



2012 Air Quality Updating and Screening Assessment for Three Rivers District Council

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

April 2012

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Executive Summary

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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 report represents an update on the air quality in Three Rivers District Council area.

Monitoring of nitrogen dioxide and PM₁₀ was undertaken at the continuous monitoring site in Rickmansworth, however, this site was discontinued in September 2011. In addition 16 nitrogen dioxide diffusion tubes were placed at sites around the district. This monitoring identified that there were exceedences of the nitrogen dioxide annual mean air quality objective within the Air Quality Management Area at Chorleywood. One diffusion tube on All Saints Lane, Croxley Green also measured levels exceeding the nitrogen dioxide annual mean air quality objective, however this was based on low data capture and was not representative of relevant exposure.

All other nitrogen dioxide diffusion tube results were substantially below the nitrogen dioxide annual mean air quality objective, including those in the Kings Langley and Chandlers Cross Air Quality Management Areas (AQMAs).

It is therefore recommended, in light of the monitoring data for 2010 and 2011, along with the conclusions from Stage 4 report in 2003⁵, that the AQMAs for NO₂ at Kings Langley and Chandlers Cross be revoked along with the AQMA for PM₁₀ at Chandlers Cross. A Detailed Assessment is not required for any pollutant at this stage, however, the deployment of diffusion tubes is to be reviewed primarily to more fully understand relevant exposure in the remaining NO₂ AQMA in Chorleywood.

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1 Introduction

1.1 Description of Local Authority Area

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 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. The Council has five Air Quality Management Areas (AQMAs) which have been declared as a result of emissions from the M25. There are no significant pollutant sources within the District apart from road traffic emissions.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report

should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

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

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running mean annual	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running mean annual	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running mean annual	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running mean 8-hour	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 (gravimetric) (PM ₁₀)	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

1.4.1 First Round of Review and Assessment

Unlike the current format of the Updating and Screening Assessment, Detailed Assessment and Further Assessment, round one of the review and assessment process was split into four staged reports, with each being more detailed than the last. The Council concluded there were three locations of relevant public exposure where the NO₂ and PM₁₀ objectives were unlikely to be met.

Further assessment of the subsequent AQMAs confirmed that exceedences were likely, but it was recommended that the areas covered by the AQMAs for NO₂ should be reduced and the AQMAs for PM₁₀ be revoked. However, in February 2004 it was decided, by the Committee of Members, to keep the original AQMAs in place.

1.4.2 Second Round of Review and Assessment

The Assessment concluded that exceedences in the existing AQMA's were likely, but no further potential exceedences were identified. Therefore a Detailed Assessment was not required.

1.4.3 Third Round of Review and Assessment

The Assessment indicated that the only likely NO₂ exceedences were within the existing AQMAs. Therefore a Detailed Assessment was not required.

The report recommended that the Council should consider reinstating diffusion tube monitoring at AQMA receptors close to the M25, to assess current NO₂ annual mean concentrations with a view to revoking one or more of the existing AQMAs.

1.4.4 Air Quality Action Plan 2007

Three Rivers District Council produced their Air Quality Action Plan in June 2007 stating their intentions for working towards reaching the air quality objectives included in the Air Quality Regulations, for the purposes of LAQM.

In pursuit of these objectives, Three Rivers District Council set out in its Action Plan to encourage direct action on the M25, although it was recognised that ultimately the

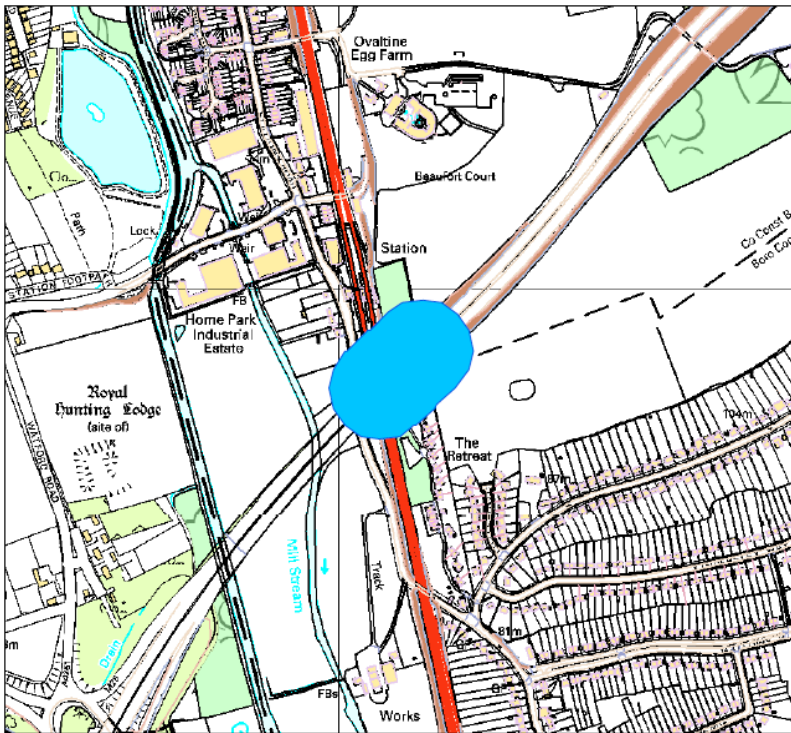
Three Rivers District Council

Highways Agency had full control over the motorway. The Action Plan also set out a series of measures to improve air quality across the whole of the District. These included: public transport schemes; a travelwise initiative; encouraging cycling; greenways; alternative fuel usage and car pooling schemes. The Action Plan also identified the importance of considering air quality within planning applications.

The five current AQMAs in the district as described on the Air Quality Archive website are:

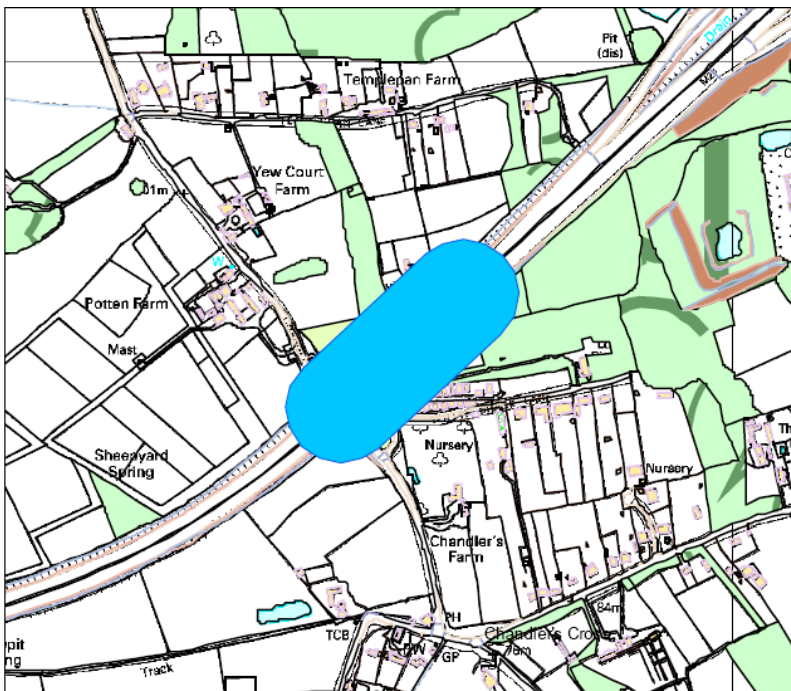
- 1) Chorley Wood NO₂ AQMA - Along the M25 from just south of Junction 18 to just north of where the motorway crosses the River Chess extending 74m either side of the centreline.
- 2) Chorleywood PM₁₀ AQMA - A slightly narrower area from just north of Junction 18, along the M25 to just north of where the motorway crosses the River Chess extending 38m either side of the centreline.
- 3) Chandlers Cross NO₂ AQMA - 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 extending 74m either side of the centreline.
- 4) Chandlers Cross PM₁₀ AQMA - A slightly narrower area than that for NO₂ extending 38m either side of the centreline.
- 5) Kings Langley NO₂ AQMA - An area surrounding where the M25 crosses the railway extending 74m either side of the centreline.

Maps of the locations of these AQMAs can be seen in the following figures.



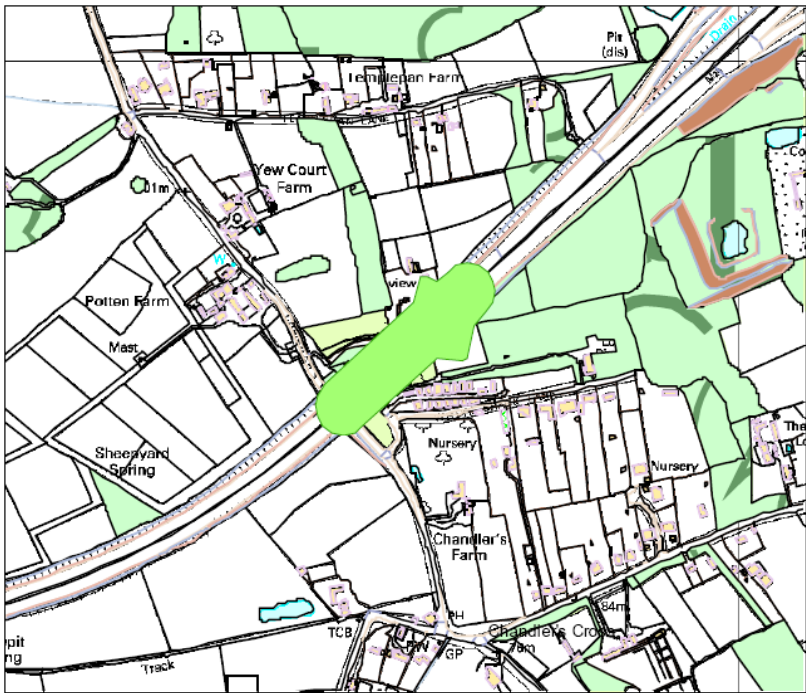
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Figure 1.1: Kings Langley NO₂ AQMA 1



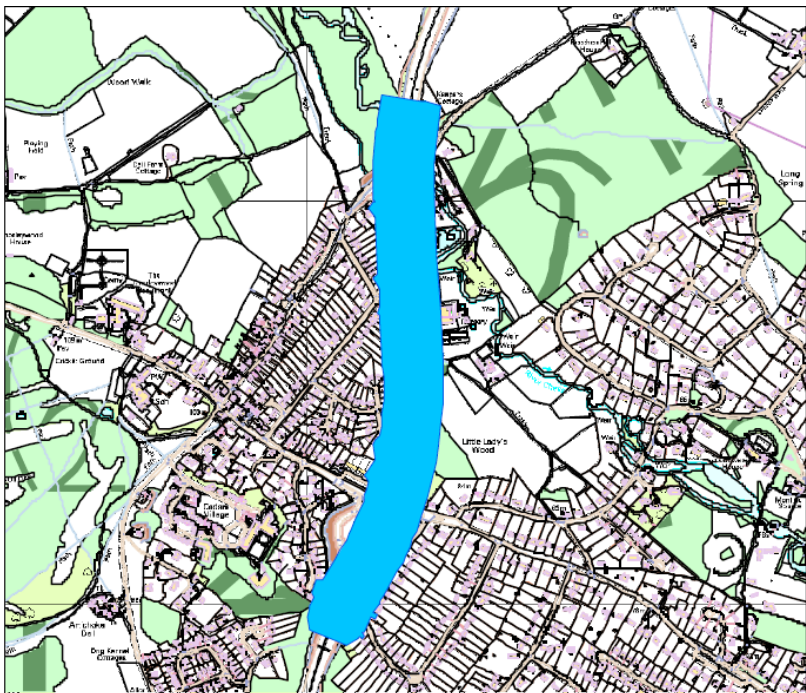
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Figure 1.2: Chandlers Cross NO₂ AQMA 2



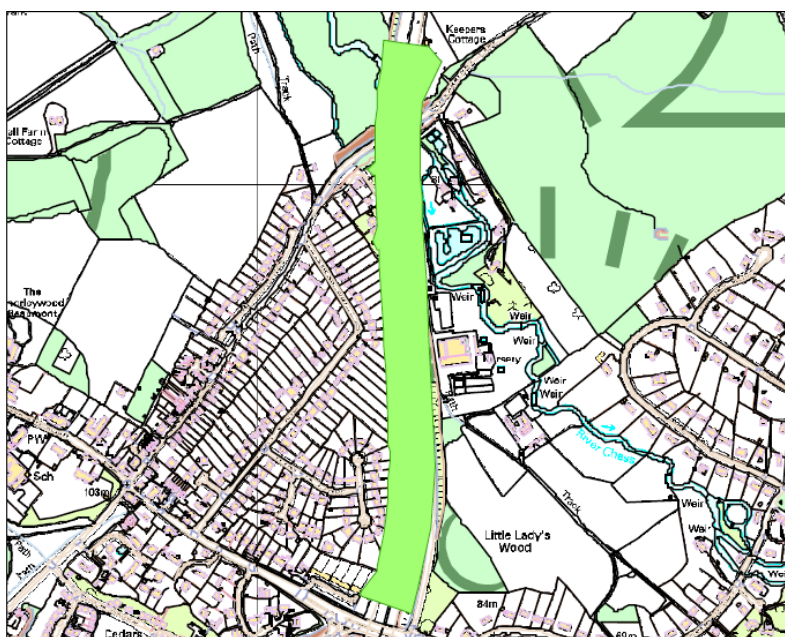
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Figure 1.3: Chandler's Cross PM₁₀ AQMA 2



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Figure 1.4: Chorleywood NO₂ AQMA 3



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Figure 1.5: Chorleywood PM₁₀ AQMA 3

1.4.5 Air Quality Progress Report 2008

The report recommended that monitoring of NO₂ using diffusion tubes be reinstated at the following sites: TR13 (within the Chorleywood AQMA); TR15 (within the Chandlers Cross AQMA); TR16 (The Retreat, within the Kings Langley AQMA) and; TR10 (All Saints Lane, Croxley Green).

It was concluded that as the annual mean NO₂ air quality objective was exceeded at TR10 and TR13 monitoring should continue at these locations and again be assessed within the 2009 Updating and Screening Assessment. It was also suggested that the Council consider monitoring NO₂ at other sites of relevant public exposure that could be affected by the widening of the M25. Continued commitment was also given monitoring of NO₂ and PM₁₀ at the Three Rivers Rickmansworth.

1.4.6 Air Quality Reports since 2008

Due to a number of reasons no reports have been submitted to defra since 2008. This means that the USA for 2009 was not submitted nor any reports since. Following discussions with the LAQM helpdesk earlier this year, it was agreed that the submission of a USA for 2012 should be submitted to update the years since the last report.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

The Council discontinued its 16 NO₂ diffusion tubes in 2007 and also discontinued its automatic monitoring site at Rickmansworth which monitored PM₁₀ and NO₂ in September 2011. In 2010 Three Rivers District Council reinstated 8 NO₂ diffusion sites the details of which can be seen in section 2.1.2.

2.1.1 Automatic Monitoring Sites

Monitoring at the Rickmansworth site has been undertaken since 2000 for both PM₁₀ and NO_x. In order to provide confidence in the data sets the continuous monitoring is subject to the quality assurance/quality control objectives set out for the HBAQMN. These procedures are:

- Fortnightly manual zero/span calibration using certified cylinders (carried out by trained LSO at Three Rivers District Council);
- Full data analyses and ratification through ERG, Kings College London; and
- Six monthly services visits and site audits.

However, due to financial pressures on services at Three Rivers District Council the continuous site was discontinued in September 2011. The site was located in Rickmansworth, was not in an AQMA and was classed as an urban background site which meant that the data gathered was of limited value in terms of LAQM. Grant funding from defra was sought to re-locate the analysers in one of the declared AQMAs to obtain more valuable air quality data for Three Rivers District Council but unfortunately the grant bid was unsuccessful.

The location of the Rickmansworth site is shown in Figure 2.1, with site details given in Table 2.1.

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
Three Rivers Rickmansworth	Back-ground	506000, 194400	NO _x /NO ₂ and PM ₁₀	N	N - 30m	10m	N

Table 2.1 Rickmansworth Automatic Monitoring Site Details



Figure 2.1 Map of Automatic Monitoring Site in Rickmansworth

2.1.2 Non-Automatic Monitoring Sites

The Council discontinued its 16 NO₂ diffusion tubes in 2007. The 2007 data set for these locations are detailed in the 2008 Progress Report, so have not been duplicated here. Following some work undertaken in 2010, Three Rivers District Council re-instated 8 NO₂ diffusion tube sites, the locations of which can be seen in figures 2.2 to 2.9 and the details of which can be seen in table 2.2. At four of these locations diffusion tubes were co-located in triplicate resulting in the deployment of 16 nitrogen dioxide tubes in total. The diffusion tubes are supplied by Harwell Scientific Services and the preparation is 50% TEA in acetone. Further information on the QA/QC procedures for the diffusion tubes can be seen in Appendix A.

Site Name	Site Type	OS Grid Ref	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	*Worst-case Location?
TR3 All Saints Lane Croxley Green	K	507000 195300	N	24	1	N
TR7 Junction 18 M25	K	504300 196300	Y	35	1	N
TR4 Glen View AQMA Chandlers Cross	B	506500 198600	Y	97	17	N
TR5 The Retreat Abbots Langley	B	508100 201800	Y	7	4	N
TR1 High Street Rickmansworth	K	506005 194455	N	1	1	N
TR2 Rectory Road Rickmansworth	R	505486 194480	N	30	10	N
TR6 Lemonfield Drive Garston	S	512300 200760	N	5	2	N
TR8 Prestwick Road, South Oxhey	U	511744 193289	Y	6	5	N

Table 2.2. Details of re-instated diffusion tube sites in 2010

Site type: K = kerbside, B = urban background

*where N is given for worst case receptor, this denotes that the monitoring site is closer to the road source than the nearest façade.

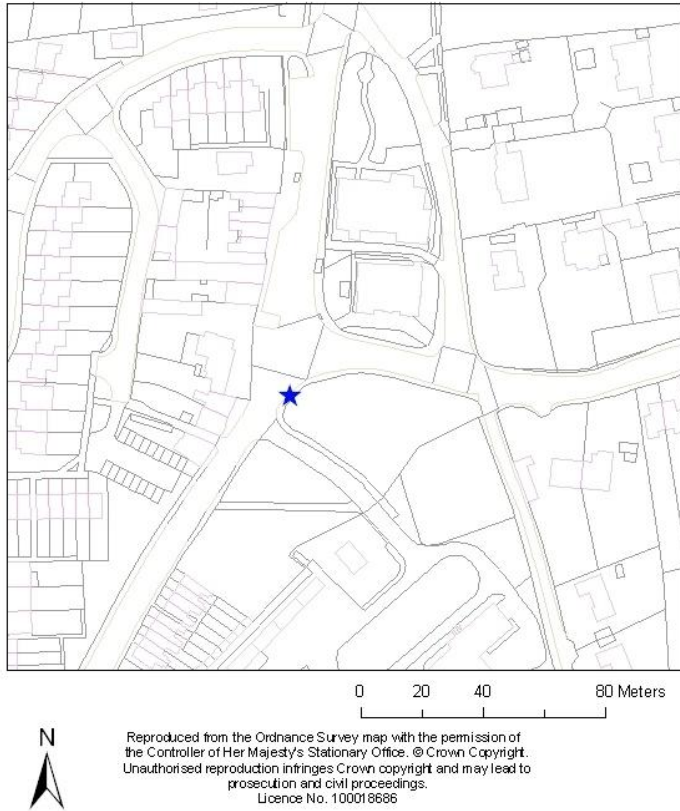


Figure 2.2. Map of All Saints Lane, Croxley Green diffusion tube site

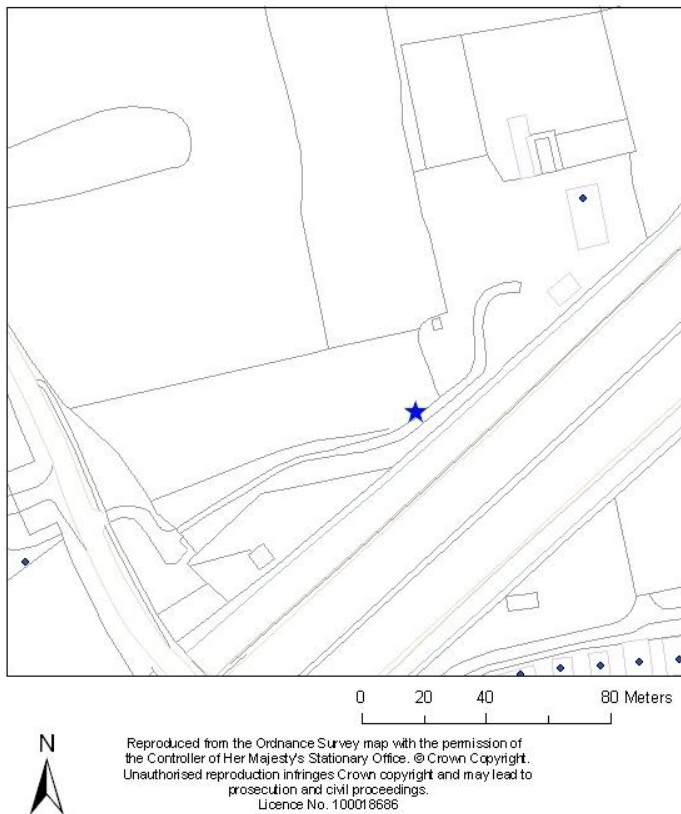


Figure 2.3. Map of Glen View, Chandlers Cross diffusion tube site

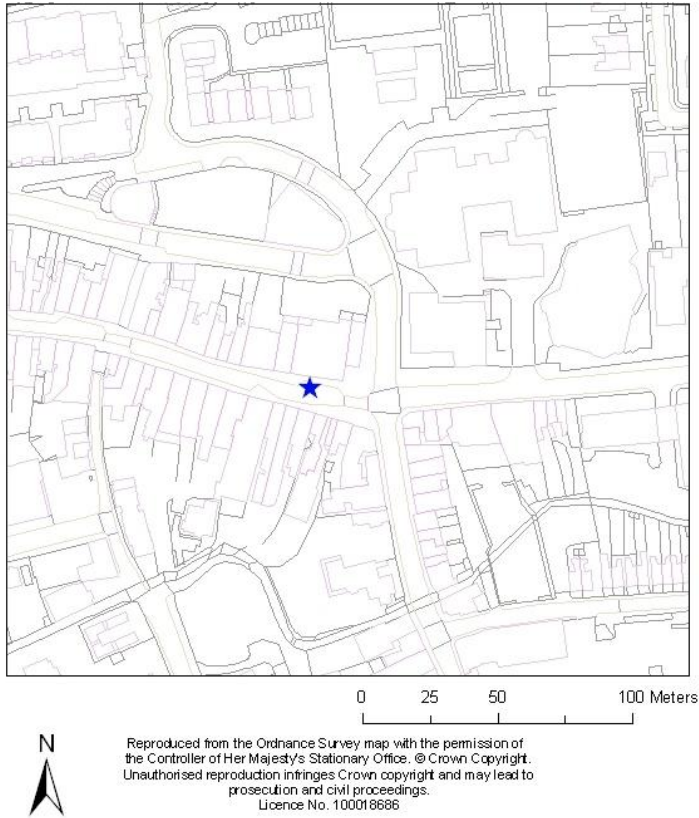


Figure 2.4. Map of High Street, Rickmansworth diffusion tube site

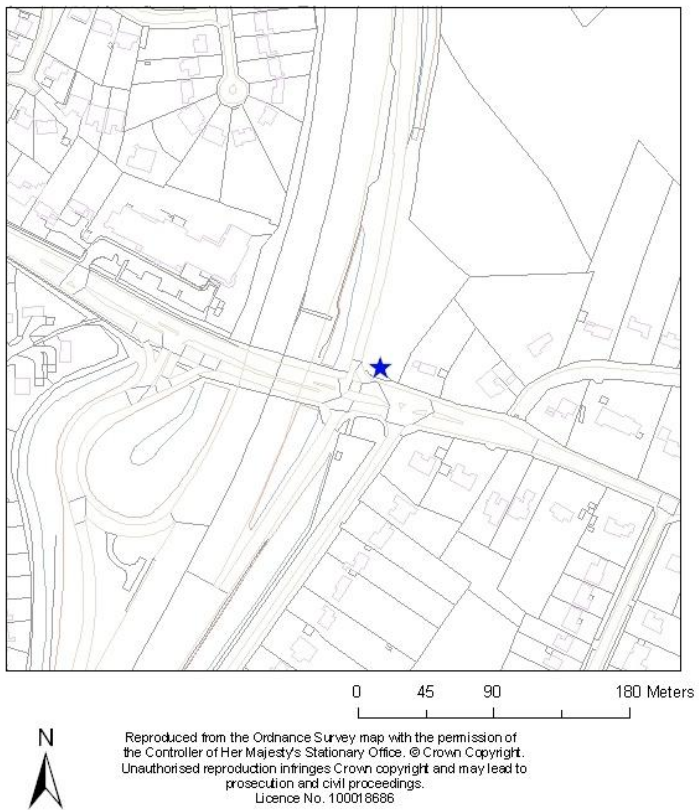


Figure 2.5. Map of Junction 18 (M25) Chorleywood diffusion tube site

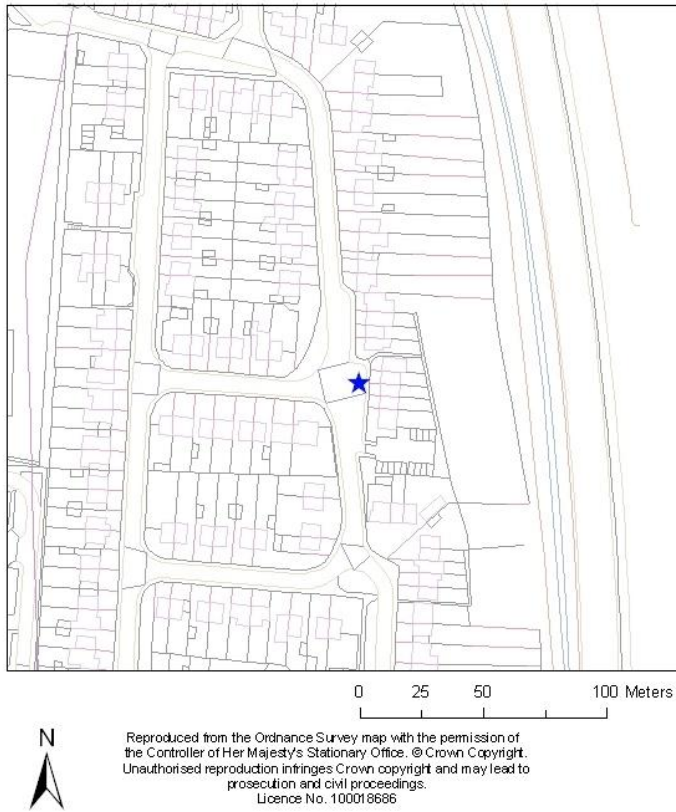


Figure 2.6. Map of Lemonfield Drive, Garston diffusion tube site

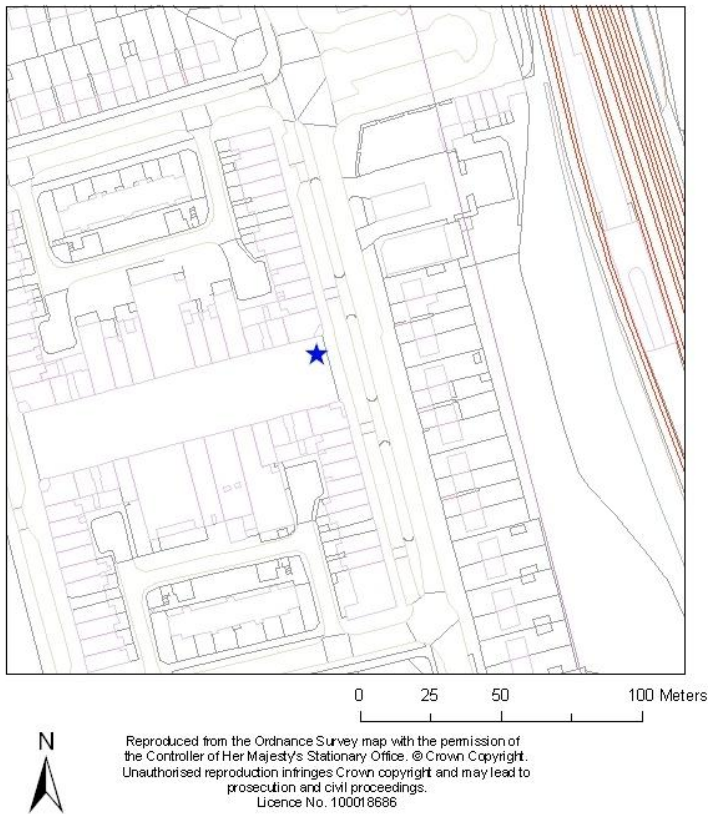


Figure 2.7. Map of Prestwick Road, South Oxhey diffusion tube site

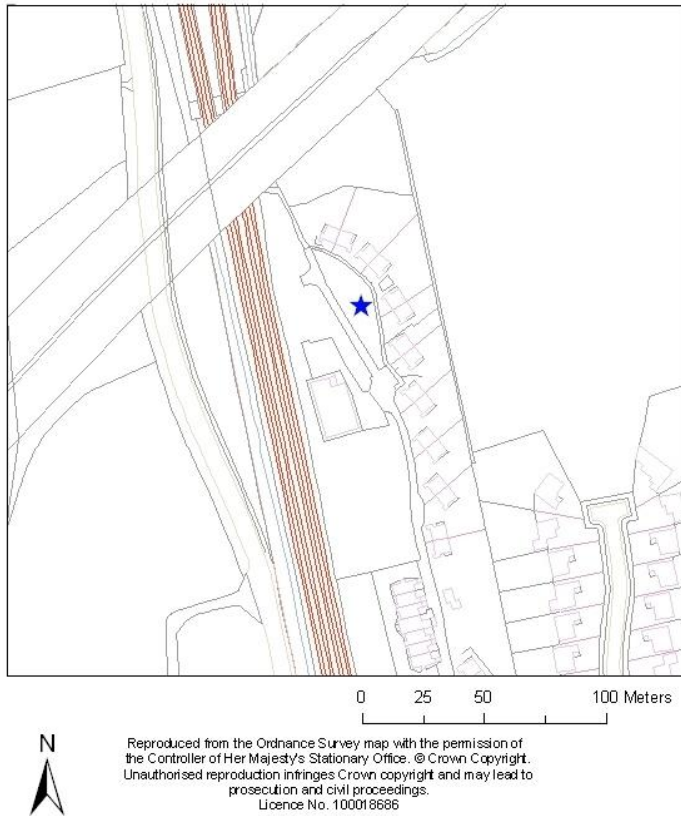


Figure 2.8. Map of The Retreat, Abbots Langley diffusion tube site

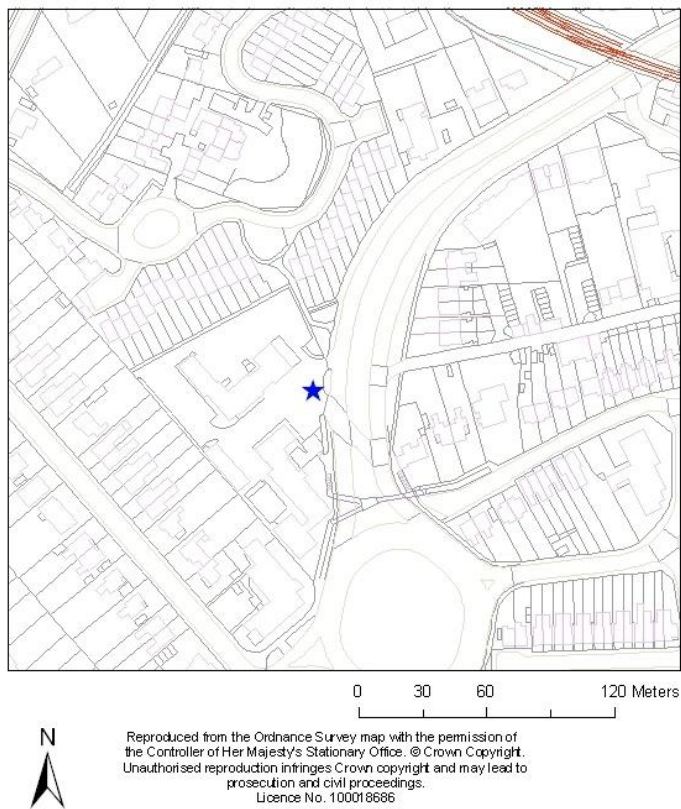


Figure 2.9. Map of Rectory Road, Rickmansworth diffusion tube site

2.2 Comparison of Monitoring Results with AQ Objectives

To assess the measured concentrations against the annual mean nitrogen dioxide air quality objective, both the tubes and the data need to be subject to quality assurance/quality control protocols. Following these QA/QC guidelines can minimise the inherent uncertainty in any measured concentrations. All details of the QA/QC procedures that have been applied to the diffusion tube monitoring data are given in Appendix A.

The purpose of the USA is to identify any possible exceedences of the air quality objectives and where this is found to be the case it is recommended that a Detailed Assessment is undertaken. In assessing monitoring results it is important to consider not only the measured concentrations in relation to the objectives, but also whether it represents relevant exposure. Where monitoring locations do not represent relevant exposure, a façade distance calculation method can be utilised as described in LAQM.TG(09)¹.

2.2.1 Nitrogen Dioxide

The two air quality objectives for NO₂ are:

- An annual mean of 40 µg/m³; and
- The number of exceedences of the 1 hour mean of 200 µg/m³ (18 allowable exceedences in total).

It is only possible to directly assess against the 1 hour objective if hourly monitoring data is available. As most NO₂ monitoring within the District has been conducted with diffusion tubes for Three Rivers District Council, where the annual mean is less than 60 µg/m³ the short term objective is deemed to be met as suggested in LAQM.TG(09)¹.

2.2.1.1 Automatic Monitoring Data

The continuous monitoring station based in Rickmansworth was discontinued in September 2011 as a result of lack of funding; however, the monitoring results from this station have been presented in table 2.3 and 2.4. The discontinuation of this monitoring site forms the main reason for the valid data capture of 67% for 2011. However, the results presented in table 2.3 have been annualised using the methodology in Box 3.2 of TG(09)¹. Details of this annualised data calculation can be seen in Appendix A. The annual mean concentration for 2011 is 41.6 $\mu\text{g}/\text{m}^3$ which represents a breach of the annual mean objective level. The results of the automatic monitoring station showed no exceedences of the hourly mean and reported a 99.8th percentile of hourly means is 149 $\mu\text{g}/\text{m}^3$. Although the annual mean concentration has been exceeded the monitoring station is not representative of relevant exposure: the site is 10 metres from the kerb of the nearest road and 30 metres from the nearest receptor. When a distance calculation is undertaken on this result using the calculator on the LAQM website the reported annual mean at the receptor is 29 $\mu\text{g}/\text{m}^3$: well below the objective. Additionally, the automatic monitoring site is not in an AQMA.

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2011 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$ 2011 ^c
Three Rivers Rickmansworth	Urban Background	N	80	67%	41.6

^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 six 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)¹, if monitoring was not carried out for the full year.

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2011 % ^b	Number of Exceedences of Hourly Mean ($200 \mu\text{g}/\text{m}^3$) 2011 ^c
Three Rivers Rickmansworth	Urban background	N	80	67	0 (149)

^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 six months the maximum data capture for the full calendar year would be 50%.)

^c If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

2.2.1.2 Diffusion Tube Monitoring Data

The diffusion tube monitoring results for 2011 can be seen in table 2.5 below. The results have been bias corrected using the national bias factor as presented in the defra spread sheet. The 2010 data has also been presented and has been annualised and bias adjusted as the tubes were only reinstated in May of that year. The bias adjustment factors, annualising data and a full dataset of the monthly mean values for 2011 (not bias corrected) are presented in Appendix A and B. Although some of the tubes have been co-located in triplicate at some of these sites, the averages have not been taken and all tube site results have been shown. Additionally, the 2011 tube sites with less than 75% data capture (9 months) have not been corrected as the collection rates are so low. The distance corrected tube results have also not been presented as if this was undertaken no exceedences of the annual mean objective would be shown. The results from diffusion tubes inside AQMAs are examined first, with a comparison against the modelled and monitored levels from the Stage 4 report in 2003⁵, followed by results from outside AQMAs.

Diffusion tube Results from Within AQMAs

The Retreat, Kings Langley

The three nitrogen dioxide diffusion tubes sited at The Retreat in 2011 (TR30, 31 and 32) recorded an annual mean concentration of 28, 28.2 and 28.4 $\mu\text{g}/\text{m}^3$ respectively based on a 100% data capture rate for all tubes. This is well below the annual mean objective of 40 $\mu\text{g}/\text{m}^3$. The 2010 results, annualised from 8 months data are also well below the annual mean objective. The Kings Langley AQMA contains four properties in The Retreat. Whilst the diffusion tube site does not represent the worst case scenario (i.e. there is a property marginally closer to the M25 than the tube site) the results would seem to suggest that the previously modelled levels over predicted the levels in this area. This over prediction is probably as a result of the topography of the land at this location. The M25 motorway at this point is on a viaduct well above ground level which provides enhanced dispersion of vehicle emissions. The Stage 4 report from 2003⁵ also found that this was the case and suggested that further

monitoring be undertaken to confirm whether the predicted annual mean NO₂ levels for 2005 (29 µg/m³) were likely. The past two years data confirm that levels continue to remain low, substantially below the annual mean objective. It is therefore recommended that this AQMA is revoked.

Glen View, Chandlers Cross

The AQMA at Chandlers Cross contains 2 properties and a number of mobile homes along the M25 including Glen View which is the closest property to the carriageway. The three diffusion tubes sited at this location (TR26, 27, 28) are exposed at the same distance from the carriageway as Glen View and in 2011 recorded annual means of 29.1, 29.3 and 32 µg/m³ respectively based on data capture ranging from 88 % to 100%. This, again, is substantially below the annual mean objective of 40 µg/m³ and even lower levels were recorded in 2010 of 23.7, 24.3 and 25.2 µg/m³. Again, it is most probably the topography of this location which results in the measured levels being lower than expected. The M25 motorway at this location is in a cutting on the brow of a hill. The Stage 4 report from 2003⁵ also found that this was the case and suggested that further monitoring be undertaken to confirm whether the predicted annual mean NO₂ levels for 2005 (30 µg/m³) were likely. The past two years data confirm that levels continue to remain low, substantially below the annual mean objective. It is therefore recommended that this AQMA is revoked.

Junction 18, M25 – Chorleywood

The Chorleywood AQMA extends along a 1.4km stretch of the M25 400 metres to the south and 1km to the north of junction 18. South of the junction there are 3 properties east of the carriageway and 4 to the west and to the north of the junction there are numerous properties to the west of the carriageway. The diffusion tube site is located on the eastern side of junction 18 adjacent to the M25/A404 off slip and in 2011 the results obtained from this location are 44.3, 47.6 and 50.5 µg/m³ compared with 2010 results of 43.1, 46.5 and 48 µg/m³. Although the diffusion tube is not representative of relevant exposure, these results represent a breach of the annual mean objective and indicate that the AQMA is still required at this location. It is therefore recommended that the three tubes are split and deployed at other locations

in this vicinity to obtain a greater understanding of NO₂ levels affecting properties in this area.

Diffusion Tube Sites outside of AQMAs

One diffusion tube annual mean results showed an exceedence of 40 $\mu\text{g}/\text{m}^3$ and that was the site at All Saints Lane, Croxley Green. The annual mean concentration was measured at 54.2 $\mu\text{g}/\text{m}^3$ in 2011 as compared to 40 $\mu\text{g}/\text{m}^3$ for 2010. However, the 2011 data capture for this year was only 4 months – approximately 33%. No annualisation was undertaken for this result but the site is located 24 metres from a relevant receptor. When a distance correction is applied (as measured although it is appreciated that no weight should be placed on 33% data capture) using the distance correction calculator the corrected value is 29.2 $\mu\text{g}/\text{m}^3$. It is therefore recommended that a new site be found in All Saints Lane which is representative of relevant exposure and in a position which is more secure to enable greater data capture.

All other NO₂ diffusion tube site results were well below the annual mean objective concentration. The Prestwick Road, South Oxhey site only recorded six months of results which has not been annualised, however, the results were 32.8 and 32.3 $\mu\text{g}/\text{m}^3$ for 2011 and 2010 respectively – well below the annual mean objective and some 6 metres from the nearest relevant receptor. The other sites: High Street, Rickmansworth; Rectory Road, Rickmansworth (3 tubes); and Lemonfield Drive, Garston recorded levels of data capture of between 90% and 100% with measured NO₂ all around 30 $\mu\text{g}/\text{m}^3$ – substantially below the annual mean objective. In light of these results it is recommended that the Rectory Road site in Rickmansworth be reduced from three tubes to one diffusion tube.

Based on the diffusion tube monitoring results, along with the automatic analyser results, indicate that the hourly mean air quality objective for nitrogen dioxide will not be exceeded at any location in the district.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2010 and 2011

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.86)	
								2010 ($\mu\text{g}/\text{m}^3$)	2011 ($\mu\text{g}/\text{m}^3$)
TR21	High Street Rickmansworth	Kerbside	N	Y	11 months	-	N	31.2	29.2
TR22	Rectory Road Rickmansworth A	Intermediate	N	Y	12 months	-	N	35.2	26.7
TR23	Rectory Road Rickmansworth B	Intermediate	N	Y	12 months	-	N	31.4	28
TR24	Rectory Road Rickmansworth C	Intermediate	N	N	12 months	-	N	31.8	29
TR25	All Saints Lane Croxley Green	Kerbside	N	N	4 months	N	N	40.0	54.2
TR26	Glen View Chandlers Cross A	Background	Y	Y	10 months	-	N	24.3	29.3
TR27	Glen View Chandlers Cross B	Background	Y	Y	11 months	-	N	25.2	29.1
TR28	Glen View Chandlers Cross C	Background	Y	Y	12 months	-	N	23.7	32
TR29	The Retreat Kings Langley A	Background	Y	Y	12 months	-	N	33.6	28.2
TR30	The Retreat Kings Langley B	Background	Y	Y	12 months	-	N	33.5	28
TR31	The Retreat Kings Langley C	Background	Y	Y	12 months	-	N	32.2	28.4
TR32	Lemonfield Drive Garston	Background	N	N	12 months	-	N	30.8	28.3

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Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.86)	Annual Mean concentration (Bias Adjustment factor = 0.84)
								2010 ($\mu\text{g}/\text{m}^3$)	2011 ($\mu\text{g}/\text{m}^3$)
TR33	Junction 18 M25 A	Kerbside	Y	Y	12 months	-	N	48.0	44.3
TR34	Junction 18 M25 B	Kerbside	Y	Y	11 months	-	N	43.1	50.5
TR35	Junction 18 M25 C	Kerbside	Y	Y	12 months	-	N	46.5	47.6
TR36	Prestwick Road South Oxhey	Intermediate	Y	N	6 months	N	N	32.3	32.8

^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 six 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)¹, if monitoring was not carried out for the full year.

2.2.2 PM₁₀

The automatic monitoring site in Rickmansworth is classed as an urban background site. The site is not in an AQMA and is not representative of relevant exposure, which is some 30m distant. The site is 10 metres from the kerbside of the nearest road. The data as presented has had the VCM applied and has been annualised using the procedure in Box 3.2 of TG(09)¹. The annual mean concentration of 21 $\mu\text{g}/\text{m}^3$ and the number of exceedences of the 24 hour mean of 50 $\mu\text{g}/\text{m}^3$ are both substantially below the objectives.

There is no monitoring data for PM₁₀ inside the AQMAs that have been declared at Chorleywood and Chandlers Cross. However, it has been highlighted that the NO₂ measured levels at the Chandlers Cross are low as a result of the topography of this location (the carriageway is on a viaduct). It is also extremely likely that the levels of PM₁₀ are also low for the same reasons. It is therefore recommended that this AQMA be revoked. This was also the conclusion in the Stage 4 report from 2003⁵.

Although the 2003⁵ report concluded that the Chorleywood AQMA for PM₁₀ also be revoked, it is recommended that this AQMA remains in place until such time as more detailed NO₂ data are available for a number of sites with relevant exposure. As there has been some time since the modelling undertaken in this report it is felt that a little more information is required before revocation.

Table 2.6 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration µg/m ³
						2011
Three Rivers Rickmansworth	Urban background	N	86	67	Y	21

^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 six months the maximum data capture for the full calendar year would be 50%).

Table 2.7 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m ³)
						2011
Three Rivers Rickmansworth	Urban background	N	86	67	Y	12 (36)

^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 six months the maximum data capture for the full calendar year would be 50%).

^c if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets

2.2.3 Sulphur Dioxide

Three Rivers District Council does not monitor for sulphur dioxide.

2.2.4 Benzene

Three Rivers District Council does not monitor for benzene.

2.2.5 Other pollutants monitored

Three Rivers District Council does not monitor for any other pollutants.

2.2.6 Summary of Compliance with AQS Objectives

Three Rivers District Council has examined the results from monitoring in the district. Concentrations outside of the AQMAs are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

Additionally, it is recommended, as a result of recent monitoring data allied to a Stage 4 Report undertaken in 2003⁵, that the AQMAs for NO₂ at Kings Langley and Chandlers Cross, and the AQMA for PM₁₀ at Chandlers Cross are revoked as they are no longer necessary.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Three Rivers District Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Three Rivers District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Three Rivers District Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Three Rivers District Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

3.5.1 Orbit Multi Modal Study (November 2002) – M25 Widening

Widening of the M25 was one of the recommendations of this multi modal study undertaken in 2002. The widening project would affect Three Rivers District Council between J16 to 23. The Council set out the key findings of the associated Environmental Impact Assessment in its Air Quality Progress Report in 2008.

The AQMA at Chandlers Cross was identified as a section where design modifications could result in central reservation realignment changes of up to 1 metre. The residential receptors in this vicinity were in close proximity to the carriageway which was thought to potentially having a substantial effect on air quality. The report concluded that the change in design would not significantly impact on estimated pollutant concentrations at Glen View, Chandlers Cross, within the AQMA and that significant local air quality impacts at relevant receptors as a result of changes to the retaining wall would be unlikely. The results obtained from the NO₂ diffusion tubes in 2010 and 2011 located near to Glen View support these conclusions.

Aside from the M25 changes addressed above, Three Rivers District Council confirms that there are no other new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Three Rivers District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Three Rivers District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Although there are airports in the wider region, none significantly impact on the Districts local air quality.

Three Rivers District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Three Rivers District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Three Rivers District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Three Rivers District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Three Rivers District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Three Rivers District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Three Rivers District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Three Rivers District Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Three Rivers District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Three Rivers District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Three Rivers District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Three Rivers District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Three Rivers District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The nitrogen dioxide monitoring results from the Kings Langley and Chandlers Cross AQMAs indicate that the NO₂ annual mean objective is currently being met. The results for the Chorleywood AQMA indicate that the nitrogen dioxide annual mean objective is exceeded.

The nitrogen dioxide diffusion tube monitoring results in the district outside of the AQMAs are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

8.2 Conclusions from Assessment of Sources

No significant changes or developments have been identified since the last submitted air quality report which are likely to lead to significant increases in any pollutant prescribed in the Air Quality Strategy. A Detailed Assessment is therefore not required.

8.3 Proposed Actions

This Updating and Screening Assessment has identified that no Detailed Assessment is required for any pollutant.

Following on from the Stage 4 report undertaken in 2003⁵, monitoring undertaken in the AQMAs of Kings Langley and Chandlers Cross have confirmed that there is no requirement for the AQMAs to be retained. It is therefore proposed that the AQMAs for NO₂ at Kings Langley and Chandlers Cross be revoked along with the AQMA for PM₁₀ at Chandlers Cross. The AQMAs for NO₂ and PM₁₀ at Chorleywood will be retained pending further more relevant monitoring.

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The current triplicate deployment at Chorleywood shall be reduced to one tube and new diffusion tube sites will be identified within the AQMA which is representative of relevant exposure in an attempt to more fully assess NO₂ levels in this area. It is also proposed that the triplicate NO₂ diffusion tube sites at Chandlers Cross and Kings Langley be reduced to one for one more year to ensure measured levels remain low. The triplicate diffusion tube site located in Rectory Road shall be reduced to one tube.

Additionally, if funding can be secured from defra for monitoring, then Three Rivers District Council would look to relocate the station within the AQMA at Chorleywood.

The next course of action for air quality is to revoke the AQMAs as outlined in this report and submit a Progress Report in 2013.

9 References

1. Part IV of Environment Act 1995: Local Air Quality Management. Technical Guidance LAQM.TG (09). Defra, February 2009.
2. The Air Quality (England) Regulations 2000 (Statutory Instrument 2000 No. 928), March 2000.
3. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007. Volume 1 and 2, ISBN 978-0-171692-5
4. The Air Quality Amendment Regulations 2002, ISBN 0 11061468 2.
5. AEA Technology, 2003, Air Quality Review and Assessment Stage 4 – A Report Produced for Three Rivers District Council, Report ref: AEAT/ENV/R/1428/Issue 1.

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Three Rivers District Council has not run a local triplicate co-location study so uses a national factor as given on the review and assessment help desk website for Harwell Scientific Services. The preparation method is 50% TEA/acetone. Results of the last two years were:

2010: 0.86

2011: 0.84

The version of the database used was 03/12.

PM Monitoring Adjustment

The PM10 data presented in this report is as measured by a TEOM using the VCM for indicative Gravimetric equivalent as outlined in Box 3.4 of TG(09)¹.

Short-term to Long-term Data adjustment

NO2 period adjustment for real time data from Rickmansworth 2011

Site	Site Type	Annual Mean	Period Mean	Ratio
London Hillingdon	Urban Background	55.1	50.53	1.09
London Haringey	Urban Background	30.9	29.4	1.05
London Teddington	Urban Background	21.3	21.8	0.97
Harwell	Rural Background	10.3	10.8	0.95
			Average	1.015

PM10 period adjustment for real time data from Rickmansworth

Site	Site Type	Annual Mean	Period Mean	Ratio
Harwell	Urban Background	18.1	19.8	0.91
London Harlington	Industrial Background	19.3	17.6	1.09
			Average	1

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Site	Site Type	Annual Mean	Period Mean	Ratio
Harwell	Rural Background	11.9	10.7	1.1
London Hillingdon	Urban Background	53.5	50.7	1.05
			Average	1.075

NO₂ period adjustment for diffusion tube data in 2010

QA/QC of automatic monitoring

Details of automatic monitoring QA/QC is given in Section 2.1.1.

QA/QC of diffusion tube monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO₂ Network's QA/QC, and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in their Local Air Quality Management work.

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

The WASP Rounds R108 – R115 (Jan 2010 – Dec 2011) show that Harwell Scientific services were classed as Satisfactory.

Appendix B: Monthly Mean Diffusion Tube Results for 2011

Site	Environment	Location	Easting	Northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TR21	kerbside	High Street Rickmansworth	506000	194400	52	39	45	37	24	24	23	30	32	39		37
		Rectory Road Rickmansworth														
TR22	intermediate	A	505500	194400	49	25	48	36	20	19	16	25	26	38	48	32
		Rectory Road Rickmansworth														
TR23	intermediate	B	505500	194400	49	35	52	29	19	22	25	23	25	41	50	31
		Rectory Road Rickmansworth														
TR24	intermediate	C	505500	194400	50	41	44	37	21	24	22	27	23	38	54	33
TR25	kerbside	All Saints Lane Croxley Green	507000	195300	61	53	100					44				
TR26	background	Glen View Chandlers Cross A	506500	198600	40		55	42	7	32	25	32	36	46		34
TR27	background	Glen View Chandlers Cross B	506500	198600	24	50	56	39	25	32	27	32	39	44	14	
TR28	background	Glen View Chandlers Cross C	506500	198600	41	49	53	40	28	19	27	30	38	47	49	37
TR29	background	The Retreat Kings Langley A	508100	201800	50	41	41	31	18	28	26	30	33	32	37	36
TR30	background	The Retreat Kings Langley B	508100	201800	45	37	46	33	21	28	29	32	28	32	37	33
TR31	background	The Retreat Kings Langley C	508100	201800	47	38	41	33	24	31	30	30	28	35	33	35
TR32	background	Lemonfield Drive Garston	512309	200760	49	30	55	35	19	23	21	26	25	41	49	31
TR33	kerbside	Junction 18 M25 A	504300	196300	77	57	65	9	46	53	44	54	24	70	60	73
TR34	kerbside	Junction 18 M25 B	504300	196300	77	60	67	57	52	49	52		59	58	57	74
TR35	kerbside	Junction 18 M25 C	504300	196300	74	55	61	58	40	48	50	53	57	64	57	65
TR36	intermediate	Prestwick Road South Oxhey	511726	193374	49	37						28		38	48	30

Table B.1. Nitrogen dioxide diffusion tube monthly results for 2011.

Appendix C: LAPPC Authorised Processes

Table E1. Part B Authorised Processes within the District

DATE OF ISSUE	PROCESS DESCRIPTION	SITE NAME/OPERATOR	SITE ADDRESS/LOCATION	PROCESS GUIDANCE NOTE
02.07.92	Crematorium	West Hertfordshire Crematorium	High Elms Lane, Garston, Watford, Hertfordshire WD25 0JS	PG5/2(04)
08.01.98	Petrol Station	Primrose Hill Service Station	Primrose Hill, Kings Langley, Hertfordshire WD4 8HR	PG1/14(06)
07.08.06	Burning of waste oil	Swift Services	34 Marlin Square, Abbots Langley, Watford, Hertfordshire WD5 0EG	PG1/1(04)
02.07.92	Manufacture of timber and wood based products	Trafalgar Cases Limited Stanhope Works	Primrose Hill, Kings Langley, Hertfordshire WD4 8HS	PG6/2(04)
02.11.98	Petrol Station	Shell Chorleywood	Rickmansworth Road, Chorleywood, Hertfordshire WD3 5SE	PG3/1(04)
30.03.93	Concrete production	CEMEX UK Materials Limited, Great Westwood Quarry	Fir Tree Hill, Chandlers Cross, Rickmansworth, Hertfordshire WD3 4LY	PG3/1(04)
02.11.98	Petrol Station	Malthurst, Rickmansworth	Moneyhill Parade, Uxbridge Road, Rickmansworth, Hertfordshire WD3 2BQ	PG1/14(06)
11.92	Vehicle resprayer	Clancy Plant Hire Limited Elm Lodge Garage	Old Uxbridge Road, West Hyde, Hertfordshire, WD3 2XY	PG6/34b(06)
	Vehicle resprayer	Clancy Plant Hire Limited Elm Lodge Garage Variation	Old Uxbridge Road, West Hyde, Hertfordshire, WD3 2XY	
02.11.98	Petrol Station	South Oxhey Express Oxhey Service Station	Prestwick Road, South Oxhety, Watford, Hertfordshire WD19 6EG	PG1/14(04)
03.96	Manufacture of timber and wood based products	Watford Timber Company Limited	Olds Approach, Tolpits Lane, Watford, Hertfordshire WD18 9RE	PG6/2(04)
02.11.98	Petrol Station	Shell Croxley Green	185/187 Watford Road, Croxley Green, Rickmansworth, Hertfordshire WD3 3ED	PG1/14(04)
12.11.98	Petrol Station	Sandy Lodge Service Station	Sandy Lane, Moor Park, Northwood, Middlesex, HA6 2HU.	PG1/14(04)
01.12.98	Petrol Station	BP Mill End Connect	283 Uxbridge Road,	PG1/14(04)

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			Rickmansworth, Hertfordshire WD3 2DS	
09.12.98	Petrol Station	Hunton Bridge Service Station	Old Mill Road, Kings Langley, Hertfordshire WD4 8QT	PG1/14(04)
15.06.07	Dry Cleaners	Al-Phoenix Dry Cleaners	10 The Parade, Prestwick Road, Watford WD19 7ED	PG6/46(04)
15.06.07	Dry Cleaners	Regal Dyers & Cleaners	11 Moneyhill Parade, Uxbridge Road, Rickmansworth, WD3 7BE	PG6/46(04)
15.06.07	Dry Cleaners	Russell's Dry Cleaners	66 High Street, Rickmansworth, Hertfordshire WD3 1AJ	PG6/46(04)
15.06.07	Dry Cleaners	Well Done Dry Cleaning	1-2 Station Approach, Watford, Hertfordshire WD19 7DT	PG6/46(04)
15.06.07	Dry Cleaners	AUM Drycleaners Limited	14The Parade, Delta Gain, Carpenders Park, Watford, Hertfordshire WD19 5BL	PG6/46(04)
15.06.07	Dry Cleaners	Kingsguard Dry Cleaners	16 Main Avenue, Moor Park, Northwood, Middlesex HA6 2HJ	PG6/46(04)
15.06.07	Dry Cleaners	Cleanability	3 Church Street, Rickmansworth, Hertfordshire WD3 1BU	PG6/46(04)
15.06.07	Dry Cleaners	Swift One Hour Dry Cleaners	36 High Street, Abbots Langley, Hertfordshire WD5 0AR	PG6/46(04)
15.06.07	Dry Cleaners	Shamma Dry Cleaners	200A Watford Road, Croxley Green, Rickmansworth, Hertfordshire WD3 3DD	PG6/46(04)
15.06.07	Dry Cleaners	Prestige Dry Cleaners	8 New Parade, Chorleywood, Hertfordshire WD3 5NJ	PG6/46(04)