2017 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the

Environment Act 1995

Local Air Quality Management

June 2017

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1 Executive Summary: Air Quality in Our Area

1.1 Air Quality in Three Rivers 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 billion[3].

Three Rivers is a sub-urban District of 88.8 square kilometres located in south-west Hertfordshire. It borders Watford and Hertsmere boroughs to the east, Buckinghamshire County (Chiltern and South Bucks Districts) to the west, St Albans City & District and Dacorum Borough to the north, and the London Boroughs of Hillingdon and Harrow are to the south.

The key road links through the District are the M1 and M25 motorways, which are significant sources of local air pollutant emissions. There are no significant pollutant sources within the District apart from road traffic emissions.

Three Rivers District Council (TRDC) monitors for nitrogen dioxide (NO_2) and particulate matter (PM_{10}) and in April 2016 commenced the monitoring of ultra-fine particulate matter ($PM_{2.5}$) at a point of relevant exposure near to Junction 18 of the M25 within Chorleywood NO_2 AQMA. A further $PM_{2.5}$ monitoring site is to be commissioned in 2017 at a location of relevant exposure on the A412, Uxbridge Road, in Rickmansworth.

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[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

The current number of NO_2 diffusion tube sites in 2016 across TRDC is seven.

The diffusion tube monitoring results indicate that neither the annual or hourly mean air quality objective for nitrogen dioxide was exceeded at any location in the district. The levels of NO_2 recorded for 2016 when compared to 2015 show a slight decrease in annual mean concentrations at the majority of monitored locations.

TRDC's Executive Committee have approved the revocation of the NO_2 Kings Langley Air Quality Management Area (AQMA) and NO_2 and PM_{10} Chandlers Cross AQMA and are awaiting instructions from the Department of Environment, Food and Rural Affairs (DEFRA) upon how to revoke the AQMAs. Once these AQMAs are revoked, there will be two remaining AQMAs in Chorleywood (for NO_2 and PM_{10}).

In terms of air pollution, TRDC is very similar to other outer London suburbs. The majority of our population lives within the M25 and many workers commute into London or around the motorway network. Road transport emissions are the major contribution to the burden of air pollution encountered in our district. As a result, TRDC works to support Highways England, who are responsible for the motorway network, with measures to improve air pollution associated with the M25.

To find more information regarding Air Quality in TRDC click on the following link: http://www.threerivers.gov.uk/service/air-quality

1.2 Actions to Improve Air Quality

TRDC has developed an Air Quality Action Plan for the years 2015-2020 which highlighted the commitment TRDC has to continue to work towards improving air quality within the district. The measures in this air quality action plan aim to encourage reductions in emissions from road traffic, industry and homes. There is also a commitment to keep the community and our partners well informed about air quality and the actions to reduce pollution or minimise its effects on vulnerable people. TRDC has introduced the airTEXT service in 2016, to inform vulnerable individuals and groups across the district when air pollution levels are high.

TRDC has also developed a Green Expectations Action Plan (2017/18) which includes objectives and developing actions on:

- Minimising greenhouse gas emissions from new developments and existing properties;

- reduce the impact of carbon emissions and local air quality of travel associated with Council operations;
- developing and improving local cycling and walking routes and actively facilitate sustainable travel and
- promoting local passenger transport and work with the statutory transport providers including bus and rail operators to encourage sustainable and healthy forms of travel.

1.3 Conclusions and Priorities

The 2017 air quality Annual Status Report (ASR) identified that measured concentrations of NO_2 continue to be below the air quality objectives across the district and within the current AQMA's. Due to the continued downward trend and being consistently below the annual objective for NO_2 over the last 4 years, it is recommended that a detailed assessment be undertaken to determine whether the remaining AQMA's in Chorleywood can also be revoked.

Three Rivers District Council's priorities for the coming year are:

- To continue to work with Highways England as a priority activity, as the main source of emissions contributing to the original exceedance of the objectives in the AQMA's are from the M25.
- Continue to work across the Council to deliver the objectives of the Green Expectations Action Plan 2017/18.

1.4 Local Engagement and How to get involved?

It is important that members of the public appreciate the impact of their transport choices on air quality.

The TRDC Action Plan highlights that the District is developing strategies to develop Sustainable Travel and Better Buses to inform how it will support the County Council's bus services.

TRDC has supported OLEV initiatives to install Electric Vehicle Charging points and is in the process of reorganising the terms under which the Council makes on-street

and off-street parking available to include the installation of more charging points for electric vehicles.

Table of Contents

List of Tables

List of Figures

2 Local Air Quality Management

This report provides an overview of air quality in Three Rivers District Council during 2016. 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 Three Rivers 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.

3 Actions to Improve Air Quality

3.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority 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 AQMAs declared by Three Rivers District Council can be found in Table 3.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=281.

There are currently 5 active AQMA's in Three Rivers District Council, however TRDC's Executive Committee have approved the revocation of the NO_2 Kings Langley AQMA and NO_2 and PM_{10} Chandlers Cross AQMA and are awaiting instructions from DEFRA upon how to revoke the AQMAs. Once these AQMA's have been revoked, there will be two remaining AQMAs in Chorleywood (for NO_2 and PM_{10}).

Due to the continued downward trend in NO_2 and the fact that concentrations have been consistently below the annual objective for NO_2 over the last 4 years, it is recommended that a detailed assessment be undertaken for both NO_2 and PM_{10} to ascertain whether the remaining Chorleywood AQMA's can also be revoked.

Further monitoring using NO_2 diffusion tubes is to be undertaken on the A412 in Rickmansworth from April 2017. The purpose of this monitoring is to ascertain current concentrations within residential areas including a new school that will be impacted upon by the proposed HS2 construction works at Long Lane/ A412/ Denham Way. This monitoring will provide data for a proposed detailed assessment bid to determine whether the impacts of the HS2 will result in an additional AQMA along the A412 between the roundabout at Rectory Road/Riverside Drive and the Denham Way roundabout.

Appendix D: Map(s) of Monitoring Locations and AQMAs This report identifies that the measured concentrations of NO_2 continue to be below the air quality objectives across the district and within the current AQMA's.

Table 3.1 – 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 (inc. date of publication)
						At Declaration	Now	
Chorleywood NO2 AQMA	Declared 01/04/2001	NO2 Annual Mean	Chorleywood	Along the M25 to south of Junction 18 to just north of where the motorway crosses the River Chess	YES	>40 µg/m^3	31.5	Three Rivers District Council Air Quality Action Plan 2015-2020 (pdf) www.threerivers.gov.uk/download?id=34952
Chorleywood PM10 AQMA	Declared 01/04/2001	PM10 24 Hour Mean	Chorleywood	A slightly narrower area from just north of Junction 18,	YES	>50 µg/m^3, exceeded more than	Not measured	Three Rivers District Council Air Quality Action Plan 2015-2020 (pdf) www.threerivers.gov.uk/download?id=34952

				along the M25 to just north of where the motorway crosses the River Chess		35 times a year		
Chandlers Cross NO2 AQMA	Declared 01/04/2001	NO2 Annual Mean	Chandlers Cross	An area along the M25 from just west of where Chandler's Lane crosses the M25 to the beginning of Junction 19 of the motorway	YES	>40 µg/m^3	24.4	Three Rivers District Council Air Quality Action Plan 2015-2020 (pdf) www.threerivers.gov.uk/download?id=34952
Chandlers Cross PM10 AQMA	Declared 01/04/2001	PM10 24 Hour Mean	Chandlers Cross	A slightly narrower area along the M25 from just west of where Chandler's Lane crosses the M25 to the	YES	>50 µg/m^3, exceeded more than 35 times a year	Not measured	Three Rivers District Council Air Quality Action Plan 2015-2020 (pdf) www.threerivers.gov.uk/download?id=34952

				beginning of Junction 19				
Kings Langley NO2 AQMA	Declared 01/04/2001	NO2 Annual Mean	Kings Langley	An area surrounding where the M25 crosses the railway extending 74m either side of the centreline	YES	>40 µg/m^3	26.3	Three Rivers District Council Air Quality Action Plan 2015-2020 (pdf) www.threerivers.gov.uk/download?id=34952

□ Three Rivers District Council does not confirm the information on UK-Air regarding their AQMA(s) is up to date. *The updated 2015-2020 AQAP has been provided to Defra, but is not yet updated on the UK-Air website

3.2 Progress and Impact of Measures to address Air Quality in Three Rivers District Council.

Defra's appraisal of last year's ASR concluded that the 2016 report was well structured, detailed, and provided the information specified in the Guidance.

Three Rivers District Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 3.2.

More detail on these measures can be found in their respective Action Plans such as the Councils Green Expectations Action Plan 2017/18. The Green Expectations Plan includes Objectives on:

- Objective 2 - Minimise greenhouse gas emissions from new developments in the District in line with our Local Plan.
- Objective 3 - Encourage the reduction of greenhouse gas emissions from existing properties in the District in line with the priorities in our Home Energy Conservation Act report.
- Objective 16 - The Council will seek to reduce the impact of carbon emissions and local air quality of travel associated with Council operations.
- Objective 17 - In conjunction with the Government, Hertfordshire County Council, Parish Council, schools, local interest groups, and other key stakeholders the Council will develop and improve local cycling and walking routes and actively facilitate sustainable travel through the provision and promotion of new infrastructure.
- Objective 18 - The Council will promote local passenger transport and work with the statutory transport providers including Hertfordshire County Council, bus and rail operators as well as other partners to encourage sustainable and healthy forms of travel.

Key completed measures are:

- Implementation of the airTEXT service for vulnerable residents in the district.
- Installation of electric vehicle charging points

- Install two $PM_{2.5}$ monitors in 2016.

Three Rivers District Council expects the following measures to be completed over the course of the next reporting year:

- Continue to monitor PM_{10} and $PM_{2.5}$ to establish current levels for reporting and supporting Public Health objectives.
- Install additional NO_2 diffusion tubes to monitor potential risk from HS2 construction activities on local communities.

Concentrations are currently achieving compliance with the objectives the measures stated above and in Table 3.2 will help to sustain full compliance.

Three Rivers District Council's priorities for the coming year are:

- To continue to work with Highways England as a priority activity, as the main source of emissions contributing to the original exceedance of the objectives in the AQMA's are from the M25.
- Continue to work across the Council to deliver the objectives of the Green Expectations Action Plan 2017/18.

Three Rivers District Council anticipates current and future activities will achieve compliance and enable the revocation of 2 remaining AQMA's in Chorleywood.

Table 3.2 – 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	AirTEXT	Public Information	Via other mechanisms	TRDC	Complete	April 2015 – April 2018	-	Exposure of most vulnerable	Operational	April 2018	April 2015 –April 2018
2	2x indicative PM2.5 AQ Monitors	Other	Other	TRDC	Complete	April 2017	PM2.5 AQ data	Inform future projects is required	Equipment sourced	TBC	April 2017
3	LTP, Walking, Cycling and bus strategy	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	TRDC	Ongoing	Ongoing	Decrease in private car use	NO2/PM	Ongoing	Ongoing	Ongoing
4	Improvement of bus network	Transport Planning and Infrastructure	Bus route improvements	TRDC	Complete	Ongoing	Increased Bus use	NO2/PM	Ongoing	TBC	Ongoing

5	OLEV initiative	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	TRDC	complete	Ongoing	Increased electric vehicle ownership	NO2/PM	One charging point installed	TBC	Ongoing
6	Additional cycle routes	Transport Planning and Infrastructure	Cycle network	TRDC	complete	Ongoing	Increase cycling	NO2/PM	Ongoing	TBC	Ongoing
7	Alternative routes via green ways	Transport Planning and Infrastructure	Other	TRDC	compete	Ongoing	Use of greenways	Reduce exposure	Ongoing	TBC	Ongoing

3.3 $PM_{2.5}$ – 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.

Three Rivers District Council is taking the following measures to address $PM_{2.5}$ and key benefits to reducing $PM_{2.5}$ emissions will come from the Air Quality Action Plan and Green Expectations Action Plan 2017/18.

The Action Plan includes:

- Continue to promote the installation of electric vehicle charging points, through working with planning and development departments to encourage new developments to take up charge points.

The Green Expectations Plan includes:

- Objective 16 - The Council will seek to reduce the impact of carbon emissions and local air quality of travel associated with Council operations.
- Objective 17 - The Council will develop and improve local cycling and walking routes and actively facilitate sustainable travel through the provision and promotion of new infrastructure.

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

4.1 Summary of Monitoring Undertaken

4.1.1 Automatic Monitoring Sites

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

Three Rivers District Council undertook monitoring with indicative (AQMesh) instrumentation at 1 site on Rickmansworth Rd, Chorleywood from April 2016. Table A. 1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

4.1.2 Non-Automatic Monitoring Sites

Three Rivers District Council undertook non- automatic (passive) monitoring of NO_2 at 7 sites during 2016 **Error! Reference source not found.** 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.

4.2 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.

4.2.1 Nitrogen Dioxide (NO_2)

No monitoring location within the district measured annual means greater than 40µg/m^3 objective. Also as no location exceeded 60µg/m^3 , it is unlikely that the hourly NO_2 objective was breached.

There are no continuous automatic NO_2 analysers in the District, using the reference chemiluminescence method of monitoring.

Error! Reference source not found. in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

Two further triple exposure NO_2 diffusion tube monitoring locations are to be installed April 2017, on the A412. The purpose of this extension to our monitoring network is to support a future bid for funding to carry out a more detailed assessment of the need (or otherwise) for an AQMA at the A412 between the roundabout at Rectory Road/Riverside Drive in Rickmansworth and the Denham Way roundabout at Maple Cross. This residential area and a new school may be impacted by the HS2 construction works at Long Lane/ A412/ Denham Way. The A412 is a heavily used and very narrow freight route though the Mill End locality for access to the M25 at J17 and it becomes severely congested whenever adverse traffic conditions pertain on the north western sector of the M25.

4.2.2 Particulate Matter (PM_{10})

TRDC commenced the monitoring of PM_{10} April 2016 using two AQMesh monitoring sensor units near to Junction 18 of the M25 within the Chorleywood AQMA. However, although this measurement device is indicative, unfortunately data capture was 64% which is below the 85% target for the calendar year and therefore not sufficient to provide an annual mean value.

4.2.3 Particulate Matter ($PM_{2.5}$)

The AQMesh instrumentation as detailed above in section 4.2.2 also monitors $PM_{2.5.}$ The monitoring of $PM_{2.5}$ was undertaken in partnership with the Public Health department to provide localised data for the air quality Public Health Outcomes Framework (PHOF) indicator. However, although this measurement device is indicative, unfortunately data capture was 64% which is below the 85% target for the calendar year and therefore not sufficient to provide an annual mean value.

5 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)
AQMesh 1	Rickmansworth Rd	Other	504162	196286	PM10, PM2.5	YES	Sensor unit (AQMesh)*	2	1	3

*Automatic monitor is sensor unit, therefore only indicative.

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)
S1 (NA)	Watford Road, Croxley Green	Kerbside	507134	195283	NO2	NO	3	1	NO	2.5
S2	Chandlers Cross	Urban Background	506430	198590	NO2	YES	97	17	NO	2.5
S3	The Retreat, Kings Langley	Urban Background	508100	201800	NO2	YES	7	4	NO	2.5
S4	Sunrise Senior Living/ Junction 18 M25, Chorleywood	Kerbside	504162	196286	NO2	YES	2	1	NO	2.5
S5	"	Kerbside	504162	196286	NO2	YES	2	1	NO	2.5

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)
S6	Sunrise Senior Living/ Junction 18 M25, Chorleywood	Roadside	504162	196286	NO2	YES	2	1	NO	2.5
S7	Rickmansworth Fire Station, Rectory Road	Suburban	505500	194400	NO2	NO	30	10	NO	2.5

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 NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
S1 (NA)	Kerbside	Diffusion Tube	100	100	33.9	33	28	26	25.9
S2	Urban Background	Diffusion Tube	100	100	29.8	29	26	27.3	26.1
S3	Urban Background	Diffusion Tube	100	100	27.2	31	26	26.6	30.1
S4	Kerbside	Diffusion Tube	100	100	**42.3**	36	34	34.3	30
S5	Kerbside	Diffusion Tube	100	100	**47.1**	35	34	35.2	34.4
S6	Roadside	Diffusion Tube	92	92	**45.3**	37	37	35.7	34.5

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
S7	Suburban	Diffusion Tube	100	100	28.4	30	27	25.9	28.2

☒ Diffusion tube data has been bias corrected

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

☒ If applicable, all data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO_2 annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

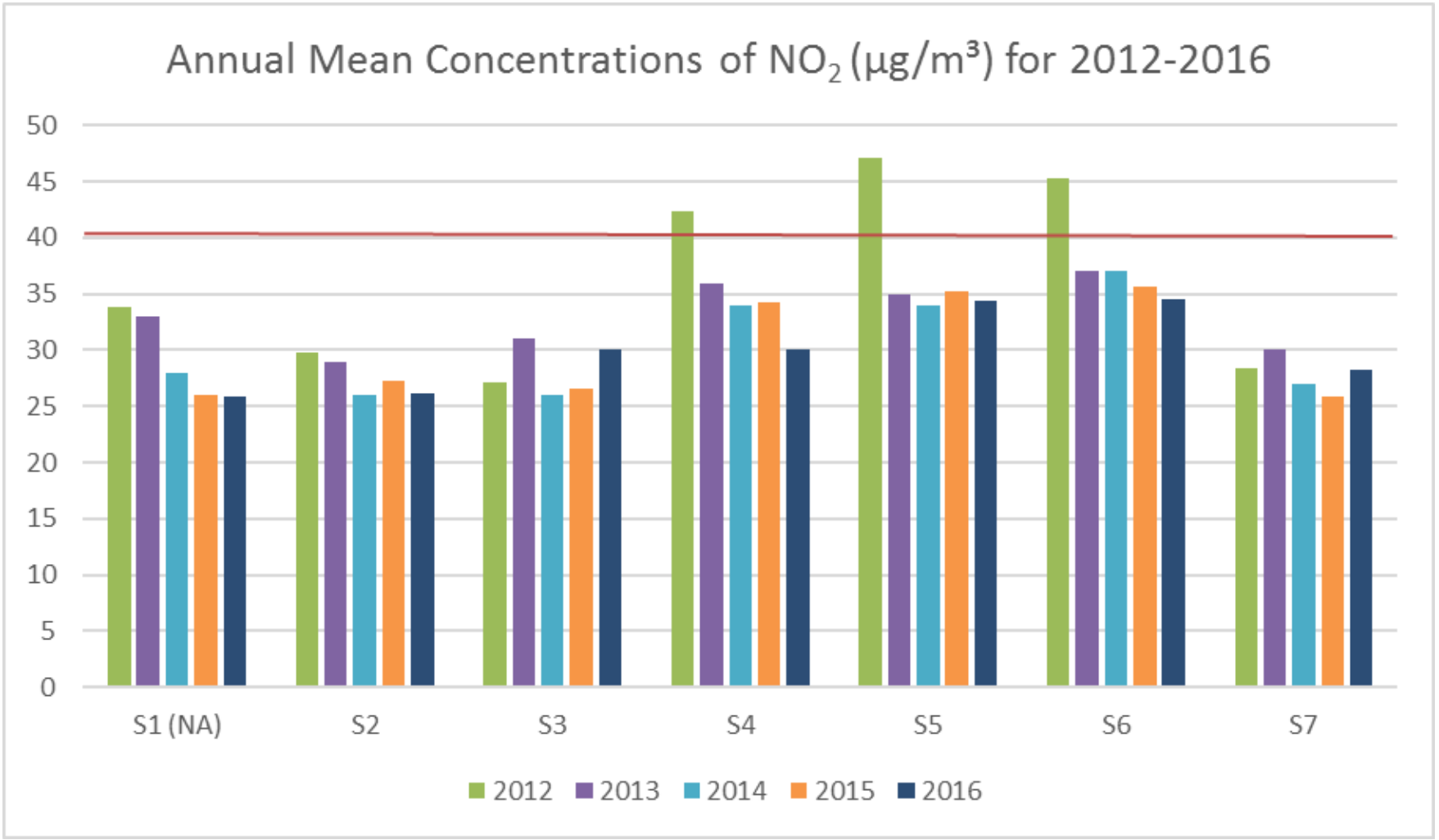
NO_2 annual means exceeding 60$\mu g/m^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(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.

Figure A.1 – Trends in Annual Mean NO_2 Concentrations



6 Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2016

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
S1 (NA)	6.5	41.3	37.4	35.3	32.5	28.8	25.2	25.9	37.7	33.4	46.9	52.6	33.6	25.9	23.4
S2	42.5	38.0	37.2	32.6	30.1	26.1	22.8	26.6	34.1	30.2	39.1	47.4	33.9	26.1	24.4
S3	32.9	51.2	50.2	39	41	39.4	36.3	33.6	33.6	32.3	35.3	44.9	39.1	30.1	26.7
S4	41.2	41.8	37.6	31.9	32.3	30.7	28.5	30.2	47.7	35.1	51	59.9	39.0	30	28.0
S5	53.5	48.2	50.4	37.7	42.1	40.5	33.3	36.8	45	35.7	53.7	59.3	44.7	34.4	31.4

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
S6	51.7	52.2	39.8	36.2	45.4	39.4	33.4		50.5	35.1	46.9	62.2	44.8	34.5	31.5
S7	42.8	40.6	39.7	33.7	38.3	32.9	22.1	27.9	38.1	36	40.3	47.8	36.7	28.2	23.0

☐ Local bias adjustment factor used

☒ National bias adjustment factor used

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

Notes:

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

Three Rivers District Council does not run a local triplicate co-location study therefore the national factor is applied. This is identified from the review and assessment help desk website for ESG Didcot. The preparation method is 50% TEA/acetone. Results of the last four years were:

2013: 0.81

2014: 0.81

2015: 0.79

2016: 0.77

QA/QC of diffusion tube monitoring

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combined two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR NO_2 PT scheme.

Summary of Laboratory Performance in AIR NO_2 Proficiency Testing Scheme

(April 2015 – February 2017) show that ESG Didcot (formerly Harwell Scientific services) achieved the following percentage (%) of results through 2016, which were subsequently determined to be **satisfactory.** (Jan- Feb 100%, April – May 75%, July – August 75%, September – October 100%. (Reference: https://laqm.defra.gov.uk/assets/airptrounds7to18apr2015feb2017.pdf)

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

Figure D. 1– Air Quality Management Areas Chorleywood NO_2 and PM_{10}

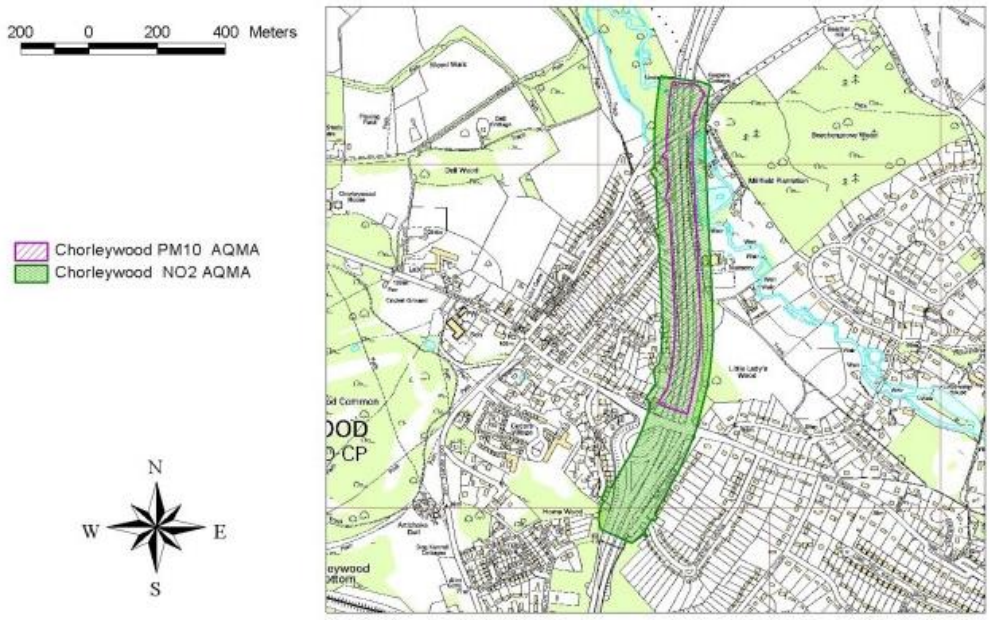


Figure D. 2 – Air Quality Management Areas Chandlers Cross NO_2 and PM_{10}

NB. Both NO2 and PM10 AQMAs awaiting revocation

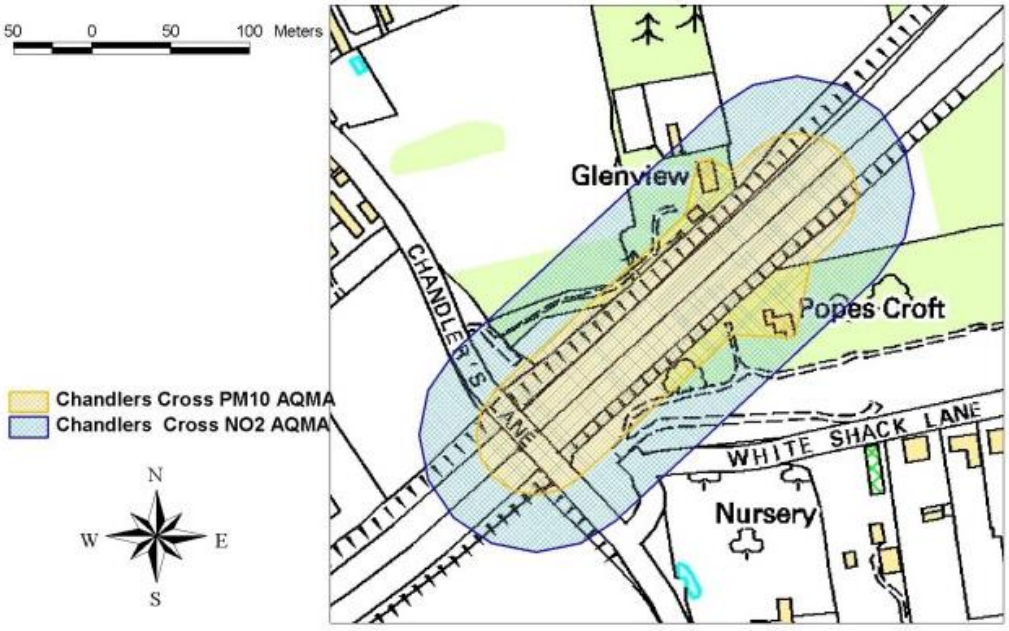
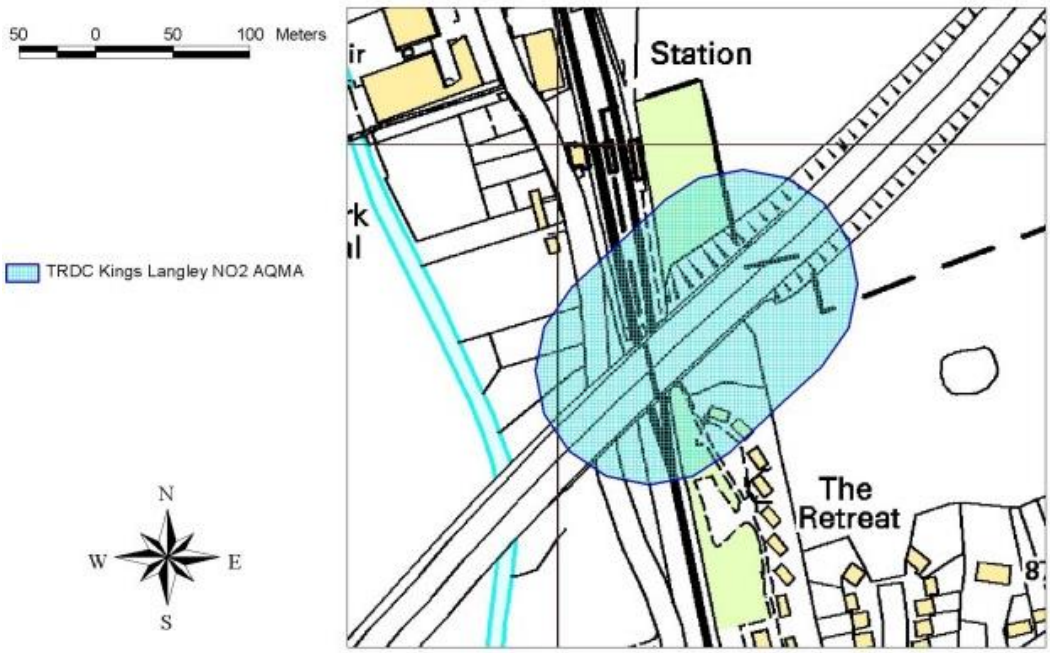


Figure D. 3 – Air Quality Management Area Kings Langley NO_2

NB. AQMA awaiting revocation



(Defra, 2016)

Figure D. 4 - Map of The Retreat, Abbots Langley diffusion tube (DT) site (S3)

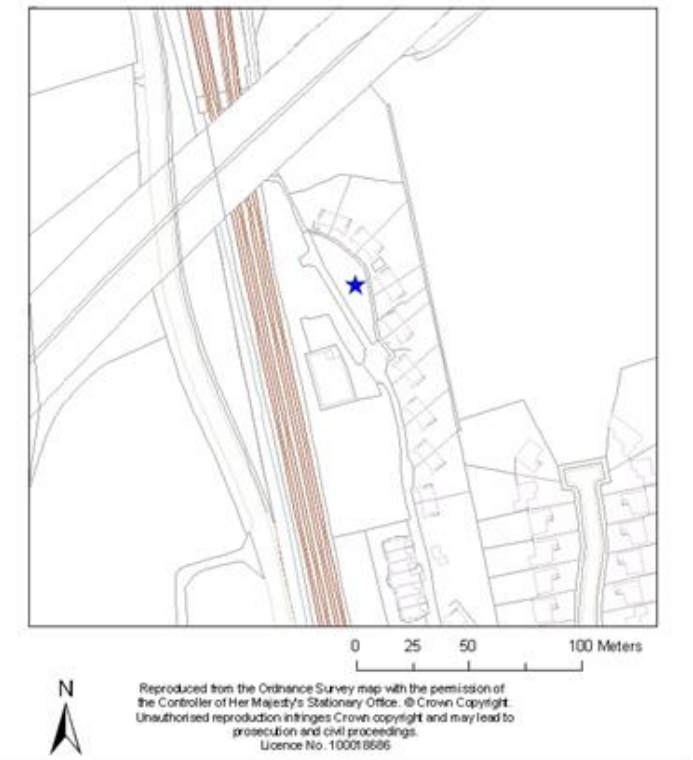


Figure D. 5 – Map of Junction 18 (M25) Chorleywood collocated DT (S4, S5 & S6) and AQMesh site.

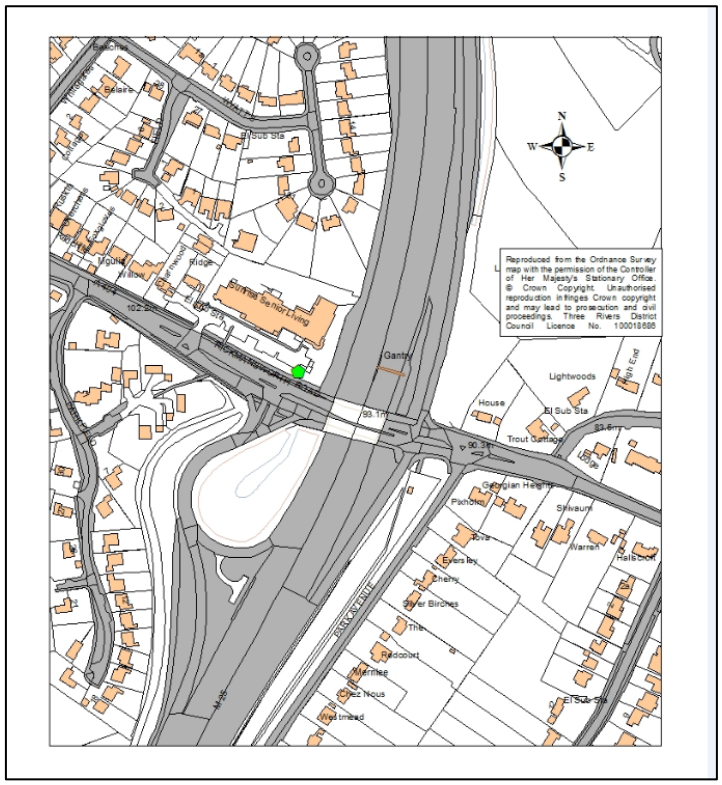


Figure D. 6 - Map of Glen View, Chandlers Cross DT site (S2)

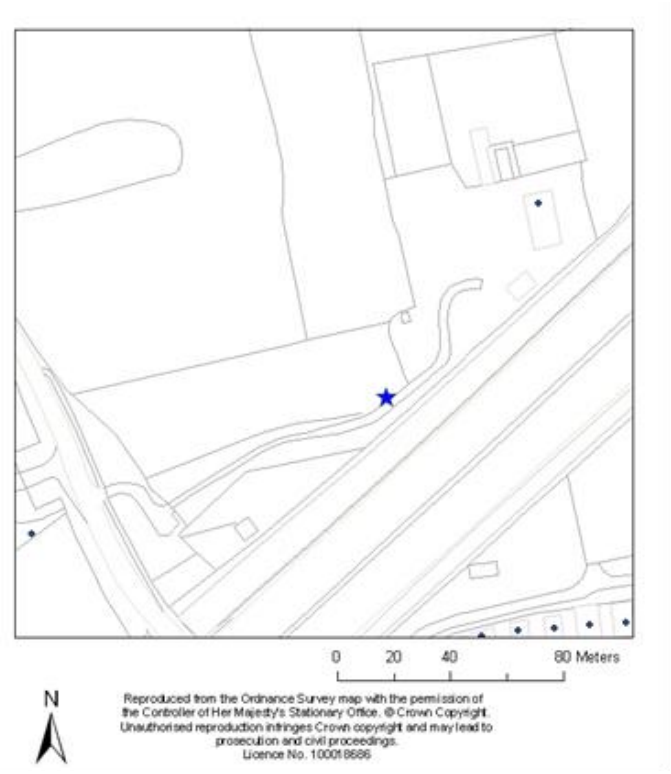


Figure D. 7 – Map of Watford Road, Croxley Green DT site (S1)

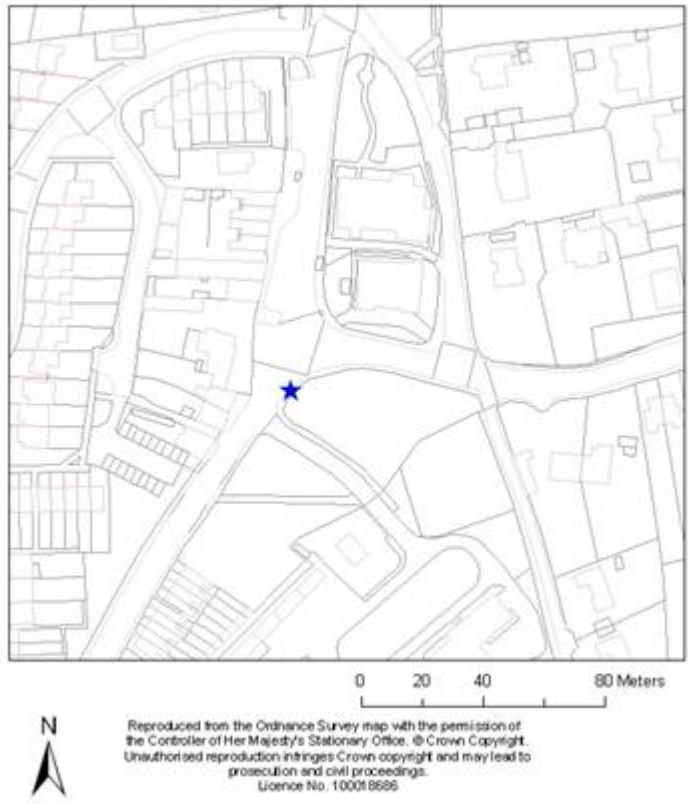
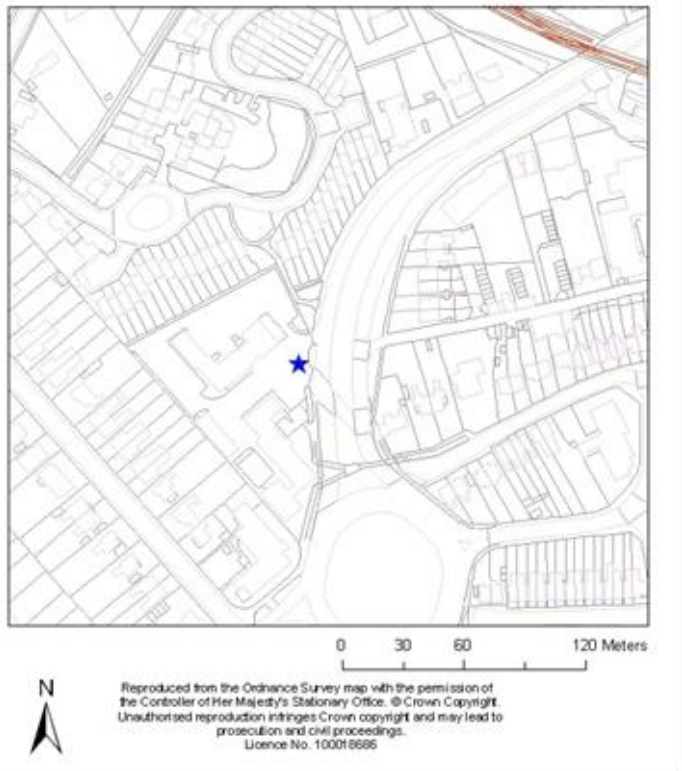


Figure D. 8– Map of Rectory Road, Rickmansworth DT site (S7)



9 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/m^3).

10 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
EU	European Union
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

11 References

AIR NO_2 Proficiency Testing Scheme (accessed 15th June 2017)

(https://laqm.defra.gov.uk/assets/airptrounds7to18apr2015feb2017.pdf)

Three Rivers District Council Air Quality Action Plan 2015-2020 (pdf)

(www.threerivers.gov.uk/download?id=34952)