



# 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: July, 2024

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## Executive Summary: Air Quality in Our Area

### Air Quality in Hertsmere Borough Council

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<sup>1</sup>.

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<sup>2</sup>.

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 <sub>2</sub> )	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO <sub>2</sub> )	Sulphur dioxide (SO <sub>2</sub> ) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM <sub>10</sub> and PM <sub>2.5</sub> )	<p>Particulate matter is everything in the air that is not a gas.</p> <p>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.</p> <p>PM<sub>10</sub> refers to particles under 10 micrometres. Fine particulate matter or PM<sub>2.5</sub> are particles under 2.5 micrometres.</p>

<sup>1</sup> UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

Hertsmere Borough Council is located in South East England, within the County of Hertfordshire. To the south lie the London Boroughs of Harrow and Barnet, to the east the London Borough of Enfield, to the northeast Welwyn Hatfield District, to the north St Albans District and to the west Watford District and Three Rivers District. The M25, M1 and A1 either border or run through Hertsmere. The main air quality issues are related to emissions from traffic, particularly within the town of Potters Bar and the village of Elstree, and close to major roads of the M25 and M1.

Historically the main Air Quality pollutant of concern within Hertsmere has been nitrogen dioxide (NO<sub>2</sub>) (Annual Mean).

There are currently six AQMAs of varying size, which have all been declared for nitrogen dioxide:

- Two AQMAs have been declared in the town of Potters Bar, one in the High Street and one on the periphery close to the M25;
- One AQMA has been declared within the village of Elstree;
- Three AQMAs have been declared in the vicinity of motorways, one close to junction 1 of the M1, and two in proximity of junction 23 of the M25.

Annual Mean Concentrations decreased at all monitoring locations within Hertsmere Borough Council during 2020, which coincided with a decrease in vehicles using the highway network in the wake of the Covid 19 epidemic. However despite the lifting of lockdown restrictions during 2021 and a reopening of the economy, a sustained decrease in all monitoring locations was observed at all monitoring locations. Following 2021, sustained compliance with the Annual Mean National Air Quality Objective for nitrogen dioxide was again observed during the 2022 and during the 2023 monitoring years, at all monitoring locations throughout Hertsmere Borough Council's administrative area, including within all previously declared Air Quality Management Areas.

Following sustained compliance with the Annual Mean National Air Quality Objective for nitrogen dioxide at all six Air Quality Management Areas (AQMAs), Hertsmere Borough Council reviewed the feasibility of revoking all six AQMAs, during 2023. Further discussion around the revocation of AQMAs 1-6, will take place within Section 2 of this report.

See <https://uk-air.defra.gov.uk/aqma/list> for further information on the six declared AQMAs.

Hertsmere Borough Council has actively worked to improve air quality in its area through the previous implementation of an Air Quality Action Plan. Hertsmere Borough Council is also working in partnership with Hertfordshire County Council on their Air Quality Strategy and Implementation Plan 2019 and through the Hertfordshire Local Transport Plan (LTP4 2018 - 2031), which was developed in partnership with Transport, Planning and Public Health colleagues.

Hertsmere Borough Council belongs to the Herts & Beds & Neighbouring Authorities Air Quality Forum; which involves other local authorities within Hertfordshire, Bedfordshire and Buckinghamshire. The group meets and discusses Air Quality, which encourages a consistent approach to dealing with Air Quality related matters, in close connection with the County Councils.

## 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<sup>3</sup> 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<sub>2.5</sub>), the pollutant of most harmful to human health. The Air Quality Strategy<sup>4</sup> 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<sup>5</sup> 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.

Actions to improve Air Quality are summarised within Section 2 below and Table 2.2.

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<sup>3</sup> Defra. Environmental Improvement Plan 2023, January 2023

<sup>4</sup> Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

<sup>5</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

## Conclusions and Priorities

Hertsmere Borough Council saw decreases of the nitrogen dioxide annual mean concentration at all of its Diffusion Tube monitoring locations, during 2023. All Diffusion Tube locations also sustained compliance with the nitrogen dioxide annual mean Air Quality objective, prior to the application of a Bias Adjustment correction factor and where necessary Annualisation. Therefore as summarised above Hertsmere Borough Council reviewed the revocation of all six of its AQMAs, during 2023.

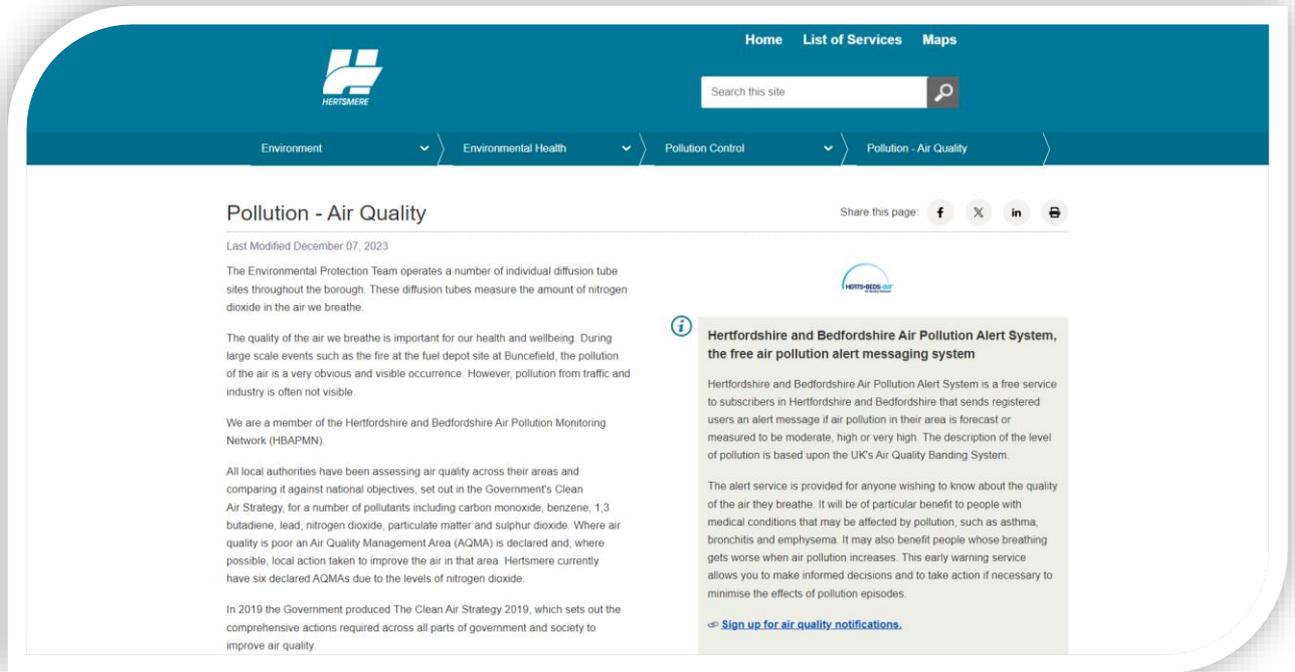
Following the revocation of all AQMAs within Hertsmere, Hertsmere Borough Council will develop a Local Air Quality Strategy, to ensure air quality remains a high profile issue and to ensure that it is able to respond quickly, in the event of a deterioration of Air Quality.

## Local Engagement and How to get Involved

Members of the public can help improve air quality in Hertsmere by reducing travel where possible and travelling using sustainable transport options such as walking, cycling and using public transport. Further information regarding Hertsmere's air quality and past reports can be found on the website [www.hertsmere.gov.uk/Home.aspx](http://www.hertsmere.gov.uk/Home.aspx)

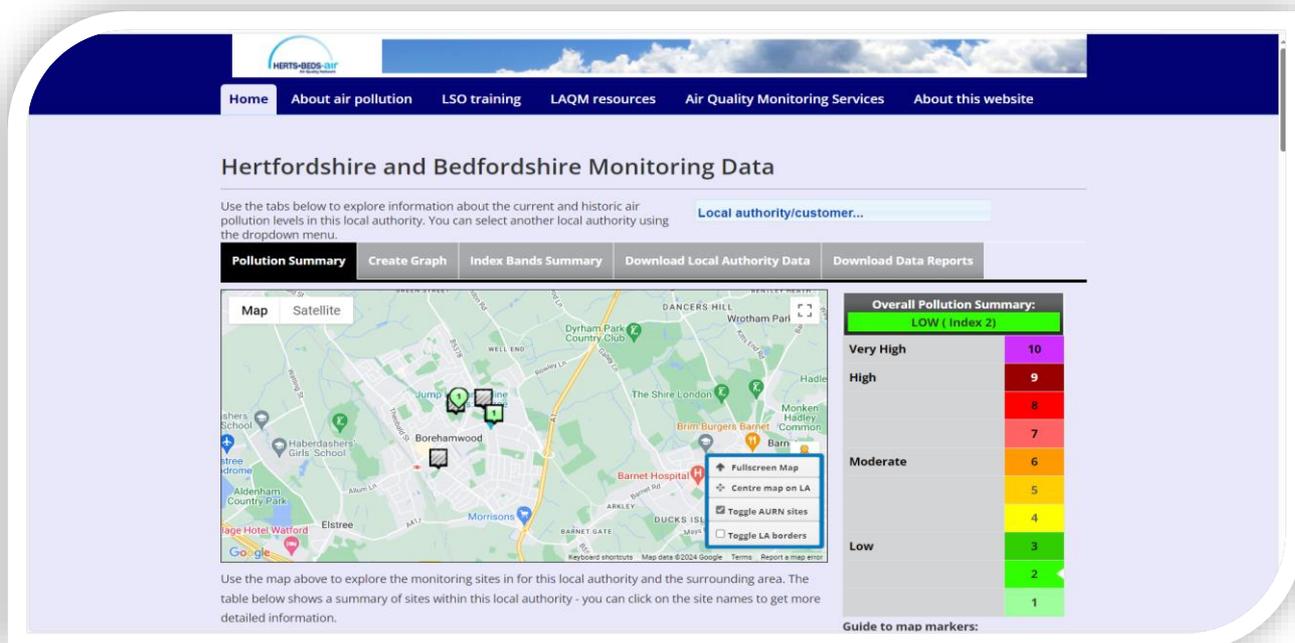
# Hertsmere Borough Council's Air Quality Webpage

<https://www.hertsmere.gov.uk/Environment-Refuse-and-Recycling/Environmental-Health/Pollution-Control/Pollution---Air-Quality.aspx>



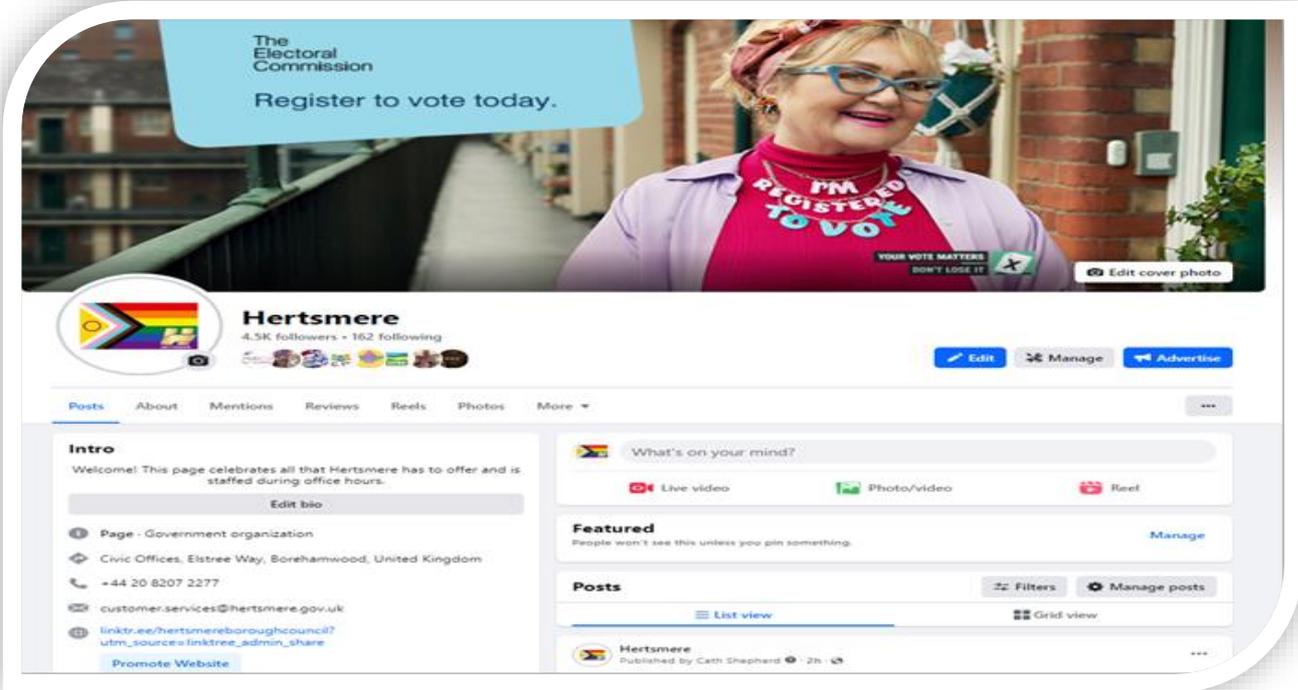
# HERTS + BEDS Air Quality Network

[https://www.airqualityengland.co.uk/local-authority/?la\\_id=408](https://www.airqualityengland.co.uk/local-authority/?la_id=408)



# Facebook

<https://en-gb.facebook.com/login.php/>



There are numerous simple measures which the public may adopt in order to improve the Air Quality around them. Such measures include,

- Making short trips and journeys on foot or by bike instead of by car, or using public transport.
- Car sharing with colleagues, or with other parents on the school run.
- Avoid Idling whilst your vehicle is stationary, particularly near schools, hospitals and care homes.
- Purchasing low-emission electric and/or hybrid vehicles, with government funding and grants available. Please see,  
<https://www.gov.uk/plug-in-vehicle-grants>
- Conserving fuel efficiency of vehicles through ensuring correct tyre pressure is maintained.
- Upgrading boilers to newest and most efficient gas condensing boilers with lowest NOx (and carbon) emissions.
- Ensuring your home is sufficiently insulated.
- Installing sources of renewable energy such as solar panel electricity systems, also known as solar photovoltaics, wind turbines or Air Source Heat Pumps.

## Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Hertsmere Borough Council with the support and agreement of the following officers and departments:

Craig Gent (Senior Scientific Officer) – Environmental Health

This ASR has been approved by:

Councillor Paul Richards: Leader of the Liberal Democrat Group, Deputy Leader of the Council: Responsible for Environmental Sustainability and Net Zero and Public Health



Paul Sawyer: Head of Environmental Health, Licensing and Resilience



This ASR has been welcomed by Sarah Perman who is the Director of Public Health at Hertfordshire County Council.

If you have any comments on this ASR please send them to Craig Gent at:

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# 1 Local Air Quality Management

This report provides an overview of air quality in Hertsmere Borough Council 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 Hertsmere Borough 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 Hertsmere Borough Council can be found in Table 2.1. The table presents a description of the six AQMAs that are currently designated within Hertsmere Borough Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO<sub>2</sub> annual mean

Hertsmere Borough Council recently revoked all six of its Air Quality Management Areas (AQMAs), following sustained compliance with the Annual Mean Air Quality Objective for nitrogen dioxide. Hertsmere Borough Council will develop a local Air Quality Strategy to prevent and reduce polluting activities in the future. Further discussion with respect to the revocation of all six AQMAs will be made within the 2025 ASR.

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	Web Link to AQAP
Hertsmere AQMA 1	08/04/2003	NO <sub>2</sub> Annual Mean	Domestic properties 23-27 Dove Lane and caravan site off A1000 Barnet Road	YES	46 µg/m <sup>3</sup>	21.8 µg/m <sup>3</sup>	6 years*	Hertsmere Air Quality Action Plan	N.A
Hertsmere AQMA 2	08/04/2003	NO <sub>2</sub> Annual Mean	One domestic property known as Charleston Paddocks, St Albans Road	YES	48 µg/m <sup>3</sup>	27.3 µg/m <sup>3</sup>	6 years*	Hertsmere Air Quality Action Plan	N.A
Hertsmere AQMA 3	08/04/2003	NO <sub>2</sub> Annual Mean	Domestic properties 31-39 Blanch Lane, South Mimms	YES	80 µg/m <sup>3</sup>	25.1 µg/m <sup>3</sup>	6 years*	Hertsmere Air Quality Action Plan	N.A

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	Web Link to AQAP
Hertsmere AQMA 4	08/04/2003	NO <sub>2</sub> Annual Mean	Area comprising the domestic properties 12 Grove Pace, Hartspring Lane, Aldenham and caravans numbered 1,2,3,4,7,8,55,56,57,58,59 & 60 within Winfield Caravan site, Hartspring Lane	YES	42 µg/m <sup>3</sup>	28.2 µg/m <sup>3</sup>	6 years*	Hertsmere Air Quality Action Plan	N.A
Hertsmere AQMA 5	22/12/2004	NO <sub>2</sub> Annual Mean	Comprising domestic dwellings within eight properties on the east side of the A5183 High Street, Elstree either side of the junction with the A411	NO	No concentrations available	29 µg/m <sup>3</sup>	6 years*	Hertsmere Air Quality Action Plan	N.A
Hertsmere AQMA 6	22/12/2004	NO <sub>2</sub> Annual Mean	Properties 133-167 High Street consisting of commercial and residential	NO	No concentrations available	21.6 µg/m <sup>3</sup>	6 years*	Hertsmere Air Quality Action Plan	N.A

Hertsmere Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.

Hertsmere Borough Council confirm that all current AQAPs have been submitted to Defra.

## 2.2 Progress and Impact of Measures to address Air Quality in Hertsmere Borough Council

Defra's appraisal of last year's ASR concluded;

*The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:*

- 1. Good quality graphs have been provided in Figures A.1 to A.5 showing the trends in the recorded concentrations of various pollutants at each monitoring site. This allows the reader to easily see if there are any exceedances in each monitoring site and to see up to 5 years' worth of concentrations and is encouraged for future reports.*
- 2. Good quality maps have been provided in Figures D.1 to D.24 showing the location of each monitoring site. This allows the reader to easily see the location of each monitoring site in proximity to main/major roads, and to see if the current monitoring network is still relevant. This is encouraged for future reports.*
- 3. There is good in-depth discussion about PM2.5 emissions within the district. There is comprehensive discussion about current PM2.5 concentrations, and about the measures that LBC are implementing to reduce PM2.5 concentrations.*
- 4. Not all boxes within Table 2.2 are filled in. These should be rectified so that the reader can see exactly the status of each measure within the table.*
- 5. The updating and publication of the AQAPs for each AQMA that is currently active (if the AQAPs are more than 5 years old) should be treated as a priority by the council and should be done as soon as possible.*
- 6. In Table 2.1, a web link and date of publication should be provided for the AQAP that corresponds to each AQMA.*
- 7. The date of declaration for each AQMA in Table 2.1 should exactly match the dates of declaration that Defra have for each AQMA.*
- 8. The tables completed as part of the excel template should match the layout of the tables contained within the blank excel template, and the tables contained within the ASR.*

- With respect to Point 4 above, all boxes within Table 2.2 have subsequently been filled in.
- With respect to Points 5 and 6 above, Hertsmere Borough Council recently revoked all six of its Air Quality Management Areas (AQMAs), following sustained compliance with the Annual Mean Air Quality Objective for nitrogen dioxide. Subsequently an Air Quality Action Plan (AQAP) is no longer necessary. Further discussion with respect to the revocation will be made within the 2025 ASR. Please note AQMAs 1-6 are reported within this report, as they remained active during the 2023 monitoring year.
- Concerning point 7 above, the full declaration dates, for example the date in which each AQMA was declared within an Air Quality Management Order, are now included within Table 2.1 of this report. For clarity the date each Air Quality Management Order was signed/sealed is considered the date of declaration, as opposed to the dates in which the Orders came in to operation, which were the 1<sup>st</sup> May 2003 for AQMAs 1, 2, 3 & 4 and 1<sup>st</sup> January 2005 for AQMAs 5 & 6. The date in which the Air Quality Management Order for Hertsmere AQMAs 1, 2, 3 and 4 was signed/sealed was the 8<sup>th</sup> April 2003, whereas the date in which the Air Quality Management Order for Hertsmere AQMAs 5 & 6 was signed/sealed was the 22<sup>nd</sup> December 2004.
- The following clarification from the LAQM Helpdesk was received with respect to the comments re Point 8 above. *Table 2.2 in the report in column 5 has the title 'Year Measure Introduced in AQAP' whereas the template has the title in the same column as 'Year Measure Introduced'. In tables A.3, A.5, A.6, A.7 and A.8, there is no Valid Data Capture for Monitoring Period.* Subsequently the text within column five of table 2.2 has been amended to Year Measure Introduced. Re tables A.3, A.5, A.6, A.7 and A.8, the *Valid Data Capture for Monitoring Period* columns have now been completed.

Hertsmere Borough 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 2.22. 16 measures are included within Table 2.2, with the type of measure and the progress Hertsmere Borough 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 2.22.

Updates with respect to measures and actions completed/aborted over the course of the 2023 reporting year, are shown below/over:

- Commencement with the renovation of Hertsmere Borough Council's Civic Offices building to facilitate hot desking and encourage future working from home/flexible working arrangements.
- Continued promotion of working from home/flexible working arrangements.
- Purchase a fully Electric Van for use by the Environmental Health & Licensing Department.
- Planning for the purchase of a second fully Electric Van for use by the Environmental Health & Licensing Department.
- Continued participation with the bike and e-bike share scheme, in partnership with Beryl via the Beryl app.
- Installation of a new nitrogen dioxide and PM 10/2.5 monitor within the vicinity of AQMA 5, in partnership with Hertfordshire County Council.
- Review and update the contents within the Council's Air Quality webpage.
- Continued participation of the Hertfordshire and Bedfordshire Air Pollution Alert System.
- Continued participation with the Hertfordshire & Bedfordshire & Neighbouring Authorities Air Quality Forum Meetings.
- Continued promotion of alternative modes of transport for Hertsmere Borough Council employees via the Cycle to work scheme.
- Environmental Health continued to review and or amend its model Air Quality Planning Conditions during 2023.
- Hertsmere Borough Council responded to several Air Quality related consultations/surveys raised by Defra during 2023, including the consultation on Draft Guidance on outdoor burning.
- Hertsmere Borough Council oversaw the successful relocation of its Background Automatic Monitoring Station at Borehamwood Bowling Club to within Meadow Park in July 2023.
- Hertsmere Borough Council completed the Diffusion Tube Co-location Data Questionnaire and associated AEA spreadsheet during spring 2023, in contributing to the establishment of a National Bias Adjustment Factor for Gradko Diffusion Tubes prepared via 20%TEA Water method.

- Environmental Health at Hertsmere Borough Council contacted several schools during the latter part of 2023 with a view to completing an Anti-Idling campaign. Unfortunately the campaign had to be aborted, due to Environmental Health either not receiving any response with respect to the proposed campaign, or as in one instance one school terminated their participation due to other unforeseen circumstances.
- Following the completion of the 2023 ASR, a new Local Plan timeline was introduced with respect to future actions, further consultation and adoption date for the new Local Plan. Subsequently the ratification and adoption the new Local Plan did not take place during 2023. Further details with respect to the Draft Local Plan 2024 may be accessed online via;

[Draft Local Plan 2024: A new sustainable Local Plan for Hertsmere - Hertsmere Borough Council](#)

Hertsmere Borough Council expects the following measures to be completed over the course of the 2024 reporting year:

- Expansion of the office renovation program at the Civic Offices to include the lower floors, which will facilitate additional hot desking and encourage working from home.
- Continue to promote working from home/flexible working arrangements amongst office based staff at Hertsmere Borough Council.
- Purchase of a second fully Electric Van for use by the Environmental Health & Licensing Department.
- Continue with participation of the bike and e-bike share scheme, in partnership with Beryl via the Beryl app.
- Continue to review and update the contents within the Council's Air Quality webpage.
- Continue with the participation of the Hertfordshire and Bedfordshire Air Pollution Alert System.
- Participate with the Hertfordshire & Bedfordshire & Neighbouring Authorities Air Quality Forum Meetings.
- Continue to promote alternative modes of transport for Hertsmere Borough Council employees via the Cycle to work scheme.
- Environmental Health will continue to review and or amend its model Air Quality Planning Conditions.
- Respond to any Air Quality related consultations/surveys raised by Defra.
- Complete an Anti-Idling campaign in cooperation with Schools located either near a major highway or within the vicinity of a previously declared AQMA.
- The Council will invite further comments from the public before its draft Local Plan is submitted to a Government appointed Inspector during 2024. The draft Local Plan, includes Policies related to Climate Change, Air Quality, Sustainable Travel including the requirement for all new homes with their own curtilage parking to include individual provision for electric vehicle charging points.
- Participate with the Clean Air Day & Clean Air Night events coordinated by Global Action Plan, via publishing messages on the Council's social feeds, such as Facebook & X/Twitter.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced	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	Purchase of a fully Electric Van for use by the Environmental Health & Licensing Department	Other	Other	2023	2023	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	£10k - 50k	Implementation	Subject to review	Number of annual vehicle charges & number of miles travelled	The first fully Electric Van was purchased during May 2023	N.A.
2	Beryl Bikes: From 20 October 2022, a new fleet of 25 bikes and 20 e-bikes were available to hire via the Beryl app.	Promoting Travel Alternatives	Promotion of cycling	2022	Ongoing	Hertsmere Borough Council and Beryl	Hertsmere Borough Council via funding from the Strategic Community Infrastructure Levy, Section 106 contribution from SKY Studios and Neighbourhood Community Infrastructure Levy from Elstree and Borehamwood Town Council.	NO	Funded	£10k - 50k	Implementation	Subject to review	Number of journeys made and the number Kilometres covered	As of 19 October 2023 the scheme had more than 4,200 active users who had generated more than 12,500 journeys covering more than 26,000 km.	N.A.
3	Commencement with the renovation of Hertsmere Borough Council's Civic Offices building to facilitate hot desking and encourage future working from home/flexible working arrangements.	Alternatives to private vehicle use	Other	2023	2024	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	£500k - £1 million	Implementation	N.A.	Number of Rooms/Floors renovated within the Civic Offices building	The third floor within the Civic Offices building had been successfully renovated during 2023	N.A.
4	Require developers to submit construction management plans (CMPs), for the control of dust associated with large scale excavation, demolition and construction.	Promoting Low Emission Transport	Other	2019	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	<£10,000	Ongoing	Subject to review	Number of Planning decisions stipulating CMP Conditions	Planning produce supplementary planning guides which contain guidance on odour smoke and dust	N.A.
5	Adoption of a new Hackney Carriage and Private Hire Licensing Policy 2022-2027, which introduced a maximum first age limit based upon the Euro 6 Emissions Standards, with respect to Air Quality.	Promoting Low Emission Transport	Taxi Licensing conditions	2022	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	£10k - 50k	Implementation	Subject to review	Number of Successful Taxi Licence Applications	Approximately 227 Taxi Licenses were issued in 2022	N.A.

Measure No.	Measure Title	Category	Classification	Year Measure Introduced	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
6	The Council continues to inspect all of its authorised processes to ensure compliance. Authorisations will be updated as and when appropriate so that operation conditions are up to date.	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2010	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	<£15,000	Ongoing	Subject to review	Number of Environmental Permits issued	All inspections have been carried out with a satisfactory outcome	N.A.
7	Review and update the information and advice within Council's Website, for residents and companies re: problems caused by bonfires. Encourage residents to compost waste	Public Information	Via other mechanisms	2018	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	<£1,000	Ongoing	N.A.	Number of smoke complaints received/investigated	Hertsmere Borough Council dealt with 100 complaints regarding bonfires/smoke in 2023.	N.A.
8	The Council continues to monitor Air Quality and manages two Automatic Monitoring Stations located at Manor Way, (Roadside) and Meadow Park (Background)	Public Information	Other	2017	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	YES	Funded	£10,000 - £50,000k	Ongoing	N.A.	Annual & Hourly Mean concentrations	Hertsmere also use diffusion tubes for data and they are reviewed every year	Funding and maintenance
9	Relocation of the Automatic Monitoring Station at Borehamwood Bowling Club to within Meadow Park.	Public Information	Other	2023	2023	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	< £10k	Completed	N.A.	Annual & Hourly Mean concentrations	Hertsmere Borough Council oversaw the successful relocation of its Background Automatic Monitoring Station at Borehamwood Bowling Club to within Meadow Park in July 2023.	N.A.
10	Hertsmere Borough Council continues to support the Watling Chase Community Forest: The Greenways Project	Promoting Travel Alternatives	Promotion of walking	1999	Ongoing	Hertsmere Borough Council, Natural England and Hertfordshire County Council	Hertsmere Borough Council	NO	Subject to review	Subject to review	Subject to review	Subject to review	N.A.	Several cycle, pedestrian and horse routes (Greenways) are open in Hertsmere	The Watling Chase Greenways Strategy is currently being reviewed to determine whether the routes still meet the Greenways standard of improved width and surface.
11	Cycle to Work Scheme	Alternatives to private vehicle use	Other	2019	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	YES	Funded via salary sacrifice	N.A.	Implementation	N.A.	Number of staff purchasing a bicycle	Ongoing	N.A.

Measure No.	Measure Title	Category	Classification	Year Measure Introduced	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
12	Anti Idling Project	Public Information	Via other mechanisms	2022	2023	Hertsmere Borough Council	Hertfordshire Climate Change and Sustainability Partnership & East Herts Council	NO	Funded	< £10k	Aborted	N.A.	Number of motorists switching their engines off	Planning phase	N.A.
13	Installation of a new nitrogen dioxide & PM10/2.5 monitor within the vicinity of AQMA 5.	Public Information	Other	2022	2023	Hertsmere Borough Council & Hertfordshire County Council	Hertfordshire County Council	NO	Funded	< £10k	Implementation	N.A.	Annual & Hourly Mean concentrations	Installation completed during August 2023	N.A.
14	Review and update of Air Quality Planning Conditions with respect to reducing emissions to below 40 mg NOx/kWh from the installation of boiler(s) or Combined Heat and Power (CHP).	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2022	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	< £10k	Implementation	N.A.	Number of Planning decisions stipulating that, no boiler(s) or Combined Heat and Power (CHP) shall be installed within the development hereby approved, other than one(s) which incorporate abatement technology to reduce emissions to below 40 mg NOx/kWh.	Implementation on-going	N.A.
15	Hertfordshire and Bedfordshire Air Pollution Alert System, the free air pollution alert messaging system	Public Information	Via other mechanisms	2019	Ongoing	Hertsmere Borough Council & its partners within the Herts & Beds & Neighbouring Authorities Air Quality Forum	Hertsmere Borough Council & its partners within the Herts & Beds & Neighbouring Authorities Air Quality Forum	NO	Funded	< £10k	Implementation	N.A.	Number of new subscriptions	At the time of writing 101 users have subscribed to the Air Pollution Alert System	N.A.
16	Continued promotion of working from home/flexible working arrangements	Policy Guidance and Development Control	Other policy	2020	Ongoing	Hertsmere Borough Council	Hertsmere Borough Council	NO	Funded	< £10k	Implementation	N.A.	Number of staff working from home	Staff are encouraged to work from home, for up to two days per week	N.A.

## 2.3 PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy<sup>6</sup>, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM<sub>2.5</sub>). There is clear evidence that PM<sub>2.5</sub> (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Hertsmere Borough Council is a member of the Herts & Beds & Neighbouring Authorities Air Quality Forum, which work closely with Hertfordshire County Council Public Health. Public Health monitors PM<sub>2.5</sub> as a health outcome and has previously funded monitors for the local authorities in the Hertfordshire area. Hertsmere Borough Council currently monitors PM<sub>2.5</sub> at two Air Quality Monitoring Stations, situated within roadside and background locations, with the latter site being incorporated on the Automatic Urban and Rural Network (AURN). Results from monitoring show that currently PM<sub>2.5</sub> is not a significant issue within Hertsmere.

Towards the latter part of 2022 Hertsmere Borough Council liaised with Hertfordshire County Council, who purchased 11 monitors from Iknai, which will capture nitrogen dioxide, PM<sub>10</sub> & PM<sub>2.5</sub>. Hertsmere Borough Council was successful in securing one of the new monitors, which will be installed within the vicinity of AQMA 5 during August 2023 and provides supplemental data with respect to PM<sub>10</sub> and PM<sub>2.5</sub> near this location.

Contained within the Hertfordshire Local Transport Plan (LTP4 2018- 2031) is a variety of measures aimed at managing emissions from road traffic on local roads and motorways. Measures intended to tackle road traffic pollutant emissions (including PM<sub>2.5</sub> emissions) include a variety of traffic management actions (strategic highway improvements to improve traffic flow and measures intended to reduce idling) and the promotion of low emission travel alternatives (e.g. cycling, walking, electric vehicles). See Table 2.2 for further information.

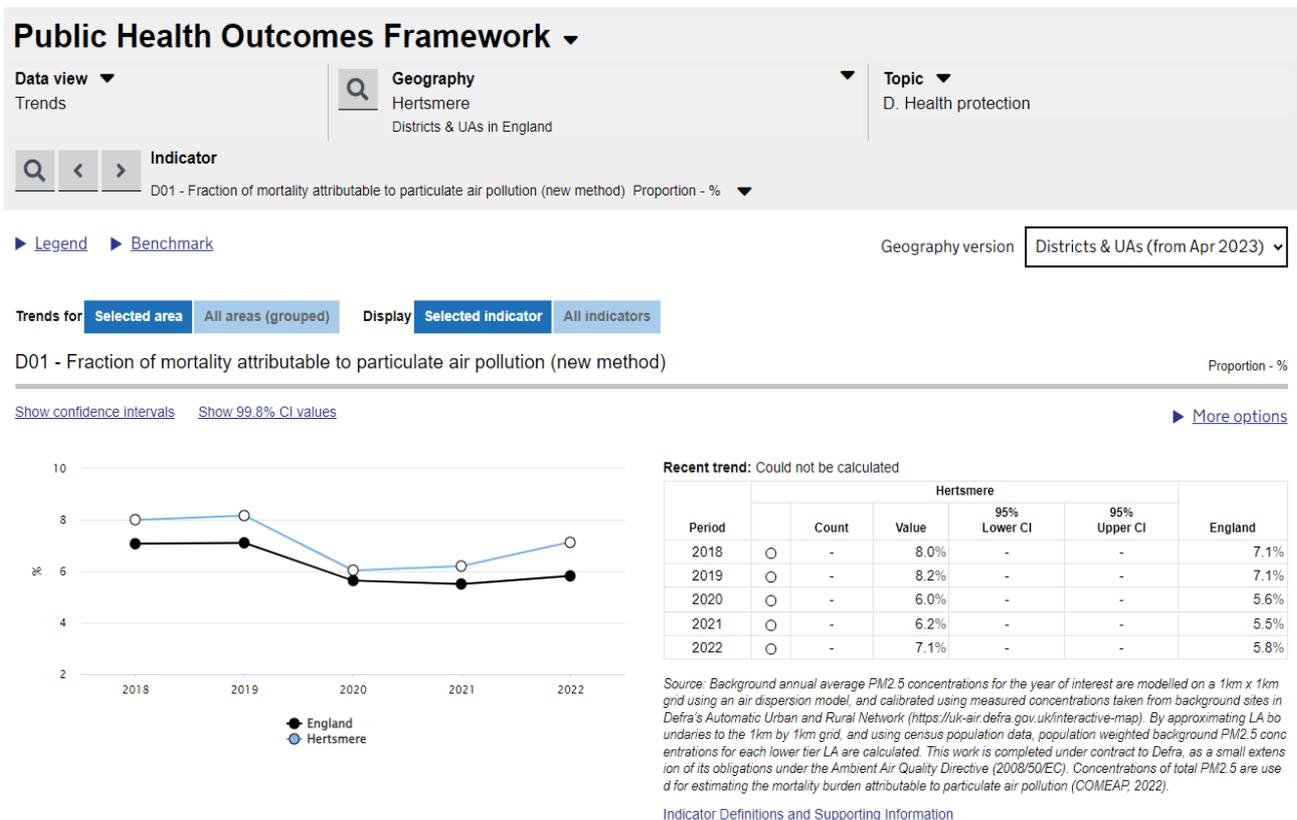
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<sup>6</sup> Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

The Public Health Outcomes Framework examines indicators which helps us understand trends in public health. The graph below displays the fraction of mortality attributable to particulate air pollution (PM<sub>2.5</sub>) for Hertsmere compared to the national average for England. The fraction of mortality attributable to (PM<sub>2.5</sub>) has consistently been above the national and regional averages within Hertsmere, therefore justifying the escalation in the number of actions in dealing with this particular air pollutant.

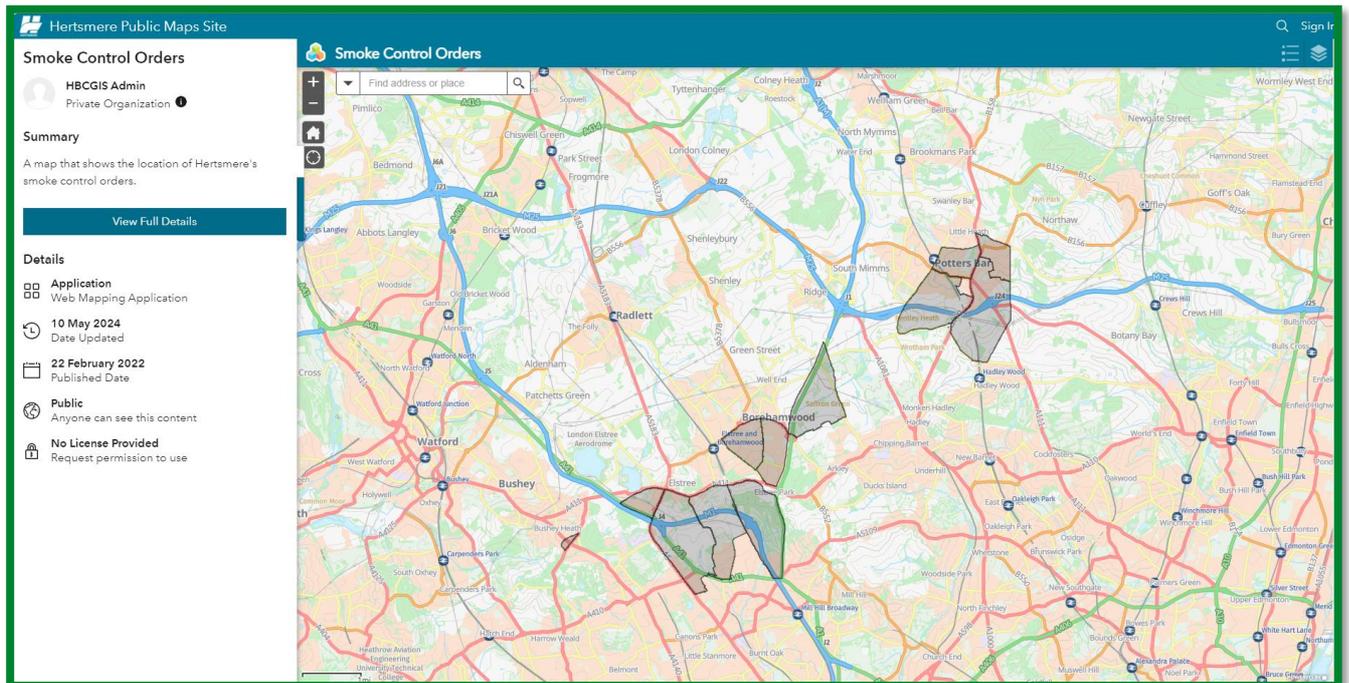
Public Health Outcomes Framework data may be accessed via the following link;

[Public Health Outcomes Framework - Data - OHID \(phe.org.uk\)](https://phe.org.uk)



There are currently 12 active Smoke Control Areas within Hertsmere, which means that it is an offence to emit smoke from a chimney of a building or a chimney which serves the furnace of any fixed boiler or industrial plant within a smoke control, area unless burning an **Authorised/Certified Fuel** or using an **Exempted Appliance**. Hertsmere Borough Council has published an online interactive map, which shows the boundaries of the Smoke Control Areas which may be accessed via;

<https://hertsmere-public-maps-site-hertsmere.hub.arcgis.com/>



Further details on these Smoke Control Areas may be obtained by contacting Environmental Health via; [Environmental.Health@hertsmere.gov.uk](mailto:Environmental.Health@hertsmere.gov.uk)

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

This section sets out the monitoring undertaken within 2023 by Hertsmere Borough 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

Hertsmere Borough Council undertook automatic (continuous) monitoring at two sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The [Hertfordshire and Bedfordshire - Air Quality monitoring service \(airqualityengland.co.uk\)](https://airqualityengland.co.uk) page presents automatic monitoring results for Hertsmere Borough Council, with automatic monitoring results also available through the UK-Air website.

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

Hertsmere Borough Council undertook non- automatic (i.e. passive) monitoring of NO<sub>2</sub> at 56 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<sub>2</sub>)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. 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<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

None of the Diffusion Tube or Automatic Monitoring Locations saw any exceedances of the 1-hour mean nitrogen dioxide air quality objective during 2023. None of the Diffusion Tube locations had an annual mean concentration of 36 µg/m<sup>3</sup> or greater and therefore fall off with distance calculations were not required. Following application of a local Bias Adjustment Factor, all monitoring results within Hertsmere were compliant with the annual mean nitrogen dioxide air quality objective at the nearest relevant exposure/receptor.

Hertsmere Borough Council carried out a further review of its Diffusion Tube monitoring network in 2023 as several of the monitoring locations were located away from a relevant exposure/receptors, or were not in a location linear with the highway, therefore preventing any necessary distance drop of calculations from being carried out in the future. Diffusion Tubes from some duplicate/triplicate monitoring sites were also redeployed to new monitoring locations within Hertsmere. The Diffusion Tube monitoring locations

decommissioned during 2023 included HM45, HM46 & HM47, HM120, HM121 & HM122 and HM145.

The new Diffusion Tube monitoring locations established during 2023 included HM155 located at 35/37 Newark Green, Borehamwood, HM156 located at 59 Shenley Road/Furzehill Road Junction, Borehamwood, HM157 located at 135 Watling Street, Radlett, HM158, HM159 & HM160, located at the Hertsmere Borehamwood Meadow Park, Background Air Quality Monitoring Station (H3) following its relocation and HM161 located at Elton House, Hartspring Lane Roundabout, Bushey.

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>.

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

The measured concentrations at both the roadside and background automatic monitoring sites during 2023, were below the annual mean air quality objective of 40 µg/m<sup>3</sup>, whereas the 24 hour mean air quality objective was also met at both sites.

Measured annual mean concentrations for the past five years are presented in Figure A3. There are no clear trends in the monitoring results for the past five years.

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

Table A.8 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past five years.

The measured concentrations were below the annual mean concentration target of 20 µg/m<sup>3</sup> at both the roadside and the background automatic monitoring sites in 2023.

Measured annual mean concentrations for the past five years are presented in Figure A5. There are no clear trends in the monitoring results for the past five years.

## 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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
(H1)	Hertsmere Borehamwood Manor Way	Roadside	520317	197099	NO <sub>2</sub> ; PM <sub>10</sub> , PM <sub>2.5</sub>	No	Chemiluminescent; FDMS	8.6	6	2.5
(H3)	Hertsmere Borehamwood Meadow Park	Urban Background	519751	197358	NO <sub>2</sub> ; PM <sub>10</sub> , PM <sub>2.5</sub>	No	Chemiluminescent; FIDAS	88	N/A	2.5

### 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

(3) The Hertsmere Borehamwood Meadow Park (H3) Automatic Monitoring Site was relocated during 2023 with the new X and Y Grid References being included within the table above. The previous X and Y Grid References of the Hertsmere Borehamwood Meadow Park (H3) were X OS Grid Ref (Easting) – 519716 and Y OS Grid Ref (Northing) – 197250.

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM39	117 Shenley Road, Borehamwood	Roadside	519421	196682	Nitrogen Dioxide	No	7.0	1.3	No	2.1
HM40	17 Essex Road, Borehamwood	Roadside	519283	196779	Nitrogen Dioxide	No	5.3	2.1	No	2.1
HM45, HM46 & HM47	Hertsmere Borehamwood Background (H3) (1, 2 & 3)	Urban Background	519716	197250	Nitrogen Dioxide	No	10.0	N/A	Yes	2.0
HM48	Liberal Synagogue Nursery, High Street, Elstree	Roadside	517846	195346	Nitrogen Dioxide	No	4.4	1.9	No	2.0
HM49	The Haven, Barnet Lane, Elstree	Kerbside	517861	195226	Nitrogen Dioxide	No	5.9	1.1	No	2.0
HM50	High Street/Barnet Lane, Elstree	Roadside	517805	195249	Nitrogen Dioxide	Yes (AQMA 5)	9.5	1.2	No	2.0
HM52	7 Walton Terrace, Watford Road, Elstree	Roadside	517746	195247	Nitrogen Dioxide	No	1.8	1.8	No	2.0
HM53	Farm View, Caldecote Lane, Bushey Heath	Suburban	515584	195096	Nitrogen Dioxide	No	0.2	0.0	No	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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM55	Highwood Avenue Garages, Bushey	Urban Background	512773	197838	Nitrogen Dioxide	No	29.0	N.A	No	2.0
HM57	11 Grove Place, Hartspring Lane, Patchetts Green	Roadside	513520	197821	Nitrogen Dioxide	Yes (AQMA 4)	9.2	1.8	No	2.0
HM61	31 Blanche Lane, South Mimms	Other	522042	200671	Nitrogen Dioxide	Yes (AQMA 3)	14.6	14.6	No	1.9
HM62	24 The Broadway, Mutton Lane/Darkes Lane, Potters Bar	Roadside	524946	201156	Nitrogen Dioxide	No	12.5	3.1	No	1.9
HM63	27 Dove Lane, Potters Bar	Other	526082	200027	Nitrogen Dioxide	Yes (AQMA 1)	19.2	29.1	No	2.3
HM64	Hollies House, 230 High Street, Potters Bar	Roadside	526229	201506	Nitrogen Dioxide	No	23.3	2.1	No	2.0
HM65	250-252- High Street, Potters Bar	Roadside	526255	201595	Nitrogen Dioxide	No	7.7	2.8	No	2.1
HM66	169-171 High Street, Potters Bar (Oakmere Lane)	Roadside	526236	201462	Nitrogen Dioxide	No	5.9	3.0	No	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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM67	149 High Street, Potters Bar	Roadside	526211	201402	Nitrogen Dioxide	Yes (AQMA 6)	0.5	11.3	No	2.0
HM69	Rear of Flats 8-12 St Johns Close, Potters Bar (Near Abbey House, Southgate Road)	Roadside	526032	200837	Nitrogen Dioxide	No	15.0	3.1	No	2.0
HM70	9 Park Avenue, Potters Bar	Roadside	526406	200459	Nitrogen Dioxide	No	9.2	1.5	No	2.0
HM71	2 Park Road, Radlett	Kerbside	516288	200030	Nitrogen Dioxide	No	4.3	1.5	No	2.1
HM74	301 Watling Street, Radlett	Roadside	516460	199624	Nitrogen Dioxide	No	9.2	6.6	No	2.0
HM79	223/225 Mutton Lane, Potters Bar	Roadside	524988	201118	Nitrogen Dioxide	No	12.2	1.7	No	2.0
HM82	10 Baker Street, Potters Bar	Kerbside	524925	201089	Nitrogen Dioxide	No	9.6	0.6	No	2.0
HM85	16 Andrew Close, Shenley	Urban Background	518597	200952	Nitrogen Dioxide	No	2.3	1.0	No	2.1
HM86	Charleston Paddocks, St Albans Road, South Mimms	Other	522970	199959	Nitrogen Dioxide	Yes (AQMA 2)	32.8	10.5	No	1.8
HM93	103 Baker Street, Potters Bar	Roadside	524575	200632	Nitrogen Dioxide	No	12.9	1.4	No	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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM99	84 High Street, Bushey	Roadside	513212	195257	Nitrogen Dioxide	No	1.9	2.4	No	2.1
HM102	Red Lion Pub, 78-80 Watling Street, Radlett	Kerbside	516387	199763	Nitrogen Dioxide	No	4.0	0.5	No	1.9
HM105	Elstree Park, Barnet Lane	Urban Background	520740	195268	Nitrogen Dioxide	No	10.7	36.1	No	2.0
HM108, HM109 & HM110	Far End 1, 2 & 3, Hartspring Lane, Bushey	Kerbside	513423	197729	Nitrogen Dioxide	No	11.1	0.5	No	1.8
HM114	Parkside Flats, High Street, Potters Bar	Roadside	526164	201363	Nitrogen Dioxide	No	16.3	9.5	No	1.9
HM117	44 High Street, Bushey	Roadside	513103	195287	Nitrogen Dioxide	No	4.3	2.3	No	2.0
HM120, HM121 & HM122	Mills Court, Todd Close, Borehamwood (1, 2 & 3)	Urban Centre	520181	197150	Nitrogen Dioxide	No	33.1	36.4	No	1.9
HM126	63 Elstree Hill North, Elstree	Roadside	517903	195552	Nitrogen Dioxide	No	13.8	2.4	No	2.1
HM132	Watling Mansions, Watling Street/Theobald Street, Radlett	Roadside	516522	199450	Nitrogen Dioxide	No	13.8	8.3	No	2.0
HM135	Winfield Park, Hartspring Lane	Other	513758	197597	Nitrogen Dioxide	Yes (AQMA 4)	4.7	20.8	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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM136	Baker Court, Shenley Road	Roadside	519802	197039	Nitrogen Dioxide	No	7.3	2.0	No	1.9
HM138	209 Shenley Road, Borehamwood	Kerbside	519647	196865	Nitrogen Dioxide	No	3.1	0.8	No	2.0
HM139	142 Shenley Road, Borehamwood	Roadside	519589	196794	Nitrogen Dioxide	No	4.0	2.0	No	1.9
HM140	Shenley Road/Furzehill Road Junction, Borehamwood	Kerbside	519312	196574	Nitrogen Dioxide	No	2.5	0.9	No	1.9
HM141	42 Shenley Road, Borehamwood	Kerbside	519233	196502	Nitrogen Dioxide	No	4.5	0.8	No	1.9
HM142	2 Hillfield Lane, Patchetts Green	Roadside	513592	197887	Nitrogen Dioxide	No	13.0	5.7	No	1.8
HM143	12 Watling Street, Radlett	Roadside	516231	200196	Nitrogen Dioxide	No	8.2	1.4	No	2.0
HM144	Hatfield Road/Hertford Mews, Potters Bar	Roadside	526213	201749	Nitrogen Dioxide	No	7.5	3.4	No	1.9
HM145	27 The Causeway, Potters Bar	Roadside	526409	201715	Nitrogen Dioxide	No	7.5	1.4	No	1.9
HM146	The Old School House, London Road, Shenley	Roadside	518991	200401	Nitrogen Dioxide	No	10.0	3.0	No	1.9

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM148, HM149 & HM150	Hertsmere Borehamwood Manor Way, Roadside (H1) (1, 2 & 3)	Roadside	520317	197099	Nitrogen Dioxide	No	8.6	5.5	Yes	1.7
HM151	19 High Road, Bushey	Roadside	514610	194356	Nitrogen Dioxide	No	15.0	2.6	No	1.9
HM152	Franklin Court, Brook Road, Borehamwood	Roadside	519731	197003	Nitrogen Dioxide	No	8.0	1.6	No	2.0
HM153	5 Bell Lane, London Colney	Roadside	518551	202915	Nitrogen Dioxide	No	7.8	12.1	No	2.1
HM154	54 Hilfield Lane, Aldenham	Roadside	513879	197724	Nitrogen Dioxide	No	12.0	1.5	No	1.8
HM155	35/37 Newark Green, Borehamwood	Roadside	521039	196673	Nitrogen Dioxide	No	8.0	3.2	No	1.9
HM156	59 Shenley Road/Furzehill Road Junction, Borehamwood	Kerbside	519285	196570	Nitrogen Dioxide	No	7.3	0.6	No	1.9
HM157	135 Watling Street, Radlett	Roadside	516258	200153	Nitrogen Dioxide	No	6.8	2.2	No	2.0
HM158, HM159 & HM160	Hertsmere Borehamwood Meadow Park, Background (H3) (1, 2 & 3)	Urban Background	519751	197358	Nitrogen Dioxide	No	89.9	N/A	Yes	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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
HM161	Elton House, Hartspring Lane Roundabout, Bushey	Roadside	513325	197567	Nitrogen Dioxide	No	5.6	2.7	No	1.9

**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<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
Hertsmere Borehamwood Manor Way (H1)	520317	197099	Roadside	99.38	99.38	30	23	23	22.5	18
Hertsmere Borehamwood Meadow Park (H3)	519751	197358	Urban Background	98.48	98.48	21	15	14	15	12

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> 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%).

(3) The Hertsmere Borehamwood Meadow Park (H3) Automatic Monitoring Site was relocated during 2023 with the new X and Y Grid References being included within the table above. The previous X and Y Grid References of the Hertsmere Borehamwood Meadow Park (H3) were X OS Grid Ref (Easting) – 519716 and Y OS Grid Ref (Northing) – 197250.

Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
HM39	519421	196682	Roadside	100	100.0	<b>47.0</b>	38.3	35.5	38.7	27.6
HM40	519283	196779	Roadside	91.7	90.4	25.9	18.1	16.3	18.2	14.9
HM45, HM46 & HM47	519716	197250	Urban Background	100	50.0	21.6	14.6	13.2	15.7	12.6
HM48	517846.49	195346.3	Roadside	100	100.0	<b>40.3</b>	29.6	28.5	37.1	22.1
HM49	517861.15	195225.71	Kerbside	100	100.0	<b>49.8</b>	35.5	31.8	37.3	27.6
HM50	517805	195249	Roadside	100	100.0	<b>52.6</b>	<b>40.0</b>	35.6	<b>41.6</b>	29.0
HM52	517746	195247	Roadside	100	100.0	39.3	28.5	26.0	31.7	22.6
HM53	515584	195096	Suburban	100	100.0	21.8	15.4	14.4	16.2	12.6
HM55	512773	197838	Urban Background	100	100.0	23.8	16.2	15.1	17.8	13.8
HM57	513520	197821	Roadside	100	100.0	<b>48.1</b>	33.5	29.6	33.9	28.2
HM61	522042	200671	Other	100	100.0	<b>45.4</b>	32.2	29.2	33.8	25.1
HM62	524946	201156	Roadside	100	100.0	<b>42.8</b>	29.1	26.8	30.7	25.8
HM63	526082	200027	Other	58.3	59.6	39.8	26.7	22.0	31.0	21.8
HM64	526229	201506	Roadside	100	100.0	<b>52.4</b>	36.2	31.0	35.4	28.7
HM65	526255	201595	Roadside	100	100.0	<b>50.1</b>	36.8	33.9	35.3	27.6
HM66	526236	201462	Roadside	100	100.0	<b>44.2</b>	31.3	28.4	30.8	24.6
HM67	526210.96	201401.62	Roadside	100	100.0	37.0	29.5	27.0	28.9	21.6
HM69	526032	200837	Roadside	100	100.0	<b>54.9</b>	<b>40.7</b>	34.0	<b>40.2</b>	32.2
HM70	526406	200459	Roadside	100	100.0	34.6	23.8	22.3	25.3	21.0
HM71	516288	200030	Kerbside	75	75.0	<b>47.3</b>	32.5	29.3	33.2	25.4
HM74	516460	199624	Roadside	91.7	92.3	33.2	24.6	22.2	25.7	19.9
HM79	524988	201118.23	Roadside	91.7	92.3	<b>43.3</b>	27.8	23.0	28.0	23.6
HM82	524925	201089	Kerbside	100	100.0	36.3	26.1	22.5	25.7	21.4
HM85	518597	200952	Urban Background	91.7	92.3	24.5	17.4	15.4	18.1	13.4
HM86	522970.04	199958.81	Other	91.7	90.4	<b>46.2</b>	-	21.9	32.6	27.3
HM93	524575	200632	Roadside	91.7	92.3	28.8	21.3	20.0	20.7	17.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
HM99	513212	195257	Roadside	75	75.0	39.8	30.4	29.1	33.2	28.4
HM102	516387	199763	Kerbside	100	100.0	<b>48.8</b>	35.3	29.2	35.2	26.6
HM105	520740	195268	Urban Background	91.7	92.3	27.4	21.6	18.9	22.0	16.1
HM108, HM109 & HM110	513423	197729	Kerbside	100	100.0	<b>54.0</b>	39.9	34.8	39.2	31.7
HM114	526163.55	201362.78	Roadside	75	75.0	36.5	27.2	26.6	29.7	24.5
HM117	513103	195287	Roadside	91.7	90.4	38.0	27.1	26.5	32.4	26.0
HM120, HM121 & HM122	520181.06	197150.48	Urban Centre	91.7	32.7	29.6	22.7	18.7	20.3	16.6
HM126	517903.13	195552.06	Roadside	100	100.0	36.1	26.6	24.1	29.6	20.0
HM132	516522	199450	Roadside	91.7	90.4	29.4	20.6	20.4	23.0	18.0
HM135	513758	197597	Other	100	100.0	35.3	25.5	22.2	26.6	20.4
HM136	519802	197039	Roadside	100	100.0	32.8	22.8	21.5	27.5	19.3
HM138	519647	196865	Kerbside	100	100.0	36.2	27.4	26.4	27.9	21.0
HM139	519589	196794	Roadside	100	100.0	<b>40.2</b>	31.5	29.8	33.5	25.5
HM140	519312	196574	Kerbside	100	100.0	<b>48.6</b>	36.8	33.3	38.3	27.6
HM141	519233	196502	Kerbside	83.3	82.7	<b>45.1</b>	33.9	28.9	35.1	27.3
HM142	513592	197887	Roadside	100	100.0	35.2	24.0	21.3	26.0	20.4
HM143	516231	200196	Roadside	100	100.0	<b>52.3</b>	35.6	32.3	<b>40.8</b>	31.9
HM144	526213	201749	Roadside	91.7	92.3	34.9	23.1	21.0	25.6	17.7
HM145	526409	201715	Roadside	33.3	25.0	<b>41.7</b>	27.9	24.3	27.6	21.6
HM146	518991	200401	Roadside	91.7	90.4	31.0	22.5	18.6	22.6	17.8
HM148, HM149 & HM150	520317	197099	Roadside	100	100.0	N.A	N.A	N.A	-	18.2
HM151	514610	194356	Roadside	100	100.0	N.A	N.A	N.A	-	17.6
HM152	519731	197003	Roadside	91.7	90.4	N.A	N.A	N.A	-	22.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
HM153	518551	202915	Roadside	100	100.0	N.A	N.A	N.A	-	17.7
HM154	513879	197724	Roadside	91.7	92.3	N.A	N.A	N.A	-	15.9
HM155	521039	196673	Roadside	100	67.3	N.A	N.A	N.A	N.A	22.3
HM156	519285	196570	Kerbside	87.5	59.6	N.A	N.A	N.A	N.A	32.3
HM157	516258	200153	Roadside	100	67.3	N.A	N.A	N.A	N.A	23.6
HM158, HM159 & HM160	519751	197358	Urban Background	100	42.3	N.A	N.A	N.A	N.A	12.2
HM161	513325	197567	Roadside	100	25.0	N.A	N.A	N.A	N.A	20.1

☒ 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  $\mu\text{g}/\text{m}^3$ .

Exceedances of the NO<sub>2</sub> annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

NO<sub>2</sub> annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 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.

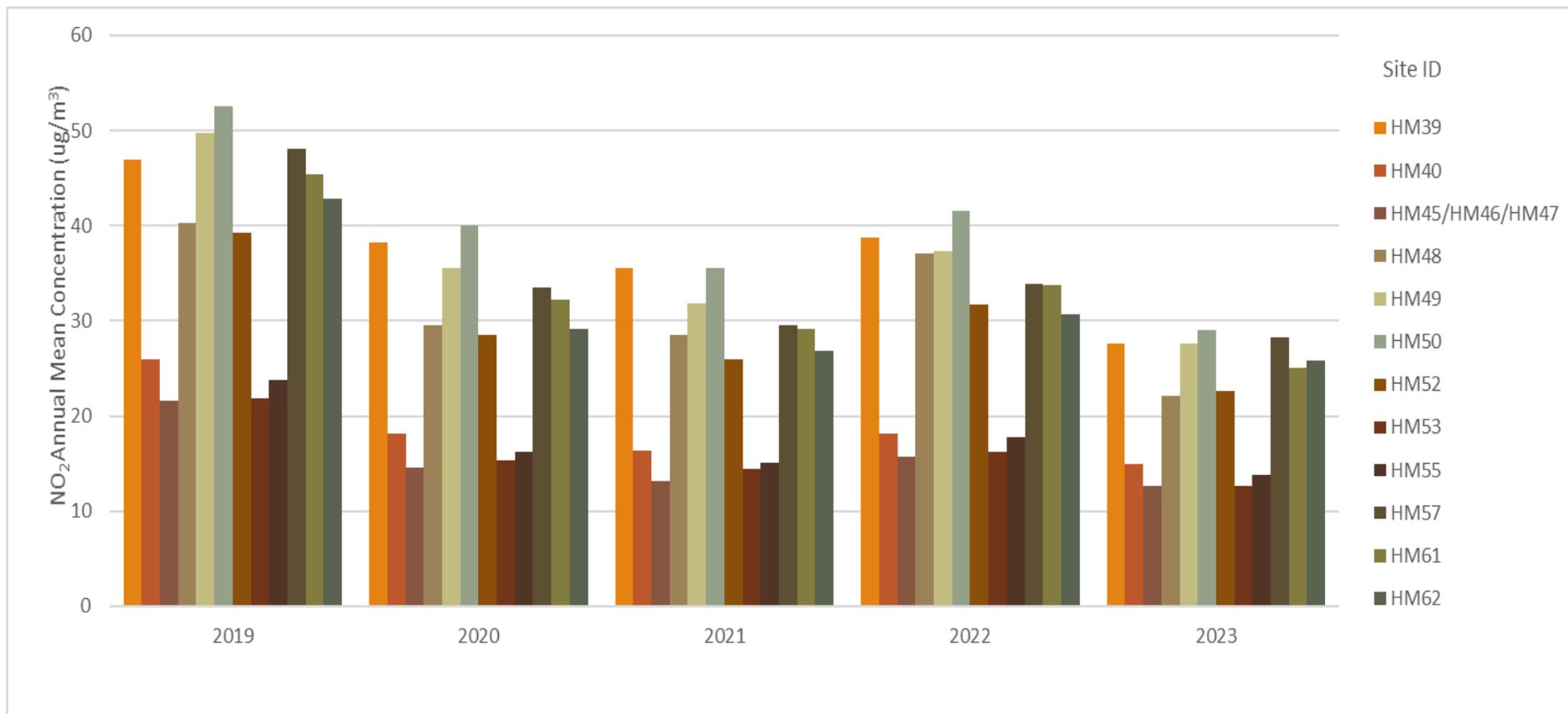
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

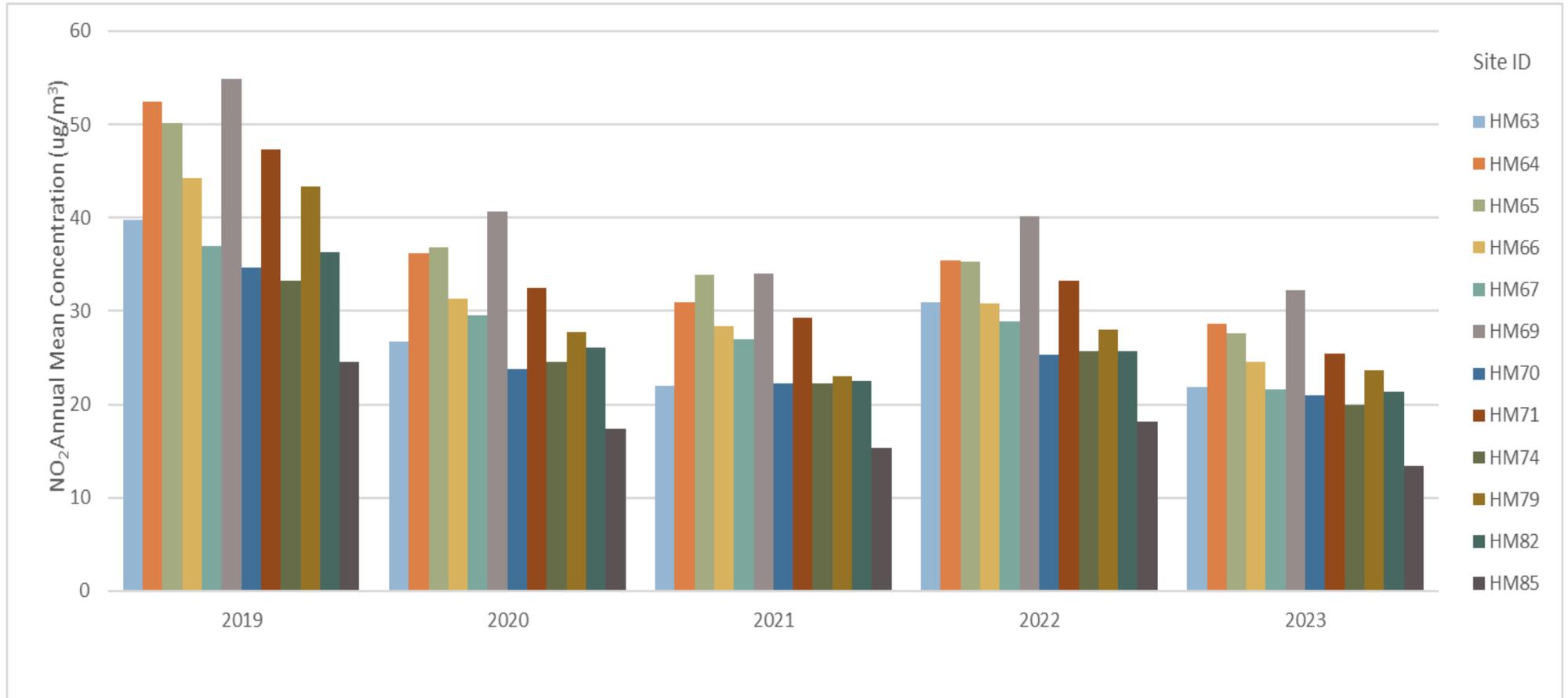
Figures A.1.A – A.1.D Trends in Annual Mean NO2 Concentrations

Figure A.1.A - NO<sub>2</sub> Annual Mean concentrations for sites HM39 to HM62 between years 2019 to 2023



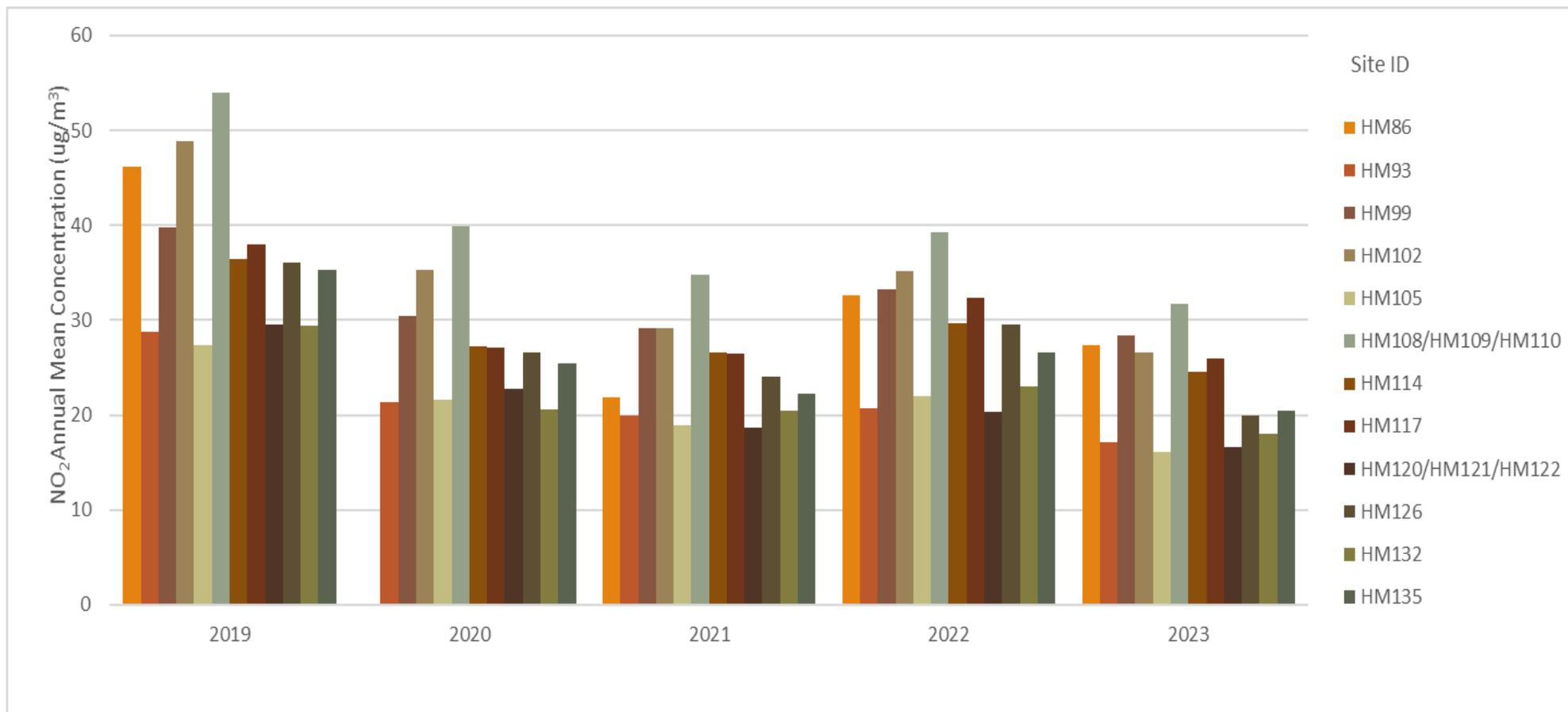
Annual Mean concentrations for nitrogen dioxide saw a reduction during 2023, compared to the previous 2022 monitoring year, at monitoring locations HM39 – HM62, which also saw a further sustained compliance with the nitrogen dioxide Annual Mean Air Quality Objective during 2023.

**Figure A.1.B - NO<sub>2</sub> Annual Mean concentrations for sites HM63 to HM85 between years 2019 to 2023**



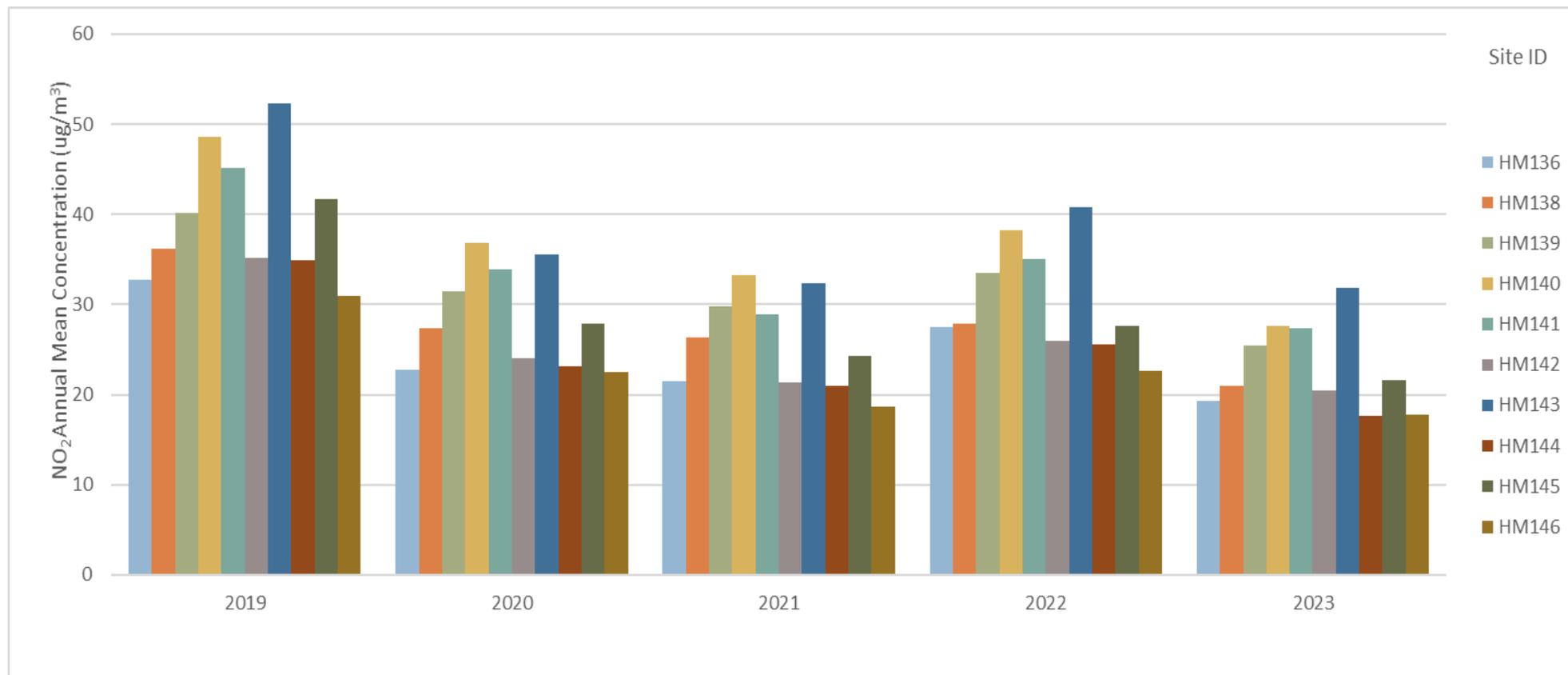
Annual Mean concentrations for nitrogen dioxide saw a reduction during 2023, compared to the previous 2022 monitoring year, at monitoring locations HM63 – HM85, which also saw a further sustained compliance with the nitrogen dioxide Annual Mean Air Quality Objective during 2023.

**Figure A.1.C - NO<sub>2</sub> Annual Mean concentrations for sites HM86 to HM135 between years 2019 to 2023**



Annual Mean concentrations for nitrogen dioxide saw a reduction during 2023, compared to the previous 2022 monitoring year, at monitoring locations HM86 – HM135, which also saw a further sustained compliance with the nitrogen dioxide Annual Mean Air Quality Objective during 2023.

**Figure A.1.D - NO<sub>2</sub> Annual Mean concentrations for sites HM136 to HM146 between years 2019 to 2023**



Annual Mean concentrations for nitrogen dioxide saw a reduction during 2023, compared to the previous 2022 monitoring year, at monitoring locations HM136 – HM146, which also saw a further sustained compliance with the nitrogen dioxide Annual Mean Air Quality Objective during 2023.

**Table A.5 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
Hertsmere Boreham wood Manor Way (H1)	520317	197099	Roadside	99.38	99.38	1	0	0	<b>0 (116)</b>	0
Hertsmere Boreham wood Meadow Park (H3)	519751	197358	Urban Background	98.48	98.48	0	0	<b>0 (57)</b>	0	0

**Notes:**

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

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

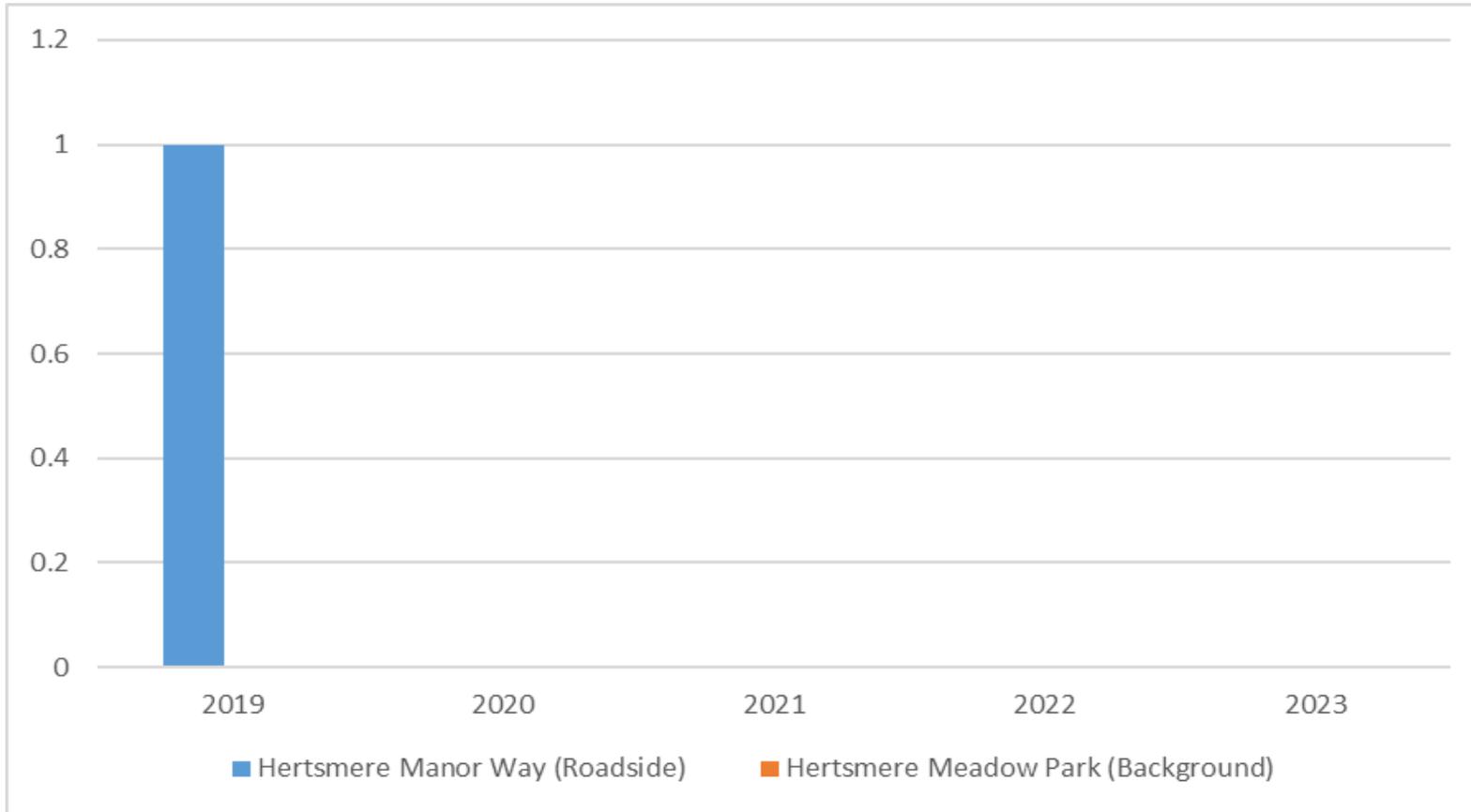
If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

(3) The Hertsmere Borehamwood Meadow Park (H3) Automatic Monitoring Site was relocated during 2023 with the new X and Y Grid References being included within the table above. The previous X and Y Grid References of the Hertsmere Borehamwood Meadow Park (H3) were X OS Grid Ref (Easting) – 519716 and Y OS Grid Ref (Northing) – 197250.

Figure A.2 – Trends in Number of NO<sub>2</sub> 1-Hour Means > 200µg/m<sup>3</sup>



**Table A.6 – Annual Mean PM<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
Hertsmere Borehamwood Manor Way (H1)	520317	197099	Roadside	35.09	35.09	16	15	16	16.2	12.8
Hertsmere Borehamwood Meadow Park (H3)	519751	197358	Urban Background	97.66	97.66	14	14	9	12.3	11

**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<sup>3</sup>.

Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

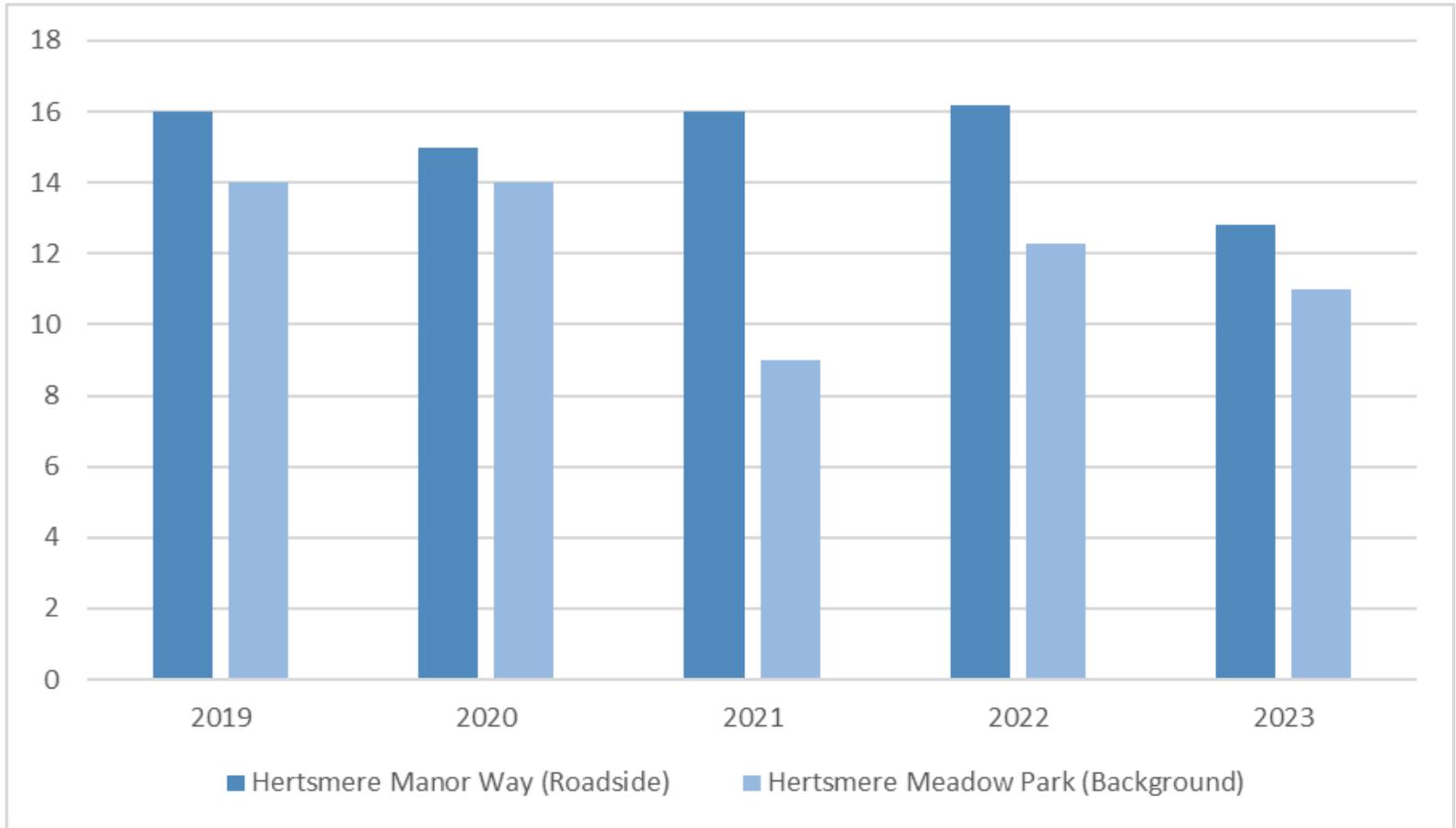
All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

(3) The Hertsmere Borehamwood Meadow Park (H3) Automatic Monitoring Site was relocated during 2023 with the new X and Y Grid References being included within the table above. The previous X and Y Grid References of the Hertsmere Borehamwood Meadow Park (H3) were X OS Grid Ref (Easting) – 519716 and Y OS Grid Ref (Northing) – 197250.

**Figure A.3 – Trends in Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>)**



**Table A.7 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
Hertsmere Borehamwood Manor Way (H1)	520317	197099	Roadside	35.09	35.09	2	0	<b>0 (25)</b>	<b>0 (26)</b>	<b>0 (22)</b>
Hertsmere Borehamwood Meadow Park (H3)	519751	197358	Urban Background	97.66	97.66	1	0	0	<b>0 (20)</b>	0

**Notes:**

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

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

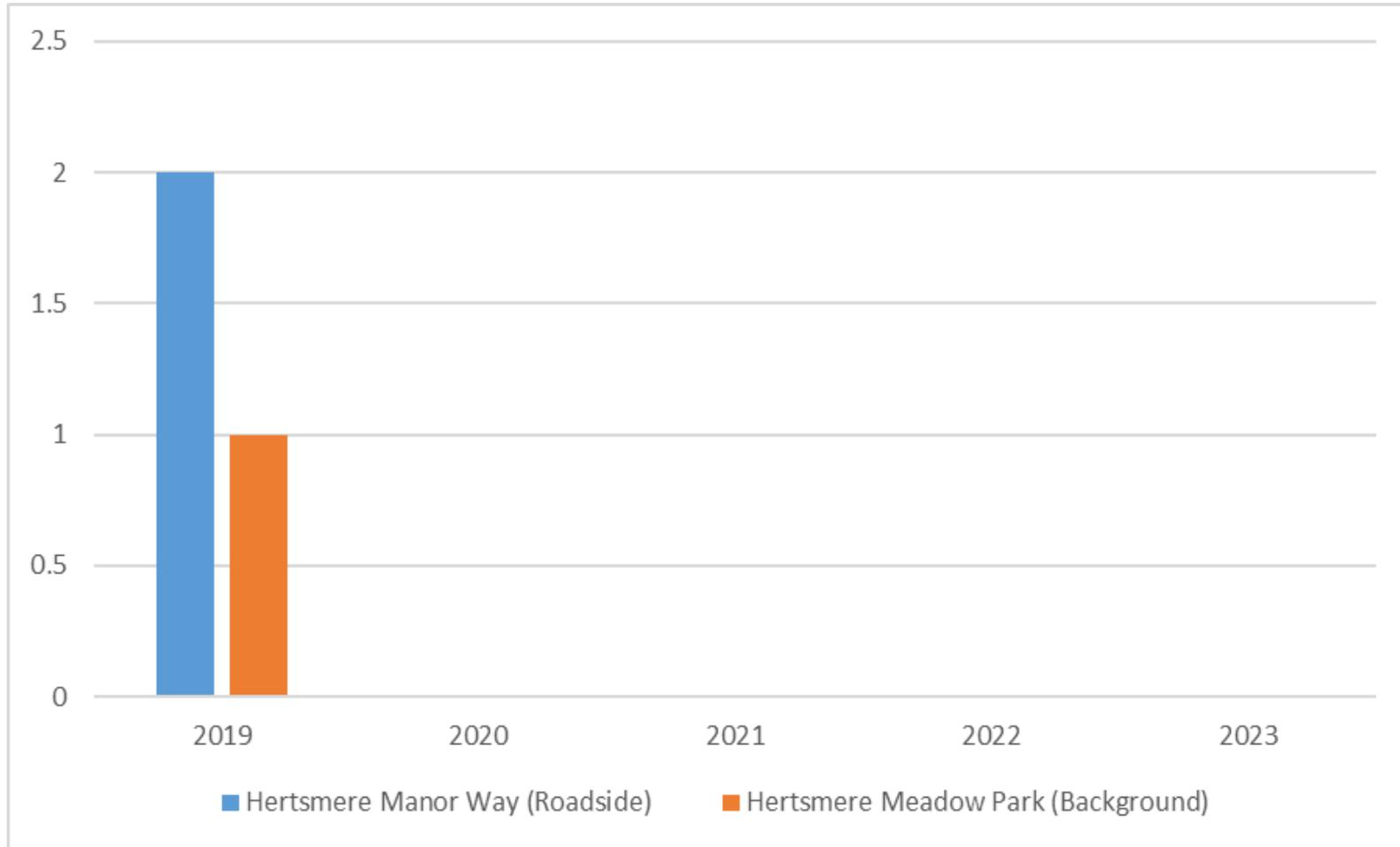
If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).

(3) The Hertsmere Borehamwood Meadow Park (H3) Automatic Monitoring Site was relocated during 2023 with the new X and Y Grid References being included within the table above. The previous X and Y Grid References of the Hertsmere Borehamwood Meadow Park (H3) were X OS Grid Ref (Easting) – 519716 and Y OS Grid Ref (Northing) – 197250.

Figure A.4 – Trends in Number of 24-Hour Mean PM<sub>10</sub> Results > 50µg/m<sup>3</sup>



**Table A.8 – Annual Mean PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2023 (%) <sup>(2)</sup>	2019	2020	2021	2022	2023
Hertsmere Borehamwood Manor Way (H1)	520317	197099	Roadside	34.93	34.93	10	9	9	9.6	7.5
Hertsmere Borehamwood Meadow Park (H3)	519751	197358	Urban Background	97.66	97.66	8.5	7.5	8.5	6.7	6.6

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

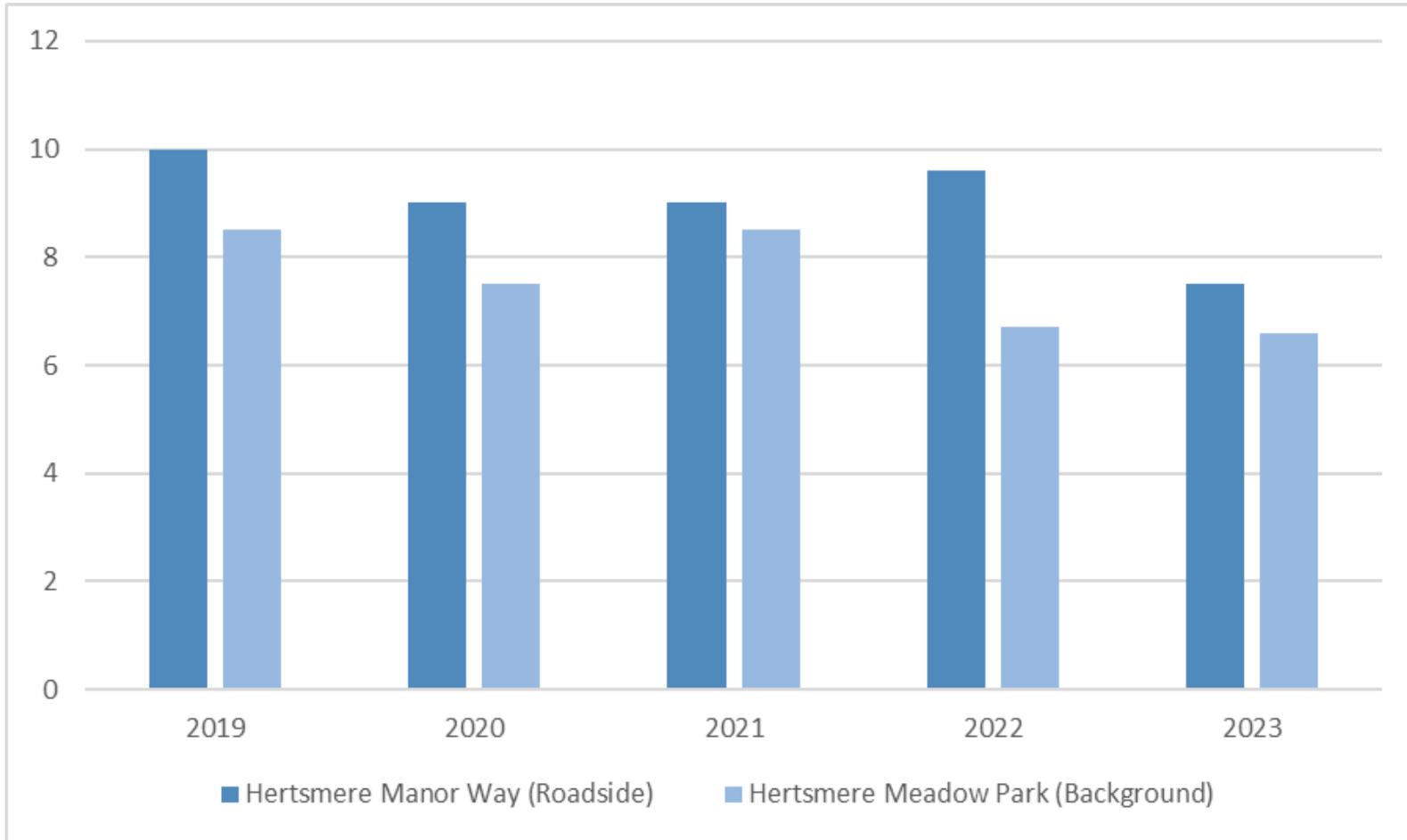
All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

(3) The Hertsmere Borehamwood Meadow Park (H3) Automatic Monitoring Site was relocated during 2023 with the new X and Y Grid References being included within the table above. The previous X and Y Grid References of the Hertsmere Borehamwood Meadow Park (H3) were X OS Grid Ref (Easting) – 519716 and Y OS Grid Ref (Northing) – 197250.

**Figure A.5 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations**



## Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO<sub>2</sub> 2023 Diffusion Tube Results (µg/m<sup>3</sup>)

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 (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HM39	519421	196682	45.7	45.7	33.5	31.5	26.9	28.1	23.9	24.4	33.5	35.1	33.0	28.3	32.5	27.6	N.A	
HM40	519283	196779	22.6	24.1	18.7	17.1	12.3	11.8	10.3	Missing	17.4	20.8	21.0	16.9	17.6	15.0	N.A	
HM45, HM46 & HM47	519716	197250	20.3	19.8	15.0	12.9	9.3	10.2	N.A	N.A	N.A	N.A	N.A	N.A	14.6	12.6	N.A	
HM48	517846	195346	37.3	36.8	31.0	27.6	23.6	27.0	18.6	19.3	17.9	26.2	26.9	19.4	26.0	22.1	N.A	
HM49	517861	195226	39.9	44.2	33.7	35.4	28.1	21.7	27.6	28.5	35.7	35.3	34.3	25.6	32.5	27.6	N.A	
HM50	517805	195249	45.7	46.0	37.7	38.0	29.6	27.0	26.1	27.3	39.1	31.9	34.2	27.1	34.1	29.0	N.A	
HM52	517746	195247	34.9	35.3	24.9	27.3	19.9	20.0	21.5	22.5	31.1	29.8	29.8	22.5	26.6	22.6	N.A	
HM53	515584	195096	21.2	22.5	17.0	15.0	10.0	8.6	8.7	11.0	14.4	17.2	18.7	13.7	14.8	12.6	N.A	
HM55	512773	197838	24.6	24.1	15.8	16.7	13.0	12.0	9.6	12.3	17.1	17.5	19.7	13.1	16.3	13.9	N.A	
HM57	513520	197821	39.8	38.9	33.4	32.5	26.1	32.0	29.9	30.5	36.4	34.9	35.4	28.7	33.2	28.2	N.A	
HM61	522042	200671	38.0	36.5	31.1	28.9	18.6	21.7	29.3	26.4	34.0	25.0	34.4	30.4	29.5	25.1	N.A	
HM62	524946	201156	37.5	40.1	29.7	29.1	27.8	25.6	23.6	24.3	31.4	34.0	33.4	27.0	30.3	25.8	N.A	
HM63	526082	200027	30.9	32.9	27.0	Missing	Missing	19.6	20.8	Missing	Missing	Missing	29.1	27.2	26.8	21.8	N.A	
HM64	526229	201506	45.9	43.6	32.0	29.0	24.4	27.3	31.1	27.5	35.0	37.5	36.5	35.1	33.7	28.6	N.A	
HM65	526255	201595	41.6	41.5	33.8	29.6	23.5	25.0	28.7	25.4	35.6	36.9	34.5	33.4	32.5	27.6	N.A	
HM66	526236	201462	40.3	40.3	28.0	25.4	19.8	20.1	22.6	22.2	29.4	31.5	34.5	33.0	28.9	24.6	N.A	
HM67	526211	201402	31.9	32.9	27.9	26.8	21.5	19.2	19.1	20.8	26.1	27.9	27.8	22.5	25.4	21.6	N.A	
HM69	526032	200837	51.2	45.2	37.7	37.4	32.2	34.4	31.6	30.9	39.7	40.8	37.8	36.1	37.9	32.2	N.A	
HM70	526406	200459	33.2	32.3	26.3	22.2	15.2	16.5	19.9	19.3	26.7	30.9	28.0	26.0	24.7	21.0	N.A	
HM71	516288	200030	Missing	34.6	Missing	33.0	30.4	28.3	23.5	23.3	31.9	29.8	34.5	X	29.9	25.4	N.A	
HM74	516460	199624	29.0	29.0	24.8	26.4	21.9	21.4	13.8	18.4	24.5	22.5	25.4	Missing	23.4	19.9	N.A	
HM79	524988	201118	34.3	39.0	30.1	30.1	27.4	25.1	19.6	23.1	Missing	28.7	27.2	21.0	27.8	23.6	N.A	
HM82	524925	201089	33.8	33.4	25.9	23.8	21.6	20.3	17.4	19.4	25.4	28.1	29.0	23.4	25.1	21.3	N.A	
HM85	518597	200952	23.2	26.1	17.0	15.2	10.6	10.3	8.7	11.0	14.3	17.8	19.0	X	15.7	13.3	N.A	
HM86	522970	199959	40.1	38.5	31.6	29.7	18.7	X	31.3	26.8	35.5	32.9	33.2	34.8	32.1	27.3	N.A	
HM93	524575	200632	29.3	27.5	21.0	18.2	13.3	13.1	12.8	15.3	21.4	25.4	24.3	X	20.1	17.1	N.A	

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 (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HM99	513212	195257	45.8	48.6	35.4	X	29.1	30.1	23.4	Missing	32.0	Missing	31.2	25.0	33.4	28.4	N.A	
HM102	516387	199763	41.1	39.4	33.3	34.0	27.2	26.4	22.5	23.8	33.8	32.9	34.6	26.3	31.3	26.6	N.A	
HM105	520740	195268	X	26.5	19.5	19.9	15.0	14.4	11.1	14.0	28.1	22.5	20.8	16.5	18.9	16.1	N.A	
HM108, HM109 & HM110	513423	197729	44.5	44.6	39.8	41.5	38.4	40.5	26.6	29.0	41.9	37.4	35.8	27.5	37.3	31.7	N.A	
HM114	526164	201363	35.9	36.9	28.8	25.6	Missing	22.3	X	X	26.2	29.6	29.2	25.0	28.8	24.5	N.A	
HM117	513103	195297	46.9	43.7	33.3	35.2	25.9	Missing	18.0	23.2	28.9	29.3	31.3	20.6	30.6	26.0	N.A	
HM120, HM121 & HM122	520181	197150	26.2	26.9	20.1	16.5	N.A	N.A	22.4	16.6	N.A							
HM126	517903	195552	38.4	32.3	24.3	21.2	17.2	16.2	18.1	18.7	24.8	25.0	26.3	19.8	23.5	20.0	N.A	
HM132	516522	199450	27.7	27.6	20.6	23.8	19.7	20.6	12.8	X	19.5	20.9	23.4	15.9	21.1	17.9	N.A	
HM135	513758	197597	32.8	30.5	25.1	19.6	15.0	17.0	21.5	20.2	26.8	28.0	27.7	24.4	24.1	20.5	N.A	
HM136	519802	197039	31.8	31.2	26.3	20.0	16.1	14.7	16.1	16.4	22.7	28.8	25.7	22.6	22.7	19.3	N.A	
HM138	519647	196865	32.9	32.1	25.9	25.5	19.5	20.1	17.2	19.3	25.0	28.8	28.3	21.7	24.7	21.0	N.A	
HM139	519589	196794	38.4	37.4	31.1	35.1	27.9	29.6	18.5	23.8	31.6	34.2	29.5	23.0	30.0	25.5	N.A	
HM140	519312	196574	40.6	41.6	33.9	34.4	28.9	33.1	23.7	25.0	35.4	36.8	30.3	25.5	32.4	27.5	N.A	
HM141	519233	196502	39.6	35.0	34.8	29.8	24.6	28.3	Missing	X	32.4	34.7	32.6	29.4	32.1	27.3	N.A	
HM142	513592	197887	32.3	30.7	24.4	21.1	18.0	19.9	18.9	20.2	26.5	25.0	27.6	23.6	24.0	20.4	N.A	
HM143	516231	200196	50.5	47.6	41.7	39.3	29.0	30.4	31.2	28.7	43.5	38.8	38.0	31.3	37.5	31.9	N.A	
HM144	526213	201749	30.4	Missing	22.9	19.5	15.5	15.2	16.9	17.5	23.5	25.6	22.3	19.2	20.8	17.7	N.A	
HM145	526409	201715	32.5	37.2	Missing	Missing	Missing	17.6	Missing	Missing	X	N.A	N.A	N.A	29.1	21.6	N.A	
HM146	518991	200401	26.4	29.6	20.6	18.8	14.0	17.2	15.7	X	22.4	23.1	23.6	19.2	21.0	17.9	N.A	
HM148, HM149 & HM150	520317	197099	31.8	31.3	21.9	19.4	14.5	16.4	16.2	16.0	21.5	23.8	24.4	19.4	21.4	18.2	N.A	
HM151	514610	194356	33.2	30.4	25.8	24.5	16.2	14.8	12.2	15.0	19.3	20.1	19.5	16.9	20.7	17.6	N.A	
HM152	519731	197003	34.4	34.8	28.0	22.9	17.5	19.4	22.6	21.7	28.8	32.9	Missing	26.9	26.4	22.4	N.A	
HM153	518551	202915	27.7	28.8	21.8	21.6	19.6	18.6	14.8	18.4	19.9	19.0	23.4	15.9	20.8	17.7	N.A	
HM154	513879	197724	24.9	25.1	20.3	15.6	12.0	13.7	14.7	16.0	Missing	21.7	22.5	19.4	18.7	15.9	N.A	
HM155	521039	196673	N.A	N.A	N.A	N.A	22.0	23.4	17.5	20.4	27.9	28.6	28.7	19.9	23.5	22.3	N.A	

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 (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HM156	519285	196570	N.A	N.A	N.A	N.A	32.1	34.5	29.4	29.1	36.2	Missing	36.5	31.6	32.8	32.3	N.A	
HM157	516258	200153	N.A	N.A	N.A	N.A	24.7	21.9	18.3	21.4	29.7	29.7	31.0	23.0	25.0	23.6	N.A	
HM158, HM159 & HM160	519751	197358	N.A	N.A	N.A	N.A	N.A	N.A	N.A	10.7	13.8	18.3	17.6	14.0	14.9	12.2	N.A	
HM161	513325	197567	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	31.6	28.7	21.5	27.3	20.1	N.A	

- ☒ All erroneous data has been removed from the NO<sub>2</sub> 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.
- ☒ Hertsmere Borough Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Key: **Missing** – indicates that a Diffusion Tube was missing upon collection from the monitoring location. Possible reasons why a Diffusion Tube was missing upon collection include but are not limited to theft, accidental removal and extreme weather events. **N.A** – (Not Applicable); indicates that Diffusion Tube monitoring was not being carried out or had ceased to be carried out, if noted within the monthly rows/columns. **X** – indicates

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

### **New or Changed Sources Identified Within Hertsmere Borough Council During 2023**

New sources with a potential to impact air quality were identified by Hertsmere Borough Council during the 2023 reporting year and include but are not limited to the following.

- Planning Ref: 23/0439/FUL - Land Adjacent To Lismirrane Industrial Park, Elstree Road, Elstree, Hertfordshire - (Demolition and redevelopment comprising of E(g)(iii) (Industrial Processes), B2 (General Industry) and B8 (Storage and Distribution) uses with ancillary offices and associated access, car parking, servicing areas and landscaping.)

### **Additional Air Quality Works Undertaken by Hertsmere Borough Council During 2023**

Hertsmere Borough Council has not completed any additional works within the reporting year of 2023, relating to the development of action plan measures or the declaration, amendment or revocation of an AQMA.

## QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for users and laboratories (February 2008). The diffusion tubes are supplied and analysed by Gradko utilising the 20% TEA in water preparation method. Gradko maintains a UKAS accredited quality system with fully documented in house methods for all analysis procedures. The concentration of nitrogen dioxide is determined for exposed diffusion tubes using method GLM7. Gradko was assessed as part of the AIR PT Proficiency Scheme and was 100% satisfactory in all AIR-PT-Rounds, (AIR PT 55-1 to AIR PT 58-4) which were carried out between February 2023 and October 2023.

Diffusion Tube monitoring during 2023 was completed in adherence with the 2023 Diffusion Tube Monitoring Calendar.

## Diffusion Tube Annualisation

**Table C.1 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )**

Site ID	Annualisation Factor Southend-on-Sea	Annualisation Factor Barnet Chalgrove School (BN2)	Annualisation Factor Northampton Spring Park (NTN4, an AURN site)	Annualisation Factor Rochester Stoke (ROCH, an AURN site)	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
HM45, HM46 & HM47	0.9673	1.0288	1.0511	1.0159	1.0158	14.6	14.8
HM63	0.9457	0.9601	0.9337	0.9904	0.9575	26.8	25.6
HM120, HM121 & HM122	0.8406	0.8516	0.8639	0.9173	0.8683	22.4	19.5
HM145	0.8228	0.9036	0.8960	0.8663	0.8722	29.1	25.4
HM155	1.1258	1.1215	1.1021	1.1054	1.1137	23.5	26.2
HM156	1.1599	1.2022	1.1612	1.1193	1.1606	32.8	38.0
HM157	1.1258	1.1215	1.1021	1.1054	1.1137	25.0	27.8
HM158, HM159 & HM160	0.9976	0.9312	0.9087	1.0106	0.9620	14.9	14.3
HM161	0.9196	0.8005	0.7854	0.9608	0.8666	27.3	23.6
Site ID	Annualisation Factor Borehamwood Meadow Park (PM <sub>10</sub> )	Annualisation Factor Oxford St Ebbes (PM <sub>10</sub> )	Annualisation Factor Reading New Town (PM <sub>10</sub> )	Annualisation Factor Southend-on-Sea (PM <sub>10</sub> )	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
H1	1.000	0.850	0.902	0.940	0.923	13.9	12.8
Site ID	Annualisation Factor Borehamwood Meadow Park (PM <sub>2.5</sub> )	Annualisation Factor Oxford St Ebbes (PM <sub>2.5</sub> )	Annualisation Factor Reading New Town (PM <sub>2.5</sub> )	Annualisation Factor Southend-on-Sea (PM <sub>2.5</sub> )	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
H1	0.900	0.822	0.833	0.900	0.900	8.3	7.5

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Hertsmere Borough Council has applied a local bias adjustment factor of 0.85 to the 2023 monitoring data. The local bias adjustment factor was derived from a colocation study carried out at the Hertsmere Borehamwood Manor Way (H1) Roadside Automatic Monitoring site. A summary of bias adjustment factors used by Hertsmere Borough 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	Local	N.A	0.85
2022	Local	N.A	0.97
2021	National	09/22	0.84
2020	Local	N.A.	0.92
2019	Local	N.A.	1.04

**Table C.3 – Local Bias Adjustment Calculation**

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12				
Bias Factor A	0.85 (0.82 - 0.89)				
Bias Factor B	17% (12% - 22%)				
Diffusion Tube Mean (µg/m <sup>3</sup> )	21.4				
Mean CV (Precision)	3.0%				
Automatic Mean (µg/m <sup>3</sup> )	18.2				
Data Capture	100%				
Adjusted Tube Mean (µg/m <sup>3</sup> )	18 (18 - 19)				

**Notes:** A single local bias adjustment factor has been used to bias adjust the 2023 diffusion tube results.

## NO<sub>2</sub> Fall-off with Distance from the Road

No diffusion tube NO<sub>2</sub> monitoring locations within Hertsmere Borough Council required distance correction during 2023.

## QA/QC of Automatic Monitoring

- During the 2023 monitoring year Karl Riahi (Principal Environmental Health Officer) and Craig Gent (Senior Scientific Officer) completed the data management and undertook the Local Site Operator (LSO) duties for the two automatic monitoring sites within Hertsmere Borough Council's district.
- The Hertsmere Borehamwood Manor Way, Roadside Automatic Monitoring Site (H1) is calibrated every two weeks, whereas the Hertsmere Borehamwood Meadow Park, Background Automatic Monitoring Site (H3) is calibrated monthly.
- Hertsmere Borough Council has an annual Service Contract with acoem for both Background and Roadside Automatic Monitoring Sites, inclusive of 2 x 6 Monthly Routine Service Visits Per Annum.
- At the time of writing the Borehamwood, Manor Way (Roadside) Air Quality Monitoring Station (AQMS) is not audited. The Borehamwood Meadow Park, (Background) AQMS is part of the AURN network and was audited during January 2023 and again in July 2023. Certificates of Calibration were issued on the 7<sup>th</sup> March 2023 (Certificate Reference: 25952/4\_0323) and 26<sup>th</sup> September 2023 (Certificate Reference 25952/4\_0923 – V2).
- The monitoring data presented within the ASR has been ratified.
- Live/historic data is available on the HERTS + BEDS Air Quality Network's webpage via [https://www.airqualityengland.co.uk/local-authority/?la\\_id=408](https://www.airqualityengland.co.uk/local-authority/?la_id=408)

## PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment

PM<sub>10</sub> and PM<sub>2.5</sub> monitoring is carried out by Hertsmere Borough Council at two locations. The Borehamwood, Manor Way (Roadside) Air Quality Monitoring Station (AQMS), uses a 1405-DF TEOM/FDMS, which has been declared equivalent to the reference method and in accordance with LAQM.TG (22) 7.164, Local Authorities can use this type of FDMS variant, without the need for correction for slope and/or intercept.

The Borehamwood Bowling Club/Meadow Park, (Background) AQMS, uses a Fidas 200, which processes both PM<sub>10</sub> and PM<sub>2.5</sub> monitoring data via an inbuilt algorithm known as

Method 11. In accordance with LAQM.TG (22) 7.174, Method 11 PM<sub>10</sub> data can be used by Local Authorities without the need for correction. Method 11 PM<sub>2.5</sub> data can be used after correction for slope by dividing by 1.06.

The PM<sub>2.5</sub> Annual Mean raw data for the Borehamwood Bowling Club/Meadow Park, (Background) AQMS is  $7\mu\text{g}/\text{m}^3 \div 1.06 = 6.6\mu\text{g}/\text{m}^3$ .

### **Automatic Monitoring Annualisation**

Annualisation was required for one of Hertsmere Borough Council's automatic monitoring sites, at Hertsmere Borehamwood Manor Way (H1), which had an annual data capture of 35.09% for PM<sub>10</sub> and 34.93% for PM<sub>2.5</sub> Annual Mean. The annualisation data for the Hertsmere Borehamwood Manor Way (H1) automatic monitoring site is summarised within Table C.1.

The Hertsmere Borehamwood Meadow Park (H3) recorded data capture of greater than 75% for all measured pollutants. Therefore it was not required to annualise any monitoring data at this site.

### **NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table A.3.

No automatic NO<sub>2</sub> monitoring locations within Hertsmere Borough Council required distance correction during 2023.

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

Figure D.1 – Map of Non-Automatic Monitoring Sites

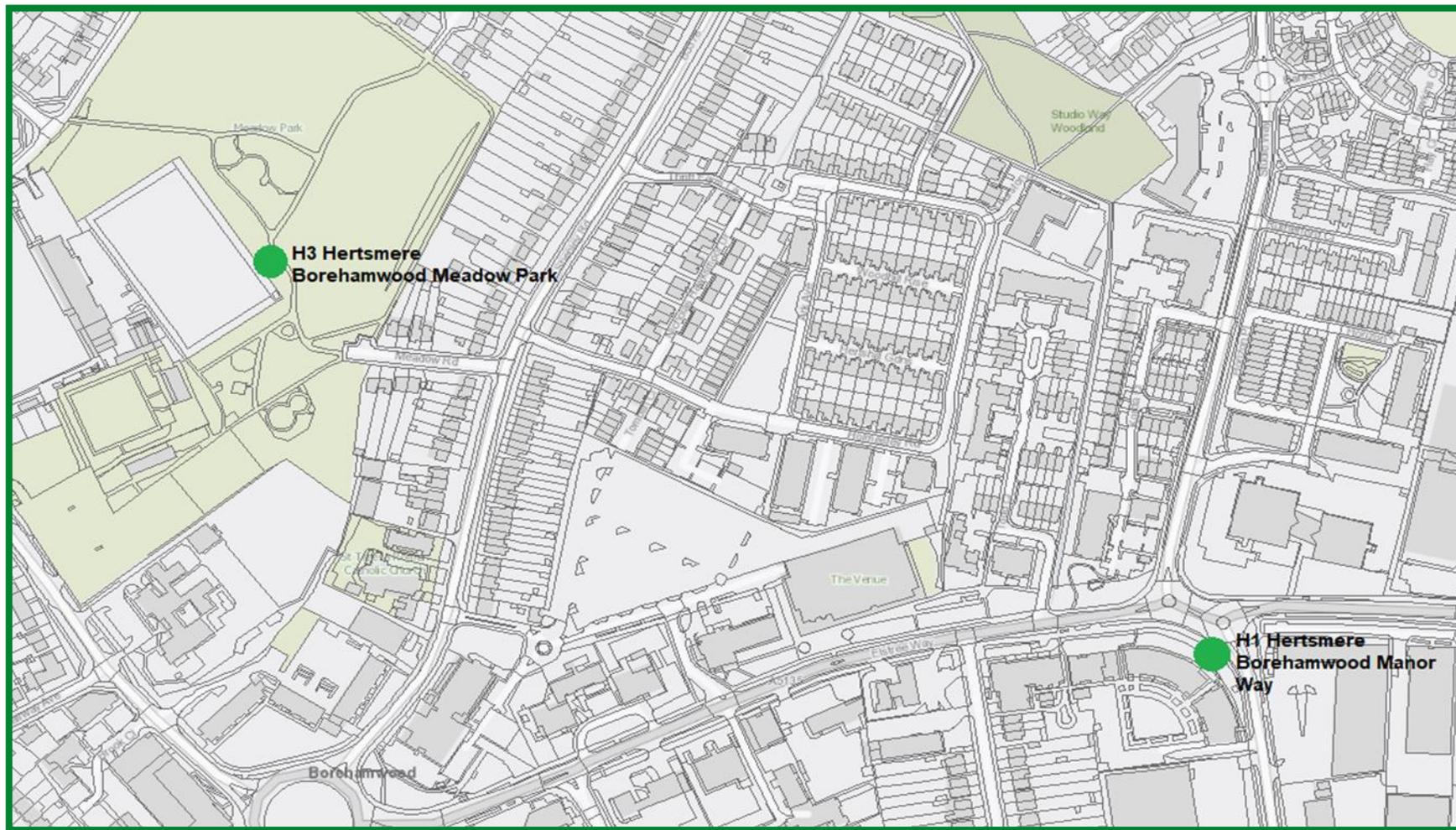
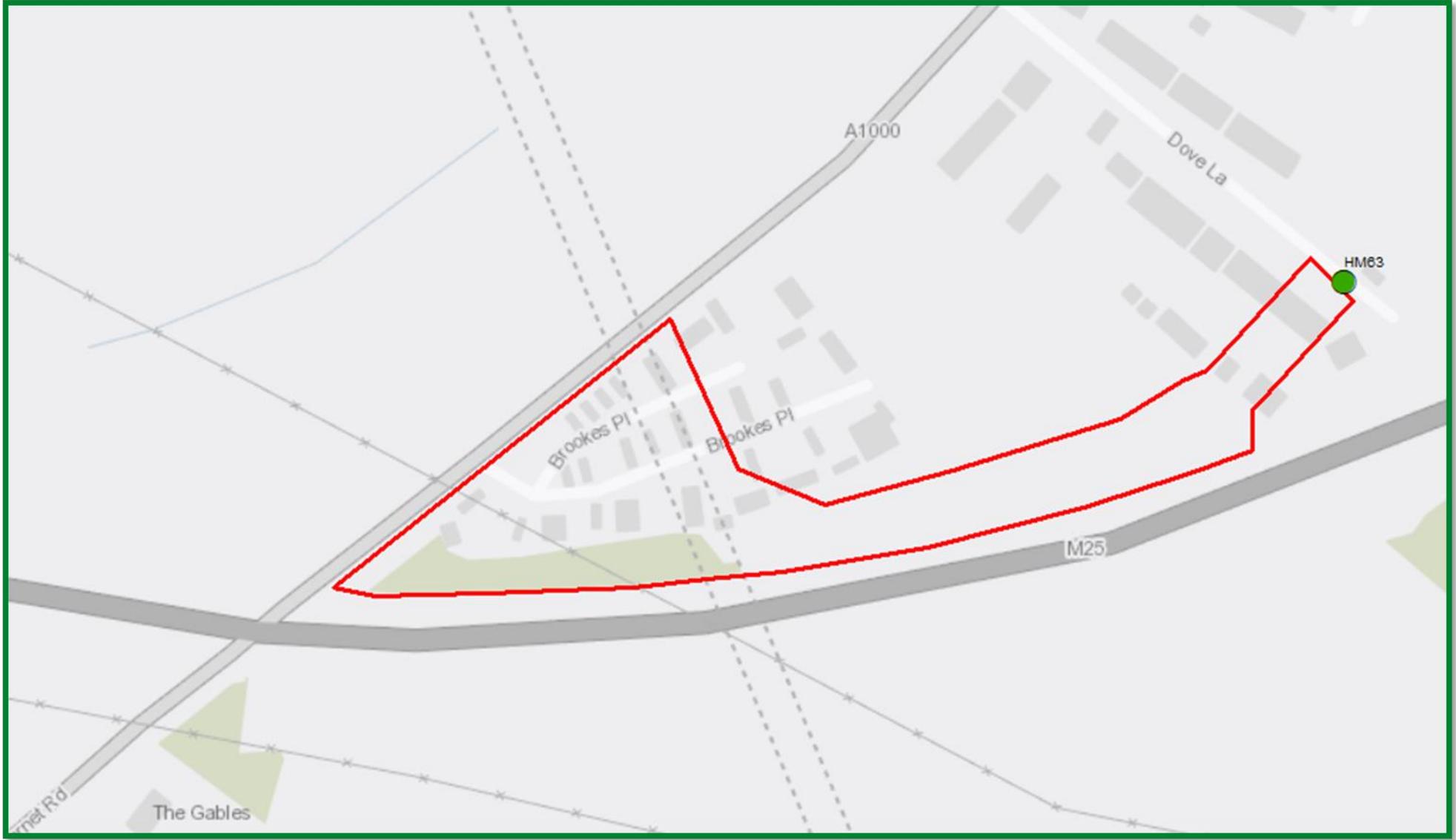


Figure D.2 – Hertsmere AQMA No.1 23-27 Dove Lane and caravan site off A1000 Barnet Road; Including Diffusion Tube monitoring location HM63



**Figure D.3 – Hertsmere AQMA No. 2 Charleston Paddocks, St Albans Road; Including Diffusion Tube monitoring location HM86**

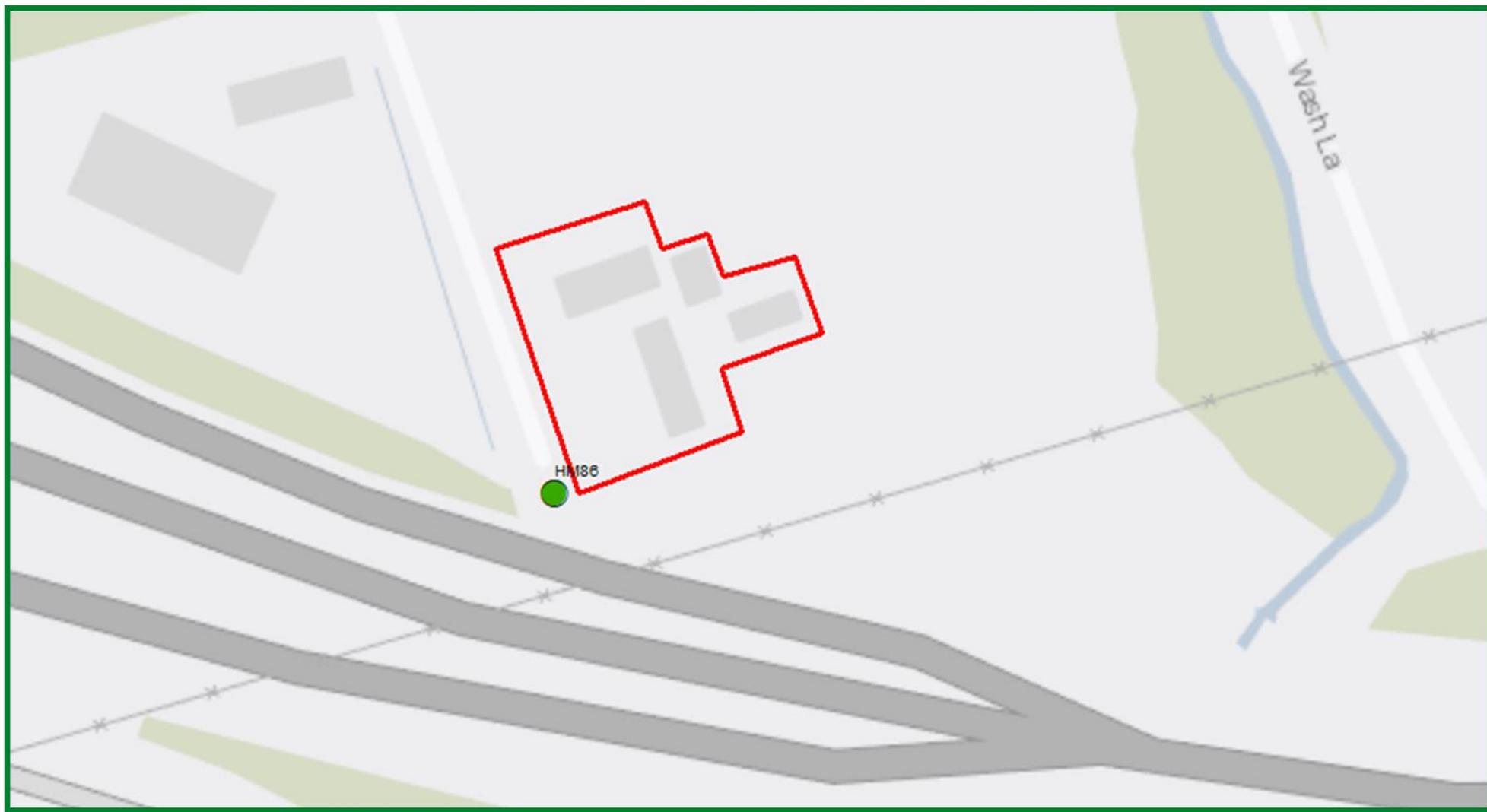


Figure D.4 – Hertsmere AQMA No. 3 31-39 Blanche Lane, South Mimms; Including Diffusion Tube monitoring location HM61



**Figure D.5 – Hertsmere AQMA No. 4 Hartspring Lane; Including Diffusion Tube monitoring locations HM57, HM108, HM109, HM110, HM135, HM142, HM154 & HM161**

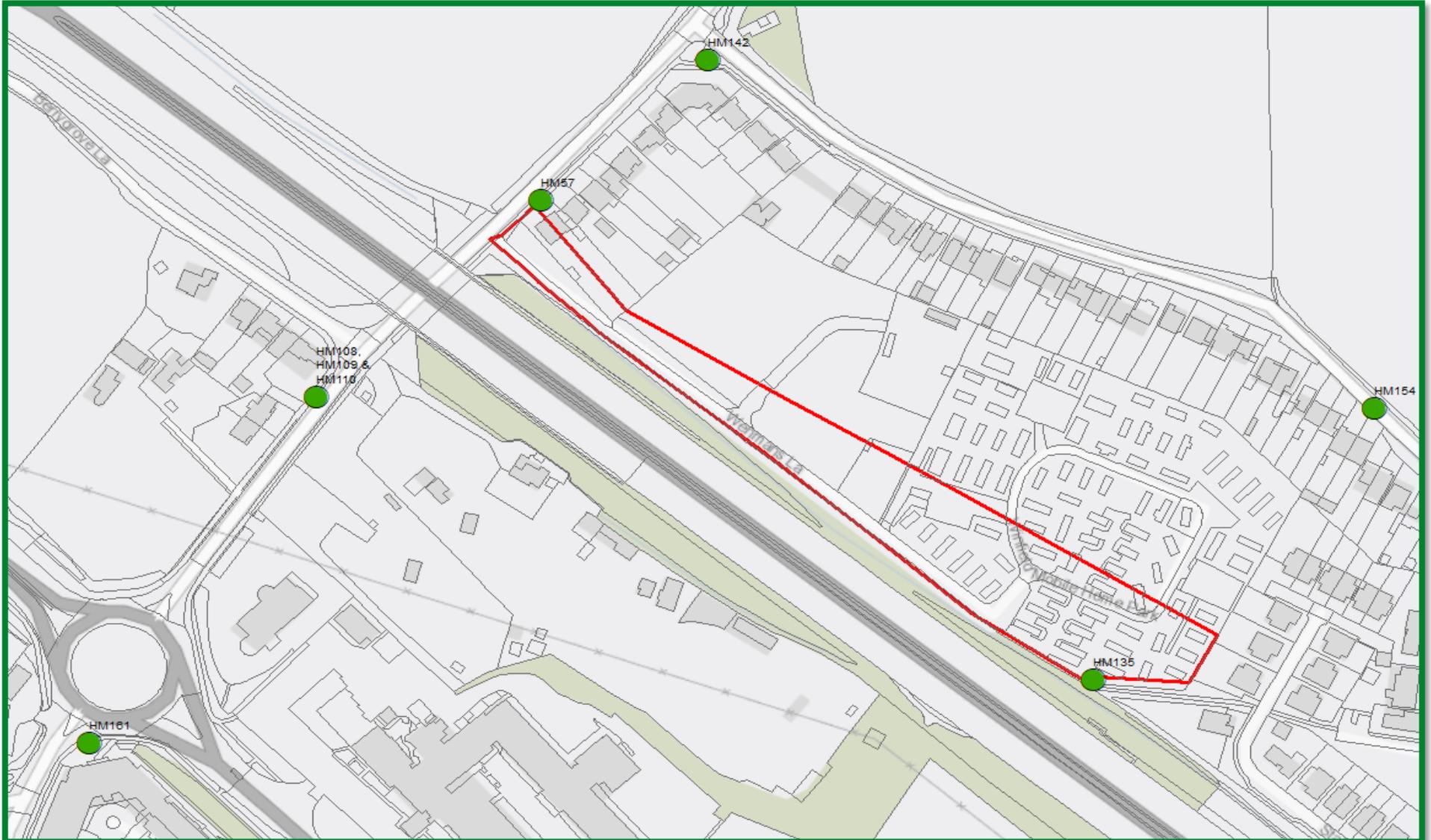
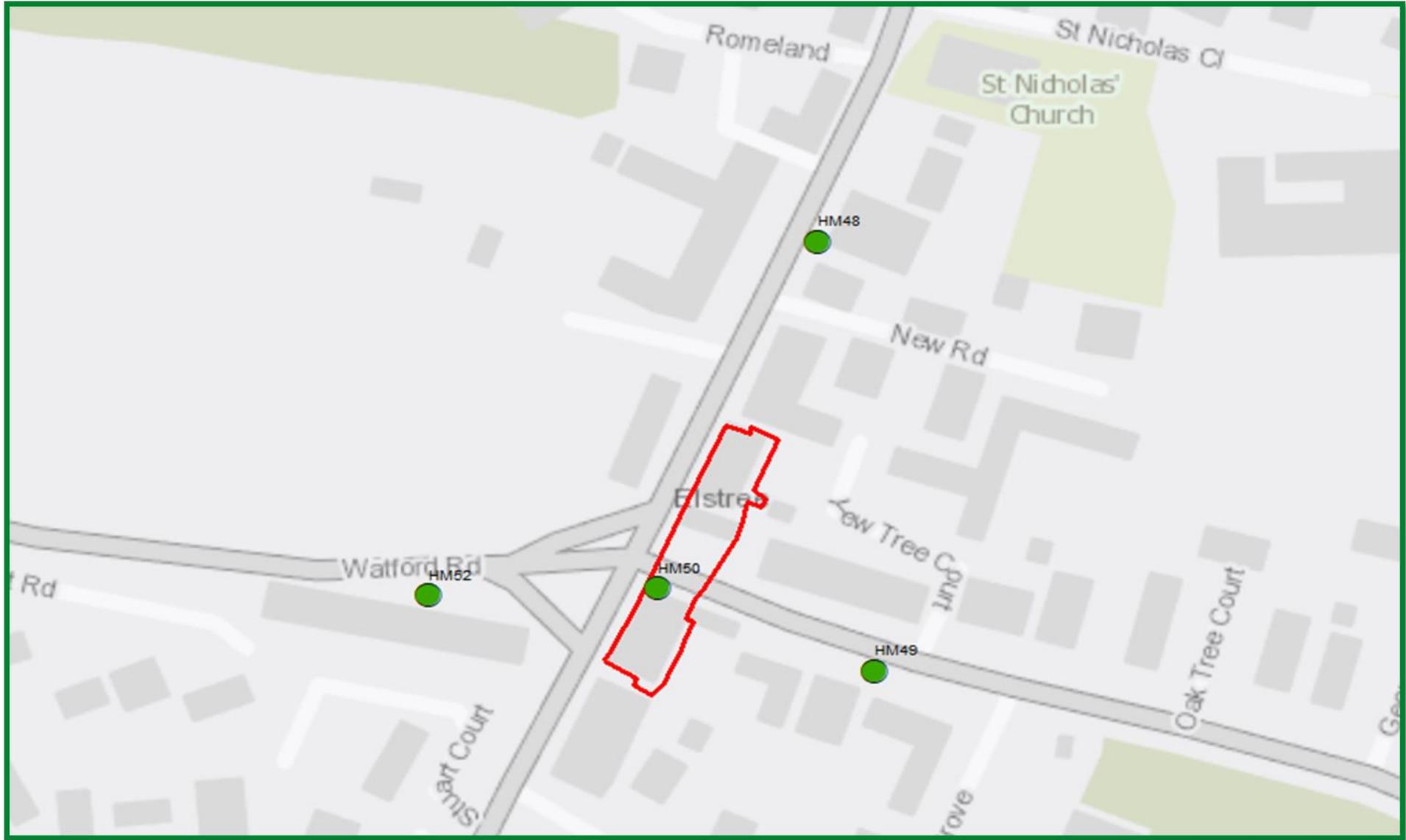


Figure D.6 – Hertsmere AQMA No. 5 Elstree Crossroads; Including Diffusion Tube monitoring locations HM48, HM49, HM50 & HM52



**Figure D.7 – Hertsmere AQMA No. 6 133 to 167 High Street, Potters Bar; Including Diffusion Tube monitoring locations HM64, HM66, HM67 & HM114**

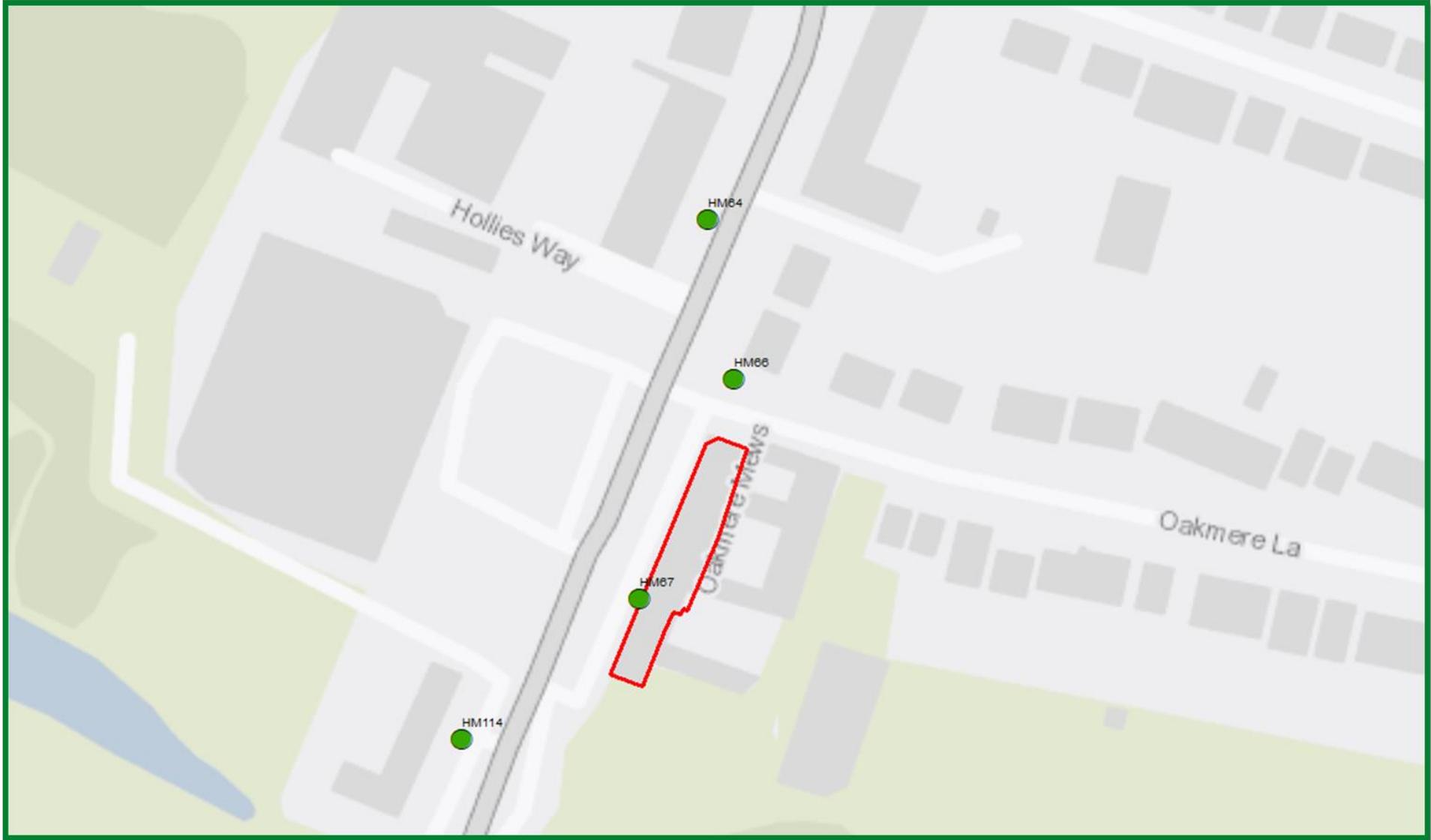


Figure D.8 – Diffusion Tube monitoring locations HM65, HM144 & HM145

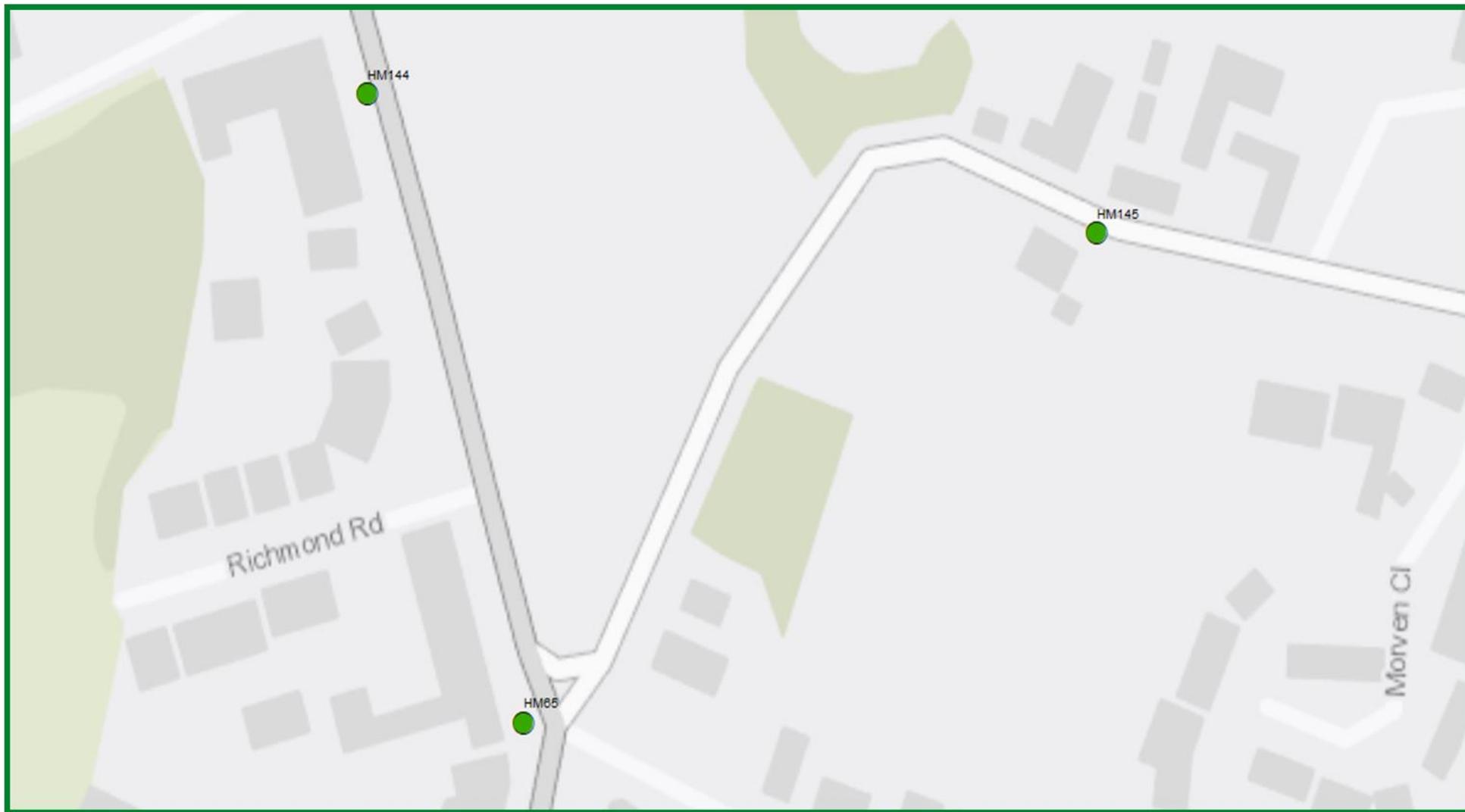


Figure D.9 – Diffusion Tube monitoring location HM69

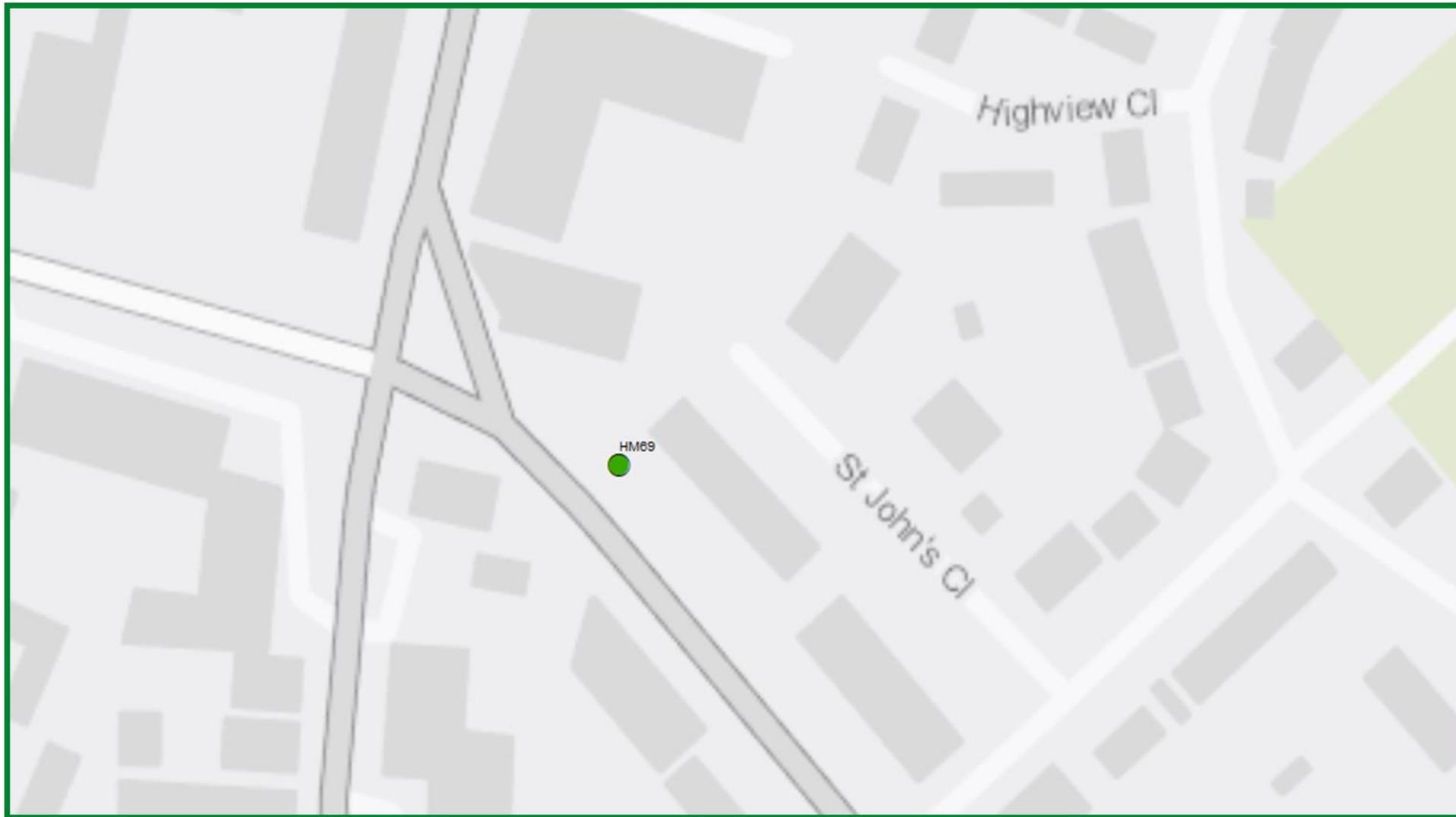


Figure D.10 – Diffusion Tube monitoring location HM70

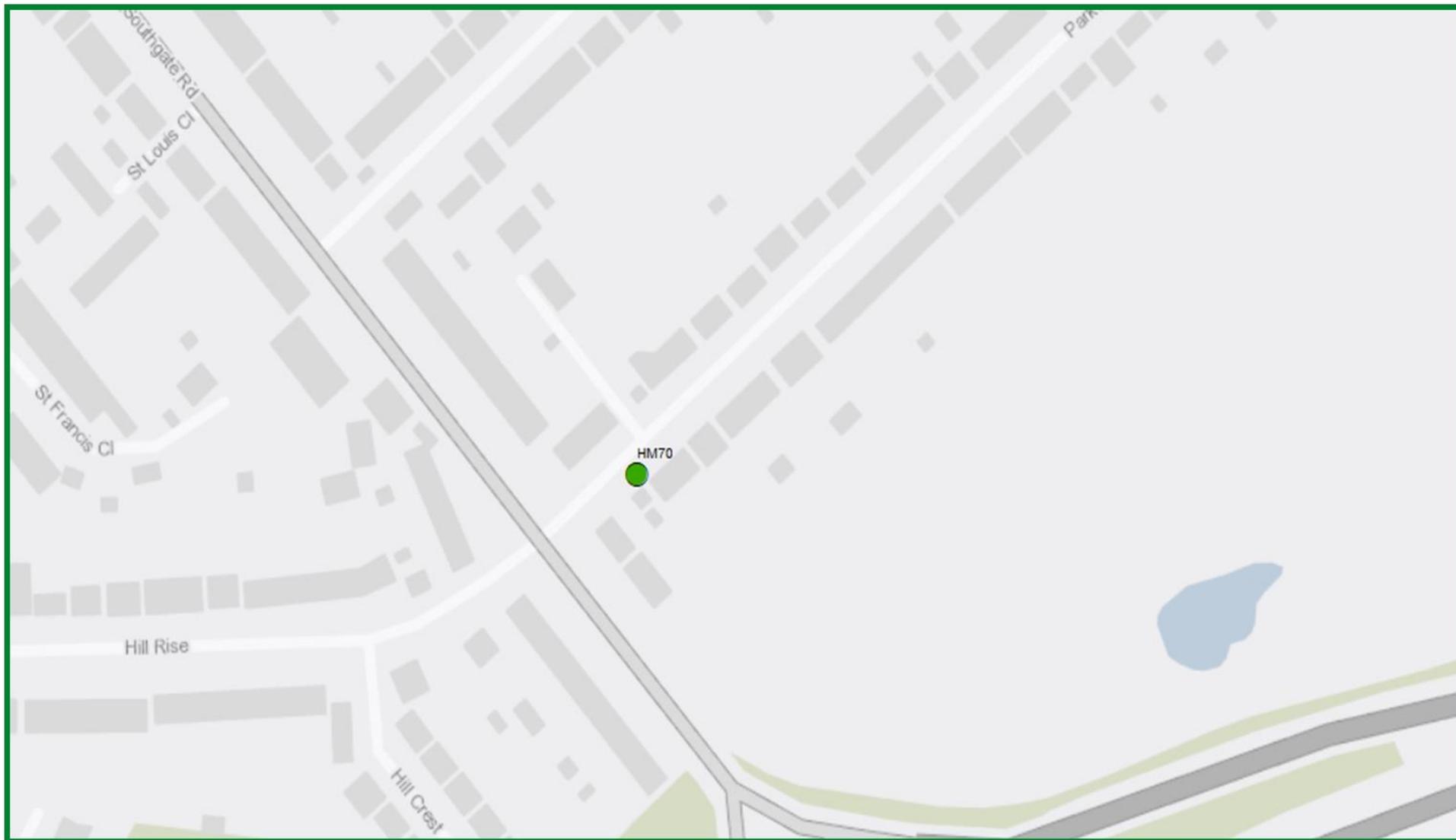


Figure D.11 – Diffusion Tube monitoring locations HM62, HM79 & HM82

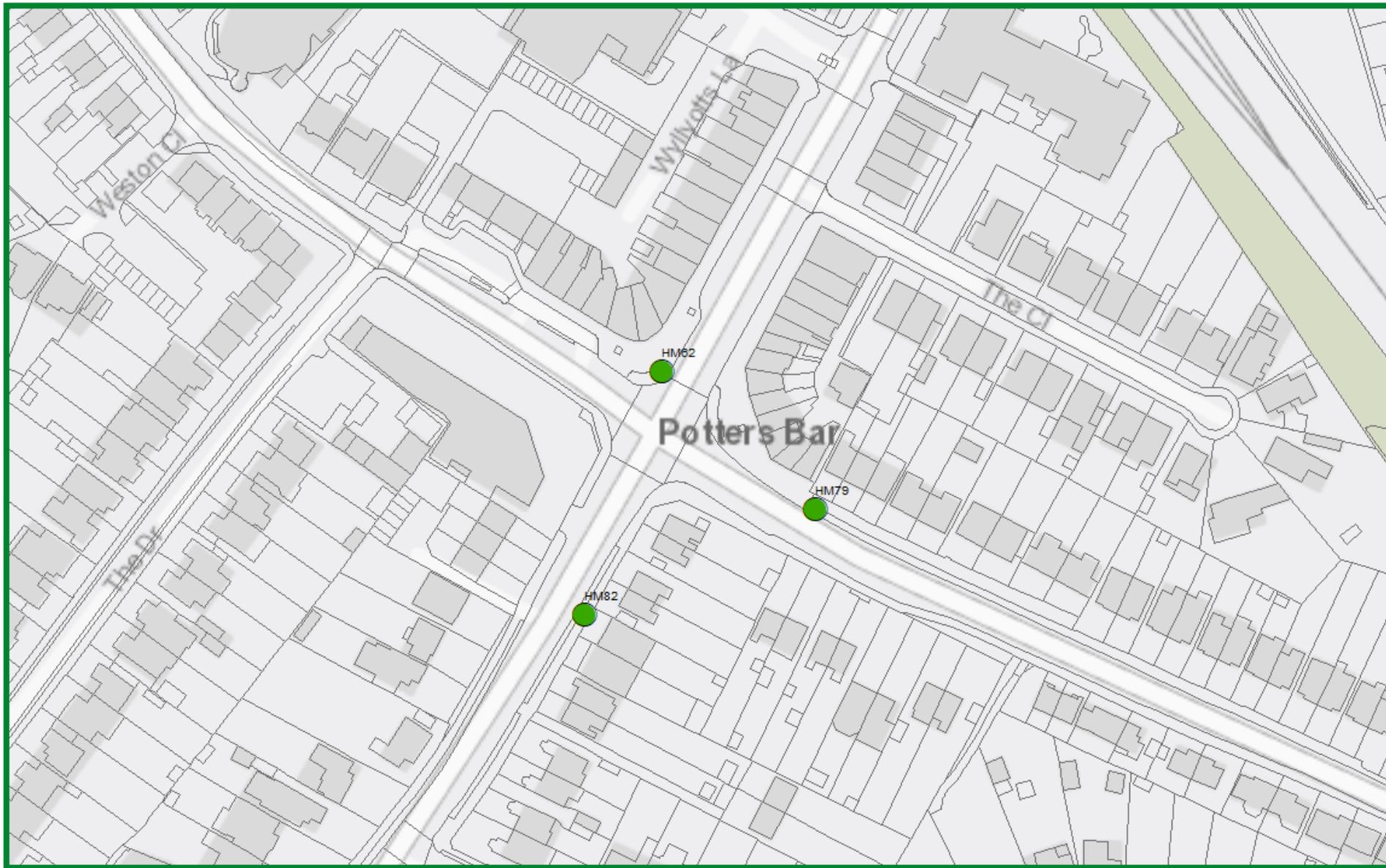


Figure D.12 – Diffusion Tube monitoring location HM93

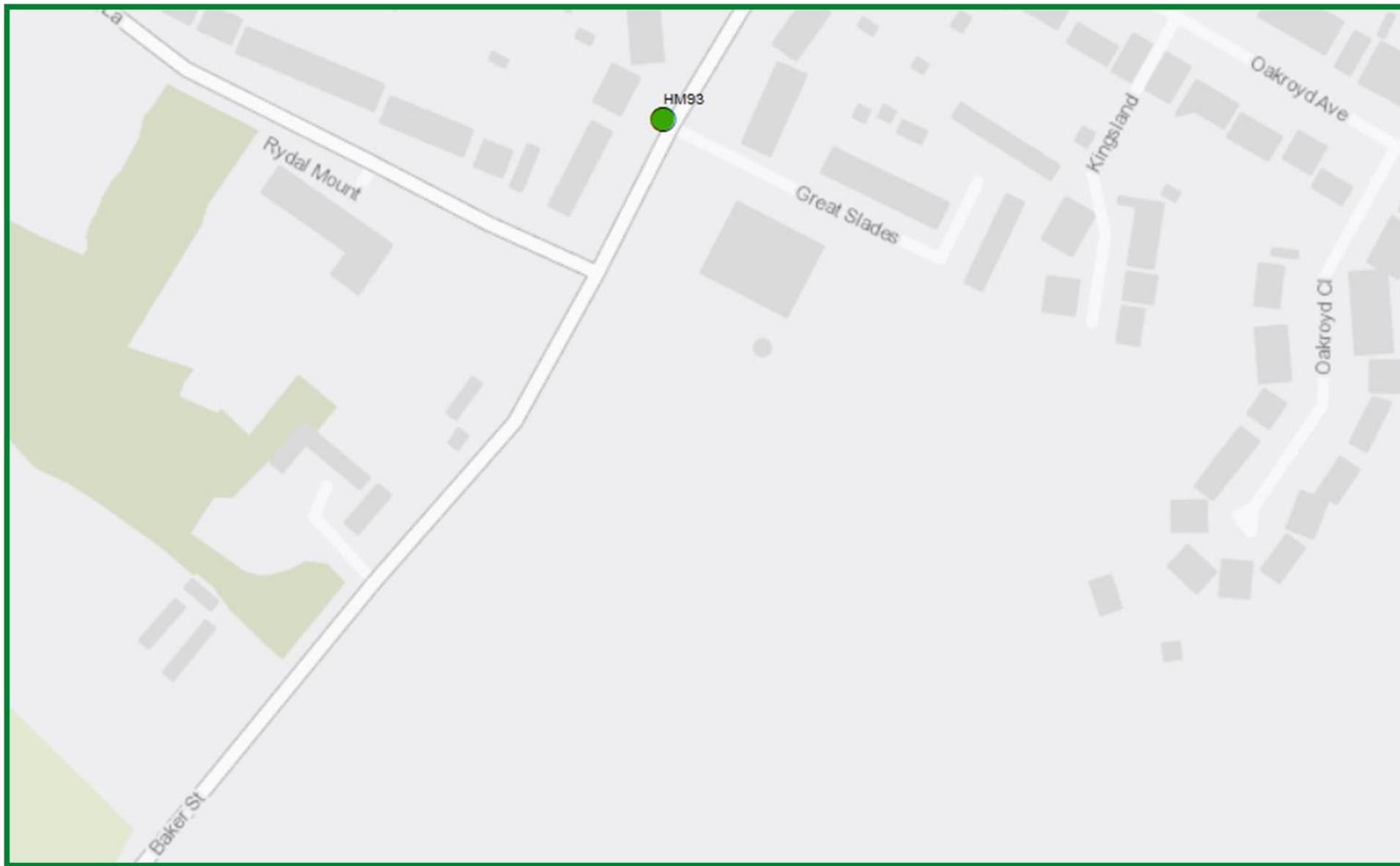


Figure D.13 – Diffusion Tube monitoring location HM153

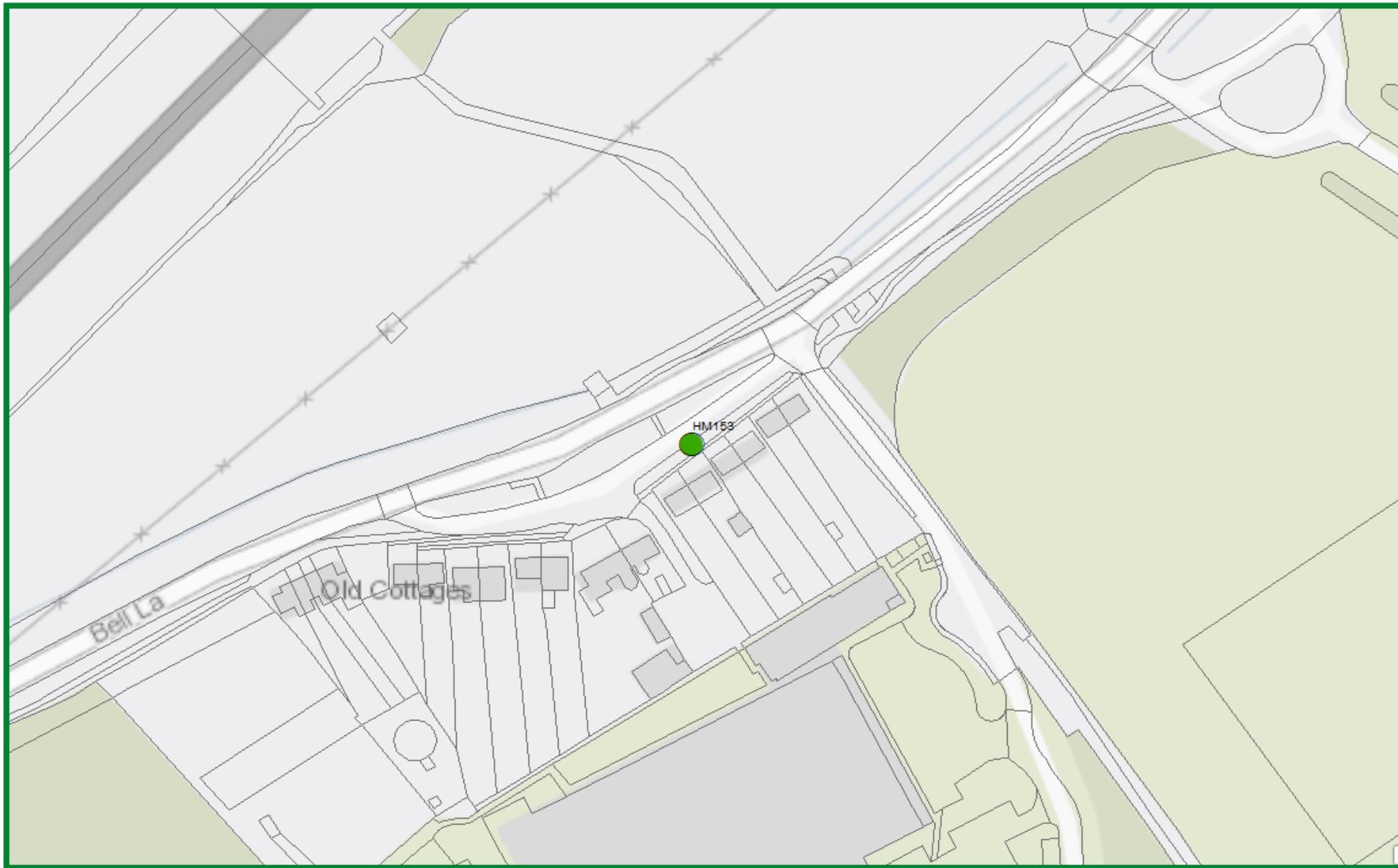


Figure D.14 – Diffusion Tube monitoring location HM146

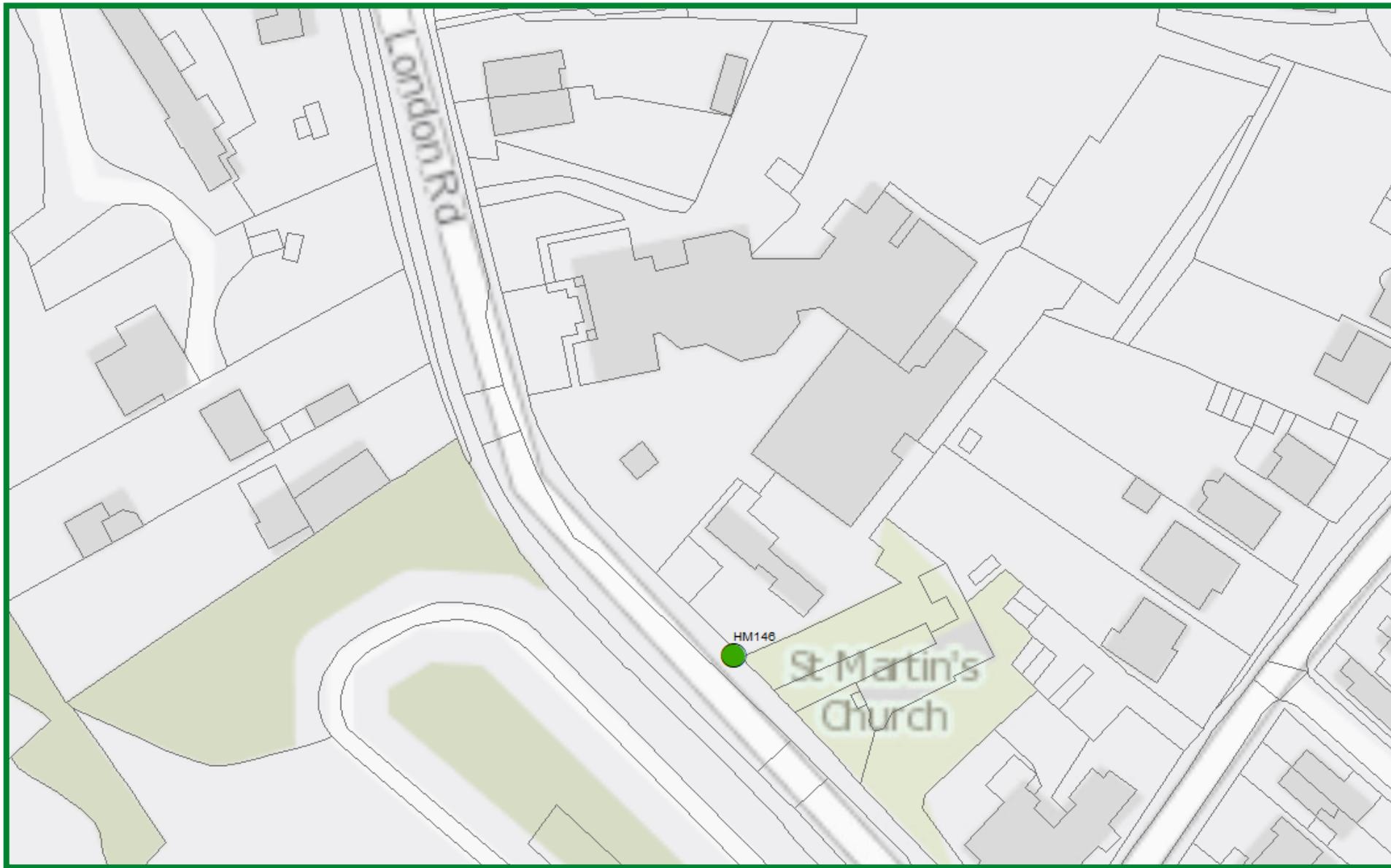


Figure D.15 – Diffusion Tube monitoring location HM85

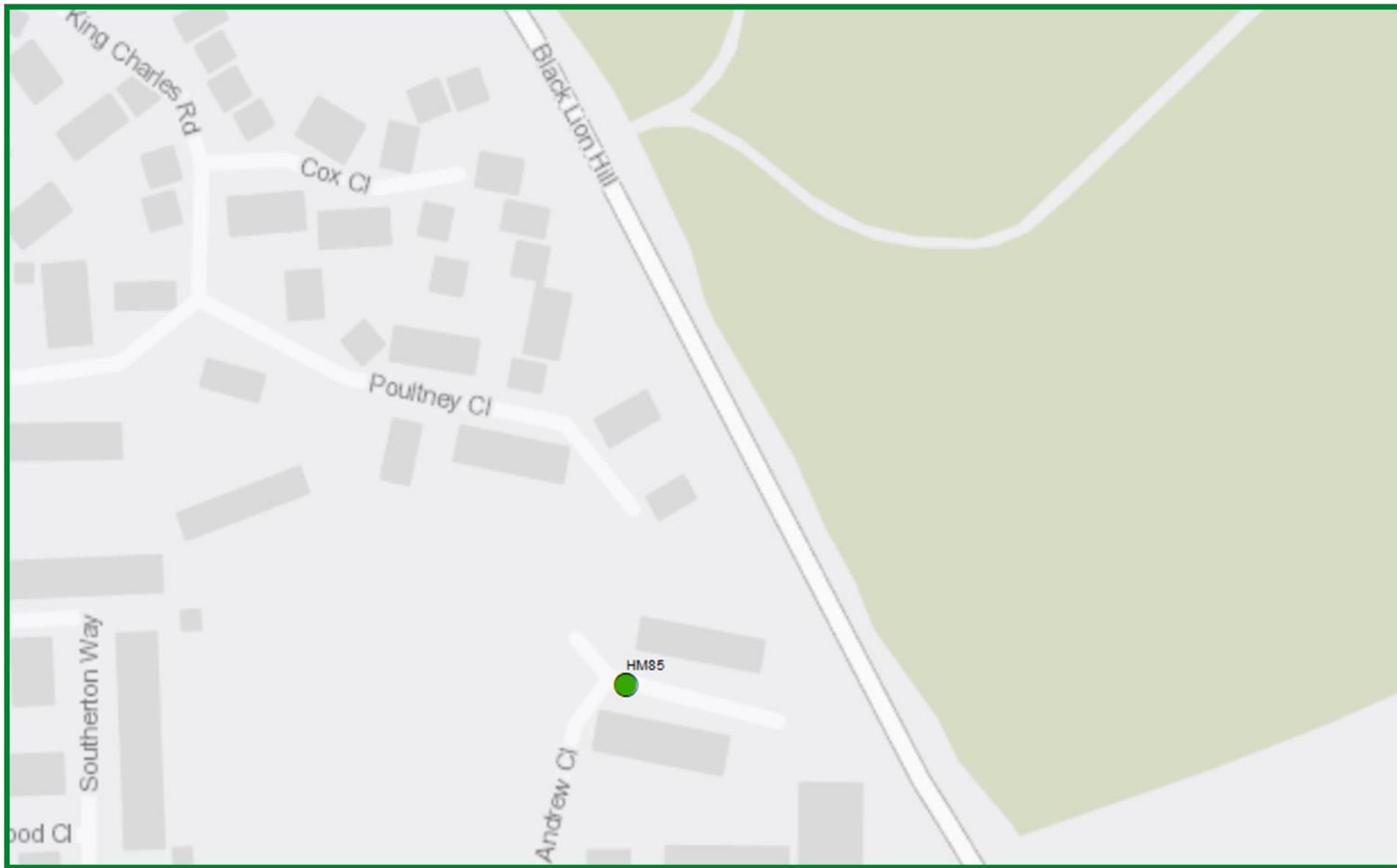


Figure D.16 – Diffusion Tube monitoring locations HM74, HM102 & HM132

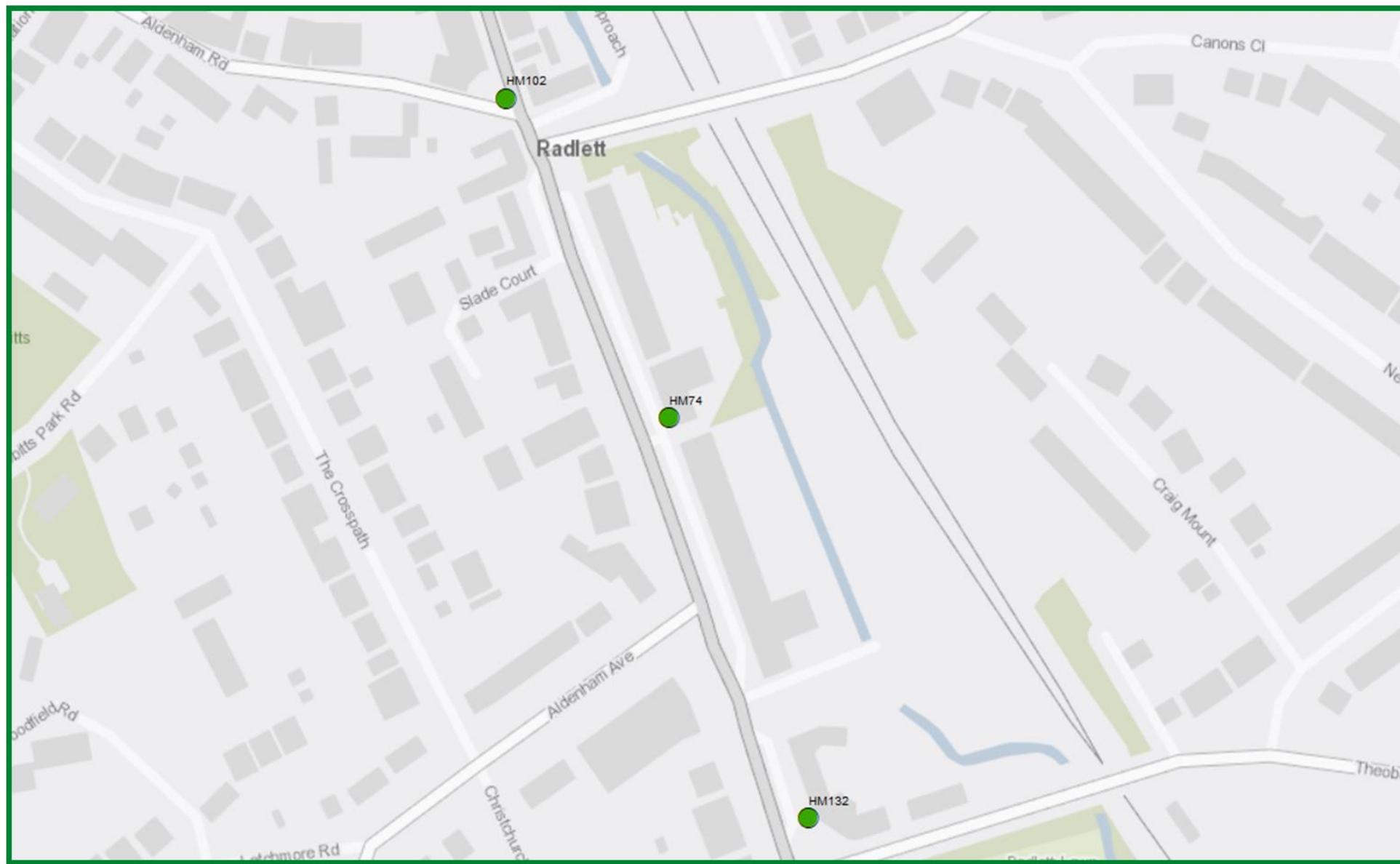


Figure D.17 – Diffusion Tube monitoring locations HM71, HM143 & HM157



Figure D.18 – Diffusion Tube monitoring location HM55

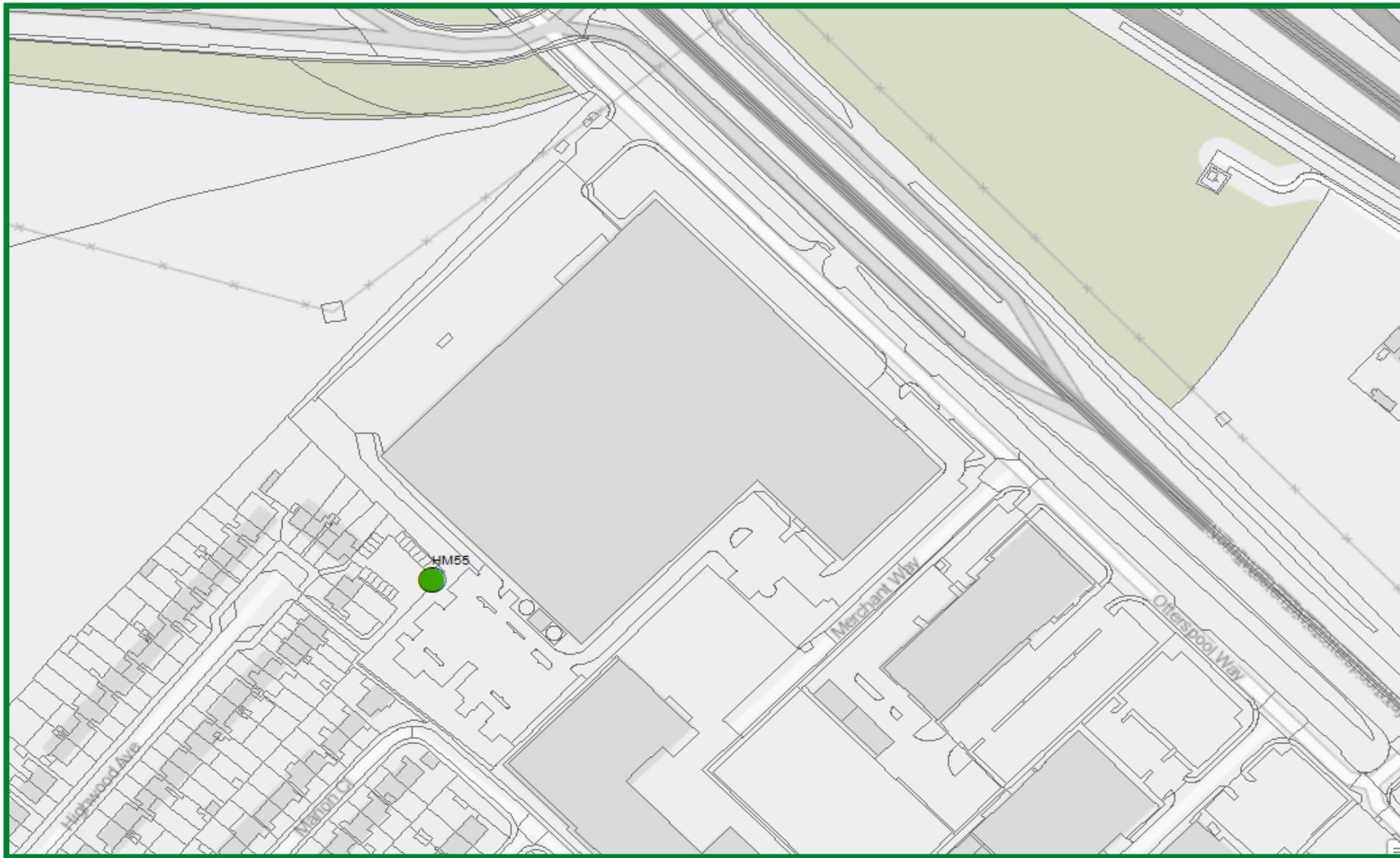


Figure D.19 – Diffusion Tube monitoring locations HM99 & HM117

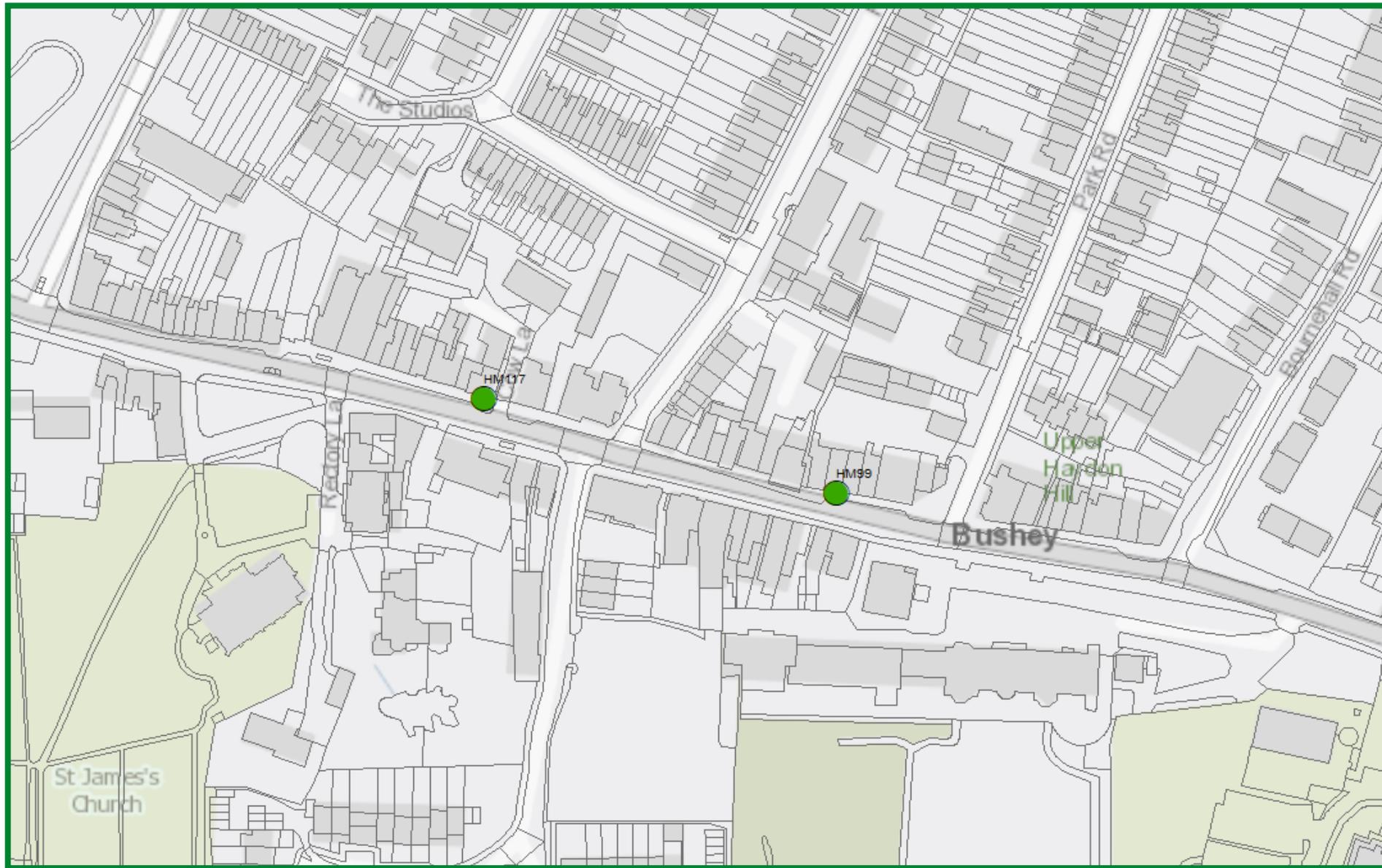


Figure D.20 – Diffusion Tube monitoring location HM151

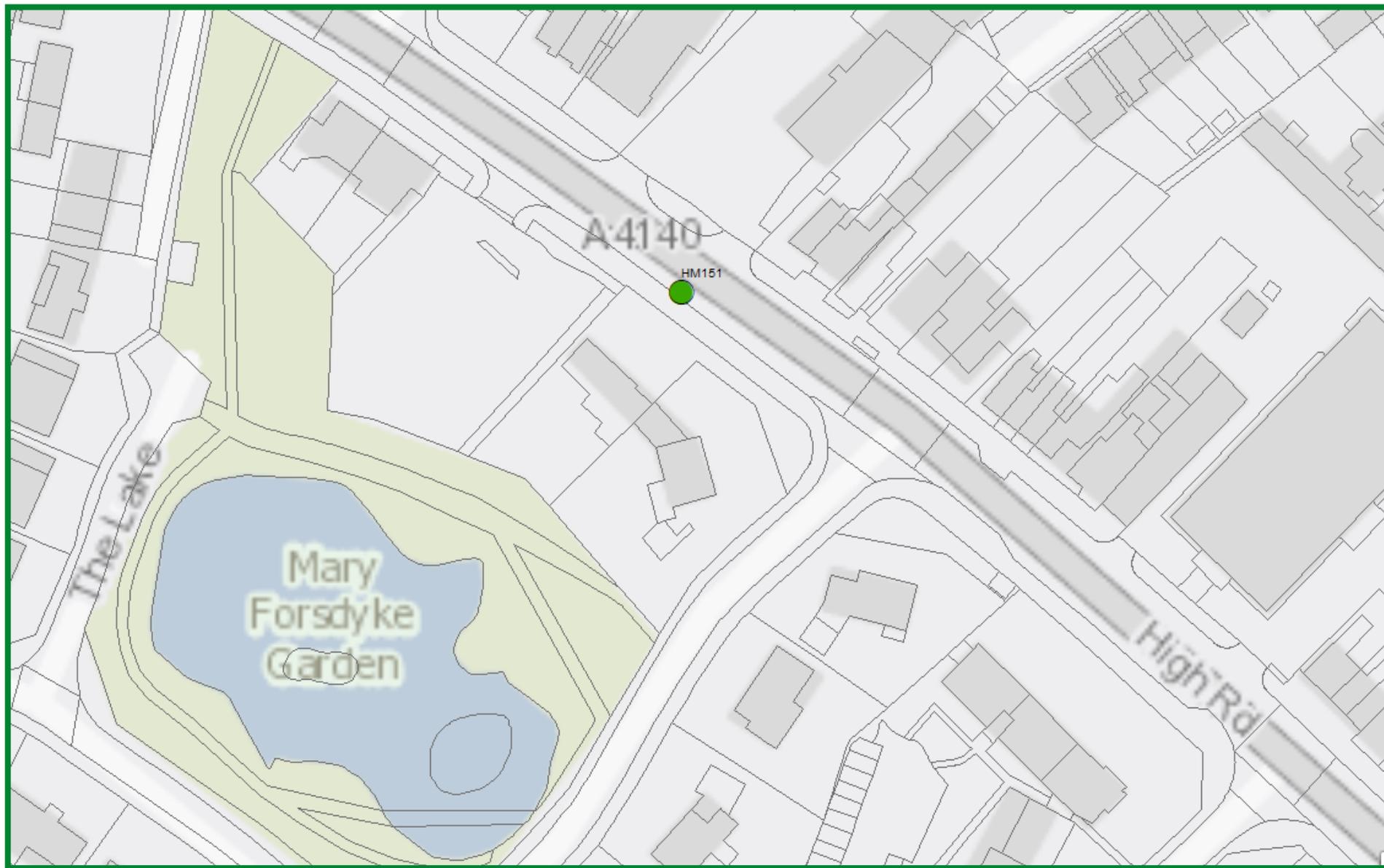


Figure D.21 – Diffusion Tube monitoring location HM53

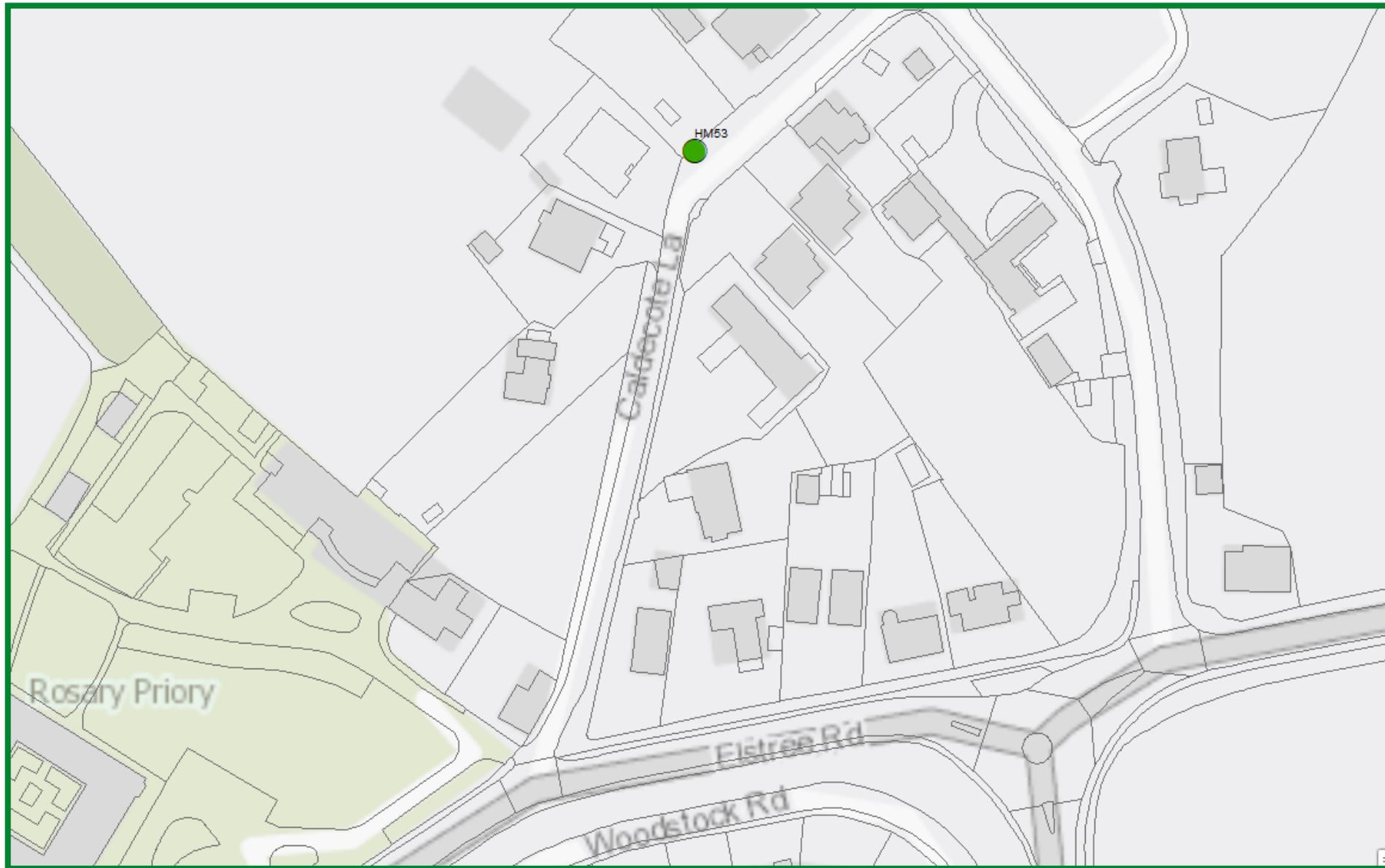


Figure D.22 – Diffusion Tube monitoring location HM126

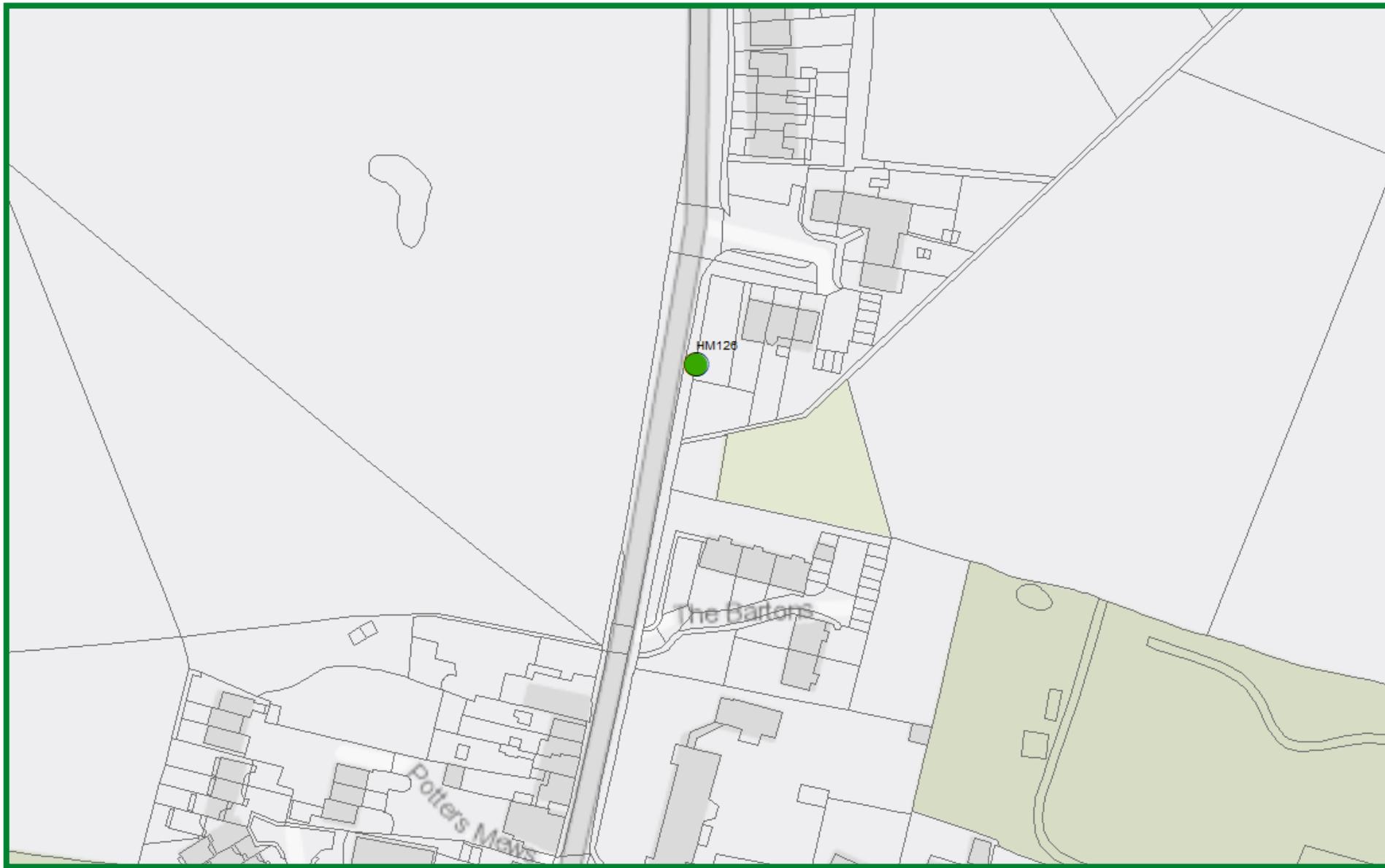


Figure D.23 – Diffusion Tube monitoring locations HM39, HM40, HM136, HM138, HM139, HM140, HM141, HM152 & HM156

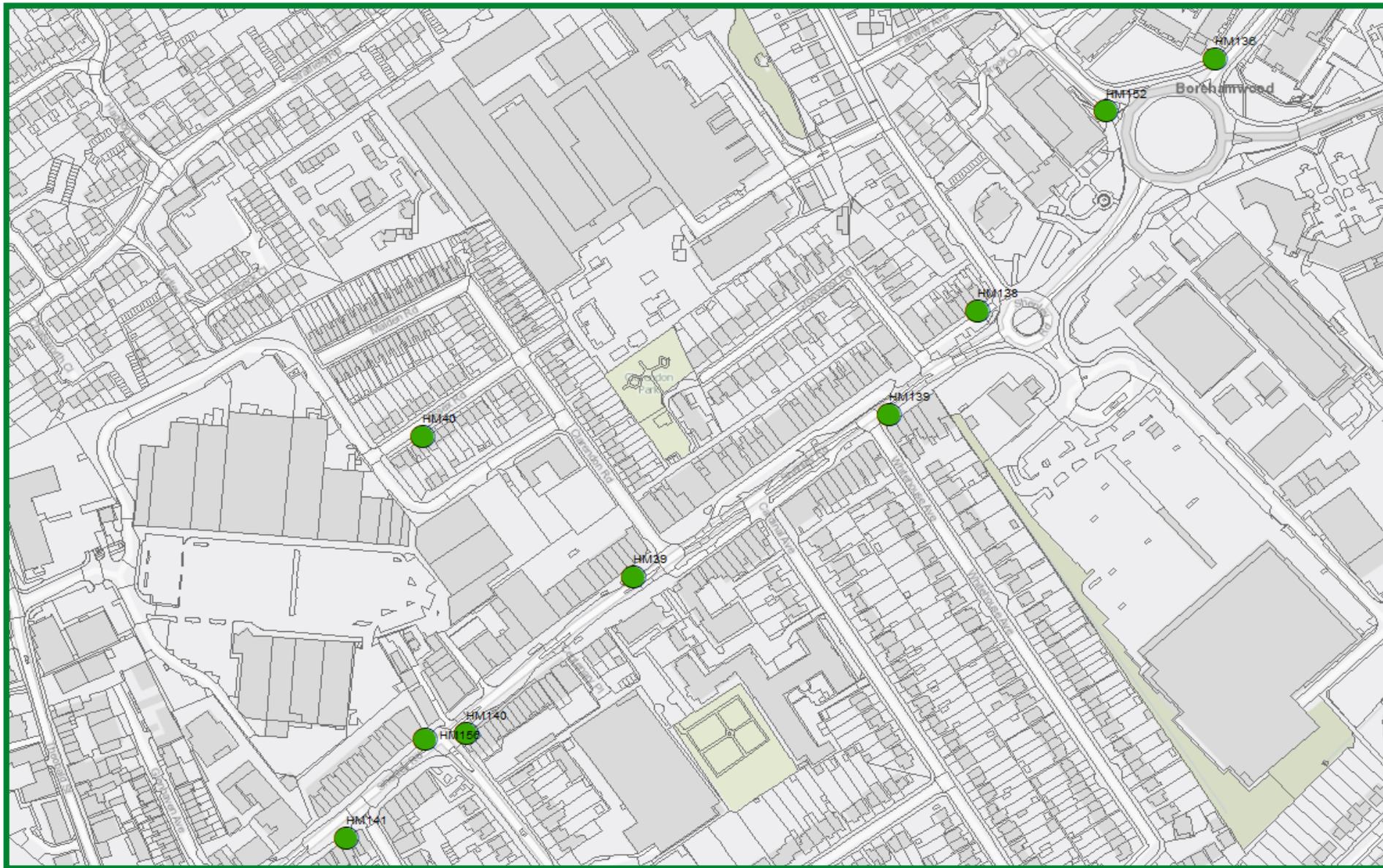


Figure D.24 – Diffusion Tube triplicate monitoring location HM148, HM149 & HM150



Figure D.25 – Diffusion Tube monitoring location HM105

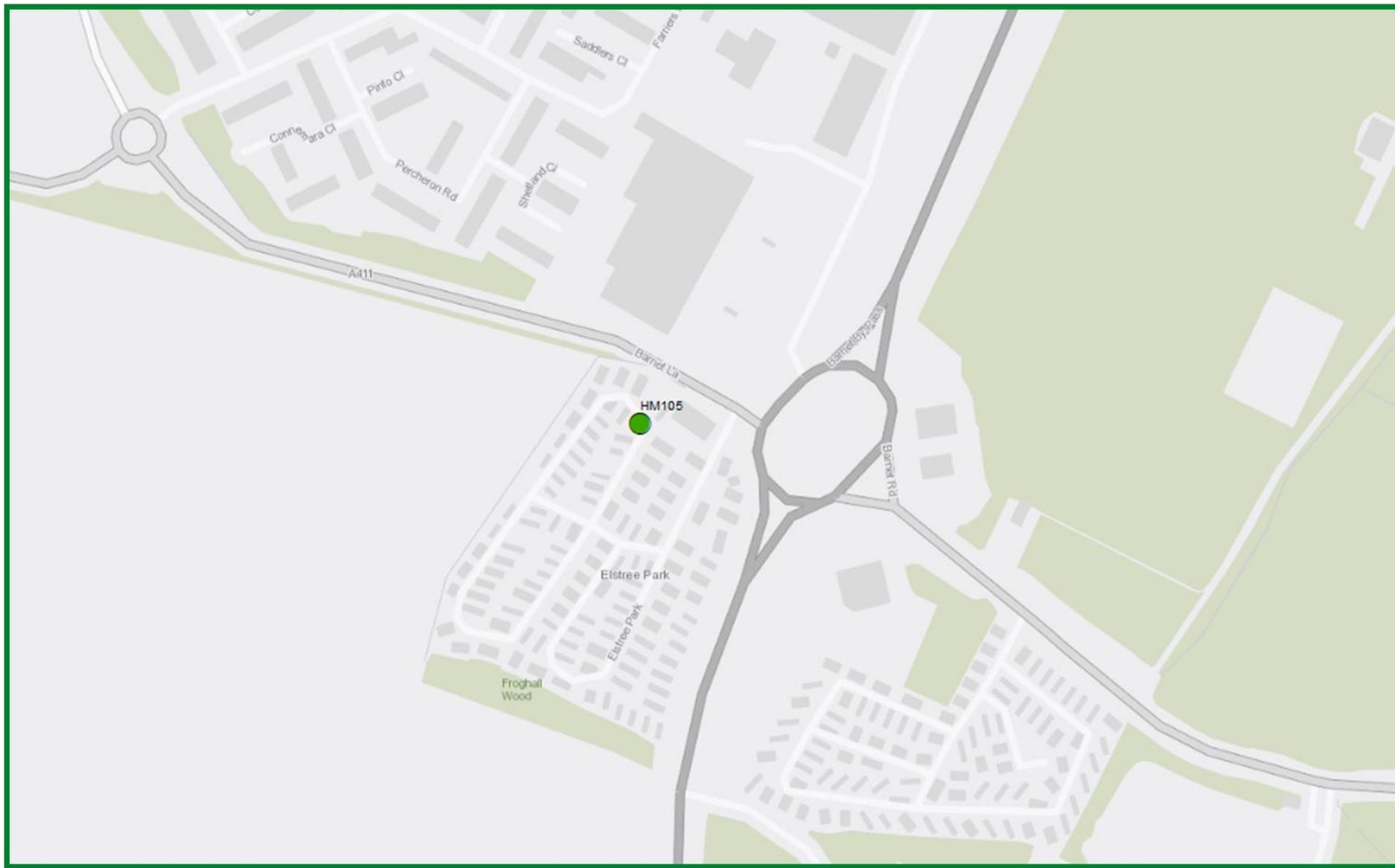
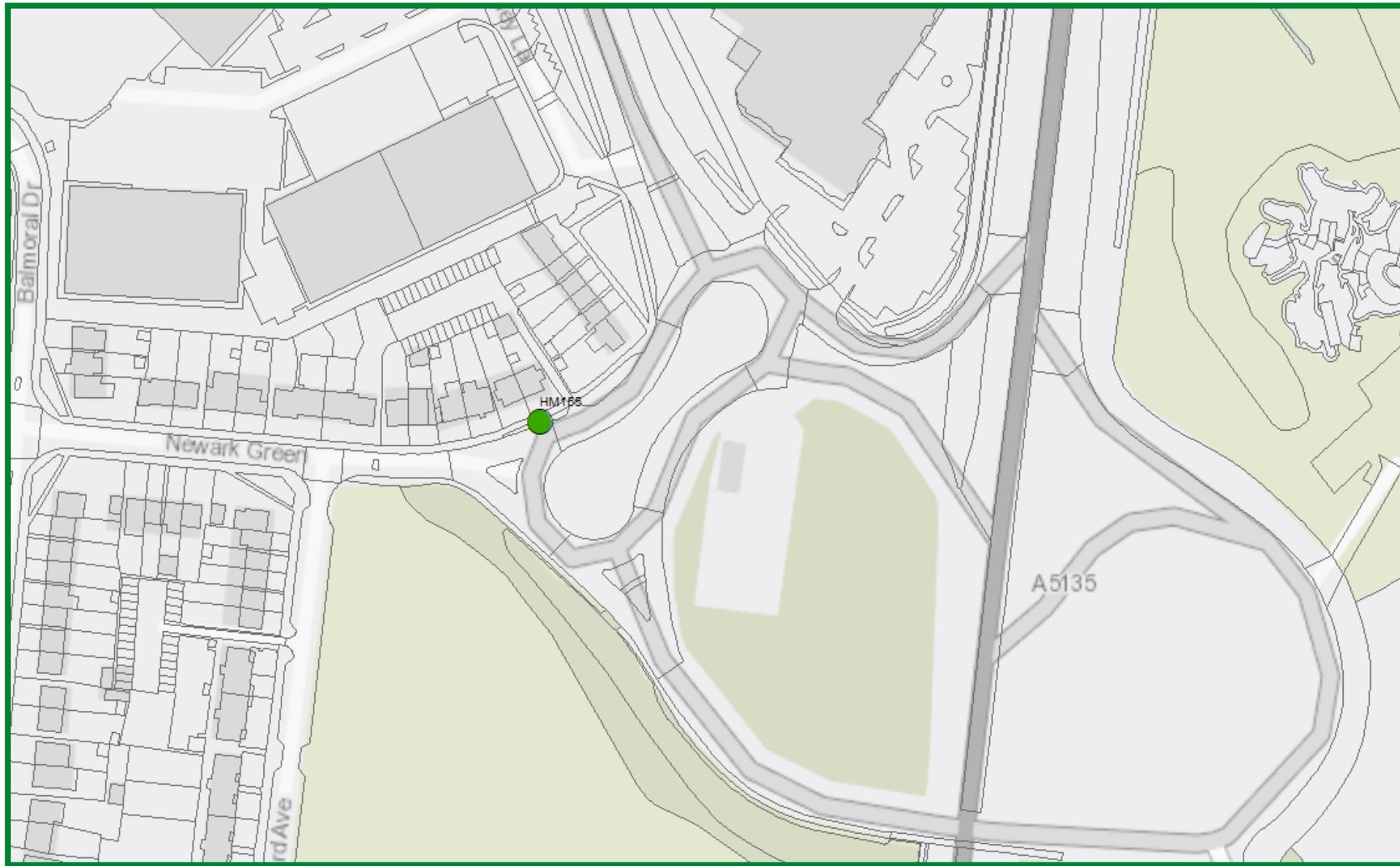


Figure D.26 – Diffusion Tube monitoring location HM155



## Appendix E: Summary of Air Quality Objectives in England

**Table E.1 – Air Quality Objectives in England<sup>7</sup>**

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO <sub>2</sub> )	40µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM <sub>10</sub> )	40µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>7</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide

## References

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- 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.
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