



Derby City Council Air Quality Annual Status Report (ASR)

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

July 2017

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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 five cities (plus London) where a mandatory Clean Air Zone (CAZ) is to be introduced as a result of the National air quality model predicting exceedances of the EU Limit Value for NO₂ in 2020.

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. 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.
- Reduce traffic congestion/managing the road network.

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

- 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 as one of five councils required to introduce a CAZ by the end of 2019, however under a draft revision to the national plans released in May 2017, mandatory charging-based CAZs may not now be enforced by Government, with the draft Plans presenting the preferred option to introduce a range of alternative measures able to deliver the same NO₂ reductions as a charging-based CAZ. The final version of the updated Plans is due to be released on the 31st July 2017 and the present position has created significant uncertainty around Derby's local action approach.

Nonetheless, work has begun to determine the nature and extent of a charging-based CAZ, and on implementing a range of other measures alongside it to help deliver the improvements needed by 2020. Revised air quality actions have been submitted to Defra 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.

To assist with implementation of measures, the Council has applied for and received Air Quality Grant funding for the following:

- Retro-fitting of Council's HGV fleet with emissions reduction technology
- Cleaner taxis research and engagement programme.
- Air quality awareness and engagement campaign, including National Clean Air Day 15th June 2017.

Other projects being taken forward include:

- OLEV Go Ultra Low City Project, in conjunction with Nottingham City and Nottinghamshire County Councils, including taking forward the provision of additional electric vehicle charging points.
- Sustainable Travel Access fund £2.73m to support sustainable transport.

Local Priorities and Challenges

The main priorities for the Council are the need to meet the NO₂ EU Limit Value as soon as possible, the modelling and feasibility study to test CAZ options, the development of an overarching Low Emissions Strategy and 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 relating to the CAZ also take account of the local exceedances for which the AQMAs were originally declared.

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 supported the UK's first ever National Clean Air Day on 15th June 2017. Events were organised to provide information on how air pollution affects health, and what can be done to make air cleaner and healthier for everyone. For suggestions of how you can reduce the amount of air pollution you create, go to: <https://www.cleanairday.org.uk/reduce-air-pollution>.



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1 Local Air Quality Management

This report provides an overview of air quality in Derby City 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 AQMA and prepare an 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

AQMAs are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an AQAP within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by Derby City Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=77.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
No. 1 Ring Roads	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.	Air Quality Action Plan Available here
No.2 A52	NO ₂ annual mean	Spondon	Sections of the A52, Derby Road and Nottingham Road in Spondon.	
Victory Road	PM ₁₀ 24-hour mean	Osmaston	An AQMA of 54 dwellings at the southern end of Victory Road, adjacent to the former QDF foundry site.	REVOKED 2011

We propose to amend AQMA No. 1 Ring Roads to encompass properties in St Mary's Court which currently lie outside of the existing AQMA boundary, but where monitoring has identified a risk of exceedance at the façade (see monitoring section for further details).

We are currently considering revocation of the Spondon AQMA; this is based on monitoring data for a number of years indicating that there are no exceedances in this area (see monitoring data for further details).

Monitoring on Ashbourne Road, outside of the AQMAs, has identified the risk of exceedances of the annual mean NO₂ objective. Based on nearby monitoring, it is

anticipated that this is localised, and additional monitoring locations will be established to investigate the extent of the exceedance area.

The Victory Road PM₁₀ AQMA was revoked in 2011; details of the revocation will be provided to Defra.

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

Derby City Council has taken forward a number of 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. Derby City Council's priority for the coming year is the development of a Low Emissions Strategy for the City and the design and implementation of the CAZ. A revised AQAP will be prepared alongside this.

Progress on measures in recent years has been hampered by a lack of resources. The Council is now 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	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
1	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
2	Develop Low Emissions Strategy for the City	Policy Guidance and Development Control	Low Emissions Strategy	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
3	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
4	Clean Air Zone (access restriction) Implementation	Promoting Low Emission Transport	Low Emission Zone (LEZ)	Derby City Council / Joint Air Quality Unit	Ongoing	Ongoing	Unknown	>3µg/m ³	Ongoing	2020
5	Clean Air Zone - Complimentary / supporting measures design and implementation	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
6	Ensure bus, taxi and private hire vehicle emission standards are improved to meet CAZ standards using licensing, franchise or partnership approaches as appropriate	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
7	A programme of awareness raising and data sharing for the CAZ	Public Information	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
8	Promotion of National Clean Air Day in conjunction with five other CAZ cities (air quality awareness and engagement campaign led by Global Action plan (GAP))	Public Information	Other	Global Action Plan (GAP)	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing

Derby City Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
9	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
10	Personalised journey planning	Promoting Travel Alternatives	Workplace Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
11	Community active travel services	Promoting Travel Alternatives	Personalised Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
12	Travel options for business employees	Promoting Travel Alternatives	Personalised Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
13	Jobseeker one stop shop and referral services	Promoting Travel Alternatives	Personalised Travel Planning	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
14	Upgrade Council vehicle fleet to include low-emissions fuels, and emissions control-devices including ensuring that all diesel-powered vehicles in the Council fleet use only ultra-low sulphur diesel	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
15	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
16	Electric vehicle parking promotion scheme	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
17	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

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
18	Consider the air quality impact of proposals in the regeneration of the city centre through the City Centre Regeneration Framework and Spatial Planning	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Derby City Council, Derby Cityscape	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
19	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
20	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
21	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
22	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
23	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
24	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
25	Introduce road works permit scheme	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
26	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 home-working, travel awareness, and other measures	Promoting Travel Alternatives	Workplace Travel Planning	Derby City Council, local businesses	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
27	Increase the percentage of low floor buses operating in Derby	Promoting Low Emission Transport	Other	Bus operators	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
28	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
29	Increase the provision and use of park and ride facilities	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
30	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
31	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
32	New and improved street lighting	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
33	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
34	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
35	Continue to provide and upgrade Real Time Information on bus routes across the city	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
36	Upgrade bus shelters	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
37	Investigate the development of a 'pavement parking' enforcement programme	Promoting Low Emission Transport	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
38	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
39	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
40	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

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
41	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
42	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
43	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
44	Encourage bus operators to purchase replacement vehicles with the lowest available emission levels	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Derby City Council, bus operators	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
45	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
46	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
47	Uttoxeter New Road (A516) Corridor Improvements	Traffic Management	UTC, Congestion management, traffic reduction	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
48	Taxi Fleet emission improvement study and engagement programme	Promoting Low Emission Transport	Taxi emission incentives	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
49	A61 Route Improvements Scheme	Transport Planning and Infrastructure	Other	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing

Derby City Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
50	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
51	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
52	Support development of Derby and Derbyshire Air Quality Working Group	Policy Guidance and Development Control	Other policy	Derby City and Derbyshire County Councils (Public Health)	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
53	Change line 7 Electric vehicle parking promotion scheme - Preferential parking spaces and charging regime for low emission vehicles	Promoting Low Emission Transport	Priority parking for LEV's	Derby City Council	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
54	Change line 5 - local authorities taking a lead in terms of their own and contractor vehicle operations and procurement in line with the CAZ framework	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Derby City Council - Fleet Management	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
55	Review of Derbyshire cycle infrastructure assets - identify strategic gaps	Transport Planning and Infrastructure	Cycle network	Derbyshire County Council / Public Health / Derbyshire AQWG	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
56	Review Derby Cycling Group route network and examine opportunities for improvements around Derby hospitals	Transport Planning and Infrastructure	Cycle network	Public Health / Sustrans	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
57	Create air quality heat map to highlight areas of poorest air quality in Derby/Derbyshire	Public Information	Via other mechanisms	Public Health / Derbyshire AQWG	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing

Derby City Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date
58	Undertake HIA to support implementation of Clean Air Zone	Public Information	Other	Derby City Council (Public Health/CAZ Project Team)	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
59	Review feasibility of Derbyshire text alert systems to reduce exposure amongst those with existing conditions	Public Information	Other	Derbyshire AQWG	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
60	Review available resources to promote awareness of poor air quality for those with existing chronic illness	Public Information	Other	Public Health / Derbyshire AQWG	Ongoing	Ongoing	Unknown	Unknown	Ongoing	Ongoing
61	Increase awareness of impacts of air quality on health across professional groups	Public Information	Other	Derbyshire AQWG / PHE / EMAQN	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 now 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 is focussing on the need to meet the EU Limit Value for NO₂, however, many of the measures that will 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 would however add that, centrally led work to encourage the manufacturing industry more quickly towards 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

3.1.1 Automatic Monitoring Sites

Derby City Council undertook automatic (continuous) monitoring at five sites until 2014. Data for these sites have been presented in previous reports and are not repeated here.

DEFRA have commissioned a new automatic AURN monitoring site adjacent to Bass Recreation ground adjacent to the A601 between Holms Bridge and The Cock Pitt, described on the DEFRA website as the Derby St Alkmund's Way site. This site was commissioned at the beginning of 2017 and data will be reported in next year's (2018) ASR.

3.1.2 Non-Automatic Monitoring Sites

Derby City Council undertook non-automatic (passive) monitoring of NO₂ at 74 sites during 2016, one of which is a triplicate co-location with the Warwick Avenue automatic monitoring station (which is currently not in operation). Table A.1 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.

Maps showing the location of the current monitoring sites 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 “annualisation” and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 7 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.

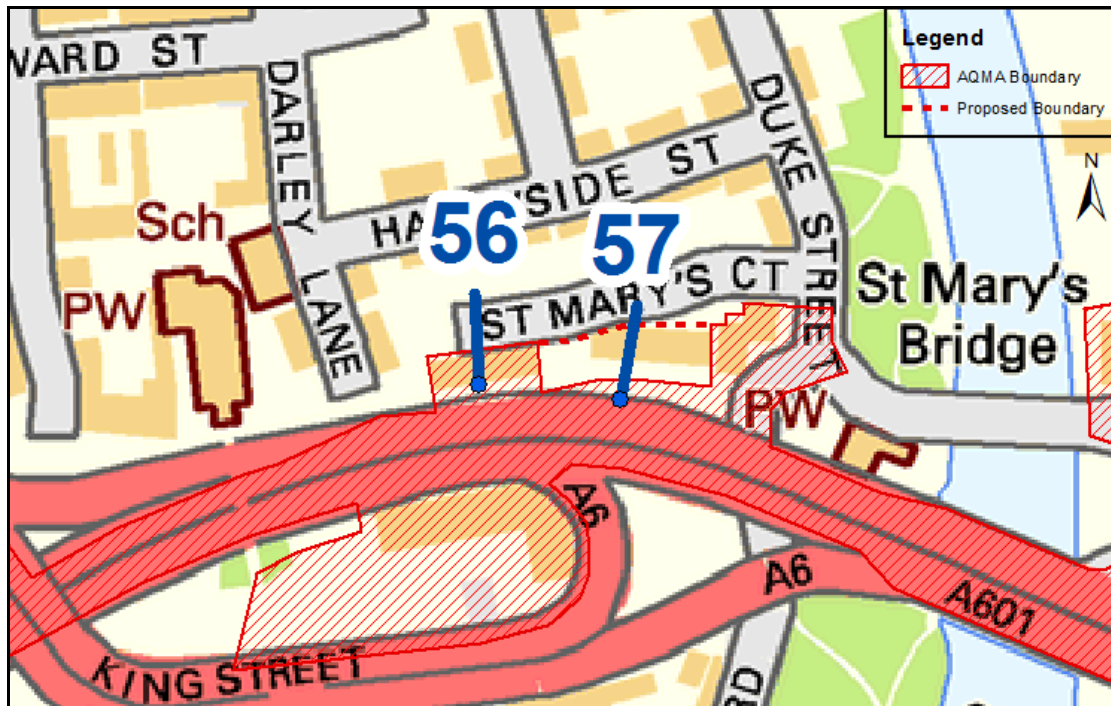
The results of the fully adjusted (bias adjusted, and annualised where appropriate), show that there are 14 locations where there are potential exceedances of the annual mean objective have been measured in 2016. Most of these locations are within the existing Ring Road AQMA, however five locations are outside of the existing AQMAs:

DT11 is a new roadside monitoring location just outside the AQMA boundary on Eastgate. In 2016, a concentration of 46.5µg/m³ was measured here. There is no relevant exposure for the annual mean objective near to this site, and therefore no further action is required. 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 is a new kerbside monitoring location adjacent to the A38, which measured a concentration of 60µg/m³ in 2016. 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 new kerbside monitoring location which lies on the boundary of the existing AQMA. It measured a concentration of 54.1µg/m³ in 2016. 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 40.5µg/m³. The adjacent monitoring site, DT56, which is on the façade of residential properties located within the AQMA measured 40.6µg/m³; in recent years, concentrations at this site have been below the annual mean objective. Derby City Council propose to amend the AQMA boundary to encompass the properties on St Mary's Court so that they are within the AQMA.

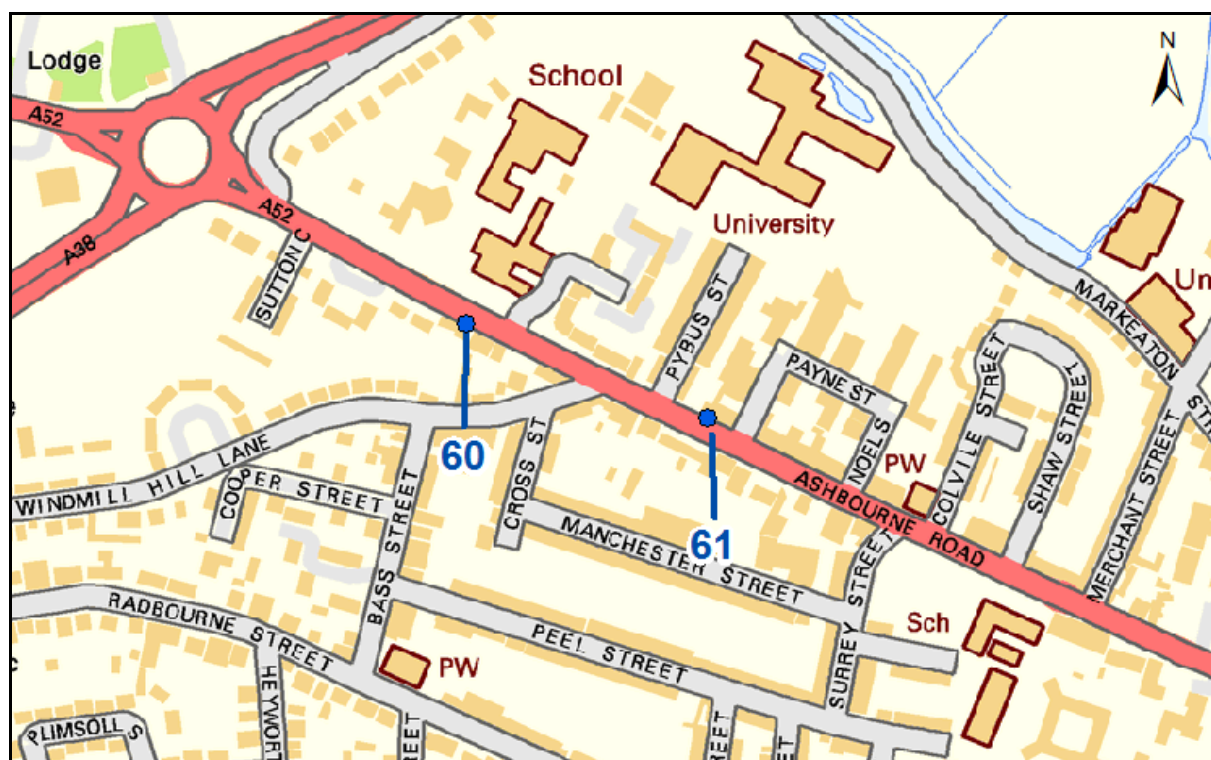
Figure 3.1: Proposed Revised AQMA Boundary



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DT60 is a new monitoring location, adjacent to the A52, which measured a concentration of $42.3\mu\text{g}/\text{m}^3$ in 2016. 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. Additional monitoring is proposed alongside the A52 to assist in determining the extent of the exceedance, and to inform an AQMA boundary.

Figure 3.2: Ashbourne Road Monitoring Locations



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DT74 is a new roadside monitoring location in Derby city centre. It is on the edge of the existing AQMA boundary, and measured a concentration of $40.6\mu\text{g}/\text{m}^3$ in 2016. There is no relevant exposure for the annual mean objective near to this monitoring location and no further action is required for this area. Nearby monitoring site DT75 has been in operation for a number of years, and has measured concentrations below $40\mu\text{g}/\text{m}^3$ since 2011.

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. As there are six years of data from monitoring sites which are located at worst-case locations in the AQMA, which have been consistently below the level of the objective, Derby City Council will consider revoking this AQMA.

3.2.2 Particulate Matter (PM_{10})

Derby City Council have not undertaken any PM_{10} 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 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

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)
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

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)
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
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

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)
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 Street	R	434713	336491	NO ₂	Y	0	2	No	1.8
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

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)
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

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

(2) 0m means the monitor is on the façade of relevant exposure.

(3) N/A - not applicable; there is no nearby relevant exposure for the annual mean objective, or the site is an UB location.

Table A.2 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture 2016 (%)	NO ₂ Annual Mean Concentration (µg/m ³) ⁽¹⁾						
				2010	2011	2012	2013	2014	2015	2016
DT1	R	Diffusion tube	92	28	26	23	30	27	30	28.6
DT2	R	Diffusion tube	100	28	25	26	29	29	28	29.0
DT3	R	Diffusion tube	100	27	22	22	28	25	25	26.0
DT4	R	Diffusion tube	100	41	35	28	38	39	36	38.0
DT5	R	Diffusion tube	100	37	23	27	37	29	27	31.1
DT6	R	Diffusion tube	100	29	27	26	31	29	28	27.8
DT7	R	Diffusion tube	92	-	-	-	-	-	-	27.0
DT8	R	Diffusion tube	100	-	-	-	-	-	-	29.1
DT9	R	Diffusion tube	100	28	28	24	29	30	29	27.8
DT10	R	Diffusion tube	92	-	-	-	-	-	-	47.4
DT11	R	Diffusion tube	92	-	-	-	-	-	-	46.5
DT12	UB	Diffusion tube	92	-	-	-	-	-	-	36.3
DT13	R	Diffusion tube	83	33	30	27	32	34	30	29.8
DT14	R	Diffusion tube	92	30	23	23	27	23	23	26.7
DT15	R	Diffusion tube	75	-	-	-	-	-	-	43.7
DT16	R	Diffusion tube	83	-	-	-	-	-	-	35.4
DT17	R	Diffusion tube	92	-	-	-	-	-	-	30.8
DT18	R	Diffusion tube	100	-	-	-	-	-	-	27.1
DT19	R	Diffusion tube	92	28	24	22	28	27	26	26.3
DT20	R	Diffusion tube	92	-	-	-	-	-	-	27.2
DT21	K	Diffusion tube	75	-	-	-	-	-	-	25.2
DT22	R	Diffusion tube	92	-	-	-	-	-	-	27.3
DT23	R	Diffusion tube	50	-	-	-	-	-	-	43.0
DT24	R	Diffusion tube	83	-	-	29	39	37	34	41.2
DT25	R	Diffusion tube	67	48	42	38	50	47	50	40.9
DT26	K	Diffusion tube	100	47	39	38	49	48	47	47.0

Site ID	Site Type	Monitoring Type	Valid Data Capture 2016 (%)	NO ₂ Annual Mean Concentration (µg/m ³) ⁽¹⁾						
				2010	2011	2012	2013	2014	2015	2016
DT27	K	Diffusion tube	100	48	41	40	49	46	44	46.5
DT28	K	Diffusion tube	100	49	39	37	47	46	43	47.6
DT29	R	Diffusion tube	83	-	-	-	-	-	-	27.3
DT30	R	Diffusion tube	92	-	-	-	-	-	-	26.5
DT31	R	Diffusion tube	83	-	-	-	-	-	-	30.8
DT32	R	Diffusion tube	100	35	34	32	43	43	39	41.0
DT33	R	Diffusion tube	100	33	27	27	32	29	28	30.9
DT34	K	Diffusion tube	75	-	-	-	-	-	-	60.0
DT35	R	Diffusion tube	92	-	-	-	-	-	-	32.1
DT36	R	Diffusion tube	92	-	-	-	-	-	-	36.8
DT37	R	Diffusion tube	100	-	35	31	29	25	23	26.1
DT38	R	Diffusion tube	100	-	-	-	25	22	21	22.9
DT39	R	Diffusion tube	100	-	-	-	-	-	-	32.7
DT40	R	Diffusion tube	75	-	-	-	-	-	-	29.4
DT41	R	Diffusion tube	83	-	-	-	-	-	-	31.4
DT42	R	Diffusion tube	92	-	-	-	-	-	-	32.5
DT43	R	Diffusion tube	92	-	-	-	-	-	-	28.1
DT44	R	Diffusion tube	83	-	-	-	-	-	-	38.1
DT45	R	Diffusion tube	100	34	30	27	35	37	32	32.7
DT46	R	Diffusion tube	92	-	-	-	-	-	-	33.6
DT47	K	Diffusion tube	67	-	-	-	-	-	-	36.1
DT48	K	Diffusion tube	83	-	-	-	-	-	-	37.2
DT49	R	Diffusion tube	100	40	30	31	35	37	31	32.7
DT50	R	Diffusion tube	83	41	37	32	42	43	39	39.2
DT51	R	Diffusion tube	92	-	-	-	-	-	-	30.4
DT52	R	Diffusion tube	100	37	31	29	38	37	33	32.4
DT53	R	Diffusion tube	83	-	-	-	-	-	-	29.9

Site ID	Site Type	Monitoring Type	Valid Data Capture 2016 (%)	NO ₂ Annual Mean Concentration (µg/m ³) ⁽¹⁾						
				2010	2011	2012	2013	2014	2015	2016
DT54	R	Diffusion tube	83	36	30	27	33	31	30	30.4
DT55	R	Diffusion tube	92	-	-	-	-	-	-	28.8
DT56	R	Diffusion tube	92	34	32	27	35	33	32	40.6
DT57	K	Diffusion tube	83	-	-	-	-	-	-	54.1
DT58	R	Diffusion tube	92	29	25	24	27	27	27	27.9
DT59	R	Diffusion tube	92	-	-	-	-	-	-	50.9
DT60	R	Diffusion tube	83	-	-	-	-	-	-	42.3
DT61	R	Diffusion tube	92	35	28	28	33	29	32	31.3
DT62	R	Diffusion tube	83	-	-	-	-	-	-	35.0
DT63	R	Diffusion tube	100	43	33	31	42	35	36	39.2
DT64	R	Diffusion tube	83	38	31	26	33	36	34	33.1
DT65	R	Diffusion tube	92	-	-	-	-	-	-	35.0
DT66	R	Diffusion tube	92	-	-	-	-	-	-	26.2
DT67	UB	Diffusion tube	92	-	-	-	-	-	-	16.7
DT68	R	Diffusion tube	100	41	34	32	38	38	36	35.3
DT69	R	Diffusion tube	100	34	29	26	34	34	31	30.9
DT70	R	Diffusion tube	92	33	29	28	36	34	35	32.5
DT71	R	Diffusion tube	83	-	-	-	-	-	-	35.3
DT72	R	Diffusion tube	83	-	-	-	-	-	-	32.0
DT73	R	Diffusion tube	100	30	26	23	29	31	27	25.8
DT74	R	Diffusion tube	50	-	-	-	-	-	-	40.6
DT75	R	Diffusion tube	92	48	36	29	40	37	38	38.7
DT76	UC	Diffusion tube	92	-	-	-	-	-	-	26.7

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

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

Trends in Concentrations at Long-Term Monitoring Sites

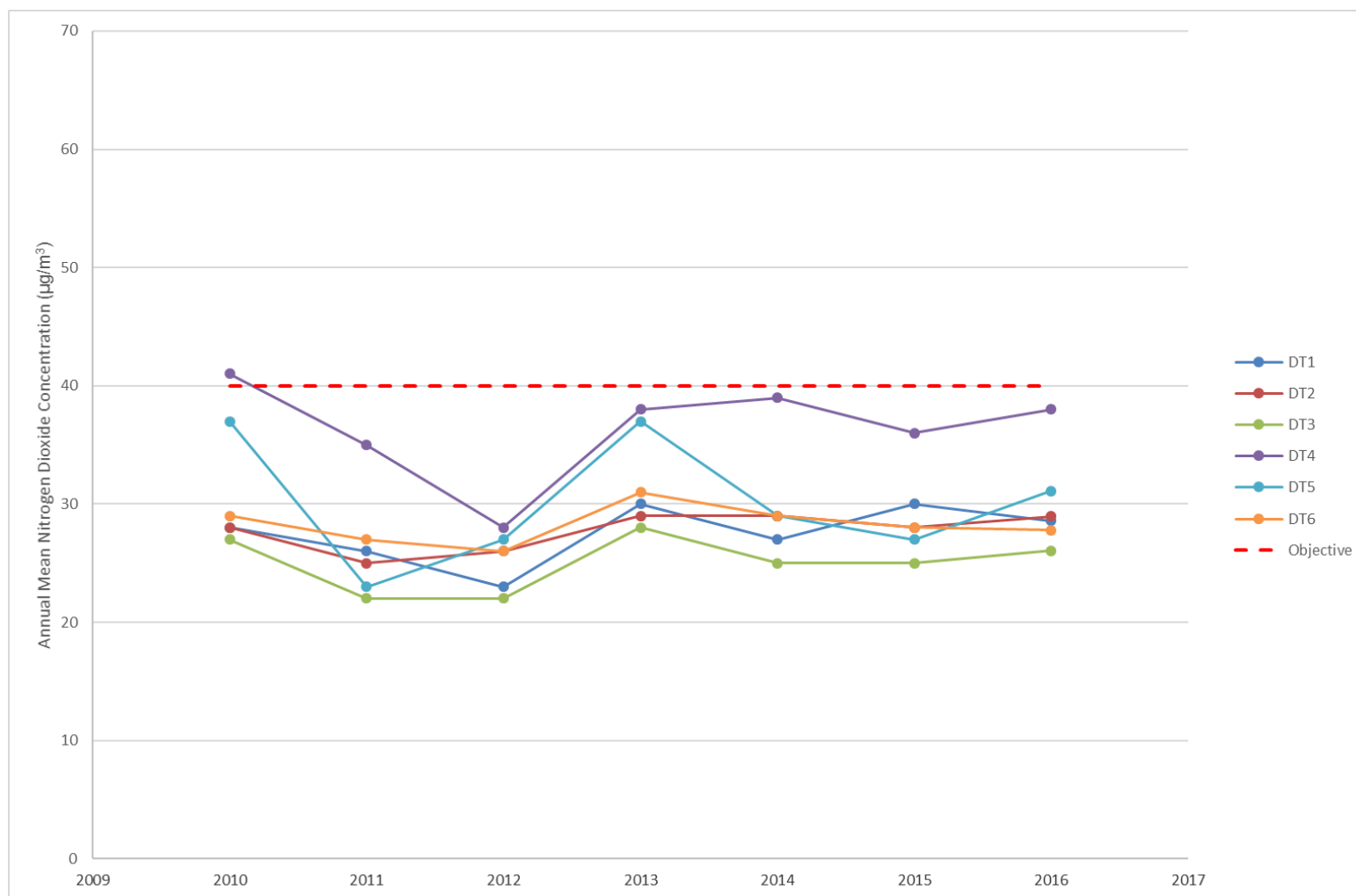
Figure A.1 – Trend in Annual Mean NO₂ Concentrations Measured in the Spondon AQMA (Sites DT1 – DT6)

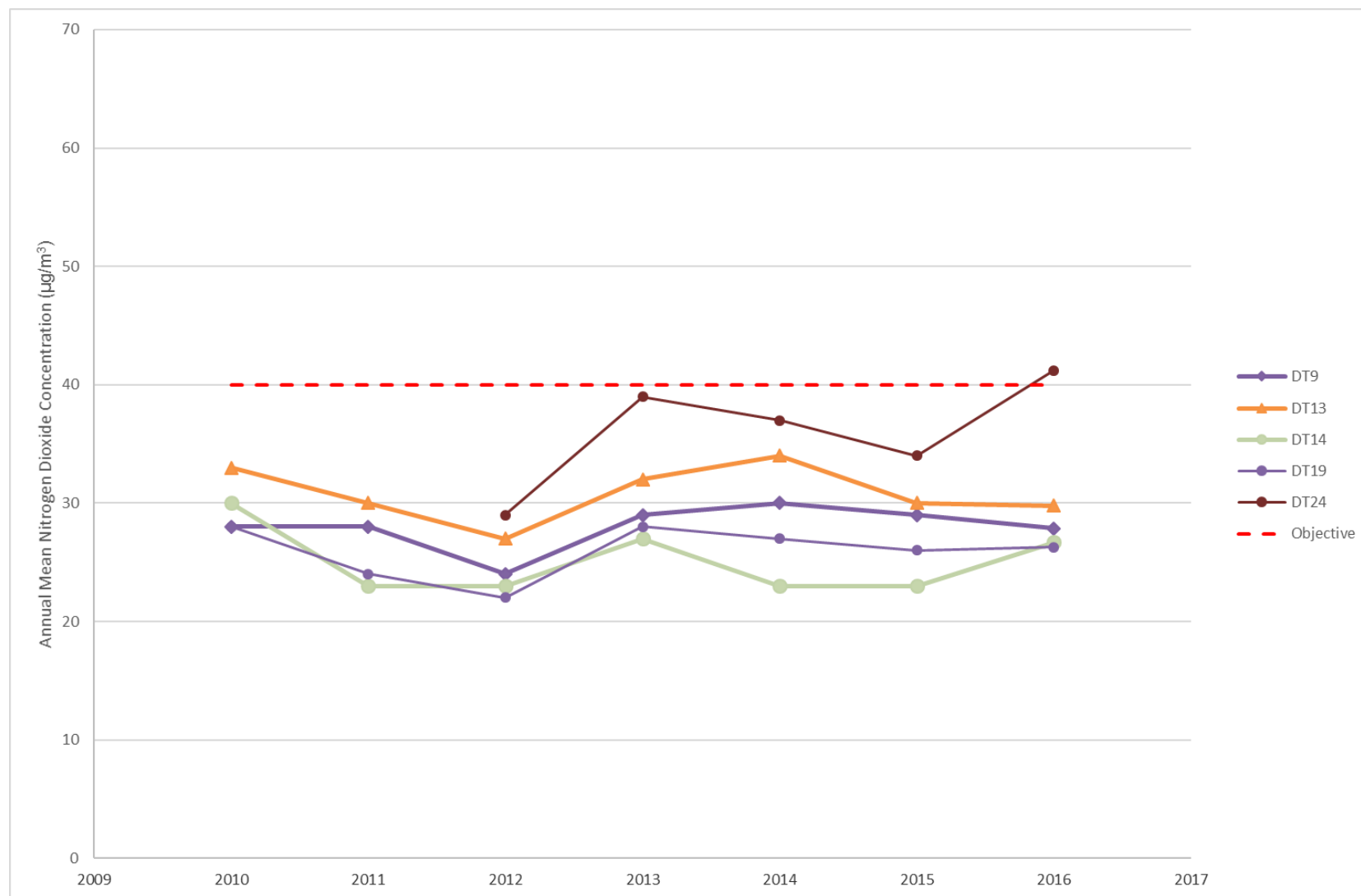
Figure A.2 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT9 – DT24

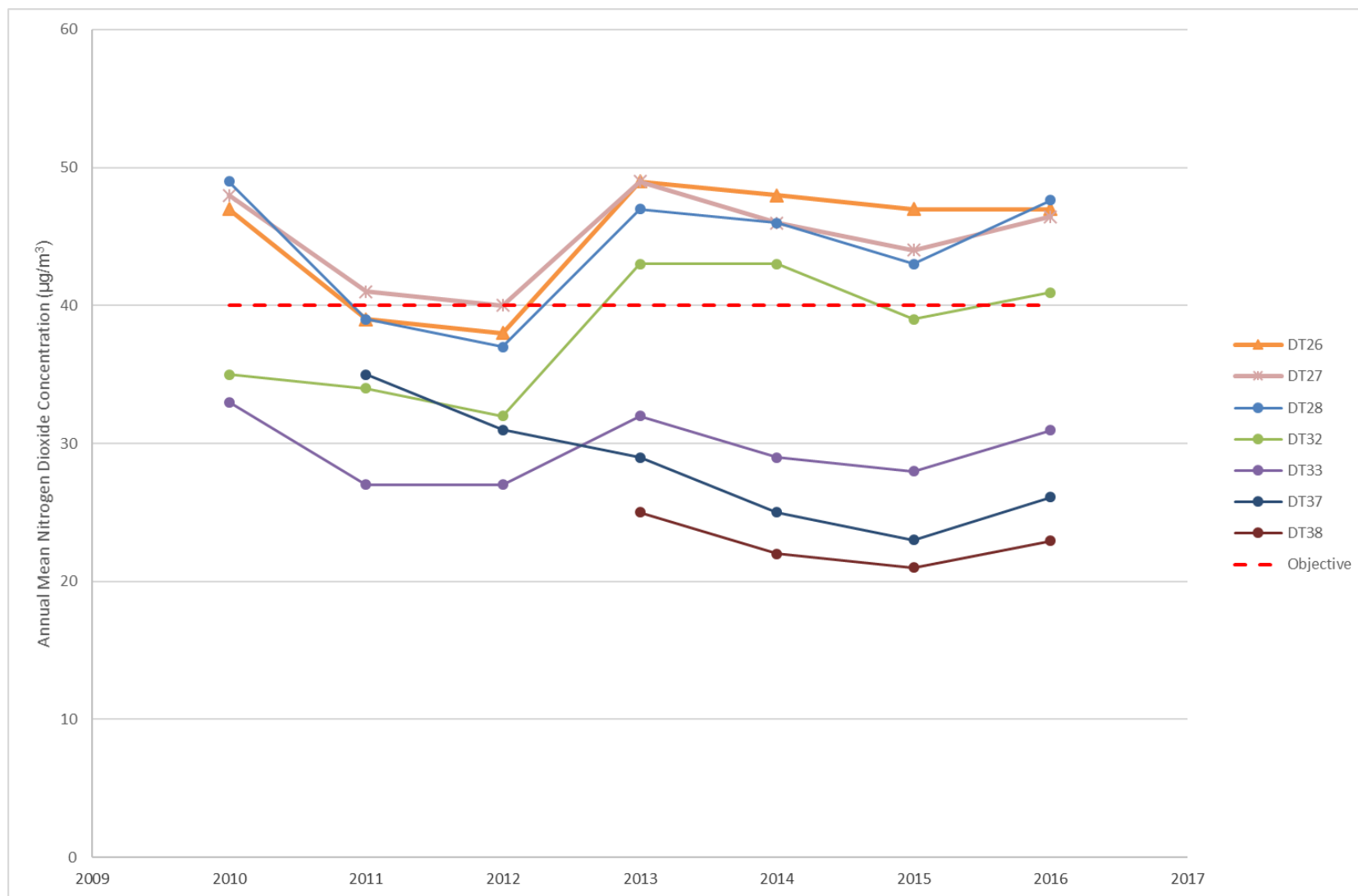
Figure A.3 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT26 – DT38

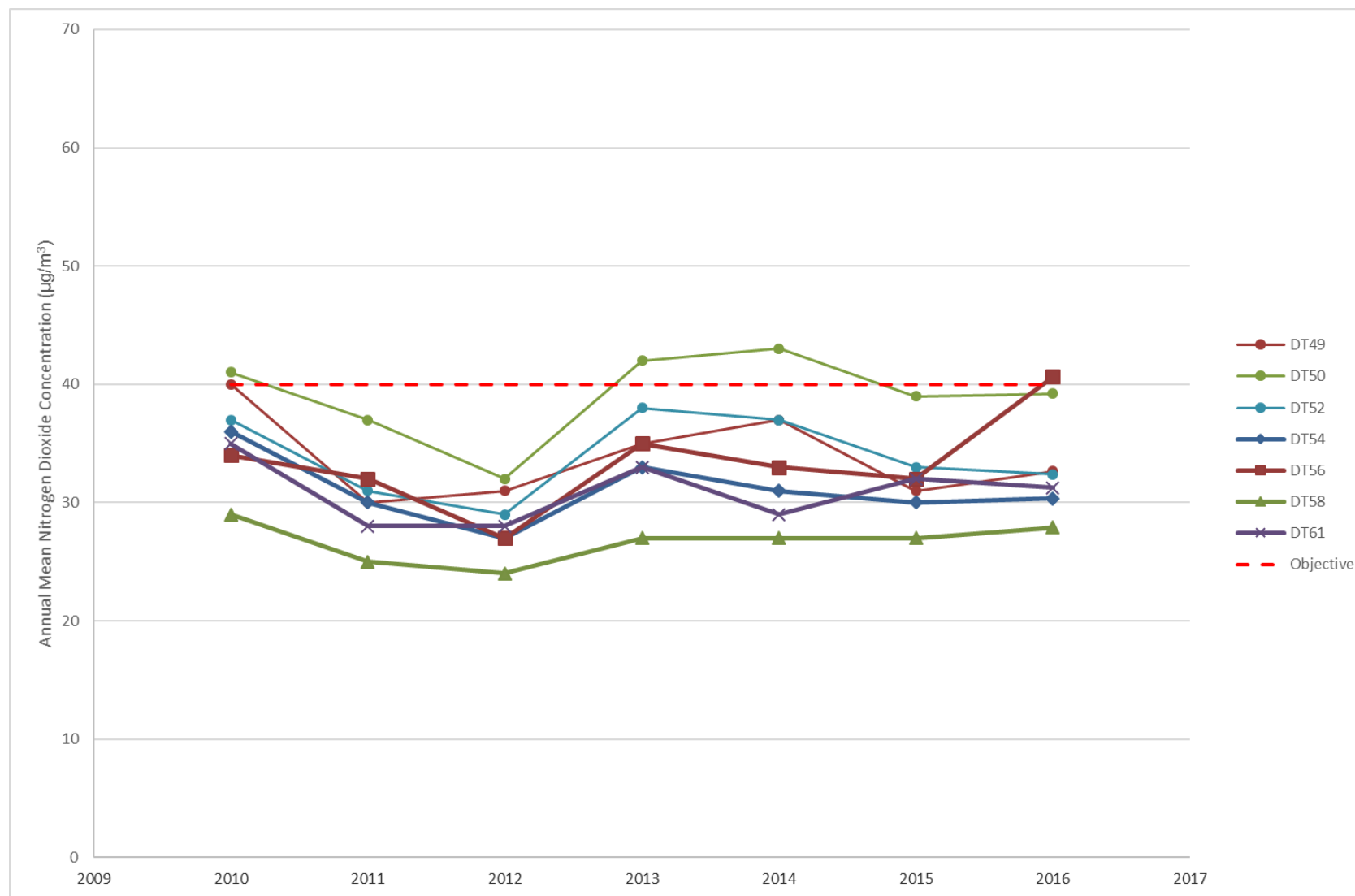
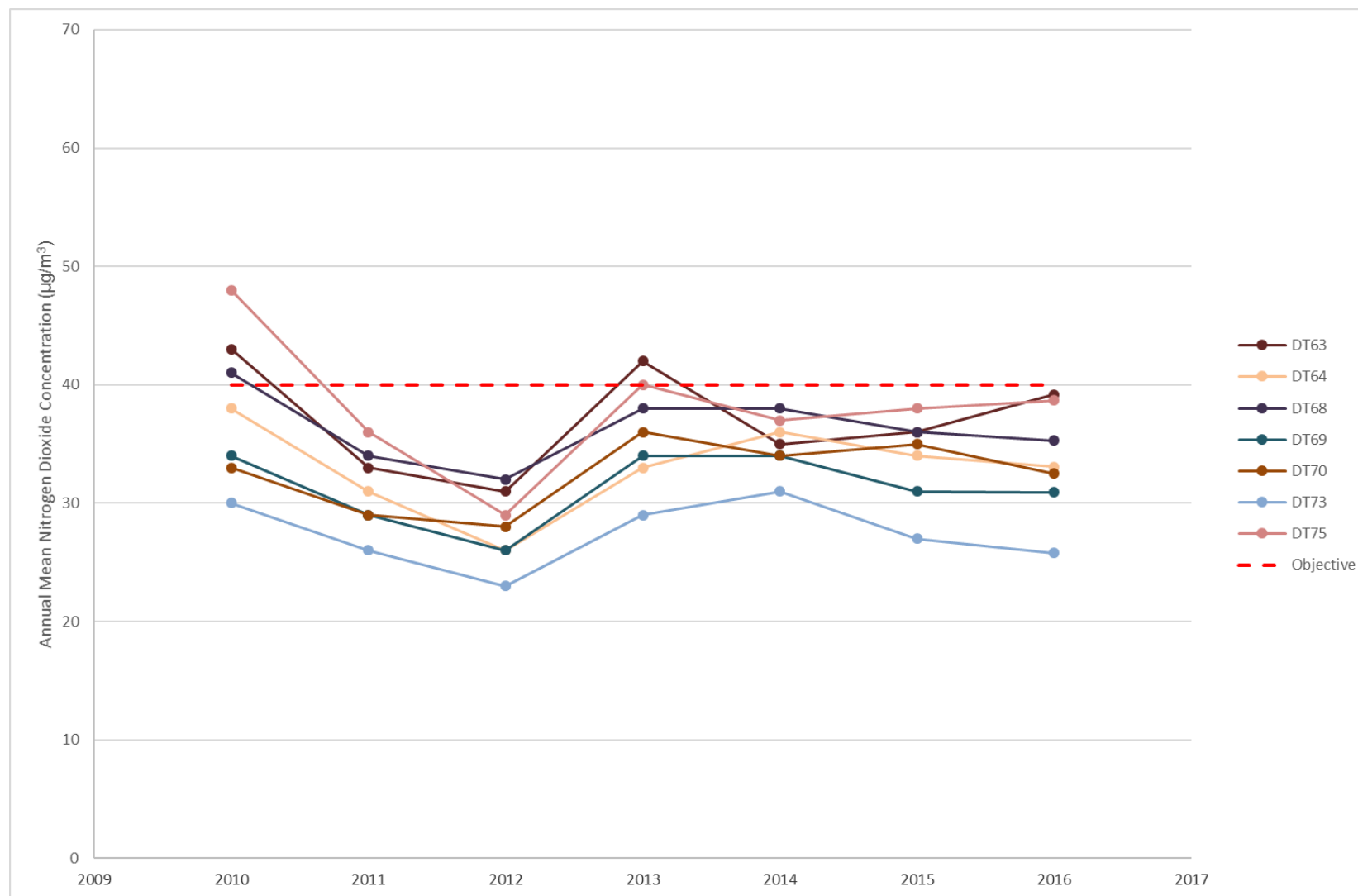
Figure A.4 – Trend in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites DT49 – DT61

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

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)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT1	41.0	-	31.7	31.0	39.8	28.6	30.6	27.4	38.0	37.8	46.3	55.9	37.1	28.6
DT2	43.6	41.8	35.1	34.0	40.7	30.7	29.3	30.5	33.1	33.6	45.4	53.5	37.6	29.0
DT3	34.1	39.4	36.5	31.9	34.4	29.6	22.8	24.3	28.2	36.0	41.7	46.9	33.8	26.0
DT4	56.5	58.1	47.3	43.0	59.6	42.5	39.1	37.3	42.1	48.0	60.3	58.5	49.4	38.0
DT5	48.4	49.8	50.9	45.5	39.1	26.6	25.1	26.6	30.5	45.4	56.8	39.9	40.4	31.1
DT6	48.4	40.8	36.5	16.8	38.1	30.8	33.5	32.3	33.5	33.0	48.0	41.4	36.1	27.8
DT7	41.2	34.8	-	29.8	40.5	29.6	24.4	25.7	27.9	36.7	49.2	46.6	35.1	27.0
DT8	51.7	39.2	37.3	33.5	45.0	25.9	29.9	26.4	36.4	34.2	43.8	49.9	37.8	29.1
DT9	39.4	42.1	35.3	33.4	41.1	23.4	37.0	29.8	35.1	29.3	44.7	43.4	36.2	27.8
DT10	62.6	68.6	66.4	63.9	69.4	56.1	-	22.1	53.2	58.8	77.5	78.6	61.6	47.4
DT11	-	40.5	67.4	55.0	73.9	76.6	43.9	51.5	53.6	66.9	77.9	57.5	60.4	46.5
DT12	-	52.4	45.6	35.2	55.2	40.2	43.7	37.7	43.6	44.5	59.4	60.4	47.1	36.3
DT13	36.4	43.7	34.3	29.4	44.9	30.0	31.1	-	38.7	-	43.8	54.7	38.7	29.8
DT14	-	36.6	38.2	28.5	41.4	28.6	22.7	24.2	30.4	36.1	46.5	48.3	34.7	26.7
DT15	58.3	77.8	-	48.7	-	-	43.9	41.8	51.6	49.5	66.3	73.4	56.8	43.7
DT16	-	52.5	-	46.0	47.7	35.0	37.8	35.0	43.0	44.1	58.5	60.5	46.0	35.4
DT17	43.4	42.1	-	40.0	40.6	39.7	29.0	28.8	39.4	42.7	42.6	52.1	40.0	30.8
DT18	57.7	36.4	36.3	33.1	29.4	31.9	23.8	25.0	30.1	36.8	39.3	42.6	35.2	27.1
DT19	-	28.7	44.3	31.0	37.4	30.1	23.1	24.9	31.1	37.8	40.1	46.7	34.1	26.3
DT20	-	34.9	36.8	35.3	30.5	27.9	22.5	51.6	29.9	33.4	44.1	41.8	35.3	27.2

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT21	-	-	-	34.9	36.4	33.8	18.0	21.3	25.4	38.4	44.9	41.3	32.7	25.2
DT22	-	38.0	37.5	34.6	36.1	34.7	25.6	28.0	30.4	37.1	44.3	43.3	35.4	27.3
DT23	-	50.0	51.3	44.6	45.9	42.0	81.5	-	-	-	-	-	52.6	40.5
DT24	46.7	51.2	56.3	52.7	54.2	51.8	-	-	45.9	56.4	65.3	54.8	53.5	41.2
DT25	-	56.2	52.7	55.1	54.4	-	32.7	34.7	44.0	55.9	-	-	48.2	37.1
DT26	62.3	66.9	66.2	63.8	65.4	60.9	53.6	47.7	55.9	53.7	72.6	63.1	61.0	47.0
DT27	56.0	63.3	64.7	63.3	60.9	57.4	52.0	50.8	61.8	61.2	59.7	72.8	60.3	46.5
DT28	65.7	62.9	67.1	66.0	60.0	49.3	49.1	50.5	56.7	62.2	78.6	74.0	61.8	47.6
DT29	-	37.5	41.5	36.9	39.6	36.9	18.3	22.6	30.8	40.7	49.7	-	35.5	27.3
DT30	-	34.1	31.8	32.2	39.7	40.6	22.3	22.7	34.2	34.7	43.5	43.1	34.4	26.5
DT31	-	-	36.6	36.6	39.5	33.6	33.9	33.0	35.9	40.0	53.9	56.4	39.9	30.8
DT32	51.4	51.2	60.2	56.3	52.7	44.6	38.8	31.4	48.5	53.5	72.3	77.4	53.2	41.0
DT33	37.9	37.8	44.7	65.4	35.9	33.6	32.4	29.3	32.9	38.5	47.4	46.5	40.2	30.9
DT34	-	93.8	-	72.7	-	75.1	68.8	63.8	76.9	87.3	96.4	66.9	78.0	60.0
DT35	-	49.5	47.9	44.8	44.3	35.6	36.9	36.2	48.3	42.5	31.7	41.2	41.7	32.1
DT36	-	58.0	55.3	42.1	47.4	32.7	33.3	38.9	46.9	51.6	61.1	59.0	47.8	36.8
DT37	32.1	36.0	38.2	33.2	32.1	28.1	20.4	21.4	29.7	40.6	45.7	49.2	33.9	26.1
DT38	33.8	26.7	26.8	30.4	31.3	24.9	17.4	19.3	25.4	33.6	41.3	46.5	29.8	22.9
DT39	35.1	42.0	46.5	44.7	45.9	43.8	24.0	25.3	37.9	52.6	54.8	56.3	42.4	32.7
DT40	37.5	40.2	-	36.5	-	30.4	27.8	31.9	37.7	-	45.6	56.1	38.2	29.4
DT41	-	48.2	46.8	42.9	37.7	36.3	35.1	34.2	34.5	39.9	-	51.9	40.8	31.4
DT42	-	42.7	46.3	43.1	39.4	41.0	30.7	28.6	38.8	43.8	55.8	53.9	42.2	32.5
DT43	-	32.9	37.9	33.7	40.3	35.5	22.9	27.2	35.6	40.8	43.3	50.7	36.4	28.1
DT44	-	48.0	52.0	47.6	51.6	51.2	25.6	36.7	-	54.4	62.4	65.2	49.5	38.1

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT45	48.1	34.8	44.5	38.1	44.7	40.6	34.0	31.1	39.4	45.7	55.4	53.4	42.5	32.7
DT46	-	47.6	47.4	47.7	46.2	38.9	40.9	37.9	43.0	43.6	55.7	30.7	43.6	33.6
DT47	-	50.4	41.1	46.0	52.2	40.9	-	34.4	40.7	-	58.1	-	45.5	35.0
DT48	49.3	-	43.9	51.1	50.2	-	39.2	35.2	46.7	44.8	58.2	64.4	48.3	37.2
DT49	55.8	40.1	44.8	42.6	40.1	38.5	29.2	28.1	39.7	38.9	52.0	59.1	42.4	32.7
DT50	51.0	52.6	54.4	49.6	54.8	39.5	39.6	-	-	45.5	62.6	59.4	50.9	39.2
DT51	-	45.7	45.5	38.8	42.8	34.9	25.0	28.8	34.9	41.9	51.1	45.3	39.5	30.4
DT52	51.7	47.3	45.8	38.1	40.7	35.3	28.6	31.1	39.0	43.3	50.9	53.0	42.1	32.4
DT53	-	52.4	21.6	36.2	41.1	33.6	39.4	29.8	-	40.3	37.8	56.2	38.8	29.9
DT54	-	44.2	40.4	36.3	42.8	32.3	31.2	30.0	41.0	-	55.6	40.5	39.4	30.4
DT55	-	41.2	37.3	32.1	36.6	36.3	25.2	23.3	36.3	42.7	49.9	51.1	37.5	28.8
DT56	51.3	55.7	54.6	47.1	-	48.7	45.1	46.9	49.8	53.1	65.8	62.5	52.8	40.6
DT57	-	77.2	64.1	74.4	68.0	68.7	62.1	53.2	71.4	-	93.0	70.9	70.3	54.1
DT58	43.1	38.4	36.3	31.5	33.5	-	27.6	23.1	34.1	38.4	48.2	44.6	36.3	27.9
DT59	-	70.7	64.7	69.8	73.3	69.0	57.1	53.4	63.2	68.2	84.4	53.3	66.1	50.9
DT60	-	54.3	56.2	50.6	54.3	53.4	47.6	48.6	52.5	-	64.4	67.9	55.0	42.3
DT61	45.0	34.4	43.8	43.2	40.2	36.1	27.2	-	30.8	42.3	49.4	54.1	40.6	31.3
DT62	-	50.3	49.8	52.1	52.1	46.8	29.4	33.6	39.6	-	51.8	48.4	45.4	35.0
DT63	47.6	50.8	46.6	79.5	52.1	51.2	34.8	36.7	42.4	51.6	59.8	57.2	50.9	39.2
DT64	52.7	R	36.6	40.8	40.4	34.0	-	32.1	45.7	43.7	50.9	52.6	43.0	33.1
DT65	-	49.2	46.5	40.0	45.5	39.6	37.3	33.3	45.4	46.6	55.9	60.4	45.4	35.0
DT66	-	36.0	36.5	29.3	34.5	29.8	26.7	25.8	36.1	34.2	45.6	40.1	34.1	26.2
DT67	-	25.0	24.2	17.8	22.3	16.2	14.0	14.0	21.7	20.8	30.3	32.9	21.7	16.7
DT68	58.0	59.1	51.8	41.1	42.3	36.2	39.6	36.1	44.3	38.4	45.4	57.4	45.8	35.3

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT69	43.2	43.2	41.3	32.3	39.8	39.5	36.9	32.1	41.4	41.1	46.8	43.9	40.1	30.9
DT70	52.6	47.3	44.4	38.4	42.9	32.6	-	30.2	38.0	36.2	50.3	51.1	42.2	32.5
DT71	-	44.0	48.7	42.8	43.7	-	66.3	29.1	35.7	43.4	53.3	50.8	45.8	35.3
DT72	-	44.6	41.2	44.1	43.2	-	26.7	32.9	34.4	42.6	53.3	52.8	41.6	32.0
DT73	44.2	38.4	36.5	34.0	35.9	27.7	12.3	23.9	30.6	35.1	45.3	37.9	33.5	25.8
DT74	-	45.2	59.0	57.6	65.9	-	-	-	-	-	72.1	70.8	61.8	47.6
DT75	47.4	56.5	48.0	48.6	51.2	43.2	-	37.4	45.9	51.4	60.0	62.8	50.2	38.7
DT76	51.3	30.6	34.4	34.7	30.7	-	12.5	22.7	32.1	33.0	48.5	51.6	34.7	26.7

(1) See Appendix C for details on bias adjustment

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 operate a chemiluminescent analyser, and therefore no co-location study is carried out. 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 03/17 v2, based on 30 studies; available at: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>). This factor has been applied to all 2016 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 2016 are provided below:

Air PT Round	AR012	AR013	AR015	AR016
Period	Jan – Feb 2016	April – May 2016	July – Aug 2016	Sept – Oct 2016
Satisfactory Results (%)	100	75	75	100

During 2016, at least 75% of samples submitted were determined to have been satisfactory.

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

Missing diffusion tubes meant that four monitoring locations did not achieve the minimum data requirements (75%) during 2016. The data for these four sites (DT23, DT25, DT47 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 2016 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; 1 Feb – 26 July 2016

Site	2016 Annual Mean	Period Mean	Ratio
Leicester University	28.4	26.4	1.076
Nottingham Centre	31.2	29.7	1.049
Stoke-on-Trent Centre	27.7	26.0	1.066
		Average	1.063

DT25; 1 Feb – 23 May, 29 June – 31 Oct 2016

Site	2016 Annual Mean	Period Mean	Ratio
Leicester University	28.4	26.1	1.087
Nottingham Centre	31.2	28.0	1.114
Stoke-on-Trent Centre	27.7	25.1	1.102
		Average	1.101

DT47; 1 Feb – 29 June, 26 July – 28 Sept, 31 Oct – 30 Nov 2016



Site	2016 Annual Mean	Period Mean	Ratio
Leicester University	28.4	27.6	1.030
Nottingham Centre	31.2	30.0	1.041
Stoke-on-Trent Centre	27.7	27.1	1.022
		Average	1.031

DT74; 1 Feb – 23 May 2016, 31 Oct 2016 – 5 Jan 2017

Site	2016 Annual Mean	Period Mean	Ratio
Leicester University	28.4	32.7	0.868
Nottingham Centre	31.2	37.0	0.842
Stoke-on-Trent Centre	27.7	32.4	0.853
		Average	0.854

Fall off with Distance Calculators

DT57

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1	metres
Step 2	How far from the KERB is your receptor (in metres)?	12	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	27	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	54.1	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	40.5	µg/m ³

Appendix D: Maps of Monitoring Locations



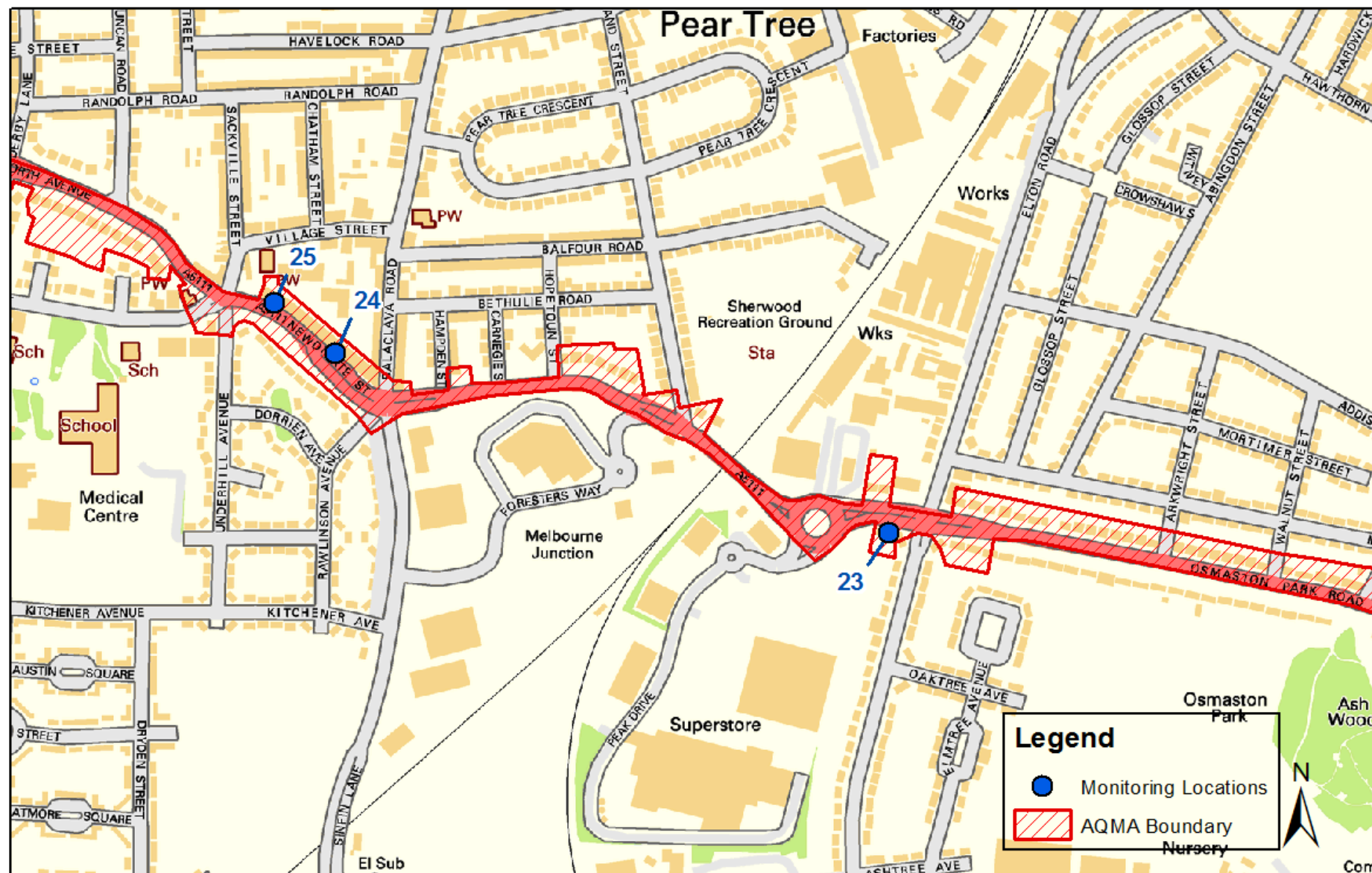
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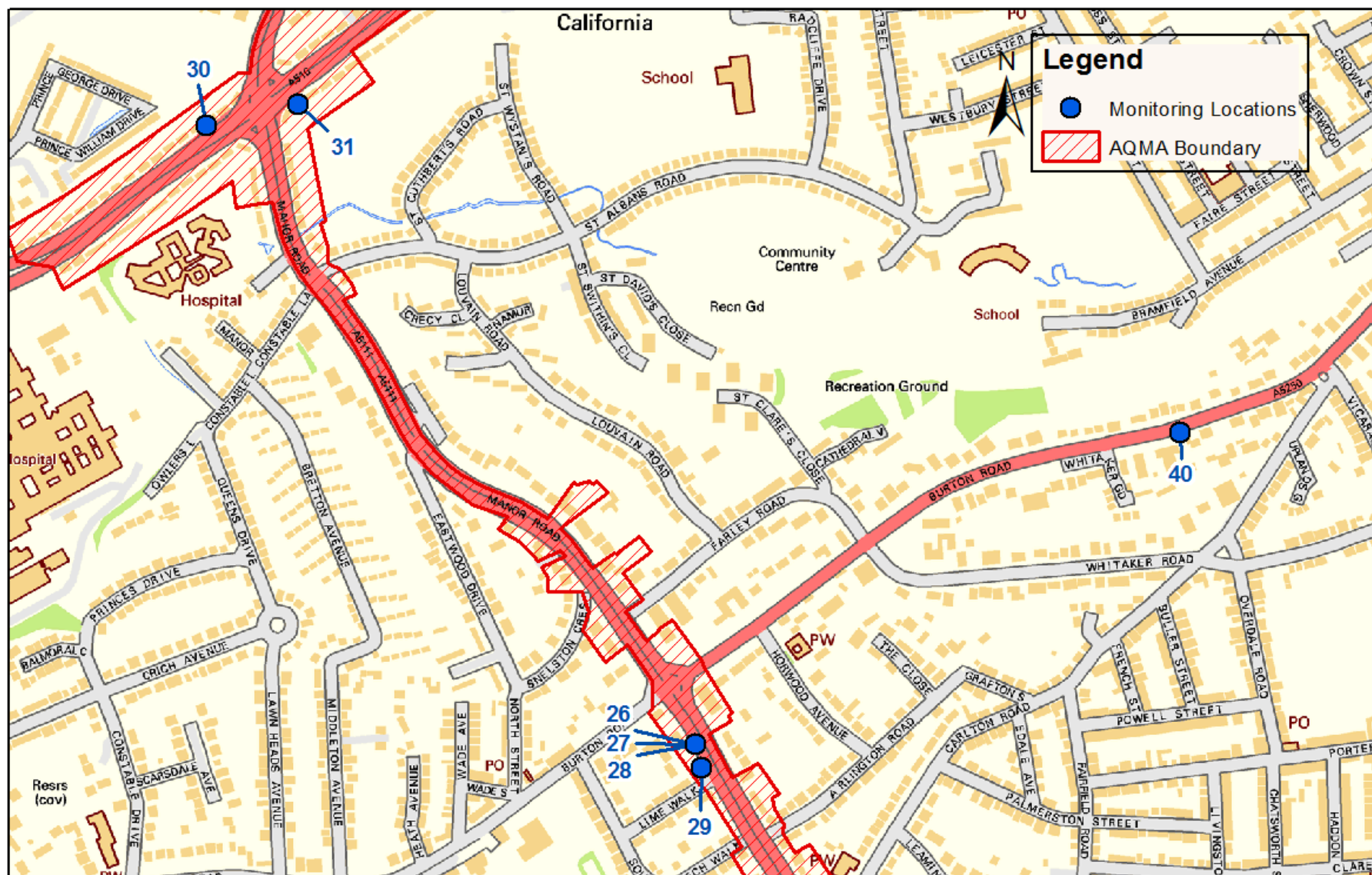
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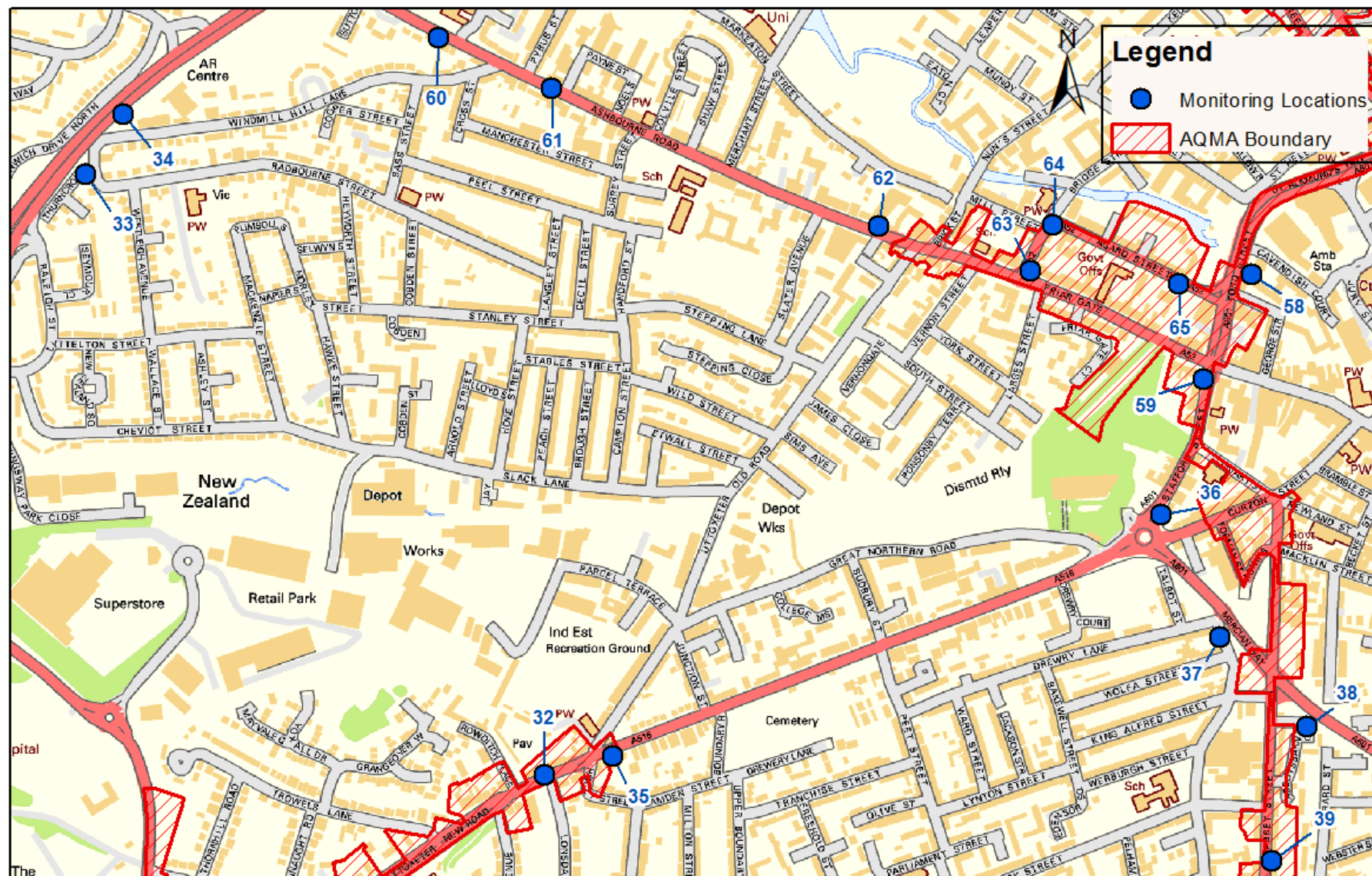
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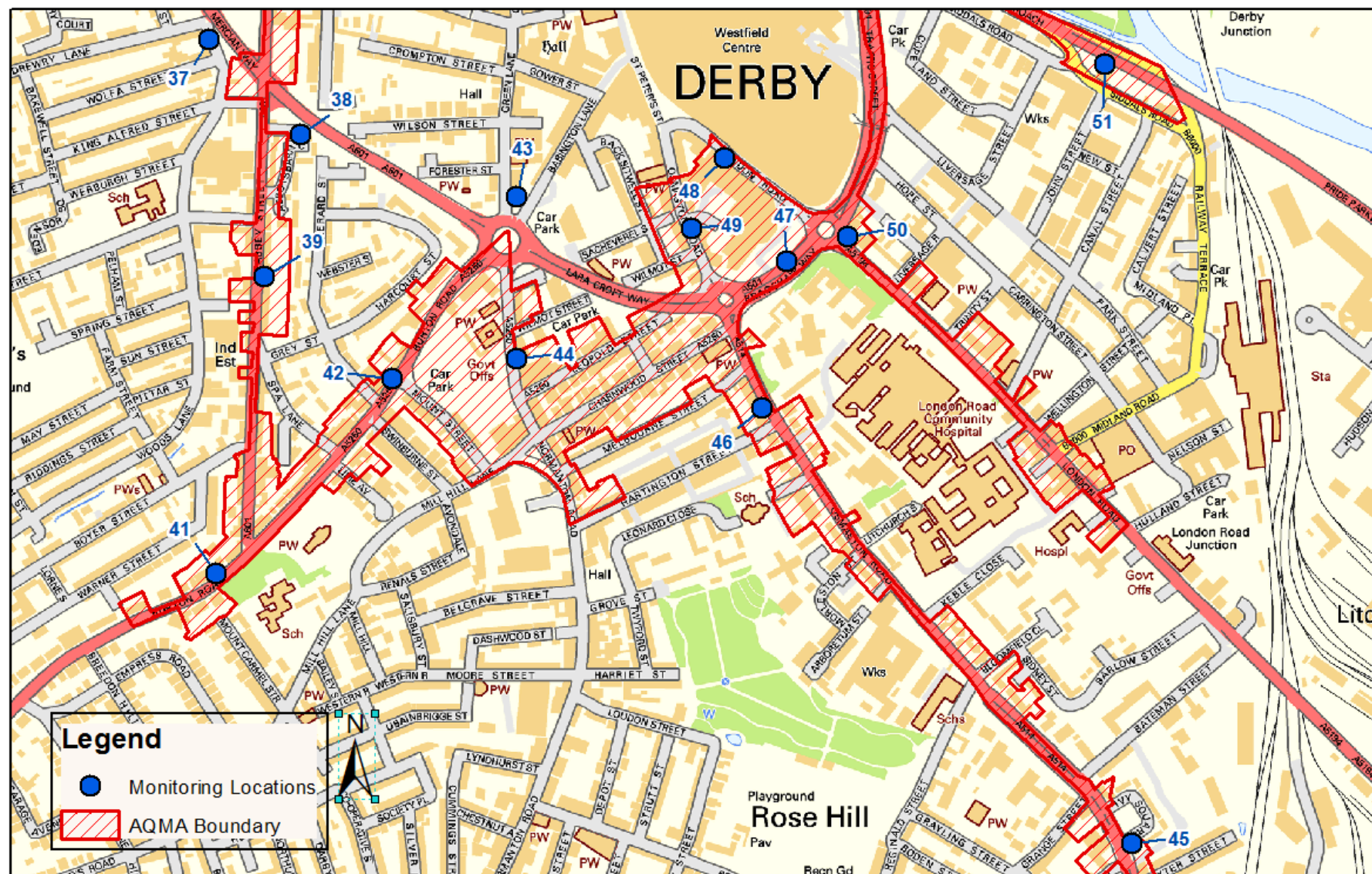
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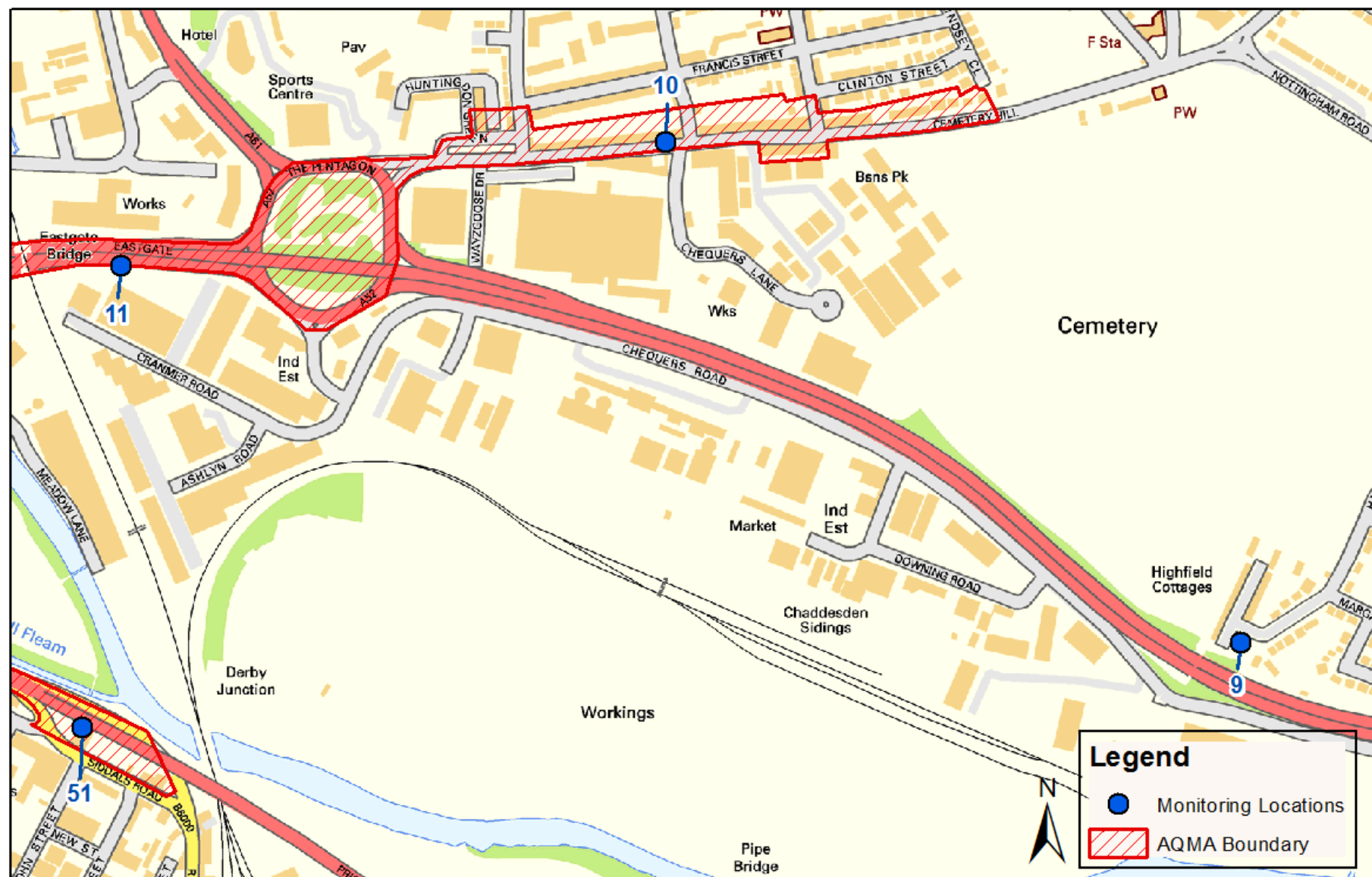
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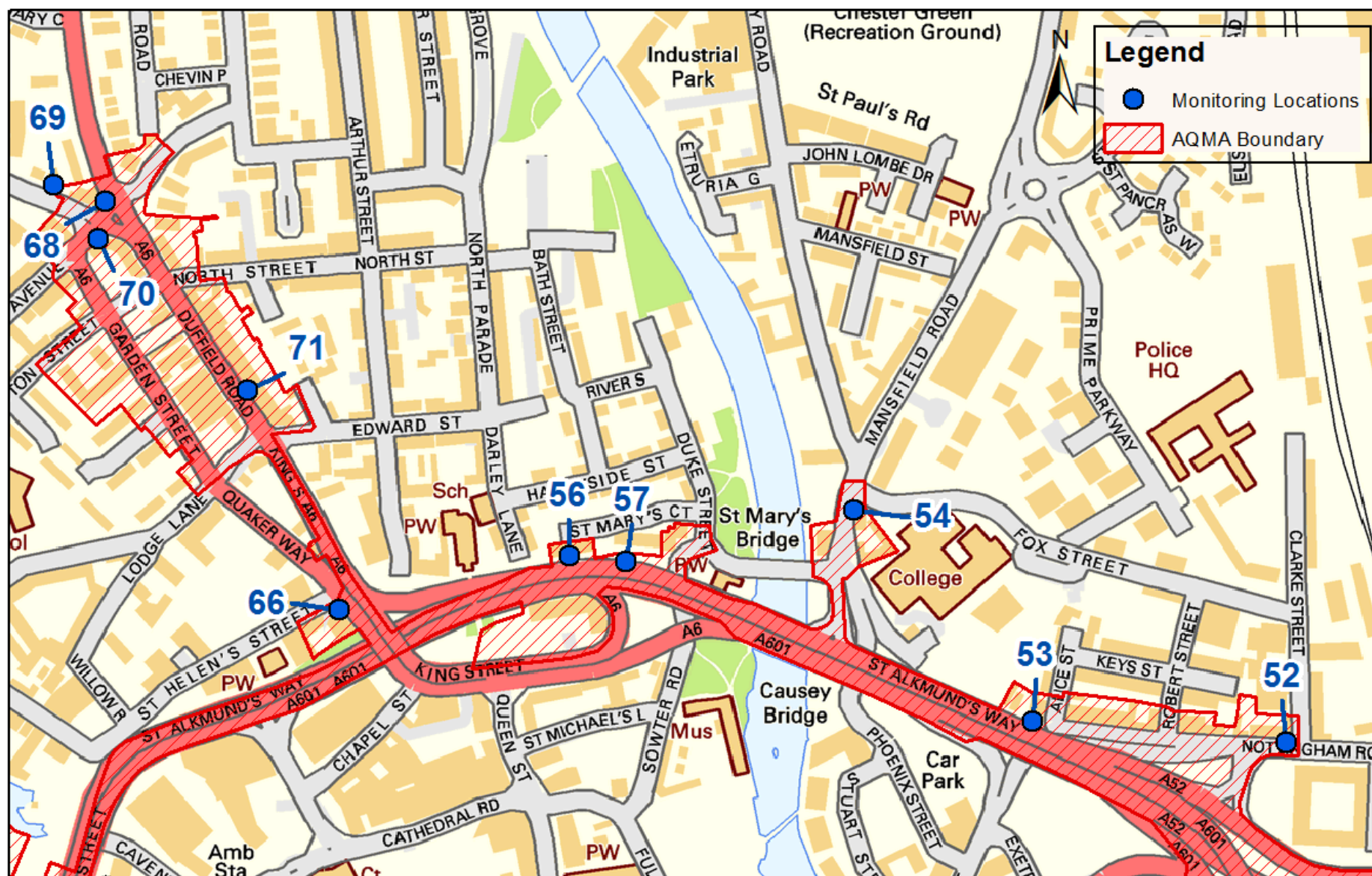
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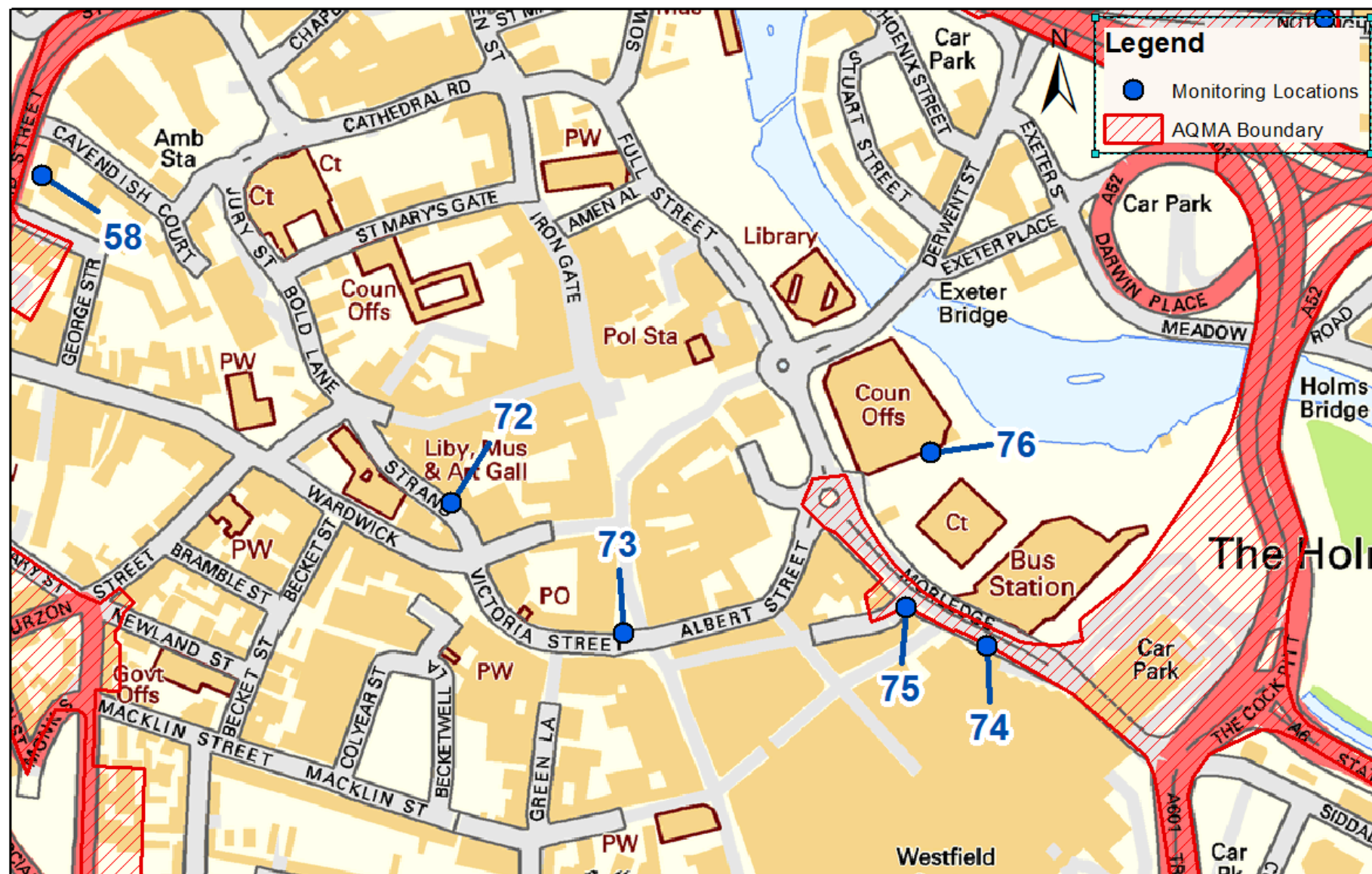
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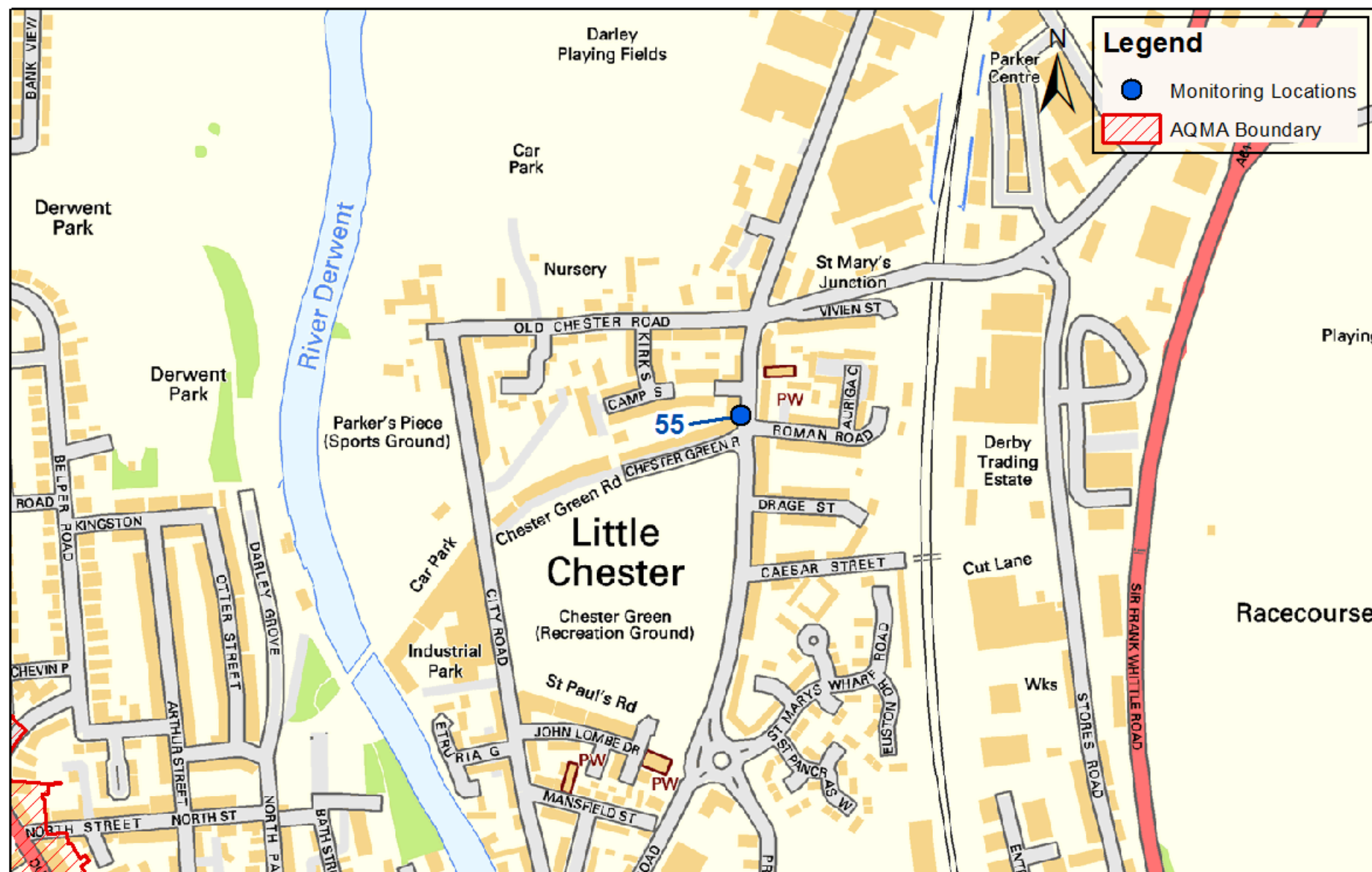
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Appendix E: Summary of Air Quality Objectives in England

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
CAZ	Clean Air Zone
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
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

