2024 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management (LAQM), as amended by the Environment Act 2021

June 2024

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Executive summary: Air quality in our area

Air quality in West Suffolk

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas
(Local Government Association (LGA) - Public Health England Air Quality - A guide for directors of public health 2017, and
Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006).

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages (Defra. Air quality appraisal: damage cost guidance, February 2024), with a total estimated healthcare cost to the NHS and social care of £157 million in 2017 (Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018). The public health outcomes framework indicator for the fraction of mortality attributable to particulate air pollution for West Suffolk was 5.59 per cent, this is in line with the value for England, which is 5.5 per cent.

West Suffolk is a mix of market towns (Brandon, Bury St Edmunds, Haverhill, Mildenhall and Newmarket) and more rural village communities. The regionally important strategic road links of the A11 and A14 also cross the area. The north of the area hosts two large air bases operated by the United States air force, whilst many of the district's towns have large industrial areas. Agriculture is also an important part of the district economy, with both arable farming and pig farming being prevalent.

One of the main sources of pollution in the area is road traffic, which is generally worst in the market towns. We monitor for the pollutant nitrogen dioxide, which is considered the main pollutant of concern for road vehicles and is particularly linked to heavy goods vehicles (HGVs) and other diesel vehicles. Consequently, the majority of our monitoring is adjacent to busy roads within our market towns, with the main exception to this being the village of Great Barton where significant monitoring is also undertaken adjacent to the A143. Monitoring is undertaken using diffusion tubes, which are small plastic test tubes that contain a material that reacts with the air. Diffusion tubes passively monitor the air for approximately a month before being sent to an independent laboratory for analysis and replaced with a new tube to monitor the next month.

Particulates, also known as PM10 and PM2.5 (particulate matter with an aerodynamic diameter of 10µm (micrometres) or less and 2.5µm or less respectively), are also an important pollutant. Particulates are associated with various sources of pollution including domestic burning, road traffic and industrial processes. Particulates can also be associated with natural sources, such as pollen and sea salt, and international sources. The east and southeast of England have a greater proportion of international particulate pollution than the north and west of England. Secondary particulate pollutants can also form from ammonia, nitrogen dioxide and other gases, with the most significant source of secondary particulate pollution being ammonia from farming activities.

PM10 and PM2.5 are more difficult to accurately measure than nitrogen dioxide and other gasses and interpretation of the data can also be difficult. Consequently, PM10 and PM2.5 are currently not measured in West Suffolk; however, we have been working with colleagues across the county, including other districts and boroughs, Suffolk County Council and the University of Suffolk to identify the best way of affordably and practically monitoring for particulates. We have also submitted a bid to the Department for Environment, Food and Rural Affairs (Defra) for instruments to monitor PM10 and PM2.5 which has now been approved and we are hoping to install in 2024.

Other pollutants, such as sulphur dioxide and carbon monoxide, have been considered and assessed and confirmed as not being at risk of exceeding their respective air quality objectives based on Defra modelling data.

Air quality was impacted in 2020, and to a lesser extent in 2021, by the changes to day-to-day life caused by the COVID-19 pandemic. The reduced level of traffic due to lock downs and changes in working patterns caused a drop in levels of nitrogen dioxide at every monitored location in West Suffolk in 2020. 2021 was again impacted by COVID-19 related lockdowns and restrictions, however, this impact was not as significant as the previous year. When comparing levels of nitrogen dioxide recorded in 2023 to previous years it is important to understand that 2020 and 2021 were not typical years and a better appreciation of the long-term trend can be established from comparing 2023 levels to pre-pandemic years.

Nitrogen dioxide pollution in West Suffolk is generally relatively low and is showing a long-term improvement at monitored locations throughout the area. Particulate pollution is, slightly higher than the national average, however, this is not due to local sources, but is a result of the disproportionate impact of international particulate pollution on the eastern region. However, the importance of continuing to improve the local air quality is at a higher profile than ever before as more information on the health impacts of air pollution is discovered.

Despite the generally good air quality, there is one air quality management area (AQMA) within West Suffolk, located on the A143 in Great Barton. AQMA are designated areas where the council have identified levels of pollutants above the objectives set by the Government. Further information on this AQMA is given below.

Each of the five market towns, as well as the village of Great Barton and a small number of other villages, have air quality monitoring, the results of which are summarised below.

- **Brandon, Haverhill, Mildenhall and Newmarket** continue to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level. Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years.

- **Bury St Edmunds** is the largest town in West Suffolk and consequently has the most monitoring points. Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years. Concentrations of nitrogen dioxide in the AQMA on Sicklesmere Road continued to be below the air quality objectives and there have been no exceedances for the past five years. This AQMA has now been revoked, although we will continue to monitor the area.

- **Great Barton** is a village to the northeast of Bury St Edmunds with a main road (A143), which is a designated HGV route, cutting through it. A row of cottages either side of, and including, the Post Office are situated close to this road and are designated as an AQMA, however, nitrogen dioxide levels have been below the objective since 2020. Recorded levels in 2023 were broadly comparable to those measured in 2022, with majority of sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years. This is partly due to the moving of the pedestrian crossing which was completed at the end of 2019. Although the levels are currently below (that is compliant with) the objectives the AQMA remains an area of concern, especially considering proposed development along the A143 corridor. A new air quality action plan (AQAP) was approved and submitted to Defra in February 2024.

- **Tuddenham** has a single monitoring point that was introduced in the village at the beginning of 2022 at the request of the parish council; this showed relatively low levels of pollution, being less than half of the annual mean objective, this has carried on in 2023 with results remaining low.

- **Lakenheath** has a monitoring point in the centre of the village. The recorded level for 2023 was lower than that recorded in 2022, which was lower than all pre-pandemic records.

- **Exning** has had two monitoring points introduced in the village in March 2023, both monitoring points have recorded results being less than half of the annual mean objective. We will undertake a second years monitoring in Exning.

- **Clare** has had two monitoring points introduced in the town in January 2023, both monitoring points have recorded results being less than the annual mean objective. We will undertake a second years monitoring in Clare.

As most of the nitrogen dioxide pollution within West Suffolk originates from road traffic, West Suffolk works closely with the local highway authority (Suffolk County Council), who have a designated point of contact for air quality matters. We are also working closely with the Suffolk County Council public health team who are developing an engagement plan to increase awareness and understanding of air quality issues within Suffolk.

We also work closely with the local planning authority to ensure new developments are appropriately controlled and mitigation is provided where required. A large animal feed processing plant (planning reference DC/22/1294/FUL) located to the northeast of Bury St Edmunds has been approved by planning which will be a new point source of pollution as well as causing additional heavy duty vehicle (HDV) movements. A number of large housing developments and industrial sites are also currently going through the planning process, with a number along the A143 corridor which have the potential to impact the Great Barton AQMA. There is also an expansion to the Stanton industrial park going through the planning process and if this is approved there will be additional heavy duty vehicle (HDV) movements and will also impact Great Barton AQMA.

More details on the extent of the AQMA mentioned above can be found at Defra - UK AIR - Air Information Resource - Local Authority Details - West Suffolk Council.

Actions to improve air quality

While air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan (Defra. Environmental Improvement Plan 2023, January 2023) sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM2.5 targets. The National Air Quality Strategy, published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM2.5 in their areas. The Road to Zero (Department for Transport. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018) details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of air quality management areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Anti-idling campaign

West Suffolk Council has directly engaged with schools with an anti-idling campaign. This has involved going into schools to work directly with pupils and teachers who are then engaging with parents at school collection. The first events proved successful with positive feedback received from teachers, parents, and children. We have worked with Suffolk County Council road safety officers to help distribute anti-idling materials to all schools currently on the road safety scheme. We contacted all schools in West Suffolk during the 2023-2024 school year to try and organise anti-idling event and throughout the academic year we have continued to distribute anti idling banners and other materials to schools.

Zero emission vehicles

West Suffolk Council has focused on the promotion of electric vehicles (EVs) since undertaking our first EV showcase event in 2016. As growth and awareness in EVs has increased we have switched our focus to the delivery of infrastructure, and during 2022 we delivered our third round of chargepoint installations under the Office for Zero Emission Vehicles (OZEV) On-street Residential Chargepoint Scheme (ORCS). At the end of March 2024, West Suffolk owned public EV chargepoints to allow 74 vehicles to charge at any one time.

At the 1 January 2024, the West Suffolk Council district area was shown on the Department for Transport map of Electric vehicle charging devices by local authority as being in the top 20 per cent of local authority areas for total number of electric vehicle charging devices and devices per 100,000 of population. West Suffolk is the only local authority in East Anglia (Suffolk, Norfolk, Essex and Cambridgeshire) in the top 20 per cent for these Department for Transport categories.

West Suffolk Council also have the following electric vehicles:

- five small vans
- one transit van
- two street sweepers
- one mowing machine
- one mobile plant (digger)

Figure 1: Picture of newly acquired electric street sweeper

Figure 2: Picture of new electric vehicle

West Suffolk Council are also working with partners across Suffolk and Norfolk to ensure regional strategies and plans are aligned and complementary. Colleagues at Suffolk County Council are delivering public chargepoints in more rural areas through their Plug-in Suffolk scheme.

Carbon reduction activities

West Suffolk Council undertake a number of carbon reduction activities that will help to reduce our impact on the environment and reduce our reliance on fossil fuels. This includes our solar farm, our solar for business scheme, tree planting, reduction in fuel use and increased recycling rates. Although these are generally not direct air quality improvement measures, they do all have a positive impact on air quality and underline our commitment to sustainability.

More information on our carbon direction work can be found in the West Suffolk Council Environmental Statement 2022-2023

Suffolk County Council actions

As a district council, West Suffolk Council works closely with Suffolk County Council (SCC) on air quality. Many of the areas that impact air quality, such as highways and sustainable transport are the responsibility of Suffolk County Council. Some of the works undertaken by SCC in the past year include:

- Suffolk Air Quality Strategy
- Bikeability courses at schools throughout the district
- Modeshift stars school schemes
- Dedicated section on air quality in the new local transport plan
- Plug-in Suffolk electric vehicle charging infrastructure scheme
- First Mile - Last Mile

Conclusions and priorities

Air quality in West Suffolk continues to be relatively good, with all the monitored locations being below (that is compliant with) the air quality objectives. Most monitoring locations in 2023 were relatively similar to 2022 but were below pre-pandemic levels at every location which is consistent with the long-term downward trend in nitrogen dioxide pollution levels. Nitrogen dioxide monitoring will continue throughout the district, including within the AQMA.

West Suffolk continues to grow, with major developments in Bury St Edmunds and Haverhill both continuing. It is important for West Suffolk to continue to monitor throughout the area and react to any new information that becomes available.

Our main ongoing actions for 2024 are to continue to expand the provision for EV charging infrastructure and continue working with schools and other organisations with our anti-idling campaign. We will also endeavour to continue working with Suffolk County Council in supporting their air quality strategy and air quality engagement plan.

Gaining significant engagement at a local level given the largely rural locality will remain a challenge in West Suffolk.

Local engagement and how to get involved

As an individual there are many actions that can be taken to improve the air quality and reduce air pollution. This will improve the quality of life for everyone, below are a few suggestions of how to get involved:

- Use your car less. Try to walk, cycle, and use the bus or train wherever possible. Conventionally fuelled cars are particularly polluting over short journeys, so aim to cut these out first.

- Consider purchasing an electric vehicle; the costs are reducing, and the technology and infrastructure are making this technology more practical for more people

- Reduce emissions from your car by ensuring it is regularly serviced and well maintained, ensure you only carry the weight you need, and you drive in a gentle, steady manner.

- Don't idle your vehicle's engine when parked. You can contact West Suffolk Council if you would like us to do a presentation about vehicle idling to your school or organisation.

- When buying a traditionally fuelled vehicle consider the most fuel-efficient petrol vehicle rather than buying a diesel vehicle.

- Encourage your employer, school, or college to set up a Green Travel Plan.
- Car share, to reduce emissions and save money. See the Suffolk Car Share website for further details.

- If you own a property with a log burner or open fire make sure you only burn the cleanest fuels such as well seasoned wood approved under the 'Ready to Burn' scheme. See the Ready to Burn website for more information.

- Avoid having bonfires at home, try to compost instead.

- Make sure your domestic boiler is well serviced to avoid unnecessary nitrogen dioxide or particulate emissions.

Bury St Edmunds resident's associations have formed a group to help raise the profile of air pollution and take action where appropriate. This group continue to meet regularly with both councillors and officers of the council. You can contact West Suffolk Council if you would like more information on this group.

For up-to-date information on air quality in West Suffolk, please visit our Air quality webpage.

Local responsibilities and commitment

This ASR was prepared by the Environment and Energy Team, Regulatory Services of West Suffolk Council with the support and agreement of the officers and departments as listed on page 2.

This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to the West Suffolk Council air quality officer using the details to the front of this report.

Contents

1.Local air quality management

This report provides an overview of air quality in West Suffolk during 2023. It fulfils the requirements of local air quality management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives. It shall also include the dates by which each measure will be carried out. This annual status report (ASR) is an annual requirement showing the strategies employed by West Suffolk Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

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 should prepare an air quality action plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by West Suffolk Council can be found in Table 2.1. The table presents a description of the AQMA that are currently designated within West Suffolk. Appendix D provides a map of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designations is the NO2 annual mean objective of 40 µg/m^3.

The Great Barton AQMA has had four years below the relevant air quality objective, however, two of these years were impact by COVID-19 restrictions and these should not be considered representative. The monitoring from 2023 will help to better establish the basis for revocation (or otherwise) of this AQMA. There is a large housing estate to the south of Great Barton that is currently in the planning system which will likely have an impact on the AQMA.

Table 2.1 – Declared air quality management areas

AQMA Name	Date of declaration	Pollutants and air quality objectives	One line description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of exceedance: declaration	Level of exceedance: current year	Number of years compliant with air quality objective	Name and date of AQAP publication
Great Barton AQMA	Declared 11 May 2011 Revoked 1 January 2013 Declared 18 April 2017	NO2 annual mean (40µg/m3)	An area incorporating Gatehouse Cottage and 1 to 8 The Street (A143), in the Parish of Great Barton.	No	48.2 µg/m^3 (2011)	No exceedance – 32.1 µg/m3	Four years	Great Barton AQMA Action Plan – Jan 2024

2.2 Progress and impact of measures to address air quality in West Suffolk

Defra's appraisal of last year's ASR concluded that West Suffolk Council should continue to undertake monitoring for nitrogen dioxide throughout the district and report results in the 2024 ASR.

West Suffolk Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Twenty-two measures are included within Table 2.2, with the type of measure and the progress West Suffolk Council or its partners have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective action plans for Great Barton air quality management area. Key completed measures are the launch of the clean air business scheme, the continued increase of electric vehicle charging infrastructure and the public awareness campaigns that West Suffolk is supporting Suffolk County Council to complete.

West Suffolk Council's priorities for the coming year are to establish which actions can be taken to better tackle particulate pollution.

West Suffolk Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Suffolk County Council
- University of Suffolk

The principal challenges and barriers to implementation that West Suffolk Council anticipates facing are reducing car use in a largely rural area and understanding the various sources of particulate pollution.

Table 2.2 – Progress on measures to improve air quality

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
1	Electric vehicle charging points through planning	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2016	Ongoing	West Suffolk	Not applicable	No	Funded	<£10,000	Implementation	Not possible to directly measure	Number of relevant planning applications with conditions successfully applied	Implemented and conditions being successfully imposed and delivered on new developments	Where building regulations require installation of charge points this action is no longer required
2	Electric vehicle charging infrastructure on council owned land	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2017	Jan-19	West Suffolk, Babergh Mid Suffolk, Highways England providing funding for Rapid chargers	Highways England	No	Funded	£10,000 – 50,000	Completed	Not possible to directly measure	Number of additional charge points installed	Rapid charge point installed January 2019	Norfolk and Suffolk wide project. Use of charge point has been better than expected since installation in January 2019.
3	Electric vehicle charging infrastructure on council owned land	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2016	Ongoing	West Suffolk	Section 106 funds, council investment and private investment	No	Funded	£100,000 - £500,000	Implementation	Not possible to directly measure	Number of additional charge points installed	Fast chargers installed in Brandon, Bury St Edmunds, Haverhill, Mildenhall and Newmarket. Rapid chargers installed in Newmarket and Mildenhall	Charger points installed in 2017, 2020, 2021 and 2022. Strategy for future installations developed.
4	On Street electric vehicle charging infrastructure	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2018	Phase 1 completed Q1 2019.	West Suffolk, OLEV and EST	OLEV and West Suffolk Council	No	Funded	£10,000 – 50,000	Completed	Not possible to directly measure	Number of additional charge points installed	22 points installed	Chargepoints being upgraded in 2023

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5	Electric vehicle showcase	Promoting low emission transport	Other	2016	Ongoing	West Suffolk	West Suffolk Council	No	Partially Funded	<£10,000	Completed	Not possible to directly measure	Increased uptake in electric vehicles	Showcase undertaken in 2016, 2017 and 2018	Event not undertaken since 2018 as new EVs have long waiting lists and demand is outstripping supply – no need to actively promote.
6	Business Grant Promotions for businesses to move to ULEV including 'Electric Innovation' event as part of the West Suffolk Business Festival.	Promoting low emission transport	Company vehicle procurement - prioritising uptake of low emission vehicles	2016	Ongoing	West Suffolk and BEE Anglia	ongoing	No	Funded	£10,000 – 50,000	Implementation	Not possible to directly measure	Increased uptake in electric vehicles	Numerous grants awarded to companies for the installation of EV chargepoints to enable fleets to become electric. One grant awarded to taxi company.	
7	Taxi licensing conditions making idling in a taxi rank or on the highway a penalty within the taxi handbook, with the potential for penalty points to be added to the drivers council licence.	Promoting Low Emission Transport	Taxi Licensing conditions	2017	Conditions implemented in 2017	West Suffolk Council	Not applicable	No	Funded	<£10,000	Completed	12% reduction in pollution at taxi rank between 2017 and 2019	Reduction in Nitrogen dioxide at taxi rank locations	Implemented and continue to monitor	Measure was backed up by regular visits to taxi rank by licensing enforcement officer during 2018

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8	Anti-idling campaigns including school anti-idling events	Public information	Via other mechanisms	2018	Jun-19	West Suffolk Council, Suffolk County Council	West Suffolk Council	No	Partially funded	<£10,000	Implementation	Not possible to directly measure	Reduction in idling at key locations	Materials completed in June 2019. First school visits completed in January 2020. Work on updated campaign messages and resources has started in preparation for a 2024 launch.	Has been difficult to engage schools since COVID-19 pandemic. School theatre productions undertaken in February and March 2023.
9	Eco driving courses for council staff	Vehicle fleet efficiency	Driver training and eco driving aids	2017	Ongoing	West Suffolk Council	Energy Savings Trust	No	Funded	<£10,000	Implementation	Not possible to directly measure	Number of staff completing course	Ongoing	Staff mileage has significantly reduced since start of COVID-19 pandemic due to a more flexible working approach.
10	Promotion of better domestic solid fuel burning	Public information	Via the Internet	2018	Ongoing	West Suffolk Council	West Suffolk Council	No	Partially Funded	<£10,000	Implementation	Not possible to directly measure	Lower emissions from private fuel burning (not measurable)	Promoted on West Suffolk website and via West Suffolk and Environmental Health Facebook pages	
11	South-East Bury St Edmunds relief road	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective	2020	2024	West Suffolk Council, Suffolk County Council and Developer	Development	No	Funded	£1 million - £10 million	Planning	Due to open 2024	Measured concentration in Nitrogen Dioxide on Sicklesmere Road	Planning permission granted in Spring 2020	Completion of road prior to 400 dwellings completed to be a condition of the planning approval

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
			vehicle priority, bus priority, high vehicle occupancy lane												
12	Haverhill North-West relief road	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2024	West Suffolk Council, Suffolk County Council and developer	Development	No	Funded	£1 million - £10 million	Implementation	To be confirmed closer to opening date - likely in the region of 20% reduction in NO_2 along Withersfield Road	Measured concentration in Nitrogen Dioxide on Withersfield Road	Development commenced March 2018. Construction underway, estimated completion spring 2024.	
13	Great Barton AQAP - moving of the pedestrian crossing	Traffic management	Urban traffic control, congestion management, traffic reduction	2019	2019	West Suffolk Council, Suffolk County Council	Defra, Suffolk County Council	Yes	Funded	£50,000 - £100,000	Completed	7.8% reduction	Reductions in Concentrations to below the objective	Completed December 2019	Scheme successful.
14	Great Barton AQAP - improvement of 'Bunbury Arms' junction to Thurston	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2024	Suffolk County Council	Section 106 funds	No	Funded	£100,000 - £500,000	Planning	To be confirmed	Monitoring of queues through Great Barton	Outline design completed	
15	Suffolk Car Share	Alternatives to private vehicle use	Car and lift sharing schemes	Ongoing	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	<£10,000	Implementation	Not possible to directly measure for a single district	Number of scheme participants	Over 3,000 members	

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16	West Suffolk Council cycling initiatives	Alternatives to private vehicle use	Other	Ongoing	Ongoing	West Suffolk Council	West Suffolk Council	No	Funded	<£10,000	Implementation	Not possible to directly measure	Numbers of employees cycling to work, business miles completed by bike	5 Pool bikes available at main office with plans to buy more in 2024 and 2 electric bikes purchased in 2023, incentives to cycle to work, free bike servicing at work	
17	Suffolk County Council cycle Lane improvements	Alternatives to private vehicle use	Other	2020	2022	Suffolk County Council	Suffolk County Council and National Government	No	Funded	£50,000 - £100,000	Implementation	Not possible to directly measure	Number of kilometres of cycle lane improvements	Improvements to cycle lanes in various locations throughout West Suffolk (Beetons Way, Risbygate Street in Bury St Edmunds)	A number of the cycle lane improvements (segregating wands) were removed in 2022.
18	Clean air business scheme	Public information	Other	2022	Ongoing	West Suffolk Council, Suffolk County Council	West Suffolk Council	No	Funded	£1,000	Implementation	Not possible to directly measure	Number of business presented with a Clean Air Business award	Scheme launched on clean air day 2022. Good interest from businesses on how to improve air quality but no formal awards presented.	Although businesses are interested, the commitment needed to gain a formal award is not a priority.

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19	Bikeability scheme	Promoting travel alternatives	Promotion of cycling	2022	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	<£10,000	Implementation	Not possible to directly measure	Number of children passing	Well established scheme targeting primary schools throughout the county. Bikeability completed at 14 Schools in West Suffolk in 2023 In 2023, 3,769 pupils across Suffolk received Bikeability training.	Added to the ASR in 2022 but has been ongoing for a number of years
20	Modeshift stars schools	Promoting travel alternatives	School travel plans	2022	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	<£10,000	Implementation	Not possible to directly measure	Number of schools registered	Well established scheme targeting schools throughout the county. Eight schools currently registered in West Suffolk including Great Barton Primary School located close to the Great Barton AQMA	Added to the ASR in 2022 but has been ongoing for a number of years

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
21	Plug-in Suffolk	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2018	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	+£200,000	Implementation	Not possible to directly measure	Number of charge points installed	Well established scheme funding EV charge points in community locations.	Locations in West Suffolk include Hundon, Ixworth, Kedington, Risby and West Row
22	E-Cargo Bike trial	Promoting travel alternatives	Promotion of cycling	2022	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	+£10,000	Implementation	Not possible to directly measure	Number of businesses that change to E-Cargo bikes	Two business took part in Bury St Edmunds in summer 2022	

2.3 PM2.5 – Local authority approach to reducing emissions and/or concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM2.5 (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM2.5 has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

West Suffolk Council is undertaking a number of measures to improve air quality generally, as described above, which we consider will also have a positive impact on PM2.5. Some of these measures, such as the promotion of clean burning, will specifically tackle particulate matter emissions.

During the latter part of 2019 and in 2020, the council, together with all the other local authorities across Suffolk worked with Suffolk County Council's Transport and Public Health colleagues to prepare an 'air quality profile' report for Suffolk. The report maps, at a district and borough level, local air pollution levels and explores evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality. The report was published in June 2021 following sign-off from the Suffolk Director of Public Health.

As a result of the report, air quality was made a priority by the Suffolk Health and Wellbeing board as part of their duty to "encourage integrated working" between health, care, police and other public services in order to improve wellbeing outcomes for Suffolk. The recommendations from the Suffolk Profile have also informed both the development of a Suffolk-wide Air Quality Strategy that was published in May 2023 and the Suffolk Community Engagement Plan.

The Air Quality Strategy sets out the range of actions identified as being important to the improvement of air quality, along with who is the lead authority for the work, timescales for implementation, and what measurements or outcomes will be achieved.

The air quality engagement plan sets out the action Suffolk County Council (SCC), working with borough and district partners, will take to raise awareness of the health impacts of air quality in Suffolk. The aim is to increase awareness to enable individuals to make choices that protect both their health and the health of others from the harmful effects of pollution.

We will continue to consult with Suffolk County Council Public Health colleagues and be advised by them, and national guidance, on any relevant measures that will reduce exposure to PM2.5.

Suffolk County Council made a joint Defra bid for 15 particle matter monitors which was initially approved but later rescinded by Defra. Some of this bid would of gone toward installation of particle matter monitors in West Suffolk as currently we rely on Defra modelling for our particle matter assessments.

Between 1 September 2020 and the 31 August 2022, the University of Suffolk carried out a case study monitoring PM2.5 and PM10 using a Zephyr Sensor. The findings of this study showed a strong correlation between $PM_{2.5}$ and PM_{10} data at all locations analysed. However, a strong relationship could not be found between traffic volumes and particulates. The only times that the levels recorded were elevated were around bonfire night both years and in March 2022 when the UK experienced a dust cloud from the Saharan Desert.

3.Air quality monitoring data and comparison with air quality objectives and national compliance

This section sets out the monitoring undertaken within 2023 by West Suffolk Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of non-automatic monitoring undertaken

West Suffolk Council undertook non-automatic (that is passive) monitoring of NO2 at 80 sites during 2023. Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on quality assurance and quality control (QA and QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (for example annualisation and/or distance correction), are included in Appendix C.

3.2 Individual pollutants: Nitrogen dioxide (NO2)

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75 per cent and greater than 25 per cent), and distance correction. Further details on adjustments are provided in Appendix C.

Table A.2 in Appendix A compare the ratified and adjusted monitored NO2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (that is the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

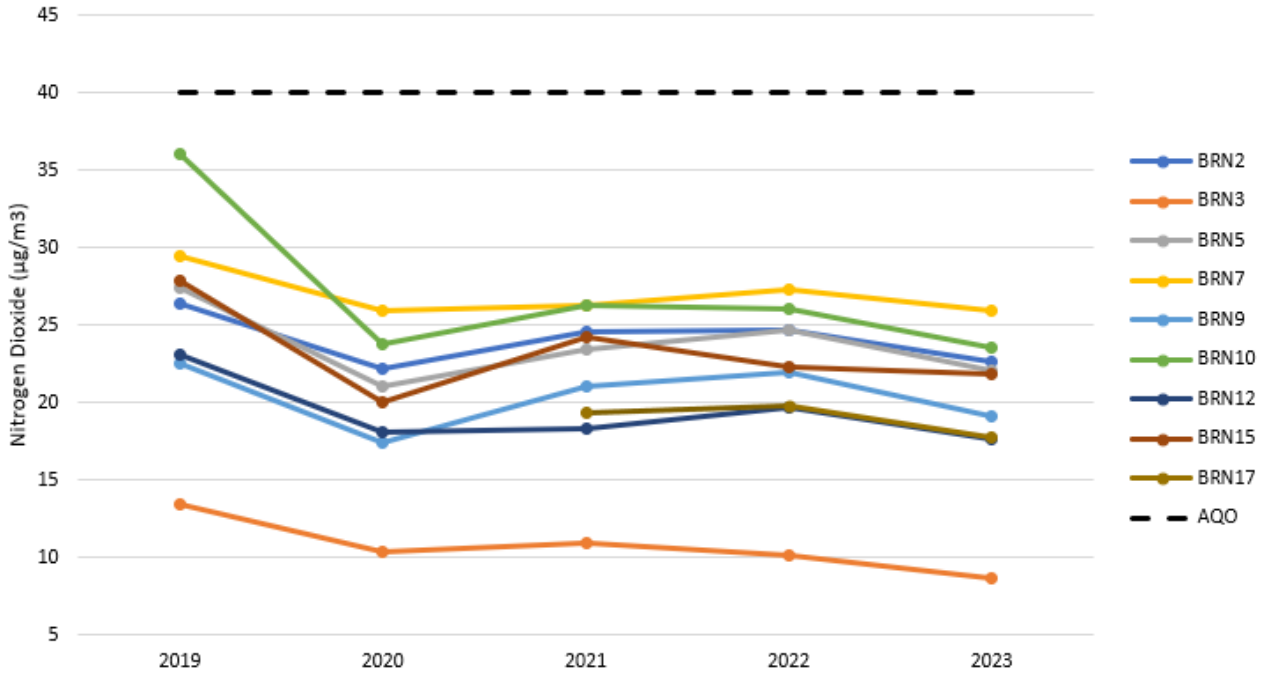
Details from each of the monitoring areas is provided below.

3.2.1 Brandon

The town of Brandon continues to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level of 40µg/m^3. Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years.

The highest concentration (25.9µg/m^3) was recorded at monitoring point BRN7 located at the junction of London Road and Church Road, with the monitoring site at BRN10 on the High Street recording the second highest concentration (23.5µg/m^3). Figure 3.1 shows the trend for all monitoring sites where data has been collected for all of the past five years and compares them to the air quality objective (AQO).

Figure 3.1: Five-year trend data for nitrogen dioxide in Brandon



3.2.2 Bury St Edmunds

Bury St Edmunds is the largest town in West Suffolk and consequently has the most monitoring points. Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years.

Concentrations of nitrogen dioxide in the AQMA on Sicklesmere Road continued to be below the air quality objectives and there have been no exceedances for the past five years. The AQMA has now been revoked after the results from 2023 also being below the objective level of 40µg/m^3. This decision was aided by Defra due to the prolonged period in which there were no exceedances.

Figure 3.2 shows the five-year trend of nitrogen dioxide from monitoring locations on Sicklesmere Road, both inside and outside of the former AQMA.

The highest recorded concentration of nitrogen dioxide in Bury St Edmunds away from the AQMA was recorded at BSE16 which is at the Northgate Lodge roundabout and was 23.9µg/m^3, with the next highest being 23.4µg/m^3 at BSE6 the Kings Road roundabout, although it should be appreciated that these values are well below the objective level of 40µg/m^3.

In October 2023 two additional monitoring points (BSE36 and BSE37) were added along Beetons Way to monitor outside local schools, these will be reported on in next year's report.

Figure 3.2 Five-year trend data for nitrogen dioxide along Sicklesmere Road, Bury St Edmunds

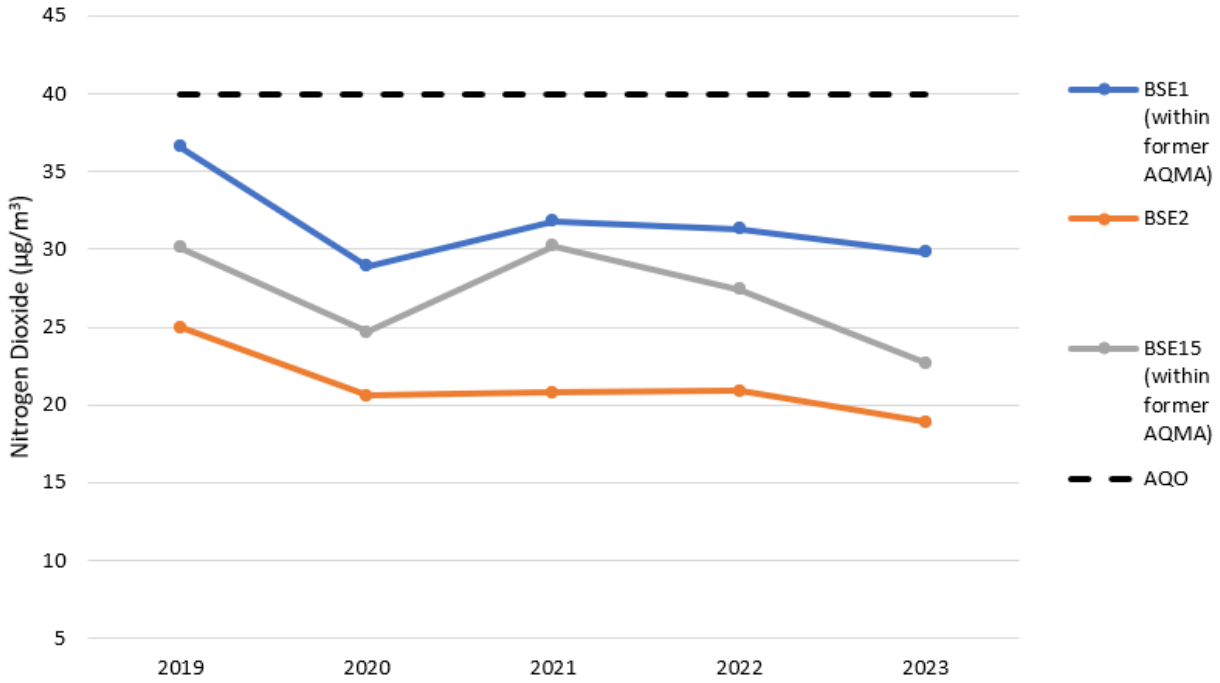
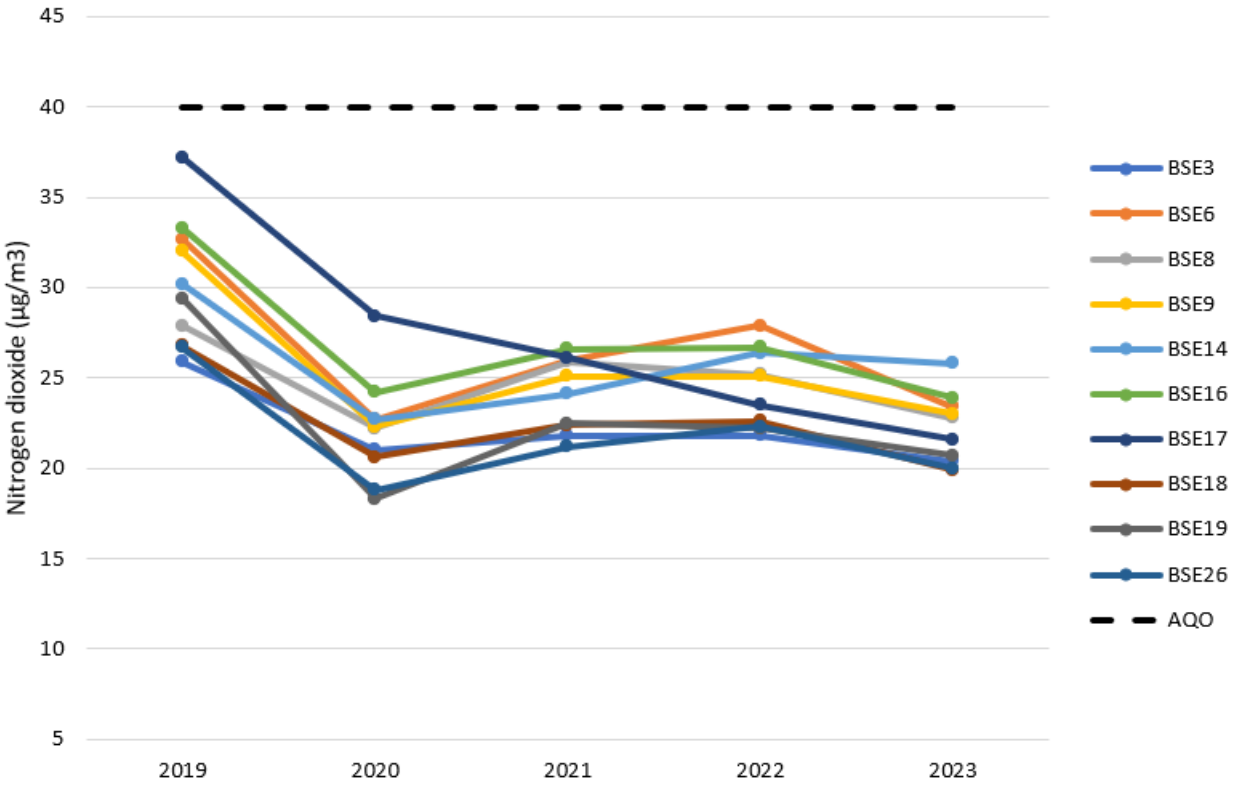


Figure 3.3 shows the five-year trend of nitrogen dioxide from monitoring locations within Bury St Edmunds. Sites with less than five-years of monitoring data have not been included.

Figure 3.3 Five-year trend data for nitrogen dioxide at selected Bury St Edmunds monitoring sites



3.2.3 Great Barton

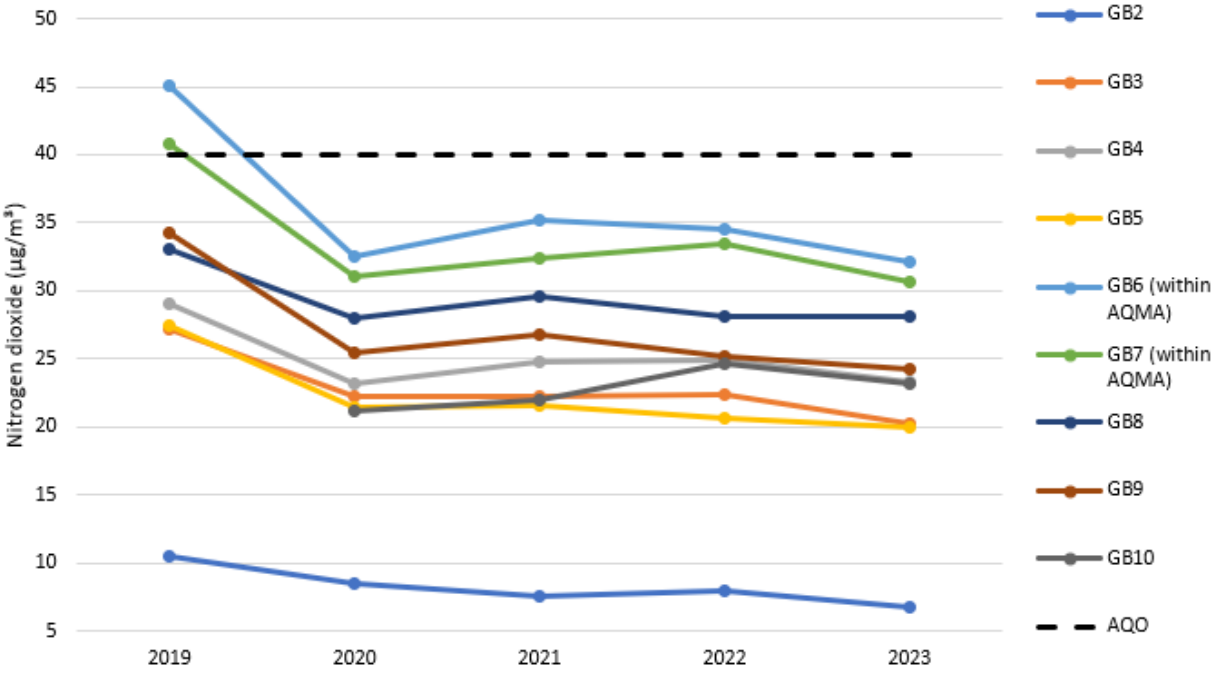
Great Barton is a village to the northeast of Bury St Edmunds with a main road (A143), which is a designated HGV route, cutting through it. A row of cottages either side of, and including, the Post Office are situated close to this road and are designated as an AQMA, however, nitrogen dioxide levels have been below the objective since 2020. Recorded levels in 2023 were similar to those in 2022, with monitoring points recording a majority of results as slightly lower values, with the highest recorded value of 32.1µg/m^3 being within the AQMA at monitoring point GB6.

All monitoring points remain below the 2019 levels, which is partly due to the moving of the pedestrian crossing with the use of a Defra grant. This was completed at the end of 2019 and was the main action from the previous AQAP and was estimated to have resulted in a 7.8 per cent reduction in concentrations between 2019 and 2020. This reduction was in addition to the reductions caused by the COVID-19 pandemic. Although the levels are currently below (that is compliant with) the objectives the AQMA remains an area of concern, especially considering proposed development along the A143 corridor.

Recently a revised AQAP has been submitted to Defra with the main action being to conduct a traffic feasibility repot looking at any improvements that could benefit the air quality in the Great Barton AQMA.

Figure 3.4 shows the five-year trend of nitrogen dioxide from monitoring locations within Great Barton, showing a significant drop for the monitoring locations within and immediately adjacent to the AQMA.

Figure 3.4 Five-year trend data for nitrogen dioxide at Great Barton monitoring sites



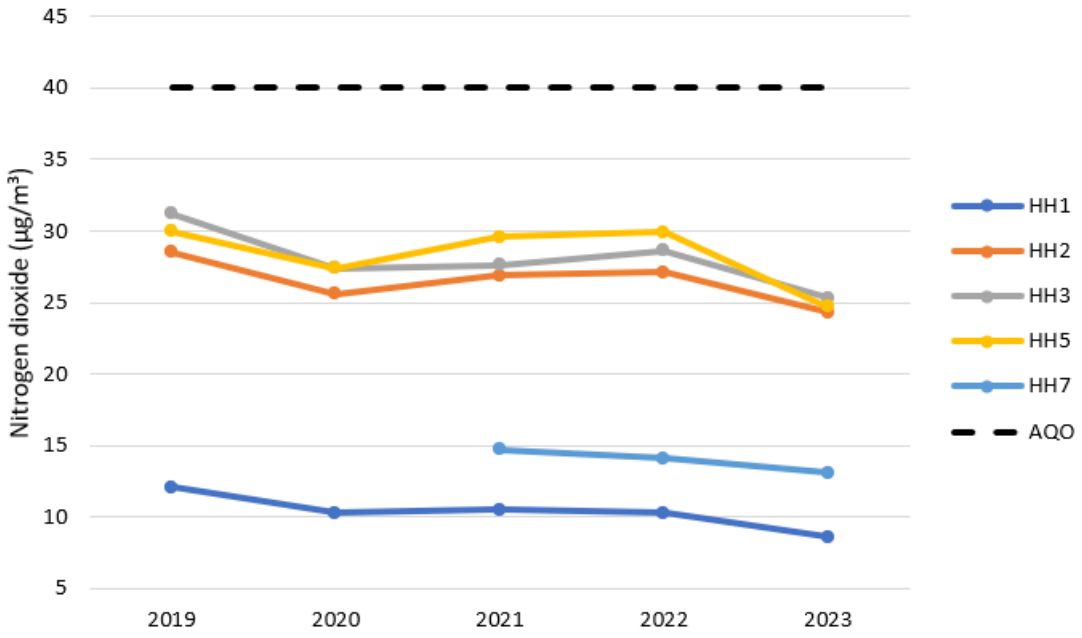
3.2.4 Haverhill

Monitoring points in Haverhill continue to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level. Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years. The highest recorded concentration was monitoring point HH3 along Withersfield Road with a value of 25.3µg/m^3.

Haverhill north-west relief road is due to open in Spring/Summer 2024 and should have a positive impact on the monitoring locations on Withersfield Road and Wratting Road (HH2, HH3 and HH5). Further information will be presented in future ASRs.

Figure 3.5 shows the five-year trend of nitrogen dioxide from monitoring locations within Haverhill.

Figure 3.5 Five-year trend data for nitrogen dioxide at Haverhill monitoring sites



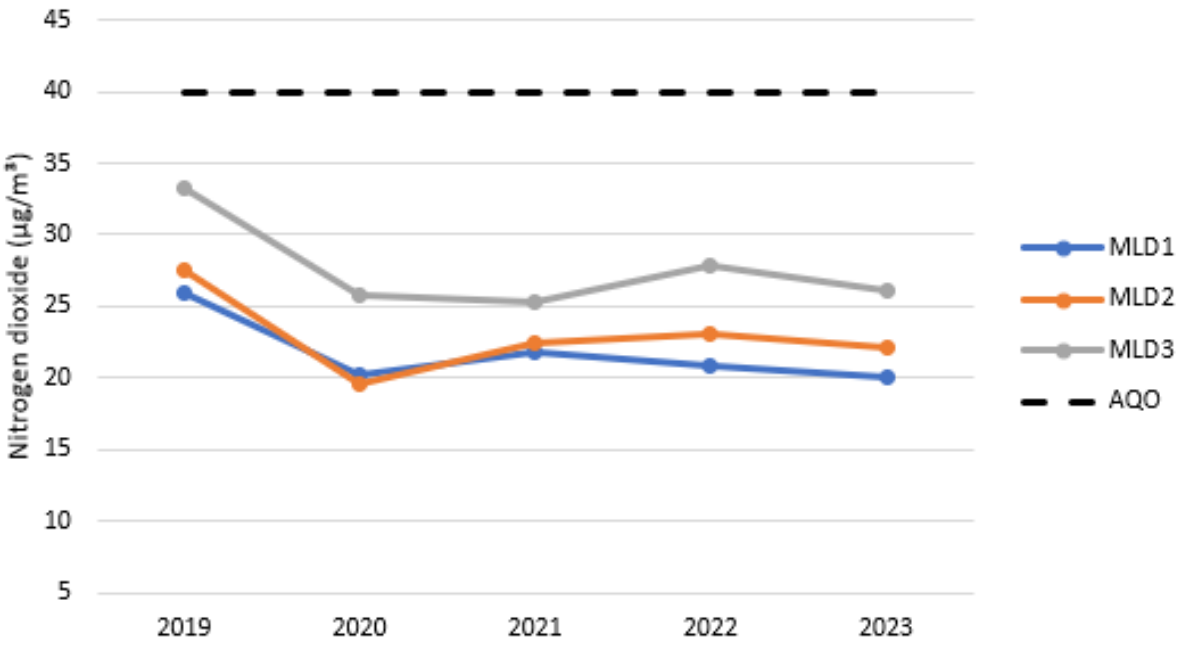
3.2.5 Lakenheath

Lakenheath has a monitoring point in the centre of the village. The recorded level for 2023 (14.0µg/m^3) was lower than that recorded in 2021 (16.1µg/m^3), which was lower than pre-pandemic records (19.7µg/m^3 in 2019).

3.2.6 Mildenhall

Mildenhall continue to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level of 40µg/m^3 with a high of 24.9µg/m^3 recorded at monitoring point MLD3 on Kingsway. Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years. Figure 3.6 shows the five-year trend of nitrogen dioxide from monitoring locations within Mildenhall, showing a drop in concentrations over the monitoring period.

Figure 3.6 Five-year trend data for nitrogen dioxide at Mildenhall monitoring sites



3.2.7 Newmarket

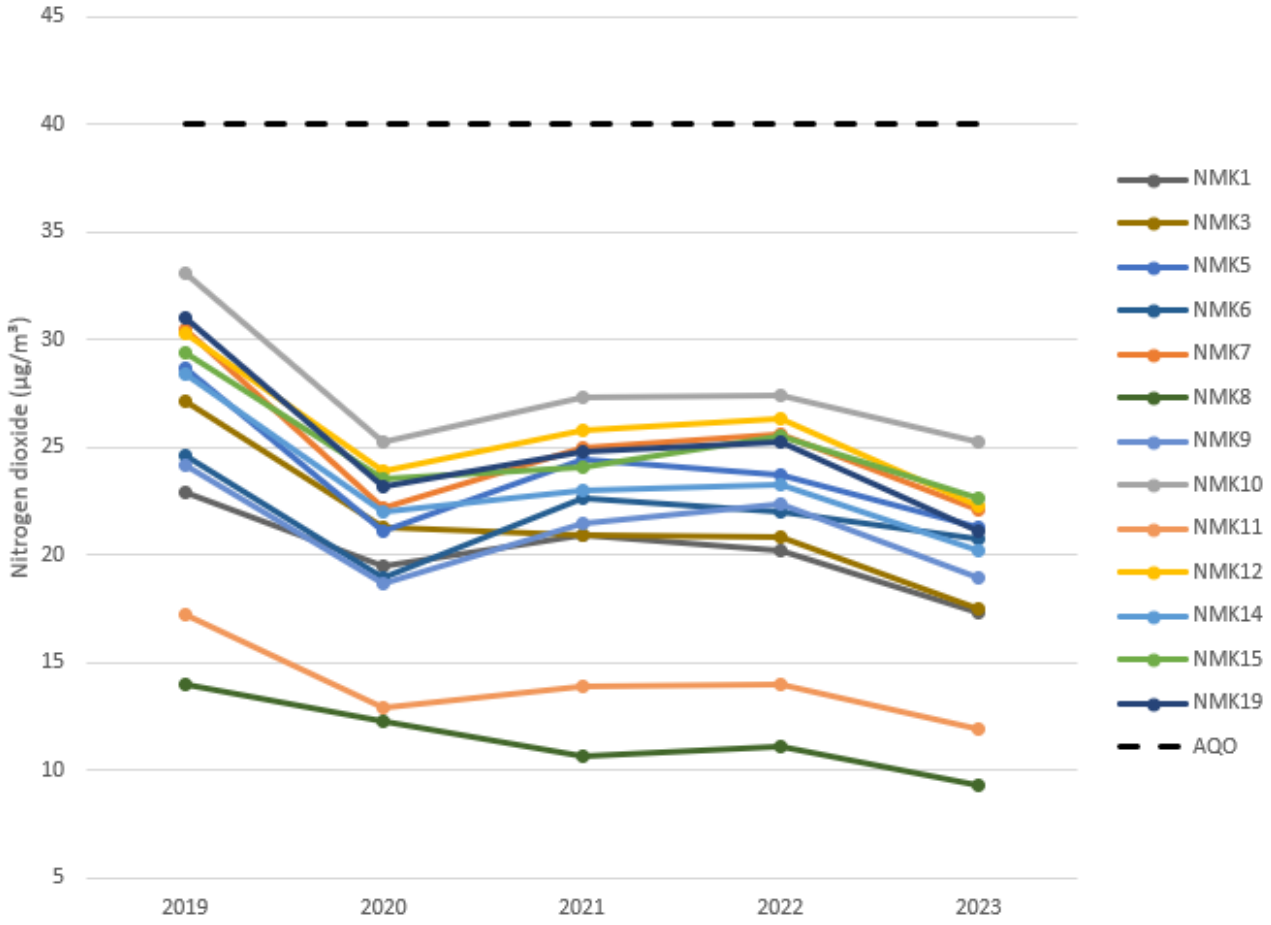
Newmarket continues to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level, with the highest concentration of nitrogen dioxide recorded at monitoring point NMK10 (adjacent to the taxi rank on the High Street) as 25.2µg/m^3.

All the monitoring locations within the former Newmarket AQMA, which was revoked in September 2021, remain well below the objective level.

Recorded levels in 2023 were broadly comparable to those measured in 2022, with all sites slightly lower. Results from all sites remain lower than those from 2019 and other pre-pandemic years.

Figure 3.7 shows the five-year trend of nitrogen dioxide from the seven monitoring locations in Newmarket with the highest records of nitrogen dioxide in 2022.

Figure 3.7 Five year trend data for nitrogen dioxide at Newmarket monitoring sites



3.2.8 Tuddenham

A single monitoring point was introduced in the village of Tuddenham at the beginning of 2022 at the request of the parish council; this showed relatively low levels of pollution at 15.8µg/m^3, being less than half of the annual mean objective of 40µg/m^3. In 2023 the annual mean has remained low at 13.0µg/m^3.

3.2.9 Clare

Two monitoring points have been installed in the village of Clare in January 2023. These both showed low levels of pollution at 20.4µg/m^3 and 16.7µg/m^3

3.2.10 Kentford

A single monitoring point has been introduced to the village of Kentford at the beginning of 2023, this monitoring point has shown low levels of pollution at 12.1µg/m^3.

3.2.11 Exning

Two monitoring points have been installed in the village of Exning in March 2023 close to the local primary school. These both showed low levels of pollution at 11.0µg/m^3 and 14.5µg/m^3 which is less than half of the annual mean objective of 40µg/m^3.

Appendix A: Monitoring results

Table A.1 – Details of non-automatic monitoring sites

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
BRN2	Brandon – 104 London Road	Roadside	577993	286163	NO2	Not in AQMA	3.3	1.7	2.2
BRN3	Brandon - Town Hall	Urban centre	578406	286460	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	Not applicable	2.4
BRN5	Brandon - 52 London Road	Roadside	578206	286407	NO2	Not in AQMA	7.0	1.1	2.2
BRN7	Brandon - London Road and Church Road	Kerbside	578073	286254	NO2	Not in AQMA	8.0	1.0	2.1
BRN9	Brandon - Riverside Lodge, High Street	Kerbside	578372	286867	NO2	Not in AQMA	3.3	0.3	2.2
BRN10	Brandon - 'Boots', High Street	Roadside	578395	286633	NO2	Not in AQMA	Hourly: 0 Annual: 0.5	2.5	2.4
BRN12	Brandon - 1 Thetford Road	Roadside	578486	286558	NO2	Not in AQMA	0.0	1.7	2.1
BRN15	Brandon - 92B High Street	Roadside	578317	287103	NO2	Not in AQMA	3.6	1.5	2.2
BRN17	Brandon - 25 London Road	Roadside	578297	286469	NO2	Not in AQMA	0.0	1.2	2.1

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
LAK1	Lakenheath - Zebra Crossing	Kerbside	571378	282855	NO2	Not in AQMA	3.5	1.0	2.1
MLD1	Mildenhall – 8 North Terrace	Roadside	571136	274878	NO2	Not in AQMA	1.5	1.9	2.1
MLD2	Mildenhall – 2 Queensway	Roadside	571092	274785	NO2	Not in AQMA	0.0	1.8	2.3
MLD3	Mildenhall - 14 Kingsway	Roadside	571326	274780	NO2	Not in AQMA	0.5	2.0	2.1
MLD4	Mildenhall – St Mary's (A1101 entrance)	Roadside	571121	275063	NO2	Not in AQMA	0.5	4.0	2.2
MLD5	Mildenhall – St Mary's – Trinity Avenue	Roadside	571259	275083	NO2	Not in AQMA	0.5	2.7	2.2
NMK1	Newmarket – 23 Old Station Road	Roadside	564716	263502	NO2	Not in AQMA	0.0	2.0	2.2
NMK3	Newmarket - Old Station Road and Rous Road	Roadside	564707	263493	NO2	Not in AQMA	2.0	1.7	2.2
NMK5	Newmarket - 'Café Nero' crossing	Kerbside	564337	263343	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	<1.0	2.2
NMK6	Newmarket - 'KFC' downpipe	Roadside	564307	263338	NO2	Not in AQMA	Hourly: 0 Annual: 0	6.5	2.3

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
NMK7	Newmarket - 'White Hart' crossing	Kerbside	564233	263274	NO2	Not in AQMA	0 – hourly 5.9 - annual	1.0	2.3
NMK8	Newmarket - Park area	Urban background	564138	263301	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	not applicable	2.2
NMK9	Newmarket - Blackbear Lane and High Street	Kerbside	564043	263159	NO2	Not in AQMA	3.0	0.6	2.3
NMK10	Newmarket - Taxi rank	Roadside	564362	263381	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	<1.0	2.3
NMK11	Newmarket - Market St 'EE'	Urban centre	564380	263407	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	11.0	2.0
NMK12	Newmarket - Clock tower crossing	Roadside	564550	263544	NO2	Not in AQMA	Hourly: 0 Annual: 0.3	2.5	2.1
NMK14	Newmarket - 'Rutland Arms' crossing	Kerbside	564480	263464	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	<1.0	2.3
NMK15	Newmarket - 'Savers' lamppost	Roadside	564383	263381	NO2	Not in AQMA	Hourly: 0 Annual: 5.5	2.5	2.3
NMK19	Newmarket - Old Station Road, Nancy's Tearoom	Kerbside	564626	263525	NO2	Not in AQMA	1.9	0.5	2.1

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
TUD1	Tuddenham - 37 High Street	Roadside	573521	271656	NO2	Not in AQMA	0.3	1.5	2.0
BSE1	Bury St Edmunds (BSE) - 2 Sicklesmere Road	Roadside	586253	263147	NO2	Not in AQMA	0.0	1.7	2.1
BSE2	BSE - 14 Sicklesmere Road	Roadside	586320	263053	NO2	Not in AQMA	0.0	4.0	2.0
BSE3	BSE - Cullum Road roundabout	Roadside	585236	263746	NO2	Not in AQMA	0.0	3.4	2.0
BSE6	BSE - Kings Road roundabout	Roadside	584905	264171	NO2	Not in AQMA	2.4	2.4	2.2
BSE8	BSE - Fornham Road (Northgate roundabout)	Roadside	585461	265050	NO2	Not in AQMA	6.0	1.5	2.0
BSE9	BSE - Fornham Road (Tollgate)	Roadside	585085	265924	NO2	Not in AQMA	2.8	1.5	2.2
BSE14	BSE - 19F Mustow Street	Roadside	585624	264334	NO2	Not in AQMA	0.2	2.3	2.2
BSE15	BSE - 7 Sicklesmere Road	Roadside	586273	263135	NO2	Not in AQMA	0.0	1.2	2.0
BSE16	BSE - Northgate Lodge Roundabout	Roadside	585424	264977	NO2	Not in AQMA	0.4	1.2	2.2

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
BSE17	BSE - Tayfen Road (Ipswich Street junction)	Roadside	585264	264921	NO2	Not in AQMA	not applicable	2.1	1.9
BSE18	BSE – 68-69 Southgate Street	Roadside	586126	263328	NO2	Not in AQMA	0.2	1.6	1.9
BSE19	BSE - Out Risbygate	Roadside	584618	264471	NO2	Not in AQMA	0.5	1.5	2.0
BSE21	BSE - Northgate Street	Roadside	585555	264494	NO2	Not in AQMA	0.0	2.6	2.0
BSE23	BSE - Guildhall Street	Roadside	585285	263841	NO2	Not in AQMA	0.3	1.0	2.0
BSE25	BSE - Orttewell Road	Roadside	587454	264216	NO2	Not in AQMA	Hourly: 10 Annual: not applicable	1.0	2.0
BSE26	BSE - 24 Kings Road	Roadside	584957	264164	NO2	Not in AQMA	0.0	1.2	2.0
BSE27	BSE - Westgate Street	Roadside	585349	263781	NO2	Not in AQMA	0.0	1.6	2.0
BSE28	BSE - Tayfen Road – New Havebury Housing	Roadside	585314	264960	NO2	Not in AQMA	0.0	1.4	2.2
BSE30	BSE - St Andrews Street South	Urban centre	585185	264285	NO2	Not in AQMA	Hourly: 0 Annual: not applicable	1.5	2.3

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
BSE32	BSE - Buttermarket	Urban centre	585315	264287	NO2	Not in AQMA	0.0	1.5	2.2
BSE33	BSE - Market Place -Preston and Duckworth	Urban centre	585281	264330	NO2	Not in AQMA	0.0	0.5	2.2
BSE31	BSE – Newmarket Road and Western Way	Roadside	583648	264767	NO2	Not in AQMA	3.5	2.0	2.2
BSE38	BSE – Tollgate – lamppost directly outside school fence	Roadside	584818	265826	NO2	Not in AQMA	0.5	3.5	2.2
BSE39	BSE – Tollgate – 137 Tollgate Lane	Roadside	584743	265777	NO2	Not in AQMA	2.5	0.3	2.2
BSE40	BSE - St Edmunds – road sign outside church	Roadside	585331	263766	NO2	Not in AQMA	0.5	3.0	2.2
BSE41	BSE - St Edmunds – Lamppost opposite YMCA	Kerbside	585405	263775	NO2	Not in AQMA	0.0	1.5	2.2
GB2	Great Barton - Downing Drive	Suburban	588917	267370	NO2	Not in AQMA	not applicable	1.5	1.9
GB3	Great Barton - The Forge Bungalows	Roadside	589163	267013	NO2	Not in AQMA	4.0	1.4	2.3

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
GB4a, GB4b, GB4	Great Barton - Post Office (lamppost)	Roadside	589130	266969	NO2	Not in AQMA	0.0	1.4	2.4
GB5	Great Barton - Church Road junction	Roadside	588993	266838	NO2	Not in AQMA	22.0	1.3	2.2
GB6	Great Barton - Post Office 2, telegraph pole	Roadside	589120	266960	NO2	Yes - Great Barton AQMA	0.3	1.0	2.4
GB7a, GB7b, GB7c	Great Barton - The Drift, 8 The Street	Roadside	589100	266941	NO2	Yes - Great Barton AQMA	0.0	1.1	2.2
GB8	Great Barton - Opposite AQMA 1	Roadside	589093	266949	NO2	Not in AQMA	not applicable	1.3	2.1
GB9	Great Barton - Opposite AQMA 2	Roadside	589117	266970	NO2	Not in AQMA	not applicable	1.3	2.1
GB10	Great Barton - Between crossing and garage	Roadside	589228	267071	NO2	Not in AQMA	5.0	1.3	2.1
HH1	Haverhill - Shetland Road	Suburban	568609	245575	NO2	Not in AQMA	not applicable	1.7	2.3
HH2	Haverhill - Wratting Road	Roadside	567270	245981	NO2	Not in AQMA	3.0	1.8	2.1

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
HH3	Haverhill - 29 Withersfield Road	Roadside	566891	245892	NO2	Not in AQMA	2.4	1.7	2.2
HH5	Haverhill - 22 Withersfield Road	Roadside	566941	245850	NO2	Not in AQMA	0.3	1.4	2.1
HH7	Haverhill - Mount Road	Kerbside	567553	245289	NO2	Not in AQMA	1.6	0.1	2.1
CLA1	Clare - 2 Cavendish Road	Kerbside	577028	245412	NO2	Not in AQMA	0.0	0.5	1.8
CLA2	Clare - Membury House, Well Lane	Roadside	576994	245281	NO2	Not in AQMA	0.5	1.5	2.2
KNT1	Kentford – Bus Stop, Bury Road (1 Orchard Place)	Roadside	570549	266761	NO2	Not in AQMA	0.5	1.5	2.2
EXN1	Exning – Primary School Lamppost	Roadside	561763	265670	NO2	Not in AQMA	0.0	4.0	2.2
EXN2	Exning – Oxford Street, Swan Lane and Chapel Street	Kerbside	561804	265663	NO2	Not in AQMA	0.0	1.5	2.0

Table A.2 – Annual mean NO2 monitoring results: Non-automatic monitoring (µg per m^3)

Note: The annual mean concentrations are presented as µg/m3 and have been corrected for bias. All annual means have been 'annualised' as per LAQM.TG22 if valid data capture for the full calendar year is less than 75 per cent. See Appendix C for details. Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment. Exceedances of the NO2 annual mean objective of 40µg/m3 are shown in bold. All diffusion tube locations were monitored for the full calendar year.

Diffusion Tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture 2023 (%)	2019	2020	2021	2022	2023
BRN2	577993	286163	Roadside	90.7	26.4	22.2	24.6	24.7	22.6
BRN3	578406	286460	Urban centre	90.7	13.5	10.4	10.9	10.2	8.7
BRN5	578206	286407	Roadside	90.7	27.4	21.0	23.4	24.7	22.1
BRN7	578073	286254	Kerbside	90.7	29.5	25.9	26.3	27.3	25.9
BRN9	578372	286867	Kerbside	56.7	22.5	17.4	21.1	22.0	19.1
BRN10	578395	286633	Roadside	90.7	36.1	23.8	26.3	26.0	23.5
BRN12	578486	286558	Roadside	90.7	23.1	18.1	18.3	19.7	17.7
BRN15	578317	287103	Roadside	67.1	27.9	20.0	24.2	22.3	21.8
BRN17	578297	286469	Roadside	67.7	-	-	19.3	17.7	17.8
LAK1	571378	282855	Kerbside	90.7	19.7	15.4	16.1	16.0	14.0
MLD1	571136	274878	Roadside	83.6	25.9	20.2	21.8	20.9	20.0
MLD2	571092	274785	Roadside	90.7	27.5	19.6	22.4	23.1	22.1
MLD3	571326	274780	Roadside	67.1	33.2	25.8	25.3	27.9	26.1
MLD4	571121	275063	Roadside	58.4	-	-	-	-	19.6
MLD5	571259	275083	Roadside	67.1	-	-	-	-	8.8
NMK1	564716	263502	Roadside	90.7	23.9	19.5	20.9	20.2	17.3
NMK3	564707	263493	Roadside	75.1	27.1	21.3	20.9	20.8	17.5
NMK5	564337	263343	Kerbside	90.7	28.7	21.1	24.4	23.7	21.3

Diffusion Tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture 2023 (%)	2019	2020	2021	2022	2023
NMK6	564307	263338	Roadside	90.7	24.6	18.9	22.6	22.0	20.7
NMK7	564233	263274	Kerbside	90.7	30.5	22.2	25.0	25.6	22.1
NMK8	564138	263301	Urban background	90.7	14.0	11.6	10.6	11.1	9.3
NMK9	564043	263159	Kerbside	90.7	24.2	18.7	21.5	22.4	18.9
NMK10	564362	263381	Roadside	82.7	33.1	25.2	27.3	27.4	25.2
NMK11	564380	263407	Urban centre	75.9	17.2	12.9	13.9	14.0	11.9
NMK12	564550	263544	Roadside	90.7	30.3	23.9	25.8	26.3	22.3
NMK14	564480	263464	Kerbside	83.0	28.4	22.0	23.0	23.3	20.2
NMK15	564383	263381	Roadside	83.3	29.4	23.5	24.1	25.5	22.6
NMK19	564626	263525	Kerbside	90.7	31.0	23.2	24.8	25.2	21.1
TUD1	573521	271656	Roadside	75.1	-	-	-	15.8	13.0
BSE1	586253	263147	Roadside	72.9	36.6	28.9	31.8	31.3	29.8
BSE2	586320	263053	Roadside	81.9	25.0	20.6	20.8	20.9	18.9
BSE3	585236	263746	Roadside	90.7	25.9	21.0	21.8	21.8	20.4
BSE6	584905	264171	Roadside	90.7	32.7	22.7	26.0	27.9	23.4
BSE8	585461	265050	Roadside	90.7	27.9	22.2	25.9	25.2	22.8
BSE9	585085	265924	Roadside	90.7	32.0	22.3	25.1	25.1	23.0
BSE14	585624	264334	Roadside	90.7	30.2	22.7	24.1	26.4	25.8
BSE15	586273	263135	Roadside	73.7	30.1	24.7	30.2	27.4	22.7
BSE16	585424	264977	Roadside	81.9	33.3	24.2	26.6	26.7	23.9
BSE17	585264	264921	Roadside	82.7	37.2	28.4	26.1	23.5	21.6
BSE18	586126	263328	Roadside	90.7	26.8	20.6	22.4	22.6	19.9
BSE19	584618	264471	Roadside	74.5	29.4	18.3	22.5	22.2	20.7

Diffusion Tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture 2023 (%)	2019	2020	2021	2022	2023
BSE21	585555	264494	Roadside	83.0	26.7	20.7	23.4	22.6	20.0
BSE23	585285	263841	Roadside	73.2	18.4	13.8	15.1	14.4	13.8
BSE25	587454	264216	Roadside	90.7	16.3	-	-	16.2	13.8
BSE26	584957	264164	Roadside	90.7	26.7	18.8	21.2	22.3	20.0
BSE27	585349	263781	Roadside	90.7	23.1	16.7	21.5	20.0	17.3
BSE28	585314	264960	Roadside	74.8	-	16.3	17.8	20.2	23.0
BSE30	585185	264285	Urban centre	74.5	-	16.3	17.8	20.2	16.5
BSE31	583648	264767	Roadside	90.7	-	22.5	24.0	24.5	21.3
BSE32	585315	264287	Kerbside	90.7	-	-	-	-	12.3
BSE33	585281	264330	Kerbside	90.7	-	-	-	-	12.5
BSE38	584818	265826	Roadside	65.5	-	-	-	-	16.1
BSE39	584743	265777	Roadside	82.2	-	-	-	-	15.0
BSE40	585331	263766	Roadside	75.1	-	-	-	-	15.6
BSE41	585405	263775	Kerbside	64.7	-	-	-	-	17.0
GB2	588917	267370	Suburban	90.7	10.5	8.5	7.6	7.9	6.7
GB3	589163	267013	Roadside	90.7	27.2	22.2	22.2	22.4	20.2
GB4a, GB4b, GB4c	589130	266969	Roadside	90.7	29.1	23.2	24.8	24.9	23.3
GB5	588993	266838	Roadside	90.7	27.4	21.5	21.6	20.7	20.0
GB6	589120	266960	Roadside	82.7	45.1	32.5	35.2	34.5	32.1
GB7a, GB7b, GB7c	589100	266941	Roadside	90.7	40.8	31.1	32.4	33.4	30.6
GB8	589093	266949	Roadside	72.9	33.1	28.0	29.6	28.1	28.1
GB9	589117	266970	Roadside	82.7	34.3	25.4	26.8	25.2	24.3

Diffusion Tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture 2023 (%)	2019	2020	2021	2022	2023
GB10	589228	267071	Roadside	90.7	-	21.2	22.0	24.7	23.2
HH1	568609	245575	Suburban	90.7	12.1	10.3	10.5	10.3	8.6
HH2	567270	245981	Roadside	90.7	28.5	25.6	26.9	27.1	24.3
HH3	566891	245892	Roadside	73.2	31.2	27.4	27.6	28.6	25.3
HH5	566941	245850	Roadside	90.7	30.0	27.4	29.6	29.9	24.7
HH7	567553	245289	Kerbside	90.7	-	-	14.7	14.1	13.1
CLA1	577028	245412	Kerbside	90.7	-	-	-	-	20.4
CLA2	576994	245281	Roadside	90.7	-	-	-	-	16.7
KNT1	570549	266761	Roadside	90.7	-	-	-	-	12.1
EXN1	561763	265670	Roadside	74.5	-	-	-	-	11.0
EXN2	561804	265663	Kerbside	56.4	-	-	-	-	14.5

West Suffolk Council can confirm that:

- annualisation has been conducted where data capture is less than 75 per cent and more than 25 per cent, in line with LAQM.TG22
- diffusion tube data has been bias adjusted
- reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), that is, prior to any fall-off with distance correction.

Table A.3 – Annual mean NO2 monitoring results for sites monitored in last five years but not during 2023: non-automatic monitoring (µg/m^3)

Note: The annual mean concentrations are presented as µg/m^3 and have been corrected for bias. All annual means have been 'annualised' as per LAQM.TG22 if valid data capture for the full calendar year is less than 75 per cent. Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

Diffusion tube ID	Site name	X OS Grid ref (Easting)	Y OS Grid ref (Northing)	Site type	2019	2020	2021	2022	2023
BRN1	Brandon – 6 Church Road	578044	286249	Roadside	21.0	17.1	-	-	-
BRN6	Brandon - London Rd - Coulson Lane	578270	286467	Roadside	22.5	-	-	-	-
BRN8	Brandon - Hellesdon House, High Street	578372	286774	Roadside	23.0	20.2	21.1	-	-
BRN13	Brandon - 25 George Street	578502	286484	Roadside	18.7	-	-	-	-
BRN14	Brandon - 28 Bury Road	578479	286320	Roadside	18.8	-	-	-	-
BRN16	Brandon – 83 - 85 London Road	578176	286357	Roadside	-	24.3	-	-	-
NMK2	Newmarket – 36 Old Station Road	564689	263500	kerbside	28.5	23.2	-	-	-
NMK17	Newmarket – Exning Road and Depot Road	563397	264498	Roadside	21.4	16.1	16.6	16.2	-
BSE5	Bury St Edmunds - Horringer Road lights	584703	263483	Roadside	20.8	-	-	-	-
BSE7	BSE - Northgate Lodge Roundabout	585446	264956	Roadside	24.2	-	-	-	-
BSE20	Bury St Edmunds – Risbygate Street	585031	264466	Roadside	18.1	13.4	16.8	14.5	-
BSE22	Bury St Edmunds - Churchgate Street	585508	264072	Roadside	19.4	-	-	-	-

Diffusion tube ID	Site name	X OS Grid ref (Easting)	Y OS Grid ref (Northing)	Site type	2019	2020	2021	2022	2023
BSE24	Bury St Edmunds - Hollow Road Bridge	586418	265179	Roadside	30.2	25.2	26.6	-	-
BSE29	Bury St Edmunds – 7 Southgate Street	585845	263730	Roadside	-	13.6	13.9	13.4	-
IXW1	Ixworth Micklesmere Drive	593655	270127	Roadside	-	-	16.3	16.6	-
IXW2	Ixworth High Street	593281	270545	Roadside	-	-	18.3	17.5	-

Appendix B: Full monthly diffusion tube results for 2023

Table B.1 – NO2 2023 diffusion tube results (µg/m^3)

Notes: No sites required distance correction. See Appendix C for details on bias adjustment and annualisation. Data received from the laboratory for November 2023 contained a number of significant errors and has therefore been excluded.

Diffusion tube ID	X OS Grid reference - easting	Y OS Grid reference - northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean: raw data	Annual mean: annualised and bias adjusted (0.77)	Comment
BRN2	577993	286163	34.8	39.7	30.2	30.9	27.9	29.6	25.3	24.7	31.9	30.4	-	17.1	29.3	22.6	
BRN3	578406	286460	17.1	17.3	12.3	10.1	9.6	8.7	6.6	7.7	11.2	13.0	-	10.9	11.3	8.7	
BRN5	578206	286407	41.4	41.6	30.1	26.0	21.2	23.3	24.8	23.0	32.0	29.5	-	22.8	28.7	22.1	
BRN7	578073	286254	29.5	40.4	33.1	32.7	32.6	30.2	28.0	29.1	43.0	40.0	-	31.5	33.6	25.9	
BRN9	578372	286867	22.1	-	-	26.6	25.6	-	17.7	20.8	-	27.1	-	20.0	22.8	19.1	
BRN10	578395	286633	29.6	35.6	32.3	35.0	30.4	32.2	21.8	25.3	35.5	33.4	-	24.4	30.5	23.5	
BRN12	578486	286558	31.4	33.1	22.3	21.0	20.7	18.7	14.9	17.4	23.6	27.6	-	21.7	22.9	17.7	
BRN15	578317	287103	30.1	-	-	27.4	28.2	25.8	-	23.1	29.4	28.1	-	21.5	26.7	21.8	
BRN17	578297	286469	26.2	29.7	24.2	-	22.1	22.1	-	18.0	22.8	-	-	16.3	22.7	17.8	
LAK1	571378	282855	23.7	25.1	19.9	18.8	17.9	16.7	12.7	14.3	21.5	19.1	-	10.2	18.2	14.0	
MLD1	571136	274878	28.4	30.8	27.6	27.1	27.1	21.5	-	20.4	29.3	30.0	-	17.5	26.0	20.0	
MLD2	571092	274785	34.3	36.1	30.3	28.2	25.8	27.4	23.8	22.2	35.7	29.7	-	22.0	28.7	22.1	
MLD3	571326	274780	-	42.3	33.6	32.1	-	24.8	23.2	33.4	-	38.5	-	30.9	32.4	26.1	
MLD4	571121	275063	-	-	25.3	-	21.5	19.7	17.0	18.6	24.8	26.7	-	-	21.9	19.6	
MLD5	571259	275083	-	-	11.9	10.1	-	7.5	8.5	7.9	12.1	14.2	-	9.9	10.3	8.8	
NMK1	564716	263502	29.8	28.5	23.3	25.1	21.9	20.1	15.0	18.7	23.8	22.1	-	19.1	22.5	17.3	
NMK3	564707	263493	32.8	34.3	23.4	20.5	16.3	17.1	17.6	18.9	23.6	-	-	-	22.7	17.5	
NMK5	564337	263343	35.6	35.1	28.9	28.6	22.5	26.0	23.2	22.5	30.2	29.9	-	22.3	27.7	21.3	
NMK6	564307	263338	32.6	33.5	27.2	25.8	23.4	26.9	26.4	23.8	24.6	29.5	-	22.6	26.9	20.7	
NMK7	564233	263274	20.7	38.2	29.0	27.4	25.1	29.7	27.4	24.4	30.3	34.7	-	28.3	28.7	22.1	
NMK8	564138	263301	20.0	20.0	12.0	12.2	7.7	8.4	8.1	8.5	11.8	14.1	-	10.1	12.1	9.3	
NMK9	564043	263159	30.1	31.2	24.7	26.0	22.1	22.8	19.9	20.2	26.6	26.4	-	20.0	24.5	18.9	
NMK10	564362	263381	47.1	45.4	32.3	27.3	23.9	26.7	29.1	28.6	32.0	35.1	-	-	32.8	25.2	
NMK11	564380	263407	22.9	23.3	15.5	14.8	11.1	12.3	-	10.9	-	19.2	-	9.5	15.5	11.9	
NMK12	564550	263544	35.1	37.9	25.8	26.2	23.2	26.5	27.4	25.9	31.1	34.8	-	24.1	28.9	22.3	
NMK14	564480	263464	31.1	34.4	29.0	22.9	20.1	22.1	21.9	23.1	-	31.8	-	26.2	26.3	20.2	
NMK15	564383	263381	33.3	34.9	30.3	30.2	-	23.7	27.4	22.7	32.7	32.4	-	25.3	29.3	22.6	
NMK19	564626	263525	35.4	36.8	28.3	30.1	21.9	23.5	24.2	25.1	35.3	29.0	-	11.3	27.4	21.1	

Diffusion tube ID	X OS Grid reference - easting	Y OS Grid reference - northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean: raw data	Annual mean: annualised and bias adjusted (0.77)	Comment
TUD1	573521	271656	22.6	25.5	16.8	16.5	16.9	13.8	10.3	13.2	16.9	-	-	-	16.9	13.0	
BSE1	586253	263147	43.3	48.6	42.1	36.2	29.9	-	29.5	34.6	40.1	44.3	-	-	38.7	29.8	
BSE2	586320	263053	28.6	33.1	-	23.9	21.9	20.2	20.5	20.1	25.0	27.8	-	24.5	24.6	18.9	
BSE3	585236	263746	34.2	36.3	28.3	24.2	21.4	22.9	22.0	23.0	26.3	30.1	-	23.4	26.6	20.4	
BSE6	584905	264171	34.1	40.5	34.9	35.1	31.3	23.7	20.9	27.2	35.5	22.9	-	27.6	30.3	23.4	
BSE8	585461	265050	37.1	38.2	29.0	31.2	28.1	25.3	21.3	27.3	30.8	34.8	-	22.3	29.6	22.8	
BSE9	585085	265924	33.5	34.9	31.8	30.6	27.5	29.4	25.0	27.3	35.9	28.2	-	24.6	29.9	23.0	
BSE14	585624	264334	35.5	39.4	37.1	35.6	26.8	27.2	31.4	30.8	36.1	36.4	-	31.8	33.5	25.8	
BSE15	586273	263135	38.5	34.7	33.4	31.4	23.1	-	-	22.7	27.5	30.4	-	23.9	29.5	22.7	
BSE16	585424	264977	39.6	39.9	-	31.5	28.3	25.4	27.2	30.5	35.9	25.6	-	26.1	31.0	23.9	
BSE17	585264	264921	32.4	30.3	30.9	27.3	24.7	22.0	24.4	24.5	33.5	30.8	-	-	28.1	21.6	
BSE18	586126	263328	33.0	33.2	28.4	31.2	16.7	25.7	16.8	23.3	27.1	29.8	-	18.8	25.8	19.9	
BSE19	584618	264471	29.5	36.7	-	25.6	-	25.8	20.1	24.7	25.0	31.5	-	22.5	26.8	20.7	
BSE21	585555	264494	31.6	34.2	32.7	25.3	22.1	20.4	20.0	17.6	28.5	-	-	27.5	26.0	20.0	
BSE23	585285	263841	23.5	27.7	18.2	15.9	13.4	-	11.2	12.6	-	21.3	-	17	17.9	13.8	
BSE25	587454	264216	18.8	24.6	17.6	19.9	13.5	17.0	11.5	15.6	19.5	25.1	-	13.4	17.9	13.8	
BSE26	584957	264164	28.1	35.1	27.7	24.7	20.8	23.1	23.4	19.7	31.1	31.2	-	21.3	26.0	20.0	
BSE27	585349	263781	20.7	35.0	25.0	23.3	20.8	20.1	16.2	20.2	19.9	24.6	-	21.9	22.5	17.3	
BSE28	585314	264960	-	37.3	32.9	29.5	-	31.7	23.0	28.4	30.2	33.9	-	21.6	29.8	23.0	
BSE30	585185	264285	22.5	27.0	19.8	-	20.3	25.1	13.9	18.2	19.9	26.5		-	21.5	16.5	
BSE32	585315	264287	19.6	24.4	16.7	17.8	14.0	14.3	10.6	12.5	14.7	17.8	-	14.0	16.0	12.3	
BSE33	585281	264330	20.1	22.2	18.6	16.0	13.9	14.5	12.5	13.0	15.0	17.6	-	15.2	16.2	12.5	
BSE31	583648	264767	32.9	34.1	30.5	29.0	21.0	26.8	21.5	25.2	31.9	27.3	-	24.7	27.7	21.3	
BSE38	584818	265826	-	25.3	-	19.8	16.4	17.0	14.7	14.3	22.7	27.5	-	-	19.7	16.1	
BSE39	584743	265777	-	25.6	20.9	20.1	17.3	18.4	14.5	15.6	22.8	26.9	-	12.4	19.5	15.0	
BSE40	585331	263766	-	28.7	20.3	17.3	14.4	16.1	-	17.5	20.9	25.0	-	22.5	20.3	15.6	
BSE41	585405	263775	-	31.6	22.1	21.7	16.4	-	17.6	17.8	23.5	-	-	15.3	20.8	17.0	
GB2	588917	267370	13.1	13.7	8.9	6.5	5.4	5.4	5.8	5.8	8.3	11.8	-	10.6	8.7	6.7	
GB3	589163	267013	35.8	33.0	26.4	22.0	19.5	19.2	23.3	26.6	24.7	31.7	-	26.1	26.2	20.2	
GB4a	589130	266969	34.3	42.2	30.1	29.4	25	26.5	20.3	27.7	30.9	28.0	-	25.9	30.3	23.3	Triplicate Site with GB4a, GB4b and GB4c
GB4b	589130	266969	36.1	41.0	28.9	31.0	28.3	28.2	21.6	25.8	31.6	36.7	-	27.9			
GB4c	58910	266969	37.8	43.5	32.8	31.1	32.1	30.0	25.6	23.1	33.9	32.6	-	20.4			
GB5	588993	266838	26.2	30.1	26.6	24.8	23.4	21.8	24.1	26.0	36.1	30.1	-	16.9	26.0	20.0	
GB6	589120	266960	38.8	51.8	42.9	42.2	35.8	41.6	38.3	40.4	43.9	41.7	-	-	41.7	32.1	

Diffusion tube ID	X OS Grid reference - easting	Y OS Grid reference - northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean: raw data	Annual mean: annualised and bias adjusted (0.77)	Comment
GB7a	589100	266941	38.9	49.6	40.6	42.5	39.0	43.1	34.1	36.5	43.9	44.8	-	28.9	40.1	30.6	Triplicate Site with GB7a, GB7b and GB7c
GB7b	589100	266941	42.1	48.8	35.2	42.3	39.9	40.9	35.9	35.3	44.2	43.6	-	-			
GB7c	589100	266941	42.2	47.6	40.2	41.5	43.3	39.1	32.7	37.0	42.5	42.3	-	25.0			
GB8	589093	266949	37.6	49.2	37.7	33.6	32.7	-	25.7	31.5	39.4	41.1	-	-	36.5	28.1	
GB9	589117	266970	25.4	41.6	31.0	30.1	30.7	34.0	27.3	27.5	34.3	33.2	-	-	31.5	24.3	
GB10	589228	267071	36.6	40.2	30.0	27.7	28.5	29.5	23.6	23.8	32.2	34.2	-	25.1	30.1	23.2	
HH1	568609	245575	14.0	17.6	12.2	9.7	6.4	7.0	8.1	7.6	11.0	16.2	-	12.5	11.1	8.6	
HH2	567270	245981	39.6	38.4	33.3	36.2	23.7	32.5	22.3	25.4	37.9	31.4	-	26.6	31.6	24.3	
HH3	566891	245892	44.5	46.0	36.5	32.6	17.9	22.5	27.8	-	-	36.8	-	31.3	32.9	25.3	
HH5	566941	245850	36.9	42.9	36.7	36.5	35.9	29.1	20.3	26.2	31.4	34.2	-	22.3	32.0	24.7	
HH7	567553	245289	29.0	23.9	17.9	15.8	12.9	11.7	10.3	12.4	17.4	20.9	-	15.0	17.0	13.1	
CLA1	577028	245412	26.5	29.4	28.4	27.7	28.5	26.4	20	24.9	30.4	30.7	-	17.9	26.4	20.4	
CLA2	576994	245281	26.0	25.1	21.5	21.6	15.5	17.2	19	18.3	24	28.6	-	21.8	21.7	16.7	
KNT1	570549	266761	22.5	24.4	16.0	15.1	11.8	13.9	9.3	11.3	15.2	19.9	-	14.0	15.8	12.1	
EXN1	561763	265670			18.7	18.0	12.4	14.5	9.8	9.1	14.1	22.0	-	10.1	14.3	11.0	
EXN2	561804	265663			19.6		13.3	17.1	14.0	-	15.8	19.0	-	16.7	16.5	14.5	

West-Suffolk-Council confirm that:

- All erroneous data has been removed from the NO2 diffusion tube dataset presented in Table B.1
- Annualisation has been conducted where data capture is less than 75 per cent and more than 25 per cent in line with LAQM.TG22
- The national bias adjustment factor has been used
- All 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

Appendix C: Supporting technical information and air quality monitoring data quality assurance and quality control

New or changed sources identified within West Suffolk Council during 2023

West Suffolk Council has not identified any significant new sources relating to air quality within the reporting year of 2023.

Additional air quality works undertaken by West Suffolk Council during 2023

West Suffolk Council has not completed any additional modelling or monitoring works within the reporting year of 2023.

Quality assurance and quality control of diffusion tube monitoring

During 2023, West Suffolk Council used Socotec, based in Didcot, for the supply and processing of diffusion tubes. The tubes were prepared by spiking acetone: triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow auto-analyser with ultraviolet detection. This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS (United Kingdom Accreditation Service) schedule. In the AIR PT (Air and Stack Emissions proficiency testing) intercomparison scheme for comparing spiked nitrogen dioxide diffusion tubes, Socotec currently holds the highest rank of a satisfactory laboratory.

All monitoring has taken place in line with the 2023 diffusion tube monitoring calendar as published by Defra.

Diffusion tube annualisation

Annualisation is required for any site with data capture less than 75 per cent but greater than 25 per cent where results may not be reflective of the yearly average. Annualisation ensures that these sites are more reflective of a whole year's data rather than just the months where data was collected.

Annualisation was required for eighteen diffusion tube monitoring locations in West Suffolk, BRN9 56.7 per cent, BRN15 67.1per cent, BRN17 67.7 per cent, BSE1 72.9 per cent, BSE15 73.7 per cent, BSE19 74.5 per cent, BSE23 73.2 per cent, BSE28 74.8 per cent, BSE30 74.5 per cent, BSE38 65.5 per cent, BSE41 64.7 per cent, GB8 72.9 per cent, HH3 73.2 per cent, MLD3 67.1 per cent, MLD4 58.4% per cent MLD5 67.1 per cent, EXN1 74.5 per cent and EXN2 56.4 per cent. Annualisation was completed using the Defra diffusion tube data processing tool using data from automatic monitoring sites in Cambridgeshire (Wicken Fen and Cambridge Roadside) and Essex (St Osyth). Details of the annualisation process is included in Table C.1.

Table C.1 - Annualisation summary (concentrations presented in µg/m³)

Site ID	Annualisation factor Wicken Fen	Annualisation factor St Osthys	Annualisation factor Cambridge Roadside	Average Annualisation factor	Raw data annual mean	Annualised annual mean
BRN9	1.1014	1.0792	1.0701	1.0836	22.8	24.8
BRN15	1.0230	1.0876	1.0648	1.0585	26.7	28.3
BRN17	0.9990	1.0184	1.0404	1.0193	22.7	23.1
BSE1	0.9871	1.0014	1.0029	0.9971	38.7	29.8
BSE15	0.9856	0.9703	0.9897	0.9819	29.5	22.7
BSE19	0.9762	1.0090	1.0337	1.0063	26.8	20.7
BSE23	1.0371	0.9873	1.0174	1.0139	17.9	13.8
BSE28	1.0083	1.0806	1.0411	1.0433	29.8	23.0
BSE30	0.9904	1.0447	1.0416	1.0256	21.5	16.5
BSE38	0.9830	1.1258	1.0712	1.0600	19.7	20.9
BSE41	1.0482	1.1025	1.0442	1.0650	20.8	22.1
GB8	0.9871	1.0014	1.0029	0.9971	36.5	28.1
HH3	1.0128	0.9752	1.0310	1.0063	32.9	25.3
MLD3	1.0333	1.0605	1.0511	1.0483	32.4	33.9
MLD4	1.0794	1.2932	1.1143	1.1623	21.9	25.5
MLD5	1.0720	1.1920	1.0784	1.1141	10.3	11.4
EXN1	1.0885	1.2189	1.0949	1.1341	14.3	11.0
EXN2	1.0898	1.2253	1.1002	1.1384	16.5	18.8

Diffusion tube bias adjustment factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 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 NOx and NO2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

West Suffolk Council have applied a national bias adjustment factor of 0.77 to the 2023 monitoring data. A summary of bias adjustment factors used by West Suffolk Council over the past five years is presented in Table C.2.

Table C.2 – Bias adjustment factors from 2019 to 2023

Monitoring year	Local or national	If national, version of national spreadsheet	Adjustment factor
2023	National	03/24	0.77
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	03/20	0.75

NO2 fall-off with distance from the road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool and NO2 fall-off with distance calculator available on the LAQM Support website.

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account).

No diffusion tube NO2 monitoring locations within West Suffolk met the above requirements distance correction during 2023.

Appendix D: Maps of monitoring locations and AQMAs

Figure D.1 – Map of non-automatic monitoring sites: Brandon

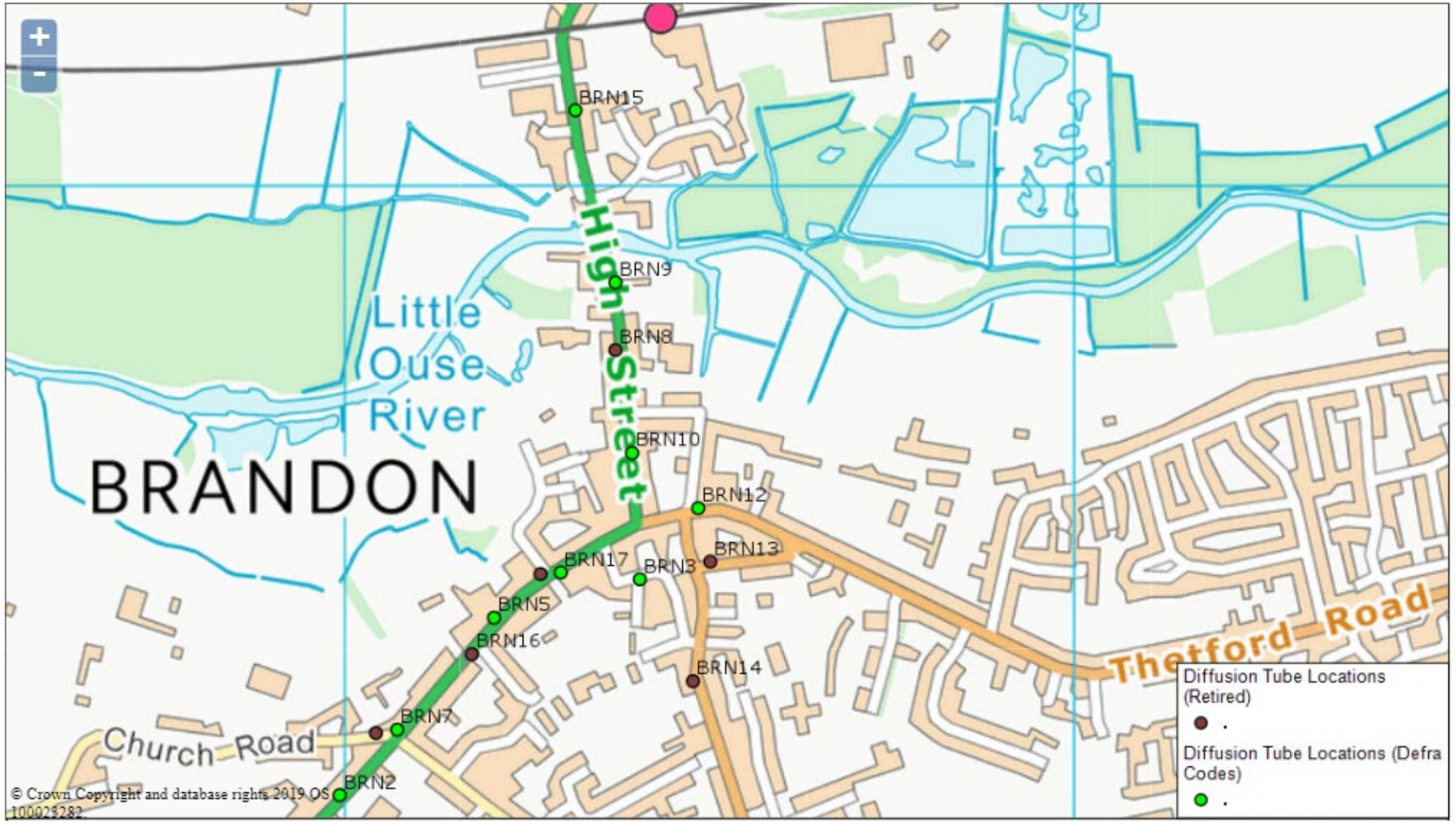


Figure D.2 – Map of non-automatic monitoring sites: Bury St Edmunds (north)

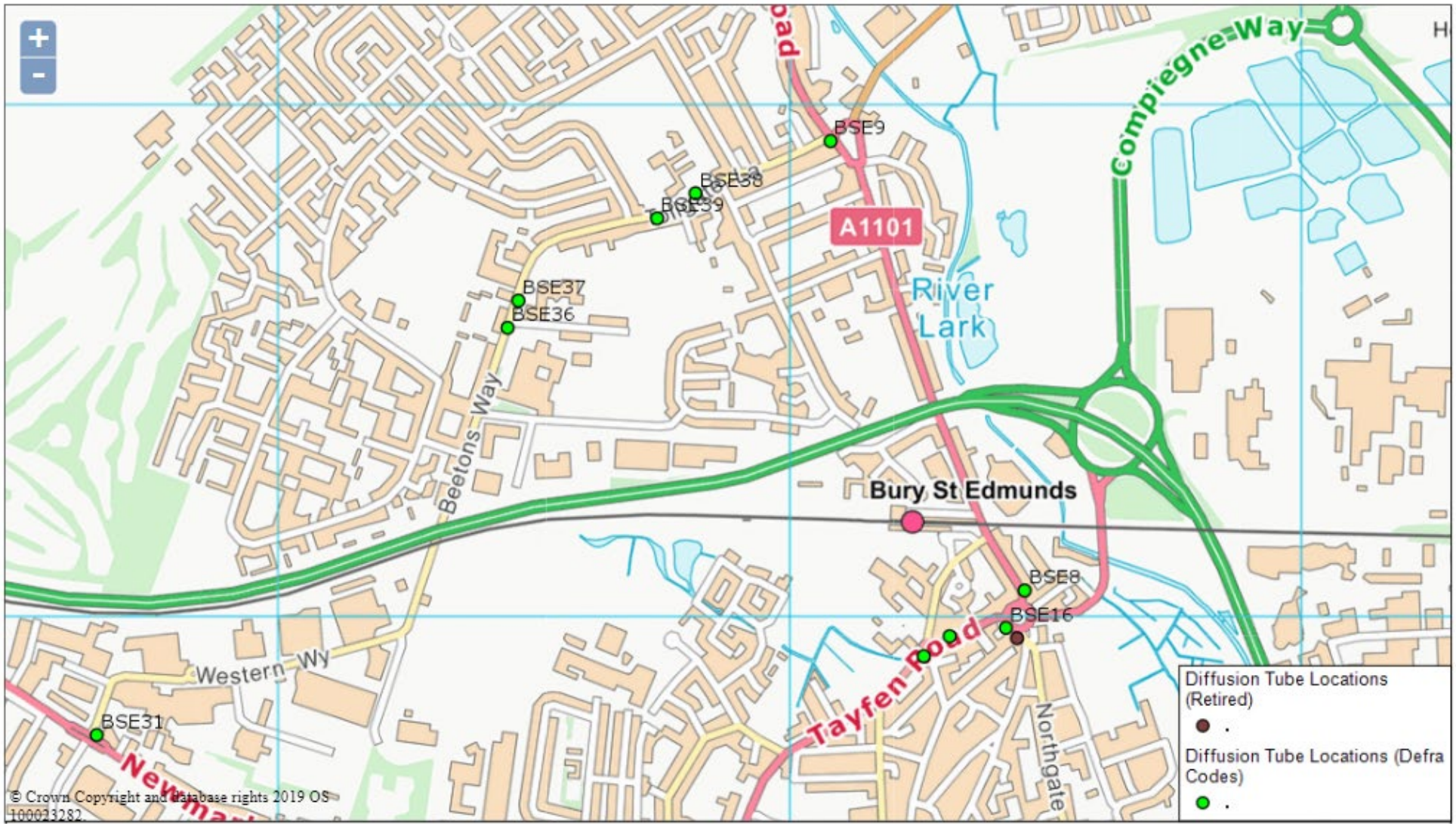


Figure D.3 – Map of non-automatic monitoring sites: Bury St Edmunds (south)

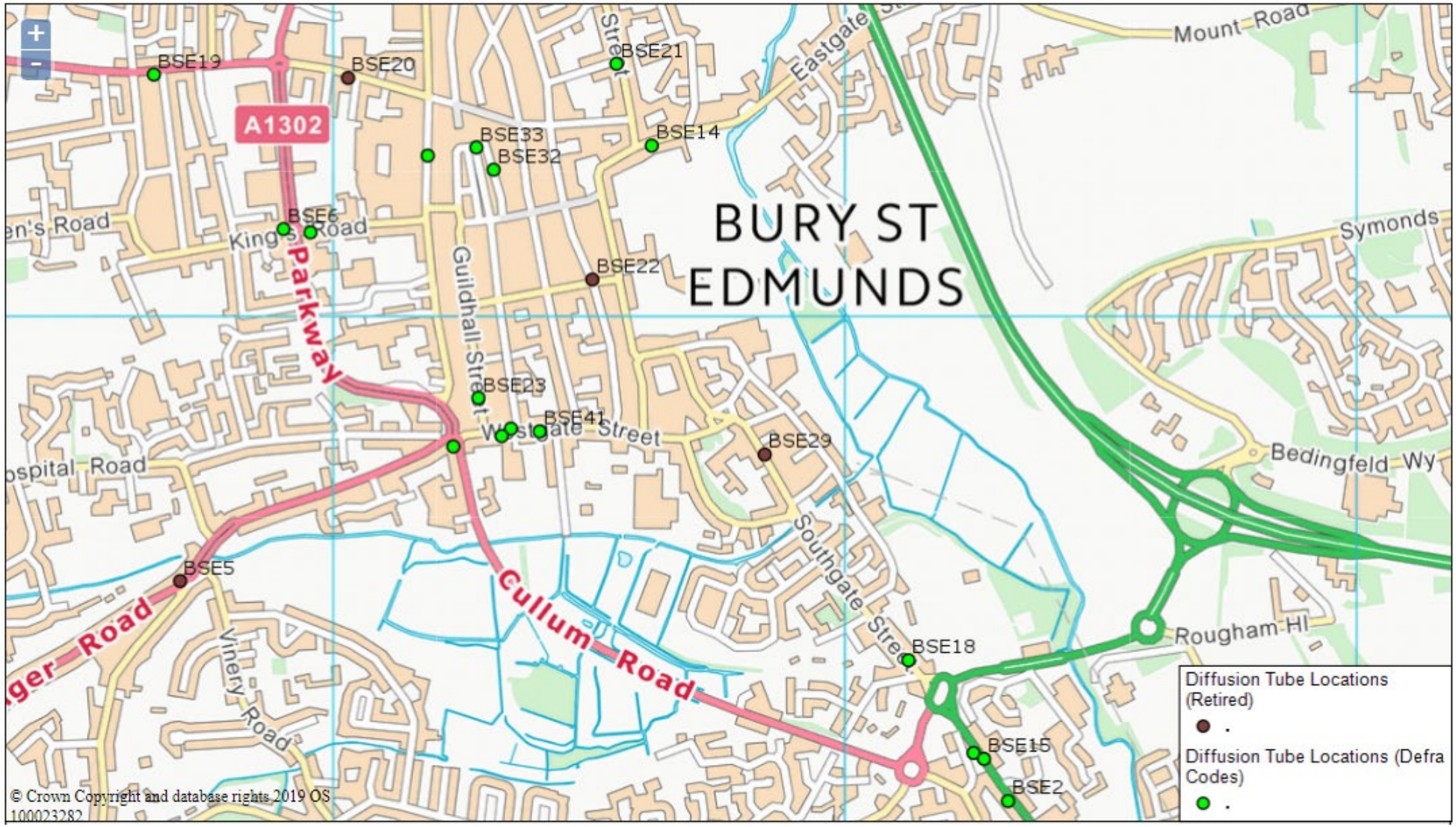


Figure D.4 – Map of non-automatic monitoring sites: Bury St Edmunds (east)

Figure D.5 – Map of non-automatic monitoring sites: Great Barton

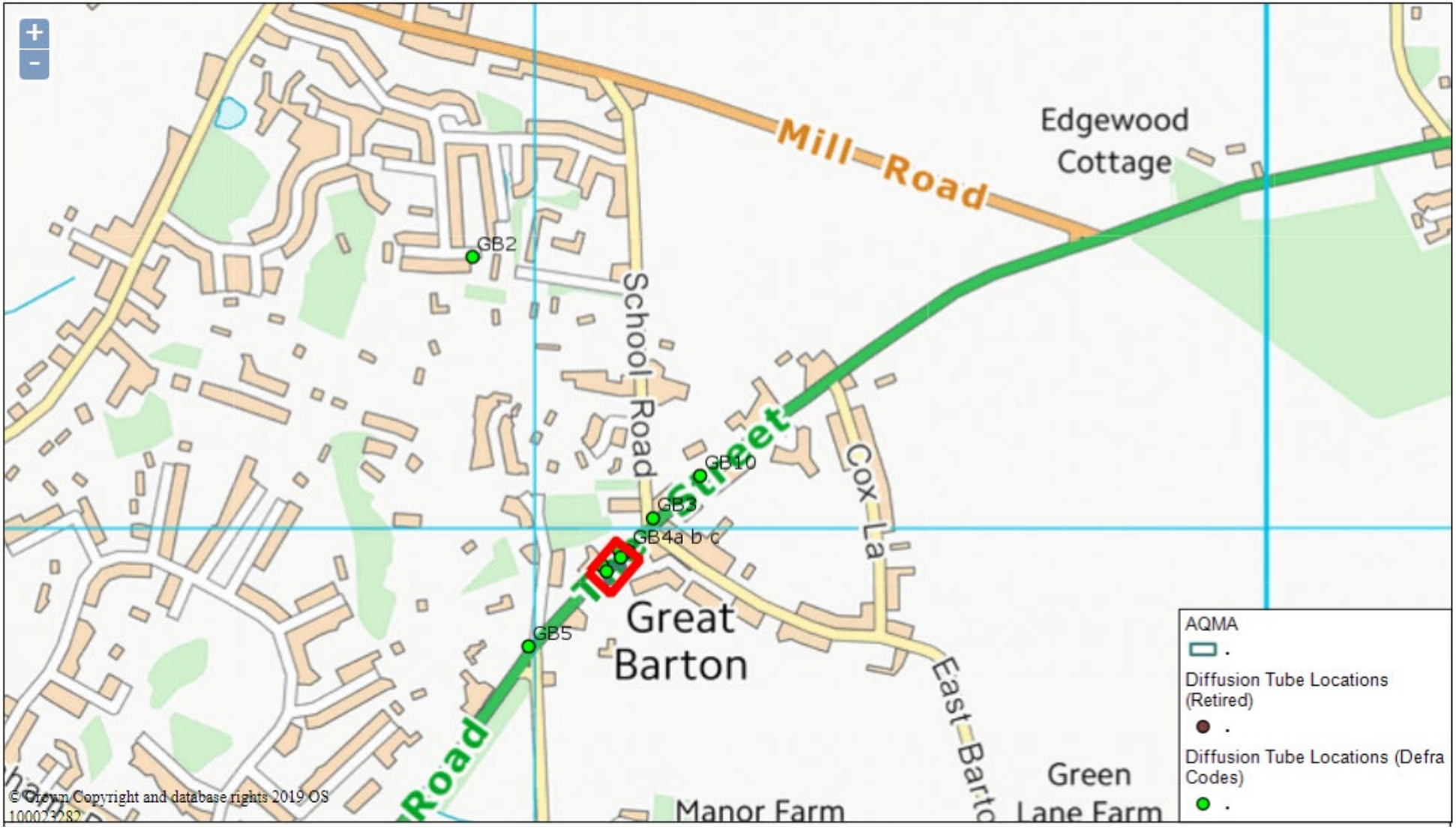


Figure D.6 – Map of Great Barton AQMA

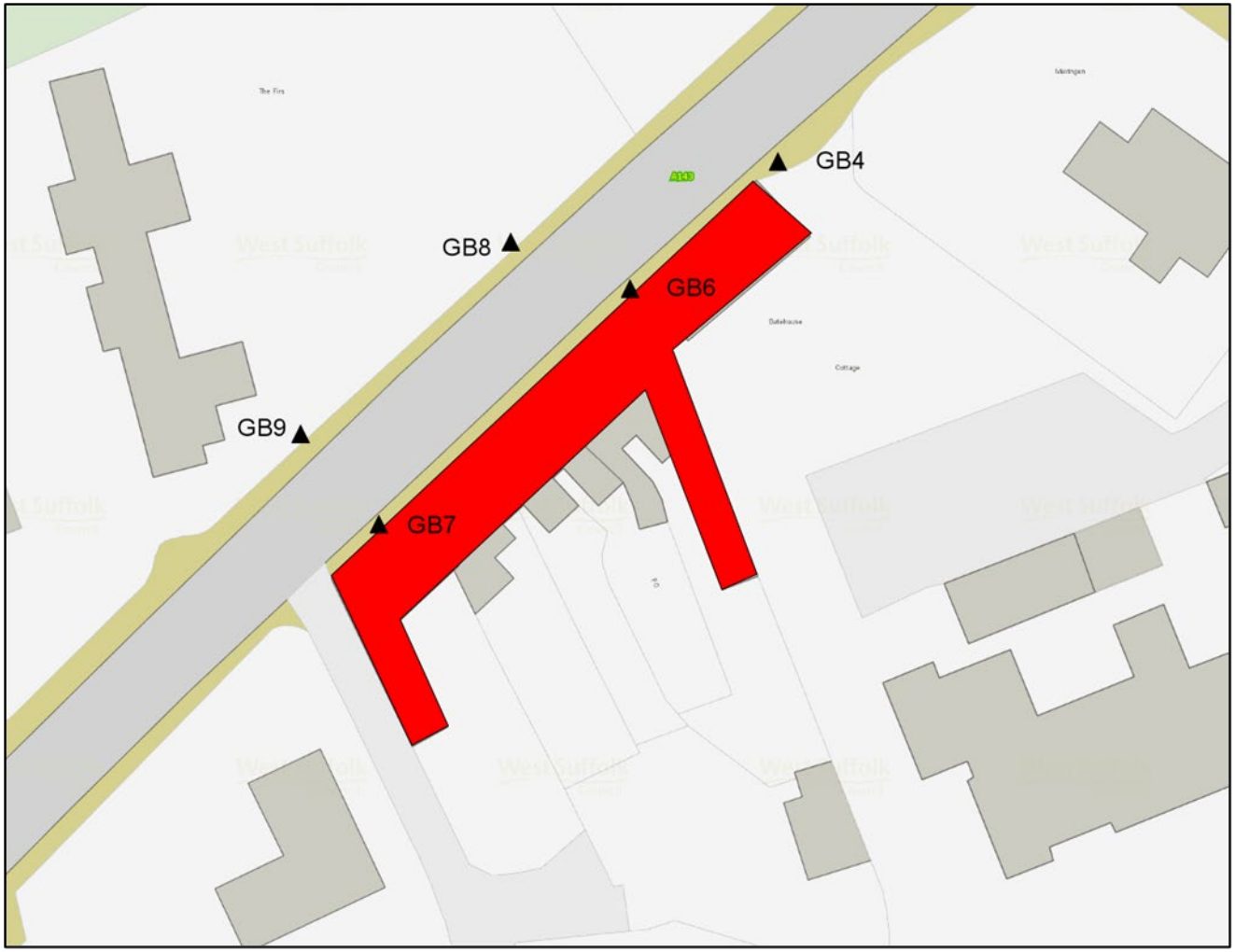


Figure D.7 – Map of non-automatic monitoring sites: Haverhill

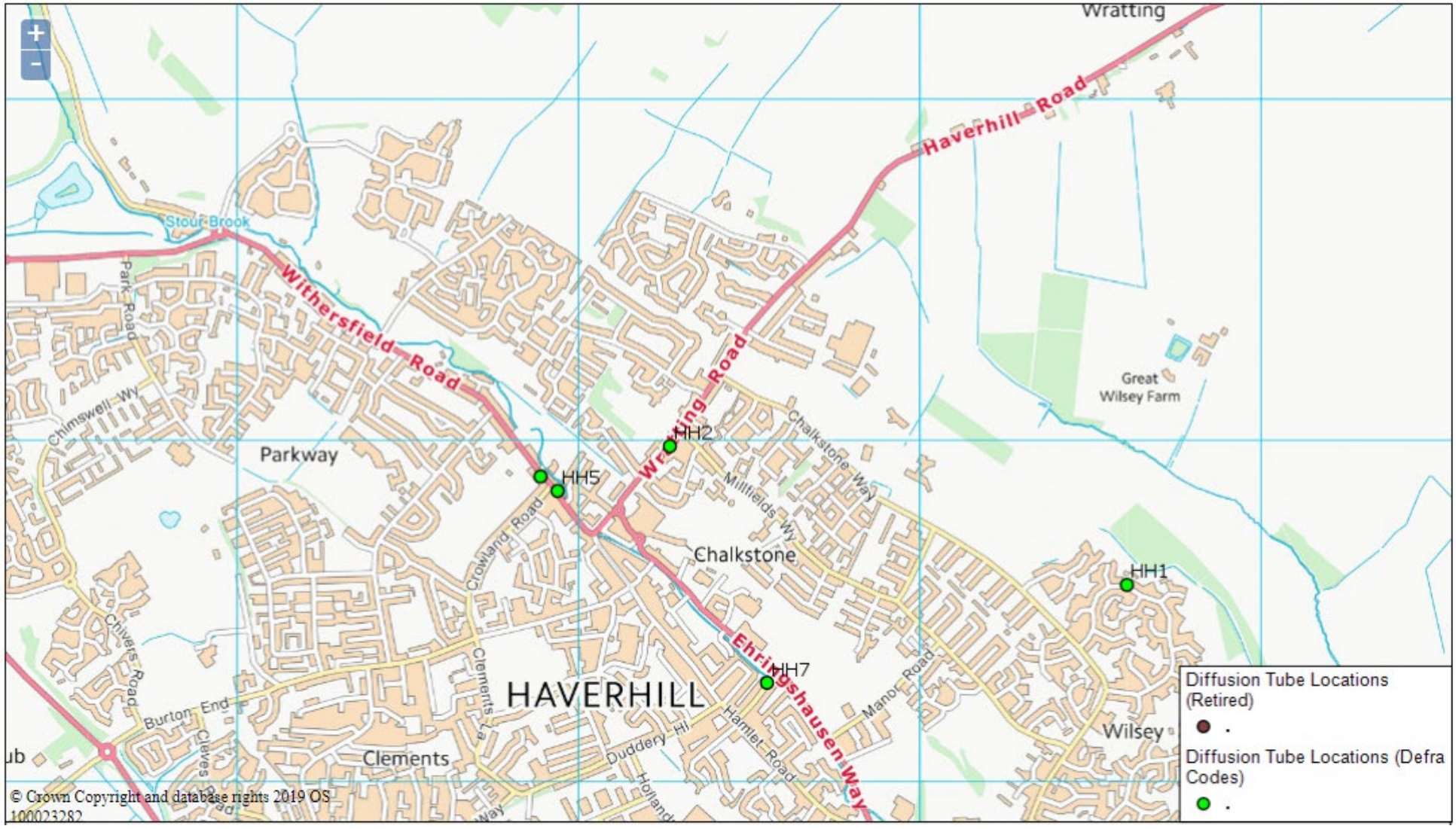


Figure D.8 – Map of non-automatic monitoring sites: Clare

Figure D.9 – Map of non-automatic monitoring sites: Lakenheath

Figure D.10 – Map of non-automatic monitoring sites: Mildenhall

Figure D.11 – Map of non-automatic monitoring sites: Newmarket town centre

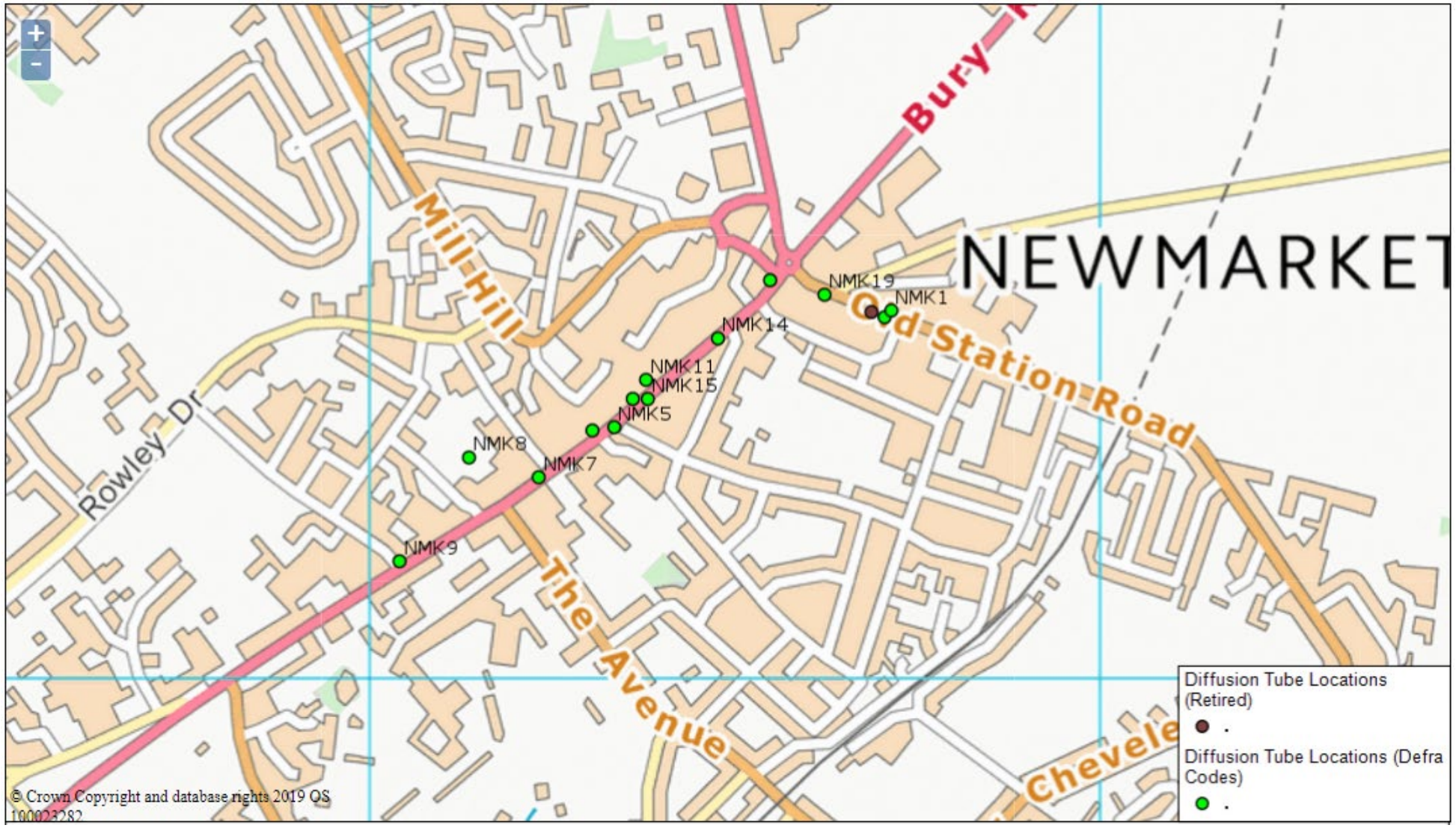


Figure D.12 – Map of non-automatic monitoring sites: Newmarket North

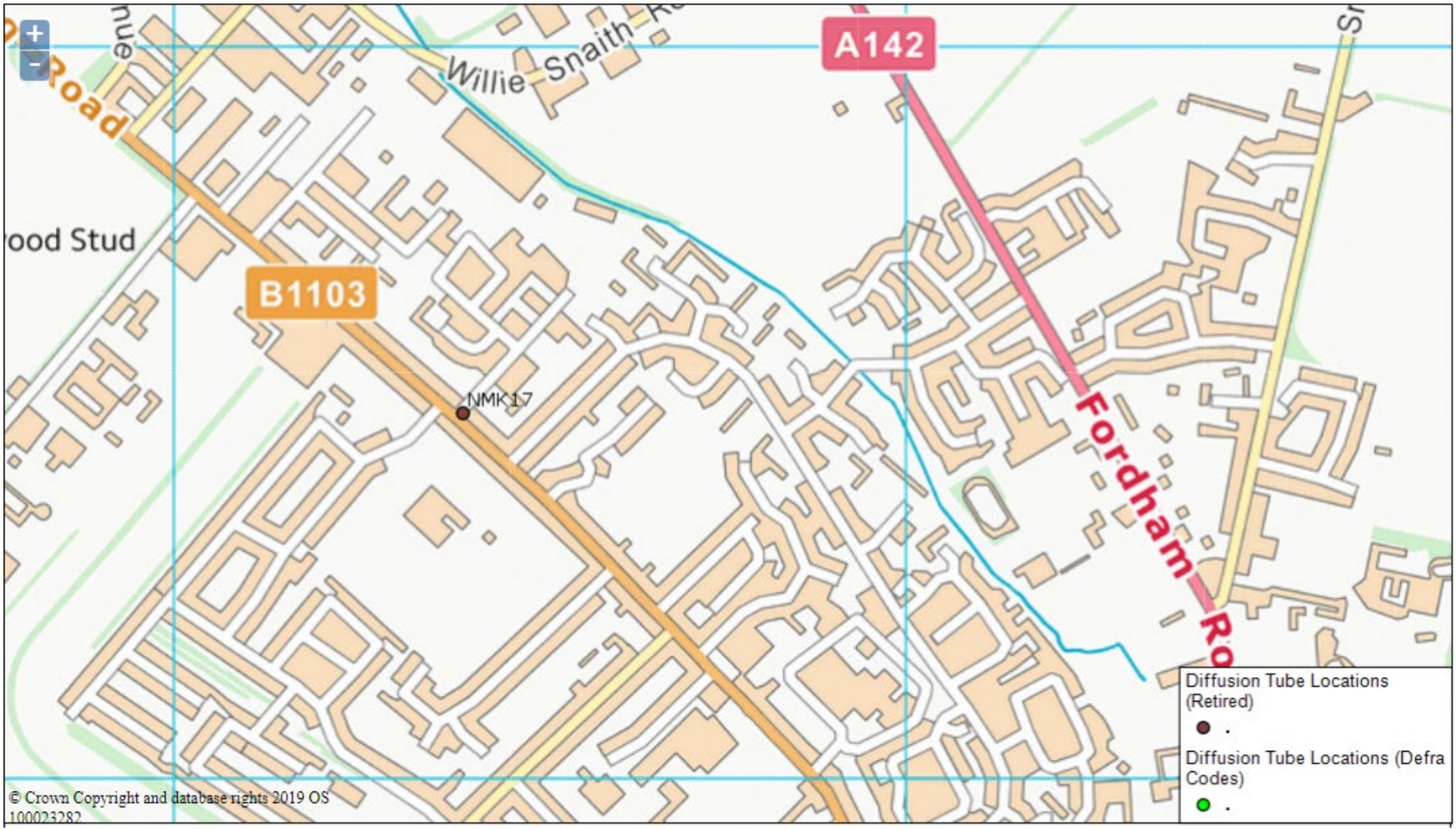


Figure D.13 – Map of non-automatic monitoring sites: Tuddenham

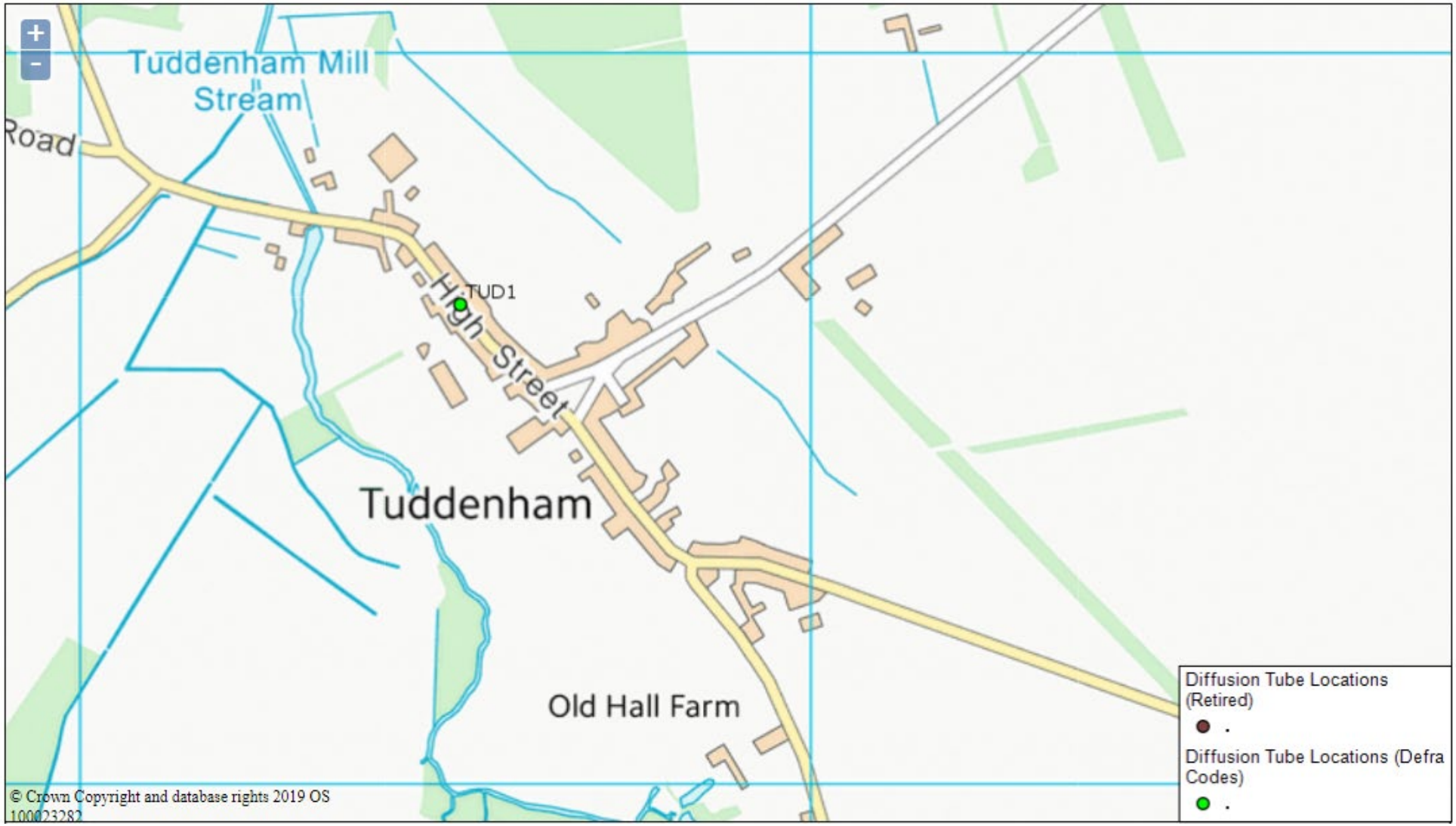


Figure D.14 – Map of non-automatic monitoring sites: Kentford

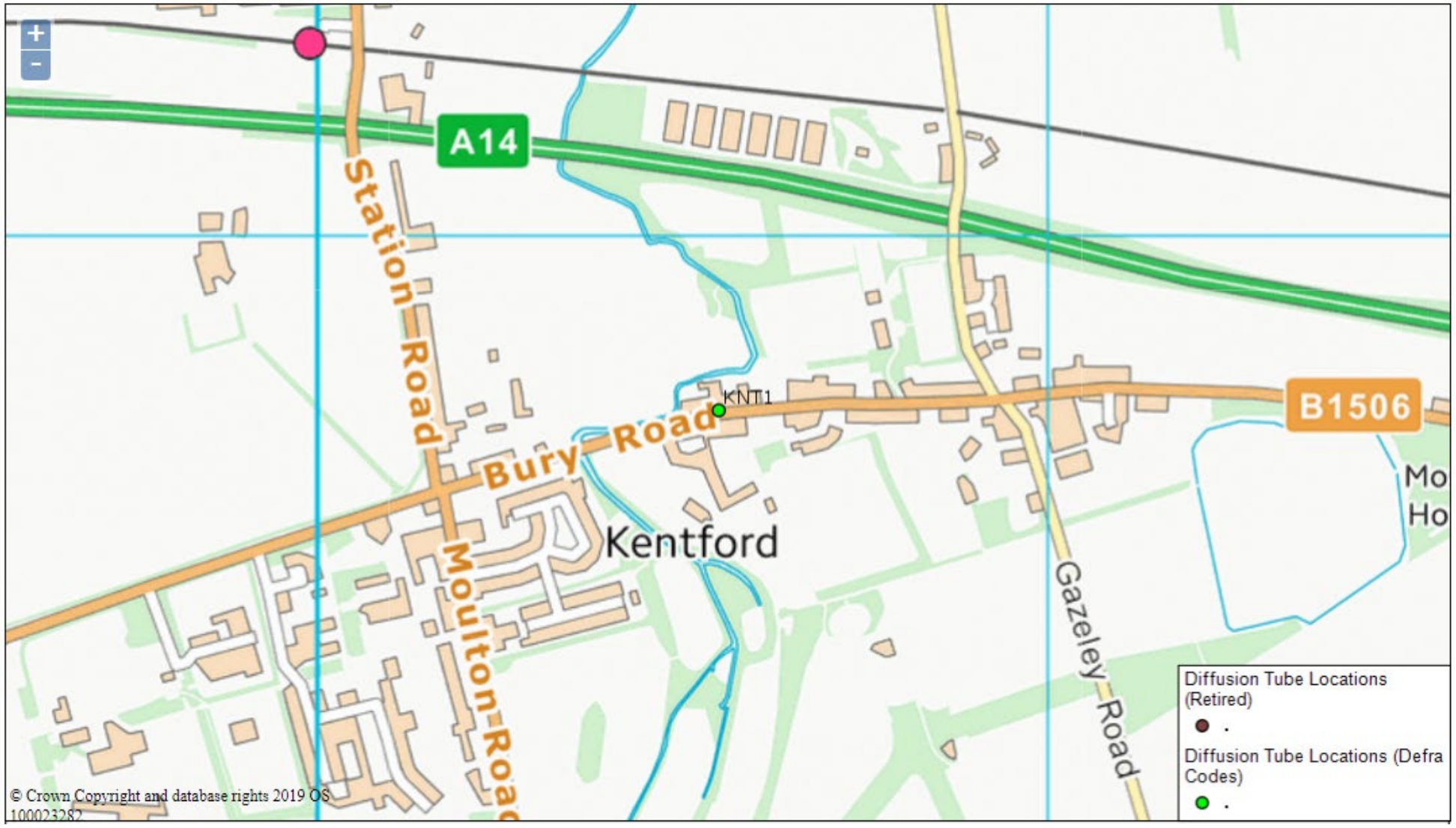


Figure D.15 – Map of non-automatic monitoring sites: Exning

Appendix E: Summary of air quality objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air quality objective: concentration	Air quality objective: measured as
Nitrogen dioxide (NO2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen dioxide (NO2)	40µg/m^3	Annual mean
Particulate matter (PM10)	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate matter (PM10)	40µg/m^3	Annual mean
Sulphur dioxide (SO2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur dioxide (SO2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur dioxide (SO2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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 or are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual status report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter dynamics Measurement System
LAQM	Local air quality management
NO2	Nitrogen dioxide
NOx	Nitrogen oxides
PM10	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM2.5	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA and QC	Quality Assurance and quality control
SO2	Sulphur dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. 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.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.