



North Hertfordshire District Council

Progress Report 2014

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

May 2014

DOCUMENT INFORMATION

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Document Status and Approval Schedule

Issue	Status	Description	Prepared by	Reviewed by
0	Draft report	Prepared	David Carr 25/04/2014	Rory Cosgrove 20/05/2014
1	Final Report	Issued to DEFRA	David Carr 21/05/2014	Rory Cosgrove 21/05/2014

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	v
1. INTRODUCTION	1
1.1 DESCRIPTION OF LOCAL AUTHORITY AREA.....	1
1.2 PURPOSE OF PROGRESS REPORT	1
1.3 AIR QUALITY OBJECTIVES	2
1.4 SUMMARY OF PREVIOUS REVIEW AND ASSESSMENTS.....	3
2. NEW MONITORING DATA.....	5
2.1 SUMMARY OF MONITORING UNDERTAKEN	5
2.1.1 Automatic Monitoring Sites	5
2.1.2 Non-Automatic Monitoring Sites.....	8
2.2 COMPARISON OF MONITORING RESULTS WITH AIR QUALITY OBJECTIVES	11
2.2.1 <i>Nitrogen Dioxide</i>	11
2.2.2 <i>Automatic Monitoring Data</i>	11
2.2.3 <i>Non-automatic Monitoring Data</i>	12
2.2.4 Particulate Matter (PM ₁₀).....	16
2.2.5 Sulphur Dioxide.....	17
2.2.6 Benzene.....	17
2.2.7 Other Pollutants	18
2.2.8 Summary of Compliance with Air Quality Strategy Objectives.....	18
3. NEW LOCAL DEVELOPMENTS	18
3.1 ROAD TRAFFIC SOURCES.....	18
3.2 OTHER TRANSPORT SOURCES	18
3.3 INDUSTRIAL SOURCES	18
3.4 COMMERCIAL AND DOMESTIC SOURCES.....	19
3.5 NEW DEVELOPMENTS WITH FUGITIVE OR UNCONTROLLED SOURCES	19
4. LOCAL AIR QUALITY STRATEGY.....	19
5. PLANNING APPLICATIONS	19
6. AIR QUALITY PLANNING POLICIES.....	20
7. LOCAL TRANSPORT PLANS AND STRATEGIES.....	20
8. CLIMATE CHANGE STRATEGIES	20
9. IMPLEMENTATION OF ACTION PLANS	20
9.1 ACTION PLAN PROGRESS.....	20
10. CONCLUSIONS AND PROPOSED ACTIONS	27
10.1 CONCLUSIONS FROM NEW MONITORING DATA	27
10.2 CONCLUSIONS RELATING TO NEW LOCAL DEVELOPMENTS	27
10.3 PROPOSED ACTIONS.....	27
11. REFERENCES	28

APPENDICES

APPENDIX 1 Air Quality Management Area (AQMA)	29
APPENDIX 2 Quality Assurance / Quality Control (QA/QC).....	30
APPENDIX 3 Site Location Maps for Diffusion Tube Network.....	32
APPENDIX 4 Monthly Diffusion Tube Data.....	45
APPENDIX 5 Fall off in Nitrogen Dioxide Concentrations with Distance from Roads.....	46

FIGURES

Figure 1.	North Hertfordshire District	1
Figure 2.	Location of NO _x Automatic Monitoring Site, Stevenage Road, Hitchin	6
Figure 3.	Location of PM ₁₀ & NO _x Automatic Monitoring Site, Paynes Park, Hitchin	7
Figures A3.1 – A3.13	Location of Diffusion Tube Network (Appendix 3)	32

TABLES

Table 1.1	Air Quality Objectives for Local Air Quality Management in England	2
Table 1.2	Summary of Previous Review and Assessments	3
Table 2	Details of Automatic Monitoring Sites	8
Table 3	Details of Non-Automatic Monitoring Sites	10
Table 4	Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40µg/m ³) and Hourly Mean Objective (200µg/m ³)	11
Table 5	Results of Automatic Monitoring for Nitrogen Dioxide since 2010: Comparison with Annual Mean Objective (40µg/m ³)	12
Table 6	Results of Non-Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40µg/m ³)	13
Table 7	Results of Non-Automatic Monitoring for Nitrogen Dioxide in the Payne's Park area of Hitchin since 2010: Comparison with Annual Mean Objective (40µg/m ³)	14
Table 8	Results of Non-Automatic Monitoring for Nitrogen Dioxide in the Stevenage Road area of Hitchin since 2010: Comparison with Annual Mean Objective (40µg/m ³)	15
Table 9	Results of Non-Automatic Monitoring for Nitrogen Dioxide in Baldock since 2010: Comparison with Annual Mean Objective (40µg/m ³)	16
Table 10	Results of Automatic Monitoring for Particulate Matter: Comparison with Annual Mean Objective (40µg/m ³)	16
Table 11	Results of Automatic Monitoring for Particulate Matter: Comparison with 24-Hour Mean Objective (50µg/m ³)	17
Table 12	Results of Automatic Monitoring for Particulate Matter since 2010: Comparison with the Annual Mean Objective (40µg/m ³)	17
Table 13	Results of Automatic Monitoring for Particulate Matter since 2010: Number of days on which Daily Mean Objective (50µg/m ³) was exceeded	17

Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on Local Authorities to review and assess the air quality within their area and take account of the Government guidance when undertaking such work. This Progress Report is a requirement of the Fifth Round of the Local Authorities' Review and Assessment duties.

The Progress Report 2014 has been undertaken in accordance with Technical Guidance LAQM.TG(09) ⁽¹⁾.

The Progress Report 2014 provides an update on air quality issues for North Hertfordshire District Council after the 2013 Progress Report completed in May 2013 ⁽²⁾. It considers all new monitoring data and assesses the data against the Air Quality Objectives as well as considering any development changes that may have an impact on air quality and updating any relevant strategy and policy changes.

NHDC used automatic analysers to monitor for particulate matter (PM₁₀) and nitrogen dioxide (NO₂) in one location, Payne's Park/Upper Tilehouse Street (Hitchin Library) roundabout, Hitchin. It also used an automatic analyser to monitor NO₂ at a roadside location at Stevenage Road, Hitchin.

Accompanying the automatic analysers NHDC has a network of 37 diffusion tubes to measure NO₂ across the district.

The mean annual average air quality objective for NO₂ was exceeded at the following automatic analyser location and diffusion tube monitoring locations:

Automatic analyser:

- **Stevenage Road (A602), Hitchin** = (NH_stv)

Diffusion tubes:

- **Hitchin (A602)** = (NH45), (NH92), (NH103), (NH105), (NH106) Stevenage Road (Hitchin Hill Roundabout)
- **Hitchin (A505/A602)** = (NH93), (NH82), (NH77) Park Way / Upper Tilehouse Street (Payne's Park roundabout)

The data obtained from the NH93 location are sufficient to require a Detailed Assessment to be undertaken in that area because of the potential for the annual mean average air quality objective for NO₂ of 40µg/m³ to be exceeded at a relevant receptor, namely 41 Upper Tilehouse Street. A Detailed Assessment focussing on the Payne's Park area, specifically Park Way and Upper Tilehouse Street, to include dispersion modelling based on 2013 data will be completed and reported to Defra during 2014/15.

Despite showing an improvement in air quality during 2013 compared to 2012 and 2011 the data obtained from the Stevenage Road monitoring locations confirmed the relevance of a Stevenage Road Air Quality Management Area.

There was no evidence of the relevant air quality objectives for PM₁₀ being exceeded during 2013.

1. Introduction

1.1 Description of Local Authority Area

The district of North Hertfordshire is predominantly rural, covering 144.9 square miles, with the bulk of its 127,000 population (as estimated from the 2011 census) located in the four main centres of Hitchin, Letchworth, Baldock and Royston.

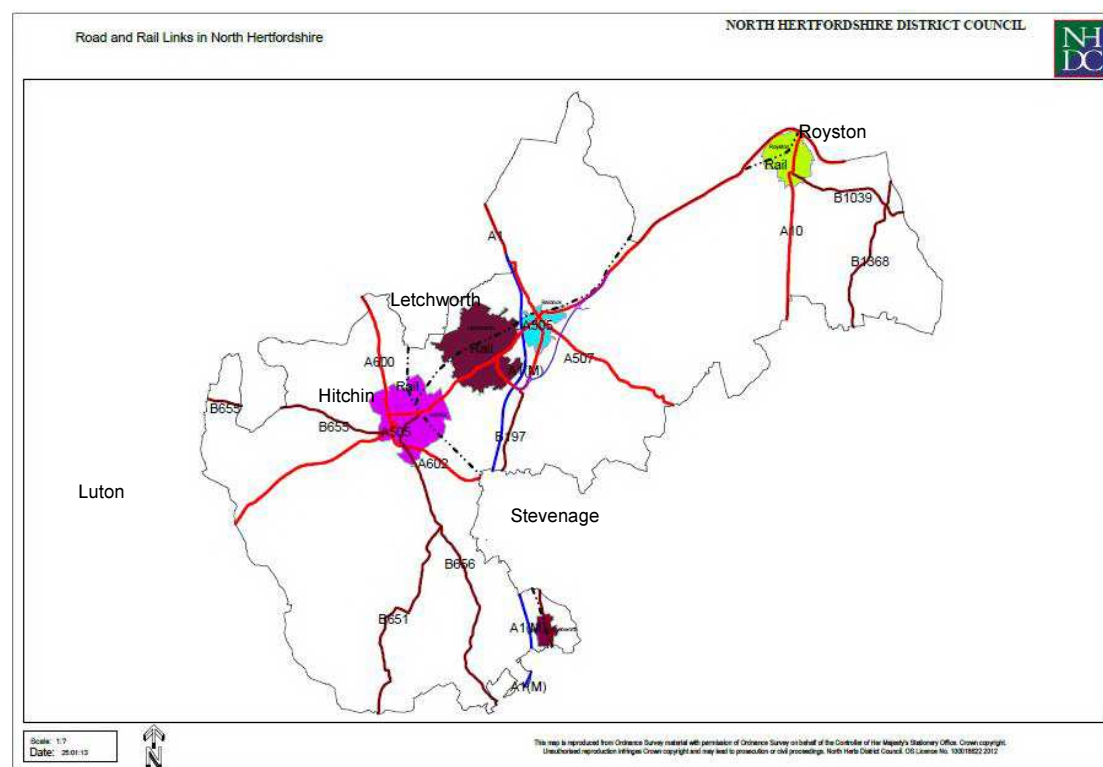


Figure 1: North Hertfordshire District

The main source of air pollution in the district is road traffic emissions from major roads notably the A1(M), A505, B656 and A602. In terms of traffic congestion the most significant locations are associated with the B656 through Baldock and the A602 and A505 through Hitchin.

Other pollution sources, including commercial, industrial and domestic sources will also contribute to background pollution concentrations.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment (USA) Reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports. However, if the Progress Report identifies the risk that an Air Quality Objective is being exceeded, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1 also includes the number of permitted exceedences in any year (where applicable).

Table 1.1 – Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Objective	Concentration measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	maximum daily running 8 hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1.2 summarises all previous local air quality management reports.

Table 1.2 Summary of Previous Review and Assessments

Round / Reports	Date	Description / Outcomes
1st Round	1999 – 2003	Assessments concluded that all pollutant levels complied with Air Quality Objectives (AQO).
2nd Round: USA Progress Reports	2003 2004 & 2005	AQO not exceeded. AQO not exceeded.
3rd Round: USA Detailed Assessment Progress Report	2006 2007 2008	Diffusion tube data indicated the annual NO ₂ AQO was exceeded at Stevenage Road, Hitchin, Payne's Park, Hitchin & Whitehorse Street, Baldock. Concluded that there was no evidence of a need for an Air Quality Management Area at the two Hitchin sites. But recommended enhancing the monitoring network in those areas. Concluded that NO ₂ concentrations at Whitehorse Street, Baldock would exceed the annual AQO, but that because of the Baldock By-Pass being opened in 2006 the decision about an AQMA should be postponed until its impact could be assessed. Due to low data capture at the three areas of concern it was not possible to provide conclusive evidence about whether AQO were exceeded.
4th Round: USA Detailed Assessment Progress Report Detailed Assessment	2009 2010 2011 2011	Concluded that NO ₂ data showed the annual AQO was exceeded at: <ul style="list-style-type: none"> - Whitehorse St, (B656) Baldock - Payne's Park (A505) roundabout, Hitchin - Stevenage Road/Hitchin Hill (A602), Hitchin - Nightingale Road (A505), Hitchin And that a Detailed Assessment was required for each area. Concluded that the AQO was not being exceeded in any of the 4 areas. However, DEFRA considered that the data collected was not robust enough to be confident of the conclusion and required NHDC to undertake another Detailed Assessment in 2011. Concluded that no new areas were at risk of AQO being exceeded. But confirmed that there was justification for a Detailed Assessment of the 4 areas previously identified as being at risk. Concluded that there was relevant exposure above the annual AQO for NO ₂ at properties on the south of Stevenage Road, Hitchin and that work to designate an AQMA should commence. Concluded that the AQO was not being exceeded at points of relevant exposure at Nightingale Road, Hitchin and the Payne's Park roundabout, Hitchin. Concluded that there was inconclusive evidence of the AQO being exceeded at Whitehorse Street, Baldock.

Table 1.2 Summary of Previous Review and Assessments (continued)

Round / Reports	Date	Description / Outcomes
4th Round (continued)	2011	In September 2011 DEFRA accepted the conclusions of the 2011 Detailed Assessment and advised NHDC to proceed with the process of designating an Air Quality Management Area at Stevenage Road.
5th Round USA	2012	Confirmed that there was relevant exposure above the annual AQO for NO ₂ at properties on the south side of Stevenage Road (A602), Hitchin within the AQMA. Identified a location of relevant exposure above the annual AQO for NO ₂ at Park Way (A602) on the Paynes Park roundabout, Hitchin; a location that had previously not been assessed as such.
Progress Report	2013	Reiterated the NO ₂ pollution issues identified in 2012 at Stevenage Road Hitchin and Park Way Hitchin.
AQMA Action Plan	2013	In support of the AQMA designation at Stevenage Road an Action Plan was finalised in September 2013

2. New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

NHDC had two automatic monitoring sites operating during 2013.

A NO_x analyser was located at Stevenage Road, (A602), Hitchin. (Figure 2). The analyser is a ML 8941B and has been collecting data from the 8th February 2013 and is still operating at the time of reporting.

On a fortnightly basis TRL staff carried out calibration visits and filter checks and changes of the analyser at Stevenage Road. The calibration readings are reported to Air Quality Data Management (AQDM) which is retained by NHDC to verify and ratify the data generated by the analyser. The ratification process is carried out to the Hertfordshire and Bedfordshire Air Quality Network (HBAQN) Standard, which is as per AURN recommended procedures. In addition TRL was engaged to undertake two services and on-site calibration (one minor service and one major service) visits in a year.

A Tapered Element Oscillating Measurement (TEOM) PM₁₀ analyser is located at the Paynes Park (Hitchin Library) roundabout site, (Park Way-A602, Upper Tilehouse Street-A505). (Figure 3). The analyser has been collecting data at that location since March 2010 and is still monitoring at the time of completion of this report.

Calibration visits and filter checks and changes were undertaken on a fortnightly basis by NHDC staff. In addition, TRL was 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 AQDM which is retained by NHDC to verify and ratify the data generated by the analyser. 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.

There is also a NO_x analyser located at the Paynes Park (Hitchin Library) roundabout site. (Figure 3). The analyser is an API M200A which was subject to calibration checks and filter checks and changes on a fortnightly basis by TRL staff. In addition TRL was employed to undertake an annual service/maintenance visit and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings were reported to AQDM which is retained by NHDC, as part of the larger Hertfordshire and Bedfordshire Air Quality Network, to verify and ratify the data generated by the analyser. The analyser operated for the whole year.

Additional Quality Assurance and Quality Control (QA/QC) information is included within Appendix 2.

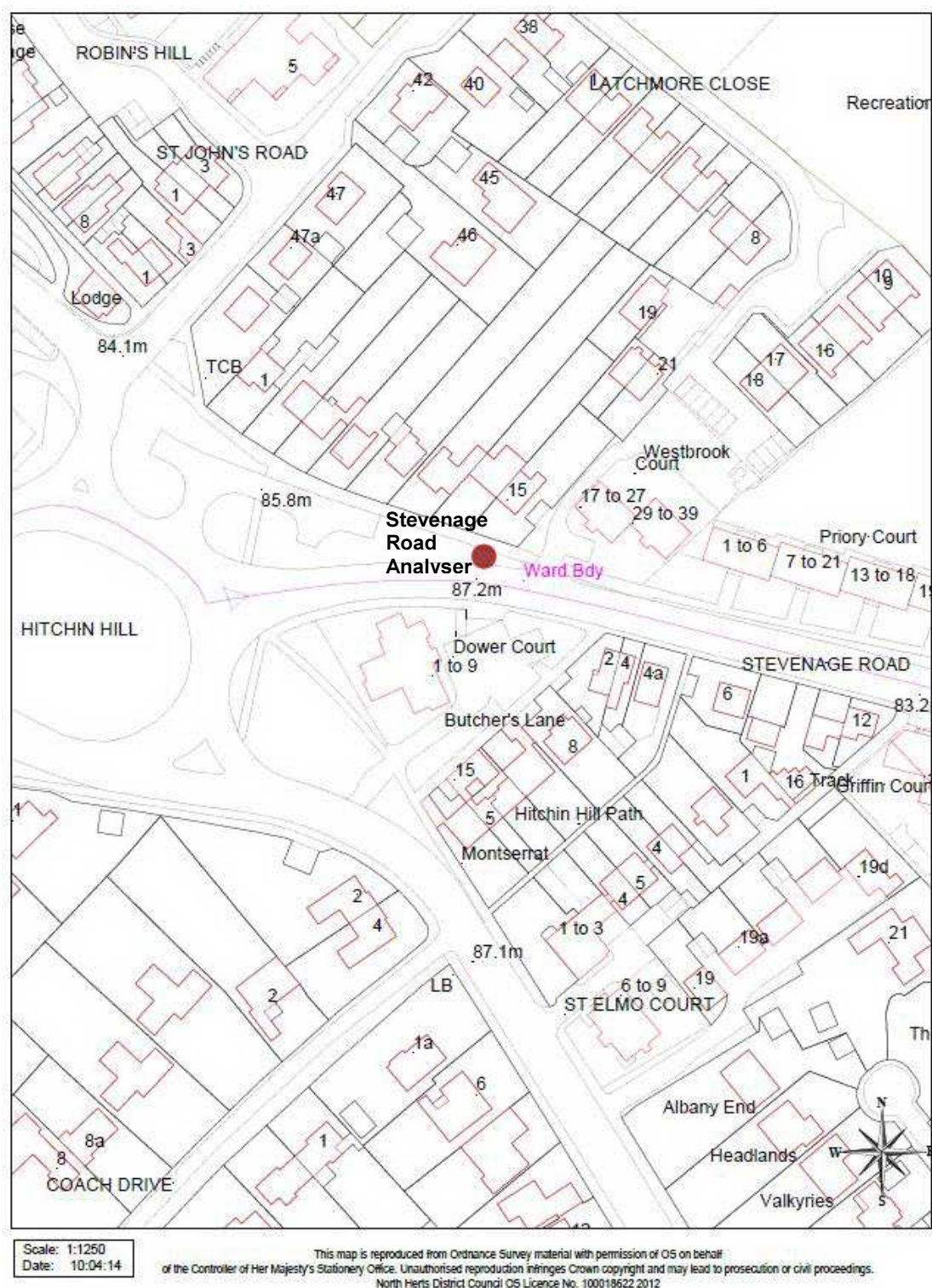


Figure 2: NOx Automatic Monitoring Site, Stevenage Road, Hitchin

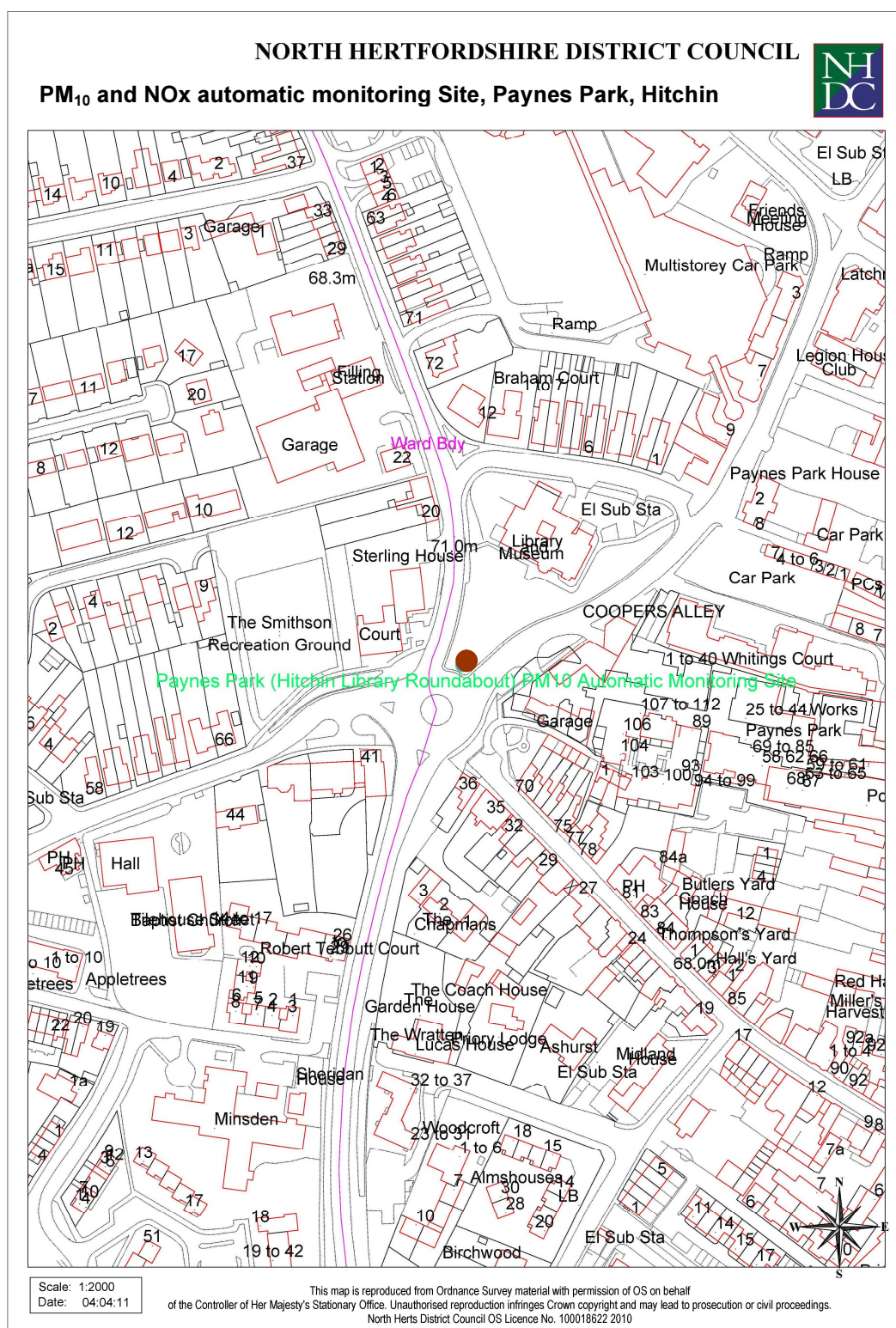


Figure 3: PM₁₀ and NO_x Automatic Monitoring Site, Paynes Park (Hitchin Library), Hitchin

Table 2: Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure	Distance to kerb of nearest road	Worst-case exposure
Paynes Park, Hitchin	Road -side	518161 229092	PM ₁₀	FDMS	No	Y (30m)	3m	N
			NO _x	Chemiluminescence				
Stevenage Road, Hitchin	Road -side	518740 228348	NO _x	Chemiluminescence	No	Y (12m)	2m	Y

2.1.2 Non-Automatic Monitoring Sites

NHDC undertakes monitoring with non-automatic methods using nitrogen dioxide (NO₂) diffusion tubes at a range of locations across the district. The diffusion tubes are 50% triethanolamine (TEA) in acetone and they are supplied and analysed by Environmental Services Group (ESG) at Harwell Scientific Services (HSS). ESG follows the procedures set out in the Harmonisation Practical Guidance. ESG also participates in the Workplace Analysis Scheme for Proficiency (WASP) and for the past five quarterly rounds received a Satisfactory rating.

No co-location study has been undertaken in the district. 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 2014 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 ESG for 2013 data was 0.80.

During 2013 NHDC had a network of 37 diffusion tubes and they are detailed in Table 3, with site location maps provided in Appendix 3. There was no change in the number of diffusion tubes from 2012, however, two locations were removed and two new locations were established.

The two diffusion tube locations that were removed were those located on Wilbury Hills Road, Letchworth, numbered NH101 and NH102. The reasons for the removal of the tubes were two-fold:

- the mean annual average concentrations recorded in 2011 were 28.7mg/m³ and 20.5mg/m³ and in 2012 were 26.5mg/m³ and 20.6mg/m³, all considerably below the 40mg/m³ objective
- the tubes had been located specifically to monitor the impact of a large railway line engineering project that occurred between 2011-2012 (the Hitchin Rail Curve / Flyover project). The project had initially planned to rely on the haulage of aggregate and earth by road into the area, but prior to project commencement it proved possible to source the material locally and avoid the need for significant road haulage. The engineering work was completed during 2013

The two new locations were selected to allow an assessment of the town centre area of Hitchin, an area that had previously not been considered for potential exposure to air pollution. Hitchin town centre is the largest town centre in the District and is a mixed retail and residential area, with further residential redevelopment likely. The locations selected for monitoring were on either side of Hermitage Road, NH109 located on the north side and NH108 on the south side.

Table 3: Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	In AQMA?	Relevant Exposure	Distance to kerb of nearest road	Worst-case exposure
Melbourn Rd, opp. Town Hall Royston (NH06)	Roadside	535906, 240794	Nitrogen Dioxide	No	Y (7m)	1.1m	N
The Brambles, Welwyn (NH100)	Roadside	524033, 217620	Nitrogen Dioxide	No	Y (8m)	20m	Y
Clothall Road, Baldock (NH59)	Roadside	524649, 234061	Nitrogen Dioxide	No	Y (11m)	3m	N
Hitchin St, nr Town Hall, Baldock (NH61)	Roadside	524428, 233882	Nitrogen Dioxide	No	Y (35m)	2m	Y
Hitchin St, nr Bus Stop, Baldock (NH70)	Roadside	524298, 233784	Nitrogen Dioxide	No	Y (1m)	3.5m	Y
Whitehorse St (nr Rose & Crown), Baldock (NH72)	Roadside	524502, 233948	Nitrogen Dioxide	No	Y (27m)	2m	Y
Church St, Baldock (NH88)	Kerbside	524448, 233898	Nitrogen Dioxide	No	Y (45m)	0.5m	Y
Hitchin – Hermitage Road 97 (NH108)	Kerbside	518534, 229302	Nitrogen Dioxide	No	Y (3m)	0.8m	Y
Hitchin – Hermitage Road 26 (NH109)	Roadside	518631, 223279	Nitrogen Dioxide	No	Y (0m)	3m	Y
Willian Rd, Hitchin (NH60)	Roadside	519916, 230099	Nitrogen Dioxide	No	Y (29m)	1.1m	N
Cadwell Court, Hitchin (NH67)	Roadside	519225, 230553	Nitrogen Dioxide	No	Y (12m)	2m	Y
Grove Rd, Hitchin (NH69)	Roadside	518821, 229993	Nitrogen Dioxide	No	Y (5m)	2m	Y
Walsworth Rd, Hitchin (NH86)	Roadside	519278, 229691	Nitrogen Dioxide	No	Y (5m)	3m	Y
Cambridge Rd (Station A), Hitchin (NH83)	Roadside	519366, 229806	Nitrogen Dioxide	No	Y (20m)	1m	Y
Cambridge Rd (Station B), Hitchin (NH84)	Roadside	519328, 229752	Nitrogen Dioxide	No	Y (12m)	1.3m	Y
Walsworth Rd/Radcliffe Rd, Hitchin (NH98)	Roadside	519080, 229510	Nitrogen Dioxide	No	Y (4m)	1.5m	Y
Nightingale Rd, Hitchin (NH99)	Roadside	518953, 229786	Nitrogen Dioxide	No	Y (5m)	1.7m	Y
West Hill, Hitchin (NH78)	Roadside	518099, 229229	Nitrogen Dioxide	No	Y (4m)	2m	Y
Hitchin Library, Hitchin (NH63)	Roadside	518160, 229092	Nitrogen Dioxide	No	Y (30m)	3.5m	N
Upper Tilehouse St (crossing) Hitchin (NH77)	Roadside	518006, 229032	Nitrogen Dioxide	No	Y (5m)	1.5m	Y
Upper Tilehouse St (roundabout) Hitchin (NH82)	Roadside	518129, 229065	Nitrogen Dioxide	No	Y (7m)	1.5m	Y
Pirton Road, Hitchin (NH95)	Roadside	517886, 228975	Nitrogen Dioxide	No	Y (22m)	1.3m	Y
Offley Road, Hitchin (NH94)	Roadside	517915, 228967	Nitrogen Dioxide	No	Y (7m)	2.3m	Y
Park Way, Hitchin (NH93)	Roadside	518130, 229036	Nitrogen Dioxide	No	Y (3m)	1.6m	Y
Queen Street, Hitchin (NH97)	Roadside	518666, 229149	Nitrogen Dioxide	No	Y (4m)	1.7m	Y
Park Street, Hitchin (NH96)	Roadside	518417, 228624	Nitrogen Dioxide	No	Y (1m)	1.8m	Y
St John's Road, Hitchin (NH91)	Roadside	518656, 228406	Nitrogen Dioxide	No	Y (5m)	7.9m	Y
London Road, Hitchin (NH89)	Roadside	518706, 228293	Nitrogen Dioxide	No	Y (20m)	1.9m	Y
Gosmore Road, Hitchin (NH90)	Roadside	518593, 228304	Nitrogen Dioxide	No	Y (20m)	2.2m	Y
Stevenage Rd (A), Hitchin (NH45)	Roadside	518708, 228347	Nitrogen Dioxide	Yes	Y (19m)	2m	Y
Dower Crt (A), Stevenage Rd, Hitchin (NH104)	Roadside	518757, 228334	Nitrogen Dioxide	Yes	Y (0m)	3.3m	Y
11 Stevenage Rd, Hitchin (NH87)	Roadside	518731, 228362	Nitrogen Dioxide	No	Y (0m)	15m	Y
Westbrook Court, Hitchin (NH103)	Roadside	518773, 228342	Nitrogen Dioxide	Yes	Y (10m)	2.4m	Y
Stevenage Rd (Griffin Court), Hitchin (NH92)	Roadside	518872, 228305	Nitrogen Dioxide	Yes	Y (5m)	2m	Y
94-98 Stevenage Road, Hitchin (NH105)	Roadside	519067, 228255	Nitrogen Dioxide	Yes	Y (7m)	3.5m	Y
Morello Gardens, Stevenage Rd, Hitchin (NH106)	Roadside	519250, 228218	Nitrogen Dioxide	No	Y (5m)	1.4m	Y
Whitehill Road, Hitchin (NH107)	Roadside	518720, 228335	Nitrogen Dioxide	No	Y (26m)	2.3m	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

NHDC monitors nitrogen dioxide (NO₂) and particulate matter (PM₁₀) and the monitoring data collected during 2013 are summarised in this Progress Report.

2.2.1 Nitrogen Dioxide

NHDC uses diffusion tubes (37 locations) to provide annual averaged (bias corrected) concentrations of NO₂ within the district and at two locations automatic (chemiluminescence) monitors were used.

Data from the following locations have confirmed potential public exposure to NO₂ above the relevant Air Quality Objectives (AQO) and these areas have been subject to some additional assessment later in this section.

- Hitchin(A505/A602) = (NH77), (NH82), (NH93) Payne's Park & Upper Tilehouse Street
- Hitchin(A602) = (NH45), (NH92), (NH103), (NH105), (NH106) & the Stevenage Road automatic analyser all located on Stevenage Road

2.2.2 Automatic Monitoring Data

The NO_x analyser was located in a roadside cabinet on Stevenage Road (A602) Hitchin and is considered a roadside monitoring site (NH_stv). During the 2013 monitoring period the analyser was operating between 8th February 2013 and the 31st December 2013. Previously a NO_x analyser had been positioned in an almost identical location at Stevenage Road, Hitchin between April 2010 and September 2011.

The other NO_x analyser is located at the Payne's Park roundabout, (A505/A602), Hitchin, within a roadside enclosure. The monitoring site (NH6) is considered to be a roadside site and it collected data for the duration of 2013, having started collecting data in April 2011.

Table 4: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40 µg/m³) and Hourly Mean Objective (200 µg/m³)

Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for monitoring period ^a %	Data capture for full calendar year 2013 ^b %	Annual Mean Concentration ^c (µg/m ³)	No. of Exceedences of hourly mean ^d (µg/m ³)
NH_stv	Stevenage Road, Hitchin	Yes	Yes	97.2	87.2	46	1 (170µg/m ³)
NH6	Hitchin Library Payne's Park	No	Yes	96.1	96.1	35	0

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. 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 would be 50%)

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year (only annualised if between 6 and 9 months data were collected)

^d If the period of valid data is less than 90% of a full year, include the 99.8% percentile of hourly means in brackets.

The data capture for the Stevenage Road analyser was below the target of 90% for the full calendar but this was due to a delay in the commissioning of the monitoring station at the start of 2013. Once operational the data capture was 97.2%. There were no data capture issues at the Hitchin Library site.

Table 4 shows that the annual mean air quality objective for NO₂ of 40µg/m³ was exceeded (46µg/m³) at the Stevenage Road automatic monitoring site.

It also shows that the 1 hour mean NO₂ air quality objective of 200µg/m³ was exceeded at the Stevenage Road site on one occasion during 2013. However, up to 18 such exceedences are permitted within a calendar year, so the Stevenage Road site does not breach the 1 hour mean objective for NO₂. But, as a result of a data capture rate of less than 90% for 2013 it is necessary to assess whether it is statistically likely that 18 exceedences would have been recorded had the whole calendar year been monitored. The 99.8th percentile of the data set is calculated for this reason and if the value reported is greater than the 1 hour mean air quality objective of 200µg/m³ then it is assumed that 18 exceedences would have been recorded. At the Stevenage Road site the 99.8th percentile was calculated as 170µg/m³ which below the 200µg/m³ objective.

For the Hitchin Library automatic analyser monitoring site Table 4 indicates that the annual mean air quality objective of 40µg/m³ was not exceeded.

Table 4 also shows that the 1hour mean NO₂ concentration of 200µg/m³ was not exceeded at the Hitchin Library site.

Table 5, summarises the annual mean NO₂ concentrations measured at the automatic monitoring sites over a number of years.

Table 5: Results of Automatic Monitoring for Nitrogen Dioxide since 2011: Comparison with Annual Mean Objective (40 µg/m³)

Site ID	Site Location	Annual Mean Concentration (µg/m ³)			
		2010	2011	2012	2013
NH_stv	Stevenage Road, Hitchin	52.4 (a)	47.5 (a)	No data	46
NH6	Hitchin Library, Payne's Park	No data	35	36	35

(a) = "annualised" mean in line with as in Box 3.2 of TG(09), because monitoring was carried out for less than 9 months of the year (See Section 3. of Appendix 2. p.27)

The data collected at the Stevenage Road, Hitchin site demonstrates that the exceedence of the 40µg/m³ annual mean air quality objective is consistent, albeit that there appears to be downward trend in the concentrations.

For the three years that NO₂ has been monitored at the Hitchin Library (NH6) site the air quality objective has not been exceeded and the concentrations measured have remained unchanged.

2.2.3 Non-automatic Monitoring Data

Thirty-seven diffusion tube monitoring locations were in use during 2013. The majority were positioned in areas of Hitchin (thirty tubes) and five tubes were located in Baldock. One tube was located by a main road in Royston and another tube in a residential street located close to the A1(M).

Table 6 summarises those data. All data presented have been bias adjusted, but because of adequate tube collection there was no need for any of the data to be annualised. The bias adjustment factor for 2013 was 0.80.

The data summarised in Table 6 are fully reported in Appendix 4.

Table 6: Results of Non-Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40 µg/m³)

Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for 2013 monitoring period ^a %	Data capture full calendar yr 2013 ^b %	2013 Annual Mean Concentration ^c (µg/m ³)
NH81	Melbourn Rd, Royston	No	Y (7m)	100	100	29.7
NH100	The Brambles, Welwyn	No	Y (8m)	100	100	28.0
NH59	Clothall Road, Baldock	No	Y (11m)	100	100	30.6
NH61	Hitchin St, nr Town Hall, Baldock	No	Y (35m)	100	100	35.1
NH70	Hitchin St, nr Bus Stop, Baldock	No	Y (1m)	100	100	27.4
NH72	Whitehorse St (nr. Rose & Crown), Baldock	No	Y (27m)	100	100	31.8
NH88	Church St, Baldock	No	Y (45m)	92	92	38.4
NH108	Hitchin – Hermitage Road (97)	No	Y (3m)	100	100	28.0
NH109	Hitchin – Hermitage Road (26)	No	Y (0m)	92	92	36.5
NH60	Willian Rd, Hitchin	No	Y (29m)	92	92	31.5
NH67	Cadwell Court, Hitchin	No	Y (12m)	83	83	28.9
NH69	(64) Grove Rd, Hitchin	No	Y (5m)	75	75	32.2
NH86	Walsworth Rd, Hitchin	No	Y (5m)	83	83	27.5
NH83	Cambridge Rd (Station A), Hitchin	No	Y (20m)	92	92	32.9
NH84	Cambridge Rd (Station B), Hitchin	No	Y (12m)	100	100	37.3
NH98	Walsworth/Radcliffe Rd, Hitchin	No	Y (4m)	92	92	32.7
NH99	Nightingale Rd, Hitchin	No	Y (5m)	92	92	32.2
NH78	West Hill, Hitchin	No	Y (4m)	92	92	29.0
NH63	Hitchin Library, Hitchin	No	Y (30m)	100	100	36.6
NH77	Upper Tilehouse St (crossing) Hitchin	No	Y (5m)	100	100	42.0
NH82	Upper Tilehouse St (roundabout) Hitchin	No	Y (7m)	100	100	40.3
NH95	Pirton Rd, Hitchin	No	Y (22m)	100	100	33.2
NH94	Offley Rd, Hitchin	No	Y (7m)	100	100	36.0
NH93	Park Way, Hitchin	No	Y (3m)	100	100	52.1
NH97	Queen St, Hitchin	No	Y (4m)	100	100	30.8
NH96	Park St, Hitchin	No	Y (1m)	100	100	34.5
NH91	St John's Rd, Hitchin	No	Y (5m)	100	100	32.0
NH89	London Rd, Hitchin	No	Y (20m)	100	100	28.4
NH90	Gosmore Rd, Hitchin	No	Y (20m)	100	100	27.7
NH45	Stevenage Rd (A), Hitchin	Yes	Y (19m)	100	100	42.0
NH104	Dower Crt (A) Stevenage Rd, Hitchin	Yes	Y (0m)	100	100	31.5
NH87	11 Stevenage Rd, Hitchin	No	Y (0m)	100	100	27.9
NH103	Westbrook Court, Stevenage Rd, Hitchin	Yes	Y (10m)	100	100	41.7
NH92	Stevenage Rd (Griffin Court) Hitchin	Yes	Y (5m)	100	100	47.6
NH105	94-98 Stevenage Rd, Hitchin	Yes	Y (7m)	92	92	47.0
NH106	Morello Gardens, Stevenage Rd, Hitchin	No	Y (5m)	100	100	44.6
NH107	Whitehill Rd, Hitchin	No	Y (26m)	100	100	29.4

^a data capture for monitoring period, in cases where monitoring was only carried out for part of the year.^b data capture for full calendar year (e.g. if monitoring was undertaken for 6 months max data capture would be 50%)^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year

Tables 7 and 8 show that there are eight locations across the district where the diffusion tube results demonstrated that the annual mean NO₂ concentrations exceeded the 40µg/m³ air quality objective. These monitoring locations can be geographically grouped as below and a brief discussion about each area follows as does, where there are sufficient data, a summary of the trends in concentrations measured.

- **Hitchin (A505/A602)**= (NH77), (NH82) (NH93) Upper Tilehouse Street, Payne's Park/Park Way (Table 7).
- **Hitchin (A602)** = (NH45), (NH92), (NH103), (NH105), (NH106) Stevenage Road (Table 8).

Hitchin (A505/A602) Upper Tilehouse Street, Payne's Park/Park Way

Table 7: Results of Non-Automatic Monitoring for Nitrogen Dioxide at or near Payne's Park and Upper Tilehouse Street, Hitchin, since 2010

Site ID	Site Location	Annual Mean Concentration (µg/m ³) (bias adjusted)			
		2010	2011	2012	2013
NH63	Hitchin Library, Payne's Park	44.0	43.9	39.4	36.6
NH93	Park Way	no data	53.1	54.8	52.1
NH82	Upper Tilehouse Street (roundabout)	44.4	42.8	40.4	40.3
NH77	Upper Tilehouse Street (traffic light crossing)	48.7	44.4	39.5	42.0
NH94	Offley Road	no data	35.6	36.5	36.0
NH95	Pirton Road	no data	33.6	32.2	33.2

2010 bias adjustment factor = 0.85

2011 bias adjustment factor = 0.84

2012 bias adjustment factor = 0.79

2013 bias adjustment factor = 0.80

The data in Table 7 indicate that there is a downward trend in annual mean NO₂ concentrations being detected since a 2010. The exception is at the Park Way monitoring location (**NH93**), which was not present in 2010 and which recorded its highest annual average concentration in 2012. On average a decline of 13% in NO₂ concentrations was recorded across NH63, NH77 and NH82 between 2010 and 2013. In 2013 annual average concentrations were higher at Pirton Road (**NH95**) and Upper Tilehouse Street (**NH77**) compared to 2012, but nonetheless the concentrations were lower than those measured in 2010.

The highest annual mean average NO₂ concentration in this area has been consistently recorded by diffusion tube **NH93**. The tube is located 1.6m from the kerb on the western side of the A602 (Park Way), on the approach to the Payne's Park roundabout. The nearest receptor is 3m from the kerb.

The procedure specified in Box 2.3 of TG(09) has been applied to the 2013 annual mean of **52.1µg/m³** from **NH93** and generates an annual mean concentration of **47.3µg/m³** at the nearest relevant public receptor (Appendix 5). When the same procedure was run on the 2012 data from NH93, in the 2013 Progress Report ⁽²⁾, the annual mean concentration at the same receptor was **46.3µg/m³** and in 2011, as reported in the 2012 USA Report ⁽³⁾, was **44.2µg/m³**. As such there are sufficient data to demonstrate that the air quality objective for NO₂ as an annual average is being exceeded at one residential property in this area of Hitchin.

The only other NO₂ concentrations recorded in that area of Hitchin that warranted the application of the Box 2.3 procedure was that recorded at NH77. Appendix 5 contains

the calculation and it produces an annual mean concentration of **35.7µg/m³** at the nearest public receptor.

Hitchin (A602) Stevenage Road (Hitchin Hill Roundabout)

Table 8: Results of Non-Automatic Monitoring for Nitrogen Dioxide in south Hitchin, since 2010: Comparison with Annual Mean Objective (40 µg/m³)

Site ID	Site Location	Annual Mean Concentration (µg/m ³) (bias adjusted)			
		2010	2011	2012	2013
NH107	Whitehill Road	no data	no data	30.8	29.4
NH106	Morello Gardens, Stevenage Road	no data	no data	43.5	44.6
NH105	94-98 Stevenage Road	no data	no data	45.8	47.0
NH92	Stevenage Road (Griffin Court)	no data	53.5	51.1	47.6
NH103	Westbrook Court, Stevenage Road	no data	no data	43.6	41.7
NH87	11 Stevenage Road	no data	30.8	29.2	27.9
NH104	Dower Court (A), Stevenage Road	no data	no data	33.9	31.5
NH45	Stevenage Road (A)	49.1	48.9	46.3	42.0

2010 bias adjustment factor = 0.85

2012 bias adjustment factor = 0.79

2011 bias adjustment factor = 0.84

2013 bias adjustment factor = 0.80

For the 5 diffusion tubes located furthest west on Stevenage Road the data in Table 8 show a downward trend in the annual mean NO₂ concentrations measured since 2010/2011. At the locations further east on Stevenage Road, the 2013 data show slightly higher concentrations of NO₂ compared to the 2012 concentrations at two of the three monitoring locations. The data available are limited so drawing any conclusions as to a definitive trend in NO₂ concentrations is not sensible at this stage.

Five of the eight monitoring locations produced annual mean average NO₂ concentrations that were above the air quality objective.

The highest annual mean average NO₂ concentration recorded in 2013 in this area was **47.6µg/m³** from diffusion tube **NH92**. The tube is located 2m from the kerb on the southern side of the A602 (Stevenage Road), on the approach to the Hitchin Hill roundabout. The nearest receptor is 5m to the south of the diffusion tube.

The procedure specified in Box 2.3 of TG(09) has been applied to the 2013 annual mean of **47.6µg/m³** from **NH92** and results in an annual mean concentration of **40.8µg/m³** at the nearest relevant receptor (Appendix 5). When the same procedure was run on the 2012 data from NH92, in the 2013 Progress Report ⁽²⁾, the annual mean concentration at the same receptor was **43.7µg/m³**. The data would appear to demonstrate that the air quality objective for NO₂ as an annual average is being exceeded at residential properties in this area of Hitchin. This supports the designation of an Air Quality Management Area (AQMA) along the southern side of Stevenage Road, Hitchin.

The procedure specified in Box 2.3 of TG(09) was also applied to the data from the other diffusion tubes (NH105 and NH106) on south side of Stevenage Road that recorded 2013 NO₂ concentrations above the relevant air quality objective. The calculated drop off in NO₂ concentrations was such that concentrations of between 37.8µg/m³ and 35.2µg/m³ would be expected at the nearest relevant (Appendix 5).

The concentration measured by the diffusion tube (NH104) located on the down-pipe at the façade of Dower Court was 31.5µg/m³, which suggests that the air quality

objective is not being exceeded at properties immediately fronting the Hitchin Hill roundabout.

Once the procedure specified in Box 2.3 of TG(09) is applied to the data from diffusion tubes NH45 and NH103, $27.7\mu\text{g}/\text{m}^3$ and $31.4\mu\text{g}/\text{m}^3$ are calculated at the nearest receptors. This supports the decision not to extend the AQMA to include the properties on the northern side of Stevenage Road (Appendix 5). The diffusion tube (NH87) located on the down-pipe of 11 Stevenage Road measured $27.9\mu\text{g}/\text{m}^3$ which is comparable to the calculated concentrations.

Baldock (B656) Hitchin Street/Whitehouse Street

Table 9 contains data from the past few years from diffusion tubes located alongside the B656 where it passes through Baldock. This is included because in previous years the annual mean nitrogen dioxide objective had been exceeded.

Table 9: Results of Non-Automatic Monitoring for Nitrogen Dioxide in Baldock since 2010: Comparison with Annual Mean Objective ($40\mu\text{g}/\text{m}^3$)

Site ID	Site Location	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) (bias adjusted)			
		2010	2011	2012	2013
NH59	Clothall Road	32.2	31.7	31.1	30.6
NH72	Whitehorse Street (nr Rose & Crown)	42.1	38.2	36.9	31.8
NH61	Hitchin Street (nr Town Hall)	43.6	36.1	36.3	35.1
NH88	Church Street	50.7	48.8	44.4	38.4
NH70	Hitchin Street (nr bus stop)	30.9	30.0	28.2	27.4

2010 bias adjustment factor = 0.85

2012 bias adjustment factor = 0.79

2011 bias adjustment factor = 0.84

2013 bias adjustment factor = 0.80

The data in Table 9 show that the annual mean NO_2 concentrations declined consistently. Looking specifically at the three tubes that measured exceedences in 2010 an average reduction of 19% has been measured between 2010 and 2013. In 2013 there were no locations where the air quality objective.

2.2.4 Particulate Matter (PM_{10})

NHDC monitors PM_{10} using a TEOM automatic monitor (reference NH6) that is located by the Hitchin Library (Payne's Park) A602/A505 roundabout. The data indicates that no relevant air quality objective is being exceeded in that area.

A Rupprecht and Patashnick 1400a TEOM is located in a roadside housing positioned in the grounds of Hitchin Library close to the A602/A505 roundabout. The site is a roadside site and began collecting data in March 2010.

Table 10: Results of Automatic Monitoring for PM_{10} : Comparison with Annual Mean Objective ($40\mu\text{g}/\text{m}^3$)

Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for monitoring period ^a %	Data capture for full calendar year 2013 ^b %	Annual Mean Concentration ^c ($\mu\text{g}/\text{m}^3$)
NH6	Hitchin Library Roundabout	No	Yes	99.2	99.2	23

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. 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 would be 50%)

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year

The data in Table 11 shows that the annual mean concentration of PM₁₀ is less than the Air Quality Objective of 40µg/m³.

Table 11: Results of Automatic Monitoring for PM₁₀: Comparison with 24-Hour Mean Objective (50 µg/m³)

Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for monitoring period ^a %	Data capture for full calendar year 2012 ^b %	Number of exceedences of daily mean objective (50µg/m ³) If data capture <90% include the 90%ile of daily mean in brackets
NH6	Hitchin Library Roundabout	No	Yes	99.2	99.2	6

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. 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 would be 50%)

The data in Table 11 show that there were 6 instances of the daily mean objective of 50µg/m³ having been exceeded, but the air quality objective allows for up to 35 such occasions over a year.

Tables 12 and 13 display the PM₁₀ data collected between 2010 and 2013 from the NH6 sampling location.

Table 12: Results of Automatic Monitoring for Particulate Matter (PM₁₀) since 2010: Comparison with Annual Mean Objective (40 µg/m³)

Site ID	Site Location	Annual Mean Concentration (µg/m ³) (bias adjusted)			
		2010	2011	2012	2013
NH6	Hitchin Library, Payne's Park	22	26	24	23

Table 13: Results of Automatic Monitoring for Particulate Matter (PM₁₀) since 2010: Number of Days on which the Daily Mean Objective (50 µg/m³) was exceeded

Site ID	Site Location	Annual Mean Concentration (µg/m ³) (bias adjusted)			
		2010	2011	2012	2013
NH6	Hitchin Library, Payne's Park	0	19	13	6

The data show a consistent situation with regard to concentrations of PM₁₀ and the absence of a breach of either of the air quality objectives.

The volatile correction model (VCM) has been applied to all results obtained from the TEOM. This model allows the correction of TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by the instrument. The resulting corrected measurements have been demonstrated as equal to the gravimetric equivalent. AQDM has applied the VCM to all PM₁₀ data listed in this document.

2.2.5 Sulphur Dioxide

NHDC does not monitor sulphur dioxide.

2.2.6 Benzene

NHDC does not monitor benzene.

2.2.7 Other Pollutants

NHDC does not monitor any other air pollutants.

2.2.8 Summary of Compliance with Air Quality Strategy Objectives

NHDC has measured concentrations of NO₂ above the annual mean objective at relevant locations in the following areas.

- **Payne's Park Roundabout, Hitchin (A505/A602) (Tube NH93)**

This location was highlighted in the 2012 USA ⁽³⁾ and the 2013 Progress Report ⁽²⁾ as a potential air pollution area, based on the 2011 and 2012 data from the NH93 tubes. There is now three years worth of consistent data indicating that the annual mean objective is being exceeded and this is sufficient to necessitate the commissioning of a detailed air quality assessment of the area.

- **Stevenage Road, Hitchin (A602) (Tubes NH92)**

This location is within the AQMA that was designated along the southern side of Stevenage Road in July 2012. The data confirms the decision to designate the AQMA.

3. New Local Developments

3.1 Road Traffic Sources

NHDC has not identified any of the following since the last Review and Assessment Report, which was the 2013 Progress Report:

- Narrow congested streets with residential properties close to the kerb.
- Busy Streets where people spend one hour or more close to traffic
- New Junctions
- New Roads constructed or proposed
- Roads with significantly changed traffic flows
- Bus or coach stations

3.2 Other Transport Sources

NHDC has not identified any of the following since the 2013 Progress Report.

- Airports (**See Section 5**)
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential relevant exposure within 15m
- Locations with a large number of movements of diesel locomotives and potential for long-term exposure within 30m
- Ports for shipping

3.3 Industrial Sources

NHDC has not identified any of the following since the 2013 Progress Report.

- Industrial installations: new or proposed for which an air quality assessment has been carried out.
- Industrial installations: existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- Major fuel storage depots storing petrol
- Petrol stations
- Poultry farms

3.4 Commercial and Domestic Sources

NHDC has not identified any new commercial or domestic sources since the 2013 Progress Report.

3.5 New Developments with Fugitive or Uncontrolled Sources

NHDC has not identified any new fugitive or uncontrolled sources since the 2013 Progress Report.

4. Local Air Quality Strategy

NHDC is a member of the Hertfordshire and Bedfordshire Air Quality Network <http://www.hertsbedsair.net>.

NHDC does not have a Local Air Quality Strategy.

5. Planning Applications

There have been no recently permitted sites that have been significant enough developments to require air quality assessments.

There are no developments that are currently underway that were required to be supported by air quality assessments.

The only noteworthy planning application is that for an expansion of Luton Airport, which NHDC was consulted on as a neighbouring authority by the local planning authority at Luton Borough Council.

Luton Airport is located within 1,500m of the village of Breachwood Green in the south west of the district of North Hertfordshire and currently has a capacity of 10million passengers per annum. The main road access to the airport is identified by Luton Airport as the M1 and, from the east, the A602 and A505 road network, which passes through the south of the district of North Hertfordshire, including Hitchin.

The planning application is for an expansion of the airport to accommodate an increase in capacity to 18million passengers per annum by 2028.

An Environmental Statement was completed by the applicants in support of their application and that document included a traffic assessment and an air quality assessment. However, neither assessment considered the impact of the proposed development on the district of North Hertfordshire, despite the A505/A602 road network through the south of Hitchin, which includes the Stevenage Road AQMA, having been identified within the planning application as a main route of road traffic access to Luton Airport, second only to the M1. For this reason, alongside a number of technical planning considerations, the Local Planning Authority at NHDC responded to the consultation with an objection.

In November 2013, the Secretary of State issued a holding direction to Luton Borough Council preventing them from determining the application at that time. However, it was confirmed on the 1st May 2014 that the Secretary of State for Communities and Local Government has not decided to “call in” the planning application.

As such it will be necessary for the Environmental Protection team to remain in contact with the NHDC Planning Control team to ensure that the status of the

planning application, which is now free to be decided by Luton Borough Council, and any conditions that may be included should it be granted, are understood and appropriate.

6. Air Quality Planning Policies

NHDC has adopted its District Local Plan No. 2 with alterations in 1996. This is in the process of being replaced with a Local Plan for the District to cover the period of 2011-2031.

To ensure that air quality is appropriately considered within the Local Plan the Environmental Protection and Housing Team has prepared a background paper to provide an evidence base and has proposed wording for inclusion as an Air Quality Policy within the Local Plan. At this stage it is likely that the policy will be supported by a supplementary planning guidance document rather than the more formal supplementary planning document. A draft guidance document has been prepared but will be reviewed closer to the date of publication of the Local Plan, to ensure that it is up to date at that time.

7. Local Transport Plans and Strategies

Hertfordshire County Council has recently published its new Local Transport Plan (LTP3) for 2011-2031, which sets out the transport strategy for Hertfordshire (over the next 20 years). The Plan covers all modes of transport including walking, cycling, public transport, car based travel and freight and takes account of the effect of transport on wider aspects including the economy, environment, climate change and social inclusion.

Within NHDC the Hitchin Urban Transport Plan 2011 has recently been adopted as has the Letchworth and Baldock Urban Transport Plan 2012.

8. Climate Change Strategies

NHDC published its climate change policy in August 2013 and it is available at http://www.north-herts.gov.uk/index/environment_and_planning/climate_change.htm.

9. Implementation of Action Plans

In June 2012 an Air Quality Management Area (AQMA) was designated along the southern side of a stretch of the Stevenage Road (A602) Hitchin (Appendix 1). An Action Plan for this AQMA was developed and adopted by Council in September 2013 following a period of public consultation

9.1 Action Plan Progress

An update on the progress with the summary of measures identified within the Action Plan is included below.

North Hertfordshire District Council Progress against Air Quality Action Plan 2013 Summary of Measures at April 2014							
Summary of Action Plan Measures					Progress since September 2013		
Measure Number	Description of Measure	Lead Responsibility	Timescales	Indicator of Success	Progress to date	Progress in last 12 months	Estimated Completion date
1	Partnership Working (Liaison & joint working with: NHDC colleagues, other Local Authorities, Hertfordshire County Council and Defra)						
1.1	Inclusion of Air Quality in NHDC's Local Plan (LP) and development of a Supplementary Planning Guidance (SPG) for Air Quality	NHDC - Environmental Protection (EP)	2013	Air quality included in Local Plan and SPG produced	- Air Quality Policy agreed for inclusion in Local Plan - Air Quality SPG document agreed in principle & draft completed	Same as progress to date	Dependant on the Local Plan timescales
1.2	Respond to planning consultations arising from air quality SPG, including considering S106 and Community Infrastructure Levy (CIL)	EP	Ongoing	Air quality impacts considered on relevant planning applications & appropriate S106/ CIL contributions obtained	- Air quality issues now routinely being considered on an application specific basis	Same as progress to date	Ongoing
1.3	Liaison on Urban Transport Plans (UTPs) and Local Transport Plans (LTPs)	EP & NHDC Planning Policy (PP)	Ongoing	Air quality issues considered in developing UTP and LTP initiatives	- No specific involvement to date	Same as progress to date	Ongoing and in line with updates of UTP and LTP documents
1.4 (see also 3.2)	Investigate possibility of linking with NHDC Community Services (CS) to promote cycling/walking	EP	2013	Establish link between change to transport mode and exercise and health	- No action to date	Same as progress to date	2015
1.5 (see also 1.4)	Link into the Public Health agenda via the Joint Strategic Needs Assessment (JSNA)	Hertfordshire Local Authority officers	2013 and ongoing	Establish presence & profile of air quality within JSNA	- Provided wording for JSNA & linked documents - ongoing liaison with working group	Same as progress to date	Ongoing

Measure Number	Description of Measure	Lead Responsibility	Timescales	Indicator of Success	Progress to Date	Progress since last 12 months	Estimated Completion date
1.6	Apply for Defra funding to help implement selected Action Plan measures	EP	Annual applications from 2013 onwards	Successful grant applications and utilisation of funds	- Defra grant: HGV survey in Hitchin & layout survey of Stevenage Rd - Olev grant for EV infrastructure	Same as progress to date	Existing grants have completion date of April 2015 Ongoing for future grants
2	Ongoing Monitoring of Air Quality & Levels of Traffic						
2.1	Monitor air quality in the District and to keep suitability of monitoring locations under review with particular focus on the AQMA	EP	Jan. 13 - NOx monitor in Stevenage Rd Annual review of diffusion tubes & report to Defra	Automatic analyser at Stevenage Rd for start of 2013 Relevant diffusion tube network Annual reports accepted by Defra	- Stevenage Rd analyser in place in February 2013 - Diffusion tube network retained - Defra reporting as required	Same as progress to date	- Complete - Ongoing - Ongoing
2.2	Establish annual traffic count location at the Hitchin Hill roundabout, Stevenage Rd	EP	Sep. 12 with annual follow up counts	Traffic data obtained inc vehicle types	- Annual traffic counts completed for 2012 and 2013	Same as progress to date	- Complete - Ongoing subject to funding
3	Publicity & Education						
3.1 (see also 3.3, 4.8)	Utilise NHDC media resources to raise awareness within NHDC and among the community	EP	Ongoing	Publish at least one AQ related article in NHDC News and in Outlook per year; appropriate info. on website	- Action Plan & AQMA press release - Press release for Electric Vehicle (EV) charging project	Same as progress to date	- Ongoing
3.2 (see also 3.3)	Engage with local schools to raise air quality awareness in general & specifically with regard to travel to school	EP	Short-term(st) and Medium term (mt) targets	(st) - identify schools in vicinity of AQMA & understand current status of travel plans & general awareness (mt) – utilise outcome of Herts &	- No action to date	Same as progress to date	- not specified

Measure Number	Description of Measure	Lead Responsibility	Timescales	Indicator of Success	Progress to Date	Progress since Last 12 months	Est. Completion Date
				Beds School Travel Plan Project (Defra funded) Overall reduction in school commutes by road, resulting from change in mode of travel			
3.3 (see also 3.1, 3.2, 1.5, 1.6, 4.4, 4.5 5.2)	Engage with local business, particularly haulage companies, public transport & taxi companies but also any companies that show an interest in improving efficiency & reducing emissions from vehicle fleet or travel planning for staff that commute	NHDC - EP & Transport Planners	(st), (md) (lt)	(mt) - NHDC engage with Green Travel Planning & changes to vehicle fleet (st) - awareness raising within the business community (mt - lt) uptake of travel plans & change to private company vehicle fleets	- No action to date, other than to provide general advice and direction to resources & information sources when contacted by companies	Same as progress to date	- not specified
4	Improve infrastructure for alternative transport						
4.1	Support measures to improve bus and rail usage including Intelligent Transport System (ITS), Bus Strategy, and Intralink Strategy	HCC	Ongoing	Improved journey times; increased bus and rail patronage;	- No action to date, no specific help or involvement requested	Same as progress to date	- not specified

Measure Number	Description of Measure	Lead Responsibility	Timescales	Indicator of Success	Progress to Date	Progress since Last 12 months	Est. Completion Date
4.2	Improve cycling infrastructure in Hitchin area, including provision of off-carriageway cycle route between Stevenage and Hitchin, and improved cycle network and cycle parking in Hitchin	HCC & PP	Hitchin- Stevenage cycle route 2014/2015 Hitchin cycle network & parking facilities ongoing	Cycle route implemented More cycle routes & integration with other transport modes; Improve mapping & signage	- No action to date, no specific help or involvement requested	Same as progress to date	- not specified
4.3	Consider the quality & provision of footways & pedestrian links & signage in vicinity of Stevenage Rd in relation to key destinations	NHDC Transport	Ongoing. Contribute to 2015/16 & future targets for increasing % journeys on foot	Improved pedestrian priority and footpath continuity to key destinations e.g. local shops, schools, town centre, public transport. To include pedestrian crossings	- Involved in discussions over location of pedestrian crossing planned on Stevenage Rd, with a view to impact on traffic flow & therefore air quality	Same as progress to date	- 2015/16 for Stevenage Rd pedestrian crossing. - Ongoing
4.4 (see also 3.1, 3.3)	Installation of electric vehicle charging infra-structure to encourage uptake of electric vehicles	NHDC & HCC	2013 include charging infrastructure requirements in SPD & associated planning docs 2013 ongoing	Inclusion of electric charging points in new builds via planning regime Presence of electric charging points in NHDC car parks	- Office of Low Emission Vehicle grant obtained for 6 (2 plug) charging points to be installed in NHDC car parks. - Installation under way but not completed	Same as progress to date	- 4 of the 6 locations operational & enforceable by civil enforcement officers (CEOs) by May 2014. - remaining 2 locations in same situation by Winter 2015

Measure Number	Description of Measure	Lead Responsibility	Timescales	Indicator of Success	Progress to Date	Progress since Last 12 months	Est. Completion Date
4.5 (see also 1.1, 1.2, 3.3)	Consider potential for gas or bio-methane refuelling facilities at supermarkets or large commercial developments	NHDC & HCC	Include in AQ SPD for adoption in 2013	Presence of gas or Bio-methane refuelling facilities within North Hertfordshire	- No action to date	Same as progress to date	- not specified
5	Encouraging Use of Alternative Fuels & Reducing Emissions						
5.1	Investigate incorporation of emissions element to controlled parking zone charges	EP, PP & Parking	TBC	Implementation of new parking charges scheme including emissions criteria	- No action to date, other than agreement that EV recharging bays will be exempt from parking charges	Same as progress to date	- not specified
5.2	Changing company fleets (inc NHDC's) to encourage use of lower emission vehicles by use of procurement and other levers	NHDC Transport, PP, EP & Legal	2013 Secure agreement to principle within NHDC; 2014 Implement proposals	Principle accepted; establish baseline; improvements secured;	- Collecting mileage data for 2 week period and trialling an EV for a week	Same as progress to date	- not specified
6	Traffic Infrastructure Alterations						
6.1	Investigate an alternative route of access for HGVs from the east/ south east to the Cadwell/ Wilbury/ Burymead industrial area of Hitchin	HCC and PP	Not known	Assessment of practicality	- Defra funded HGV survey under way	Same as progress to date	- Winter 2014 for outcome of HGV survey - Ongoing

Measure Number	Description of Measure	Lead Responsibility	Timescales	Indicator of Success	Progress to Date	Progress since Last 12 months	Est. Completion Date
6.2	Investigate impact of altering current bus-stop locations on Stevenage Road to disperse impact of idling & reduce congestion	HCC transport planners	Not known	Assessment of practicality Implementation or not	- No progress to date. But may be identified as an issue relevant to changes to Stevenage Road layout project	Same as progress to date	- not specified
6.3	Review parking provision and restrictions along Stevenage Road with the aim of reducing congestion	PP	Not known	Assessment of practicality Implementation or not	- No progress to date. But may be identified as an issue relevant to changes to Stevenage Rd layout project	Same as progress to date	- not specified
6.4	Investigate improvements to layout of Stevenage Road to ease congestion	HCC & PP	Not known	Assessment of practicality Implementation or not	- Defra grant for feasibility study into layout changes at Stevenage Rd with aim to improve air quality	Same as progress to date	- 2015

10. Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Stevenage Road, Hitchin (A602)

The monitoring data for 2013 has confirmed the need for the AQMA along a stretch of the Stevenage Road (A602) in Hitchin. The new monitoring data is indicative of a reduction in NO₂ concentrations within the AQMA, however, the amount of data is not sufficient to conclude that this will be a permanent trend. Therefore, for the following reasons there is currently no intention to alter the extent of the Stevenage Road AQMA.

- Only two years of data has been collected from a number of the diffusion tube sites in question.
- It is acknowledged ⁽⁴⁾ that setting the boundary of an AQMA involves an element of judgement and that it may be administratively simpler to designate a wider area than attempting to be too precise.

Payne's Park Roundabout, Hitchin (A505/A602)

The monitoring data for 2013 from Park Way, Hitchin (NH93) has confirmed that, at 41 Upper Tilehouse Street, there is potential public exposure to an annual mean average NO₂ concentration that is above the 40µg/m³ objective. This was first identified as a potential problem location by the data collected from NH93 in 2011, which was reported in the 2012 USA ⁽³⁾ and confirmed in 2012 in the 2013 Progress Report ⁽²⁾.

On the basis that for three years running a public exposure issue has been identified at the Park Way and Upper Tilehouse Street junction of the Payne's Park roundabout it is considered appropriate to commission a Detailed Assessment of air quality in this particular area of Hitchin.

10.2 Conclusions relating to New Local Developments

It will be necessary for NHDC to maintain a close watching brief on the status of the planning application to expand passenger capacity at Luton Airport from 10million per annum to 18million per annum. This is because the A505/A602 road network through the south of Hitchin, which includes the Stevenage Road AQMA, has been identified within the planning application as a main route, second only to the M1, of road traffic access to Luton Airport.

10.3 Proposed Actions

NHDC has commissioned a Detailed Assessment report for the Payne's Park area of Hitchin to determine if there is sufficient justification for the designation of an AQMA in the area, or the extension of the existing AQMA at Stevenage Road to included the Payne's Park area.

NHDC will continue to implement its Action Plan.

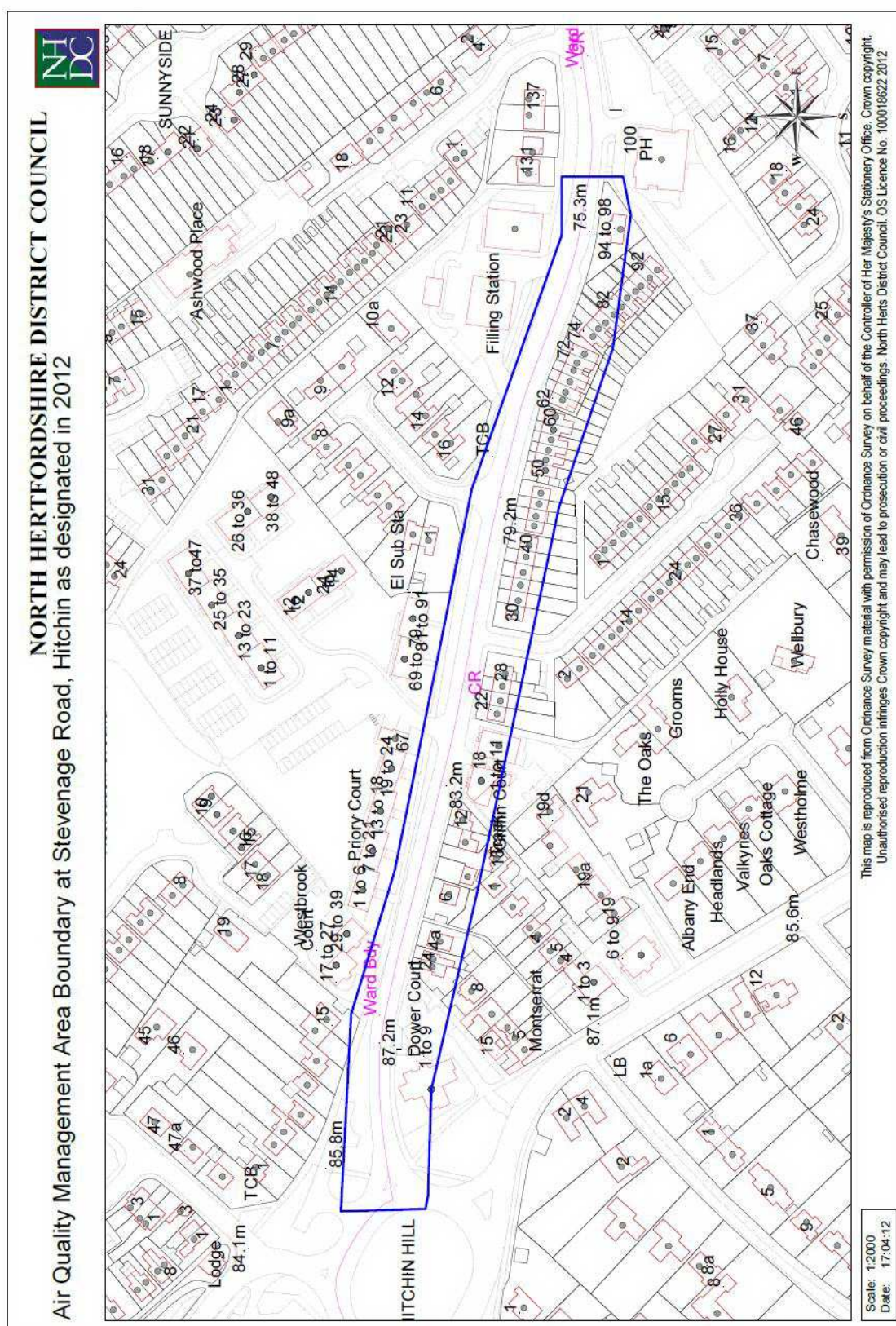
To support the ongoing monitoring of air quality in the Stevenage Road area of Hitchin the automatic roadside analyser will be retained for 2014.

The diffusion tube network has not been altered for 2014.

11. References

1. Defra. 2009. Local Air Quality Management Technical Guidance LAQM.TG(09)
2. NHDC. May 2013. LAQM Progress Report 2013.
3. NHDC. April 2012. LAQM Updating and Screening Assessment Report 2012
4. Defra. 2009. Local Air Quality Management Policy Guidance LAQM.PG(09)

Appendix 1: Stevenage Road Air Quality Management Area (2012)



Appendix 2: Quality Assurance / Quality Control (QA/QC)

1.1 PM₁₀ Monitoring Adjustment

The analyser is Tapering Element Oscillating Microbalance (TEOM) continuous PM₁₀ analyser. The analyser has a heated manifold to prevent condensation of water vapour, which may lead to a loss of volatile particles. The measured concentrations of these analysers have been corrected using the Volatile Correction Model (VCM).

LAQM.TG (09) sets out the calculation required for TEOM results using the VCM to estimate gravimetric equivalent. This replaces the use of the previous 1.3 factor. Data for 2012 has been corrected using the VCM model by AQDM.

1.2 QA/QC of automatic monitoring (including Calibration and Rescaling)

The ML8941B analyser (NH₂stv) has calibration checks and filter checks and changes undertaken on a fortnightly basis by TRL staff. The calibration readings were reported to Air Quality Data Management (AQDM). This company is retained by NHDC, as part of the larger Herts and Beds Air Quality Network, to verify and ratify the data generated by the analyser. The ratification process is carried out as per AURN recommended procedures. In addition TRL is engaged to undertake two service and on-site calibration visits in a year, one minor service and one major service.

The API M200 analyser and the R&P 1400a Tapered Element Oscillating Measurement (TEOM) analyser (NH6) are subject to calibration checks and filter checks and changes on a fortnightly basis by NHDC staff. In addition TRL was employed to undertake an annual service/maintenance visit and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings were reported to AQDM. This company is retained by NHDC, as part of the larger Herts and Beds Air Quality Network, to verify and ratify the data generated by the analyser. This process includes the application of the volatile correction model (VCM) and the results of the data reported have had this applied and been demonstrated as equal to the gravimetric equivalent.

As with most accurate measurement equipment, the APNA 360 and ML8941B must be calibrated to determine its function. Calibration is simply the testing of equipment against a known quantity to determine whether it produces expected results. In the case of both nitrogen dioxide analysers, calibration takes the form of two routines:

- a) The response of the analyser to high concentrations of nitric oxide is assessed by a "span calibration". Simply, a nitric oxide (at a known high concentration) is passed into the analyser and the result produced by it is noted.
- b) The response of the analyser to sample containing no oxides of nitrogen (NO_x) is assessed by passing air which has been "scrubbed" clean of NO_x ("zero air") into the analyser and thus conduct a "zero calibration" and the analysed result noted.

The analyser should produce a result, which is close to the absolute concentration at both ends of the scale - the span range.

Span and zero calibrations are conducted regularly by the NO_x analyser automatically and stored in the data-logger for periodic inspection. To ensure a consistently high quality assurance standard, the NO_x analyser is calibrated, for both zero and span, every 10 - 14 days and the result used for validation.

For a host of reasons analysers, such as the APNA 360, do not always produce calibration results that are exactly in line with the anticipated levels during both the span and zero calibration operation. This does not mean that the data produced must be discarded because it is not accurate. "Calibration drift" is common and can be compensated by the use of a scaling calculation; any under/over reading by the analyser is distributed over the span range so that the data produced routinely is altered to reflect any inaccuracy.

The result of rescaling is to ensure that data from the analyser is accurate at the concentrations encountered routinely. Rescaling is not conducted by North Hertfordshire District Council, but is undertaken by AQMA under contract at both sites. Rescaling takes place after every manual calibration to ensure a robust data set.

2. Diffusion Tubes

2.1 Factor from Local Co-location Studies (if available)

North Hertfordshire District Council undertakes no co-location studies.

2.2 Laboratory Analysis

The diffusion tubes are 50% triethanolamine (TEA) in acetone and are supplied and analysed by Environmental Services Group (ESG) at Harwell Scientific Services. ESG/HSS follows the procedures set out in the Harmonisation Practical Guidance. ESG/HSS 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.

2.3 Bias Adjustment Factors

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 2014 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 Harwell Scientific Services in 2013 was 0.80.

3. Short-term to Long-term Data Adjustment (Annualisation) for Automatic and Non-Automatic Monitoring

Where it has only been possible to carry out monitoring at a location, whether automatic or non-automatic, at a site for less than 12 months the results need to be adjusted to enable an estimate of the annual mean for that location to be calculated.

It should be noted that a minimum 6 month period is necessary for this process to be valid. There were no monitoring locations where less than 6 months data were collected during 2013. As such no annualisation was required for 2013 data.

Appendix 3: Site Location Maps for Diffusion Tube Network

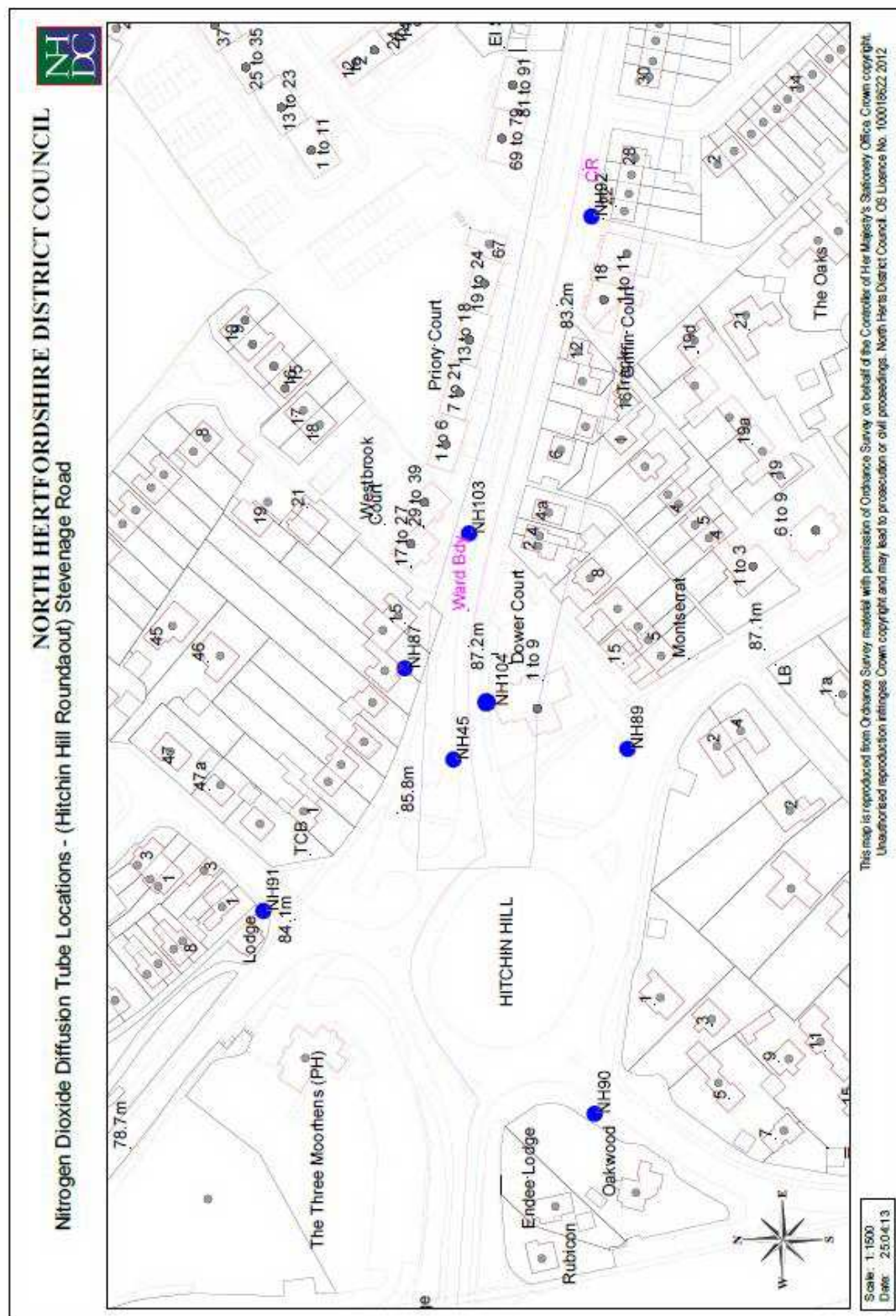


Figure A3.1 Diffusion Tube Locations 2013 – Hitchin Hill Roundabout, Stevenage Road, Hitchin

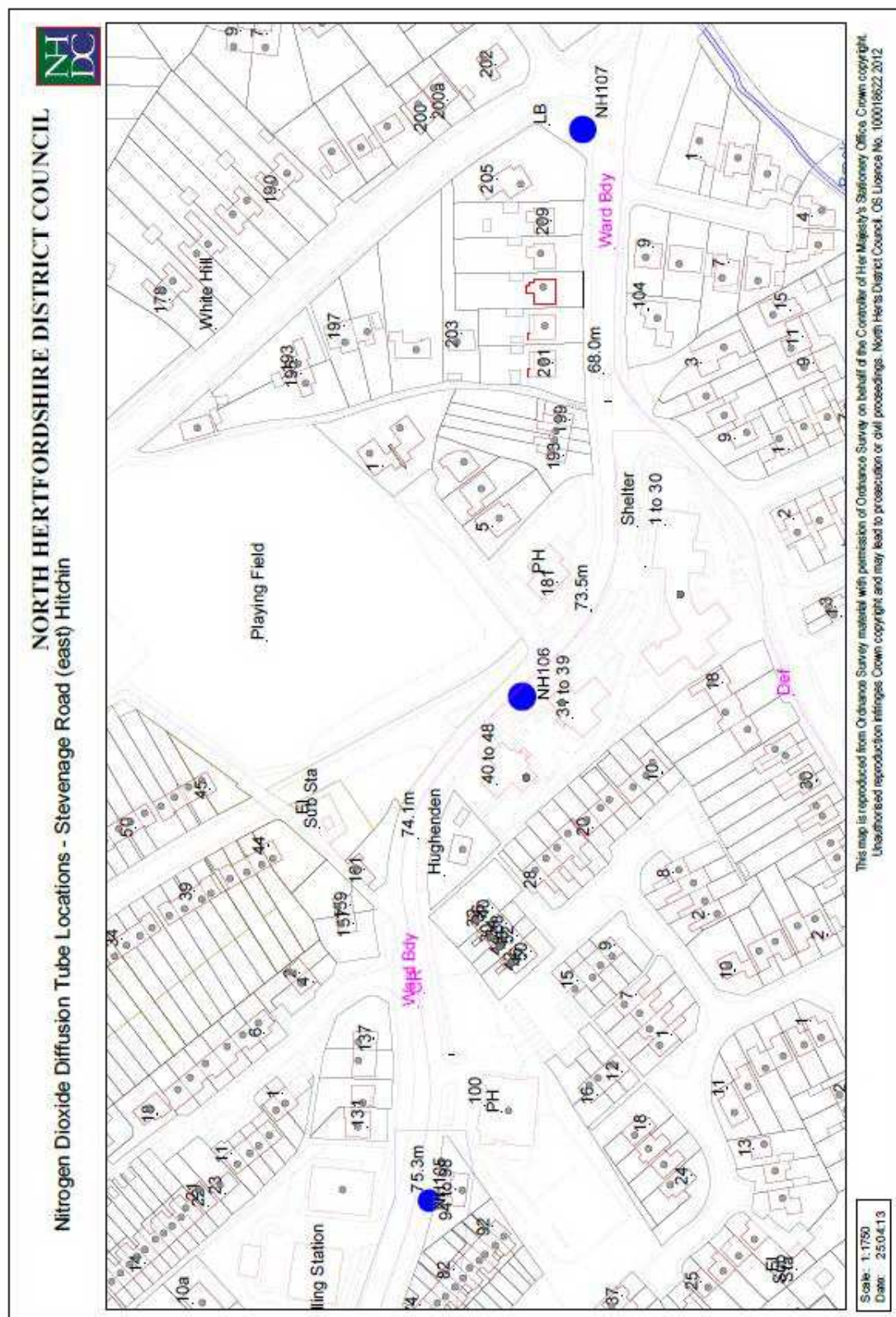


Figure A3.2 Diffusion Tube Locations 2013 – Stevenage Road (east), Hitchin

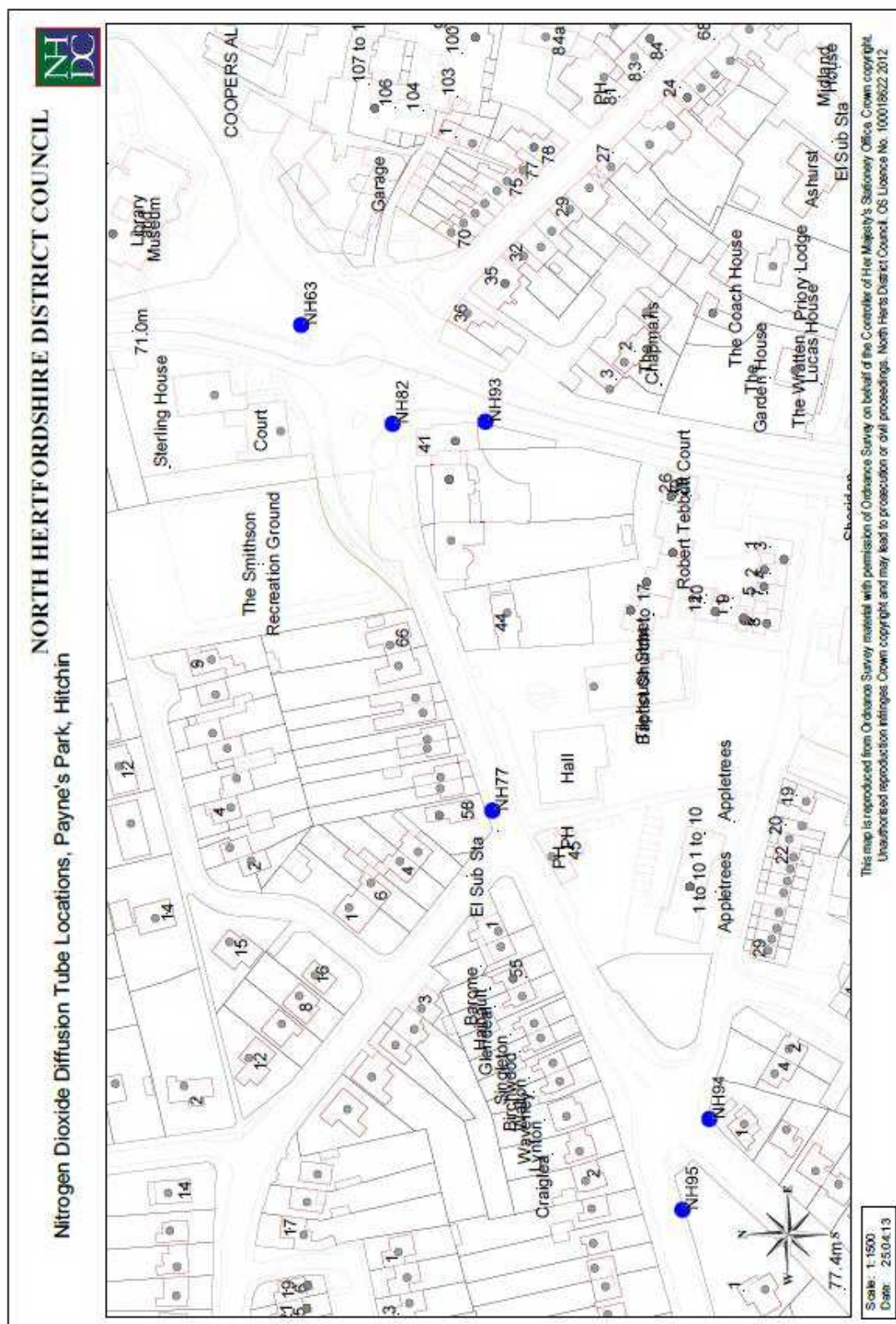


Figure A3.3 Diffusion Tube Locations 2013 – Stevenage Road (east), Hitchin

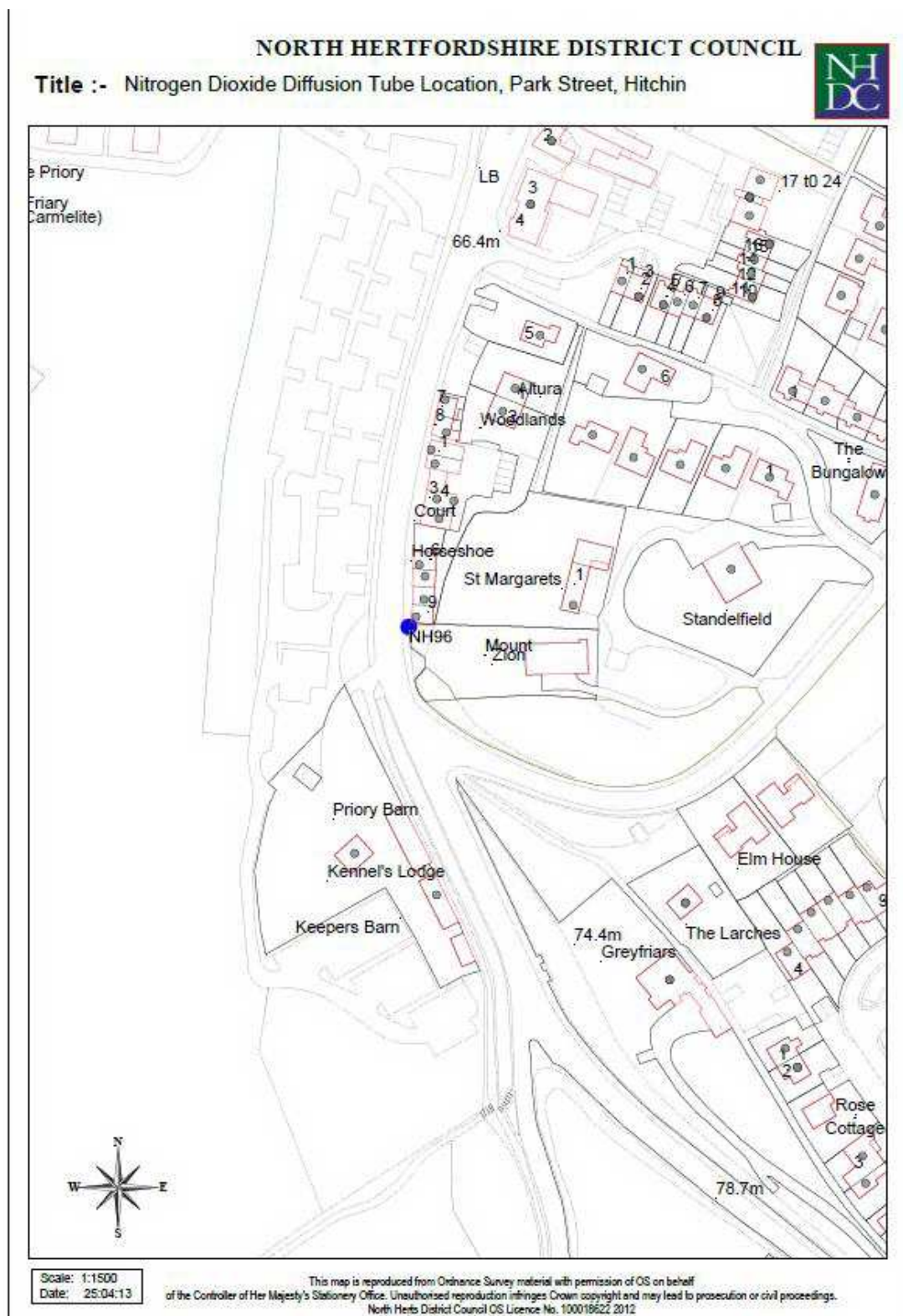


Figure A3.4 Diffusion Tube Location 2013 – Park Street, Hitchin

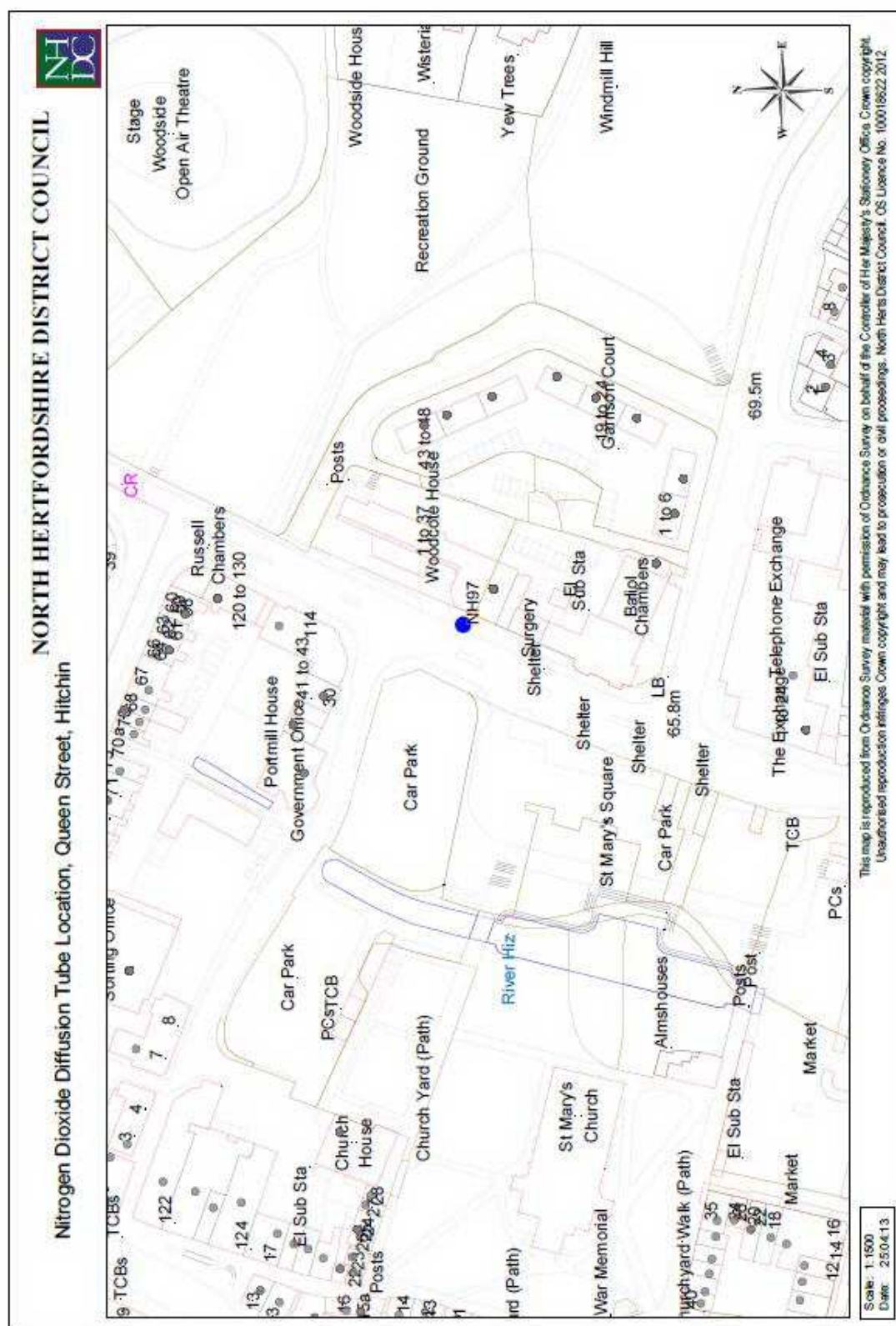


Figure A3.5 Diffusion Tube Location 2013 – Queen Street, Hitchin

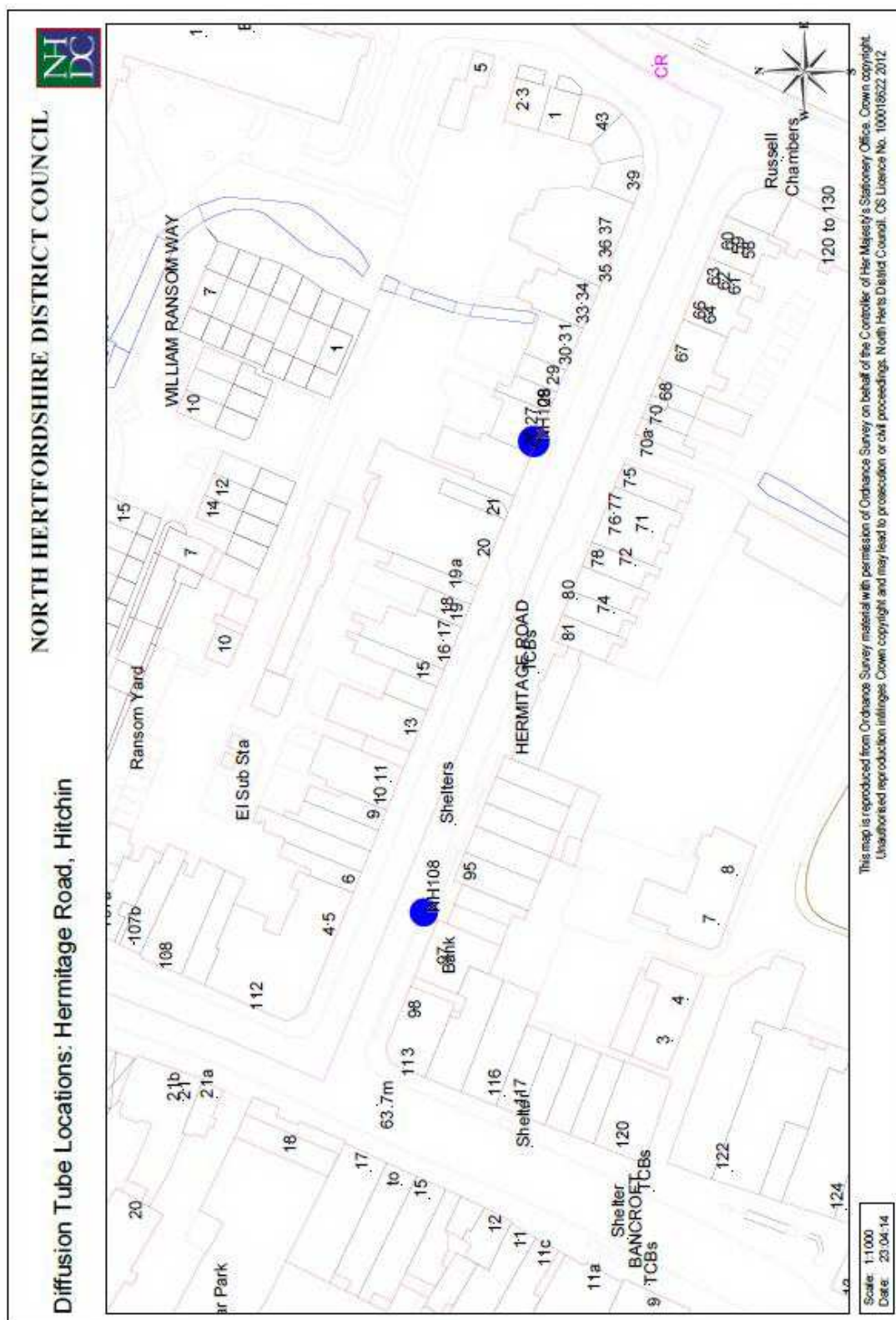


Figure A3.6 Diffusion Tube Locations 2013 – Hermitage Road, Hitchin

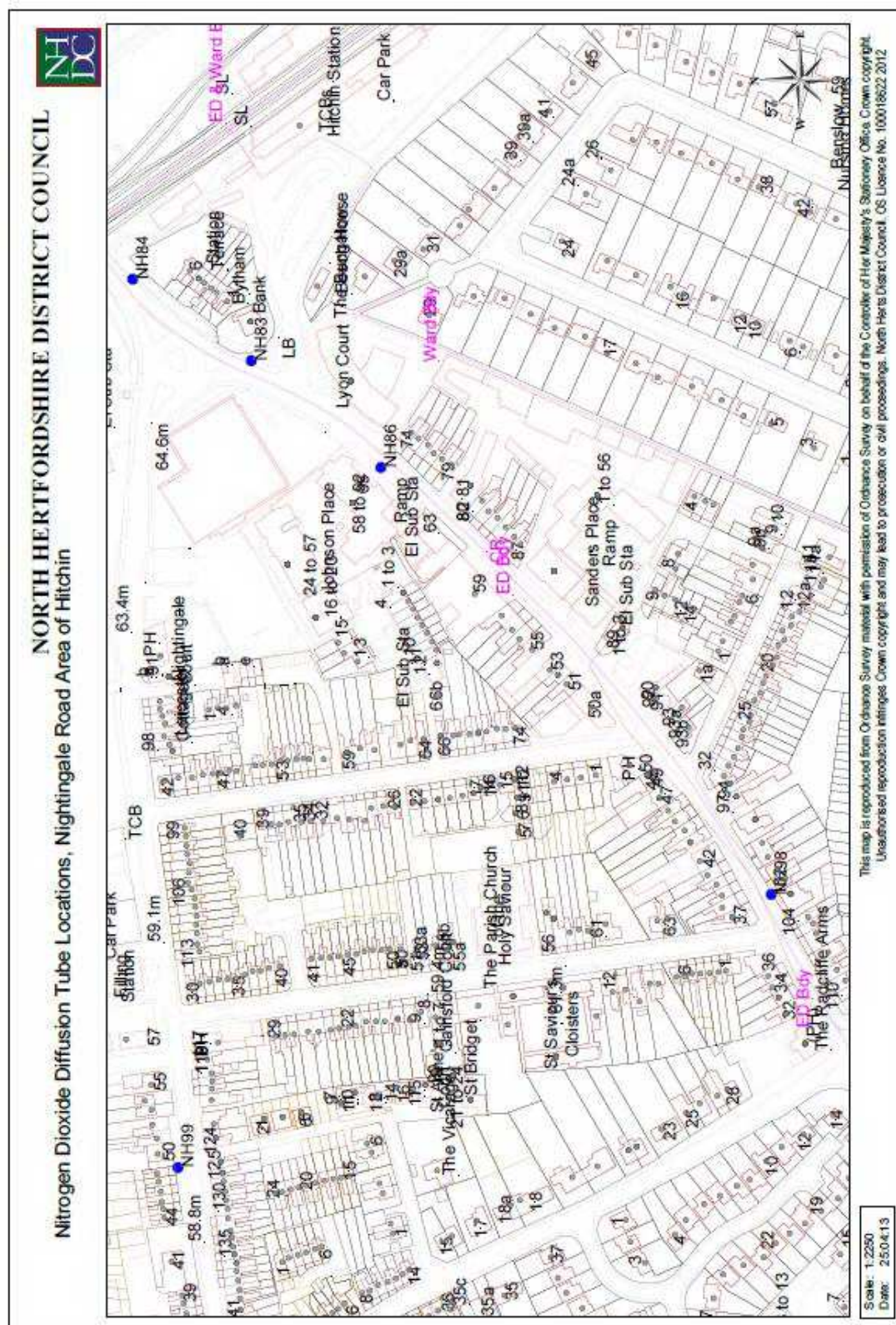


Figure A3.7 Diffusion Tube Locations 2013 – Walsworth Road and Nightingale Road, Hitchin

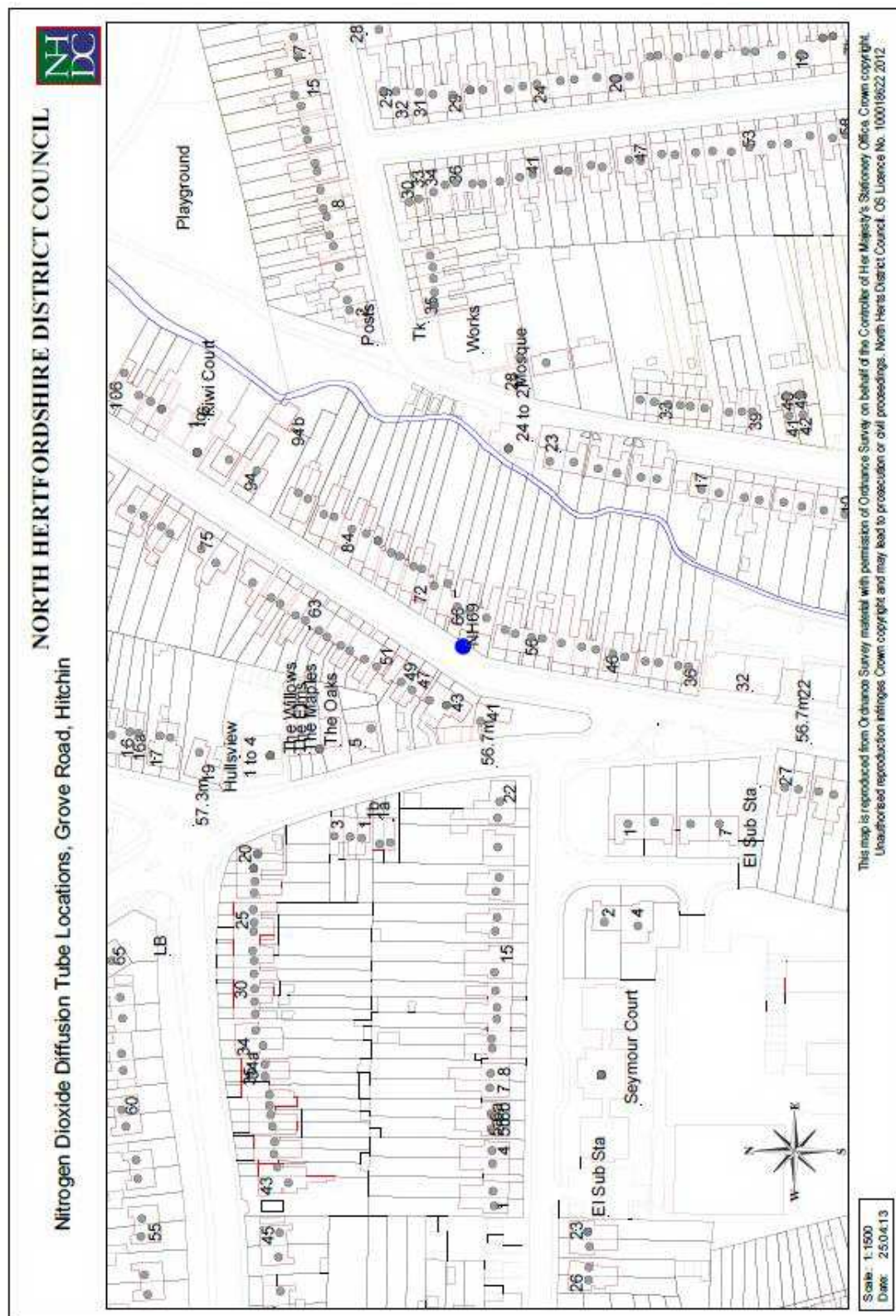


Figure A3.8 Diffusion Tube Location 2013 – Grove Road, Hitchin

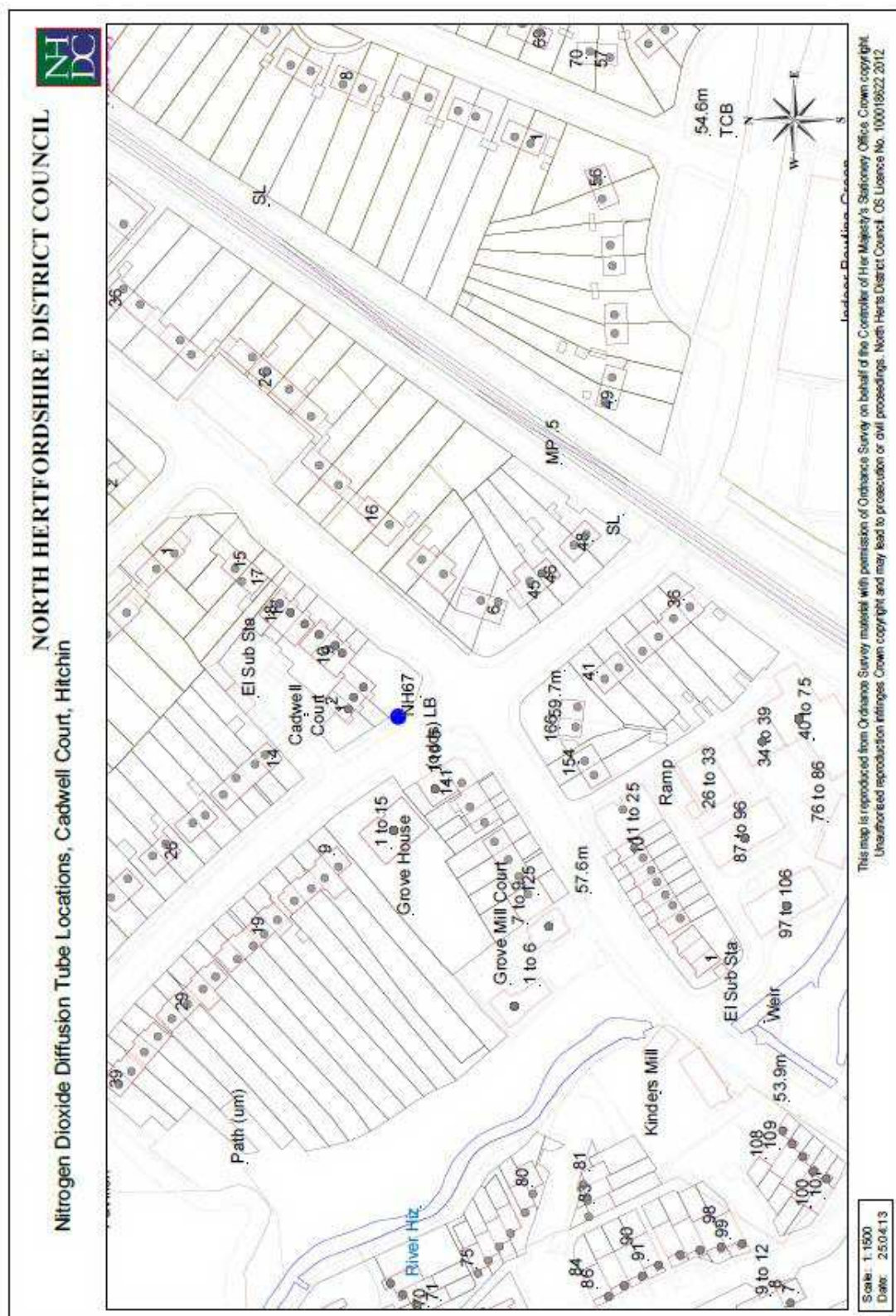


Figure A3.9 Diffusion Tube Location 2013 – Cadwell Court, Hitchin

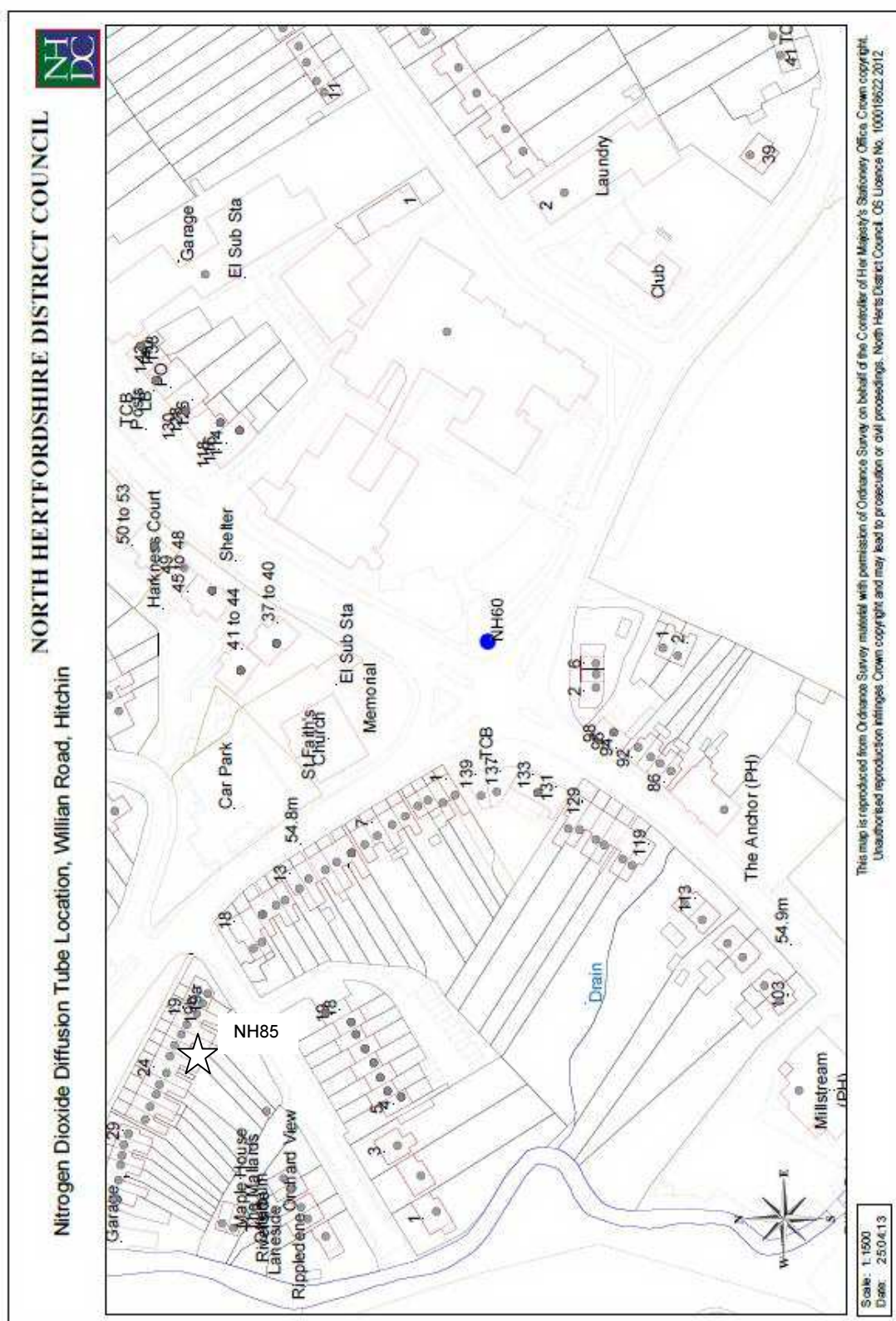


Figure A3.10 Diffusion Tube Location 2013 – Willian Road, Hitchin

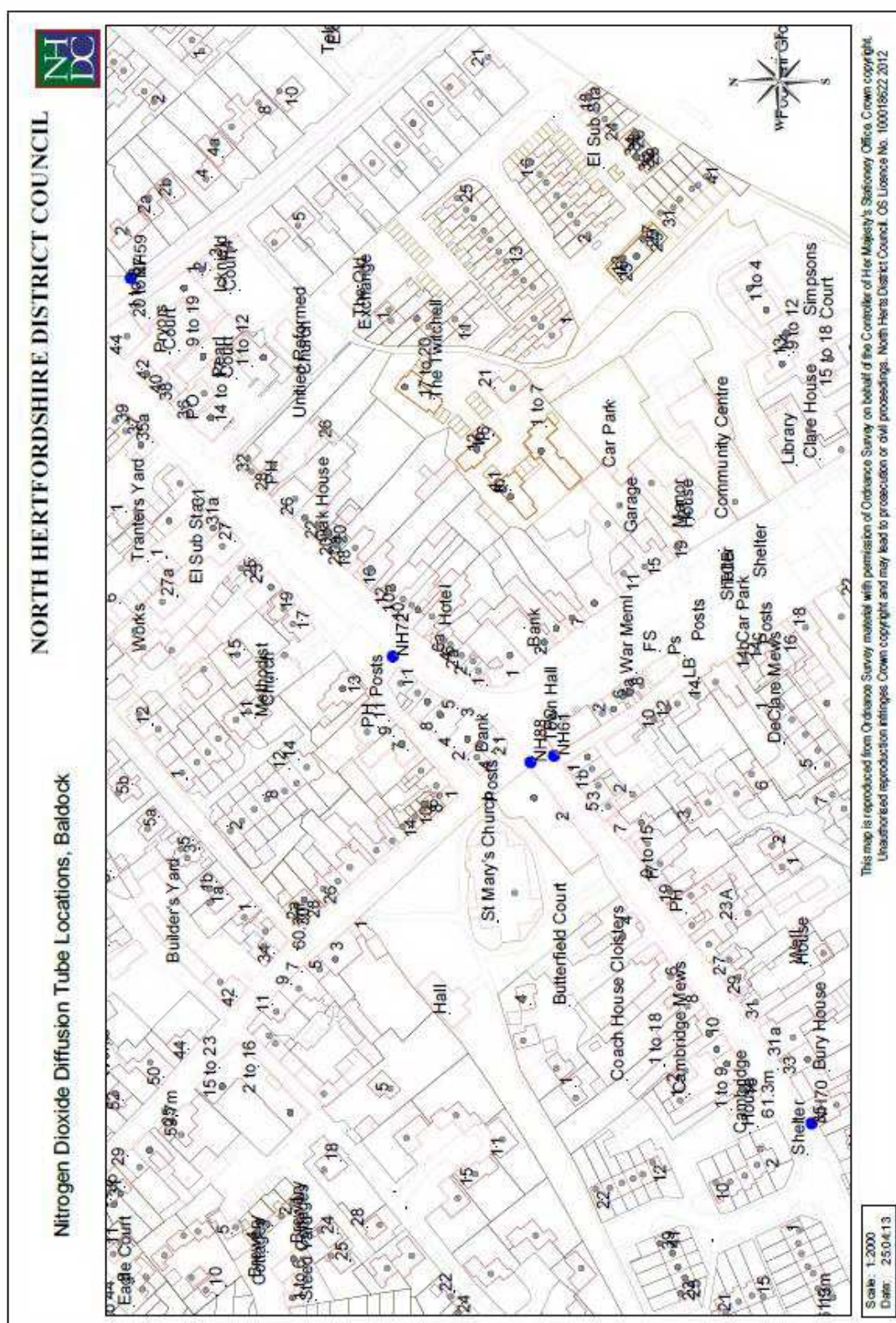


Figure A3.11 Diffusion Tube Locations 2013 – Hitchin Street and Whitehorse Street, Baldock

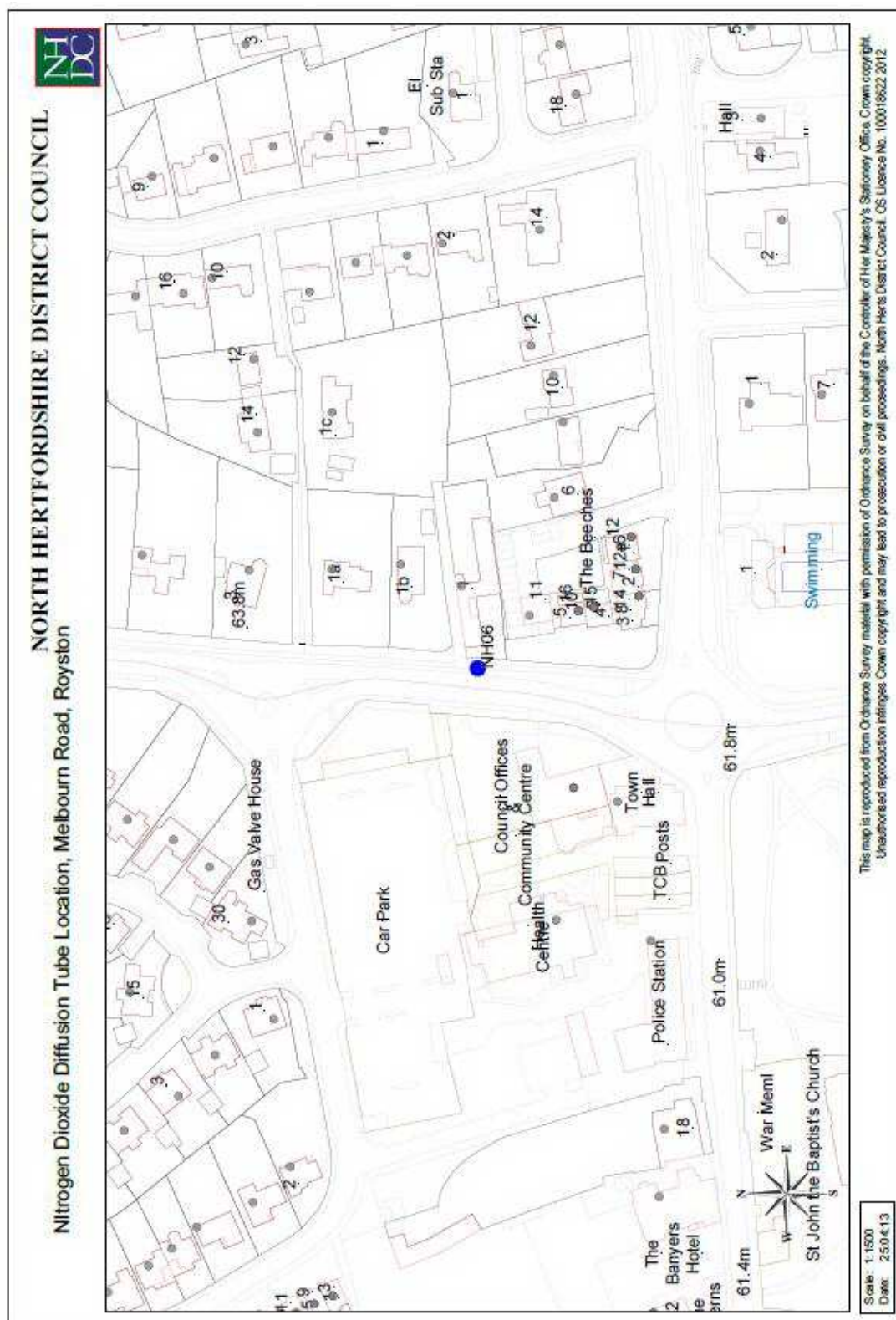


Figure A3.12 Diffusion Tube Location 2013 – Melbourn Road, Royston

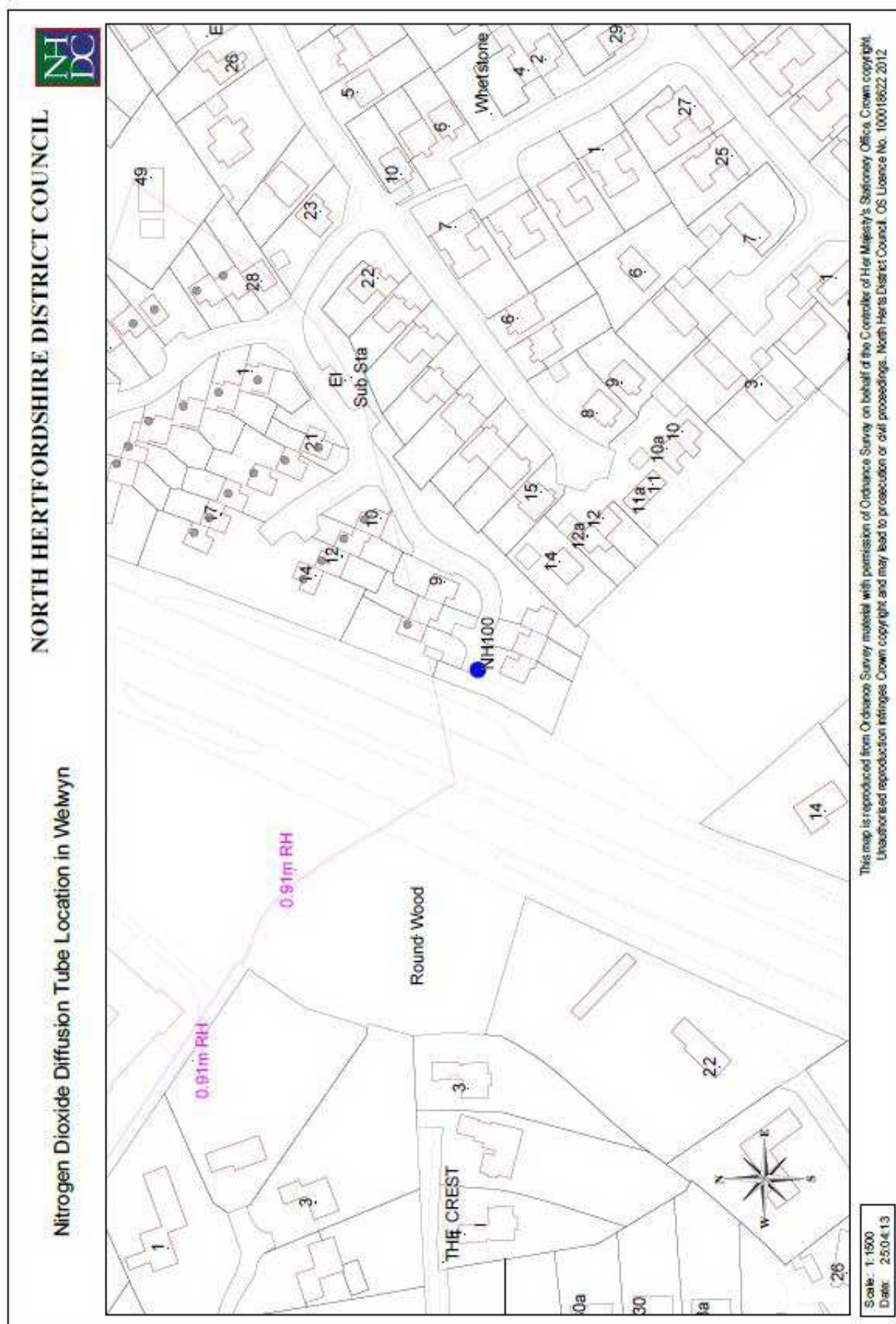


Figure A3.13 Diffusion Tube Location 2013 – Welwyn, alongside A1(M)

Appendix 4: Diffusion Tube Data

NH Code	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Bias
NH06	Melbourn Road, Opposite Town Hall, Royston	45.9	42.8	40.4	30.6	33.7	30.3	31.2	34.2	43.8	34.9	39.9	37.5	37.1	29.7
NH45	Stevenage Road A, Hitchin	66	57.2	55.6	52.3	48.2	45.2	42.6	49.2	58.3	56.3	58.2	41.5	52.6	42.0
NH59	(NH04a) Clothall Road, Baldock	39.3	38.8	42.4	37.3	33.7	34	30.9	33.3	42.3	41.3	47.8	38.6	38.3	30.6
NH60	(NH13a) Willian Road, Hitchin	44.2	48.6		34.6	36.4	37.9	29.2	34.2	41.3	34.5	53.2	39.4	39.4	31.5
NH61	(NH53a) Whitehorse Street, Baldock (nr town hall)	49.1	48.2	53	43.6	37.5	36.8	37.9	39.1	43.7	45.9	50.1	41.5	43.9	35.1
NH63	(NH02a) Library Hitchin	46.2	49.9	42.2	40.1	40.5	36.8	39	42.6	51	49.7	58.7	51.8	45.7	36.6
NH67	Cadwell Court, Hitchin	46.2	35.9	35	26.8			20.3	36.8	41	40.4	47.3	31.1	36.1	28.9
NH69	64 Grove Road, Hitchin	47.6	46.1	50.4	35.6			26.3	31	35.2		46.3	43.8	40.3	32.2
NH70	Nr Bus Stop Hitchin Street Baldock	40.8	37.6	29.3	34.8	28.6	27.7	27.5	29.3	38.8	35.8	44.1	36	34.2	27.4
NH72	Opp Rose Crown, Whitehorse Street, Baldock	47.7	47.1	36.1	37	34.3	32.4	32.1	33.3	42.9	41.9	52	39.5	39.7	31.8
NH103	Westbrook Court, Hitchin	64.1	59	54.5	49.5	43.9	47	44	44.5	57.2	54.1	62	46.1	52.2	41.7
NH77	Upper Tilehouse Street, Hitchin (traffic lights)	63.2	57.5	57	49.7	44.1	46.8	42.9	45.8	55.1	52.4	63.5	52.6	52.6	42.0
NH78	West Hill, Hitchin	37.9	40.3	34.6	37	32.7	11.8		32.2	37.6	40	54.8	40	36.3	29.0
NH82	Upper Tilehouse Street, Nr Roundabout	59.9	49	59	49.7	49.9	45.1	46.9	42	50.3	51.6	51.5	49.6	50.4	40.3
NH83	Hitchin Station, Roundabout A	39.4	48.4	43.7	38	30.3		24.3	35.9	44.2	45.7	57.6	44.2	41.1	32.9
NH84	Hitchin Station, Roundabout B	57.3	52.3	56.5	42.1	42.4	44.8	43.4	39.9	45.1	47.9	43.1	44.6	46.6	37.3
NH86	Walsworth Rd, Hitchin (Nr Station)	36.4	39.9	43.2	31.5	31.2	26.3	25.6	25.3	37.6		46.2		34.3	27.5
NH87	11 Stevenage Road, Hitchin	44.8	40.5	38.8	29.6	26	29.2	26.1	29.2	38.2	38.7	44.2	33.9	34.9	27.9
NH88	Church St, Baldock (Opp. Town Hall)	44	51.6	41.2	43.2	39.3	37.4	40.1	46		51.6	68.3	65.2	48.0	38.4
NH89	London Road, Hitchin	38.6	40.6	39.9	29.2	31.4	27.3	28.8	28.4	41.2	38.3	49.3	33.1	35.5	28.4
NH90	Gosmore Road, Hitchin	41.2	48.1	51.6	38.5	33	29.5	25.9	27.6	33.9	35.8	32.5	17.6	34.6	27.7
NH91	St John's Road, Hitchin	53.4	43.5	38.3	31.8	31.1	31	25.6	33.4	48.6	42.4	54	46.8	40.0	32.0
NH92	Stevenage Road (Griffin), Hitchin	70.9	65.3	63.7	56.3	52.6	45.3	47	58.6	66.1	54.2	67.8	65.6	59.5	47.6
NH93	Park Way, Hitchin	61.8	65.1	63.8	62.2	61.7	65.1	71.9	61.8	79.7	65.3	662.7	60.2	65.1	52.1
NH94	Offley Road, Hitchin	51.3	53.4	42.4	40.9	40.6	40.2	36.5	43.1	50.7	39	55.2	47	45.0	36.0
NH95	Pirton Road, Hitchin	56.4	35.5	44.2	42.2	38.2	34.2	44.8	26.1	43.7	44.2	46.6	42.6	41.6	33.2
NH96	Park Street, Hitchin	45.4	53.2	52.1	48.5	40.7	39.8	42.3	38.1	41.2	37.4	44.6	34.9	43.2	34.5
NH97	Queen Street, Hitchin	34.8	45.5	48.2	36.7	32.6	355.7	34.1	35.5	41.2	42.1	43.6	32.6	38.6	30.8
NH98	Walsworth/Radcliffe Road, Hitchin	55	45.6	48.4	37.7	30		32.7	32.7	42.4	41.4	43.8	40.3	40.9	32.7
NH99	Nightingale Road, Hitchin	51.5	43.3	45.3		35	32.6	29.9	32.8	44	35.4	50.3	43.1	40.3	32.2
NH100	Foxglove Way, Welwyn	45.1	42.2	27.7	29.3	34.5	27.4	25.9	34.1	38.8	34.1	38.2	42.6	35.0	28.0
NH108	Hitchin – Hermitage Road (97)	32.9	42.7	43.4	32.8	26.9	33.1	27.9	28.4	39.9	37.4	45.5	29.5	35	28.0
NH109	Hitchin – Hermitage Road (26)	48.4	51.9	45.7	43.3	41.2	37.7	36.2	43.8	48.3	52.1		53.8	45.7	36.5
NH104	Dower Court (A), Stevenage Road, Hitchin	38.5	44.6	44.2	33.8	36.7	30.9	33.2	35.8	49	39.4	51	34.8	39.3	31.5
NH105	94-98 Stevenage Road, Hitchin	66.1		60.8	52.6	52.9	47.7	46	55.8	66.2	64	71.9	62.4	58.8	47.0
NH106	Morello Gardens, Stevenage Road, Hitchin	62.4	64.5	62.6	50.3	46.7	48.7	43	49.2	62.6	57.7	73.6	47.7	55.8	44.6
NH107	Whitehill Road, Hitchin	43.7	41.2	42.3	30.4	32	28.3	30.2	33.5	44.9	23.7	51.8	39.4	36.8	29.4

Appendix 5: Fall off in Nitrogen Dioxide Concentrations with Distance from Road

Stevenage Road (A), Hitchin – NH45

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	21	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	15.95809	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	42	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	27.7	µg/m ³

Upper Tilehouse Street (Roundabout), Hitchin – NH82

Step 1	How far from the KERB was your measurement made (in metres)?	1.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	8.5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	18.02865	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	40.3	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	31.8	µg/m ³

Stevenage Road (Griffin Court), Hitchin – NH92

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	15.95809	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	47.6	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	40.8	µg/m ³

Park Way, Hitchin – NH93

Step 1	How far from the KERB was your measurement made (in metres)?	1.6	metres
Step 2	How far from the KERB is your receptor (in metres)?	3	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	18.02865	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	52.1	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	47.3	µg/m ³

Westbrook Court, Stevenage Road, Hitchin – NH103

Step 1	How far from the KERB was your measurement made (in metres)?	2.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	12.4	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	15.95809	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	41.7	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	31.4	µg/m ³

94-98 Stevenage Road, Hitchin – NH105

Step 1	How far from the KERB was your measurement made (in metres)?	3.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	10.5	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	15.95809	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	47	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	37.8	µg/m ³

Morello Gardens, Stevenage Road, Hitchin – NH106

Step 1	How far from the KERB was your measurement made (in metres)?	1.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	6.4	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	15.95809	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	44.6	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	35.2	µg/m ³