



2018 Air Quality Annual Status Report (ASR)

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

May 2018

Local Authority Officer	Fiona Brown
Department	Environmental Protection Team
Address	Communities, Environment and Regulatory Services Department Communities and Place Directorate Derby City Council Council House Corporation Street Derby, DE1 2FS
Telephone	01332 642372
E-mail	Fiona.Brown@derby.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Derby City 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}.

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

Derby City Council has declared two Air Quality Management Areas (AQMAs) as a result of exceedances of the annual mean nitrogen dioxide (NO₂) objective, predominantly due to emissions from road traffic. Derby has also been identified as one of a number of Local Authorities where air quality measures need to be introduced, as a result of the National air quality model (PCM) predicting exceedances of the EU Limit Value for NO₂.

A review of monitoring locations was undertaken at the beginning of 2016; consequently, a number of sites were discontinued, and additional sites established, including within the area identified in national modelling as experiencing exceedances. Monitoring at these locations continued in 2017. Measured NO₂ concentrations at long-term monitoring sites indicate that, overall, there has been no discernible change in concentrations in the City.

Actions to Improve Air Quality

An Air Quality Action Plan (AQAP) was prepared in 2011 describing policies and actions relating to six broad categories:

- Reducing vehicle emissions.
- Reducing the impact of new developments.

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

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

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

- Reduce traffic congestion/managing the road network.
- Encourage modal shift away from the private car.
- Promote cleaner vehicle technologies.
- Reduce emissions from non-traffic related sources including domestic, industrial and commercial buildings.

Derby City Council was identified in the 2015 National Air Quality Plan, later updated in July 2017, as one of a number of councils required to introduce urgent air quality improvement measures. Work continues to determine the nature and extent of a range of, primarily traffic-based, measures, designed to deliver the improvements needed in the shortest time possible.

Revised air quality actions are included in this report, which take account of the CAZ work that is underway in the City, however this list is not exhaustive, and many other options are being considered besides.

These projects include:

- Air quality awareness and engagement campaign.
- Go Ultra Low Project, in conjunction with Nottingham City and Nottinghamshire County Councils, including taking forward the provision of additional electric vehicle charging points.
- Retro-fitting of Council's HGV fleet with emissions reduction technology following receipt of Air Quality Grant funding.
- Cleaner taxis research and engagement programme. Funding has been awarded for an electric taxi hub in the city centre.
- Clean Bus Technology Funding – awarded to bus companies to allow retro-fitting emission reduction technology to the local bus fleet.
- The completion of the UK's largest eBike Sharing Scheme.
- Working with local businesses to assist in early uptake of low emission vehicles and identifying available grants.

Conclusions and Priorities

The main priorities for the Council are the need to meet the NO₂ EU Limit Value as soon as possible, continuing the studies to test and implement the CAZ, the development of an overarching Low Emissions Strategy, whilst also identifying a range of complimentary measures that can also help to reduce PM_{2.5} levels. Key challenges will be obtaining funding to implement the required measures, and ensuring that measures are holistic, taking account of both the CAZ and also the existing AQMAs.

Local Engagement and How to get Involved

Everyone can help to improve air quality within Derby. Travel choices can have a significant impact on pollutant emissions; reducing single occupancy car travel; using alternatives such as public transport; and walking and cycling for short journeys all help to reduce emissions. A number of online tools are available to help you plan your journey, including walkit.com and cyclestreets.net.

When you have to travel by car, avoiding excessive acceleration and hard braking will also reduce the impact of the journey.

Derby City Council will once again be supporting Clean Air Day, which falls on the 21st of June 2018. Clean Air Day is an annual event held to raise awareness of the health effects of air pollution, and provide information on what can be done to make air cleaner and healthier for everyone. To find out how you can get involved in this year's event, go to: www.cleanairday.org.uk/Pages/Category/get-involved-in-national-clean-air-day. For suggestions of how you can reduce the amount of air pollution you create, go to: www.cleanairday.org.uk/reduce-air-pollution.



Endorsement from the Director of Public Health

Air pollution is a key Public Health priority, associated with a number of adverse effects across the life course. Sources of air pollution are predominately the result of human activity, and in particular road transport and industrial and domestic combustion.

Even modest reductions in air pollution could have significant direct and indirect benefits for the population of Derby including reductions in Hospital admissions, GP consultations and congestion, and increases in physical activity and economic growth. With levels of traffic and urban development expected to rise, there is a growing need for collaborative action.

Improvements in air quality cannot be achieved in isolation and will require the action of organisations, business and individuals across Derby. The Annual Status Report and Clean Air Strategy include a range of measures which will support long term air pollution improvement for the population of Derby. Public Health will continue to work with partners to advocate for improvements in Air Quality and provide expertise and evidence to inform policy.



Cate Edwynn
Director of Public Health
Derby City Council

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1 Local Air Quality Management

This report provides an overview of air quality in Derby City Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Derby City 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 (AQMA) 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 AQMA declared by Derby City Council can be found in Table 2.1. Further information related to declared or revoked AQMA, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=77.

We propose to review all AQMA boundaries in light of the results of monitoring in recent years; this is likely to include extending the boundary of AQMA No. 1 Ring Roads to encompass properties in St Mary's Court and on Ashbourne Road which currently lie outside of the existing AQMA boundary, but where monitoring has identified the risk of exceedances.

Monitoring within the Spondon AQMA in recent years indicates that it may be possible to revoke this AQMA. The decision to revoke has been postponed pending the results of further monitoring, which has been instigated to confirm the effects of recent road reconfiguration works in the area.

The monitoring section provides further details.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
No. 1 Ring Roads	Declared 01/08/2001, Amended 01/09/2002 and 23/10/2006	NO ₂ annual mean	Derby	An AQMA encompassing the Inner and Outer Ring-Roads in the city, as well as some sections of radial roads and the entire length of Osmaston Road.	NO	63.6	µg/m ³	48.5	µg/m ³	Air Quality Action Plan	2011	Available here .
No.2 A52	Declared 01/08/2001, Amended 01/09/2002 and 23/10/2006	NO ₂ annual mean	Spondon	Sections of the A52, Derby Road and Nottingham Road in Spondon.	YES	40.6	µg/m ³	37.0	µg/m ³	Air Quality Action Plan	2011	Available here .

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

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

Defra's appraisal of last year's ASR concluded that "*The report is well structured, and comprehensive, and provides the information specified in the Guidance*". The specific comments received are as follows:

No.	Comment	Response (if required)
1	The submission of the Annual Status report has taken place during the development of measures towards delivering the air quality objectives based upon a Clean Air Zone, which is being addressed as a separate initiative to this report. Hence the development of CAZ measures will not be considered further within this appraisal.	
2	The City Council have reviewed the current monitoring strategy and introduced diffusion tube monitoring sites more representative of relevant exposure. There are now 76 diffusion tube sites, previously 100, and 1 operative continuous monitoring site, compared to up to 5 in previous years.	
3	There is no clear explanation in relation to intentions to continue with continuous monitoring within the city. The presentation of long term trends show little signs of significant improvement in pollution levels at long term monitoring sites, suggesting that the measures within the existing AQAP are not addressing the key sources of the	<p>The Alkmund's Way automatic monitoring site, located adjacent to Bass Recreation ground on the A601 between Holms Bridge and The Cock Pitt, was commissioned at the beginning of 2017 and data for this site are presented in this report.</p> <p>Derby City Council are developing a Low Emissions Strategy for the City</p>

	emissions giving rise to the pollution exceedances.	and are working towards the implementation of the CAZ. A revised AQAP will be prepared alongside this.
4	The results for diffusion tube monitoring have not been corrected for distance, and results have not been presented on the latest ASR Template. It will be particularly important in future years to ensure that the monitoring strategy is maintained as a basis for determining the degree of emissions reductions required from future action plan and CAZ measures. Local monitoring should determine the location of pollution hotspots as a basis for determining future action plan measures.	The ASR preparation commenced prior to the 2017 template being made available. The majority of exceedances measured in 2016 were within the existing AQMA. A fall off with distance calculation was performed for DT57 (see Appendix C of the 2017 ASR), as this tube measured a concentration in excess of $40\mu\text{g}/\text{m}^3$, is located outside of an existing AQMA, and is closer to the road than nearby relevant exposure; therefore there was a risk that the AQMA boundary would need to be amended. This was discussed in the ASR. At all other locations, the monitoring was either on the façade of the relevant exposure, or the results of a fall off with distance calculation would not have changed the conclusion of the report. Fall off with distance calculations have been performed for 2017 data at all locations where the monitoring is not representative of relevant exposure.
5	This process is clearly described for the development of Air Quality Action Plans, within the latest Policy and Technical Guidance from Defra, particularly Chapter 2 of LAQM TG(16), which details the recommended approach for	Modelling is underway to inform the CAZ implementation, as well as the revised AQAP. This will identify the pollution hotspots and main sources contributing to the exceedance to inform the appropriate measures

	<p>developing an action plan. The basis of the approach involves gaining an understanding of the current level of excess emissions giving rise to the air quality exceedance, with knowledge from a source apportionment of which pollution sources are contributing to the excess. Without this approach, there is no basis for assuming that measures that are otherwise prescribed to reduce emissions are likely to be effective.</p>	<p>and actions. Relevant guidance provided by Defra will be followed as appropriate.</p>
6	<p>If the data from source apportionment is to reliably inform the Action Plan process, the traffic data needs to include local details on traffic congestion, queuing and delays on the relevant road sections. It is only when emissions from congested traffic are accounted for that a realistic picture of traffic emissions can be considered as a basis for developing further actions.</p>	<p>Modelling underway for the CAZ implementation takes account of the guidance provided by Defra. The results of the modelling will be fully evaluated and used, as appropriate, to inform the measures and actions, and to understand their likely effectiveness. Further details will be provided in the AQAP.</p>
7	<p>The purpose of source apportionment is to provide an informed starting point in relation to where measures that are likely to be effective in addressing the pollution exceedances, need to be targeted. It is likely that traffic management measures that consider the management of traffic through the AQMA area will be required to address the pollution exceedances.</p>	
8	<p>This process is described in detail within the latest Technical Guidance LAQM TG(16) from Defra in Chapter 2, Section 7.104-106 and Box 7.6. The</p>	

	Guidance makes clear that: “ <i>The AQAP should only be considered in detail once the source and extent of the problem are clearly understood</i> ”. [Ref: LAQM TG(16) para 2.30].	
9	Hence air pollution emissions reduction targets, should underpin the further development of Action Plan.	
10a	The latest Technical Guidance LAQM TG(16), para 2.69 makes clear, as a minimum AQAP’s should include the following: Quantification of source contributions (e.g. HGVs, buses, taxis, other transport, industrial or domestic sources etc.) responsible for the exceedance of the relevant objective; knowing the source of the problem will allow the AQAP measures to be effectively targeted.	
10b	The latest Technical Guidance LAQM TG(16), para 2.69 makes clear, as a minimum AQAP’s should include the following: Quantification of impacts of proposed measures including, where feasible, expected emission and concentration reductions (either locally obtained and/or via national monitoring/modelling statistics). It is important that the local authority shows how it intends to monitor and evaluate the effectiveness of the plan.	
11	We agree that AQMA2 for Spondon should be considered for revocation, and AQMA1 amended to include additional	Due to road reconfiguration in the area including the Spondon AQMA, a decision to revoke has been

	areas of exceedance. The Council may wish to consider the fast track procedure, as detailed in LAQM TG(16) for the AQMA amendment.	postponed pending the results of further and additional monitoring.
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Derby City Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of ongoing measures are set out in Table 2.2. These measures are included in the revised AQAP.

Derby City Council continue to develop the Low Emissions Strategy for the City (first phase completed successfully), and to design and implement the CAZ, with a completion date of 2018.

The Council is working alongside Defra's Joint Air Quality Unit, Public Health England, the East Midlands Air Quality Network, Derbyshire County Council, Derbyshire Air Quality Working Group, local bus operators and businesses, and developers to implement and deliver proposed measures.

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
1	eBike Sharing Scheme	Alternatives to private vehicle use	Other	Derby City Council / D2N2 Local Enterprise Partnership	Complete	In progress	Unknown	Unknown	Installation of docking stations started April 2018	Ongoing	
2	Feasibility Study for Clean Air Zone	Promoting Low Emission Transport	Low Emission Zone (LEZ)	Derby City Council / Joint Air Quality Unit	Ongoing	Ongoing	Unknown	>3µg/m ³	Ongoing	2018	
3	Clean Air Zone Implementation	Promoting Low Emission Transport	Low Emission Zone (LEZ)	Derby City Council / Joint Air Quality Unit	Ongoing	Ongoing	Unknown	>3µg/m ³	Ongoing	2020	
4	Develop Electric Vehicle Charging Strategy (EVCS) for the City	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Funding
5	Develop Low Emissions Strategy for the City	Policy Guidance and Development Control	Low Emissions Strategy	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	First phase successful, second phase on-going
6	A local targeted scrappage scheme for non-compliant vehicles - feasibility/design and implementation	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
7	Cleaner Taxis - taxi duty cycle review and options available to trade	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Data collating underway
8	A programme of awareness raising and data sharing for the CAZ	Public Information	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	To cover several measures - SCRT, GUL, Taxis and Buses
9	Promotion of National Clean Air Day in conjunction with five other CAZ cities (air	Public Information	Other	Global Action Plan (GAP)	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Annual event

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	quality awareness and engagement campaign led by Global Action plan (GAP))										
10	CAZ - Working with businesses to recognise and incentivise action – engaging businesses to encourage early take-up of low emission vehicles to use of low emission vehicles	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Business engagement, PTP, access to government grants
11	Personalised journey planning	Promoting Travel Alternatives	Workplace Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Engagement through business management, site events, website and social media.
12	Community active travel services	Promoting Travel Alternatives	Personalised Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Connected service
13	Travel options for business employees	Promoting Travel Alternatives	Personalised Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Connected service
14	GUL - Go Ultra Low project Promotions and Engagement	Promoting Travel Alternatives	Personalised Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	In partnership with Nottingham, promotion and engagement about EVs
15	Funding secured to retrofit DCC Fleet	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	SCRT tender prepared, awaiting final comments from DEFRA
16	Encourage bus companies to enforce policies about idling engines and the benefits of smoother driving	Promoting Low Emission Transport	Other	Derby City Council/Bus operators	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Work as part of partnership
17	GUL - increase in public network charging points	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Installation of additional charge points on public network
18	Ensure that air pollution is taken into consideration when assessing applications for planning permission and ensure mitigation is secured via planning conditions where necessary	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
19	Consider the air quality impact of proposals in the regeneration of the city centre through the City	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Derby City Council, Derby Cityscape	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	

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	Centre Regeneration Framework and Spatial Planning										
20	Develop Supplementary Planning Guidance on Air Quality - including AQ assessment standards and minimum AQ mitigation requirements for proposed Development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Derby City Council, PHE, EMAQN	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
21	Develop Guidance on Air Quality for spatial planners/regeneration	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Derby City Council/PHE/EMAQN	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
22	Seek financial contributions from developments and require mitigating measures such as business travel plans via planning agreements with developers to help mitigate the impacts of developments and support improvements to public transport and sustainable travel modes	Policy Guidance and Development Control	Other policy	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
23	Extend traffic signal control systems to optimise traffic flows and modal priority across the city	Traffic Management	UTC, Congestion management, traffic reduction	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Study underway as part of bus station extension project
24	Monitor air quality following opening of 'Connecting Derby' (new road network) to determine any air quality improvements or issues	Public Information	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
25	Grade separating congested junctions e.g. flyovers and underpasses on A38 and A52	Traffic Management	Other	Derby City Council, Highways England	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
26	Road works permit scheme	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Introduced
27	Implement a range of travel planning and sustainable transport measures across the Council, local schools and businesses, and through a personalised travel planning service. Including	Promoting Travel Alternatives	Workplace Travel Planning	Derby City Council, local businesses	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	

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	home-working, travel awareness, and other measures										
28	Increase the percentage of low floor buses operating in Derby	Promoting Low Emission Transport	Other	Bus operators	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Over 95% compliant
29	Develop a new Strategic Bus Partnership with bus companies to encourage sustainable driving practices and new sustainable vehicles	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Derby City Council, bus operators	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Fleet being retrofitted through CBTF
30	Increase the provision and use of park and ride facilities	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Identify new sites through ongoing development of the network and new commercial and residential developments
31	The development or enabling of a city-centre cycling facility including cycle parking, hire, repair, maintenance, sales, showering, lockers and changing and increase the completed length of the strategic cycle network	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Bid in progress
32	Maintain and improve footway condition and signage for ease of pedestrian access	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
33	New and improved street lighting	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
34	Improve transport interchange and sustainable transport information offer in the city centre, district centres, schools and work places linking bus and rail station facilities and information for cyclists and pedestrians	Promoting Low Emission Transport	Other	Derby City Council, developer	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Bus station extension project commenced
35	Implement 'stop specific' information panels on all bus stops in Derby	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Review as part of city centre partnership with bus operators

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36	Maintain real time information system for bus services at locations across Derby	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Budget pressures to maintain additional sites
37	Upgrade bus shelters	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Review city centre provision as part of contract renewal for advertising locations
38	Enforcement of 'pavement parking' programme	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Scheme introduced
39	Implement intensive sustainable travel marketing and promotion campaign to raise awareness of travel choices including bus, cycle and car clubs/car share, information portals and training programmes	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Covers all measures and communication channels, website, social media, engagement events
40	Expand city wide cycle and pedestrian training, including adult, family and child, commuter and leisure trip training	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Bid in progress
41	Infrastructure improvements for the enhancement of major routes used by alternative modes to the private car, in consultation with local communities and stakeholders to improve accessibility to services and facilities	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Bus station extension project commenced, bus shelter review, cycle network
42	Consider ways of bringing disused railway lines back into use, where they have been safeguarded in the City of Derby Local Plan	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
43	Continue to support national aims to improve rail infrastructure, particularly Midlands Mainline electrification, and the development of High Speed Rail between Derby and London	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	

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44	Lobby Network Rail and DfT Rail for improvements in rail emissions	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
45	Clean Bus Technology Funding awarded to allow bus companies to retrofit their existing fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Derby City Council, bus operators	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Funding received, legal agreements being drawn up
46	Continue to work to reduce emissions from industrial sources by regularly inspecting premises and enforcing legislation in accordance with government guidelines and the Environment Agency	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
47	Include measures to promote good practice on air quality issues to all Council employees via the Staff Travel Plan	Policy Guidance and Development Control	Other policy	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Internal communications, engagement, roadshows. Cross working departments
48	Uttoxeter New Road (A516) Corridor Improvements	Traffic Management	UTC, Congestion management, traffic reduction	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Low emission corridor, Manor Kingsway
49	Cleaner Hackney Carriages and Private Hire Vehicles - Electric taxi hub in city centre -	Promoting Low Emission Transport	Taxi emission incentives	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Funding awarded
50	A61 Route Improvements Scheme	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Low emission corridor
51	Support development of East Midlands Air Quality Network	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area-wide Strategies to reduce emissions and improve air quality	Derby City Council / PHE	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Regular meetings and actions ongoing

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52	Commitment to provide annual report on air quality to Derbyshire Health Protection Board and Derby City Health and Well Being Board	Policy Guidance and Development Control	Other policy	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Next report being prepared for 4th May 2018
53	Support Air Quality Working Group at Strategic and Operational Level	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area-wide Strategies to reduce emissions and improve air quality	Derby City Council / Derbyshire County Council / PHE	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	Regular meetings and actions ongoing
54	Engage with partners to promote workplace policies which support reductions in travel and shift to sustainable travel	Promoting Low Emission Transport	Regional Groups Co-ordinating programmes to develop Area-wide Strategies to reduce emissions and improve air quality	Derby City Council / Derbyshire County Council / PHE	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	
55	Raise awareness of impacts of coal and wood burning	Public Information	Regional Groups Co-ordinating programmes to develop Area-wide Strategies to reduce emissions and improve air quality	Derby City Council / Derbyshire County Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	DEFRA Leaflet now on Council websites (City and County). In addition, Derbyshire County Council Healthy Homes Programme continues to offer grant funding to convert coal fires to gas central heating systems.
56	Provide training and resources to health professionals to support long term condition management	Other	Other	Derby City Council / Derbyshire County Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing	

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.

Derby City Council continues to focus on the need to meet the EU Limit Value for NO₂, however, many of the measures that are to be implemented to improve NO₂ concentrations will also be of benefit to reducing particulate matter concentrations, as they have many of the same sources e.g. vehicle emissions.

In addition, the Council will continue to implement a range of measures designed to address PM_{2.5} more specifically, the following:

- Appropriate enforcement in respect of smoke from domestic bonfires, a zero-tolerance approach to the burning of trade waste and a general policy to discourage bonfires generally;
- Attempt to ensure the submission and agreement of Construction Management Plans (including specific and detailed dust management measures), secured via planning condition/s for all significant developments in the City;
- Development of an air quality focussed policy on the installation and use of domestic and all other non-permit threshold biomass boilers.

Given the now well-known large contribution to PM_{2.5} emissions arising from vehicle break and tyre wear, it is acknowledged that the work being carried out to encourage modal shift from road traffic to walking/cycling is an important part of local action to reduce PM_{2.5}. The Council advocate that, centrally led work to encourage the manufacturing industry to implement significant improvements in tyre and break materials to minimise, or even avoid, wear, is a vital part of the programme to reduce PM_{2.5}.

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

3.1 Summary of Monitoring Undertaken

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

3.1.1 Automatic Monitoring Sites

DEFRA commissioned a new automatic AURN monitoring site adjacent to Bass Recreation ground alongside the A601 between Holms Bridge and The Cock Pitt. This site is described on the DEFRA website as the Derby St Alkmund's Way site, and monitoring commenced at the beginning of 2017.

Table A.1 in Appendix A presents the details of this site. National monitoring results are available at <https://uk-air.defra.gov.uk/data/>.

A map showing the location of the monitoring site is provided in Appendix D. The site is part of the AURN and has been calibrated by DEFRA to national standards.

3.1.2 Non-Automatic Monitoring Sites

Derby City Council undertook non-automatic (passive) monitoring of NO₂ at 74 sites during 2017, one of which is a triplicate co-location with the Warwick Avenue automatic monitoring station (which is currently not in operation). Table A.2 in Appendix A shows the details of the sites.

A review of all monitoring sites was undertaken at the end of 2015, and the locations of a number of tubes were revised so that they better represent relevant exposure; many were moved to the façade of the nearest residential property. In addition, a number of additional sites were established to inform the work being done to support the CAZ. A number of tube relocations have been made for 2018, but during 2017, the tubes remained in the same locations as 2016.

Maps showing the location of the monitoring sites during 2017 are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes 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)

Site type: R – Roadside, K – Kerbside, UB – Urban Background, UC – Urban Centre.

- (1) 0m means the monitor is on the façade of relevant exposure.
- (2) N/A - not applicable; there is no nearby relevant exposure for the annual mean objective, or the site is an UB location.

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

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

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for 2017 with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

The results of the fully adjusted (bias adjusted, and annualised where appropriate), show that there are 11 locations where there are potential exceedances of the annual mean objective have been measured in 2017. Most of these locations are within the existing Ring Road AQMA, however four locations are outside of the existing AQMAs:

DT11 was a new roadside monitoring location in 2016, just outside the AQMA boundary on Eastgate. In 2016, a concentration of 46.5µg/m³ was measured here and in 2017 this concentration reduced to 44.7µg/m³. There is no relevant exposure for the annual mean objective near to this site, and therefore no further action is required for LAQM purposes. This monitoring site has been established to inform compliance with the EU Limit Value, which apply at all locations (except where members of the public do not have access and there is no fixed habitation; on factory premises or at industrial processes; and on the carriageway of roads / central reservations of roads, except where there is normally pedestrian access).

DT34 was a new kerbside monitoring location in 2016, adjacent to the A38. A concentration of 60µg/m³ was measured here in 2016, and this increased to 61.9µg/m³ in 2017. There is no AQMA in the vicinity of this monitoring site. There is relevant exposure nearby, however, monitoring site DT33 is located on the façade of the closest nearby properties. At this site, the measured concentration was 30.9µg/m³. Historically, DT33 has measured concentration well below the objective. No further action is required for this area.

DT57 is a kerbside monitoring location established in 2016 which lies on the boundary of the existing AQMA. It measured a concentration of 54.1µg/m³ in 2016 and 58.0µg/m³ in 2017. A fall off with distance calculation (Appendix C) estimates that the concentration at the façade of nearby residential properties in St Mary's

Court is $41.3\mu\text{g}/\text{m}^3$. The adjacent monitoring site, DT56, which is on the façade of residential properties located within the AQMA measured $40.6\mu\text{g}/\text{m}^3$ in 2016 and $39.8\mu\text{g}/\text{m}^3$ in 2017. This indicates that the concentration estimated using the fall off with distance calculator may be overly precautionary in 2017. Prior to 2016, concentrations at this site were below the annual mean objective. Derby City Council propose to review the AQMA boundary across the City.

DT60 is a monitoring location adjacent to the A52, established in 2016. A concentration of $42.3\mu\text{g}/\text{m}^3$ was measured in 2016 and $42.9\mu\text{g}/\text{m}^3$ in 2017. There is no AQMA near to this monitoring site, and it is located on the façade of a residential property. Concentrations measured at nearby long-term monitoring DT61 (which is also on the façade of residential exposure) have been below the objective in recent years, with a concentration of $31.3\mu\text{g}/\text{m}^3$ measured in 2016. Derby City Council propose to review the AQMA boundary across the City.

Monitoring is carried out at seven locations within the **Spondon AQMA**; measured concentrations at each of the seven sites have been below $40\mu\text{g}/\text{m}^3$ since 2011. There have been recent changes to the road layout in the area and therefore the decision to revoke has been postponed pending the results of further monitoring.

3.2.2 Particulate Matter (PM₁₀)

Derby City Council have not undertaken any PM₁₀ monitoring since 2013. These data have been presented in previous reports and are not repeated here; measured concentrations were well below the relevant objectives.

3.2.3 Particulate Matter (PM_{2.5})

Derby City Council do not currently monitor PM_{2.5} concentrations and have no plans to do so in the future.

3.2.4 Sulphur Dioxide (SO₂)

Derby City Council do not currently monitor SO₂ concentrations and have no plans to do so in the future.

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)
AURN	St Alkmund's Way AURN	Roadside	435763	336306	NO ₂	YES	Chemiluminescent	N/A	3.7	1.2

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 ⁽¹⁾	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽²⁾	Distance to kerb of nearest road (m) ⁽³⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT1	23 Gilbert Close	R	439776	335696	NO ₂	Y	0	10	No	1.8
DT2	10 Kirkleys Ave North	R	440206	335650	NO ₂	Y	0	10	No	1.8
DT3	27 Kirkleys Ave South	R	440198	335611	NO ₂	Y	0	12	No	1.8
DT4	24 Nottingham	R	439899	335348	NO ₂	Y	0	6	No	1.8
DT5	1 Station Road	R	439793	335415	NO ₂	Y	0	8	No	1.8
DT6	23 Leeway	R	439616	335547	NO ₂	Y	0	12	No	1.8
DT7	1 Drury Avenue	R	439851	335674	NO ₂	Y	0	9.5	No	1.8
DT8	198 Derby Road	R	438947	335870	NO ₂	N	0	2	No	1.8
DT9	109 Highfield Lane	R	437382	336044	NO ₂	N	2	19	No	1.8
DT10	203/201 Nottingham Road	R	436700	336637	NO ₂	Y	0	2	No	1.8
DT11	Eastgate (Pentagon)	R	436053	336490	NO ₂	N	N/A	3	No	1.8
DT12	Bass Recreation Ground/The Holmes	UB	439750	336205	NO ₂	N	11	N/A	No	1.8
DT13	16/18 Harrow Road	R	437196	334410	NO ₂	Y	0	8	No	1.8
DT14	713 London Road	R	437090	334432	NO ₂	N	0	5	No	1.8

DT15	938 London Road	R	437676	334090	NO ₂	Y	0	3	No	1.8
DT16	1178 London Road	R	438162	333654	NO ₂	Y	0	5	No	1.8
DT17	7 Raynesway	R	438534	333509	NO ₂	Y	0	8	No	1.8
DT18	772 Osmaston Road	R	436836	332961	NO ₂	Y	0	2	No	1.8
DT19	831 Osmaston Road	R	436992	332713	NO ₂	Y	0	10	No	1.8
DT20	113 Chellaston Road	R	437175	332111	NO ₂	Y	0	10	No	1.8
DT21	376 Osmaston Park Road	K	436869	332783	NO ₂	N	0	1	No	1.8
DT22	523 Osmaston Park Road	R	436809	332824	NO ₂	Y	0	3	No	1.8
DT23	104 Osmaston Park Road	R	435715	333324	NO ₂	Y	0	4.5	No	1.8
DT24	32 Newdigate Street	R	435091	333526	NO ₂	Y	0	2	No	1.8
DT25	80 Newdigate Street	R	435023	333583	NO ₂	Y	0	2	No	1.8
DT26	Warwick Ave monitoring station	K	433680	334536	NO ₂	Y	6	0.3	Monitor not currently operational	1.8
DT27	Warwick Ave monitoring station	K	433680	334536	NO ₂	Y	6	0.3	Monitor not currently operational	1.8
DT28	Warwick Ave monitoring station	K	433680	334536	NO ₂	Y	6	0.3	Monitor not currently operational	1.8
DT29	2a Lime Walk	R	433688	334507	NO ₂	Y	0	2	No	1.8
DT30	430 Uttoxeter New Road	R	433076	335299	NO ₂	Y	0	7	No	1.8
DT31	431 Uttoxeter New Road	R	433189	335326	NO ₂	Y	0	9	No	1.8

DT32	266 Uttoxeter New Road	R	433788	335775	NO ₂	Y	0	2	No	1.8
DT33	150 Radbourne Street	R	433119	336651	NO ₂	N	0	4	No	1.8
DT34	Kingsway / A38	R	433173	336738	NO ₂	N	N/A	5	No	1.8
DT35	199 Uttoxeter New Road	R	433887	335804	NO ₂	N	0	2	No	1.8
DT36	59a Stafford Street	R	434688	336155	NO ₂	N	0	2	No	1.8
DT37	4 Dunkirk	R	434773	335977	NO ₂	N	0	5	No	1.8
DT38	Wilson Street West	R	434900	335846	NO ₂	N	0	16	No	1.8
DT39	201 Abbey Street	R	434849	335650	NO ₂	Y	0	2	No	1.8
DT40	315 Burton Road	R	434279	334921	NO ₂	N	0.2	2	No	1.8
DT41	220 Burton Road	R	434784	335241	NO ₂	Y	0	3	No	1.8
DT42	114a Burton Road	R	435026	335509	NO ₂	Y	0	2	No	1.8
DT43	131 Green Lane	R	435198	335761	NO ₂	N	0	6	No	1.8
DT44	57 Normanton Road	R	435198	335537	NO ₂	Y	0.2	2	No	1.8
DT45	29 Ivy Square off Osmaston Road	R	436045	334869	NO ₂	Y	0	6	No	1.8
DT46	114 Osmaston Road	R	435536	335469	NO ₂	Y	0	2	No	1.8
DT47	Bradshaw Way	K	435570	335672	NO ₂	Y	N/A	1	No	1.8
DT48	London Road/Westfield	K	435484	335813	NO ₂	Y	N/A	2	No	1.8
DT49	59 Osmaston Road	R	435439	335717	NO ₂	Y	0.1	2	No	1.8

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DT50	Royal Telegraph Pub	R	435653	335706	NO ₂	Y	0	2	No	1.8
DT51	176 Siddals Road	R	436008	335943	NO ₂	Y	0	5	No	1.8
DT52	123 Nottingham Road	R	435796	336624	NO ₂	Y	0	3	No	1.8
DT53	63 Nottingham Road	R	435586	336642	NO ₂	Y	0	3	No	1.8
DT54	14 Mansfield Road	R	435439	336817	NO ₂	Y	0	3	No	1.8
DT55	171 Mansfield Road	R	435608	337435	NO ₂	N	0	3	No	1.8
DT56	St Marys Court	R	435203	336779	NO ₂	Y	0	3	No	1.8
DT57	St Alkmunds Way	K	435250	336774	NO ₂	N	11	1	No	1.8
DT58	171/182 Cavendish Court	R	434820	336505	NO ₂	N	0	15	No	1.8
DT59	Stafford Street Burleigh Mews Flats	R	434750	336352	NO ₂	Y	0	4	No	1.8
DT60	189/191 Ashbourne Road	R	433633	336850	NO ₂	N	0	4	No	1.8
DT61	148 Ashbourne road	R	433796	336786	NO ₂	N	0	3	No	1.8
DT62	Millgate, Ashbourne Road	R	434276	336576	NO ₂	Y	0	4	No	1.8
DT63	Friargate / Bridge Street corner	R	434497	336510	NO ₂	Y	0	7	No	1.8
DT64	Bridge Street / Agard Street	R	434530	336577	NO ₂	Y	0	2	No	1.8
DT65	8 / 10 Agard	R	434713	336491	NO ₂	Y	0	2	No	1.8

	Street									
DT66	69 King Street	R	435013	336734	NO ₂	Y	0	4	No	1.8
DT67	26 / 24a Penny Long Lane	UB	434364	337881	NO ₂	N	10	N/A	No	1.8
DT68	Duffield Road (55 West Avenue)	R	434819	337072	NO ₂	Y	0	2	No	1.8
DT69	8 Kedleston Road (Chriopodist)	R	434777	337086	NO ₂	Y	0	8	No	1.8
DT70	Duffield Road/North Street	R	434814	337041	NO ₂	Y	2	4	No	1.8
DT71	5 Duffield Road	R	434937	336916	NO ₂	Y	0	4	No	1.8
DT72	14 The Strand	R	435131	336256	NO ₂	N	N/A	2	No	1.8
DT73	Victoria Street/Corn Market	R	435262	336157	NO ₂	N	N/A	5	No	1.8
DT74	Morledge	R	435539	336147	NO ₂	N	N/A	12	No	1.8
DT75	25 Morledge	R	435477	336176	NO ₂	N	N/A	11	No	1.8
DT76	Council House	UC	435496	336294	NO ₂	N	N/A	>50	No	1.8

Notes:

- (3) Site type: R – Roadside, K – Kerbside, UB – Urban Background, UC – Urban Centre.
- (4) 0m means the monitor is on the façade of relevant exposure.
- (5) N/A - not applicable; there is no nearby relevant exposure for the annual mean objective, or the site is an UB location.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
AURN	R	Automatic	94	94					36.9
DT1	R	Diffusion tube	100	100	30	27	30	29	27
DT2	R	Diffusion tube	100	100	29	29	28	29	29
DT3	R	Diffusion tube	100	100	28	25	25	26	25
DT4	R	Diffusion tube	92	92	38	39	36	38	37
DT5	R	Diffusion tube	100	100	37	29	27	31	36
DT6	R	Diffusion tube	92	92	31	29	28	28	31
DT7	R	Diffusion tube	100	100				27	25
DT8	R	Diffusion tube	92	92				29	30
DT9	R	Diffusion tube	100	100	29	30	29	28	30
DT10	R	Diffusion tube	100	100				47	48
DT11	R	Diffusion tube	100	100				47	45
DT12	UB	Diffusion tube	100	100				36	38
DT13	R	Diffusion tube	83	83	32	34	30	30	32
DT14	R	Diffusion tube	100	100	27	23	23	27	25
DT15	R	Diffusion tube	92	92				44	44
DT16	R	Diffusion tube	100	100				35	35
DT17	R	Diffusion tube	92	92				31	32
DT18	R	Diffusion tube	100	100				27	24
DT19	R	Diffusion tube	100	100	28	27	26	26	26
DT20	R	Diffusion tube	100	100				27	23

DT21	K	Diffusion tube	83	83				25	22
DT22	R	Diffusion tube	100	100				27	27
DT23	R	Diffusion tube	25	25				43	36
DT24	R	Diffusion tube	100	100	39	37	34	41	38
DT25	R	Diffusion tube	83	83				41	36
DT26	K	Diffusion tube	100	100	49	48	47	47	32
DT27	K	Diffusion tube	100	100	49	46	44	46	33
DT28	K	Diffusion tube	100	100	47	46	43	48	30
DT29	R	Diffusion tube	92	92				27	25
DT30	R	Diffusion tube	100	100				27	24
DT31	R	Diffusion tube	75	75				31	48
DT32	R	Diffusion tube	92	92	43	43	39	41	40
DT33	R	Diffusion tube	100	100	32	29	28	31	28
DT34	K	Diffusion tube	100	100				60	62
DT35	R	Diffusion tube	100	100				32	35
DT36	R	Diffusion tube	100	100				37	36
DT37	R	Diffusion tube	92	92	29	25	23	26	27
DT38	R	Diffusion tube	83	83	25	22	21	23	23
DT39	R	Diffusion tube	67	67				33	29
DT40	R	Diffusion tube	92	92				29	28
DT41	R	Diffusion tube	92	92				31	33
DT42	R	Diffusion tube	92	92				32	32
DT43	R	Diffusion tube	92	92				28	25
DT44	R	Diffusion tube	92	92				38	33
DT45	R	Diffusion tube	100	100	35	37	32	33	34
DT46	R	Diffusion tube	83	83				34	37

DT47	K	Diffusion tube	67	67				36	35
DT48	K	Diffusion tube	83	83				37	39
DT49	R	Diffusion tube	92	92	35	37	31	33	31
DT50	R	Diffusion tube	92	92	42	43	39	39	38
DT51	R	Diffusion tube	100	100				30	28
DT52	R	Diffusion tube	92	92	38	37	33	32	32
DT53	R	Diffusion tube	100	100				30	33
DT54	R	Diffusion tube	92	92	33	31	30	30	31
DT55	R	Diffusion tube	100	100				29	27
DT56	R	Diffusion tube	100	100	35	33	32	41	40
DT57	K	Diffusion tube	100	100				54	41
DT58	R	Diffusion tube	92	92	27	27	27	28	26
DT59	R	Diffusion tube	92	92				51	48
DT60	R	Diffusion tube	83	83				42	43
DT61	R	Diffusion tube	92	92	33	29	32	31	29
DT62	R	Diffusion tube	100	100				35	33
DT63	R	Diffusion tube	83	83	42	35	36	39	33
DT64	R	Diffusion tube	100	100	33	36	34	33	31
DT65	R	Diffusion tube	92	92				35	35
DT66	R	Diffusion tube	100	100				26	25
DT67	UB	Diffusion tube	100	100				17	16
DT68	R	Diffusion tube	58	58	38	38	36	35	36
DT69	R	Diffusion tube	100	100	34	34	31	31	31
DT70	R	Diffusion tube	100	100	36	34	35	32	26
DT71	R	Diffusion tube	100	100				35	29
DT72	R	Diffusion tube	100	100				32	29

DT73	R	Diffusion tube	100	100	29	31	27	26	26
DT74	R	Diffusion tube	42	42				41	36
DT75	R	Diffusion tube	92	92	40	37	38	39	38
DT76	UC	Diffusion tube	92	92				27	29

☒ Diffusion tube data has been bias corrected

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

☒ If applicable, 2017 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.

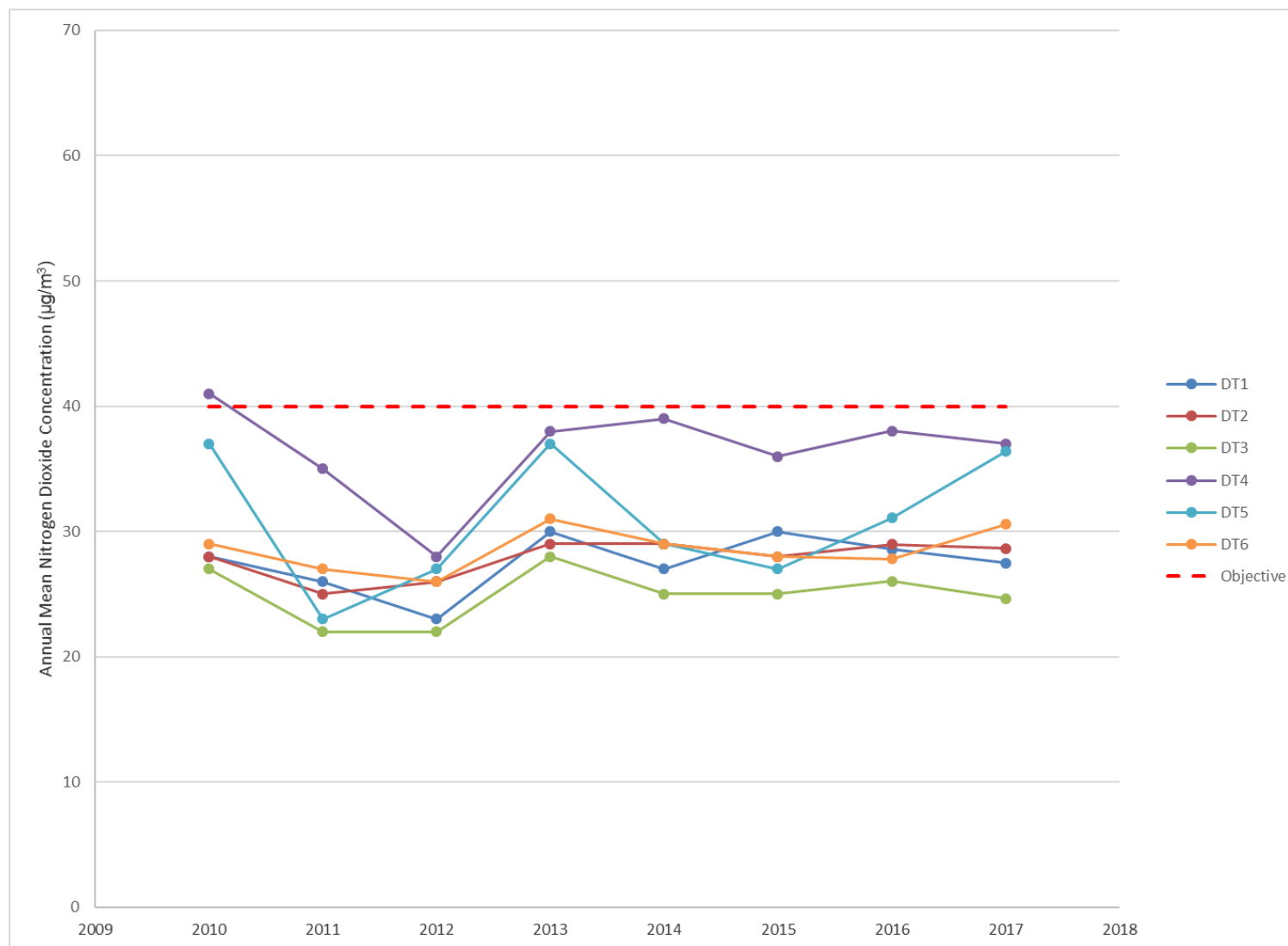
Figure A.1 – Trend in Annual Mean NO₂ Concentrations Measured in the Spondon AQMA (Sites DT1 – DT6)

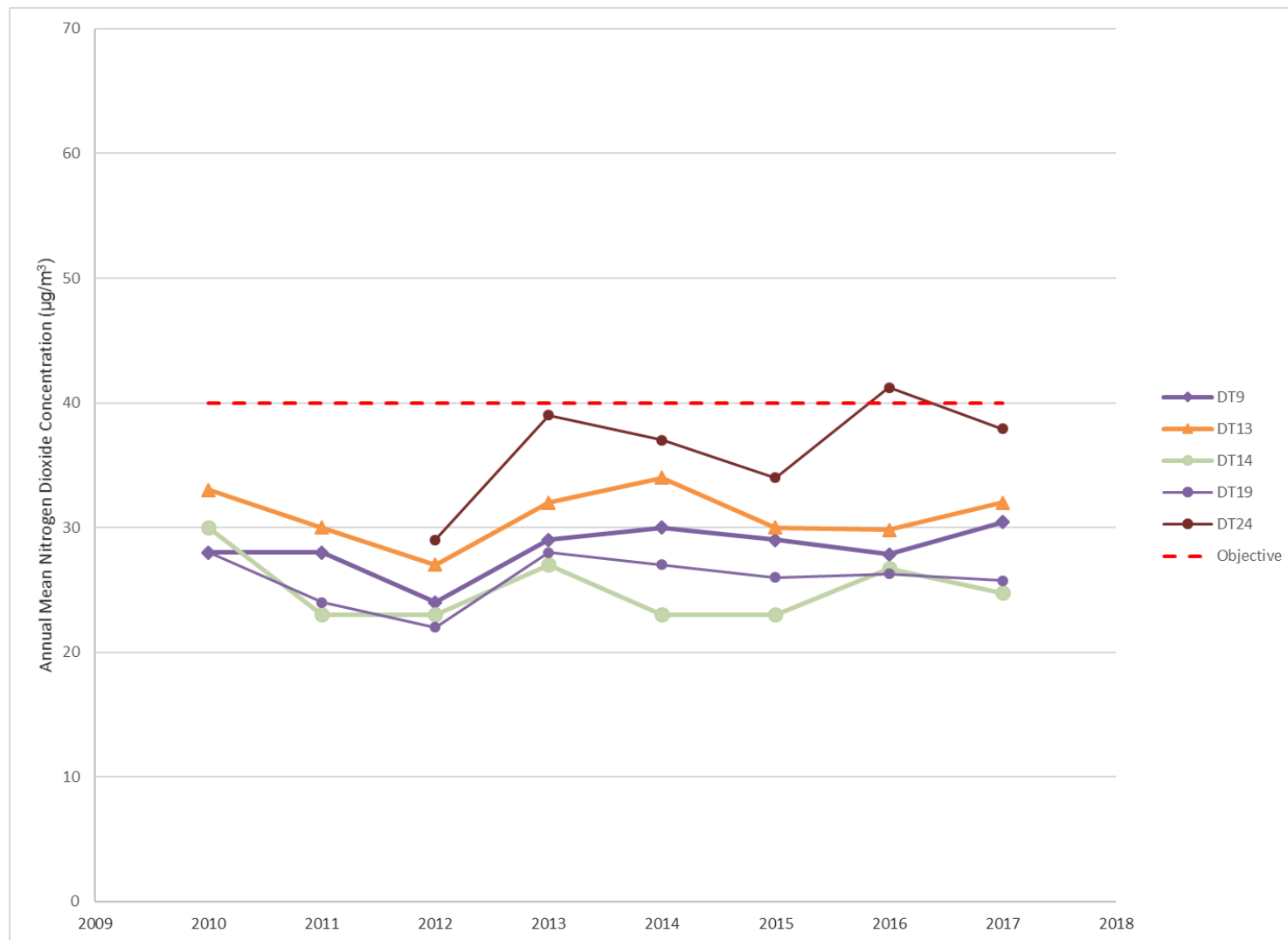
Figure A.2 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT9 – DT24

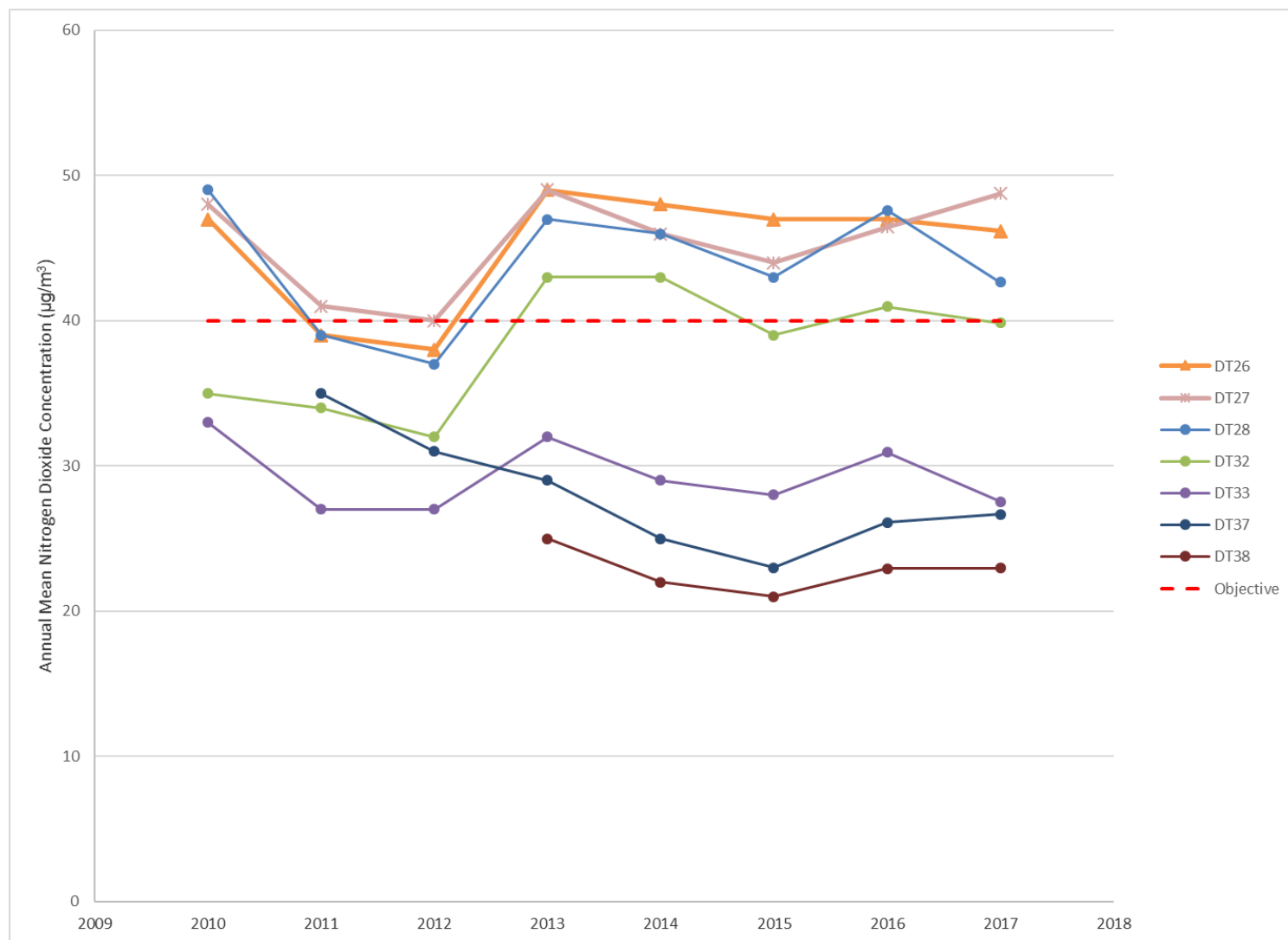
Figure A.3 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT26 – DT38

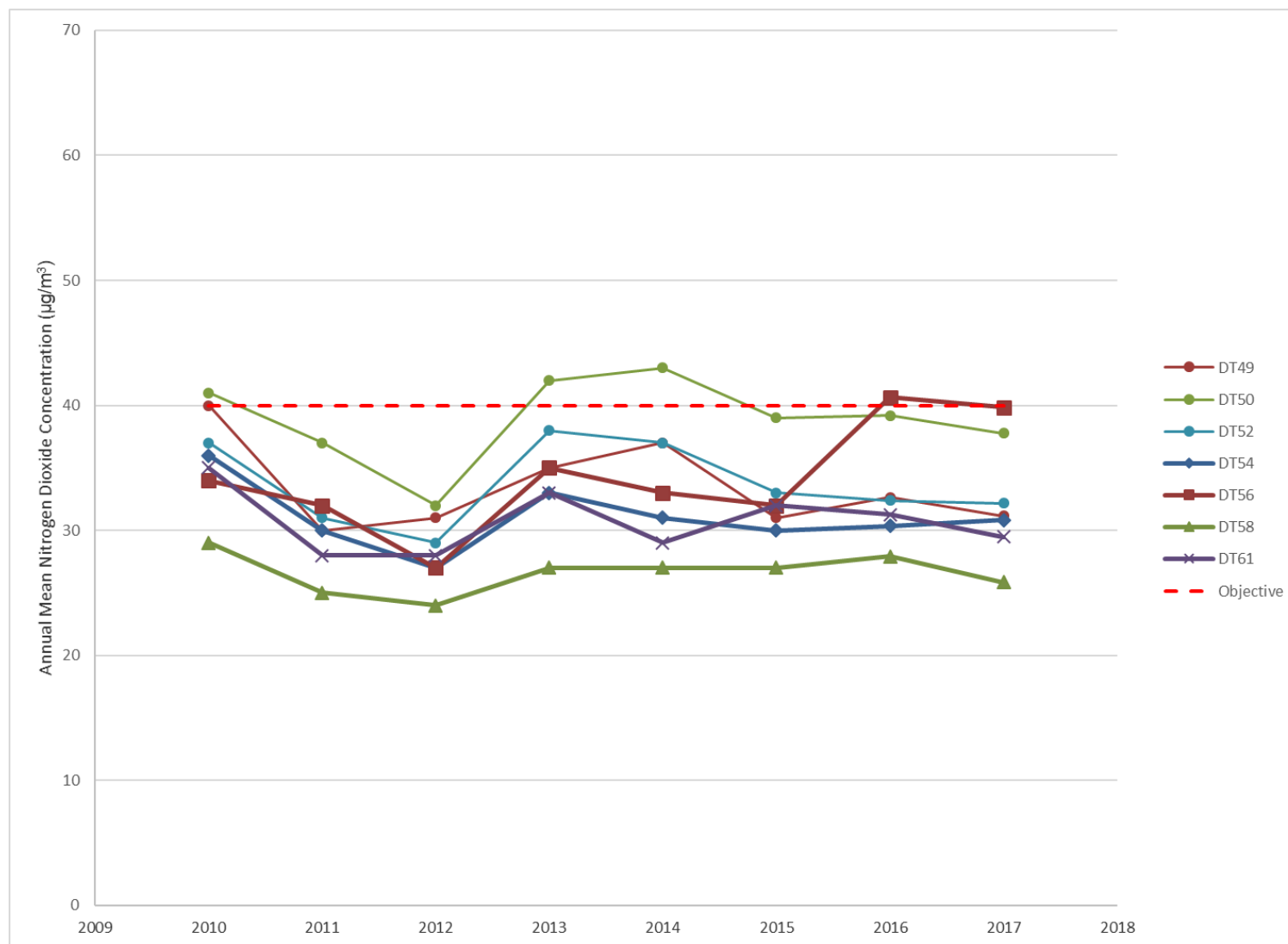
Figure A.4 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT49 – DT61

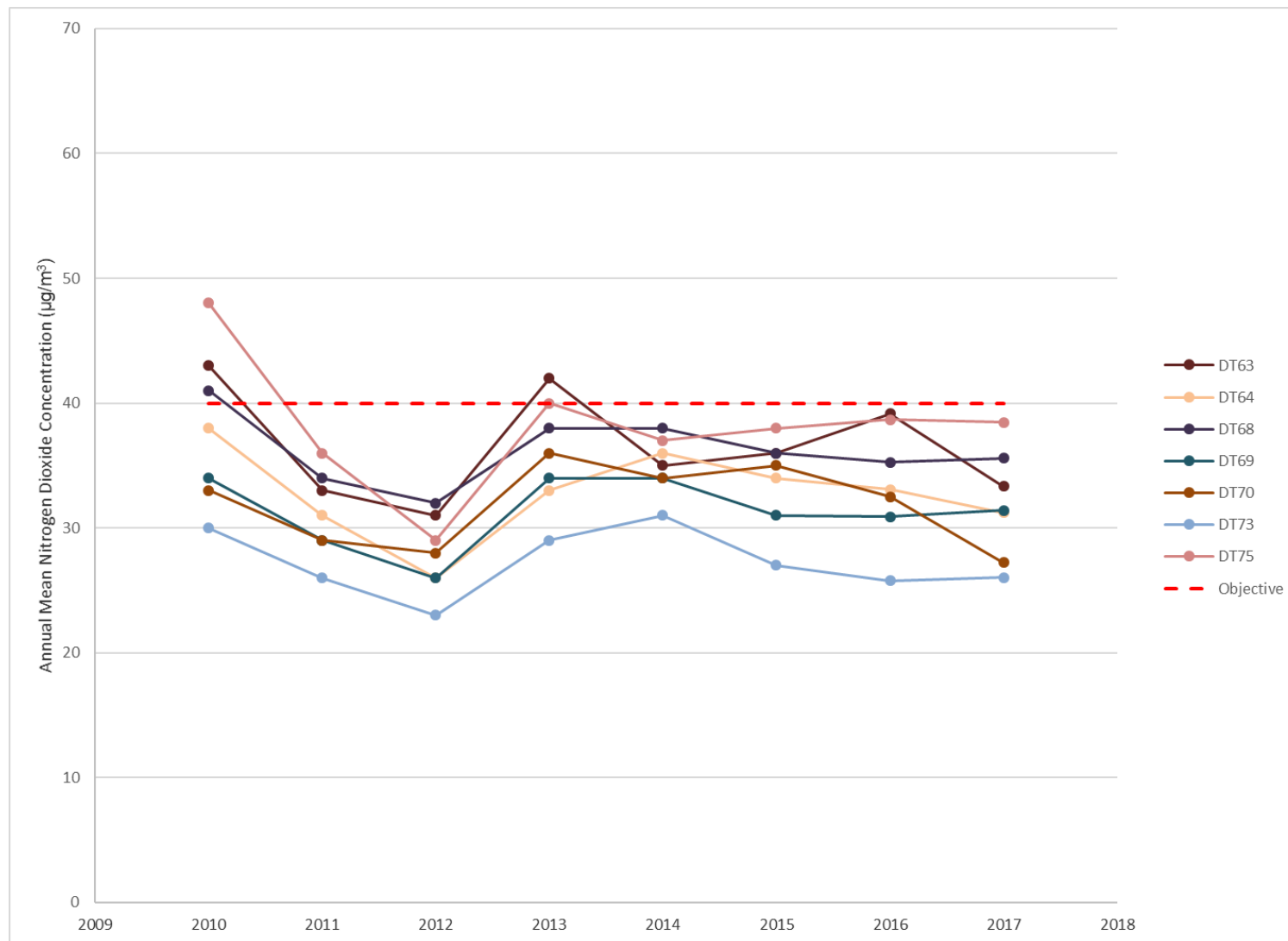
Figure A.5 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT54 – DT75

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

Site ID	R	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2013	2014	2015	2016	2017
AURN	R	Automatic	94	94	-	-	-	-	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.

Appendix B: Full Monthly Diffusion Tube Results for 2017

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

Site ID	NO ₂ Mean Concentrations (µg/m³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.77) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DT1	55.1	42.9	45.3	30.2	22.7	28.2	28.0	29.2	33.6	39.8	36.6	36.6	35.7	27.5	
DT2	52.8	42.3	44.7	35.6	28.9	24.0	28.0	33.0	32.5	39.1	42.1	43.3	37.2	28.6	
DT3	51.1	37.2	32.5	32.4	25.9	21.7	23.3	24.0	30.2	28.8	39.8	37.4	32.0	24.7	
DT4	71.4	57.4	50.7	50.8	38.5	38.6	37.3	39.4	41.0	40.7	62.6		48.0	37.0	
DT5	79.9	77.3	64.2	41.9	45.0	28.6	26.0	26.9	34.5	36.9	52.0	53.9	47.3	36.4	
DT6	49.6	40.8		43.8	25.1	31.6	30.5	35.0	37.2	37.7	55.4	49.8	39.7	30.6	
DT7	45.8	34.8	34.9	33.9	20.9	24.1	23.7	27.2	30.8	31.0	44.5	39.2	32.6	25.1	
DT8	50.6	45.9	40.6	39.9	30.8	29.8	29.3	31.9	35.7	38.5	52.1		38.6	29.8	
DT9	53.8	49.4	46.5	37.7	24.6	33.6	26.1	24.6	34.0	44.9	47.4	51.4	39.5	30.4	29.9
DT10	80.2	73.7	66.7	69.6	53.2	51.6	57.8	53.8	59.1	69.1	84.2	36.5	63.0	48.5	
DT11	69.7	60.7	60.8	61.0	54.8	44.0	49.9	47.7	54.6	53.3	66.3	73.8	58.1	44.7	
DT12	53.0	51.2	52.0	49.4	36.5	40.9	38.0	42.7	47.5	50.5	64.9	58.7	48.8	37.6	
DT13	61.1	46.1	42.8		27.7	30.0	35.8	33.8	40.8		55.4	42.0	41.6	32.0	
DT14	49.4	38.4	33.7	30.1	27.7	22.4	25.0	23.1	32.3	33.7	43.2	26.6	32.1	24.7	
DT15	79.0	67.8		58.9	48.1	43.8	44.7	45.3	57.4	55.5	70.0	59.3	57.3	44.1	

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DT16	64.5	51.2	51.8	49.3	36.8	36.1	38.8	38.7	46.2	44.2	50.9	40.1	45.7	35.2	
DT17	58.4	50.6		45.2	40.6	33.5	32.2	33.1	39.9	41.4	39.1	42.9	41.5	32.0	
DT18	48.1	29.9	32.0	29.1	27.8	24.4	24.7	23.7	32.2	29.9	38.4	33.3	31.1	24.0	
DT19	46.6	37.9	30.7	35.4	29.9	25.2	27.3	26.2	30.3	33.7	42.7	35.0	33.4	25.7	
DT20	46.8	25.9	34.5	29.0	26.6	24.1	24.7	24.4	29.8	27.9	36.2	33.0	30.2	23.3	
DT21	41.4	36.2		28.8	28.4	20.6	20.0	22.1	20.0		33.9	30.9	28.2	21.7	
DT22	50.6	37.1	32.8	31.0	33.0	26.0	26.5	29.4	39.0	34.8	43.2	40.6	35.3	27.2	
DT23	61.3	52.8	55.2										56.4	35.6	
DT24	66.3	52.5	52.1	44.5	49.7	39.2	40.9	35.5	52.9	47.6	60.8	48.9	49.2	37.9	
DT25	70.7	56.7	42.5	43.7	46.7		39.6	41.1		45.4	52.3	32.6	47.1	36.3	
DT26	104.8	53.9	63.6	58.4	48.1	48.4	49.2	48.3	62.3	51.0	72.0	59.8	60.0	46.2	31.9
DT27	91.0	65.7	65.1	57.7	43.9	55.1	56.3	57.6	82.6	55.5	64.4	65.0	63.3	48.8	33.2
DT28	84.0	61.8	63.7	62.7	41.3	45.9	27.4	51.4	61.4	50.0	63.5	51.5	55.4	42.6	30.1
DT29		36.6	32.4	32.2	26.7	22.9	54	25.5	33.7	28.3	36.8	34.7	33.1	25.5	
DT30	53.0	38.9	38.2	24	32.3	24.7	23.1	22.3	28.4	28.5	34.5	33.9	31.8	24.5	
DT31	49.4		88.8	87.4	60.5	31.6	32.1	132.6	40.2	42.7			62.8	48.4	
DT32	66.6		52.7	53.1	48.2	41.4	50.6	44.1	44.3	53.5	63.3	51.7	51.8	39.9	
DT33	43.0	36.5	34.0	36.4	30.5	29.4	29.9	34.3	38.8	36.9	45.6	34.0	35.8	27.5	
DT34	100.7	94.6	91.8	93.6	75.6	65.3	68.2	66.8	73.7	71.1	89.0	75.0	80.5	61.9	
DT35	61.0	53.8	52.3	42.4	42.0	36.1	32.7	37.8	45.7	48.7	48.7	37.5	44.9	34.6	
DT36	66.8	55.8	47.4	41.4	47.5	34.3	34.6	37.5	49.0	44.3	53.6	42.1	46.2	35.6	
DT37	46.3	37.5	42.6	24.9	26.3		38.3	24.2	28.0	35.3	40.2	37.2	34.6	26.7	
DT38	39.1		63.3	22.7	25.2	18.3	19.2	22.6	26.6		35.5	25.7	29.8	23.0	
DT39	59.6	47.1	41.1	31.0	42.7			28.4			39.7	39.8	41.2	29.2	
DT40	59.6	45.7	37.6	27.0	33.9	23.4		27.0	35.2	35.9	44.8	35.3	36.9	28.4	28.2
DT41	53.5	45.1	48.5	40.2	37.7	33.5	34.1		42.4	40.7	51.3	43.3	42.8	32.9	
DT42	55.0	47.4	42.4	41.0	32.9	35.7	36.4	39.2	47.8	42.6		33.7	41.3	31.8	

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DT43	51.8	41.4	34.1	28.8	34.8	22.5		23.9	27.2	34.7	33.9	30.7	33.1	25.5	
DT44	66.9	51.5	43.4		47.8	29.8	31.4	35.6	45	36.2	41.7	39.4	42.6	32.8	32.7
DT45	56.0	49.6	44.8	38.0	37.2	36.7	36.2	36.9	42.5	41.8	53.6	49.7	43.6	33.6	
DT46	60.8	54.0	49.9		41.0	41.9	40.7	43.0	45.6	50.6		53.8	48.1	37.1	
DT47	64.1	51.1		37.8	43.7	29.7		33.9	44.7			50.6	44.5	34.7	
DT48	61.7	58.7	56.9	46.0	44.7	38.9		44.7	50.2	50.0		50.9	50.3	38.7	
DT49	57.4	41.9	38.4	40.2	37.6	30.8	28.5	34.8	43.3	42.7	49.3		40.4	31.1	31.1
DT50	67.1	58.8	50.7	49.1		37.1	40.4	38.5	44.9	44.9	57.0	51.2	49.1	37.8	
DT51	55.1	42.5	36.5	29.7	36.1	25.7	31.0	29.2	37.3	31.8	47.4	33.3	36.3	28.0	
DT52	63.0	50.4	47.1	36.3	31.3	30.7	33.3		37.9	40.1	50.7	39.0	41.8	32.2	
DT53	59.6	50.3	47.9	42.6	35.2	38.8	37.4	36.7	44.3	34.8	51.5	38.7	43.2	33.2	
DT54	58.0	47.8	40.2	33.4	33.8	31.9	31.1	31.4	37.3		50.5	44.8	40.0	30.8	
DT55	56.9	41.7	34.3	27.2	29.6	24.6	27.6	27.0	34.1	34.2	39.0	40.5	34.7	26.7	
DT56	64.7	54.8	62.0	52.8	45.6	43.9	42.1	44.6	52.4	51.3	57.1	49.6	51.7	39.8	
DT57	99.4	83.5	69.3	76.3	65.3	60.2	73.4	66.3	80.1	80.0	77.2	72.9	75.3	58.0	41.3
DT58	48.9		30.5	29.6	26.8	23.9	27.0	25.6	33.4	37.7	43.2	42.4	33.5	25.8	
DT59	71.9	69.4	67.5		60.1	56.1	52.7	59.1	64.8	58.6	69.5	52.6	62.0	47.8	
DT60	63.1	60.4			52.1	44.7	48.2	48.0	57.7	59.1	66.3	57.4	55.7	42.9	
DT61	61.4	47.9	35.1	31.0	30.2	26.1	30.3		36.8	36.1	48.6	37.7	38.3	29.5	
DT62	60.3	51.5	46.1	39.6	44.9	28.6	37.7	33.7	43.0	36.9	52.0	38.3	42.7	32.9	
DT63	58.3			41.2	44.1	33.6	38.3	33.7	44.6	43.3	50.9	44.7	43.3	33.3	
DT64	59.6	53.2	38.9	34.8	38.5	31.6	31.6	31.7	42.8	44.0	40.3	39.5	40.5	31.2	
DT65	71.2	55.4	49.3	41.6	37.9	33.6	31.3		41.7	39.9	51.1	43.2	45.1	34.7	
DT66	51.0	40.5	40.1	25.6	19.1	23.3	24.2	27.0	32.3	36.0	38.5	35.6	32.8	25.2	
DT67	29.8	28.5	23.5	18.0	14.7	12.4	16.0	16.7	20.6	22.8	23.7	22.1	20.7	16.0	
DT68	56.1	53.7	48.2	45.3	34.2	35.8		40.3					44.8	35.6	
DT69	48.0	43.6	41.1	39.8	35.9	36.3	37.7	37.2	43.6	41.9	45.8	38.7	40.8	31.4	

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DT70	47.3	49.0	45.5	33.2	28.9	26.4	30.3	29.3	37.2	32.4	42.7	21.9	35.3	27.2	26.1
DT71	53.8	42.5	41.8	33.1	35.7	25.9	27.8	28.7	37.5	35.5	43.2	39.6	37.1	28.6	
DT72	58.1	43.8	43.2	34.4	37.1	24.7	27.6	29.6	37.7	32.0	46.0	40.4	37.9	29.2	
DT73	48.6	41.3	30.1	28.6	26.0	20.1	24.3	26.2	30.0	49.8	37.9	42.4	33.8	26.0	
DT74	73.2	58.5		49.2							49.3	58	57.6	36.2	
DT75	68.2	56.7	49.5	44.2	52.5		36.7	41.9	43.1	52.3	53.7	50.7	50.0	38.5	
DT76	41.9	46.3	38.2	28.5	34.2		27.6	29.5	32.9	39.0	48.5	44.1	37.3	28.7	

☐ 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 for those sites where the tube is not located on the façade.

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

Diffusion Tube QA/QC

Derby City Council deploy diffusion tubes prepared and analysed by ESG Didcot (50% TEA in acetone method). Tubes are changed on a monthly basis.

Bias Adjustment Factors from Local Co-location Studies

Derby City Council do not currently undertake a co-location study. It is therefore not possible to calculate a local bias adjustment factor.

National Bias Adjustment Factor

The national bias adjustment factor for ESG Didcot in 2016 is 0.77 (taken from spreadsheet 03/18, based on 27 studies; available at: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>). This factor has been applied to all 2017 diffusion tube data.

Air Proficiency Testing

ESG Didcot take part in the UKAS accredited proficiency testing scheme Air PT, operated by LGC and the Health and Safety Laboratory (HSL). Available data in 2017 are provided below:

Air PT Round	AR018	AR019	AR021	AR022
Period	Jan – Feb 2017	April – May 2017	July – Aug 2017	Sept – Oct 2017
Satisfactory Results (%)	100	100	100	100

During 2017, 100% of samples submitted were determined to have been satisfactory.

Short-term to Long-term Data Adjustment (Annualisation)

Missing diffusion tubes meant that five monitoring locations did not achieve the minimum data requirements (75%) during 2017. The data for these sites (DT23, DT39, DT47, DT68 and DT74) have therefore been adjusted to an annual mean, based on the ratio of concentrations during the short-term monitoring period to those over the 2017 calendar year. This has utilised data from the three closest urban background monitoring sites whose data are available from the Automatic Urban and Rural Network (AURN; <https://uk-air.defra.gov.uk>) where long-term NO₂ data are available (with data capture >90%).

DT23; 5 Jan – 29 March 2017

Site	2017 Annual Mean	Period Mean	Ratio
Leicester University	25.9	31.5	0.824
Nottingham Centre	29.7	37.0	0.802
Stoke-on-Trent Centre	25.6	30.7	0.835
		Average	0.820

DT39; 5 Jan – 31 May, 2 Aug – 29 Aug, 7 Nov 2017 – 4 Jan 2018

Site	2017 Annual Mean	Period Mean	Ratio
Leicester University	25.9	28.2	0.919
Nottingham Centre	29.7	32.2	0.921
Stoke-on-Trent Centre	25.6	27.8	0.923
		Average	0.921

DT47; 5 Jan – 1 March, 29 March – 28 June, 2 Aug – 28 Sept, 6 Dec 2017 – 4 Jan 2018

Site	2017 Annual Mean	Period Mean	Ratio
Leicester University	25.9	25.2	1.028
Nottingham Centre	29.7	29.3	1.012
Stoke-on-Trent Centre	25.6	25.6	1.004
		Average	1.015

DT68; 5 Jan – 28 June, 2 Aug – 29 Aug 2017

Site	2017 Annual Mean	Period Mean	Ratio
Leicester University	25.9	25.1	1.034
Nottingham Centre	29.7	29.0	1.023
Stoke-on-Trent Centre	25.6	24.7	1.039
		Average	1.032

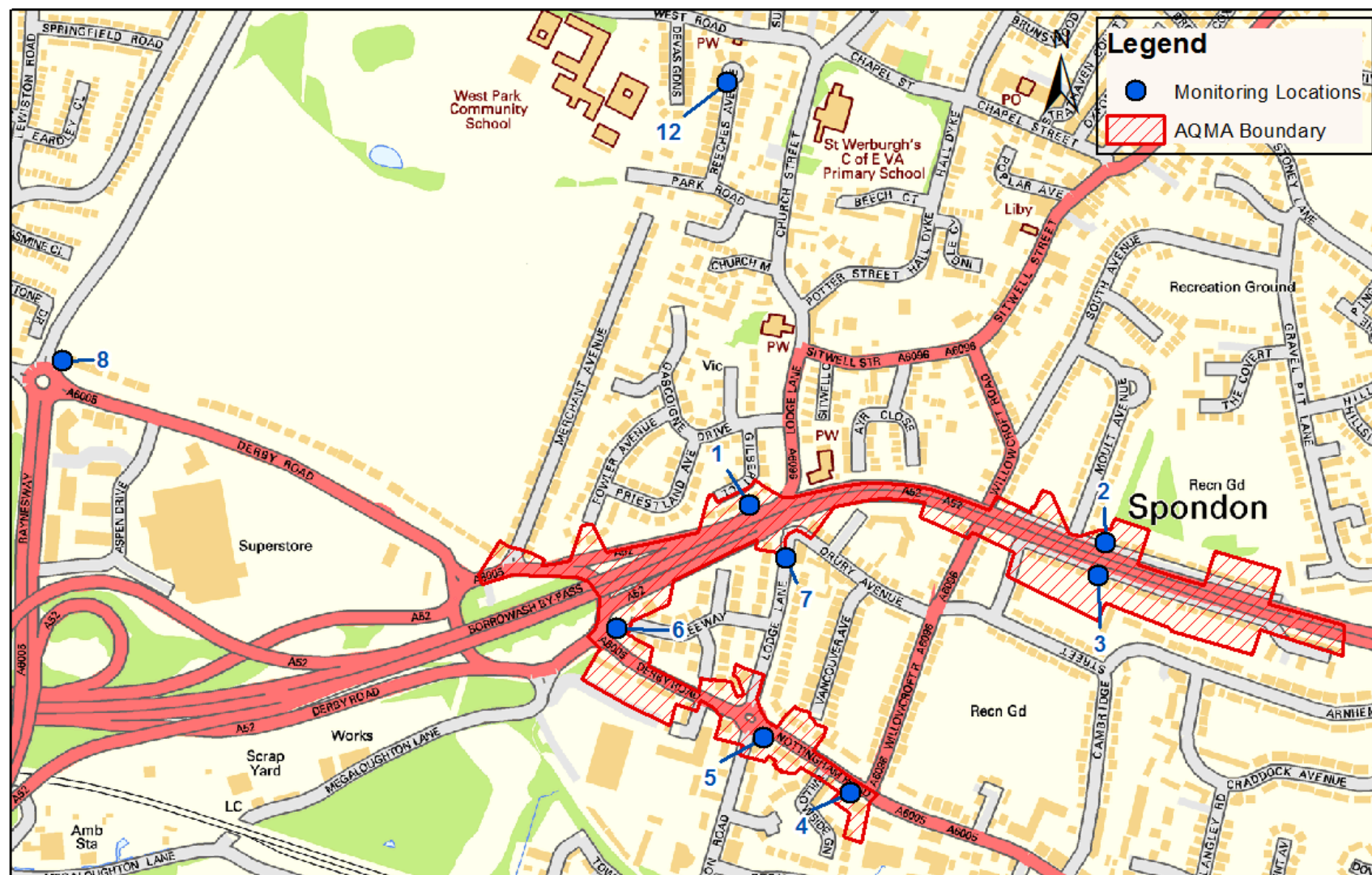
DT74; 5 Jan – 1 March, 29 March – 27 April, 7 Nov 2017 – 4 Jan 2018

Site	2017 Annual Mean	Period Mean	Ratio
Leicester University	25.9	31.7	0.819
Nottingham Centre	29.7	36.4	0.815
Stoke-on-Trent Centre	25.6	31.6	0.811
		Average	0.815

Fall off with Distance Calculator

Site Name/ID	Distance (m)		NO ₂ Annual Mean Concentration (µg/m ³)			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor	
DT26	0.3	6.3	17.3	46.2	31.9	
DT27	0.3	6.3	17.3	48.8	33.2	
DT28	0.3	6.3	17.3	42.6	30.1	
DT57	1.0	12.0	24.7	58.0	41.3	Predicted concentration at Receptor above AQS objective.
DT9	19.0	21.0	20.0	30.4	29.9	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution. Warning: your monitor is more than 10m further from the kerb than your receptor - treat result with caution.
DT40	2.0	2.2	19.1	28.4	28.2	
DT44	2.0	2.2	28.0	32.8	32.7	
DT49	2.0	2.1	28.0	31.1	31.1	
DT70	4.0	6.0	17.4	27.2	26.1	

Appendix D: Maps of Monitoring Locations and AQMAs



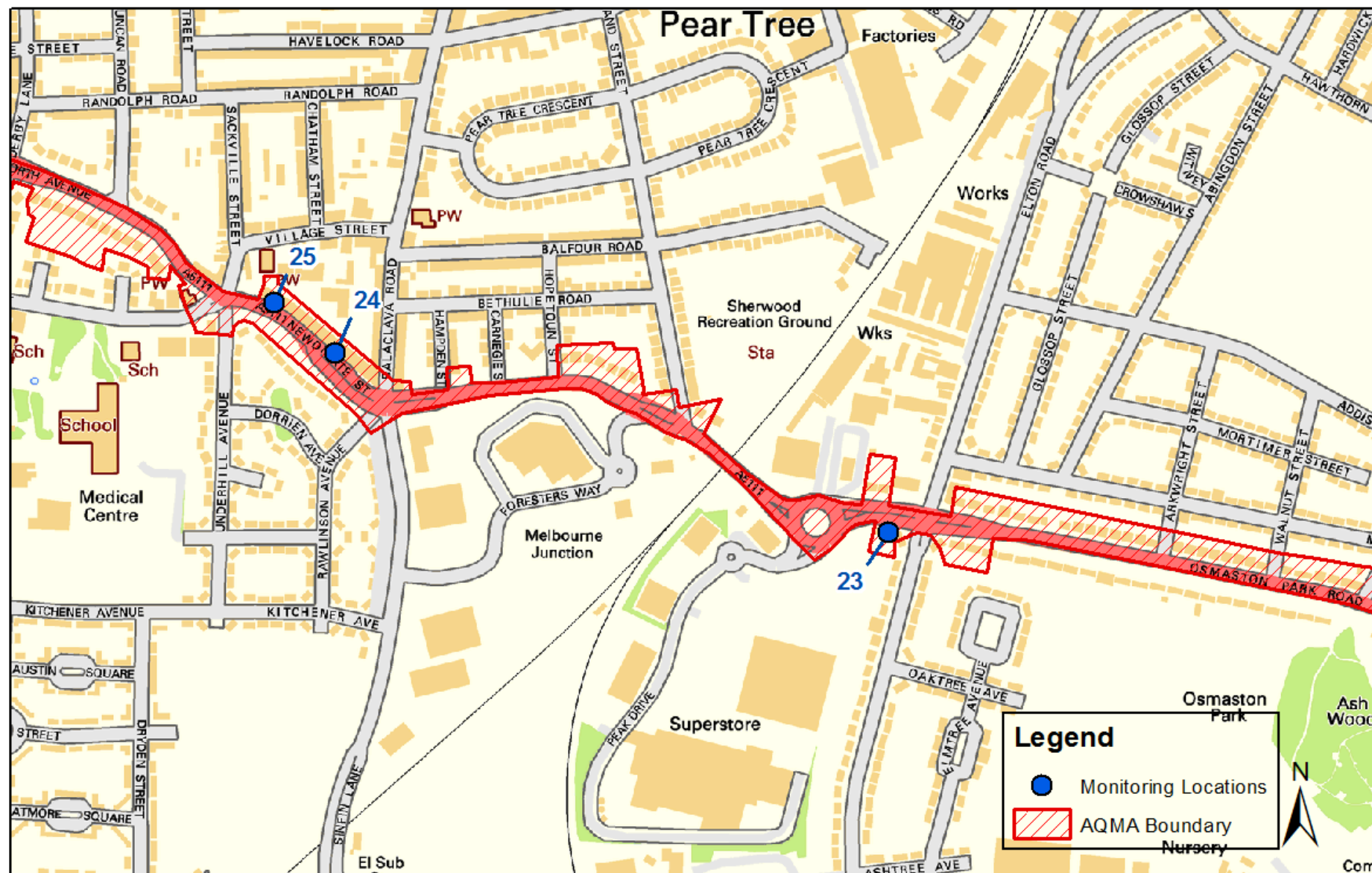
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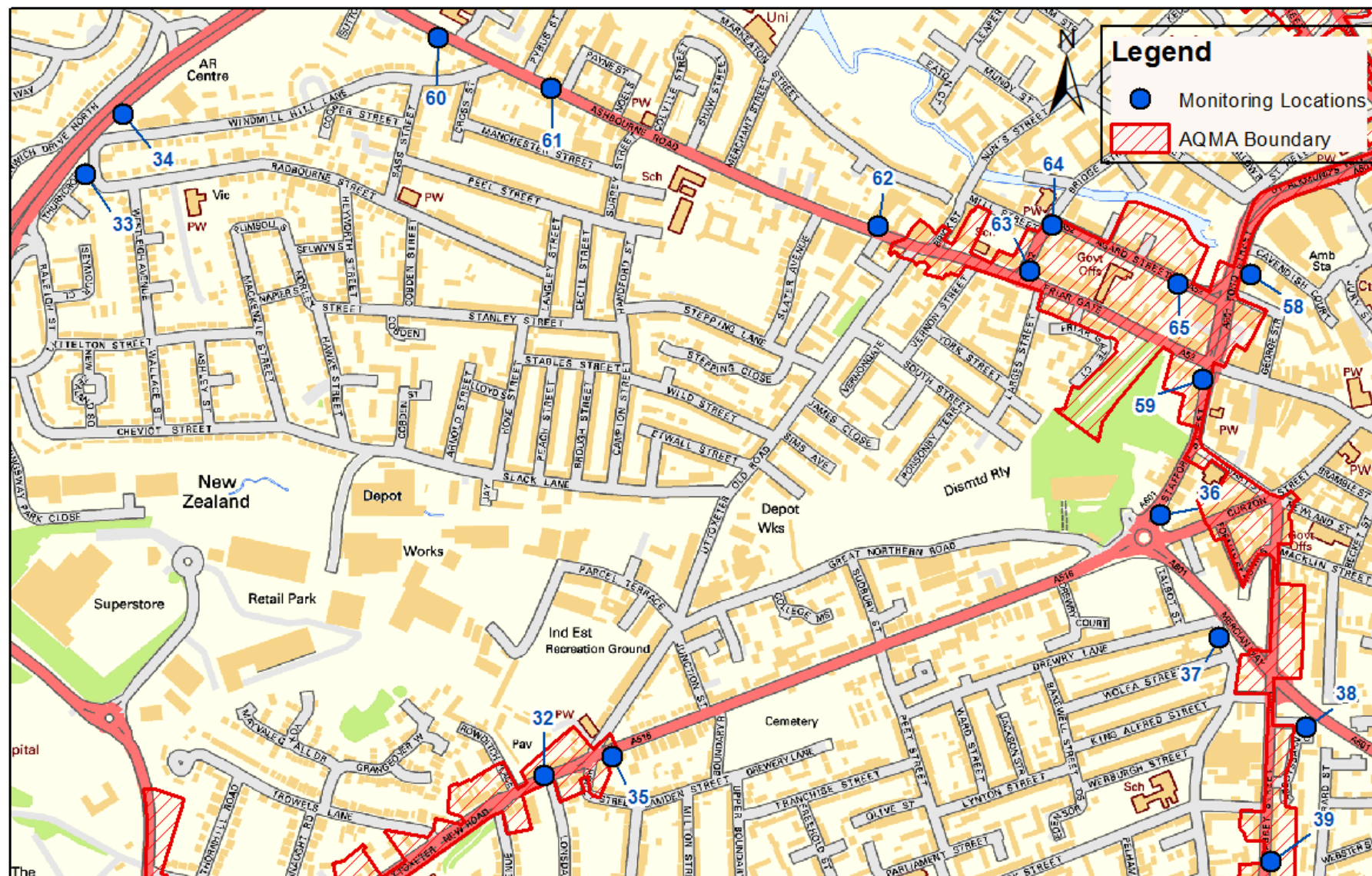
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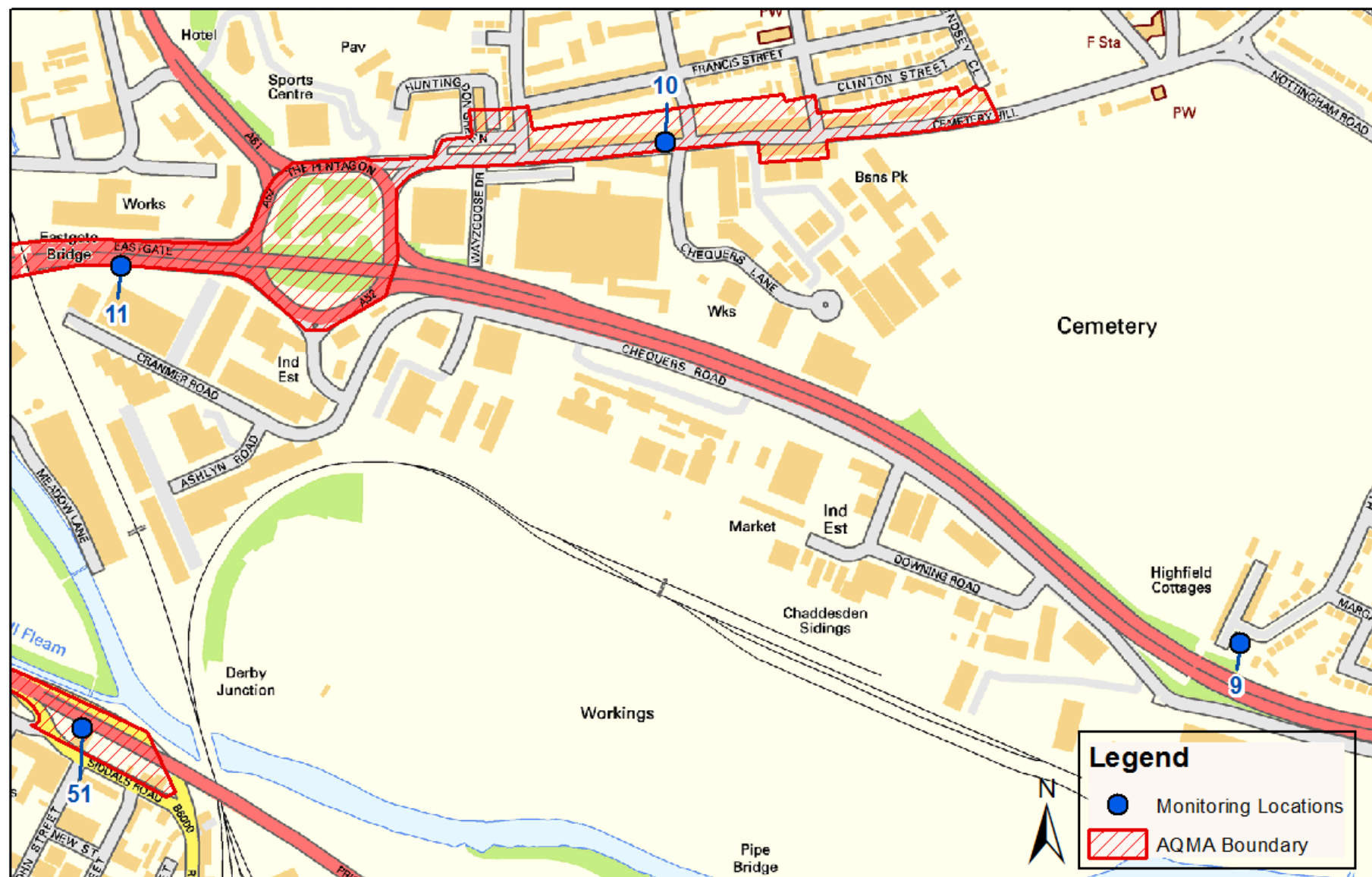
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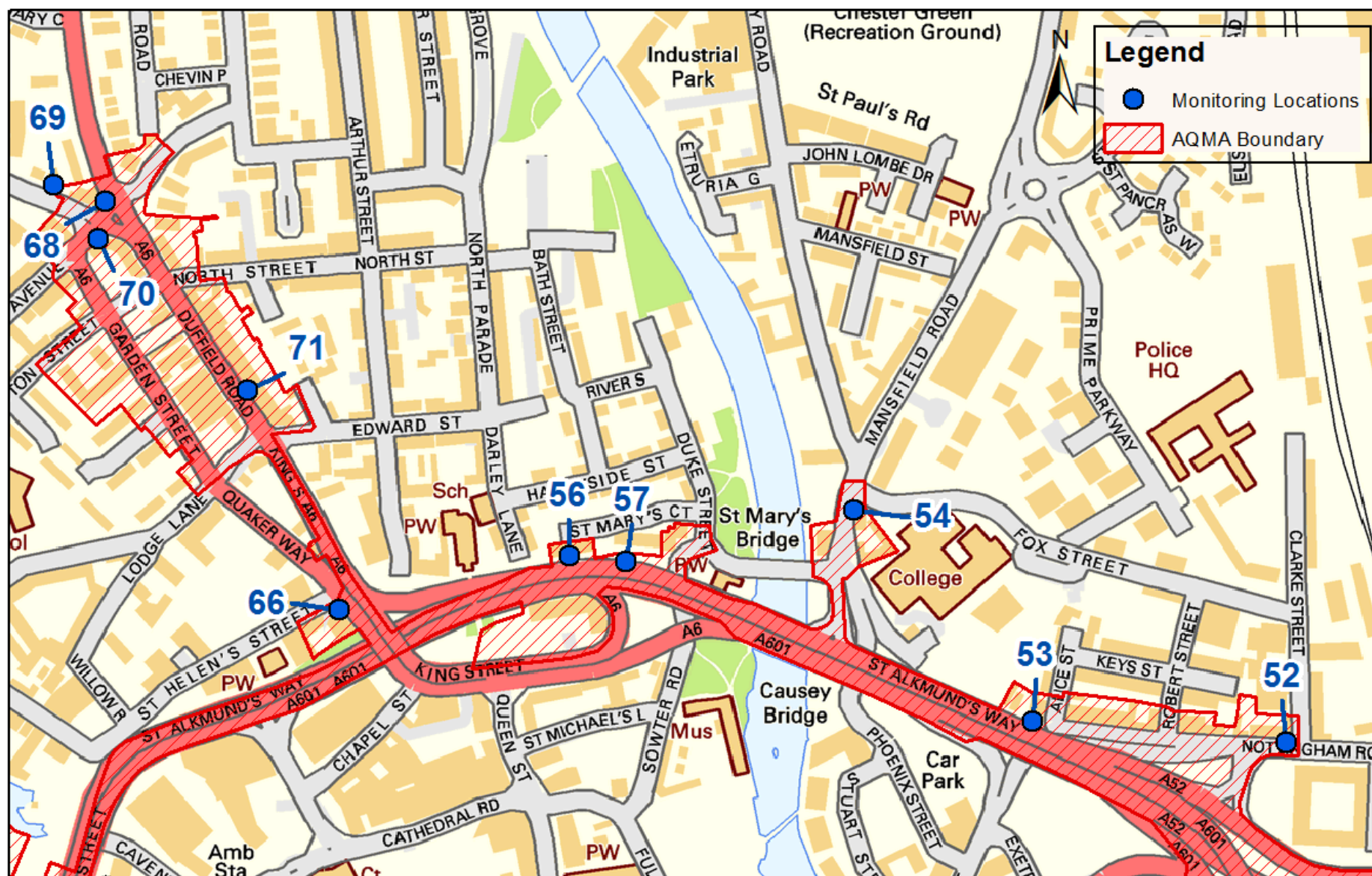
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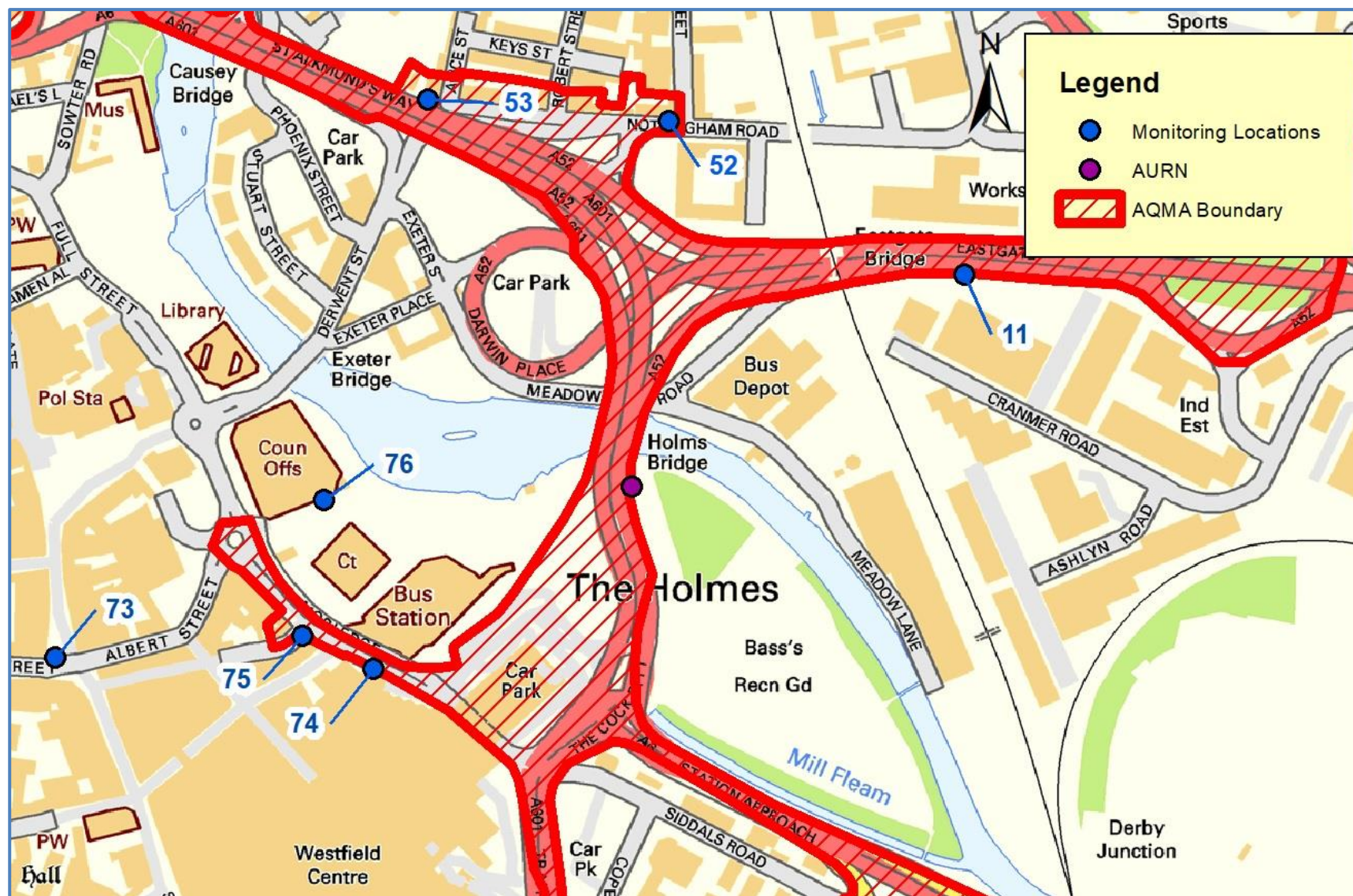
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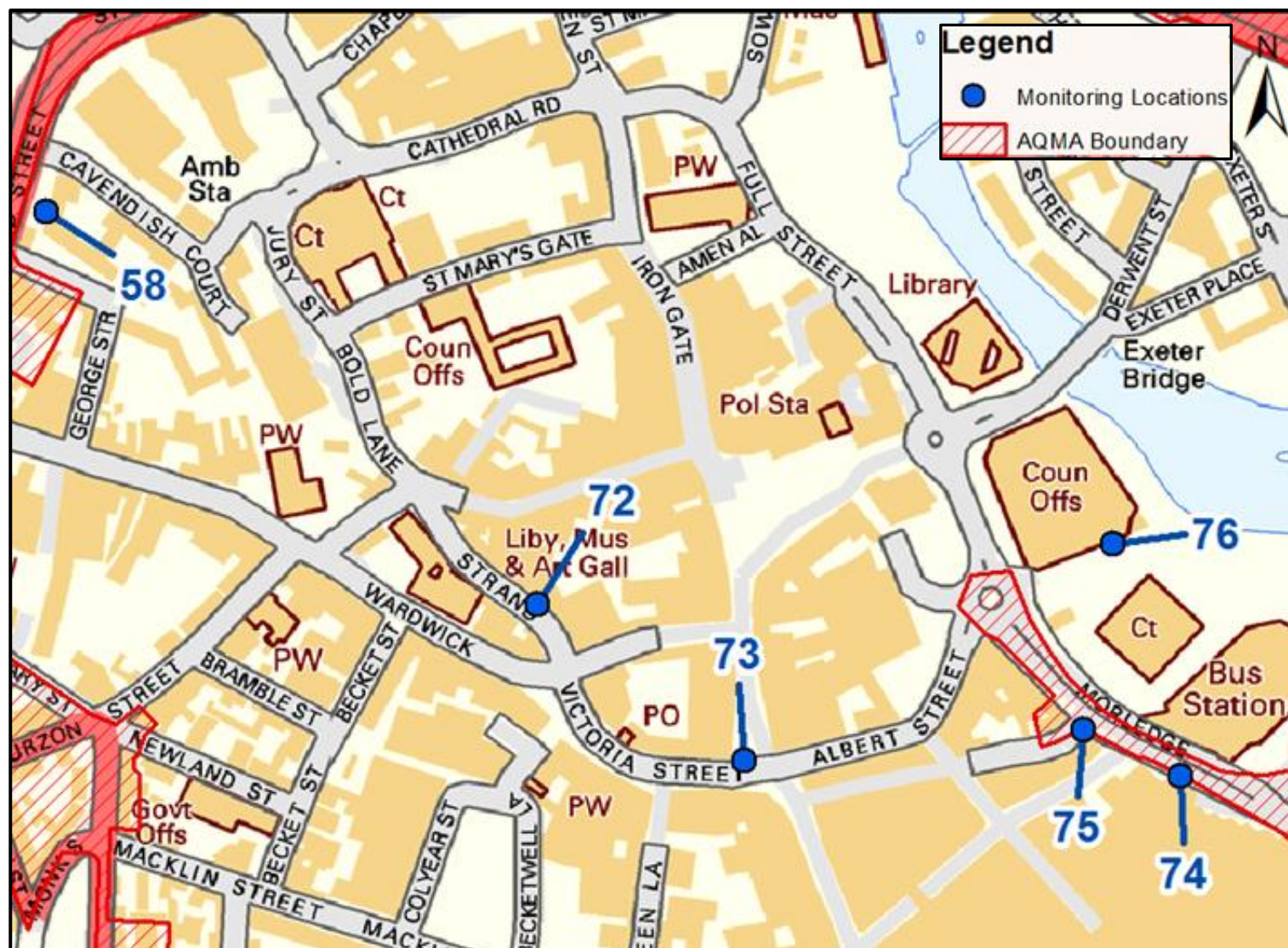
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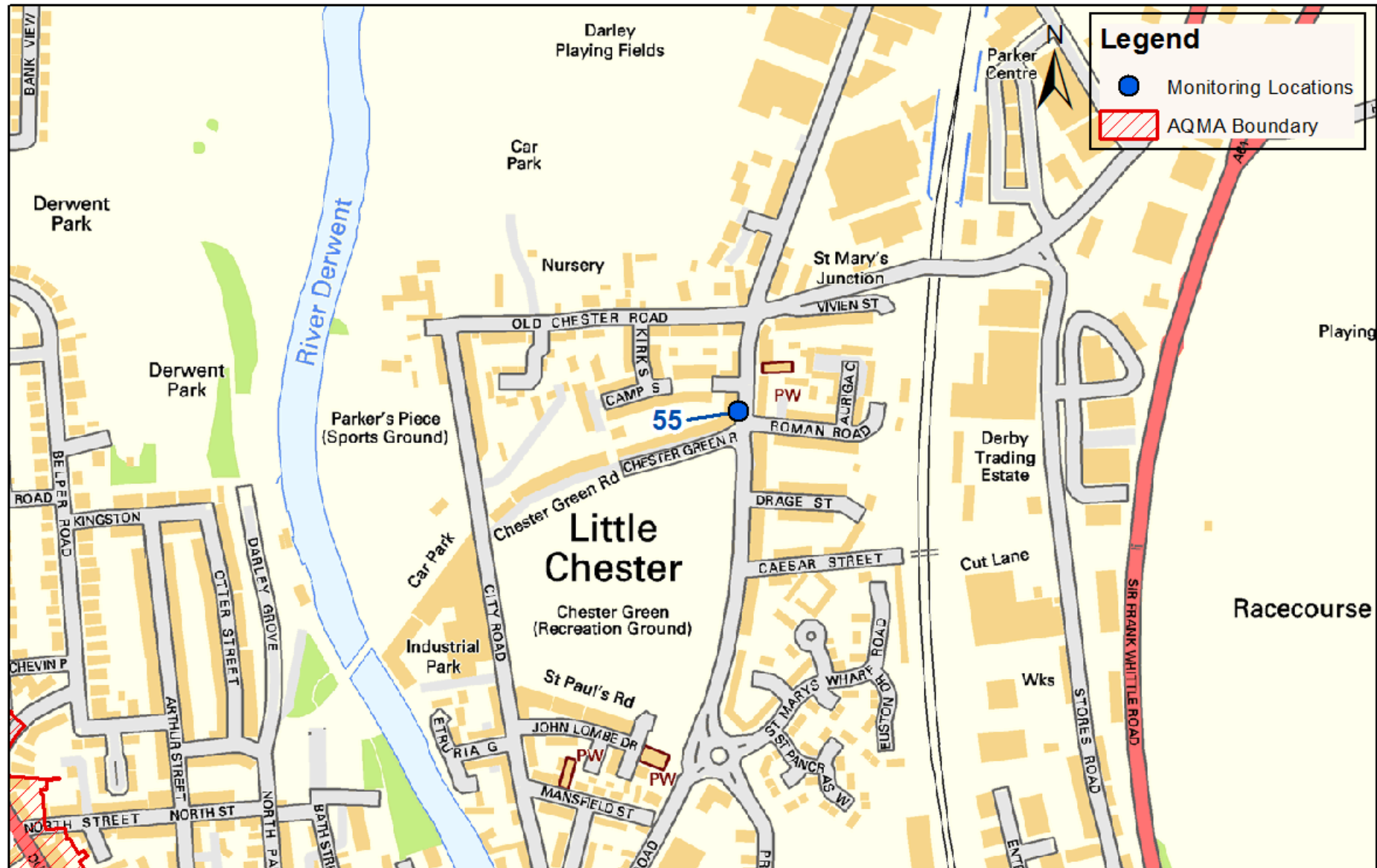
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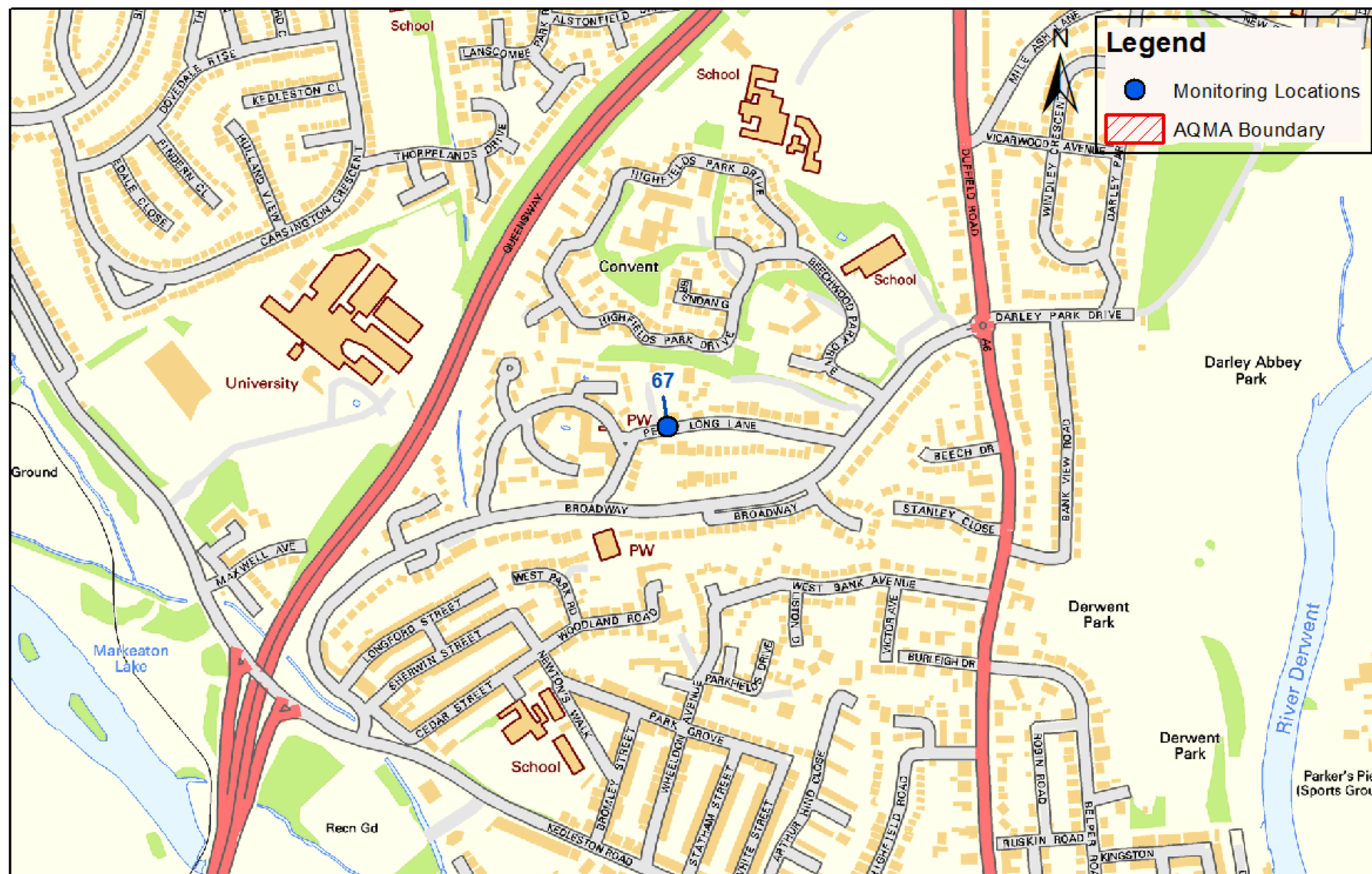
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Appendix E: Summary of Air Quality Objectives in England

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