2012 Air Quality Updating and Screening Assessment for *Central Bedfordshire Council*

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

Date (April, 2012)

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Executive Summary

Central Bedfordshire Council came into force on the 1st April 2009 comprising of the legacy authorities of Mid Bedfordshire District Council, South Bedfordshire District Council and parts of Bedfordshire County Council. Data is collected by continuous analysers and diffusion tube for a variety of pollutants. Currently there is one Air Quality Management Area (AQMA) within the district, which was declared in 2004 for the annual NO_2 objective in Dunstable.

Following Detailed Assessments carried out in 2008– it was recommended that AQMAs be declared in Sandy and Chalton with respect to the annual NO_2 objective. There have been some delays to the public consultation process but work will progress as soon as practicable.

The Highways Agency has announced the decision to proceed with the Public Inquiry following contributions from a local developer and work would potentially commence in 2014 on the A5 – M1 Link Road (Dunstable northern bypass). Potentially this may impact on the residential properties at Chalton and so the situation will be monitored closely.

As a result of a review of nitrogen dioxide diffusion tube sites in 2010 – a new site was set up on the façade of a row of terraced houses alongside the A1 in Sandy approximately 1 metre from the carriageway. The annual mean result concentration of the tube was 74.6µg/m^3 (with national bias adjustment factor 0.89 applied). This indicates that there is a breach of the hourly objective at this location which falls within the proposed AQMA for Sandy.

A Detailed Assessment report (July 2011) has been carried out for Bedford Street and Dunstable Street, Ampthill after being identified as two narrow congested streets with a traffic flow of over 5,000 vehicles per day. Based on the Detailed Assessment of the monitoring data within the areas under review and findings relating to relevant exposure, the following recommendations were made:

- To declare an Air Quality Management Area (AQMA) on the basis of the NO_2 diffusion tube monitoring and the measured and predicted exceedences of the annual air quality objective (40µg/m^3) along Bedford Street (from the Park Street junction) and continue along Dunstable Street until the street widens approximately adjacent to number 103.

- To clarify the locations of relevant exposure (i.e. residential property).

- To continue diffusion tube monitoring in the vicinity of Bedford Street and Dunstable Street, Ampthill. This will ensure that any future changes in air quality are detected notably locations representative of relevant exposure (i.e. facades of residential buildings).

- Additional monitoring work will be presented as part of Further Assessment Report(s), which are required to be produced within 12 months of the declaration of an AQMA. This will be used to support the conclusion to declare the AQMA(s); to corroborate the assumptions on which the AQMA(s) have been based and to check that the original designation(s) are still valid and do not need amending in any way.

- Air Quality Action Plan(s) to clarify the major source(s) of pollution and to identify options to work towards the reduction of NO_2 levels are required to be produced within 18 months of the declaration of the AQMA. Defra acknowledge a close link between the preparation of the Further Assessment(s) and the Air Quality Action Plan(s) and it is envisaged that these will be taken forward in parallel following declaration of the AQMA(s).

No additional areas within the district have been identified as requiring further assessment with respect to any pollutant.

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1 Introduction

1.1 Description of Local Authority Area

Central Bedfordshire Council came into force on the 1st April 2009. The legacy authorities were South Bedfordshire District Council, Mid Bedfordshire District Council and aspects of Bedfordshire County Council.

Central Bedfordshire covers an area of 716 square kilometres. The estimated population of is 255,200 (based on 2010 figures). The area is mainly rural but has some market and larger towns distributed throughout.

The major source of air pollution in the district is from road transportation.

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 micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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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 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, 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 Summary of previous reviews and assessments

Authority	Reports produced	Dates produced	Report conclusions
SBDC	1st stage air quality review	1999/2000	CO / 1,3 butadiene / SO_2 / Benzene unlikely to exceed objectives anywhere in district. NO_2 / PM_{10} to proceed to 2nd stage
SBDC	Air Quality review & assessment (2nd stage)	April 2000	Concluded 3rd stage review for NO_2 & PM_{10} not necessary as levels within objectives. Monitoring to continue.
SBDC	USA	April 2003	Concluded that due to a number of changes in circumstances, it was considered that nitrogen dioxide (NO_2) and particulate matter (PM_{10}) were in danger of being breached. However objectives for CO / SO_2 / benzene / 1, 3 – butadiene and lead would be met.
SBDC	Detailed Assessment	2004	concentrated on levels of nitrogen dioxide and particulate matter in Dunstable town centre as a result of traffic using the A5, A505 and B489. The conclusion of the report was that the annual mean nitrogen dioxide objective was likely to be breached at the facades of buildings along all roads at the town centre junction and recommended that an Air Quality Management Area (AQMA) be declared. The report also predicted that the 2004 annual mean and 24-hour objectives for PM_{10} are unlikely to be exceeded.
SBDC	Declaration of AQMA in Dunstable	January 2005	AQMA officially declared by Council
SBDC	Progress Report	December 2005	Following the recent declaration of an Air Quality Management Area, the next phase of the process is the production of Stage 4 report (including source apportionment) and an Action Plan (to identify options to reduce concentrations of pollutant(s) in order to achieve the objective(s)).
SBDC	Stage 4 Report / source apportionment	2005	The source apportionment study indicated that background NO_X levels are generally the major contributor to ambient NO_X concentrations at the receptors included in the study. Emissions from taxis idling in ranks and vehicles in car parks are a minor source of NO_X. However, there are two large sources of NO_X over which the council has some control:

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			▪ Cars and HGVs travelling along the roads in question are major source of NO_X. In particular, HGVs are responsible for a large portion of these emissions despite their relatively small flows. ▪ Buses idling at stops contribute large amounts of NO_X to the immediate surroundings and create small areas of high concentrations that may affect nearby buildings. Reductions in NO_2 concentration of 22% and 5% respectively are required at the receptors near the High Street North and Church Street bus stops to reduce the ambient concentration to 40 µg/m^3.
SBDC	Air Quality Action Plan	Dec 2006	Identified potential actions to work towards reduction of pollution levels within the AQMA
SBDC	USA	2006	Identified Chalton as another possible area where Air Quality Objectives might be breached and further monitoring (via diffusion tubes) commenced.
SBDC	Progress Report	2007	Changes needed to AQAP after consultation
SBDC	Detailed Assessment	2008	Identified possibility of annual mean NO_2 objective likely to be exceeded at 4 receptors out of six. NO_2 hourly objectives unlikely to be breached.
MBDC	1st review & assessment	2000	This assessment concluded that the air quality objectives contained in the Air Quality Regulations 1997 would be achieved throughout the District.
MBDC	USA	2003	Due to a number of changes in circumstances, although it was thought that the objectives for carbon monoxide, benzene, 1, 3 – butadiene and lead would be met, it was considered that the objectives for sulphur dioxide, nitrogen dioxide (NO_2) and PM_{10} were in danger of being breached.
MBDC	Detailed Assessment	2004	Concentrated on ground level ambient concentrations of SO_2 as a result of emissions from Stewartby Brickworks and levels of NO_2 / particulate matter as a result of traffic using the A1 Sandy roundabout. Conclusions from this study resulted in the declaration of an AQMA for SO_2 levels around the brickworks and that more monitoring was required for the A1 Sandy roundabout junction to more accurately assess current levels of NO_2.
MBDC	Progress Report	2005	Updating on changes since the last review and assessment report

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MBDC	Declaration of AQMA in the vicinity of Stewartby	2005	AQMA officially declared by Council
MBDC	USA	2006	identifies that the risk of the objectives being exceeded for carbon monoxide, benzene, 1,3 –butadiene, lead, nitrogen dioxide and particulate matter (PM_{10}) is not significant. The Stewartby Brickworks will be subject to a Further Assessment.
MBDC	Further Assessment	2007	concluded that the AQMA remain in place as originally declared
MBDC	Air Quality Action Plan	2007	Identified actions to address the SO_2 levels – accepted by Defra
CBC	USA	2009	Following Detailed Assessments carried out in 2008 by both Mid and South Beds District Councils; it was recommended that AQMAs be declared in Sandy and Chalton, both in relation to the annual NO_2 Air Quality Objective. Consultations will be carried out, followed by declarations and Further Assessments by Central Bedfordshire Council. Two new narrow congested streets with a traffic flow of over 5000 vehicles per day identified. CBC will revieww these areas (Bedford Street and Dunstable Street, Ampthill) and carry out a Detailed Assessment if necessary. The major source of pollution in the district is from road transportation as Stewartby Brickworks have now closed.
CBC	Air Quality Revocation Order	2009	Since the closure of the Stewartby Brickworks (early 2008) the ambient levels of SO_2 have dropped off dramatically. The data from the Marston Vale Forest Centre indicates that the peaks do not rise above 40 mg/m^3 as a 15 minute average, clearly below the objective level. Additionally, both the 1hour mean and 24hour mean SO_2 objectives continue to be met across the Hertfordshire and Bedfordshire monitoring network. AMQA revoked due to closure of the Brickworks.
CBC	Detailed Assessment 2010 (Ampthill)	2011	Recommended to declare AQMA on basis of NO_2 diffusion tube monitoring along Bedford Street (by Park Street junction) and Dunstable Street (adj no 103); to clarify areas of relevant exposure and to continue monitoring.
CBC	Progress Report	2011	Updating on changes since last R&A report

SBDC – South Beds District Council; MBDC – Mid Beds District Council (pre April 2009)
CBC - Central Bedfordshire Council (post 1st April 2009)

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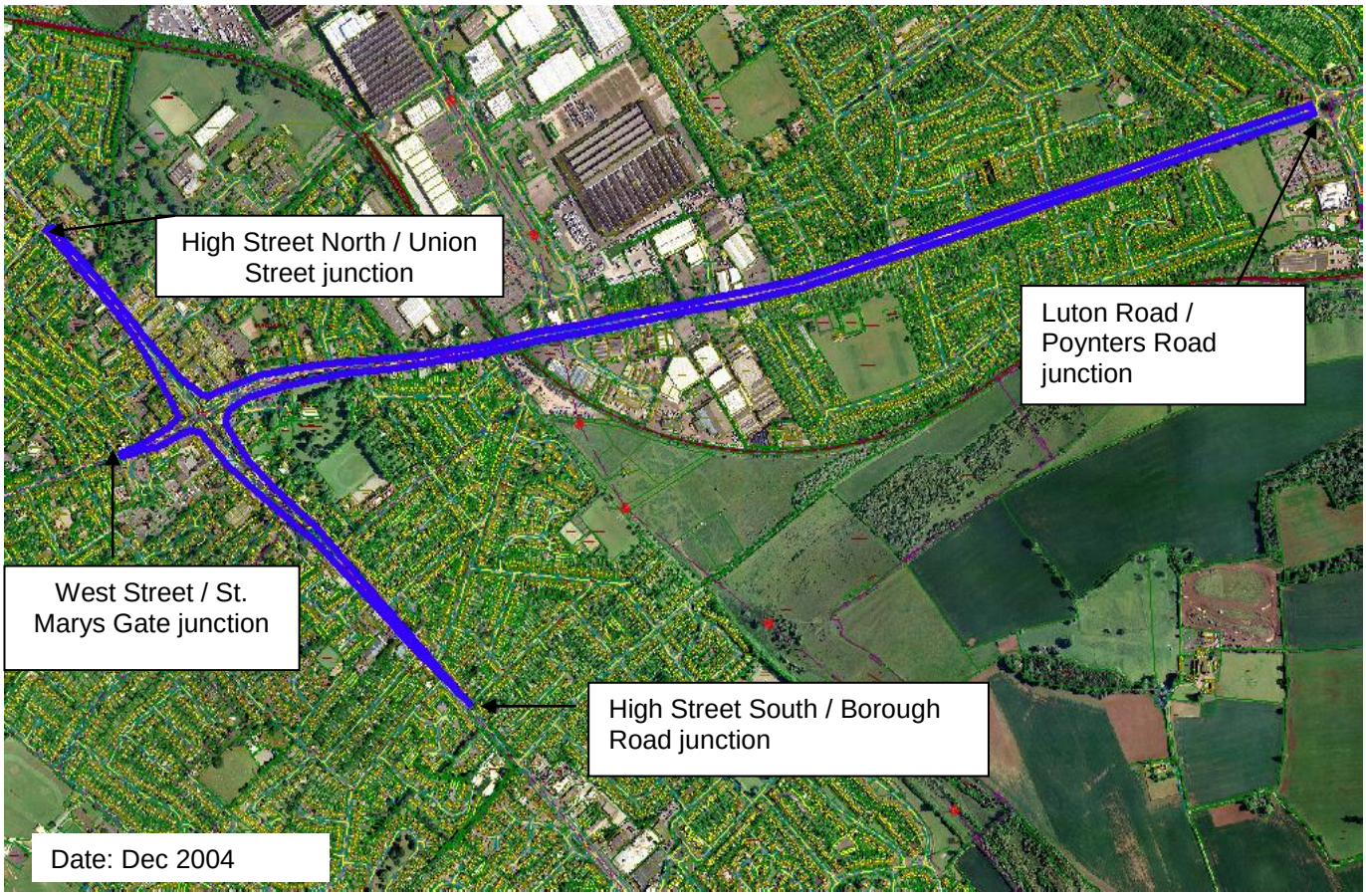
Figure 1.1 Map of AQMA Boundary

A map of the existing AQMA in Dunstable is shown below.



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2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

This section provides a summary of the air quality monitoring results available since Central Bedfordshire Council completed its USA in 2009 and Progress Report in 2011.

Central Bedfordshire Council has two realtime analysers sited in Sandy (monitoring NO_2, PM_{10} and $PM_{2.5}$) and in Marston Moretaine (monitoring Ozone).

In addition a network of NO_2 diffusion tube monitors are utilised throughout the district.

Details of Central Bedfordshire Council's two continuous analysers can be found in Table 2.1.

The Sandy site became an affiliated site in the AURN National Network in January 2009 which resulted in an FDMS upgrade to the PM_{10} TEOM and also the installation of a $PM_{2.5}$ FDMS TEOM. Data capture for the site was 93% in 2008; 73% in 2009 and 96% in 2010 and 94% in 2011 for NO_2 and for particulates 99% in 2008; 91% in 2009 and 86% in 2010 but only 37% in 2011.

NO_2 is measured using an API chemiluminescent NO_x analyser which is housed in an air conditioned cabin. Data is collected remotely using a GSM modem link. The analyser is serviced every six months by Casella. The station and the is visited every two weeks by a Council Officer and calibrated using bottled gas of a known concentration and the results logged. Since the affiliation of the Sandy site with Defra's national network, an audit is to be undertaken every 6 months.

The data from the AQMS at Sandy Roadside was ratified by ERG until September 2011 to the AURN standard and QA/QC visits are carried out by Casella at this site. Now data validation and ratification is carried out by Air Quality Data Management (AQDM).

The ozone analysers at the Marston Vale are calibrated every 4 weeks by the local authority. The data from the Marston Vale site is ratified to the HBAQN network standard.

Automatic measurements of PM_{10} were made using the Tapered Element Oscillating Microbalance (TEOM) method. The NO_X and PM_{10} instruments are subject to UKAS accredited audit by AEA Technology four times a year.

See Appendix A for details of QA/QC.

The Air Quality Monitoring Station at Dunstable (Dunstable Background) which monitored NO_2 and PM_{10} was decommissioned during 2010, following continuing breakdown of the old equipment.

Prior to its decommission the site was visited every two weeks by a Council Officer and calibrated using bottled gas of a known concentration, the results noted and forwarded to ERG who carried out validation and ratification of the data.

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In this report PM_{10} results from the Dunstable Realtime Analyser were adjusted using the King's College Volatile Correction Model (VCM) to correct data measured using a Tapered Element Oscillating Microbalance (TEOM). See Appendix B.

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Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

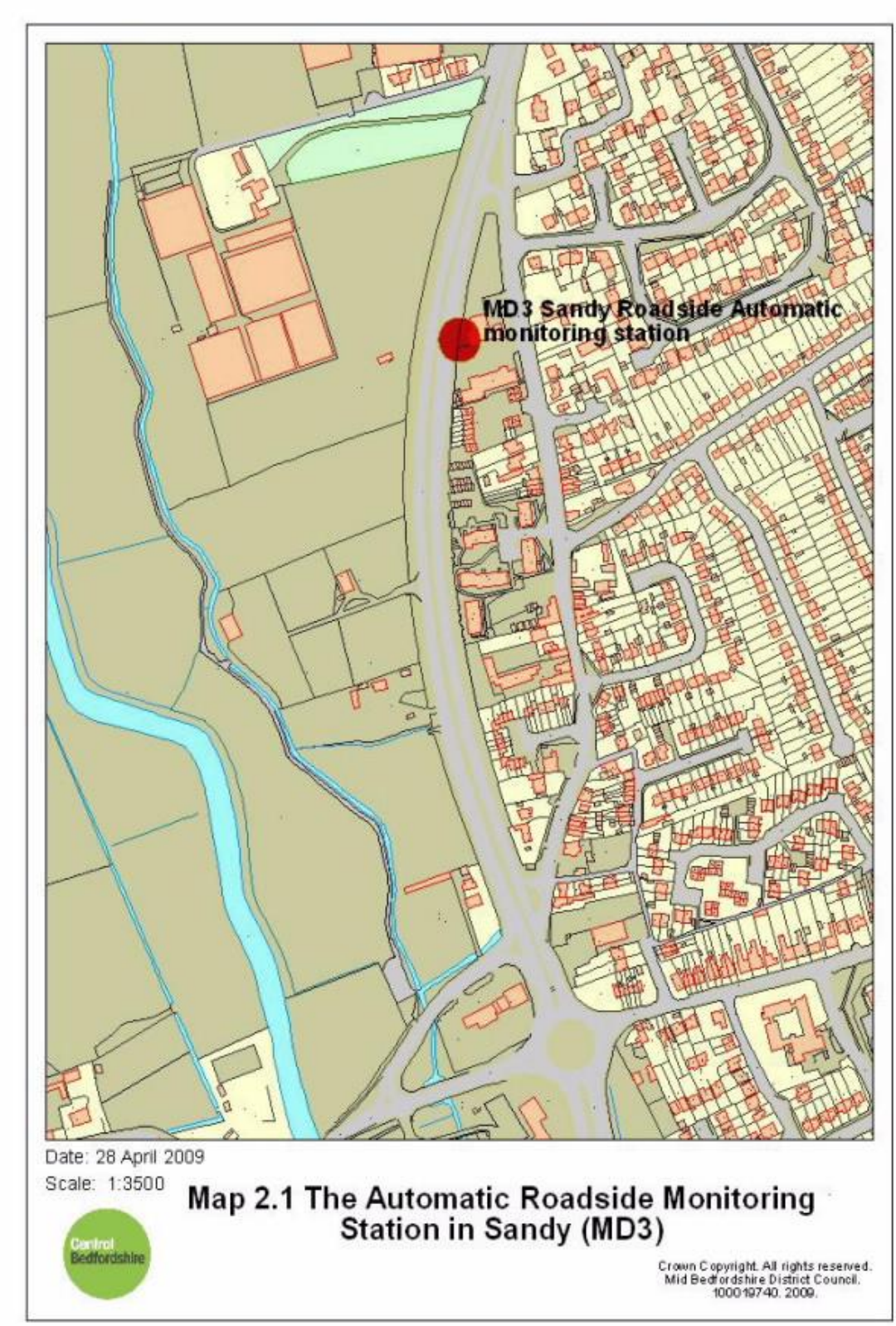

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Figure 2.2 Map of Marston Vale Automatic Monitoring Station

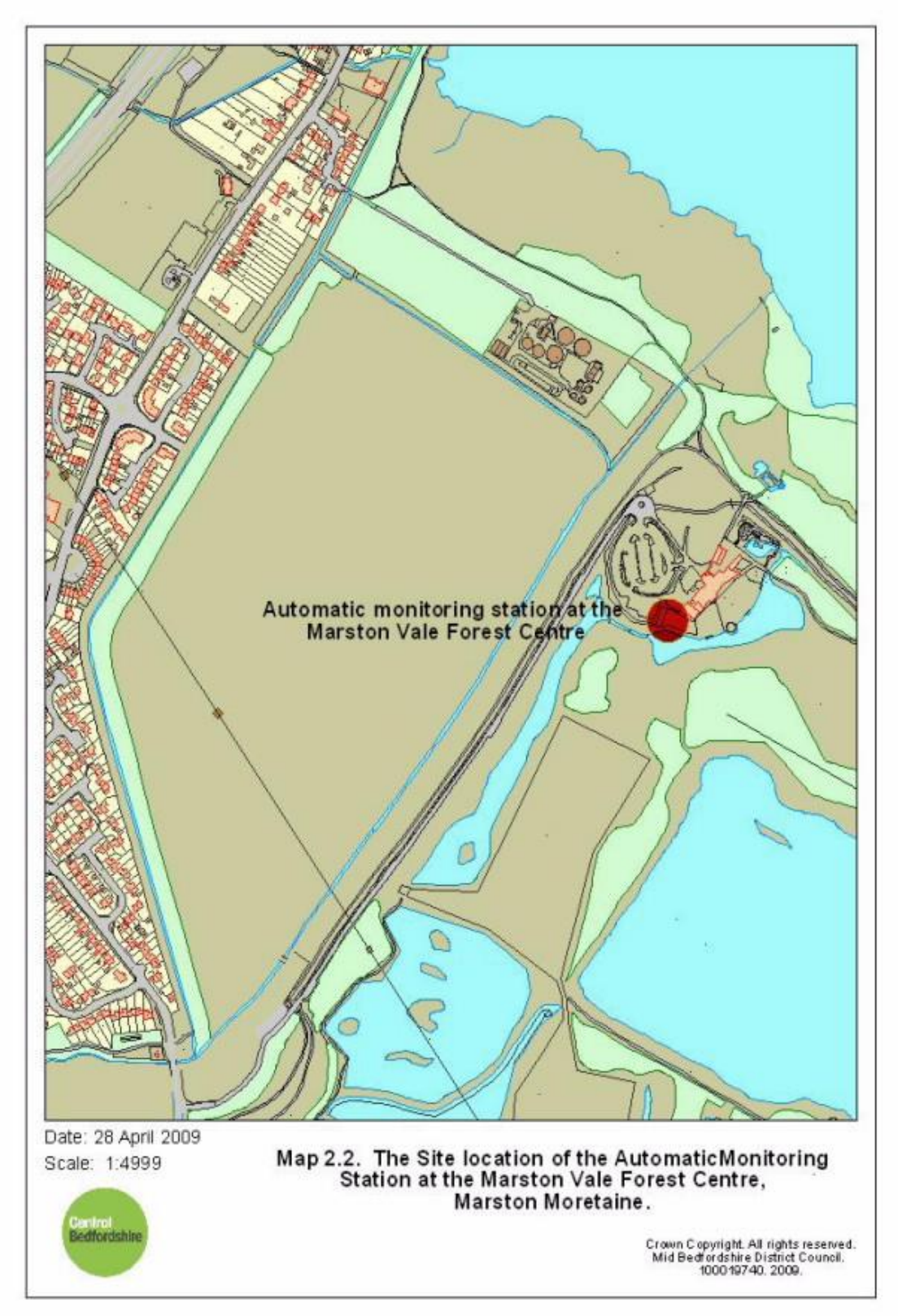

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Figure 2.3 Map of Dunstable Automatic Monitoring Station

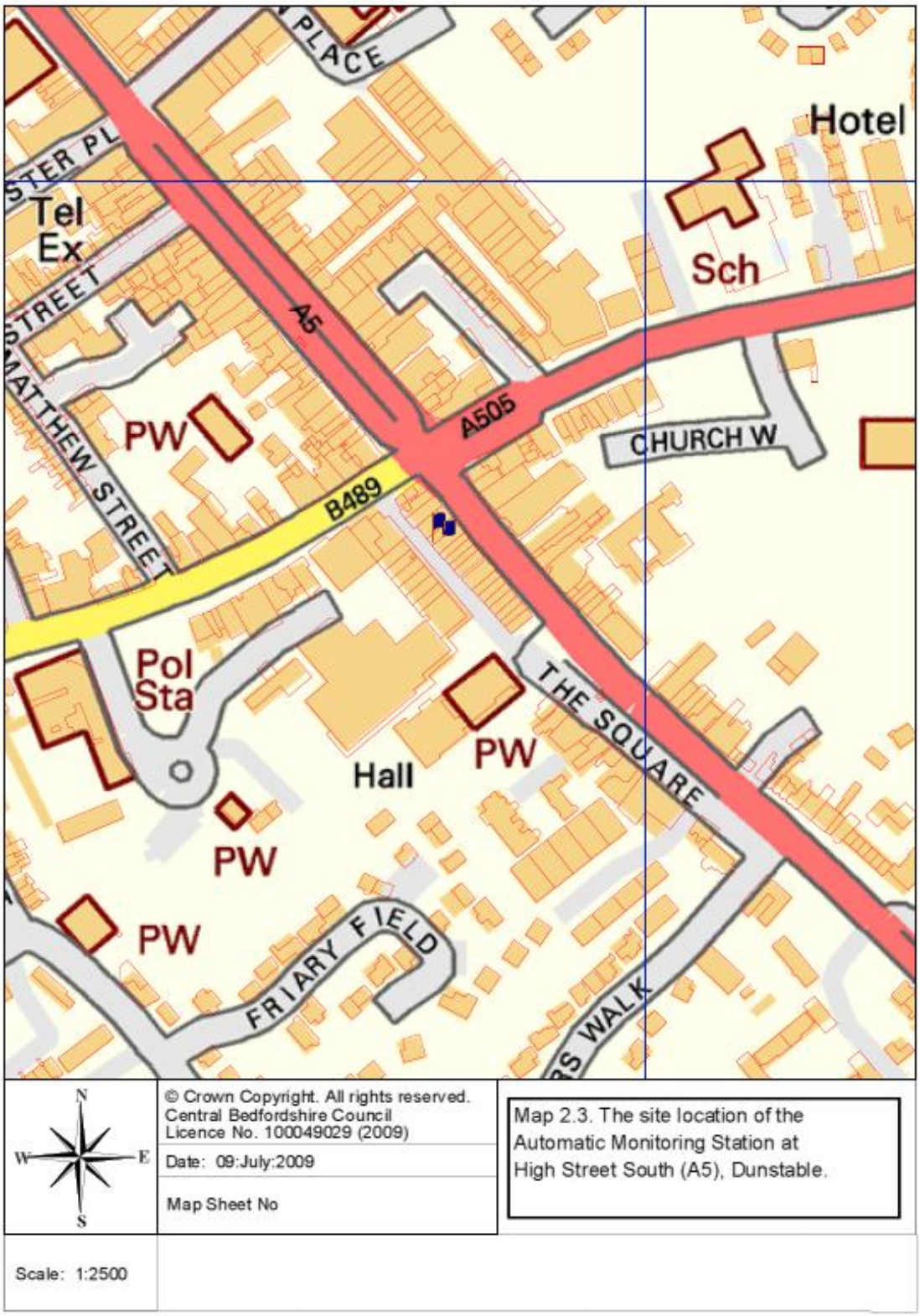

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Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Marston (MD4)	Rural	X500445	Y241670	O_3	N	ultra-violet fluorescence N	N/A	N/A	N
Sandy (MD3)	Roadside	X516436	Y249600	NO / PM_{10} / $PM_{2.5}$	N	Chemiluminescence / FDMS TEOM N	N	4m	N
Dunstable (SB1)	Urban background	X501898	Y221819	NO2 / PM10	Y	Chemiluminescence / TEOM	N	12m	N (site closed)

2.1.2 Non-Automatic Monitoring Sites

In addition to the continuous monitors, Central Bedfordshire Council measures nitrogen dioxide using passive diffusion tubes at sites throughout the district. The locations of the monitoring sites can be seen in Appendix C.

The tubes are supplied and analysed by Gradko International Ltd and prepared using 20% TEA in water methodology. Gradko International is a UKAS accredited laboratory and was considered 'Good' in the latest results from the laboratory precision and WASP scheme.

Table 2.2 shows the details of Non-Automatic Monitoring Sites (NO_2) measured at sites in 2011. Three tubes have been co-located with the air quality monitoring station on the A1 Sandy since January 2003 to enable a local bias adjustment factor to be calculated. No co-location of tubes was possible at the Dunstable analyser (due to physical and health and safety restraints) and so used the nationally calculated bias adjustment factors, available from the internet (www.uwe.ac.uk/aqm/review/).

The national bias adjustment factor is available for Gradko 20% TEA in water tubes from http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

The bias adjustment factor for 2009 was 0.90 (as of April 2010) calculated from 33 studies across the country.

The bias adjustment factor for 2010 was 0.92 (as of July 2011) calculated from 39 studies across the country.

The bias adjustment factor for 2011 was 0.89 (as of April 2012) calculated from 26 studies across the country.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*
A1 Sandy	Kerbside	X 516482	Y 249212	NOx	N	N	Y (3m)	1m
Rose Lane, Biggleswade	Kerbside	X 519161	Y 244651	NOx	N	N	Y (4m)	1m
High Street, Biggleswade	Kerbside	X 518991	Y 244596	NOx	N	N	N	1m
A1, Beeston	Kerbside	X 517162	Y 248188	NOx	N	N	Y (2m)	1 m
M1, Tingrith	Kerbside	X 501043	Y 232825	NOx	N	N	Y (15m)	13 m
Station Road, Tempsford	Kerbside	X 516277	Y 253855	NOx	N	N	N	1m
Bedford Road, Sandy	Kerbside	X 516619	Y 249100	NOx	N	N	Y (6m)	2m
Highfield Cres, Brogborough	Kerbside	X 496330	Y 238300	NOx	N	N	Y (10m)	4m
M1, Warren Farm	Kerbside	X 500200	Y 234519	NOx	N	N	N	36m
Hunts Car Company, A1	Kerbside	X 516448	Y 249685	NOx	N	N	Y (4m)	1m

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*
Hunts Car Company, A1	Kerbside	X 516479	Y 249704	NOx	N	N	N	2m
Market Square	Kerbside	X 517310	Y 249228	NOx	N	N	Y (3m)	1m
NO_x co-loc	Kerbside	X 516436	Y 249599	NOx	N	**Y**	N	4m
NO_x co-loc	Kerbside	X 516436	Y 249599	NOx	N	**Y**	N	4m
NO_x co-loc	Kerbside	X 516436	Y 249599	NOx	N	**Y**	N	4m
Battlesden	Kerbside	X 495944	Y 229191	NOx	N	N	N	1 m
Bedford Rd, Sandy 1	Kerbside	X 516593	Y 249083	NOx	N	N	Y (12m)	3m
Bedford Rd, Sandy 2	Kerbside	X 516569	Y 249074	NOx	N	N	Y (8m)	2m
Eddie's Cott	Kerbside	X 516579	Y 249078	NOx	N	N	Y (0m)	11m
Doorway	Kerbside	X 516582	Y 249078	NOx	N	N	Y(1m)	3m
Ampthilil 1	Roadside	X 503444	Y 238197	NOx	**N**	N	**Y**	4m
Ampthill 2	Kerbside	X 503466	Y 238141	NOx	N	N		1m
Ampthill 3	Kerbside	X 503458	Y 238039	NOx	N	N		1m
High St South Dunstable	Kerbside	X 501925	Y 221829	NOx	**Y**	N	N	1m

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*
Mardale Ave Dunstable	Kerbside	X 502023	Y 220725	NOx	N	N	Y (3m)	1m
Rowley Furrow Linslade	Urban Backgrnd	X 491014	Y 225777	NOx	N	N	Y (in garden)	10m
Barton	Kerbside	X 508064	Y 230873	NOx	N	N	Y (5m)	2m
Slip End	Kerbside	X 507696	Y 218374	NOx	N	N	Y(3m)	2m
Vimy Rd, L/B	Kerbside	X 491642	Y 225009	NOx	N	N	N	2m
Houghton Regis	Kerbside	X 501988	Y 223954	NOx	N	N	N	2m
Tebworth	Rural Backgrnd	X 499542	Y 226940	NOx	N	N	N	30m
Sallowsprings	Rural Backgrnd	X 500525	Y 218839	NOx	N	N	N	50m
London/Mayfield Rd, Dunstable	Kerbside	X 502848	Y 220829	NOx	N	N	Y(5m)	3m
Argos HSN Dunstable	Kerbside	X 501705	Y 222089	NOx	**Y**	N	N	2m
20 - Court Dr	Kerbside	X 501797	Y 222200	NOx	N	N	Y(8m)	1m
21 - Frenchs	Kerbside	X 500790	Y 223047	NOx	N	N	Y(5m)	2m
26 - West St,	Kerbside	X 501571	Y221742	NOx	N	N	N	2m
27 - 89 Luton Rd	Kerbside	X 503214	Y 222123	NOx	Y	N	Y(3m)	2m
28 - Chalton	Kerbside	X 503764	Y 261024	NOx	N	N	N	2m
Church St	Kerbside	X 501961	Y 218842	NOx	**Y**	N	Y (2m)	5m
5 HSS	Kerbside	X 501910	Y 218492	NOx	**Y**	N	Y (4m)	0.5m
Flint Court	Kerbside	X 501504	Y 222784	NOx	N	N	Y (1m)	5m
247 Luton	Kerbside	X 503848	Y 222325	NOx	**Y**	N	Y (3m)	3m
32 Luton	Kerbside	X 502838	Y 222071	NOx	**Y**	N	Y (4m)	2m

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*
H'ton Rd	Kerbside	X 501151	Y 222821	NOx	N	N	Y (3m)	2m
West St	Kerbside	X 501029	Y 221488	NOx	N	N	Y (3m)	3m
Chalton X	Kerbside	X 503922	Y 225855	NOx	N	N	Y (0m)	8m
Clipstone	Rural backgnd	X 493958	Y227012	NOx	N	N	N	1m
RPS – 28 HSS	Kerbside	X 501932	Y 221801	NOx	**Y**	N	Y (0.5m)	3m

Two sites (8 – Vimy Road, Leighton Buzzard; 42 – Halifax Dunstable) were closed in 2011 as tubes regularly went missing.

2.2 Comparison of Monitoring Results with AQ Objectives

This section looks at the results from the monitoring undertaken in 2011, with comparisons to earlier years where appropriate, on a pollutant by pollutant basis for both realtime monitors and diffusion tubes.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The 2011 nitrogen dioxide annual average for the Sandy automatic monitoring site was 35µg/m^3 and there were no exceedences of the hourly NO_2 mean objective. Data capture was 93.6%. The location is representative of public exposure at certain locations along the A1, however, some residential properties are closer to the road (although standing traffic does not occur as much at these locations) and some more distant. This section of the A1 was the subject of a Detailed Assessment in 2008 and it was recommended that an AQMA be declared for NO_2 in respect of the annual objective. Delays to the consultation exercise has put back work on the declaration of the AQMA.

The automatic monitoring analyser which was based in Dunstable town centre (which is within an AQMA declared in 2005 on the basis of the NO_2 annual objective) monitored NO_2, NO, NO_x and PM_{10}.

It was classed as an urban background site as although the monitor was adjacent to a busy road (A5) it was sited in the roof space of offices, due to physical constraints. Therefore this site did not represent relevant exposure.

Data from the Dunstable site (SB1) has been included to give data for 2007 – 2009. The site was decommissioned in 2010 due to equipment breakdown.

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 μg/m^3				
					2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
MD3	Roadside	N	-	93.6	38	39	44	38	35
SB1	Urban background	Y	-	-	30	31	27	-	-

[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), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

As can be seen from Table 2.3 the Sandy site recorded an annual mean concentration of NO_2 over the Air Quality Objective level (44μg/m^3) in 2009, however this level has reduced to that below the objective level in 2010 and 2011.

The Marston Vale site does not monitor NO_2 and the Dunstable site is now closed.

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 μg/m^3)				
					2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
MD3	Roadside	N	-	93.6	0	0	1 (212)	1(216)	0
SB1	Urban background	Y	-	-`	0	2	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 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
*Number of exceedences for previous years are optional.

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Diffusion Tube Monitoring Data

Central Bedfordshire Council utilises diffusion tubes in locations throughout the district to measure nitrogen dioxide.

Details of the laboratory, preparation and QA/QC for Mid Beds District Council diffusion tubes can be seen in Appendix A.

The results for the diffusion tubes which exceeded the Air Quality Objective level were adjusted for the distance to the receptor (where possible) using http://laqm.defra.gov.uk/documents/NO2withDistancefromRoadsCalculatorIssue4.xls. There were three sites (with relevant exposure) which remained over the objective level in 2011 – Chalton Cross Cottages, which has been subject to a detailed assessment report in 2008 which concluded that an AQMA should be declared; and Church Street and 32 Luton Road, Dunstable – both sites are within the existing Dunstable AQMA.

Locations of NO_2 diffusion tube monitoring sites can be seen in Appendix C.

Monthly results can be seen in Appendix D.

Hourly objective

As a result of a review of nitrogen dioxide diffusion tube sites in 2010 – a new site was set up on the façade of a row of terraced houses alongside the A1 in Sandy approximately 1 metre from the carriageway. The annual mean result concentration of the tube was 74.6µg/m^3 (with national bias adjustment factor 0.89 applied). This indicates that there is a breach of the hourly objective at this location which falls within the proposed AQMA for Sandy. A map of this site can be seen in Appendix C.

Central Bedfordshire Council - England

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	In AQMA?	Triplicate or Collocated Tube	Data capture 2011 No of months or %)	Data with less than 9 months has been annualised (Y/N)	Annl mean concentration 2011 (µg/m^3)		Data distance corrected (Y/N) 2011 (µg/m^3)	
							National bias adj = 0.89	Local bias adj = 0.91	National bias adj	Local bias adj
	A1 Sandy	Kerbside	N	-	12	-	**45.09**	**46.1**	37.1	37
	Rose Lane, Biggleswade	Kerbside	N	-	11	-	27.09	27.7	N/A	N/A
	High St, Biggleswade	Kerbside	N	-	12	-	37.50	38.3	N/A	N/A
	A1, Beeston	Kerbside	N	-	12	-	35.28	36.1	N/A	N/A
	Bedford Rd, Sandy	Kerbside	N	-	12	-	38.13	39	N/A	N/A
	Highfield Cres, Brogborough	Kerbside	N	-	12	-	25.65	26.2	N/A	N/A
	A1 Sandy	Kerbside	N	-	11	-	**74.62**	**76.30**	No drop off	No drop off
	Hunts Car Co A1	Kerbside	N	-	11	-	39.71	**40.6**	No relevant exposure	No relevant exposure
	Hunts Car Co A1	Kerbside	N	-	11	-	26.86	27.5	N/A	N/A
	Market Sq	Kerbside	N	-	12	-	28.42	29.1	N/A	N/A
	Co located	Kerbside	N	T&C	12	-	33.22	34	N/A	N/A
	Co located	Kerbside	N	T&C	12	-	32.91	33.7	N/A	N/A
	Co located	Kerbside	N	T&C	12	-	33.36	34.5	N/A	N/A
	Battlesden	Kerbside	N	-	12	-	12.75	13	N/A	N/A
	Bedford Rd 1	Kerbside	N	-	12	-	33.73	34.5	N/A	N/A
	Bedford Rd 2	Kerbside	N	-	12	-	**41.65**	**42.6**	No relevant exposure	No relevant exposure
	Eddie's Cottage	Kerbside	N	-	11	-	33.48	34.2	N/A	N/A
	Doorway	Kerbside	N	-	11	-	**43.14**	**44.1**	No drop off	No drop off
	Ampthill 1	Roadside	N	-	10	-	24.45	25	N/A	N/A
	Ampthill 2	Kerbside	N	-	12	-	39.84	**40.7**	No drop off	No drop off
	Ampthill 3	Kerbside	N	-	11	-	**47.35**	**48.4**	No drop off	No drop off

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Site ID	Location	Site Type	In AQMA?	Triplicate or Collocated Tube	Data capture 2011 No of months or %)	Data with less than 9 months has been annualised (Y/N)	Annl mean concentration 2011 (μg/m^3)		Data distance corrected (Y/N) 2011 (μg/m^3)	
							National bias adj = 0.89	Local bias adj = 0.91	National bias adj	Local bias adj
SB1	High St South	Kerbside	Y	-	12	-	**45.00**	**46.01**	No relevant exposure	No relevant exposure
SB3	Mardale	Urban backgrnd	N	-	8	N	13.70	14.01	N/A	N/A
SB5	Rowley	Urban backgrnd	N	-	12	-	12.78	13.07	N/A	N/A
SB6	Barton	Kerbside	N	-	12	-	22.86	23.38	N/A	N/A
SB7	Slip End	Urban backgrnd	N	-	12	-	17.84	18.24	N/A	N/A
SB10	Houghton	Kerbside	N	-	12	-	31.66	32.37	N/A	N/A
SB13	Tebworth	Rural	N	-	10	-	12.92	13.22	N/A	N/A
SB14	Sallowsprings	Rural	N	-	12	-	10.41	10.65	N/A	N/A
SB17	London/Mayfield	Roadside	N	-	11	-	31.80	32.35	N/A	N/A
SB18	Argos	Kerbside	**Y**	-	12	-	**40.58**	**41.49**	No relevant exposure	No relevant exposure
SB20	Court Drive	Kerbside	N	-	12	-	29.01	29.66	N/A	N/A
SB21	Frenchs Ave	Roadside	N	-	11	-	33.22	33.97	N/A	N/A
SB26	West St	Kerbside	N	-	12	-	29.94	30.61	N/A	N/A
SB27	89 Luton Rd	Kerbside	**Y**	-	11	-	31.98	32.69	N/A	N/A
SB28	Chalton	Kerbside	N	-	10	-	**45.84**	**46.87**	No relevant exposure	No relevant exposure
SB33	Church St	Roadside	**Y**	-	12	-	**42.34**	**43.29**	Y – 39.4	Y – **40.3**
SB34	5 High St South	Kerbside	**Y**	-	12	-	**45.98**	**47.01**	Y – 32	Y – 32.6
SB35	Flint Court	Roadside	N	-	12	-	35.24	36.03	N/A	N/A
SB36	247 Luton Rd	Kerbside	**Y**	-	12	-	37.41	38.25	N/A	N/A
SB37	32 Luton Rd	Kerbside	**Y**	-	11	-	**42.97**	**49.93**	Y – 36.7	Y – **41.8**
SB39	Houghton Rd	Kerbside	N	-	12	-	35.76	36.56	N/A	N/A
SB41	Chalton X Cotts	Kerbside	N	-	12	-	**40.51**	**41.42**	No drop off	No drop off
SB47	Clipstone	Rural	N	-	12	-	14.17	14.49	N/A	N/A

[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), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

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Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2010)

Site ID	Site Type	Within AQMA?	2008* (Bias Adj factor)	Receptor distance adj	2009* (Bias Adj factor)	Receptor distance adj	2010* (Bias Adj factor = 0.92)	Receptor distance adj
A1 Sandy	K	N	**47.5**	39.7	**45**	38	**47**	39.3
Rose Lane Biggleswade	K	N	27.9	N/A	27	-	27	-
High St Biggleswade	K	N	37.4	N/A	37	No exposure	**42**	No exposure
A1 Beeston	K	N	**41.2**	37	38	-	**42**	37.8
Bedford Rd Sandy	K	N	35.6	N/A	35	-	**41**	33.6
Highfield Cres Brogborough	K	N	**41.8**	34.8	**40**	33.8	**42**	35
A1 London Rd 1	K	N	**41.6**	No exposure	37	-	**46**	No exposure
A1 London Rd 2	K	N	28.5	-	26	-	30	-
A1 Hunts	K	N	38.8	-	36	-	37	-
Hunts collocation 1	K	N	34.6	-	36	-	39	-
Hunts collocation 2	K	N	36.4	-	35	-	37	-
Battlesden	Rural bkgnd	N	13.3	-	13	-	15	-
Bedford Rd Sandy 1	K	N	39.1	-	37	-	**41**	30.7
Bedford Rd Sandy 2	K	N	**49.2**	37.6	**43**	33.3	**44**	33.7
Eddies Cott	K	N	34.6	-	32	-	36	-
53 Bedford Rd Sandy	K	N	34.5	-	39	-	**41**	38.9
Ampthiill 1	K	N	-	-	27.15	-	30.73	
Ampthill 2	K	N	-	-	**44.94**		**50.99**	
Ampthill 3	K	N	-	-	**45.65**		**53.32**	
HSS	Kerbside	**Y**	**42.02**	No exposure	37.82	No exposure	**49.58**	No exposure
Mardale	Urban backgrnd	N	17.18	-	15.46	-	20.53	-
Rowley	Urban backgrnd	N	14.85	-	13.37	-	14.90	-
Barton	Kerbside	N	25.61	-	23.05	-	26.11	-

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Site ID	Site Type	Within AQMA?	2008* (Bias Adj factor)	Receptor distance adj	2009* (Bias Adj factor)	Receptor distance adj	2010* (Bias Adj factor = 0.92)	Receptor distance adj
Slip End	Urban backgrnd	N	20.85	-	18.76	-	22.29	-
Vimy Rd	Kerbside	N	31.51	-	28.36	-	29.04	-
Houghton	Kerbside	N	36.96	--	33.26	-	32.01	-
Tebworth	Rural	N	14.30	-	12.87	-	13.74	-
Sallowsprings	Rural	N	11.92	-	10.72	-	15.06	-
London/Mayfield	Roadside	N	37.75	-	33.97	-	38.70	-
Argos	Kerbside	**Y**	**45.08**	No exposure	**40.57**	No exposure	**46.19**	No exposure
Court Dr	Kerbside	N	30.11	-	27.10	-	30.15	-
Frenchs Ave	Roadside	N	36.33	-	32.70	-	35.55	-
West St	Kerbside	N	33.56	-	30.20	-	33.37	-
89 Luton Rd	Kerbside	**Y**	36.54	-	32.89	-	39.29	-
Chalton	Kerbside	N	**52.46**	No exposure	**47.21**	No exposure	**48.89**	No exposure
Church St	Roadside	**Y**	**46.47**	**44.9**	**41.82**	39.1	**45.03**	**41.9**
5 HSS	Kerbside	**Y**	**54.69**	**41.5**	**49.22**	36.8	**49.84**	38.1
Flint Ct	Roadside	N	**40.45**	39.3	36.40		39.91	31.1
247 Luton Rd	Kerbside	**Y**	**43.83**	39.6	39.44		**41.95**	37.4
32 Luton Rd	Kerbside	**Y**	**46.92**	**41.1**	**42.23**	35.9	**47.89**	**41.6**
Houghton Rd	Kerbside	N	**40.29**	35.9	36.26		**40.48**	35.1
Chalton Cross Cott	Kerbside	N	**44.80**	No drop off	**40.32**	No drop off	**43.46**	No drop off
Clipstone	Rural	N	-	-	13.19	-	16.04	-

The bias adjustment factor used by MBDC was 0.85 for 2008 and 0.86 for 2009 and by SBDC 0.90 for both 2008 & 2009, Central Bedfordshire Council used the national bias adjustment factor of 0.92 in 2010

2.2.2 PM_{10}

As illustrated in the tables below, the monitoring results for the annual mean and 24-hour mean objectives indicate that neither is in danger of being exceeded. The annual mean result from the Dunstable realtime TEOM analyser has been corrected using the Volatile Correction Method web portal as set out in Box 3.4 of Technical Guidance LAQM.TG(09). Details from this VCM method can be seen in Appendix 4. As the Sandy site is affiliated to the AURN network – data from the TEOM does not require to be adjusted by the VCM.

As with the NO_2 analyser, the location is representative of public exposure at certain locations along the A1, however, some residential properties are closer to the road (although standing traffic doesn't occur as much at these locations) and some are more distant. This section of the A1 was the subject of a Detailed Assessment in 2008 which included PM_{10}. It was found that PM_{10} levels did not threaten either of the objectives, which were backed up by 2008 monitoring data.

The automatic monitoring analyser based in Dunstable town centre (which is within an AQMA declared on the basis of the NO_2 annual objective) monitoring NO_2, NO, NO_x and PM_{10} has now been decommissioned due to equipment breakdown. In this report PM_{10} results from the Dunstable Realtime Analyser were adjusted using the King's College Volatile Correction Model (VCM) to correct data measured using a Tapered Element Oscillating Microbalance (TEOM). See Appendix B.

Table 2.7 Results of Automatic Monitoring of PM_{10}: 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				
						2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
MD3	Roadside	N	-	37	Y	-	19.4	20	21	17
SB1	Urban backgnd	Y	-	-	na	27.2	21	19	-	-

[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), if monitoring was not carried out for the full year.
* Optional

Table 2.8 Results of Automatic Monitoring for PM_{10}: 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)				
						2007*	2008*	2009*	2010*	2011
MD3	Roadside	N		37	Y	-	6	5	2	0
SB1		Y		-	-	0	2	1	-	-

[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
* Optional

2.2.3 Sulphur Dioxide

A Detailed Assessment conducted in 2004, along with monitoring results, indicated that sulphur dioxide levels were exceeding the 15 minute mean objective. The former Mid Beds District Council, therefore, declared an Air Quality Management Area for sulphur dioxide as a result of emissions from Stewartby Brickworks.

Stewartby Brickworks stopped production of bricks from February 28th 2008; although the process continued for a few weeks afterwards due to the inherent nature of the production method (i.e. the fires in the kilns proceeded after the input of the final green bricks until they finally went out). This means that the Mid Beds District Council site (MD4) only ever monitored background levels of sulphur dioxide, following this closure.

The results of the monitoring of SO_2 continued for a period after the closure of the brickworks and showed that SO_2 concentrations met the air quality objectives. The MD4 site ceased monitoring SO_2 in April 2009.

There were no exceedences of any of the SO_2 objectives in 2008 at the Bedford Stewartby (rural) site (BF1) – the site was decommissioned in February 2009.

Subsequently the AQMAs relating to the emissions from the brickworks have been revoked by Central Bedfordshire Council and its neighbouring authority Bedford Borough Council.

Currently there are no locations where exceedence of the objectives is likely.

2.2.4 Benzene

There are no continuous benzene analysers in Hertfordshire or Bedfordshire. Diffusion tube monitoring carried out for previous rounds of review and assessment showed that the 2003 Air Quality Objective is likely to have been met in all locations.

2.2.5 Other pollutants monitored

2.2.5.i Carbon Monoxide (CO)

Previous rounds of review and assessment have shown that CO levels throughout Hertfordshire and Bedfordshire are well within the objective levels of 10mg/m^3 (running 8 hour mean). No AQMA(s) have been declared nationally.

2.2.5.ii 1,3 Butadiene

The Government and the Devolved Administrations have adopted a maximum running annual mean concentration of 2.25μg/m^3 to be achieved by the end of 2003.

The main source of 1,3-butadiene in the UK is emissions from motor vehicle exhausts. It is also an important industrial chemical, which is handled in bulk at a small number of industrial premises.

Concentrations of 1,3-butadiene are measured at a limited number of UK national network sites. Maximum running annual mean concentrations are already well below the 2003 objective.

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The continuing number of vehicles equipped with 3 way catalysts and agreed further reductions in vehicle emissions and improvements to fuel quality will continue to significantly reduce emissions of this pollutant in future years.

Data gathered in previous review and assessments showed that the objectives for 1,3 butadiene have been achieved in Central Bedfordshire Council's district.

No changes have occurred since the Updating and Screening Assessment produced in 2009 to alter this situation.

2.2.5.iii Lead

The Government and the Devolved Administrations have adopted a maximum annual mean concentration of 0.5 μg/m^3 to be achieved by the end of 2004 and 0.25μg/m^3 by the end of 2008.

The main source of lead in the atmosphere has historically been from combustion of petrol. Since the phasing out of leaded petrol across Europe, lead levels have fallen sharply. Monitoring was carried out in South Bedfordshire for 12 months from February 1999 and produced an annual mean of 0.06μg/m^3, confirming that both the 2004 and 2008 objectives were being met. Therefore, lead monitoring is no longer considered necessary in Hertfordshire and Bedfordshire.

No changes have occurred since the Updating and Screening Assessment produced in 2009 to alter this situation.

2.2.5.iv Ozone (O_3)

The Government has set an air quality objective for ground level ozone but, as it is a national and international problem rather than a local one, it is not included in environmental legislation. This means that local authorities are not required to take action to specifically decrease ground level ozone levels.

The sun shining on polluted air, which contains nitrogen dioxide and volatile organic compounds, produces ozone. Given that strong sunshine is essential in the formation of ozone the pollutant is, in the main, a summertime problem.

Ozone concentrations tend to be highest in rural locations. This is due to ozone being used by other pollutants in photochemical reactions and as such ozone levels will be decreased in urban situations where traffic or industrial pollutants tend to be higher.

Table 2.9 The National Air Quality Standards and Objectives for ground level ozone

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Ozone (O_3)	100 μg/m^3 (50 ppb)	Running 8 hour mean daily maximum of running 8hr mean not to be exceeded more than 10 times per year	**31/12/2005**

Monitoring results indicate that all parts of Hertfordshire and Bedfordshire will have failed to achieve this objective.

Central Bedfordshire Council - England

Unlike all of the other pollutants, ozone (0_3) concentrations across the network have seen a steady increase over the last nine years and this helps to indicate why the reduction in NO_x is not being directly translated into a similar reduction in NO_2. Ozone levels are highly dependent on the weather and a series of warm sunny summer periods can cause a sharp increase in mean levels. Furthermore, a large proportion of the ozone experienced in Hertfordshire and Bedfordshire is transported from continental Europe during easterly and southerly winds.

The pattern of rising ozone levels is common across the UK. There are a number of possible reasons why, despite falling NO_x concentrations. Climate change may be causing more hours of sunlight and higher temperatures helping to drive the reaction that forms ozone.

Ozone 'precursors', such as hydrocarbons and secondary particulate compounds emitted by both vehicles and industrial processes, may be increasing. It is even possible that emission control technologies such as particle traps fitted to diesel vehicles are upsetting the balance between NO and NO_x. As ozone is a transboundary pollutant, which can travel hundreds or even thousands of miles, the reasons and possible solutions, have to be sought within and outside of the borders of the UK.

2.2.6 Summary of Compliance with AQS Objectives

Central Bedfordshire Council has measured concentrations of NO_2 above the annual mean objective at relevant locations outside of the existing AQMA in Dunstable.

However Detailed Assessments have already been produced and submitted to Defra for Chalton and Sandy, which concluded that AQMAs be declared in relation to the NO_2 annual objective. A new NO_2 diffusion tube monitoring site on the façade of a house approximately 1metre from the carriageway of the A1 in Sandy shows the annual mean to be above 60µg/m^3, which indicates that the hourly NO_2 objective may be exceeded in this location. However the site falls within the boundary of the proposed Sandy AQMA. Monitoring will continue in this location.

In addition a Detailed Assessment was produced and submitted to Defra in respect of the narrow, congested streets identified in the 2009 USA. The Detailed Assessment concluded that an AQMA should be declared in respect of the annual NO_2 mean.

Work to declare the AQMAs is currently in progress.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Central Bedfordshire Council's USA 2009 report highlighted that as a result of the new standards in the Technical Guidance LAQM.TG(09), two roads (Bedford Street and Dunstable Street, Ampthill) were identified as being narrow congested streets with a flow of above 5,000 vehicles per day and residential properties close to the kerb. A Detailed Assessment report produced in 2010 concluded that an AQMA needs to be declared with regard to the annual NO_2 objective. As a result monitoring is continuing at these locations and work is progressing to declare an AQMA.

Within Central Bedfordshire, there have been no changes to:

- Busy streets where people may spend one hour or more close to traffic
- Roads with a high flow of buses and/or HGVs
- Junctions
- New roads constructed or proposed since the last round of Review and Assessment
- Roads with significally changed traffic flows
- Bus or coach stations

Central Bedfordshire 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

Central Bedfordshire Council has measured concentrations of NO_2 above the annual mean objective at relevant locations outside of the AQMA. However, Detailed Assessments have already been produced for these areas (and submitted to Defra) in 2008. Following the Detailed Assessments completed in 2008, it was recommended that an AQMA be declared in Chalton and at the A1 roundabout in Sandy in relation to the annual NO_2 objective. This work is currently in progress.

As a result of a review of nitrogen dioxide diffusion tube sites in 2010 – a new site was set up on the façade of a row of terraced houses alongside the A1 in Sandy approximately 1 metre from the carriageway. The annual mean result concentration of the tube was 74.6µg/m^3 (with national bias adjustment factor 0.89 applied). This indicates that there is a breach of the hourly objective at this location which falls within the proposed AQMA for Sandy.

It was identified in the previous round of review and assessment, that the B579 (Luton Road, Chalton) met the criteria of having a traffic flow of more than 10,000 vehicles per day, but the residential properties were not within 5m of the kerb (they are approximately 8m away).

Central Bedfordshire Council - England

There are two NO_2 diffusion sites in the vicinity, one on a lamp post approx 3 metres from the kerb adjacent to the B579 and on the side of the bridge nr the M1 (SB28) and one of the facia of 1 Chalton Cross Cottages approx 8m from the kerb (SB41).

Table 2.10 – Results from Chalton NO2 diffusion tubes

Site	2006 (bias 0.98)	2007 (bias 0.87)	2008 (bias 0.90)	2009 (bias 0.90)	2010 (bias 0.92)	2011 (bias 0.89)
SB28	44.37µg/m^3	46.15 µg/m^3	44.80 µg/m^3	47.21 µg/m^3	48.89 µg/m^3	45.84 µg/m^3
SB41	50.30 µg/m^3	52.70 µg/m^3	52.46 µg/m^3	40.32 µg/m^3	43.46 µg/m^3	40.51 µg/m^3

A Detailed Assessment report was produced for this location, the conclusions of which were that an AQMA should be declared for the annual nitrogen dioxide objective. Feedback has recently been received from Defra which upheld this conclusion. Therefore work is in progress to declare an AQMA in Chalton.

Central Bedfordshire 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.

Traffic data gathered from the former Bedfordshire County Council (now part of Central Bedfordshire Council and Bedford Borough Council) has consistently shown that no roads in the district have an unusually high proportion of HGVs/buses with relevant exposure within 10metres.

Central Bedfordshire Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Central Bedfordshire 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

There are no new roads which have been proposed/constructed since the last round of review and assessment, which have not been assessed during prior rounds of Review and Assessment.

Central Bedfordshire Council - England

Central Bedfordshire Council have no new roads which have been constructed since the last
round of review and assessment, which carry more than 10,000 vehicles per day. As reported within the 2006/2009 Updating and Screening Assessments there were some proposed
road schemes where this traffic flow (or more) was expected.

- M1 junction 10-13 widening and creation of Junction 11a (and widening between junctions 6a-10).
  It was announced in January 2009 that the widening scheme proposed between junctions 10-13 has been postponed until 2013 (at the earliest). Instead a hard shoulder running scheme is being implemented. Construction commenced in December 2009.
  Construction on the redesigned junctions commenced in February 2011 and are scheduled for completion by spring 2013.

- M1 - A5 Link Road – Dunstable Northern bypass

  The A5 – M1 link road was originally scheduled to go to Public Inquiry in June 2010, this was postponed due to the Comprehensive Spending Review and the project put into the “future schemes” for potential construction in future Spending Review periods.

  However following this announcement and in response to representations from a local developer offering a contribution to the scheme, the Secretary of State subsequently agreed that, subject to an appropriate agreement being in place in regard to the contribution, the Public Inquiry would re-commence as soon as possible with a potential start to works in 2014. The agreement is now in place and the Highways Agency has announced the decision to proceed with the Public Inquiry.

Central Bedfordshire Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Central Bedfordshire Council confirms that there are no roads with an increase of more than 25% traffic flow.

Central Bedfordshire Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Central Bedfordshire Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

London Luton airport is situated in a neighbouring authority's district.

Air quality is monitored within and around the airport site. Currently there are 13 NO_2 diffusion tube sites. Two of which recorded an annual mean of above 40µg/m^3 in 2011, neither of which are at locations which represent "relevant exposure".

There is "relevant exposure" within 1000metres of the airport boundary. However the current runway is some distance from the boundary and nitrogen dioxide levels rapidly decrease upon moving away from the source. Additionally aircraft will be at 200metres above ground level before passing over housing, as such, emissions from aircraft make a negligible contribution to ground level concentrations in Central Bedfordshire. In addition, in easterly mode, aircraft approach from the west and depart to the east, heading into the easterly wind. The opposite occurs in westerly mode. The westerly mode is predominant as this is the prevailing wind direction. This results in pollution emanating from the airport being transported away from the Central Bedfordshire Council's district.

London Luton Airport carries out NO_2 diffusion tube monitoring both on and off the site. Tube preparation method is 50% TEA/Acetone. Results (in µg/m^3 and bias adjustment factor applied) are shown in Table 2.11 below:

Table 2.11 – Results for Luton Airport NO_2 diffusion tubes

Bias Adjusted (national factor)		1.01	0.98	0.93	0.97	1.03	0.93
code	**address**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
LA01	Terminal Patio	39.47	37.49	39.99	40.58	51.84	40.69
LA02	Airport Approach Road	45.11	32.91	32.71	25.32	45.88	38.05
LA03	Runway Threshold (western)	23.40	27.77	24.34	23.6	30.9	28.36
LA04	Runway Threshold (eastern)	19.53	19.60	19.69	19.15	24.29	20.85
LA05	Runway Apron	42.17	45.16	44.33	45.67	55.62	45.50
LA06	President Way Junction	37.45	36.10	35.19	39.21	44.72	36.89
LA07	Terminal Car Park	28.20	28.83	27.44	26.99	37.51	30.46
LA08	BAM Co-locator	33.84	33.81	30.46	30.39	39.48	32.62
LA09	Stagenhoe Bottom Farm	11.78	11.60	11.63	13.1	16.14	12.79
LA10	Grove Farm Slip End	11.95	12.90	12.94	14.23	18.71	14.11
LA12	Pickford Rd Markyate	15.99	16.82	15.42	17.46	-	-
LA13	Delmerend Lane Flamstead	14.56	14.62	13.18	15.35	22.40	15.65
LA14	Stand 60 Luton Airport	45.28	42.96	37.98	35.24	42.92	38.60
LA15	Easton Green Road	-	-	-	32.01	36.05	36.43

Historical NO_2 diffusion tube monitoring at locations near to the boundary of the airport carried out by Luton Borough Council and South Bedfordshire District Council (now Central Bedfordshire Council), indicates that levels meet the objective. Table 2.12 below shows the results (all in µg/m^3):

Table 2.12 – Historical NO_2 diffusion tube results

Location	Grid ref	2002	2003	2004	2005	2006	2007	2008
Colwell Rise (LBC[1])	512430 222253	26.9	34.5	27.4	32.9	-	-	-
Someries (CBC[2])	512093 220205	-	-	-	-	18.6	20.2	19.40

[1] Luton Borough Council

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Monitoring has indicated that properties within the Central Bedfordshire Council's district are not exposed to nitrogen dioxide concentrations above that of the annual objective levels.

The latest figures show that during 2010 the airport had a throughput of under 9 million passengers and some 28,904 tonnes of freight. Thereby the total equivalent passenger number (mppa) is under the 10 million threshold, additionally the background NOx concentration is below 25µg/m3.

Central Bedfordshire Council confirms that there are no airports in the Local Authority area and the one in a neighbouring authority does not impact on air quality in the district.

4.2 Railways (Diesel and Steam Trains)

Railways were considered during previous rounds of review and assessment and found they were unlikely to be an issue (not enough periods of idling or relevant exposure). There have been no significant changes to train services or exposures.

The narrow gauge railway at Leighton Buzzard continues to run during school holidays and weekends) using engines which are coal powered. However there have been no changes to the route or scheduled stops, which means that it is highly unlikely that the trains will be stationary for 15 minutes or more and the public would have access to within 15metres (unless they are on the train).

4.2.1 Stationary Trains

Central Bedfordshire 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

Central Bedfordshire 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)

Central Bedfordshire Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

[2] Central Bedfordshire Council (formerly South Bedfordshire District Council)

5 Industrial Sources

5.1 Industrial Installations

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

Central Bedfordshire 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

Central Bedfordshire 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

Central Bedfordshire 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

Central Bedfordshire Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Central Bedfordshire Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Central Bedfordshire Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Central Bedfordshire Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Central Bedfordshire Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

As reported in the Progress Report 2011, Central Bedfordshire Council received a proposal for a waste incinerator to be erected and operated within the district. Comments have been made with regards to issues surrounding air quality. The decision for approval of the project is pending.

However there are no new landfill sites, quarries, unmade haulage roads on industrial sites, waste transfer stations or other potential sources of fugitive particulate emissions since the last review and assessment.

Central Bedfordshire Council has identified the following potential local developments which may impact on air quality in the Local Authority area.

Proposed waste incinerator at Marston Vale, which is currently being reviewed.

If necessary this will be taken into consideration in future Review and Assessments.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

This Updating and Screening Assessment report highlights that two Detailed Assessments were produced during 2008 relating to locations in Sandy (near to the A1) and Chalton (adjacent to the B579 and in the vicinity of the M1). Both reports recommended that AQMAs be declared in relation to the annual NO_2 objective.

As a result of a review of nitrogen dioxide diffusion tube sites in 2010 – a new site was set up on the façade of a row of terraced houses alongside the A1 in Sandy approximately 1 metre from the carriageway. The annual mean result concentration of the tube was 74.6µg/m^3 (with national bias adjustment factor 0.89 applied). This indicates that there is a breach of the hourly objective at this location which falls within the proposed AQMA for Sandy

There have been some delays to the public consultation process but work will progress on declaring the AQMAs as soon as practicable. The Highways Agency has announced the decision to proceed with the Public Inquiry following contributions from a local developer and work would potentially commence in 2014 on the A5 – M1 Link Road (Dunstable northern bypass). Potentially this may impact on the residential properties at Chalton and so the situation will be monitored closely.

In addition a Detailed Assessment was completed in 2010 for Ampthill, in respect of the annual NO_2 objective. It concluded that an AQMA should be declared. There have been some delays in carrying out the public consultation but work will progress on declaring the AQMA as soon as practicable.

Some delays have resulted in Statutory consultees' will be contacted and comments assessed before the AQMAs are declared and Further Assessments produced.

No additional areas within the district have been identified as requiring further assessment with respect to any pollutant.

8.2 Conclusions from Assessment of Sources

Potential sources of pollution have been considered during previous rounds of review and assessment and as there have been no changes in circumstances, continue to not to require further assessment.

However work continues to declare the three AQMAs (Sandy, Chalton and Ampthill) where breaches of the annual NO2 objective have been recorded.

8.3 Proposed Actions

This USA report has not identified the need to proceed to a Detailed Assessment in respect to any pollutant. However previous reports identified three areas which exceed the annual NO2 objective and work will continue to declare AQMAs in those locations (Sandy, Chalton and Ampthill) by carrying out public consultation.

Once the AQMAs have been declared then Further Assessments will be produced to identify the major sources of the pollution and to work towards achieving the objective through targeted action plans.

9 References

Central Bedfordshire Council USA 2009 report

Central Bedfordshire Council Progress Report 2011

Central Bedfordshire Council Local Transport Plan 3

Defra – Local Air Quality Management Technical Guidance (LAQM.TG(09))

Defra website NO2 fall off with distance calculator accessed at

http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Defra website National bias adjustment factor spreadsheet (March 2012) accessed at

http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Defra website Background maps accessed at

http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

Hertfordshire and Bedfordshire Air Quality Monitoring Network accessed at www.HertsBedsAir.net

Appendices

Appendix A: QA/QC Data

Appendix B: Volatile Correction Method (VCM) details

Appendix C: Location maps of NO_2 Diffusion Tube Data

Appendix D: Monthly NO_2 Diffusion Tube Data Results

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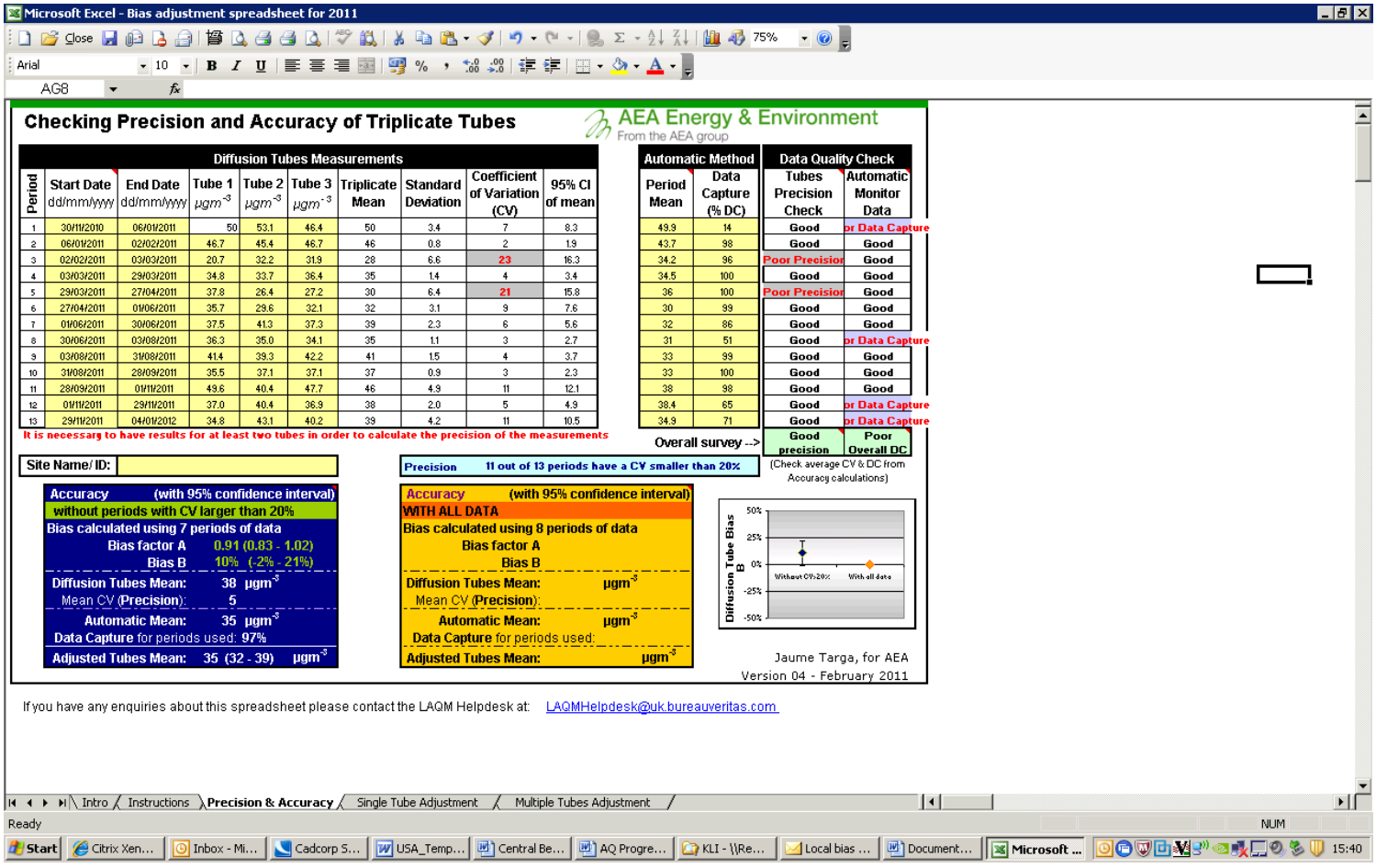
Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Both the legacy authorities of Central Bedfordshire Council (the former Mid Beds District Council and South Beds District Council) used Gradko NO_2 diffusion tubes and their analysis. The preparation is 20% TEA in water. Central Bedfordshire Council will continue to use the same laboratory and tube preparation.

Factor from Local Co-location Studies (if available)

Mid Beds District Council co-location study reported a figure of 0.91 for 2011 which is broadly in line with the national study figure of 0.89. The co-location data is included in the national database.



Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm-3	Tube 2 µgm-3	Tube 3 µgm-3	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	30/11/2010	06/01/2011	50	53.1	46.4	50	3.4	7	8.3	49.9	14	Good	or Data Capture
2	06/01/2011	02/02/2011	46.7	45.4	46.7	46	0.8	2	1.9	43.7	98	Good	Good
3	02/02/2011	03/03/2011	20.7	32.2	31.9	28	6.6	23	16.3	34.2	96	Poor Precision	Good
4	03/03/2011	29/03/2011	34.8	33.7	36.4	35	1.4	4	3.4	34.5	100	Good	Good
5	29/03/2011	27/04/2011	37.8	26.4	27.2	30	6.4	21	15.8	36	100	Poor Precision	Good
6	27/04/2011	01/06/2011	35.7	29.6	32.1	32	3.1	9	7.6	30	99	Good	Good
7	01/06/2011	30/06/2011	37.5	41.3	37.3	39	2.3	6	5.6	32	86	Good	Good
8	30/06/2011	03/08/2011	36.3	35.0	34.1	35	1.1	3	2.7	31	51	Good	or Data Capture
9	03/08/2011	31/08/2011	41.4	39.3	42.2	41	1.5	4	3.7	33	99	Good	Good
10	31/08/2011	28/09/2011	35.5	37.1	37.1	37	0.9	3	2.3	33	100	Good	Good
11	28/09/2011	01/11/2011	49.6	40.4	47.7	46	4.9	11	12.1	38	98	Good	Good
12	01/11/2011	29/11/2011	37.0	40.4	36.9	38	2.0	5	4.9	38.4	65	Good	or Data Capture
13	29/11/2011	04/01/2012	34.8	43.1	40.2	39	4.2	11	10.5	34.9	71	Good	or Data Capture

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision | Poor Overall DC

(Check average CV & DC from Accuracy calculations)

Discussion of Choice of Factor to Use

The 2011 local and national bias adjustment factors are available for Gradko 20% TEA in water tubes and are 0.91 and 0.89 respectively.

The national bias adjustment factor was obtained from version 3-12 of the spreadsheet comprisingof 26 studies and available from http://laqm.defra.gov.uk/documents/Diffusion_Tube_Bias_Factors-v03_12.xls

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The effects of both bias adjustment factors on the NO_2 diffusion tube data can be seen in Table 2.5. and use of the local figure results in more sites exceeding the objective.

Due to the range of locations of monitoring sites throughout the district, which differ from the c0-location monitoring site, use of the nationally calculated bias adjustment figure is more representative although slightly less conservative in nature.

PM Monitoring Adjustment

The annual mean results from the Dunstable analyser was corrected using the Volatile Correction Method as set our in Box 3.4 of LAQM.TG(09). Details from the VCM method can be seen in Appendix B. The automatic monitoring analyser based in Dunstable town centre (which was within an AQMA declared on the basis of the NO_2 annual objective) monitoring NO_2, NO, NO_x and PM_{10} has now been decommissioned due to equipment breakdown.

Both Mid and South Bed District Councils used Tapered Element Oscillating Microbalance (TEOM) analyser to monitor PM_{10} data. The TEOM uses a heated sample inlet to prevent moisture from contaminating the filter: studies in recent years have shown that this results in the loss of volatile and semi-volatile components of PM_{10} and until recently Defra advised applying a default correction factor of 1.3 to take account of this. This has been superseded; the current advice is to use the King's College London Volatile Correction Model (VCM) wherever possible.

The VCM Model allows TEOM measurements to be converted into gravimetric equivalent data by making use of FDMS volatile fraction data from a nearby monitoring station.

The Sandy site has been affiliated to the AURN network and so data does not require to be adjusted by the VCM method. As with the NO_2 analyser, the location is representative of public exposure at certain locations along the A1, however, some residential properties are closer to the road (although standing traffic doesn't occur as much at these locations) and some are more distant. This section of the A1 was the subject of a Detailed Assessment in 2008 which included PM_{10}. It was found that PM_{10} levels did not threaten either of the objectives, which were backed up by 2008 monitoring data.

The annual mean results for the former Dunstable automatic monitoring site were corrected using the Volatile Correction Method web portal as set out in Box 3.4 of Technical Guidance LAQM.TG(09).

Short-term to Long-term Data adjustment

None was undertaken for this report.

QA/QC of automatic monitoring

The Sandy site became an affiliated site in the AURN National Network in January 2009 which resulted in an FDMS upgrade to the PM_{10} TEOM and also the installation of a $PM_{2.5}$ FDMS TEOM. NO_2 is measured using an API chemiluminescence NOx analyser. The analysers are housed in an air conditioned cabin.

Data is collected remotely using a GSM modem link.

Local Authority officers carry out calibrations of the NO_2 analyser every two weeks and the Ozone analyser every month.

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Since the affiliation of the Sandy site with Defra's national network, a site audit is carried out every 6 months by Casella.

The sites analysers are covered by service and maintenance contracts with Supporting U and Casella and this covers calibration checks, flow and leak checks, cleaning of components, analyser diagnostic checks and replacement of faulty components and consumables. These services are carried out twice a year.

"The NPL QA/QC testing methodology includes the following:
During the NPL calibration visits, ozone analyser accuracy was determined using an NPL transfer standard photometer. NOx, and CO analysers were tested with zero gas and span concentration mixtures, which are certified against Primary Standards held at NPL. The linearity of this type of analyser was tested using a number of dilution points generated using a high concentration mixture and zero air. NOx analyser converter efficiency was determined using Gas Phase Titration.

Automatic measurements of PM_{10} were made using the Tapered Element Oscillating Microbalance (TEOM) method. Measurements of NO_X used were made using the chemiluminescent method with automatic equipment subject to fortnightly calibration traceable to National Metrological Standards. All measurements were logged by the instruments themselves and collected by Air Quality Data Management (AQDM) each hour. Measurements from the monitoring site were validated by AQDM using the most up to date calibration factors and publicly disseminated in near real time on the HBAQN web page (http://www.hertsbedsair.net/).

A final measurement data set to the end of 2011 was produced by AQDM following retrospective ratification of the measurements using procedures, which exceed the requirements detailed in LAQM TG09 (Defra, 2009). During ratification information from regular calibrations, audits and daily manual validation were used to establish an operational and calibration history of the instruments and the pollution measurements were corrected to establish traceability to National Metrological Standards. Details of the monitoring site and the final dataset can be found at http://www.hertsbedsair.net/.

The data undergoes 'daily sensibility' checks 365 days per year and it is then further ratified on a monthly basis, taking local authority, Engineer or NPL visits into account. It is reviewed again as an annual dataset at the end of the year following the receipt of the sites audit report when linear scaling processes are applied to the data. The data is compared to data collected from other local network monitoring sites.

The data from the AQMS at Sandy Roadside is ratified by ERG to the AURN standard and QA/QC visits are carried out by Casella at this site. The data from the Marston Vale site is ratified to the Herts and Beds Air Quality Network standard.

The former South Beds District Council carried out the calibrations of the TEOM/NO_2 analyser every two/four weeks. The data from the AQMS at the Dunstable Background site was ratified by ERG to the Herts and Beds Air Quality Network standard.

The data underwent 'daily sensibility' checks 365 days per year and was then further ratified on a monthly basis, taking local authority and engineer/service visits into account. It was reviewed again as an annual dataset at the end of the year following the receipt of the sites audit report when linear scaling processes were applied to the data. The data was compared to data collected from other local network monitoring sites.

The analysers (NO_2 and PM_{10}) were covered by a service and maintenance contract with

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Signal Ambitech and this covered calibration checks, flow and leak checks, cleaning of components, analyser diagnostic checks and replacement of faulty components and consumables. The services were carried out on a twice yearly frequency. The Dunstable site uses certified calibration gases.

This service agreement ceased on 1st January 2010 whereupon the decision was made that due to the age and increasing unreliability of the NO_2 monitor and the location of the site the Ambirak would be switched off and the site moved to a new more relevant location. New NO_2 monitor is being purchased and a new site being chosen at the present time. The current TEOM analyser will be incorporated into the new site.

Automatic measurements of PM_{10} were made using the Tapered Element Oscillating Microbalance (TEOM) method. In this report PM_{10} results from the Dunstable analyser were adjusted using Kings College Volatile Correction Model (VCM) to correct data measured using a TEOM.

Measurements of NO_X used were made using the chemiluminescent method with automatic equipment subject to fortnightly calibration traceable to National Metrological Standards. All measurements were logged by the instruments themselves and collected by King's each hour. Measurements from the monitoring site were validated by King's using the most up to date calibration factors and publicly disseminated in near real time on the HBAQN web page.

A final measurement data set to the end of 2009 was produced by King's following retrospective ratification of the measurements using procedures, which exceed the requirements detailed in LAQM TG09 (DEFRA, 2009) and the latest guidance released in 2006. During ratification information from regular calibrations, audits and daily manual validation were used to establish an operational and calibration history of the instruments and the pollution measurements were corrected to establish traceability to National Metrological Standards.

QA/QC of diffusion tube monitoring

The nitrogen dioxide diffusion tubes used by Central Bedfordshire Council are supplied by Gradko International Ltd. The tube preparation is 20% TEA/Water. This laboratory was considered **'GOOD'** in the latest results from the laboratory precision and WASP scheme.

Appendix B: Volatile Correction Method details

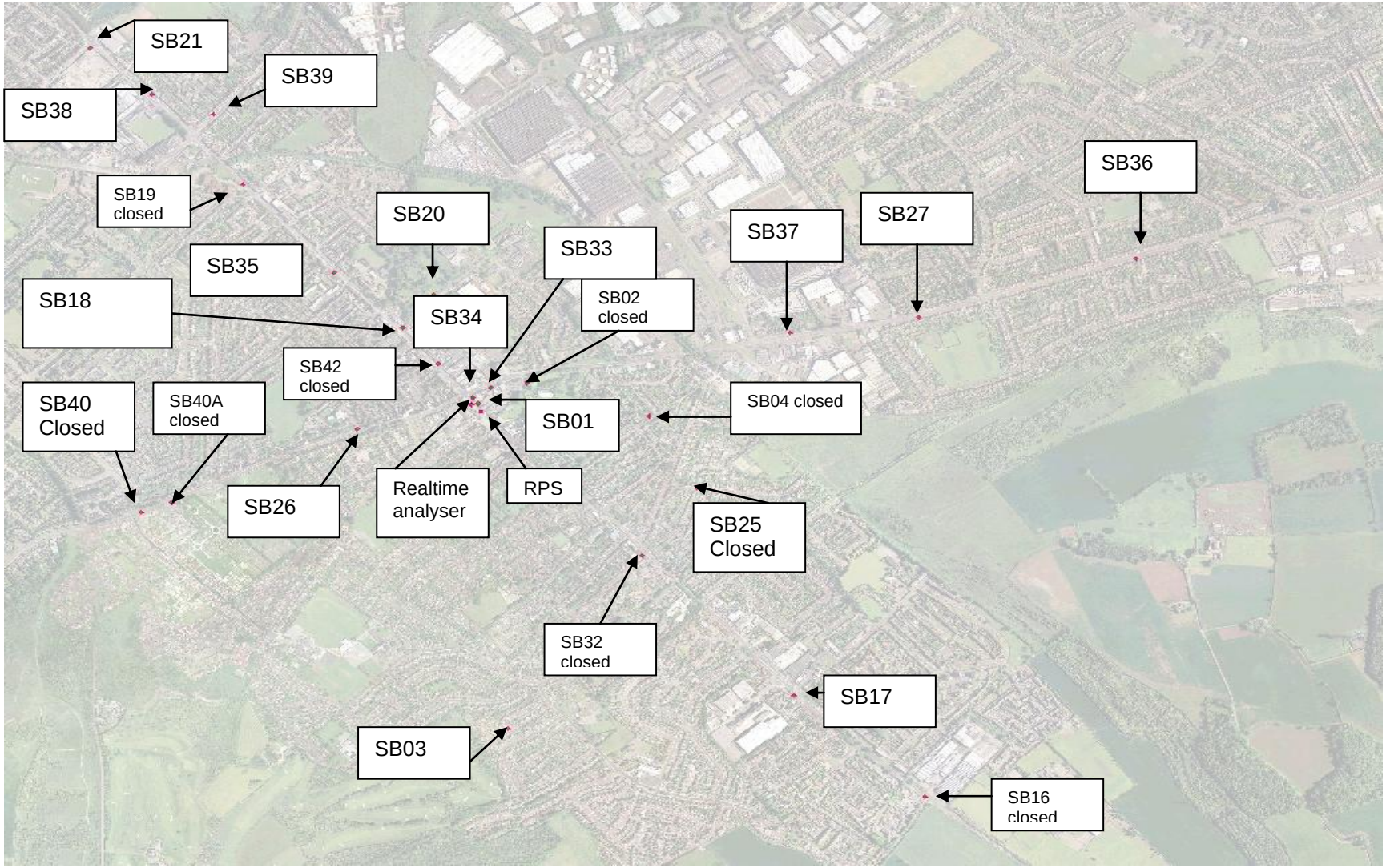
Central Bedfordshire Council (formerly Mid & South Bed District Councils) use Tapered Element Oscillating Microbalance (TEOM) analysers to monitor PM_{10} data. The TEOM uses a heated sample inlet to prevent moisture from contaminating the filter: studies in recent years have shown that this results in the loss of volatile and semi-volatile components of PM_{10} and until recently Defra advised applying a default correction factor of 1.3 to take account of this. This has been superseded; the current advice is to use the King's College London Volatile Correction Model (VCM) wherever possible.

The VCM Model allows TEOM measurements to be converted into gravimetric equivalent data by making use of FDMS volatile fraction data from a nearby monitoring station.

Results from the Dunstable monitoring station were subject to VCM. All calculations were made in accordance with the approach set out in Box 3.4: Application of the VCM within Defra's Technical Guidance LAQM.TG(09).

Appendix C: Maps of NO_2 diffusion tube monitoring sites

NO_2 Diffusion Tube monitoring sites in Dunstable



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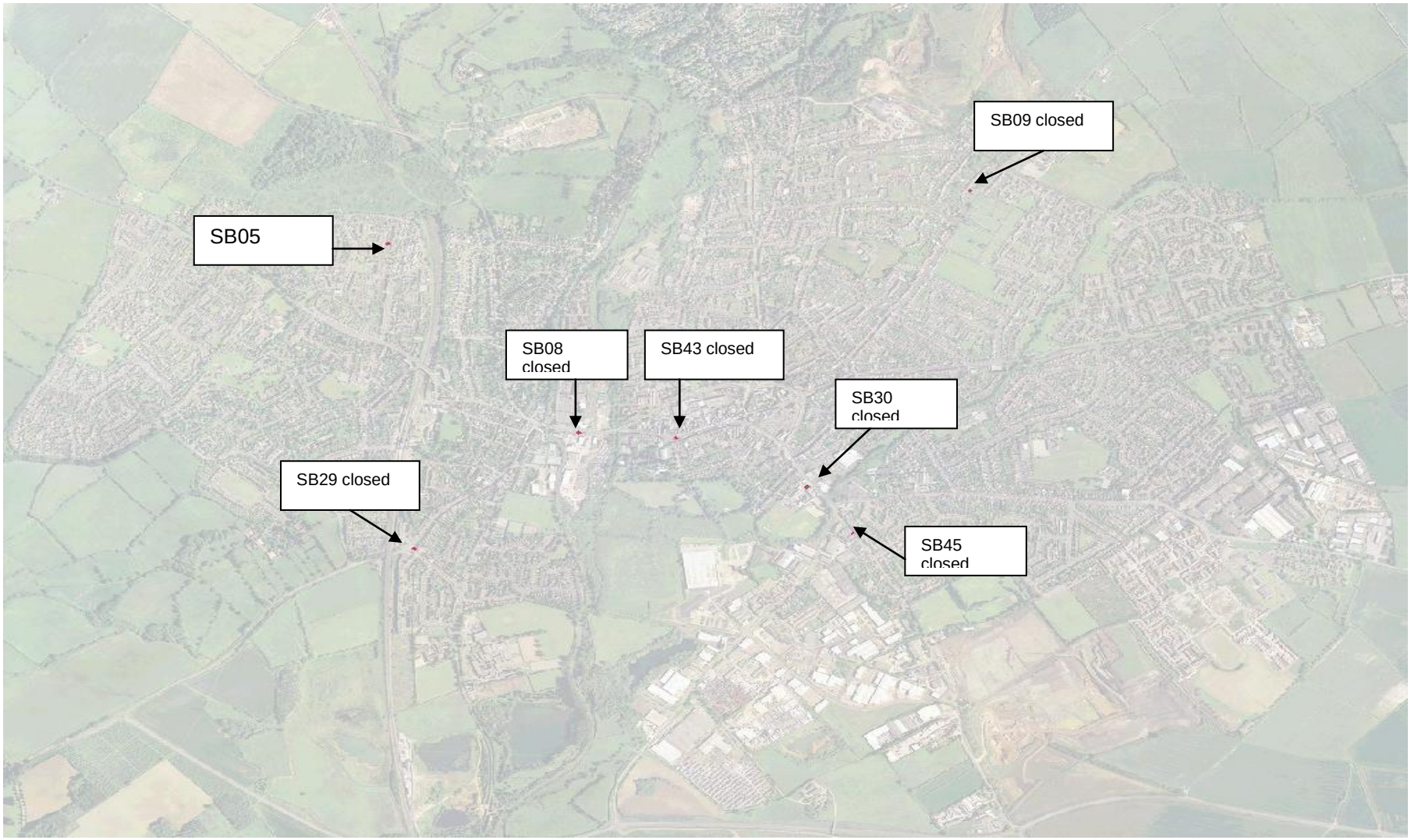
NO_2 Diffusion Tube monitoring sites in Leighton Buzzard



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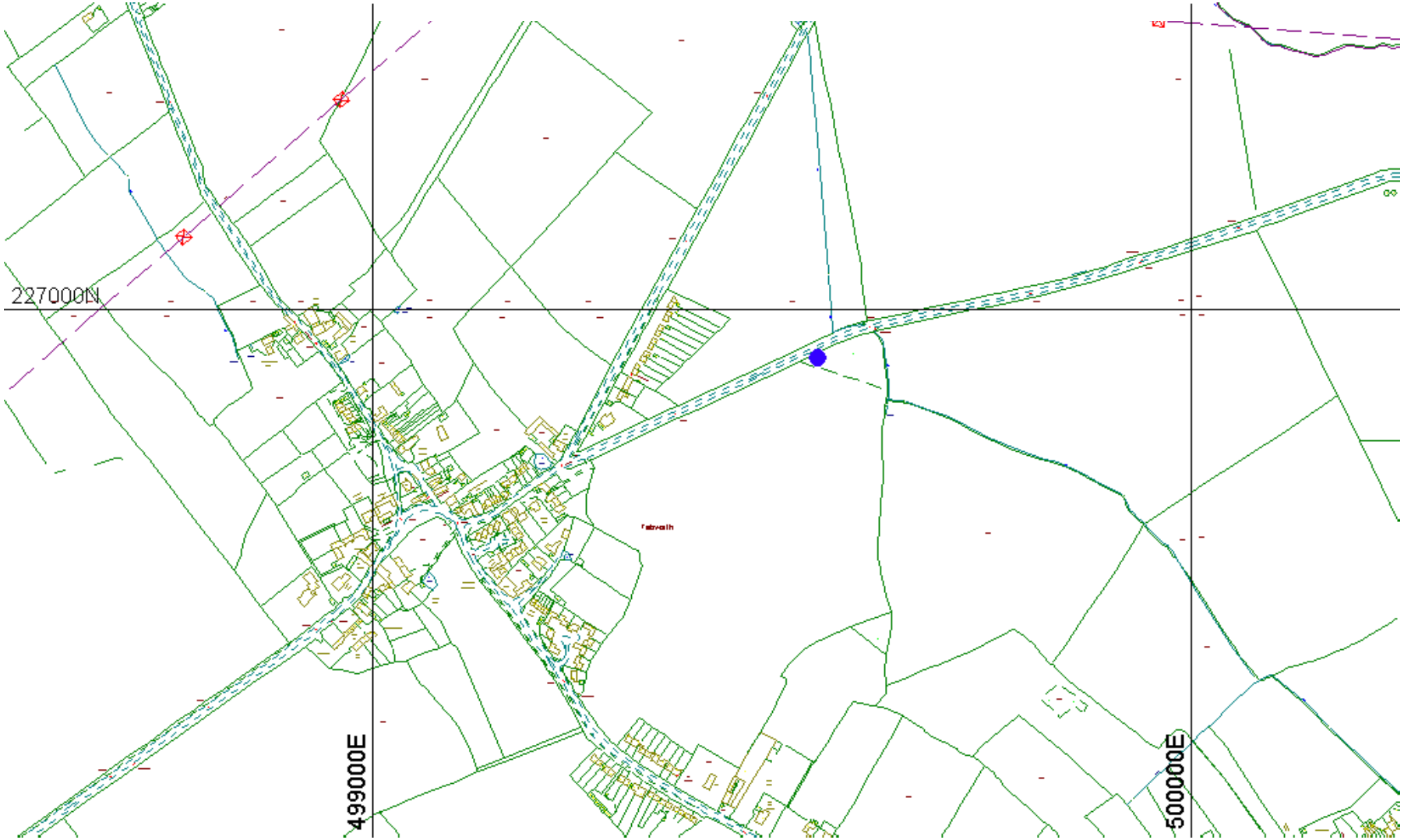
NO_2 Diffusion Tube monitoring site in Tebworth



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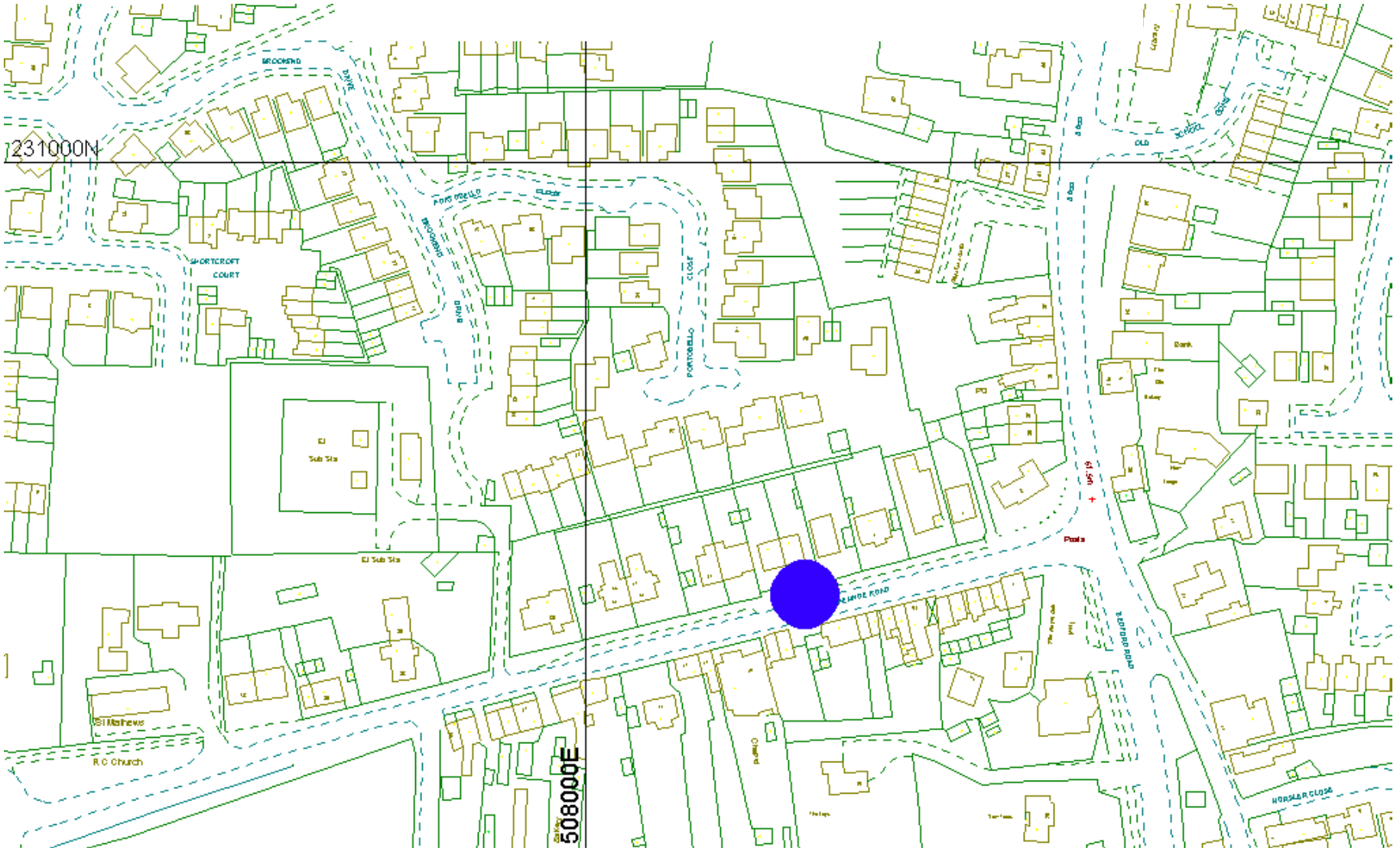
NO_2 Diffusion Tube monitoring site in Barton



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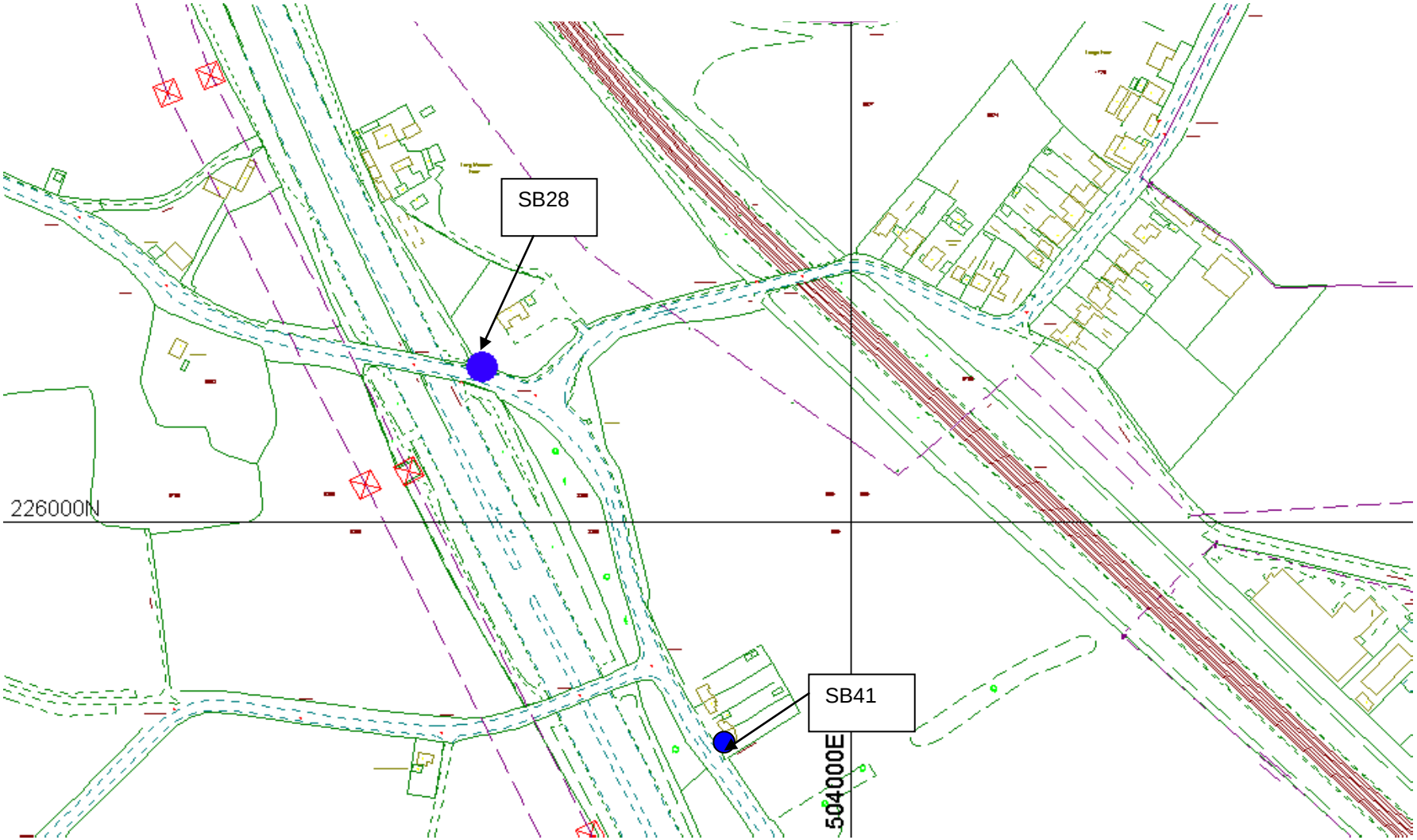
NO_2 Diffusion Tube monitoring sites in Chalton



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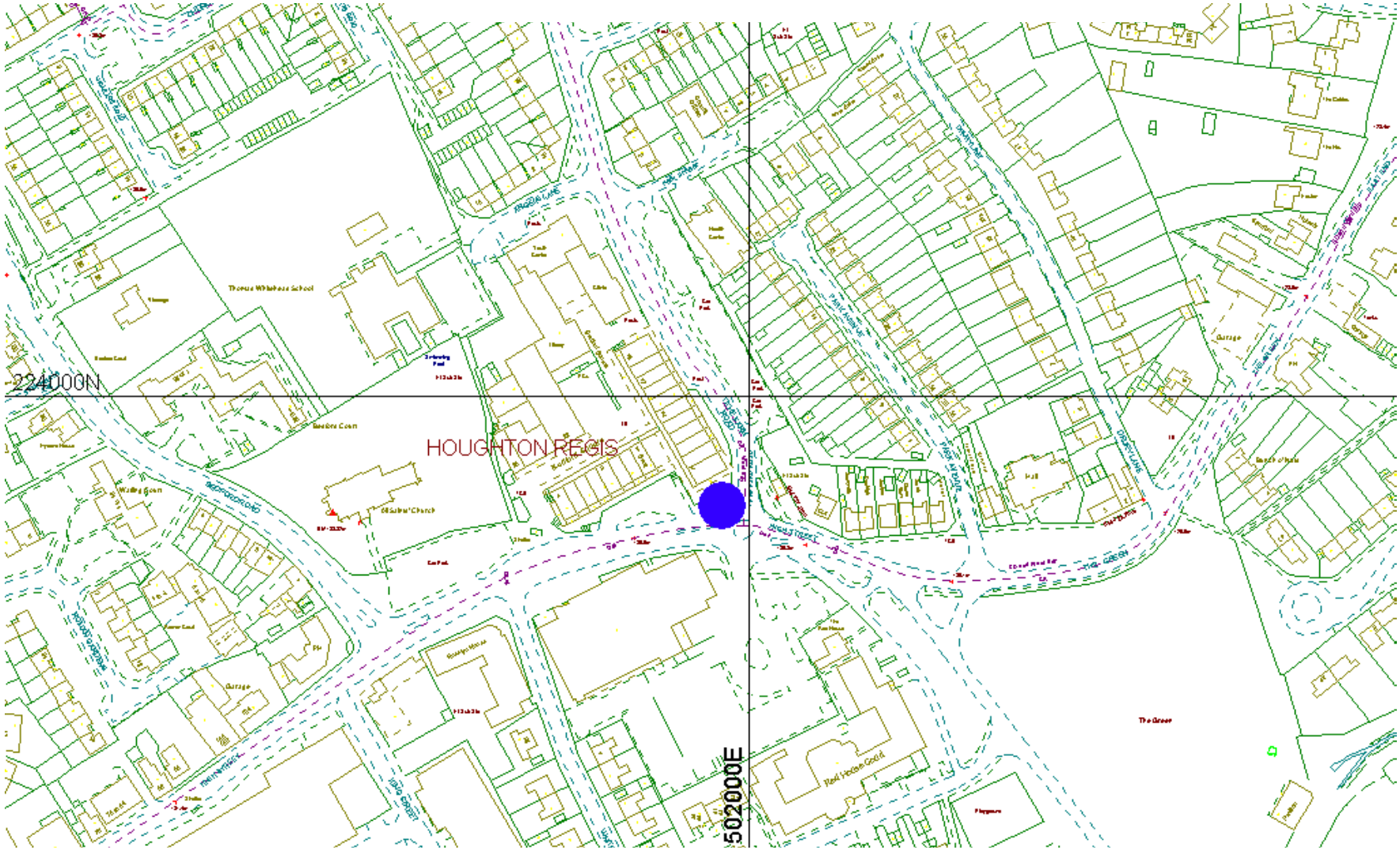
NO_2 Diffusion Tube monitoring site in Houghton Regis



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NO_2 Diffusion Tube monitoring site in Slip End

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NO_2 Diffusion Tube monitoring site in Clipstone

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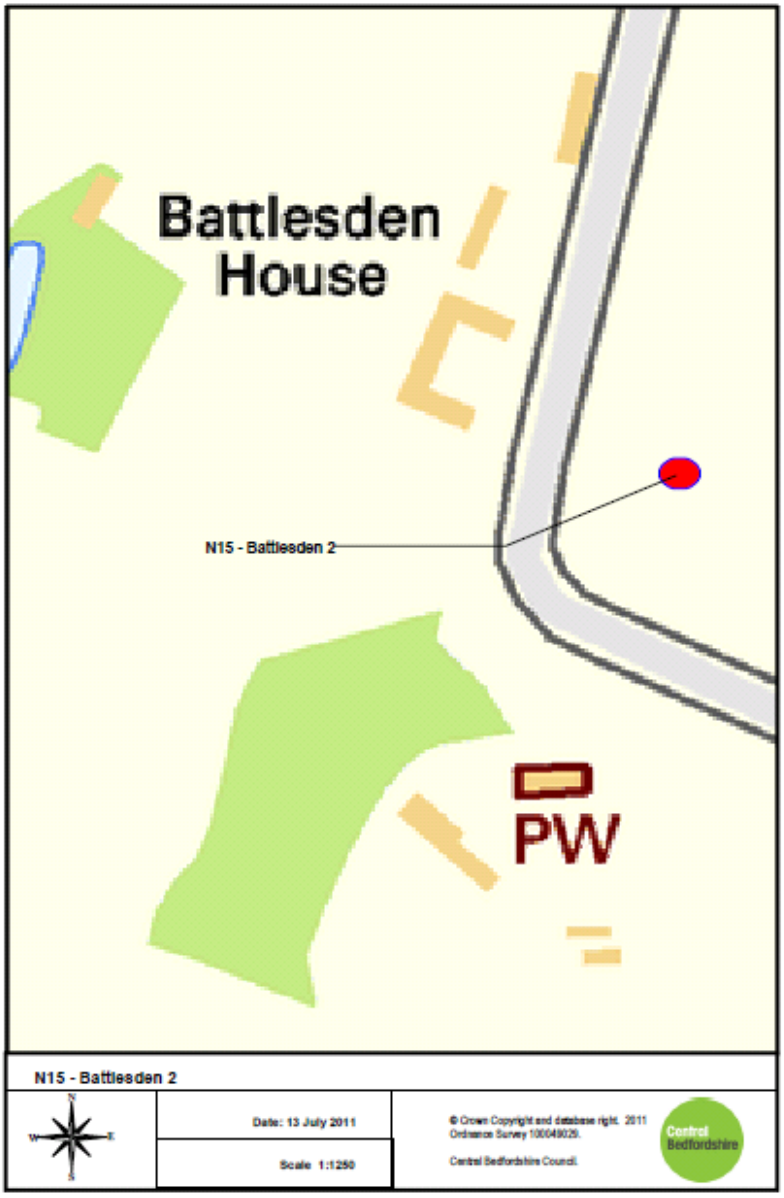

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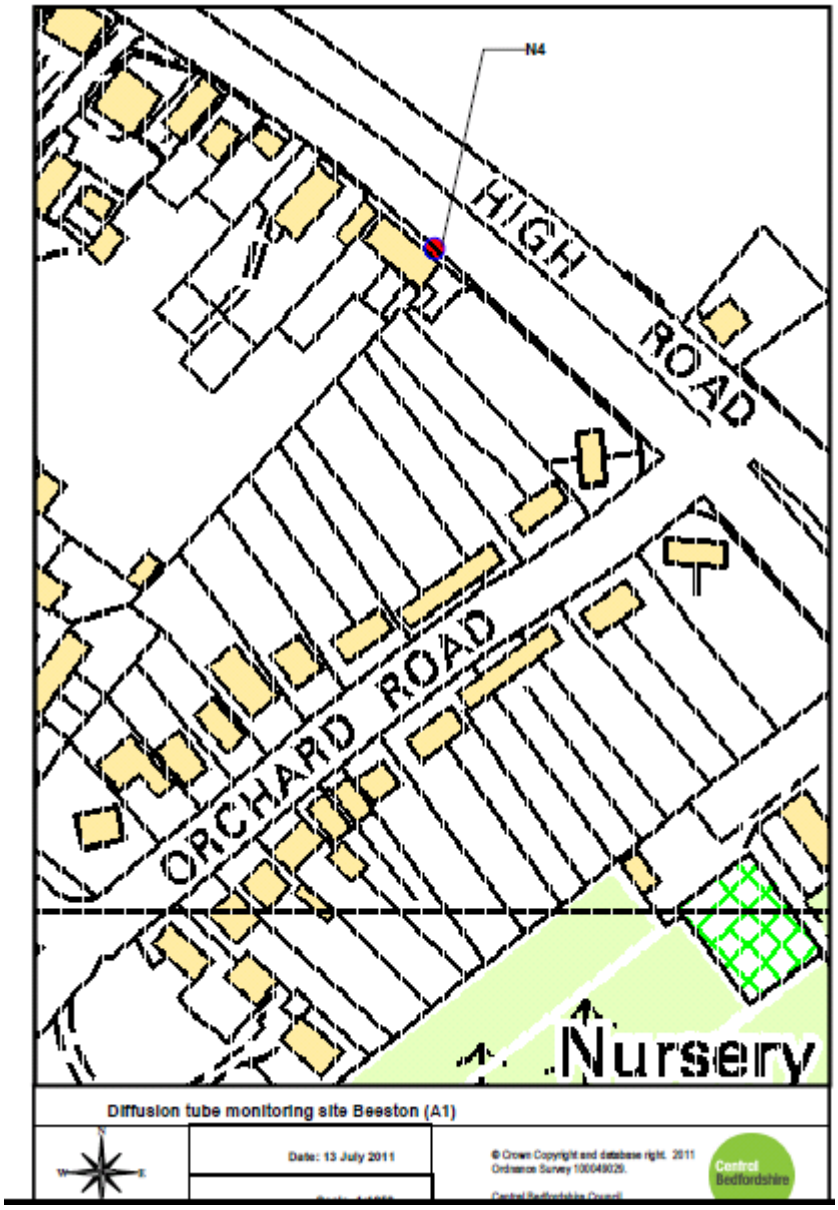

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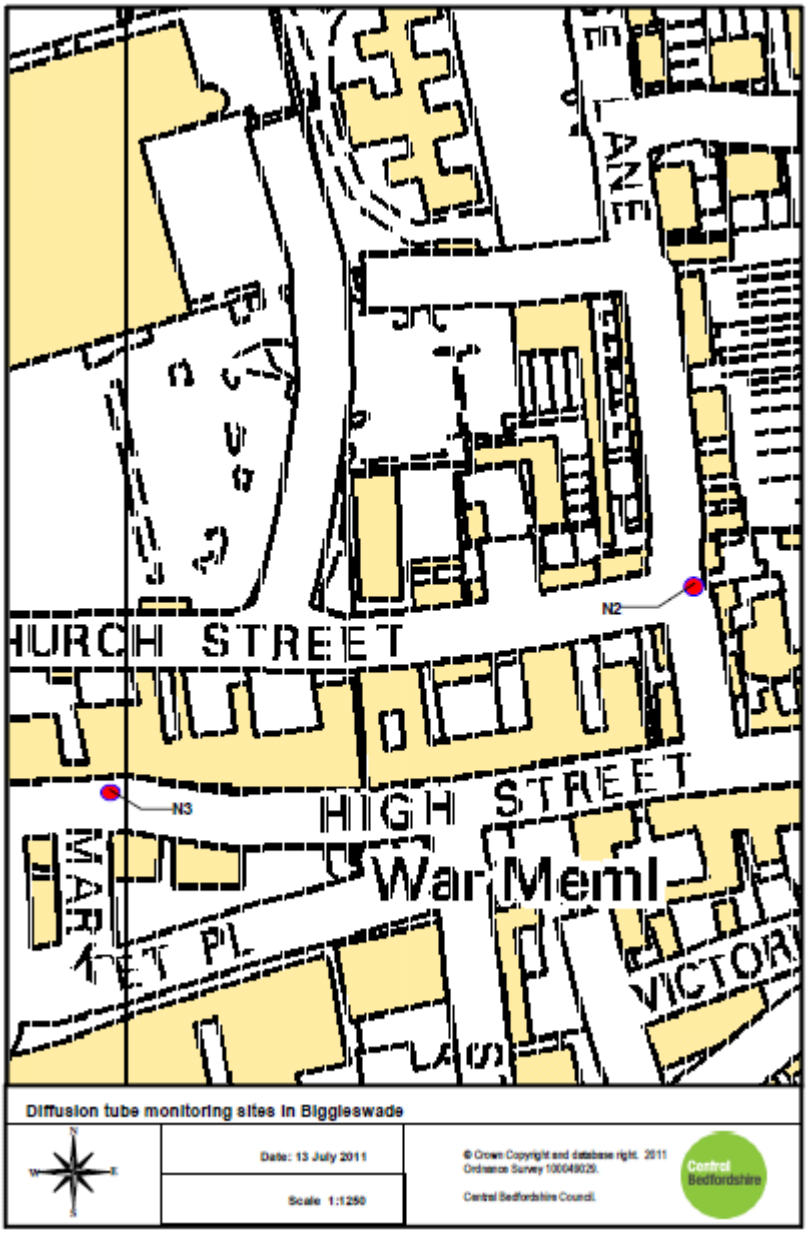

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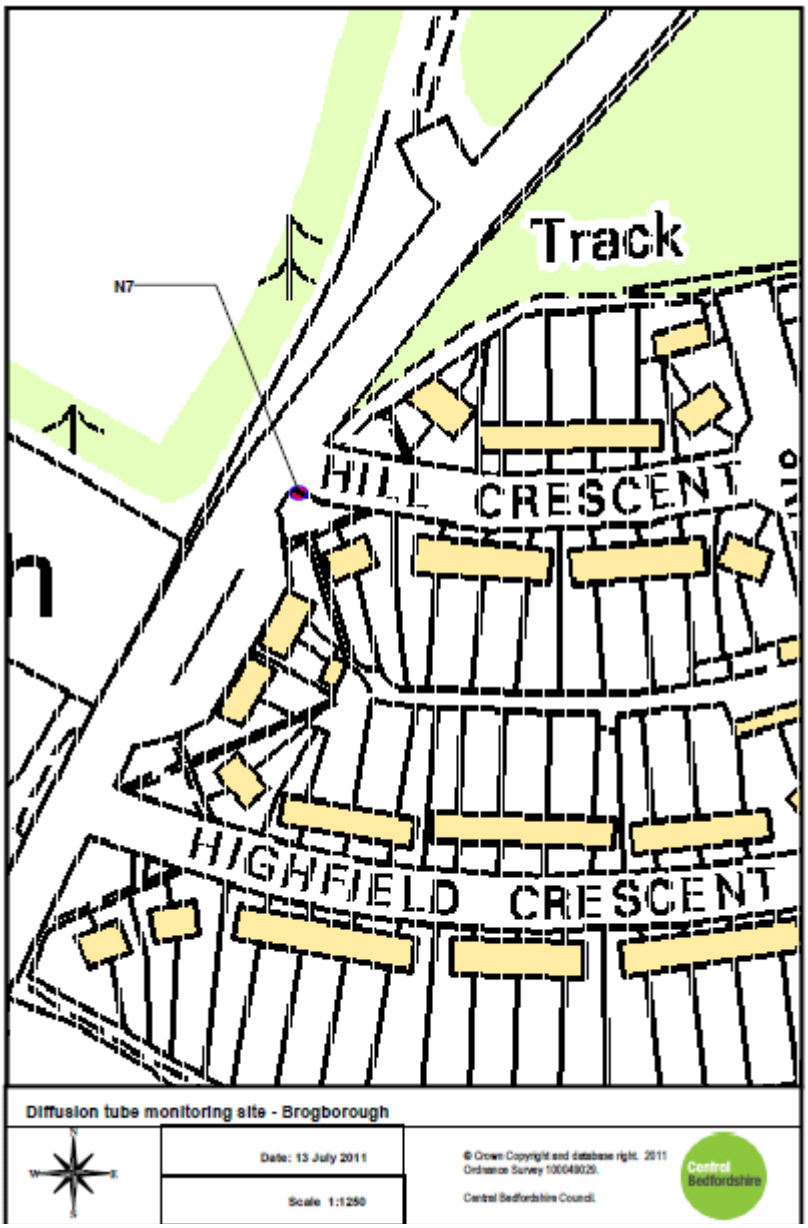

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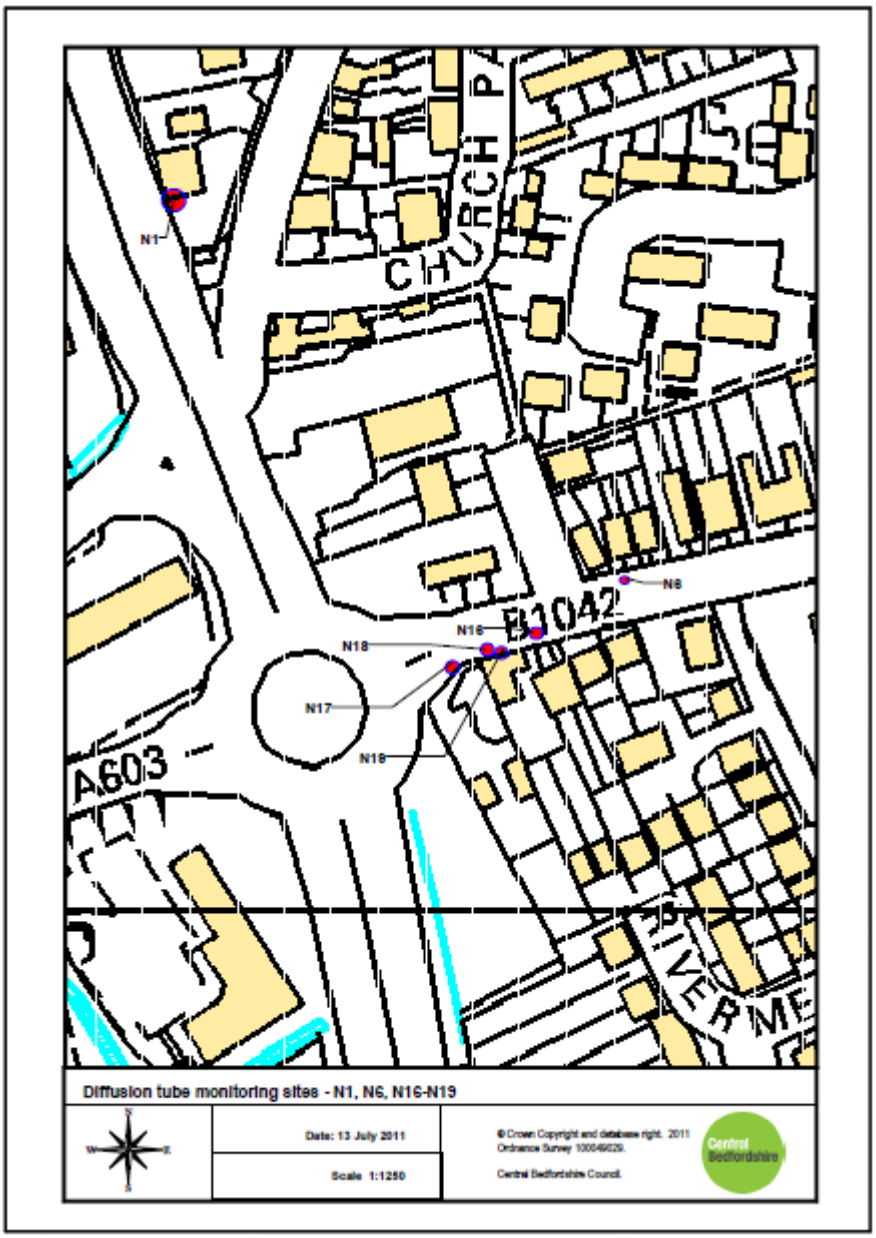

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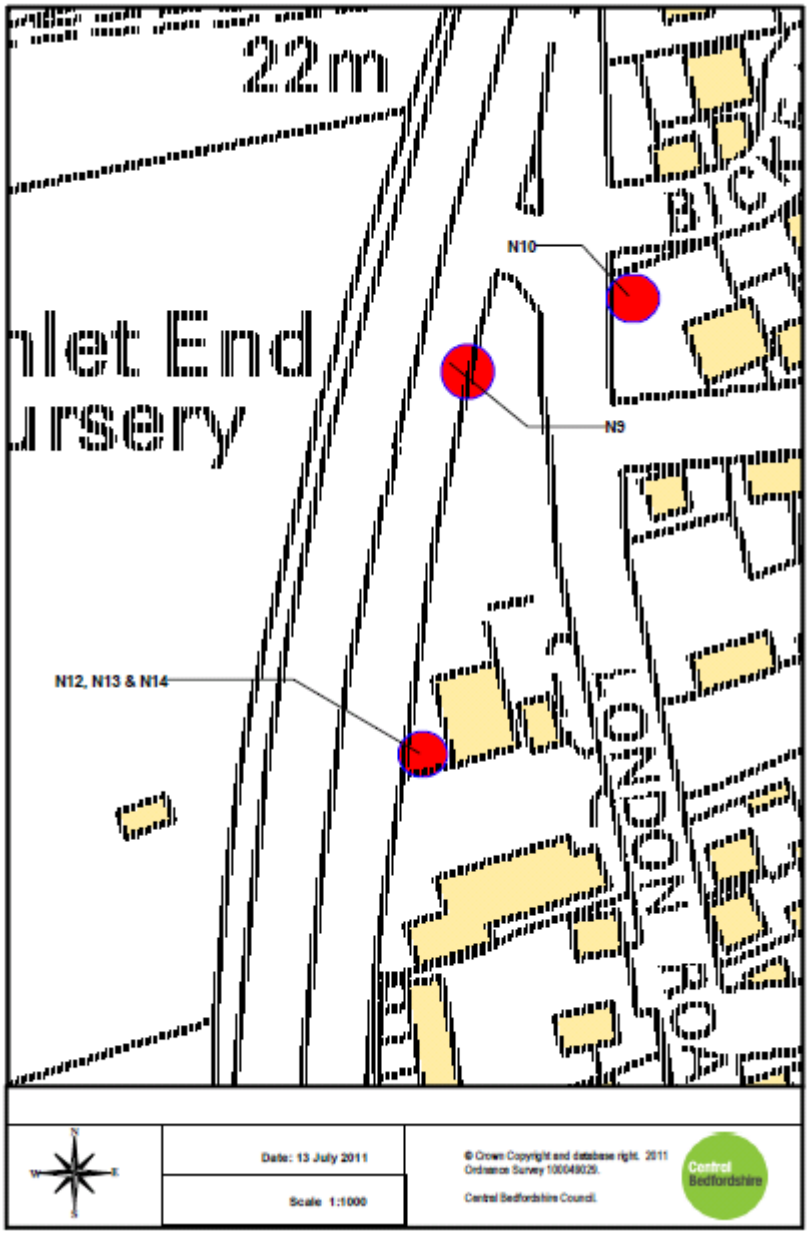

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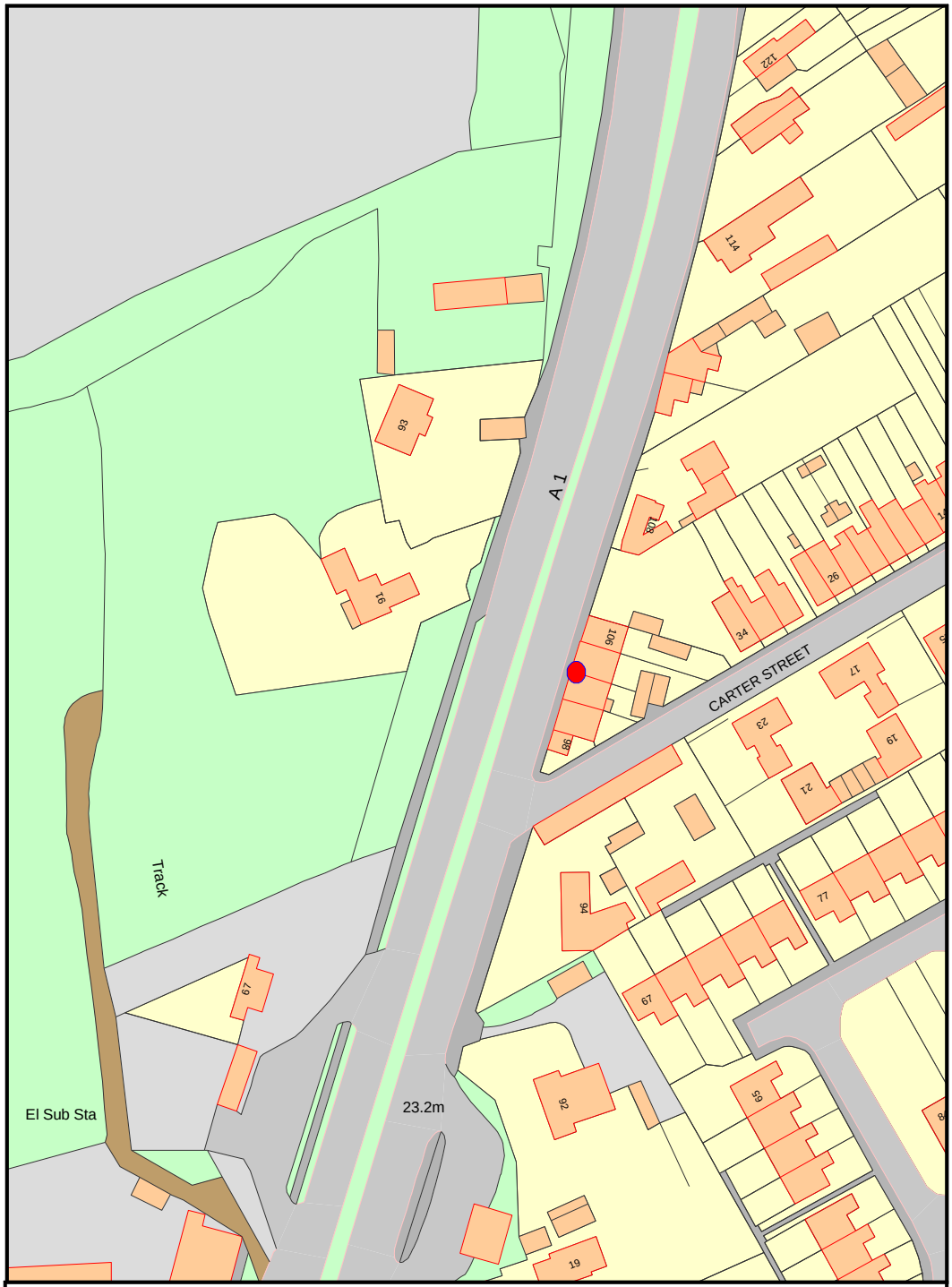
New site in Sandy – which has annual mean greater than 60µg/m^3



Appendix D: NO2 Diffusion Tube Monthly Results Data

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Monthly NO_2 Diffusion Tube Results – 2011 (South of district)+

		ug/m3														
		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	AVE	nat bias 0.89	local bias 0.91
1	High St South	70.35	50.02	67.87	54.15	45.18	45.32	54.82	51.83	39.74	41.18	57.23	28.99	50.56	45.00	46.01
3	Mardale	25.18	24.28		15.55		10.84	12.33	11.29	11.30			12.37	15.39	13.70	14.01
5	Rowley	22.04	15.87	19.33	13.38	9.31	8.75	10.05	9.71	10.36	16.95	25.92	10.71	14.37	12.78	13.07
6	Sharpenhoe Road Barton	33.60	33.76	28.33	23.10	18.47	20.62	20.78	22.67	22.73	27.59	34.44	22.18	25.69	22.86	23.38
7	Claydown	34.27	25.65	25.26	21.40	12.43	14.28	16.18	14.57	14.37	19.10	31.79	11.20	20.04	17.84	18.24
8	Vimy Rd	43.04	30.73	34.92	37.19	24.26	26.45							32.77	29.16	29.82
10	Houghton	45.01	39.37	37.10	47.62	30.02	32.39	31.58	32.59	33.70	38.43	35.84	23.19	35.57	31.66	32.37
13	Tebworth	21.54	16.89	15.05	13.78	10.50	9.13		8.26	6.10	17.74	26.23		14.52	12.92	13.22
14	Sallowspring	17.47	16.63	13.69	10.91	7.50	8.12	2.80	10.26	9.30	14.84	20.97	7.90	11.70	10.41	10.65
17	London/Mayfield Rd	45.14		36.62	27.12	33.91	39.10	35.41	34.06	38.33	35.07	42.32	26.01	35.74	31.80	32.52
18	Argos (High St North)	55.76	39.25	63.32	60.38	36.06	41.31	44.22	40.05	39.86	46.94	47.03	32.92	45.59	40.58	41.49
20	Asda (Court Drive)	42.98	39.07	32.33	39.58	23.87	26.45	23.95	26.06	29.59	34.58	45.33	27.35	32.60	29.01	29.66
21	High St North/Frenchs Ave	45.13	51.37	35.36	38.52		33.33	32.17	28.46	35.93	38.16	45.05	27.12	37.33	33.22	33.97
26	West St, Dunstable	46.08	37.33	38.54	33.08	29.42	28.72	30.17	30.79	29.16	31.16	38.83	30.34	33.64	29.94	30.61
27	Luton Rd o/s 89, D'ble	49.52	37.98	51.78		25.89	29.09	33.61	34.00	28.05	32.81	46.38	26.09	35.93	31.98	32.69
28	Luton Rd, Chalton	60.82	61.96	50.41	54.33	39.29	52.05	44.43			58.78	48.81	44.18	51.51	45.84	46.87
33	16 Church Street, Dunstable	52.65	62.28	47.31	59.32	41.97	43.31	40.09	47.72	46.21	49.64	41.81	38.56	47.57	42.34	43.29
34	5 High St South	68.22	48.65	63.14	38.52	47.85	51.77	49.00	49.03	48.40	48.07	73.14	34.17	51.66	45.98	47.01
35	6 Flint Court, High St North	52.96	43.75	38.24	44.08	37.29	36.11	36.06	32.18	34.42	41.19	45.92	32.89	39.59	35.24	36.03
36	247 Luton Road, Dunstable	55.76	43.53	50.82	45.54	37.17	35.94	36.12	37.72	35.81	37.40	48.18	40.46	42.04	37.41	38.25
37	32 Luton Road, Dunstable	64.34	45.78	51.89	52.52	42.54	43.12	53.36		41.24	41.19	53.71	41.36	48.28	42.97	43.93
39	15 Houghton Road	53.21	45.78	37.62	39.62	34.43	37.49	37.31	39.50	42.89	39.88	41.67	32.74	40.18	35.76	36.56
41	1 Chalton Cross Cottages	57.16	52.23	27.63	53.36	37.78	47.60	42.14	45.60	44.76	47.45	50.07	40.36	45.51	40.51	41.42
42	Halifax, High St North	57.63	40.54	41.06										46.41	41.30	42.23
47	Clipstone	25.56	20.82	22.75	16.41	10.20	9.46	10.72	10.25	10.81	15.70	24.63	13.73	15.92	14.17	14.49

Central Bedfordshire Council - England

Monthly NO_2 Diffusion Tube Results – 2011 (North of district)

Site Name		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	nat bias 0.89	loc bias 0.91
A1	Sandy	60.3	46.6	43.3	30.4	41	53.8	57.6	48.8	53.5	48.3	56.5	67.9	50.7	**45.09**	**46.10**
Rose Lane	Biggleswade	32.4	27.6	31.5	26.6	19.2	25.4	22.6		24.6	29.9	35.5	59.7	30.4	27.09	27.70
High St	Biggleswade	51.4	39.8	49.9	34	37.1	42.9	43.3	41.3	48.6	43.0	44.3	30.1	42.1	37.50	38.35
A1	Beeston	48.7	35	41.9	32.9	30.1	37.4	49.1	41.6	33.7	44.7	51.4	29.3	39.6	35.28	36.08
Bedford Road	Sandy	54.6	43.9	41.8	32.1	34.6	41.1	38.4	44.5	40.4	49.7	46.2	46.9	42.8	38.13	38.99
Highfield Crescent	Brogborough	38.5	28.1	30.1	19.6	20.5	25.9	27.8	24.6	24.7	31.9	37.3	36.9	28.8	25.65	26.23
A1	Sandy	106	90.4	91.8		56.1	78.0	100.6	95.2	74.1	83.2	111.8	35.2	83.8	**74.62**	**76.30**
A1	Hunts Car Co	56.5	39.7	45		32.3	46.7	47.5	47.7	42.0	50.5	45.5	37.6	44.6	39.71	**40.60**
A1	Hunts Car Co 2	39.6	31.2	29.6		19.7	27.0	26.8	28.2	26.6	34.3	35.1	34.0	30.2	26.86	27.46
Market Square	Sandy	46	30.1	39	18.5	22.5	30.1	35.8	30.5	26.8	36.9	36.8	30.4	31.9	28.42	29.06
NOx Box 1	Sandy	46.7	20.7	34.8	37.8	35.7	37.5	36.3	41.4	35.5	49.6	37.0	34.8	37.3	33.22	33.96
NOx Box 2	Sandy	45.4	32.2	33.7	26.4	29.6	41.3	35.0	39.3	37.1	40.4	40.4	43.1	37.0	32.91	33.65
NOx Box 3	Sandy	46.7	31.9	36.4	27.2	32.1	37.3	34.1	42.2	37.1	47.7	36.9	40.2	37.5	33.36	34.11
Rural Background	Battlesden	21.2	18.7	18.5	12.1	9.04	9.9	10.0	8.8	10.7	15.3	28.4	9.2	14.3	12.75	13.04
Bedford Rd South 1	SAndy	60.2	39.6	46.9	25.4	31.1	14.4	39.6	40.8	29.7	39.0	43.7	44.4	37.9	33.73	34.49
Bedford Rd South 2	Sandy	62.9	46.4	50.9	27.8	35.7	46.2	41.0	47.2	53.4	62.6	46.2	41.4	46.8	**41.65**	**42.58**
Eddies Cottage			30.2	38.3	39.8	26.7	43.0	34.4	43.3	45.0	40.1	35.7	37.3	37.6	33.48	34.23
Doorway		51.7	44.1	35.8	39.9	41.2	67.1	65.8	59.4	35.9	49.6	42.7		48.5	**43.14**	**44.11**
Ampthill 1		38.3	29.1	33.1	25.3	21	26.0		23.6	23.3	33.2		21.8	27.5	24.45	25.00
Ampthill 2		60.5	57.6	43.4	46	37.6	5.1	49.1	49.2	44.7	51.9	47.3	44.8	44.8	39.84	**40.74**
Ampthill 3		59.3	63.3	54.5	34.9	39.4	53.5	60.7	50.2	47.2	59.2	63.0		53.2	**47.35**	**48.41**