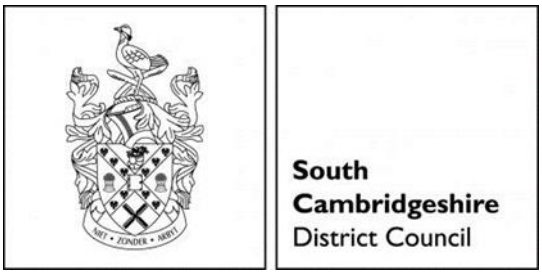

2024 Air Quality Annual Status Report (ASR)

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

Date: June, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in South Cambridgeshire

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1]. In South Cambridgeshire 5.8% of all deaths in people aged 30 and over in 2022 were attributable to long term exposure to particulate air pollution and this is the same as the figure for England as a whole.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes.

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

	PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

South Cambridgeshire District Council (SCDC) is a predominantly rural district that surrounds the city of Cambridge. The district has good transport links to London and the South-East, including the strategically important roads of the M11, A11 and A14. The district is experiencing significant growth including development on the edge of Cambridge City as well as major residential developments in Waterbeach, Cambourne and Northstowe. South Cambridgeshire and Cambridge have a high concentration of high tech businesses and biomedical companies.

Air quality in South Cambridgeshire is generally relatively good and there are currently no air quality management areas (AQMAs) in the district. An AQMA existed along the A14 corridor between Bar Hill and Milton from 2008 to 2022 when it was revoked due to consistent air quality improvements in that area. Details of the former AQMA can be found on the Defra AQMA webpage.

Despite the significant growth within the district, levels of nitrogen dioxide, the pollutant principally associated with vehicle exhaust fumes, has continued to decrease at monitored locations, with levels decreasing by approximately a third over the last five years. All monitored locations are now well below the UK air quality objectives (AQO), with the highest recorded nitrogen dioxide reading in 2023 being less than half of the annual mean AQO. Levels of NO_2 have been recorded as decreasing in recent years[3], partially due to changes in transport and working habits since COVID-19 but also the introduction of cleaner engines and an increase in electric vehicles, with numbers of plug-in vehicles in South Cambridgeshire being over twice the national average per 100,000 population[4].

SCDC has worked with Cambridge City Council to develop a joint air quality strategy, known as the Greater Cambridge Air Quality Strategy. The joint strategy aligns geographically with the emerging joint Greater Cambridge Local Plan and allows for joined up policy implementation through the planning process. The transport infrastructure between SCDC and the City is intrinsically linked, with numerous cross boundary sustainable transport projects either already in existence (such as the park and ride sites) or being planned (such as the proposed 'greenways').

[3] https://www.gov.uk/government/statistics/air-quality-statistics/summary#nitrogen-dioxide-no2

[4] Local area data: Electric vehicles and charging points (parliament.uk)

The objectives of the strategy are:

- Continue to meet and deliver all legislative and policy requirements associated with air quality.
- Continue to improve air quality across Greater Cambridge enhancing the health of those living, working and visiting Greater Cambridge.
- Work towards World Health Organization Air Quality Guideline annual averages as longer-term targets with interim targets for delivery within the lifetime of the Strategy (5 years).

This will be achieved through four key priority areas:

- Key Priority 1: Regulatory Policies & Development Control
- Key Priority 2: Infrastructure Improvements
- Key Priority 3: Community Engagement & Promotion
- Key Priority 4: Monitoring

The interim targets and WHO guideline values outlined in the objectives of the strategy are provided in Table ES 2 below. The purpose of the interim targets is to ensure that emphasis on improving air quality is maintained and improvements can still be achieved in the context of the rapid growth of the Greater Cambridge area.

Table ES 2 – UK air quality objectives compared to Greater Cambridge air quality strategy interim targets and WHO guideline values

Pollutant	Averaging Period	Concentration		
		Current UK Limit	Interim Target (2029)	WHO guideline value
PM_{10} µg/m^3	Annual Mean	40	20	15
	24 Hour Mean	50	-	45
NO_2 µg/m^3	Annual Mean	40	20	10
	1 Hour Mean	200	-	-
$PM_{2.5}$ µg/m^3	Annual Mean	10 (target to be achieved by 2040)	10	5

SCDC and Cambridge City have quarterly update meetings with key stakeholders for the strategy, including the Greater Cambridge Partnership, Cambridgeshire County Council Highways, Cambridgeshire and Peterborough Combined Authority and the Greater Cambridge Shared Planning service.

Actions to Improve Air Quality

Whilst 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[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant most harmful to human health. The Air Quality Strategy[6] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[7] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

SCDC are continuing to monitor throughout the district and expanded the diffusion tube monitoring network in 2023 to cover a number of villages not previously monitored, including Gamlingay, Great Shelford and Melbourn. Two new automatic monitors in Harston and Northstowe were also commissioned during 2023, both of which monitor for nitrogen dioxide as well as PM_{10} and $PM_{2.5}$. A number of short-term monitoring projects were also carried using lower cost 'Zephyr' sensors which are reported separately on the SCDC website.

[5] Defra. Environmental Improvement Plan 2023, January 2023

[6] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

[7] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

SCDC is a strategic partner in the Greater Cambridge Partnership (GCP), who are working on numerous sustainable transport projects that link SCDC and the City. These include a number of 'Greenways' which are designed as sustainable transport corridors linking the district to the city. The GCP are also developing 'corridor schemes' linking major areas of growth to the city. This includes Cambourne to Cambridge which will comprise a dedicated bus route.

South Cambridgeshire District Council in partnership with Cambridge City Council are producing a new joint Greater Cambridge Local Plan for their combined area. Work on the emerging plan seeks to address air quality issues, including considering the transport accessibility and air quality impacts in the identification of the emerging development strategy, as well as through design and infrastructure policies.

SCDC also recognises the importance of behavioural change and are developing a project to work with schools educating young people and their families on the small actions we can all take to help improve air quality. This will supplement the existing work that we've been undertaking such as social media posts during clean air day and clean air night, as well as articles in the South Cambridgeshire magazine encouraging reduced solid fuel burning.

South Cambridgeshire District Council declared a climate emergency in 2019 and are taking a wide range of actions, with partners, which will contribute to reducing emissions and adapting to climate change both on their own estates, and in the wider district. SCDC's Zero Carbon Strategy outlines how SCDC are supporting the District to halve carbon emissions by 2030 and reduce them to zero by 2050, including delivering a reduction in the councils own carbon footprint of at least 45% by 2025 (on a 2019 baseline) and at least 75% by 2030. Many of the measures within the Zero Carbon Strategy will have a positive impact on air quality either directly or indirectly and a number of the most relevant measures will be included in the main body of this report.

Conclusions and Priorities

All of the monitored locations returned results of pollutants well below the UK air quality objectives with an approximate reduction in nitrogen dioxide levels of a third over the last five years. As part of our Greater Cambridge Air Quality Strategy, SCDC have an ambition to reach the World Health Organization air quality guideline values, with interim targets set for the lifetime of the strategy (i.e. 2029). The interim targets for NO_2 were also reached at

all monitoring points. The WHO guideline values were achieved in some locations, including all three diffusion tubes in Cambourne.

For PM_{10} the UK objective and interim target were achieved at all three continuous monitors that returned an annual mean value and two of the continuous monitors achieved the WHO guideline value.

For $PM_{2.5}$ the UK target for 2040 and Greater Cambridge AQS interim targets were achieved at all three sites that returned an annual mean, but the WHO guideline value was exceeded.

However, both PM_{10} and $PM_{2.5}$, had poor data collection and although annualisation has been undertaken the results should be considered with caution.

Given the significant continued growth in areas such as Northstowe, Cambourne and Waterbeach, monitoring will continue throughout the district and any new areas of concern monitored.

Local Engagement and How to get Involved

Previous Annual Status Reports and details on air quality monitoring are available on our website and you can share your views via our email address air.quality@scambs.gov.uk and follow our Facebook page[8] for general updates and news. The website contains a link to live data from our continuous monitor locations and from the Zephyr monitors.

As part of the process of adopting the new Greater Cambridge Air Quality Strategy, SCDC and Cambridge City Council undertook engagement with all of our key partners, including Greater Cambridge Partnership, Cambridgeshire County Council and Cambridgeshire and Peterborough Combined Authority. The strategy went before SCDC councillors at the Climate and Environment Advisory Committee (CEAC) both before and after a public consultation. The public consultation was run jointly with Cambridge City Council (as it was a joint strategy) and provided valuable information on the local understanding of air quality and the issues that impact our residents.

Although most responders to the consultation did already undertake some measures to help reduce their air pollution footprint, only 50% of people knew that air pollution information was included on the councils website.

Ways you can help to improve air quality in South Cambridgeshire include:

[8] SCDC Facebook

- Minimise car use wherever possible:
    - Avoid using your car for short trips (under 2 miles) – short trips are very polluting as modern engines need to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.
    - For short journeys try cycling or walking more often – this helps you stay healthy and saves you money in fuels costs.
    - For longer journeys consider public transport options.
    - Use journey-planning apps such as MyBusTrip or MotionMap for travel by bus, train, walking and cycling.
- Switch it off – don't leave your car engine idling if you are stationary e.g. waiting to pick someone up, in a traffic jam or waiting at level crossings.
- When driving, use techniques that help you use less fuel, like driving more slowly and smoothly.
    - You could use 10% less fuel by following the tips on the AA website
    - Like switching your engine off when stationary, this will not only reduce your emissions of air pollution but will save fuel and therefore money too!
- Consider making your next vehicle an electric vehicle.
- Join a car club or car-share regularly.
- Consider working at home where possible – the first Covid-19 lockdown showed widespread improvements in the air quality as the amount people travelled reduced.
- Use less energy at home – consider a smart meter to monitor usage and be aware of boiler standards.
- Opt for 'green energy' tariffs where available or switch to renewable sources of heating or power.
- Reduce the use of solid fuel stoves and open fires – domestic burning is now the single biggest source of particulate matter pollution in the UK (greater than traffic and industry).
    - If you are burning wood or coal ensure any fuel used meets the new standards of moisture content and emissions. Find more information on the Woodsure Ready to Burn Scheme website
- Improve indoor air quality by ensuring adequate ventilation through opening windows, especially when cooking or cleaning, as these activities produce pollutants.
- Make your children aware of the impact that day to day activities have on air quality.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health & Licensing Department of South Cambridgeshire District Council with the support and agreement of the officers from Greater Cambridge Partnership and Cambridgeshire County Council.

This ASR has been approved by:

Bode Esan	Head of Climate, Environment & Waste, South Cambridgeshire District Council
Jeremy Smith	Group Manager, Transport Strategy and Funding, Cambridgeshire County Council
Stephen Kelly	Joint Director of Greater Cambridge Shared Planning & 3C Building Control
Val Thomas	Acting Director of Public Health, Cambridgeshire County Council
Isobel Wade	Greater Cambridge Partnership

This ASR has been approved by the acting Director of Public Health.

If you have any comments on this ASR please send them to South Cambridgeshire District Council at:

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in South Cambridgeshire 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 and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by South Cambridgeshire District 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.

South Cambridgeshire District Council currently does not have any declared AQMAs. A local Air Quality Strategy (AQS) is in place to prevent and reduce polluting activities. The local Air Quality Strategy is a joint strategy with Cambridge City Council, known as the Greater Cambridge Air Quality Strategy and is available on the South Cambridgeshire District Council air quality webpage. The AQS covers the period 2024 to 2029 and was adopted by both authorities in April 2024.

2.2 Progress and Impact of Measures to address Air Quality in South Cambridgeshire

Defra's appraisal of last year's ASR concluded that South Cambridgeshire District Council should continue with the monitoring and analysis that was reported in the 2023 ASR.

South Cambridgeshire District 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 2.1. Sixteen measures are included within Table 2.1, with the type of measure and the progress South Cambridgeshire District Council 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 2.1.

Key measures are:

- Production of public friendly reports based on monitoring using low-cost Zephyr monitors.
- Implementation of schemes to increase electric vehicle charging throughout the district, including infrastructure at our offices in Cambourne and the SCDC Electric Vehicle Charge Point Grant.
- Work with partner bodies on infrastructure projects, such as the GCP and their development of 'Greenways' and 'Corridor Schemes'.

SCDC's priorities for the coming year are to undertake more focused work with schools, continue to produce public facing reports based on the monitoring undertaken with the Zephyr, work with partners to ensure the development of infrastructure projects and raise the profile of the contribution of solid fuel burning on PM background levels.

SCDC work to implement measures in partnership with the following stakeholders:

- Cambridge City Council
- Great Cambridge Partnership
- Cambridge County Council
- Cambridgeshire and Peterborough Combined Authority

The principal challenges and barriers to implementation that SCDC anticipates facing are detailed in Table 2.2 below.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Zephyr School Monitoring Projects	Public Information	Other	2021	2025	SCDC	SCDC	NO	Funded	£10k - 50k	Implementation	Not possible to measure directly	Number of reports issued	Promoting air quality by producing reports based on monitoring by low cost Zephyr monitors at locations of interest, such as outside schools.	Six reports completed and published on SCDC website as at the end of April 2024 (https://www.scambs.gov.uk/environmental-health/pollution/air-pollution/air-quality-monitoring)
2	Low Emission Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2019	2022	SCDC Environmental Health Planning Department	Developer Contributions	NO	Funded	< £10k	Implementation	Not possible to measure directly	Number of Planning permissions issued with Low Emission Strategy	In Progress ongoing - Low Emission Strategies required as per SC Local Plan 2018 and Sustainable Design & Construction SPD. This will incorporate measures such as EV charging and low NOx boilers at developments.	
3	Greenways	Transport Planning and Infrastructure	Cycle network	2020	2026	Greater Cambridge Partnership (GCP)	Greater Cambridge Partnership (GCP)	NO	Funded	> £10 million	Implementation	Not possible to measure directly	N/A	Various Greenways at different stages of implementation. See GCP for details of progress on individual projects. (https://www.greatercambridge.org.uk/sustainable-transport-programme/active-travel-projects/greater-cambridge-greenways)	A series of twelve Greenways feeding into Cambridge from SCDC allowing walkers, cyclists and other non-motorised vehicle users to travel safely and sustainably
4	Electric Vehicle Charging community scheme	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2023	2025	SCDC	SCDC	NO	Funded	£100k - £500k	Implementation	Not possible to measure directly	Number of charge points installed	The Electric Vehicle (EV) Charge Point Grant is available to fund installation of Electric Vehicle Charge Points (EVCPs) for use by the public, and related works, in the car parks of community buildings and village halls within South Cambridgeshire	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
5	A14 improvement - Junction 31-32 (EB & WB)	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2015	2015	Cambridgeshire County Council (CCC) Cambridgeshire and Peterborough Combined Authority (CPCA)	CCC	NO	Funded	£100k - £500k	Completed	Not possible to measure directly		Completed Autumn 2015	
6	A14/M11 re-alignment	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2016	2020	CCC/National Highways	CCC/National Highways	NO	Funded	£1 million - £10 million	Completed	Not possible to measure directly		Completed 2020	
7	Taxi Policies	Promoting Low Emission Transport	Taxi Licensing conditions	2023	2028	SCDC	SCDC	NO	Funded	< £10k	Implementation	Not possible to measure directly	N/A	Restrictions on older vehicles and gradual introduction of policies to ensure a transition to zero emission vehicles	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
8	Cycle Plus Improvements	Transport Planning and Infrastructure	Cycle network	2020	2027	GCP	GCP	NO	Funded	> £10 million	Implementation	Not possible to measure directly	N/A	Numerous improvements to the cycle network within SCDC and Cambridge City areas. Some projects implemented (Fulbourn/Cherry Hinton), some remain in planning. Some projects within City area only but impact traffic and sustainable transport from SCDC	
9	Corridor Schemes	Transport Planning and Infrastructure	Bus route improvements	2020	2027	GCP, CPCA	GCP	NO	Funded	> £10 million	Planning	Not possible to measure directly	N/A	Four corridor schemes to offer better public transport and active travel routes along corridors, identified as essential to link growing communities in the north, south, east and west.	Various schemes at different stages of development. www.greatercambridge.org.uk/sustainable-transport-programme/public-transport-schemes
10	Travel Hubs	Alternatives to private vehicle use	Bus based Park & Ride	2019	2025	GCP	GCP	NO	Funded	> £10 million	Planning	Not possible to measure directly	N/A	Travel hubs associated with corridor schemes	
11	New railway station for Waterbeach	Other	Other	2020	2026	GCP / Network Rail / CPCA	GCP / Network Rail	NO	Funded	> £10 million	Planning	Not possible to measure directly	N/A	Relocation of Waterbeach train station to facilitate sustainable transport from major residential development	
12	Council Fleet transition to Electric Vehicles	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles		2030	SCDC and Cambridge City	SCDC, Cambridge City and Cambridge and Peterborough Combined Authority	NO	Funded	£1 million - £10 million	Planning	Not possible to measure directly	N/A	Planned upgrade of all fleet vehicles to electric. The Councils are delivering the £5.7m Waterbeach Depot Solar Park project, including funding from the CPCA. This will enable more of the waste collection fleet to go electric	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
13	Electric Vehicle Charging at Council Offices	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022	2023	SCDC	SCDC	NO	Funded	£50k - £100k	Completed	Not possible to measure directly	N/A	Installing electric vehicle charge points at Council offices in Cambourne for staff and public use, including bays for taxi	
14	Air Quality promotional work	Public Information	Other	2022	2024	SCDC	SCDC	NO	Funded	< £10k	Implementation	Not possible to measure directly	N/A	Social media posts during campaigns (clean air day and clean air night) as well as articles in the South Cambridgeshire residents magazine and in the Zero Carbon Communities newsletters	
15	Air Quality at schools project	Public Information	Other	2023	2026	SCDC, Cambridgeshire and Peterborough Combined Authority, CCC	SCDC and Section 106	NO	Funded	< £10k	Planning	5% reduction outside schools	Measured reduction in pollution	Presentations and workshops in schools together with anti-idling events and monitoring	
16	Camshare	Alternatives to private vehicle use	Car & lift sharing schemes	2012	2040	Cambridgeshire County Council (CCC)	CCC	NO	Partially Funded	£1 million - £10 million	Implementation	Not possible to measure directly	N/A	Over 6,000 members for schemes covering the Greater Cambridge area	https://liftshare.com/uk/community/camshare
17	County Electric Vehicle Strategy and LEVI funding	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2023	2040	Cambridgeshire and Peterborough Combined Authority, Cambridgeshire County Council (CCC)	Office for Low Emission Vehicles (OLEV)	NO	Partially Funded	£1 million - £10 million	Planning	Not possible to measure directly	N/A	County wide EV strategy including the implementation of LEVI funding to increase EV charging infrastructure, especially in rural areas (such as much of SCDC) where commercial projects are unlikely to be financially attractive	

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[9], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

SCDC now undertakes monitoring for $PM_{2.5}$ at all of its automatic monitors with the results presented in the following sections. SCDC also has a number of low-cost Zephyr sensors that monitor for $PM_{2.5}$ and can be used to identify hotspots or areas where action may be required.

All of the measures presented in Table 2.2 will have an impact on reducing $PM_{2.5}$, however a number of measures are particularly relevant to $PM_{2.5}$ reduction, for example measure 15, public awareness, which has included SCDC taking part in Clean Air Night and having articles in the South Cambridgeshire magazine about the impacts of solid fuel burning. Although SCDC does not have any Smoke Control Areas, measures to highlight the risks of solid fuel burning will continue to be taken and studies to identify areas of high risk will also be taken forward.

The Office for Health Improvement and Disparities reports the health impacts of Particulate Matter ($PM_{2.5}$) through the fraction of mortality attributable to particulate air pollution. This was reported as 5.8% for South Cambridgeshire in 2022 (the most recently available data). This is the same as the England Average but slightly lower than the East of England regional average of 6.2%.

[9] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

This section sets out the monitoring undertaken within 2023 by South Cambridgeshire District 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 Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Cambridgeshire District Council undertook automatic (continuous) monitoring at four sites during 2023. This included one site (Impington A14) that monitored throughout the year; two sites (Harston and Northstowe) that were newly installed during 2023; and one site that was discontinued part way in to the year. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The Ricardo AEA webpage presents automatic monitoring results for South Cambridgeshire.

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

3.1.2 Non-Automatic Monitoring Sites

South Cambridgeshire District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 38 sites during 2023. Table A.2 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/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 (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 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 (i.e. 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.

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

The recorded levels of nitrogen dioxide at all of the continuous and diffusion tube monitoring sites are significantly below the air quality objectives. The highest recorded value was 17.5 µg/m^3 at DT2 on Histon High Street, compared to a UK air quality objective annual mean of 40 µg/m^3.

As noted in early sections, the Greater Cambridge Air Quality Strategy has an ambition to meet the WHO air quality guideline value of 10 µg/m^3 with an interim target set for 2029 of 20 µg/m^3. All monitored locations met the Greater Cambridge Air Quality Strategy interim target whilst seven locations met the WHO guideline value. The seven locations to meet the WHO guideline value for nitrogen dioxide included all three of the monitoring locations in Cambourne.

There were also no exceedances of the hourly mean recorded at any of the automatic monitors during 2023. None of the annual means from the diffusion tubes indicate the possibility of an exceedance of the hourly mean objective.

The long term (five year) trend indicates levels of nitrogen dioxide are decreasing steadily, with an average reduction in nitrogen dioxide of approximately a third over the last five years. DT2 (Histon High Street) has decreased from 27.2 µg/m^3 in 2019 to 17.5 µg/m^3 in 2023. This is likely to be a combination of factors, including the increased efficiency of internal combustion engine vehicles, the increase in electric and hybrid cars and the changes in working habits following the COVID-19 lockdowns and increased working from home.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

All data is fully ratified by Ricardo AEA and has been annualised where required. It should be noted that the continuous monitor at Northstowe only had 21.6% data capture for the year, which is below that required for annualisation. The annual mean results for Northstowe have therefore not been presented.

All the continuous monitors recorded concentrations of PM_{10} well below the annual mean air quality objective of 40µg/m^3, with the highest recorded concentration being at Impington, which is adjacent to the A14 trunk road, with a level of 15.6 µg/m^3.

All sites where PM_{10} monitoring took place were below the interim target of 20 µg/m^3 set out in the Greater Cambridge air quality strategy, while only Impington exceeded the WHO guideline value of 15 µg/m^3.

The five-year trend for PM_{10} is showing relatively stable levels of pollution, with Impington showing very similar results for four of the last five years, although Orchard Park has shown a slight decrease over the five year period, the 2023 results should be treated with caution as data collection was only 25.6%.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

All data is fully ratified by Ricardo AEA and has been annualised where required. It should be noted that the continuous monitor at Northstowe only had 21.7% data capture for the year, which is below that required for annualisation. The annual mean results for Northstowe have therefore not been presented.

All the continuous monitors recorded concentrations of $PM_{2.5}$ below the annual mean target of 10 µg/m^3 to be achieved by 2040 as set in the Environmental Targets (PM) regulations 2023. 10 µg/m^3 is also the interim target for 2029 set in the Greater Cambridge Air Quality Strategy. The WHO guideline value is 5 µg/m^3, which all sites exceeded.

The highest concentration (8.9 µg/m^3) was recorded at Orchard Park, although this should be treated with caution due to low data collection (25%).

It is difficult to put much weight on the long term (five year) trends for $PM_{2.5}$ given the low data collection at three of the four sites and considering two of the four sites were newly installed in 2023.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
IMP	Impington (A14)	Roadside	543739	261625	NO_2, PM_{10}, $PM_{2.5}$	No	Chemiluminescent; BAM; TEOM-FDMS	12	2	2
ORCH	Orchard Park Primary School	Urban Background	544558	261579	NO_2, PM_{10}, $PM_{2.5}$	No	Chemiluminescent; BAM	1	N/A	2
HARS	Harston (A10)	Roadside	542542	250940	NO_2, PM_{10}, $PM_{2.5}$	No	Chemiluminescent; TEOM-FDMS	14	4.5	2
NSTOW	Northstowe	Roadside	539897	267660	NO_2, PM_{10}, $PM_{2.5}$	No	Chemiluminescent; TEOM-FDMS	13	3	2

Notes:

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

(2) N/A if not applicable

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

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT2	The Gables, High St, Histon	Roadside	543770	263678	NO_2	Not in AQMA	0.0	1.0	No	2.0
DT-28N	73 Cambridge Road, Milton	Roadside	547436	262295	NO_2	Not in AQMA	15.0	2.0	No	2.0
DT4	96 High St, Sawston	Urban Background	548600	249136	NO_2	Not in AQMA	0.5	1.0	No	2.0
DT5	Rhadegund Farm Cottage, Bar Hill, A14	Roadside	538744	263640	NO_2	Not in AQMA	0.0	18.0	No	2.0
DT-6N	22 High St, Linton	Roadside	555942	246680	NO_2	Not in AQMA	1.0	2.0	No	2.0
DT-8N	47 High St, Harston	Roadside	542555	251001	NO_2	Not in AQMA	5.0	2.0	No	2.0
DT9	3 Garners Close, Milton	Urban Background	547452	263175	NO_2	Not in AQMA	5.0	1.0	No	2.0
DT12	Lone Tree Ave, Impington	Roadside	544119	261862	NO_2	Not in AQMA	7.0	1.0	No	2.0
DT13	1 Brook Close, Histon	Urban Background	543955	263588	NO_2	Not in AQMA	2.0	1.0	No	2.0
DT14	22 Water Lane, Histon	Roadside	544050	263306	NO_2	Not in AQMA	2.0	2.0	No	2.0
DT15	Cambridge Rd, Impington	Urban Background	544243	261819	NO_2	Not in AQMA	7.0	1.0	No	2.0
DT-32N	Banworth Lodge, A10	Roadside	548742	264698	NO_2	Not in AQMA	8.0	0.5	No	2.0

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT22	Flack End, Orchard Pk	Roadside	545435	261906	NO_2	Not in AQMA	7.0	4.5	No	2.0
DT26	Co-op, High Street, Histon	Roadside	543900	263585	NO_2	Not in AQMA	1.0	4.5	No	2.0
DT28	22 Topper St, Orchard Pk	Roadside	545169	261764	NO_2	Not in AQMA	4.0	0.5	No	2.0
DT29	Church Yard, Abington	Urban Background	552961	249251	NO_2	Not in AQMA	14.0	2.0	No	2.0
DT-30N	63, Denny End Rd,Waterbeach	Roadside	549154	266006	NO_2	Not in AQMA	7.0	2.0	No	2.0
DT31	Church Road, Teversham	Roadside	549457	258573	NO_2	Not in AQMA	14.0	1.5	No	2.0
DT32	Gazelle Way, Cherry Hinton	Roadside	549406	257551	NO_2	Not in AQMA	18.0	2.0	No	2.0
DT33	Hudson Road, Upper Cambourne	Urban Background	533359	259765	NO_2	Not in AQMA	7.0	2.0	No	2.0
DT34	Jeavons Lane, Great Cambourne	Roadside	532092	259086	NO_2	Not in AQMA	6.0	1.0	No	2.0
DT35	Swansley Lane, Lower Cambourne	Roadside	531247	259475	NO_2	Not in AQMA	17.0	1.0	No	2.0
DT36	55 St Neots Road	Roadside	538122	259523	NO_2	Not in AQMA	20.0	3.0	No	2.0
DT37	Old Railway Tavern, Longstanton	Roadside	539847	268153	NO_2	Not in AQMA	2.0	3.0	No	2.0

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT38	High Street, Longstanton	Roadside	539569	266845	NO_2	Not in AQMA	1.5	2.0	No	2.0
DT39	Rampton Drift, Longstanton	Roadside	540543	266863	NO_2	Not in AQMA	15.0	2.0	No	2.0
DT40	White Croft Road Meldreth	Roadside	537456	245595	NO_2	Not in AQMA	2.0	1.5	No	2.0
DT41	2 Mill Street, Gamlingay	Roadside	523723	252302	NO_2	Not in AQMA	1.0	1.5	No	2.0
DT42	38a Mill Street, Gamlingay	Roadside	523740	252081	NO_2	Not in AQMA	1.0	1.5	No	2.0
DT43	Mortlock Street, Melbourn	Roadside	538344	244608	NO_2	Not in AQMA	5.5	1.5	No	2.0
DT44	High Street, Melbourn	Roadside	538268	244767	NO_2	Not in AQMA	0.0	2.0	No	2.0
DT45	High Street, Harston	Roadside	542443	250755	NO_2	Not in AQMA	4.0	2.0	No	2.0
DT46	Station Road, Great Shelford	Roadside	546498	252169	NO_2	Not in AQMA	1.0	2.0	No	2.0
DT47	Cambridge Rd, Great Shelford	Roadside	545629	253218	NO_2	Not in AQMA	11.0	1.0	No	2.0
DT48	Cambridge Road (north), Linton	Roadside	555873	246591	NO_2	Not in AQMA	2.0	2.0	No	2.0
DT49	Cambridge Road (south), Linton	Roadside	555875	246574	NO_2	Not in AQMA	2.0	2.0	No	2.0
DT50	Cambridge Road, Fulbourn	Roadside	551463	255937	NO_2	Not in AQMA	3.0	2.0	No	2.0

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT51	High Street, Oakington	Roadside	540971	264452	NO_2	Not in AQMA	4.0	1.5	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
IMP	543739	261625	Roadside	97.6	97.6	16	13	16	16	15.0
ORCH	544558	261579	Urban Background	99.8	25.8	15	11	11	12	10.9
HARS	542542	250940	Roadside	98.1	76.7	-	-	-	-	12.1
NSTOW	539897	267660	Roadside	99.2	83.2	-	-	-	-	12.1

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction.**

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
DT2	543770	263678	Roadside	100	100.0	27.2	19.7	21.1	19.9	17.5
DT-28N	547436	262295	Roadside	92.6	92.6	23.0	18.8	17.3	15.1	13.4
DT4	548600	249136	Urban Background	100	100.0	23.0	16.5	17.0	17.1	15.0
DT5	538744	263640	Roadside	76.9	76.9	13.4	10.8	12.2	12.1	11.3
DT-6N	555942	246680	Roadside	100	100.0	21.0	15.1	16.5	15.8	13.7
DT-8N	542555	251001	Roadside	100	100.0	15.3	12.3	13.1	13.0	11.3
DT9	547452	263175	Urban Background	100	100.0	15.5	13.3	12.0	12.8	10.6
DT12	544119	261862	Roadside	100	100.0	16.3	12.7	12.2	11.9	10.5
DT13	543955	263588	Urban Background	91.8	91.8	16.3	11.5	12.1	12.7	11.6
DT14	544050	263306	Roadside	100	100.0	22.3	20.2	17.1	17.7	15.1
DT15	544243	261819	Urban Background	100	100.0	18.5	13.4	11.9	11.7	10.5
DT-32N	548742	264698	Roadside	100	100.0	21.6	19.0	15.3	16.9	13.8
DT22	545435	261906	Roadside	100	100.0	15.9	13.3	13.5	14.2	11.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
DT26	543768	263708	Roadside	100	100.0	17.1	13.2	13.2	13.1	11.9
DT28	545169	261764	Roadside	57.7	57.7	16.7	14.1	13.9	13.5	11.0
DT29	552961	249251	Urban Background	100	100.0	10.9	8.4	7.8	8.0	6.9
DT-30N	549154	266006	Roadside	92.6	92.6	-	12.2	12.1	12.3	10.1
DT31	549457	258573	Roadside	100	100.0	-	-	14.0	12.3	10.8
DT32	549406	257551	Roadside	100	26.9	-	-	14.6	14.4	13.6
DT33	533359	259765	Urban Background	90.4	90.4	-	-	10.7	9.2	8.5
DT34	532092	259086	Roadside	100	100.0	-	-	12.3	10.3	8.9
DT35	531247	259475	Roadside	100	100.0	-	-	11.5	11.2	9.1
DT36	538122	259523	Roadside	100	100.0	-	-	12.3	12.0	10.8
DT37	539847	268153	Roadside	100	100.0	-	-	-	-	13.2
DT38	539569	266845	Roadside	76.9	76.9	-	-	-	-	10.3
DT39	540543	266863	Roadside	60.7	60.7	-	-	-	-	7.2
DT40	537456	245595	Roadside	100	32.7	-	-	-	-	10.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
DT41	523723	252302	Roadside	100	32.7	-	-	-	-	15.9
DT42	523740	252081	Roadside	100	32.7	-	-	-	-	11.4
DT43	538344	244608	Roadside	100	32.7	-	-	-	-	10.7
DT44	538268	244767	Roadside	100	32.7	-	-	-	-	12.2
DT45	542443	250755	Roadside	100	32.7	-	-	-	-	11.8
DT46	546498	252169	Roadside	100	32.7	-	-	-	-	13.3
DT47	545629	253218	Roadside	100	25.0	-	-	-	-	11.4
DT48	555873	246591	Roadside	69.2	17.3	-	-	-	-	-
DT49	555875	246574	Roadside	69.2	17.3	-	-	-	-	-
DT50	551463	255937	Roadside	100	25.0	-	-	-	-	9.6
DT51	540971	264452	Roadside	100	34.3	-	-	-	-	7.2

☒ **Annualisation has been conducted where data capture is <75% and >25% 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), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations (Continuous monitors and diffusion tubes DT2 to DT-8N)

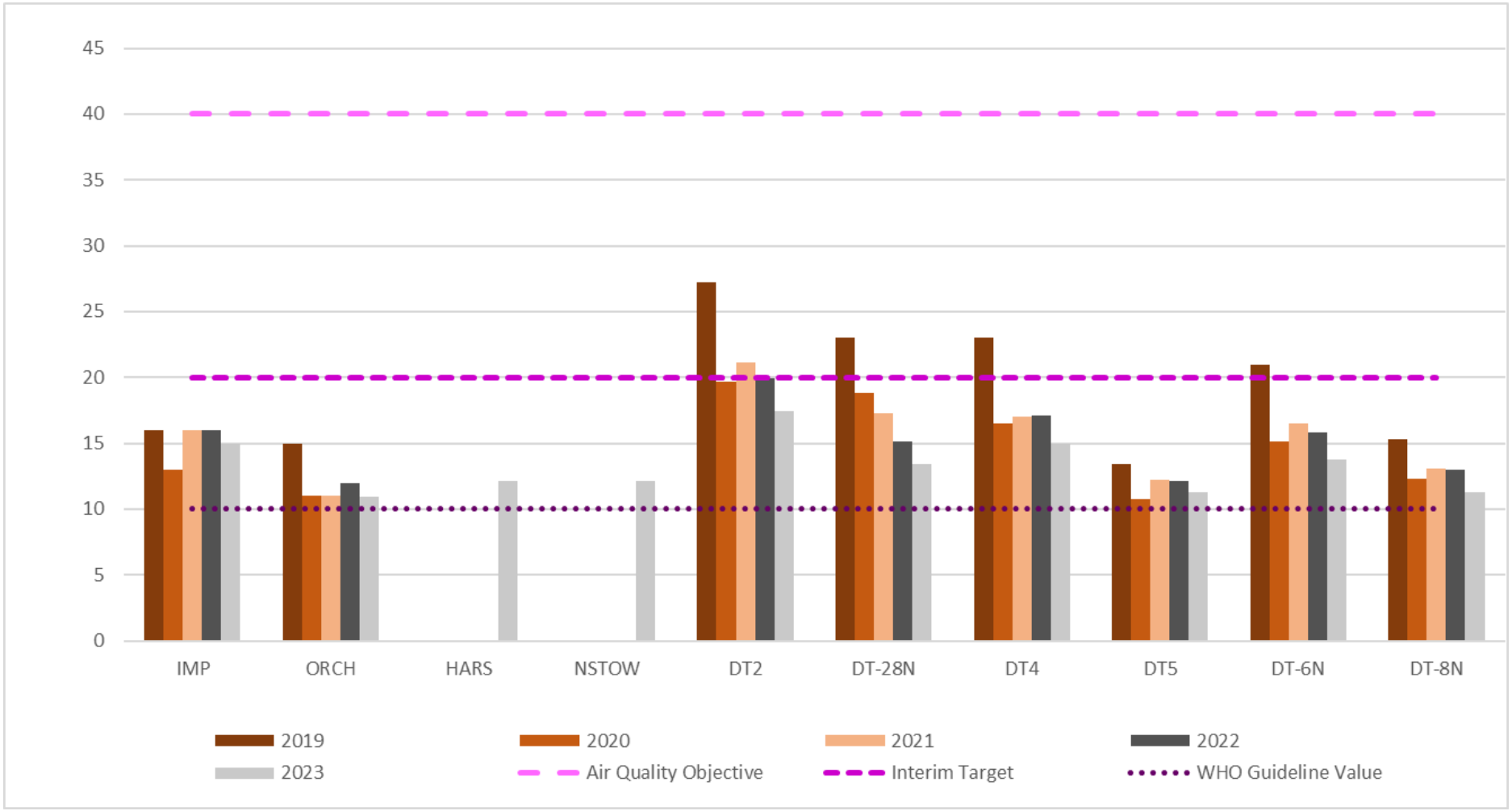


Figure A.2 – Trends in Annual Mean NO_2 Concentrations (Diffusion tubes DT9 to DT29)

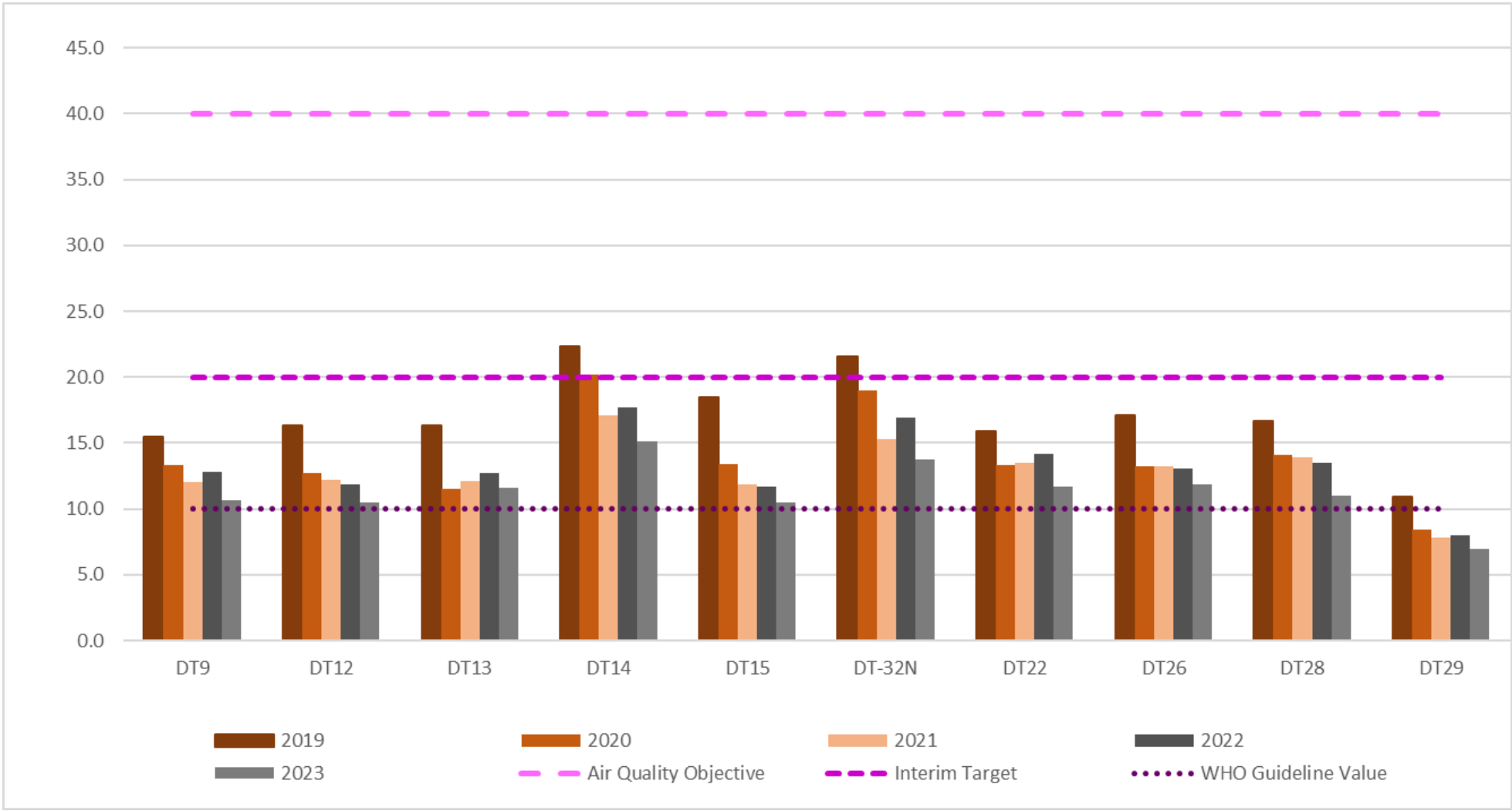


Figure A.3 – Trends in Annual Mean NO_2 Concentrations (Diffusion tubes DT-30N to DT39)

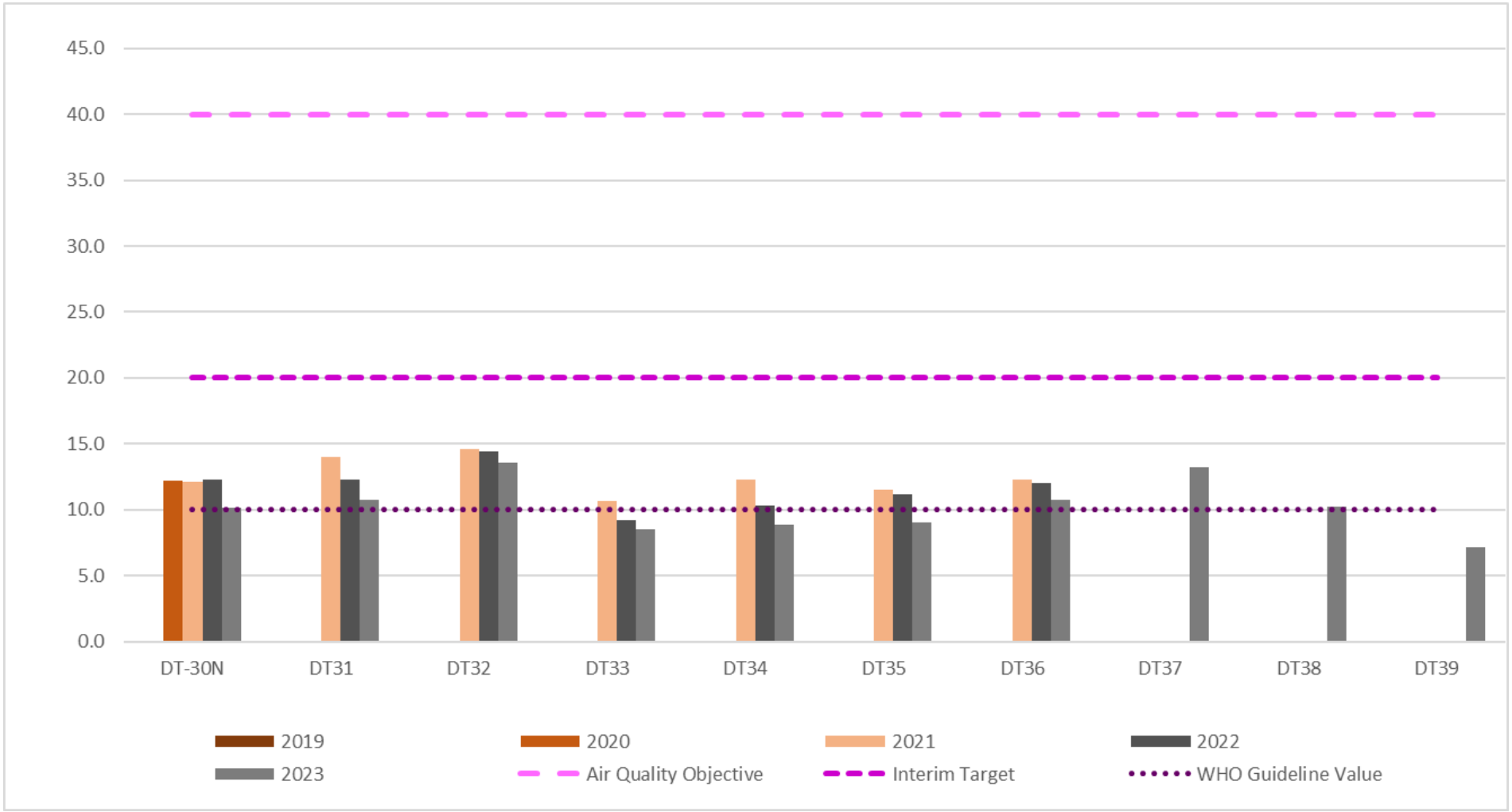


Figure A.4 – Trends in Annual Mean NO_2 Concentrations (Diffusion tubes DT40 to DT51)

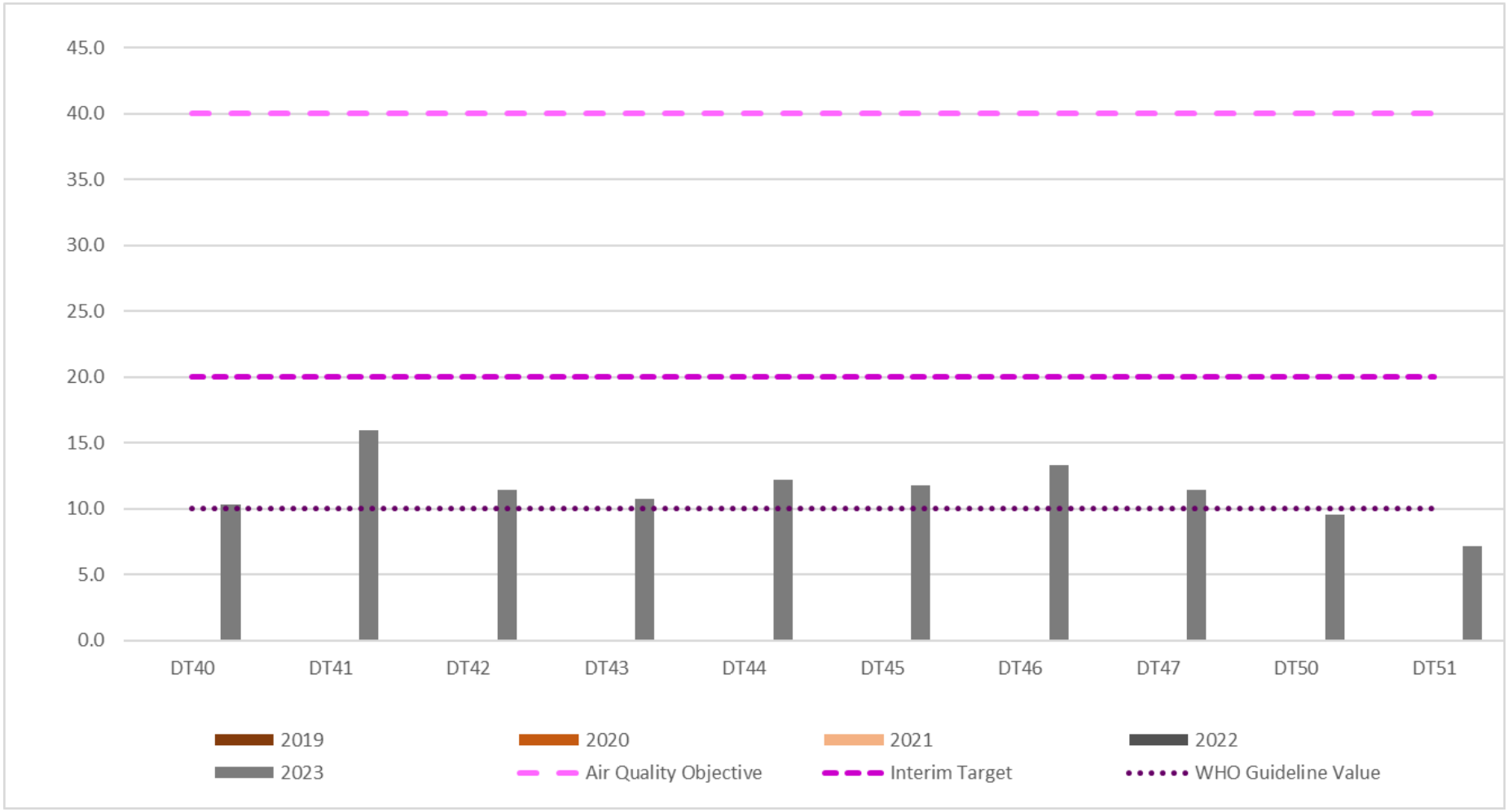


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
IMP	543739	261625	Roadside	97.6	97.6	0	0	0	0	0
ORCH	544558	261579	Urban Background	99.8	25.8	0	0	0	0	0 (63)
HARS	542542	250940	Roadside	98.1	76.7	-	-	-	-	0 (58)
NSTOW	539897	267660	Roadside	99.2	83.2	-	-	-	-	0 (51)

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
IMP	543739	261625	Roadside	95.3	95.3	16	15	15	18	15.6
ORCH	544558	261579	Urban Background	98.9	25.6	14	12	12	12.8	11.3
HARS	542542	250940	Roadside	87.2	67.7	-	-	-	-	13.4
NSTOW	539897	267660	Roadside	73.4	21.6	-	-	-	-	-

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Figure A.5 – Trends in Annual Mean PM_{10} Concentrations

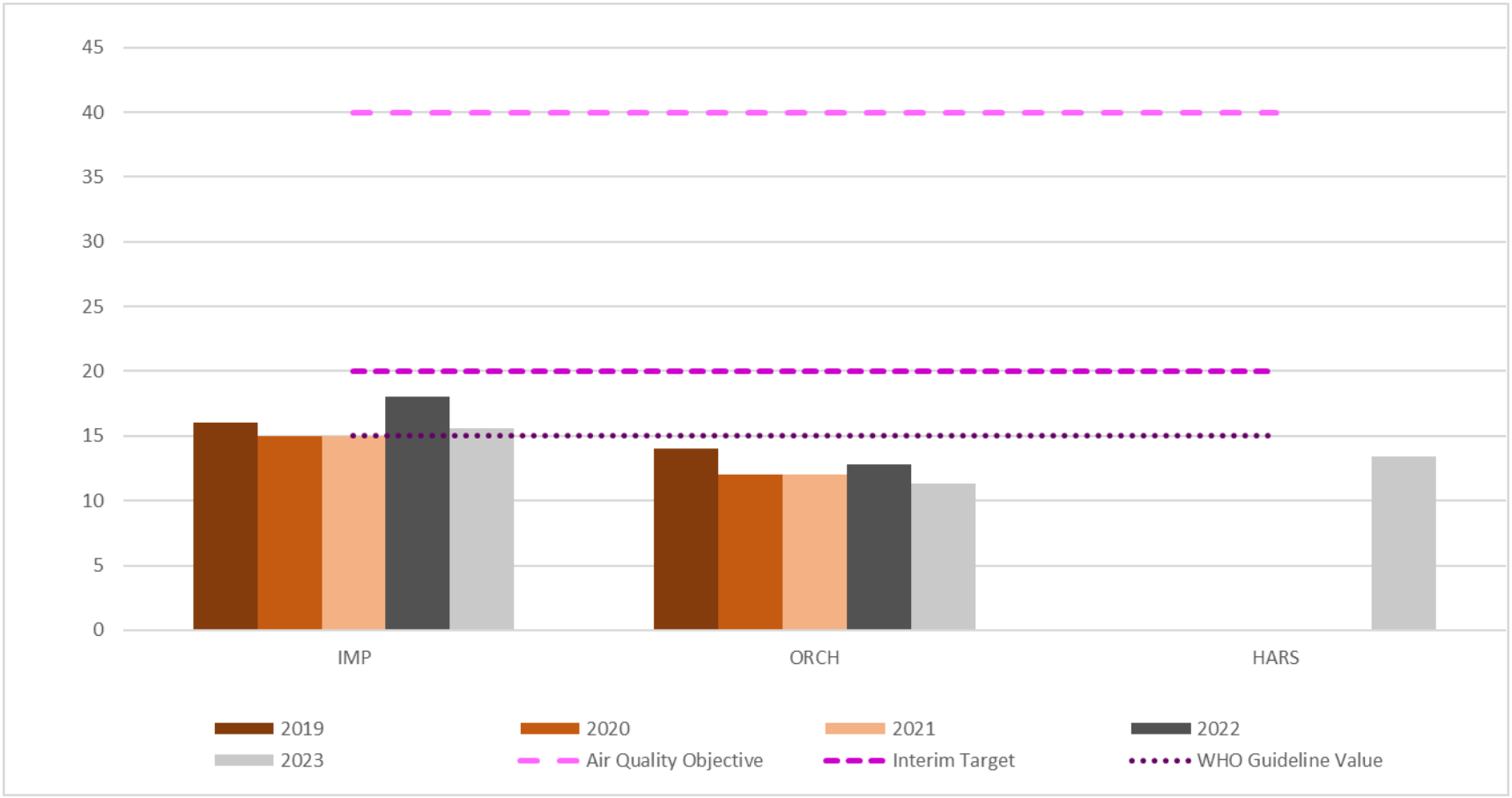


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
IMP	543739	261625	Roadside	95.32	95.32	2	0 (22)	0	2 (28)	0
ORCH	544558	261579	Urban Background	98.9	25.57	1	0	0	0 (26)	0 (22)
HARS	542542	250940	Roadside	87.2	67.66	-	-	-	-	0 (19)
NSTOW	539897	267660	Roadside	73.4	21.64	-	-	-	-	0 (12)

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
IMP	543739	261625	Roadside	27.7	27.7	11	10	13	7.5	7.7
ORCH	544558	261579	Urban Background	96.7	25.0	-	13	12	12.4	8.9
HARS	542542	250940	Roadside	79.1	61.4	-	-	-	-	8.2
NSTOW	539897	267660	Roadside	73.7	21.7	-	-	-	-	-

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

Notes:

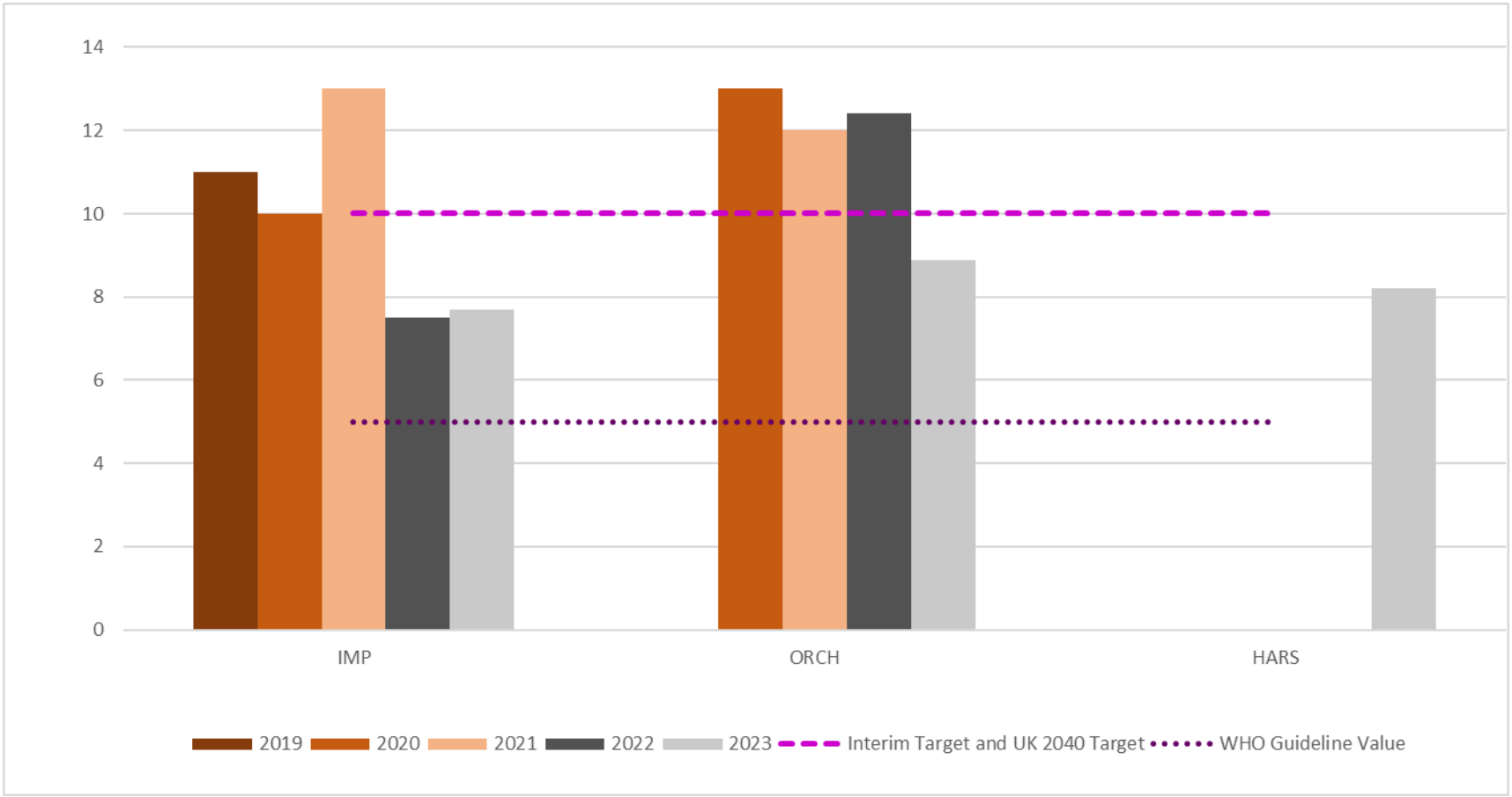
The annual mean concentrations are presented as µg/m^3.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Figure A.6 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (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)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT2	543770	263678	32.7	28.0	20.5	24.6	13.3	19.7	20.4	21.3	28.6	27.6	25.8	9.8	22.7	17.5	-	
DT-28N	547436	262295	28.8	14.4	12.6		5.6	12.9	16.1	15.5	19.8	23.9	23.9	17.7	17.4	13.4	-	
DT4	548600	249136	32.2	11.0	20.9	20.5	15.4	12.9	16.1	18.1	21.5	23.9	24.8	16.4	19.5	15.0	-	
DT5	538744	263640	19.0	16.4	5.9	17.3	18.9	17.1	7.4	13.2			16.6		14.6	11.3	-	
DT-6N	555942	246680	26.3	13.5	18.5	18.9	12.2	16.4	12.8	14.3	20.7	23.1	22.0	15.4	17.8	13.7	-	
DT-8N	542555	251001	21.3	14.5	13.3	17.9	12.7	14.2	7.0	11.4	16.4	17.6	17.9	11.5	14.6	11.3	-	
DT9	547452	263175	25.3	17.3	11.7	13.1	7.8	9.0	9.5	8.9	12.9	15.2	18.4	16.5	13.8	10.6	-	
DT12	544119	261862	22.7	15.0	10.4	17.0	7.4	10.1	9.7	12.3	8.2	21.0	17.9	11.7	13.6	10.5	-	
DT13	543955	263588	23.1	20.2		13.5	8.9	12.1	11.3	12.0	18.7	17.4	19.4	9.0	15.1	11.6	-	
DT14	544050	263306	36.1	26.9	14.3	19.0	12.5	13.6	15.2	17.7	16.5	23.6	21.5	18.4	19.6	15.1	-	
DT15	544243	261819	22.3	19.2	10.2	13.8	7.1	9.8	10.1	11.6	14.3	19.5	13.2	12.0	13.6	10.5	-	
DT-32N	548742	264698	30.2	25.9	13.3	12.0	14.0	18.5	7.8	15.0	20.5	20.8	22.1	14.5	17.9	13.8	-	
DT22	545435	261906	25.0	21.2	12.0	12.8	16.1	12.7	9.6	12.4	15.8	18.8	15.0	10.6	15.2	11.7	-	
DT26	543768	263708	24.5	18.2	12.8	12.6	10.0	11.5	10.7	12.8	15.4	21.7	22.0	12.6	15.4	11.9	-	
DT28	545169	261764	26.3	13.8	11.4	14.4	10.7	11.9	10.9						14.2	11.0	-	
DT29	552961	249251	14.2	14.5	5.6	9.7	6.1	6.0	5.2	7.5	8.3	10.4	13.7	6.8	9.0	6.9	-	
DT-30N	549154	266006	22.0	9.4	9.2		9.5	9.6	9.3	10.9	13.7	18.0	21.1	11.7	13.1	10.1	-	
DT31	549457	258573	26.5	17.5	14.7	12.4	9.5	9.9	8.8	11.6	12.4	16.5	21.6	6.3	14.0	10.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (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)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT32	549406	257551	29.7	24.1	14.7										22.8	13.6	-	
DT33	533359	259765	20.0	16.7	6.8	11.7	8.3	8.1	5.9		8.4	11.6	16.9	7.5	11.1	8.5	-	
DT34	532092	259086	19.5	17.7	9.6	10.4	8.9	9.2	4.6	9.5	11.8	13.7	17.0	6.6	11.5	8.9	-	
DT35	531247	259475	17.8	19.9	7.6	11.6	9.3	9.4	4.4	9.0	10.7	16.3	15.4	9.9	11.8	9.1	-	
DT36	538122	259523	24.0	21.1	11.3	13.1	14.0	11.8	9.1	9.9	14.1	13.8	17.3	8.4	14.0	10.8	-	
DT37	539847	268153	22.3	21.0	16.6	18.7	13.8	16.0	12.3	14.3	17.4	23.7	17.4	12.3	17.2	13.2	-	
DT38	539569	266845	22.7	12.5				4.9	10.2	10.2	14.6	17.0	16.2	11.6	13.3	10.3	-	
DT39	540543	266863	15.3	12.9			4.9		6.1	6.9			13.1	9.0	9.7	7.2	-	
DT40	537456	245595									15.1	16.2	17.2	10.8	14.8	10.3	-	
DT41	523723	252302									17.7	16.1	41.6	16.1	22.9	15.9	-	
DT42	523740	252081									14.8	17.3	17.9	15.6	16.4	11.4	-	
DT43	538344	244608									13.6	18.4	18.4	11.2	15.4	10.7	-	
DT44	538268	244767									17.6	17.2	21.7	13.3	17.5	12.2	-	
DT45	542443	250755									15.8	18.7	21.5	11.7	16.9	11.8	-	
DT46	546498	252169									20.5	21.8	21.1	13.1	19.1	13.3	-	
DT47	545629	253218										21.6	17.8	13.4	17.6	11.4	-	
DT48	555873	246591										34.7	21.1		-	-	-	
DT49	555875	246574											31.9	21.7	-	-	-	
DT50	551463	255937										16.8	19.4	8.0	14.7	9.6	-	
DT51	540971	264452	18.8	5.6	8.9	12.3									11.4	7.2	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**.

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Local bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **South Cambridgeshire District Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

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**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within South Cambridgeshire During 2023

South Cambridgeshire District Council has not identified any significant new sources relating to air quality within the reporting year of 2023, however, significant residential and commercial growth continues within the district.

Additional Air Quality Works Undertaken by South Cambridgeshire During 2023

South Cambridgeshire District Council has not completed any formal additional works within the reporting year of 2023. Informal studies using a low cost sensor have been undertaken as detailed in other sections of the report.

QA/QC of Diffusion Tube Monitoring

During 2023, South Cambridgeshire District 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 schedule. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a satisfactory laboratory.

Monitoring was mostly in line with the 2023 diffusion tube monitoring calendar as published by Defra, however, a small number of months were undertaken slightly outside the dates specified by the calendar when no air quality officer was in post. All monitoring periods remained an appropriate length of either 4 or 5 weeks and we consider the results to remain valid.

Diffusion Tube Annualisation

Table C.1 – Annualisation Summary Nitrogen Dioxide (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Northampton Spring Park	Annualisation Factor Wicken Fen	Annualisation Factor Borehamwood Meadow Park	Annualisation Factor Haringey Priory	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
DT28	1.0868	0.9647	1.0219	0.9654	1.0097	14.2	14.3
DT32	0.8097	0.7178	0.7862	0.7724	0.7715	22.8	17.6
DT39	0.9345	0.9526	0.9818	0.9631	0.9580	9.7	9.3
DT40	0.8319	0.9631	0.8804	0.9458	0.9053	14.8	13.4
DT41	0.8319	0.9631	0.8804	0.9458	0.9053	22.9	20.7
DT42	0.8319	0.9631	0.8804	0.9458	0.9053	16.4	14.8
DT43	0.8319	0.9631	0.8804	0.9458	0.9053	15.4	13.9
DT44	0.8319	0.9631	0.8804	0.9458	0.9053	17.5	15.8
DT45	0.8319	0.9631	0.8804	0.9458	0.9053	16.9	15.3
DT46	0.8319	0.9631	0.8804	0.9458	0.9053	19.1	17.3
DT47	0.7844	0.8932	0.8323	0.8666	0.8441	17.6	14.9
DT50	0.7844	0.8932	0.8323	0.8666	0.8441	14.7	12.4
DT51	0.8716	0.7628	0.8279	0.8055	0.8170	11.4	9.3

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 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.

South Cambridgeshire District Council have applied a national bias adjustment factor of 0.77 to the 2023 monitoring data as no local co-location studies were completed. A summary of bias adjustment factors used by South Cambridgeshire District Council over the past five years is presented in

Table C.2.

Table C.2 – Bias Adjustment Factor

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

NO_2 Fall-off with Distance from the Road

No diffusion tube NO2 monitoring locations within South Cambridgeshire required distance correction during 2023.

QA/QC of Automatic Monitoring

South Cambridgeshire District Council is a member of the Calibration Club, operated by Ricardo – AEA. All NOx analysers are chemiluminescence analysers. Particulate matter analysers are a combination of BAMs and TEOM-FDMS. In line with current guidance, BAM data is multiplied by 1.3 to give the gravimetric equivalent. QA/QC of automatic monitoring data is carried out by Ricardo. Tri-annual audits of the monitoring stations are carried out by Ricardo. Services of all AQ monitoring stations are carried out bi-annually by the appointed Equipment Support Unit (ESU), which in 2023 was ACOEM (Air Monitors). The sites are manually calibrated on a monthly basis by a Council Officer serving as Local Site Operative (LSO). The output from the calibrations is forwarded to Ricardo – AEA for QA/QC and ratification purposes. The monitoring data in the ASR has been ratified. Live and historic data is available at https://scambs-airquality.ricardo-aea.com/.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM10/PM2.5 monitor(s) utilised within South Cambridgeshire District Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. For NO_2 annualisation was only required for Orchard Park, which was discontinued during 2023 and therefore only had data capture of 25.8%.

For PM_{10} Orchard Park, Harston and Northstowe all had data below 75% and were therefore annualised. Northstowe was also below 25% and therefore the annualisation was not carried out. The poor data capture for these instruments was due to them not being in place for the whole year (Orchard Park was discontinued, whilst Harston and Northstowe were new in 2023), and teething problems with the instruments at both Harston and Northstowe.

For $PM_{2.5}$ all four continuous monitors required annualisation as they all recorded less than 75% data throughout the year, with Northstowe again being below 25% and Orchard Park and Impington being only just above 25%.

The annualisation summaries are included in Tables C.3 to C.5 for the various pollutants. All sites used for annualisation are Defra AURN background sites, where possible within 50 miles of the subject site, although some of the sites used for PM may be slightly further given the lack of background PM sites with an acceptable data set close to South Cambridgeshire.

Table C.3 – Annualisation Summary Nitrogen Dioxide (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Northampton Spring Park	Annualisation Factor Wicken Fen	Annualisation Factor Borehamwood Meadow Park	Annualisation Factor Haringey Priory	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
ORCH	0.79	0.71	0.77	0.76	0.76	14.4	10.9

Table C.4 – Annualisation Summary PM_{10} (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Wicken Fen	Annualisation Factor St Osyth	Annualisation Factor Weybourne	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
ORCH	1.03	1.02	0.89	0.98	11.5	11.3
HARS	1.00	1.00	1.05	1.02	13.2	13.4

Table C.5 – Annualisation Summary $PM_{2.5}$ (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Wicken Fen	Annualisation Factor St Osyth	Annualisation Factor Weybourne	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
IMP	1.30	1.27	1.26	1.28	6.0	7.7
ORCH	0.85	0.92	0.84	0.87	10.2	8.9
HARS	1.10	1.12	1.14	1.12	7.3	8.2

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within South Cambridgeshire District Council required distance correction during 2023.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Site – Bar Hill

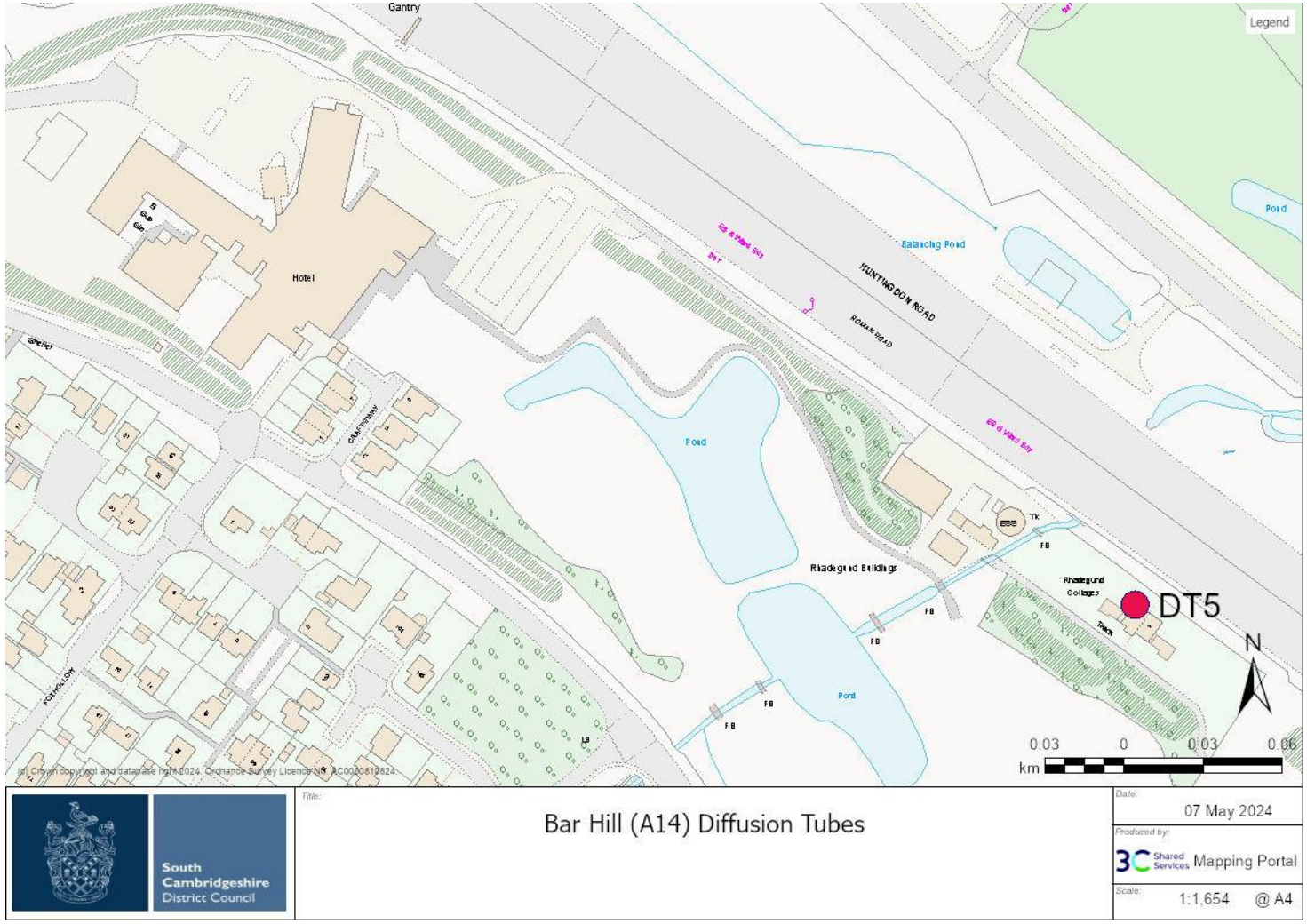


Figure D.2 – Map of Non-Automatic Monitoring Sites – Cambourne

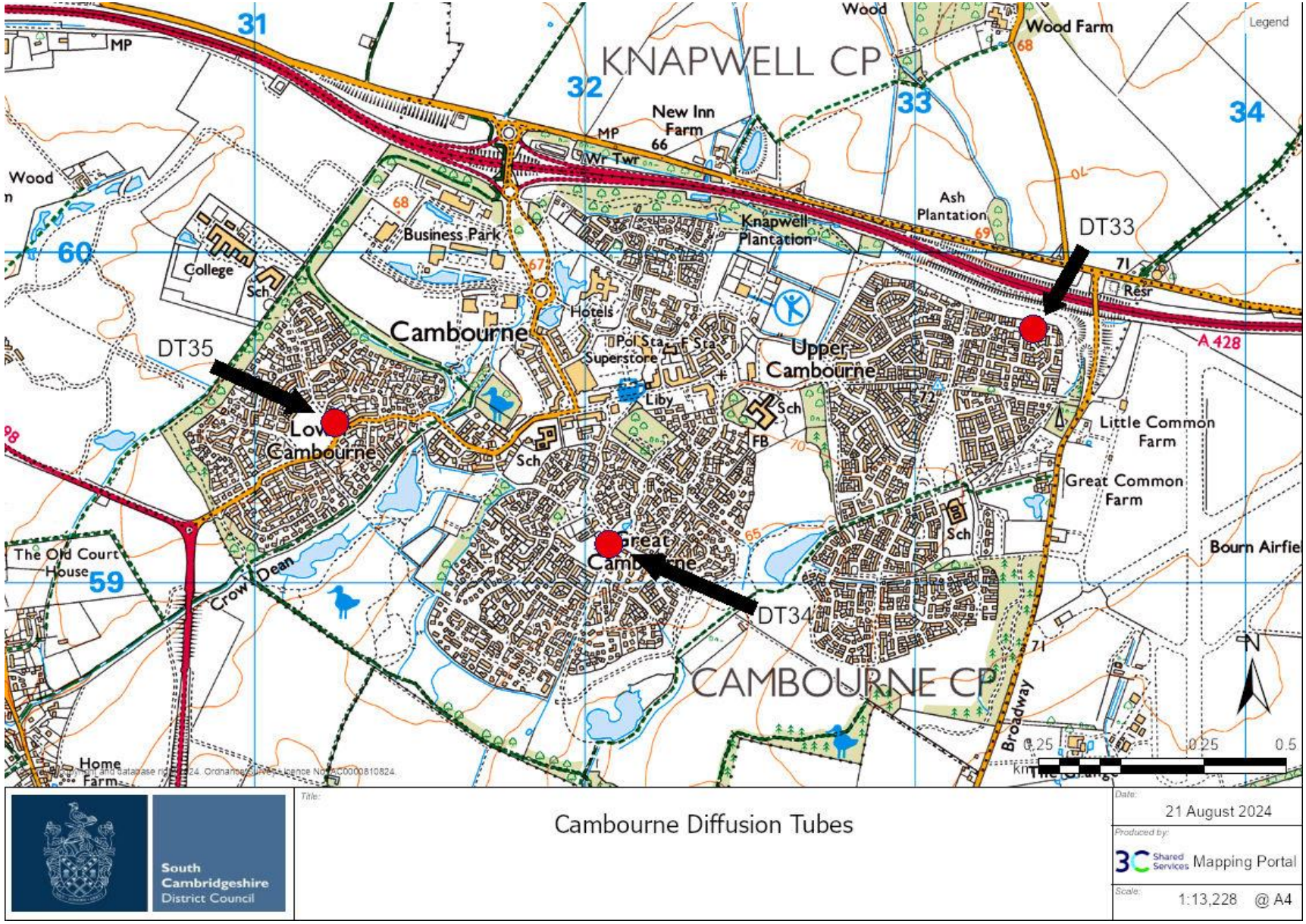


Figure D.3 – Map of Non-Automatic Monitoring Site – Cherry Hinton

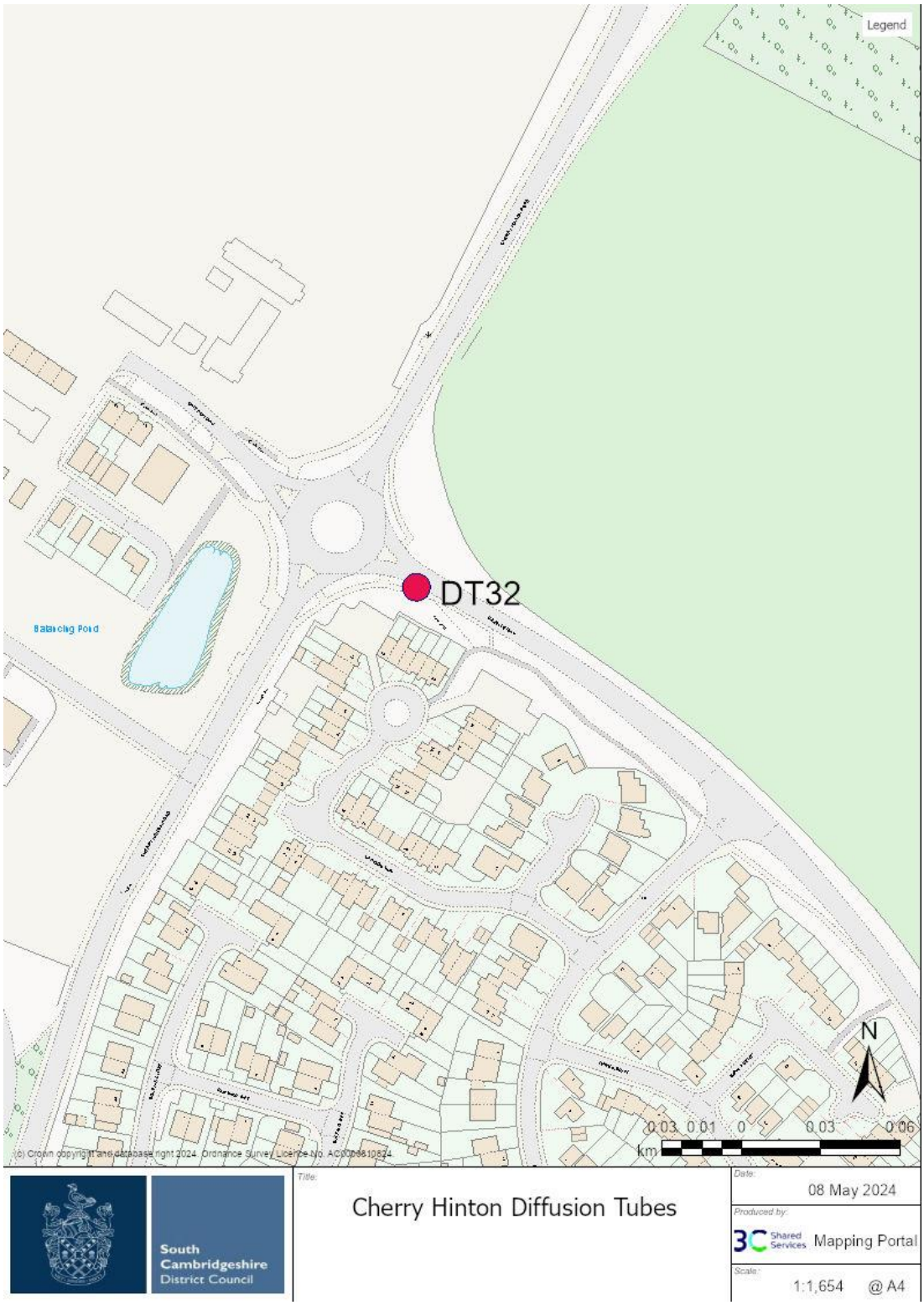


Figure D.4 – Map of Non-Automatic Monitoring Site – Fulbourn

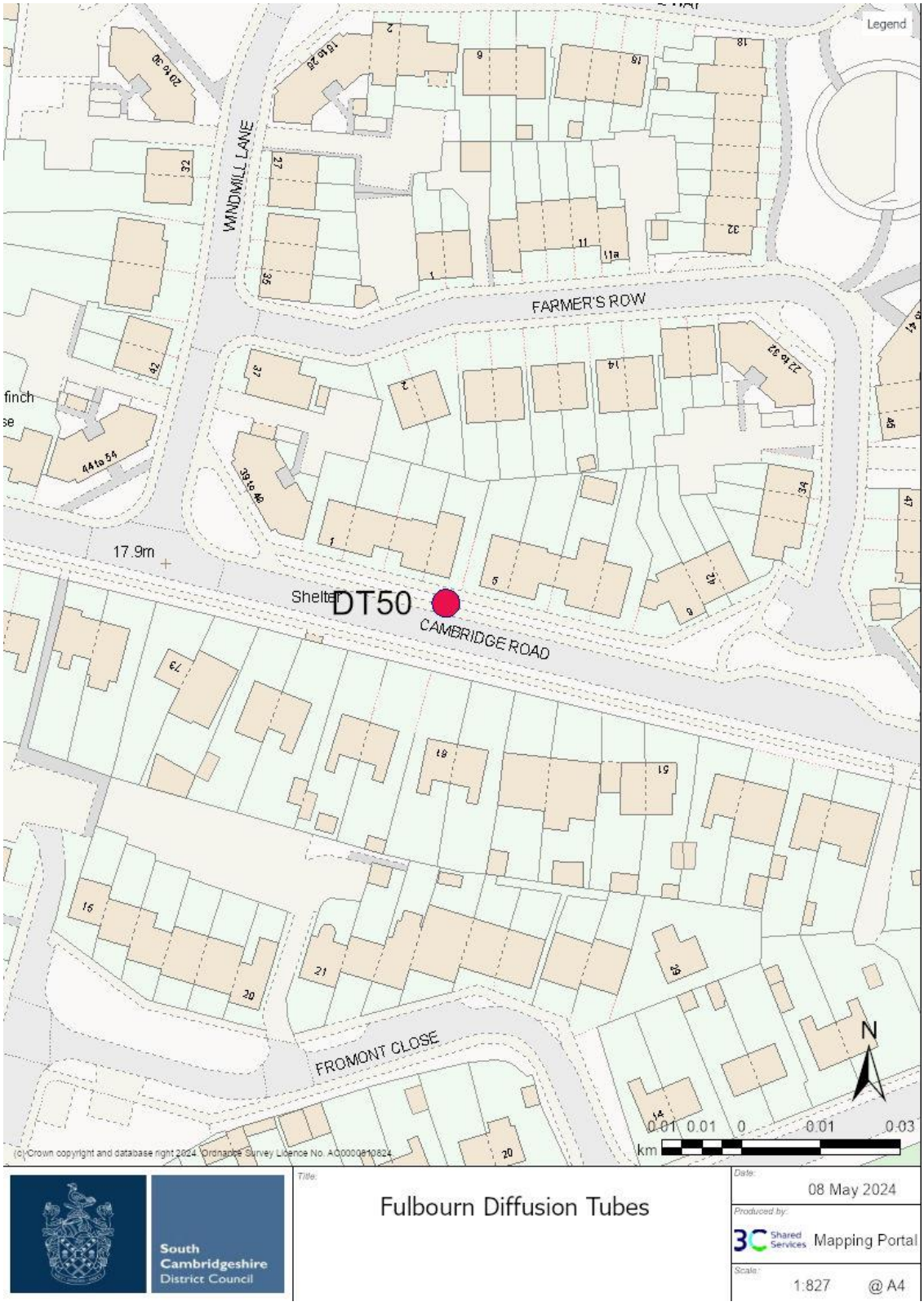


Figure D.5 – Map of Non-Automatic Monitoring Sites – Gamlingay

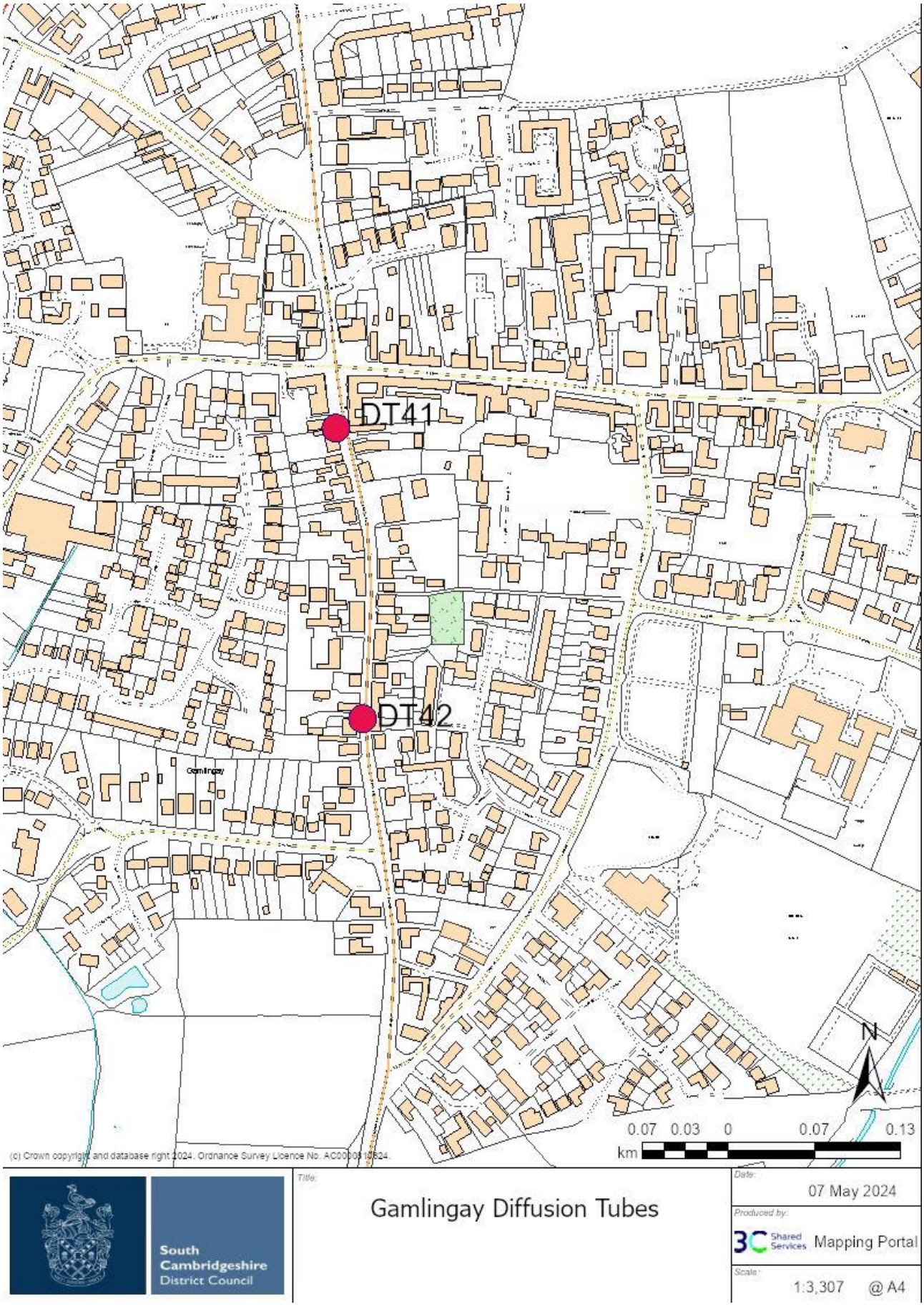


Figure D.6 – Map of Non-Automatic Monitoring Sites – Great Shelford

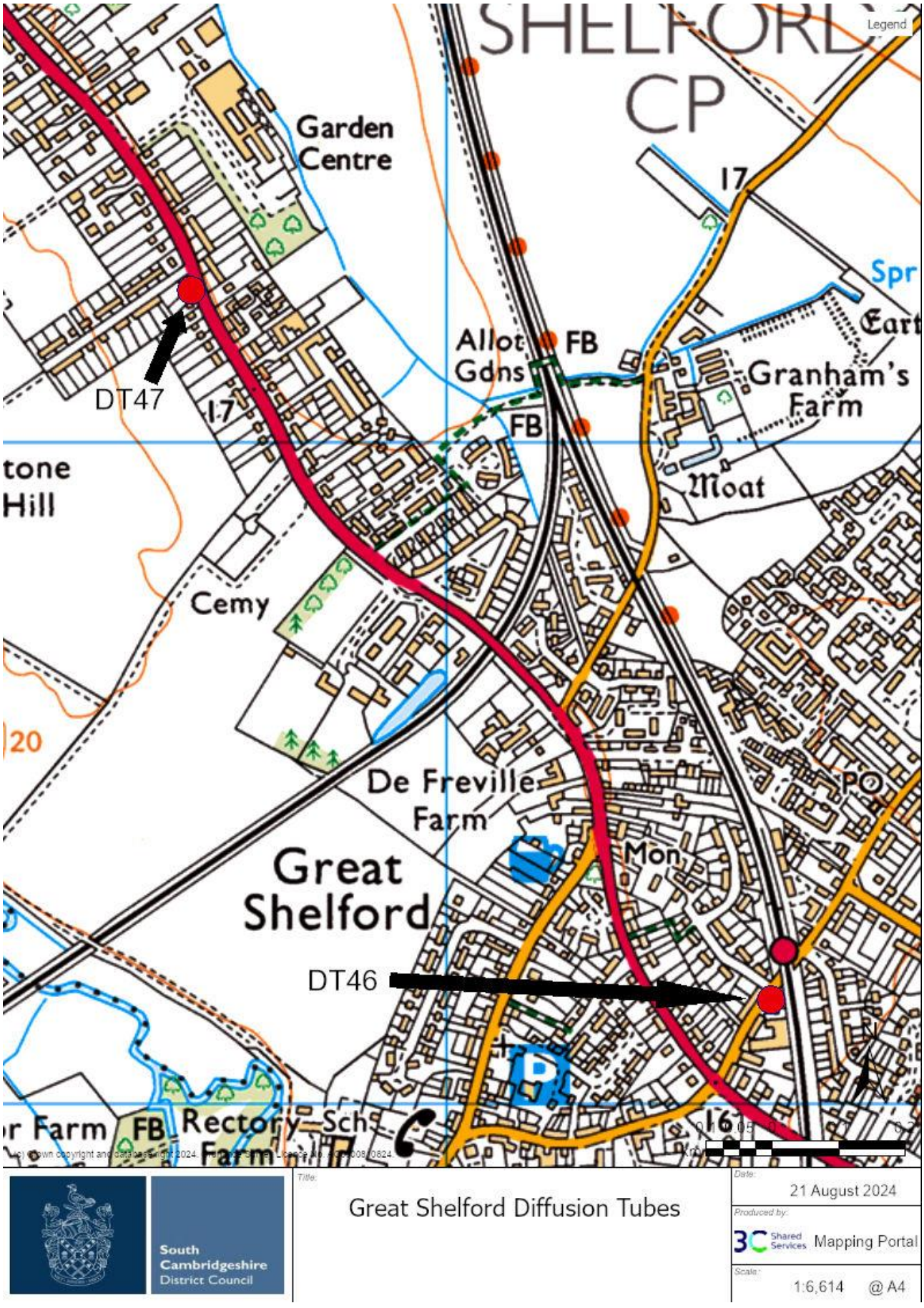


Figure D.7 – Map of Non-Automatic and Automatic Monitoring Sites – Harston

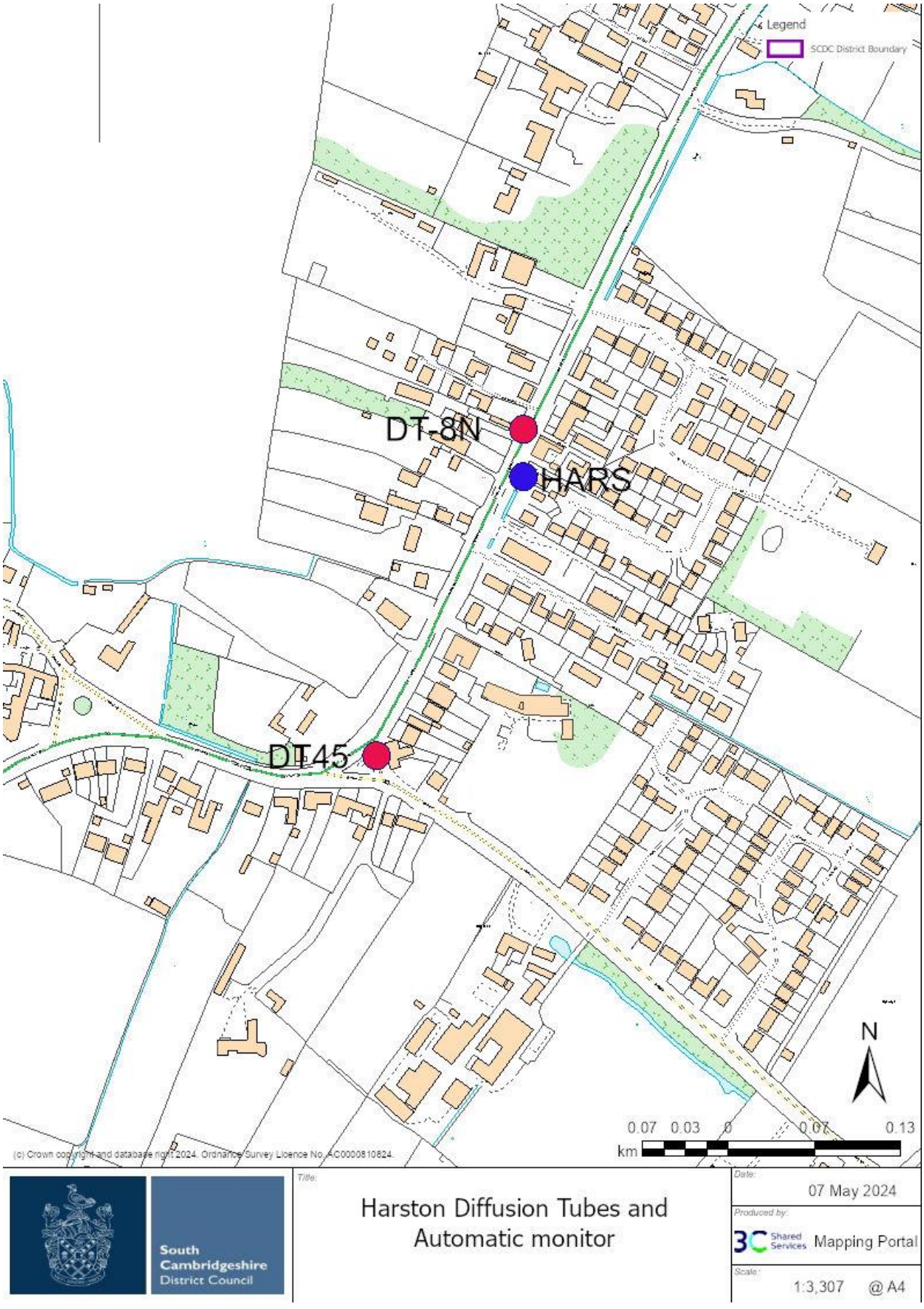


Figure D.8 – Map of Non-Automatic Monitoring Sites – Histon

Figure D.8 – Map of Non-Automatic and Automatic Monitoring Sites – Impington and Orchard Park

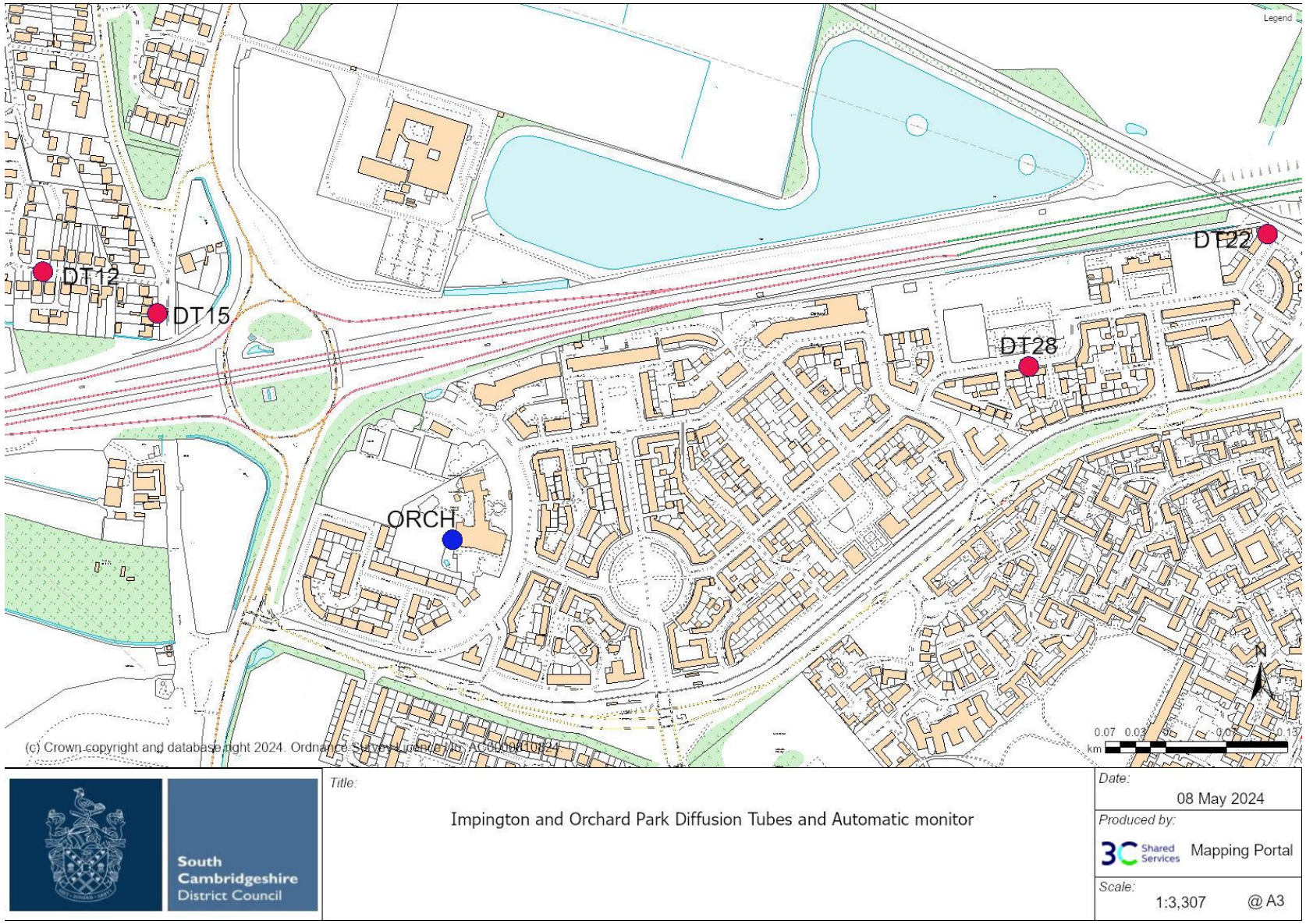


Figure D.9 – Map of Automatic Monitoring Site – Impington (A14)

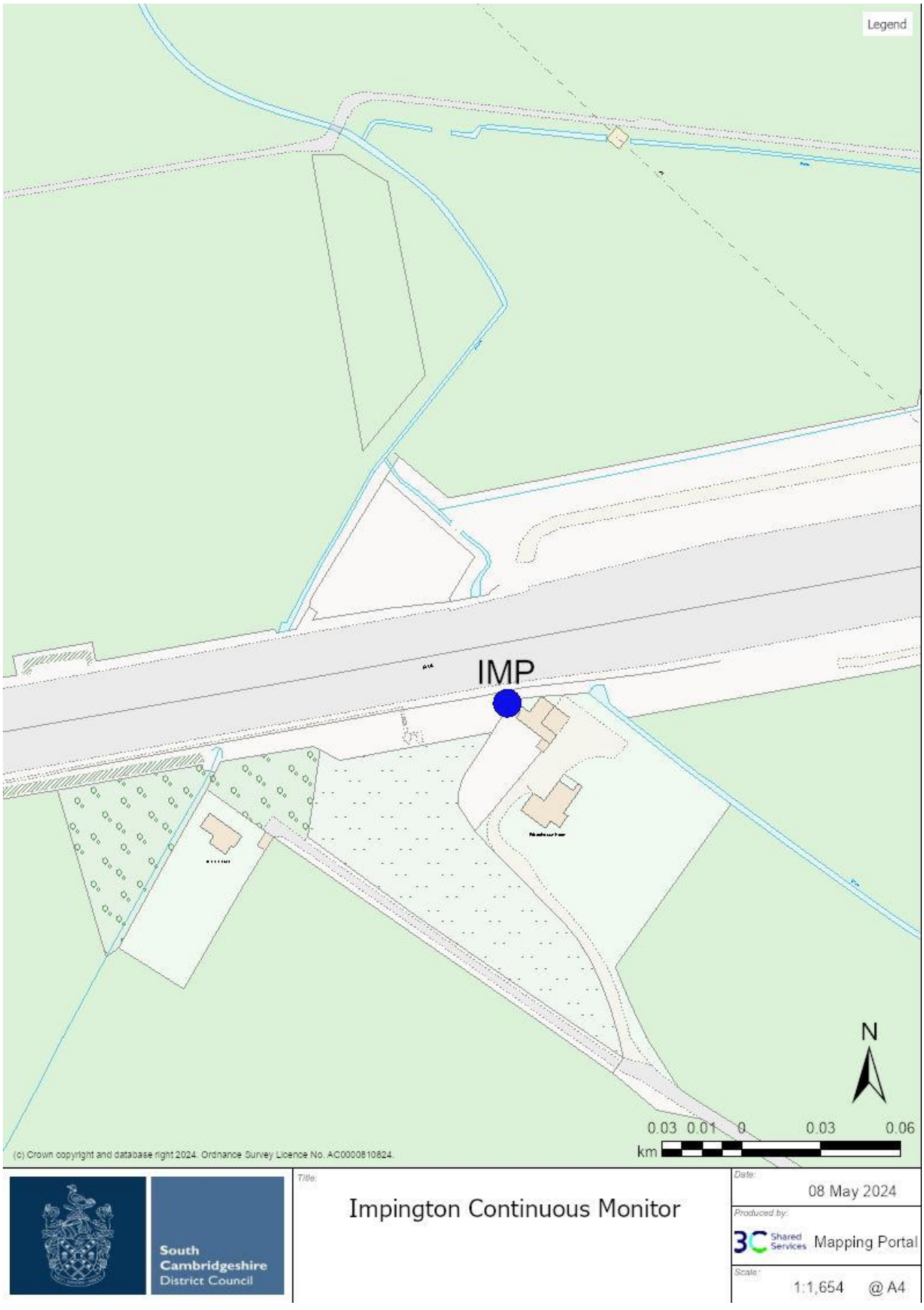


Figure D.10 – Map of Non-Automatic Monitoring Sites – Linton

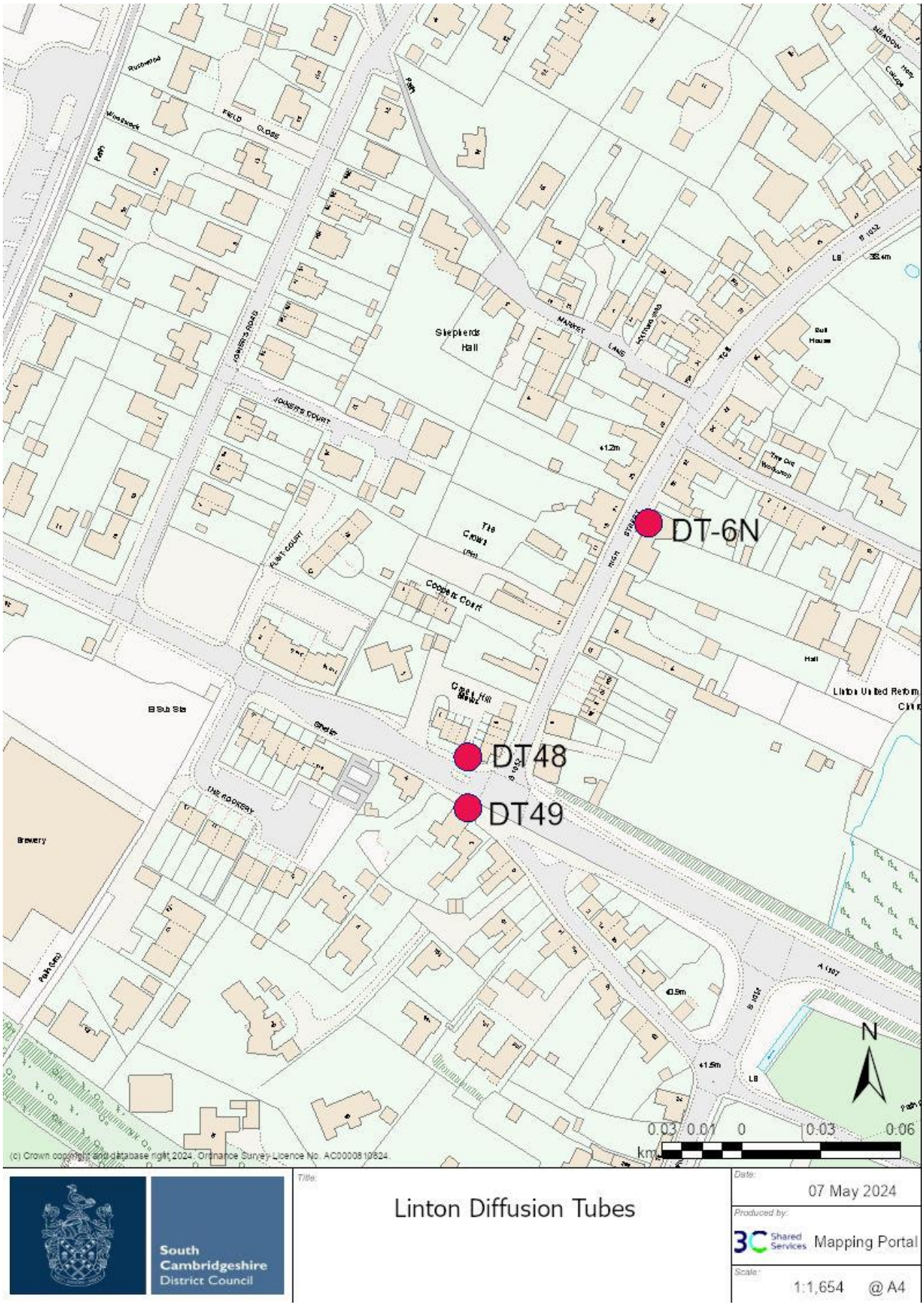


Figure D.11 – Map of Non-Automatic Monitoring Site – Little Abington

Figure D.12 – Map of Non-Automatic and Automatic Monitoring Sites – Longstanton and Northstowe

Figure D.13 – Map of Non-Automatic Monitoring Sites – Melbourn and Meldreth

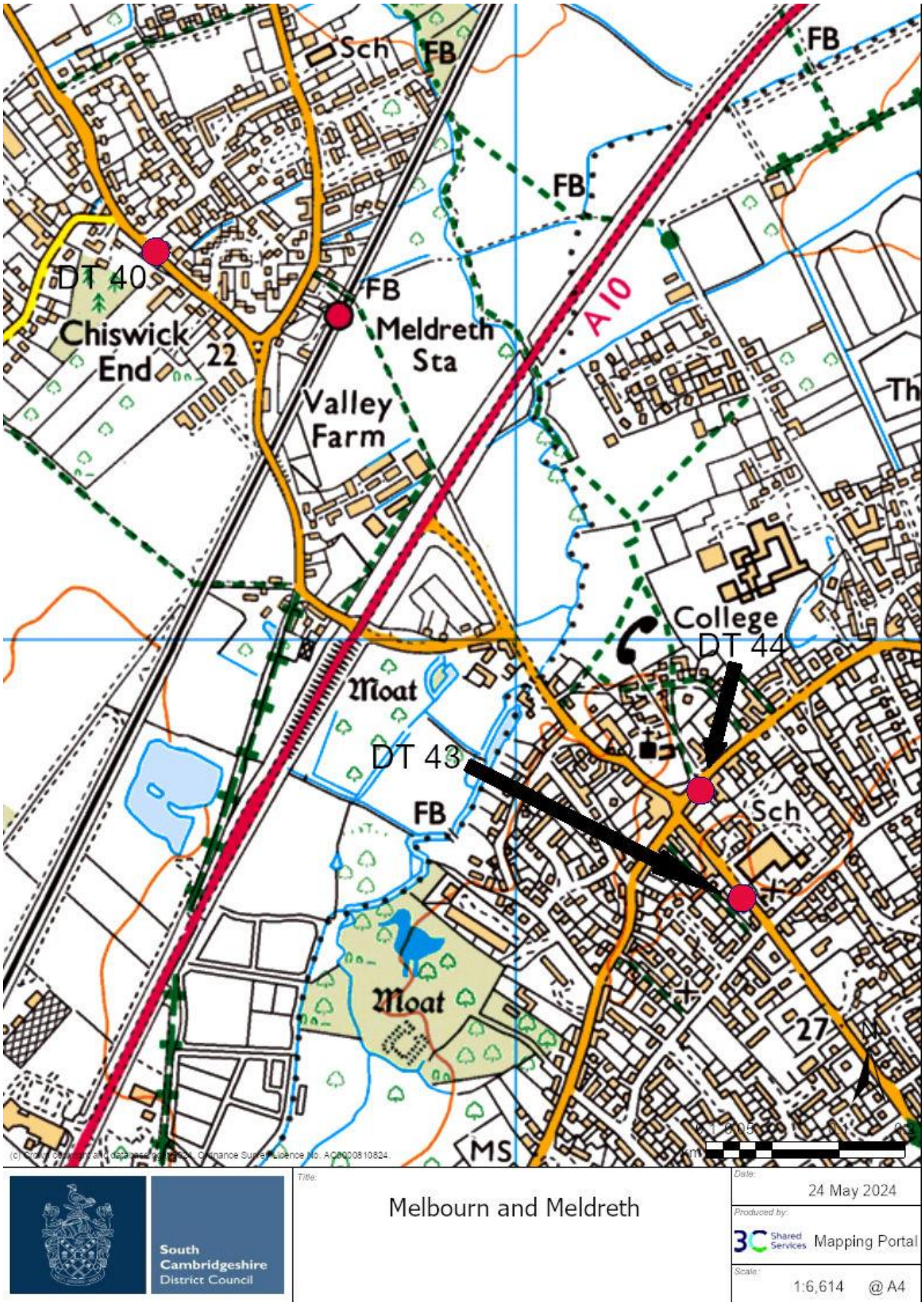


Figure D.14 – Map of Non-Automatic Monitoring Sites – Milton

Figure D.15 – Map of Non-Automatic Monitoring Sites – Oakington

Figure D.16 – Map of Non-Automatic Monitoring Site – Sawston

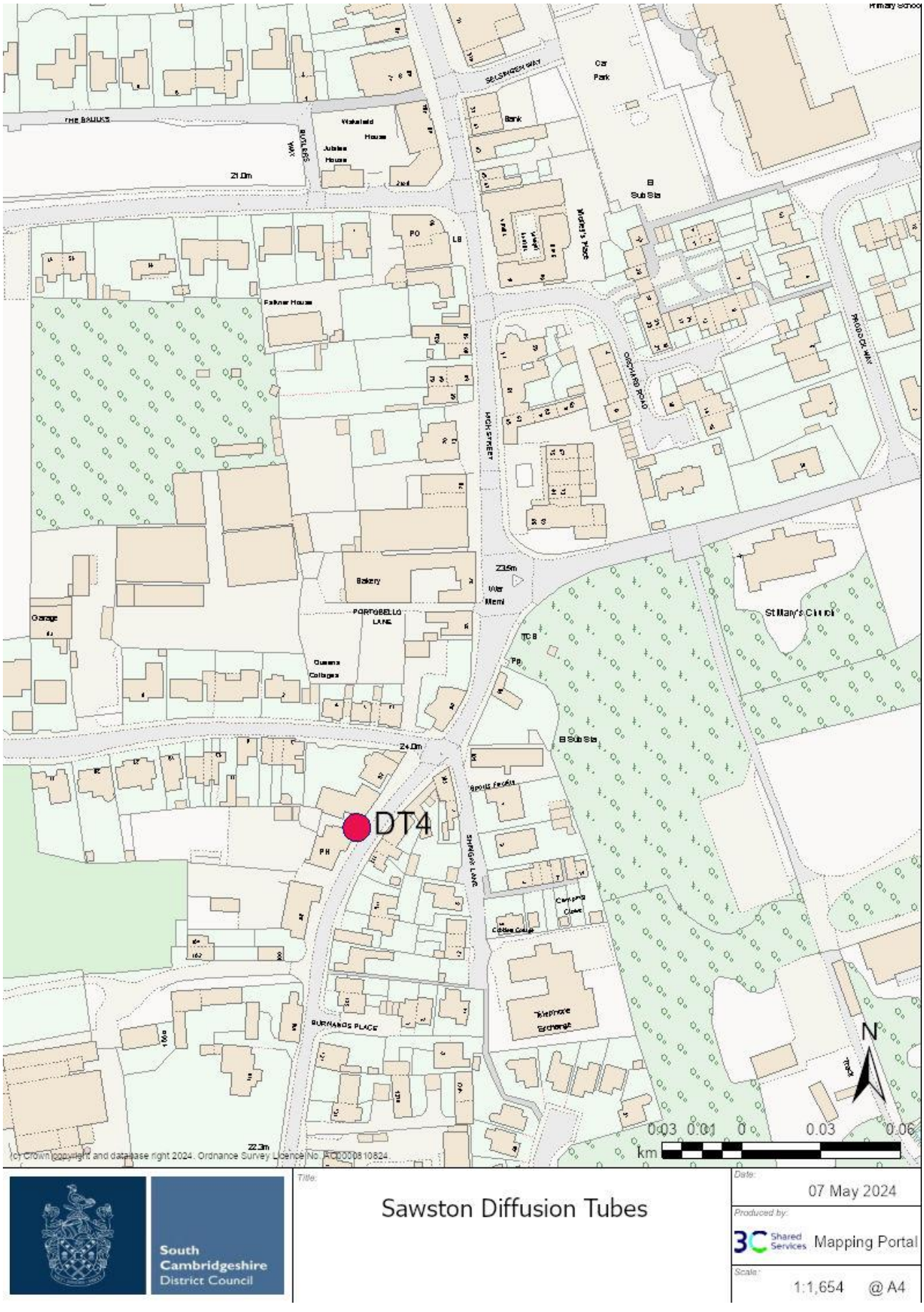


Figure D.17 – Map of Non-Automatic Monitoring Site – St Neots Road

Figure D.18– Map of Non-Automatic Monitoring Site – Teversham

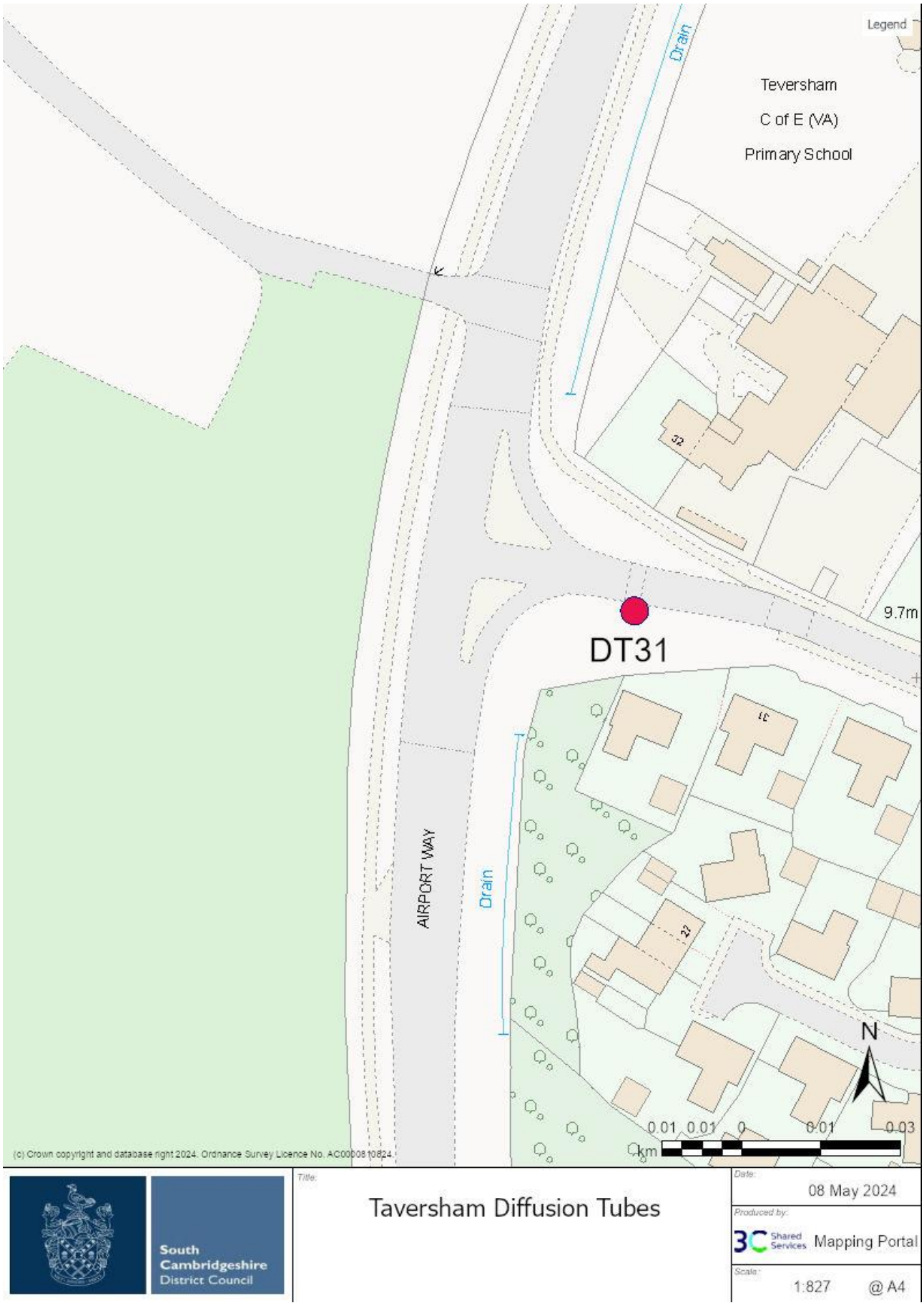


Figure D.19– Map of Non-Automatic Monitoring Sites – Waterbeach

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[10]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[10] 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	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
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm 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.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.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.
- Greater Cambridge Air Quality Strategy, April 2024, Published by Cambridge City Council and South Cambridgeshire District Council