



Reading
Borough Council

Working better with you

2017 Air Quality Annual Status Report (ASR)

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

June 2017

Reading Borough Council

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Executive Summary: Air Quality in Our Area

This Annual Status Report has been undertaken by Reading Borough Council (RBC).

It follows the Department for Environment, Farming and Rural Affairs' (DEFRA) checklists and guidance for screening for potential exceedence of the National Air Quality Objectives (NAQOs) for the pollutants included in the Air Quality Regulations. It has reviewed new monitoring data and changes to sources and receptors since the previous round of Review and Assessment.

During the last round of Review and Assessment, RBC concluded that the NAQOs for all pollutants would be met, except for Nitrogen Dioxide (NO₂). No new areas of exceedence have been identified since the last round of Review and Assessment.

This Annual Status Report has shown that the majority of air quality objectives for all pollutants continue to be achieved, although the NO₂ annual objective continues to be exceeded. None of the areas of exceedence identified fall outside the existing AQMA boundaries.

Therefore no Detailed Assessment is required for any pollutant. The situation will be updated during the 2018 Annual Status Report.

Air Quality in Reading 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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Reading is a heavily built up area, in which the roads get congested during peak times. The main air quality issue identified in Reading are vehicle emissions. NO₂ is the only pollutant exceeding a national objective, but PM₁₀ and PM_{2.5} are also pollutants of concern due to their effects on health even at low concentrations.

Reading Borough Council's monitoring of these pollutants indicates that after years of stagnation the levels are beginning to fall again.

There is currently 1 large AQMA in Reading covering all the major arterial roads in and out of the town as well as the central area. The majority of the AQMA does not exceed national objective levels, but there are hotspot locations along each route that do. https://uk-air.defra.gov.uk/aqma/details?aqma_id=263

Actions to Improve Air Quality

Last year a new taxi emissions policy was introduced. This introduced a maximum age of 15 years for taxis to be licensed to the fleet, but also enabled drivers to be licensed to the fleet for longer if they bought or retrofitted their taxi to be a low emission vehicle running on LPG or electric.

In January Reading Buses introduced the first 5 CNG powered double decker buses in the world to the fleet. 5 second-hand, ex-Stagecoach Optare Solos have also been converted to run on CNG and 1 more Scania E300CNG has been added to the 34 already on the fleet.

We are currently undertaking a no idling campaign across the borough. This campaign is comprised of a school competition for children to design a 'no idling' sign. The winner will have their design incorporated into a sign to be put up in idling hotspots such as outside schools, taxi ranks and bus stops across the borough. This will be complemented by campaign days where officers will go out and talk to motorists who are found to be idling. Those who refuse to turn off their engines after being asked will be issued with a fixed penalty notice.

Key actions undertaken in recent years are:

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

- Introduction of low emission buses. Reading Buses, a Council owned company has the highest proportion of hybrid or CNG powered buses (nearly 50%) of any fleet in the country.
- The introduction of Readybike, the town's own cycle hire scheme, this now has more than 10,000 subscriptions.
- Opening of Reading's largest cycle hub, with space for 600 bicycles
- Christchurch Bridge, the Council's new pedestrian and cycle bridge over the Thames
- two new park and rides at Mere oak and Winnersh, with 1,000 parking spaces.
- new A33 bus lane, speeding up bus journeys and complement the Mere oak site.
- recent work to relieve congestion on the A33 and the A4.
- The recent redevelopment of Reading Station, including new interchanges to the north and south of the station
- The Council has recently completed installing thousands of solar panels on Council and community buildings, with more to come, to reduce emissions and energy bills.

Conclusions and Priorities

Reading Borough Council's monitoring shows that NO₂ is the only pollutant that currently exceeds a national objective within the AQMA. The monitoring also indicates that after years of stagnation the levels are beginning to fall again. No exceedences have been identified outside the AQMA. PM₁₀ and PM_{2.5} are also pollutants of concern due to their effects on health even at low concentrations.

Priorities over the coming year are to continue our no idling campaign to reduce pollutants at idling hotspots. We will also complete a strategic air quality assessment to feed into and minimise the cumulative impact of future developments proposed in the Local Plan.

Local Engagement and How to get Involved

Vehicle emissions standards mean that newer vehicles should cause less pollution than older vehicles. However, air pollution has not fallen as expected. It is now

known that emissions standards have not been effective in real world driving conditions, especially in diesel vehicles. Reading has a good bus service, as well as dedicated cycle and walking routes. These options reduce the amount of pollutants an individual is responsible for emitting and are cheaper and often quicker than driving. Utilising low emission technologies, including vehicles that run on hydrogen or electricity is increasingly a viable alternative.

These alternative modes of transport have additional advantages of reducing our carbon emissions, making Reading a more pleasant place to be and promoting a healthier lifestyle.

If you are sensitive to the effects of air pollution, you may wish to take measures to minimise your exposure such as:

- Limiting the length of time spent in busy roadside locations where the highest pollution concentrations occur.
- Exercise in the morning when ozone levels are lower.

It is particularly important for those sensitive to pollution to take these actions on days when air pollution is forecast to be high. A five day forecast can be found at:

<https://uk-air.defra.gov.uk/>

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1 Local Air Quality Management

This report provides an overview of air quality in Reading Borough Council during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Reading Borough Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at:

https://laqm.defra.gov.uk/images/aqma_maps/Reading.jpg

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan (inc. date of publication)
						At Declaration	Now	
Reading AQMA	19/08/2009	NO2 Annual Mean	Reading	An area encompassing all the main arterial routes in and out of Reading and central area.	YES	57	48	Reading Borough Council AQAP 2015

Reading Borough Council confirm the information on UK-Air regarding their AQMA is up to date

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

Defra's appraisal of last year's ASR concluded Pollutant concentrations have declined over the last few years but remain above the objective within the AQMA. The 24 hourly objective for PM₁₀ has not been exceeded in 2015 and PM_{2.5} concentrations are within the guidelines.

Reading Borough Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans. Key completed measures are:

- Installation of 4 Electric charging points (2 rapid +2 fast) at the Civic offices. This has enabled the introduction of the first EV (the animal wardens van) onto the Council fleet. This is due to be followed by others in the coming year as well as electric pool cars.
- Adoption of a new taxi emissions policy. This will result in the oldest dirtiest taxis no longer being licensed. The policy gives drivers an option to convert their vehicles to run on LPG or alternative clean technology to enable them to be licenced to the fleet for longer.

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

- A no idling campaign targeting idling hotspots such as taxi ranks and outside the front of schools. This is expected to result in a reduction in pollutants in these locations.
- Strategic Air Quality Assessment for Reading Local Plan (2036). This will be used in the consultation process to ensure that the cumulative impact of proposed developments in an area does not adversely impact air quality.
- The Reading section of NCN 422 cross boundary cycle route is scheduled to be completed in spring 2018. This will improve East to West accessibility through Reading by bike.

Reading Borough Council's priorities for the coming year are to complete the tasks set out above. In addition to this the Council will investigate further ways in which emissions from taxis can be reduced. With Reading Buses already being a modern, low emission fleet, taxis are seen as the only remaining mode of public transport within the borough that are relatively old and polluting that could be upgraded to low emission vehicles.

The principal challenges and barriers to implementation that Reading Borough Council anticipates facing are gaining funding to help implement measures. Without further external funding implementation of further actions will not be possible.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Reading Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the Reading AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
RDAQ1	Railway upgrade	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	Network Rail	Ongoing	Sep-17	Reduced congestion Improved journey times Improved air quality	Reduced vehicle emissions	Funding secured, planning phase	Aug-18	Cow Lane works are expected to take place in September 2017 until August 2018.
RDAQ2	Green Park Station	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	RBC, GWR & Network Rail Funded by LEP	Ongoing	Jan-18	Reduced congestion on A33	Reduced vehicle emissions	Implementation ongoing	Dec-18	Planning application approved 2014. Currently Discharging development conditions prior to construction.
RDAQ3	Southern Mass Rapid Transit (MRT)	Transport Planning and Infrastructure	Bus route improvements	RBC Funded by LEP	Ongoing	Date	Improved journey times for public transport Increase in the number of people using public transport for local journeys	Reduced vehicle emissions	Phase 1 a complete Dec 2016. Phase 1b/2 under construction expected completion Dec2017. Further phases continuing to be developed in accordance with LEP plan.	Mar-19	Subject to ongoing funding approval from LEP.
RDAQ4	Eastern MRT	Transport Planning and Infrastructure	Bus route improvements	RBC Funded by LEP	Ongoing	Jul-19	Improved journey times for public transport Increase in the number of people using public transport for local journeys Improved accessibility for pedestrians and cyclists	Reduced vehicle emissions	Funding secured, subject to spend approval. Planning application submitted July 2017. Consultation ongoing.	Mar-22	Subject to detailed designs expected to be complete June 2018.

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RDAQ5	Southern (Mere oak) Park & Ride	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	RBC, WBC	Complete	Complete	Increased use of park and ride facilities	Reduced vehicle emissions	Car park opened August 2015, served by Greenwave buses as a pre-MRT service.	Aug-15	Service improvements dependent upon MRT South completion.
RDAQ6	Winnersh Park & Ride	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	RBC, WBC	Complete	Complete	Increased use of park and ride facilities	Reduced vehicle emissions	Complete with full commercial operation October 2015.	Oct-15	-
RDAQ7	East (Thames Valley Park) Park & Ride	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	WBC Funded by LEP	Complete	Summer 2018	Increased use of park and ride facilities	Reduced vehicle emissions	Implementation on-going	Winter 2019	-
RDAQ8	Traffic signal upgrading	Traffic Management	UTC, Congestion management, traffic reduction	-	-	-	-	-	-	-	No information available on this at present
RDAQ9	A33 Congestion pinchpoint relief scheme	Transport Planning and Infrastructure	Other	RBC Funded by DfT	Complete	Complete	Improved journey times	Reduced vehicle emissions	Complete	Spring 2015	-
RDAQ10	A4 Congestion relief pinchpoint scheme	Transport Planning and Infrastructure	Other	-	-	-	-	-	-	N/A	not taken forward due to unexpected costs relocating services
RDAQ11	Work towards electrification of vehicle fleet	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	RBC	Complete	Ongoing	procurement of electric charge points and vehicles	Reduced vehicle emissions	4 charge points installed at civic offices. 1 electric van on RBC fleet	Ongoing	funding
RDAQ12	Expansion of Ready Bike cycle scheme	Promoting Travel Alternatives	Promotion of cycling	RBC, Hourbike	Complete	Ongoing	Increase in the number of journeys made by ReadyBike	Reduced vehicle emissions	ReadyBike monitoring data shows that 79,559 rentals and 14,506 subscriptions over an estimated 357,224 miles have been made by ReadyBike	On-going	Currently undertaking procurement process to identify new contractor, following the decision to remove ReadyBike subsidy. The Contract is expected to be

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									since the scheme launched in June 2014.		awarded late July 2017 for a minimum 3 year period. As part of the new Contract, existing docking stations may be relocated/removed or new stations installed to ensure the scheme is commercially viable.
RDAQ13	Cross boundary cycle routes	Transport Planning and Infrastructure	Cycle network	RBC, West Berks, Wokingham Council & Bracknell Forest Council Funded by LEP	Ongoing	Ongoing	Increase number of people cycling along cross-boundary routes	Reduced vehicle emissions	Phase 1 expected to be complete by Autumn 2017. Phase 2 expected to commence on-site in the Autumn. Phase 3 to be developed and delivered in parallel to red routes and East Reading Study and complete in March 2018.	Mar-19	Subject to scheme and spend approval.
RDAQ14	Cycle route infrastructure improvements	Transport Planning and Infrastructure	Cycle network	RBC	Ongoing	Ongoing	Increase in the number of people cycling for local journeys	Reduced vehicle emissions	Annual Implementation Plan reported to Traffic Management Sub-Committee in June 2017. Main actions to be taken forward in 2017/18: Thames Path Cycle Track Orders, delivering incentivisation programme EMPOWER, reprocurring ReadyBike and delivering NCN 422 cross boundary scheme.	Mar-18	Thames Path subject to Secretary of State confirming Cycle Track Orders.
RDAQ15	Thames pedestrian/cycle bridge	Transport Planning and Infrastructure	Cycle network	RBC Funded by DfT	Complete	Complete	Increase in number of cycling & walking trips to/from	Reduced vehicle emissions	Complete September 2015. Post-LSTF monitoring data shows an increase in the	Sep-15	-

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							Caversham		number of pedestrians and cyclists crossing the River Thames. The Council is now planning to expand the cycle network in the vicinity of the bridge by changing the legal status of the footpath to shared-use. Public consultation carried out in Summer 2017 resulted in 191 objections to the proposal, which will now be passed to the Secretary of State for determination.		
RDAQ16	Minimising industrial emissions	Environmental Permits	Other measure through permit systems and economic instruments	RBC	ongoing	ongoing	inspections of permitted installations carried out. EP Annual subscriptions and applications. Annual search for unpermitted processes	Reduce industrial emissions to air	Nothing over and above statutory requirements	Ongoing	-
RDAQ17	Through Reading Climate Change Partnership increase business participation in reducing emissions through measures such as cycle to work	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	RBC, Sustainability	Complete	ongoing	Reading climate change partnership	-	-	2020	-

	schemes, reducing building energy, low emission delivery vehicles.										
RDAQ18	Through planning process ensuring that future development does not result in further deterioration of air quality and where possible results in an improvement	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	RBC	Ongoing	ongoing	Air Quality assessments produced for new developments. Monitoring results	-	Strategic AQ assessment to be completed in 2017/18 to focus on cumulative impact of developments feed into LP	2018	-
RDAQ19	Ensure that measures to address air quality do not conflict with climate change actions, by considering the interlinked causal factors and promoting mutually beneficial solutions	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	RBC	Ongoing	Ongoing	-	-	-	-	-

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RDAQ20	Continue Reading Buses investment Programme to ensure the bus fleet has the lowest emissions it can.	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	RBC, Reading Buses	Ongoing	Ongoing			34 CNG buses already on fleet. 5 new double decker CNG and 6 new single deckers introduced this year		
RDAQ21	Continue to explore and implement ways to improve emissions from Readings taxi fleet.	Vehicle Fleet Efficiency	Other	RBC	Ongoing	ongoing	measures introduced to improve emissions from taxis	Reduce taxi emissions	taxi emissions policy introduced to incrementally improve emissions standards of fleet	2020	
RDAQ22	Reduce emissions from idling vehicles at hotspot locations within the AQMA.	Public Information	Via other mechanisms	RBC	Complete	ongoing	reduction on emissions in idling hotspots		competition for children to design a sign to be put out at idling hotspots underway	2018	to be followed up with officers talking to drivers and issuing FPNs where necessary
RDAQ23	Continue to offer Bikeability cycle training to all schools across Reading	Promoting Travel Alternatives	Promotion of cycling	RBC Funded by DfT	on-going	on-going	Increase the number of children cycling to school		Participation in Bikeability continues to increase with almost 1200 children receiving Bikeability training in 2016/17.	Mar-20	Funding secured for the delivery of Bikeability until March 2020, including new Bikeability Plus modules.

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RDAQ24	Continued funding for a Cycle development officer to help promote cycling and deliver the Cycling Strategy.	Promoting Travel Alternatives	Promotion of cycling	RBC Funded by DfT	Complete	Complete	Increase the number of people cycling for local journeys		Complete	Mar-16	RBC to seek new funding opportunities to continue delivering a range of cycling initiatives in the future.
											RBC is planning to develop a Local Cycling & Walking Infrastructure Plan to further encourage people to travel by these modes for local journeys.
RDAQ25	Continue to inspire people to walk more via initiatives such as Beat the Street.	Promoting Travel Alternatives	Promotion of walking	RBC Funded by DfT & CCG	Complete	Complete	Increase the number of people walking for local journeys		Complete	Jul-15	RBC to seek new funding opportunities to continue delivering a range of walking initiatives in the future. RBC is planning to develop a Local Cycling & Walking Infrastructure Plan to encourage more people to consider travelling by these modes for local journeys.
RDAQ26	Continue to monitor air pollution at existing monitoring locations and make results available to view on RBC website.	Public Information	Other	RBC	Complete	Ongoing	Monitoring data available on RBC website. Achieve a good level of data capture.	none	Ongoing	2020	-

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RDAQ27	Investigate the feasibility of introducing locally based alert system to inform residents of forecasted pollution episodes.	Public Information	Other	RBC	Complete	Complete	complete an assessment of the feasibility of such a system	none	Investigations show that uptake would be limited. Cost benefit indicates that it is not currently feasible.	Complete	Although desirable, data shows usage would be low, therefore funding will be sought to implement other measures in preference to a local alert system
RDAQ28	Bonfires - Provide advice to residents and take enforcement action where appropriate to discourage the use of bonfires when disposing of waste material.	Public Information	Via the Internet	RBC	Complete	Ongoing	number of enquiries	unknown	-	Ongoing	-
RDAQ29	Solid Fuel Burning - The Smoke Control Survey 2014; Showed there was a relative lack of	Public Information	Via other mechanisms	RBC	Complete	Complete	responses to survey. Press release in run up to winter	unknown	of 4000 surveys sent our 720 responses were received. Press releases were sent out and webpages were updated with information in an attempt to raise peoples awareness	2016	-

	<p>knowledge of smoke control areas, it is now proposed to inform people of the existence of smoke control areas, how to find out if you live in one and what you should or shouldn't do if you live in one. This will be done through an awareness raising campaign to promote best practice for people heating their homes using wood, coal and other solid fuels.</p>										
RDAQ30	<p>Provide advice, guidance and support to</p>	<p>Public Information</p>	<p>Via other mechanisms</p>	<p>RBC</p>	<p>Ongoing</p>	<p>Ongoing</p>	<p>Home energy conservation act report, EPC ratings of houses</p>	<p>unknown</p>	<p>-</p>	<p>-</p>	<p>-</p>

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	improve home energy efficiency through the private sector renewal scheme and winter watch.											
RDAQ31	Generate a larger proportion of energy from renewable sources. 8% by 2020	Promoting Low Emission Plant	Other Policy	RBC	Complete	Ongoing	Government registration	unknown	2020	-	-	

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Reading Borough Council is taking the following measures to address PM_{2.5}:

The corporate plan includes the following target - Narrow the gap to the national average (5.3%) of deaths in over 25s linked to PM_{2.5}. In order to do this it is proposed to continue to implement the AQAP.

The action plan targets anthropogenic emissions of pollution from vehicles, industry and other sources. Although the action plan was drawn up to address exceedences of NO₂ objectives, PM_{2.5} is a pollutant that is emitted from the same sources, so where an action reduces emissions of NO₂, PM_{2.5} will also be reduced.

The following non transport related measures from table 2.2 above may more directly help to address mortality from anthropogenic PM_{2.5}:

Measure No. RDAQ16 (industrial emissions), RDAQ27 (bonfires) and RDAQ28 (solid wood burning)

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Reading Borough Council undertook automatic (continuous) monitoring at 3 sites during 2016. Table A.1 in Appendix A shows the details of the sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. National monitoring results are available at http://www.airqualityengland.co.uk/local-authority/?la_id=278.

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

Reading Borough Council undertook non- automatic (passive) monitoring of NO₂ at 56 sites during 2016. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided at: <http://www.airqualityengland.co.uk/local-authority/reading-diffusion-tubes>. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

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

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

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

As can be seen from graph C.1 in appendix C below, background concentrations of nitrogen dioxide measured at Reading new Town AURN rose sharply in 2016 to 34µg/m³.

The Kings Road AQMS was moved to London Road to become DEFRA affiliated. In it's first year of operation the new London Road AQMS monitored levels of NO₂ below the annual average NAQO for NO₂ (32µg/m³). The other two roadside monitoring stations Oxford Road (30µg/m³) and Caversham Road (39µg/m³) were also both below the annual mean NAQO for NO₂.

None of the continuous monitoring stations indicate an exceedence of the 1- hour mean objective.

3.2.2 Particulate Matter (PM₁₀)

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

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

None of the continuous analysers have recorded an exceedence of the annual mean objective (40 µg/m³) in 2016.

None of the sites exceeded the 24hour objective (more than 35 exceedences of 50 µg/m³), due to the low capture rate at London Road (64%) it was necessary to annualise the data (shown in brackets). However it can be seen that also using this method the site did not exceed the 50 µg/m³ objective.

3.2.3 Particulate Matter (PM_{2.5})

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

The annual mean concentrations monitored at the AURN have been steadily decreasing since their monitoring began, although in 2016 there was a slight increase in the annual mean concentration.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
Reading AURN	AURN	Urban Background	473441	173198	NO ₂ ; PM ₁₀ ; PM _{2.5} ; O ₃	NO	Chemiluminescent; TEOM FDMS; UV Photometrics	N/A	100	2.5
RD1	Caversham Rd	Roadside	471153	174429	NO ₂ , PM ₁₀	YES	Chemiluminescent; Beta-Attenuation Mass	2	3	1.5
RD3	Oxford Rd	Roadside	468700	174126	NO ₂ , PM ₁₀	YES	Chemiluminescent; Beta-Attenuation Mass	9	6	1.5
RD4	London Rd	Roadside	473703	173409	NO ₂ , PM ₁₀	YES	Chemiluminescent; Beta-Attenuation Mass	16	3.5	1.5

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT01	Kings Oak Flats, Queens Road	Roadside	Roadside	173223	NO2	Y	0	5.5m	N	2.5
DT02	AUN Co-location	Urban Background	473467	173207	NO2	N	N/A	N/A	Y	2.5
DT03	AUN Co-location	Urban Background	473467	173207	NO2	N	N/A	N/A	Y	2.5
DT04	AUN Co-location	Urban Background	473467	173207	NO2	N	N/A	N/A	Y	2.5
DT05	Wycliffe Church	Roadside	473072	173204	NO2	Y	10	2m	N	2.5
DT06	17 Church Road (Earley)	Roadside	474421	172054	NO2	Y	0	3m	N	2.5
DT07	162 London Road	Roadside	473490	173326	NO2	Y	0	6.5m	N	2.5
DT08	419 London Road	Roadside	473729	173432	NO2	Y	0	9m	N	2.5
DT09	276 Kings Road	Roadside	472716	173218	NO2	Y	0	10m	N	2.5
DT10	10-20 Hieatt Close	Roadside	471919	172684	NO2	Y	0	5m	N	2.5
DT11	Shinfield Rd above hedge	Roadside	473338	170269	NO2	Y	10	5m	N	2.5
DT12	Shinfield Rd side of shop	Roadside	473354	170482	NO2	Y	5	1m	N	2.5
DT13	495 Basingstoke Road	Roadside	471709	170043	NO2	Y	10	8m	N	2.5
DT14	102 Whitley Street	Roadside	472002	172158	NO2	Y	0	6.5m	N	2.5

DT15	Red Cow, Southampton Street	Roadside	471685	172853	NO2	Y	0	1.5m	N	2.5
DT16	44 Crown Street	Roadside	471717	172856	NO2	Y	0	4.5m	N	2.5
DT17	4 Tilehurst Road	Roadside	470628	173076	NO2	Y	2	3m	N	2.5
DT18	162a Castle Hill	Roadside	470835	172992	NO2	Y	0	8m	N	2.5
DT19	128 Castle Hill	Roadside	470987	173016	NO2	Y	0	2.5m	N	2.5
DT20	Blenheim Terrace	Roadside	471061	173018	NO2	Y	2	3m	N	2.5
DT21	144 Bath Road	Roadside	468287	172172	NO2	Y	0	5m	N	2.5
DT22	Tilehurst Rd / Water Road	Roadside	468866	173071	NO2	Y	5	2m	N	2.5
DT23	Norcot/School Lane	Roadside	467041	174000	NO2	Y	5	5m	N	2.5
DT24	689 Oxford Road	Roadside	468978	173895	NO2	Y	0	2.5m	N	2.5
DT25	744 Oxford Road	Roadside	468967	173935	NO2	Y	0	2.5m	N	2.5
DT26	762 Oxford Road	Roadside	468915	173967	NO2	Y	0	4m	N	2.5
DT27	606 Oxford Road	Roadside	469230	173814	NO2	Y	0	6.5m	N	2.5
DT28	494 Oxford Road	Roadside	469470	173715	NO2	Y	0	5m	N	2.5
DT29	Cow Lane Bridges	Roadside	470230	173818	NO2	Y	20	1m	N	2.5
DT30	327 Oxford Road	Roadside	470057	173489	NO2	Y	0	7.5m	N	2.5
DT31	252 Oxford Road	Roadside	470080	143511	NO2	Y	0	3.5m	N	2.5
DT32	281 Oxford Road	Roadside	470294	173445	NO2	Y	0	6.5m	N	2.5

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DT33	165 Oxford Road	Roadside	470717	173373	NO2	Y	0	4m	N	2.5
DT34	10 Trinity Place	Roadside	470738	173433	NO2	Y	0	7.5m	N	2.5
DT35	Picture House	Roadside	471113	173487	NO2	Y	0	5m	N	2.5
DT36	Sackville Street	Roadside	471177	173641	NO2	Y	0	0.5m	N	2.5
DT37	Vachel Street	Roadside	471174	173705	NO2	Y	0	25m	N	2.5
DT38	Garrard Street	Roadside	471422	173694	NO2	Y	0	1.5m	N	2.5
DT39	Friar Street nr Nandos	Roadside	471437	173589	NO2	Y	7	5m	N	2.5
DT40	Station 1	Roadside	471400	173400	NO3	YES	20	1m	NO	2.5
DT41	Station 2	Roadside	471325	173818	NO4	YES	25	1m	NO	2.5
DT42	33 Caversham Road	Roadside	471123	173734	NO2	Y	0	3m	N	2.5
DT43	59a Caversham Road	Roadside	471169	173869	NO2	Y	0	4m	N	2.5
DT44	50 Cardiff Rd	Roadside	470828	174076	NO2	Y	4	4m	N	2.5
DT45	125 Cardiff Road	Roadside	470866	174059	NO2	Y	0	2m	N	2.5
DT46	Railway Depot	Roadside	470899	174017	NO2	Y	20	N/A	N	1.5
DT47	197 Caversham Road	Roadside	471161	174379	NO2	Y	0	7m	N	2.5
DT48	Caversham Co-location	Roadside	471156	174424	NO2	Y	5	5m	Y	1.5
DT49	Caversham Co-location	Roadside	471156	174424	NO2	Y	5	5m	Y	1.5
DT50	Caversham Co-location	Roadside	471156	174424	NO2	Y	5	5m	Y	1.5

DT51	108 Caversham Road	Roadside	471293	174236	NO2	Y	0	6.5m	N	2.5
DT52	31a Vastern Road (lampost)	Roadside	471420	174129	NO2	Y	3	3m	N	2.5
DT53	131 Caversham Road	Roadside	471261	174236	NO2	Y	0	7m	N	2.5
DT54	14 Church Road (Caversham)	Roadside	471103	174774	NO2	Y	0	2.5m	N	2.5
DT55	Caversham Café	Roadside	471401	174790	NO2	Y	0	2m	N	2.5
DT56	Baron Cadogan PH	Roadside	471461	174840	NO2	Y	0	5m	N	2.5
DT57	45 Prospect Street	Roadside	471558	174919	NO2	Y	0	1.5m	N	2.5
DT58	59 Prospect Street	Roadside	471599	174966	NO2	Y	0	1m	N	2.5
DT59	60 Prospect Street	Roadside	471557	174944	NO2	Y	0	3m	N	2.5
DT60	241 Gosbrook Road	Roadside	471942	174600	NO2	Y	0	6m	N	2.5
DT61	68 George Street (Caversham)	Roadside	471913	174490	NO2	Y	0	3m	N	2.5
DT62	40 George Street	Roadside	471909	174543	NO2	Y	0	3.5m	N	2.5

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2012	2013	2014	2015	2016
AURN	Urban Background	Automatic	76	76	25	27	27	22	34
RD1	Roadside	Automatic	98	98	47	43	41	38	39
RD3	Roadside	Automatic	98	98	38	43	35	31	30
RD4	Roadside	Automatic	90	75	-	-	-	-	32

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

If applicable, all data has been distance corrected for relevant exposure

Notes:

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

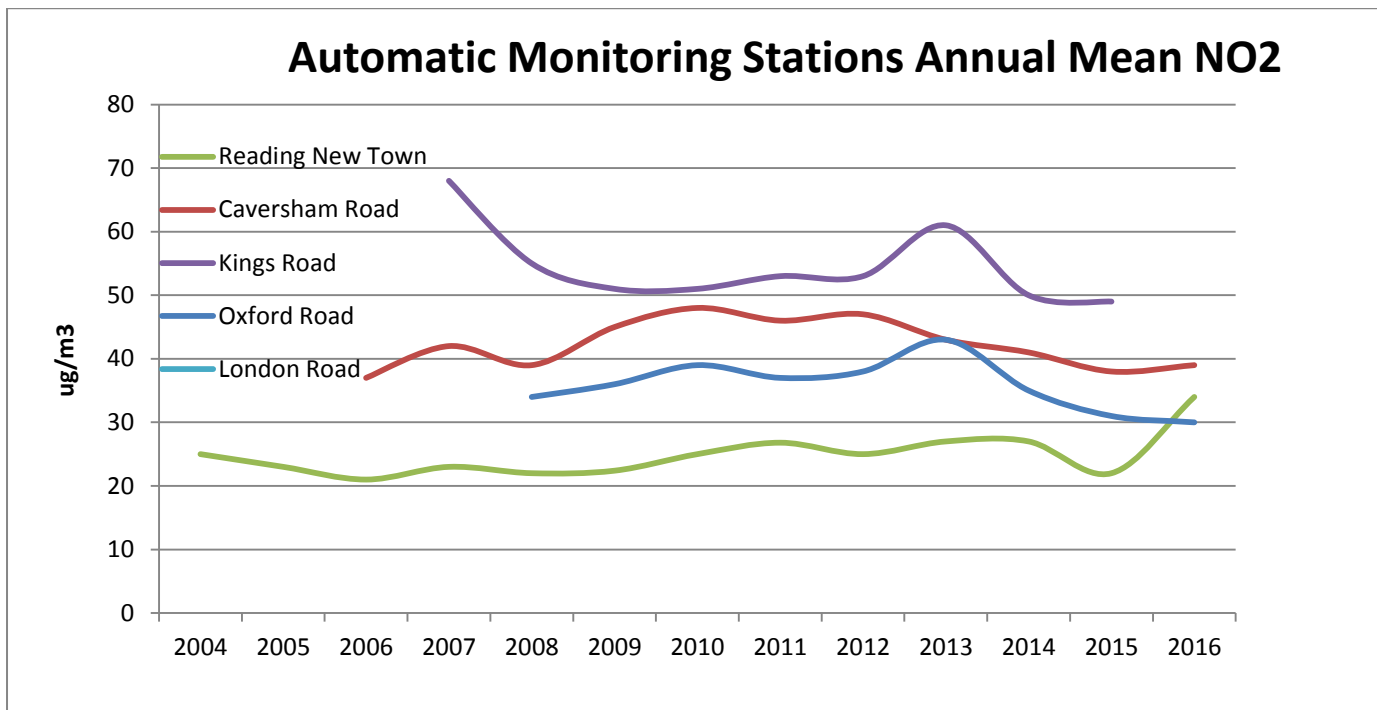


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2012	2013	2014	2015	2016
AURN	Urban Background	Automatic	76	76	0	0	0	0	4(112)
RD1	Roadside	Automatic	98	98	0	3	0	1	0
RD3	Roadside	Automatic	98	98	0	3(156)	0	0	0
RD4	Roadside	Automatic	90	75	-	-	-	-	0

Notes:

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

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

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

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

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2012	2013	2014	2015	2016
AURN	Urban Background	96	96	18	13	14	12	13
RD1	Roadside	92	92	32	34	33	28	20
RD3	Roadside	96	96	24	20(23)	20	23	22
RD4	Roadside	96	64					19(19)

Annualisation has been conducted where data capture is <75%

Notes:

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

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

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

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

Figure A.2 – Trends in Annual Mean PM₁₀ Concentrations

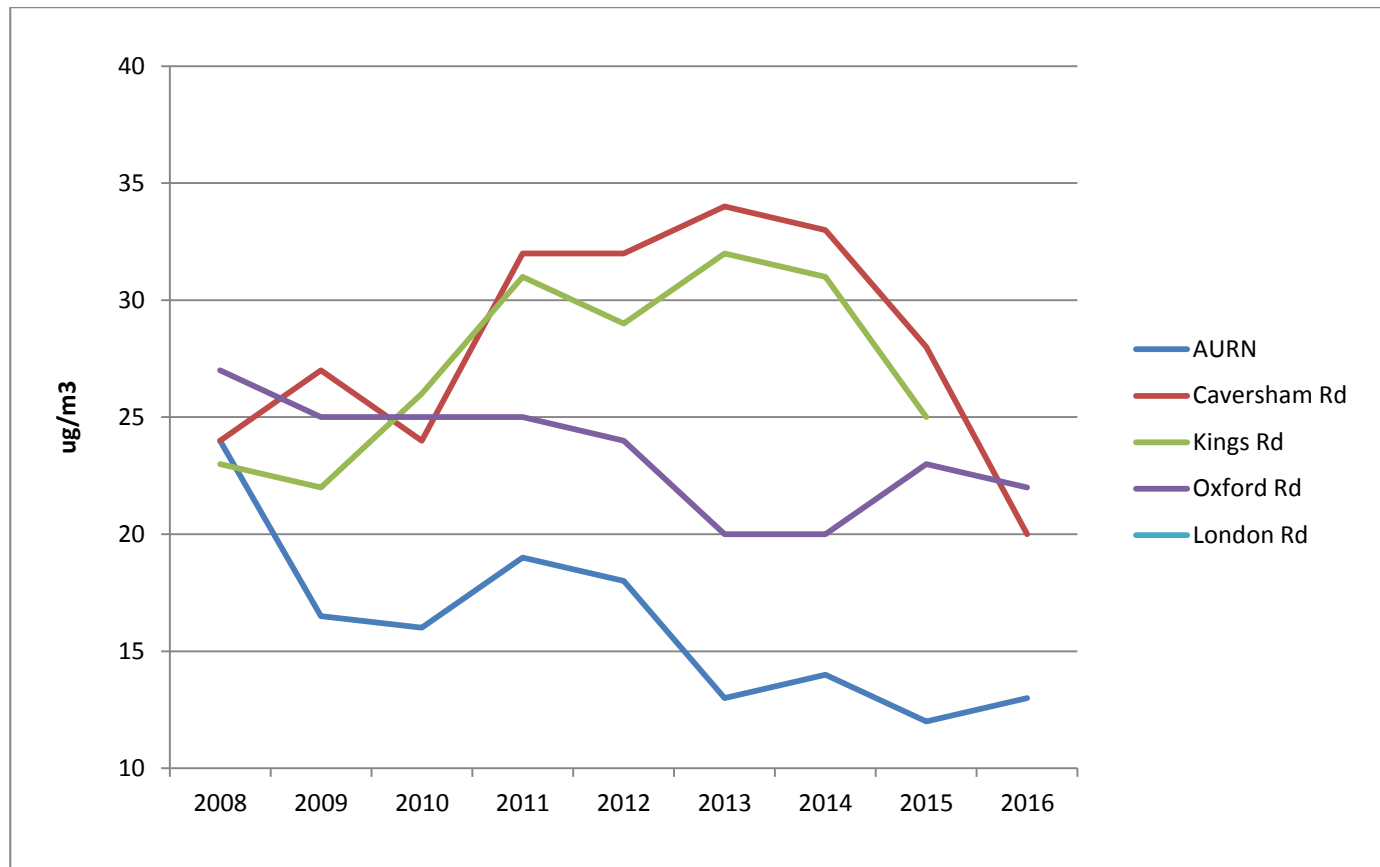


Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2012	2013	2014	2015	2016
AURN	Urban Background	96	96	8	-	0	0	3
RD1	Roadside	92	92	33	34	31(51)	8(41)	5
RD3	Roadside	96	96	13	4(49)	3	7	3
RD4	Roadside	96	64	-	-	-	-	2(30)

Notes:

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

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

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

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

Table A.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2012	2013	2014	2015	2016
AURN	Urban Background	88	88	12	10	10	7	9

Annualisation has been conducted where data capture is <75%

Notes:

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2016

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (1.03) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Kings Oak Flats	30.61	17.65	32.53	32.75	29.53	32.42	26.38	26.24	35.67	37.10	39.90	40.08	31.74	32.69	32.69
AURN	22.20	16.16	16.71	17.31	16.17	14.35	11.17	11.95	18.25	21.45	25.23	32.11	18.59	19.15	
AURN	23.21	13.97	19.79	16.87	15.99	10.87	12.29	12.62	17.40	20.36	24.86	26.75	17.91	18.45	
AURN	25.12	16.05	19.34	17.98	15.85	13.01	11.58	11.75	18.15	19.93	26.20	28.37	18.61	19.17	
Wycliffe Church						40.39	41.64	34.49	58.14	50.23	51.60	57.74	47.75	49.18	44.1
17 Church Rd Earley	43.45	24.67	36.39	38.28	38.95	37.11	35.71	33.66	44.56	37.14	46.41	51.31	38.97	40.14	40.1
162 London Rd	47.85	23.83	31.59	35.83	43.09	41.14	37.68	36.00	52.38	40.44	46.47	53.13	40.79	42.01	42.0
London Rd (419)	41.6	29.77			43.97			36.98	45.39	41.6		45.58	40.34	41.55	41.6
276 Kings Road	38.28	23.63	25.66	29.22	31.62	28.14	25.98	25.35	37.56	35.28	37.05	38.23	31.33	32.27	32.3
Hieatt Close	37.48	18.75	31.16	29.25	30.52	26.52	26.88	23.74	35.62	28.42	39.01	45.31	31.06	31.99	32.0
Shinfield Rd/Whitley Wood Rd	36.23	24.66	32.81	24.94	27.59	26.52	33.93			35.33	38.85	45.90	32.68	33.66	32.9

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Shinfield Rd/Cedar Rd	40.11			35.54	38.54	38.17		33.86		38.38	49.39	53.84	40.98	42.21	39.5
495 Basingstoke Road	33.99	23.22	28.86	28.17		31.29	30.15	24.31		31.40	39.13	46.36	31.69	32.64	32.1
102 Whitley Street	32.65	21.42	26.68	24.65	25.12	24.78	23.00	21.55	32.09	30.68	34.90	39.53	28.09	28.93	28.9
Red Cow	40.39	22.98	38.73	33.03	37.53	38.22	26.33	28.81	41.77	42.70	43.12	51.22	37.07	38.18	38.2
44 Crown Street	34.33	22.90	33.70	33.76	33.48	31.56	33.84	32.64	47.56	39.48	44.16	47.14	36.21	37.30	37.3
Blenheim Terrace	45.40	26.68	36.64	33.88	38.22	36.65	32.76	33.40	40.19	40.63	48.07	47.51	38.34	39.49	39.5
128 Castle Hill	35.16	25.16	45.57	39.43	41.50	41.33	38.32	39.19	63.40	52.20	53.88	53.13	44.02	45.34	45.3
162a Castle Hill	34.01	26.61	34.75	35.01	33.62	35.65	29.53	30.88	40.29	40.04	41.88	45.48	35.65	36.72	36.7
6 Tilehurst Rd	32.32	22.17	27.51	31.10	26.72	25.09	21.17	21.13	34.37	32.20	36.21	44.06	29.50	30.39	30.4
Water Rd/Tilehurst Rd Jct	35.90	23.63	30.58	37.30	35.58	31.68	25.33	23.17	30.08	21.53	38.76	41.35	31.24	32.18	32.0
144 Bath Road	28.65	18.50	28.81	25.60	27.71	29.01	22.28	24.52	33.76	32.09	30.91	41.35	28.60	29.46	29.5
Norcot Rd/School Rd Jct	32.11	19.44	22.83	29.54	27.92	21.10	23.80	23.08	26.98	25.75	34.25	44.38	27.60	28.43	28.0
689 Oxford Road	44.27	22.67	34.37	38.95	38.11	35.22	34.84	34.24	50.27	36.63	43.73	51.30	38.72	39.88	39.9
744 Oxford Road	46.60	23.61	44.16	44.35	49.10	47.74	38.51	39.25	45.79	47.72	51.43	58.32	44.72	46.06	46.1
494 Oxford Road	31.77	24.51	43.64	38.12	37.21	37.56	25.11	27.76	37.95	38.63	39.86	43.14	35.44	36.50	36.5
Cow Lane Bridges	35.39	22.01	21.18	28.09	29.43	27.68	25.08	26.32	34.68	35.28	40.08	43.95	30.76	31.69	27.0
252 Oxford Road	36.47	20.72	32.82	29.16	36.22	34.39	26.30	27.10	41.54	36.15	39.40	46.74	33.92	34.93	34.9

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327 Oxford Road	45.17	25.02	34.28	39.53	39.50	36.03	34.83	34.03	54.65	38.56	41.73	44.00	38.94	40.11	40.1
281 Oxford Road	46.51	25.05	36.23	43.18	40.95	41.20	38.81		52.54	42.11	46.32	53.20	42.37	43.64	43.6
10 Trinity Place	29.07	24.00	27.97	31.37	30.62	27.75	20.30	25.41	35.19	33.66	36.74	39.12	30.10	31.00	31.0
165 Oxford Road	51.30	29.38	35.34	41.07	46.62	40.55	40.67	38.76	50.32	39.88	48.00	56.32	43.19	44.48	44.5
Picture House	29.46	20.36	34.01	31.35	32.14	29.71	21.79	23.57	36.16	34.74	38.14	44.09	31.29	32.23	32.2
Sackville Street	37.73	25.29	34.76	39.46	39.13	33.19	29.74	28.49	43.16	35.51	41.07	45.34	36.07	37.15	37.2
Vachel Road	35.45	26.87	30.38	37.16	35.55	33.02	27.94	26.57	39.36	39.31	38.55	41.41	34.30	35.33	35.3
Garrard Street	39.00	31.05		42.10	43.73	40.83	30.10			44.65	45.23	51.88	40.95	42.18	42.2
Friar Street	48.71	30.97	53.12	48.78	51.69	50.84	42.04	48.39	56.50	56.64	54.06	63.47	50.43	51.95	50.1
Station 1 (nr entrance)	50.41	31.31	47.28	55.61	53.34	40.87	36.57	34.13	46.17	45.12	50.87	59.93	45.97	47.35	41.8
Station 2 (bus stops w/n sign)	43.98	27.87	64.38	48.46	49.11	59.66	31.64	36.76	46.39	55.23	59.10	56.69	48.27	49.72	39.5
33 Caversham Road	47.51	25.10	38.93	40.14	44.51	39.67	37.42	37.73	51.67	41.38	48.63	51.89	42.05	43.31	43.3
59a Caversham Road	44.52	23.07	28.69	40.88	41.04		39.48	35.20	53.28	41.09	43.83	48.24	39.94	41.14	41.1
50 Cardiff Rd	40.69	23.73	23.21	22.85	24.66	19.26				23.73	34.12	40.75	28.11	28.96	29.0
125 Cardiff Road	43.18	21.90	21.32	24.60	24.00	20.59	27.30		31.04	19.45	30.97	38.87	27.57	28.39	28.4
131 Caversham Road	46.14	20.89	33.59	28.38	27.87	31.44	33.26	24.75	56.16	31.67	40.56	50.10	35.40	36.46	36.5
31a Vastern Rd	46.59	21.96	30.61	32.00	35.43	27.17	31.23	27.80	44.98	28.36	42.73	56.62	35.46	36.52	36.5

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108 Caversham Road	36.90	32.27	32.72	30.63	45.04	39.65	31.70	33.92	55.17	38.89	45.85	49.15	39.32	40.50	40.5
Caversham Rd AQMS	39.49	20.63	33.31	32.48	37.86	34.25	28.81	33.98	53.16	39.02	40.87	42.41	36.36	37.45	37.5
Caversham Rd AQMS	38.29	26.49	32.72	35.16	38.18	36.71	29.28	31.71	54.94	33.02	40.84	45.62	36.91	38.02	38.0
Caversham Rd AQMS	42.06	22.69	29.51	28.51	39.19	37.34	29.60	32.14	56.10	37.58	39.28	22.93	34.74	35.79	35.8
197 Caversham Road	46.73	21.15		37.16	33.68	26.71	23.46	23.75	35.90	29.79	38.90	51.81	33.55	34.56	34.6
Rail Depot	57.86	26.38	28.63	29.20	29.88	18.77	27.54	31.94	41.57	25.16	39.62	46.60	33.60	34.61	34.4
14 Church Road	41.06	18.48	31.15	33.89	37.26	34.15	36.53	32.51	44.59	35.09	38.25	43.89	35.57	36.64	36.6
Caversham Café/Co-op funeral	45.23	23.21	44.05	44.15	35.55	40.11	33.91	34.33	44.47	45.26	48.72	47.47	40.54	41.75	41.8
Baron Cadogan	44.53	29.69	41.69	41.52	40.83	41.67	42.39	36.29	53.94	44.83	59.23	55.06	44.31	45.64	45.6
60 Prospect Street	34.30	26.18	32.21	28.69	35.92	34.05	29.12	28.14	36.20	33.20	39.71	42.12	33.32	34.32	34.3
59 Prospect Street	52.06	29.86	44.01	35.61	48.80	40.16	44.16	38.19	68.20	45.67	52.55	57.57	46.40	47.80	47.8
45 Prospect Street	41.10	24.22	35.01	30.91	32.85	32.11	35.64	29.42	44.14	34.30	44.06	55.65	36.62	37.72	37.7
241 Gosbrook Road	42.11	27.47	29.18	28.39	30.94	29.95	32.22	31.23	45.62	32.33	39.24	43.82	34.38	35.41	35.4
68 George Street	33.96	23.56	33.13	32.08	28.74	30.67	27.65	24.70	44.48	32.42	34.84	40.04	32.19	33.15	33.2
40 George Street	49.83	26.85	38.98	40.06	40.26	32.58	45.50	37.81	54.05	39.04	51.23	55.31	42.63	43.90	43.9

Local bias adjustment factor used

National bias adjustment factor used

Annualisation has been conducted where data capture is <75%

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

Table B.2 – NO₂ Annual Mean Diffusion Tube Results – 2012-2016

Site	2012	2013	2014	2015	2016
20-30 New Bright Street	33	33	32	-	-
Kings Oak Flats, Queens Road	37	39	38	33	33
AUN Co-location	23	22	20	18	19
AUN Co-location	21	24	21	18	18
AUN Co-location	21	24	21	18	19
Wycliffe Church	-	-	-	-	49
17 Church Road (Earley)	44	43	45	42	40
Alfred Sutton PS	33	33	34	-	-
162 London Road	46	48	50	48	42
419 London Road	47	49	46	43	42
276 Kings Road	36	34	37	33	32
10-20 Hieatt Close	41	39	38	34	32
Shinfield Rd above hedge	34	37	33	30	34
Shinfield Rd Whiteknight sign	33	35	32	-	-
Shinfield Rd side of shop	41	41	43	39	42
Elm Road	-	-	29	27	-
495 Basingstoke Road	33	32	34	31	33
52 Kingsley Close	32	34	-	-	-
102 Whitley Street	33	36	36	32	29
Red Cow, Southampton Street	42	44	45	38	38
44 Crown Street	39	43	43	36	37

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Mundesley Street	31	35	32	-	
4 Tilehurst Road	33	35	35	29	30
162a Castle Hill	40	39	40	36	37
128 Castle Hill	46	55	52	45	45
Blenheim Terrace	44	43	41	40	39
144 Bath Road	29	35	31	30	29
Tilehurst Rd / Water Road	37	39	37	34	32
Norcot/School Lane	-	-	32	28	28
689 Oxford Road	45	42	45	40	40
744 Oxford Road	51	51	55	47	46
762 Oxford Road	34	35	44	-	-
606 Oxford Road	33	34	32	-	-
494 Oxford Road	38	38	38	35	37
Cow Lane Bridges	34	35	37	31	32
327 Oxford Road	50	47	49	43	40
252 Oxford Road	41	43	37	32	35
281 Oxford Road	47	49	48	45	44
165 Oxford Road	52	48	51	47	44
10 Trinity Place	33	37	32	31	31
Picture House	34	34	34	30	32
Sackville Street	44	41	43	40	37
Vachel Street	38	36	38	33	35
Garrard Street	38	52	41	42	42

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Friar Street nr Nandos	52	52	53	47	52
Station (nr entrance)	-	-	-	-	47
Station (bus stops wn sign)	-	-	-	-	50
33 Caversham Road	69	49	51	48	43
59a Caversham Road	46	42	47	42	41
50 Cardiff Rd	-	38	36	32	29
125 Cardiff Road	-	-	33	32	28
Railway Depot	-	48	42	39	35
197 Caversham Road	44	42	43	39	35
Caversham Co-location	39	41	41	38	37
Caversham Co-location	40	42	40	37	38
Caversham Co-location	38	40	41	37	36
108 Caversham Road	41	43	48	41	41
31a Vastern Road (lampost)	40	38	40	36	37
131 Caversham Road	43	43	47	40	36
14 Church Road (Caversham)	41	41	42	35	37
Caversham Café	45	45	45	42	42
Baron Cadogan PH	52	51	50	44	46
45 Prospect Street	45	45	44	39	38
59 Prospect Street	50	49	58	49	48
60 Prospect Street	38	40	38	35	34
212 Gosbrook Road	43	34	40	-	-
241 Gosbrook Road	43	38	40	35	35

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2 Kings Road (Caversham)	35	33	39	-	-
68 George Street (Caversham)	37	36	38	34	33
40 George Street	50	44	52	42	44

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

QA/QC

Reading Borough Council operate a network of NO₂ passive diffusion tubes, the tubes are supplied and analysed by Gradko International using the preparation method 50% TEA in acetone. The tubes are exposed for approximately one month following the standard exposure calendar, all sites use single tubes other than the co-location studies where triplicate tubes are deployed.

The Gradko laboratory is UKAS accredited, follows the procedures set out in the harmonisation practical guidance and participates in the AIR-PT NO₂ proficiency testing scheme.

Under the AIR-PT scheme Gradko tubes were found to have satisfactory performance under the new criteria using Z- score performance for the most recent AIR-PT rounds 7 to 18 (April 2015 – Feb 2017) as in all previous rounds.

Reading carry out two local co-location studies; one is situated at the Defra AURN urban background analyser, and the other is situated at the RBC owned continuous roadside monitor on Caversham Road. Neither has been submitted to be included in the national spreadsheet of bias adjustment factors this year.

The deadline for submission of our results to the national spreadsheet of bias adjustment factors (BAFs) was missed this year. However, the average from the national dataset has still been applied to the RBC 2016 data (1.03). The national figure was chosen because it has been used as the bias adjustment factor in the previous 10 years, creating a consistent approach, enabling trends in the historic data to be more easily identified

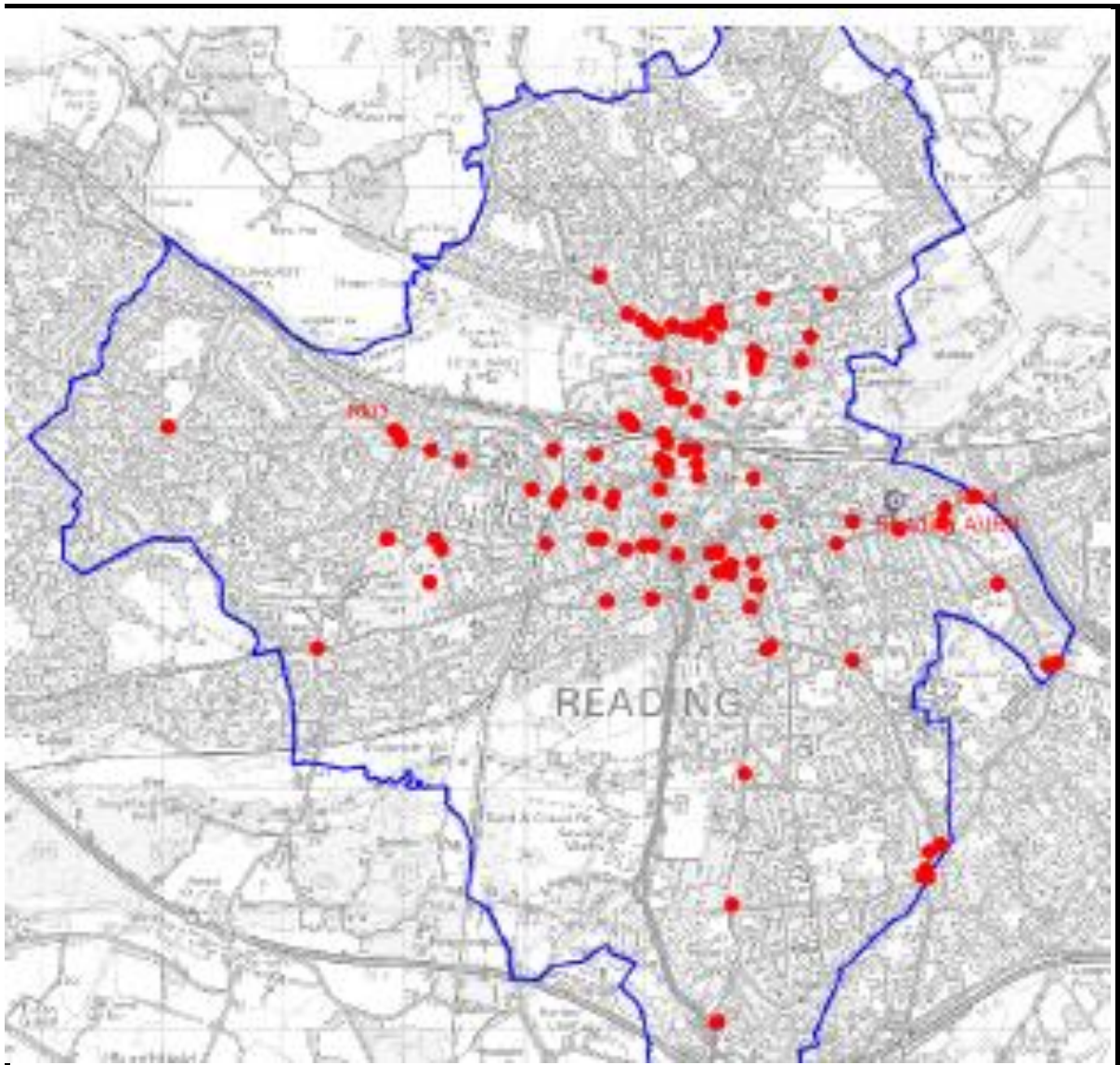
Table C1 Annualised Monitoring Data

London Road AQMS PM10

Site	Annual Mean	Perion Mean	Ratio
London Harlington	15.4	15.9	0.97
Ealing	28.4	28.9	0.98
Reading New Town	13	13.5	0.96
Chilbolton Observatory	14.9	13.6	1.1
Average			1.0

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

Map of Monitoring Locations



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
...	...

References

RBC 2007 Detailed Assessment
RBC 2008 Further Assessment
RBC 2009 Air Quality Action Plan
RBC 2012 Updating & Screening Assessment
RBC 2013 Progress Report
RBC 2014 Progress Report
RBC 2015 Updating & Screening Assessment
RBC 2016 Annual Status Report
RBC 2012 SDPD
Development Control and Planning (EPUK)
Policy Guidance (PG16)
Technical Guidance (TG16)
Practical Guidance 1 – Economic Principles
Practical Guidance 2 – Low Emissions Zones
Practical Guidance 3 – Uptake of Low Emissions Vehicles
Practical Guidance 4 – Uptake of Retrofitting