St Albans City & District Council

Annual Status Report 2019

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Contact Details		
Company Name	Bureau Veritas UK Limited	St Albans City & District Council
Contact Name	Hannah Smith	Tara Murphy
Position	Senior Consultant	Specialist Officer Environmental Compliance
Address	5th Floor 66 Prescot Street London E1 8HG	Civic Centre, St Peters Street, St Albans, Hertfordshire, AL1 3JE

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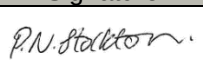
Prepared By	P Stockton	Graduate Consultant	
Prepared By	A Smith	Graduate Consultant	
Approved By	H Smith	Senior Consultant	

2019 Air Quality Annual Status Report (ASR)

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

November 2019

Local Authority Officer	Tara Murphy
Department	Community Services
Address	Civic Centre, St Peters Street, St Albans, Hertfordshire, AL1 3JE
Telephone	01727 819432
E-mail	tara.murphy@stalbans.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in St Albans City & District Council

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

St Albans City and District Council is set within Hertfordshire to the north of Greater London. The District has an area of just over 60 square miles with its boundary lines extending from just south of the M25 to a northern point south of Luton. The District is mainly rural in nature but there are a number of urban areas located as towns such as St Albans, Harpenden and Wheathamstead.

The main source of air pollution within St Albans City and District Council is from vehicle emissions. The main pollutants of concern being Nitrogen Dioxide (NO_2), and Particulate Matter (PM_{10} and $PM_{2.5}$). A number of main roads pass through the District in addition to smaller roads serving the main population centres. The M25 runs east to west through the southern area of the District. The M1 runs north to south up through the western area of the District and the 414 (North Orbital Road) provides an interlink between the M25 and M1.

The road network that serves the main population areas within the District, although smaller in size and in terms of traffic flow to the main roads, pass close to residential areas. The road network experiences more urban based driving conditions such as congestion, causing constant acceleration and deceleration. In addition, the siting of buildings close to these roads can entrap pollutants in urban canyon environments that lessen the effects of natural dispersal. This is apparent to the conditions experienced in St Albans town centre.

[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

There are three designated Air Quality Management Areas (AQMAs) currently in force within the District, details can be found here: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=254. The AQMAs have been declared due to exceedances of the NO_2 annual mean AQS objective. All AQMA boundaries are either close to, or have busy roads within them, recognising the influence vehicle emissions have upon air quality.

The three AQMAs can be seen online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=254. Details of the AQMAs are provided in Table 2.1 and boundary maps are presented in Appendix D: Maps of Monitoring Locations and AQMAs.

An Air Quality Action Plan (AQAP) was completed in 2003 and the progress on the existing measures was last updated in last year's ASR. A further update is included within this report, see Table 2.2. Within the AQAP, measures are outlined to be completed in order to achieve the annual mean objective for NO_2 thus improving air quality within the AQMAs and therefore the District as a whole. The AQAP is updated as measures are progressed and there are a number of projects that are ongoing that will provide a steer for the updated measures included.

Monitoring of NO_2 is completed within St Albans using a network of passive diffusion tubes. There are currently 43 diffusion tubes within the network. In July 2018**,** 11 diffusion tubes were removed and 8 were relocated to nearby sites to allow for more relevant exposure and enhanced AQMA monitoring. A further 16 diffusion tubes were redeployed to new locations across St Albans and Frogmore.

Results from the monitoring period completed in 2018 indicate that the annual mean Air Quality Objective (AQO) for NO_2 (40µg/m^3) was exceeded at locations SA136, SA138, SA143b, SA148, SA157 and SA160 following bias adjustment and prior to distance correction. Furthermore, sites SA137a, SA144, SA151 and SA156 were within 10% of the AQO for NO_2 prior to distance correction.

The NO_2 fall-off with distance calculator was used to estimate the NO_2 concentration at relevant exposure for the diffusion tube locations that were exceeding or were within 10% of the AQO; details are presented in Appendix C.

Following distance correction, all sites fell below the annual mean NO_2 objective apart from SA138, SA143b, SA148, SA157 and SA160. All remaining sites were now below 10% of the AQO following distance correction. The closest receptor to SA138 is located

on the second floor of the building façade and the NO_2 fall-off with distance calculator does not account for height, therefore this represents the worst case concentration as concentrations will decrease with height. SA143b, SA148, SA151, SA156, SA157 and SA160 were all new locations as of July 2018, therefore further trend analysis will be required to understand the annual mean NO_2 concentrations at these sites and whether they are likely to be an issue in the future.

Annual mean concentrations were below 60µg/m^3 at all monitoring locations during 2018, therefore as per Defra guidance it is unlikely that the NO_2 1-hour objective of 200µg/m^3 was exceeded at any location.

NO_2 monitoring data for St Albans is presented from 2014 to 2018 (where available) in Table A.2. The majority of the monitoring sites present an overall downward trend of annual mean NO_2 concentrations with peak concentrations experienced predominately in 2014.

This general trend in concentration reduction from 2014 to 2018 could be due to the continual commitment and progress made by the St Albans City and District Council to improve local air quality with the aim to revoke the declared AQMAs. The council has also introduced additional monitoring both within and outside of the existing AQMAs following recommendations upon appraisal of the 2017 ASR. No comparison was possible for the new sites and therefore trends will be assessed in next year's ASR.

Actions to Improve Air Quality

The monitoring network within St Albans City and District is in place to constantly monitor NO_2 throughout the year to identify any increases at identified locations throughout the district. Due to the current AQMAs being designated as a result of elevated NO_2 emissions, the monitoring network is an essential part of Local Air Quality Management (LAQM) that aids decision making on air quality issues and identifies where actions are required.

Efforts have been focussed on monitoring NO_2 concentrations in St Albans City and District due to the health effects and growing national concern surrounding this pollutant, illustrated in the Government's Air Quality Plan for NO_2. It is noted that PM_{10} concentrations haven't been ignored, as typically both NO_2 and PM_{10} share the same origin, therefore actions which target NO_2 levels simultaneously impact PM_{10} levels.

Nonetheless, the Council will continue to act upon guidance issued by Defra, and will undertake supplementary monitoring if required. In 2018, the highest PM_{10} concentration within St Alban's City and District area, obtained from the Defra estimated background maps (updated 2017), was 18.6µg/m^3, which is well below the AQS objective of 40µg/m^3.

Real-time and historic air quality data across Hertfordshire and Bedfordshire can be viewed on the Herts and Beds Air Quality website; *www.airqualityhertsbeds.co.uk*. This allows the public to view current air quality concentrations, historical data and previously completed LAQM reports. Although there are no real-time automatic monitoring stations within St Albans City, the raw diffusion tube concentrations for St Albans are available for download from the St Albans City and District Council website - *https://www.stalbans.gov.uk/environmentandwaste/pollution/air-pollution/*.

Due to the main source of air pollutant emissions arising from vehicular sources within the District, alternative modes of transport to private internal combustion engine vehicles continue to be promoted. These 'Green Travel' alternatives are as follows:

- Cycling – A District wide cycling map continues to be available to help plan routes across the District and a revised cycling map was launched in spring 2019. SADC Green Travel Plan set out a range of actions to reduce emissions from staff travel, including a staff cycle scheme that was relaunched in spring 2019. The Green Ring route project encircles the city centre; it is a continuous 9km cycling and walking route that will help reduce congestion, pollution and provides a valuable and easy way to exercise. Additional strategies include the provision of secure cycle parking racks, upgrading and constructing new cycle paths and installation of Trixie mirrors at key junctions;
- Public Transport – A well connected bus route that serves St Albans city centre aims to reduce the use of private vehicles, there are services from North London, Welwyn Garden City, Hatfield, Luton and Watford in addition to routes to city suburbs and outlying shopping areas;
- The Idling Action St Albans campaign has been running since 2017 to raise awareness of the issue and urge car, van, lorry, bus and taxi drivers to switch off their engine when parked or stationary for more than a minute. It includes social media activities, letters, school engagement activities, market stalls, Idling Action St Albans events and information leaflets issued with resident car

parking permits. In 2019, St Albans are investigating the possibility of installing street signage to encourage drivers outside schools to turn off their engines when stationary;

- Car Sharing & Eco-Driving Tips – A number of car sharing websites are promoted on stalbans.gov.uk, such as *http://www.stalbans.gov.uk/environmentandwaste/greenerliving/greentravel/carsharing.aspx*; helping drivers link up with others who are willing to car share, reducing the number of cars helps alleviate problems such as congestion as well as reducing NO_2 and PM10 emissions. Eco-Driving Tips are also provided on the stalbans.gov.uk page above, to not only reduce pollutant emissions but also to reduce fuel consumption and save the driver money; and
- Electric Vehicles – There are a growing number of electrical vehicle (EV) charging points within the District to promote the use of both pure EVs and plug-in hybrid EVs. Details of these points in addition to available grants and subsidies available for EVs are available at;

  https://www.stalbans.gov.uk/transport-and-streets/electricvehicles.aspx

St Albans was unsuccessful following a grant submission in 2018 to DEFRA for a Clean Air Zone (CAZ) feasibility study and funding of clean air zones. The feasibility study bid was in response to 2016's appraisal comments surrounding the support into new initiatives to develop the action plan and 2017's appraisal comments to further investigate CAZ feasibility following 2017's bus gate proposal and bus based CAZ scenario. St Albans is considering submitting a proposal for grant funding when released by DEFRA in 2020.

The ongoing work in reference to the control of idling vehicles has continued into 2019 with the anti-idling campaign raising awareness at schools and for members of the public.

Conclusions and Priorities

St Albans City and District is predominately rural in nature and the main source of air pollution within the District is from road traffic emissions. The city centre has a number of busy streets where canyon effects of pollution are apparent due to buildings being in close proximity to the road. In addition there are a number of main roads with a high volume of traffic that pass through the District including the M1, the M25 and the A414.

The three AQMAs that are currently designated reflect these road conditions as two of the AQMAs are close to the areas of the M25 and the M1, and the third is located within a congested central road within St Albans that is representative of street canyon conditions.

The priorities for the coming year include continuing to work with the Air Quality Action Plan (AQAP) measures, implementing the actions that are ready for completion and working with separate departments within St Albans City and District Council on measures benefitting air quality within the Climate Change Action Plan 2016, the council Green Travel Plan and the Hertfordshire County Council Local Transport Plan 2011 – 2031. The good work already undertaken in relation to the reduction of vehicle idling and exploring new options for promotion and enforcement of anti-idling will continue.

The 2018 monitoring network showed exceedances of the NO_2 annual mean Air Quality Strategy (AQS) objective at five locations once distance correction had been taken into consideration;

- SA138, which is situated at the façade of a pub within AQMA No. 1;
- SA143b, which is situated at the façade of a commercial property within AQMA No.1;
- SA148, which is situated at the façade of a commercial property just outside AQMA No.1;
- SA157, which is situated at the façade of a residential property along Catherine Street; and
- SA160, which is situated at the façade of a commercial property within AQMA No.1.

It should be noted that relevant exposure is on the second floor of the buildings situated close to SA138, SA143b and SA148. Site SA138 has been in exceedance of the AQO since its installation in 2008 and has increased from 2017 at 41.2µg/m^3 to 45.2µg/m^3 in 2018. Following distance correction, this was reduced to 43.4µg/m^3, however the nearest receptor is situated on the second floor and the distance correction method does not account for height. The concentrations recorded at site SA138 therefore represent the worst-case scenario.

Furthermore, only 6 months of data was available for SA143b, SA148, SA157 and SA160 as the diffusion tubes were installed in July 2018. As a result, further years of data is required to provide an accurate trend analysis to determine whether the AQMA will need to be extended.

The Council redeployed 16 diffusion tubes, thus creating 16 new monitoring locations in 2018; eight tubes were also relocated to nearby, therefore there are three new sites located within existing AQMAs (SA160, SA143b in AQMA No.1 and SA123b in AQMA No.7). Both of the new sites within AQMA No.1 exceeded the AQO following distance correction.

Local Engagement and How to get Involved

At an individual level there are a number of ways the public are able to get involved and help improve air quality on a local level. The main source of air pollution within the District is vehicle emissions, changing the method of transport used can help reduce the amount of pollutant emissions released from vehicle sources. This can be due from both the reduction in the number of vehicles being used and through the type of vehicles being used.

Changes in transport use such as the following help in reducing emissions of NO_2, PM_{10} and $PM_{2.5}$ from vehicle sources:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the number of vehicles and reducing congestion;
- Walk or cycle if your journey allows – Choosing to walk or cycle for your journey reduces the number of vehicles on the road. There is the added benefit of keeping fit and healthy. In addition many of the cycle routes are off-road meaning you are not in close proximity to emissions from road traffic sources;
- Reduce time of idling vehicles – If using a car for a journey avoid idling for any long periods of time. When it is apparent there will be no movement required then switch the engine off to reduce the amount of pollutant emissions released;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school, car sharing reduces the number of vehicles on the road and therefore the amount of emissions being released.

This can be promoted via travel plans through the workplace and within schools; and

- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel efficient cars are available and all have different levels of benefits by reducing the amount of emissions being released.

Real time and historical air quality data for Hertfordshire and Bedfordshire is presented at *www.airqualityhertsbeds.co.uk*, an index related legend is provided so users can follow the current air quality. Also there are a number of links providing further information including the legislation of air quality within the UK, diffusion tube data, previous LAQM reports and graphical representations of data across the region. Up to date diffusion tube data and news relating to air quality within the District can be found on the St Albans City and District website at *https://www.stalbans.gov.uk/environmentandwaste/pollution/air-pollution/*.

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1 Local Air Quality Management

This report provides an overview of air quality in St Albans City and District Council 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 St Albans City and District Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by St Albans City and District can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at *https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=254.* Alternatively, see Appendix D: Maps of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMAs.

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
St Albans AQMA No. 1	Declared 02/11/2004, and amended in 08/07/2009	NO_2 Annual Mean	St Albans	The area comprising of odd numbers 1-7 London Road, 1-11c Holywell Hill and even numbers 2-38 London Road, St Albans.	NO	61µg/m^3	59.3/m^3	Air Quality Action Plan for St Albans City and District Council	Dec-03	http://aqma.defra.gov.uk/action-plans/StADC%20AQAP%202003.pdf
		PM_{10} 24 Hour Mean				-	-			
St Albans AQMA No. 2	Declared 02/11/2004	NO_2 Annual Mean	St Albans	The area comprising of Beechtree Cottage, Hemel Hempstead Road, St Albans (adjacent to junction of M1 (J7) and M10).	YES	52µg/m^3	30.2µg/m^3	Air Quality Action Plan for St Albans City and District Council	Dec-03	http://aqma.defra.gov.uk/action-plans/StADC%20AQAP%202003.pdf
St Albans AQMA No. 7	Declared 21/09/2004	NO_2 Annual Mean	St Albans	An area encompassing a number of domestic properties in Frogmore on Radlett Road and Colney Street in the vicinity of the M25.	NO	44µg/m^3	34.4µg/m^3	Air Quality Action Plan for St Albans City and District Council	Dec-03	http://aqma.defra.gov.uk/action-plans/StADC%20AQAP%202003.pdf

☒ St Albans City and District Council confirm the information on UK-Air regarding their AQMAs is up to date
Note: Each reported monitored concentration is taken from the monitoring site situated within each AQMA

2.2 Progress and Impact of Measures to address Air Quality in St Albans City and District Council

DEFRA's appraisal of last year's ASR has not been completed at the time of writing due to late submission, therefore conclusions cannot be drawn at this time.

St Albans City and District Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans; key measures to be completed over the course of the next reporting year are:

- Continuation of the Idling Action St Alban's campaign that commenced in 2017 and has seen success in raising awareness of the issue since its implementation; and
- Continue to review and enhance monitoring locations around St. Albans following the July 2018 network diffusion tube overhaul

The principal barrier to implementation that St Albans City and District Council anticipates facing is predominately the delay upon the bus fleet upgrade measure. Funding was not awarded to retrofit approximately 90 buses as part of the Hertfordshire and Bedfordshire bid application, therefore an alternative measure may need to be considered by the Council.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, St Albans City and District Council anticipates that further additional measures will be required in subsequent years to achieve compliance and enable the revocation of AQMAs no. 1, 2 and 7. There were several approved planning applications in 2018 that may impact on several of the existing monitoring sites, however many are consisting of similar use renovations to existing buildings and so may not produce construction dust notable to next year's monitoring data. Permission has been granted for a rear extension and creation of five floors of new office space at The Maltings, located 100m from AQMA No. 1 boundary, the works are relatively minor but could impact PM10 concentrations in the short-term whilst construction activities take place. The granted applications however will be reviewed in the next year's ASR if any areas of concern are apparent, particularly if located within an AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
1	Investigate the status of on-street parking in the AQMA and determine if parking is contributing to traffic congestion at each junction. Investigate the provision of on-street loading facilities and co-ordinated timings of deliveries.	Traffic Management	Other	SADC/HCC	2017/18	2019	Parking restrictions in place	See note 1 at end of table	The Parking Team have been consulting on proposals to amend parking restrictions to improve traffic flows during 2019/20. Work on Belmont hill has been completed with a new residents parking scheme introduced in September 2019. Loading restrictions are in place during peak traffic hours near the shops on Holywell Hill. Further consultation to remove parking bays on Holywell Hill to assist with traffic movement is to be considered further but, this has not been fully agreed and is subject to consultation. This is on the Parking Services work programme for the next financial year.	2019/21	
2	SADC will assert comprehensive control over Part B/Part A2 processes for smaller scale industries under the environmental permitting (England & Wales) regulations 2007.	Environmental Permits	Other	SADC	NA	Annually	Number of inspection	See note 1 at end of table	All processes are risk rated annually and inspection frequency determined based upon risk. Programmed annual inspections to April 2019, are currently up to date. Processes operating without a permit are identified and appropriate enforcement action taken.	Continuous	
3	SADC will investigate complaints about nuisance (domestic and	Public Information	Other	SADC	NA	On receipt	Time taken to resolve complaints	See note 1 at end of table	Complaints are investigated as and when received.	Continuous	

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
	industrial emissions).										
4	Continue to monitor air quality within the district and as necessary review the suitability of monitoring locations in line with DEFRA guidance TG16	Policy Guidance and Development Control	Other	SADC	2018	Continuous - Reviewed annually	Data capture	N/A	The details of diffusion tubes and continuous monitoring are recorded on http://www.stalbans.gov.uk/environmentandwaste/pollution/air-pollution/	Continuous	
5	To increase bus patronage and encourage modal shift from the car to public transport.	Transport Planning and Infrastructure	Bus route improvements	SADC/HCC		Continuous - Reviewed annually	Service numbers	See note 1 at end of table	St Albans Bus Users Forum provides a platform for bus users, bus service operators and HCC Passenger Transport Team to discuss services and hear about service improvements. Intalink, using powers enabled by the Bus Services Act 2017, is developing the country's first Enhanced Partnership which provides a forum for closer working between HCC, LA's and Bus Operators. 5 objectives identified, Priority is bus services in traffic. Feasibility studies to identify improvements are being undertaken. HCC will hold beneficiaries of bus service improvements to higher standards and enforce them. Intention is to reverse spiral of decline where congestion leads to more expensive (to operate) bus services, lower patronage, greater congestion. The consultation documents are available at:	Ongoing - Bus Users Forum meets twice yearly.	Bus Services operated on a commercial basis

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
									www.hertfordshire.gov.uk/intalinkpartnership		
6	To investigate the feasibility of a Clean Air Zone	Promoting Low Emission Transport	Low Emission Zone (LEZ)	SADC / HCC	2018	NA	Vehicle counts	N/A	To investigate suitability and eligibility for funding for Clean Air Zones via DEFRA		St Albans are working on putting together a bid for the next grant released by DEFRA in 2020
7	Pilot the Station Travel Plan	Promoting Travel Alternatives	Other	HCC	2010		Usage figures	See note 1 at end of table	Station Travel Plan – the travel plan documents are very limited in scope and it will require a Station Travel Plan working group to be established to take ownership of the plan and move towards achieving the objectives. It has been decided to wait until the station development is completed before setting up the working group. Val Male HCC Rail Team.		
8	Community Rail Partnership (CRP) The Abbey Line	Promoting Travel Alternatives	Promote use of rail and inland waterways	SADC/HCC	2010	2011-2016	Usage figures	See note 1 at end of table	Community Rail Partnership (The Abbey Line) – the shuttle bus was found not to be commercially viable so has been withdrawn. The CRP is working closely with the new operator LNR to find ways to engage with communities along the line. This includes a campaign to recruit more station adopters and a primary school engagement programme.		
9	Investigate possibility of road signs to discourage through traffic.	Traffic Management	Other	HCC	2017/18	Continuous - Reviewed annually	Traffic counts	See note 1 at end of table	Variable Message Signs to be activated during city centre events to inform motorists of delays and parking options.	Ongoing	Messages restricted by DfT Traffic Signs

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
											Regulation s & General Direction
10	Investigate introduction of additional electric charging at council car parks within the District.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	SADC	2019/20	2021/22	Usage figures	See note 1 at end of table	Car Parking now back in house (Oct 19) We are currently looking at options to install EV charging points in all our Car Parks.	Continuous	
11	Consider requiring developers to install electric charging points in new developments under S106 agreements.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	SADC	2018/19	Following implementation of SLP and subject to discussions with Planning Dept. for inclusion in the detailed Local Plan.	Installation	See note 1 at end of table	We provided a response to the SLP consultation. Further discussions with the Planning Department regarding formulation of St Albans AQ Planning Policy Guidance to provide consistency of advice to developers across Herts & Beds are continuing. Electric Vehicle Charge Points to be installed in new Harpenden Sports and Leisure Centre	2019/20	
12	Consider an increase in car parking charges with the view to making bus travel a more attractive alternative.	Promoting Travel Alternatives	Other	SADC`	2018/19	2019/20	Car park volume figures	See note 1 at end of table	Annual review undertaken. Potential price increase in car park charging is under negotiation.	Continuous	
13	Continue the Trees Against Pollution project and explore green wall/hedging opportunities	Transport Planning and Infrastructure	Other	SADC	2017/18	2018/19	Number of trees planted: 600,000	See note 1 at end of table	Heartwood Forest – this is a new mixed native woodland on private land owned by the Woodland Trust to the north of Sandridge village. The planting of 600,000 trees (mainly as whips or forestry transplants) on approximately 370 hectares commenced in 2009 and was	Continuous	

St Albans City & District Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
									completed in 2017/18, planted entirely by volunteers. Woodland planting has been negotiated on BRE and Harperbury and we are in negotiation on the current Hanstead Wood Application. Andrew Branch/Alex Laurie are looking at additional sources of funding to increase tree planting.		
14	Cycling and walking Strategy	Promoting Travel Alternatives	Promotion of cycling	SADC / HCC	2016/17	2018/19	Usage figures	See note 1 at end of table	Cycling (2008) and Walking (2009) strategies in place. SADC Green Travel Plan sets out a range of actions to reduce emissions from staff travel. Staff cycle scheme relaunched in Spring 2019. Improvements and investments in cycling and walking infrastructure include; • Implementation of the St Albans Green Ring route project. • Revised St Albans Cycling map launched Spring 2019. • Construction of cycle and walking paths in Verulamium Park. • Provision of secure cycle parking racks within the city centre and at rail stations. • Upgrading and resurfacing of the Alban Way Leisure path. • Installation of Trixie mirrors at key junctions in the city centre • Installation of new section of shared footpath/cyclepath London Road, St Albans. • Early cycle release traffic signals at Hatfield Road, St Albans • Improved access to Nicky Line	Continuous	

St Albans City & District Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
									in Harpenden. • New link from Alban Way to St Albans City Rail station. • Provision of way finding monoliths within the city centre. A414 Corridor Strategy identifies package of walking/cycling improvements		
15	Taxi emissions.	Promoting Low Emission Transport	Taxi Licensing conditions	SADC	2017/18	2018/19	Certificate of Compliance data	See note 1 at end of table	Emissions controlled through Certificate of Compliance at garage check. The frequency of checks is dependent upon the age of the vehicles; 1 – 5 years old; annually 5 – 7 years old; every 6 months Over 7 years old; every 4 months Vehicle Licence Conditions amended to include the following; Any taxi driver can licence a fully electric vehicle as long as it complies with the hackney carriage and private hire vehicle licence conditions. This type of vehicle attracts a discount of £60 The Licensing and Regulatory Committee at their meeting in January 2019 made a decision not to form a Task and Finish group to consider the recommendations of the Electric Taxi Feasibility Study, and the matter be removed from the work programme. The Committee heard that the matter was part of a wider piece of work being undertaken by the Community, Environment and Sport Scrutiny Committee on Electric Vehicle Usage and	Continuous	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
									Infrastructure Strategy. The Chair was therefore of the opinion that to avoid work duplication and premature conclusions, the Committee should not form a task and finish group at this time and members of the Committee concurred with this.		
16	Campaign to raise awareness of air quality and the impact on air quality, of idling engines (when parked)	Public Information	Via the Internet	SADC	2016/17	2019/20	Media coverage	See note 1 at end of table	The Idling Action St Albans campaign has been running since 2017 to raise awareness of the issue and urge car, van, lorry, bus and taxi drivers to switch off their engine when parked or stationary for more than a minute. It includes social media activities, letters, school engagement activities, market stalls, Idling Action St Albans events and information leaflets issued with resident car parking permits. The following numbers were spoken to as part of the campaign: School engagement total 1,700; Community engagement 696 In 2019 we are looking at the possibility of installing street signage to encourage drivers outside schools to turn off their engines when stationary.	2019	
17	Bus fleet/ lower pollutant emissions	Promoting Low Emission Transport	Other	SADC/HCC		N/A	Number of link improvements	See note 1 at end of table	The A414 Corridor Strategy was consulted on earlier this year, and supports the development of an east west mass rapid transit system along the A414 corridor to provide an alternative for private car journeys. HCC will work with District partners on developing these proposals and establish the type of MRT and its routing.	Ongoing	

St Albans City & District Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated/ Actual Completion Date	Comment/ Barriers to implement ation
									It provides opportunities for improving links by public transport from St Albans to Watford, Hemel and towards Welwyn, Hatfield and Hertford and providing alternatives to individual car use. The development of such a system could support improvements in AQ.		
18	Freight Management Plan	Freight and Delivery Management	Other	SADC	2014/17	2019/20	Numbers of vehicles and routes taken	TBC	Project is on hold pending possibility of feeding into larger scale project (feasibility of CAZ) subject to funding stream being available. St Albans is considering submitting a proposal for grant funding when released by DEFRA in 2020, subject to eligibility criteria.	Ongoing	
NOTE 1 - It is not possible to specifically quantify the impact of small scale projects that the Council are working on with partners. However individual & cumulative AQ measures which reduce emissions are beneficial to improving pollutant levels both AQMA's and the District generally.											

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

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

St Albans City and District Council are working to reduce emissions of air pollutants across the District, many of the measures used to reduce emissions of NO_2 also impact the emissions of PM_{10} and $PM_{2.5}$ due to the pollutants originating from the same sources. The main source of local air pollution concentrations within St Albans is from vehicle emissions, both NO_2 and particulates are released from vehicular sources, therefore measures focussing on changing the number of vehicles on the roads, and the type of vehicles being used will help reduce emissions of both pollutants.

The Public Health Outcomes Framework indicator[4] for the fraction of deaths attributable to $PM_{2.5}$ in St Albans is 5.8% (current available report ref. 2017), which is slightly above the regional average of 5.5% and the national average of 5.1%.

There is currently no ongoing monitoring of $PM_{2.5}$ within the District, and no specific measures in place to address $PM_{2.5}$ concentrations, as the air quality across the District is considered good. Modelled concentrations of $PM_{2.5}$ in 2018 using the Defra 2017 Background Maps tool identify that grid reference x509500, y207500 contains the highest $PM_{2.5}$ concentration across the district at a predicted 11.7µg/m^3. This area is located 5.3km west of St Albans close to junction 8 of the A414 joining onto the M1.

[4] https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000006/ati/101/are/E07000143/iid/30101/age/230/sex/4

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

There is currently no continuous monitoring undertaken by St Albans City and District Council.

3.1.2 Non-Automatic Monitoring Sites

St Albans City and District Council undertook non-automatic (passive) monitoring of NO_2 at 43 single tube locations during 2018, six of these tubes are located within an AQMA. In July 2018, eight of the diffusion tube sites were relocated to allow for more relevant exposure and enhanced AQMA monitoring, including two that were moved to inside an AQMA (SA123b, SA143b), and one that was relocated to 12m from an AQMA boundary (SA137b). Redeployment of diffusion tubes led to sixteen new tube locations, one that is located within an AQMA (SA160) and one that is within 12m of an AQMA boundary (SA148). Currently all other monitoring locations are outside of the existing AQMAs. Eleven diffusion tubes were removed due to consistently low readings. Table A.2 in Appendix A presents details of the current 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)

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

Table C.2 provides details of the St. Albans’ monitoring sites requiring annualisation in 2018. There were 47 sites reporting less than 75% data capture. The relocated site

SA137b and new site SA150 only reported 2 months' data and new site SA161 reported one months' data. Due to the low data capture at these sites, annualisation could not be carried out accurately and therefore proved an insufficient data set for the purposes of an annual mean trend analysis. They are anticipated to be presented in next year's ASR.

Following the application of annualisation and bias adjustment to the raw data, six exceedances of the AQS annual mean objective were identified in total for NO_2 at sites SA136, SA138, SA143b, SA148, SA157 and SA160. Sites SA137a, SA144, SA151 and SA156 were also found to be within 10% of reaching the exceedance threshold following annualisation and bias adjustment. The closest receptor to Site SA138, SA143b, SA148 and SA160 are located on the second floor of the building façade, as the distance calculator does not account for height, the distance corrected concentration at these locations should be treated with caution. All sites have been distance corrected in Table C.3.

Following distance correction and bias adjustment, Sites SA138, SA143b, SA148, SA157 and SA160 are still in exceedance of the AQS annual mean objective. Sites SA138, SA143b, SA148 and SA160 are within or close to AQMA No.1. However, the closest receptor to all 4 sites is located on the second floor of the building façade, therefore the result represents worst-case exposure. Furthermore, sites SA143b, SA148, SA157 and SA160 only reported 50% data capture for the year as they were newly installed diffusion tubes. Site SA157 is not within an AQMA and was also a new location, therefore only had 50% data capture. Further trend analysis over the following years is required to ascertain whether there is a problem at these locations.

Table A.2 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 40µg/m^3. The overall trend in NO_2 concentrations has been declining where peak concentrations were recorded in 2014. When compared with 2017, approximately half of the sites have recorded increased NO_2 concentrations and half have recorded decreased NO_2 concentrations. Monitoring site SA138 has increased from 2017, remaining above the AQO at 45.2µg/m^3 in 2018. The kerbside site SA144 was above the exceedance limit in 2017 and has fallen just below the AQO in 2018 at 39.7µg/m^3.

Defra guidance states that exceedances of the NO_2 1-hour objective are unlikely to occur where the annual mean concentration is below 60µg/m^3. All diffusion tube 2018

annual mean NO_2 concentrations recorded are below 60µg/m^3 therefore it can be considered as per Defra guidance that there were no exceedances of the AQS 1-hour objective for NO_2.

Appendix A: Monitoring Results

Table A.1 – 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)
SA101	Museum Hatfield Road St Albans SA001	Roadside	515105	207476	NO2	NO	9.3	1.6	NO	2.7
SA102	Folly Lane St Albans SA041	Kerbside	514160	207694	NO2	NO	20.0	2.0	NO	2.3
SA104	Ben Austin Redbourn SA005	Roadside	509002	211731	NO2	NO	12.5	6.0	NO	2.4
SA105	St Agnells Lybury Lane Redbourn SA023	Rural	509012	213678	NO2	NO	0.0	0.5	NO	2.4
SA107a	Redbourn JMI Long Cutt Redbourn SA011	Urban Background	510194	212526	NO2	NO	0.0	28.0	NO	2.2
SA107b	Redbourn JMI Long Cutt Redbourn SA011 (RELOCATED July 2018)	Urban Background	510138	212525	NO2	NO	11.3	2.2	NO	2.6
SA109a	High Street Harpenden SA009	Kerbside	513345	214409	NO2	NO	22.0	3.0	NO	2.4
SA109b	High Street Harpenden SA009 (RELOCATED July 2018)	Kerbside	513427	214308	NO2	NO	6.3	0.1	NO	2.6

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)
SA110a	Crabtree JMI Crabtree Lane Harpenden SA0	Kerbside	514498	214382	NO2	NO	21.0	2.0	NO	2.7
SA110b	Crabtree JMI Crabtree Lane Harpenden SA0 (RELOCATED July 2018)	Kerbside	514438	214353	NO2	NO	7.5	1.5	NO	2.6
SA111	Butterfield Road Wheathampstead SA014	Kerbside	517604	213349	NO2	NO	15.0	1.0	NO	2.4
SA112a	High Street Wheathampstead SA013	Kerbside	517732	214117	NO2	NO	18.0	3.0	NO	2.7
SA112b	High Street Wheathampstead SA013 (RELOCATED July 2018)	Kerbside	517727	214041	NO2	NO	16.3	1.7	NO	2.6
SA114	Fleetville 1 Royal Road St Albans SA020	Urban Background	516549	207391	NO2	NO	51.3	12.5	NO	2.5
SA117	Five Acres London Colney Roundabout SA01	Kerbside	517712	204782	NO2	NO	11.9	1.4	NO	2.4
SA118	Ridgeview Hostel Barnet Rd London Colney	Urban Background	518645	203435	NO2	NO	0.0	40.0	NO	2.5
SA119	Bowmans JMI Telford Rd London Colney SA0	Kerbside	517482	203881	NO2	NO	24.0	1.0	NO	2.4

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)
SA120	Sleapcross Gardens Smallford SA037	Kerbside	520053	206618	NO2	NO	15.6	1.7	NO	2.3
SA121	Mount Drive Park Street SA033	Kerbside	514654	204546	NO2	NO	37.5	1.4	NO	2.5
SA122	Sycamore Drive Park Street SA032	Kerbside	514899	203857	NO2	NO	12.0	2.0	NO	2.5
SA123a	Radlett Road Park Street SA031	Kerbside	515295	202765	NO2	NO	4.0	0.3	NO	2.5
SA123b	Radlett Road Park Street SA031 (RELOCATED July 2018)	Kerbside	515311	202730	NO2	YES	4.4	0.3	NO	2.4
SA124	Smug Oak Lane Bricket Wood SA030	Kerbside	515383	202528	NO2	NO	4.5	1.3	NO	2.5
SA125	Lye Lane Bricket Wood SA021	Kerbside	513308	202655	NO2	NO	15.6	0.4	NO	2.4
SA126	Five Acres Avenue Bricket Wood SA027	Kerbside	512689	202700	NO2	NO	5.5	2.0	NO	2.6
SA127	Oakwood Road Bricket Wood SA026	Kerbside	512570	202716	NO2	NO	4.4	1.4	NO	2.4
SA128	Waterdale Old Watford Rd Bricket Wd A405	Roadside	512004	202105	NO2	NO	0.0	25.0	NO	2.4
SA129	Ashridge Drive Bricket Wood SA012	Kerbside	512880	202238	NO2	NO	9.0	1.0	NO	2.4

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)
SA130	Tippendell Lane Chiswell Green SA016	Kerbside	513569	204537	NO2	NO	13.5	2.5	NO	2.7
SA132	Westminster Lodge Holywell Hill St Alban	Urban Background	514317	206453	NO2	NO	0.0	1.0	NO	2.3
SA133	Belmont Hill St Albans SA042	Kerbside	514606	206801	NO2	NO	13.8	2.5	NO	2.4
SA134	Albert Street St Albans SA043	Kerbside	514648	206919	NO2	NO	5.0	2.2	NO	2.6
SA135a	Watsons Walk St Albans SA040	Kerbside	515096	206921	NO2	NO	18.0	2.0	NO	2.7
SA135b	Watsons Walk St Albans SA040 (RELOCATED July 2018)	Kerbside	515060	206866	NO2	NO	3.8	1.2	NO	2.5
SA136	St Peters Street St Albans SA003	Kerbside	514883	207422	NO2	NO	8.6	1.1	NO	2.3
SA137a	High Street St Albans SA039	Kerbside	514664	207125	NO2	NO	5.0	1.0	NO	2.1
SA137b	High Street St Albans SA039 (RELOCATED July 2018)	Kerbside	514684	207105	NO2	NO	4.3	1.6	NO	2.5
SA138	Peahen PH Holywell Hill St Albans SA015	Kerbside	514701	207082	NO2	YES	2.5	2.6	NO	2.6
SA139	Civic Centre St Peters St St Albans SA03	Urban Background	514921	207391	NO2	NO	73.1	2.4	NO	>3.0
SA140	Lattimore Road St Albans	Kerbside	515185	207070	NO2	NO	6.3	2.5	NO	2.5

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)
SA141	Town Hall St Albans	Urban Background	514722	207226	NO2	NO	1.9	1.5	NO	2.6
SA142	Beech Tree Cottage St Albans (AL3 6AR)	Roadside	510754	206091	NO2	YES	20.2	0.0	NO	2.3
SA143a	The Maltings/London Road St Albans	Kerbside	514802	207074	NO2	NO	0.0	4.0	NO	2.4
SA143b	London Road West St Albans (RELOCATED July 2018)	Kerbside	514752	207094	NO2	YES	0.6	2.8	NO	2.6
SA144	Forester House 1 St Peters Street St Albans	Kerbside	514833	207347	NO2	NO	9.3	1.2	NO	2.6
SA145	Moor Mill Lane Colney Street	Roadside	515257	202638	NO2	YES	12.5	1.6	NO	2.3
SA146	Forrester House 2 St Peters Street St Albans (NEW July 2018)	Urban Background	514856	207353	NO2	NO	5.6	21.9	NO	2.6
SA147	Shops St Peters Street St Albans (NEW July 2018)	Urban Background	514818	207357	NO2	NO	47.5	15.6	NO	2.5
SA148	Chequer Street St Albans (NEW July 2018)	Kerbside	514705	207119	NO2	NO	3.1	0.7	NO	2.4
SA149	London Road 3 St Albans (NEW July 2018)	Roadside	515067	206946	NO2	NO	5.6	2.5	NO	2.6

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)
SA150	Hatfield/Royal Road St Albans (NEW July 2018)	Kerbside	516590	207276	NO2	NO	7.5	1.8	NO	2.3
SA151	Thamesdale London Colney (NEW July 2018)	Roadside	518782	203507	NO2	NO	4.4	1.5	NO	2.3
SA152	Shenley Lane/Kings Road London Colney (NEW July 2018)	Roadside	517091	204114	NO2	NO	6.9	2.4	NO	2.4
SA153	Watling Street Park Street (NEW July 2018)	Kerbside	515275	202794	NO2	NO	12.0	1.4	NO	2.4
SA154	Mount Pleasant Lane Bricket Wood (NEW July 2018)	Roadside	512776	202050	NO2	NO	21.9	2.0	NO	2.5
SA155	Westminster Court St Albans (NEW July 2018)	Kerbside	514346	206329	NO2	NO	27.5	1.8	NO	2.4
SA156	Folly Lane East St Albans (NEW July 2018)	Roadside	514602	207674	NO2	NO	2.5	1.6	NO	2.4
SA157	Catherine Street St Albans (NEW July 2018)	Kerbside	514840	207613	NO2	NO	1.3	0.5	NO	2.4
SA158	High Street Redbourn (NEW July 2018)	Roadside	510818	212167	NO2	NO	2.5	1.7	NO	2.6
SA159	Marford Road Wheathampstead (NEW July 2018)	Roadside	517727	213901	NO2	NO	2.5	2.0	NO	2.6

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)
SA160	Hollywell Hill St Albans (NEW July 2018)	Roadside	514682	207060	NO2	YES	2.5	2.5	NO	2.4
SA161	London Road East St Albans (NEW July 2018)	Kerbside	514787	207069	NO2	NO	1.9	0.5	NO	2.5

Notes:

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

(2) N/A if not applicable.

Within 15m of an AQMA boundary

Table A.2 – 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 (µg/m^3) [3]				
					2014	2015	2016	2017	2018
SA101	Roadside	Diffusion Tube	83	83	33.2	27.9	35.6	28.5	28.3
SA102	Kerbside	Diffusion Tube	67	33	29.4	24.8	26.8	26.5	21.1
SA104	Roadside	Diffusion Tube	67	33	28.0	20.3	23.4	22.2	19.9
SA105	Rural	Diffusion Tube	67	33	24.6	17.4	20.8	15.6	18.8
SA107a	Urban Background	Diffusion Tube	67	33	22.6	20.3	24.1	20.7	18.1
SA107b	Urban Background	Diffusion Tube	100	50					20.9
SA109a	Kerbside	Diffusion Tube	67	33	29.3	30.9	33.4	31.7	28.1
SA109b	Kerbside	Diffusion Tube	67	33					25.0
SA110a	Kerbside	Diffusion Tube	67	33	19.7	15.7	21.4	17.7	17.3
SA110b	Kerbside	Diffusion Tube	83	42					21.0
SA111	Kerbside	Diffusion Tube	67	33	22.0	16.8	19.7	19.8	21.2
SA112a	Kerbside	Diffusion Tube	67	33	26.3	20.4	24.6	21.4	21.3
SA112b	Kerbside	Diffusion Tube	100	50					26.7
SA114	Urban Background	Diffusion Tube	67	67	26.7	22.3	27.2	26.4	26.3

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
SA117	Kerbside	Diffusion Tube	83	83				23.0	25.5
SA118	Urban Background	Diffusion Tube	67	33	26.8	22.6	27.8	25.7	23.7
SA119	Kerbside	Diffusion Tube	67	33	29.6	22.1	24.9	24.1	20.8
SA120	Kerbside	Diffusion Tube	83	83	37.4	31.5	30.3	30.3	29.3
SA121	Kerbside	Diffusion Tube	83	83	**47.0**	35.3	36.0	35.0	31.6
SA122	Kerbside	Diffusion Tube	67	33	29.9	26.9	29.4	27.8	23.8
SA123a	Kerbside	Diffusion Tube	67	33	38.4	32.0	37.6	35.1	30.4
SA123b	Kerbside	Diffusion Tube	100	50					34.4
SA124	Kerbside	Diffusion Tube	83	83	37.4	36.2	36.4	33.7	34.4
SA125	Kerbside	Diffusion Tube	67	67	28.2	23.9	29.1	26.2	25.8
SA126	Kerbside	Diffusion Tube	67	33	25.7	22.6	27.2	23.1	21.5
SA127	Kerbside	Diffusion Tube	83	83	30.0	26.2	31.4	25.9	26.6
SA128	Roadside	Diffusion Tube	83	83	38.8	31.0	35.9	34.3	34.7
SA129	Kerbside	Diffusion Tube	67	33	28.3	23.5	26.2	25.1	21.4
SA130	Kerbside	Diffusion Tube	67	33	34.4	23.6	27.4	26.5	24.7

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
SA132	Urban Background	Diffusion Tube	67	33	22.7	21.5	25.6	20.1	21.5
SA133	Kerbside	Diffusion Tube	67	67	30.9	33.9	37.9	34.1	31.8
SA134	Kerbside	Diffusion Tube	83	83	**42.3**	30.9	35.7	32.8	34.8
SA135a	Kerbside	Diffusion Tube	67	33	**43.2**	30.9	**40.0**	35.9	33.9
SA135b	Kerbside	Diffusion Tube	100	50					34.3
SA136	Kerbside	Diffusion Tube	83	83	**60.0**	38.8	**51.0**	**52.5**	**48.5**
SA137a	Kerbside	Diffusion Tube	67	33	**47.9**	**40.2**	**44.2**	**40.2**	37.7
SA137b	Kerbside	Diffusion Tube	33	17					**N/A**
SA138	Kerbside	Diffusion Tube	83	83	**55.5**	**42.4**	**46.5**	**41.2**	**45.2**
SA139	Urban Background	Diffusion Tube	83	83	26.0	28.5	25.1	24.4	22.4
SA140	Kerbside	Diffusion Tube	83	83	30.0	26.8	28.9	26.5	27.3
SA141	Urban Background	Diffusion Tube	42	42					26.8
SA142	Roadside	Diffusion Tube	83	83				36.0	30.2
SA143a	Kerbside	Diffusion Tube	67	33				36.8	30.7
SA143b	Kerbside	Diffusion Tube	100	50					**42.4**

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
SA144	Kerbside	Diffusion Tube	75	75				**46.5**	39.7
SA145	Roadside	Diffusion Tube	83	83				37.4	34.2
SA146	Urban Background	Diffusion Tube	100	50					30.6
SA147	Urban Background	Diffusion Tube	100	50					35.2
SA148	Kerbside	Diffusion Tube	100	50					**52.7**
SA149	Roadside	Diffusion Tube	100	50					32.3
SA150	Kerbside	Diffusion Tube	33	17					**N/A**
SA151	Roadside	Diffusion Tube	100	50					36.8
SA152	Roadside	Diffusion Tube	100	50					29.1
SA153	Kerbside	Diffusion Tube	100	50					27.6
SA154	Roadside	Diffusion Tube	83	42					29.3
SA155	Kerbside	Diffusion Tube	100	50					31.3
SA156	Roadside	Diffusion Tube	100	50					37.1
SA157	Kerbside	Diffusion Tube	83	42					**46.2**
SA158	Roadside	Diffusion Tube	83	42					25.4

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
SA159	Roadside	Diffusion Tube	100	50					29.7
SA160	Roadside	Diffusion Tube	100	50					**59.3**
SA161	Kerbside	Diffusion Tube	17	8					**N/A**

☒ **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**.

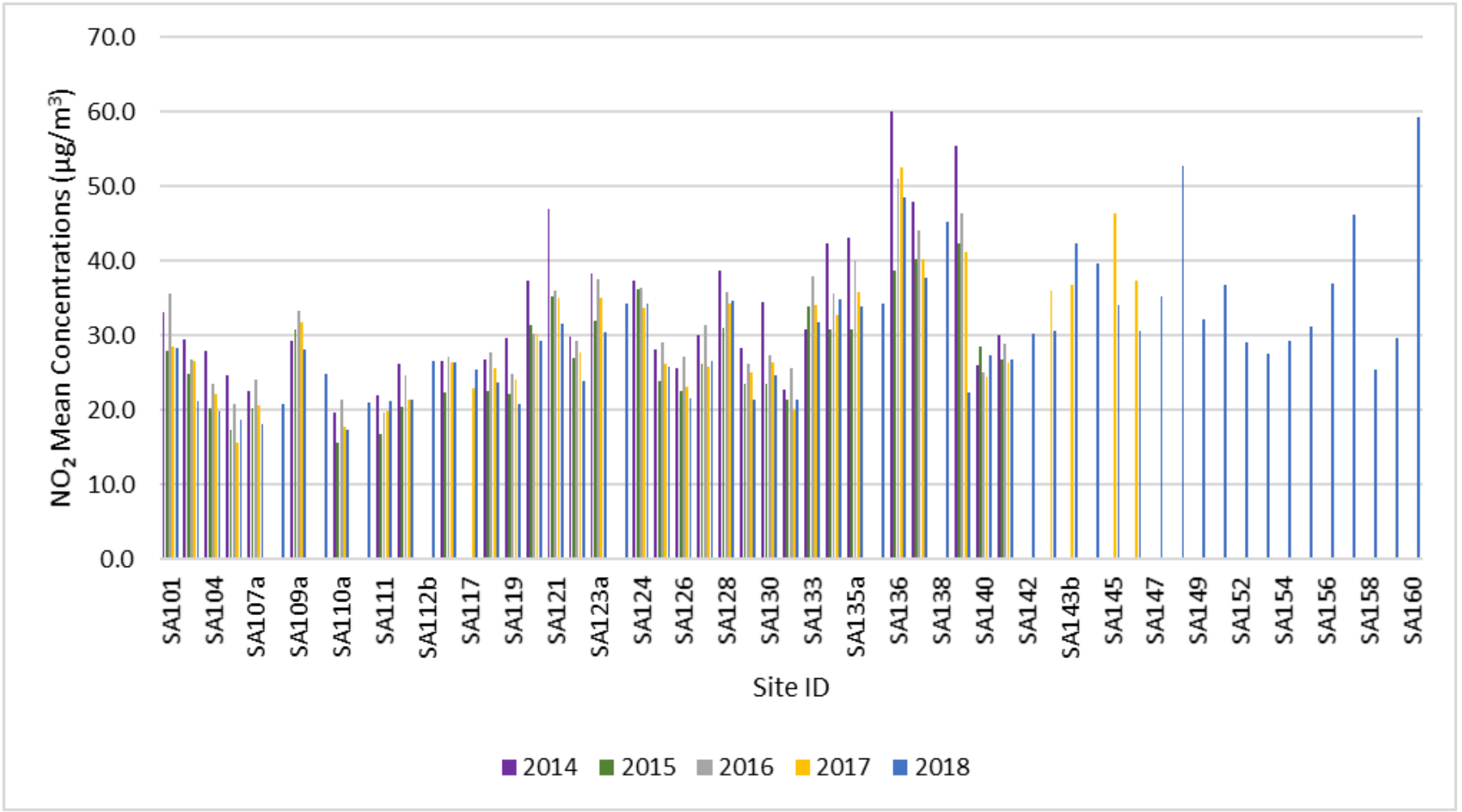
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(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



Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – 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 (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SA101	29.3	32.7	35.8	31.8			31.1	27.5	20.5	30.9	33.6	34.7	30.8	28.3	
SA102	28.8	23.3	30.8	24.0			x	x	x	x	x	x	26.7	21.1	
SA104	30.1	18.0	29.9	22.3			x	x	x	x	x	x	25.1	19.9	
SA105	20.7	23.9	28.3	21.9			x	x	x	x	x	x	23.7	18.8	
SA107a	23.7	23.6	25.5	18.6			x	x	x	x	x	x	22.9	18.1	
SA107b	x	x	x	x	x	x	18.3	17.2	19.2	22.9	28.4	24.6	21.8	20.9	
SA109a	33.6	32.9	40.8	34.5			x	x	x	x	x	x	35.5	28.1	
SA109b	x	x	x	x	x	x	24.5	21.5	24.9			25.1	24.0	25.0	
SA110a	24.9	22.8	23.3	16.3			x	x	x	x	x	x	21.9	17.3	
SA110b	x	x	x	x	x	x		15.3	18.8	22.3	25.0	31.4	22.6	21.0	
SA111	23.7	38.2	25.3	19.8			x	x	x	x	x	x	26.8	21.2	
SA112a	27.6	26.4	27.6	26.1			x	x	x	x	x	x	26.9	21.3	
SA112b	x	x	x	x	x	x	25.3	22.3	28.0	25.8	35.7	29.5	27.8	26.7	
SA114	35.7	32.9	32.9	26.7			21.3	20.0			38.4	34.2	30.3	26.3	
SA117	27.5	30.4	33.7	26.9			24.2	21.9	24.1	28.1	32.5	27.8	27.7	25.5	
SA118	30.7	29.5	32.9	26.6			x	x	x	x	x	x	29.9	23.7	

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 (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SA119	27.0	25.7	27.9	24.5			x	x	x	x	x	x	26.3	20.8	
SA120	32.1	31.0	33.6	33.0			33.9	26.6	29.4	27.6	38.2	32.5	31.8	29.3	
SA121	37.0	32.8	38.3	30.8			33.8	30.4	39.8	29.5	34.9	36.0	34.3	31.6	
SA122	28.4	27.5	35.6	28.9			x	x	x	x	x	x	30.1	23.8	
SA123a	42.1	38.4	43.2	29.7			x	x	x	x	x	x	38.3	30.4	
SA123b	x	x	x	x	x	x	31.5	27.9	41.6	31.5	44.5	37.9	35.8	34.4	
SA124	36.0	38.4	45.8	41.7			37.0	31.6	34.5	34.8	36.2	37.8	37.4	34.4	
SA125	30.3	34.9	37.2	28.9			28.7	22.1			24.7	30.9	29.7	25.8	
SA126	26.9	28.0	29.7	24.2			x	x	x	x	x	x	27.2	21.5	
SA127	32.4	33.6	32.3	27.3			27.9	22.8	26.1	25.9	31.2	29.7	28.9	26.6	
SA128	38.4	45.1	42.7	36.4			33.8	32.4	37.0	36.8	36.5	37.9	37.7	34.7	
SA129	28.5	25.7	30.2	23.8			x	x	x	x	x	x	27.1	21.4	
SA130	35.6	27.7	33.8	27.9			x	x	x	x	x	x	31.2	24.7	
SA132	26.5	29.0	30.9	22.2			x	x	x	x	x	x	27.2	21.5	
SA133	39.6	25.7	47.7	40.1			39.5			35.9	42.5	35.2	38.3	31.8	
SA134	39.3	40.9	44.6	39.3			38.7	27.8	30.2	37.0	43.5	37.3	37.9	34.8	
SA135a	43.1	43.0	44.9	40.0			x	x	x	x	x	x	42.7	33.9	
SA135b	x	x	x	x	x	x	35.0	30.6	31.5	35.3	41.6	40.5	35.8	34.3	
SA136	49.9	59.5	64.3	55.3			54.3	43.5	42.1	50.2	60.8	47.2	52.7	**48.5**	34.9*
SA137a	45.4	44.8	56.8	43.6			x	x	x	x	x	x	47.6	37.7	31.4*

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 (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SA137b	x	x	x	x	x	x			46.2			54.1	50.2	N/A	
SA138	50.2	49.7	64.6	53.7			52.2	39.6	39.6	45.9	49.8	46.1	49.1	**45.2**	**43.4***
SA139	26.3	25.5	27.8	22.8			21.9	19.9	22.3	22.5	26.5	27.6	24.3	22.4	
SA140	33.9	32.1	35.7	30.6			22.0	21.5	24.1	29.5	35.2	32.0	29.7	27.3	
SA141	33.6	33.6	36.8	31.7					24.5				32.1	26.8	
SA142	34.7	32.5	37.9	36.2			32.9	27.5	28.4	34.0	36.7	27.1	32.8	30.2	
SA143a	42.7	38.0	41.2	33.2			x	x	x	x	x	x	38.8	30.7	
SA143b	x	x	x	x	x	x	47.0	39.3	40.7	45.7	42.5	49.4	44.1	**42.4**	**41.1***
SA144	41.5	43.0	53.5	44.3			43.0	39.8	38.5	41.0	43.7		43.2	39.7	29.9
SA145	47.7	34.4	44.0	39.4			32.2	29.8	33.6	30.6	42.5	37.5	37.2	34.2	
SA146	x	x	x	x	x	x	29.5	27.5	30.0	34.8	32.0	37.6	31.9	30.6	
SA147	x	x	x	x	x	x	37.5	34.5	36.8	36.7	34.1	40.1	36.6	35.2	
SA148	x	x	x	x	x	x	64.9	53.8	54.8	47.5	51.2	57.1	54.9	**52.7**	**41.8***
SA149	x	x	x	x	x	x	31.8	24.1	28.0	37.0	40.7	39.9	33.6	32.3	
SA150	x	x	x	x	x	x	34.8					33.1	33.9	N/A	
SA151	x	x	x	x	x	x	34.5	36.8	33.7	39.7	42.6	42.8	38.3	36.8	32.3
SA152	x	x	x	x	x	x	27.8	25.6	29.2	28.6	35.6	35.3	30.3	29.1	
SA153	x	x	x	x	x	x	27.6	25.3	25.7	24.9	35.5	33.5	28.7	27.6	
SA154	x	x	x	x	x	x	30.0	25.1		29.5	34.8	36.2	31.1	29.3	
SA155	x	x	x	x	x	x	32.0	29.6	35.8	24.2	41.5	32.2	32.6	31.3	

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SA156	x	x	x	x	x	x	34.2	35.0	47.3	33.5	40.2	41.5	38.6	37.1	33.1
SA157	x	x	x	x	x	x	50.3	41.4		51.2	55.0	47.5	49.1	**46.2**	**40.0**
SA158	x	x	x	x	x	x	22.9	21.4	23.6	26.5		31.8	25.3	25.4	
SA159	x	x	x	x	x	x	24.6	26.1	31.8	30.2	37.5	35.2	30.9	29.7	
SA160	x	x	x	x	x	x	73.7	61.3	59.3	56.0	60.3	59.9	61.8	**59.3**	**52.2**
SA161	x	x	x	x	x	x						51.8	51.8	N/A	

☒ **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.**

Data not available – Diffusion tubes not changed between May and June therefore data excluded from analysis

x – Site closed

* Closest relevant exposure located on the second floor of the building façade, result should be treated with caution

(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

Diffusion Tube Bias Adjustment Factors

It is stated within the LAQM section of https://uk-air.defra.gov.uk/ that diffusion tubes are affected by several sources of interference which can cause substantial under or overestimation (bias) compared to a chemiluminescent analyser (the reference method). This can prove to be a problem in any situation where diffusion tube results are compared with the AQS objectives. As a result, local authorities are required to quantify the bias of their diffusion tube measurements and apply an appropriate bias adjustment factor if required.

The bias adjustment factor, which is an estimate of the difference between diffusion tube concentration and continuous monitoring, the latter assumed to be a more accurate method of monitoring has been used to factor the results. LAQM.TG(16) provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

With regard to the application of a bias adjustment factor for diffusion tubes, the Defra Technical Guidance LAQM.TG(16) and the LAQM Helpdesk[5] recommend the use of a local bias adjustment factor where available and relevant to diffusion tube sites.

St Albans City and District Council does not operate any continuous monitors within the District and therefore a co-location study is not available to derive a local bias factor, thus the national bias adjustment factor spreadsheet[6] has been used.

Diffusion tube data for St Albans City and District Council is supplied and analysed by Gradko International Ltd, the tubes were prepared using the 20% TEA in water preparation method. The 2018 national bias adjustment factor for Gradko 20% TEA in

[5] Laqm.defra.gov.uk
[6] National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 09/19 published in September 2019

water is 0.92 (based on 40 studies, version 09/19) as derived from the national bias adjustment factor spreadsheet.

The bias adjustment factors used for 2014 to 2018 are shown in Table C.1.

Table C.1 – Bias Adjustment Factors

Year of Data	Bias Adjustment Factor
2014	0.92 – National factor
2015	0.91 – National factor
2016	0.92 – National factor
2017	0.87 – National Factor
2018	0.92 – National Factor

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Gradko International Limited utilising the 20% Triethanolamine (TEA) in acetone preparation method.

Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The laboratory follows the procedures set out in the Harmonisation Practical Guidance and participates in the AIR proficiency-testing (AIR-PT) scheme. Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in the AIR-PT is also assessed by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Inter-Comparison Exercise.

In the 2018 AIR-PT results, AIR-PT AR0024 (January to February 2018), AIR-PT AR025 (April to May 2018), AR027 (July to August 2018) and AR028 (September to October 2018), Gradko scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Short-term to Long-term Data Adjustment

For the 2018 diffusion tubes, annualisation was required at 47 sites due to data capture being below 75%. Annualisation has been completed in line with Defra Technical Guidance LAQM.TG(16) Box 7.10 and full working details are provided in Table C.2 .

A number of diffusion tube relocations were carried out in July 2018, resulting in the requirement for annualisation. In completing the annualisation procedure, data has been taken from three automatic monitoring stations that are within 50 miles of the sites to be annualised: Haringey Priory Park South, London Bloomsbury and London N. Kensington. These sites form part of the national AURN network and are background monitoring sites. As such, they are not influenced by local sources of air pollution, such as road traffic emissions at roadside monitoring sites. The details of the annualisation have been provided in Table C.2 . Monitoring sites SA137b, SA150 and SA161 reported less than three months of data and were therefore deemed insufficient for the annual mean reporting.

Table C.2 – Annualisation data, St. Albans City and District Council

Site ID	Unadjusted Diffusion Tube Mean (µg/m^3)	AF London Haringey Priory Park South	AF London Bloomsbury	AF London N. Kensington	Average AF	Annualised & Bias Adjusted (0.92) Concentration (µg/m^3)
SA102	26.7	0.843	0.856	0.883	0.861	21.1
SA104	25.1	0.843	0.856	0.883	0.861	19.9
SA105	23.7	0.843	0.856	0.883	0.861	18.8
SA107a	22.9	0.843	0.856	0.883	0.861	18.1
SA107b	21.8	1.100	1.017	1.015	1.044	20.9
SA109a	35.5	0.843	0.856	0.883	0.861	28.1
SA109b	24.0	1.172	1.109	1.110	1.130	25.0
SA110a	21.9	0.843	0.856	0.883	0.861	17.3
SA110b	22.6	1.075	0.981	0.973	1.010	21.0
SA111	26.8	0.843	0.856	0.883	0.861	21.2
SA112a	26.9	0.843	0.856	0.883	0.861	21.3
SA112b	27.8	1.100	1.017	1.015	1.044	26.7
SA114	30.3	0.966	0.923	0.949	0.946	26.3
SA118	29.9	0.843	0.856	0.883	0.861	23.7
SA119	26.3	0.843	0.856	0.883	0.861	20.8
SA122	30.1	0.843	0.856	0.883	0.861	23.8
SA123a	38.3	0.843	0.856	0.883	0.861	30.4
SA123b	35.8	1.100	1.017	1.015	1.044	34.4

Site ID	Unadjusted Diffusion Tube Mean (µg/m^3)	AF London Haringey Priory Park South	AF London Bloomsbury	AF London N. Kensington	Average AF	Annualised & Bias Adjusted (0.92) Concentration (µg/m^3)
SA125	29.7	0.966	0.923	0.949	0.946	25.8
SA126	27.2	0.843	0.856	0.883	0.861	21.5
SA129	27.1	0.843	0.856	0.883	0.861	21.4
SA130	31.2	0.843	0.856	0.883	0.861	24.7
SA132	27.2	0.843	0.856	0.883	0.861	21.5
SA133	38.3	0.919	0.887	0.906	0.904	31.8
SA135a	42.7	0.843	0.856	0.883	0.861	33.9
SA135b	35.8	1.100	1.017	1.015	1.044	34.3
SA137a	47.6	0.843	0.856	0.883	0.861	37.7
SA137b	50.17 (2 month's data)	Insufficient Data	Insufficient Data	Insufficient Data	N/A	N/A
SA141	32.1	0.897	0.903	0.922	0.907	26.8
SA143a	38.8	0.843	0.856	0.883	0.861	30.7
SA143b	44.1	1.100	1.017	1.015	1.044	42.4
SA146	31.9	1.100	1.017	1.015	1.044	30.6
SA147	36.6	1.100	1.017	1.015	1.044	35.2
SA148	54.9	1.100	1.017	1.015	1.044	52.7
SA149	33.6	1.100	1.017	1.015	1.044	32.3
SA150	33.92 (2 months' data)	Insufficient Data	Insufficient Data	Insufficient Data	N/A	N/A
SA151	38.3	1.100	1.017	1.015	1.044	36.8
SA152	30.3	1.100	1.017	1.015	1.044	29.1
SA153	28.7	1.100	1.017	1.015	1.044	27.6
SA154	31.1	1.080	0.993	0.998	1.024	29.3
SA155	32.6	1.100	1.017	1.015	1.044	31.3
SA156	38.6	1.100	1.017	1.015	1.044	37.1
SA157	49.1	1.080	0.993	0.998	1.024	46.2
SA158	25.3	1.124	1.088	1.070	1.094	25.4
SA159	30.9	1.100	1.017	1.015	1.044	29.7
SA160	61.8	1.100	1.017	1.015	1.044	59.3
SA161	51.85 (1 month's data)	Insufficient Data	Insufficient Data	Insufficient Data	N/A	N/A

Fall-off With Distance Correction of Sites Exceeding the NO_2 Annual Mean Objective

The NO_2 fall-off with distance calculator was used to estimate the NO_2 concentration at the nearest locations relevant for exposure for the diffusion tubes with annual mean concentrations above 36µg/m^3. As the closest relevant exposure to SA136, SA137a, SA138, SA143b and SA148 are located on the second floor of the building façade and

height is not considered in the distance correction calculator, results should be treated with caution. SA136, SA137a, SA138, SA143b and SA148 are therefore representative of worst case exposure as concentrations are likely to decrease with height.

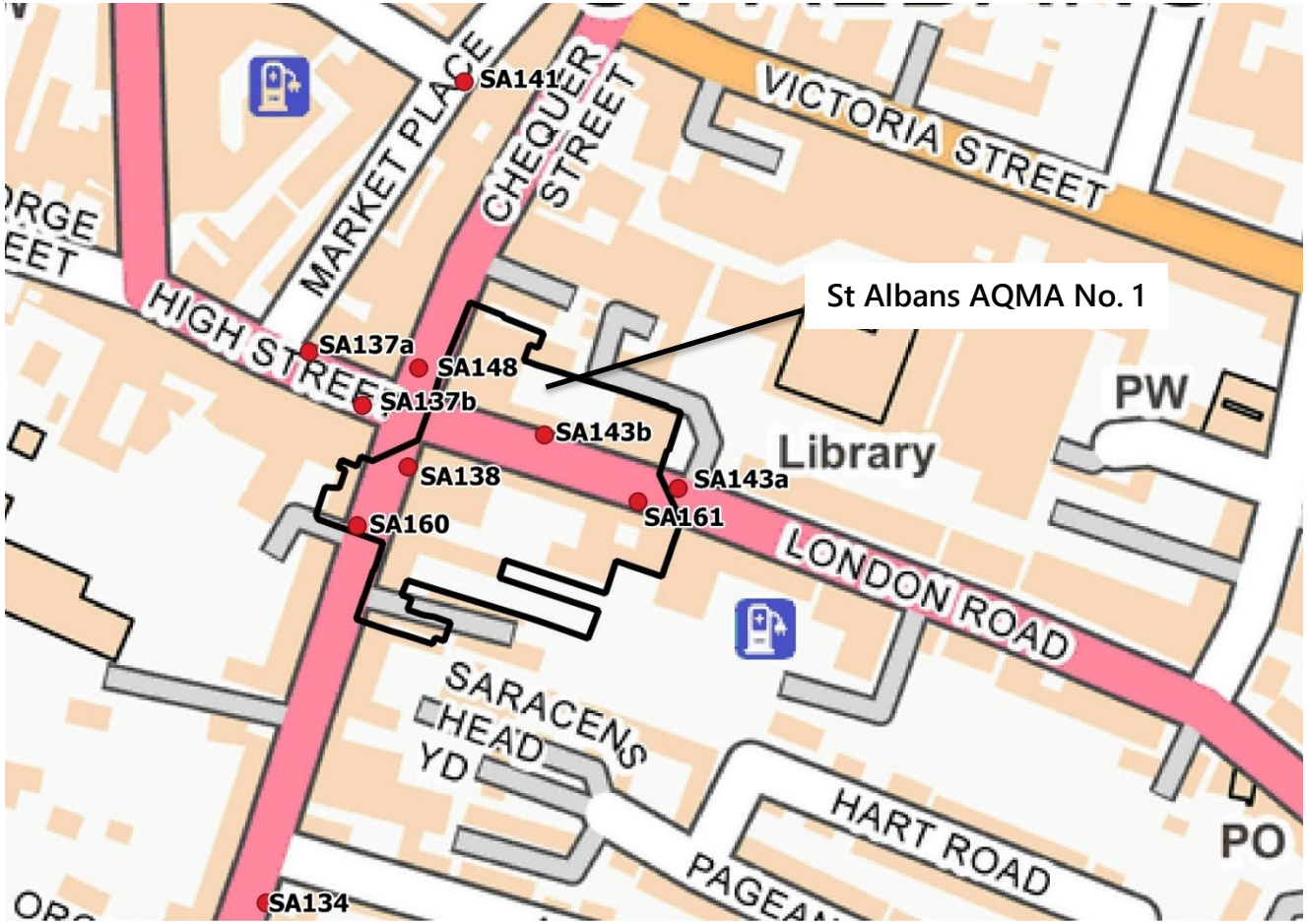
Table C.3 – Fall-off With Distance Correction of Sites Exceeding the NO_2 Annual Mean Objective (2018)

Site ID	Site Name	Distance to kerb (m)	Distance from relevant exposure to kerb (m)	Bias Adjusted and Annualised Annual Mean (µg/m^3)	Distance Corrected Annual Mean (µg/m^3)
SA136	St Peters Street St Albans SA003	1.1	9.7	**48.5**	34.9*
SA137a	High Street St Albans SA039	1.0	6.0	37.7	31.4*
SA138	Peahen PH Holywell Hill St Albans SA015	2.6	3.4	**45.2**	**43.4***
SA143b	London Road West St Albans (RELOCATED July 2018)	2.8	3.4	**42.4**	**41.1***
SA144	Forester House 1 St Peters Street St Albans	1.2	10.5	39.7	29.9
SA148	Chequer Street St Albans (NEW July 2018)	0.7	3.9	**52.7**	**41.8***
SA151	Thamesdale London Colney (NEW July 2018)	1.5	5.9	36.8	32.3
SA156	Folly Lane East St Albans (NEW July 2018)	1.6	4.1	37.1	33.1
SA157	Catherine Street St Albans (NEW July 2018)	0.5	1.8	**46.2**	**40.0**
SA160	Hollywell Hill St Albans (NEW July 2018)	2.5	5.0	**59.3**	**52.2**

*Closest relevant exposure is on the second floor of the building façade, result should be treated with caution

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 - Map of Current Air Quality Management Area Boundaries and 2018 Monitoring Locations – St Albans



Legend

Diffusion Tube Locations

AQMA Boundary

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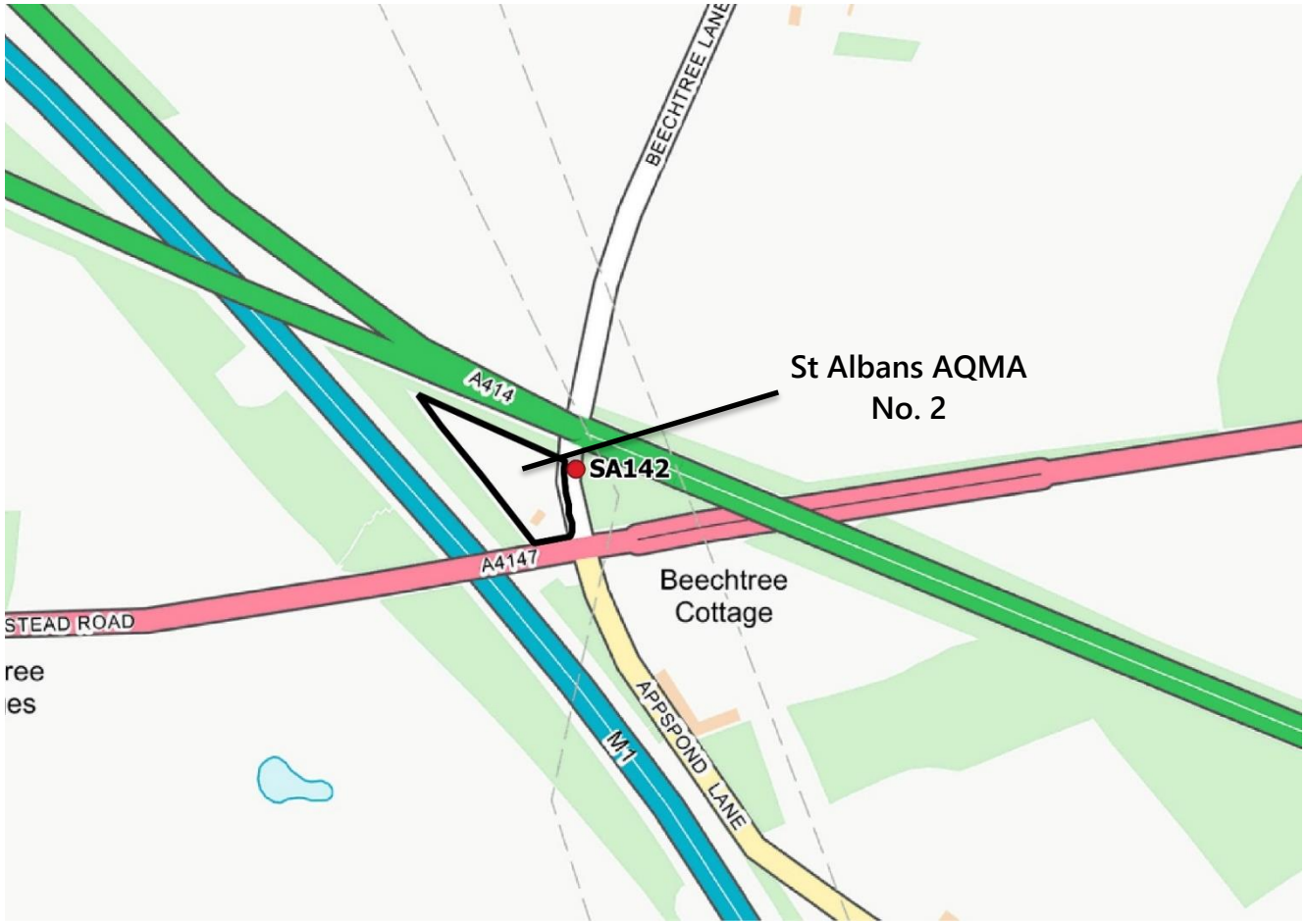
Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location
St Albans and City and District Council

Title
St Albans AQMA No. 1

By	**Approved**
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.1**

Figure D.2 - Map of Current Air Quality Management Area Boundaries and 2018 Monitoring Locations – Beechtree Cottages



Legend

Diffusion Tube Locations

AQMA Boundary

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Location
St Albans and City and District Council

Title
St Albans AQMA No. 2

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PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.2**

Figure D.3 - Map of Current Air Quality Management Area Boundaries - Frogmore

Legend

Diffusion Tube Locations

AQMA Boundary

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Location
St Albans and City and District Council

Title
St Albans AQMA No. 7

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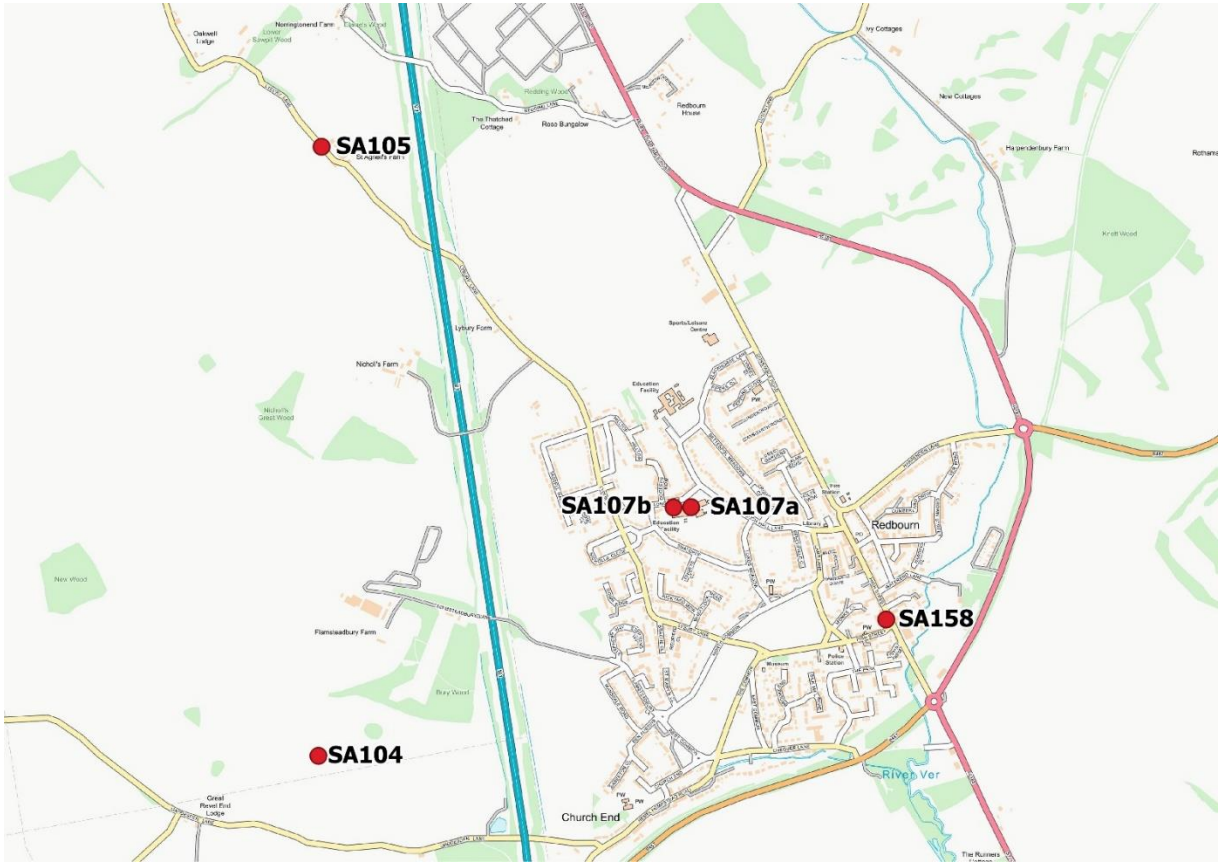
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.3**

Figure D.4 - Diffusion Tube Locations – Redbourn



Legend

Diffusion Tube Locations

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Location
St Albans and City and District Council

Title

Diffusion Tube Locations – Redbourn

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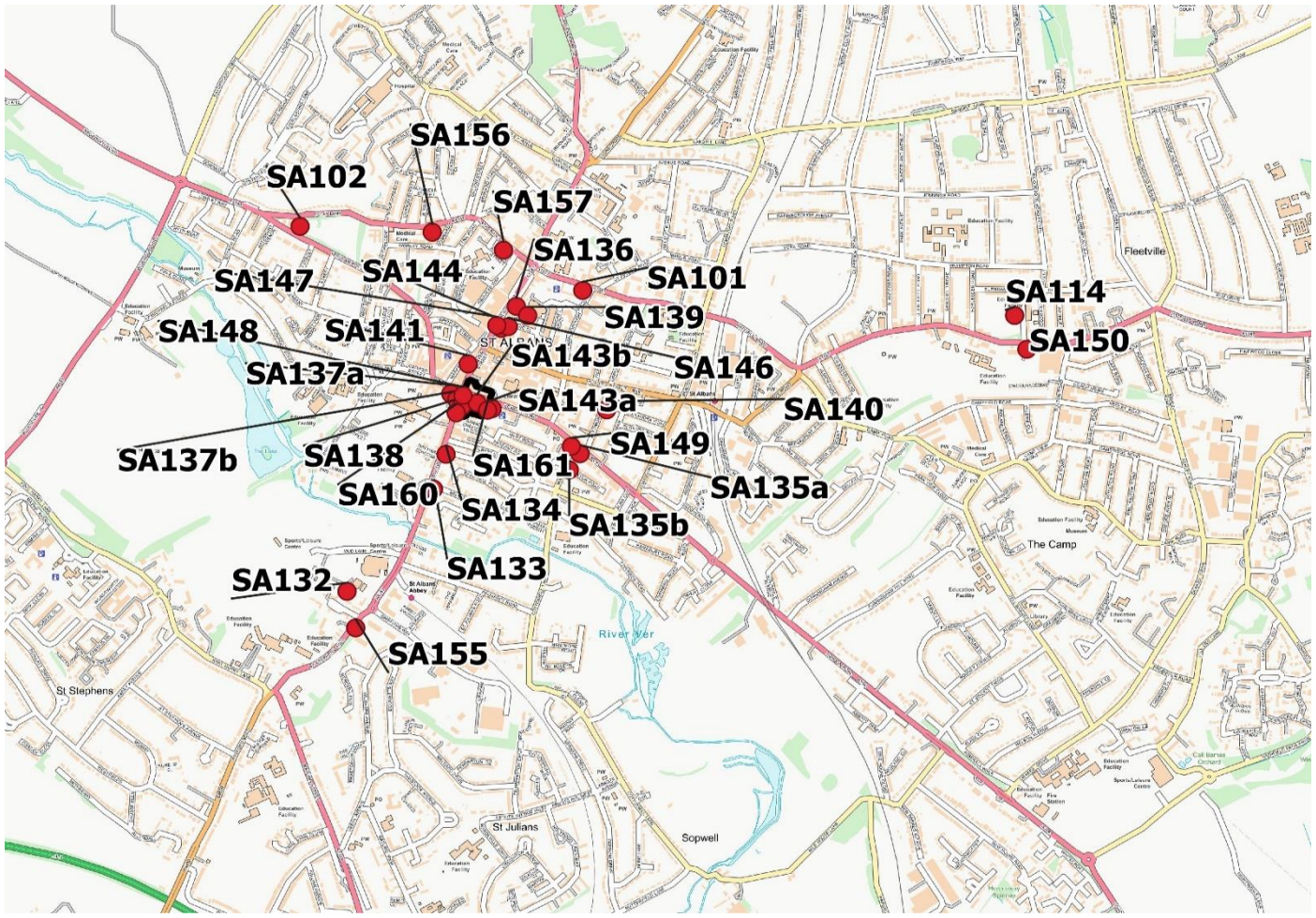
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.4**

Figure D.5 - Diffusion Tube Locations - St. Albans



Legend

Diffusion Tube Locations

AQMA Boundary

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Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location

St Albans and City and District Council

Title

Diffusion Tube Locations – St Albans

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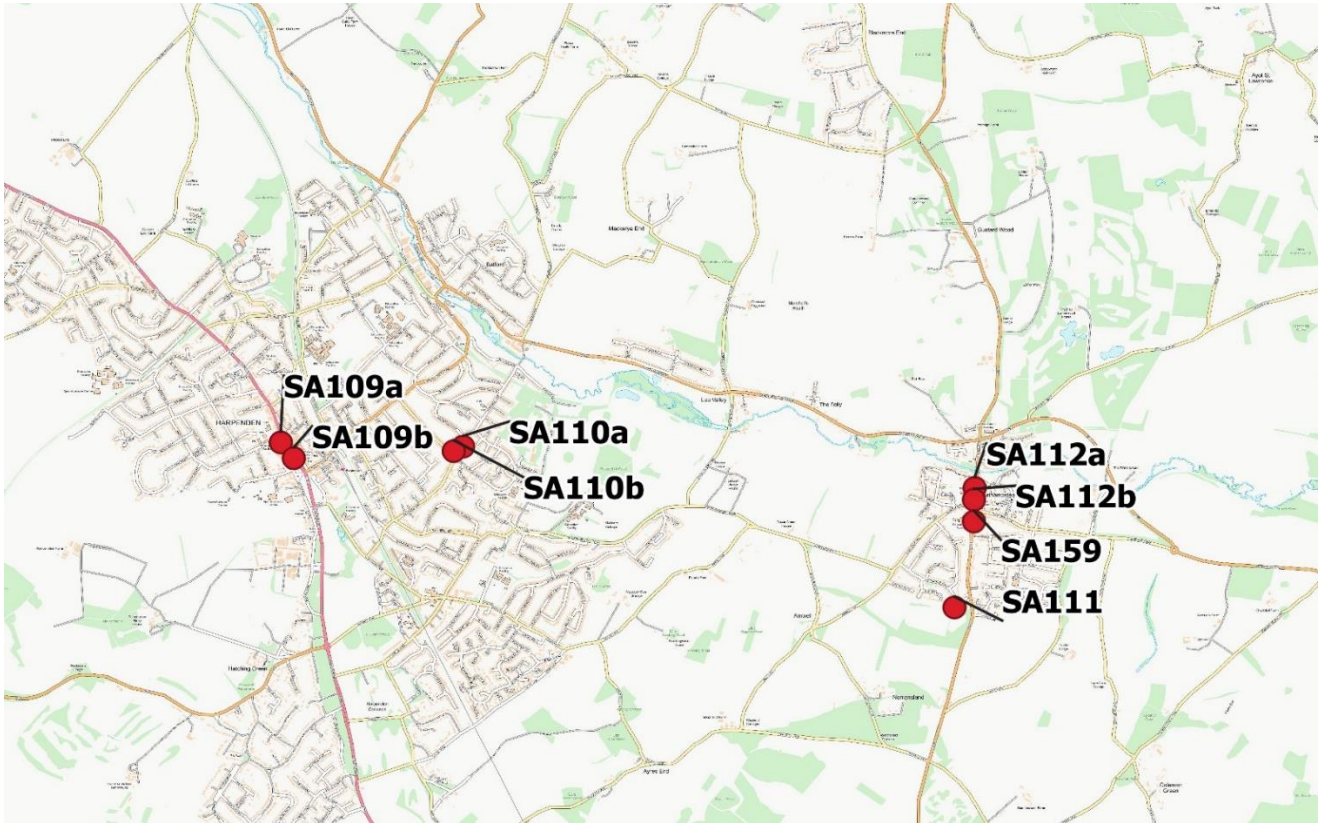
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.5**

Figure D.6- Diffusion Tube Locations - Harpenden/Wheathampstead



Legend

Diffusion Tube Locations

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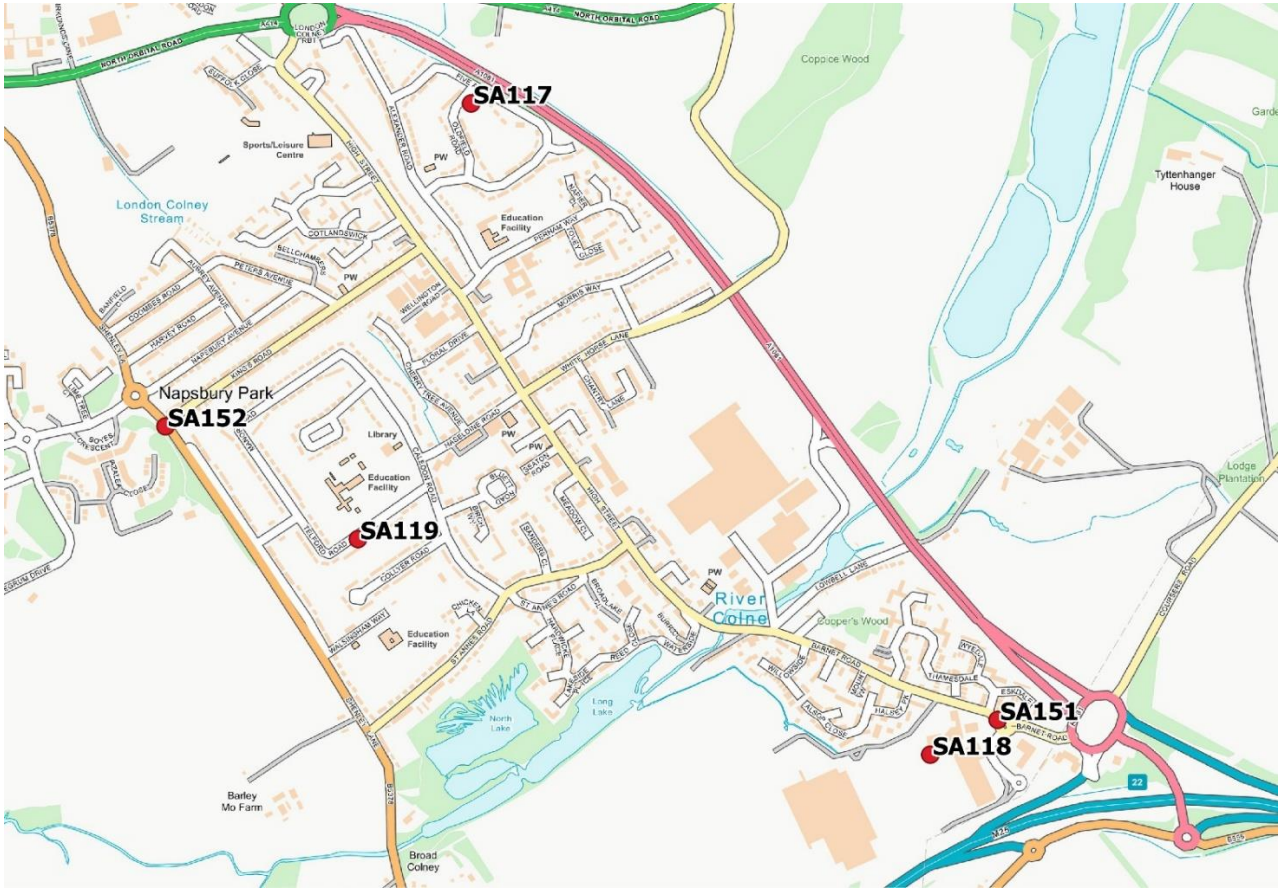
Location
St Albans and City and District Council

Title
Diffusion Tube Locations – Harpenden/Wheathampstead

By	**Approved**
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.6**

Figure D.7 - Diffusion Tube Locations - London Colney



Legend

Diffusion Tube Locations

Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location

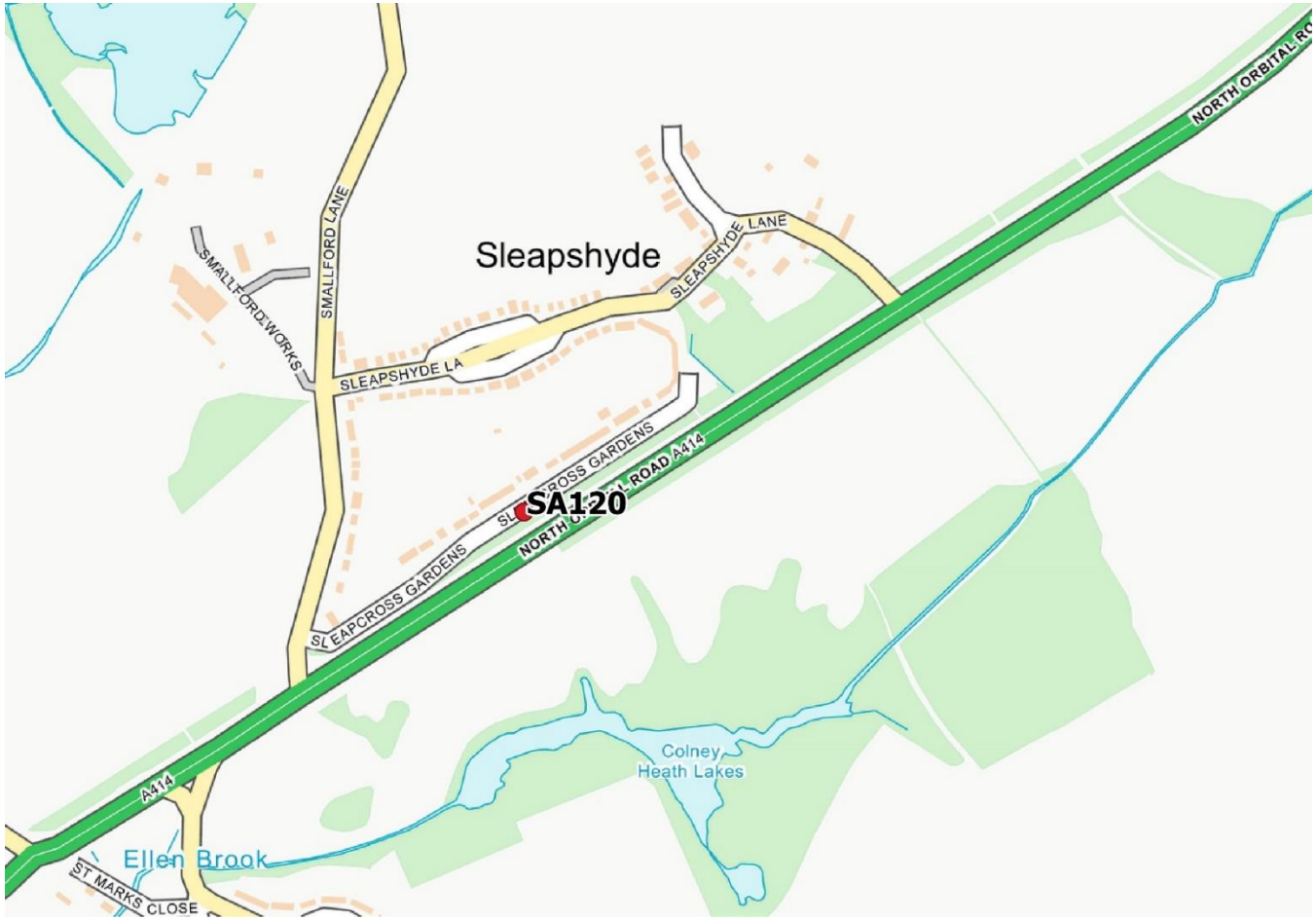
St Albans and City and District Council

Title

Diffusion Tube Locations – London Colney

By	Approved
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.7**

Figure D.8 - Diffusion Tube Locations - Sleapshyde



Legend

Diffusion Tube Locations

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Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location

St Albans and City and District Council

Title

Diffusion Tube Locations – Sleapshyde

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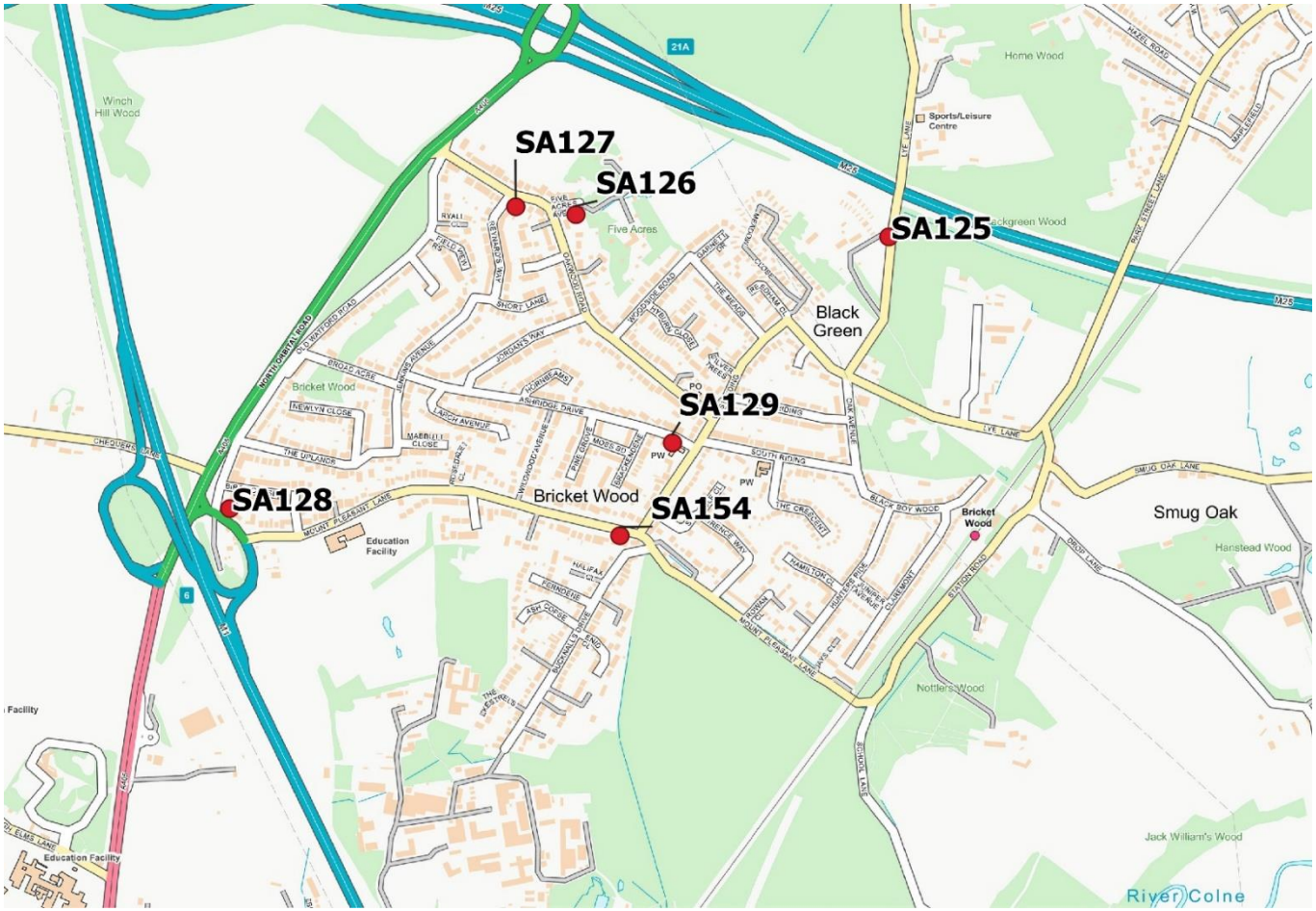
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.8**

Figure D.9 - Diffusion Tube Locations - Bricket Wood & Smug Oak



Legend

Diffusion Tube Locations

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Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location
St Albans and City and District Council

Title

Diffusion Tube Locations – Bricket Wood & Smug Oak

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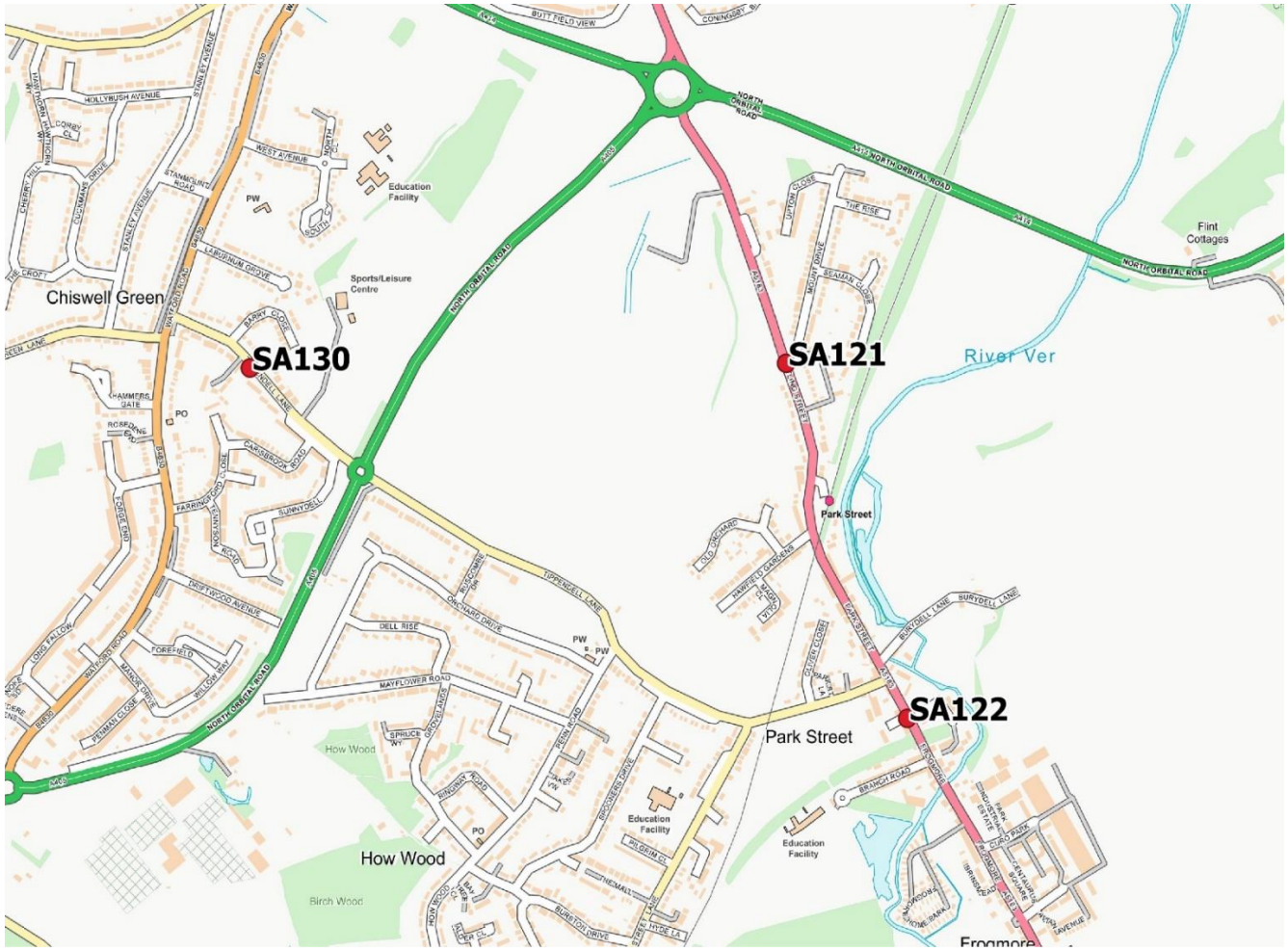
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.9**

Figure D.10 - Diffusion Tube Locations - Park Street



Legend

Diffusion Tube Locations

Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location

St Albans and City and District Council

Title

Diffusion Tube Locations – Park Street

By	Approved
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.10**

Figure D.11 - Diffusion Tube Locations - Frogmore

Legend

Diffusion Tube Locations

AQMA Boundary

Air Quality Bureau Veritas Atlas Business Park 2nd Floor Atlantic House Manchester M22 5PR

Location
St Albans and City and District Council

Title
Diffusion Tube Locations – Frogmore

By	**Approved**
PS	HS
Scale	**Job Ref**
Not To Scale	4766262
Date	**Figure No.**
October 2019	**D.11**

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[7]	
	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

[7] 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
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG(16). Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG(16). Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- NO_2 Fall off With Distance Tool, available at http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html
- National Diffusion Tube Bias Adjustment Spreadsheet, version 09/19 published in September 2019.
- St Albans City and District Council 2018 Annual Status Report
- Hertfordshire County Council, Local Transport Plan 3, 2011-2031.
- St Albans City and District Council Climate Change Action Plan 2016.
- St Albans City and District Council Green Travel Plan, April 2016.