



2018 Air Quality Annual Status Report (ASR)

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

June 2018

North Hertfordshire District Council

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Executive Summary: Air Quality in Our Area

Air Quality in North Hertfordshire District Council

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Across the majority of the North Hertfordshire air quality is good, being below the Government's health based limits known as Air Quality Objectives (AQOs). There is also evidence of a continuing improvement in air quality, albeit a very gradual improvement.

There are no locations within the district where concentrations of particulate matter, whether PM₁₀, or the smaller PM_{2.5} fractions exceed the relevant AQOs according to the Government's national modelling. Furthermore, the real-time automatic monitoring equipment located at one of the busiest roads has not measured particulate matter or either fraction size at concentrations above the relevant limits.

The situation is a little different for nitrogen dioxide because in two residential areas of the district the annual average AQO for nitrogen dioxide has been marginally, but regularly, exceeded. These two areas in the town of Hitchin, Stevenage Road and the Payne's Park roundabout at Park Way, are located alongside the same road, the A602. The main source of the pollution is from the exhaust emissions of the diesel and petrol engine road vehicles travelling on the A602 through the areas.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Both of the areas are designated as Air Quality Management Areas (AQMA) because of the elevated nitrogen dioxide. The Stevenage Road AQMA was designated in 2012 and the Payne's Park AQMA was designated in 2017. The locations of the AQMA's can be found in Appendix D, the formal designations can be found at <http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire> and the AQMA's are also included within the national list of AQMA's that can be found at <http://uk-air.defra.gov.uk/aqma/list> .

As a result of the designation of the 2017 AQMA, NHDC consulted on and published a joint Action Plan to identify measures that can be taken to attempt to reduce emissions of nitrogen dioxide and improve air quality at both of the AQMA's. The joint Action Plan can be found at <http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire> but it is also discussed further in Section 2 of this report.

As a result of the major source of local air pollution originating from road vehicle emissions there is a need to work with other professionals to enhance our management of local air quality for the following reasons:

- many vehicles using North Hertfordshire's roads will not begin or end their journeys within this District.
- commercial expansion or contraction and housing growth in and around North Hertfordshire will impact upon the levels of road traffic.
- the road network within North Hertfordshire is managed either by Hertfordshire County Council (HCC) or Highways England.
- local air pollution has a direct public health impact and Hertfordshire County Council Public Health has a significant public health protection remit in the Hertfordshire.

Therefore, NHDC Environmental Health actively engages with the following partners:

- Other environmental health professionals in Hertfordshire and Bedfordshire via a working group, the Hertfordshire and Bedfordshire Air Quality Forum, which meets quarterly. The Forum includes representatives from the planning

profession and the public health profession in addition to HCC transport professionals.

- Public health professionals in Hertfordshire via a task and finish group, which is activated as and when a specific project is identified either by Public Health or Environmental Health.
- Day to day working relationships with NHDC Transport Planning Officers, Strategic Planning Officers and Development Control Officers to ensure that air quality is appropriately considered within the planning regime.
- A combination of NHDC and HCC professionals from those disciplines within a North Hertfordshire specific Air Quality Management Area Steering Group.

It is hoped that a combination of the above partnership working and the positive impact of NHDC's Action Plan work since 2013 have contributed in some small way to the gradual improvement in air quality, as measured by nitrogen dioxide concentrations, that has been observed across North Hertfordshire.

Where comparable monitoring have been available since 2012 or 2013, which was thirty-three monitoring locations, an overall reduction in nitrogen dioxide concentrations has been observed in thirty-one of them and an increase at two locations (Appendix A – Table A.3).

Importantly this observed trend has been seen within the two designated AQMAs. Within the Stevenage Road AQMA, for the first time since its designation, none of the annual average concentrations of nitrogen dioxide measured were high enough to represent a breach of the AQO at a residential dwelling. Therefore, it is hoped that it will be possible to make a case to revoke the Stevenage Road AQMA if this trend can be maintained over a number of years.

There have not been any new major sources of emissions introduced in to North Hertfordshire during 2017, but the district needs to accommodate at least 14,000 new homes and the associated facilities and infrastructure to support them by 2031. Neighbouring districts also need to accommodate similar levels of growth and there is a proposal for the expansion of London-Luton Airport (located on the western boundary of North Hertfordshire) from 18million passengers per annum (mppa) to approximately 36mppa by 2051. Therefore, the cumulative impact of this scale of

development is likely to generate an increase in road traffic within and through North Hertfordshire and so potentially increase the emission of air pollution. This represents the only currently foreseeable major future source of air pollution in the district and it has the potential to slow or reverse the recently observed improvement in air quality across North Hertfordshire.

Actions to Improve Air Quality

During 2017 NHDC focussed on improving partnership working and establishing policies and guidance that will enable practical actions to be implemented in future years to improve local air quality. Without these relationships, principles and documented approaches in place the likelihood of successfully introducing measures to positively impact local air quality will be reduced.

The highest priority was to ensure that the District's Local Plan is adequately served by an Air Quality Policy (Policy D4) and a supporting Air Quality Planning Guidance Document. Both the Policy and Guidance were refined during 2017 and required justification and support throughout the Local Plan Examination in Public process.

Additionally, comprehensive responses were provided to the HCC Local Transport Plan (LTP) 4 consultations highlighting the need for greater consideration of the issues facing North Hertfordshire and greater support for ultra low emission road vehicles.

A further priority was to manage the transition of contracts for the management of the NHDC owned Electric Vehicle (EV) recharging infrastructure in order to provide improved performance from the recharging points in public car parks and improved back office support services.

Conclusions and Priorities

The medium-term (~ 6 years) trend in levels of local air pollution, as measured by nitrogen dioxide, is still slightly down, representing an improving air quality situation in North Hertfordshire. Also, for the first time since its designation as an AQMA concentrations of nitrogen dioxide in the Stevenage Road area were not deemed to exceed the annual AQO at residential dwellings (Figure 3.2). However, because of the ongoing pressure for North Hertfordshire and its neighbours to accommodate housing growth North Hertfordshire faces an air pollution problem that will present it

with an ongoing challenge into the near future. Therefore, being able to implement a number of the priority measures identified in the joint Action Plan will be important, particularly those aimed at:

- ensuring that the planning process can be appropriately utilised
- raising public awareness to promote changes in travel choices
- providing infrastructure to facilitate changes in travel choices
- reducing emissions from heavy duty vehicles, including public transport

Local Engagement and How to get Involved

The potential for the residents and businesses of North Hertfordshire to have a positive impact on air quality is considerable by choosing where practical to travel using:

- public transport
- car sharing / car clubs including e-car clubs
- more sustainable private modes of transport (i.e. not petrol or diesel engine vehicles)
- more modern models of petrol and diesel engine vehicles, which emit lower levels of pollution
- walking or cycling

Potentially useful sources of further information include:

<https://www.goultralow.com/> = Central Government website about low emission vehicles

<https://www.zap-map.com/live/> = Locations of EV charging points across UK

<http://www.hertsdirect.org/services/transtreets/ltp/live/> = HCC Local Transport Plan

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1 Local Air Quality Management

This report provides an overview of air quality in North Hertfordshire during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMA declared by North Hertfordshire District Council (NHDC) can be found in Table 2.1. Further information related to declared or revoked AQMA, including maps of AQMA boundaries are available online at <https://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire>. A full list of AQMA in England can be found at <https://uk-air.defra.gov.uk/aqma/list>.

Appendix D provides maps of the air quality monitoring locations and where relevant their locations in relation to the AQMA.

It should be noted that on the 9th January 2017 a new AQMA was declared on the basis of the annual mean average Air Quality Objective of 40mg/m³ being exceeded at the Payne's Park area in Hitchin. This declaration prompted the preparation of a joint Air Quality Action Plan that has the aim of addressing the nitrogen dioxide air pollution problem at both of the Stevenage Road, Hitchin AQMA and the nearby Payne's Park, Hitchin AQMA.

The joint Action Plan dated January 2018 supersedes the Stevenage Road, Hitchin, AQMA Action Plan dated September 2013. More details on the January 2018 joint Action Plan are included within Section 2.2 of this Annual Status Report.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan
						At Declaration	Now	Name Date of Publication Link
AQMA Stevenage Road	29 th June 2012	NO ₂ Annual Mean	Hitchin	An area encompassing a number of residential properties fronting & located on the south side of Stevenage Road (A602)	NO	41.8µg/m ³	37.7 µg/m ³	Joint Action Plan Stevenage Road & Payne's Park, Hitchin AQMAs January 2018 https://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire
AQMA Payne's Park	9 th January 2017	NO ₂ Annual Mean	Hitchin	An area encompassing one residential property fronting & located on the west side of Park Way (A602) at the Payne's Park roundabout	NO	44.5µg/m ³	41.3 µg/m ³	Joint Action Plan Stevenage Road & Payne's Park, Hitchin AQMAs January 2018 https://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire

☒ North Hertfordshire District Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in North Hertfordshire

Defra's appraisal of last year's ASR concluded that it was a well structured report that provided most of the information specified in the Guidance. Additionally it stated that NHDC should review the measures that are in place and due to be implemented for the Stevenage Road AQMA and review measures for the Payne's Park AQMA, with the focus being on measures targeted at the two AQMAs.

NHDC is able to confirm that it has acted on the above advice in preparing, consulting and publishing its joint AQMA Action Plan dated January 2018.

North Hertfordshire District Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the Action Plan <https://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire>. Key completed measures, which unless stated, have been referenced against the Measure Numbers from the joint AQMA Action Plan dated January 2018, are:

- *Measure 21 – Local Plan Policy and Air Quality Planning Guidance Document:* Policy D4 is the Air Quality Policy within the Local Plan. Work on this Measure has continued in the form of appearing at the Local Plan Examination in Public day that examined this Policy. A further day of attendance at the Local Plan Examination in Public was required to explain the Policy and the supporting Air Quality Planning Guidance Document in relation to the local air quality throughout the North Hertfordshire and the preferred development sites identified within the Local Plan.

This work required considerable liaison and partnership working with strategic planning officers and addressing many concerns and questions raised by the public in relation to local air quality across North Hertfordshire. All of which has gone a long way to raising public awareness of the local air quality, pollution levels and the issues surrounding them.

Associated to this is the fact that planning application consultations are being responded to from a local air quality perspective and has resulted in the majority of planning permissions being granted with conditions requiring the developers to provide air pollution mitigation. This also has a direct impact on the achievement of *Measure 7: Increasing private availability of recharging infrastructure for Electric Vehicles*.

- *Measure 13 – Engage with Herts CC on development of Local Growth & Transport Plans:*

A revised LTP4 was prepared in order to be more focussed on future technology and opportunities than the previous consultation version. The new consultation version of the LTP4 also included a number of projects of relevance to North Hertfordshire that were not apparent in the original consultation version of the LTP4. Specifically:

- the inclusion of Hitchin, Baldock and Letchworth within the major scheme ‘cycle infrastructure improvement towns’
- the identification of the Stevenage – Hitchin – Luton (corridor 6) as a key corridor with commentary that there will be emphasis placed on inter-urban passenger travel and sustainable travel links between Stevenage and Luton.

It is hoped that the comments made by NHDC to the first consultation version played a role in the decision taken by HCC to revise the LTP4. Furthermore, this new version of the LTP4 provided NHDC with another opportunity, which was taken, to push for an overall approach and specific initiatives and projects that place the mitigation of air pollution and protection of local air quality as a significant consideration.

- *Measure 5. Increasing/improving publicly available recharging for Electric Vehicles in car parks:* Finalised a contract for the provision of back-office software and servicing and maintenance for the existing NHDC Electric Vehicle Charging Point Network. This is expected to improve the level of customer service for EV owners living in, working in and travelling through North Hertfordshire.

- *Measure 2.1. Monitoring Local Air Quality (2013 - Action Plan for Stevenage Road AQMA):* District wide diffusion tube network maintained. Real-time monitoring capability at Stevenage Road, Hitchin maintained.
- *Measure 5.1. Emissions Element in Controlled Parking Zone Charges (2013 - Action Plan for Stevenage Road AQMA):* Recommendations were made for this to be included in a response to the NHDC Parking Strategy Review in November 2017. It is anticipated that a policy will be built into the Strategy that will provide the ability to implement this type of subsidy in the future.

North Hertfordshire District Council expects the following measures to be completed over the course of the next reporting year (2018):

- *Measure 21 – Local Plan Policy and Air Quality Planning Guidance Document:*

It is anticipated that the NHDC Local Plan, including the Air Quality Policy will have been accepted by the end of 2018. It is anticipated that the advice contained within the Air Quality Planning Guidance Document will continue to be acted upon by developers and planning officers.

- *Measures 1 & 2 – ECO Stars scheme within the Hitchin Industrial Areas to attempt to reduce emissions from HGV and LGV traffic:*

A bid has been made for Defra grant to support this scheme.

- *Measure 6 – Increasing/improving publicly available on street re-charging for EV:*

NHDC is now represented on a Future Transport and EV Charging working group chaired by Hertfordshire County Council and supported by the ten Hertfordshire local authorities. It is hoped that this will help to overcome the significant barriers that exist to the establishment of on-street charging across Hertfordshire.

- *Measure 8 – Dedicated and free parking bays for EVs at charging points:*

Despite the ongoing financial pressures faced by local government, NHDC continues to provide free parking within its car parks for EVs whilst they are charging.

- *Measure 17 – Participate in National Clean Air Day:*

NHDC will continue to contribute to and publicise Hertfordshire County Council's initiatives and projects leading up to and during National Clean Air Day.

- *Measure 18 – Air Quality Notification System:*

A competitive quotation process has been initiated to establish an Air Pollution Notification System for Hertfordshire and Bedfordshire.

- *Measure 19 – Reducing emissions from public transport:*

A joint bid with other Hertfordshire local authorities and the support of Hertfordshire County Council has been made for a DfT/Defra grant to retrofit buses that travel through AQMAs with emission abatement technology.

Of the above measures North Hertfordshire District Council's priorities for the coming year (2018) are:

- *Measures 1 & 2 – ECO Stars scheme within the Hitchin Industrial Areas and subsequently Hitchin Town Centre* because it is a measure that is specifically targeted to a significant source of air pollution within the two AQMA and because it was widely supported by the public that responded to the Action Plan consultation.
- *Measure 18 – Air Quality Notification System* because it is a project that is being encouraged by Hertfordshire County Council Public Health and because it is a measure that has come close to being implemented in previous years.
- *Measure 10 – Establish legal status of anti-idling provision and enforcement by NHDC* because it has the potential to reduce vehicle emissions along Stevenage Road, Hitchin, where there are a number of businesses and considerable potential for on-road and layby stopping for deliveries.
- *Measure 11 – Review of on-street parking designation & enforcement* because along Stevenage Road, in particular, there is frequent long-term parking on the road which narrows the carriageway to such an extent that a

HGV travelling in one direction cannot proceed if vehicles are coming in the opposite direction.

The principal challenges and barriers to implementation that North Hertfordshire District Council anticipates facing are:

- the availability of funding whether from central government or from within NHDC's existing budget
- the amount of time available to the lead officer on local air quality, given the other work streams responsibilities that include land contamination, local authority pollution prevention and control and the day to day local air quality management duties
- the need to engage with and raise the priority attributed to local air quality issues with colleagues in other teams within NHDC and other partner organisations, all of whom have existing work loads and responsibilities that are not focused on improving air quality.

Progress on the following measures has been slower than expected:

- *Measure 18. Air Quality Notification System:*

Although the reliability and robustness of the generated notifications of moderate, high or very high air pollution incidents was proven, it was impossible to disseminate those messages to the appropriate populations in a way that did not incur costs. As such this measure was not further progressed during 2017.

- *Measure 6. Increasing/improving publicly available recharging for Electric Vehicles in car parks:*

Because of the need to get a contract in place to ensure that the existing EV recharging infrastructure is managed appropriately no work was undertaken to introduce new EV recharging infrastructure to the public car parks managed by North Hertfordshire District Council.

- *Measure 4. Promotion of cycling & walking:* Not progressed due to lack of time and other priorities.
- *Measure 20. Engage with Schools to Raise Awareness of Air Pollution*
Insufficient resourcing to meaningfully promote and support the education/teaching resource packages that are established and available for junior and senior schools.
- *Measure 9. Review NHDC fleet with focus on replacing diesel with low emission vehicles:* No progress because no leases expired in 2017.
- *Measure 12. Hitchin Industrial Estate Relief Road:* This scheme has yet to be formally proposed and there is currently no indication as to whether and according to what timetable it will be.

The following measures from the Stevenage Road AQMA Action Plan (2013) have been dropped for the following reasons.

- *Measure 3.3. Engage with Local Businesses:* incorporated into Measures 1 and 2 of the joint AQMA Action Plan dated (2018).
- *Measures 4.1. & 4.2. Support Public Transport and Cycling Infrastructure:* incorporated into Measures 3, 14 and 15 of the joint AQMA Action Plan (2018)
- *Measure 4.5. Gas or Bio-methane Refuelling Facilities for Industry:* This is not considered a viable enough technology for the size of industrial or commercial facilities located within Hitchin.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, North Hertfordshire District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve ongoing compliance within the Stevenage Road AQMA and to achieve compliance within the Payne's Park AQMA in Hitchin.

This reflects the possibility that the baseline source of air pollution, specifically the number of road vehicles, will increase over the next ten years due to the growth and development pressures on the area that were summarised on pages iii-iv..

However, it is hoped that the average 2% yearly reduction in concentrations of nitrogen dioxide observed within the Stevenage Road AQMA will persist, or at least offset the anticipated negative impact of increased traffic flow through the AQMA. If such a reduction can be maintained with at least three of the next four years of monitoring demonstrating that an AQO is not being exceeded NHDC will make a case for the revocation of the Stevenage Road AQMA. A 2% reduction in the concentration of $37.7\mu\text{g}/\text{m}^3$ as predicted at the nearest relevant receptor represents a $0.75\mu\text{g}/\text{m}^3$ reduction in nitrogen dioxide.

Similarly, it is hoped that the average 1.9% reduction in concentrations of nitrogen dioxide observed within the Payne's Park AQMA will persist, or offset the anticipated negative impact of increased traffic flow through the AQMA. If such a reduction could be maintained it would in theory result in a $0.78\mu\text{g}/\text{m}^3$ reduction in the nitrogen dioxide concentrations predicted at the nearest relevant receptor and lead to that concentration falling below the AQO of $40\mu\text{g}/\text{m}^3$ by 2022 (Figures 3.5 and 3.6).

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Intro to & uptake of ECO Stars scheme in Hitchin industrial estates	Freight & delivery management / Vehicle Fleet Efficiency	Delivery & Service Plans / Route Management Plans	Local Authority, Funding & Defra Air Quality Grant	2017	Planned for 2018	Number of companies signed up	Not defined	Defra Grant Bid 2017/2018 was unsuccessful, so need to pursue alternative means of funding	Not known due to need to source alternative means of funding	Requirement for funding means that implementation is unlikely to occur in 2018, unless alternative source of funding is found
2	Intro to & uptake of ECO Stars scheme in Hitchin Town Centre	Freight & delivery management / Vehicle Fleet Efficiency	Delivery & Service Plans / Route Management Plans	Local Authority, Funding & Defra Air Quality Grant	2018	Proposed for 2019 to follow on from the Industrial Estate scheme	Numbers of companies signed up	Not defined	Defra Grant Bid 2017/2018 was unsuccessful, so need to pursue alternative means of funding	Not known due to need to source alternative means of funding	Requirement for funding means that implementation is unlikely to occur in 2019, unless alternative source of funding is found
3	Engage with & promote school travel plans in 9 Hitchin schools	Promoting travel alternatives	School travel plans	Local Authority Environmental Protection & Hertfordshire County Council. Cost neutral relies on existing staff resources	2018-19	Not defined	Number of schools with updated Travel Plans & proactively engaging with travel planning	Reduction in private car journeys to school & associated reduction in vehicle emissions	None	Unknown – requires a project plan that reviews existing School Travel Plans & reinvigorates them to account for new technologies & links to school curriculum & teaching resources	Work with Modeshift Stars & TARS Active & Safer Travel Team & contractors & schools to optimise existing or introduce new plans Staff time at both HCC and NHDC Environmental Protection Team to prepare & then implement work programme.
4	Promotion of walking & cycling for commuting in North Hertfordshire	Promoting travel alternatives	Promotion of walking and cycling	North Hertfordshire Environmental Protection Team & Active Communities Team & HCC TARS Team. costs not known	Not defined	Not defined	Not defined	Not defined	None	Not defined	Work with NHDC Active Communities Team and HCC TARS to investigate initiatives to promote walking & cycling

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
5	Increasing / improving publicly available re-charging for Electric Vehicles (EV) in car parks	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure	North Hertfordshire Environmental Protection Team	2018	2018 project to improve existing charging points completed. 2019 – decision to be made on increasing number of charging points	EV ownership numbers in Hertfordshire & records of usage of available posts	Not defined	Upgrading of service and maintenance provision and introduction of PAYG functionality completed in February 2018. No progress on increasing number of available charging points	Completed 2018 2019 or later	New provider is now in place and disruption to user of existing charging points has been reduced to a negligible level. Investigations ongoing about potential to increase numbers of charging points
6	Increasing / improving publicly available re-charging for on-street EV	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure	North Hertfordshire Environmental Protection Team and Hertfordshire County Council	2018	Not defined	Presence of on-street EV charging infrastructure	Not defined	Member of the Future Transport & EV Charging working group chaired by Herts County Council & supported by the 10 Hertfordshire local authorities	Not defined	Significant barriers exist that require collaborative working & experience sharing to overcome. These include financial viability, civil engineering, accessibility & enforcement & health & safety issues
7	Increasing private availability of recharging infrastructure for Electric Vehicles	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure	North Hertfordshire Environmental Protection Team	Completed	Ongoing	Number of Discharge of Condition Planning Cases referred to EP Team & number of EV re-charging points approved in a year	Not defined	Standard conditions available & supported by Local Plan Policy & guidance document. Planning permissions being granted with EV infrastructure conditions in place	Ongoing	First developments completed with Infrastructure in place. Multiple permissions granted with EV recharging infrastructure conditions in place
8	Dedicated & free parking bays for EVs at charging points	Promoting Low Emission Transport	Priority Parking for LEVs	North Hertfordshire Environmental Protection Team	Completed	Ongoing	Continuation of agreement not to charge for EV parking at charge points	Not defined	Principle of free parking is established	Ongoing – annual review of car parking tariffs	Will advocate continued support of this approach

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
9	NHDC fleet review diesel to low emission vehicles	Promoting Low Emission Transport	Company vehicle procurement	North Hertfordshire Environmental Protection Team	2018	2019 & 2020	Presence in NHDC fleet of Low Emission Vehicles	Not defined	2015 study failed to make business case for EV uptake. Re-run study in 2019 when the first of the current leases expire	2019 & 2020 (expiry date of existing leases)	It is hoped that improved range & greater geographical spread of charging points will enable some EV uptake
10	Establish legal status of anti-idling provision (S.42 Road Traffic Act 1988) & application by NHDC	Traffic Management	Anti-idling enforcement	North Hertfordshire Environmental Protection Team	2018	Not defined	Statistics on prosecutions & frequency of occurrence	Not defined	Initial enquiry within NHDC to Legal Services and Parking Enforcement	Not defined	Need to establish if there is applicable legislation, if we have appropriately authorised officers and if there are resources available to act on legislation
11	Review on-street parking designation & enforcement at Stevenage Road & Upper Tilehouse Street	Traffic Management	Parking Enforcement on Highway	North Hertfordshire Environmental Protection Team and Strategic Planning Team	2018	Not defined	Changes to parking controls & enforcement activity. Reduced queuing	Not defined	None	Not defined	Identified as a possible option at the Steering Group Meeting in 2017. Needs to align to priorities and existing work-loads with colleagues in Strategic Planning
12	Hitchin Industrial Estate Relief Road	Transport Planning & Infrastructure	Strategic Highway Improvement	Herts County Council	2017	Decision on whether implementation will happen is not imminent	Reduction in numbers of HGV passing through AQMAs	Not defined	Hertfordshire County Council is aware of findings of HGV movement survey & the associated AQ issues	Not known	Project dependant on HCC & associated financial, need & political issues. North Herts to be present at HCC Highways' quarterly Stevenage & NH Scheme Meetings

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
13	Engage with Herts CC on development of LTP4 & Local Growth & Transport Plan	Traffic Management & Transport Planning & Infrastructure	Strategic Highway Improvement	North Hertfordshire Environmental Protection Team via Hertfordshire County Council	2017	2018/19	Inclusion of Air Quality as consideration for prioritising projects for North Herts	Not defined	Consultation responses have strengthened presence of Air Quality as an issue and the importance of mitigation and benefits of specific projects including some relevant to Hitchin	Completed responses to both public consultations on the LTP4. Will engage in development of Local Growth & Transport Plan	NHDC is only able to influence decision making by way of representation and provision of data.
14	Baseline survey – state of cycling provision in Hitchin	Transport Planning & Infrastructure	Cycle network	North Hertfordshire Environmental Protection Team & Hertfordshire County Council	2018	2018/19	Thorough understanding of the current situation & identification of future options	Not defined	None	Not defined	Barrier is staff resource to dedicate to the measure
15	Workplace & School based car sharing including consideration of preferential parking	Alternatives to private car use	Car and lift sharing schemes	North Hertfordshire Environmental Protection with Hertfordshire County Council Travel Planning Team	2019	Not defined	Engagement by schools and businesses	Not defined	None	Not defined	Linked directly to Measure 3 and also 1 & 2 as hoped that this may be an additional outcome. Herts Liftshare
16	Car clubs for new developments	Alternatives to private car use	Car and lift sharing schemes	North Hertfordshire Environmental Protection with Hertfordshire County Council Travel Planning Team	completed	Ongoing - Planning application specific	Prevalence of car clubs in North Herts & number of Travel Plans with Car Clubs specified by condition	Not defined	Standard conditions available & supported by Local Plan Policy & guidance document. Planning permissions being granted with Travel Plans in place	Ongoing and dependant on planning permissions	None
17	Participate in National Clean Air Day	Public Information	Internet and electronic media	Hertfordshire County Council and North Hertfordshire District Council	Ongoing	June 2018 and annually thereafter	Publicity generated	Not defined	Contributing to the working group & Communications Team re-tweeting etc	June 2018 and annually thereafter	None

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
18	Air Quality Notification System	Public Information	Air Pollution Alert	North Hertfordshire DC, other Herts local authorities & Herts County Council Public Health	2018	2018	Numbers of members of the Notification System	Not defined	Request for competitive quotation has been advertised to potential suppliers	June 2018	Costs quoted by potential suppliers needs to be available within existing local authorities' existing budgets. There is no new funding option
19	Reducing emissions from public transport	Vehicle fleet efficiency	Vehicle retrofitting programmes	North Hertfordshire District Council & other Herts local authorities via Defra/DfT grant	2017	2018	Number of buses retrofitted	NO ₂ reduction of 0.009g/km per Euro 5 bus	Defra/DfT bid was unsuccessful	Not defined	NHDC will need to look for alternative sources of funding.
20	Engage with schools to raise awareness of air pollution	Public Information	Other mechanisms	North Hertfordshire in liaison with Herts CC TARS Active & Safer Travel Team	2018	2019 onwards	Number of schools in Hitchin utilising the Air Pollution teaching toolkit	Not defined	Air Quality for Schools Toolkit Resources are upload to the Herts Grid for learning	Not defined	Toolkit is available needs to be effectively publicised within North Hertfordshire and need to have funding available to encourage its uptake
21	Local Plan Policy and Air Quality Planning Guidance Document	Policy Guidance & Development Control	Air quality & planning guidance & local plan policy	North Hertfordshire's Environmental Protection and Planning Teams	Complete	Ongoing	Acceptance of the Air Quality Policy within the Local Plan	Not defined	The Inspector of the Local Plan has accepted the need & form of the Local Plan Air Quality Policy	Planning Guidance Document completed 2017 Local Plan Policy completed 2018	Planning consultations need to be continually responded to, to ensure developments are appropriate and mitigation is implemented
22	Herts & Beds Air Quality Forum including Public Health, Transport Planners & Development Control representation	Policy Guidance & Development Control	Regional groups co-ordinating programmes and strategies	North Hertfordshire's Environmental Protection Officer is Chairman of group	Complete	Ongoing	County-wide initiatives and joint working on bids and projects	Not defined	Active & well-established Forum	Completed but work ongoing	Consider TARS representation on the group

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
23	Green Wall	Other	Other	North Hertfordshire District Council Environmental Protection Team	2018	2019	Green Wall in place on west side of Park Way approaching Payne's Park roundabout	Not defined	None	2019	Will need funding
2.1	Monitoring Air Quality	Other	Other	North Hertfordshire District Council Environmental Protection Team	Completed	ongoing	Relevant diffusion tube network & operational automatic analysers	Not relevant	NOx, PM ₁₀ & PM _{2.5} analysers established in the Stevenage Road AQMA	Ongoing	None
5.1	Incorporation of emission element to controlled parking charges	Promoting low emission transport	Priority parking for LEV and other	North Hertfordshire District Council	Ongoing	Ongoing	Emissions Element in Controlled Parking Zone Charges	Not defined	Recommendations made for this to be included in the NHDC Parking Strategy Review in November 2017. It is expected that a policy will be written into the Strategy to provide the ability to implement such a subsidy in the future	Completed	Reliant on the NHDC Department that is responsible for the Car Parking Strategy to integrate the appropriate policy

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

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

North Hertfordshire District Council is taking the following measures to address PM_{2.5}:

- Continuation of the effective partnership working arrangements with Hertfordshire County Council Public Health that have been in place since 2014/15. This has occurred as a result of three key drivers:
 - Increased evidence and awareness of the harm from exposure to PM_{2.5}
 - The transfer of central government funding from a central public health body to County Councils
 - The existence of the Public Health Outcome Indicator (PHOI) for the fraction of mortality attributable to particulate air pollution measured as fine particulate matter PM_{2.5}.

The outcomes of this work resulted in the formation of an Air Quality (Public Health) Planning Group. The group now operates as a task and finish group for particular air quality projects with the routine engagement and information sharing taking place within the meetings of the Hertfordshire and Bedfordshire Air Quality Forum. North Hertfordshire District Council has been particularly active in the establishment and continued activity of this Group because its Environmental Protection Officer is the Chair of the H&B AQ Forum.

- Access to Public Health Funding for each of the ten Hertfordshire Local Authorities enabled North Hertfordshire District Council to purchase and establish a PM_{2.5} Beta Attenuation Measurement (BAM) Real-Time Analyser in its area. The analyser is located within the Stevenage Road, Hitchin Air Quality Management Area in the expectation that this location represents a worst case measurement of PM_{2.5} concentrations within North Hertfordshire.

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2017 represents the second full year of PM_{2.5} monitoring within North Hertfordshire and the data are included within this report.

The provision of monitoring equipment was considered a priority because it was identified that there was no actual baseline data available within Hertfordshire. So the validity of the modelled value for the PHOI for Hertfordshire and its Local Authorities could not be judged nor subsequent changes measured.

- The North Hertfordshire District Council Environmental Protection Officer is responsible for preparing an annual report on PM_{2.5} monitoring across Hertfordshire for Hertfordshire County Council's Public Health. The report based on the 2016 data is published at <http://www.airqualityengland.co.uk/local-authority/hnb-reports>

North Hertfordshire District Council has not yet identified any measures targeted specifically at reducing PM_{2.5} and it is considered unlikely that any such measures will be identified over the coming years. Instead it is anticipated that:

- Measures to reduce emissions of NO_x by encouraging a move away from internal combustion engine vehicles to ultra low emission vehicles (ULEV) will reduce PM_{2.5} emissions from exhausts
- Measures to reduce road travel altogether will reduce PM_{2.5} emissions from brake and tyre wear and dust re-suspension.

North Hertfordshire District Council has Smoke Control Areas designated in Letchworth Garden City, which date from the 1960s.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

North Hertfordshire District Council undertook automatic (continuous) monitoring at two closely located sites during 2017. Both of the monitoring sites are on Stevenage Road, Hitchin and were operating throughout 2017. One monitors for oxides of nitrogen, including nitrogen dioxide, the other monitors particulate matter (PM₁₀ and PM_{2.5}).

Table A.1 in Appendix A shows the details of the sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. Local circumstances in North Hertfordshire are such that there is no justification to monitor or report on those pollutants. National monitoring results are available at <https://uk-air.defra.gov.uk/networks/network-info?view=aur> .

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

North Hertfordshire District Council undertook non- automatic (passive) monitoring of NO₂ at 40 sites (one site comprises 3 co-located diffusion tubes) during 2017. Table A.2 in Appendix A shows the details of the sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 6 years with the air quality objective of 40µg/m³.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

In each of 2013 and 2014 there was only 1 exceedence recorded of the hourly mean and none in 2015. However, 2016 represented a significant change with 10 occasions, spread across 7 days, when the hourly mean was exceeded, which represented a significant worsening of short term air quality within the Stevenage Road AQMA. The data from 2017 suggests that 2016 was an anomalous year because there were only 4 occasions, spread over 3 days, when the hourly mean was exceeded.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B. It should be noted that only the annual mean values that exceeded the AQO at the monitoring location have been corrected to provide a value representative of exposure at the nearest relevant receptor. Figures are included below that show the trends within the two Hitchin AQMAs.

Figure 3.1 displays the NO₂ annual mean concentrations measured along Stevenage Road, Hitchin, in relation to the Air Quality Objective (AQO). All of the monitoring points are within the boundary of the AQMA and in 2017 all of the monitoring locations recorded a decrease in nitrogen dioxide concentrations in relation to 2016. This represented a reversal of the increase seen between 2015 and 2016 and illustrates why the assessment of air pollution levels and any subsequent decision making is based on medium term trends in air pollutants.

An assessment of the longer term trends in the concentrations of NO₂ measured within the Stevenage Road AQMA indicate that there has been a gradual decline in

the concentrations since 2010, with occasional 'outlier' years such as 2014 and 2016 where concentrations rise in relation to that broader downward trend. Averaged across the seven monitoring locations displayed in Figure 3.1 the average yearly percentage reduction in NO₂ concentrations is 2%.

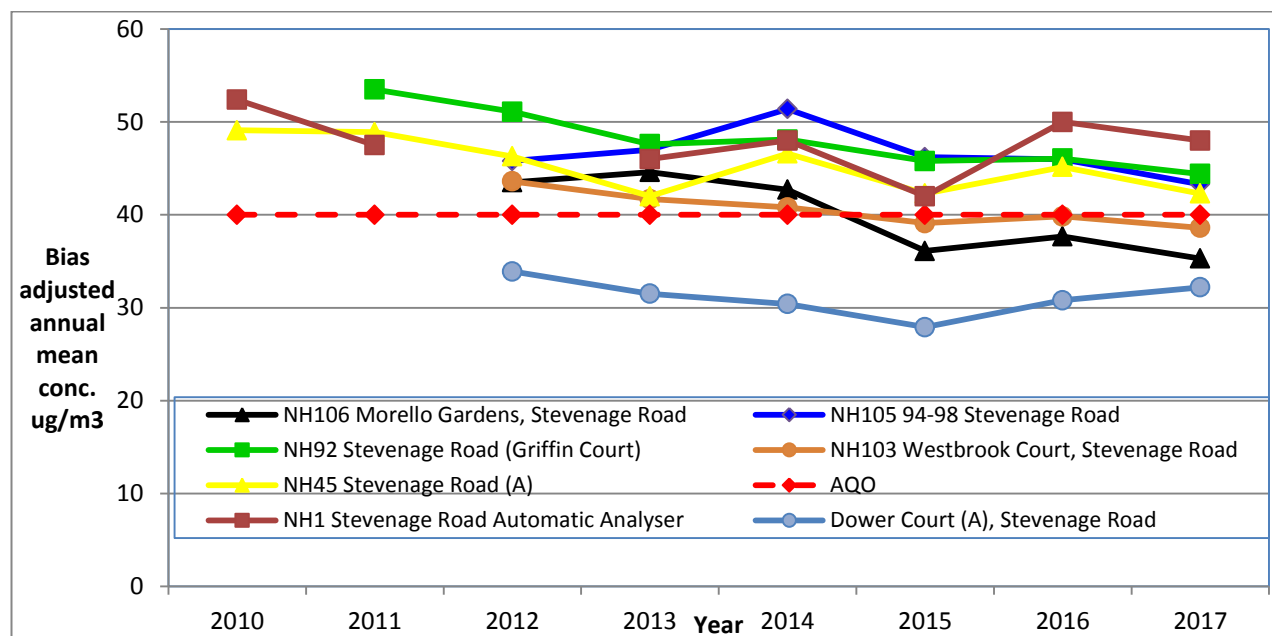


Figure 3.1: Trends in NO₂ concentrations at monitoring sites (all except NH106) located within the AQMA at Stevenage Road, Hitchin

The mean annual average of 43.3µg/m³ measured at NH105 in 2017 represents 37.7µg/m³ at the point of public exposure at 94-98 Stevenage Road. This is the only year since monitoring commenced there in 2012 that the AQO was not exceeded at the point of public exposure.

Similarly the mean annual average of 44.4µg/m³ measured at NH92 in 2017 represents 37.7µg/m³ at 22 Stevenage Road, which is below the AQO for the second consecutive year and the third time since monitoring commenced in 2010.

Although in 2017 there are assessed to be no exceedances of the AQO at any of the relevant receptors within the Stevenage Road AQMA there is currently no intention to revoke the designation of the AQMA because 2017 represents the only year since 2010 when this has been the case.

The status of the Stevenage Road AQMA will be kept under review by continuing to monitor the air quality within and around the AQMA and annually assessing the trends in the measured concentrations.

Figure 3.2 illustrates this gradual decline extrapolated to the nearest relevant receptor for the two monitoring locations that in recent years had been representative of an exceedance of the annual AQO at a relevant receptor.

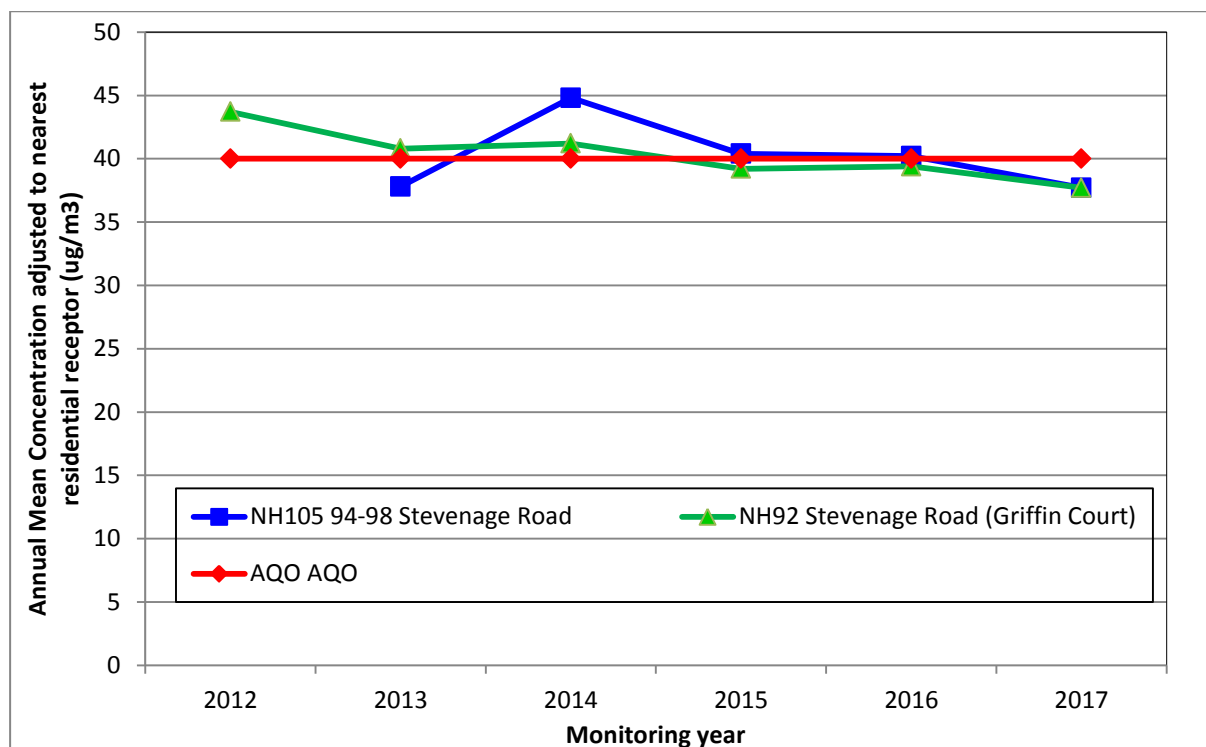


Figure 3.2: Trends in NO_2 concentrations monitored at NH105 and NH92 adjusted to be relevant to the nearest residential receptors

Figure 3.3 displays the NO_2 annual mean average concentrations from the Payne's Park area of Hitchin in relation to the Air Quality Objective (AQO). On the basis of six consecutive years of the annual mean average AQO for NO_2 being exceeded an AQMA at Payne's Park was declared in January 2017. The AQMA boundary, (Appendix D), encompasses one residential property, 41 Upper Tilehouse Street.

Figure 3.3 shows that in 2017 the NO_2 concentrations decreased in relation to 2016 and thereby continued the gradual downward trend in NO_2 concentrations that has been seen since 2011. Despite the decreased concentrations measured at the majority of the diffusion tube locations, there is still one location, NH93, where the AQO is exceeded.

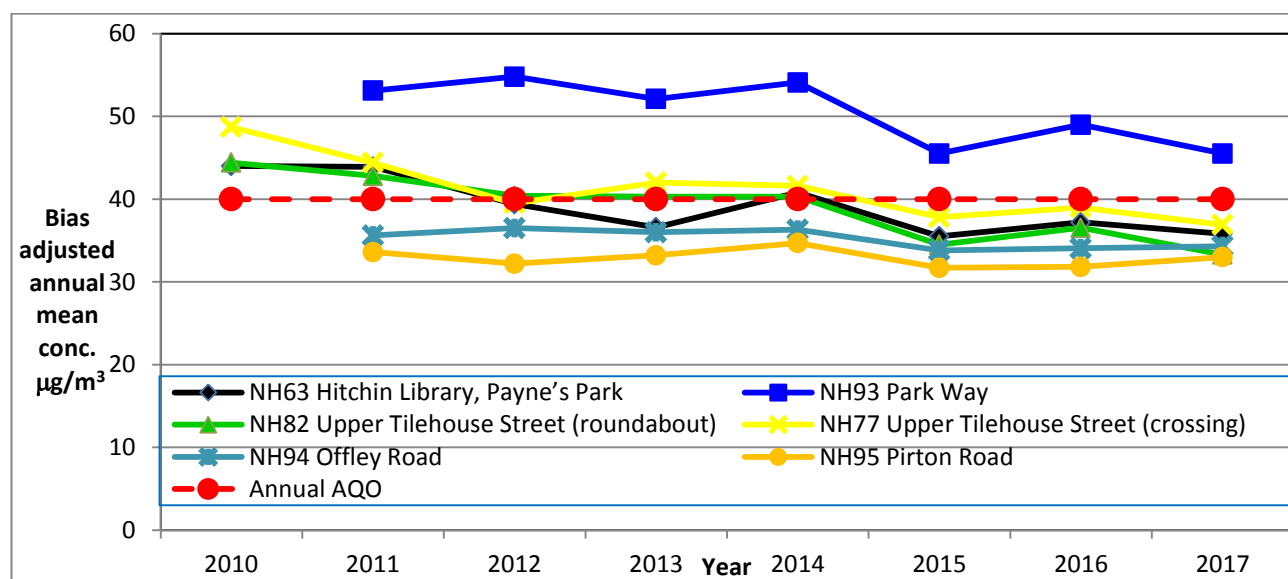


Figure 3.3: Trends in NO₂ concentrations at monitoring sites at Payne's Park, Hitchin

The NH93 annual mean average concentrations measured during 2011 to 2016 were also above the 40µg/m³ AQO when adjusted to the nearest residential receptor (41 Upper Tilehouse Street). The same fall off calculation was undertaken for the NH93 result for 2017 and demonstrates that the measured 45.5µg/m³ is representative of 41.3µg/m³ at 41 Upper Tilehouse Street. This exceeds the AQO of 40µg/m³ and validates the decision taken in 2017 to declare the AQMA at Payne's Park, Hitchin.

An assessment of the longer term trends in the concentrations of NO₂ measured within and close to the Payne's Park AQMA indicates that there has been a gradual decline in the concentrations since 2010. Averaged across the six monitoring locations displayed in Figure 3.3 the average yearly percentage reduction in NO₂ concentrations is 1.9%. This is comparable to the average yearly percentage reduction in NO₂ concentrations of 2% within and in the vicinity of the Stevenage Road AQMA.

Figure 3.4 illustrates this gradual decline in NO₂ at the relevant receptor, 41 Upper Tilehouse Street, compared against the annual mean average AQO.

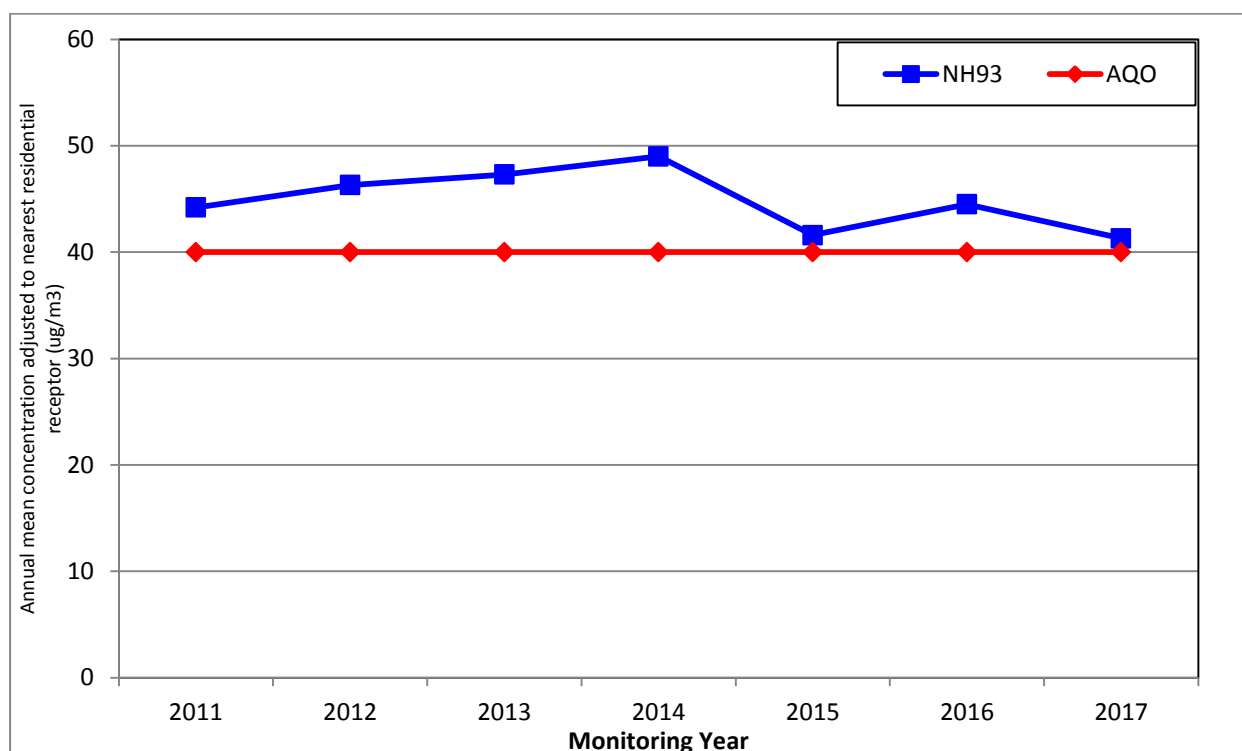


Figure 3.4: Trends in NO₂ concentrations monitored at NH93 adjusted to be relevant to the nearest residential receptor (41 Upper Tilehouse Street).

Figure 3.5 shows the trend-line for NO₂ for the seven years of available data. The line does not represent a strong fit, with the value of 0.236 being a considerable distance from the value of 1 that would represent the strongest fit. However, by extrapolating this trend-line it is possible to predict when the NO₂ levels at the nearest residential receptor will be expected to decline below the AQO of 40µg/m³. Figure 3.6 illustrates that the predicted date of compliance with the AQO at 41 Upper Tilehouse Street is 2022.

This predication is obviously dependant on many variables, perhaps the most significant of which is linked to the primary local source of NO₂ emissions, the road traffic. The number of vehicles using the roads through the AQMAs, the impact of congestion and the nature of the vehicles, such as the numbers of cars and light and heavy duty vehicles and also their engine type.

Traffic counts are the only readily available measure of a change in the local sources of NO₂. However, following correspondence with the Department for Transport it has been established that 'the publication (of road traffic count statistics for 2017) is

provisionally scheduled for early July (2018)'. As such, Figure 3.7 can only show road traffic data covering the 2005 to 2016 period.

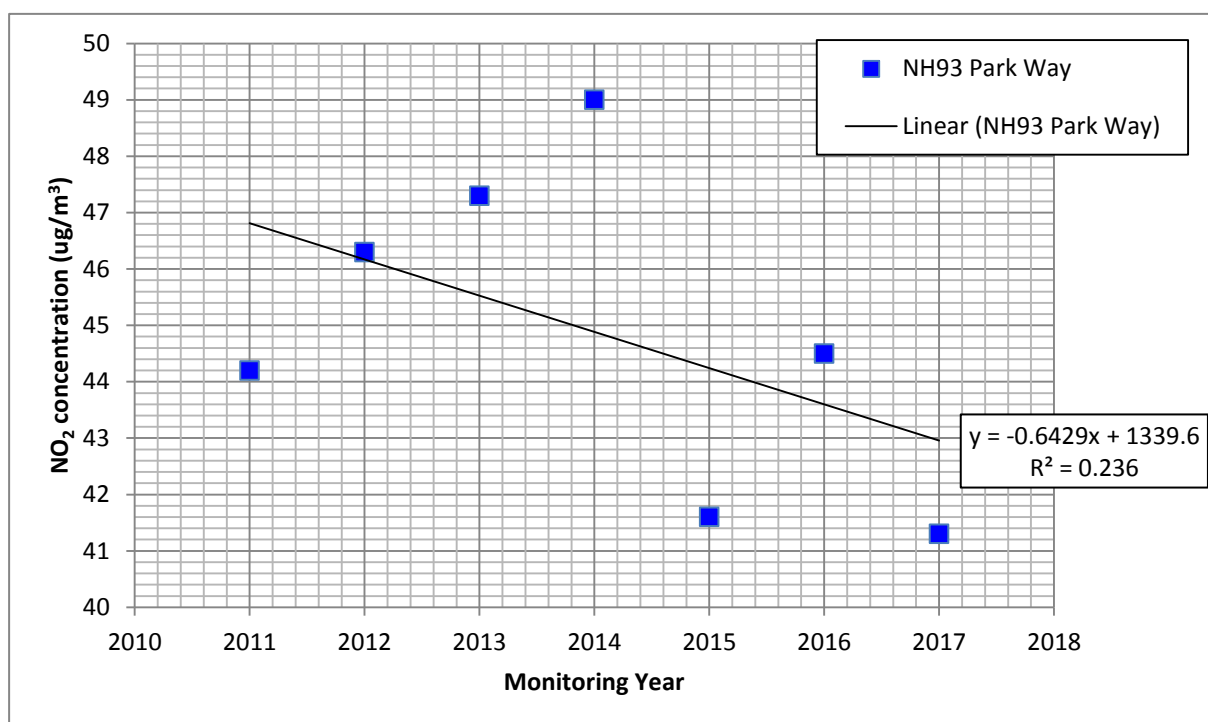


Figure 3.5: Trend-line for NO₂ concentrations as calculated at 41 Upper Tilehouse Street.

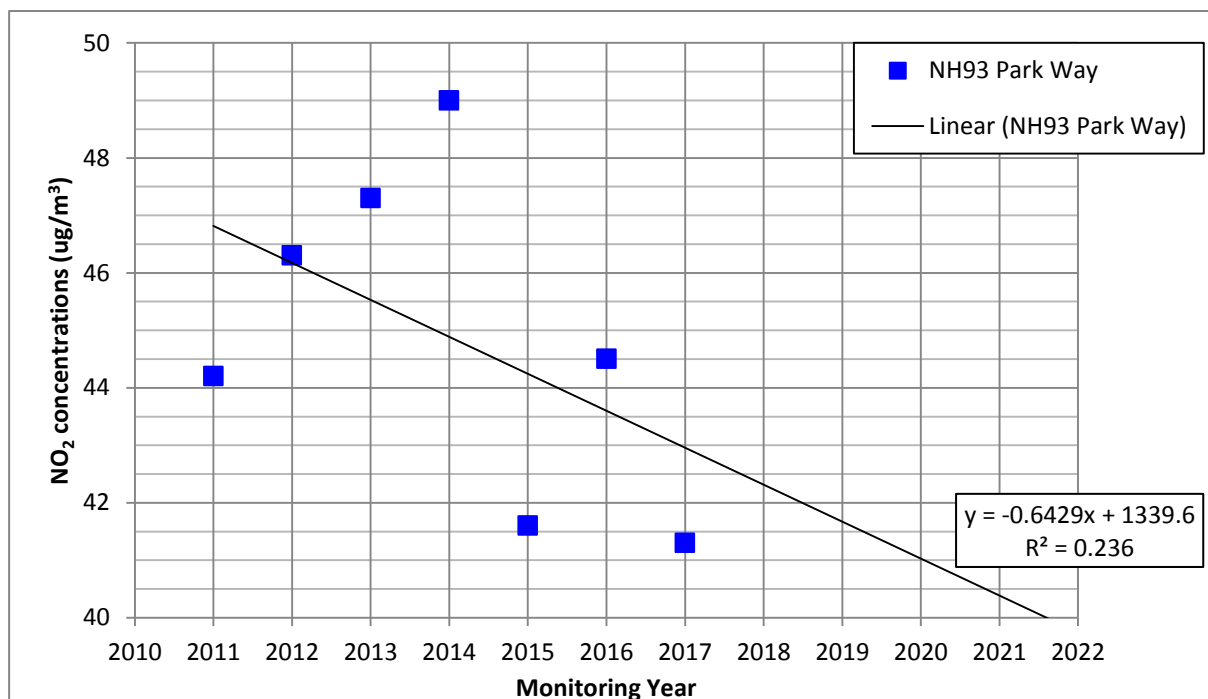


Figure 3.6: Predicted change in NO₂ concentrations at 41 Upper Tilehouse Street based on extrapolation of seven years of monitoring

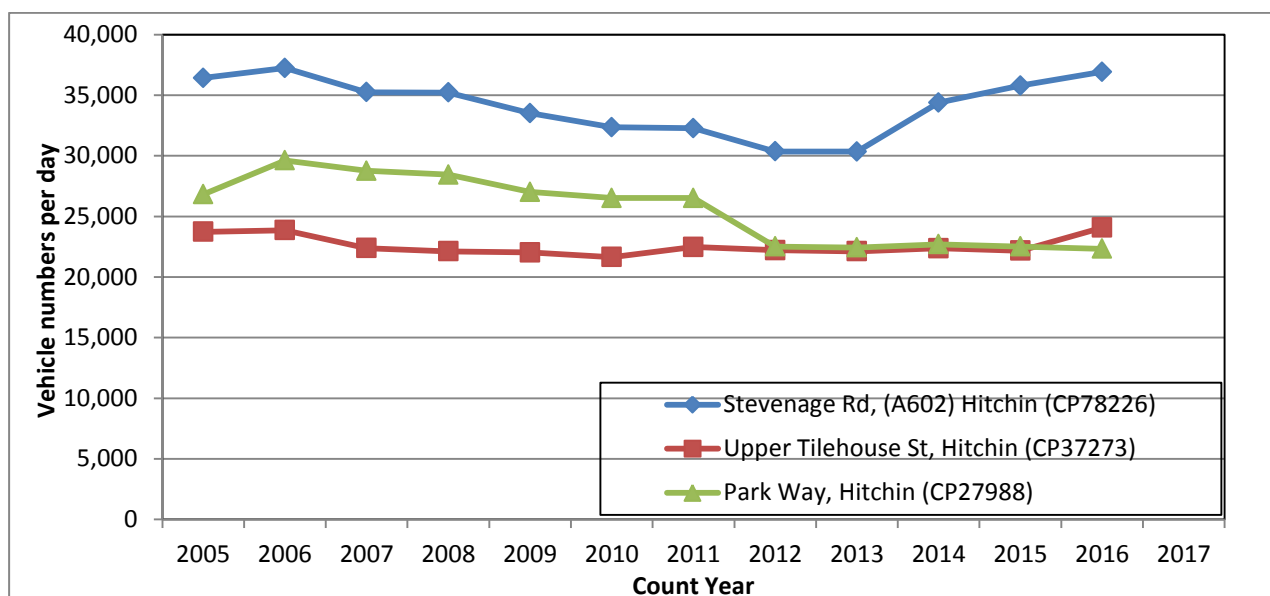


Figure 3.7: Trends in road traffic counts at the three DfT count points closest to the Stevenage Road AQMA and Payne’s Park AQMA in Hitchin

Reductions in the volume of traffic at Stevenage Road had been recorded between 2005 and 2013. However 2014, 2015 and 2016 saw an increase in the volume of road traffic passing through the AQMA. This increase coincided with an increase in NO₂ recorded in the AQMA in 2014 and 2016, but did not correlate to the reduction in NO₂ recorded in 2015.

At the Payne’s Park/Park Way count location, traffic volumes have remained steady since a decline in 2012 and 2016 indicated no change in this trend. At the Upper Tilehouse Street count location, traffic volumes had been relatively unchanged for a longer period than at Payne’s Park/Park Way location. However, the 2016 data show a notable increase in road traffic compared to the preceding period.

The split of vehicles comprising the traffic counted at the three sites since 2010 are illustrated by Figures 3.8, 3.9 and 3.10. This is of interest because heavy goods vehicles (HGV) and to a lesser extent light goods vehicles (LGV) contribute more emissions of NO₂ per vehicle compared to cars and motor-cycles. Buses (Public Transport Vehicles) share this characteristic with HGV, but it should be noted that HGV are much more prevalent than buses in these areas of Hitchin.

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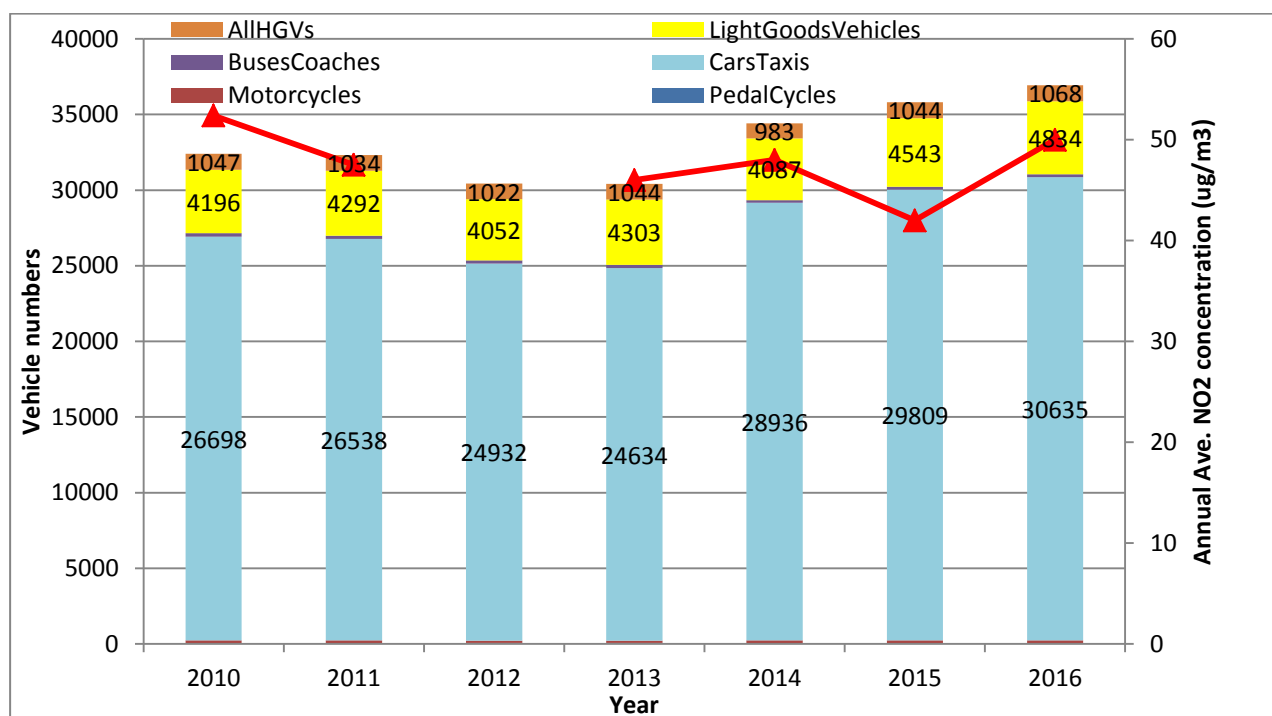


Figure 3.8: Road traffic counts at DfT count point 78226 within the Stevenage Road AQMA Hitchin compared to mean annual average NO₂ measured by the automatic analyser.

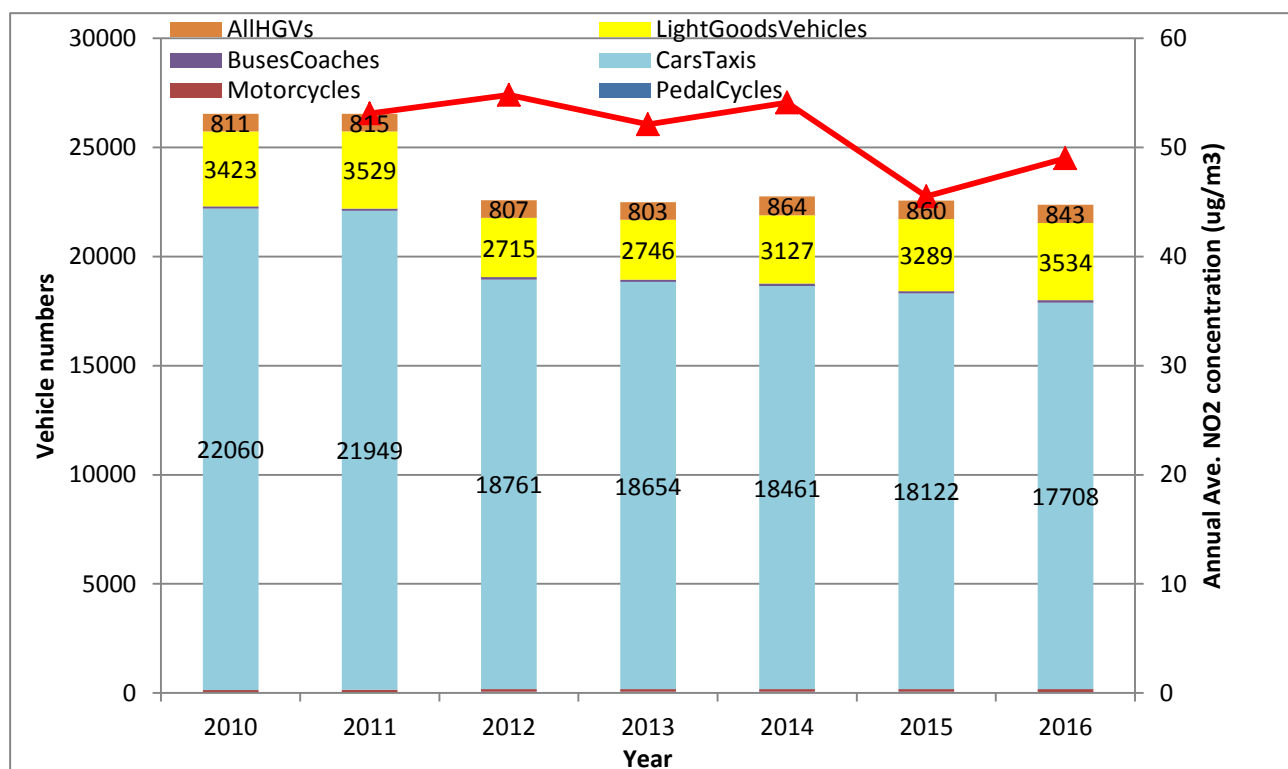


Figure 3.9: Road traffic counts at DfT count point 27988 at Park Way, Hitchin compared to the mean annual average NO₂ measured by diffusion tube NH93

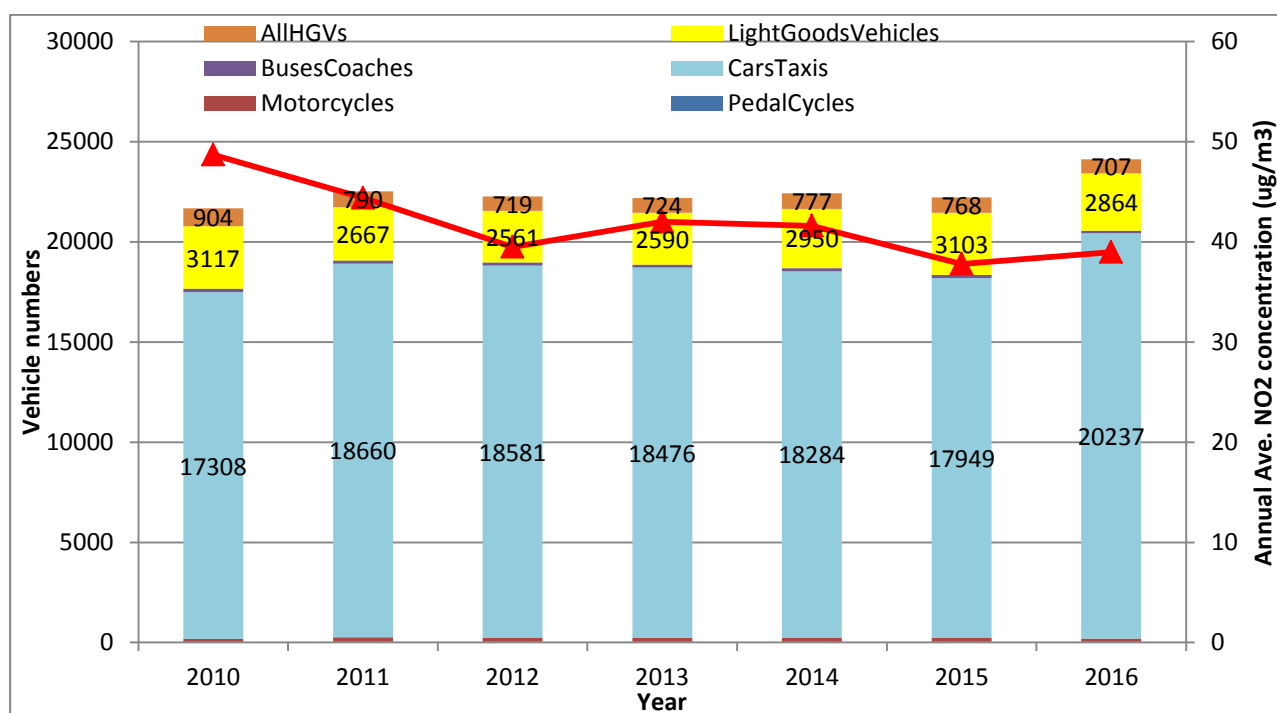


Figure 3.10: Road traffic counts at DfT count point 37273 at Upper Tilehouse Street, Hitchin compared to the mean annual average NO₂ measured by diffusion tube NH77

Across the three traffic count locations, there is not a strong direct link between the measured NO₂ concentrations and total vehicle numbers, or the numbers of particular groups of vehicle for any of the locations considered. Such a simplistic relationship would not really be expected, in particular when considering such proportionately low changes in vehicle numbers and the influence that meteorological conditions can have on the delivery of national or international air pollution and on the dispersion of air pollutants locally emitted from vehicle exhausts. There is also the expectation that with an improving vehicle fleet, in terms of lower air pollution emissions per exhaust, that numbers of vehicles could rise without a commensurate increase in air pollution emissions.

The only other area of North Hertfordshire where an exceedance of the annual AQO has been considered to be likely is in Baldock and Figure 3.11 is included here to illustrate how similar gradual reductions in NO₂ to those observed in Hitchin have also been observed in Baldock. NH88 is a kerbside site and so it is not ideally located to be used to assess whether there is justification for an AQMA. Additionally the drop off with distance to nearest residential receptor calculation included on p.50 shows that there is no current need to consider the declaration of an AQMA.

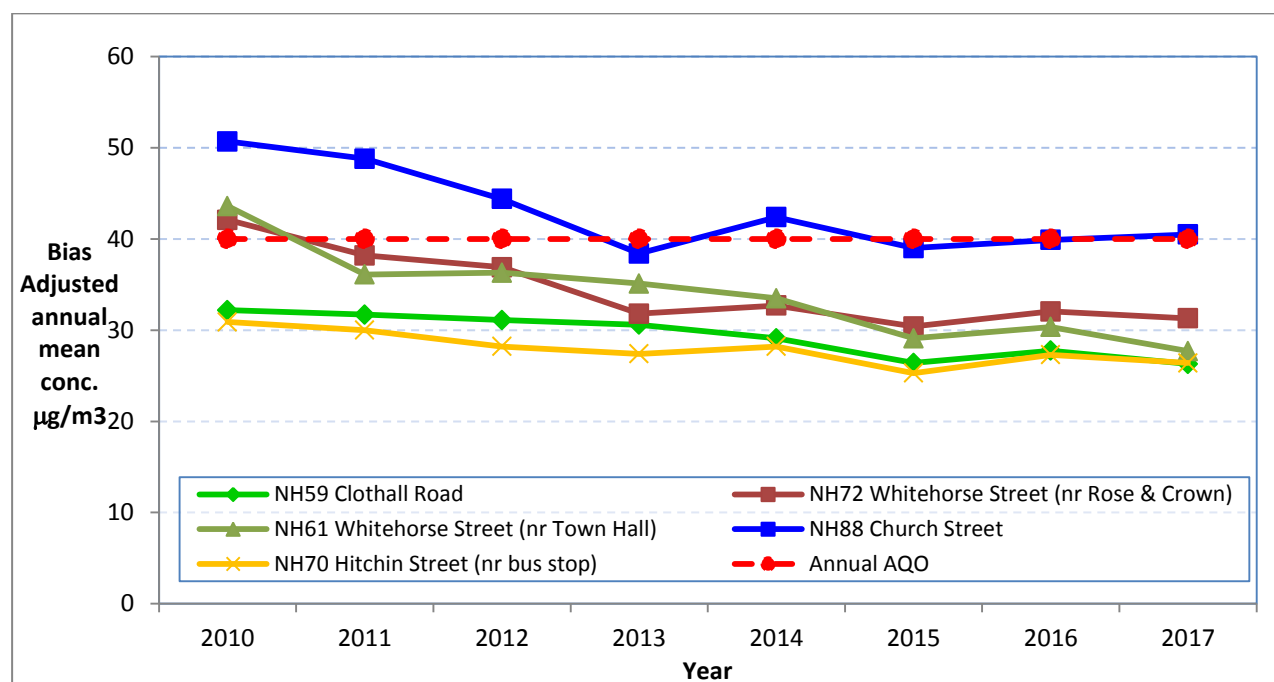


Figure 3.11: Trends in NO₂ concentrations at monitoring sites in Baldock

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

2017 was the second full year of PM₁₀ monitoring at the Stevenage Road location. The data from 2016 and 2017 are displayed in Figure 3.12 and show that the mean average concentrations for both years were below the 40µg/m³ AQO. The number of

daily exceedences of the $50\mu\text{g}/\text{m}^3$ AQO is also shown in Figure 3.11 as displayed with the number of allowable exceedences in a calendar year.

Although the annual mean average concentration reduced from 2016 to 2017, the number of daily exceedences was higher in 2017 compared to 2016. However, just two years of monitoring data are not sufficient to establish a trend. It should also be noted that the data capture rate from the PM_{10} analyser in 2017 was only at 80.39% compared to 98.88% in 2016. The largest periods of missing data from 2017 were the 31 days of October and 28 days in November.

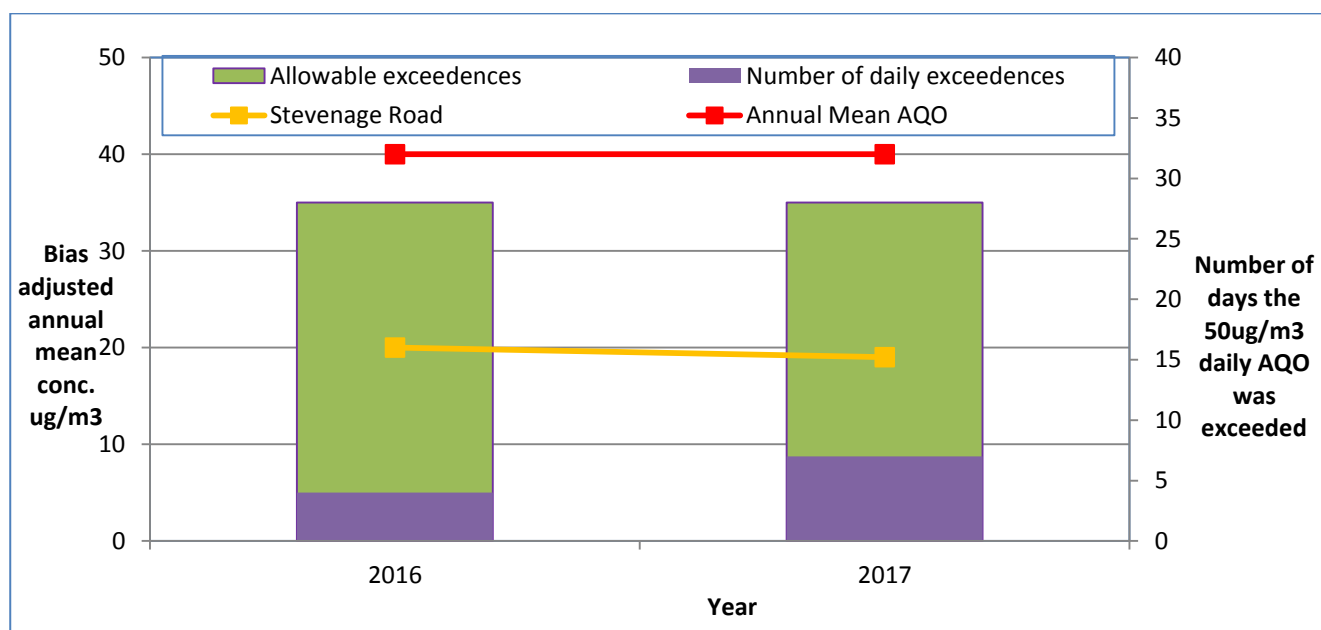


Figure 3.12: PM_{10} concentrations measured at Stevenage Road, Hitchin

3.2.3 Particulate Matter ($\text{PM}_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored $\text{PM}_{2.5}$ annual mean concentrations for the past 5 years.

2017 was the second full year of $\text{PM}_{2.5}$ monitoring at the Stevenage Road location. The data from 2016 and 2017 are displayed in Figure 3.12 and show that the mean average concentrations for both years were below the non-statutory target value of $25\mu\text{g}/\text{m}^3$. The number of days when moderate and high (as defined by the Defra Daily Air Quality Index) concentrations of $\text{PM}_{2.5}$ were measured are also displayed in Figure 3.13. but there is no limit or objective in place specifying how many, if any, days of exceedences of a given $\text{PM}_{2.5}$ concentration are allowed.

Although two years of monitoring data are not sufficient to establish a trend, both the annual mean average PM_{2.5} concentration and the number of days when moderate and high PM_{2.5} concentrations were detected were lower in 2017 compared to 2016.

The data capture rate in 2017 was 86.6% in 2017, which compares reasonably well to the 91.3% data capture rate in 2016.

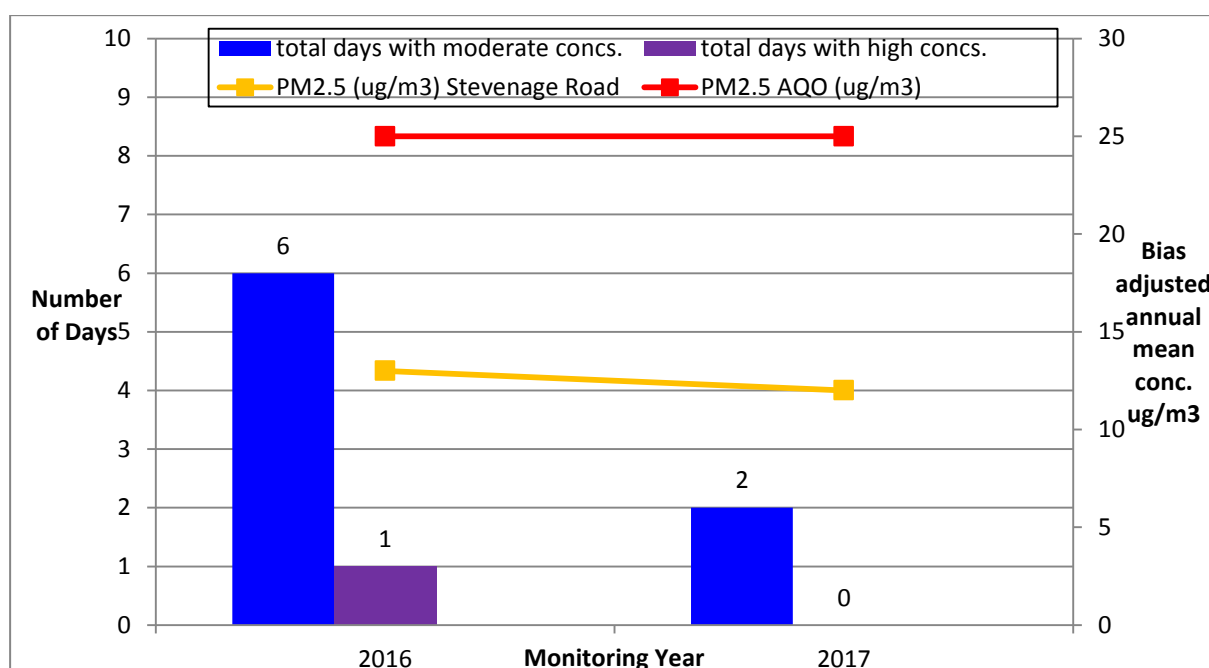


Figure 3.13: PM_{2.5} concentrations measured at Stevenage Road, Hitchin

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
NH1	Stevenage Road NOx	Roadside	518740	228348	NO2	YES	Chemiluminescent	11	2	1.5
NH2	Stevenage Road PM	Roadside	518713	228349	PM10, PM2.5	YES	TEOM, BAM	19	2	1.5

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.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
NH06	Melbourn Road, Opposite Town Hall, Royston	Roadside	535906	240794	NO ₂	NO	7	1.1	NO	2.1
NH45	Stevenage Road A, Hitchin	Roadside	518708	228347	NO ₂	YES	19	2	NO	2
NH59	(NH04a) Clothall Road, Baldock	Roadside	524649	234061	NO ₂	NO	11	3	NO	2
NH60	(NH13a) Willian Road, Hitchin	Roadside	519916	230099	NO ₂	NO	29	1.1	NO	2
NH61	(NH53a) Whitehorse Street, Baldock (nr town hall)	Roadside	524428	233882	NO ₂	NO	35	2	NO	2.1
NH63	(NH02a) Library Hitchin	Roadside	518160	229092	NO ₂	NO	30	3.5	NO	2
NH67	Cadwell Court, Hitchin	Roadside	519225	230553	NO ₂	NO	12	2	NO	2.1
NH69	64 Grove Road, Hitchin	Roadside	518821	229993	NO ₂	NO	5	2	NO	2
NH70	Nr Bus Stop Hitchin Street Baldock	Roadside	524298	233784	NO ₂	NO	1	3.5	NO	2.1
NH72	Opp Rose Crown, Whitehorse Street, Baldock	Roadside	524502	233948	NO ₂	NO	27	2	NO	2
NH103	Westbrook Court, Hitchin	Roadside	518773	228342	NO ₂	YES	10	2.4	NO	2

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
NH77	Upper Tilehouse Street, Hitchin (traffic lights)	Roadside	518006	229032	NO ₂	NO	5	1.5	NO	2
NH78	West Hill, Hitchin	Roadside	518099	229229	NO ₂	NO	4	2	NO	2
NH82	Upper Tilehouse Street, Nr Roundabout	Roadside	518129	229065	NO ₂	NO	7	1.5	NO	2
NH83	Hitchin Station, Roundabout A	Roadside	519366	229806	NO ₂	NO	20	1	NO	2
NH87	11 Stevenage Road, Hitchin	Roadside	518731	228362	NO ₂	NO	0	15	NO	1.9
NH88	Church St, Baldock (Opp. Town Hall)	Kerbside	524448	233898	NO ₂	NO	13	0.5	NO	2
NH89	London Road, Hitchin	Roadside	518706	228293	NO ₂	NO	20	1.9	NO	2
NH90	Gosmore Road, Hitchin	Roadside	518593	228304	NO ₂	NO	20	2.2	NO	2
NH91	St John's Road, Hitchin	Roadside	518656	228406	NO ₂	NO	5	7.9	NO	2.1
NH92	Stevenage Road (Griffin), Hitchin	Roadside	518872	228305	NO ₂	YES	5	2	NO	2
NH93	Park Way, Hitchin	Roadside	518130	229036	NO ₂	YES	3	1.6	NO	1.8
NH94	Offley Road, Hitchin	Roadside	517915	228967	NO ₂	NO	7	2.3	NO	2
NH95	Pirton Road, Hitchin	Roadside	517886	228975	NO ₂	NO	22	1.3	NO	2
NH97	Queen Street, Hitchin	Roadside	518666	229149	NO ₂	NO	4	1.7	NO	2

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
NH98	Walsworth/Radcliffe Road, Hitchin	Roadside	519080	229510	NO ₂	NO	4	1.5	NO	2
NH99	Nightingale Road, Hitchin	Roadside	518953	229786	NO ₂	NO	5	1.7	NO	2
NH108	Hitchin - Hermitage Road (97)	Roadside	518534	229302	NO ₂	NO	3	0.8	NO	2
NH104	Dower Court (A), Stevenage Road, Hitchin	Roadside	518757	228334	NO ₂	YES	0	3.3	NO	1.8
NH105	94-98 Stevenage Road, Hitchin	Roadside	519067	228255	NO ₂	YES	7	3.5	NO	2.1
NH106	Morello Gardens, Stevenage Road, Hitchin	Roadside	519250	228218	NO ₂	NO	5	1.4	NO	2
NH107	Whitehill Rd, Hitchin	Roadside	518720	228335	NO ₂	NO	26	2.3	NO	2
NH110	Stevenage Road, AQ Analyser 1, Hitchin	Roadside	518740	228348	NO ₂	YES	11	2	YES	1.2
NH111	Stevenage Road, AQ Analyser 2, Hitchin	Roadside	518740	228348	NO ₂	YES	11	2	YES	1.2
NH112	Stevenage Road, AQ Analyser 3, Hitchin	Roadside	518740	228348	NO ₂	YES	11	2	YES	1.2
NH114	Old Park Road, Hitchin (number 20)	Roadside	518150	229160	NO ₂	NO	0	2.45	NO	2.1
NH115	Old North Road, Royston	Roadside	535373	241466	NO ₂	NO	9	1	NO	1.9
NH116	6 Horseshoe, Park Street, Hitchin	Roadside	518492	228669	NO ₂	NO	0	2.4	NO	1.8

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
NH117	Hitchin - Fishponds Road	Roadside	518278	229752	NO ₂	NO	0	3.3	NO	2
NH118	High Street (27) Graveley	Roadside	523125	227954	NO ₂	NO	1.2	1.8	NO	2
NH119	High Street (125) Codicote	Roadside	521767	218110	NO ₂	NO	0.4	1.1	NO	2
NH120	Five House Farmhouse Sandon Rd, Therfield	Rural	533805	233823	NO ₂	NO	11.4	1.2	NO	1.9

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾					
					2012	2013	2014	2015	2016	2017
NH1	Roadside	Automatic	97.39	97.39		46	48	42	50	48
NH06	Roadside	Diffusion Tube	92	92	27.9	29.7	29.3	26.8	25.94	26.5
NH45	Roadside	Diffusion Tube	100	100	46.3	42	46.6	42.3	45.16	42.3
NH59	Roadside	Diffusion Tube	100	100	31.1	30.6	29.1	26.4	27.75	26.3
NH60	Roadside	Diffusion Tube	100	100	30	31.5	29	29.5	29.89	29.4
NH61	Roadside	Diffusion Tube	100	100	36.3	35.1	33.5	29.2	30.35	27.7
NH63	Roadside	Diffusion Tube	100	100	39.4	36.6	40.8	35.5	37.20	35.8
NH67	Roadside	Diffusion Tube	83	83	29.8	28.9	26.6	25.3	27.15	28.3
NH69	Roadside	Diffusion Tube	92	92	31.9	32.2	28.8	26.9	28.33	26.3
NH70	Roadside	Diffusion Tube	83	83	28.2	27.4	28.2	25.3	27.30	26.4
NH72	Roadside	Diffusion Tube	92	92	36.9	31.8	23.7	30.4	32.05	31.3
NH103	Roadside	Diffusion Tube	100	100	43.6	41.7	40.8	39.1	39.83	38.6
NH77	Roadside	Diffusion Tube	100	100	39.5	42	41.6	37.8	38.99	36.9
NH78	Roadside	Diffusion Tube	92	92	28.6	29	29.3	25.9	26.90	24.3
NH82	Roadside	Diffusion Tube	92	92	40.4	40.3	40.3	34.5	36.53	33.3
NH83	Roadside	Diffusion Tube	83	83	32.7	32.9	34.1	30.4	32.35	31.4
NH87	Roadside	Diffusion Tube	100	100	29.2	27.9	27.4	26.3	26.93	26.9
NH88	Kerbside	Diffusion Tube	100	100	44.4	38.4	42.4	39	39.89	40.5
NH89	Roadside	Diffusion Tube	92	92	29.5	28.4	28.7	26.3	29.70	28.2
NH90	Roadside	Diffusion Tube	100	100	27.6	27.7	25.8	24.2	26.24	24.0
NH91	Roadside	Diffusion Tube	100	100	34.6	32	29.9	31.2	31.85	32.2

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾					
					2012	2013	2014	2015	2016	2017
NH92	Roadside	Diffusion Tube	100	100	51.1	47.6	48.1	45.8	46.05	44.4
NH93	Roadside	Diffusion Tube	92	92	54.8	52.1	54.1	45.5	48.99	45.5
NH94	Roadside	Diffusion Tube	92	92	36.5	36	36.3	33.8	34.06	34.3
NH95	Roadside	Diffusion Tube	92	92	32.2	33.2	34.7	31.7	31.81	33.0
NH97	Roadside	Diffusion Tube	100	100	32	30.8	32.4	29.7	29.43	28.4
NH98	Roadside	Diffusion Tube	100	100	33.6	32.7	31.9	30.3	30.44	28.6
NH99	Roadside	Diffusion Tube	100	100	33.4	32.2	29.1	28.2	30.71	29.8
NH108	Roadside	Diffusion Tube	92	92		36.5	40.2	36.1	34.04	33.1
NH104	Roadside	Diffusion Tube	100	100	33.9	31.5	30.4	27.9	30.80	32.2
NH105	Roadside	Diffusion Tube	100	100	45.8	47	51.4	46.2	45.96	43.3
NH106	Roadside	Diffusion Tube	83	83	43.5	44.6	42.7	36.1	37.68	35.3
NH107	Roadside	Diffusion Tube	100	100	30.8	29.4	29.6	28.4	29.01	27.8
NH110	Roadside	Diffusion Tube	100	100				49.6	50.16	48.2
NH111	Roadside	Diffusion Tube	100	100				58.6	56.38	54.3
NH112	Roadside	Diffusion Tube	83	83				48.7	54.21	49.6
NH114	Roadside	Diffusion Tube	92	92					30.52	29.0
NH115	Roadside	Diffusion Tube	83	83					26.46	26.8
NH116	Roadside	Diffusion Tube	100	100						35.8
NH117	Roadside	Diffusion Tube	100	100						28.1
NH118	Roadside	Diffusion Tube	100	100						21.3
NH119	Roadside	Diffusion Tube	100	100						26.1
NH120	Rural	Diffusion Tube	100	100						13.7

☒ Diffusion tube data has been bias corrected

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

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

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

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2013	2014	2015	2016	2017
NH1	Roadside	Automatic	97.39	97.39	1	1	0	10	4

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
NH2	Roadside	80.39	80.39			20	20	19

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

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

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

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

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2013	2014	2015	2016	2017
NH2	Roadside	80.39	80.39			1	4	7

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Table A.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
NH2	Roadside	86.63	86.63			11	13	12

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

Notes:

(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) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.8 – SO₂ Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	Number of Exceedances 2017 (percentile in bracket) ⁽³⁾		
				15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)

No monitoring undertaken within North Hertfordshire

Notes:

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

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

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

(3) If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.97) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
NH06	38.2	29.11	26.5	22.01	24.52		22.56	23.74	24.31	28.48	32.76	28	27.3	26.5	
NH45	63.74	50.55	49.66	32.92	38.52	42.41	39.62	39.25	40.31	45.32	43.02	38.2	43.6	42.3	26.9
NH59	40.28	26.78	25.67	22.91	25.51	24.17	24.11	24.71	29.55	25.2	28.8	28.1	27.2	26.3	
NH60	40.29	31.95	31.3	27.59	26.8	26.4	25.66	24.22	38.27	27.72	34.69	28.7	30.3	29.4	
NH61	45.33	33.02	32.12	23.28	29.23	26.06	23.72	25.02	20.69	27.03	30.4	27	28.6	27.7	
NH63	48.28	36.92	36.05	30.25	33.47	39.31	33.69	36.54	29.09	37.64	42.19	39.1	36.9	35.8	
NH67	50.86	32.73	26.57		24.23	22.45	24.76	23.51	29.92	29.48		27	29.2	28.3	
NH69		39.36	32.72	21.82	23.41	20.6	23.02	24.44	29.84	27.77	28.65	26.9	27.1	26.3	
NH70	41.85	31.07	28.69	19.76	23.95	21.86	23.2	22.86			30.06	28.8	27.2	26.4	
NH72	49.16	35.11	33.83	25.37	25.82	25.57	26.49	31.47	30.72		34.52	37	32.3	31.3	
NH103	57.68	44.87	40.73	32.7	37.88	33.01	35.43	34.52	38.98	41.21	41.06	39.3	39.8	38.6	
NH77	55.5	40.3	40.33	31.77	35.15	34.76	33.02	36.14	37.76	38.23	37.86	35.5	38.0	36.9	
NH78	41.41	28.24	21.24	21.21	21.91	18.75		21.36	24.12	26.3	26.83	24.5	25.1	24.3	
NH82	49.12	36.52	35.72	30.39	29.49	33.07	31.04	32.12	33.37	34.06		32.4	34.3	33.3	
NH83	46.45	36.88	32.27	30.17	30.08			25.7	30.98	24.7	32.4	34.1	32.4	31.4	

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Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.97) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
NH87	44.73	33.22	26.87	22.82	22.35	21.8	22.67	24.65	26.59	28.83	30.31	28.1	27.7	26.9	
NH88	56.46	42.44	53.15	35.08	29.57	35.23	33.98	40.67	39.43	39.73	47.59	47.3	41.7	40.5	25.2
NH89	49.2	31.83	30.7	25.14	22.17	21.05	24.03		28.55	29.06	31.67	26.3	29.1	28.2	
NH90	42.34	27.98	23.44	21.35	24.78	21.06	22.49	21.69	23.72	21.57	26.09	20.7	24.8	24.0	
NH91	53.88	34.29	31.83	25.57	24.42	26.76	23.66	32.2	34.39	32.1	41.21	38.4	33.2	32.2	
NH92	70.05	51.03	50.76	38.13	38.26	40.19	39.58	41.06	43.6	44.3	47.49	45.3	45.8	44.4	37.7
NH93	59.61	44.94	43.34	47.72	47.86	48.66	49.25	47.23	45.08	33.76	48.53		46.9	45.5	41.3
NH94	46.24	39.85	35.56	33.63	29.9	29.39	30.9	32.68	33.18		41.25	36.1	35.3	34.3	
NH95	44.25	34.96		29.89	29.89	32.86	31	32.15	34.73	37.4	34.96	31.8	34.0	33.0	
NH97	51.98	37.31	27.93	22.74	26.44	24.44	22.62	26.01	27.78	26.93	31.26	25.9	29.3	28.4	
NH98	42.49	35.91	30.85	24.32	24.01	22.34	21.43	23.35	27.46	30.54	38.93	31.8	29.5	28.6	
NH99	47.51	34.94	32.08	22.55	24.26	24.79	25.66	26.52	32.46	29.41	33.32	35	30.7	29.8	
NH108	53.58	34.48	34.99	29.81	27.07	30.98	24.74		34	33.14	36.75	35.5	34.1	33.1	
NH104	46.38	32.24	31.37	31.47	23.44	26.27	26.45	50.02	30.41	29.16	38.84	32.3	33.2	32.2	
NH105	69.3	47.73	43.97	41.33	37.23	44.2	38.32	37.91	44.78	39.77	51.04	39.6	44.6	43.3	37.7
NH106	57.83		32.98	30.51	31.6	35.63	35.78		37.42	38.45	34.22	29.2	36.4	35.3	
NH107	47.11	29.51	27.94	23.25	23.55	24.3	25.78	25.52	29.38	21	36.14	31	28.7	27.8	
NH110	67.61	59.54	44.45	37.89	42.12	43.71	45.27	49.98	42.21	50.6	66.41	46.6	49.7	48.2	34.2
NH111	75.09	58.25	54.86	51.28	48.34	46.25	47.88	55.13	55.19	61.76	63.7	53.6	55.9	54.3	37.9

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Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.97) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
NH112	72.31	47.94	43.78	40.6		41.19	39	46.8	51.88	60.84	67.05		51.1	49.6	35.0
NH114	42.14	31.57			22.49	26.73	25.01	28.13	32.07	29.26	33.02	28.8	29.9	29.0	
NH115	44.43	31.02	28.38		20.58		20.45	24.48	25.3	25.15	30.89	26	27.7	26.8	
NH116	48.54	41.16	34.4	31.81	38.16	39.59	37.8	40.09	38.39	36.31	28.56	28.4	36.9	35.8	
NH117	44.73	32.27	27.31	23.92	21.04	24.96	23.39	25.41	28.32	35.73	31.91	28.6	29.0	28.1	
NH118	35.11	26.94	22.25	18.37	15.27	16.77	16.55	18.6	21.07	21.77	27.75	23.5	22.0	21.3	
NH119	48.44	30.81	24.23	22.65	23.88	22.2	19.01	20.57	25.99	25.43	32.92	26.3	26.9	26.1	
NH120	23.43	15.45	11.68	9	10.56	9.29	7.17	9.41	12.52	31.76	16.5	13.1	14.2	13.7	

- ☐ Local bias adjustment factor used
☒ National bias adjustment factor used
☒ Annualisation has been conducted where data capture is <75%
☒ Where applicable, data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

(2) Distance corrected to nearest relevant public exposure.

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

Automatic Monitoring:

The R&P 1400a Tapered Element Oscillating Measurement (TEOM) monitor at Stevenage Road, Hitchin is subject to calibration visits and filter checks and changes on a monthly basis by NHDC staff. In addition, Enviro-Technology is employed to undertake two service/maintenance visits (one minor and one major service) and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings are reported to Ricardo Energy and Environment who are retained by NHDC to verify and ratify the data generated by the monitor. This process includes the application of the volatile correction model (VCM) and the results of the data reported have had this applied and have been demonstrated as equal to the gravimetric equivalent.

The Met-One Smart Heated BAM 1020 PM_{2.5} monitor at Stevenage Road requires no periodic calibration checks, only a tape change approximately once every six weeks which is undertaken by NHDC staff. In addition Enviro-Technology is employed to undertake two service/maintenance visits (one minor and one major service) and to respond in the event of any maintenance issues encountered during daily operation. The outcome of the servicing and the associated performance of the monitor are reported to Ricardo Energy and Environment who are retained by NHDC to verify and ratify the data generated by the monitor.

The Teledyne-API T200A chemiluminescence monitor at Stevenage Road is subject to calibration checks and filter checks and changes on a monthly basis by NHDC staff. In addition Enviro-Technology is employed to undertake two service/maintenance visits (one minor and one major service) and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings are reported to Ricardo Energy and Environment who are retained by NHDC, as part of the larger Hertfordshire and Bedfordshire Air Quality Network, to verify and ratify the data generated by the monitor.

Non-Automatic Monitoring:

The diffusion tubes are 50% triethanolamine (TEA) in acetone and are supplied and analysed by Gradko Limited. Gradko follows the procedures set out in the Harmonisation Practical Guidance. Gradko also participates in the Workplace Analysis Scheme for

Proficiency (WASP) and is currently ranked as a Category Satisfactory laboratory. This information was used in selecting the below bias adjustment factor.

Data from the diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location database. The bias adjustment factor has been taken from the March 2018 version of the Diffusion Tube Bias Adjustment Factors spreadsheet available from the Defra Review and Assessment website (<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>).

According to the above database the bias adjustment factor for Gradko in 2017 was 0.97.

Short-term to Long-term Data adjustment (Annualisation):

Where it has only been possible to carry out monitoring at a location, whether automatic or non-automatic, at a site for less than 75% of the 12 months the results need to be adjusted to enable an estimate of the annual mean for that location to be calculated. There were no monitoring locations where less than 75% data were collected during 2017, so annualisation was not required.

It should be noted that a minimum 6 month period is necessary for this process to be valid.

Calculations for Reduction of Nitrogen Dioxide with Distance from Kerb

The calculation of the reduction of nitrogen dioxide with distance from the kerb was undertaken in line with the methodology that is downloadable from <https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html> and which is referred to by TG(16).

In all cases local background concentrations were derived from 2015 mapping (the most current available at the time of completion of the report) sourced from

<https://uk-air.defra.gov.uk/data/laqm-background-home>

Site Name/ID	Distance (m)		NO ₂ Annual Mean Concentration (µg/m ³)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
NH1	2.0	11.0	13.1	48.0	34.1
NH92	2.0	5.0	13.1	44.4	37.7
NH105	3.5	7.0	13.1	43.3	37.7
NH45	2.0	19.0	13.1	42.3	26.9
NH110	2.0	11.0	13.1	48.2	34.2
NH111	2.0	11.0	13.1	54.3	37.9
NH112	2.0	11.0	13.1	49.6	35.0
NH93	1.6	3.0	15.2	45.5	41.3
NH88	0.5	13.0	14.0	40.5	25.2

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

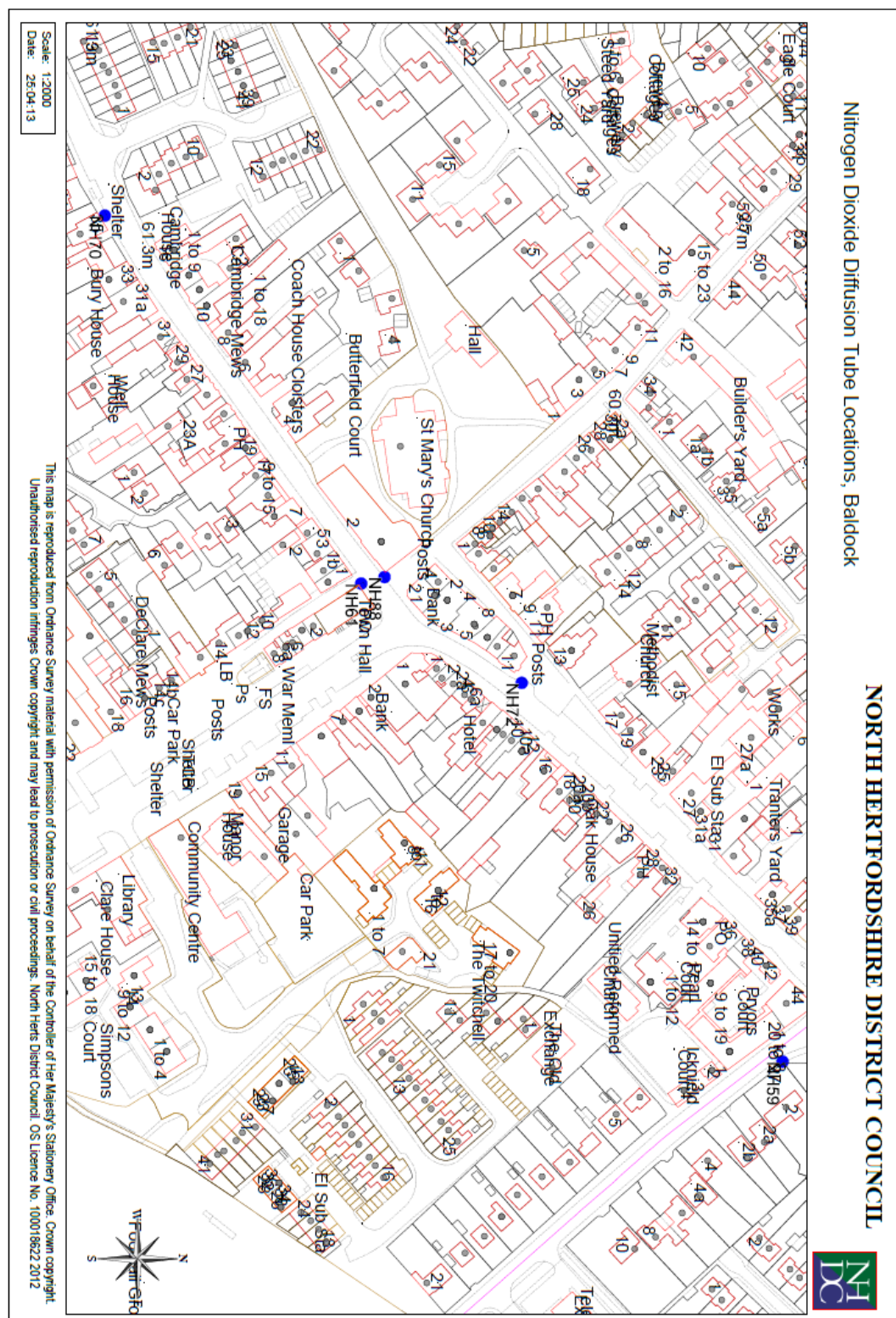


Figure D1: Diffusion Tube Monitoring Locations (NH72, NH88, NH70, NH59 & NH61) in Baldock - 2017

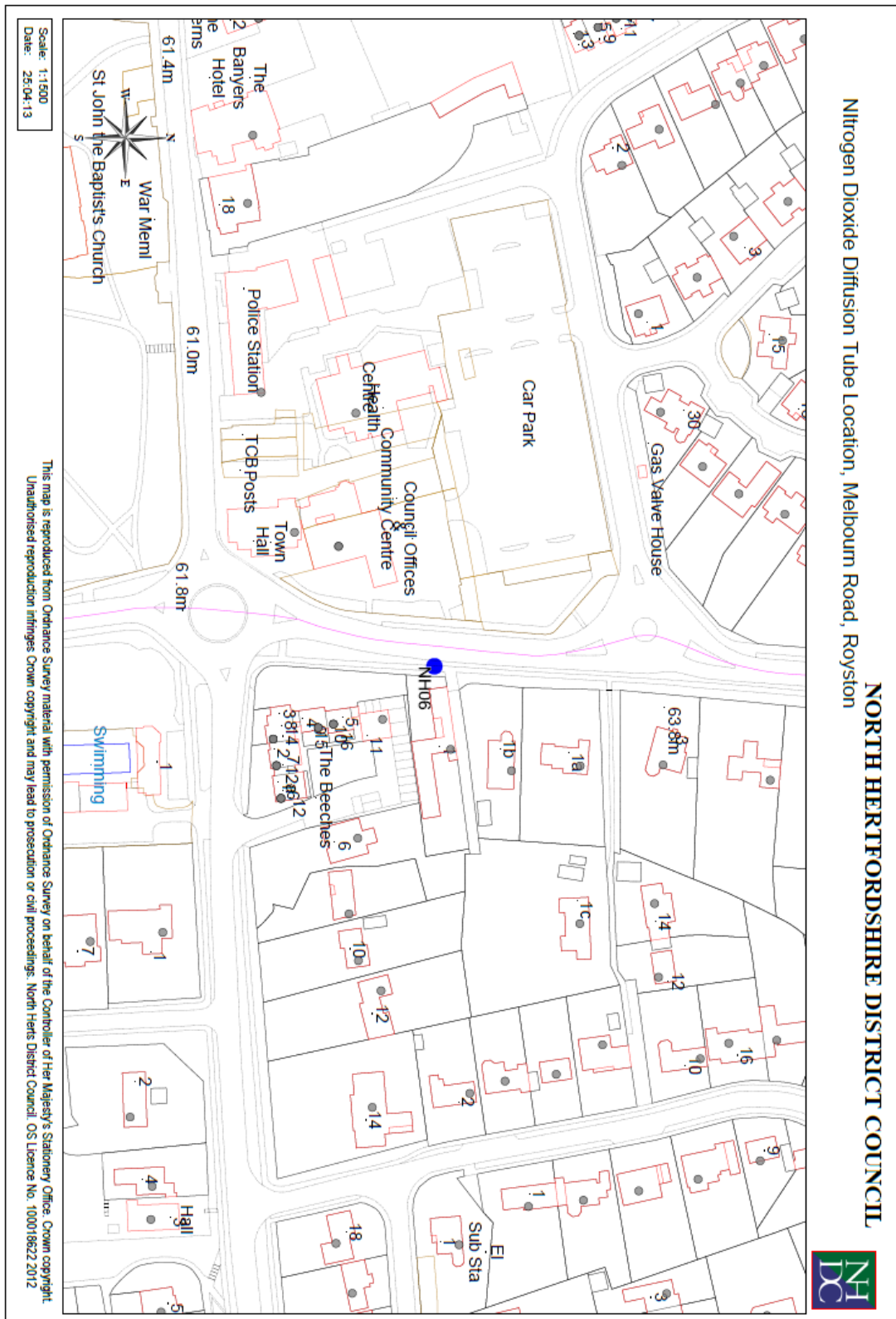


Figure D2: Diffusion Tube Monitoring Location (NH06) at Melbourn Road, Royston - 2017

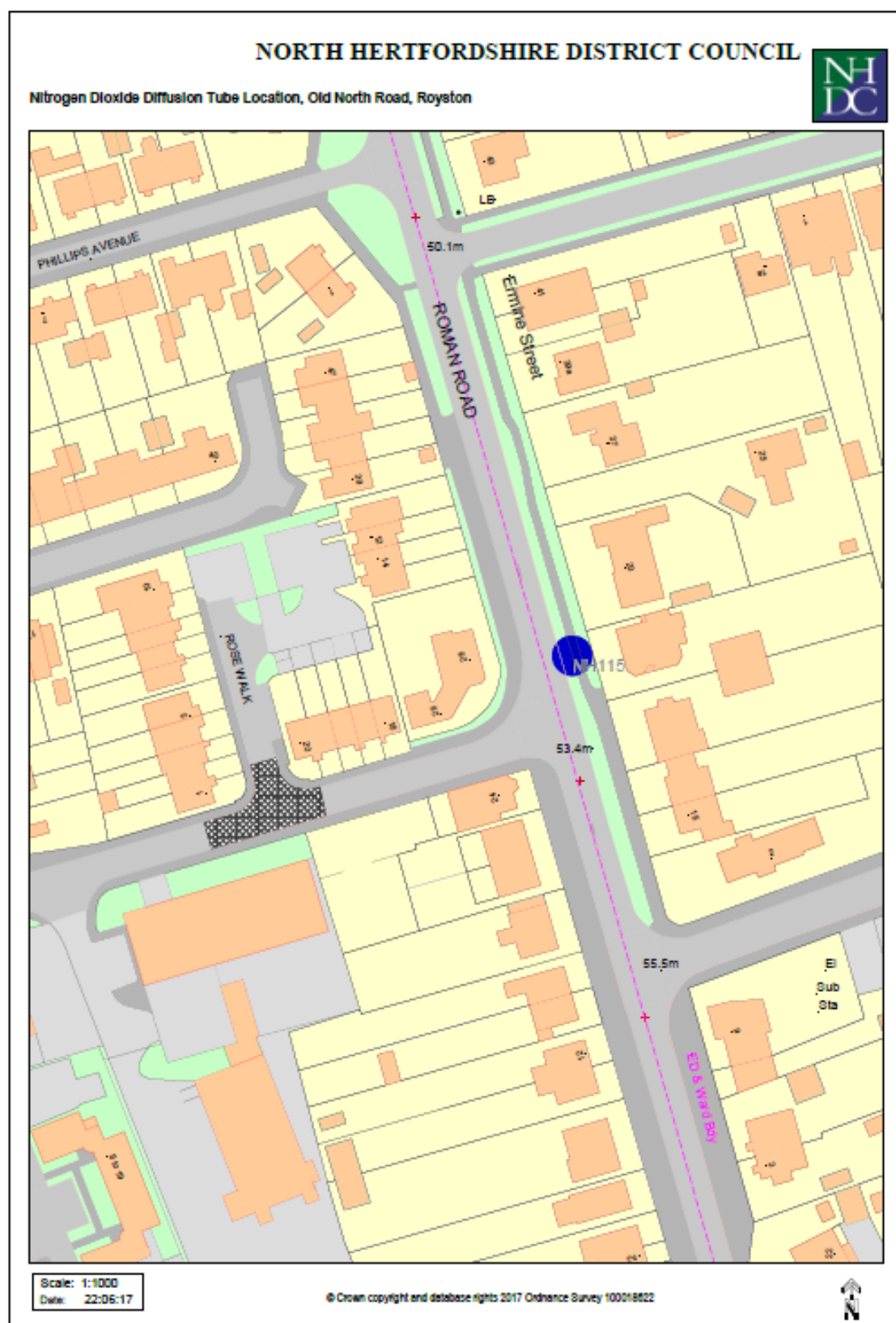


Figure D3: Diffusion Tube (NH115) Monitoring Location at Old North Road, Royston - 2017

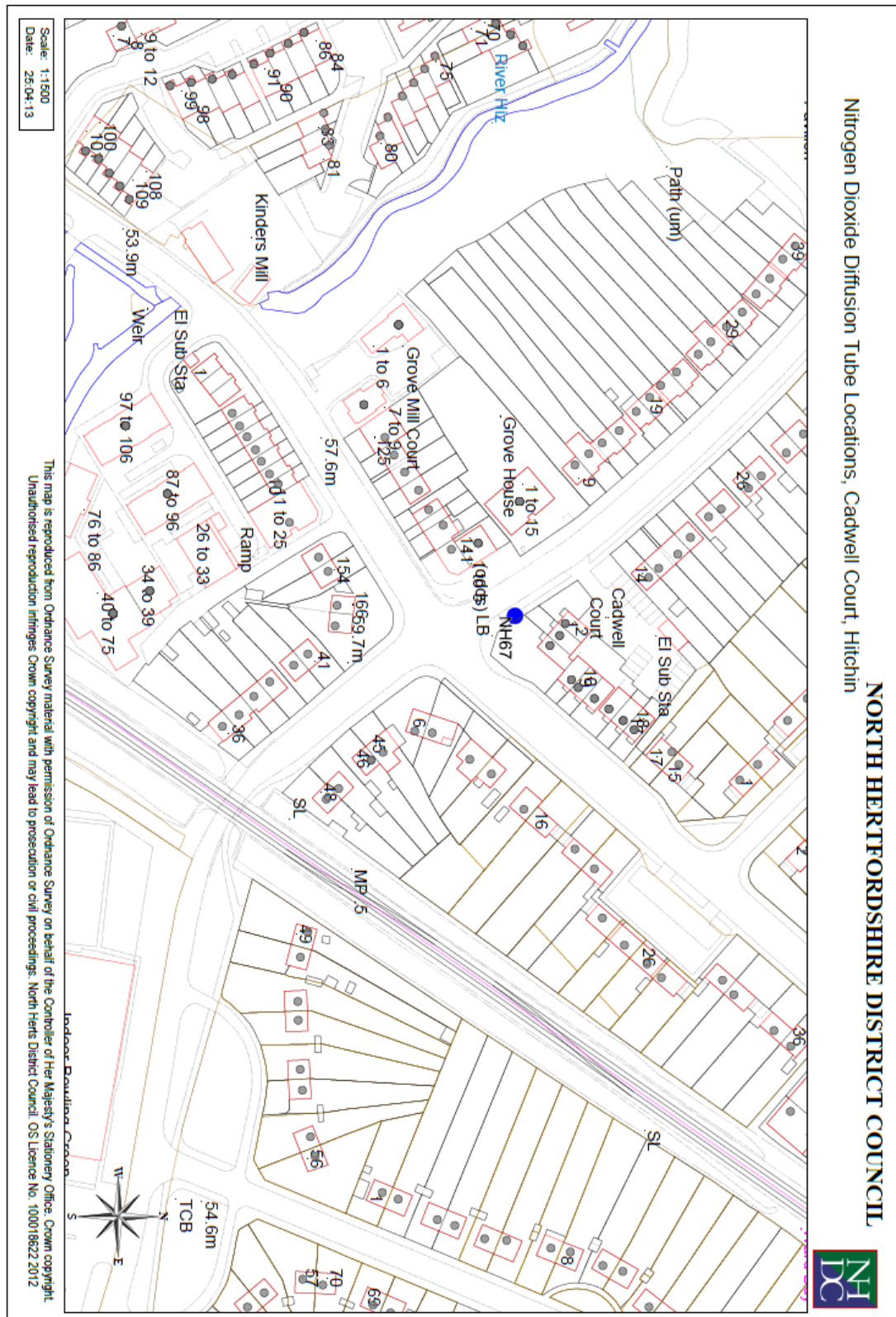


Figure D4: Diffusion Tube (NH67) Monitoring Location at Cadwell Court, Hitchin - 2017

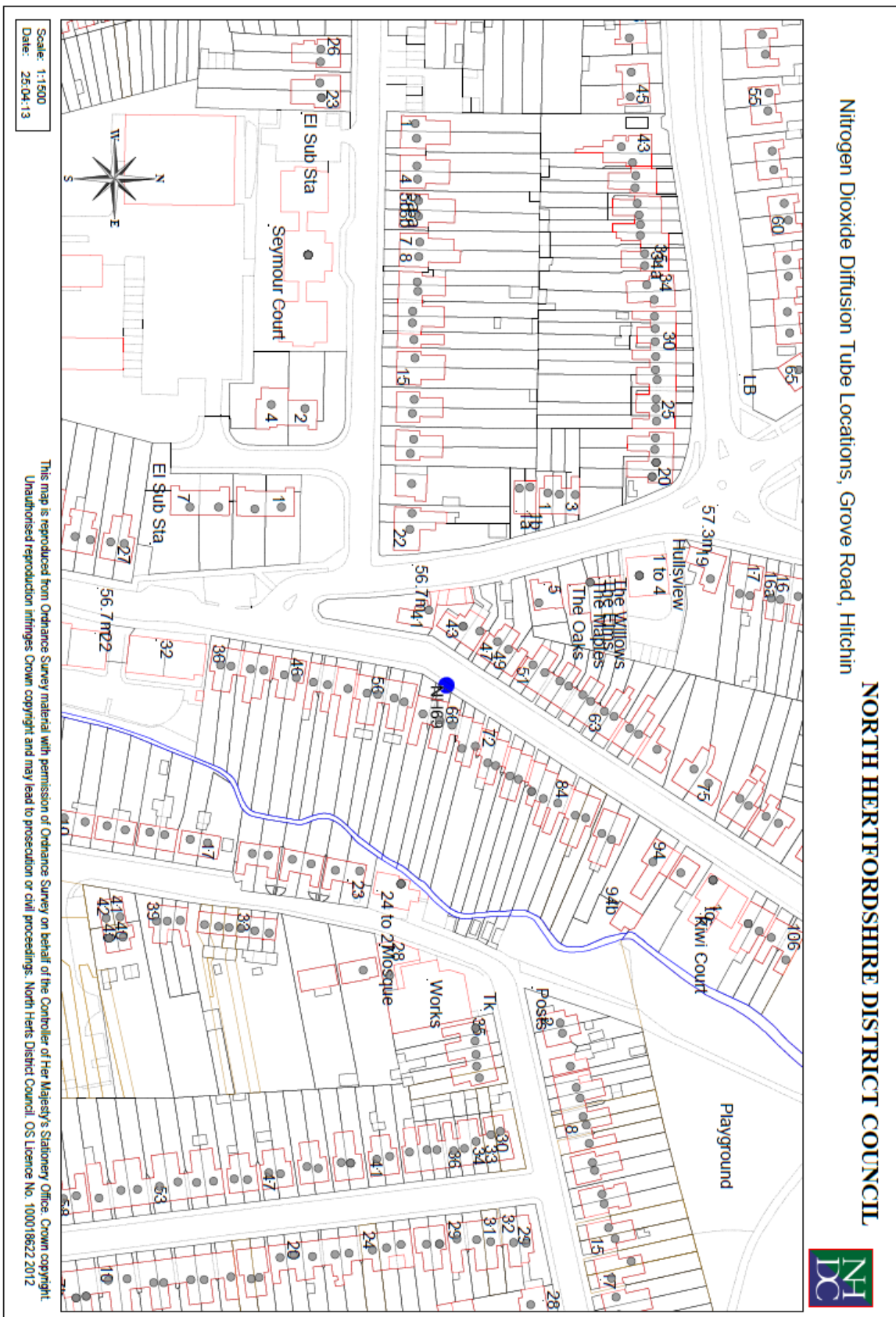


Figure D5: Diffusion Tube (NH69) Monitoring Location at Grove Road, Hitchin - 2017



Figure D6: Diffusion Tube Monitoring Locations (NH99, NH83 & NH98) in the Nightingale Road Area of Hitchin – 2017

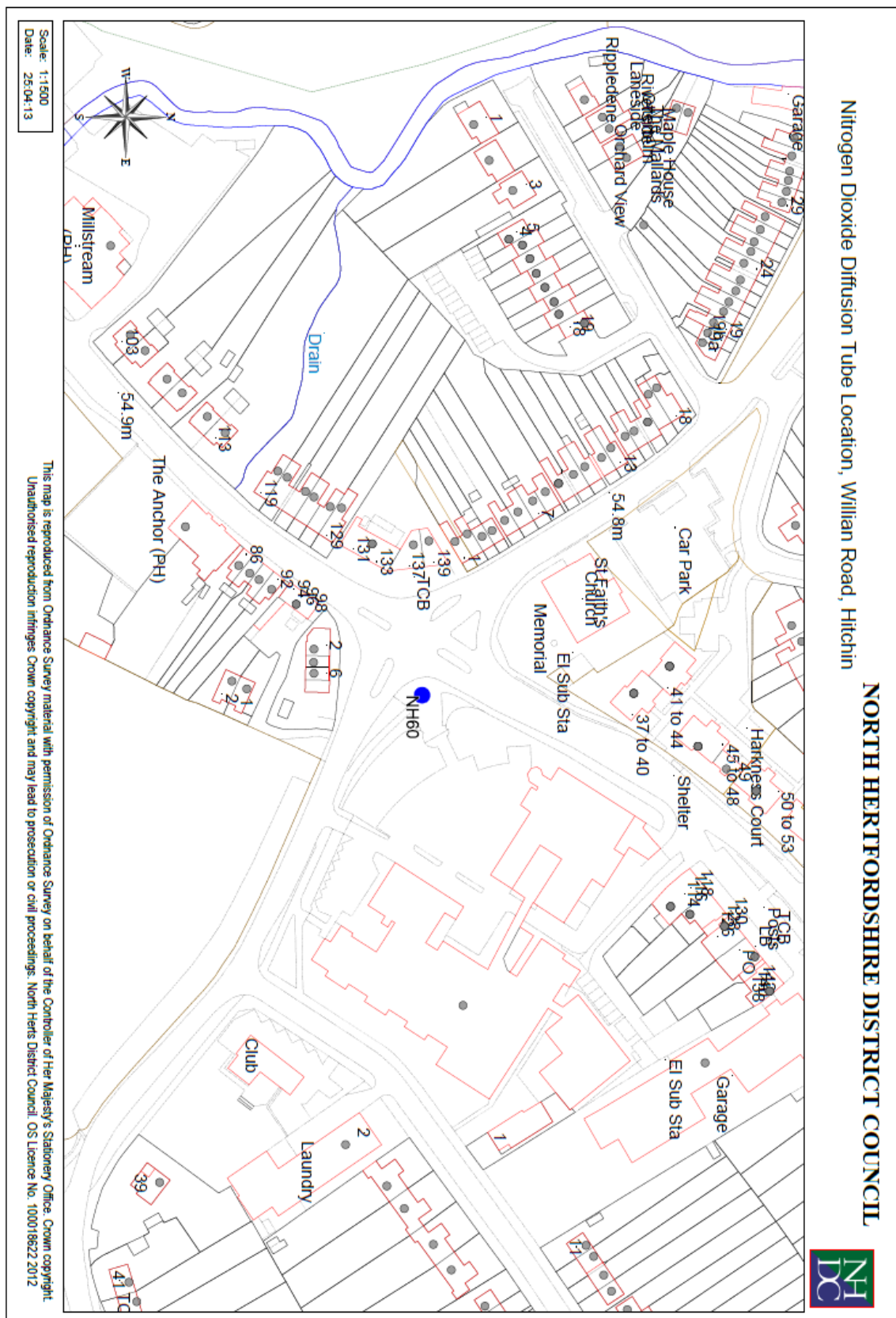


Figure D7: Diffusion Tube Monitoring Location (NH60) at Willian Road, Hitchin - 2017

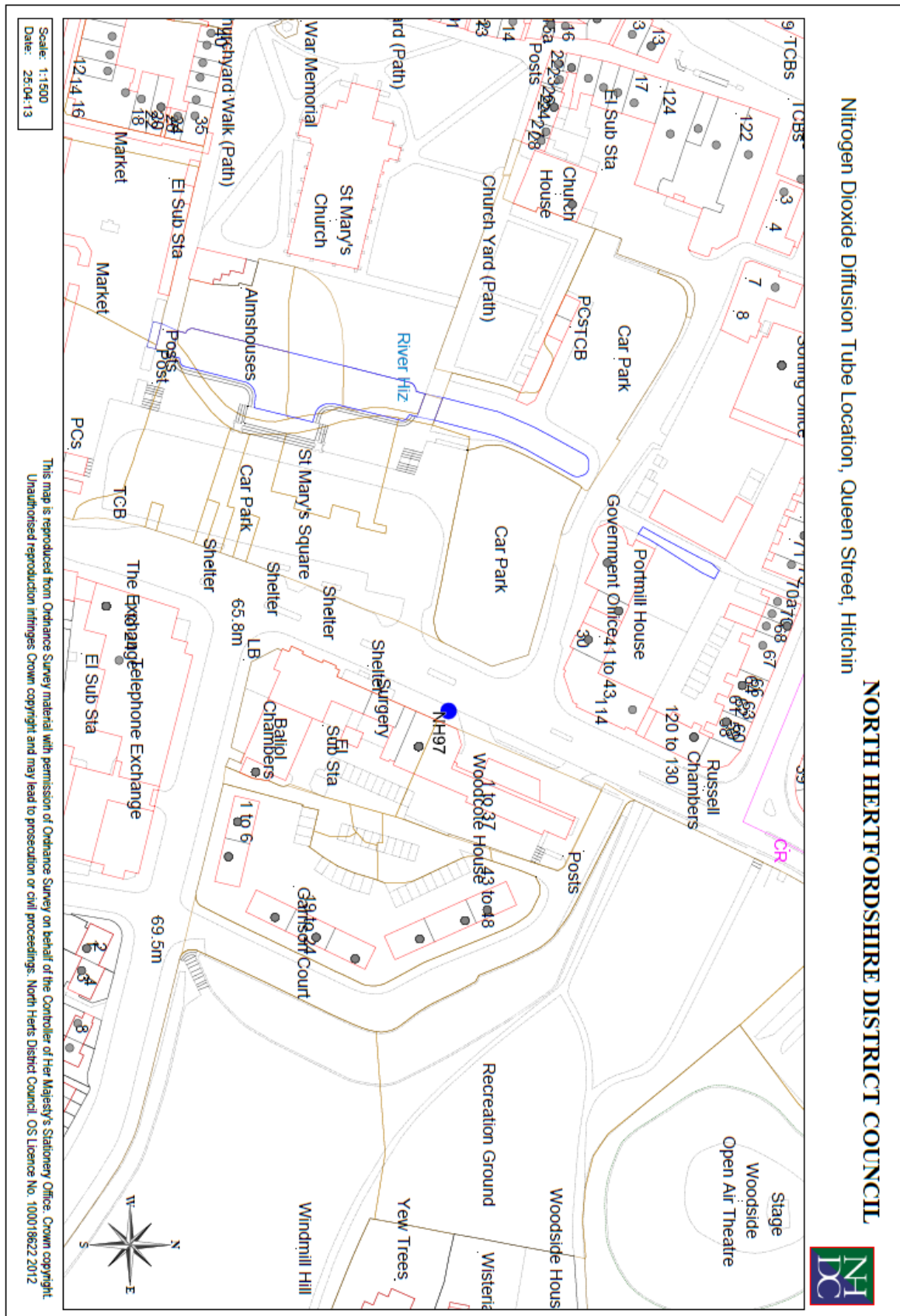


Figure D8: Diffusion Tube Monitoring Location (NH97) at Queen Street, Hitchin - 2017

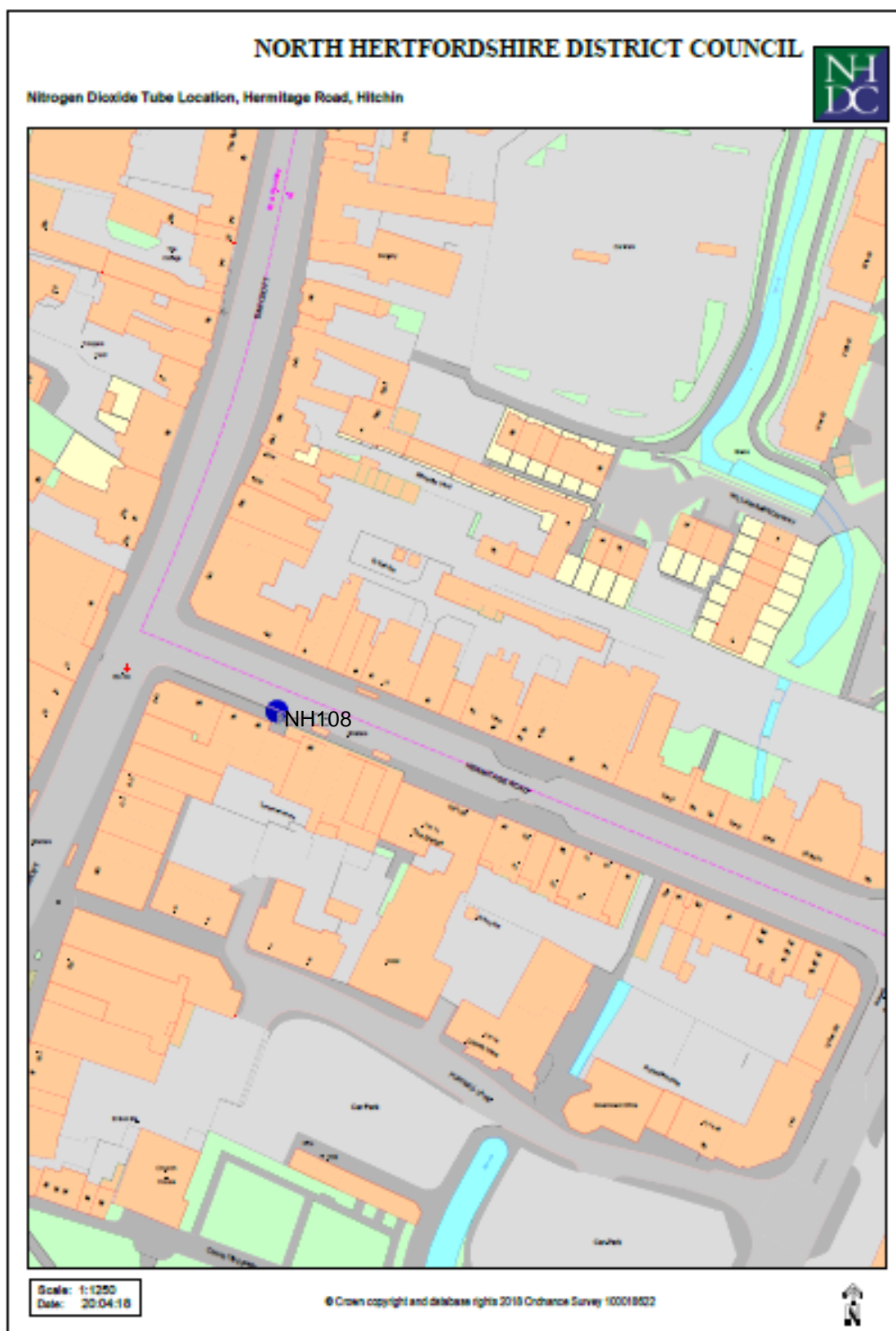


Figure D9: Diffusion Tube Monitoring Location (NH108) at Hermitage Road, Hitchin – 2017

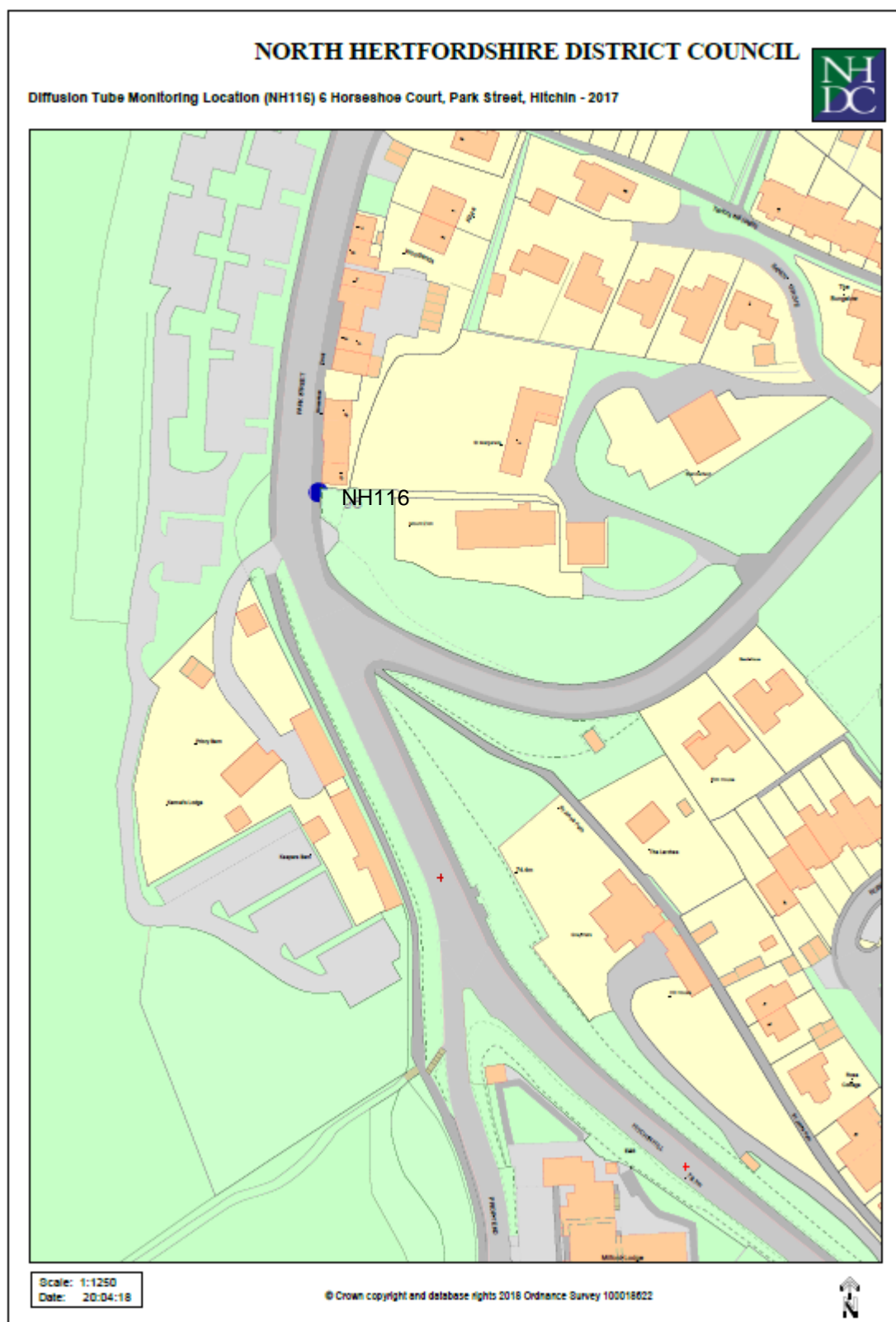


Figure D10: Diffusion Tube Monitoring Location (NH116) at 6 Horseshoe Court, Park Street, Hitchin - 2017

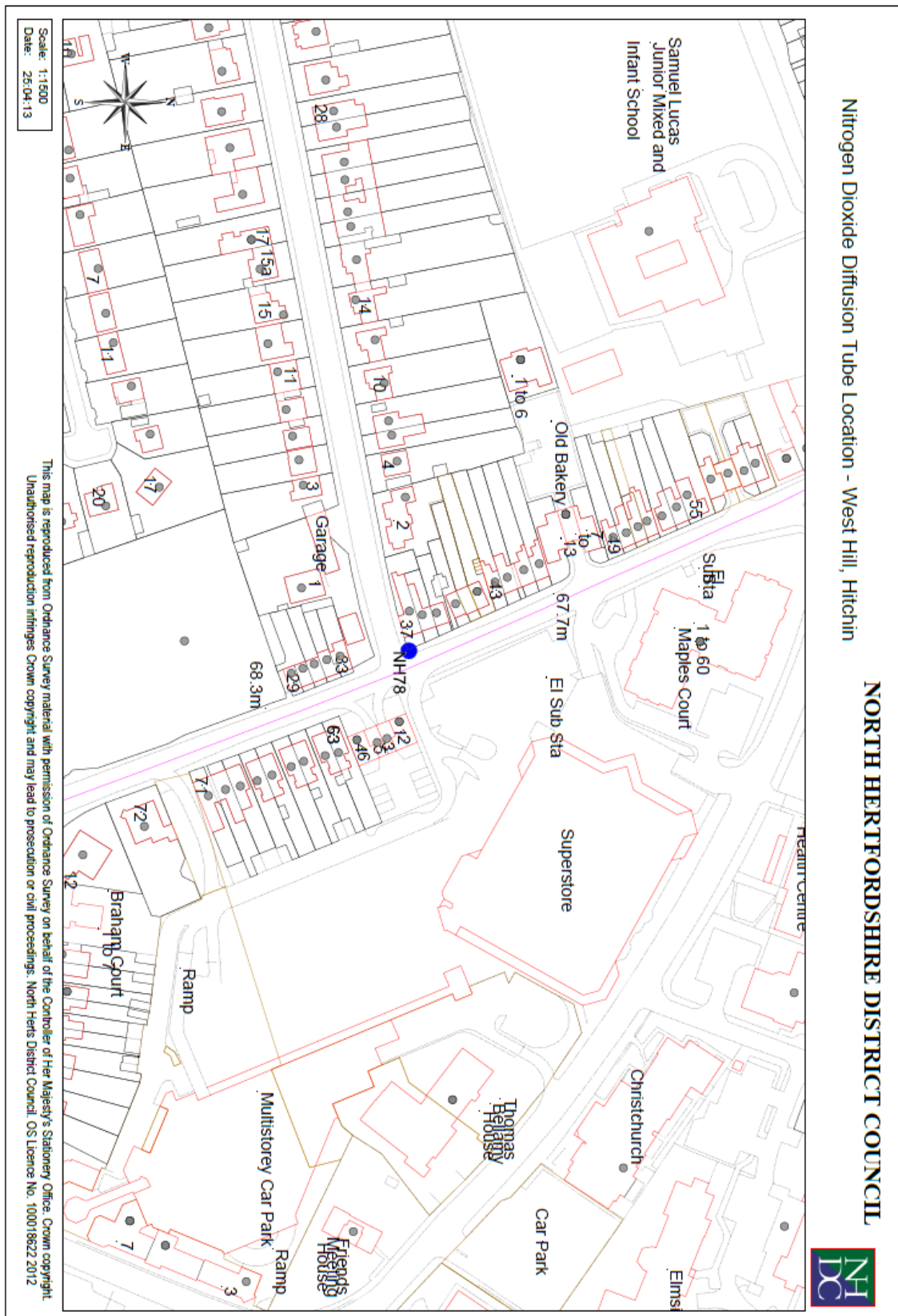


Figure D11: Diffusion Tube Monitoring Location (NH78) at West Hill Hitchin – 2017

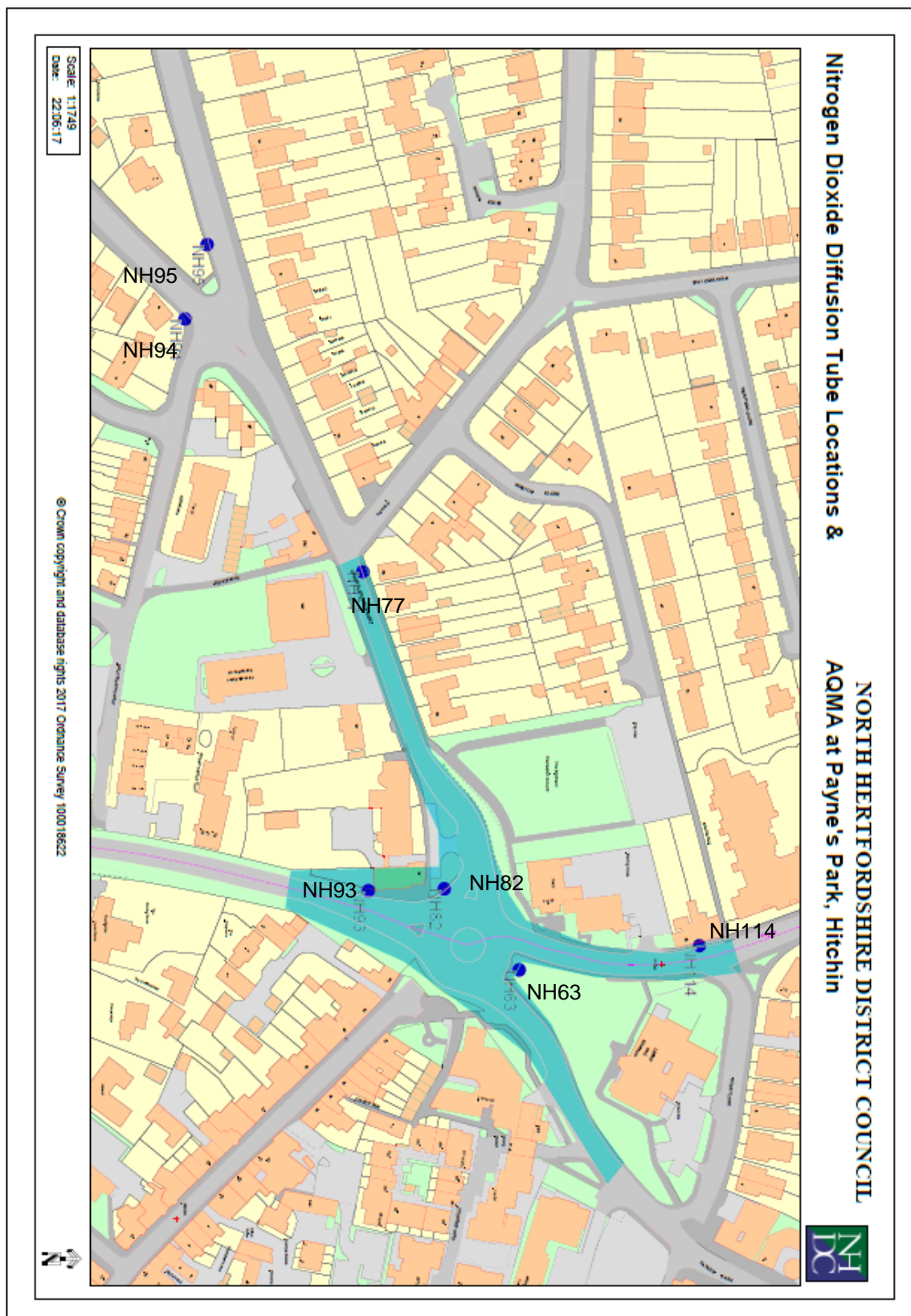


Figure D12: Diffusion Tube Monitoring Locations (NH108 & NH109) & Extent of AQMA at Payne's Park, Hitchin – 2017

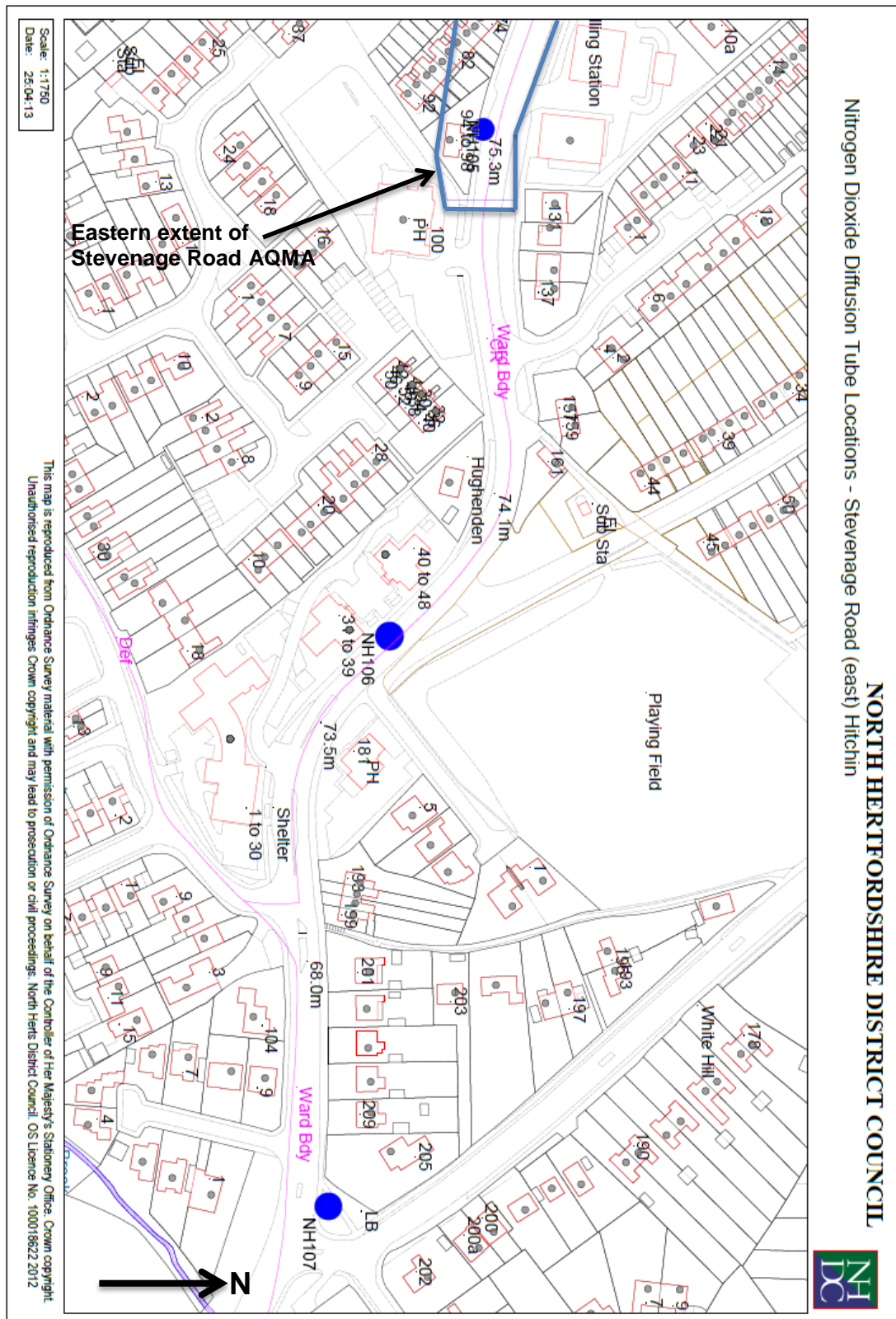


Figure D13: Diffusion Tube Monitoring Locations (NH105, NH106 & NH107) & Eastern Extent of the Stevenage Road AQMA at Stevenage Road, Hitchin – 2017

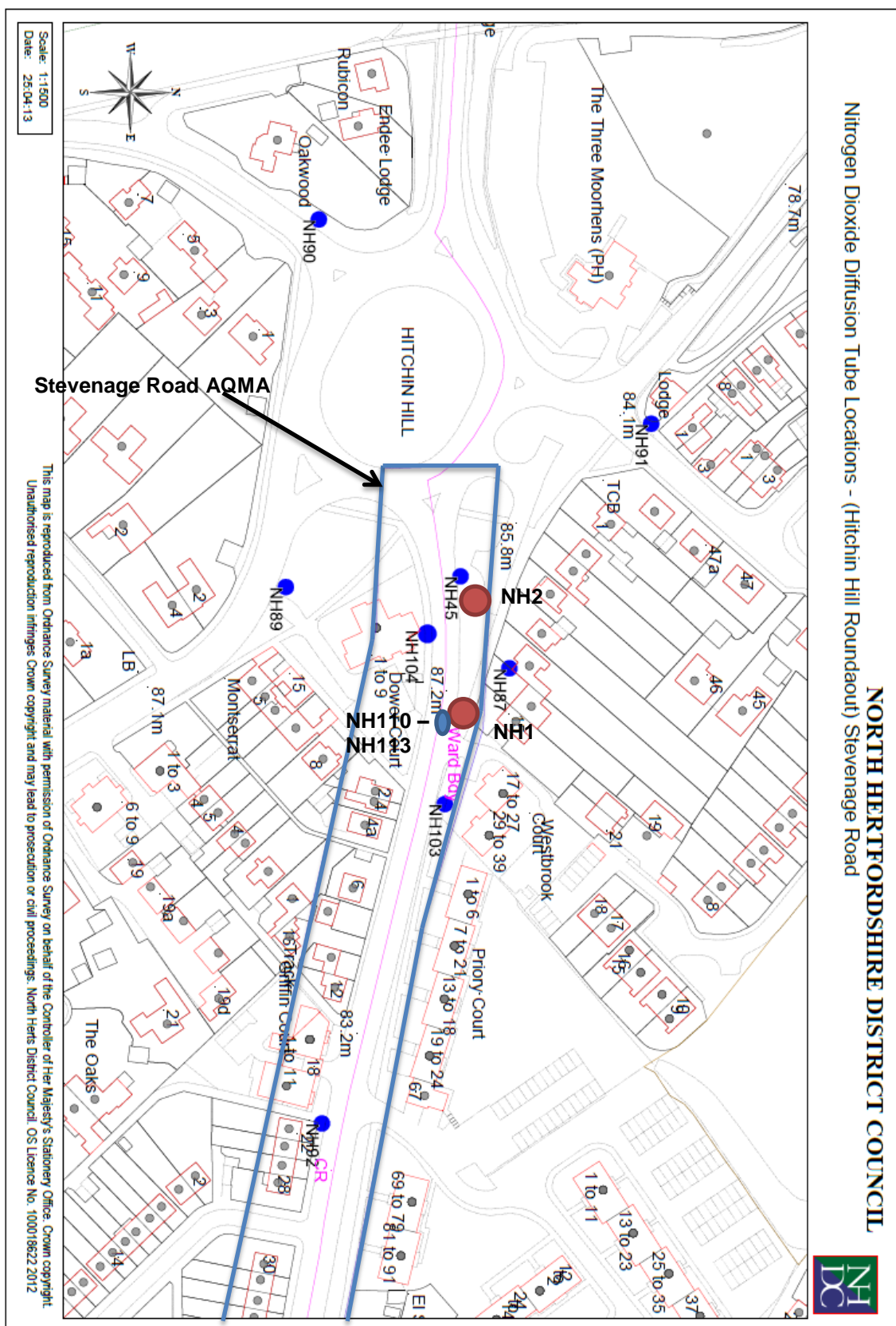


Figure D14: Diffusion Tube Monitoring Locations (NH45, NH87, NH89, NH90, NH91, NH92, NH91 & NH110-112), Real-Time Analyser Locations (NH1 and NH2) & the Stevenage Road AQMA at Stevenage Road, Hitchin – 2017

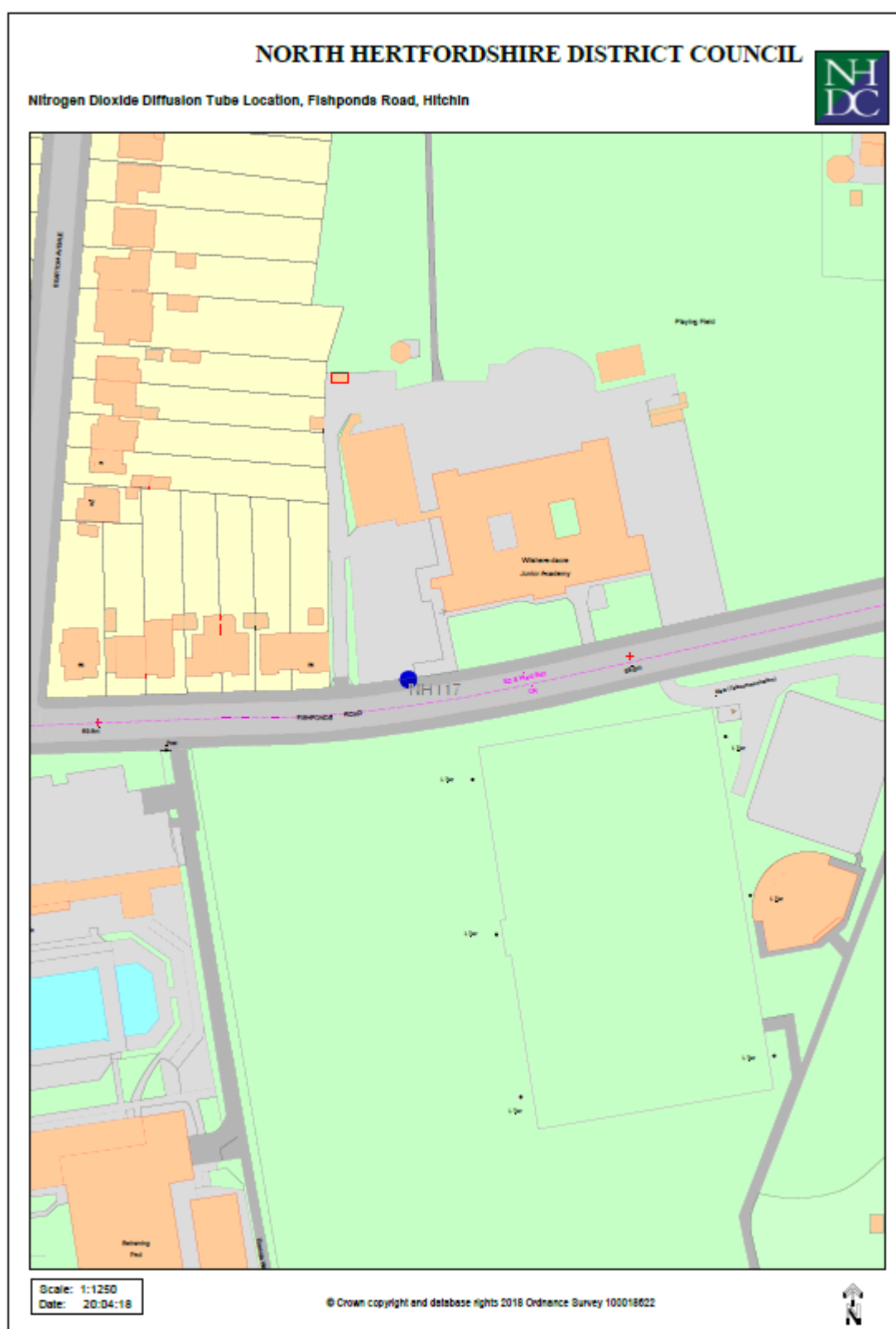


Figure D14: Diffusion Tube Monitoring Location (NH117) at Fishponds Road, Hitchin - 2017

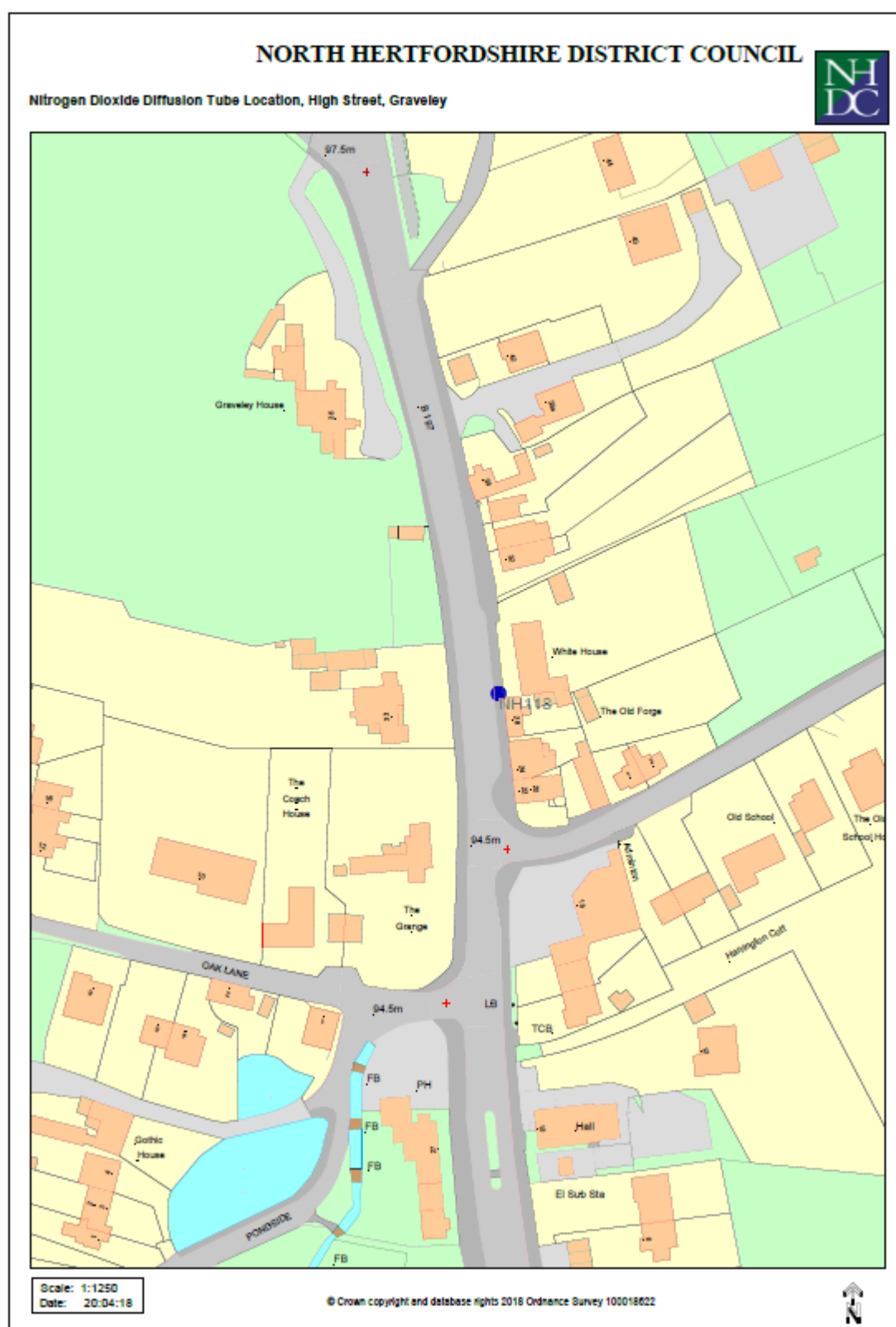


Figure D15: Diffusion Tube Monitoring Location (NH118) at High Street (27), Graveley – 2017

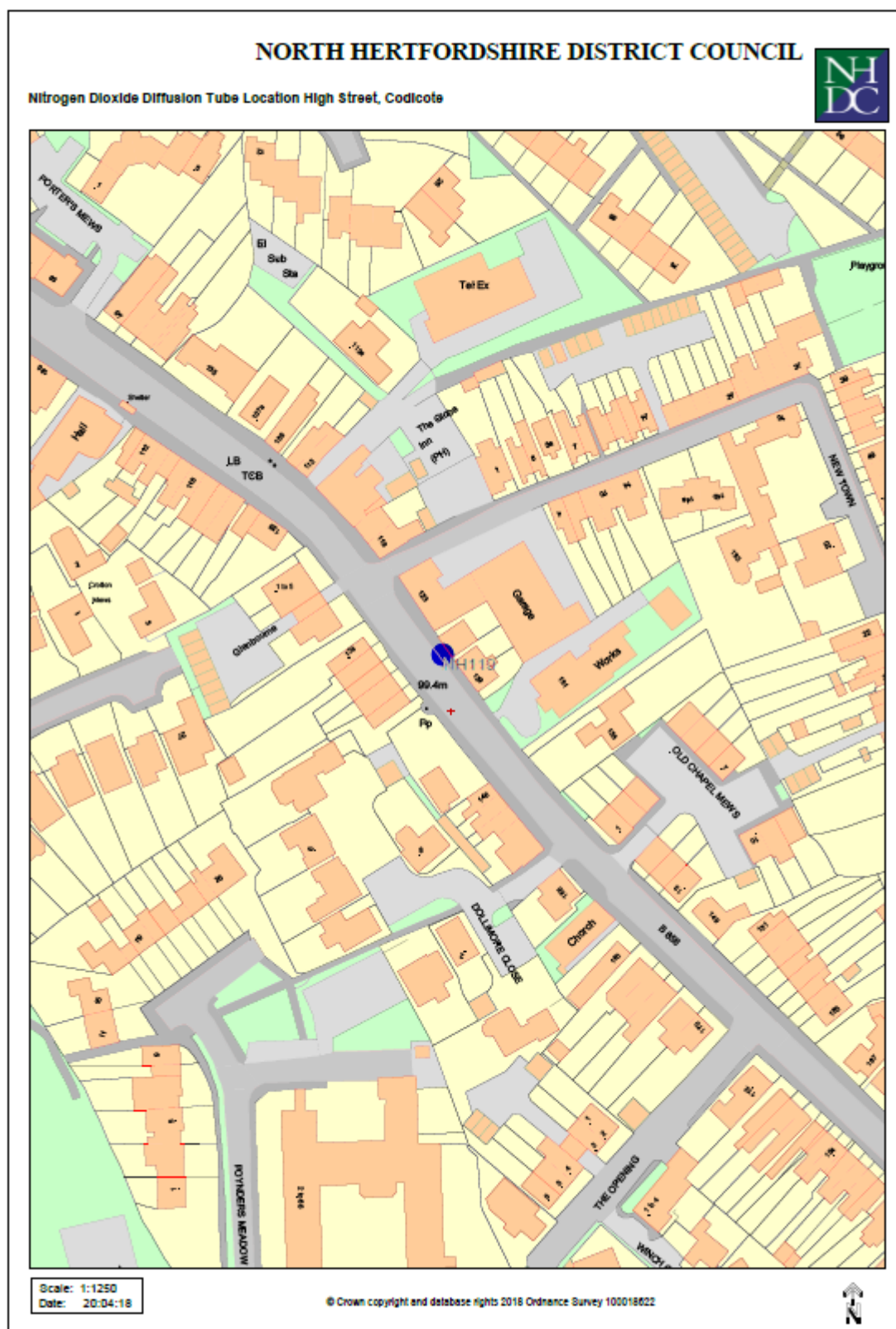


Figure D16: Diffusion Tube Monitoring Location (NH119) at High Street (125), Codicote - 2017

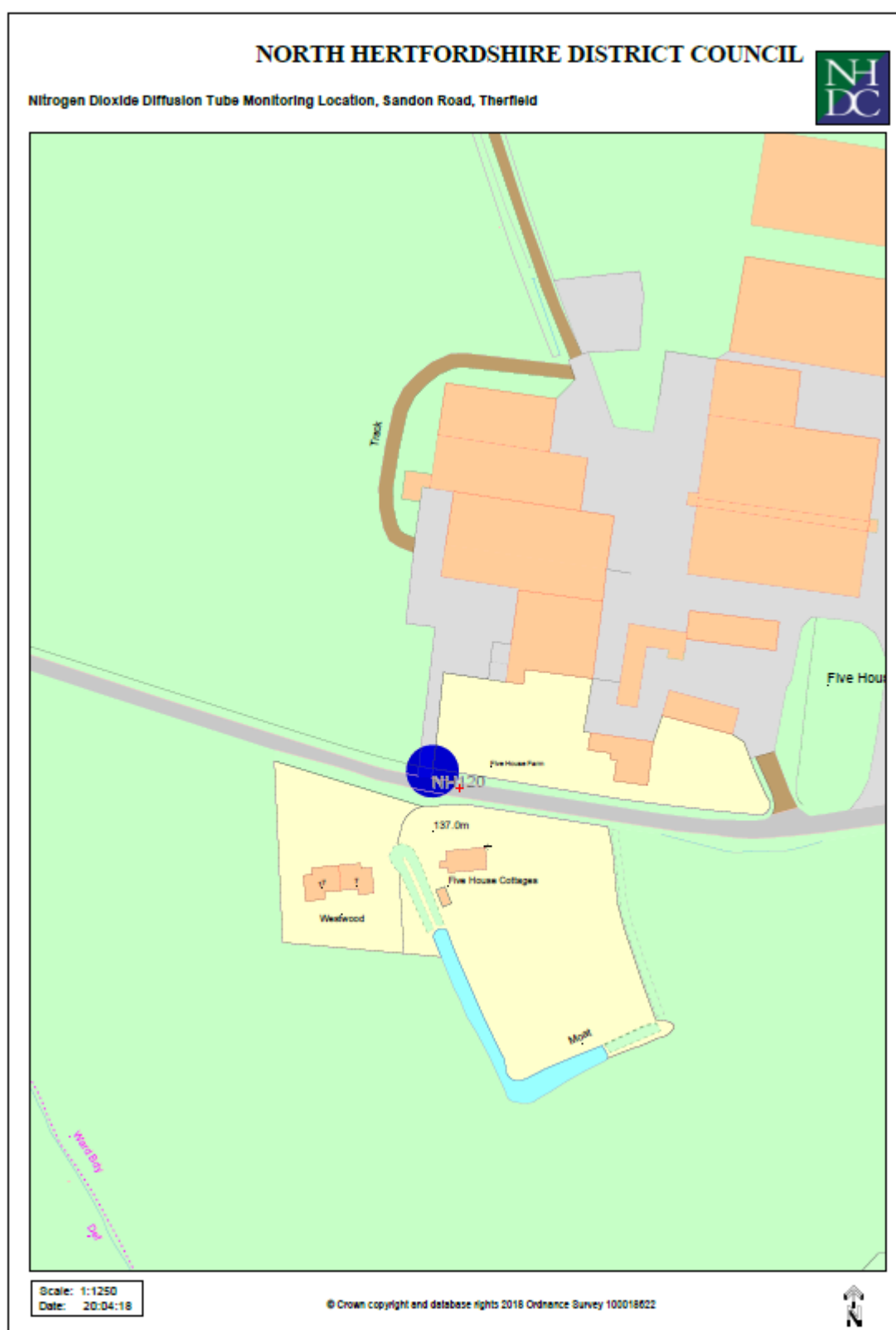


Figure D17: Diffusion Tube Monitoring Location (NH120) at Five House Farmhouse, Sandon Lane, Therfield - 2017

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

No additional references