2013 Air Quality Progress Report for Central Bedfordshire Council

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

Date (April, 2013)

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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.

There is one Air Quality Management Area (AQMA) within the district, which was declared in 2004 in relation to the annual nitrogen dioxide air quality objective (40µg/m^3). Monitoring results continue to show exceedence of the NO_2 annual objective within the AQMA. Therefore this AQMA needs to remain.

A mix of continuous analysers and diffusion tubes are utilised to collect data for a number of pollutants within the district.

Results from monitoring continue to show exceedence of the NO_2 annual objective at two sites within Ampthill (N22 & N23). Work is continuing to complete a public consultation to declare an Air Quality Management Area in this location.

Results from some diffusion tube sites along the A1 in Sandy (N1 & N9) and two in Bedford Road, Sandy (N17 & N19) continue to show exceedence with the NO_2 annual objective. In addition site N20 continues to have an annual mean over 60µg/m^3 which indicates that concentrations of nitrogen dioxide are likely to be exceeding the hourly air quality objective at this location. Work is continuing to complete a public consultation to declare an Air Quality Management Area.

Results of monitoring at Chalton continue to show exceedence of the annual mean NO_2 objective at a row of cottages. This is on the site of a proposed new road network. On the 18th October 2012, The Department for Transport published the Secretary of State's interim decision letter following the Public Inquiry along with the Inspectors Report regarding the M1-A5 Link Road (Dunstable Northern Bypass). Both documents can be found on the following link - http://www.dft.gov.uk/publications/a5m1-link-dunstable-northern-bypass/

The final decision of the Secretary of State is imminent but it is unlikely to change from that of the favourable Interim decision. If this is the case then construction may start as early as 2014. Should this occur then the properties currently exceeding the nitrogen dioxide annual air quality objective at Chalton would be likely to be demolished in early 2015, thereby removing relevant exposure at this location.

In addition, Central Bedfordshire Council has received a Development Consent Order for the construction of the Woodside Link road (which will provide a direct link to the new 11a M1 junction created as part of the M1-A5 to an Industrial Estate in Dunstable thereby removing HGVs from the local road network).

Given the above information it is proposed that work on a public consultation and declaration of an AQMA at Chalton is suspended pending the final decision from the Secretary of State. However work could be resumed if the decision or construction is delayed indefinitely.

Two new NO_2 diffusion tube monitoring locations have been introduced into the monitoring network, this is to ascertain pollution levels in Poynters Road, Dunstable. This is a well used road nearby part of the existing AQMA (Luton Road, Dunstable). Results of these locations will be reported in future review and assessment reports.

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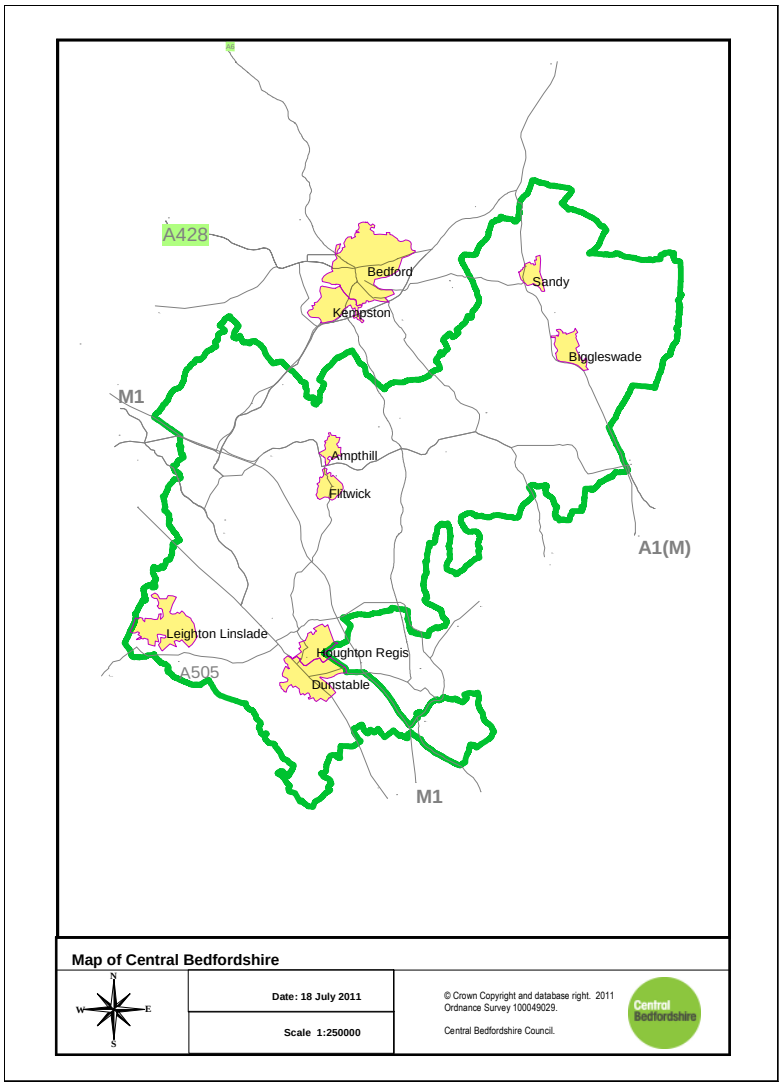
1 Introduction

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 (see map below). The estimated population of is 254,400 (based on 2011 figures). The area is mainly rural but has some market and larger towns distributed throughout. See map below.



Central Bedfordshire is situated some 30 miles to the north of London, and has excellent links to the national motorway network having the M1, A1, A5 and the A6 running through the area and the ease of access to the M25, M11 and M40.

Rail links from Leighton Buzzard mean London Euston can be reached in forty minutes. Arlesey, Biggleswade and Sandy are served by the Peterborough to Kings Cross line whilst Harlington and Flitwick are served by the Bedford to St Pancras

International line. Rail freight services are also available from nearby Luton railway station.

Central Bedfordshire Council is a member of the Herts and Beds Air quality monitoring network comprising of all the local authorities in the two counties, plus Luton Airport.

Data is collected by continuous analysers and nitrogen dioxide diffusion tubes

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

1.2 Purpose of Progress 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.

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to 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 µg/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 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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: ▪ Cars and HGVs travelling along the roads in question are major source of NO_X. In particular, HGVs are

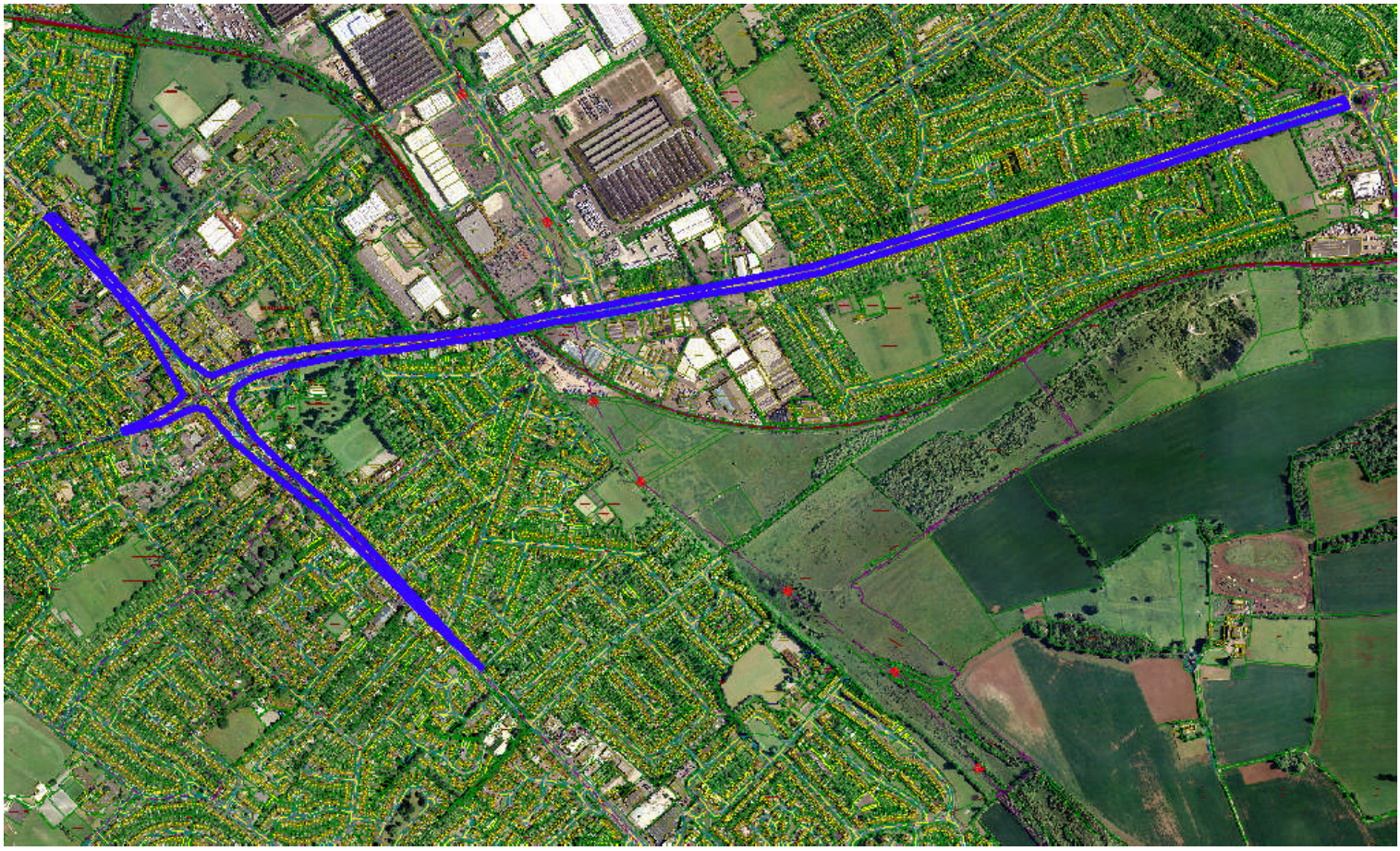
			responsible for a large portion of these emissions despite their relatively small flows. ▪ Buses idling at stops contribute large amounts of NO_X to the immediate surroundings and create small areas of high concentrations that may affect nearby buildings. Reductions in NO_2 concentration of 22% and 5% 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
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 review 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
CBC	USA	2012	Reported that a Public Inquiry for the M1 – A5 link road (Dunstable Northern bypass) would proceed.

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

Figure 1.1 Map of AQMA Boundaries

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



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 the last air quality report (Updating and Screening Assessment Report 2012).

Central Bedfordshire Council has two realtime analysers sited in Sandy (monitoring NO_2, PM_{10} and $PM_{2.5}$) and in Marston Moretaine (Marston Vale) (monitoring Ozone (O_3)).

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

Details of the 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.

During 2012 data capture for the Sandy site for NO_2 was 98.5%, PM_{10} was 75.6% and $PM_{2.5}$ was 67%.

During 2012 the data capture of ozone was 99.8% at the Marston Moretaine monitor.

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 and is visited every two weeks by a council officer who calibrates it using bottled gas of a known concentration and the results are 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 site at Sandy roadside is ratified by ERG to the AURN standard and QA/QC visits are carried out by Casella on a regular basis.

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 Hertfordshire and Bedfordshire Air Quality Network standard.

Figure 2.1 Map(s) of Automatic Monitoring Sites

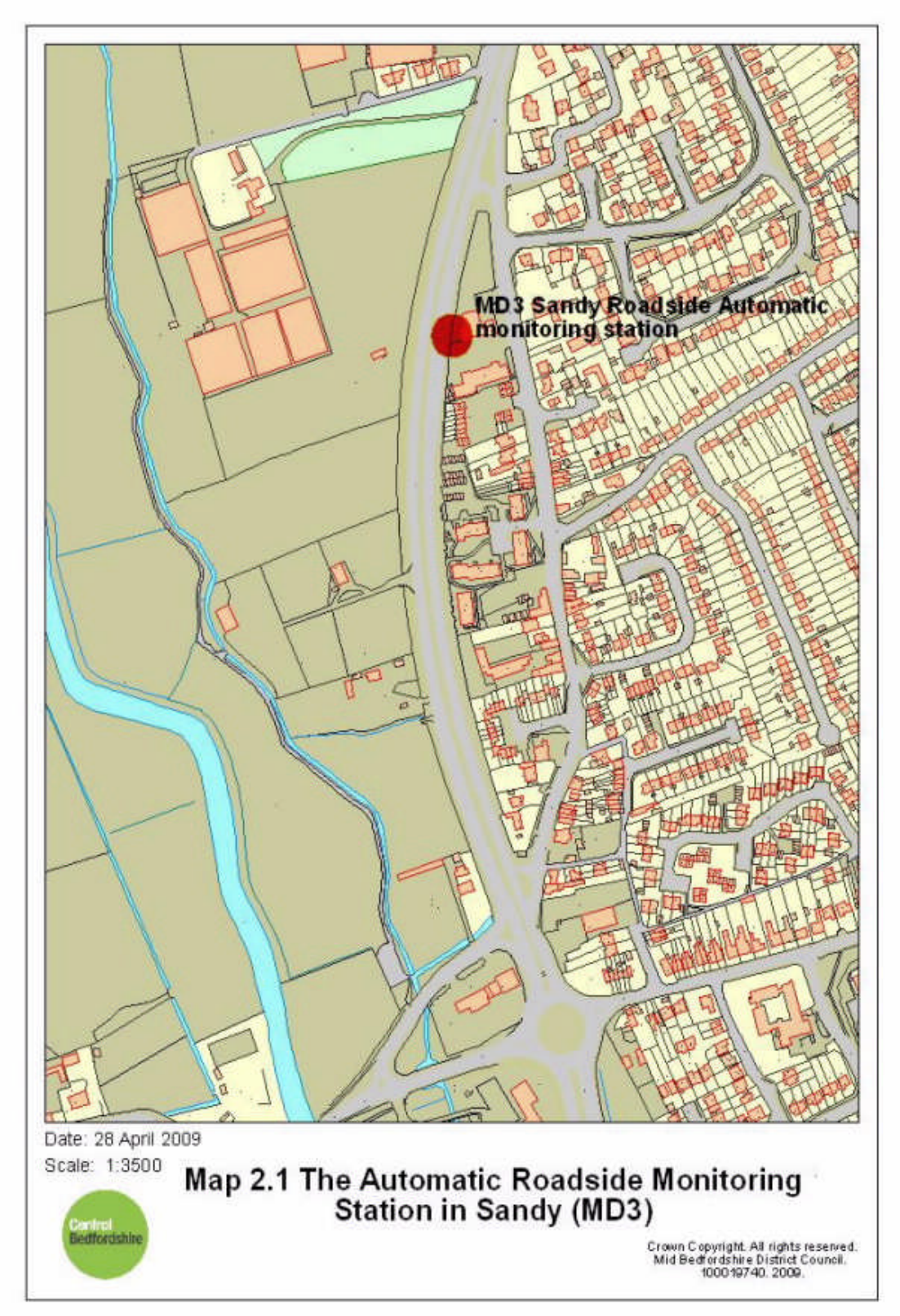


Figure 2.2 Map(s) of Automatic Monitoring Sites

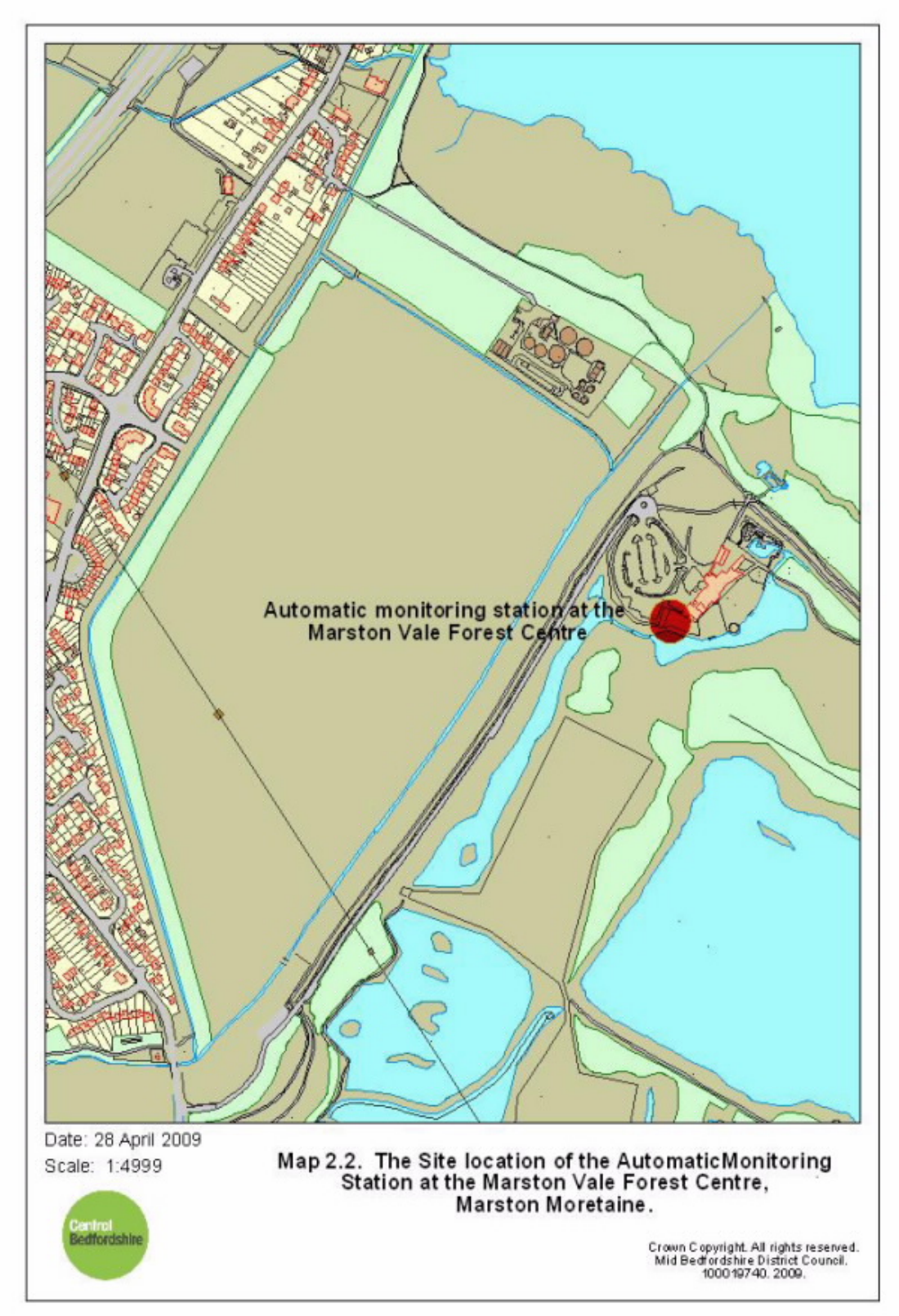


Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
MD4	Marston	Rural	500445	241670	3	O_3	N	ultra-violet fluorescence	N/A	N/A	N
MD3	Sandy	Roadside	516436	249600	3	NO_2 / PM_{10} / $PM_{2.5}$	N	Chemiluminescence / FDMS TEOM	N	4m	N

2.1.2 Non-Automatic Monitoring Sites

In addition to the continuous monitors, Central Bedfordshire Council measures nitrogen dioxide using 45 passive diffusion tubes at sites throughout the district. The locations of the monitoring sites can be seen in Appendix 2.

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.

There appeared to be a problem with a small batch of faulty NO_2 diffusion tubes utilised in July 2012 – however a phone call to Gradko confirmed that Central Bedfordshire Council were unaffected by this and so data from this period has been included in this report.

Table 2.2 shows the details of Non-Automatic Monitoring Sites (NO_2) measured at sites in 2012. 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.

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 local bias adjustment factor was used by the former Mid Bedfordshire District Council in 2008 (0.85) and 2009 (0.86)

South Bedfordshire District Council used the national bias adjustment factor of 0.90 in 2008 and 2009.

Central Bedfordshire Council used the national bias adjustment of 0.92 in 2010.

Central Bedfordshire used both the national bias adjustment (0.89) and the local bias adjustment factor (0.91) in 2011. Using the local factor in conjunction with the distance correction calculations provided a more conservative dataset, which showed exceedences of the annual objective at SB33 and SB37 in 2011. However these sites were below the objective level if the national bias adjustment factor was utilised in conjunction with distance correction calculations.

The national bias adjustment factor 2012 was 0.97 (as of April 2013). The local bias factor was calculated as being 0.96. The national figure was utilised in this report as provided a slightly more conservative scenario.

All national bias adjustment figures were obtained from http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
N1	A1 Sandy	Kerbside	516482	249212	2.5	NO_2	N	N	Y(3)	1	N
N2	Rose Lane, Biggleswade	Kerbside	519161	244651	3	NO_2	N	N	Y(4)	1	N
N3	High Street, Biggleswade	Kerbside	518991	244596	3	NO_2	N	N	N	1	N
N4	A1, Beeston	Kerbside	517162	248188	2.5	NO_2	N	N	Y(2)	1	Y
N6	Bedford Road, Sandy	Kerbside	516619	249100	3	NO_2	N	N	Y (6)	2	N
N7	Highfield Cres Brogborough	Kerbside	496330	238300	3	NO_2	N	N	Y (10)	4	N

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
N20	A1Sandy (Carters)	K	516529	249967	2.5	NO_2	N	N	Y	1	Y
N9	Hunts Car Co 1, A1	Kerbside	516448	249685	2.5	NO_2	N	N	Y (4)	1	N
N10	Hunts Car Company 2, A1	Kerbside	516479	249704	2.5	NO_2	N	N	N	2	N
N24	Market Square	Kerbside	517310	249228	3	NO_2	N	N	Y(3)	1	N
N12	NO_x co-loc	Kerbside	516436	249599	3	NO_2	N	Y	N	4	N
N13	NO_x co-loc	Kerbside	516436	249599	3	NO_2	N	Y	N	4	N
N14	NO_x co-loc	Kerbside	516436	249599	3	NO_2	N	Y	N	4	N
N15	Battlesden	Kerbside	495944	229191	2.5	NO_2	N	N	N	1	N

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
N16	Bedford Rd, Sandy 1	Kerbside	516593	249083	2.5	NO_2	N	N	Y(12)	3	N
N17	Bedford Rd, Sandy 2	Kerbside	516569	249074	2.5	NO_2	N	N	Y(8)	2	Y
N18	Eddie's Cott	Kerbside	516579	249078	1.8	NO_2	N	N	Y(0)	11	Y
N19	Doorway	Kerbside	516582	249078	1.8	NO_2	N	N	Y(1)	3	Y
N21	Ampthill 1	Kerbside	503444	238197	2.5	NO_2	N	N	Y (0)	4m	N
N22	Ampthill 2	Kerbside	503466	238141	2.5	NO_2	N	N	N	1m	Y
N23	Ampthill 3	Kerbside	503458	283039	2.5	NO_2	N	N	N	1m	Y
01	High St South	Kerbside	501925	221829	3	NO_2	Y	N	N	1	Y
03	Mardale	Kerbside	502023	220725	3	NO_2	N	N	Y(3)	1	N
05	Rowley	Urban Rural	491014	225777	1.5	NO_2	N	N	Y(in rear garden)	5	N
06	Barton	Kerbside	508064	230873	3	NO_2	N	N	Y(5)	1	N

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
07	Slip End	Kerbside	507696	218374	3	NO_2	N	N	Y(3)	1	N
10	Houghton	Kerbside	501988	223954	3	NO_2	N	N	N	1	Y
13	Tebworth	Rural Backgnd	499542	226940	1.5	NO_2	N	N	N	8	N
14	Sallowsprings	Rural Backgnd	500525	218839	1.5	NO_2	N	N	N	8	N
17	London/Mayfield	Kerbside	502848	220829	3	NO_2	N	N	Y(5)	2	Y
18	Argos	Kerbside	501705	222089	3	NO_2	Y	N	N	1	Y
20	Court Drive	Kerbside	501797	222200	2	NO_2	N	N	Y(8)	1	N
21	Frenchs Ave	Kerbside	500790	223047	3	NO_2	N	N	Y(5)	2	N
26	West St	Kerbside	501571	221742	3	NO_2	N	N	N	1	N
27	Luton Rd (89)	Kerbside	503214	222123	3	NO_2	Y	N	Y(2)	2	Y
28	Chalton	Kerbside	503764	261024	1.5	NO_2	N	N	N	1	Y
33	Church St	Kerbside	501961	218842	3	NO_2	Y	N	Y(2)	4	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
34	High St South (5)	Kerbside	501910	218492	3	NO_2	Y	N	Y(5)	1	Y
35	Flint Court	Kerbside	501504	222784	1.5	NO_2	N	N	Y(0)	4	Y
36	Luton Rd (247)	Kerbside	503848	222325	3	NO_2	Y	N	Y(2)	2	Y
37	Luton Rd (32)	Kerbside	502838	222071	3	NO_2	Y	N	Y(4)	2	Y
39	Houghton Rd	Kerbside	501151	222821	3	NO_2	N	N	Y(3)	1	Y
41	Chalton X	Kerbside	503922	225855	1.5	NO_2	N	N	Y(0)	8	Y
47	Clipstone	Rural Backgnd	493958	227012	1.5	NO_2	N	N	N	1	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

A summary of the concentrations monitored are presented below:

Automatic Monitoring Data

As can be seen from Table 2.3 (Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with annual mean and hourly objective), the Sandy site recorded an annual mean concentration of NO_2 over the air quality objective level (44µg/m^3) in 2009. However there have been no exceedences in the years since.

The Marston Moretaine site does not monitor NO_2.

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2012 % [b]	Annual Mean Concentration (µg/m^3)				
					2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]
MD3	Roadside	N	N/A	99.8	39	**44**	38	35	35

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

[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) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2012 % [b]	Number of Hourly Means > 200µg/m^3				
					2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]
MD3	Roadside	N	N/A	98.5	0	1 (212)	1 (216)	0	0

In bold, exceedence of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

[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 data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

* Number of exceedences for previous years is optional

Diffusion Tube Monitoring Data

Table 2.5 below details the results of the diffusion tube monitoring carried out in 2012.

Two sites had data capture of less than 75% and thereby results were annualised in accordance with Defra guidance. Further details of the calculations can be seen in Appendix 1.

Table 2.6 shows previous years monitoring results and the distance correction factors which were applied to sites with an annual mean greater than the annual objective. This calculation takes into account the fall off of NO_2 from the source to the receptor and was completed using Defra's online calculator which can be accessed from http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Hourly objective

Following on from the review of diffusion tubes carried out in 2010 – monitoring continues at the façade of a row of terraced houses alongside the A1 in Sandy approximately 1 metre from the carriageway. The measured annual mean concentration has exceeded 60µg/m^3 each year, indicating a breach of the hourly objective at this location.

Table 2.5 Results of NO_2 Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) [a]	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.97 [b]
N1	A1, Sandy	Kerbside	N	N	12 (100%)	**43.39**
N2	Rose Lane, Biggleswade	Kerbside	N	N	12 (100%)	29.78
N3	High St, Biggleswade	Kerbside	N	N	12 (100%)	*38.45*
N4	A1, Beeston	Kerbside	N	N	12 (100%)	*38.27*
N6	Bedford Rd, Sandy	Kerbside	N	N	12 (100%)	*36.56*
N7	Highfield Cres, Brogborough	Kerbside	N	N	12 (100%)	26.76
N20	A1 Sandy (Carters)	Kerbside	N	N	12 (100%)	**80.45**
N9	A1, Hunts Car Co, Sandy	Kerbside	N	N	12 (100%)	**42.74**
N10	A1, Hunts Car Co 2, Sandy	Kerbside	N	N	12 (100%)	27.10
N24	Market Sq, Sandy	Kerbside	N	N	12 (100%)	35.08
N12	NOx Box 1, Sandy	Kerbside	N	Y	12 (100%)	35.18
N13	NOx Box 2, Sandy	Kerbside	N	Y	12 (100%)	33.44
N14	NOx Box 3, Sandy	Kerbside	N	Y	12 (100%)	35.15
N15	Battlesden	Rural Background	N	N	12 (100%)	13.47
N16	Bedford Rd South 1, Sandy	Kerbside	N	N	12 (100%)	34.40
N17	Bedford Rd South 2, Sandy	Kerbside	N	N	12 (100%)	**45.35**
N18	Eddie's Cottage,	Kerbside	N	N	12 (100%)	35.61

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) [a]	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.97 [b]
N19	Doorway	Kerbside	N	N	11 (92%)	**41.66**
N21	Ampthill 1	Kerbside	N	N	12 (100%)	26.57
N22	Ampthill 2	Kerbside	N	N	10 (83%)	**40.69**
N23	Ampthill 3	Kerbside	N	N	12 (100%)	**47.07**
1	High St South, Dunstable	Kerbside	Y	N	10 (83%)	**43.32**
3	Mardale, Dunstable	Kerbside	N	N	10 (83%)	14.87
5	Rowley Furrows, Linslade	Urban Backgrnd	N	N	11 (92%)	12.82
6	Barton	Kerbside	N	N	11 (92%)	22.56
7	Slip End	Kerbside	N	N	11 (92%)	16.38
10	Houghton Regis	Kerbside	N	N	11 (92%)	33.38
13	Tebworth	Rural Backgrnd	N	N	8 (67%)	16.66 (annualised data)
14	Sallowsprings	Rural Backgrnd	N	N	11 (92%)	11.17
17	London/Mayfield, Dunstable	Kerbside	N	N	10 (83%)	33.20
18	Argos, Dunstable	Kerbside	Y	N	9 (75%)	*38.91*
20	Court Drive, Dunstable	Kerbside	N	N	7 (58%)	26.58 (annualised data)
21	Frenchs/High St North, Dunstable	Kerbside	N	N	11 (92%)	30.94
26	West St, Dunstable	Kerbside	N	N	11 (92%)	26.29
27	89 Luton Rd, Dunstable	Kerbside	Y	N	11 (92%)	32.84
28	Chalton	Kerbside	N	N	11 (92%)	**53.72**
33	Church St, Dunstable	Kerbside	Y	N	10 (83%)	**41.75**

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) [a]	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.97 [b]
34	5 High St South, Dunstable	Kerbside	Y	N	10 (83%)	**48.51**
35	Flint Court, Dunstable	Kerbside	N	N	11 (92%)	34.97
36	247 Luton Rd, Dunstable	Kerbside	Y	N	11 (92%)	35.52
37	32 Luton Rd, Dunstable	Kerbside	Y	N	10 (83%)	**41.44**
39	Houghton Rd, Dunstable	Kerbside	N	N	10 (83%)	*38.33*
41	Chalton Cross Cotts	Kerbside	N	N	11 (92%)	**40.80**
47	Clipstone	Rural Backgrnd	N	N	11 (92%)	13.28

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3, *Italics indicate where the annual mean is borderline (36µg/m^3) or above.*

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Box 3.2 of TG(09)(http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%

[b] If an exceedence is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30).

Table 2.6 Results of NO_2 Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]									
			2008 Bias Adj	Distance correction	2009 Bias Adj	Distance correction	2010 Bias Adj	Distance correction	2011 Bias Adj	Distance correction	2012 Bias Adj	Distance correction
A1, Sandy	K	N	**47.5**	39.7	**45**	38	**47**	39.3	**45.09**	**37.1**	**43.39**	35.5
Rose Lane	K	N	27.9	-	37	-	27	-	27.09	**-**	29.78	-
High St Biggleswade	K	N	37.4	-	37	-	**42**	No exposure	37.50	**-**	38.45	-
A1 Beeston	K	N	41.2	37	38	-	**42**	37.8	35.28	**-**	38.27	-
Bedford Rd Sandy	K	N	35.6	-	35	-	**41**	33.6	38.13	**-**	36.56	-
Highfield Cres	K	N	**41.8**	34.8	**40**	33.8	**42**	35	25.65	-	26.76	-
A1 Sandy (Carters)	K	N	**-**	-	**-**	-	**-**	-	**74.62**	**No drop off**	**80.45**	**No drop off**
A1 London Rd 1	K	N	**41.6**	No exposure	37	-	**46**	No exposure	39.7		**42.74**	33.8
A1 London Rd 2	K	N	28.5	-	26	-	30	-	26.9	**-**	27.10	-
Market Sq, Sandy	K	N	29.1	-	28.98	-	35.42	-	28.4	**-**	35.08	-
NOx co loc 1	K	N	38.8	-	36	-	37	-	33.22	**-**	35.18	-
NOx co loc 2	K	N	34.6	-	36	-	39	-	32.91	**-**	33.44	-
NOx co loc 3	K	N	36.4	-	35	-	37	-	33.36	**-**	35.15	-
Battlesden	RB	N	13.3	-	13	-	15	-	12.75	-	13.47	-
Bedford Rd 1	K	N	39.1	-	37	-	**41**	30.7	33.73	-	34.40	-
Bedford Rd 2	K	N	**49.2**	37.6	**43**	33.3	**44**	33.7	**41.65**		**45.35**	35.6
Eddies	K	N	34.6	-	32	-	36	-	33.48	-	35.61	-
Doorway	K	N	34.5	-	39	-	**41**	38.9	**43.14**		**41.66**	*39.7*
Ampthill 1	K	N	-	-	27.15	-	30.73	-	24.45	-	26.57	-
Ampthill 2	K	N	-	-	**44.94**		**50.99**		39.84	No drop off	**40.69**	No drop off
Ampthill 3	K	N	-	-	**45.65**		**53.32**		**47.35**	**No drop off**	**47.07**	No drop off
1	K	Y	**42.02**	No exposure	37.82	No exposure	**49.58**	**-**	**45.00**	**No exposure**	**43.32**	**No exposure**

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]									
			2008 Bias Adj	Distance correction	2009 Bias Adj	Distance correction	2010 Bias Adj	Distance correction	2011 Bias Adj	Distance correction	2012 Bias Adj	Distance correction
3	K	N	17.18	-	15.46	-	20.53	-	13.70	-	14.87	-
5	UB	N	14.85	-	13.37	-	14.90	-	12.78	-	12.82	-
6	K	N	25.61	-	23.05	-	26.11	-	22.86	-	22.56	-
7	K	N	20.85	-	18.76	-	22.29	-	17.84	-	16.38	-
10	K	N	36.96	-	33.26	-	32.01	-	31.66	-	33.38	-
13	RB	N	14.30	-	12.87	-	13.74	-	12.92	-	16.66a	-
14	RB	N	11.92	-	10.72	-	15.06	-	10.41	-	11.17	-
17	K	N	37.75	-	33.97	-	38.70	-	31.80	-	33.20	-
18	K	Y	**45.08**	No exposure	**40.57**	No exposure	**46.19**	No exposure	**40.58**	**No exposure**	38.91	-
20	K	N	30.11	-	27.10	-	30.15	-	29.01	-	26.58a	-
21	K	N	36.33	-	32.70	-	35.55	-	33.22	-	30.94	-
26	K	N	33.56	-	30.20	-	33.37	-	29.94	-	26.29	-
27	K	Y	36.54	-	32.89	-	39.29	-	31.98	-	32.84	-
28	K	N	**52.46**	-	**47.21**	-	**48.89**	-	**45.84**	**-**	**53.72**	**34**
33	K	Y	**46.47**	**44.9**	**41.82**	**39.1**	**45.03**	**41.9**	**42.34**	**39.4**	**41.75**	*39.2*
34	K	Y	**54.69**	**41.5**	**49.22**	36.8	**49.84**	38.1	**45.98**	32	**48.51**	*36.7*
35	K	N	**40.45**	39.3	36.40	-	39.91	31.1	35.24	-	34.97	-
36	K	Y	**43.83**	39.6	39.44	-	**41.95**	37.4	37.41	-	35.52	-
37	K	Y	**41.92**	**41.1**	**42.23**	35.9	**47.89**	**41.6**	**42.97**	36.7	**41.44**	*38.3*
39	K	N	**40.29**	35.9	36.26	-	**40.48**	35.1	35.76	-	38.33	-
41	K	N	**44.80**	**No drop off**	**40.32**	**No drop off**	**43.46**	**No drop off**	**40.51**	**No drop off**	**40.80**	**No drop off**
47	RB	N	-	-	-	-	16.04	-	14.17	-	13.28	-

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%

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/NO2withDistancefrom RoadsCalculator.xls

2.2.2 Particulate Matter (PM_{10})

As illustrated in the tables below, the monitoring results for the annual mean and 24hour mean objectives indicate that neither is in danger of being exceeded. The Sandy site is affiliated to the AURN network and therefore the data from the TEOM does not require adjustment in line with 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 properties are more distant from the road. This section of the A1 was the subject of a Detailed Assessment in 2008 which included PM_{10}. It found that PM_{10} levels did not threaten either objective, a conclusion that has been confirmed by subsequent monitoring data.

Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2012 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]
MD3	Roadside	N	-	75.6	Y	-	20	21	17	19

In bold, exceedence of the PM_{10} annual mean AQS objective of 40µg/m^3

[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) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are 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 2012 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]
MD3	Roadside	N	-	75.6	Y	-	0	2 (32)	0	5 (31)

In bold, exceedence of the PM_{10} daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)

[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 for full calendar year is less than 90%, include the 90.4th percentile of 24-hour means in brackets

* Number of exceedences for previous years is optional

2.2.3 Sulphur Dioxide (SO_2)

A Detailed Assessment conducted in 2004, along with monitoring results, indicated that sulphur dioxide levels were exceeding the 15minute mean objective. As a result an Air Quality Management Area was declared with regard to sulphur dioxide emissions from Stewartby Brickworks.

Production stopped at the brickworks from the 28th February 2008; although the process did continue for a few weeks after that date, due to the inherent nature of the production method (fires in the kilns continued after the input of the final batch of the green bricks until the process was complete and the fires went out).

Monitoring continued for a period of time after the closure of the brickworks and showed that SO_2 concentrations met the air quality objectives. The realtime analyser ceased monitoring for SO_2 in April 2009. Additionally the realtime monitor operated by Bedford Borough Council decommissioned their monitoring station in February 2009.

Subsequently the AQMAs relating to the emissions from the brickworks have been revoked.

Central Bedfordshire Council is currently carrying out no sulphur dioxide monitoring within the district.

2.2.4 Benzene

There are no continuous benzene analysers in Hertfordshire or Bedfordshire as previous rounds of review and assessment showed that the objective is likely to have been met in all locations.

2.2.5 Other Pollutants Monitored

2.2.5i 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 2.2.5 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.

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 realtime analyser in Marston Moretaine showed that the number of days where the running 8hour mean of 100µg/m^3 exceeded the objective level in both 2011 (36 days) and 2012 (23 days).

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 in Ampthill identified in the 2009 USA. The Detailed Assessment concluded that an AQMA should be declared in respect of the annual NO_2 mean.

Works to declare the AQMAs are currently in progress.

Central Bedfordshire Council has examined the results from monitoring in the district. Concentrations within the Dunstable AQMA still exceed the annual objective for nitrogen dioxide (NO_2) and as such the AQMA should remain.

Central Bedfordshire Council has measured concentrations of nitrogen dioxide (NO_2) above the annual mean objective at relevant locations outside of the AQMA. Detailed Assessments have been produced which concluded that AQMAs should be declared in Ampthill and Sandy, work towards which is in progress.

In addition to the above, monitoring at a location in Sandy has shown that the annual mean is above 60µg/m^3, which indicates that it is likely that the hourly mean objective is being exceeded too. The proposed AQMA for Sandy includes this specific location.

Results of monitoring at Chalton continue to show exceedence of the annual mean NO_2 objective at a row of cottages. This is on the site of a proposed new road network. On the 18th October 2012, The Department for Transport published the Secretary of State's interim decision letter following the Public Inquiry along with the Inspectors Report regarding the M1-A5 Link Road (Dunstable Northern Bypass). Both documents can be found on the following link - http://www.dft.gov.uk/publications/a5m1-link-dunstable-northern-bypass/

The final decision of the Secretary of State is imminent but it is unlikely to change from that of the favourable Interim decision. If this is the case then construction may start as early as 2014. Should this occur then the properties currently exceeding the nitrogen dioxide annual air quality objective at Chalton would be likely to be demolished in early 2015, thereby removing relevant exposure at this location.

In addition, Central Bedfordshire Council has received a Development Consent Order for the construction of the Woodside Link road (which will provide a direct link to the new 11a M1 junction created as part of the M1-A5 to an Industrial Estate in Dunstable thereby removing HGVs from the local road network).

Given the above information it is proposed that work on a public consultation and declaration of an AQMA at Chalton is suspended pending the final decision from the Secretary of State. However work could be resumed if the decision or construction is delayed indefinitely.

3 New Local Developments

3.1 Road Traffic Sources

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 significantly changed traffic flows
- Bus or coach stations

However, two new NO_2 diffusion tube monitoring locations have been introduced into the monitoring network; this is to ascertain pollution levels in Poynters Road, Dunstable. This is a well used road nearby part of the existing AQMA (Luton Road, Dunstable). Results of these locations will be reported in future review and assessment reports.

3.2 Other Transport Sources

There are no new:

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

All relevant sources above have been considered in previous review and assessments the findings of which were that no air quality objectives were likely to be breached in any such locations; this remains unchanged for this current review and assessment.

3.3 Industrial Sources

In a previous report (Progress Report 2011), it was reported that a proposal for a waste incinerator was being reviewed. No further progression has occurred relating to this.

There are no:

- Existing installations emissions have increased substantially or have been subject to new relevant exposure
- New or significantly changed installations with no previous air quality assessment.
- New major fuel storage depots storing petrol, petrol stations or poultry farms.

3.4 Commercial and Domestic Sources

Since the last review and assessment, there are no new:

- Biomass combustion plant – individual installations
- Areas where the combined impact of several biomass combustion sources may be relevant
- Areas where domestic solid fuel burning may be relevant

3.5 New Developments with Fugitive or Uncontrolled Sources

Proposals for a waste incinerator reported in the last review and assessment report – however there have been no further developments on this issue.
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 confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Central Bedfordshire Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Implementation of Action Plans

Previous rounds of Review and Assessment identified parts of Dunstable as needing to be declared as an AQMA in January 2005.

An Air Quality Action Plan (AQAP) was drafted in December 2006 to identify and prioritise various actions that might be adopted in order to improve air quality in the AQMA.

Air Quality was not considered in isolation, the wider social, economic and environmental considerations of the proposed actions were addressed and where possible were integrated with wider plans/strategies (Local Transport Plans). At the time of producing the AQAP guidance dictated that proposed measures should be ranked and prioritised based on costs and overall benefit to local air quality. This proved difficult to do as many options had no clearly quantifiable costs/benefits.

The overall purpose of the key action points were assigned with regards to six main improvement areas:

- Transport planning
    - Reducing the need to travel
    - Encouraging walking/cycling and use of public transport
    - Reducing number of trips in the AQMA
    - Improving traffic management and reducing congestion
    - Reducing emissions from HGVs and busses
    - Encouraging use of alternative fuels and more efficient vehicles
- Land use planning
    - Reducing the need to travel
    - Encouraging walking/cycling and use of public transport
    - Reducing number of trips in the AQMA
    - Improving traffic management and reducing congestion
    - sustainability
- Energy management
    - Encouraging use of alternative fuels and more efficient vehicles
    - Encouraging better energy efficiency
- Local Air Quality Management
    - Monitoring
    - Partnership working
    - Review and Assessment process
- Pollution control
    - Reducing emissions from non-transport related sources
        industrial emissions and nuisance
- Environmental promotion
    - Environmental campaigns and information dissemination

Since 1st April 2009 Central Bedfordshire Council has continued the work commenced by South Bedfordshire District Council and Bedfordshire County Council alongside the Highways Agency, etc.

A number of the proposed actions have now been completed and have been reported in previous reports (Progress Report 2011) and so are not included in the update overleaf.

Table 9.1 Action Plan Progress

No	Measure	Focus	Lead authority	Indicator	Target AQMA annual emission reduction	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1	Increased use of mixed developments	Improving sustainability by increasing public transport links, cycling and walking networks. Developments to provide facilities in locality to reduce the need to travel and the no of trips in AQMA	SBDC now Central Bedfordshire Council (CBC)	% of such developments	<1%	<1% of all planning applications relate to this type of development (but there has been an increase in the number of such developments)	The number of such developments is likely to increase as the Government has stated 26,000 new homes to be built in this area.	Ongoing	By locating facilities locally and improving public transport links and cycling/walking it is hoped that reliance on private cars will be reduced which will impact on levels of emissions.
3	Encourage adoption of Travel Plans	Measures to encourage staff / parents to reduce dependence / use of single occupancy cars	SBDC & BCC (schools) now CBC	No of new / existing travel plans	<1%	Council continuing it's work on the promotion of Green Travel initiatives across Central Bedfordshire	Council continuing it's work on the promotion of Green Travel initiatives across Central Bedfordshire	Ongoing	Travel plans can offer real benefits not only to the organisation and its employees, but also the community that surrounds it. It may help to relieve local parking or congestion problems or improve public transport connections across the area. It may also relieve stress on employees through reducing delays or providing the opportunity to cut their travel commitments by working from home on occasion.
4	CBC Green Travel Plan	To encourage staff to reduce dependence / use of single occupancy cars	SBDC now CBC	Changes to modes of staff travel	<1%	SBDC produced green travel plan & carried out staff surveys to identify how staff travelled & why	CBC to produce green travel plan	Ongoing	As above
6	Encourage walking / cycling and use of public transport	To reduce dependence & use of cars	SBDC now CBC	passengers nos & travel survey / time comparison	<1%	Publicity re use of these transport methods		Ongoing	Publicising bus, walking and cycling routes has helped to raise the profile of these methods of transport

No	Measure	Focus	Lead authority	Indicator	Target AQMA annual emission reduction	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
8	Improve/extend cycle path network	To reduce dependence & use of cars	SBDC/BCC now CBC	Additions to network / no of users / work done	<1%	Since AQAP there has been a 74% increase in on/off road cycle paths	Continuance to identify development of cycle paths & users	Ongoing	By providing dedicated cycle lanes (both on/off road) it improves the riders experience and safety. This is likely to encourage more users.
10	Encourage use & promote benefits of public transport	To reduce dependence & use of cars	SBDC/BCC now CBC	No of passengers & travel survey / time comparisons	<1%	Bus routes / services are good within towns	Rural, etc. bus routes are continued to be financially supported by CBC	Ongoing	DfT 2011/12 Transport Trends show that national bus usage has risen slightly in the last few years
12	Provision of incentives to use public transport	To reduce dependence & use of cars	SBDC/BCC now CBC	Passenger nos, trip time comparison	<0.5	Free bus passes for senior citizens	Rural, etc. bus routes are continued to be financially supported by CBC	Ongoing	Whilst its not financially viable to discount all travel on public transport. CBC continues to issue free bus passes to senior citizens and support rural evening and Sunday routes/services.
13	Improvements in public transport infrastructure	To reduce dependence & use of cars	SBDC/BCC now CBC	Congestion data, journey time comparison, etc	<0.5	No room to add dedicated bus lanes to the road network. New bus routes added to area	New bus routes added. Regular reviews of services	Ongoing	A guided bus way is currently being constructed in conjunction with a combined cycle/footpath. Bus services maintained.
15	Encourage car sharing, walking/cycling, etc	To reduce dependence & use of cars	SBDC/BCC now CBC	Numbers of walkers/cyclists & travel survey	<0.5	Travel plans are assisting with this	Walking/cyclin g/ car sharing numbers are	Ongoing	DfT 2011 Transport Trends show that the number of walking trips has remained static (but there is under reporting of shorter trips). Cycling has remained static
16	Improvements to road network	Improving traffic management and reducing congestion	SBDC/BCC & HA now CBC & HA	Congestion / road capacity/density statistics	<1.0	M1 widening between J 6-10 commenced. Public enquiry re other road schemes (Dunstable bypass etc)	M1 widening complete. Proposed hard shoulder running on M1 between junctions 10-13	Ongoing	Dunstable bypass to go ahead joining with new M1 junction and a link road to the major industrial estate in Dunstable.

No	Measure	Focus	Lead authority	Indicator	Target AQMA annual emission reduction	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
23	Promote use & availability of alternative fuels / more efficient vehicles	Encouraging use of alternative fuels and more efficient vehicles	SBDC now CBC	Availability and amount sold. % of these fuels in overall sales	<0.5	Availability of alternative fuels increasing with growing number of vehicles on road	Some further petrol station sites have alternative fuels available	Ongoing	Number of alternatively fuelled cars remain low. Electric charging points installed in CBC car parks.
24	Develop availability of alternative fuels	Encouraging use of alternative fuels	SBDC now CBC	Check local availability	<0.5	More availability of alternative fuels but sites remain limited in number	New petrol stations encouraged to make alternative fuels available	Ongoing	Number of alternative fuel locations remains low. CBC installed electric vehicle charging points at offices
28	Local Development Framework – adoption of policies improving AQ	Land-use Planning	SBDC now CBC	Review and implement changes as required	<0.5	SBDC put in place environmental policies inc AQ	CBC developing its LDF meanwhile legacy authority policies remain in place	2014	The current Local Plan for the South Area will continue to control development over the next three years while the new Local Development Framework is put in place. In the North Area (the former Mid Beds) the Core Strategy and Development Management Policies document will guide development.
30	Develop/maintain partnerships to improve services / planning / access	To improve services, etc	SBDC/BCC Now CBC HA/LBC & bus operators	Inter agency communications	<0.5	Ongoing/ new partnerships to develop Local Transport Plans etc continue	Ongoing/ new partnerships to develop Local Transport Plans etc continue	Ongoing	Forging links with peers to ensure the development of future plans (ie LTP) include air quality issues
31	Review provision of alternative transportation priority measures	To reduce dependence & use of cars	SBDC/BCC now CBC & HA	Road capacity/ journey times	-	No room to add dedicated bus lanes to the road network. New bus routes added to area	No room to add dedicated bus lanes to the road network. New bus routes added to area	Ongoing	Development of guided busway linking Dunstable and Luton (with adjoining footpath/cyclepath) under construction.

No	Measure	Focus	Lead authority	Indicator	Target AQMA annual emission reduction	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
32	Guided busway Introduction	To reduce dependence & use of cars Encouraging use of public transport Reducing number of trips within the AQMA	SBDC/BCC now CBC and LBC	Completion of scheme	<0.5	Progress has been slow and a public enquiry and various consultations have caused delays	The scheme is currently under construction	2015	Guided busway linking Dunstable – Luton which will join the normal road network to extend the routes/service provided is currently being constructed along with a shared cycle/foot path
33	road network improvements	Reducing number of trips within the AQMA	SBDC/BCC now CBC & HA	Congestion / traffic counts	<1.0	M1 widening between J 6-10 complete Public enquiry re other road schemes (Dunstable bypass etc) completed	M1 widening between J 6-10 complete Public enquiry re other road schemes (Dunstable bypass etc) completed	2014/15	Hard shoulder running in operation allowing vehicles to utilise as directed to reduce congestion. M1-A5 link to form new M1 junction 11a due to start construction 2014/15. Potential Woodside link to be constructed to provide a link to the new junction and the main industrial estate in Dunstable.
41	AQ monitoring, reports, identifying/implementing options to improve aq	Local Air Quality Management	SBDC now CBC	Pollution levels, report deadlines, adoption of measures	Meeting objectives etc	All reports completed and submitted to defra as required. Monitoring carried out , etc	All reports completed and submitted to defra as required. Monitoring carried out , etc	Ongoing	Continued monitoring shows trends in AQ levels and assists in identifying areas requiring further investigations
42	LAPPC inspections	Reducing emissions from non-transport related sources	SBDC now CBC	Adhere to guidance / risk assessment	<0.5	All inspections carried out as per guidelines, new installations identified and permitted	All inspections carried out as per guidelines, new installations identified and permitted	Ongoing	National legislation ensures that emissions from certain industrial processes are controlled by either the local authority or the Environment Agency

No	Measure	Focus	Lead authority	Indicator	Target AQMA annual emission reduction	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
44	Nuisance complaints	Reducing emissions from non-transport related sources, nuisance – bonfires, fugitive dust sources, construction sites	SBDC now CBC	Resolving such cases	<0.5	SBDC investigated all such problems	CBC currently investigates all such problems	Ongoing	Investigating/stopping bonfires on trade premises, etc instigates educate greener ways of waste disposal
45	Dissemination of AQ information & campaigns	Environmental Promotion Dissemination of AQ information – website, consultation, press Environmental campaigns	SBDC now CBC	No of such events	<0.5	Air Alert, press releases, herts & beds website, reports, attendance at local events and talks to clubs/schools	Funding is no longer available for the Air Alert scheme.	Ongoing	Provision of talks/demonstrations to schools, etc

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

Monitoring data from 2012 shows continuing exceedences of the annual nitrogen dioxide air quality objective within the existing AQMA in Dunstable.

In addition exceedences have continued in areas of the proposed AQMAs in Ampthill, Chalton and Sandy.

The proposed development in Chalton – the construction of the Dunstable northern bypass (A5 – M1 link) and a new junction (11a) of the M1 – is due to commence in 2014. The new junction will be sited so that the current receptors will be removed and therefore there will be no relevant exposure upon completion. However work will progress with the public consultation and the declaration of an AQMA in this location in case of delays in the construction.

Work is progressing to declare the AQMAs in Sandy and Ampthill

5.2 Conclusions relating to New Local Developments

Proposals for a waste incinerator reported in the last review and assessment report – however there have been no further developments on this issue. Future reports will discuss this further if necessary.

Central Bedfordshire Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

5.3 Proposed Actions

The new monitoring data has not identified a need to progress to a Detailed Assessment for either NO_2 or PM_{10} in any new locations not already identified in the district.

However, two new NO_2 diffusion tube monitoring locations have been introduced into the monitoring network; this is to ascertain pollution levels in Poynters Road, Dunstable. This is a well used road nearby part of the existing AQMA (Luton Road, Dunstable). Results of these locations will be reported in future review and assessment reports.

Central Bedfordshire Council will work to declare the AQMAs in Ampthill and Sandy by September 2013.

Results of monitoring at Chalton continue to show exceedence of the annual mean NO_2 objective at a row of cottages. This is on the site of a proposed new road network. On the 18th October 2012, The Department for Transport published the Secretary of State's interim decision letter following the Public Inquiry along with the Inspectors Report regarding the M1-A5 Link Road (Dunstable Northern Bypass). Both documents can be found on the following link - http://www.dft.gov.uk/publications/a5m1-link-dunstable-northern-bypass/

The final decision of the Secretary of State is imminent but it is unlikely to change from that of the favourable Interim decision. If this is the case then construction may start as early as 2014. Should this occur then the properties currently exceeding the nitrogen dioxide annual air quality objective at Chalton would be likely to be demolished in early 2015, thereby removing relevant exposure at this location.

In addition, Central Bedfordshire Council has received a Development Consent Order for the construction of the Woodside Link road (which will provide a direct link to the new 11a M1 junction created as part of the M1-A5 to an Industrial Estate in Dunstable thereby removing HGVs from the local road network).

Given the above information it is proposed that work on a public consultation and declaration of an AQMA at Chalton is suspended pending the final decision from the Secretary of State. However work could be resumed if the decision or construction is delayed indefinitely.

6 References

Reports produced for previous rounds of review and assessments – formerly Mid and South Beds District Council and since 1st April 2009, Central Bedfordshire Council

Central Bedfordshire Council Local Transport Plan 3

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

Defra website pages including:

- website NO2 fall off with distance calculator accessed at http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html
- National bias adjustment factor spreadsheet (March 2012) accessed at http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
- 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 1: Quality Assurance / Quality Control (QA/QC) Data

Appendix 2: Location maps of NO_2 diffusion monitoring sites

Appendix 3: 2012 NO_2 diffusion tube monthly results

Appendix 1: QA/QC Data

Diffusion Tube Bias Adjustment Factors

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 2.

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.

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.

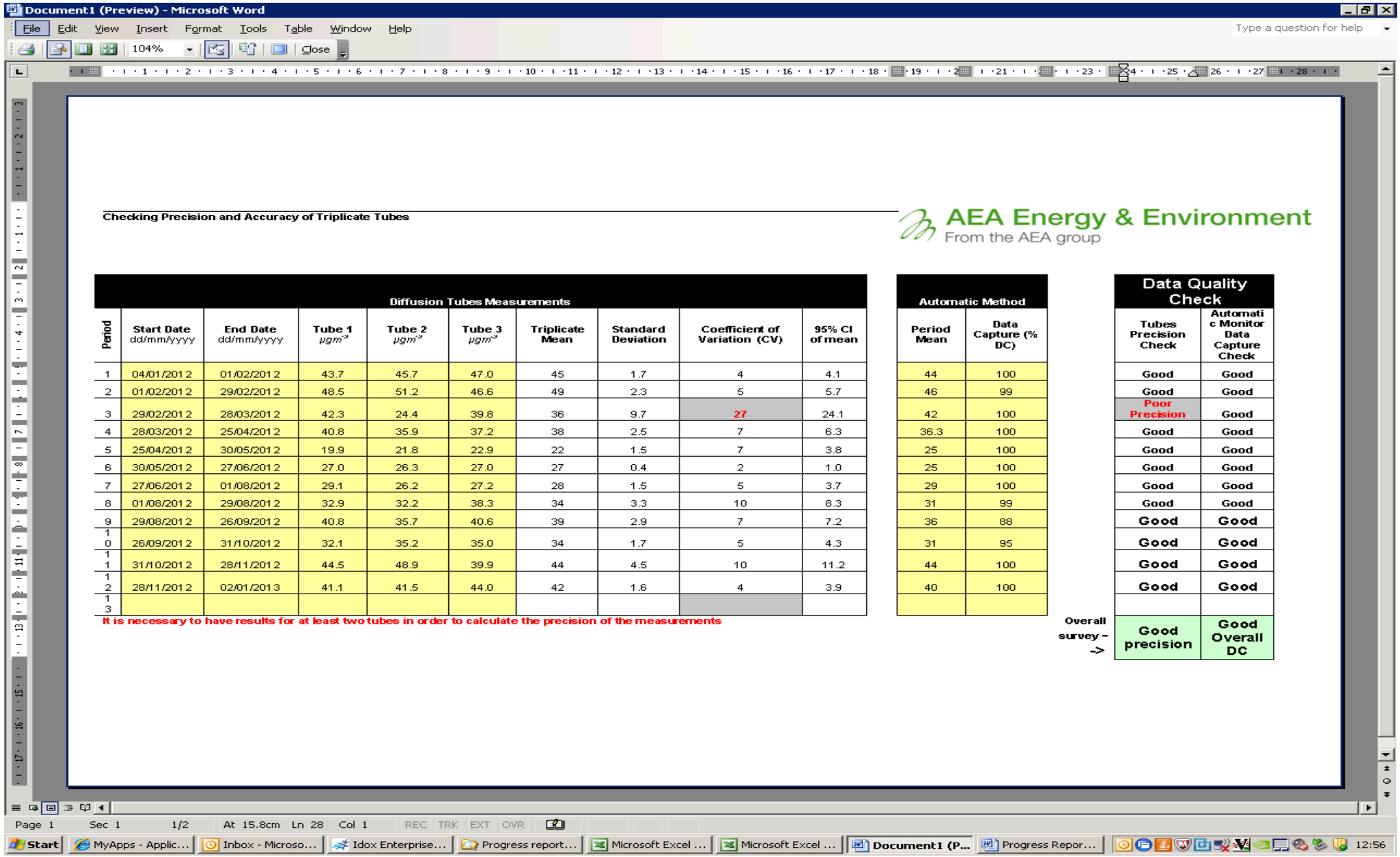
The bias adjustment factor for 2010 was 0.92 (as of July 2011) calculated from 39 studies across the country.

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

The bias adjustment factor for 2012 was 0.97 (as of March 2013) calculated from 27 studies across the country.

Factor from Local Co-location Studies

The local bias adjustment factor calculations can be seen below, which resulted in a local bias adjustment factor of 0.96



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
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 Capture Check
1	04/01/2012	01/02/2012	43.7	45.7	47.0	45	1.7	4	4.1	44	100	Good	Good
2	01/02/2012	29/02/2012	48.5	51.2	46.6	49	2.3	5	5.7	46	99	Good	Good
3	29/02/2012	28/03/2012	42.3	24.4	39.8	36	9.7	27	24.1	42	100	Poor Precision	Good
4	28/03/2012	25/04/2012	40.8	35.9	37.2	38	2.5	7	6.3	36.3	100	Good	Good
5	25/04/2012	30/05/2012	19.9	21.8	22.9	22	1.5	7	3.8	25	100	Good	Good
6	30/05/2012	27/06/2012	27.0	26.3	27.0	27	0.4	2	1.0	25	100	Good	Good
7	27/06/2012	01/08/2012	29.1	26.2	27.2	28	1.5	5	3.7	29	100	Good	Good
8	01/08/2012	29/08/2012	32.9	32.2	38.3	34	3.3	10	8.3	31	99	Good	Good
9	29/08/2012	26/09/2012	40.8	35.7	40.6	39	2.9	7	7.2	36	88	Good	Good
10	26/09/2012	31/10/2012	32.1	35.2	35.0	34	1.7	5	4.3	31	95	Good	Good
11	31/10/2012	28/11/2012	44.5	48.9	39.9	44	4.5	10	11.2	44	100	Good	Good
12	28/11/2012	02/01/2013	41.1	41.5	44.0	42	1.6	4	3.9	40	100	Good	Good
13													
											Overall survey ->	Good precision	Good Overall DC

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

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Site Name/ ID:	

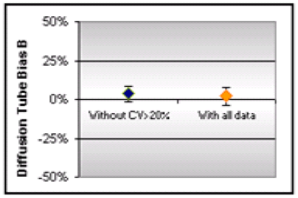
Accuracy	(with 95% confidence interval)
without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.96 (0.92 - 1.01)
Bias B	4% (-1% - 9%)
Diffusion Tubes Mean:	37 µg m-3
Mean CV (Precision):	6
Automatic Mean:	35 µg m-3
Data Capture for periods used:	98 %
Adjusted Tubes Mean:	35 (34 - 37) µgm-3

Precision	11 out of 12 periods have a CV smaller than 20%

Accuracy	(with 95% confidence interval)
WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.98 (0.93 - 1.04)
Bias B	2% (-4% - 8%)
Diffusion Tubes Mean:	36 µgm-3
Mean CV (Precision):	8
Automatic Mean:	36 µgm-3
Data Capture for periods used:	98 %
Adjusted Tubes Mean:	36 (34 - 38) µgm-3

(Check average CV & DC from Accuracy calculations)

	Without CV>20%	With all data
	4%	2%
	5.0%	5.9%



Jaume Targa, for AEA

Version 04 - February 2011

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Discussion of Choice of Factor to Use

Central Bedfordshire Council calculated both National and Local bias adjustment factors.
The national adjustment figure was 0.97
The local adjustment figure was 0.96
It was decided to use the national factor as this provided a more (albeit slightly) conservative factor.

PM Monitoring Adjustment

As the Sandy site is affiliated to the AURN network – data from the TEOM does not require to be adjusted by the VCM.

The PM_{10} monitoring results for the annual mean and 24-hour mean objectives indicate that neither is in danger of being exceeded 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.

As the Sandy site is affiliated to the AURN network – data from the TEOM does not require to be adjusted by the VCM.

Short-term to Long-term Data adjustment

Two NO_2 diffusion tube sites had data capture rates of 75% or less during 2012, therefore the results were annualised in accordance with Technical Guidance. The methodology used for this calculation followed that detailed in Box 3.2 of TG(09) for both SB13 (Tebworth) and SB20 (Court Drive) are detailed below.

Table A.1 Short-Term to Long-Term Monitoring Data Adjustment

2012 ppb data source H&B network	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	data capture%
East Herts Sawbridgeworth background	7	8	6	4	4	4	4	4	6	7	10	12	6	100
Luton Challney background	18	18	14	10	8	8	9	14	18	19	23	19	15	99
2012 converted to ug/m^3 (ppb*1.913)														
East Herts Sawbridgeworth background	13	15	11	8	8	8	8	8	11	13	19	23	12	
Luton Challney background	34	34	27	19	15	15	17	27	34	36	44	36	28	
Period Mean	Jan		Mar/Apr		Jun		Aug-Dec							
East Herts Sawbridgeworth background	13		10		8		15							
Luton Challney background	34		23		15		36							
Ann mean : period mean (ratio)														
East Herts Sawbridgeworth background	0.93		1.27		1.51		0.81							
Luton Challney background	0.83		1.24		1.89		0.8							
Ave	**0.88**		**1.25**		**1.70**		**0.80**					**1.16**		
	AM	Ra												
	14.8	1.16												
Tebworth annualised tube ave AM*Ra			**17.18**											

2012 ppb data source H&B network	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	data capture%
East Herts Sawbridgeworth background	7	8	6	4	4	4	4	4	6	7	10	12	6	100
Luton Challney background	18	18	14	10	8	8	9	14	18	19	23	19	15	99
2012 converted to ug/m^3 (ppb*1.913)														
East Herts Sawbridgeworth background	13	15	11	8	8	8	8	8	11	13	19	23	12	
Luton Challney background	34	34	27	19	15	15	17	27	34	36	44	36	28	
Period mean	Jan		Mar/Apr		Jun-Aug		Oct							
East Herts Sawbridgeworth background	13		10		8		13							
Luton Challney background	34		23		20		36							
Ann mean : Period Mean (ratio)														
East Herts Sawbridgeworth background	0.93		1.21		1.58		0.93							
Luton Challney background	0.83		1.23		1.44		0.79							
Ave	0.88		1.22		1.51		0.86					**1.12**		
	AM	Ra												
	24.5	1.1												
Asda annualised tube ave AM*Ra			**27.4**											

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.

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. NO_x, 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. NO_x 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/

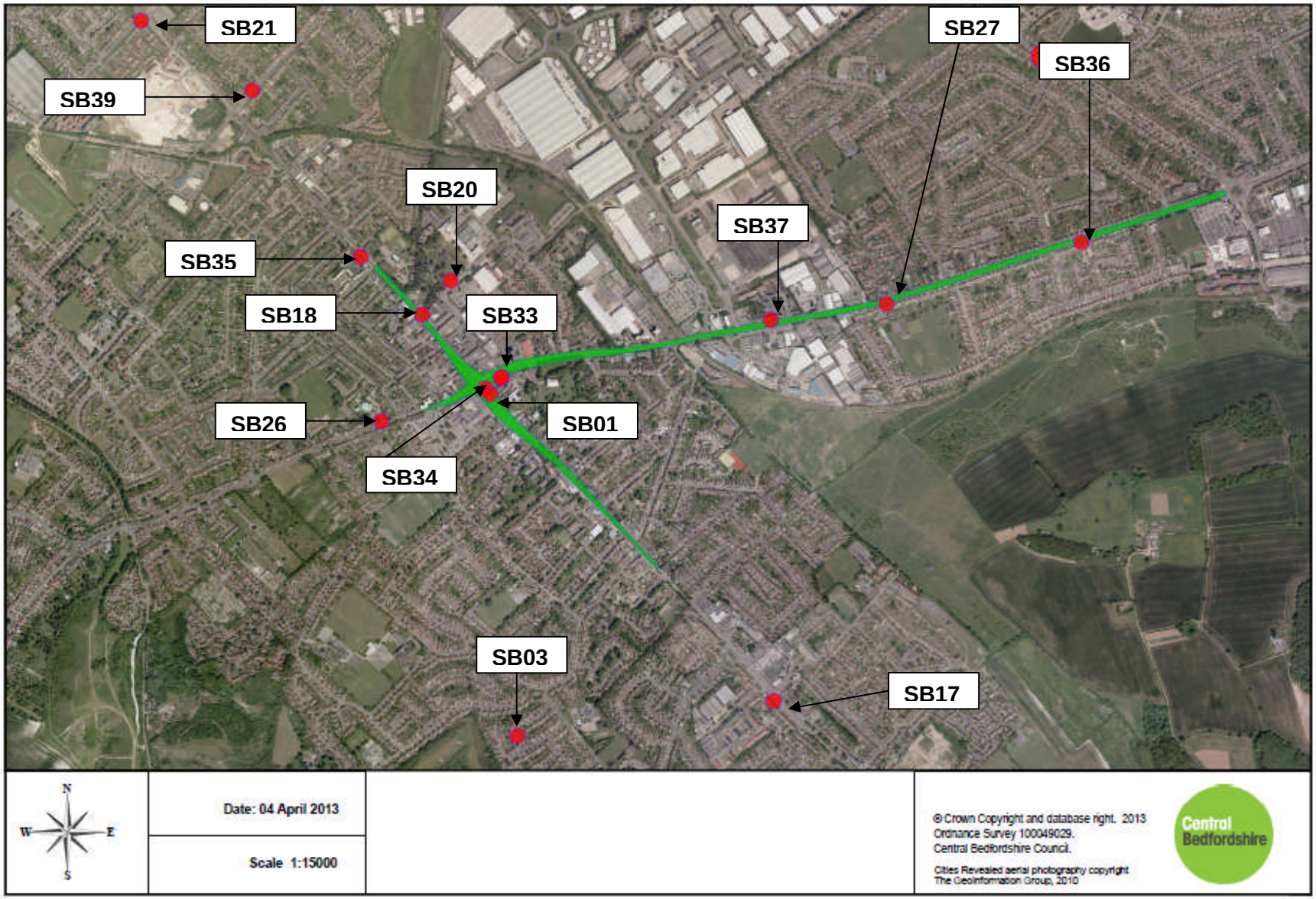
A final measurement data set to the end of 2011 was produced by AQDM following retrospective ratification of the measurements using procedures, which exceed the requirements detailed in LAQM TG09 (Defra, 2009). During ratification information from regular calibrations, audits and daily manual validation 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.

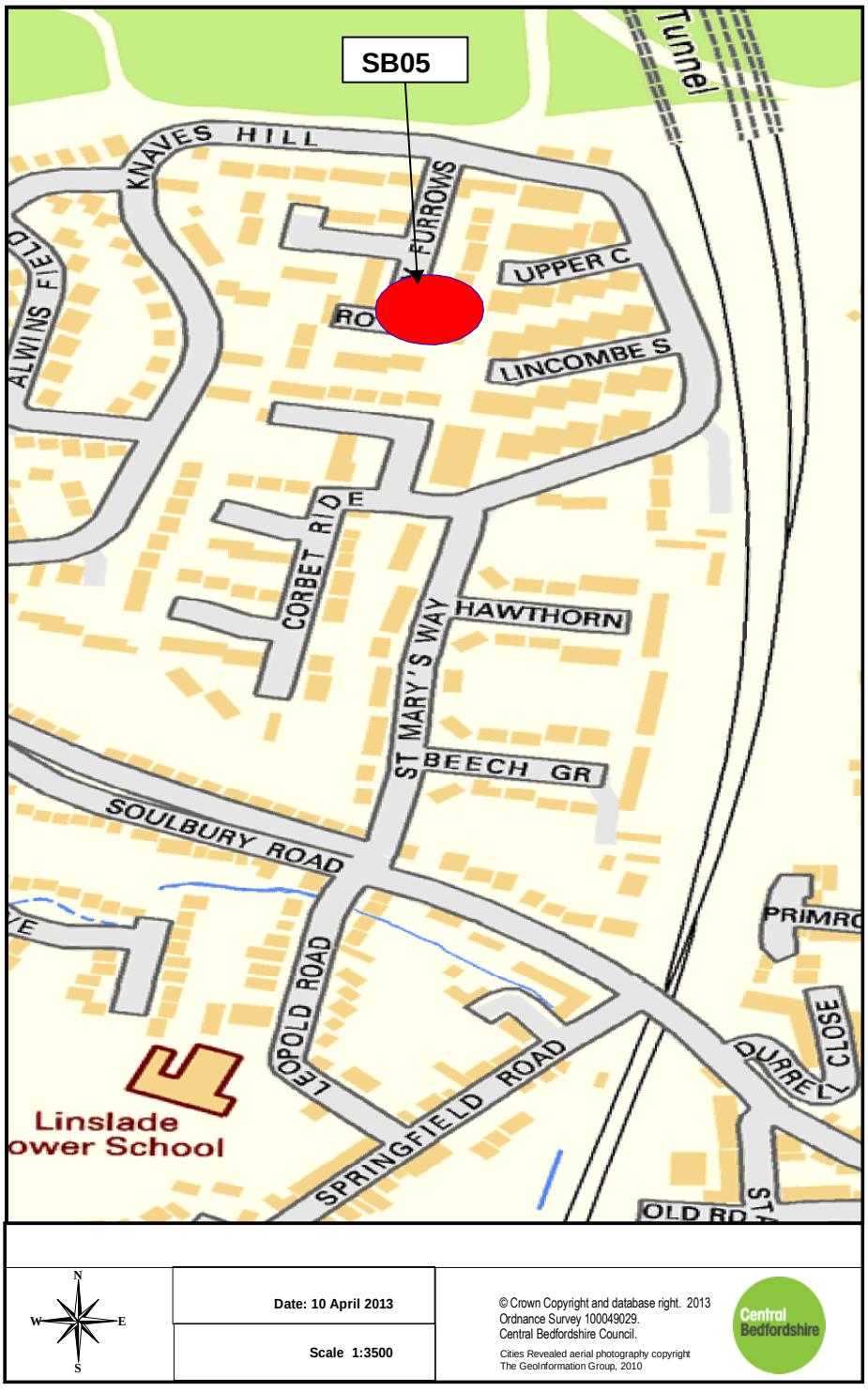
The data from the AQMS at Sandy Roadside is ratified by ERG to the AURN standard and QA/QC visits are carried out by Casella at this site. The data from the Marston Vale site is ratified to the Herts and Beds Air Quality Network standard.

Appendix 2: Location maps of diffusion tube sites

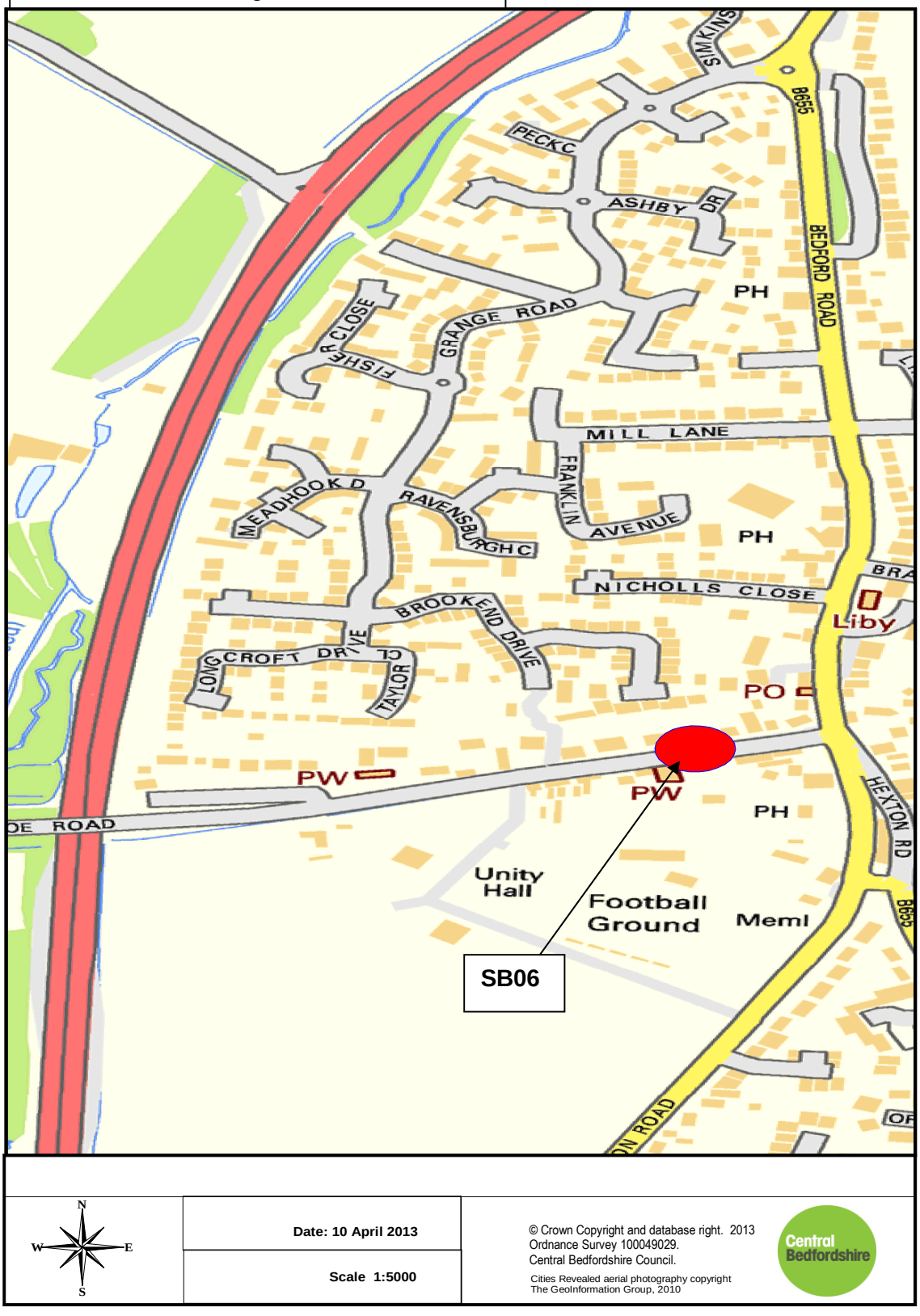
Dunstable NO_2 diffusion tube monitoring locations with AQMA highlighted



Leighton – Linslade NO_2 monitoring location



Barton NO_2 monitoring location



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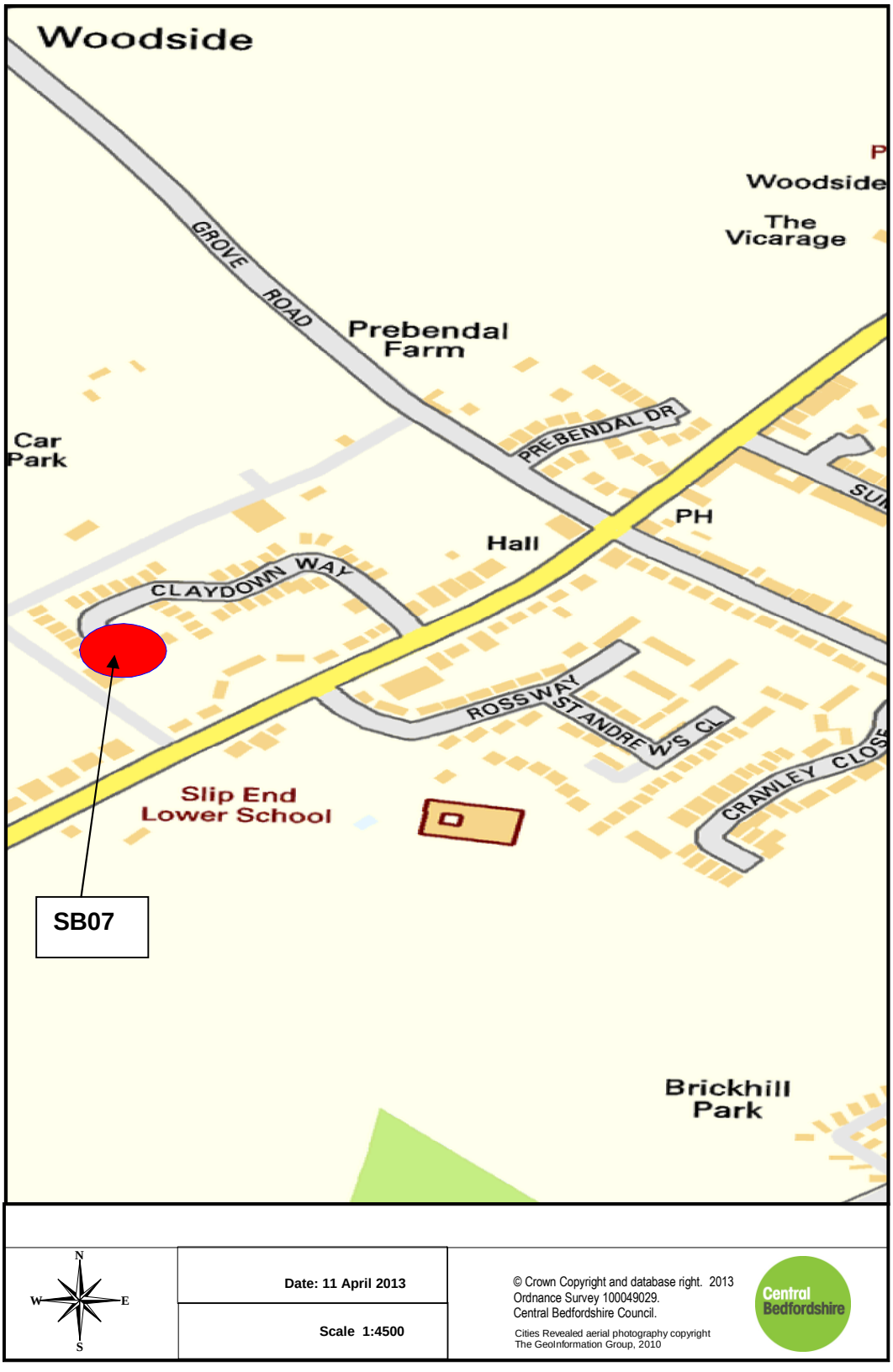
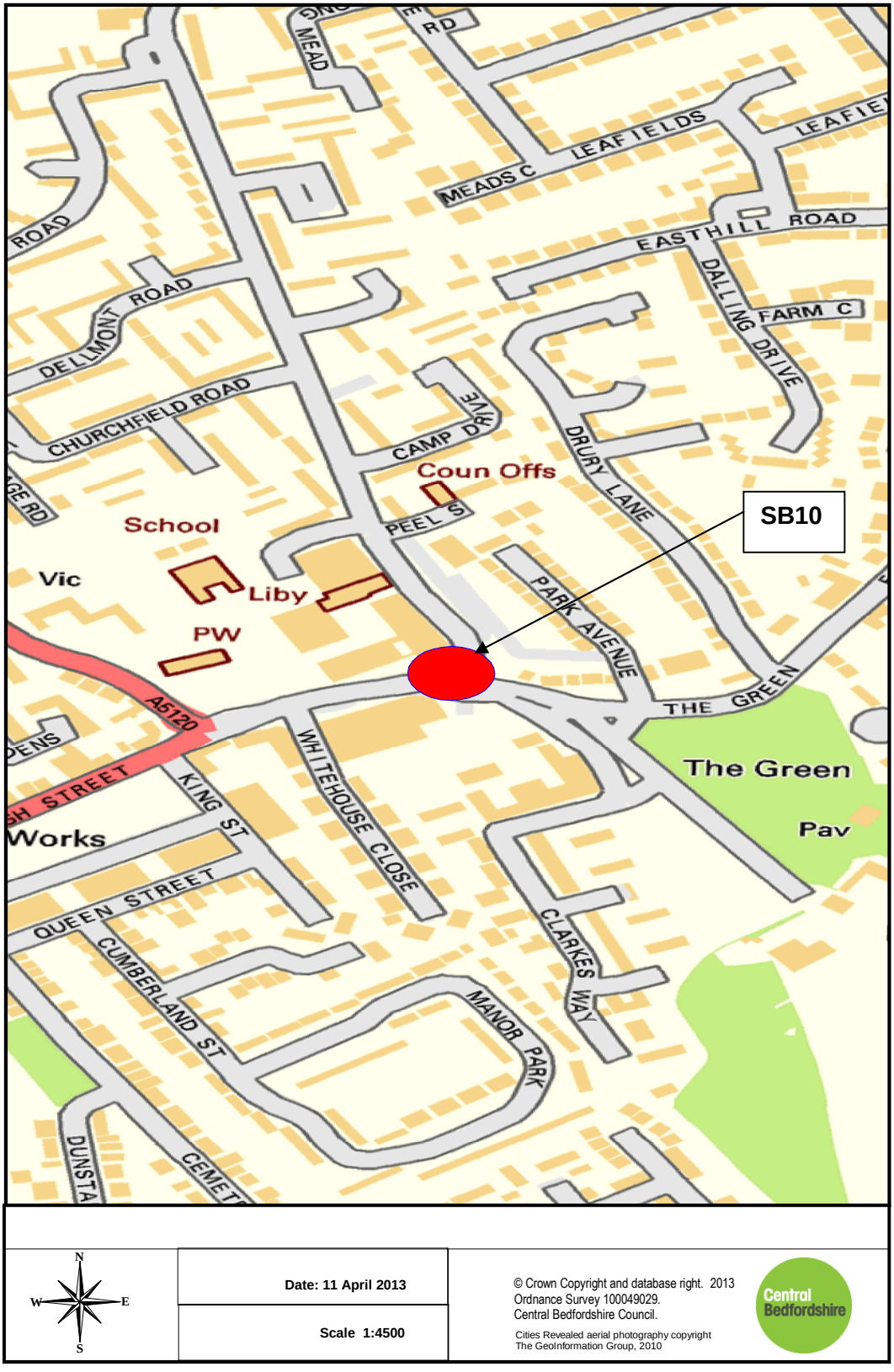
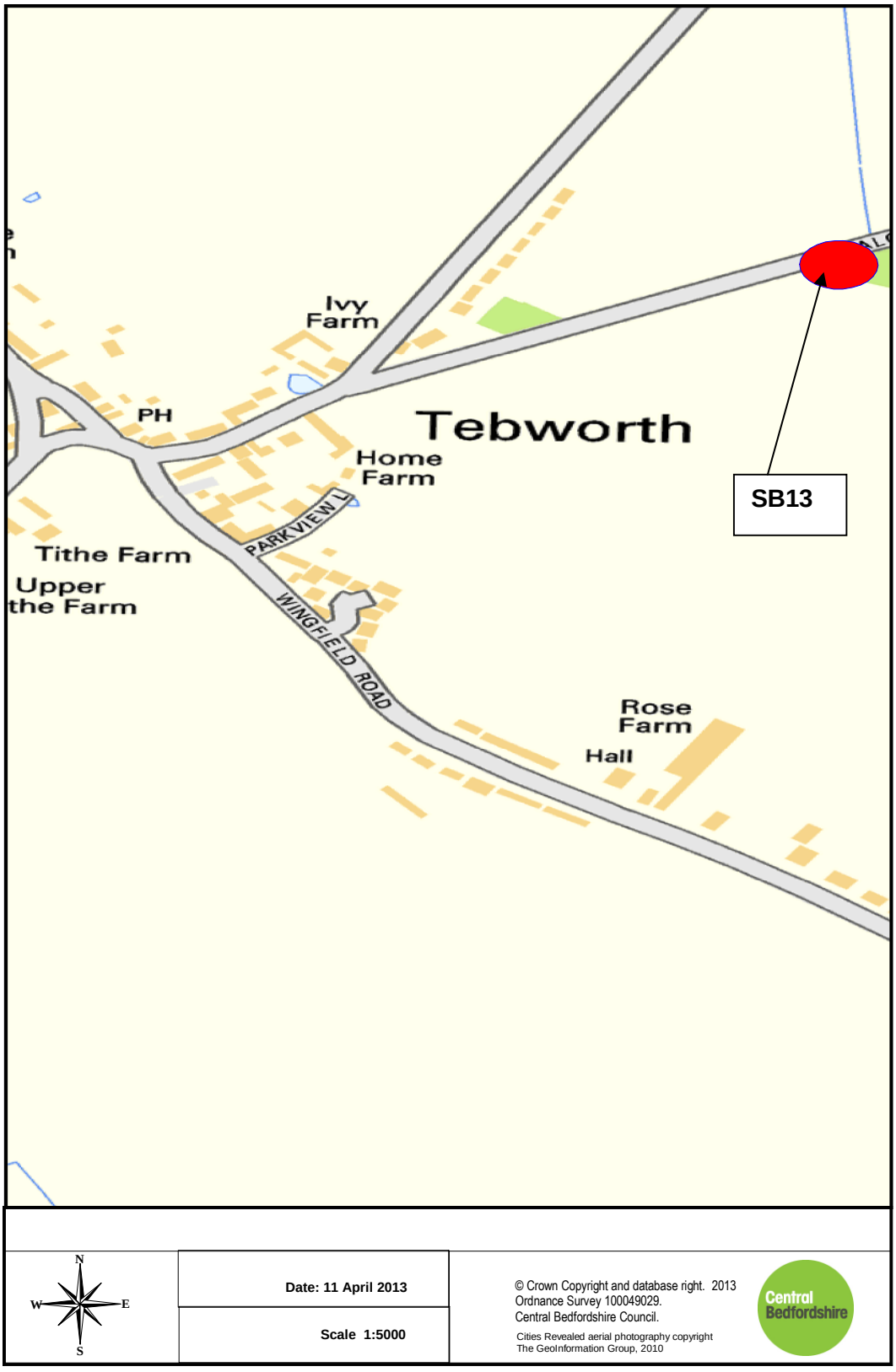
Slip End NO_2 monitoring location



Houghton Regis NO_2 monitoring location

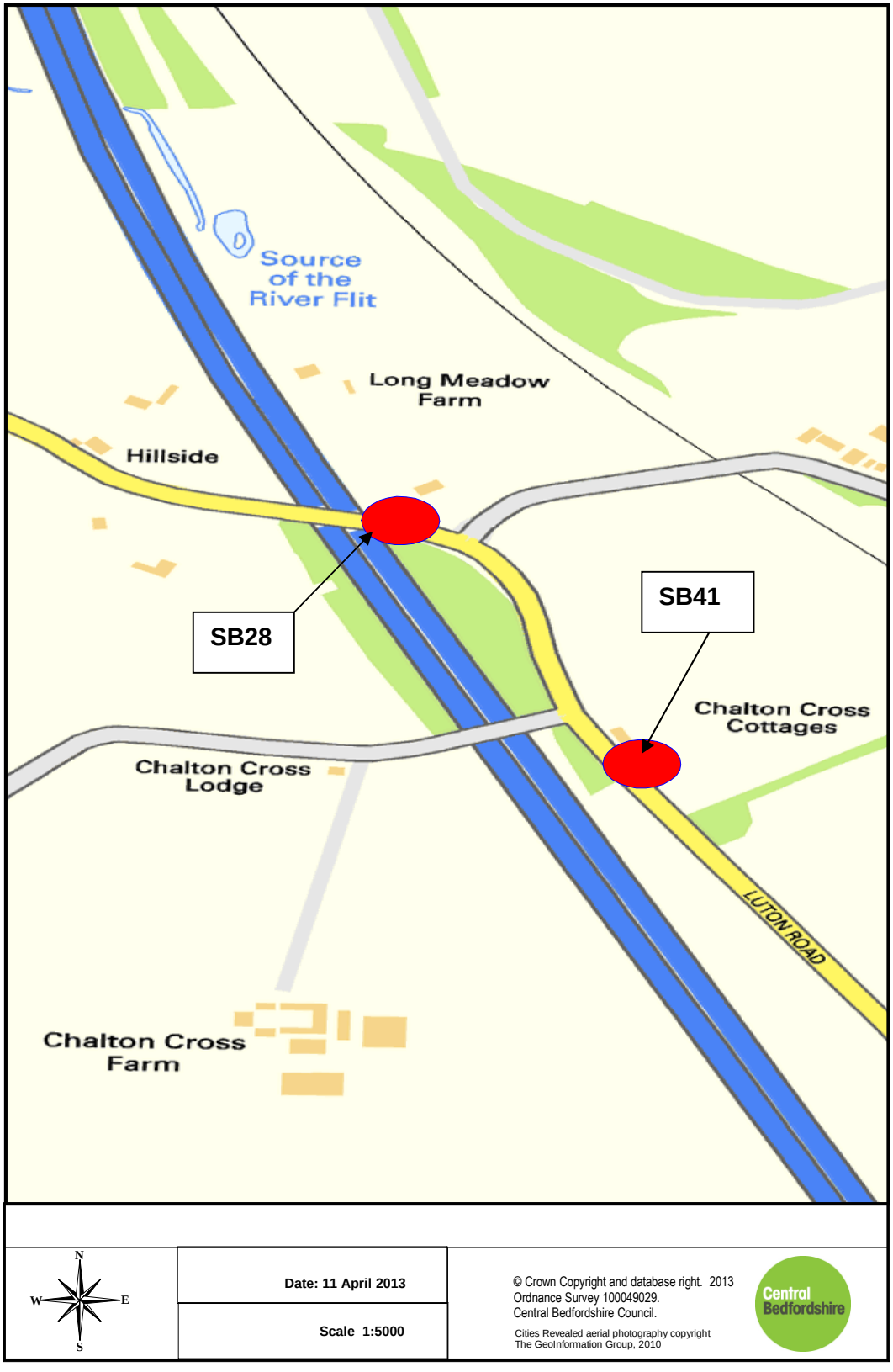


Tebworth NO_2 monitoring location

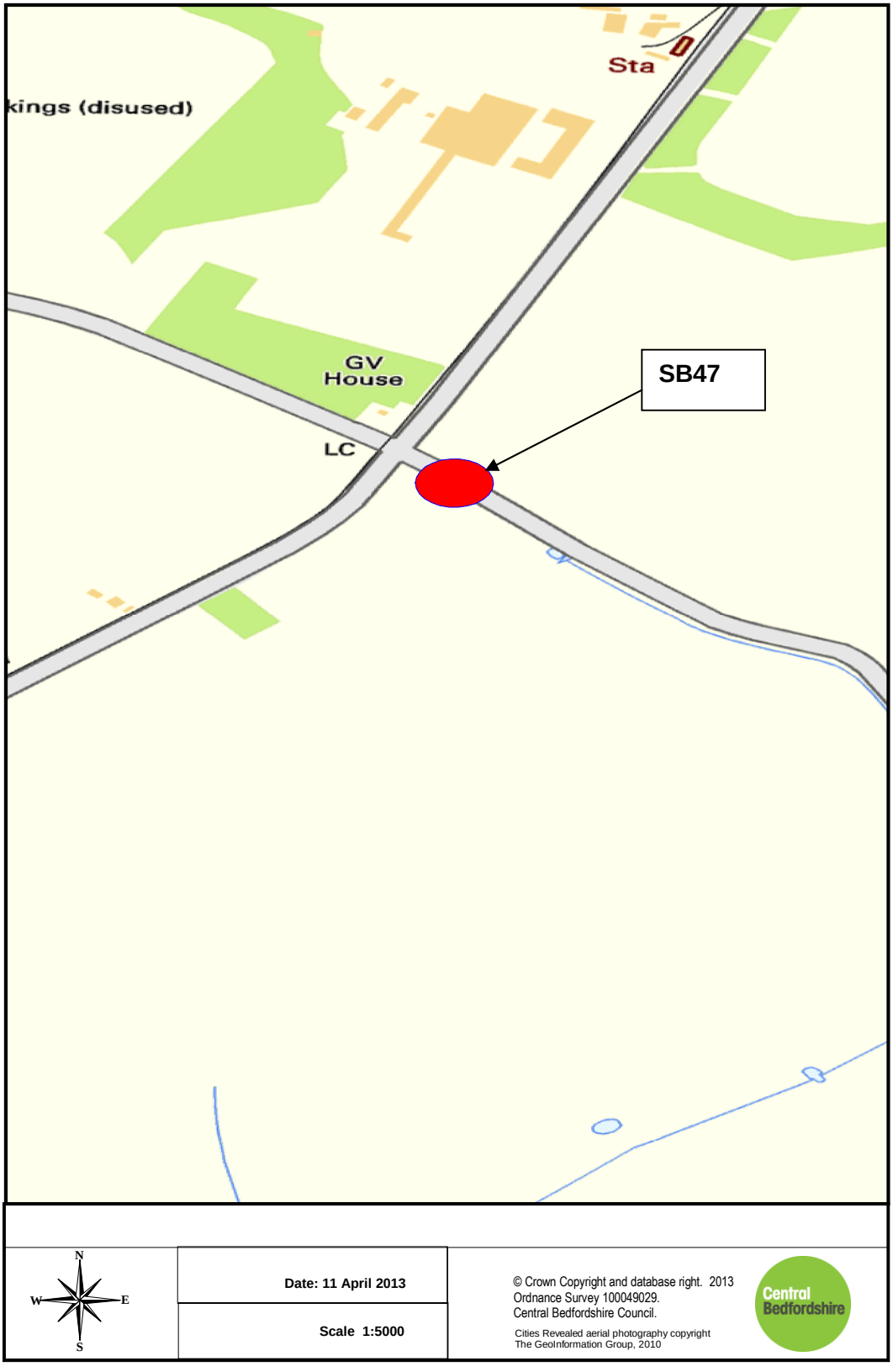


Sallowsprings NO_2 monitoring location

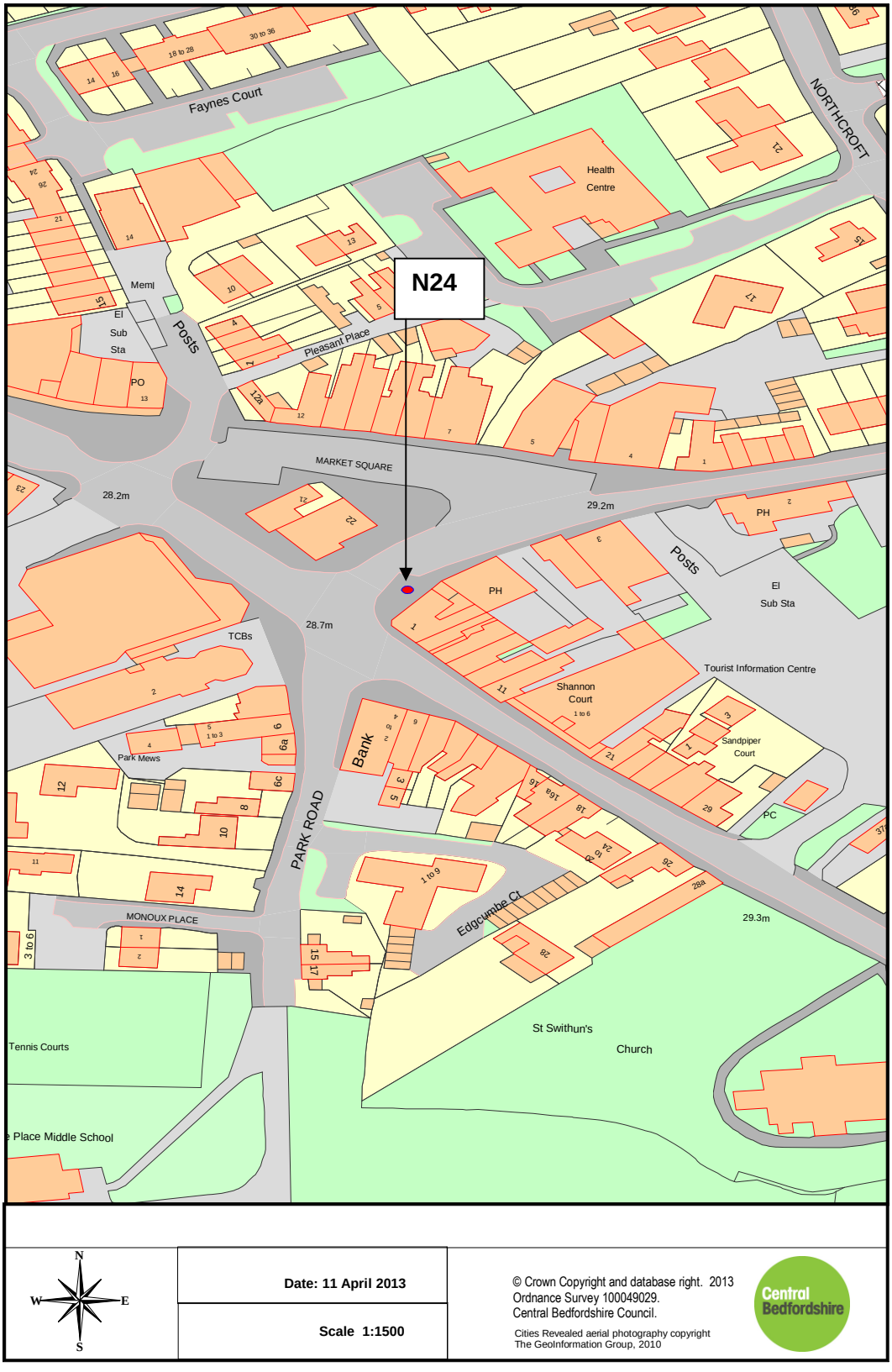
Chalton NO_2 monitoring location

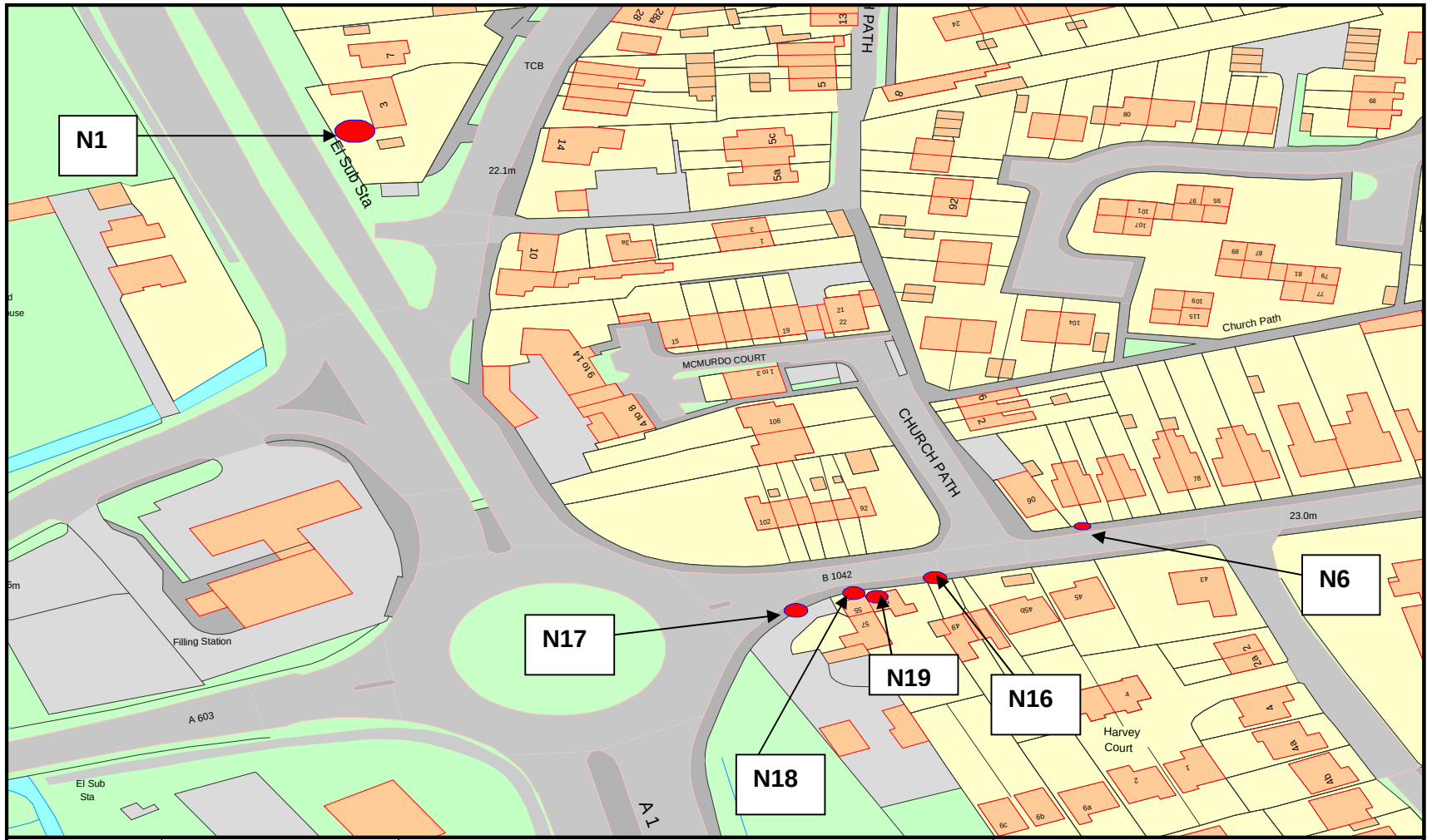


Clipstone NO_2 monitoring location



Sandy NO_2 monitoring location – N24




N1
N17
N18
N19
N16
N6
El Sub Sta
TCB
22.1m
MCMURDO COURT
CHURCH PATH
Church Path
B 1042
23.0m
Filling Station
A 603
A 1
Harvey Court
El Sub Sta
N
W
E
S
Date: 11 April 2013
Scale 1:1500
Sandy NO_2 monitoring locations – N17 / N18 / N19 / N16 / N6
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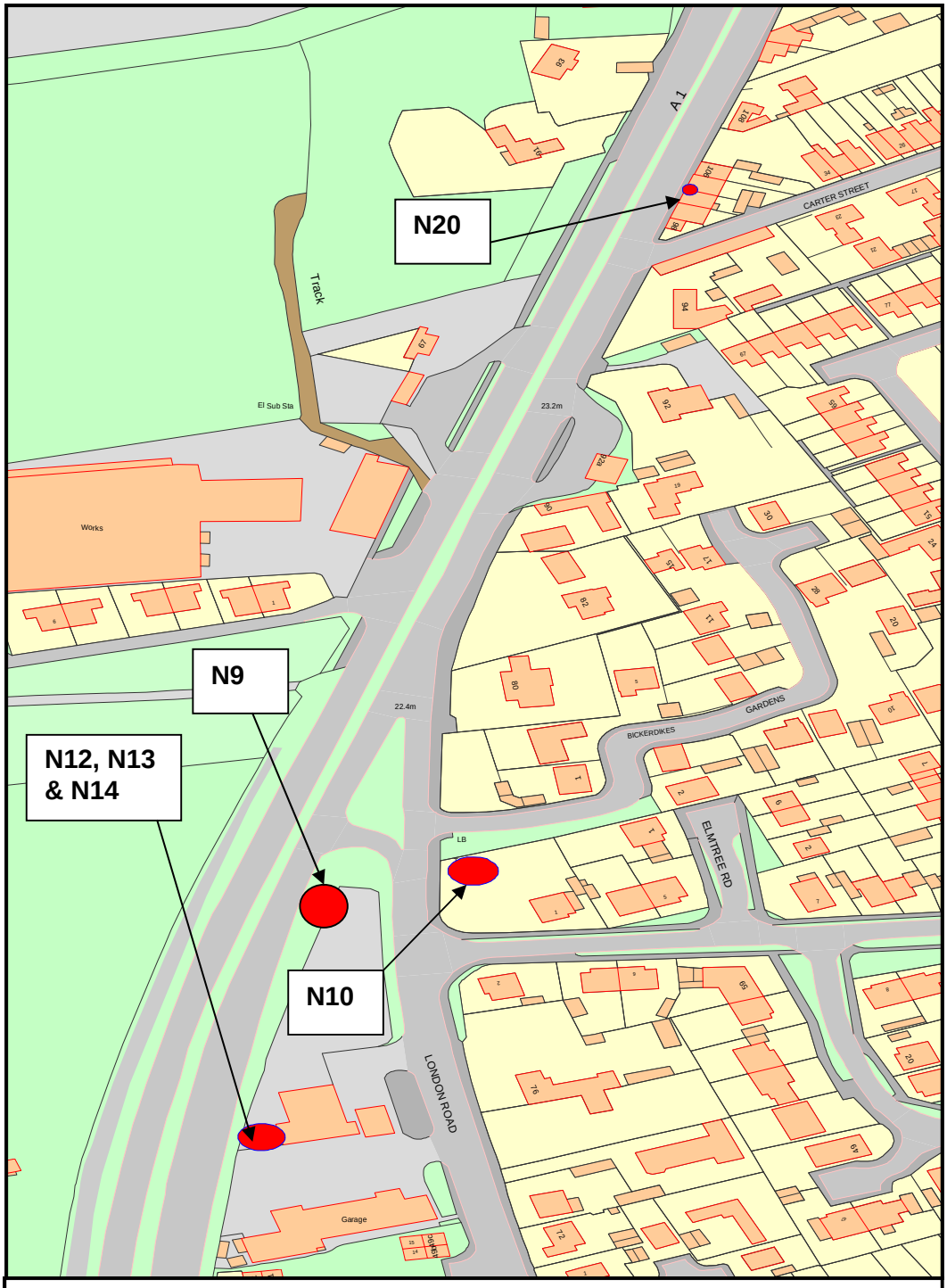
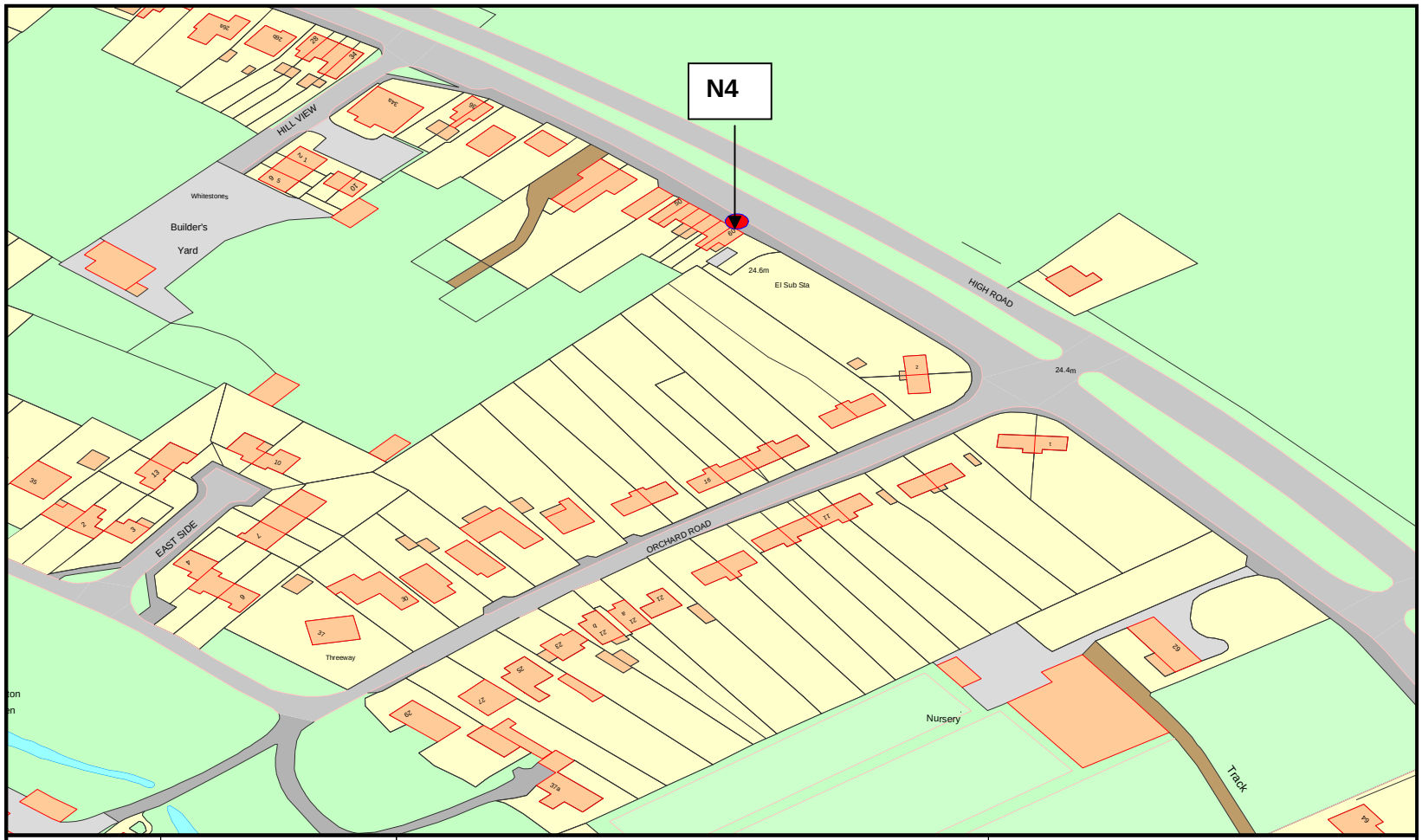
Cities Revealed aerial photography copyright The GeoInformation Group, 2010
Central Bedfordshire

Sandy NO2 monitoring locations – N9, N10, N12, N13, N14& N20




N4
HILL VIEW
Whitestones
Builder's
Yard
HIGH ROAD
24.6m
El Sub Sta
24.4m
EAST SIDE
ORCHARD ROAD
Threeway
Nursery
Track
N
W
E
S
Date: 11 April 2013
Scale 1:2000
Beeston NO_2 monitoring location
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Central Bedfordshire Council.
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Central Bedfordshire


N3
N2
CHURCH STREET
HIGH STREET
Market Square
Abbots Walk
Bank
Club
Regency Lodge
Market House
War Meml
The White Hart (PH)
Camberley House
Victoria Court
Station Chambers
SAND LANE
BACK STREET
STATION
Warehouse
BONDS LANE
Claremont Cottages
WELLS COURT
Works
The Malting
TCB
TCBs
PC
PH
LB
El Sub Sta
Hall
Police
30.0m
30.1m
30.8m
32.6m
Date: 11 April 2013
Scale 1:1500
Biggleswade NO_2 monitoring locations
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Central Bedfordshire Council.
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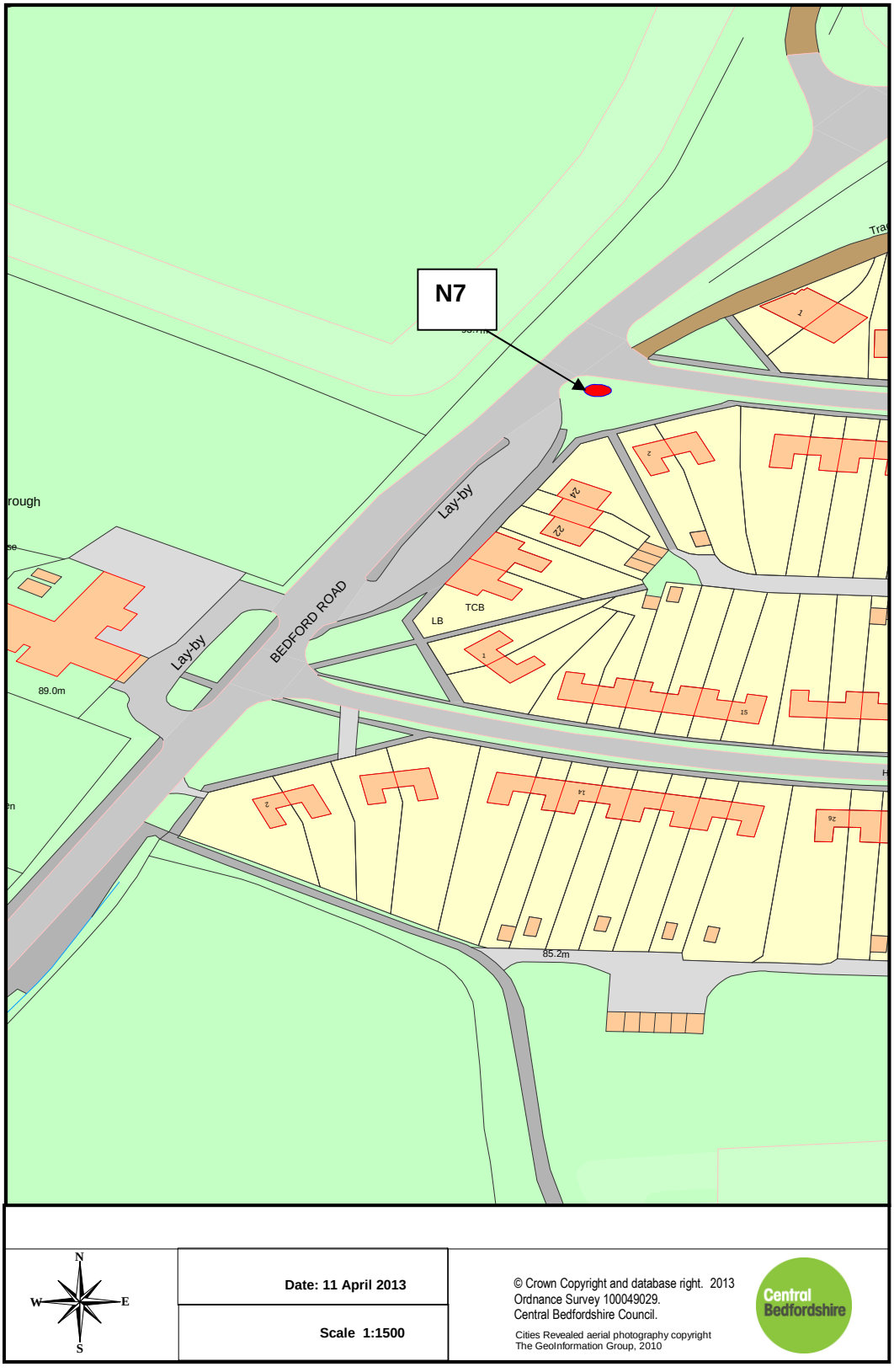
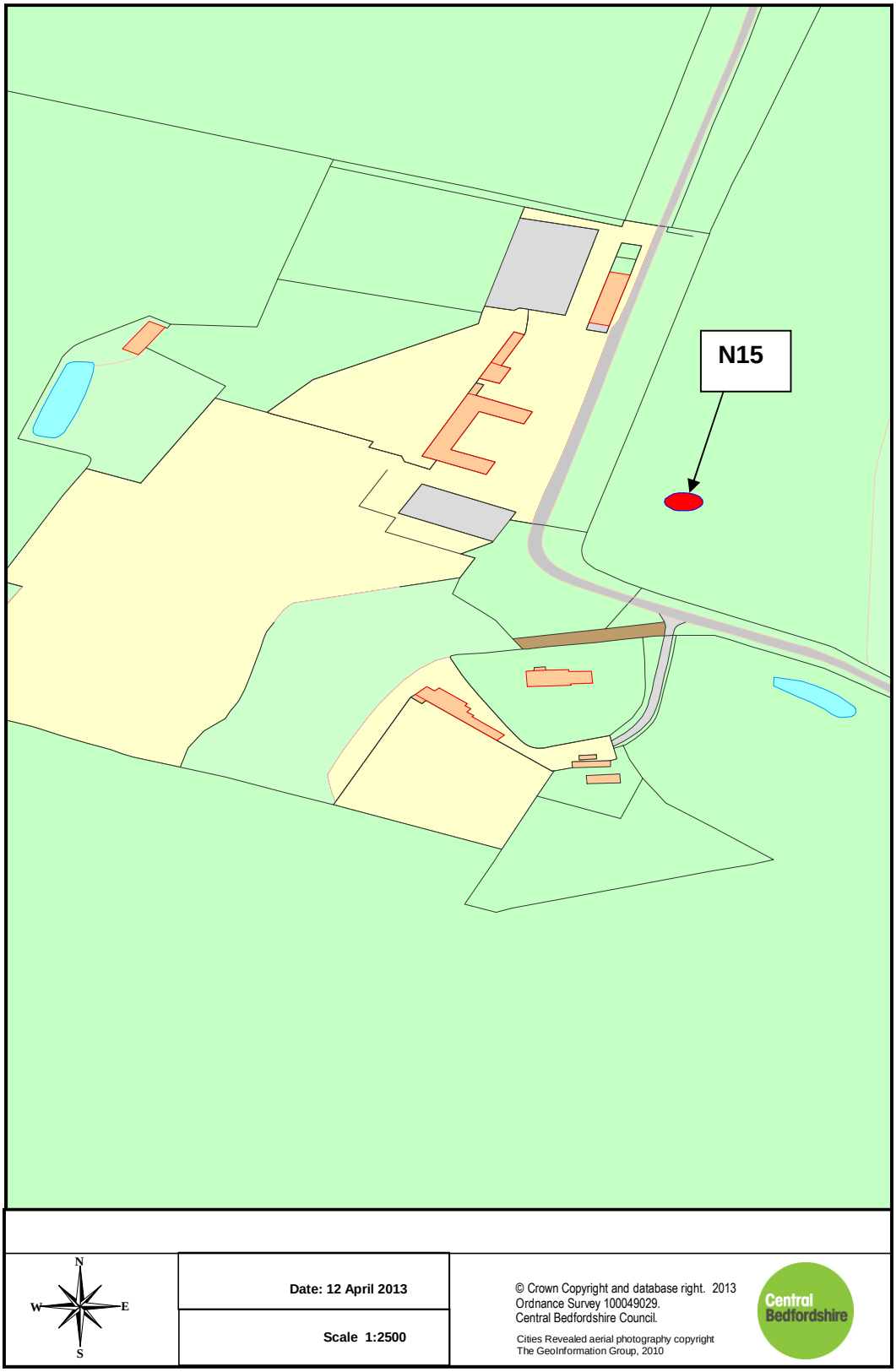
Central Bedfordshire

Brogborough NO_2 monitoring location



Battlesden NO_2 monitoring location



Appendix 3: 2012 monthly NO_2 diffusion tube monitoring results - South

Site Id	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	AVE	annualised
1	**49.33**		**40.35**		**56.09**	**39.15**	**44.79**	**40.03**	**44.49**	**55.44**	**49.52**	**41.27**	**46.05**	
3	21.65		20.26	12.50	10.71	9.01		10.66	11.15	18.17	22.17	21.76	15.80	
5	17.90		16.85	12.24	9.23	7.72	8.29	9.86	10.59	15.80	20.43	21.00	13.63	
6	31.90		28.94	24.60	18.35	16.10	17.53	16.09	20.35	28.11	33.89	27.90	23.98	
7	20.10		21.33	18.04	14.40	12.19	11.89	10.52	14.08	20.35	24.34	24.28	17.41	
10	37.79		37.52	39.40	26.26	28.42	29.50	32.88	36.31	39.73	**44.31**	38.06	35.47	
13			19.17	13.01		8.08		7.50	11.50	15.94	22.38	20.93	14.81	17.18
14	13.66		14.85	10.04	8.66	7.83	8.02	10.15	10.10	12.60	18.25	16.48	11.88	
17	34.62			30.52	33.41	30.86	34.60	34.42	34.62	**40.55**	**46.35**	32.95	35.29	
18	34.87		**49.61**		**41.51**	**41.03**	**43.77**	**42.81**	37.92	39.61		**41.01**	**41.35**	
20	33.37		30.52	23.85		21.55	17.64	17.94		26.46			24.48	27.4
21	33.84		32.70	32.02	25.47	27.55	32.77	35.17	33.07	37.48	40.88	30.85	32.89	
26	34.46		32.51	29.89	24.76	22.44	25.19	24.59	31.02	10.93	39.67	31.85	27.94	
27	**44.11**		39.36	40.31	31.32	24.93	28.17	26.11	30.24	40.92	42.33	36.09	34.90	
28	**59.56**		**57.95**	45.80	34.88	50.51	60.74	54.28	68.46	52.53	79.29	63.99	57.09	
33	**48.41**		**45.77**	45.68	39.11	40.08	43.05	47.41	43.66		47.08	43.51	44.38	
34	**52.99**		**58.21**	48.68	40.52		47.98	52.68	55.10	53.60	61.43	44.43	51.56	
35	**44.53**		38.88	43.43	31.62	29.45	33.61	34.33	35.72	39.63	40.36	37.26	*37.17*	
36	**52.78**		39.36	41.93	31.59	31.93	31.82	24.15	35.12	**43.17**	**46.32**	37.04	*37.75*	
37	**48.68**		**45.33**	49.59	**40.54**	33.86	36.35		**42.22**	**44.45**	**44.93**	**54.46**	**44.04**	
39	**47.50**		**42.23**	47.93	31.85	29.69	36.29	39.31		**44.22**	**48.58**	39.73	**40.73**	
41	**46.61**		**45.79**	47.97	32.29	36.72	37.16	**40.59**	**42.31**	**47.92**	**54.08**	**45.56**	**43.36**	
47	16.89		20.63	14.11	9.91	9.40	9.08	10.29	11.35	14.09	19.58	19.95	14.12	

Due to illness NO_2 tubes were not collected in February - so results from Feb to March (outside standard changeover period)

2012 monthly NO_2 diffusion tube monitoring results - North

Site Id	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
N1	**56.5**	**75.6**	**52.9**	**51.8**	38.7	39.2	38.3	31.7	23.5	**44.5**	**49.3**	**46.4**	**44.7**
N2	37.7	42.4	33.5	29.8	23.0	21.5	18.8	24.7	36.9	28.9	41.3	37.0	30.7
N3	46.1	50.3	45.7	44.2	42.6	33.0	30.3	30.8	29.2	41.1	46.2	42.7	*39.6*
N4	44.0	53.5	48.4	42.1	39.3	32.9	27.5	32.2	38.1	38.1	42.7	39.4	*39.5*
N6	10.7	54.0	45.8	36.6	28.1	30.7	27.7	31.4	39.0	37.9	47.6	35.9	37.7
N7	33.4	35.9	33.1	31.0	21.4	19.8	21.2	23.9	23.2	28.4	34.2	31.3	27.6
N20	96.2	106.5	97.5	57.8	64.7	73.4	76.7	82.2	78.4	88.0	103.5	83.7	**82.9**
N9	56.5	59.1	50.1	44.9	36.0	32.4	35.4	39.0	41.9	40.5	57.2	48.3	**44.1**
N10	35.8	41.3	34.4	28.2	19.8	18.9	20.4	24.0	24.5	25.8	38.7	31.3	27.9
N24	41.8	44.1	41.9	33.8	25.8	25.4	23.8	23.5	24.6	32.4	80.9	41.6	*36.2*
N12	43.7	48.5	42.3	40.8	19.9	27.0	29.1	32.9	40.8	32.1	44.5	41.1	*36.3*
N13	45.7	51.2	24.4	35.9	21.8	26.3	26.2	32.2	35.7	35.2	48.9	41.5	34.5
N14	47.0	46.6	39.8	37.2	22.9	27.0	27.2	38.3	40.6	35.0	39.9	44.0	*36.2*
N15	18.1	20.5	22.0	11.3	8.5	8.5	5.5	11.7	11.2	12.5	21.6	19.6	13.9
N16	48.9	51.4	43.3	38.2	26.3	29.5	31.7	29.0	18.0	39.1	39.5	44.3	35.5
N17	65.2	46.4	43.2	52.8	27.8	44.7	50.1	39.9	58.4	54.8	59.9	36.4	**46.7**
N18	45.3	66.8	53.9	33.7	25.4	25.9	30.4	31.4	25.0	33.0	42.3	35.9	*36.7*
N19	47.9	50.7	41.4		37.3	35.0	37.4	52.8	44.7	38.7	48.3	43.2	**43.0**
N21	30.1	38.1	32.9	29.3	23.1	19.7	20.6	24.0	21.9	28.8	31.6	31.3	27.4
N22	50.4	50.8	28.1	44.2		38.3	40.0	35.5	46.6	45.7		48.3	**42.0**
N23	59.7	62.5	60.3	47.3	43.2	44.7	32.0	39.1	41.2	55.8	54.2	53.4	**48.5**