In addition, a secure cycle storage facility has been provided inside the building to encourage cycle ownership.</p> <p>All seven council homes developed at Constable Road have been provided with passive EV</p> <p>charging stations, with two provided with wall pods for residents to use. Individual secure cycle storage has also been provided for each property.</p> <p>Proposals for development at St. Columba's Close will see 26 existing council-owned flats with poor energy efficiency replaced by 46 new homes of mixed type, with ground source heat pumps providing heating and hot water to these new homes rather than traditional gas-fired boilers.</p> <p>Proposals for Worcester Close and Istead Rise include the use of air-source heat pumps to provide heating and hot water.</p> <p>An energy-saving advice document has been produced for council tenants, advising on how they can help reduce their carbon emissions and save money on their energy costs.</p> <p>Emissions continue to identify as being reduced by overall percentage on the council's own estates and operations.</p> <p>The Council has piloted new schemes to look into innovative technologies. In particular renewal energy, solar PV battery storage and also in house monitoring systems for energy use.</p> <p>The council also delivered measures to reduce carbon emission in the council's own estate and the private sector through insulation and heating programmes and reducing energy bills through a collective switching scheme.</p> <p>Gravesham has adopted reporting on the Home Energy Conservation as was required by BEIS. This will enable progress being monitored on all areas of</p> |                                       |

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|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>energy efficiency work in Housing. All lights are now on sensors to ensure lights are not on in areas where no one is present.</p> <p>Programme in place for lighting replacement in own estates and also Housing stock.</p> <p>Emissions of continue to identify as being reduced by overall percentage on the council's own estates and operations.</p> <p>There is an emphasis on "green" issues with the council's properties service researching and trialling and implementing low energy schemes as well as giving consideration to whole of life, significant reduction in the use of plastics including an inhouse staff scheme.</p> <p>The council has a strong Climate Change Officer Working Group with senior management and councillor support. The Climate Change Action Plan has been adopted and due to the influence of the Environmental Protection Team the emphasis on the reduction of all emissions include those relating to LAQM i.e., the climate change actions cannot be at the expense of local air quality e.g., the introduction of biomass CHP etc.</p> <p>Gravesham intend to actively engage with organisations such as the Greater Southeast Energy hub to bring forward initiatives intended to improve efficiency in domestic properties.</p> <p>There is also an intention that in line with the Communications Strategy, there will be regular updates to residents to assist them in reducing their own energy usage and renewable energy options.</p> <p>Gravesham work with businesses to identify funding opportunities to support improvements to energy efficiency within their business.</p> |                                       |

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| 21          | The council will encourage the planting of trees which benefit air quality within the borough through the planning process, Gravesham's Open Space Strategy and green initiative partnerships. | Policy Guidance and Development Control | Other policy   | -                               | On-going                           | Kent County Council/Graves ham Borough Council / Groundwork | -              | -                      | -              | -                         | Implementation | -  | No. of trees planted      | <p>Advice is given on planting trees beneficial for air quality to developers and to other council services on a regular basis.</p> <p>Tree and other green planting schemes are expected on major developments including highways schemes e.g., Lower Thames Crossing.</p> <p>Lower Thames Crossing is keen to plant trees to help ensure the mental wellbeing of the local residents.</p> <p>Gravesham's own horticultural services. Have planted a total of 8201 trees since 2014 with 3209 of them being planted in 2022.</p> <p>During the most recent tree planting season the council planted 3,174 trees in various locations. Once established,</p> <p>The benefit to air quality is small but it is aesthetically important.</p> <p>A sensory garden was built in Woodlands Park for the Queen's Platinum Jubilee, surrounded by long-established woodland and new tree planting.</p> <p>Work has commenced developing a planting strategy for the council that promotes biodiversity, colour and growth along Gordon Promenade in Gravesend as part of the restoration work after the flooding caused by Storm Eunice.</p> <p>Since April 2022, the council has sent a total of 13.1 tonnes of green waste from parks and open spaces to the Green Landfill Facility at Pepperhill for composting.</p> <p>The council continues to play an active role in the Delivery and Steering Group of the Kent and Medway Plan Tree Partnership, which has the objective to increase the borough's tree canopy coverage by 8% by 2030.</p> <p>Wildflowers were introduced at 12 locations within the borough this year, increasing the biodiversity opportunities in the</p> |                                       |

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|             |   |   |  |                                 |                                    |   |                |                        |                |                           |                |  |                              | <p>borough as well as supporting the health and well-being of visitors to these locations.</p> <p>The Bee Garden at Windmill Hill has continued to develop with the remapping of the grass pathways, wildflower areas, inclusion of several bee structures, and season floral display and has been used to host several events promoting the benefits of biodiversity with groups such as the Girl Guides.</p> <p>Twenty bat, bird, and owl boxes were installed in various locations in the Borough to promote habitat for wildlife.</p> <p>A proposal for a chalk grassland feature at the Warren is being taken forward, with support from independent ecologists and a Kent County Council specialist. An active strategy commenced during the year to take sites back to the bare growing medium and allow fresh growth for the season. Analysis was completed in-year on the existing grassland, wildflowers, and insect variety at locations with the plan to trial areas for sowing of wildflower seed mixes.</p> |                                       |
| 22          | Provide advice to the public and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings. | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | -                               | On-going                           | Kent County Council/Gravesham Borough Council | -              | -                      | -              | -                         | Implementation | -  | Number utilising the service | <p>Information on energy efficiency measures has been promoted to borough residents during the year through the council website and, with Your Home featuring energy-saving tips and advice tied in with money-saving advice regarding the cost-of-living crisis.</p> <p>Active publicity was undertaken for Phase Two of the Solar Together Scheme, a group-buying platform for PV panels and battery storage. 118 Gravesham residents took part in the current phase of the scheme, with 52 installations completed to date, 50 of these installations have included battery storage, providing a total capacity of 237KW/h. In total, 566 solar panels were installed, producing 0.22MW of energy every hour.</p> <p>The council is currently one of a number of authorities across Kent delivering the 'Share the Warmth' Scheme, a trial programme intended to encourage and empower low/middle-income households</p>  |                                       |

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|-------------|---------|----------|----------------|---------------------------------|------------------------------------|------------------------|----------------|------------------------|----------------|---------------------------|----------------|--|---------------------------|--|---------------------------------------|
|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           | <p>to make low or no-cost behaviour changes that will reduce their domestic energy consumption.</p> <p>Advice is posted on the website and available to any caller in person or by telephone/email. Customers directed to the purpose built KentAir website for up-to-date air quality matters, health guidance, and reports for all councils in Kent as well as the Care4Air education toolkit</p> <p>Review of the KentAir website content is regularly carried out to provide more user friendly and focussed.</p> <p>Members of the public often contact the council to find out what the air quality is like at their address. Advice is always given, and also passive monitoring installed for a short period to offer reassurance to residents that the air quality is not in exceedance in the locality in which they live. If however exceedances were to be found monitoring would continue although this has not occurred to date.</p> <p>The School Air Quality Toolkit – Care4Air – is available to teachers and parents through the</p> <p>KentAir website, financed by Kent County Public Health and available through KentAir.</p> <p>During January to March 2022 the Development of a 'Stay Safe, Shop Local' campaign using EU Welcome Back funding has produced an ongoing publicity tool to encourage people to reduce travel to shopping centres.</p> <p>Advice is given by engaging with local schools through various channels to promote and encourage awareness and measures. In April 2023 a Quiz was held for schools with a school in each borough being able to win a £100 prize to use as they wish on school equipment.</p> |                                       |

| Measure No. | Measure  | Category           | Classification                                      | Year Measure Introduced in AQAP | Estimated / Actual Completion Date | Organisations Involved                                      | Funding Source | Defra AQ Grant Funding | Funding Status | Estimated Cost of Measure | Measure Status | Reduction in Pollutant / Emission from Measure | Key Performance Indicator      | Progress to Date  | Comments / Barriers to Implementation  |
|-------------|--|--------------------|---|---------------------------------|------------------------------------|---|----------------|------------------------|----------------|---------------------------|----------------|--|--------------------------------|---|--|
|             |  |                    |   |                                 |                                    |   |                |                        |                |                           |                |  |                                | <p>Schools are encouraged to sign up to national Eco Schools programme. Two schools have been approached. One school has signed up and is being assisted by the council.</p> <p>Advice is provided through the use of Your Borough and Your Home magazines to reach all residents with updates and educational material re council's efforts to lower emissions and how residents and businesses can contribute as well as providing information on the new smoke control regime.</p> <p>Social media is also used to promote air quality matters and smoke control.</p> <p>There are frequent updates through media releases/briefings re implementation of key measures e.g., installation of EV charging points in council-owned car parks.</p> <p>Staff involved in air quality matters are involved in the climate change working group which works predominantly on emissions from the council's own buildings and housing stock of which there are approx. 6000 units.</p> |  |
| 23          | Adequate enforcement of on-street parking restrictions | Traffic Management | UTC,<br>Congestion management,<br>traffic reduction | -                               | On-going                           | Kent County Council/Graves ham Borough Council / Groundwork | -              | -                      | -              | -                         | Implementation | -  | No. on street parking offences | <p>Parking enforcement is carried out in in all congested areas in the urban area and Air Quality Management Areas.</p> <p>The one-way system remains the main area of focus in respect of ensuring parked cars that obstruct the traffic flow are moved on straight away.</p> <p>Parking Services attend regular meetings with County to ensure that the local perspective is put forward.</p> <p>The objective of maintaining the free flow of traffic across the borough through enforcement of parking restrictions remains the number one objective in the Parking Services Annual Report .</p> <p>The number of on street parking tickets issued are as follows:<br/><br/>19/20 was 18,822</p>  | There is always a balance needed between high car park charges to dissuade people bringing their cars into town and the need to encourage residents and visitors to come into the town to keep it vibrant. |



| Measure No. | Measure                                | Category                                | Classification                                      | Year Measure Introduced in AQAP | Estimated / Actual Completion Date | Organisations Involved | Funding Source   | Defra AQ Grant Funding | Funding Status | Estimated Cost of Measure | Measure Status | Reduction in Pollutant / Emission from Measure  | Key Performance Indicator   | Progress to Date  | Comments / Barriers to Implementation   |
|-------------|--|---|---|---------------------------------|------------------------------------|------------------------|------------------|------------------------|----------------|---------------------------|----------------|---|---|---|---|
|             |  |   |   |                                 |                                    |                        |                  |                        |                |                           |                |   |   | 20/21 was 13,139<br>21/22 was 16, 039<br>22/23 was 19,408   |   |
| 24          | Speed Regulation                       | Traffic Management                      | UTC,<br>Congestion management,<br>traffic reduction | -                               | COMPLETED                          | National Highways      | Highways England | -                      | -              | -                         | COMPLETED      | -   | Improved journey times with improved traffic flows                      | <p>Traffic management on the A2 Trunk Road was implemented despite the historical reluctance on the part of the Highways England however traffic growth was significant up to the Pandemic with the traffic on the A2 Trunk Road at Gravesend often queuing due to weight of traffic at peak times. However, since the pandemic the congestion has not returned to the same level as previous and currently is not problematic although occasionally there is congestion caused by the Dartford Crossing being closed.</p> <p>The Lower Thames Crossing is of concern in terms of causing congestion during construction phase which is to commence in approx. 2 years. however, the road itself should reduce congestion on the A2/M2 considerably. The council are involved in regular consultations on the scheme.</p> <p>The high number of exceedances previously experienced before the re-routing of the A2 Trunk and those occurring previous to the pandemic have much reduced. However, some houses remain in the area of marginal exceedance at Pepperhill and Marling Cross where the existing route of the A2 remains.</p> | <p>The proposed Lower Thames Crossing is involving the council in discussions with National Highways on the route and speed of the traffic.</p> <p>National Highways intends to have it designated as 70 mph which is of concern to Gravesham as it is considered that a well- managed 50mph limit is safer and will cause less congestion due to lower numbers of accidents etc.</p> <p>The LTC is considered by National Highways to be a key way of reducing congestion at the Dartford River Crossing.</p> <p>LTC construction works are likely to create traffic issues on the A2/M2 up tits opening year.</p> |
| 25          | Reduction in overall background levels | Policy Guidance and Development Control | Other policy  | -                               | On-going                           |                        | -                | -                      | -              | -                         | Implementation | <p>Air quality improvement by at least 1.8 µg/m<sup>3</sup> at background monitoring sites since 2012.</p> <p>Concentrations have decreased further in 2020, however this is likely a resulting</p> | Decline in monitored NO <sub>2</sub> concentrations at background sites | <p>All background monitoring locations in Gravesham</p> <p>Borough Council have reported a decline in NO<sub>2</sub> concentrations on a yearly basis.</p> <p>NO<sub>2</sub> concentrations have declined by up to 5.5 µg/m<sup>3</sup> between 2012 and 2019 at background monitoring locations. Concentrations decreased further in 2020, however this was likely a</p>   | <p>Improvements in the background levels throughout the Borough could be achieved, but the impact on NO<sub>x</sub> and PM<sub>10</sub> emissions within the AQMA is likely to be small without National Policies.</p> <p>Socio-economic impacts:</p>   |

| Measure No. | Measure  | Category                        | Classification  | Year Measure Introduced in AQAP | Estimated / Actual Completion Date | Organisations Involved  | Funding Source | Defra AQ Grant Funding | Funding Status | Estimated Cost of Measure | Measure Status | Reduction in Pollutant / Emission from Measure | Key Performance Indicator                        | Progress to Date   | Comments / Barriers to Implementation   |
|-------------|--|---------------------------------|---|---------------------------------|------------------------------------|---|----------------|------------------------|----------------|---------------------------|----------------|--|--|--|---|
|             |  |                                 |   |                                 |                                    | Central Government / Kent County Council / Gravesham Borough Council          |                |                        |                |                           |                | impact of the COVID-19 pandemic.               |  | <p>resulting impact of the COVID-19 pandemic. They have increased since the lockdown with journeys to work recommencing but not to the level seen before the pandemic.</p> <p>PM<sub>10</sub> background concentrations have remained relatively stable between 2012 and 2020 at the industrial background site.</p>   | <p>Tighter standards and controls could affect industry, businesses and the public</p> <p>Dependent of the measures introduced. Tighter controls and fiscal measures are likely to be viewed negatively. Local measures such as through travel plans and quality partnerships are likely to be viewed more positively.</p> <p>Major infrastructure developments may well contribute to background levels in future even if they do not create an exceedance:</p> <ul style="list-style-type: none"> <li>Tilbury2 &amp; 3</li> <li>Tilbury Energy Centre</li> <li>Lower Thames Crossing</li> <li>Northfleet Harbourside</li> </ul> |
| 29          | Reduction in PM <sub>10</sub> emissions from combined impact of industrial processes in Northfleet | Environmental Permits           | Other measure through permit systems and economic instruments | -                               | COMPLETED                          | GBC, the Environment Agency, the Local Business Partnership, local industries | -              | -                      | -              | -                         | COMPLETED      | Level of PM <sub>10</sub> below objective      | Reduction in PM <sub>10</sub> to below objective | Significant reduction in emissions to below objectives therefore measure has been completed but work carries on ensuring the levels of PM <sub>10</sub> are kept as low as possible.   |   |
| 30          | Rail Freight Strategy  | Freight and Delivery Management | Other   | 2012                            | On-going                           | Kent County Council/ Gravesham Borough Council                                | -              | -                      | -              | -                         | Implementation | -  | -  | <p>Rail use of Northfleet sidings has ceased after dealing with Crossrail spoil</p> <p>KCC have produced a Freight Action Plan for Kent – which includes Operation Stack, lorry routing, rail freight which sets out the vision to: “Promote safe and sustainable freight distribution networks into, out of and within Kent, which support local and national economic prosperity and quality of life, whilst working to address any negative impacts on local communities and the environment both now and in the future.”</p> |   |

| Measure No. | Measure | Category | Classification | Year Measure Introduced in AQAP | Estimated / Actual Completion Date | Organisations Involved | Funding Source | Defra AQ Grant Funding | Funding Status | Estimated Cost of Measure | Measure Status | Reduction in Pollutant / Emission from Measure | Key Performance Indicator | Progress to Date | Comments / Barriers to Implementation  |
|-------------|---------|----------|----------------|---------------------------------|------------------------------------|------------------------|----------------|------------------------|----------------|---------------------------|----------------|--|---------------------------|------------------|--|
|             |         |          |                |                                 |                                    |                        |                |                        |                |                           |                |  |                           |                  | Although not relating to freight usage, the rail station redevelopment at Gravesham has rejuvenated the rail use in GBC especially with its access to HS1 and the new Cycle Hub, with bus interchange to come. It is hoped that the temporary influence of the pandemic will not impact the long term use of the passenger services from the nearby towns which help to reduce the number of cars in the town. |

## **PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations**

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Gravesham Borough Council is taking the following measures to address PM<sub>2.5</sub>:

- Regulatory Services will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process;
- Continue to improve emissions standards for Council Fleet and Public Service Vehicles;
- Further public transport improvements;
- Further improve the facilities for cycling and walking;
- Continue promoting Employer and School Travel Plans;
- Public information
- HGV rerouting; and
- Continued strict implementation of the Environmental Permitting Regime at minerals sites particularly with regards to cement etc.

The majority of the urban area in Gravesham, including Gravesend and Northfleet, are designated as Smoke Control Areas (SCAs). In these areas, only authorised and smokeless fuels are allowed to be burnt, unless being used in an exempt appliance. This helps control and reduce PM<sub>2.5</sub> emissions in these areas. Further information on these, including advice, can be found on Gravesham Borough Council's website.

The introduction of a new policy and procedure to implement the additional enforcement powers to tackle smoke control offences are to be publicised and implemented at Gravesham including the use of fixed penalty notices which will further help to reduce PM<sub>2.5</sub> emissions.

The introduction of a new policy and procedure for the early use of enforcement powers to reduce the number of bonfires in the residential areas of the borough including the use of

fixed penalty notices which also help control the PM<sub>2.5</sub> emissions from antisocial burning of waste.

The adoption of the Kent and Medway Energy and Low Emissions Strategy across Kent will help to reduce emissions over the coming years of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> as well as emissions of greenhouse gases such as CO<sub>2</sub> and Methane. This has been published and implemented in 2020.

The current Defra background maps for Gravesham Borough Council (2018 reference year) show that all 2022 background concentrations of PM<sub>2.5</sub> are far below the recommended annual mean AQS objective for PM<sub>2.5</sub> of 25 µg/m<sup>3</sup>, with an average of 9.9 µg/m<sup>3</sup>. The highest concentration is predicted to be 12.3 µg/m<sup>3</sup> within the 1km x 1km grid square with the centroid grid reference of 563500, 173500. This is largely a residential area within Gravesham located near Dover Road East.

The Department of Health's Public Health Outcomes Framework<sup>7</sup> has a number of public health indicators that are used for public health actions, to identify areas of health inequality and concern, and monitor the differences in health impacts across regions in the UK. This framework includes an indicator "D01- Fraction of Mortality Attributable to Particulate Air Pollution" which is calculated using background annual average PM<sub>2.5</sub> concentrations, modelled at a 1km<sup>2</sup> resolution based on measured concentrations from the AURN. Gravesham has a 5.5% fraction of mortality calculated for 2022, which is in line with the average for England overall (5.5%), and above the South East Region (5.1%). The 2021 data is presented as the 2022 dataset has not been made available at the time of writing, and is available via the Fingertips Public Health Outcomes Framework website.

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<sup>7</sup> Public Health Outcomes Framework: D01- Fraction of Mortality Attributable to Particulate Air Pollution

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

This section sets out the monitoring undertaken within 2022 by Gravesham Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

#### **Summary of Monitoring Undertaken**

##### **3.1.1 Automatic Monitoring Sites**

Gravesham Borough Council undertook automatic (continuous) monitoring at 2 sites during 2021. Table A.1 in Appendix A shows the details of the automatic monitoring sites. 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. The KentAir website presents automatic monitoring results for Gravesham Borough Council, with automatic monitoring results also available through the UK-Air website .

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**

Gravesham Borough Council undertook non- automatic (i.e., passive) monitoring of NO<sub>2</sub> at 66 sites during 2022, inclusive of 5 triplicate sites. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

## Individual Pollutants

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

### 3.1.3 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40 µg/m<sup>3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e., the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200 µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

Both automatic monitoring sites within Gravesham continue compliance to the AQS objective, additionally, neither of the automatic monitoring sites reported 1-hour concentration exceedances more than 18 times/year of 200 µg/m<sup>3</sup>.

During 2022, 58 sites reported decreases in NO<sub>2</sub> and 7 reported increases in NO<sub>2</sub>, there was one exceedance of the annual mean NO<sub>2</sub> AQS objective of 40 µg/m<sup>3</sup>, this was at GR142 (42.9 µg/m<sup>3</sup>). The maximum concentration was also reported at GR142, which is located within AQMA No.1 A2 Trunk. The remaining sites reported NO<sub>2</sub> concentrations below the AQS objective, and 2 monitoring locations reported annual mean concentrations with 10% of the AQS objective.

- GR13, within the A226 One-way System AQMA – 37.6 µg/m<sup>3</sup>
- GR119, within the A226 One-way System AQMA – 39.4 µg/m<sup>3</sup>

Fall-off with distance calculations were required at 2 diffusion tube locations (GR13 and GR142), where annual mean concentrations were greater than 36 µg/m<sup>3</sup>. This was completed using the Diffusion Tube Data Processing Tool version v3.0, in line with the

methodology outlined in LAQM.TG(22). Details of this calculation are presented in Table C.3.

Figure A.1 – Figure A.5 displays NO<sub>2</sub> concentration trends for the last 5 years, there is a general trend of decrease in all passive monitoring locations.

No passive monitoring sites reported an annual mean NO<sub>2</sub> concentration greater than 60 µg/m<sup>3</sup> in 2022, therefore it can be assumed that there are no sites where there is likely to be a risk of exceeding the 1-hour mean NO<sub>2</sub> AQS objective, as per guidance provided in LAQM.TG(22).

### 3.1.4 Particulate Matter (PM<sub>10</sub>)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40 µg/m<sup>3</sup>.

Table A.7 in [Appendix A](#) compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past five years with the air quality objective of 50 µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.

Compliance of both the annual mean PM<sub>10</sub> AQS objective (40 µg/m<sup>3</sup>) and 24-hour PM<sub>10</sub> AQS objective (no more than 35 24-hourly concentrations greater than 50 µg/m<sup>3</sup>) has been achieved in 2022 at both automatic monitoring locations.

Over the last 5 years of annual PM<sub>10</sub> monitoring, PM<sub>10</sub> concentrations have remained stable at both the A2 Roadside and Industrial Background sites. Both sites underwent minimal changes from 2021 – 2022, with a slight reduction at the A2 Roadside site of 0.7 µg/m<sup>3</sup>, and an increase of 1.2 µg/m<sup>3</sup> at the Industrial Background site.

The 24 – hour mean PM<sub>10</sub> monitoring for 2022 shows no exceedances of the 50 µg/m<sup>3</sup> AQS objective, which continues the same trend over the last 5 years of monitoring.

Whilst compliance of the annual mean PM<sub>10</sub> AQS objective has been maintained for over 5 years in the Northfleet Industrial Area AQMA, the Council does not wish to revoke this designation as there is a significant amount of development taking place, or due to take place, within it. These include industrial and mixed-use developments, designation as an AQMA facilitates the requirement of additional mitigation measure in the planning process, particularly during the construction phase, so as to ensure that PM<sub>10</sub> concentrations do not increase in coming years. The Council will look to revoke the AQMA once much of this



development has been completed, and a better understanding of whether compliance will continue to be maintained.

### 3.1.5 Particulate Matter (PM<sub>2.5</sub>)

Gravesham Borough Council does not undertake monitoring of PM<sub>2.5</sub> within its designation, however as per LAQM.TG(22) Sections 7.118 to 7.124, PM<sub>2.5</sub> concentrations can be estimated from PM<sub>10</sub> concentrations. This uses a nationally derived correction ratio of 6.4 (roadside) and 5.5 (background) as per the annual update provided by LAQM.

Using the PM<sub>10</sub> annual averages, the estimated PM<sub>2.5</sub> annual averages for both continuous monitoring sites in 2022 is as follows:

- ZG2 (A2 Roadside) – 8.9 µg/m<sup>3</sup>

The A2 Roadside site estimated PM<sub>2.5</sub> concentration are well below the recommended PM<sub>2.5</sub> annual mean objective of 20 µg/m<sup>3</sup>.

It is not recommended to calculate PM<sub>2.5</sub> from PM<sub>10</sub> at Industrial sites due to their unique site-specific characteristics. Therefore, an estimation can't be calculated for this site.

## Appendix A: Monitoring Results

**Table A.1 – Details of Automatic Monitoring Sites**

| Site ID | Site Name                       | Site Type  | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored               | In AQMA? Which AQMA?                | Monitoring Technique | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Inlet Height (m) |
|---------|---------------------------------|------------|-------------------------|--------------------------|------------------------------------|-------------------------------------|----------------------|--|---|------------------|
| ZG2     | Gravesham A2 Roadside           | Roadside   | 562589                  | 172076                   | NO <sub>2</sub> , PM <sub>10</sub> | Y – AQMA A2 Trunk Road              | Chemiluminescent BAM | 0  | 72  | 3                |
| ZG3     | Gravesham Industrial Background | Industrial | 562155                  | 174360                   | NO <sub>2</sub> , PM <sub>10</sub> | Y – AQMA Northfleet Industrial Area | Chemiluminescent BAM | 3.7  | 24  | 3                |

**Notes:**

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

(2) N/A if not applicable

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

| Diffusion Tube ID   | Site Name   | Site Type        | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?                   | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---------------------|---|------------------|-------------------------|--------------------------|----------------------|--|--|---|---|-----------------|
| GR08a, GR08b, GR08c | Painters Ash School Northfleet, Air Monitoring Station, Northfleet            | Roadside         | 562589                  | 172076                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA                  | 0.0  | 72.0  | Yes   | 3.0             |
| GR13                | 88 West Street, Gravesend, Kent, DA11 0BX Pelican Crossing                    | Roadside         | 564696                  | 174431                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA | 0.1  | 2.0   | No  | 2.9             |
| GR19a, GR19b, GR19c | Lawn Primary School, Air Monitoring Station, Highstreet, Northfleet, DA11 9HB | Urban Background | 562155                  | 174360                   | NO <sub>2</sub>      | NO                                     | 3.7  | 20.0  | No  | 2.0             |
| GR24                | 28- 29 Milton Road (Lamp post),, Gravesend, Kent, DA12 2RF                    | Roadside         | 565128                  | 174049                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA | 0.2  | 2.2   | No  | 2.5             |
| GR31                | 32 Harmer Street GF (façade), Gravesend, DA12 2AX                             | Roadside         | 565052                  | 174149                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA | 0.0  | 2.0   | No  | 2.7             |
| GR39                | 19 Stone Street (Downpipe), Gravesend, DA12 1AP                               | Roadside         | 564730                  | 174030                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA | 0.1  | 2.0   | No  | 2.5             |
| GR40                | Somerset Public House (sign post), 10 Darnley Road,                           | Roadside         | 564486                  | 174095                   | NO <sub>2</sub>      | Y – Gravesham A226 One                 | 0.1  | 1.5   | No  | 2.5             |

| Diffusion Tube ID | Site Name   | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?                               | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|---|-----------|-------------------------|--------------------------|----------------------|--|--|---|---|-----------------|
|                   | Gravesend, DA11 0RU   |           |                         |                          |                      | Way System AQMA                                    |  |   |   |                 |
| GR45              | Princes Street (Sign Post) (Opp Jury Street), Gravesend, Kent, DA11 0AA | Roadside  | 564708                  | 174266                   | NO <sub>2</sub>      | NO   | 6.8  | 2.0   | No  | 2.5             |
| GR47              | 29- 31 Harmer Street (façade), Gravesend, DA12 2AP                      | Roadside  | 565043                  | 174173                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA             | 0.0  | 2.0   | No  | 2.5             |
| GR52              | 32 The Hill (Lamppost), Northfleet, DA11 9EX                            | Roadside  | 562449                  | 174191                   | NO <sub>2</sub>      | NO   | 0.2  | 1.5   | No  | 2.5             |
| GR55              | Butchers (façade) 140 Pelham Road, Gravesend                            | Roadside  | 563943                  | 173378                   | NO <sub>2</sub>      | NO   | 0.0  | 2.5   | No  | 2.7             |
| GR56              | Junies (façade), Parrock Road, Gravesend, DA12 1QF                      | Roadside  | 565210                  | 172980                   | NO <sub>2</sub>      | NO   | 0.4  | 2.0   | No  | 2.5             |
| GR57              | 61 Old Road West (Hairdressers - façade), Gravesend, Kent, DA11 0LW     | Roadside  | 564472                  | 173158                   | NO <sub>2</sub>      | Y – Gravesham A227 Wrotham Road/Old Road West AQMA | 0.3  | 2.2   | No  | 2.0             |
| GR58              | The Venue (Lamppost), Milton Road, Gravesend, DA12 2rf                  | Roadside  | 565166                  | 174036                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA             | 0.0  | 3.0   | No  | 2.7             |

| Diffusion Tube ID | Site Name   | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?                               | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|---|-----------|-------------------------|--------------------------|----------------------|--|--|---|---|-----------------|
| GR59              | 44 Old Road West (Façade - Pharmacy), Gravesend, Kent, DA11 0LJ             | Roadside  | 564530                  | 173171                   | NO <sub>2</sub>      | Y – Gravesham A227 Wrotham Road/Old Road West AQMA | 0.4  | 2.0   | No  | 2.5             |
| GR60              | Bookmakers (Down Pipe), 188 Old Road West, Gravesend                        | Roadside  | 563899                  | 173368                   | NO <sub>2</sub>      | NO   | 0.0  | 4.3   | No  | 2.7             |
| GR61              | 62 New Road (Pounce - Down Pipe), Gravesend, Kent, DA11 0AD                 | Roadside  | 564429                  | 174152                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA             | 0.2  | 2.6   | No  | 3.0             |
| GR62              | The Terrace (façade), Gravesend, DA12 2BB                                   | Roadside  | 565004                  | 174324                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA                              | 0.0  | 4.0   | No  | 2.8             |
| GR66              | Russell Quay (Lamppost), West Street, Gravesend, DA11 0BE                   | Roadside  | 564512                  | 174448                   | NO <sub>2</sub>      | NO   | 0.1  | 2.5   | No  | 2.5             |
| GR67              | Echo Public House (Façade), Old Road East, Gravesend, DA12 1NR              | Roadside  | 565214                  | 172958                   | NO <sub>2</sub>      | NO   | 3.3  | 2.0   | No  | 2.5             |
| GR68              | Opp The Old Prince of Orange (Lamppost), Old Road West, Gravesend, DA12 1NG | Roadside  | 564808                  | 173086                   | NO <sub>2</sub>      | NO   | 1.6  | 1.5   | No  | 2.7             |

| Diffusion Tube ID   | Site Name   | Site Type        | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?  | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---------------------|---|------------------|-------------------------|--------------------------|----------------------|-----------------------|--|---|---|-----------------|
| GR69a, GR69b, GR69c | Golf Driving Range (Fencing), Thong Lane, Gravesend, DA12 4LF | Urban Background | 567270                  | 171925                   | NO <sub>2</sub>      | NO                    |  | 410.0   | No  | 2.5             |
| GR72a, GR72b, GR72c | Northfleet Cemetery (Post), Northfleet, DA11 8HW              | Urban Background | 562437                  | 173175                   | NO <sub>2</sub>      | NO                    | 41.0   | 157.0   | No  | 2.8             |
| GR75a, GR75b, GR75c | Gravesend Cemetery, Gravesend, DA11 7LY                       | Urban Background | 564087                  | 173080                   | NO <sub>2</sub>      | NO                    | 79.0   | 110.0   | No  | 2.0             |
| GR78                | Canal Tavern Public House, Canal Road, Gravesend, DA12 2RS    | Roadside         | 565658                  | 174195                   | NO <sub>2</sub>      | NO                    | 0.2  | 1.8   | No  | 2.5             |
| GR92                | 1 Hall Road, Northfleet, Kent, DA11 8AW                       | Roadside         | 562323                  | 172589                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA | 0.0  | 7.9   | No  | 1.5             |
| GR94                | Opp The George PH, Wrotham Road, Meopham, DA13 0AJ            | Roadside         | 564392                  | 166012                   | NO <sub>2</sub>      | NO                    | 0.9  | 0.7   | No  | 2.8             |
| GR96                | Parrock Street, Gravesend, DA12 1EZ                           | Roadside         | 564963                  | 173717                   | NO <sub>2</sub>      | NO                    | 2.0  | 1.7   | No  | 2.3             |
| GR98                | The Leather Bottle PH, Dover Road, Northfleet, DA11 9PH       | Roadside         | 562529                  | 174049                   | NO <sub>2</sub>      | NO                    | 0.0  | 2.0   | No  | 2.8             |
| GR104               | 8 Roman Road (Downpipe), Northfleet                           | Roadside         | 562465                  | 172153                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA | 0.0  | 8.7   | No  | 2.6             |

| Diffusion Tube ID | Site Name   | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?                | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|---|-----------|-------------------------|--------------------------|----------------------|-------------------------------------|--|---|---|-----------------|
| GR107             | 46 Pepper Hill (Façade), Northfleet                             | Roadside  | 562272                  | 172281                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA               | 0.0  | 8.5   | No  | 2.0             |
| GR109             | 30 Old Road East (Façade) DA11 8EP                              | Roadside  | 565229                  | 172955                   | NO <sub>2</sub>      |                                     | 0.0  | 7.3   | No  | 1.6             |
| GR110             | Nells Café, Valley Drive, Gravesend                             | Roadside  | 566149                  | 170436                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA               | 0.0  | 20.0  | No  | 1.9             |
| GR112             | 50 Stonebridge Road (Façade), Northfleet                        | Roadside  | 561502                  | 174682                   | NO <sub>2</sub>      | NO                                  | 0.0  | 4.0   | No  | 2.5             |
| GR116             | Saxon Close, Northfleet, Lamp post opposite No.38.              | Roadside  | 562480                  | 172225                   | NO <sub>2</sub>      | NO                                  | 7.5  | 1.0   | No  | 2.7             |
| GR118             | 40 Windmill Street, Gravesend DA12 1BA (Façade)                 | Roadside  | 564755                  | 173862                   | NO <sub>2</sub>      | NO                                  | 0.0  | 9.0   | No  | 2.4             |
| GR119             | Woodville Place (lamp post)                                     | Roadside  | 564729                  | 173824                   | NO <sub>2</sub>      | NO                                  | 0.0  | 2.0   | No  | 2.5             |
| GR122             | King & Taylor 10-12 Wrotham Road (façade) DA11                  | Roadside  | 564667                  | 173891                   | NO <sub>2</sub>      | NO                                  | 0.0  | 8.0   | No  | 2.5             |
| GR123             | City Praise Centre Lower Higham Road, Gravesend, Kent, DA12 2LY | Roadside  | 566538                  | 173109                   | NO <sub>2</sub>      | NO                                  | 0.0  | 9.0   | No  | 2.0             |
| GR124             | Stonebridge Road Telegraph Post Opposite No.67                  | Roadside  | 561338                  | 174925                   | NO <sub>2</sub>      | Y – Northfleet Industrial Area AQMA | 1.5  | 4.7   | No  | 2.6             |
| GR125             | Café Taj (Façade), 170 Parrack Street, Gravesend                | Roadside  | 564877                  | 173937                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA               | 0.0  | 4.9   | No  | 2.4             |
| GR127             | 17 Darnley Road   | Roadside  | 564456                  | 173979                   | NO <sub>2</sub>      |                                     | 0.0  | 8.8   | No  | 2.5             |

| Diffusion Tube ID | Site Name  | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?                   | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|--|-----------|-------------------------|--------------------------|----------------------|--|--|---|---|-----------------|
| GR128             | 1a Railway Place (façade)                                    | Roadside  | 564727                  | 174002                   | NO <sub>2</sub>      | Y – Gravesham A226 One Way System AQMA | 0.0  | 1.5   | No  | 2.4             |
| GR129             | 20 Stone Street (façade)                                     | Roadside  | 564694                  | 173969                   | NO <sub>2</sub>      | NO                                     | 0.0  | 2.6   | No  | 2.5             |
| GR130             | 6 Wrotham Road, The Hair Shop (Façade)                       | Roadside  | 564687                  | 173934                   | NO <sub>2</sub>      | NO                                     | 0.0  | 5.2   | No  | 2.2             |
| GR131             | 7 Wrotham Road, Martin Tolhurst Solicitors (façade)          | Roadside  | 564661                  | 173940                   | NO <sub>2</sub>      | NO                                     | 2.2  | 34.4  | No  | 1.8             |
| GR133             | 23 Wrotham Road (façade)                                     | Roadside  | 564657                  | 173799                   | NO <sub>2</sub>      | NO                                     | 0.0  | 5.8   | No  | 1.9             |
| GR134             | 17 Wrotham Road (façade)                                     | Roadside  | 564659                  | 173831                   | NO <sub>2</sub>      | NO                                     | 0.0  | 5.8   | No  | 2.0             |
| GR135             | 25 Wrotham Road (lamp post adjacent to building)             | Roadside  | 564657                  | 173764                   | NO <sub>2</sub>      | NO                                     | 6.0  | 1.6   | No  | 2.6             |
| GR136             | Woodville Place, Lamp Post opp 17 Wrotham Road               | Roadside  | 564686                  | 173828                   | NO <sub>2</sub>      | NO                                     | 0.2  | 1.8   | No  | 2.7             |
| GR137             | Lamp post Opposite 2 Peartree Place, Gravesend Road          | Roadside  | 570719                  | 171143                   | NO <sub>2</sub>      | NO                                     | 6.0  | 2.1   | No  | 0.7             |
| GR138             | Telegraph Post, Foxbury Manor, Old Watling Street, Rochester | Roadside  | 570583                  | 169549                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA                  | 6.1  | 32.0  | No  | 1.8             |
| GR139             | Rosherville Way, Lamppost near Compass Court                 | Roadside  | 563178                  | 173976                   | NO <sub>2</sub>      | NO                                     | 14.1   | 4.3   | No  | 2.3             |
| GR140             | Nuxley Toys, 13-14 Milton Road                               | Roadside  | 564955                  | 174098                   | NO <sub>2</sub>      | Y – Gravesham                          | 0.0  | 4.0   | No  | 2.4             |



| Diffusion Tube ID | Site Name   | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA?     | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|---|-----------|-------------------------|--------------------------|----------------------|--------------------------|--|---|---|-----------------|
|                   |   |           |                         |                          |                      | A226 One Way System AQMA |  |   |   |                 |
| GR141             | Park Pale, Telegraph Post   | Roadside  | 569588                  | 169603                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA    | 9.4  | 29.5  | No  | 2.0             |
| GR142             | Inn on the Lake, Watling Street, Shorne DA12 3HB (Light post)       | Roadside  | 567500                  | 169836                   | NO <sub>2</sub>      | Y – Gravesham A2 AQMA    | 25.2   | 21.4  | No  | 2.4             |
| GR143             | 29 Wrotham Road (Façade)  | Roadside  | 564646                  | 173745                   | NO <sub>2</sub>      | NO                       | 0.0  | 3.0   | No  | 2.0             |
| GR144             | 43 Singlewell Road (Downpipe)                                       | Roadside  | 564728                  | 172826                   | NO <sub>2</sub>      | NO                       | 0.0  | 2.3   | No  | 3.7             |
| GR145             | Lamp post adjacent Chantry Community Academy, Ordnance Road         | Roadside  | 565336                  | 174066                   | NO <sub>2</sub>      | NO                       | 17.0   | 1.5   | No  | 2.6             |
| GR146             | Lamp post adjacent 354 Thong Lane DA12 4LH                          | Roadside  | 567150                  | 171231                   | NO <sub>2</sub>      | NO                       | 12.0   | 4.8   | No  | 2.4             |
| GR147             | 36/38 The Street, Cobham DA12 3BZ (façade)                          | Roadside  | 567051                  | 168432                   | NO <sub>2</sub>      | NO                       | 0.0  | 9.2   | No  | 2.1             |
| GR148             | Byeways, Lower Rochester Road, Higham (Façade) ME3 7HD              | Roadside  | 571572                  | 172847                   | NO <sub>2</sub>      | NO                       | 0.0  | 5.8   | No  | 1.7             |
| GR149             | Telegraph Post, adjacent Chequers Court, Canal Road, Higham ME3 7HD | Roadside  | 571445                  | 172881                   | NO <sub>2</sub>      | NO                       | 1.0  | 1.9   | No  | 2.5             |
| GR150             | Telegraph Post, adjacent 10 Michele Cottages, Chalk                 | Roadside  | 571250                  | 172933                   | NO <sub>2</sub>      | NO                       | 7.0  | 1.6   | No  | 2.2             |

| Diffusion Tube ID | Site Name  | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|--|-----------|-------------------------|--------------------------|----------------------|----------------------|--|---|---|-----------------|
|                   | Road, Higham ME3 7JZ   |           |                         |                          |                      |                      |  |   |   |                 |
| GR151             | Telegraph Post, Higham Primary School, School Lane, Higham ME3 7JL | Roadside  | 571371                  | 172270                   | NO <sub>2</sub>      | NO                   | 0.0  | -   | No  |                 |
| GR152             | 235 Dover Road (Façade), Northfleet DA11 9QN                       | Roadside  | 562974                  | 173653                   | NO <sub>2</sub>      | NO                   | 0.0  | 4.6   | No  | 1.7             |

**Notes:**

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

(2) N/A if not applicable.

**Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type  | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-------------------------|--------------------------|------------|---|--|------|------|------|------|------|
| ZG2     | 562589                  | 172076                   | Roadside   | 99.1  | 99.1                                       | 29.9 | 29.1 | 23.7 | 22.8 | 22.2 |
| ZG3     | 562155                  | 174360                   | Industrial | 97.6  | 97.6                                       | 23.5 | 24.5 | 22.0 | 21.0 | 18.2 |

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

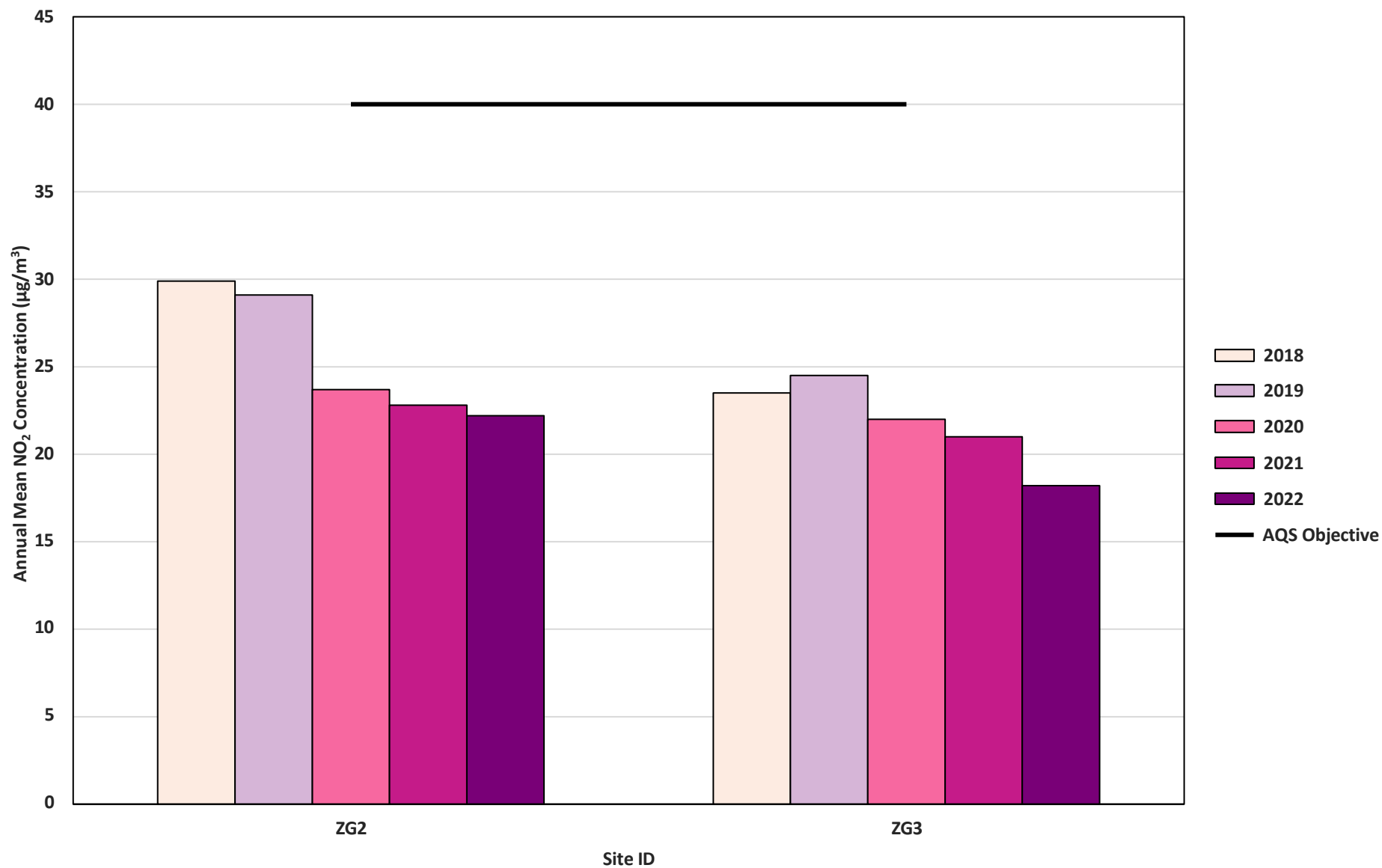
Exceedances of the NO<sub>2</sub> annual mean objective of 40 µg/m<sup>3</sup> are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

**Figure A.1 – Trends in Annual Mean NO<sub>2</sub> at Automatic Monitors**

**Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

| Diffusion Tube ID   | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type        | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018        | 2019        | 2020 | 2021        | 2022 |
|---------------------|-------------------------|--------------------------|------------------|---|--|-------------|-------------|------|-------------|------|
| GR08a, GR08b, GR08c | 562589                  | 172076                   | Roadside         | 92.3  | 92.3                                       | 30.4        | 30.9        | 24.3 | 23.9        | 22.4 |
| GR13                | 564696                  | 174431                   | Roadside         | 92.3  | 92.3                                       | <b>47.1</b> | <b>46.1</b> | 38   | <b>41.2</b> | 37.6 |
| GR19a, GR19b, GR19c | 562155                  | 174360                   | Urban Background | 92.3  | 92.3                                       | 23.3        | 23.2        | 20.6 | 20.9        | 18.9 |
| GR24                | 565128                  | 174049                   | Roadside         | 92.3  | 92.3                                       | <b>45.4</b> | <b>42.7</b> | 36.7 | <b>40.0</b> | 35.0 |
| GR31                | 565052                  | 174149                   | Roadside         | 92.3  | 92.3                                       | <b>42.9</b> | <b>43.7</b> | 38.2 | 37.4        | 34.0 |
| GR39                | 564730                  | 174030                   | Roadside         | 92.3  | 92.3                                       | 35.8        | 35          | 28.3 | 31.0        | 29.3 |
| GR40                | 564486                  | 174095                   | Roadside         | 92.3  | 92.3                                       | <b>45.2</b> | <b>43.4</b> | 35   | 38.3        | 35.3 |
| GR45                | 564708                  | 174266                   | Roadside         | 84.6  | 84.6                                       | 27          | 29.3        | 24.1 | 24.4        | 21.7 |
| GR47                | 565043                  | 174173                   | Roadside         | 92.3  | 92.3                                       | <b>45.4</b> | <b>42.9</b> | 36.3 | <b>41.0</b> | 35.0 |
| GR52                | 562449                  | 174191                   | Roadside         | 92.3  | 92.3                                       | 36.4        | 32.6        | 27.5 | 30.1        | 27.8 |
| GR55                | 563943                  | 173378                   | Roadside         | 92.3  | 92.3                                       | 34.1        | 32.1        | 27.3 | 28.9        | 26.6 |
| GR56                | 565210                  | 172980                   | Roadside         | 92.3  | 92.3                                       | 27.5        | 30.3        | 27   | 27.7        | 24.7 |
| GR57                | 564472                  | 173158                   | Roadside         | 82.7  | 82.7                                       | 38.4        | 40.2        | 31.1 | 33.7        | 31.7 |
| GR58                | 565166                  | 174036                   | Roadside         | 92.3  | 92.3                                       | 37.6        | 38          | 31.2 | 33.0        | 31.6 |
| GR59                | 564530                  | 173171                   | Roadside         | 92.3  | 92.3                                       | 39.5        | 37.7        | 30.2 | 32.4        | 28.7 |
| GR60                | 563899                  | 173368                   | Roadside         | 76.9  | 76.9                                       | 36.9        | 36.5        | 30.5 | 33.7        | 30.7 |
| GR61                | 564429                  | 174152                   | Roadside         | 92.3  | 92.3                                       | 35.5        | 35.1        | 27.7 | 30.7        | 30.2 |
| GR62                | 565004                  | 174324                   | Roadside         | 76.9  | 76.9                                       | 30.7        | 30.8        | 25.8 | 25.6        | 24.8 |
| GR66                | 564512                  | 174448                   | Roadside         | 82.7  | 82.7                                       | 31.9        | 31.6        | 27.9 | 28.2        | 26.3 |
| GR67                | 565214                  | 172958                   | Roadside         | 92.3  | 92.3                                       | 34.9        | 36.3        | 28.6 | 29.6        | 28.3 |
| GR68                | 564808                  | 173086                   | Roadside         | 82.7  | 82.7                                       | 34.7        | 35.8        | 28.4 | 28.6        | 27.1 |
| GR69a, GR69b, GR69c | 567270                  | 171925                   | Urban Background | 92.3  | 92.3                                       | 19.1        | 20.7        | 16.3 | 15.8        | 15.2 |
| GR72a, GR72b, GR72c | 562437                  | 173175                   | Urban Background | 92.3  | 92.3                                       | 23.9        | 24.4        | 20.8 | 21.4        | 19.8 |
| GR75a, GR75b, GR75c | 564087                  | 173080                   | Urban Background | 92.3  | 92.3                                       | 21.8        | 21.8        | 17.2 | 19.5        | 16.2 |
| GR78                | 565658                  | 174195                   | Roadside         | 92.3  | 92.3                                       | 31.3        | 32.5        | 26.2 | 27.5        | 26.9 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018        | 2019        | 2020        | 2021        | 2022        |
|-------------------|-------------------------|--------------------------|-----------|---|--|-------------|-------------|-------------|-------------|-------------|
| GR92              | 562323                  | 172589                   | Roadside  | 92.3  | 92.3                                       | 36.9        | 38.6        | 33.3        | 33.0        | 29.0        |
| GR94              | 564392                  | 166012                   | Roadside  | 84.6  | 84.6                                       | 37.2        | 36.1        | 27.2        | 25.5        | 26.6        |
| GR96              | 564963                  | 173717                   | Roadside  | 92.3  | 92.3                                       | 32.4        | 31.4        | 27.3        | 25.5        | 25.0        |
| GR98              | 562529                  | 174049                   | Roadside  | 84.6  | 84.6                                       | 33.5        | 33.2        | 28.5        | 30.3        | 25.8        |
| GR104             | 562465                  | 172153                   | Roadside  | 84.6  | 84.6                                       | 33.4        | 34.2        | 29.2        | 28.3        | 26.9        |
| GR107             | 562272                  | 172281                   | Roadside  | 92.3  | 92.3                                       | 35          | 36.3        | 30.6        | 29.8        | 27.7        |
| GR109             | 565229                  | 172955                   | Roadside  | 92.3  | 92.3                                       | 33.9        | 34.3        | 28.8        | 27.3        | 29.5        |
| GR110             | 566149                  | 170436                   | Roadside  | 92.3  | 92.3                                       | 35.3        | 38.7        | 32.1        | 29.7        | 28.3        |
| GR112             | 561502                  | 174682                   | Roadside  | 92.3  | 92.3                                       | 34.8        | 35.7        | 30.1        | 31.1        | 30.5        |
| GR116             | 562480                  | 172225                   | Roadside  | 92.3  | 92.3                                       | 32.2        | 32.3        | 28.3        | 29.3        | 26.3        |
| GR118             | 564755                  | 173862                   | Roadside  | 92.3  | 92.3                                       | 34.8        | 34.9        | 29          | 30.9        | 30.3        |
| GR119             | 564729                  | 173824                   | Roadside  | 92.3  | 92.3                                       | <b>53.4</b> | <b>49.5</b> | 37.6        | <b>41.7</b> | 39.4        |
| GR122             | 564667                  | 173891                   | Roadside  | 92.3  | 92.3                                       | 36.1        | 37          | 30.7        | 32.6        | 31.4        |
| GR123             | 566538                  | 173109                   | Roadside  | 92.3  | 92.3                                       | 24          | 26.3        | 21.5        | 21.2        | 20.8        |
| GR124             | 561338                  | 174925                   | Roadside  | 92.3  | 92.3                                       | 30.4        | 31          | 29          | 27.6        | 27.7        |
| GR125             | 564877                  | 173937                   | Roadside  | 92.3  | 92.3                                       | 32.1        | 33.2        | 27.5        | 29.6        | 28.3        |
| GR127             | 564456                  | 173979                   | Roadside  | 92.3  | 92.3                                       | 30.1        | 30.4        | 24.9        | 26.6        | 24.0        |
| GR128             | 564727                  | 174002                   | Roadside  | 92.3  | 92.3                                       | 30.9        | 31.8        | 26          | 29.6        | 26.0        |
| GR129             | 564694                  | 173969                   | Roadside  | 92.3  | 92.3                                       | 27.8        | 28.4        | 24.7        | 25.0        | 23.4        |
| GR130             | 564687                  | 173934                   | Roadside  | 84.6  | 84.6                                       | 30.6        | 31.3        | 26          | 27.0        | 25.7        |
| GR131             | 564661                  | 173940                   | Roadside  | 92.3  | 92.3                                       | 24.9        | 26.4        | 22.5        | 22.1        | 21.8        |
| GR133             | 564657                  | 173799                   | Roadside  | 92.3  | 92.3                                       | 36.3        | 36.2        | 28.7        | 28.3        | 27.5        |
| GR134             | 564659                  | 173831                   | Roadside  | 82.7  | 82.7                                       | 32.8        | 33.7        | 24.9        | 25.2        | 27.6        |
| GR135             | 564657                  | 173764                   | Roadside  | 84.6  | 84.6                                       | <b>44.8</b> | <b>43.9</b> | 36.8        | 35.7        | 31.1        |
| GR136             | 564686                  | 173828                   | Roadside  | 92.3  | 92.3                                       | 39.3        | 37.4        | 32.3        | 31.1        | 30.1        |
| GR137             | 570719                  | 171143                   | Roadside  | 84.6  | 84.6                                       | 30.7        | 33.1        | 26.9        | 26.7        | 27.0        |
| GR138             | 570583                  | 169549                   | Roadside  | 92.3  | 92.3                                       | 28.8        | 30.2        | 25.3        | 24.1        | 24.8        |
| GR139             | 563178                  | 173976                   | Roadside  | 92.3  | 92.3                                       | 30.5        | 34          | 31.5        | 30.7        | 29.6        |
| GR140             | 564955                  | 174098                   | Roadside  | 75  | 75.0                                       | 38.1        | 38.5        | 33.7        | 34.2        | 30.8        |
| GR141             | 569588                  | 169603                   | Roadside  | 84.6  | 84.6                                       | 29.3        | 27.1        | 25.2        | 22.5        | 21.2        |
| GR142             | 567500                  | 169836                   | Roadside  | 92.3  | 92.3                                       | <b>55</b>   | <b>59.8</b> | <b>46.1</b> | <b>41.1</b> | <b>42.9</b> |
| GR143             | 564646                  | 173745                   | Roadside  | 92.3  | 92.3                                       | 36.6        | 37          | 29.5        | 29.0        | 28.2        |
| GR144             | 564728                  | 172826                   | Roadside  | 92.3  | 92.3                                       | 33.4        | 34.9        | 28.9        | 30.3        | 28.5        |
| GR145             | 565336                  | 174066                   | Roadside  | 92.3  | 92.3                                       | 32.2        | 30.6        | 28.9        | 29.6        | 29.3        |
| GR146             | 567150                  | 171231                   | Roadside  | 92.3  | 92.3                                       | 22.8        | 18.5        | 14.9        | 14.3        | 13.9        |
| GR147             | 567051                  | 168432                   | Roadside  | 92.3  | 92.3                                       | -           | -           | 23.9        | 25.3        | 22.1        |
| GR148             | 571572                  | 172847                   | Roadside  | 84.6  | 84.6                                       | -           | -           | -           | 14.3        | 13.4        |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------------------|-------------------------|--------------------------|-----------|---|--|------|------|------|------|------|
| GR149             | 571445                  | 172881                   | Roadside  | 84.6  | 84.6                                       | -    | -    | -    | 14.7 | 13.0 |
| GR150             | 571250                  | 172933                   | Roadside  | 84.6  | 84.6                                       | -    | -    | -    | 16.1 | 15.1 |
| GR151             | 571371                  | 172270                   | Roadside  | 84.6  | 84.6                                       | -    | -    | -    | 18.8 | 18.4 |
| GR152             | 562974                  | 173653                   | Roadside  | 92.3  | 92.3                                       | -    | -    | -    | -    | 19.7 |

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

☒ Diffusion tube data has been bias adjusted.

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

#### Notes:

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

Exceedances of the NO<sub>2</sub> annual mean objective of 40  $\mu\text{g}/\text{m}^3$  are shown in **bold**.

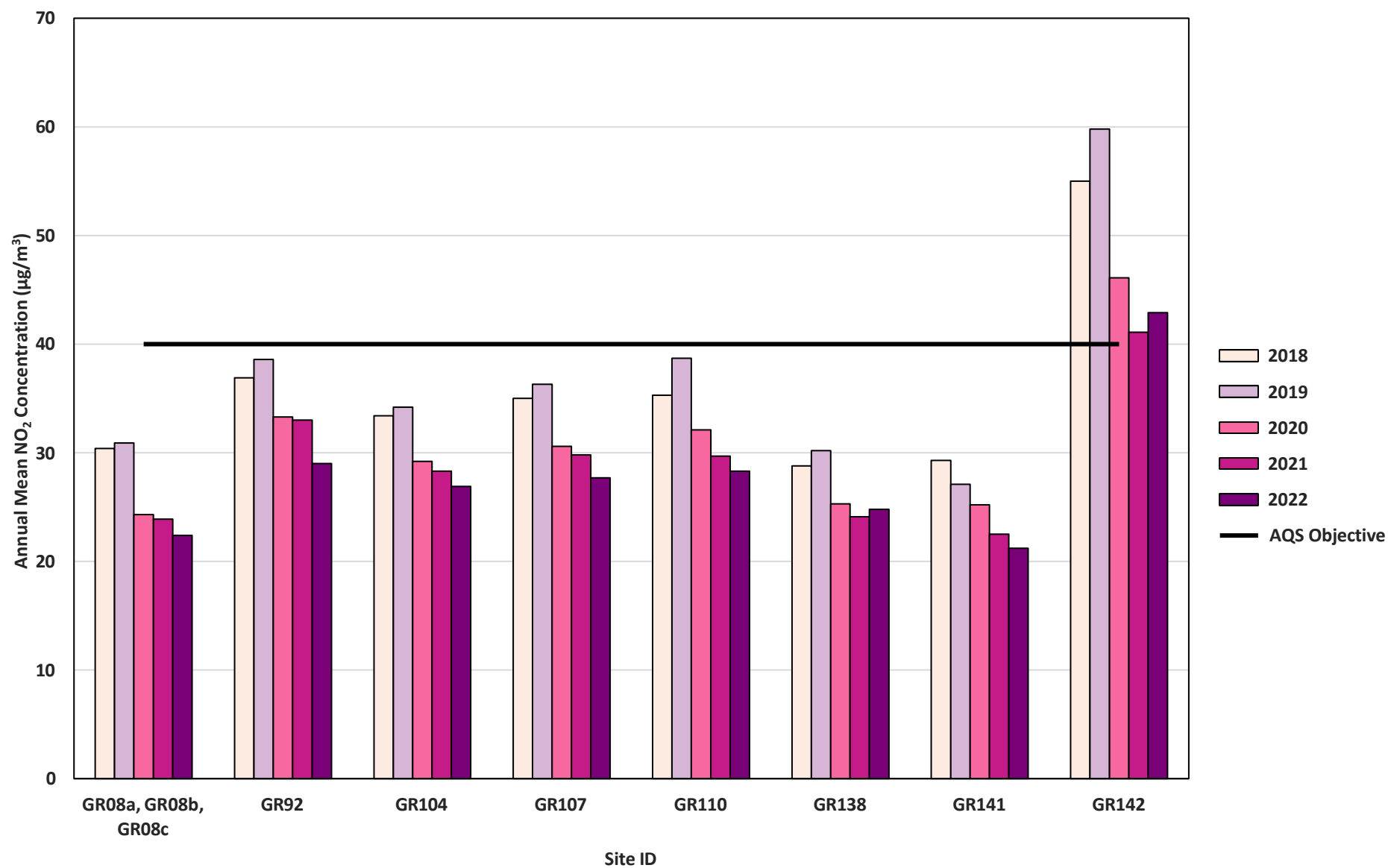
NO<sub>2</sub> annual means exceeding 60  $\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

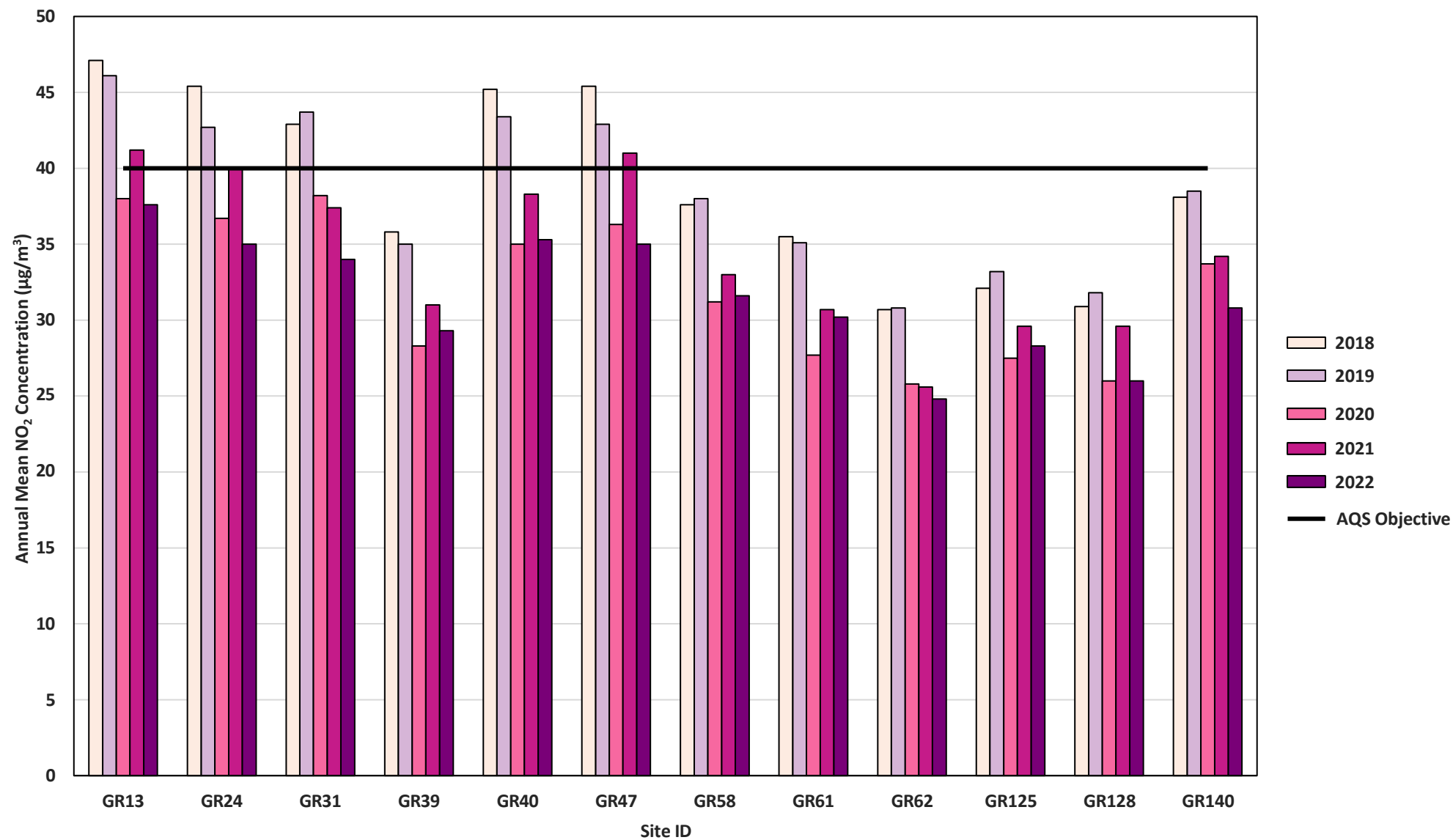
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

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

**Figure A.2 – Trends in Annual Mean NO<sub>2</sub> Concentrations: AQMA No.1 A2 Trunk**



**Figure A.3 – Trends in Annual Mean NO<sub>2</sub> Concentrations: AQMA No.3 A226 One-way System**

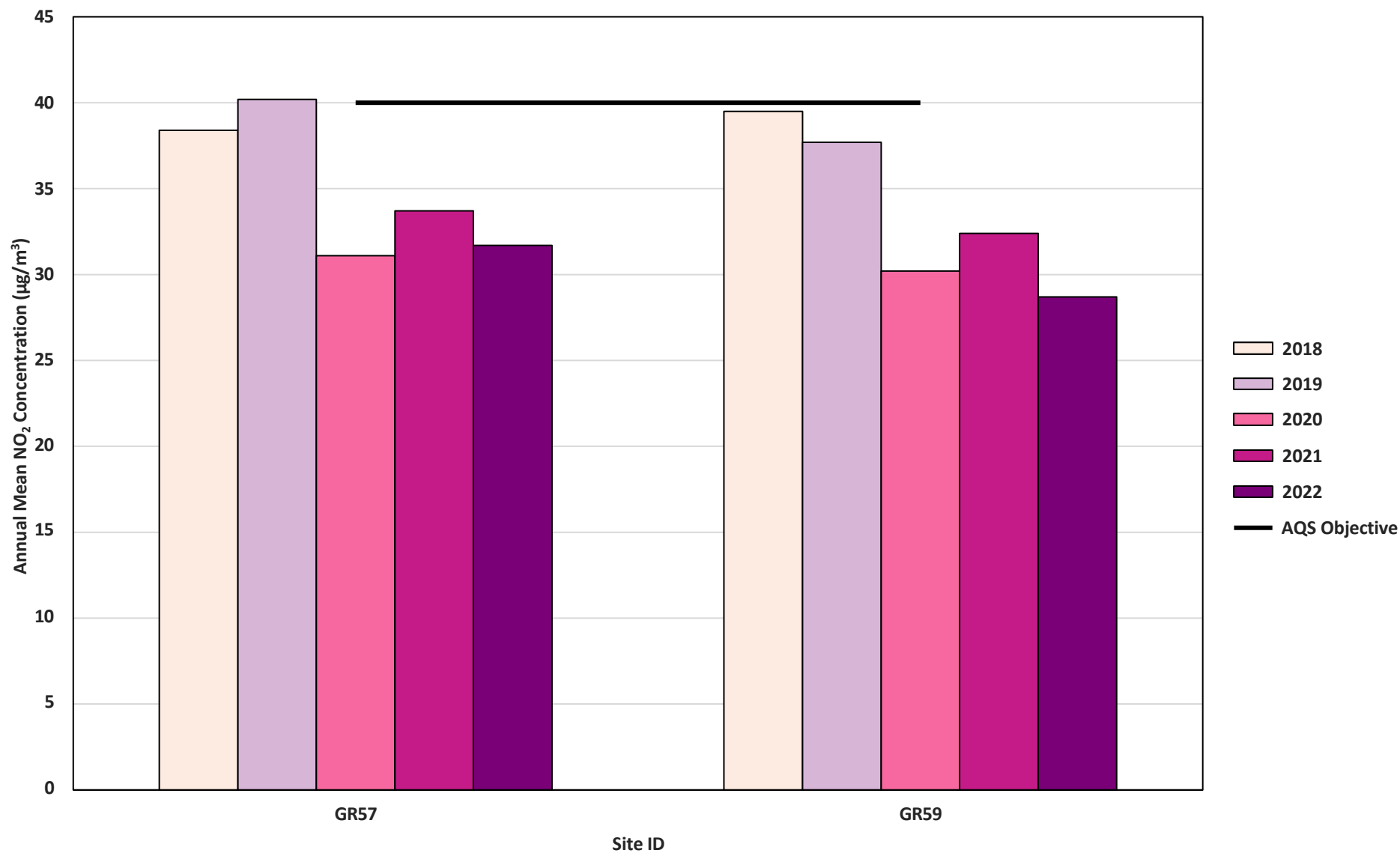
**Figure A.4 – Trends in Annual Mean NO<sub>2</sub> Concentrations: AQMA No.4 A227 Wrotham Road/ B261 Old Road West**

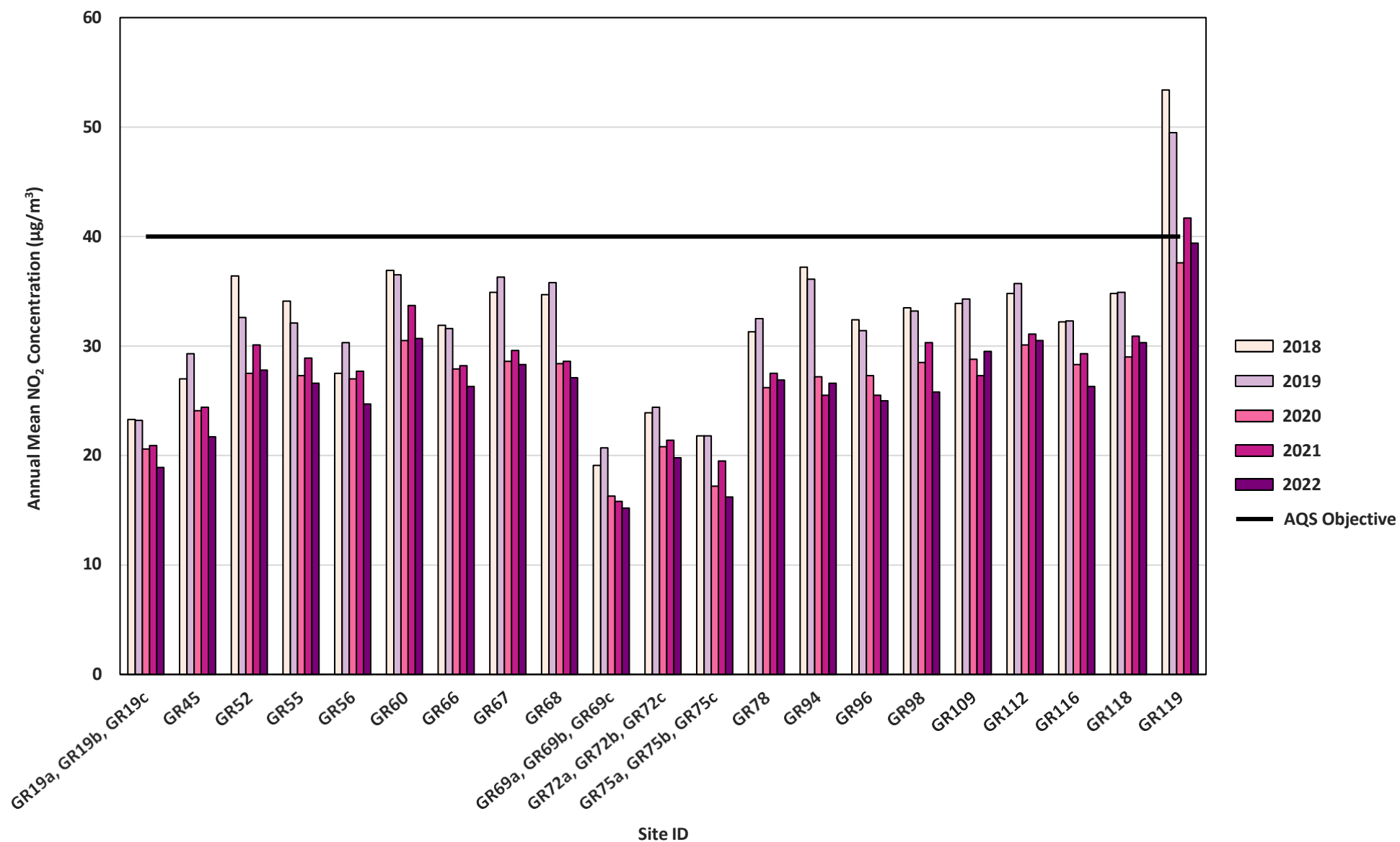
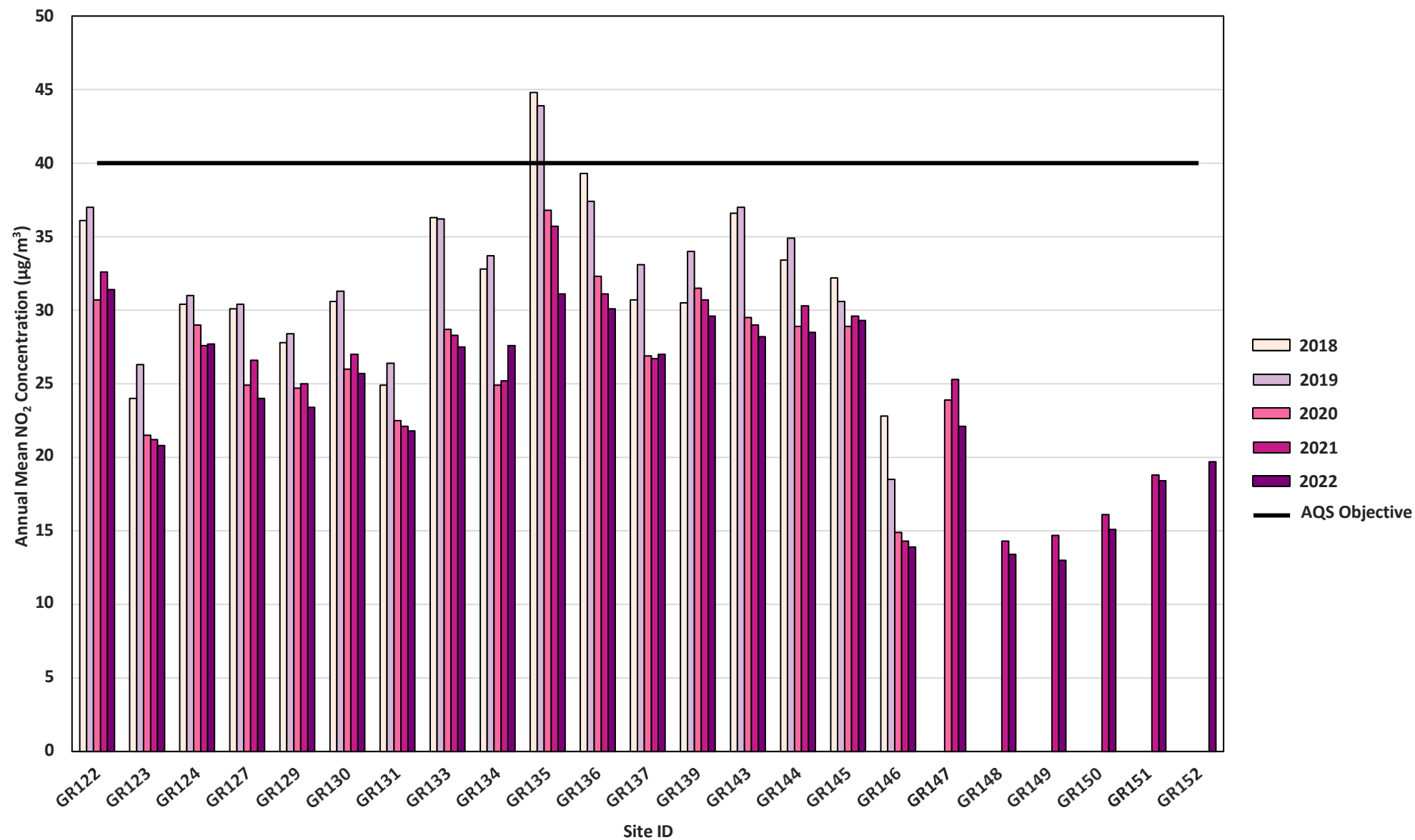
Figure A.5 – Trends in Annual Mean NO<sub>2</sub> Concentrations: Outside AQMAs

Figure A.6 – Trends in Annual Mean NO<sub>2</sub> Concentrations: Outside AQMAs (2)

**Table A.5 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200 µg/m<sup>3</sup>**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type  | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-------------------------|--------------------------|------------|---|--|------|------|------|------|------|
| ZG2     | 562589                  | 172076                   | Roadside   | 99.1  | 99.1                                       | 0    | 0    | 0    | 0    | 0    |
| ZG3     | 562155                  | 174360                   | Industrial | 97.6  | 97.6                                       | 0    | 0    | 0    | 0    | 0    |

**Notes:**

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg/m<sup>3</sup> have been recorded.

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200 µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

**Table A.6 – Annual Mean PM<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type  | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-------------------------|--------------------------|------------|---|--|------|------|------|------|------|
| ZG2     | 562589                  | 172076                   | Roadside   | 98.0  | 98.0                                       | 15.4 | 15.3 | 16.3 | 16.0 | 15.3 |
| ZG3     | 562155                  | 174360                   | Industrial | 97.1  | 97.1                                       | 21.9 | 22.3 | 21.3 | 20.6 | 22.5 |

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

**Notes:**

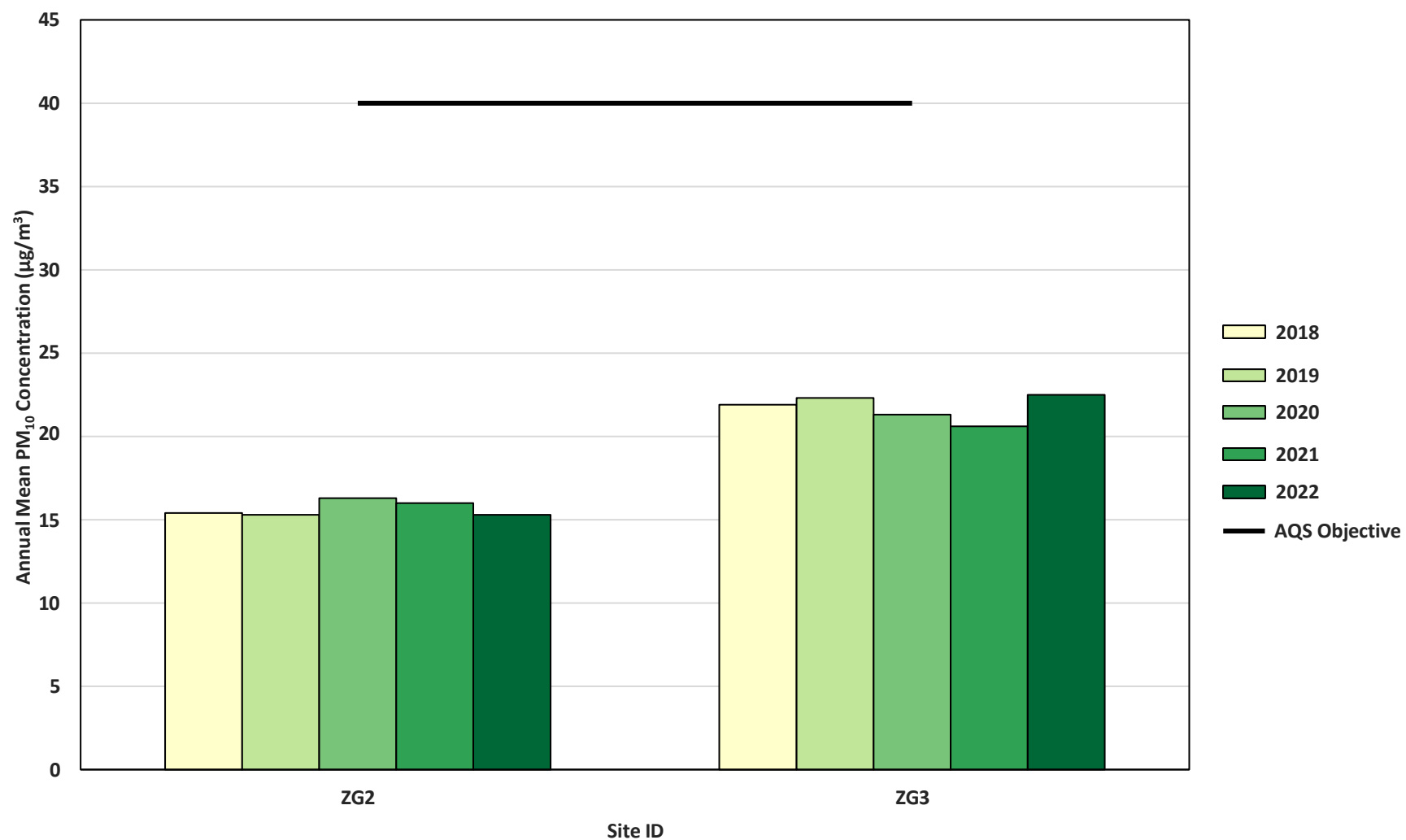
The annual mean concentrations are presented as µg/m<sup>3</sup>.

Exceedances of the PM<sub>10</sub> annual mean objective of 40 µg/m<sup>3</sup> are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

**Figure A.7 – Trends in Annual Mean PM<sub>10</sub> Concentrations**

**Table A.7 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50 µg/m<sup>3</sup>**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type  | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2022 (%) <sup>(2)</sup> | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-------------------------|--------------------------|------------|---|--|------|------|------|------|------|
| ZG2     | 562589                  | 172076                   | Roadside   | 98.0  | 98.0                                       | 1    | 1    | 1    | 0    | 0    |
| ZG3     | 562155                  | 174360                   | Industrial | 97.1  | 97.1                                       | 3    | 10   | 8    | 1    | 0    |

**Notes:**

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50 µg/m<sup>3</sup> have been recorded.

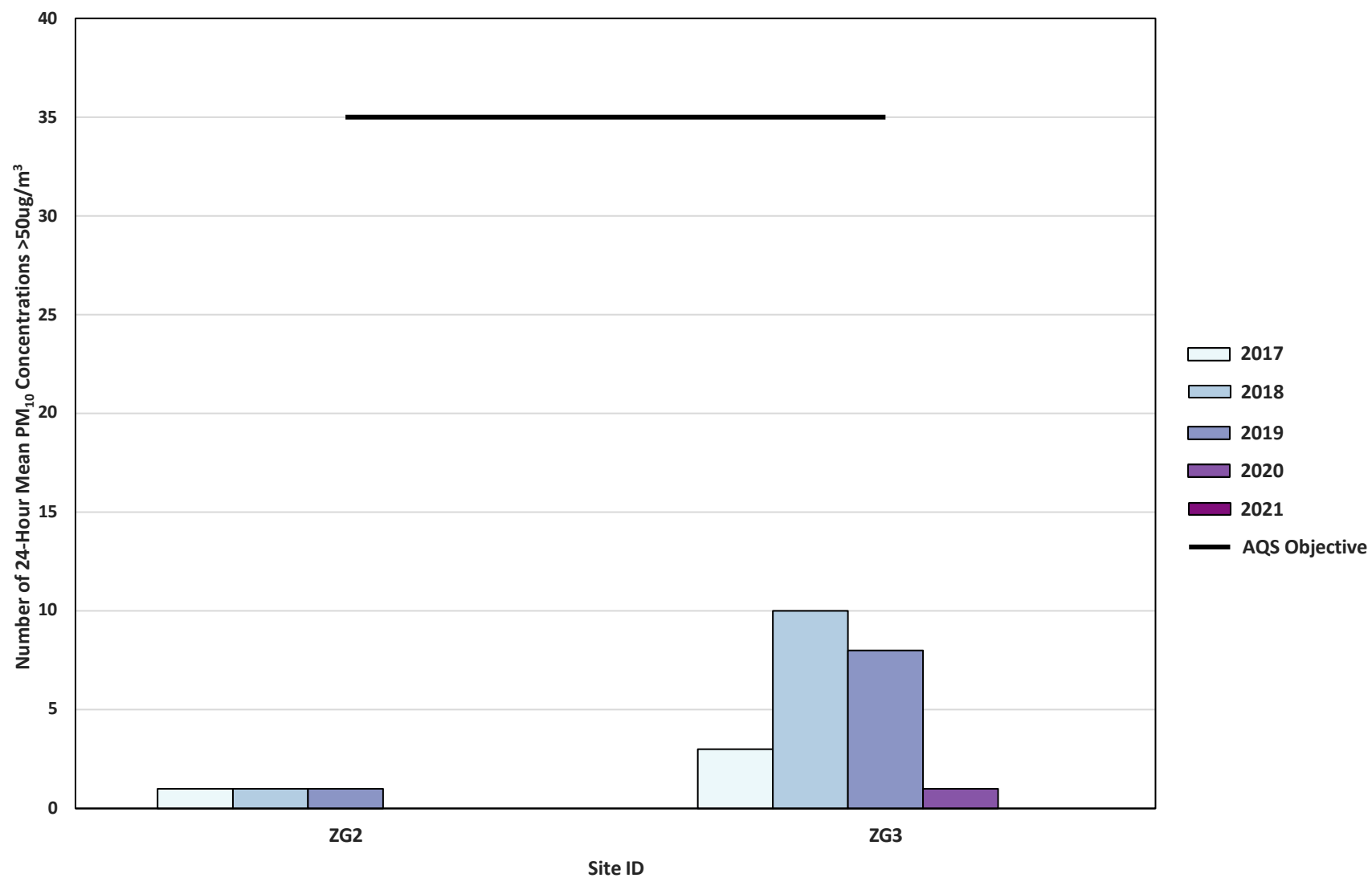
Exceedances of the PM<sub>10</sub> 24-hour mean objective (50 µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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



**Figure A.8 – Trends in Number of 24-Hour Mean PM<sub>10</sub> Results > 50 µg/m<sup>3</sup>**

## Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO<sub>2</sub> 2022 Diffusion Tube Results (µg/m<sup>3</sup>)

| DT ID | X OS<br>Grid Ref<br>(Easting<br>) | Y OS<br>Grid Ref<br>(Northing<br>) | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug | Sep  | Oct  | Nov  | Dec  | Annual Mean:<br>Raw Data | Annual Mean:<br>Annualised and<br>Bias Adjusted<br>0.85 | Annual Mean:<br>Distance<br>Corrected to<br>Nearest<br>Exposure | Comment   |
|-------|-----------------------------------|------------------------------------|------|------|------|------|------|------|------|-----|------|------|------|------|--------------------------|---|---|---|
| GR08a | 562589                            | 172076                             | 36.8 | 29.4 | 29.8 | 18.9 | 23.8 | 21.0 | 21.2 | -   | 24.1 | 21.5 | 29.0 | 28.7 | -                        | -   | -   | Triplicate Site with GR08a, GR08b and GR08c - Annual data provided for GR08c only |
| GR08b | 562589                            | 172076                             | 37.0 | 27.8 | 31.5 | 22.3 | 24.0 | 22.9 | 22.6 | -   | 23.3 | 25.9 | 27.0 | 22.9 | -                        | -   | -   | Triplicate Site with GR08a, GR08b and GR08c - Annual data provided for GR08c only |
| GR08c | 562589                            | 172076                             | 41.8 | 29.3 | 31.4 | 21.4 | 22.4 | 23.6 | 22.6 | -   | 23.5 | 20.7 | 27.9 | 27.2 | 26.2                     | 22.4  | -   | Triplicate Site with GR08a, GR08b and GR08c - Annual data provided for GR08c only |
| GR13  | 564696                            | 174431                             | 71.4 | 45.7 | 56.3 | 43.9 | 35.4 | 31.3 | 40.7 | -   | 45.0 | 36.9 | 36.7 | 40.5 | 44.0                     | 37.6  | 37.5  |   |
| GR19a | 562155                            | 174360                             | 22.1 | 19.5 | 28.7 | 26.2 | 14.5 | 16.9 | 18.4 | -   | 20.9 | 19.0 | 22.7 | 22.6 | -                        | -   | -   | Triplicate Site with GR19a, GR19b and GR19c - Annual data provided for GR19c only |
| GR19b | 562155                            | 174360                             | 37.3 | 19.2 | 33.3 | 26.2 | 15.9 | 16.3 | 19.7 | -   | 20.4 | 18.8 | 21.1 | 21.2 | -                        | -   | -   | Triplicate Site with GR19a, GR19b and GR19c - Annual data provided for GR19c only |
| GR19c | 562155                            | 174360                             | 34.3 | 18.0 | 34.5 | 25.5 | 16.7 | 16.4 | 18.6 | -   | 20.8 | 19.1 | 21.9 | 21.7 | 22.1                     | 18.9  | -   | Triplicate Site with GR19a, GR19b and GR19c - Annual data provided for GR19c only |
| GR24  | 565128                            | 174049                             | 60.4 | 32.1 | 58.1 | 47.6 | 37.0 | 35.2 | 40.1 | -   | 27.5 | 33.6 | 38.0 | 40.5 | 40.9                     | 35.0  | -   |   |
| GR31  | 565052                            | 174149                             | 58.4 | 41.1 | 42.9 | 36.7 | 38.8 | 32.9 | 34.2 | -   | 44.1 | 30.8 | 36.5 | 41.4 | 39.8                     | 34.0  | -   |   |
| GR39  | 564730                            | 174030                             | 44.3 | 31.6 | 53.8 | 36.7 | 27.5 | 23.2 | 29.7 | -   | 34.7 | 27.6 | 34.8 | 32.9 | 34.3                     | 29.3  | -   |   |
| GR40  | 564486                            | 174095                             | 53.3 | 33.3 | 57.0 | 44.3 | 37.9 | 33.7 | 39.9 | -   | 42.1 | 35.9 | 37.1 | 39.2 | 41.2                     | 35.3  | -   |   |
| GR45  | 564708                            | 174266                             | 28.8 | 25.9 | 33.9 | 18.7 | 23.7 | 20.2 | 22.7 | -   |      | 23.2 | 26.5 | 30.3 | 25.4                     | 21.7  | -   |   |
| GR47  | 565043                            | 174173                             | 43.1 | 34.0 | 50.6 | 46.7 | 30.6 | 40.0 | 40.7 | -   | 47.3 | 36.5 | 42.4 | 38.1 | 40.9                     | 35.0  | -   |   |
| GR52  | 562449                            | 174191                             | 44.4 | 25.2 | 48.3 | 40.7 | 24.1 | 23.5 | 30.2 | -   | 31.4 | 25.0 | 31.2 | 33.3 | 32.5                     | 27.8  | -   |   |
| GR55  | 563943                            | 173378                             | 44.2 | 25.9 | 44.2 | 33.0 | 24.5 | 24.2 | 26.8 | -   | 29.2 | 26.5 | 31.4 | 31.8 | 31.1                     | 26.6  | -   |   |
| GR56  | 565210                            | 172980                             | 48.4 | 30.4 | 32.7 | 21.6 | 24.7 | 22.9 | 21.9 | -   | 26.3 | 29.9 | 28.2 | 30.4 | 28.9                     | 24.7  | -   |   |
| GR57  | 564472                            | 173158                             | 50.9 | 34.2 | 45.9 | 35.9 | -    | 34.8 | 28.9 | -   | 32.0 | 32.5 | 39.3 | 36.1 | 37.1                     | 31.7  | -   |   |
| GR58  | 565166                            | 174036                             | 62.5 | 34.7 | 43.9 | 30.2 | 31.1 | 27.0 | 30.7 | -   | 43.4 | 30.0 | 35.5 | 38.2 | 37.0                     | 31.6  | -   |   |
| GR59  | 564530                            | 173171                             | 49.5 | 31.1 | 45.1 | 37.1 | 17.1 | 29.2 | 30.3 | -   | 34.7 | 27.1 | 35.5 | 32.9 | 33.6                     | 28.7  | -   |   |
| GR60  | 563899                            | 173368                             | 51.6 | -    | -    | 38.7 | 31.9 | 29.3 | 29.8 | -   | 35.0 | 33.8 | 36.9 | 36.3 | 35.9                     | 30.7  | -   |   |
| GR61  | 564429                            | 174152                             | 55.9 | 33.1 | 47.4 | 37.2 | 29.8 | 25.3 | 31.6 | -   | 39.5 | 29.9 | 25.1 | 34.1 | 35.4                     | 30.2  | -   |   |
| GR62  | 565004                            | 174324                             | 49.9 | -    | 35.1 | 26.3 | 23.6 | 19.4 | 22.9 | -   | -    | 28.0 | 27.5 | 28.1 | 29.0                     | 24.8  | -   |   |
| GR66  | 564512                            | 174448                             | 47.4 | 31.7 | 40.1 | 32.9 | -    | 22.9 | 26.1 | -   | 26.2 | 22.5 | 29.4 | 28.5 | 30.8                     | 26.3  | -   |   |

| DT ID | X OS<br>Grid Ref<br>(Easting<br>) | Y OS<br>Grid Ref<br>(Northing<br>) | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug | Sep  | Oct  | Nov  | Dec  | Annual Mean:<br>Raw Data | Annual Mean:<br>Annualised and<br>Bias Adjusted<br>0.85 | Annual Mean:<br>Distance<br>Corrected to<br>Nearest<br>Exposure | Comment   |
|-------|-----------------------------------|------------------------------------|------|------|------|------|------|------|------|-----|------|------|------|------|--------------------------|---|---|---|
| GR67  | 565214                            | 172958                             | 50.6 | 32.7 | 41.6 | 28.7 | 25.5 | 28.8 | 25.4 | -   | 33.0 | 30.5 | 33.4 | 33.6 | 33.1                     | 28.3  | -   |   |
| GR68  | 564808                            | 173086                             | 47.6 | 25.1 | 39.6 | 29.3 |      | 22.9 | 25.4 | -   | 30.8 | 32.1 | 26.9 | 37.4 | 31.7                     | 27.1  | -   |   |
| GR69a | 567270                            | 171925                             | 41.7 | 16.7 | 23.5 | 14.2 | 13.1 | 12.5 | 12.1 | -   | 15.6 | 14.5 | 14.7 | 26.0 | -                        | -   | -   | Triplicate Site with GR69a,<br>GR69b and GR69c - Annual<br>data provided for GR69c only |
| GR69b | 567270                            | 171925                             | 33.4 | 17.5 | 24.5 | 14.9 | 13.1 | 12.0 | 12.3 | -   | 15.5 | 13.7 | 18.4 | 20.2 | -                        | -   | -   | Triplicate Site with GR69a,<br>GR69b and GR69c - Annual<br>data provided for GR69c only |
| GR69c | 567270                            | 171925                             | 30.8 | 17.9 | 23.2 | 12.4 | 22.5 | 12.0 | 11.2 | -   | 15.7 | 14.0 | 15.3 | 13.0 | 17.8                     | 15.2  | -   | Triplicate Site with GR69a,<br>GR69b and GR69c - Annual<br>data provided for GR69c only |
| GR72a | 562437                            | 173175                             | 34.4 | 19.3 | 32.7 | 26.4 | 19.1 | 16.7 | 20.0 | -   | 22.6 | 14.1 | 22.0 | 29.3 | -                        | -   | -   | Triplicate Site with GR72a,<br>GR72b and GR72c - Annual<br>data provided for GR72c only |
| GR72b | 562437                            | 173175                             | 34.9 | 21.6 | 30.0 | 25.3 | 16.7 | 15.3 | 15.8 | -   | 21.1 | 17.5 | 25.9 | 20.8 | -                        | -   | -   | Triplicate Site with GR72a,<br>GR72b and GR72c - Annual<br>data provided for GR72c only |
| GR72c | 562437                            | 173175                             | 37.8 | 24.4 | 36.1 | 23.7 | 17.6 | 15.7 | 19.4 | -   | 24.4 | 18.5 | 20.2 | 26.8 | 23.2                     | 19.8  | -   | Triplicate Site with GR72a,<br>GR72b and GR72c - Annual<br>data provided for GR72c only |
| GR75a | 564087                            | 173080                             | 29.9 | 17.6 | 30.5 | 19.1 | 15.3 | 11.9 | 11.4 | -   | 19.1 | 15.3 | 18.9 | 13.6 | -                        | -   | -   | Triplicate Site with GR75a,<br>GR75b and GR75c - Annual<br>data provided for GR75c only |
| GR75b | 564087                            | 173080                             | 32.0 | 17.8 | 27.1 | 17.8 | 14.6 | 11.8 | 13.4 | -   | Null | 16.1 | 17.7 | 23.0 | -                        | -   | -   | Triplicate Site with GR75a,<br>GR75b and GR75c - Annual<br>data provided for GR75c only |
| GR75c | 564087                            | 173080                             | 30.2 | 16.7 | 30.8 | 19.0 | 16.6 | 11.6 | 14.0 | -   | 17.1 | 15.5 | 20.8 | 22.4 | 19.0                     | 16.2  | -   | Triplicate Site with GR75a,<br>GR75b and GR75c - Annual<br>data provided for GR75c only |
| GR78  | 565658                            | 174195                             | 45.8 | 28.9 | 41.1 | 26.7 | 27.8 | 25.4 | 26.6 | -   | 30.9 | 30.4 | 32.8 | 29.9 | 31.5                     | 26.9  | -   |   |
| GR92  | 562323                            | 172589                             | 50.7 | 35.2 | 35.1 | 32.7 | 16.6 | 30.1 | 30.3 | -   | 34.9 | 34.4 | 38.7 | 34.6 | 33.9                     | 29.0  | -   |   |
| GR94  | 564392                            | 166012                             | 40.1 | 24.5 | 40.7 | 31.3 | 26.2 | 29.1 | 29.1 | -   |      | 32.4 | 26.4 | 31.4 | 31.1                     | 26.6  | -   |   |
| GR96  | 564963                            | 173717                             | 43.2 | 18.6 | 46.6 | 30.2 | 21.3 | 18.0 | 25.6 | -   | 29.6 | 26.3 | 27.4 | 35.4 | 29.3                     | 25.0  | -   |   |
| GR98  | 562529                            | 174049                             | 31.8 | 27.0 | 43.8 | 34.7 | 24.9 | 21.6 | 27.1 | -   | 27.3 | 27.1 |      | 37.1 | 30.2                     | 25.8  | -   |   |
| GR104 | 562465                            | 172153                             | 45.6 | 31.7 | 32.1 | 26.7 | 26.8 | 29.2 | 26.8 | -   |      | 27.7 | 35.1 | 33.5 | 31.5                     | 26.9  | -   |   |
| GR107 | 562272                            | 172281                             | 46.4 | 35.9 | 29.9 | 27.1 | 31.0 | 30.8 | 27.3 | -   | 29.3 | 33.0 | 36.6 | 29.7 | 32.5                     | 27.7  | -   |   |
| GR109 | 565229                            | 172955                             | 52.5 | 29.6 | 48.1 | 33.8 | 29.2 | 27.0 | 24.5 | -   | 30.1 | 29.6 | 34.6 | 41.3 | 34.6                     | 29.5  | -   |   |
| GR110 | 566149                            | 170436                             | 51.8 | 31.5 | 36.9 | 26.8 | 18.9 | 31.1 | 27.7 | -   | 32.0 | 34.8 | 33.3 | 39.1 | 33.1                     | 28.3  | -   |   |
| GR112 | 561502                            | 174682                             | 45.8 | 32.4 | 47.9 | 37.1 | 29.7 | 30.4 | 31.2 | -   | 34.6 | 34.3 | 31.4 | 38.3 | 35.7                     | 30.5  | -   |   |
| GR116 | 562480                            | 172225                             | 50.7 | 32.9 | 37.1 | 25.8 | 20.7 | 22.2 | 21.7 | -   | 28.2 | 28.0 | 37.1 | 33.6 | 30.7                     | 26.3  | -   |   |
| GR118 | 564755                            | 173862                             | 50.3 | 31.5 | 51.5 | 37.2 | 26.6 | 27.1 | 30.3 | -   | 33.8 | 32.1 | 31.2 | 38.4 | 35.5                     | 30.3  | -   |   |
| GR119 | 564729                            | 173824                             | 65.0 | 48.5 | 51.6 | 43.6 | 40.5 | 36.3 | 42.3 | -   | 48.3 | 43.6 | 42.2 | 45.2 | 46.1                     | 39.4  | -   |   |
| GR122 | 564667                            | 173891                             | 51.8 | 33.5 | 43.3 | 31.6 | 32.2 | 32.0 | 32.7 | -   | 36.2 | 34.5 | 36.8 | 39.9 | 36.8                     | 31.4  | -   |   |

| DT ID | X OS<br>Grid Ref<br>(Easting<br>) | Y OS<br>Grid Ref<br>(Northing<br>) | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug | Sep  | Oct  | Nov  | Dec  | Annual Mean:<br>Raw Data | Annual Mean:<br>Annualised and<br>Bias Adjusted<br>0.85 | Annual Mean:<br>Distance<br>Corrected to<br>Nearest<br>Exposure | Comment |
|-------|-----------------------------------|------------------------------------|------|------|------|------|------|------|------|-----|------|------|------|------|--------------------------|---|---|---------|
| GR123 | 566538                            | 173109                             | 41.9 | 24.5 | 30.4 | 19.6 | 19.1 | 17.4 | 17.4 | -   | 22.4 | 20.4 | 25.6 | 29.1 | 24.3                     | 20.8  | -   |         |
| GR124 | 561338                            | 174925                             | 51.7 | 30.1 | 43.6 | 27.5 | 26.9 | 25.0 | 27.3 | -   | 32.7 | 27.8 | 30.0 | 33.3 | 32.4                     | 27.7  | -   |         |
| GR125 | 564877                            | 173937                             | 50.5 | 27.7 | 48.2 | 33.3 | 25.4 | 23.9 | 27.9 | -   | 32.8 | 31.0 | 26.0 | 37.8 | 33.1                     | 28.3  | -   |         |
| GR127 | 564456                            | 173979                             | 44.4 | 17.3 | 39.8 | 31.4 | 22.1 | 19.3 | 26.3 | -   | 28.2 | 26.7 | 26.7 | 27.3 | 28.1                     | 24.0  | -   |         |
| GR128 | 564727                            | 174002                             | 45.8 | 29.8 | 42.0 | 33.5 | 10.6 | 22.0 | 26.0 | -   | 30.9 | 27.9 | 30.2 | 35.9 | 30.4                     | 26.0  | -   |         |
| GR129 | 564694                            | 173969                             | 48.1 | 24.3 | 35.2 | 24.6 | 19.4 | 17.5 | 21.4 | -   | 26.6 | 24.5 | 25.1 | 34.6 | 27.4                     | 23.4  | -   |         |
| GR130 | 564687                            | 173934                             | 39.0 |      | 41.2 | 28.7 | 22.7 | 22.7 | 26.4 | -   | 26.7 | 29.5 | 30.3 | 33.2 | 30.0                     | 25.7  | -   |         |
| GR131 | 564661                            | 173940                             | 41.9 | 24.9 | 36.1 | 26.4 | 14.0 | 15.1 | 19.8 | -   | 23.1 | 23.3 | 24.8 | 31.8 | 25.6                     | 21.8  | -   |         |
| GR133 | 564657                            | 173799                             | 45.8 | 34.6 | 40.4 | 33.8 | 27.1 | 23.3 | 21.9 | -   | 33.9 | 27.9 | 32.4 | 33.0 | 32.2                     | 27.5  | -   |         |
| GR134 | 564659                            | 173831                             | 45.8 | 29.2 | 43.7 | 29.3 | 22.2 | 20.8 | 26.2 | -   | 29.7 | -    | 30.2 | 45.6 | 32.3                     | 27.6  | -   |         |
| GR135 | 564657                            | 173764                             | 58.5 |      | 46.5 | 37.6 | 34.9 | 32.2 | 36.0 | -   | 41.3 | 37.2 | 17.4 | 22.4 | 36.4                     | 31.1  | -   |         |
| GR136 | 564686                            | 173828                             | 44.2 | 32.6 | 50.5 | 39.0 | 31.2 | 29.1 | 32.9 | -   | 37.3 | 33.8 | 27.1 | 29.8 | 35.2                     | 30.1  | -   |         |
| GR137 | 570719                            | 171143                             | 43.0 | 22.8 | 47.5 | 28.8 | 25.6 | 24.8 | -    | -   | 31.3 | 29.9 | 32.7 | 29.1 | 31.6                     | 27.0  | -   |         |
| GR138 | 570583                            | 169549                             | 42.8 | 33.4 | 34.2 | 20.5 | 25.5 | 22.7 | 21.4 | -   | 24.5 | 29.6 | 31.5 | 33.2 | 29.0                     | 24.8  | -   |         |
| GR139 | 563178                            | 173976                             | 50.6 | 34.2 | 46.4 | 32.3 | 29.4 | 27.1 | 31.2 | -   | 31.0 | 32.8 | 35.1 | 30.7 | 34.6                     | 29.6  | -   |         |
| GR140 | 564955                            | 174098                             | 53.5 | 31.4 | 50.0 | 42.0 | 30.6 | 16.8 | 32.3 | -   | -    | -    | 29.8 | 37.6 | 36.0                     | 30.8  | -   |         |
| GR141 | 569588                            | 169603                             | 41.0 | 27.3 | -    | 20.0 | 13.2 | 22.4 | 20.9 | -   | 23.5 | 27.4 | 23.3 | 29.2 | 24.8                     | 21.2  | -   |         |
| GR142 | 567500                            | 169836                             | 65.5 | 55.9 | 51.5 | 37.8 | 47.2 | 47.4 | 45.4 | -   | 46.0 | 58.0 | 47.3 | 49.9 | 50.2                     | <b>42.9</b>   | 32.2  |         |
| GR143 | 564646                            | 173745                             | 47.7 | 32.5 | 39.0 | 31.4 | 28.8 | 22.6 | 27.5 | -   | 30.0 | 34.1 | 34.2 | 34.5 | 32.9                     | 28.2  | -   |         |
| GR144 | 564728                            | 172826                             | 46.6 | 32.1 | 40.0 | 31.4 | 28.5 | 27.2 | 28.9 | -   | 32.0 | 27.3 | 35.4 | 36.8 | 33.3                     | 28.5  | -   |         |
| GR145 | 565336                            | 174066                             | 54.0 | 27.5 | 43.3 | 33.8 | 58.2 | 24.5 | 28.3 | -   | 25.3 | 24.5 | 27.6 | 30.2 | 34.3                     | 29.3  | -   |         |
| GR146 | 567150                            | 171231                             | 29.2 | 15.8 | 23.9 | 15.7 | 10.6 | 9.8  | 11.4 | -   | 16.1 | 13.5 | 13.5 | 19.9 | 16.3                     | 13.9  | -   |         |
| GR147 | 567051                            | 168432                             | 44.4 | 21.6 | 34.7 | 24.6 | 18.3 | 18.6 | 27.2 | -   | 26.3 | 21.4 | 17.5 | 29.7 | 25.8                     | 22.1  | -   |         |
| GR148 | 571572                            | 172847                             | 26.5 | 12.9 | 21.5 | 11.8 | 11.4 | 9.0  | 11.5 | -   | -    | 14.3 | 16.6 | 21.0 | 15.7                     | 13.4  | -   |         |
| GR149 | 571445                            | 172881                             | 29.1 | 15.4 | 11.8 | 13.6 | 12.3 | 10.7 | 12.7 | -   | -    | 14.3 | 12.3 | 19.6 | 15.2                     | 13.0  | -   |         |
| GR150 | 571250                            | 172933                             | 36.1 | 17.7 | 19.9 | 14.8 | 11.1 | 11.7 | 12.4 | -   | -    | 13.3 | 17.9 | 21.3 | 17.6                     | 15.1  | -   |         |
| GR151 | 571371                            | 172270                             | 35.8 | 19.6 | 27.1 | 17.7 | 16.9 | 15.5 | 16.6 | -   | -    | 18.4 | 23.4 | 24.3 | 21.5                     | 18.4  | -   |         |
| GR152 | 562974                            | 173653                             | 26.9 | 23.7 | 31.7 | 23.6 | 19.8 | 18.0 | 19.4 | -   | 21.0 | 20.5 | 23.2 | 25.7 | 23.0                     | 19.7  | -   |         |

☒ All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1.

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

☒ Local bias adjustment factor used.

- ☐ National bias adjustment factor used.
- ☒ Where applicable, data has been distance corrected for relevant exposure in the final column.
- ☒ Gravesham Borough Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40 µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60 µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

### **New or Changed Sources Identified Within Gravesham Borough Council During 2022**

Gravesham Borough Council have identified the following planning applications as having the potential to impact air quality:

**Planning Reference: 20211540**

#### **Development**

Change of use from existing car park. Erection of 4 to 7 storey buildings with a 10 storey tower (Ground + 9 storeys) to provide 156 flats, 2612.40 sqm of commercial space, including office, retail and workshops, with ancillary car parking, open space and access to Eden Place.

#### **Location**

Lord Street Development - Pending Decision - Change of use from existing car park. Erection of 4 to 7 storey buildings with a 10 storey tower (Ground + 9 storeys) to provide 156 flats, 2612.40 sqm of commercial space, including office, retail and workshops, with ancillary car parking, open space and access to Eden Place.

#### **Status**

Pending Decision

### **Additional Air Quality Works Undertaken by Gravesham Borough Council During 2022**

#### **Gravesham Climate Change Annual Report**

Gravesham Borough Council adopted its Climate Change Strategy in December 2021, Gravesham has seen a renewed focus on delivering actions to reduce carbon emissions across council operations, its housing stock, and the wider borough.

Within 2022 Gravesham Council progressed the following:

- Progressed projects to increase the efficiency of council buildings, including the ambitious plans for a new leisure facility at the Cascades Leisure Centre site.
- Commenced a borough-wide programme of electric vehicle charging point installation
- Introduced electric vehicles within its extensive fleet of 110 vans and 25 HGVs.
- Sought government funding to enable the council to retrofit existing council-owned dwellings and increase energy efficiency standards in newly built council homes.
- Supported local residents in improving the energy efficiency of their own properties.
- Worked with local businesses to increase their knowledge and understanding of carbon initiatives within the commercial sector.
- Made improvements to parks and open spaces to promote biodiversity alongside enabling residents and visitors alike to have an appreciation of the health and well-being benefits such facilities can provide.

The full Climate Change Strategy can be accessed here:  
<https://www.gravesham.gov.uk/downloads/file/469/climate-change-annual-report-2022>

## QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2022 were supplied and analysed by SOCOTEC Didcot, the tubes were prepared using the 50% Triethanolamine (TEA) in acetone preparation method. All results have been bias adjusted and annualised where required before being presented in Table A.4.

SOCOTEC participates in the AIR-PT scheme which is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL).

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in AIR-PT is also assessed, by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a 'z' score. A score of 2 or less indicates satisfactory laboratory performance.

Additionally, the precision of the NO<sub>2</sub> diffusion tubes supplied by SOCOTEC have been classified as 'good' for all observations during 2022. This precision reflects the laboratory's

performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Precision summary results are available from the LAQM website.

The passive monitoring network changeover was aligned with the DEFRA LAQM calendar for the 2022 reporting year.

### Diffusion Tube Annualisation

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

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Gravesham Borough Council have applied a local bias adjustment factor of 0.85 to the 2022 monitoring data. A summary of bias adjustment factors used by Gravesham Borough Council over the past five years is presented in Table C.1.

**Table C.1 – Bias Adjustment Factor**

| Monitoring Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|-----------------|-------------------|--|-------------------|
| 2022            | Local             | -  | 0.85              |
| 2021            | Local             | -  | 0.90              |
| 2020            | Local             | -  | 0.89              |
| 2019            | Local             | -  | 0.78              |
| 2018            | Local             | -  | 0.77              |



**Table C.2 – Local Bias Adjustment Calculation**

|  | Local Bias Adjustment Input 1 | Local Bias Adjustment Input 2 |
|--|-------------------------------|-------------------------------|
| Periods used to calculate bias                   | 11                            | 10                            |
| Bias Factor A                                    | 0.87 (0.81 - 0.95)            | 0.84 (0.77 - 0.92)            |
| Bias Factor B                                    | 15% (6% - 24%)                | 19% (9% - 29%)                |
| Diffusion Tube Mean ( $\mu\text{g}/\text{m}^3$ ) | 26.2                          | 21.2                          |
| Mean CV (Precision)                              | 5.9%                          | 3.7%                          |
| Automatic Mean ( $\mu\text{g}/\text{m}^3$ )      | 22.8                          | 17.8                          |
| Data Capture                                     | 99%                           | 99%                           |
| Adjusted Tube Mean ( $\mu\text{g}/\text{m}^3$ )  | 23 (21 - 25)                  | 18 (16 - 19)                  |

**Notes:**

A combined local bias adjustment factor of 0.85 has been used to bias adjust the 2022 diffusion tube results.

**NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

Fall-off with distance calculations were required at 2 passive monitoring locations, where annual mean concentrations were greater than 36  $\mu\text{g}/\text{m}^3$ . Distance correction was applied to passive monitoring sites GR13 and GR142, however annual mean concentrations should be treated with caution because the receptor is more than 20m further from the kerb than the monitoring site. Distance correction calculations were completed using the Diffusion Tube Data Processing Tool version 3.0, in line with the methodology outlined in LAQM.TG(22). Details of these calculations and results are presented in Table C.3.

**Table C.3 – NO<sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m<sup>3</sup>)**

| Site ID | Distance (m): Monitoring Site to Kerb | Distance (m): Receptor to Kerb | Monitored Concentration (Annualised and Bias Adjusted) | Background Concentration | Concentration Predicted at Receptor | Comments  |
|---------|---------------------------------------|--------------------------------|--|--------------------------|-------------------------------------|---|
| GR13    | 2.0                                   | 2.1                            | 37.6   | 26.9                     | 37.5                                | <i>Predicted concentration at Receptor within 10% the AQS objective.</i>  |
| GR142   | 21.4                                  | 46.6                           | 42.9   | 16.8                     | 32.2                                | <i>Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.</i> |

## QA/QC of Automatic Monitoring

2022 data management and ratification for Gravesham Borough Council was carried out by Air Quality Data Management (AQDM) as part of the KentAir contract.

All LSO duties are carried out by Gravesham Borough Council.

Calibrations are carried out every three weeks. These were previously conducted every two weeks, however due to limited staff resources this was not manageable. There does not however appear to be any negative impacts on the data as a result of this. BAM tapes are changed every six weeks in order to coincide with the calibrations.

## PM<sub>10</sub> Monitoring Adjustment

The type of PM<sub>10</sub> monitor(s) utilised within Gravesham Borough Council do not require the application of a correction factor.

## Automatic Monitoring Annualisation

All automatic monitoring locations within Gravesham Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation

**NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

## Appendix D: Maps of Monitoring Locations and AQMAs

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

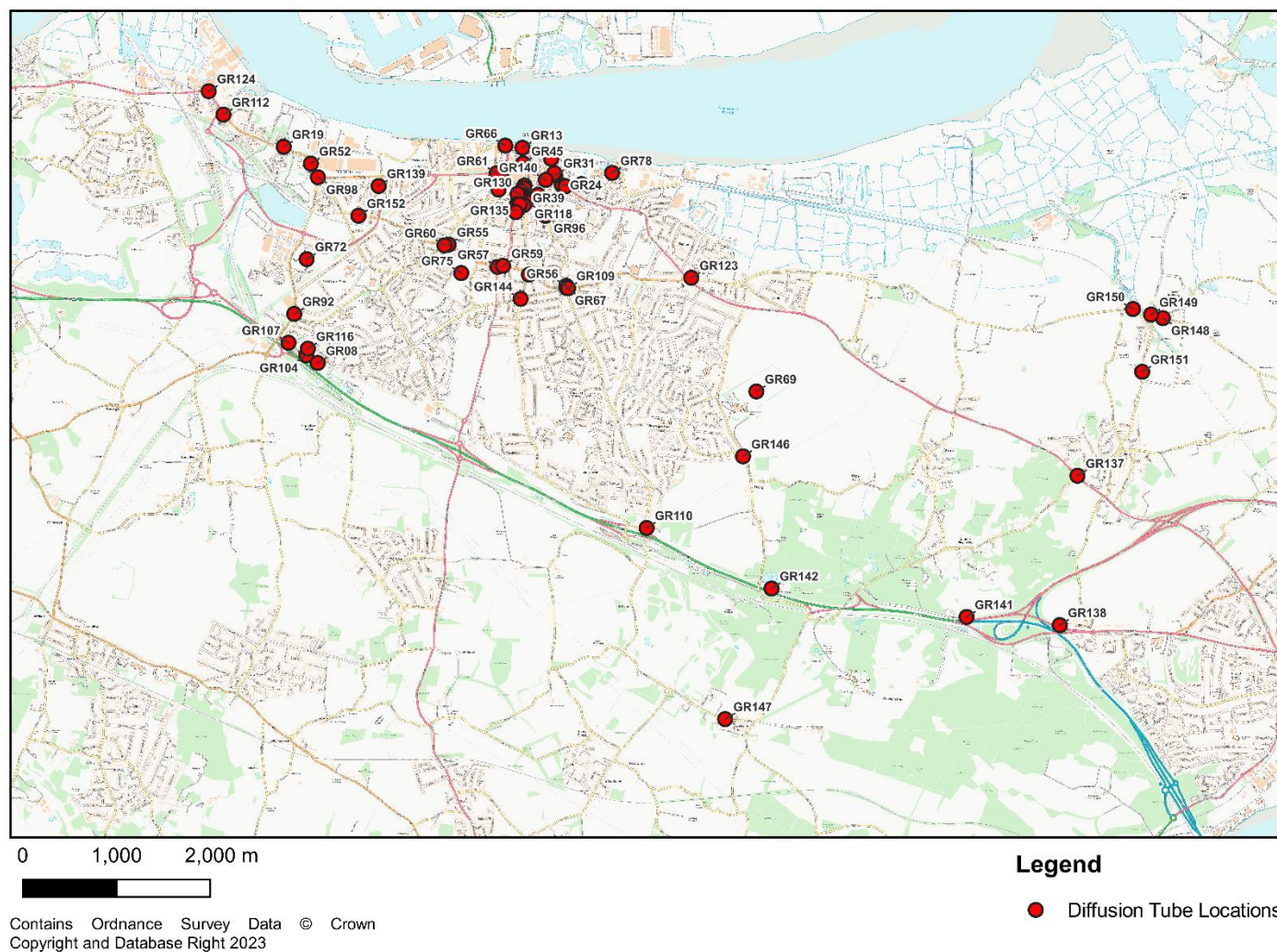




Figure D.2 – Map of Monitoring Sites Within/Near AQMA No.1: Gravesham A2

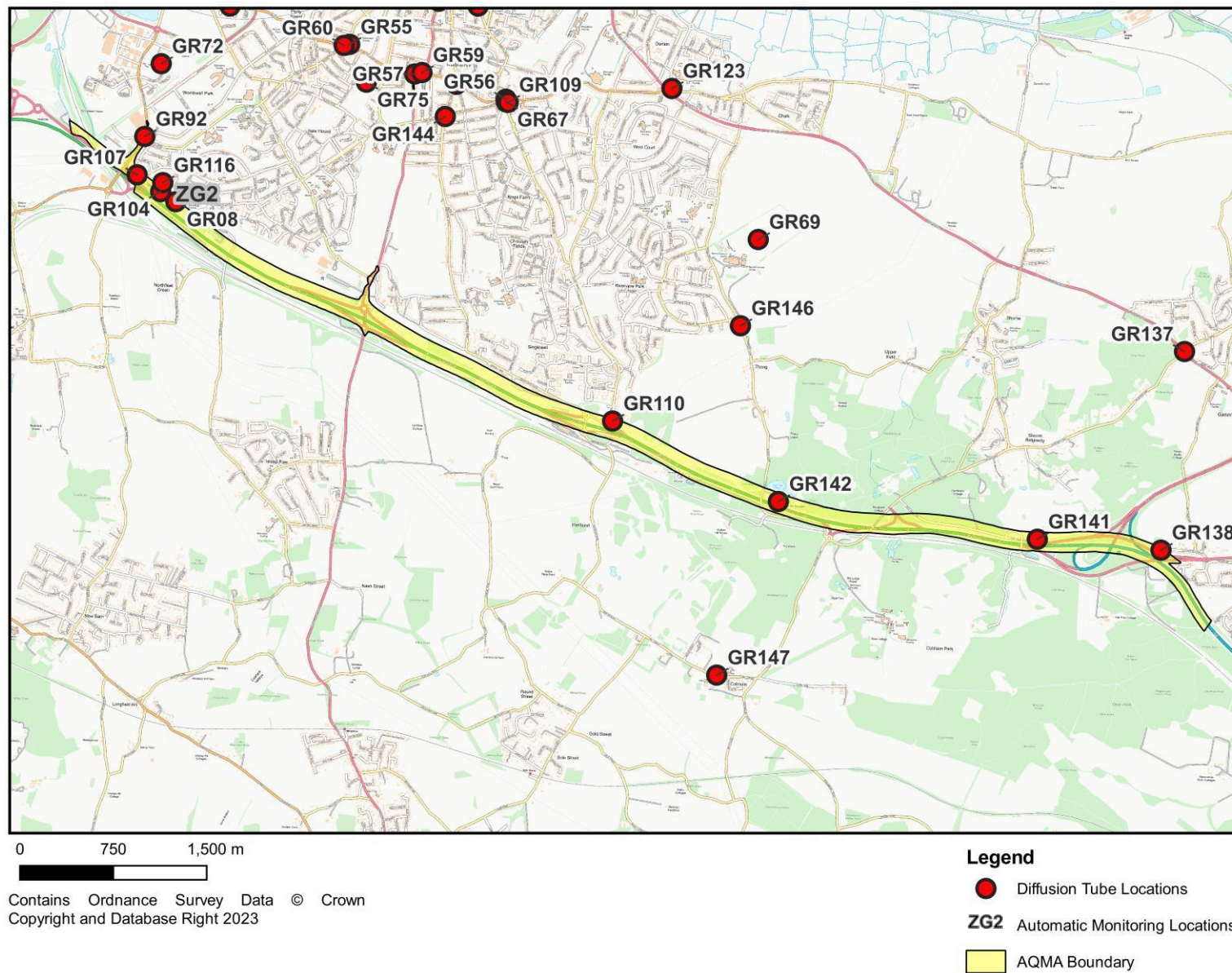


Figure D. 3 - Map of Monitoring Sites Within/Near AQMA No.2: Northfleet Industrial

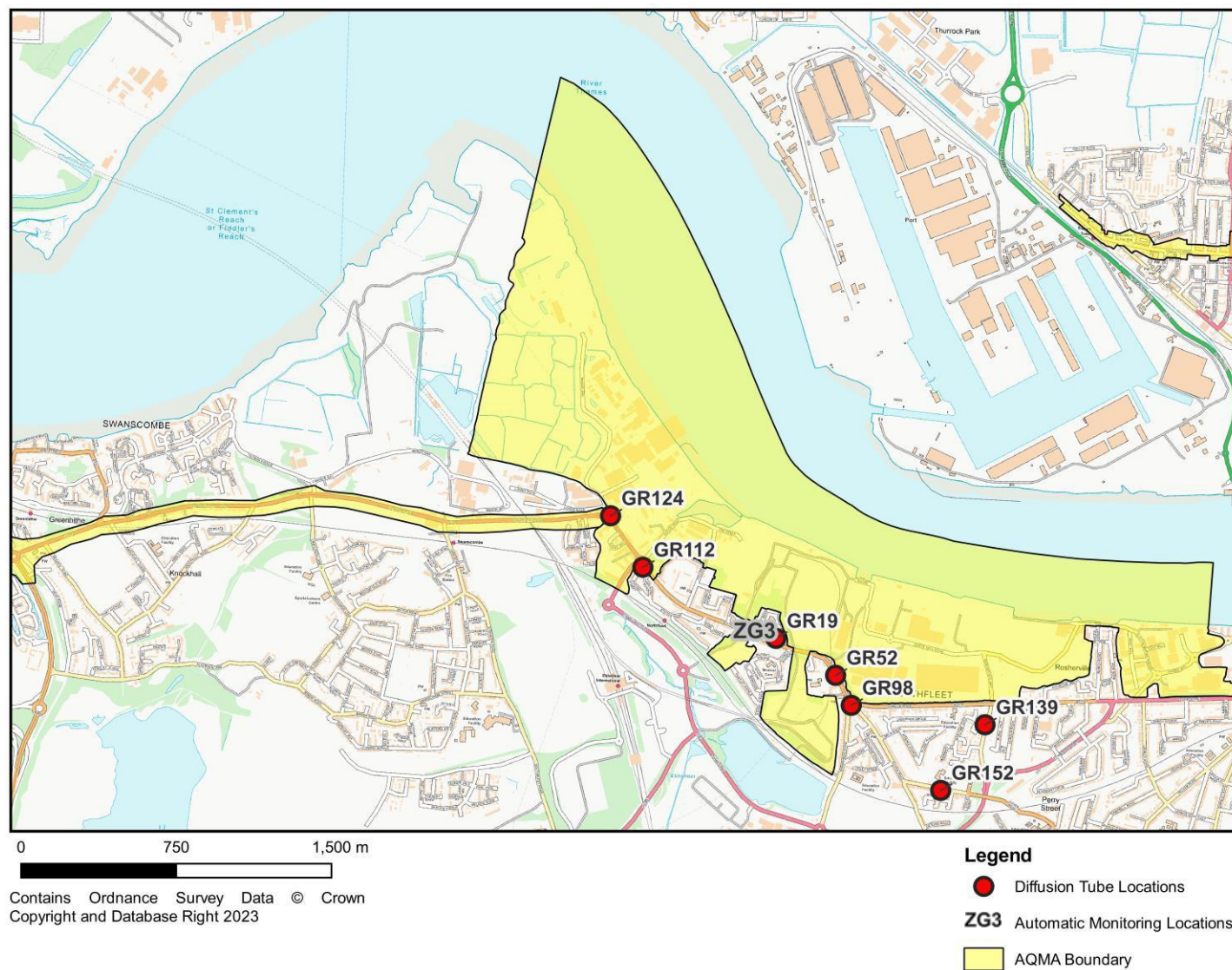




Figure D.4 – Map of Monitoring Sites Within/Near AQMA No.3: A226 One-Way System, Gravesend

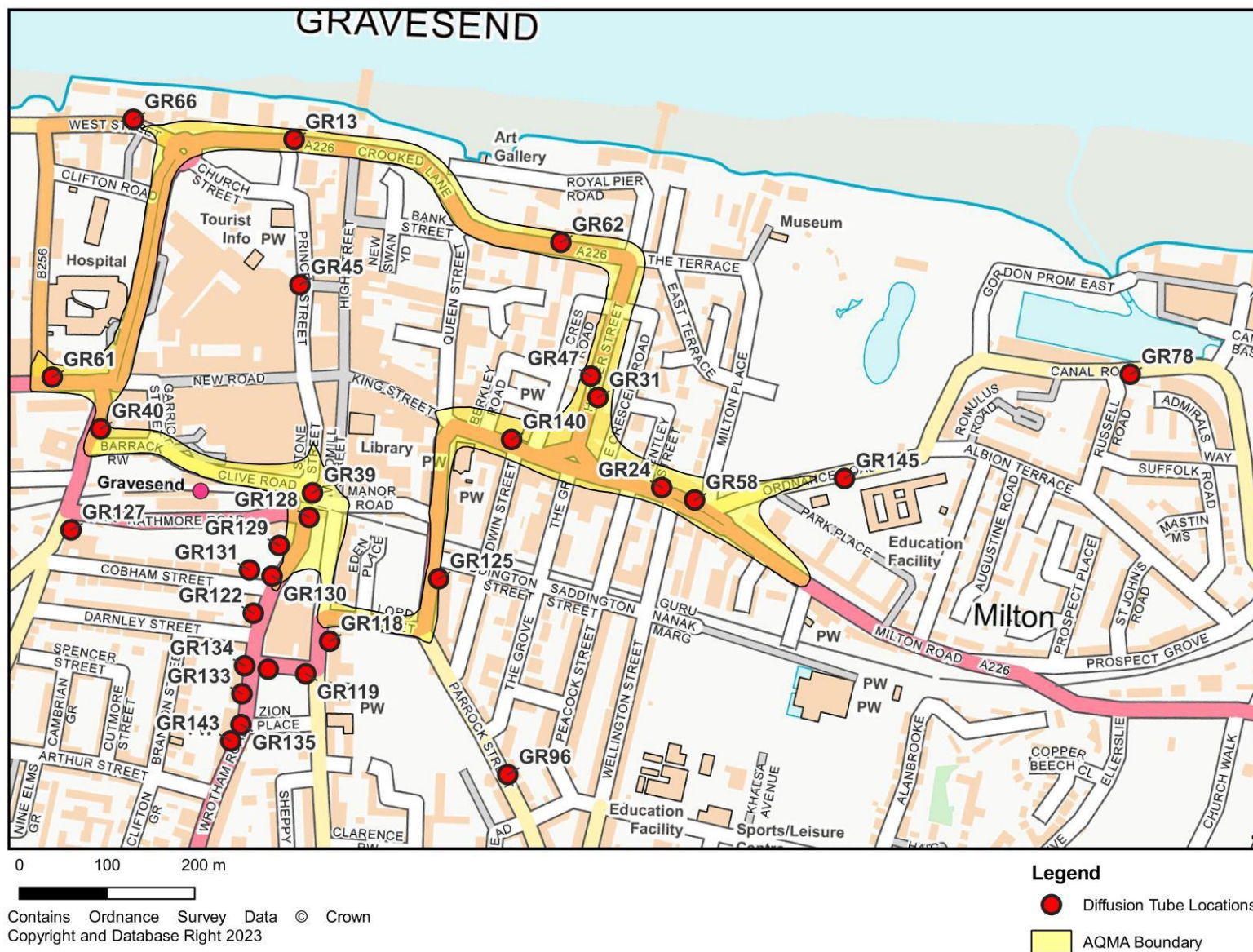
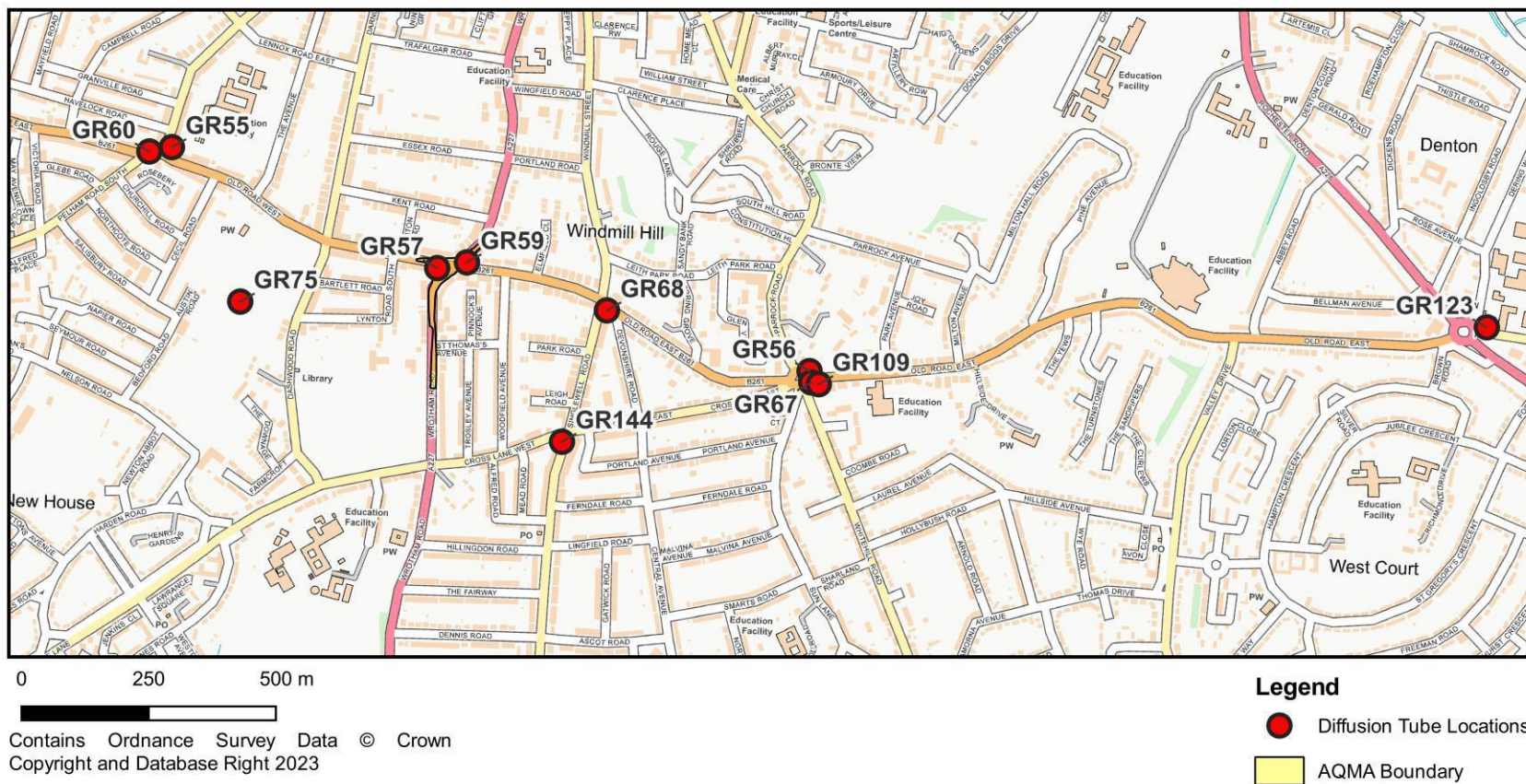
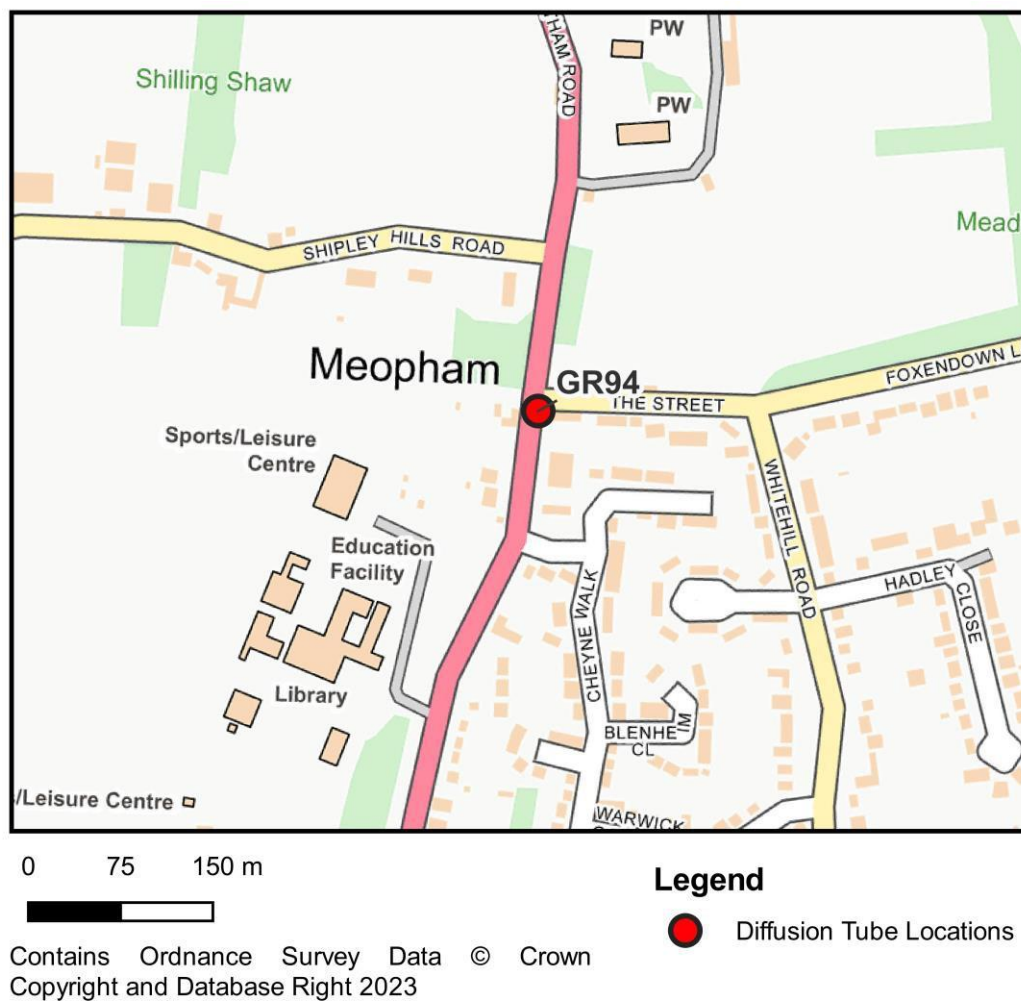


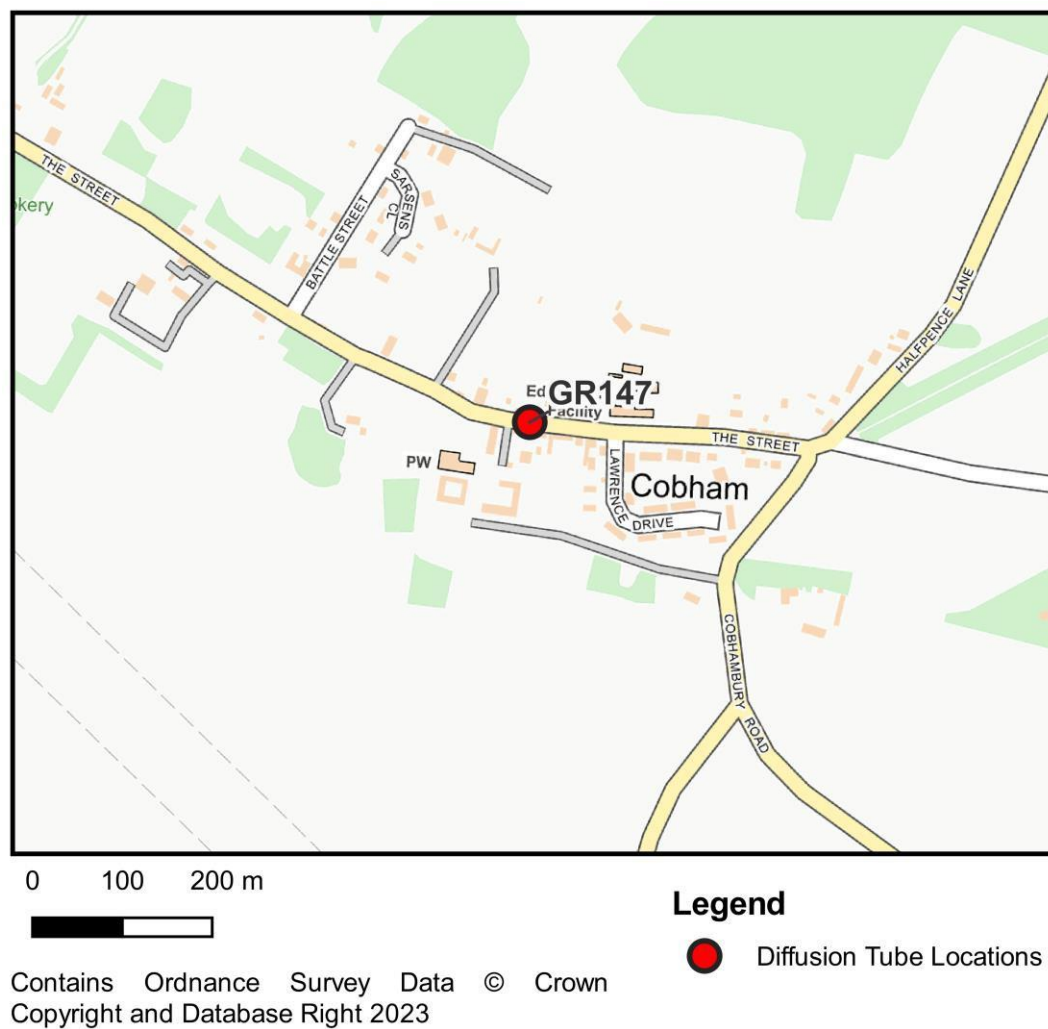


Figure D.5 – Map of Monitoring Sites Within/Near AQMA No.4: A227/B261 Wrotham Road/Old Road West Junction

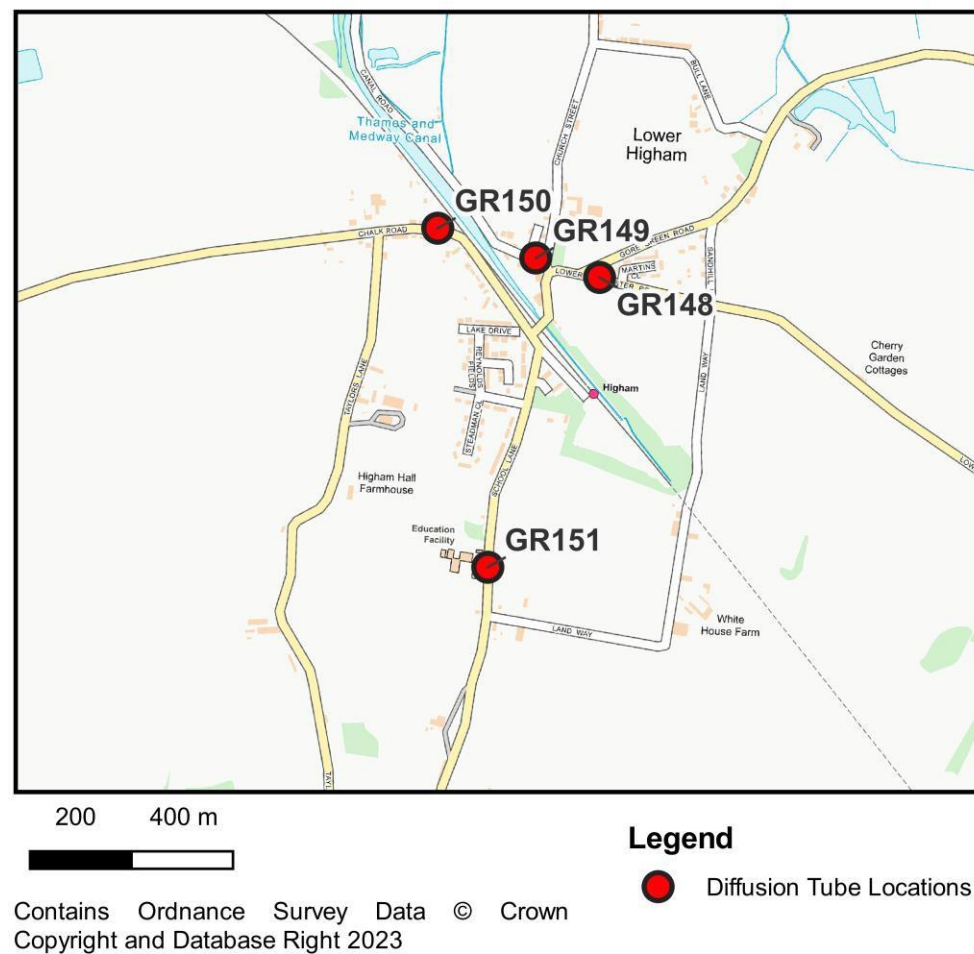




**Figure D.6 – Map of Monitoring Sites Outside of Any AQMA Near Meopham**

**Figure D.7 – Map of Monitoring Sites Outside of Any AQMA Near Cobham**

### Figure D.8 – Map of Monitoring Sites Outside of Any AQMA Near Lower Higham



## Appendix E: Summary of Air Quality Objectives in England

**Table E.1 – Air Quality Objectives in England<sup>8</sup>**

| Pollutant                              | Air Quality Objective: Concentration                                 | Air Quality Objective: Measured as |
|--|--|------------------------------------|
| Nitrogen Dioxide (NO <sub>2</sub> )    | 200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year   | 1-hour mean                        |
| Nitrogen Dioxide (NO <sub>2</sub> )    | 40 µg/m <sup>3</sup>   | Annual mean                        |
| Particulate Matter (PM <sub>10</sub> ) | 50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year  | 24-hour mean                       |
| Particulate Matter (PM <sub>10</sub> ) | 40 µg/m <sup>3</sup>   | Annual mean                        |
| Sulphur Dioxide (SO <sub>2</sub> )     | 350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year | 1-hour mean                        |
| Sulphur Dioxide (SO <sub>2</sub> )     | 125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year  | 24-hour mean                       |
| Sulphur Dioxide (SO <sub>2</sub> )     | 266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year | 15-minute mean                     |

<sup>8</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## Glossary of Terms

| Abbreviation      | Description   |
|-------------------|---|
| AQAP              | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'    |
| AQMA              | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| ASR               | Annual Status Report  |
| Defra             | Department for Environment, Food and Rural Affairs  |
| DMRB              | Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways  |
| EU                | European Union  |
| FDMS              | Filter Dynamics Measurement System  |
| LAQM              | Local Air Quality Management  |
| NO <sub>2</sub>   | Nitrogen Dioxide  |
| NO <sub>x</sub>   | Nitrogen Oxides   |
| PM <sub>10</sub>  | Airborne particulate matter with an aerodynamic diameter of 10µm or less  |
| PM <sub>2.5</sub> | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less   |
| QA/QC             | Quality Assurance and Quality Control   |
| SO <sub>2</sub>   | Sulphur Dioxide   |
| AQS               | Air Quality Standard  |
| SCAs              | Smoke Control Areas   |

## References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Gravesham Brough Council Annual Status Report 2022.