AECOM

2019 Air Quality Annual Status Report (ASR)

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

June 2019

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Executive Summary: Air Quality in Our Area

Air Quality in County Durham

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].

When quantifying the total impact associated with exposure to pollutants nitrogen dioxide (NO_2) and particulate matter of a size less than 2.5 microns ($PM_{2.5}$), it is necessary to account for an overlap in the response functions. The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

In County Durham, the main pollutant of concern is NO_2, with the primary source being from road vehicle exhaust emissions. Durham County Council (DCC) have declared two air quality management areas due to monitored exceedances of the annual mean NO_2 objective:

- Menceforth Cottages in Chester-le-Street (http://www.durham.gov.uk/article/3826/Air-quality-in-Chester-le-Street), although it is proposed this AQMA will be revoked.
- Durham City (http://www.durham.gov.uk/article/3825/Air%20-quality-in-Durham-City)

Air quality across County Durham has remained stable in 2018, compared to 2017, with annual mean NO_2 concentrations continuing to exceed the annual mean objective at a number of sites on key routes within Durham City.

No significant new emission sources were identified since the previous ASR, and the most significant source of atmospheric pollution continues to be emissions from road traffic. The concern is predominantly high concentrations of NO_2 in Durham City,

[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

although it is recognised that fine (PM_{10}) and ultra-fine ($PM_{2.5}$) particulate matter can have health effects at concentrations below the NAQS.

County Durham is a unitary authority, and so the single County administrative area encompasses the former districts. The County administration incorporates departments for Environmental Permitting, Planning, Traffic Management, Sustainable Transport and Public Health.

Actions to Improve Air Quality

The Durham City Air Quality Action Plan (AQAP) was adopted at a Council Cabinet meeting on 15th June 2016 to satisfy the statutory requirements of Defra's Local Air Quality Management (LAQM) regime for local authorities that have declared Air Quality Management Areas (AQMAs).

The County Durham Plan has not yet been finalised, which has delayed the effective adoption of a number of policies, and also introduces some uncertainty into the implementation and measurement of air quality interventions. A consultation on the pre-submission draft of the Plan ended on the 8th March 2019. The comments and representations made during the consultation are currently being considered with submission due to take place during June 2019.

A summary of the Actions that have been adopted is presented below.

Action
Action 1: The introduction of a UTMC or SCOOT system to coordinate traffic through a network of junctions within Durham City and reduce congestion.
Action 2: The retrofitting of emissions abatement systems on diesel engines on buses using routes within the declared AQMA.
Action 3: Encourage the operation of hybrid buses using routes within the declared AQMA.
Action 4: Ensuring the park and ride buses are compliant with the Euro VI emission standard.
Action 5: The development of cycle-ways to encourage modal shift across Durham city that link into national and county cycle routes in accordance with the draft Durham City Sustainable Transport Strategy.
Action 6: The promotion of Smarter Choices with businesses in the city to encourage large employers within the city to implement car sharing and pooling or the use of alternative forms of travel.
Action 7: To undertake detailed dispersion modelling of air quality emissions from any development growth and infrastructure that may potentially have an impact on air quality within and on the periphery of the declared AQMA. The outcome of this will enable opportunities to mitigate any detrimental impacts and potential benefits to be identified.

Action
Action 8: The establishment of the current Air Quality and Planning Guidance Note as a Supplementary Planning Document (SPD). This sets out the requirements on developers when proposing new development within the city and its environs set out in the emerging Local Plan.
Action 9: The establishment of an Air Quality Strategy that will integrate the strategic policies covering air quality in the emerging Local Plan, the measures detailed within the LTP, the draft Durham City Sustainable Transport Strategy and the carbon reduction strategy in focusing and addressing air quality issues in Durham City.
Action 10: To raise awareness of air quality by undertaking a campaign that will integrate with and will involve other campaigns elsewhere in the Council to improve air quality.
Action 11: Variable message and car park direction signing system to direct traffic to available parking.
Action 12: Explore the provision of travel and driver information integrated with the UTMC and to explore the provision of information on air quality through the use of texts, email alerts and social networking.
Action 13: To explore whether it is viable or not to progress the introduction of variable charges for residential parking permits with preferential rates for low polluting vehicles (with regard to local air quality effects).
Action 14: To explore whether it is viable or not to extend existing park and ride routes and /or the provision of further park and ride sites, taking into consideration the emerging County Durham Plan and Sustainable Transport Strategy for Durham City.
Action 15: Explore the options for additional highway infrastructure in line with the Durham Sustainable Transport Strategy, taking into account environmental, financial and planning considerations to enable the removal of through traffic from the City Centre and contribute to the overall reduction of traffic emissions.
Action 16: To assess the significance of taxi vehicular emissions in Durham City.
Action 17: To work with the Environment and Design Team to complete a Green Infrastructure (GI) feasibility study for the AQMA in Durham City.

The timescales for the implementation of a number of actions have been set having regard to when it is anticipated the emerging Local Plan will be finalised. A date for the completion of the actions has been incorporated within the Implementation Plan although none of the actions have yet been fully completed, with the exception of ensuring the buses operating on the Park & Ride routes have engines of Euro VI specification.

DCC has taken forward a number of measures since the previous ASR was published in pursuit of improving local air quality, including the following key Actions:

Action 2: The retrofitting of emissions abatement systems on diesel engines on buses using routes within the declared AQMA: The bus fleet in use on services in Durham AQMA has continued to evolve in 2018/19, albeit more slowly than in former years. The main change has been the introduction of new Euro VI buses on DCC's "Cathedral Bus" service, and the cascade of some newer mid-life buses that have displaced older buses.

Action 7: A detailed dispersion modelling study of the impacts of the County Durham Plan (CDP) on air quality (levels of nitrogen dioxide) within the Durham City Air Quality Management Area has been carried out to fulfil the requirements of Action. This takes into consideration the strategic land use allocations (strategic residential and industrial land uses in conjunction with infrastructure) as set out in the County Durham Plan. The completed report provides supporting evidence to the draft County Durham Plan (CDP); Action 7.

The Durham City Sustainable Transport Strategy (STS) 2016-2030 was established for the City in April 2016 to investigate means of addressing the traffic congestion issues, and includes recommendations that support the implementation of some of the actions that have been incorporated in the Action Plan. The proposed measures in the Transport Strategy broadly support and complement the actions incorporated in the AQAP, and an additional action was included in the AQAP to ensure that the provision of highway infrastructure considers the Durham STS.

In terms of specific policy guidance and development control actions:

- Action 8 of the AQAP is to establish the current Air Quality and Planning Guidance Note as a Supplementary Planning Document; and,
- Action 9 is the establishment of an Air Quality Strategy that will integrate the strategic policies covering air quality in the emerging Local Plan, the measures detailed within the LTP, the draft Durham City STS and the carbon reduction strategy in focusing and addressing the air quality issues in Durham City.

Two additional actions have been included in the action plan to cover air quality projects since the last ASR was submitted:

1. The assessment of the significance of taxi vehicular emissions in Durham City.
2. To work with the Environment and Design Team to complete a Green Infrastructure feasibility study for the AQMA in Durham City.

Conclusions and Priorities

The most significant local challenge in the County continues to be the AQMA declared in Durham City, which incorporates a significant proportion of a major east-west route across the city. An Air Quality Action Plan (AQAP) has been adopted by DCC, which includes specific measures to improve air quality in the City.

The areas of high pollutant concentrations incorporated in the Durham City AQMA are not continuous, but there are discrete and highly localised areas of the City where the annual mean objective for nitrogen dioxide is exceeded; e.g. Apex Corner (comprising the junction of Church Street and Hallgarth Street) in New Elvet, Alexandria Crescent, and Gilesgate.

The levels of nitrogen dioxide at locations outside the declared AQMA on Church Street in the vicinity of the junction of Church and Hallgarth Street in New Elvet exceeded the Annual Mean AQ Objective. In accordance with the conclusions of the 2016 Annual Status Report (DCC, 2016), the number of monitoring sites was increased to determine the extent of the localised area where the objective is exceeded. Based on the 2017 and 2018 annual mean NO_2 concentrations at these locations, the Council is progressing the amendment of the Durham City AQMA to include the short section of Church Street in the New Elvet area of the city.

The annual mean air quality objective has not been exceeded at both monitoring sites on Menceforth Terrace within the Chester-le-Street AQMA for the previous 4 years including the levels recorded in 2018. Therefore, the Council is progressing the revocation of the Chester-le-Street AQMA.

The decision to revoke the AQMA is based on compliance with the objective at both sites at Menceforth Cottages during the last four consecutive years. The last recorded measured exceedance of the objective was in 2014, when there were periods when traffic lights located on the road outside the properties that potentially will have increased queuing and congestion it is suggested may have contributed to the historical high concentrations.

Two locations outside the AQMA in Chester-le-Street exceeded the annual mean objective in 2018. However, one of these was a new location with only 6 months monitoring, therefore it is proposed to continue monitoring to inform whether there is a risk of continued exceedance before taking any action. This location is on the façade of a public house close to where traffic queues on the approach to a traffic light operated crossing and the public house is awaiting a new tenancy and is therefore currently unoccupied. The other location is located on a lamp-post close to a roundabout and is not representative of relevant exposure.

The details of both of these AQMA changes were reported to the relevant committee of the Council. The committee have given approval for the Council to proceed with

both of these actions and DEFRA was consulted. The actions will take effect once local consultation has been completed.

Local Engagement and How to get Involved

The development of the Durham City AQAP included a significant period of public consultation, during which members of the public and interested stakeholders had the opportunity to steer the AQAP and voice opinions and concerns. The consultation focussed on encouraging views to be voiced on proposed low emissions measures. The AQAP has been influenced by the consultation and includes the outcomes from this feedback.

Furthermore, it should also be recognised that alternative suggestions for actions were also submitted during the consultation, resulting in the adoption of a further two Actions in the AQAP; variable residential parking charges (low polluting vehicles in relation to air quality pollutants), and improvements to the Park & Ride network. However, the initial component of these Actions is an assessment to explore further whether these action measures are viable or not.

The Durham City AQAP includes a number of Actions that will require a high level of public support and buy-in to ensure they are successful, such as:

- Increasing the access to alternative modes of travel to the use of the private motor car.
- Increased use of low emission vehicles.
- Increased use of cycle-ways as a modal shift across Durham City.
- Adoption of Smarter Choices, including the uptake of car sharing and pooling or the use of alternative forms of travel.

It is proposed to provide access to tools to support travel choices that are expected to represent an excellent enabler to ensure the success of low emission measures.

A period of consultation was carried out for the pre-submission draft of the County Durham Plan, which ended on the 8th March 2019. The comments and representations made during the consultation are currently being considered with submission due to take place during June 2019. More information can be found at http://www.durham.gov.uk/article/7440/What-is-the-County-Durham-Plan-.

The Council have progressed a campaign to raise the profile of air quality by focussing on ways the public themselves can get involved/participate by making choices that will potentially improve air quality. In addition, presentations on the progress of the implementation of the action measures are made by officers to Council Committees that oversee the overarching performance objectives set by the Council together with air quality now a topic on the agenda for discussion at meetings of the Council's Climate Change Group. This not only raises the profile of air quality both internally and externally but also will maintain the momentum of engagement and involvement of stakeholders and the public following the previous consultation exercise on the Durham City AQAP.

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1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Durham County 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 http://www.durham.gov.uk/article/3825/Air-quality-in-Durham-City and http://www.durham.gov.uk/article/3826/Air-quality-in-Chester-le-Street. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMA(s).

Durham County Council are progressing the revocation of the AQMA in Chester-le-Street and the amendment of the Durham City AQMA to include the short section of Church Street in the New Elvet area of the city. The relevant committee of the Council has given approval to proceed with both of these actions.

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
Durham City AQMA	Declared 9th May 2011, Amended 2014	NO_2 Annual Mean	Durham	(i) The A690 west to east route through Durham City from the Stonebridge roundabout (Broom Lane), Neville's Cross, the Peth to the Crossgate Lights junction, Alexandria Crescent and Sutton Street to the Framwelgate roundabout, across Milburngate Bridge to Gilesgate to the junction of	NO	56.4	µg/m^3	48.2	µg/m^3	AQAP for Durham City	15th June 2016	http://www.durham.gov.uk/article/3825/Air-quality-in-Durham-City

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
				Dragon Lane and Sunderland Road. (ii)A section of New Elvet to the junction of Hallgarth and Church Street; and (iii)A section of Claypath from Leases Road to the junction with Providence Row.								

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
Chester-le-Street AQMA	Declared May 2013, Amended 2015	NO_2 Annual Mean	Chester-le-Street	A localised area comprising of the row of terraced properties known as Menceforth Cottages situated on Pelton Fell Road to the west of Chester le Street town centre.	NO	40.6	µg/m^3	35.3	µg/m^3	No AQAP was prepared. Based on the 2017 and 2018 NO_2 results (<36 µg/m^3 the Council propose to revoke this AQMA	N/A	http://www.durham.gov.uk/article/3826/Air-quality-in-Chester-le-Street

☒ **Durham County 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 County Durham

Last year's ASR concluded that the most significant local challenge in the County continued to be the AQMA declared in Durham City, which incorporates a significant proportion of a major east-west route across the city. The areas of high pollutant concentrations incorporated in the Durham City AQMA were not continuous, but were at discrete and highly localised areas of the City where the annual mean objective for nitrogen dioxide is exceeded. The levels of nitrogen dioxide at locations outside the declared AQMA on Church Street in the vicinity of the junction of Church and Hallgarth Street in New Elvet exceeded the Annual Mean AQ Objective, and so the Council have progressed the amendment of the Durham City AQMA to include the short section of Church Street in the New Elvet area of the city, and the revocation of the Chester-le-Street AQMA.

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

The DCC Air Quality Action Plan for Durham City was adopted at a Council cabinet meeting on 15th June 2016. In addition, a Draft Durham City Sustainable Transport Strategy 2016-2030 has been established that includes recommendations that support the implementation of some of the actions that have been incorporated in the Action Plan, and particularly those in relation to the development of the cycle ways (Action 5) and the promotion of Smarter Travel Choices (Action 6).

DCC has taken forward a number of measures during the current reporting year up to June 2019 (time of writing this report) in pursuit of improving local air quality. With the exception of the action measure to ensure that the buses operating on the Park & Ride have engines with Euro VI specification, no measures have yet been fully completed, but progress has been achieved on the following measures reported in Table 2.2.

In addition, a further two measures have been incorporated within the action plan to cover two additional projects being progressed. These are The Durham City Green Infrastructure Project, looking at the types of Green Infrastructure (GI) that are available together with any improvements they may have on air quality, and The

Durham City Taxi Project, that will identify the requirement for interventions to reduce emissions of air quality pollutants from taxis. This will be helpful in addressing the increasing number of enquiries on taxis in relation to air quality.

Table 2.2 – Progress on Measures to Improve Air Quality

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
1	The introduction of a UTMC or SCOOT system to coordinate traffic through a network of junctions within Durham City and reduce congestion	Traffic Management	UTC, Congestion management, traffic reduction	DCC Traffic Management	Completed	-	Monitoring using traffic flow count data, as well as subjective analysis of the queuing times, and compared with the modelled option to indicate whether the predicted emission reductions may be achieved	13% average emissions reduction and up to 30-40% reduction on Castle Chare and Gilesgate. Maximum 8 µg/m^3 NO_2 near affected junctions.	The operation of the traffic signalled junctions within Durham City has been synchronised since October 2016 via a UTC system. The additional interaction of the Scoot software is not yet fully functioning however this will make almost no difference during normal daily activities.		
2	The retrofitting of emissions abatement systems on diesel engines on buses using routes within the declared AQMA	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	Lead: DCC Sustainable Transport Team with support from Bus Companies (Arriva, Go North East)	On-going	On-going	The composition of the bus fleets will be reported annually to track the number of vehicles that satisfy each emission standard, as well as new vehicles, those removed from	10% emissions reduction on North Road, or 2 µg/m^3 NO_2	The bus fleet in use on services in Durham AQMA has continued to evolve in 2018/19, albeit more slowly than in former years. The main change has been the introduction of new Euro VI buses on DCC's "Cathedral Bus" service, and the cascade of some newer mid-life buses that have displaced older buses. The core of the fleet continues to be buses meeting Euro V emission standards, as there had been a lot of investment in new	Further fleet improvement expected in 2019/20 with buses from Newcastle – Middlesbrough x12 which are being retrofitted to equate to Euro VI with government funding	

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
							the fleet, or those that have been upgraded or retrofitted with exhaust abatement.		buses in that era. These buses will not become life expired for some years. No retrofit opportunities arose during 18/19. However, there will be some benefit in 19/20 from buses on Newcastle – Middlesbrough x12 which are being retrofitted to equate to Euro VI with government funding for action to reduce emissions in Newcastle/Gateshead.		
3	Encourage the operation of hybrid buses using routes within the declared AQMA	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Lead: DCC Sustainable Transport Team with support from Bus Companies (Arriva, Go North East)	On-going	On-going	The number of hybrid and micro-hybrid buses operating in the Durham fleet (as of August 2016) was: - 10 Hybrid buses are operating on route 21 - 6 Micro-hybrid buses are operating on route 22 - 20 Micro-hybrid buses are operating on route 20/20a - 7 Micro-hybrid buses are operating on route X21	1% emissions reduction on North Road, or <1 µg/m^3 NO_2	No opportunities have yet been found to progress full hybrid operation, beyond the GNE buses operating on service 21 purchased in 2012 under the Green Bus Fund. However, both Arriva and GNE have invested in “Micro-hybrid” buses on GNE svc 20/20a and X21 (28 buses in total, Euro V and Euro VI) and Arriva 22 (7 buses, Euro V). However, note these are inter-urban services with only a small minority of the time spent in the Durham AQMA. Other vehicle renewal has occurred in Arriva, GNE and other bus operator fleets through the cascade of newer buses displacing older buses with earlier Euro emission standards. It is highly likely that any investment in full hybrid buses (especially with a material “full electric” range), or in electric buses, will be dependent on grant funding.	Further vehicle cascades are expected to continue, although no key dates have been identified at this stage.	

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
									Recent grant funding opportunities have been focussed on more metropolitan areas, and have required match-funding. No DCC funding has been identified. Further investment in micro-hybrid buses is anticipated when current mid-life buses fall due for renewal; however, the large investment by both Arriva and GNE in recent years means there are a lot of Euro V buses that are not yet due for renewal		
4	Ensuring the park and ride buses are compliant with the Euro VI emission standard	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	DCC Sustainable Transport	Achieved 2016	-	This Action was completed in 2016 and the park and ride buses have been upgraded to comply with Euro VI.	Greatest impacts of 10% on Claypath, or 2 $\mu g/m^3$ NO_2	The Park and Ride buses are compliant with Euro VI emission regulations. Consideration of the type of buses to be provided in future will coincide with the current contract renewal in September 2021.	2016	
5	The development of cycle-ways to encourage modal shift across Durham city that link into national and county cycle routes in accordance with the draft Durham City Sustainable Transport Strategy	Transport Planning and Infrastructure	Cycle network	DCC Sustainable Transport	Durham City Sustainable Transport Strategy completed April 2016	2017 onwards	The length of new cycle routes and other facilities (such as high quality cycle parking) constructed will be reported annually.	Greatest impacts of 7% on most affected roads, or <1 $\mu g/m^3$ NO_2 although these maximum effects are unlikely to be achieved by 2017.	960 m of the Great North cycle route have been provided at the Cock O'North, adjacent to the A167.	On-going	

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
6	The promotion of Smarter Travel Choices with businesses in the city to encourage large employers within the city to implement car sharing and pooling or the use of alternative forms of travel	Promoting Travel Alternatives	Workplace Travel Planning	DCC Sustainable Transport with support from DCC Pollution Control	2016	On-going	The Smarter Choices travel planning scheme will initially involve membership and commitment from major employers in the city. This is a key milestone that will enable the establishment of Travel Planning and Car Sharing schemes that can be used as 'best practice' and rolled out with other businesses in the city.	Greatest impacts of 10% on most affected roads, or 2 µg/m^3 NO_2		On-going Engagement of all major employers as part of Go Smarter to Work project in Durham City.	
7	To undertake detailed dispersion modelling of air quality emissions from any development growth and infrastructure in and around Durham City as shown in the emerging Local Plan that may potentially have an impact on	Policy Guidance and Developme nt Control	Air Quality Planning and Policy Guidance	Lead: DCC Traffic Management with support from DCC Spatial Planning Team and DCC Pollution Control	On-going	On-going	The completion of the assessment will have an ongoing point of implementati on and so there will not be a definite milestone for	No defined target	A detailed dispersion modelling study of the impact of the County Durham Plan was undertaken on emissions of air quality pollutants within and on the periphery of the declared Air Quality Management Area. The completed report is included as a supporting document to the pre-submission draft of the Plan that has been		

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
	air quality within and on the periphery of the declared AQMA. The outcome of this will enable opportunities to mitigate any detrimental impacts and potential benefits.						completion Note: The assessment will not determine whether the development or infrastructure is viable or not. The purpose is to identify impacts on air quality.		established. Such detailed dispersion modelling did not extend to the locality of the proposed relief roads situated to the west and north of the city but these will be required in support of any planning applications for these infrastructure developments.		
8	The establishment of the current Air Quality and Planning Guidance Note as a Supplementary Planning Document (SPD). This sets out the requirement on developers when proposing new development within the city and its environs set out in the emerging Local Plan.	Policy Guidance and Developme nt Control	Air Quality Planning and Policy Guidance	Lead: DCC Spatial Planning with support from DCC Pollution Control	2016		Policy-based Actions will entail a single point of implementati on , and so these will have a definite milestone for completion. The establishment of the SPD and AQS, which will initially be published in draft form before being finalised.	No defined target	This note has been updated to reflect the latest Environmental Protection (UK) and Institute of Air Quality Management (IAQM) Guidance: Planning for Air Quality (January 2017). However, it cannot be further progressed until the County Durham Plan has been finalised since to establish the Guidance Note as a Supplementary Planning Document (SPD) will be dependent on policies within the Plan		
9	The establishment of an Air Quality Strategy that will integrate the strategic policies	Policy Guidance and Developme nt Control	Low Emissions Strategy	Lead: DCC Pollution Control support from DCC Spatial	2016	Draft covering all sections established	The publication of the Strategy is a definite	No defined target	A draft air quality strategy that covers all the sections of the Council that may have an input and a role in relation to air quality has been	A draft air quality strategy that covers all the	

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	covering air quality in the emerging Local Plan, the measures detailed within the LTP, the draft Durham City Sustainable Transport Strategy and the carbon reduction strategy in focusing and addressing air quality issues in Durham City.			Planning, Sustainable Transport and Climate Change			milestone for completion		established. There is currently an internal consultation on the completed strategy with representations/comments made by officers at management level and attendees on the Air Quality Corporate Steering Group. These representations/comments will now be considered, and the strategy revised accordingly and, in particular,, this will be necessary to bring it up to date with regard to other initiatives that will have a bearing on air quality now being progressed across the Council	sections of the Council that may have an input and a role in relation to air quality has been established	
10	To raise awareness of air quality by undertaking a campaign that will integrate with and will involve other campaigns elsewhere in the Council to improve air quality.	Public Information	Via other mechanisms	Lead: DCC Pollution Control Team with support from DCC Neighbourhood Communications and Sustainable Transport	On-going	The first stages were implemented in 2017. Further Actions will be ongoing.	Publication of air quality documents Marketing material associated with the Smarter Choices programme Access to real-time air quality information on the air quality website. Creation of an LAQM portal that will encompass online tools	No defined target	An air quality campaign is currently being progressed in collaboration with the Living Streets initiative to support alternative modes of travel in preference to the use of private motor vehicles. This has involved visits by Living Streets representatives to schools across the County to promote this initiative including a message on how this can be beneficial for air quality. The web pages on air quality have been altered and ways of communicating this information have been established to support this message e.g. leaflets. In addition, arrangements have been made to undertake a promotional event on Clean Air Day (20th June 2019) that		

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							for the Smarter Choices programme.		will involve a competition with participation of schools in Durham City in designing a poster around the theme of alternative modes of travel to the private motor car. It is intended that Living Streets will organise and run a Walk to event on the day itself.		
11	Variable messages and car park direction signing system to direct traffic to available parking.	Public Information	Via other mechanisms	DCC Traffic Management	2017	December 2017	The completion of the variable message signs to display information on parking availability will have a single point of implementation and so there will be a definite milestone for completion.	No defined target	All signs have now been installed and the associated motorizing equipment will be installed this financial year. Not all car parks will be covered due to ongoing construction works.	Integrated with UTMC system in December 2018.	
12	Explore the provision of travel and driver information integrated with the UTMC and to explore the provision of information on air quality through the use of texts, email alert and social networking	Public Information	Via other mechanisms	Lead: DCC Traffic Management with support from Pollution Control	2017	On-going	The completion of the viability assessment will have a single point of implementation and so there will be a definite milestone for completion.	No defined target	Journey time information from the UTMC system and traffic camera images are available on the Durham County Council website and information on 'Traffic & Travel' from the UTMC is shown in the form of Variable Message Signs. A project to publish comprehensive 'Traffic & Travel' information on the DCC website is being led by Corporate		

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
									Communications. The current UTMC system is to be replaced this financial year. It is understood the replacement UTMC system can communicate with the Air Quality Mesh monitors and therefore traffic interventions may be made by responding to high levels of air quality pollutant levels.		
13	To explore whether it is viable or not to progress the introduction of variable charges for residential parking permits with preferential rates for low polluting vehicles (with regard to local air quality effects).	Promoting Low Emission Transport	Priority parking for LEV's	Lead: DCC Traffic Management	There is commitment to a date for the completion of an assessment to determine whether the action measure is viable or not.		The completion of the viability assessment will have a single point of implementation and so there will be a definite milestone for completion.	No defined target	Variable residential parking permit rates are not currently offered as only residents in terraced streets who are unable to charge electric vehicles would be theoretically eligible for the discount. We are however currently examining the potential to provide charging facilities within such streets which would be associated with a residential discount.	There is commitment to a date for the completion of an assessment to determine whether the action measure is viable or not.	
14	To explore whether it is viable or not to extend existing park and ride routes and/or the provision of further park and ride sites, taking into consideration the emerging County Durham Plan and Sustainable Transport Strategy for Durham City.	Alternatives to private vehicle use	Bus based Park & Ride	Lead: DCC Traffic Management	There is commitment to a date for the completion of an assessment to determine whether the action measure is viable or not.		The completion of the viability assessment will have a single point of implementation and so there will be a definite milestone for completion.	No defined target	Work is progressing to provide one new site to the West of the City and the expansion of Sniperley Park and Ride with external funding currently being pursued.		
15	Explore the options for additional highway infrastructure in line with the Durham	Transport Planning and Infrastructure	Public transport improvements-interchanges	Lead: DCC Traffic Management with support	The development of highway infrastructure will be		The Sustainable Transport Strategy will identify	No defined target	Proposals to reduce traffic in the City by the creation of a Northern Relief Road are being pursued with a report to Cabinet in July. In addition, a	Proposals are being pursued with a report to	

	Measure	EU Category	EU Class-ification	Organisations involved and Funding Source	Planning Phase	Imple-mentation Phase	Key Performance Indicator	Redn in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to imple-mentation
	Sustainable Transport Strategy, taking into account environmental, financial and planning considerations to enable the removal of through traffic from the City centre and contribute to the overall reduction of traffic emissions.		stations and services	from Pollution Control	dependent on the recommendations of the Sustainable Transport Plan and the emerging County Durham Plan and whether these will be implemented or not.		potential highway infrastructure options and these will then be explored further as individual schemes.		planning application has been progressed for a road that will link Renny's lane to Damson Way in Dragonville Industrial Estate and the completed air quality assessment demonstrates an improvement in air quality at and close to the junction of Dragon Lane and Sunderland Road. There are currently two monitoring sites close to this junction including one of these at a receptor on Belle Vue Terrace and the levels measured by these have either exceeded or have been close to the annual mean air quality objective. The modelled levels for the receptor at this location show a considerable reduction in levels of nitrogen dioxide.	Cabinet in July	
16	To assess the significance of taxi vehicular emissions in Durham City.								An ANPR traffic survey was completed in June 2019.	2019	
17	To work with the Environment and Design Team to complete a Green Infrastructure (GI) feasibility study for the AQMA in Durham City.								A review of the literature available on research on the impact of Green Infrastructure (GI) on reducing levels of air quality pollutants has been carried out. This has then been used to produce a report on where GI interventions may be progressed within the declared AQMA.		

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 2.5 µm 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.

Furthermore, Defra published 'A Briefing for Directors of Public Health' in March 2017 (Defra, 2017), which advises that health outcomes from PM should be considered in the assessment and planning process.

The main sources of $PM_{2.5}$ in County Durham are road traffic emissions (comprising engine exhaust, road and tyre/brake abrasion), although there are a number of large-scale construction, mineral extraction and industrial processes at sites throughout the County. All the AQAP measures aim to reduce road traffic emissions or to promote the use of alternative and sustainable modes of transport.

The estimated background pollutant concentrations for the 1km grid squares for the whole of the UK are published by Defra (https://uk-air.defra.gov.uk/data/laqm-background-home). The maximum concentration of $PM_{2.5}$ identified in the Durham County administrative area in 2018 was 7.9 $\mu g/m^3$. This is well below the $PM_{2.5}$ target value of 25 $\mu g/m^3$ to be achieved by 2020.

The Public Health Outcomes Framework has published statistics on the health effects of exposure of the public to fine particulate pollution (http://www.phoutcomes.info). The fraction of mortality attributable to particulates measured as healthy life expectancy at birth for males and females are shown below in Figures 3.1 and 3.2. Durham County is highlighted, which indicates that particulates are near the lower end of the range where particulates are a major contributor to mortality, compared to other regions. This data was downloaded in May 2019.

Figure 3.1: Public Health Outcomes Framework, Fraction of Mortality Attributable to Particulates (Male)

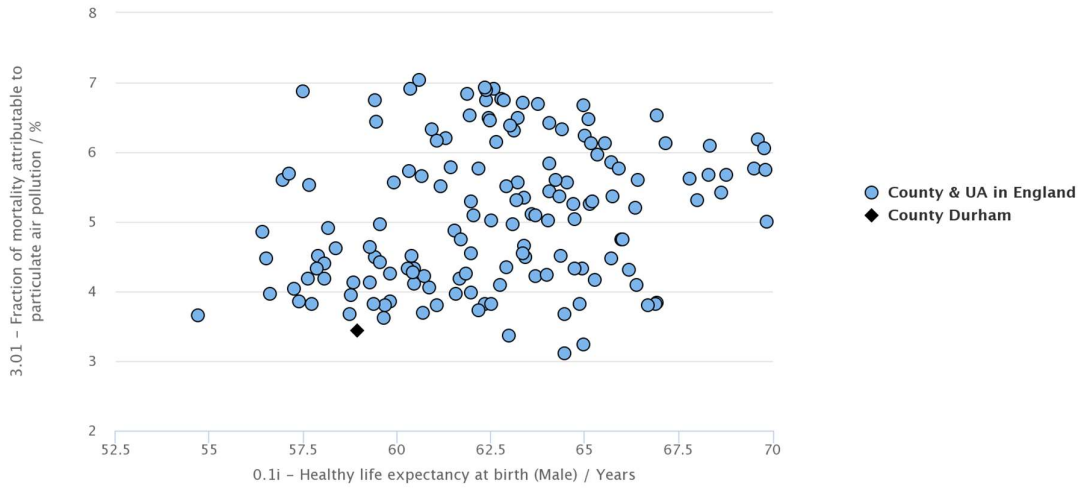
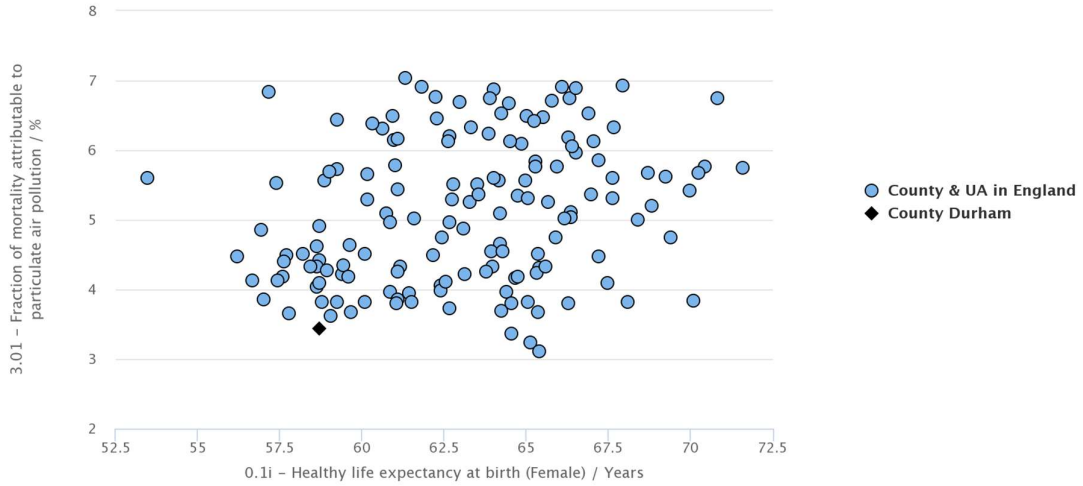


Figure 3.2: Public Health Outcomes Framework, Fraction of Mortality Attributable to Particulates (Female)



Action 8 defines the establishment and development of the current air quality and planning guidance note as a Supplementary Planning Document (SPD).

However, the note cannot be further developed and finalised as an SPD until the emerging Local Plan has been finalised, since the note will need to be supported by strategic planning policies.

The SPD will require all new planning applications to consider the impact of the proposal on $PM_{2.5}$ as well as in relation to PM_{10} and NO_2, and therefore will indicate potential new sources of $PM_{2.5}$ in the County. Where potential new sources of $PM_{2.5}$

may be identified through planning as having potential significant impacts then mitigation measures will be employed to reduce emissions of fine particulates.

2.4 Planning

The following planning applications have been received in the past 12 months, for which potential air quality effects may be associated:

- Planning Ref: DM/18/00828/OUT – Residential Development (84 dwellings); Vigo Lane Site, Chester le Street. An air quality assessment report was completed by Air Quality Consultants Ltd dated March 2018; Comments were submitted on 10th April 2018.
- Planning Ref: DM/17/00518/OUT – Residential Development; Holme Farm, Toft Hill. An air quality assessment report was completed by SYSTRA Ltd dated 12th June 2018.
- Planning Ref: DM/18/03002/FPA – Mixed Use Development comprising A1 Retail and Restaurant (A3); East Durham & Houghall Community College, Peterlee. An air quality assessment report was completed by Redmore Environmental dated 28th August 2018; Comments were submitted on 7th November 2018.
- Planning Ref: DM/18/02369/FPA – Office Headquarters & Car Parking provision; Sands Car Park & Durham Sixth Form College, Freemans Place, Durham City. An air quality assessment report was completed by SLR Consulting dated August 2018; Comments were submitted on 28th August 2018.
- Planning Ref: DM/18/02924/FPA – Office Block (B1) & Shop, Food & Drink (A1, A3 and D2); Re-development of Milburngate House, Framwelgate, Durham City. An air quality assessment report was completed by Atkins Ltd dated 11th September 2018; Comments were submitted on 25th October 2018.
- Planning Ref: DM/18/01650/FPA – Maths & Science Block, Durham University, Stockton Road, Durham City. An air quality assessment report was completed by Wardell Armstrong dated July 2018; Comments were submitted on 12th July 2018.

- Planning Ref: DM/18/03346/OUT – Outline Residential Development (290 dwellings); Hustledown Road, Stanley. An air quality assessment report was completed by Air Quality Consultants Ltd dated October 2018; Comments were submitted on 11th December 2018.
- Planning Ref: DM/17/03238/FPA – Residential Development & Road Infrastructure changes; Hermitage Academy, Chester le Street. An air quality assessment report was completed by Wardell Armstrong dated October 2017; Comments were submitted on 13th November 2018.
- Planning Ref: DM/19/00283/OUT – Outline Application for Industrial & Trade Park, Offices, Hotel, Retail Units and Petrol Station, Newton Aycliffe. An air quality assessment report was completed by NJD Environmental Associates Ltd dated December 2018; Comments were submitted on 25th February 2019.
- Planning Ref: DM/19/00260/OUT – Outline Application for A1 Food-store & Parking; Barnard Castle. An air quality assessment report was completed by Redmore Environmental dated 6th December 2018; Comments were submitted on 20th February 2019.
- Planning Ref: DM/19/01234/FPA – Construction of Link Road (Between Renny's Lane & Damson Way, Dragonville Industrial Estate, Durham City. An air quality assessment report was completed by Wardell Armstrong dated April 2019; Comments were submitted on 9th May 2019.
- Planning Ref: DM/19/01084/FPA – Provision of Infrastructure incorporating new pedestrian & cycle ways and provision of car park; links Durham University sites from Stockton Road to Upper Mountjoy, Durham City. An air quality assessment report was completed by Arup dated 27th February 2019; Comments were submitted on 7th May 2019.
- Planning Ref: DM/18/02982/OUT – Residential Development (230 dwellings); Cockhouse Lane, Ushaw Moor. An air quality assessment report was completed by Air Quality Consultants Ltd dated October 2018; Comments were submitted on 5th November 2018.
- Planning Ref: DM/19/00528/OUT – Residential Development (148 dwellings); Blue House Farm, Chilton. An air quality assessment report

was completed by Wardell Armstrong dated December 2018; Comments were submitted on 6th March 2019.

- Planning Ref: DM/19/01060/OUT – Residential Development (210 dwellings); Startforth Park, Barnard Castle. An air quality assessment report was completed by Wardell Armstrong dated March 2019; Comments were submitted on 29th April 2019.

The following new or altered permitted processes that may potentially have an impact on emissions of air quality pollutants have been received:

- Strathmore Renewables: A small Part B waste incineration process involving the burning of waste wood; Cleatlam, County Durham.
- Appletree: The operation of a wood combustion process which is additional to the timber.
- Trinity Kitchens (NE) Limited: Timber process, Unit 34 Northfield Way, Aycliffe Business Park, Co Durham DL6 6UF.
- Mighty Mortar: Blending, packing, loading, unloading & use of bulk cement; Jays Storage, Business Village, Drum Industrial Estate, Chester le Street, DH2 1AA.
- Acre Rigg Filling Station: Unloading of petrol into storage at petrol stations, Easington Way, Peterlee, Co Durham, SR8 5AZ.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

Durham County Council undertook automatic (continuous) monitoring at one site during 2018. **Error! Reference source not found.** in Appendix A shows the details of the site. The site at Hawthorn Terrace was commissioned on the 30th January 2017. Data from the continuous monitoring stations are published online at:

http://www.ukairquality.net/home/text/423.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

An Air Quality Mesh Pod is a monitor that uses relatively low-cost sensors to measure nitrogen dioxide, and a particulate counter to measure PM_{10} and $PM_{2.5}$. Two of these monitors have been located at sites adjacent to the Gilesgate roundabout and on Alexandria Crescent, both within the Durham City AQMA to indicate changes to levels in air quality pollutants (nitrogen dioxide and particulates) following the implementation of measures in the city. Problems have occurred with the failure of the electrochemical sensors, although particulate (PM_{10} and $PM_{2.5}$) data has been presented below for reference.

3.1.2 Non-Automatic Monitoring Sites

Durham County Council undertook non-automatic (passive) monitoring of NO_2 at 64 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

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

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

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

Chester-le-Street AQMA

In May 2013, an AQMA at Menceforth Cottages in Chester-le-Street was declared. DCC undertake monitoring at two locations within this AQMA, D23 and D129. The trends recorded at these sites are shown in Figure 3.

No exceedences of the annual mean objective were recorded in this area in 2018 and no sites recorded concentrations within 10% of the annual mean objective (>36 µg/m^3), and the revocation of this AQMA is now being progressed.

Durham City AQMA

DCC has historically operated an extensive network of 48 diffusion tubes throughout the Durham City AQMA, although several of these sites have been amended or closed prior to 2018.

The following sites recorded an exceedence of the annual mean objective in 2018:

- D12
- D19
- D70 (distance adjusted indicates compliance at nearest receptor)
- D79 (Not representative of relevant exposure)
- D130

- D149
- D154
- D155

No sites recorded an annual mean value greater than 60 µg/m^3, which indicates that an exceedance of the 1-hour mean objective is not likely to occur[4]

Several sites also recorded concentrations within 10% of the annual mean objective (>36 µg/m^3), which may indicate risk of a potential exceedence:

- D1 (Not representative of relevant exposure)
- D8
- D20
- D106
- D137 (Not representative of relevant exposure)
- D151

Outside the AQMA

Exceedances of the annual mean NO_2 objective were recorded outside of the Chester-le-Street AQMA at:

- D26 (distance adjusted indicates compliant at nearest receptor)
- D157 (based on 6-months of data)

Note: Diffusion tube 157 is located on the façade of a public house close to the edge of the road carriageway that is currently unoccupied, therefore not representative of relevant exposure.

Exceedances have continued to be recorded outside of the Durham City AQMA on Church Street:

- D116
- D117

An additional site of exceedance was recorded outside of the Durham City AQMA at the Gilesgate Roundabout:

[4] Defra (2016) Local Air Quality Management Technical Guidance, LAQM.TG(16)

- D145 (distance adjusted indicates compliant at nearest receptor)

Several sites also recorded concentrations within 10% of the annual mean objective (>36 μg/m^3), which may indicate risk of a potential exceedence:

- D139
- D140

Summary of Monitoring

Monitored annual mean NO_2 concentrations continue to exceed the annual mean objective at locations within the Durham City AQMA, although there are exceedences outside the AQMA on Church Street. Therefore, monitoring will continue in this area and will be used to inform the proposed amendment to the AQMA. It is considered that there are now sufficient monitoring results available from locations on Church St that are outside of the AQMA to proceed with the amendment of the AQMA. Therefore the Council will complete the amendment of the Durham City AQMA using the 'fast-track' procedure to include the short section of Church Street following local consultation.

Monitoring results within the Chester-le-Street AQMA have fluctuated slightly in the past few years, with values exceeding the annual mean NO_2 objective in 2013 and 2014, although concentrations below the objective were recorded for 2015, 2016, 2017 and this reporting year 2018. Since the monitoring results at both locations were below 36 μg/m^3 (10% of the annual mean objective) in 2018 the revocation of the AQMA will be completed following local consultation.

It was recognised that two sites in Chester-le-Street exceeded the annual mean objective in 2018 outisde the AQMA. However, this was based on 6-months data, and so it is proposed that monitoring will continue to inform whether there is a risk of continued exceedence in this area before taking any action.

3.2.2 Particulate Matter (PM_{10})

Monitoring for PM_{10} is not undertaken by Durham County Council with the exception of Air Quality Mesh Monitors at Queen Alexandra Crescent and Gilesgate.

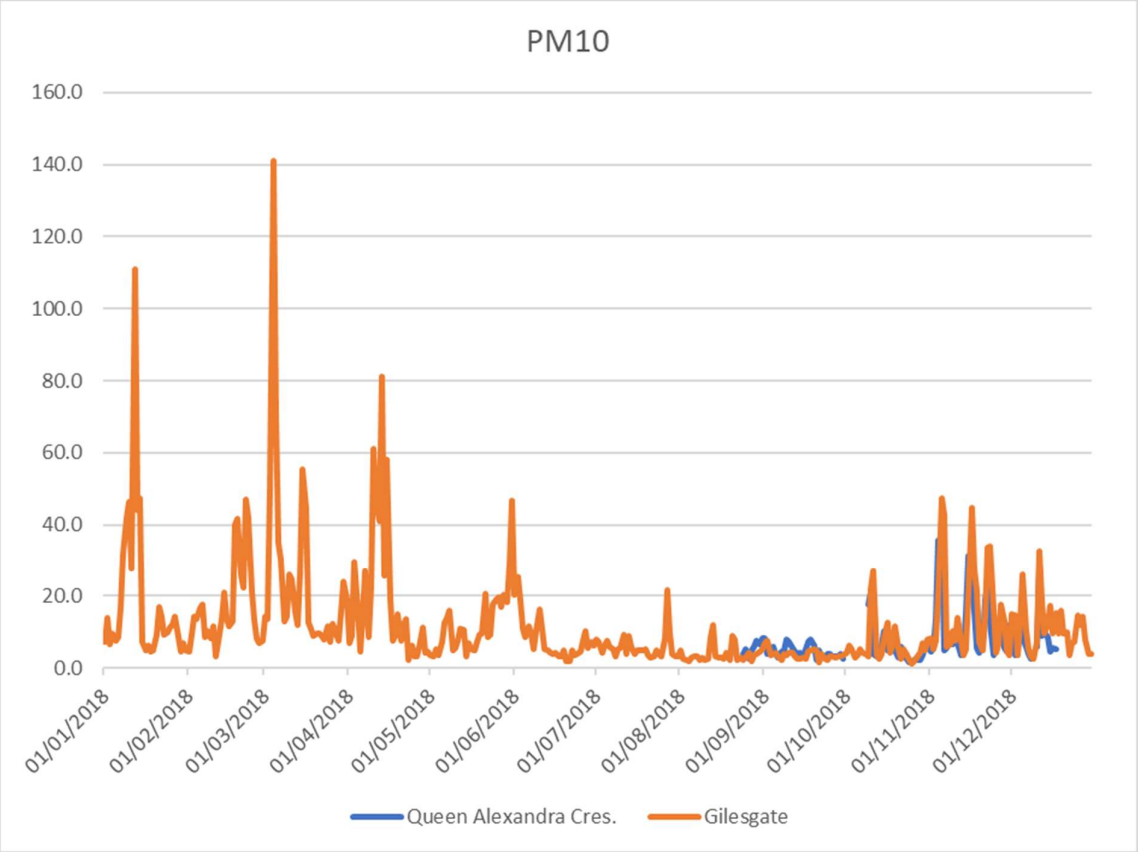
These data have been reported here for information only and do not comprise part of the LAQM reporting data-set.

The mean concentrations recorded at both sites were well below the annual mean objective, although the Queen Alexandra Crescent site only recorded 29.4% of the year.

Table 3.1 –PM_{10} Monitoring

Site Name	Pollutants Monitored	Daily Average	Daily Min	Daily Max	Annual Data Capture
Queen Alexandra Crescent	PM_{10}	7.4	1.6	35.6	99.5%
Gilesgate	PM_{10}	12.1	1.3	141.1	29.3%

Figure 3.1. - PM_{10} Monitoring



3.2.3 Particulate Matter ($PM_{2.5}$)

Monitoring for $PM_{2.5}$ is not undertaken by Durham County Council with the exception of Air Quality Mesh Monitors.

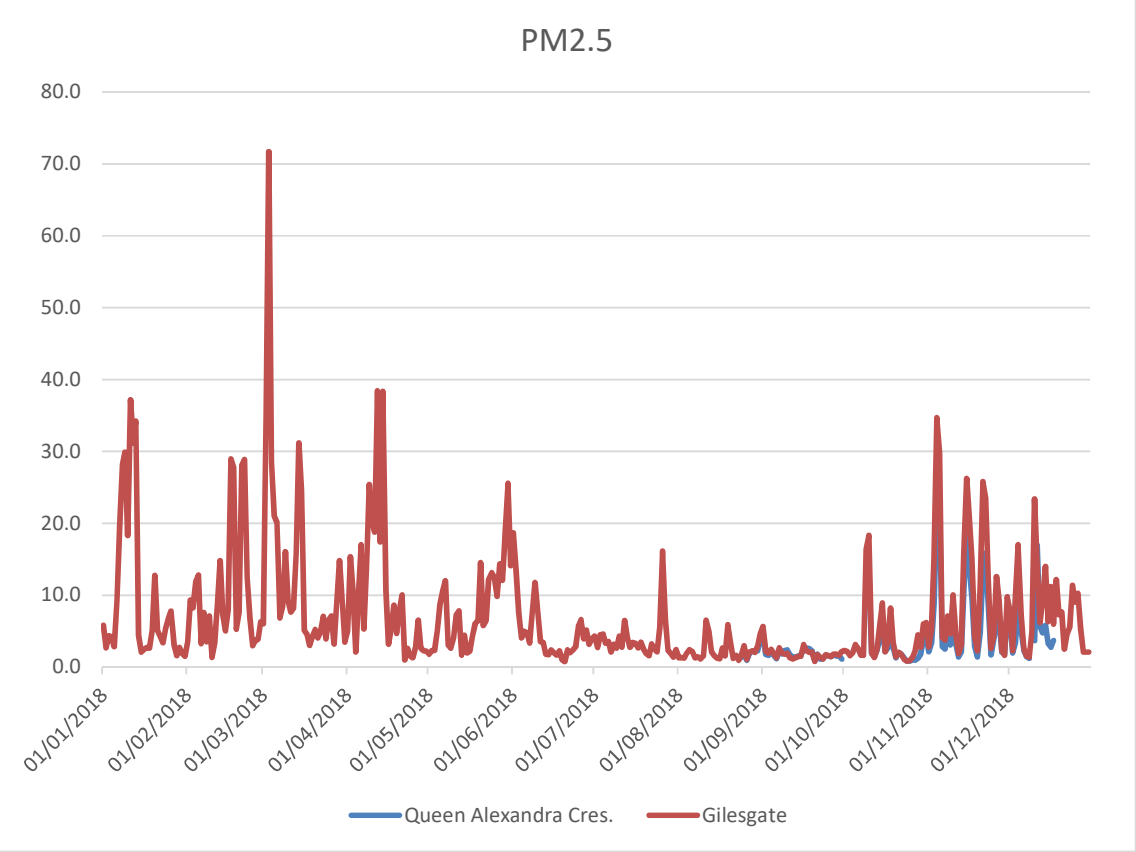
These data have been reported here for information only and do not comprise part of the LAQM reporting data-set.

The mean concentrations recorded at both sites were well below the annual mean objective, although the Queen Alexandra Crescent site only recorded 29.4% of the year.

Table 3.2 –$PM_{2.5}$ Monitoring

Site Name	Pollutants Monitored	Daily Average	Daily Min	Daily Max	Annual Data Capture
Queen Alexandra Crescent	$PM_{2.5}$	4.1	0.8	23.7	99.5%
Gilesgate	$PM_{2.5}$	7.2	0.8	71.7	29.3%

Figure 3.2. - $PM_{2.5}$ Monitoring



3.2.4 Sulphur Dioxide (SO_2)

Monitoring for SO_2 is not undertaken by Durham County Council.

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)
DUR4	Hawthorne Terrace	Roadside	426793	542440	NO_2	YES	Chemiluminescent	2	1	1.8

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
D30	Cockton Hill lamp post	Roadside	420814	528440	NO_2	NO	2	2	NO	2
D31	132 Cockton Hill	Roadside	420806	528432	NO_2	NO	0	7	NO	2
D23	5 Menceforth Cottages	Roadside	426895	551717	NO_2	YES	0	1.5	NO	3
D26	Lamp post opp. 1 Blind Lane	Roadside	427408	552720	NO_2	NO	15	2	NO	3
D27	3 Blind Lane	Roadside	427453	552656	NO_2	NO	0	7	NO	3
D64	Gainford care home	Roadside	427532	551668	NO_2	NO	Supermarket	1.5	NO	3
D85	adj Bus Depot Picktree Lane	Roadside	427659	551829	NO_2	NO	N/A	2	NO	3
D100	1 Appledore Garden	Roadside	427732	551944	NO_2	NO	N/A	1.5	NO	3
D101	Riverside Cricket Ground	Urban Background	428211	550438	NO_2	NO	N/A	1	NO	3
D108	6 Blind Lane	Roadside	427476	552607	NO_2	NO	0	7	NO	3
D109	14 Picktree Lane (opp. Aldi)	Roadside	427614	551774	NO_2	NO	0	1.5	NO	3
D129	1 Menceforth Cottages	Roadside	426910	551708	NO_2	YES	0	1.5	NO	3
D157	Bridge St, Pub	Roadside	427477	551650	NO_2	NO	0	2	NO	2
D1	Dragonlane Lights, Durham	Roadside	429657	543114	NO_2	YES	3	1.5	NO	3
D7	Highgate South	Roadside	427114	542692	NO_2	YES	0	6	NO	3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?	Height (m)
D8	Highgate North	Roadside	427121	542848	NO_2	YES	0	5	NO	3
D11	Crossgate Lights	Roadside	426838	542298	NO_2	YES	5	1.5	NO	3
D12	1 Colpitts Terrace	Roadside	426768	542368	NO_2	YES	0	2	NO	3
D17	New Inn Church St Head	Roadside	427517	541650	NO_2	NO	1	1.5	NO	3
D19	1 Church Street	Roadside	427689	542078	NO_2	YES	0	2	NO	3
D20	80 Gilesgate	Roadside	428385	542740	NO_2	YES	0	5	NO	3
D42	97 Claypath	Roadside	427504	542635	NO_2	YES	0	2	NO	3
D59	The Sands	Urban Background	427649	542994	NO_2	NO	10	2	NO	3
D70	The Peth Westbound	Roadside	426654	542102	NO_2	YES	11	1.5	NO	3
D71	opp EBGB Colpitts Tce	Roadside	426786	542355	NO_2	YES	4	1.5	NO	3
D78	Nevilles Cross Bank Westbound	Roadside	426221	541985	NO_2	YES	N/A	2	NO	3
D79	Nevilles Cross Bank Eastbound	Roadside	426138	541933	NO_2	YES	2	1.5	NO	3
D81	88 Claypath	Roadside	427529	542647	NO_2	YES	0	2	NO	3
D106	6 Belle Vue Tce, Dragonville lights	Roadside	429700	543139	NO_2	YES	N/A	2	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?	Height (m)
D113	58 Gilesgate	Roadside	428198	542712	NO_2	YES	0	3	NO	3
D115	Auton House (Nevilles Cross Bank Eastbound)	Roadside	426133	541939	NO_2	YES	0	5	NO	2
D116	3 Church Street	Roadside	427686	542072	NO_2	NO	0	1.5	NO	2
D117	33 Church Street	Roadside	427672	542066	NO_2	NO	0	1.5	NO	2
D118	Heaviside Road lamp post	Urban Background	428422	542887	NO_2	NO	0	2	NO	2
D120	George Henry House, Sutton St	Roadside	426797	542502	NO_2	YES	0	2	NO	3
D122	Sherburn Road/Gilesgate	Roadside	428663	542761	NO_2	YES	0	2	NO	3
D130	1 Sutton Street	Roadside	426808	542461	NO_2	YES	0	1.5	NO	2
D132	7 High St South	Roadside	425352	540650	NO_2	NO	0	1.5	NO	2
D133	MotorCycle Shop, High St North	Roadside	425325	540636	NO_2	NO	0	1.5	NO	2
D134	41 High St, Meadowfield	Roadside	425221	540477	NO_2	NO	1.5	1.5	NO	2
D135	173 Gilesgate	Roadside	428218	542691	NO_2	YES	0	2	NO	2
D136	52 Highgate	Roadside	427133	542767	NO_2	YES	0	5	NO	2
D137	Archery Rise	Roadside	426437	542027	NO_2	YES	6	3	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
D139	5 Church St	Roadside	427676	542051	NO_2	NO	0	1.5	NO	2
D140	9 Church St	Roadside	427663	542014	NO_2	NO	0	1.5	NO	2
D141	28 Church St	Roadside	427655	542023	NO_2	NO	0	1.5	NO	2
D142	29 Church St Lampost	Roadside	427665	542041	NO_2	NO	0	1.5	NO	2
D143	Church St Primary School Lamp post	Roadside	427588	541781	NO_2	NO	0	2	NO	2
D144	Neville Cross Primary School	Roadside	426098	541924	NO_2	NO	0	4	NO	1.5
D145	Gilesgate Roundabout	Roadside	428180	542699	NO_2	NO	5.5	1.5	NO	2
D146	35/36 Sutton St	Roadside	426796	542458	NO_2	YES	0	2	NO	2
D147	20 Sutton St	Roadside	426800	542597	NO_2	NO	0	1.5	NO	2
D148	29 Sutton St	Roadside	426789	542594	NO_2	NO	0	1.5	NO	2
D149	69 Gilesgate	Roadside	428272	542715	NO_2	YES	0	3	NO	2
D150	1-2 Durham Road	Roadside	430769	537643	NO_2	NO	0	2	NO	2
D151	6 Sutton Street	Roadside	426808	542488	NO_2	YES	0	1.5	NO	2
D152	24 Mitchell Street	Roadside	426901	542576	NO_2	NO	0	1.5	NO	2
D153	30 High St, Langley Moor	Roadside	425284	540544	NO_2	NO	0	2	NO	2
D154	Colpitts Hotel Pub	Roadside	426772	542403	NO_2	YES	0	1.5	NO	2
D155	75/76 Gilesgate	Roadside	428323	542720	NO_2	YES	0	2	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
D156	Co-op Durham Road	Roadside	430783	537657	NO_2	NO	0	2	NO	2
D158	41 Byron Terrace	Roadside	440666	550188	NO_2	NO	0	4	NO	2
D159	Seaton Lane/Byron Tce Roundabout	Roadside	440682	550189	NO_2	NO	0	2	NO	2
D161	Lamp post Opp. 29 Leechmere Cres	Roadside	440619	550182	NO_2	NO	0	2	NO	2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
DUR2	Roadside	Automatic	N/A	N/A	**43.6**	-	-	-	-
DUR3	Roadside	Automatic	N/A	N/A	36.9	30.7	-	-	-
DUR4	Roadside	Automatic	97	97	-	-	-	23.9	29.4
D22	Roadside	DT	N/A	N/A	-	-	-	-	-
D23	Roadside	DT	100	100	**42.8**	34.2	36.3	34.9	34.8
D24	Kerbside	DT	N/A	N/A	-	-	-	-	-
D25	Kerbside	DT	N/A	N/A	-	-	-	-	-
D26	Roadside	DT	100	100	35.2	36.5	35.5 (26.0)	**47.9** (32.5)	**42.3** (28.2)
D27	Roadside	DT	100	100	35.5	27.6	30.6	29.4	27.9
D28	Roadside	DT	N/A	N/A	32.4	23.0	29.5 (24.6)	-	-
D64	Roadside	DT	42	42	38.1	29.6	32.5	30.7	29.3
D65	Roadside	DT	N/A	N/A	-	-	-	-	-
D66	Roadside	DT	N/A	N/A	-	-	-	-	-
D85	Roadside	DT	42	42	38.6	27.0	31.0	28.0	30.1
D94	Kerbside	DT	N/A	N/A	32.7	-	-	-	-
D95	Roadside	DT	N/A	N/A	29.3	-	-	-	-
D100	Roadside	DT	50	50	**41.4** (31.5)	27.8	30.9	27.7	30.5
D101	Urban Background	DT	83	83	14.5	10.9	13.0	11.0	13.1
D108	Roadside	DT	92	92	34.5	26.4	31.5	29.4	27.2
D109	Roadside	DT	42	42	35.9	27.0	30.4	30.6	30.4
D48	Roadside	DT	N/A	N/A	-	-	-	-	-

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
D49	Roadside	DT	N/A	N/A	-	-	-	-	-
D50	Kerbside	DT	N/A	N/A	-	-	-	-	-
D1	Roadside	DT	100	100	**47.0** (38.3)	36.2	**40.5** (32.2)	34 (28.6)	36.4 (30.1)
D2	Roadside	DT	N/A	N/A	36.6	27.8	28.3	-	-
D3	Kerbside	DT	N/A	N/A	32.1	25.9	27.4 (23.6)	25 (20.1)	-
D4	Roadside	DT	N/A	N/A	**42.4**	36.9	33.4	29.0	-
D5	Kerbside	DT	N/A	N/A	27.6	-	-	-	-
D6	Roadside	DT	N/A	N/A	-	-	-	-	-
D7	Roadside	DT	92	92	**42.9**	32.0	33.8	32.3	31.8
D8	Roadside	DT	83	83	**51.2**	38.1	**40.3**	-	38.4
D9	Kerbside	DT	N/A	N/A	-	-	-	-	-
D10	Roadside	DT	N/A	N/A	33.1	29.1	34.6	-	-
D11	Roadside	DT	100	100	**46.3** (38.4)	**35.9**	37.9 (30.2)	35.7 (28.2)	33.5 (26.0)
D12	Roadside	DT	92	92	**55.9**	**42.4**	**43.6**	**40.5**	**44.1**
D13	Roadside	DT	N/A	N/A	34.5	-	-	-	-
D14	Roadside	DT	N/A	N/A	39.7	30.4	33.7	-	-
D15	Kerbside	DT	N/A	N/A	**40.3** (39.8)	30.0	26.8 (25.0)	-	-
D16	Kerbside	DT	N/A	N/A	38	28.0	-	-	-
D17	Kerbside	DT	17	17	**40.5** (36.9)	29.8	31.7 (30.0)	28.2 (26.3)	-
D18	Roadside	DT	N/A	N/A	-	-	-	-	-
D19	Roadside	DT	100	100	**61.9**	**46.6**	**45.0**	**43.8**	**41.2**
D20	Roadside	DT	58	58	**49.3**	38.0	**41.4**	37.0	36.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
D21	Roadside	DT	N/A	N/A	32	-	-	-	-
D42	Roadside	DT	92	92	**50.4**	34.1	36.0	30.9	32.6
D43	Roadside	DT	N/A	N/A	-	-	-	-	-
D44	Kerbside	DT	N/A	N/A	-	-	-	-	-
D45	Roadside	DT	N/A	N/A	-	-	-	-	-
D46	Roadside	DT	N/A	N/A	-	-	-	-	-
D56	Roadside	DT	N/A	N/A	-	-	-	-	-
D57	Roadside	DT	N/A	N/A	-	-	-	-	-
D58	Roadside	DT	N/A	N/A	-	-	-	-	-
D59	Urban Background	DT	100	100	21.9	16.5	16.5	16.3 (15.6)	16.6 (15.0)
D60	Roadside	DT	N/A	N/A	-	-	-	-	-
D61	Roadside	DT	N/A	N/A	-	-	-	-	-
D62	Roadside	DT	N/A	N/A	-	-	-	-	-
D69	Roadside	DT	N/A	N/A	38.1	26.8	31.5	-	-
D70	Roadside	DT	83	83	**60.4 (42.4)**	**44.0**	**42.2** (29.3)	**41.9** (28.2)	**45.8** (29.2)
D71	Roadside	DT	25	25	**40.8** (31.3)	28.1	31.4 (27.2)	26.7 (22.7)	24.2 (20.2)
D72	Kerbside	DT	N/A	N/A	**57.5**	**41.7**	34.6	-	-
D73	Kerbside	DT	N/A	N/A	**44.3 (44.3)**	33.5	35.2	34.4	-
D74	Roadside	DT	N/A	N/A	**44.2 (43.3)**	32.5	32.0	31.3	-
D75	Roadside	DT	N/A	N/A	25.3	-	-	-	-
D76	Suburban	DT	N/A	N/A	21.6	-	-	-	-
D77	Kerbside	DT	N/A	N/A	**57.3 (42.8)**	**43.9**	**50.7** (35.6)	-	-

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2014	2015	2016	2017	2018
D78	Roadside	DT	100	100	**41.8** (32.7)	30.0	32.9	30.9	28.8
D79	Roadside	DT	100	100	**59.3 (54.7)**	**45.9**	**51.6 (45.1)**	**48.3 (41.3)**	**48.1 (40.8)**
D80	Kerbside	DT	N/A	N/A	34.7	25.8	30.4	-	-
D81	Roadside	DT	100	100	**45.8**	31.1	33.1	29.9	31.6
D82	Kerbside	DT	N/A	N/A	39.6	27.9	31.2	-	-
D83	Kerbside	DT	N/A	N/A	23	-	-	-	-
D84	Kerbside	DT	N/A	N/A	-	-	-	-	-
D91	Roadside	DT	N/A	N/A	-	-	-	-	-
D92	Roadside	DT	N/A	N/A	-	-	-	-	-
D93	Roadside	DT	N/A	N/A	-	-	-	-	-
D96	Roadside	DT	N/A	N/A	24.3	-	-	-	-
D97	Roadside	DT	N/A	N/A	32.9	22.4	22.2	-	-
D98	Kerbside	DT	N/A	N/A	37.5	26.2	30.2	-	-
D99	Roadside	DT	N/A	N/A	38.2	29.2	-	-	-
D102	Kerbside	DT	N/A	N/A	36.5	29.3	29.1 (26.3)	-	-
D103	Kerbside	DT	N/A	N/A	37.4	28.7	26.5	-	-
D104	Kerbside	DT	N/A	N/A	**45.9** (24.8)	36.9	32.8	-	-
D105	Kerbside	DT	N/A	N/A	39.9	30.7	32.7	27.9	-
D106	Roadside	DT	100	100	**49.5**	38.5	**41.3**	35.7	36.3
D107	Roadside	DT	N/A	N/A	37	28.3	31.6	28.7	-
D110	Roadside	DT	N/A	N/A	36.2	29.0	-	-	-
D111	Roadside	DT	N/A	N/A	35.9	26.4	-	-	-

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
D112	Roadside	DT	N/A	N/A	35.6	27.2	-	-	-
D113	Roadside	DT	50	50	**46.3**	32.2	37.3	33.0	31.9
D114	Roadside	DT	N/A	N/A	37.7	27.5	27.5	-	-
D115	Roadside	DT	92	92	**58.1**	35.0	37.5	33.9	32.2
D116	Roadside	DT	83	83	**65.1**	**47.4**	**46.1**	**49.9**	**44.2**
D117	Roadside	DT	100	100	**68.3**	**44.4**	**43.4**	**47.0**	**40.1**
D118	Urban Background	DT	92	92	24.5	16.9	17.4	15.4	14.7
D119	Roadside	DT	N/A	N/A	33.4	21.6	21.0	-	-
D36	Roadside	DT	N/A	N/A	-	-	-	-	-
D37	Roadside	DT	N/A	N/A	-	-	-	-	-
D38	Urban Background	DT	N/A	N/A	-	-	-	-	-
D39	Roadside	DT	N/A	N/A	-	-	-	-	-
D40	Roadside	DT	N/A	N/A	-	-	-	-	-
D41	Roadside	DT	N/A	N/A	-	-	-	-	-
D67	Roadside	DT	N/A	N/A	-	-	-	-	-
D51	Kerbside	DT	N/A	N/A	-	-	-	-	-
D52	Roadside	DT	N/A	N/A	-	-	-	-	-
D53	Kerbside	DT	N/A	N/A	-	-	-	-	-
D54	Kerbside	DT	N/A	N/A	29.7	-	-	-	-
D55	Kerbside	DT	N/A	N/A	26.4	-	-	-	-
D68	Kerbside	DT	N/A	N/A	22.8	-	-	-	-

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
D86	Kerbside	DT	N/A	N/A	26.4	-	-	-	-
D87	Kerbside	DT	N/A	N/A	20.1	-	-	-	-
D88	Kerbside	DT	N/A	N/A	17.1	-	-	-	-
D29	Roadside	DT	N/A	N/A	-	-	-	-	-
D30	Roadside	DT	83	83	38.3	28.7	30.1 (27.9)	27.5 (24.6)	26.1 (23.2)
D31	Roadside	DT	83	83	32.7	26.0	27.0	26.2	24.6
D32	Roadside	DT	N/A	N/A	-	-	-	-	-
D33	Kerbside	DT	N/A	N/A	-	-	-	-	-
D34	Kerbside	DT	N/A	N/A	-	-	-	-	-
D35	Roadside	DT	N/A	N/A	-	-	-	-	-
D47	Roadside	DT	N/A	N/A	-	-	-	-	-
D89	Kerbside	DT	N/A	N/A	34.0	22.9	19.2 (18.8)	-	-
D90	Roadside	DT	N/A	N/A	34.9	22.6	22.6	-	-
D129	Roadside	DT	100	100	-	34.6	36.3	34.7	35.3
D120	Roadside	DT	25	25	-	29.3	32.8	30.5	24.6
D121	Roadside	DT	N/A	N/A	-	27.2	29.7	26.0	-
D122	Roadside	DT	25	25	-	31.1	32.8	30.7	27.6
D123	Roadside	DT	N/A	N/A	-	19.2	18.3	-	-
D124	Roadside	DT	N/A	N/A	-	17.5	19.8 (19.2)	-	-
D125	Roadside	DT	N/A	N/A	-	29.1	28.9 (27.3)	-	-
D126	Roadside	DT	N/A	N/A	-	28.7	26.5 (25.2)	-	-
D127	Roadside	DT	N/A	N/A	-	30.4	26.2 (24.9)	-	-

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
D128	Roadside	DT	N/A	N/A	-	23.1	21.8	20.2	-
D130	Roadside	DT	100	100	-	-	**48.3**	**43.3**	**46.2**
D131	Roadside	DT	N/A	N/A	-	-	29.2	25.5	-
D132	Roadside	DT	75	75	-	-	38.6	32.0	32.9
D133	Roadside	DT	92	92	-	-	39.5	32.6	32.8
D134	Roadside	DT	83	83	-	-	36.1	29.4 (26.6)	31.0 (27.5)
D135	Roadside	DT	0	0	-	-	26.1	28.6	-
D136	Roadside	DT	83	83	-	-	36.3	33.9	31.3
D137	Roadside	DT	100	100	-	-	39.4	36.5 (29.7)	37.4 (29.6)
D139	Roadside	DT	100	100	-	-	31.8	37.6	36.3
D140	Roadside	DT	100	100	-	-	33.7	38.1	37.5
D141	Roadside	DT	100	100	-	-	27.9	31.6	31.9
D142	Roadside	DT	75	75	-	-	34.9	36.5	35.4
D143	Roadside	DT	67	67	-	-	-	21.6	24.1
D144	Roadside	DT	75	75	-	-	-	13.6	15.1
D145	Roadside	DT	75	75	-	-	-	38.6 (29.5)	**41.6** (31.1)
D138	Roadside	DT	N/A	N/A	-	-	-	10.7	-
D146	Roadside	DT	92	92	-	-	-	**40.4**	35.4
D147	Roadside	DT	100	100	-	-	-	19.0	19.4
D148	Roadside	DT	83	83	-	-	-	21.1	20.8
D149	Roadside	DT	67	67	-	-	-	**53.6**	**48.2**
D150	Roadside	DT	92	92	-	-	-	31.1	31.6

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
D151	Roadside	DT	92	92	-	-	-	34.6	39.0
D152	Roadside	DT	83	83	-	-	-	23.8	24.4
D153	Roadside	DT	100	100	-	-	-	-	31.5
D154	Roadside	DT	67	67	-	-	-	-	**43.9**
D155	Roadside	DT	50	50	-	-	-	-	**45.7**
D156	Roadside	DT	67	67	-	-	-	-	30.4
D157	Roadside	DT	50	50	-	-	-	-	**41.8**
D158	Roadside	DT	25	25	-	-	-	-	24.9
D159	Roadside	DT	25	25	-	-	-	-	27.1
D161	Roadside	DT	25	25	-	-	-	-	24.1

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

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

Notes:

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

Note: the concentrations presented in the following graphs are not adjusted for distance to receptors and are used to indicate trends. The distance adjusted data are presented in Table A.3.

Figure 3. Background Sites

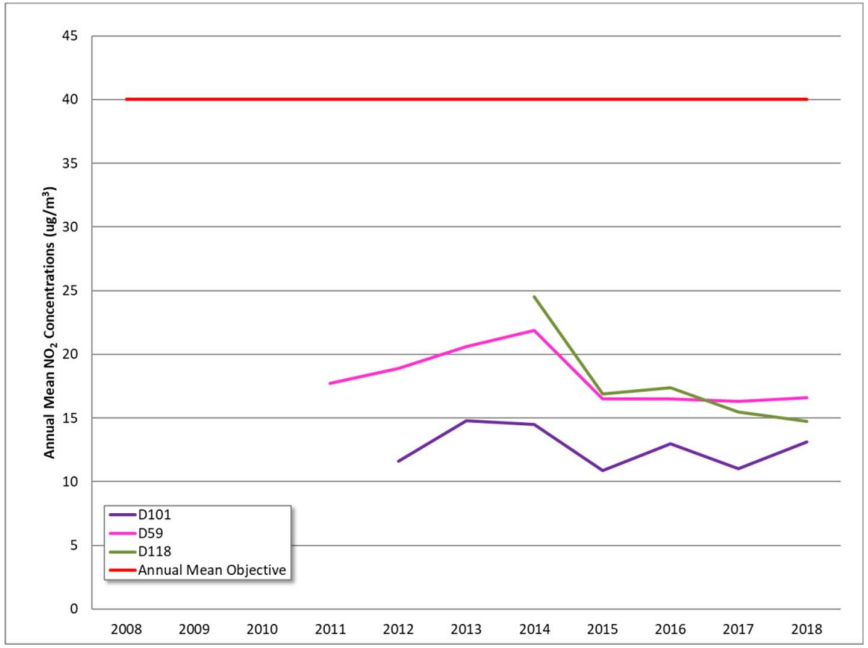


Figure 4. Monitoring Sites in Chester-le-Street

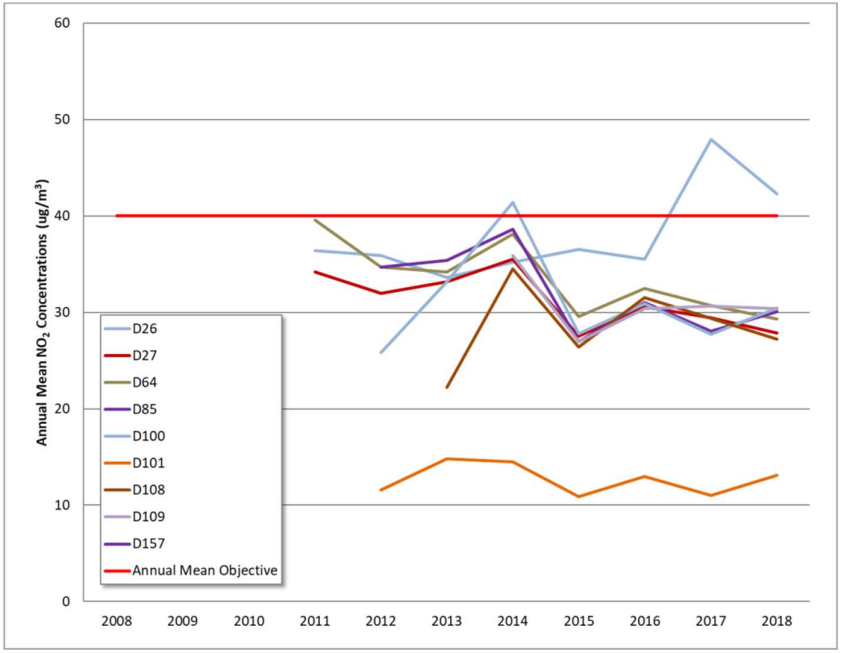


Figure 5. Monitoring Sites at Menceforth Cottages

Figure 6. Monitoring Sites in Gilesgate & Sunderland road

Figure 7. Monitoring Sites in Claypath

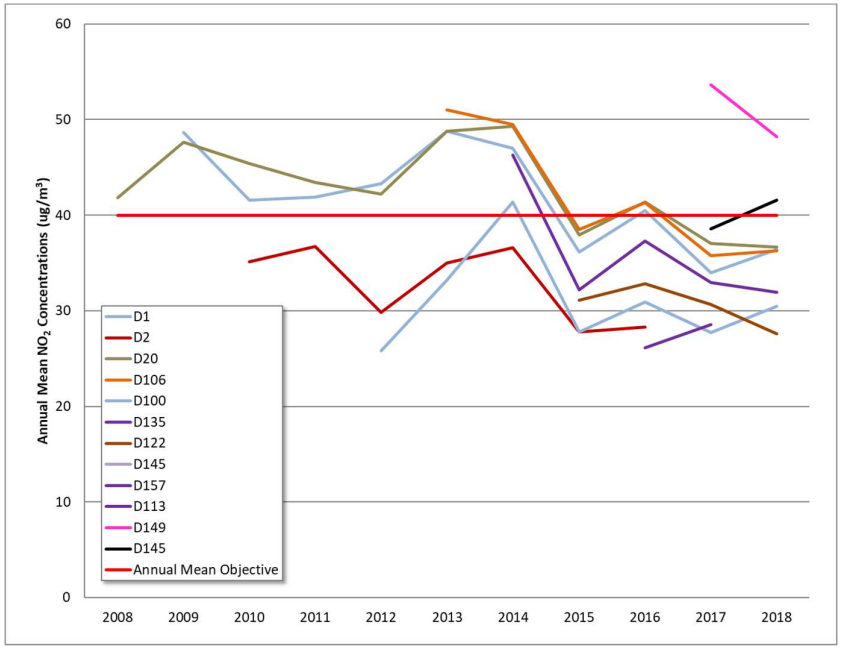


Figure 8. Monitoring Sites in Framwellgate

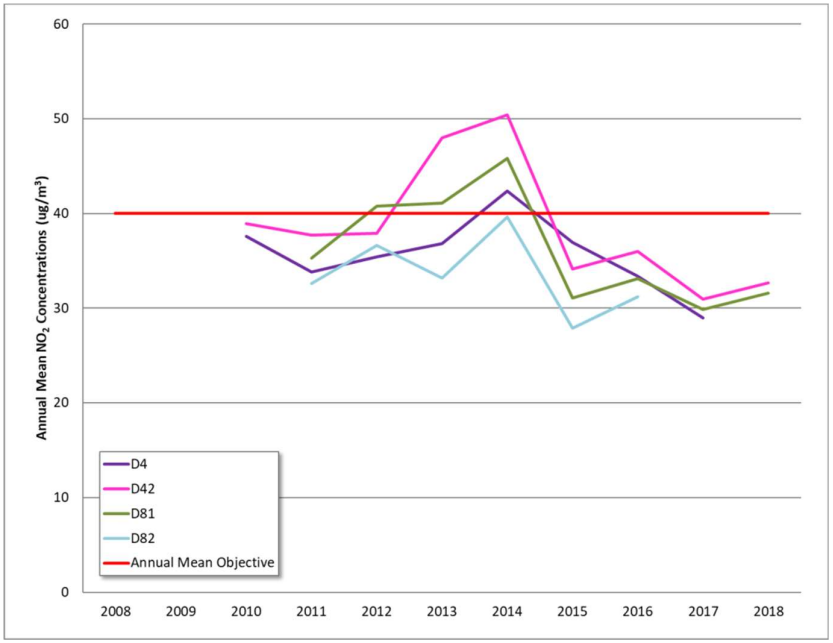


Figure 9. Monitoring Sites in New Elvet

Figure 10. Monitoring Sites West of Framwellgate Rounabout

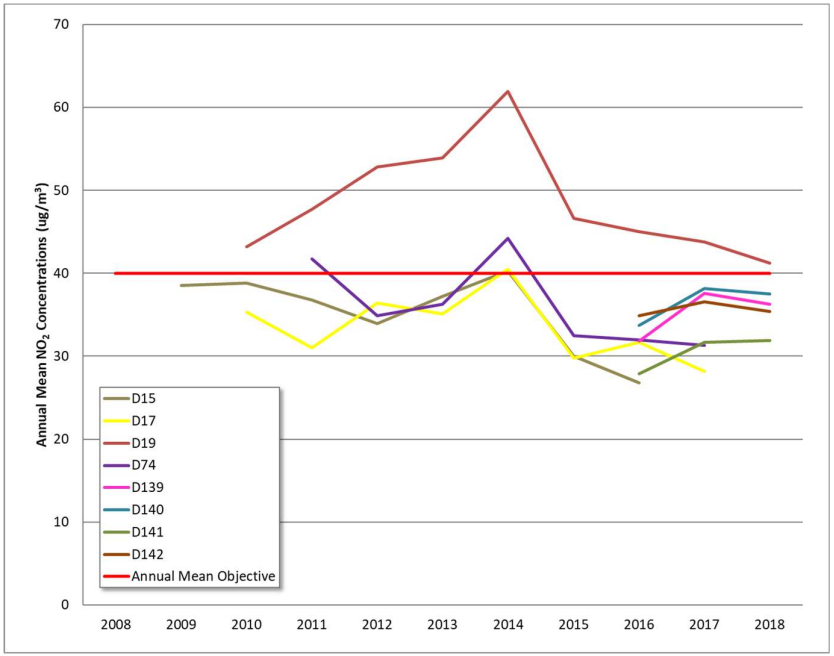


Figure 11. Monitoring Sites in Crossgate Peth & Alexandria Crescent

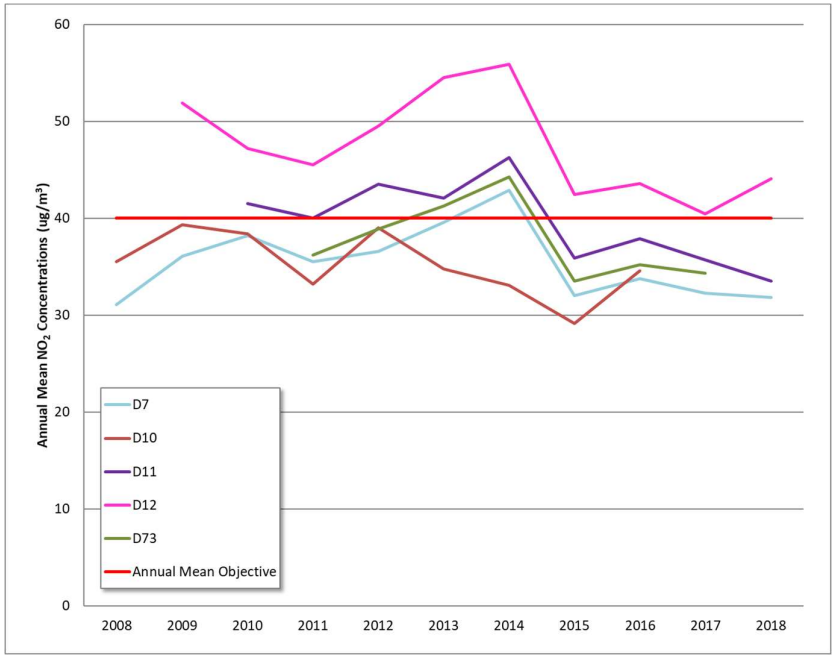
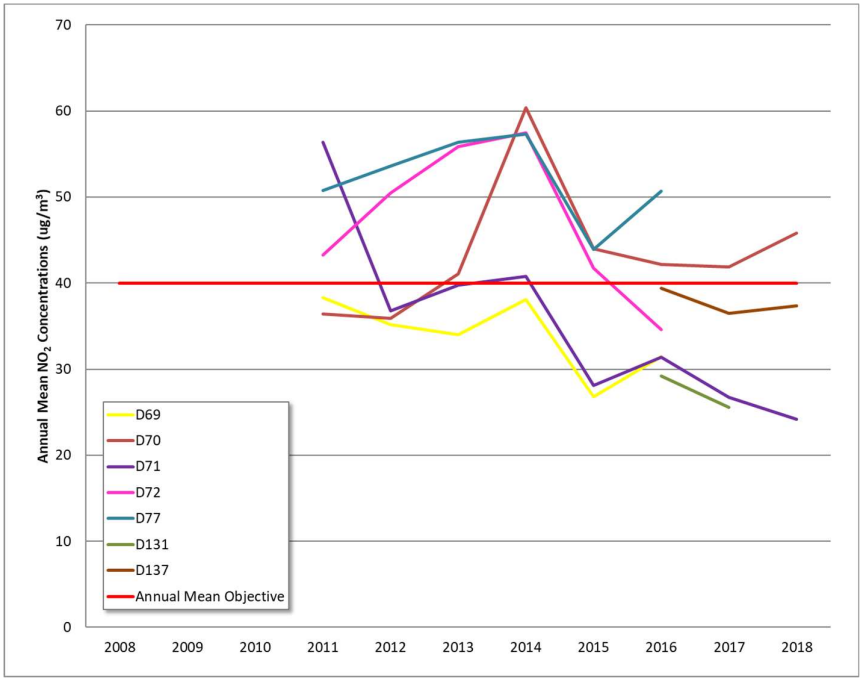


Figure 12. Monitoring Sites in Nevilles Cross Bank & Langley Moor


70
60
50
40
30
20
10
0
Annual Mean NO2 Concentrations (ug/m3)
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
D69
D70
D71
D72
D77
D131
D137
Annual Mean Objective

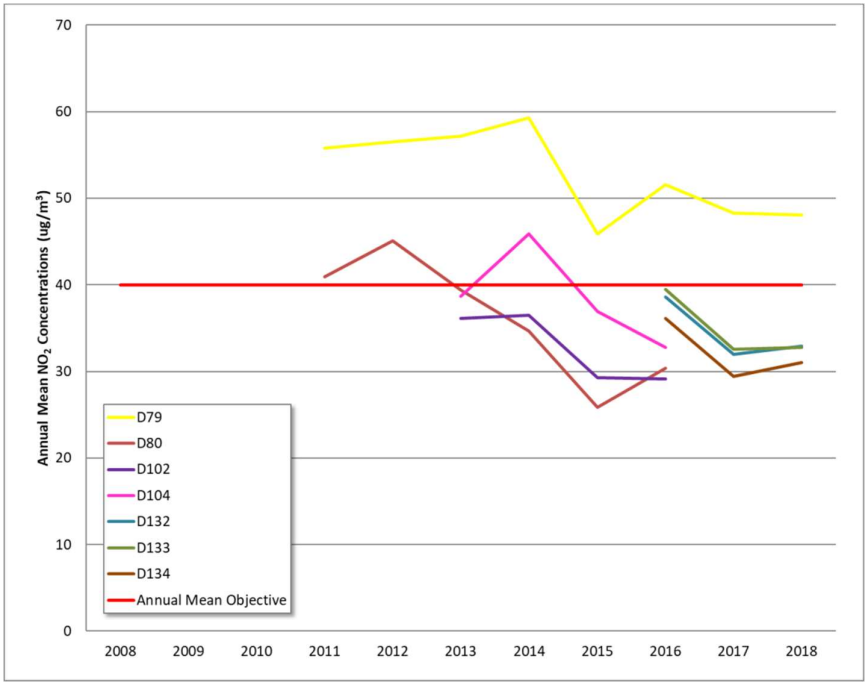

70
60
50
40
30
20
10
0
Annual Mean NO2 Concentrations (ug/m3)
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
D79
D80
D102
D104
D132
D133
D134
Annual Mean Objective

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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m³ (3)				
					2014	2015	2016	2017	2018
DUR4	Roadside	Automatic	97	97	-	-	-	23.9 (0)	29.4

Notes:

Exceedances of the NO_2 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 2018

Table B.3 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
D30	35.7	27.1	31.3	28.7	28.7	23.7	25.8	22.1	27.8	29.4			28.0	26.1	23.2
D31	32.3	30.8	29.9	28.9	24.6	22.6	23.7	21.4	24.5	25.5			26.4	24.6	
D23	39.0	46.7	43.5	34.9	35.7	33.2	30.5	27.4	34.7	36.8	43.6	42.5	37.4	34.8	
D26	53.7	47.3	50.4	40.9	42.5	39.7	41.4	35.2	37.3	44.5	59.8	53.4	45.5	42.3	28.2
D27	34.6	34.0	33.7	31.3	25.6	23.0	24.6	24.4	26.5	30.5	38.2	33.2	30.0	27.9	
D64	35.6	35.8	37.9	30.2	32.4								34.4	29.3	
D85	31.9	36.0	41.5	32.9	33.8								35.2	30.0	
D100	33.6	38.5	36.5	31.7	31.8	27.8							33.3	30.5	
D101	16.1	18.2	15.1	11.1	11.1	9.0	9.6			12.1	20.8	17.8	14.1	13.1	
D108	31.1	35.1		28.1	26.1	25.8	29.4	23.3	25.0	32.4	32.2	33.5	29.2	27.2	
D109	37.9	39.2	38.8	30.6	31.5								35.6	30.4	
D129	41.2	38.4	41.2	36.3	33.4	33.1	36.2	30.3	31.5	38.0	51.3	44.4	37.9	35.3	
D157							43.0	36.6	37.0	44.4	54.5	51.7	44.5	**41.8**	
D1	37.2	43.2	44.5	37.1	40.7	37.2	35.3	29.5	32.6	42.5	48.3	42.0	39.2	36.4	30.1
D7	36.1		35.6	30.0	36.9	34.7	33.2	27.3	33.6	35.7	35.6	37.9	34.2	31.8	
D8	42.1		43.8	37.9	51.0	45.7	42.1	32.7		39.0	39.7	39.0	41.3	38.4	

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 (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
D11	39.1	37.3	36.3	35.9	35.5	31.3	31.0	27.8	36.1	38.8	48.5	35.0	36.0	33.5	26.0
D12	47.9	65.5	44.9	40.5	45.2	39.9	42.4	32.6		51.1	57.2	54.4	47.4	**44.1**	
D17	29.1	40.2											34.7		
D19	38.3	47.1	44.0	43.0	44.7	44.7	44.1	35.9	43.0	43.4	57.4	46.2	44.3	**41.2**	
D20	42.5	36.8	39.7		50.6		42.3	36.1			34.5		40.3	36.7	
D42	35.3	38.5	37.2	31.4	34.3	32.9	34.6	26.1		32.9	43.6	39.3	35.1	32.6	
D59	23.5	19.8	17.8	17.5	13.6	12.5	13.8	12.6	14.5	19.0	26.1	23.0	17.8	16.6	15.0
D70		46.9	51.1	44.8	60.3	56.8	55.8	39.8	43.8		49.3	44.5	49.3	**45.8**	29.2
D71	28.4	33.5	34.4										32.1	24.2	20.2
D78	32.5	28.5	31.4	28.2	31.3	29.1	32.5	23.8	26.6	31.0	41.4	34.8	30.9	28.8	
D79	58.6	53.2	56.4	55.5	50.4	44.7	47.8	39.0	50.2	52.8	53.2	59.4	51.8	**48.1**	**40.8**
D81	32.3	42.4	36.4	31.5	31.6	30.9	29.4	25.5	31.7	35.6	41.9	38.1	33.9	31.6	
D106	39.7	42.2	43.7	35.4	40.2	34.7	36.5	27.4	37.7	39.0	45.9	45.5	39.0	36.3	
D113	35.0	40.0					32.9	22.9	27.0	36.8			32.4	31.9	
D115	38.0	33.8		36.6	38.3	29.7	33.3	25.5	34.3	35.5	38.4	37.9	34.6	32.2	
D116			51.6	51.0	55.5	45.8	46.7	37.1	41.6	50.8	48.5	46.7	47.5	**44.2**	
D117	35.7	46.4	41.8	43.3	40.6	40.0	37.2	35.3	47.9	49.3	53.5	46.7	43.1	**40.1**	
D118		19.4	16.8	15.5	13.0	11.1	11.6	11.7	13.4	18.1	23.1	20.5	15.8	14.7	
D120	34.3	32.3	31.3										32.6	24.6	
D122	34.5	39.9	35.2										36.5	27.6	

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 (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
D130	43.6	77.8	54.1	46.5	57.2	50.0	49.5	32.6	33.0	48.0	59.5	44.5	49.7	**46.2**	
D132			40.1	37.1	37.3	33.9	34.7	27.4	28.6		43.3	36.1	35.4	32.9	
D133	37.4	33.2	35.5	36.4	34.8	31.0	31.9	28.0		32.9	43.6	42.7	35.2	32.8	
D134	35.1	36.3	33.4	31.3	34.7	30.5	32.4	23.7			40.0	35.6	33.3	31.0	27.5
D135															
D136	37.8			35.9	30.2	34.3	32.5	29.4	31.6	32.7	37.4	35.1	33.7	31.3	
D137	41.9	38.4	43.5	37.6	44.8	40.6	35.7	32.4	39.8	43.1	40.5	44.6	40.2	37.4	29.6
D139	28.3	45.5	41.4	38.3	45.1	42.5	39.3	26.8	35.0	35.7	51.8	38.6	39.0	36.3	
D140	26.5	44.7	44.9	37.4	45.9	48.3	39.2	30.0	36.0	38.5	49.1	43.5	40.3	37.5	
D141	25.2	40.6	39.1	38.6	37.8	35.5	28.3	24.0	30.0	34.0	44.3	33.9	34.3	31.9	
D142	31.5	45.9	37.4	33.7	41.9			33.7	41.1		34.6	43.1	38.1	35.4	
D143	23.0			24.4	25.2	21.2	19.6	15.8	19.6	25.7			21.8	24.1	
D144	16.9	20.8		15.1	14.9	11.6	12.9			13.7	22.1	18.8	16.3	15.1	
D145	41.6	70.4	48.5			43.3	41.5	32.7	35.8	44.0		45.1	44.8	**41.6**	31.1
D146	42.5		35.5	37.6	39.9	34.5	36.7	29.3	37.7	43.2	49.1	32.7	38.1	35.4	
D147	22.1	27.5	24.4	19.6	19.7	17.2	18.1	12.6	14.4	20.7	29.6	24.5	20.9	19.4	
D148	24.5	25.5	25.6			18.2	18.6	14.6	17.8	22.4	32.8	23.7	22.4	20.8	
D149	50.1	81.9					52.1	40.9	42.6	53.2	60.6	61.6	55.4	48.2	
D150	35.1		42.1	32.6	38.2	33.2	31.6	24.9	22.5	29.3	47.2	37.1	34.0	31.6	
D151	48.3		41.4	40.6	44.0	38.4	39.2	30.3	36.8	46.4	51.1	45.4	42.0	39.0	

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 (0.93) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
D152	29.9	27.4	28.2	24.9		23.3	25.2	16.0		25.1	31.7	30.6	26.2	24.4	
D153	30.0	39.8	37.7	35.9	35.3	32.9	35.3	25.0	26.2	31.5	43.8	33.7	33.9	31.5	
D154					46.9	40.9	42.3	29.4	34.9	47.4	57.7	48.7	43.5	**43.9**	
D155						43.0	45.4	36.1	43.3	47.5		42.8	43.0	**45.7**	
D156				29.6	32.2	31.4	29.7	21.7	19.4	30.0		34.5	28.5	30.4	
D158										29.8	36.3	37.4	34.5	24.9	
D159										34.0	39.1	39.5	37.5	27.1	
D161										28.6	36.6	34.8	33.3	24.1	

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

QA/QC

The NO_2 diffusion tubes used were supplied and analysed in 2018 by Gradko and analysed using 20% TEA/Water. The same method has been used for many years.

Gradko International Ltd takes part in the WASP and NETCEN accreditation schemes.

Co-location Study

No local colocation data was available for 2018.

National Bias Adjustment Factor

The national bias adjustment value of 0.93 for 2018 was determined from version v03_19 FINAL of the national bias adjustment spreadsheet.

The summary of laboratory precision published by the UWE Air Quality Helpdesk, tubes analysed by Gradko displayed 'Good' precision in 28 of the 30 studies in 2018 for 20% TEA / Water, with the remaining 2 using a single tube, therefore precision was not applicable (based on spreadsheet version v03_19 FINAL published March 2019).

The following bias adjustment factors ('national' if not indicated otherwise) have been used to derive the mean concentrations for historical data: 2011 (0.92 (local)), 2012 (0.97), 2013 (0.99 (local)), 2014 (0.91), 2016 (0.94) and 2017 (0.89). Further details are provided in previous Progress Reports.

Discussion of Choice of Factor to Use

For 2011 and 2013 sufficient data were available to allow local adjustment factors to be derived, and the national biased adjustment factor was applied to the raw data in 2014, 2015 and 2016, as described in previous Progress Reports.

Short-term to Long-term Data Adjustment

A number of diffusion tube monitoring sites recorded <75% data capture in 2018. These data were seasonally adjusted (annualised) by comparison with four regional automatic monitoring stations operated as part of the Defra Automatic Urban and Rural Network (AURN).

Table C.1 – Seasonal Diffusion Tube Adjustment Calculations

Site	Data Capture	Missing Months	Concentration, µg/m³				Adjustment Ratio				
			Billingham	Hartlepool St Abbs Walk	Newcastle Centre	Sunderland Silksworth	Billingham	Hartlepool St Abbs Walk	Newcastle Centre	Sunderland Silksworth	Average
AURN Annual Mean	-		17.3	13.1	28.6	14.0	-				
AURN Data Capture			97%	99%	88%	95%					
D64	42%	June, July, Aug, Sept, Oct, Nov, Dec	19.5	14.6	31.3	14.4	0.89	0.89	0.91	0.98	0.92
D85	42%	June, July, Aug, Sept, Oct, Nov, Dec	19.5	14.6	31.3	14.4	0.89	0.89	0.91	0.98	0.92
D100	50%	July, Aug, Sept, Oct, Nov, Dec	17.9	13.4	29.1	13.9	0.96	0.97	0.98	1.01	0.98
D109	42%	June, July, Aug, Sept, Oct, Nov, Dec	19.5	14.6	31.3	14.4	0.89	0.89	0.91	0.98	0.92
D157	50%	Jan, Feb, Mar, Apr, May, June	17.1	12.7	28.2	14.1	1.01	1.03	1.01	0.99	1.01
D20	58%	Apr, Jun, Sept, Oct, Dec	18.2	13.3	28.5	14.3	0.95	0.98	1.00	0.98	0.98
D71	25%	Apr, May, June, July, Aug, Sept, Oct, Nov, Dec	23.0	17.0	34.0	15.9	0.75	0.77	0.84	0.89	0.81
D113	50%	Mar, Apr, May, June, Nov, Dec	16.3	12.2	27.3	13.3	1.06	1.07	1.05	1.05	1.06
D120	25%	Apr, May, June, July, Aug, Sept, Oct, Nov, Dec	23.0	17.0	34.0	15.9	0.75	0.77	0.84	0.89	0.81
D122	25%	Apr, May, June, July, Aug, Sept, Oct, Nov, Dec	23.0	17.0	34.0	15.9	0.75	0.77	0.84	0.89	0.81
D143	67%	Feb, Mar, Nov, Dec	14.3	10.4	24.9	12.3	1.21	1.25	1.15	1.14	1.19
D149	67%	Mar, Apr, May, Jun	18.6	14.3	30.2	14.7	0.93	0.92	0.95	0.95	0.94
D154	67%	Jan, Feb, Mar, Apr	15.7	11.7	26.3	13.6	1.10	1.12	1.09	1.04	1.08
D155	50%	Jan, Feb, Mar, Apr, May, Nov	14.8	11.0	25.1	13.0	1.17	1.19	1.14	1.08	1.14
D156	67%	Jan, Feb, Mar, Nov	14.7	11.0	25.7	12.8	1.18	1.19	1.11	1.10	1.14
D158	25%	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept	22.9	17.7	35.4	17.4	0.75	0.74	0.81	0.81	0.78
D159	25%	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept	22.9	17.7	35.4	17.4	0.75	0.74	0.81	0.81	0.78
D161	25%	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept	22.9	17.7	35.4	17.4	0.75	0.74	0.81	0.81	0.78

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

Figure D1: Air Quality Monitoring Locations in Bishop Auckland

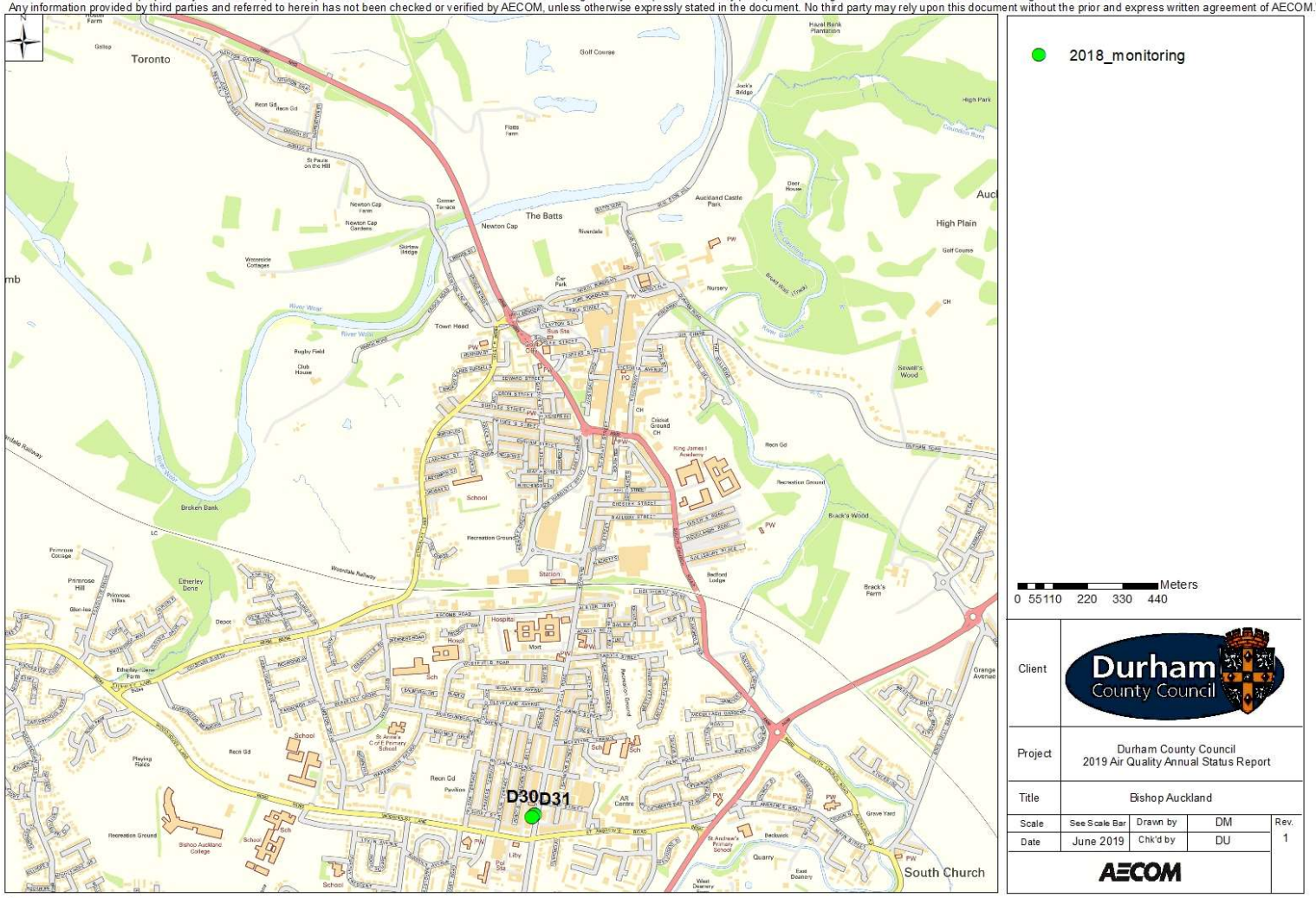


Figure D2: Air Quality Monitoring Locations in Bowburn

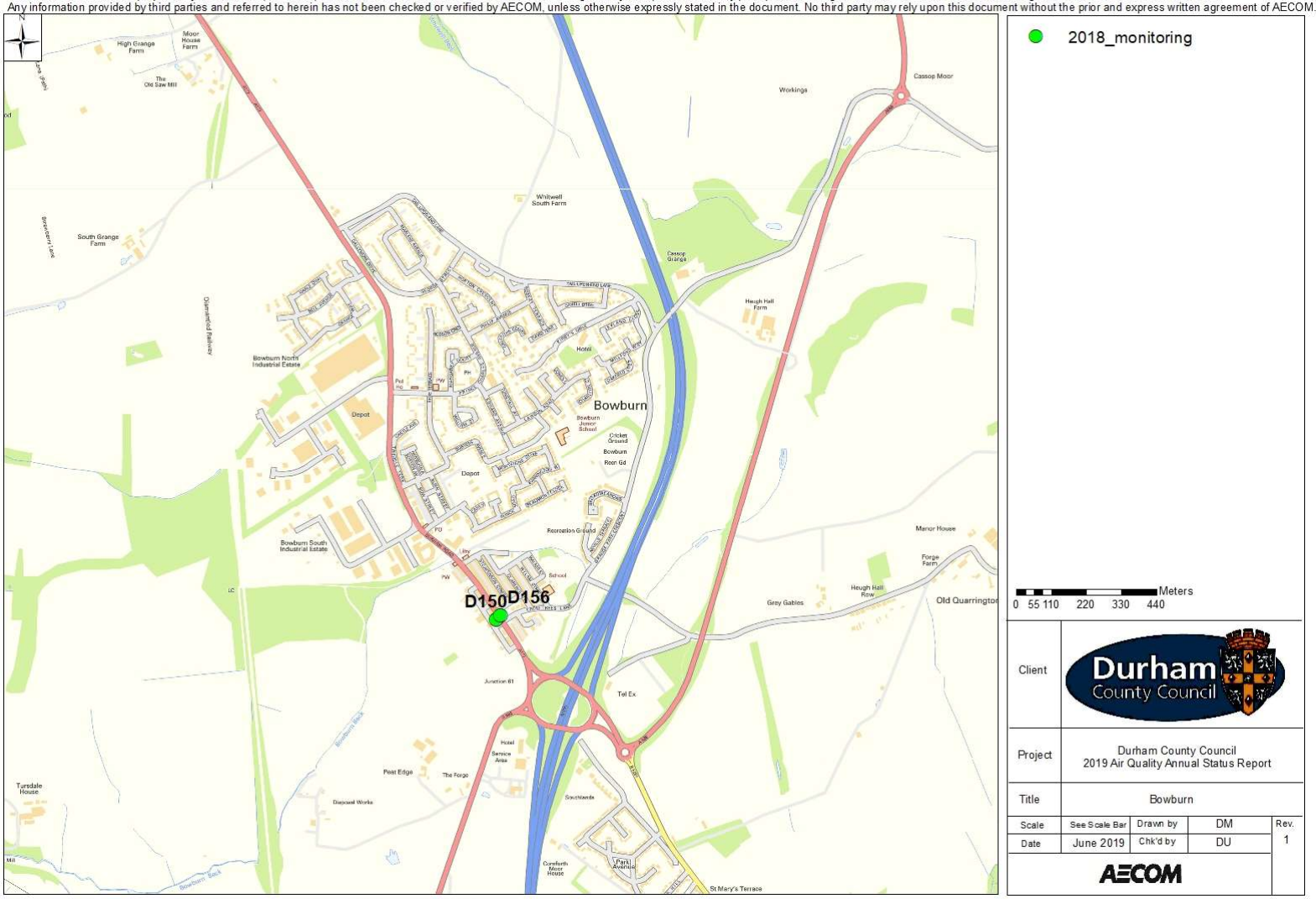


Figure D3: Air Quality Monitoring Locations in Chester-le-Street

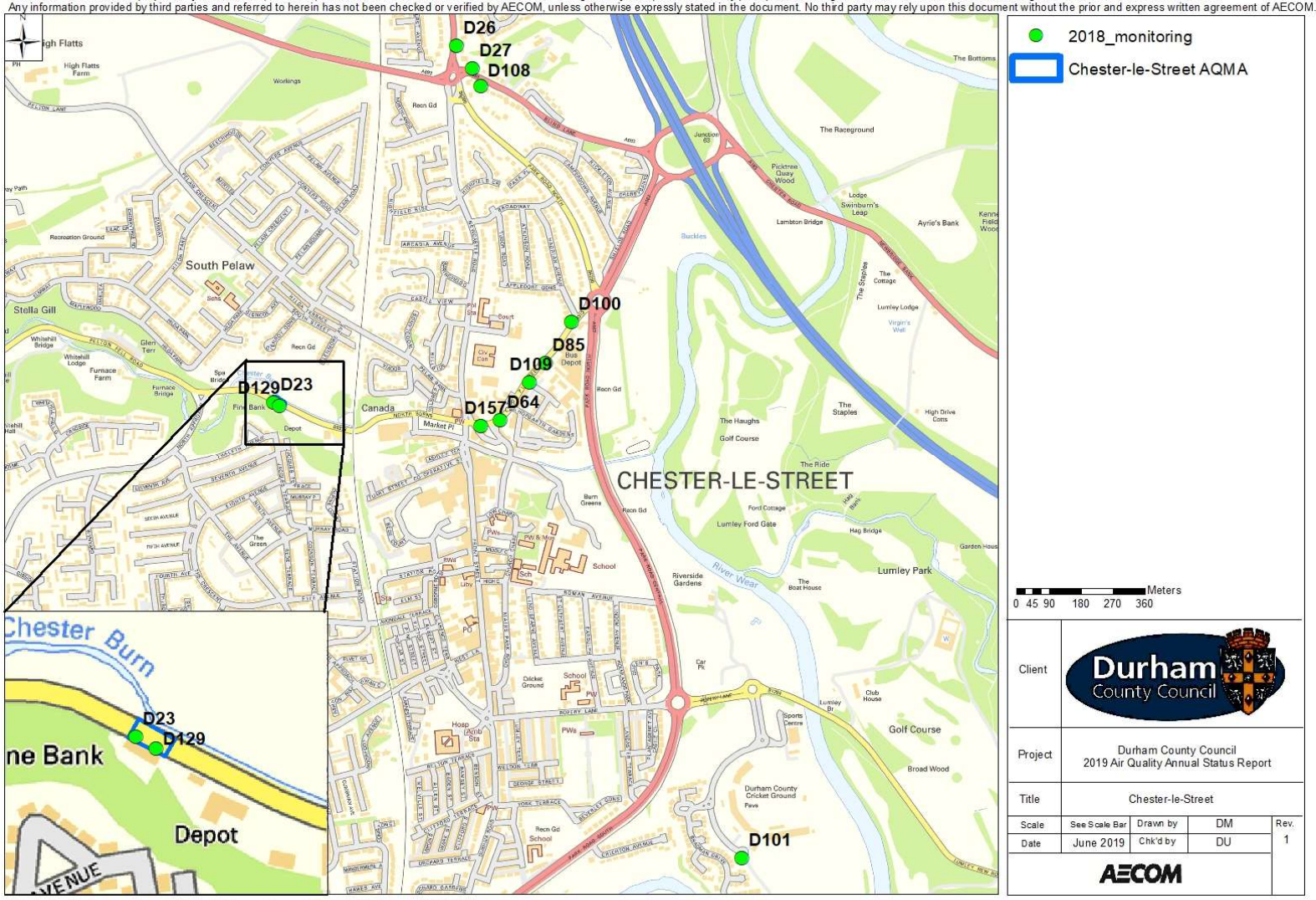


Figure D4: Air Quality Monitoring Locations in Durham Centre

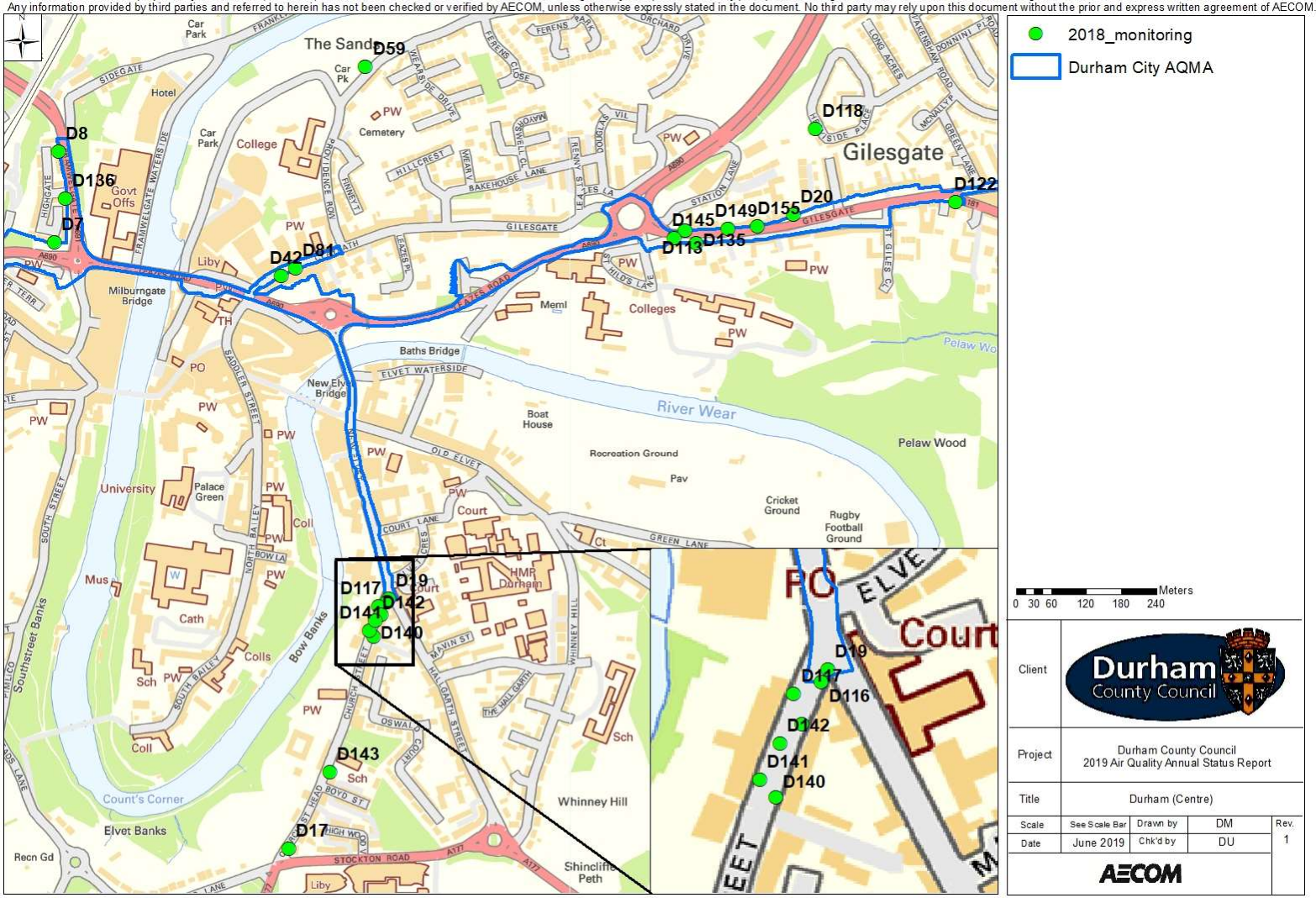


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Figure D5: Air Quality Monitoring Locations in Durham East

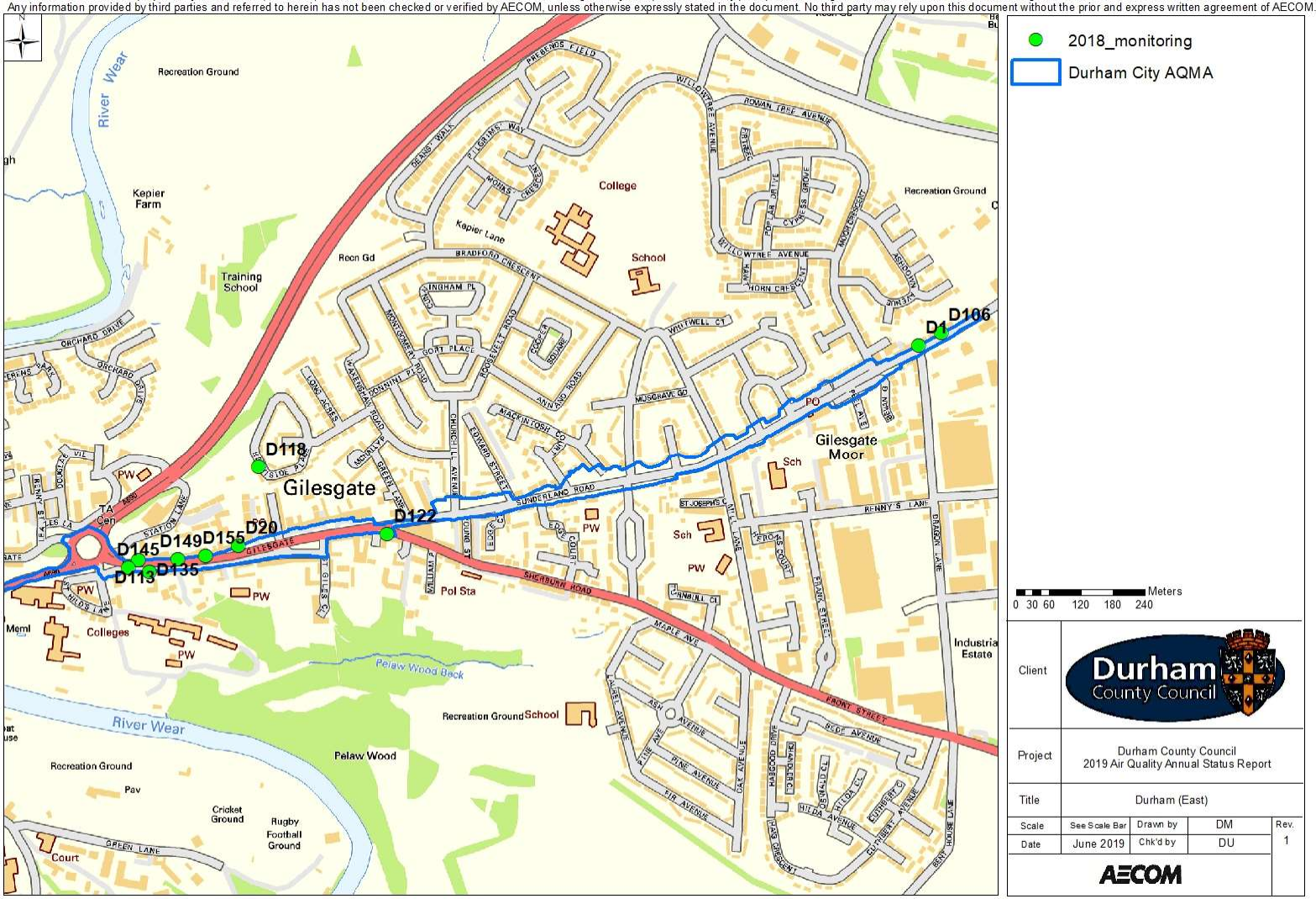


Figure D6: Air Quality Monitoring Locations in Durham West

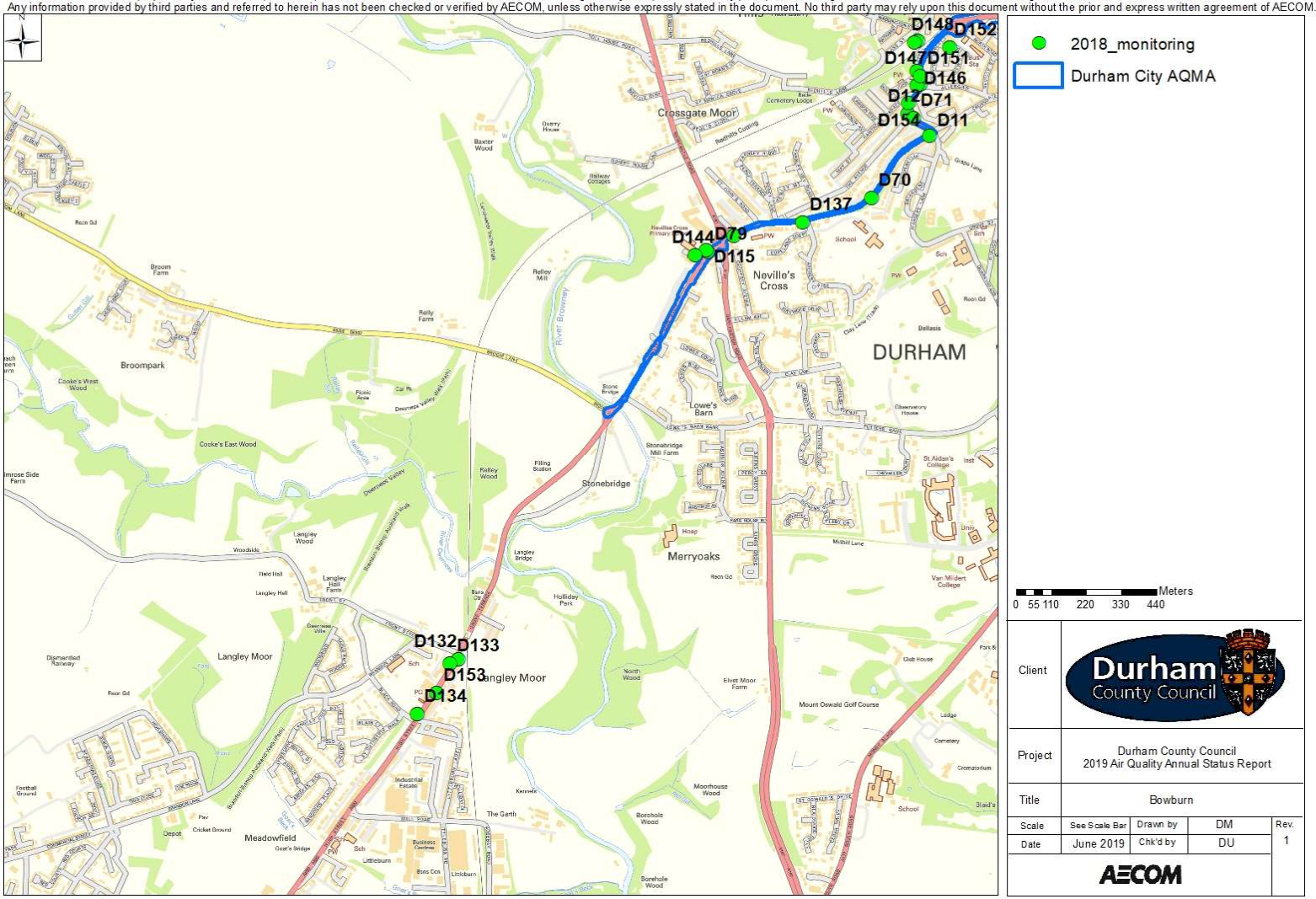
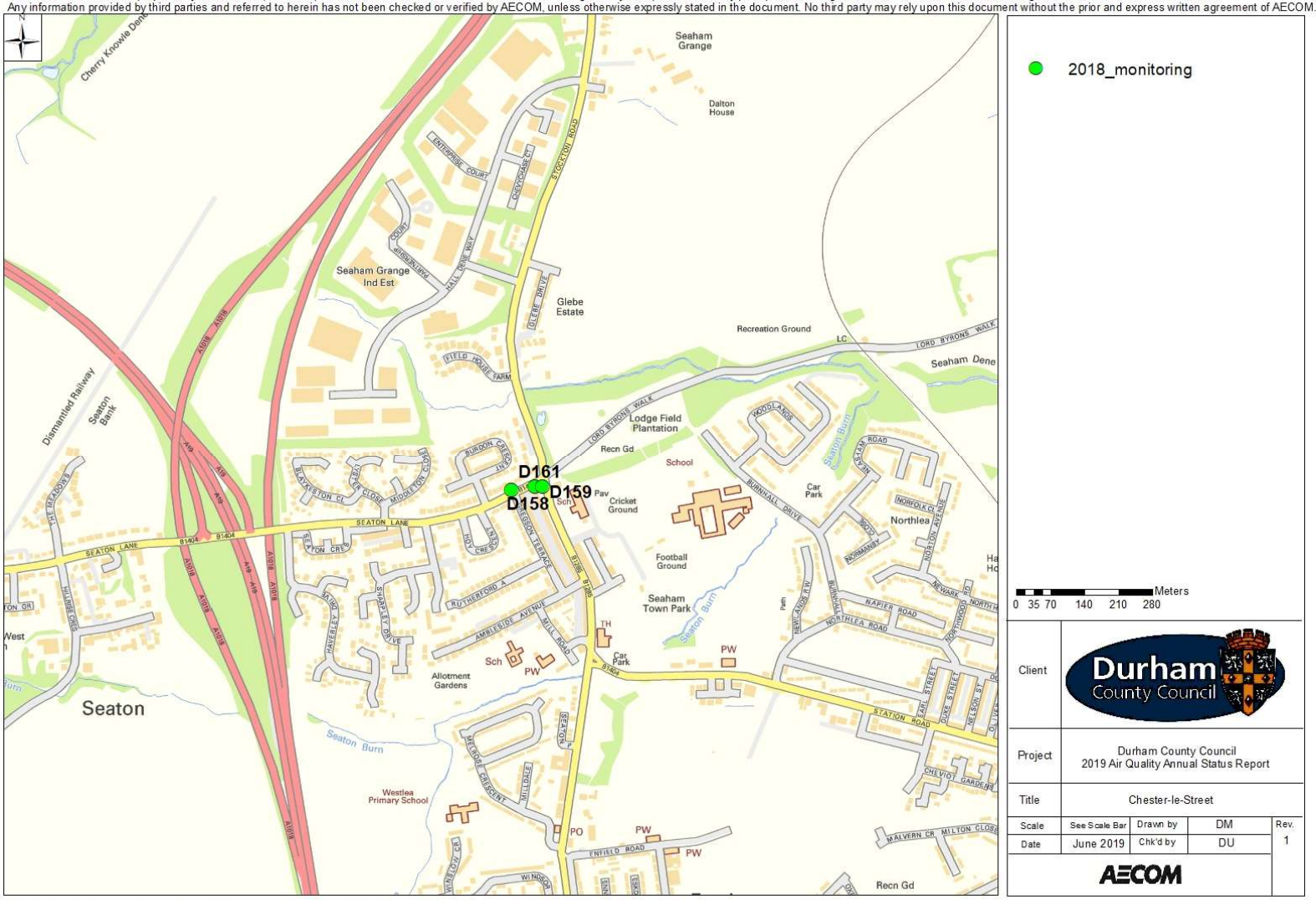


Figure D7: Air Quality Monitoring Locations in Seaham



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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[5]	
	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

[5] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

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
NAQS	National Air Quality Strategy
NECA	North East Combined Authority
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
SCOOT	Split Cycle Offset Optimisation Technique
SO_2	Sulphur Dioxide
UTMC	Urban Traffic Management and Control

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