

Date July 2011

Central Bedfordshire Council – England



**2011 Progress Report for  
*Central Bedfordshire Council*  
(Incorporating Air Quality Action Plan  
Progress Report)**

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

Date July 2011

|                                |                              |
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| <b>Local Authority Officer</b> | <a href="#">Kay Sterling</a> |
|--------------------------------|------------------------------|

|                   |                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------|
| <b>Department</b> | <a href="#">Community Safety &amp; Public Protection</a>                                             |
| <b>Address</b>    | <a href="#">Priory House, Monks Walk, Chicksands, Shefford, Bedfordshire, SG6 1LF</a>                |
| <b>Telephone</b>  | <a href="#">0300 300 5065</a>                                                                        |
| <b>e-mail</b>     | <a href="mailto:kay.sterling@centralbedfordshire.gov.uk">kay.sterling@centralbedfordshire.gov.uk</a> |

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| <b>Report Reference number</b> | AQPR/AQAPPR 2011 |
| <b>Date</b>                    | July 2011        |

## Executive Summary

Central Bedfordshire Council came into force on the 1<sup>st</sup> April 2009. The legacy authorities were Mid Bedfordshire District Council, South Bedfordshire District Council and aspects of Bedfordshire County Council. This is a Progress Report covering Central Bedfordshire Council's district.

Data is collected by continuous analysers and diffusion tubes for a variety of pollutants.

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<sub>2</sub> Air Quality Objective. Work to declare two new AQMAs both relating to the annual NO<sub>2</sub> objective in Sandy and Chalton are proceeding (currently at the consultation stage), to be followed by Further Assessment Report(s) and Air Quality Action Plan(s).

Since the closure of the Stewartby Brickworks (early 2008) the ambient levels of SO<sub>2</sub> dropped off dramatically. The data from the Marston Vale Forest Centre indicated that the peaks did not rise above 40 mg/m<sup>3</sup> as a 15 minute average, clearly below the objective level. Additionally, both the 1hour mean and 24hour mean SO<sub>2</sub> objectives continue to be met across the Hertfordshire and Bedfordshire monitoring network.

As a result of Stewartby Brickworks closing, which resulted in a dramatic reduction in SO<sub>2</sub> levels in the area, the AQMA previously declared was revoked in November 2009. The major source of pollution in the district is now from road transportation.

A Detailed Assessment report (July 2011) has been carried out for Bedford Street and Dunstable Street, Ampthill and were 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<sub>2</sub> diffusion tube monitoring and the measured and predicted exceedences of the annual air quality objective (40µg/m<sup>3</sup>) along Bedford Street (from the Park Street junction) and continue along Dunstable Street until the street widens approximately adjacent 103 Dunstable Street.
- 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<sub>2</sub> 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

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Plan(s) and it is envisaged that these will be taken forward in parallel following declaration of the AQMA(s).

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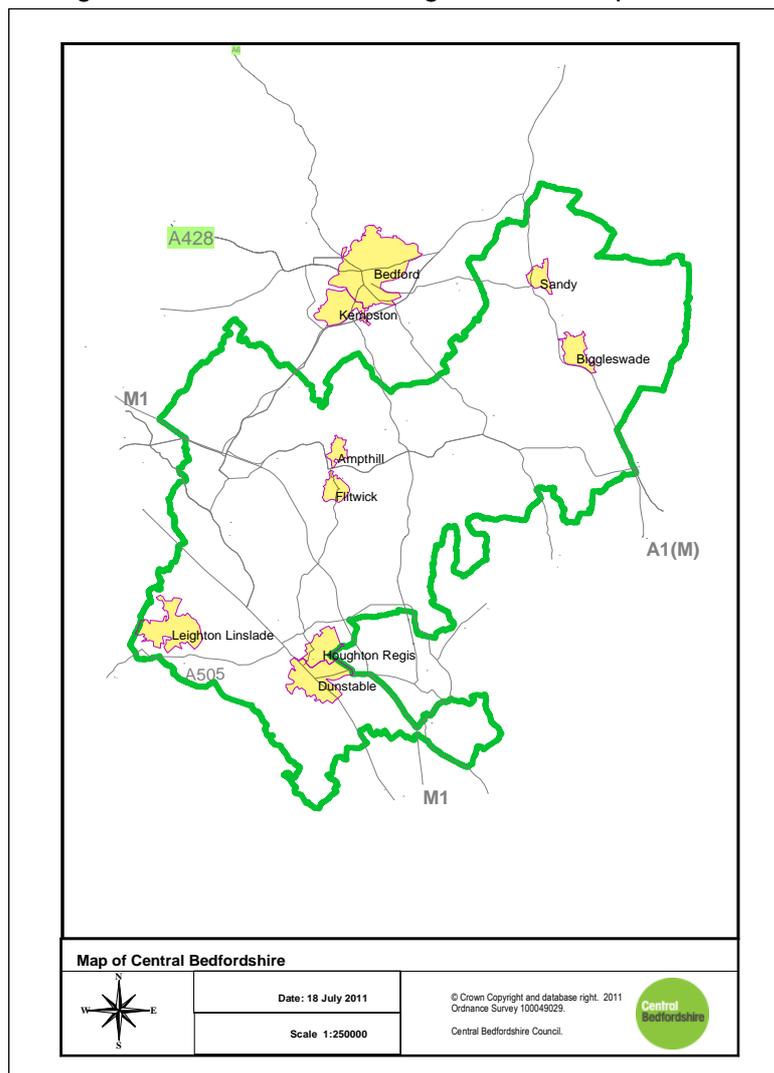
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# 1.0 Introduction

## 1.1 Description of Local Authority Area

Central Bedfordshire Council came into force on the 1<sup>st</sup> 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 712 square kilometres (see map below). The estimated population of is 252,900 (based on 2009 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 diffusion tubes for a variety of pollutants.

The major source of pollution in the district is from road transportation as Stewartby Brickworks have now closed.

## 1.2 Purpose of Progress Report

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 should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

## 1.3 Air Quality Objectives

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

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

| <b>Pollutant</b>                                 | <b>Concentration</b>                                                        | <b>Measured as</b>  | <b>Date to be achieved by</b> |
|--------------------------------------------------|-----------------------------------------------------------------------------|---------------------|-------------------------------|
| <b>Benzene</b>                                   | 16.25 $\mu\text{g}/\text{m}^3$                                              | Running annual mean | 31.12.2003                    |
|                                                  | 5.00 $\mu\text{g}/\text{m}^3$                                               | Running annual mean | 31.12.2010                    |
| <b>1,3-Butadiene</b>                             | 2.25 $\mu\text{g}/\text{m}^3$                                               | Running annual mean | 31.12.2003                    |
| <b>Carbon monoxide</b>                           | 10.0 $\text{mg}/\text{m}^3$                                                 | Running 8-hour mean | 31.12.2003                    |
| <b>Lead</b>                                      | 0.5 $\mu\text{g}/\text{m}^3$                                                | Annual mean         | 31.12.2004                    |
|                                                  | 0.25 $\mu\text{g}/\text{m}^3$                                               | Annual mean         | 31.12.2008                    |
| <b>Nitrogen dioxide</b>                          | 200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year   | 1-hour mean         | 31.12.2005                    |
|                                                  | 40 $\mu\text{g}/\text{m}^3$                                                 | Annual mean         | 31.12.2005                    |
| <b>Particles (PM<sub>10</sub>) (gravimetric)</b> | 50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year  | 24-hour mean        | 31.12.2004                    |
|                                                  | 40 $\mu\text{g}/\text{m}^3$                                                 | Annual mean         | 31.12.2004                    |
| <b>Sulphur dioxide</b>                           | 350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year | 1-hour mean         | 31.12.2004                    |
|                                                  | 125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year  | 24-hour mean        | 31.12.2004                    |
|                                                  | 266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year | 15-minute mean      | 31.12.2005                    |

## 1.4 Summary of Previous Review and Assessments

**Table 1.2 Summary of previous reviews and assessments**

| Authority | Reports produced                                        | Dates produced | Report conclusions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SBDC      | 1 <sup>st</sup> stage air quality review                | 1999/2000      | CO / 1,3 butadiene / SO <sub>2</sub> / Benzene unlikely to exceed objectives anywhere in district. NO <sub>2</sub> / PM <sub>10</sub> to proceed to 2 <sup>nd</sup> stage                                                                                                                                                                                                                                                                                                                                                               |
| SBDC      | Air Quality review & assessment (2 <sup>nd</sup> stage) | April 2000     | Concluded 3 <sup>rd</sup> stage review for NO <sub>2</sub> & PM <sub>10</sub> 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 <sub>2</sub> ) and particulate matter (PM <sub>10</sub> ) were in danger of being breached. However objectives for CO / SO <sub>2</sub> / 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 <sub>10</sub> 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 <sub>x</sub> levels are generally the major contributor to ambient NO <sub>x</sub> 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 <sub>x</sub> . However, there are two large sources of NO <sub>x</sub> over which the council has some control: <ul style="list-style-type: none"> <li>■ Cars and HGVs travelling along the roads in question are major source</li> </ul> |

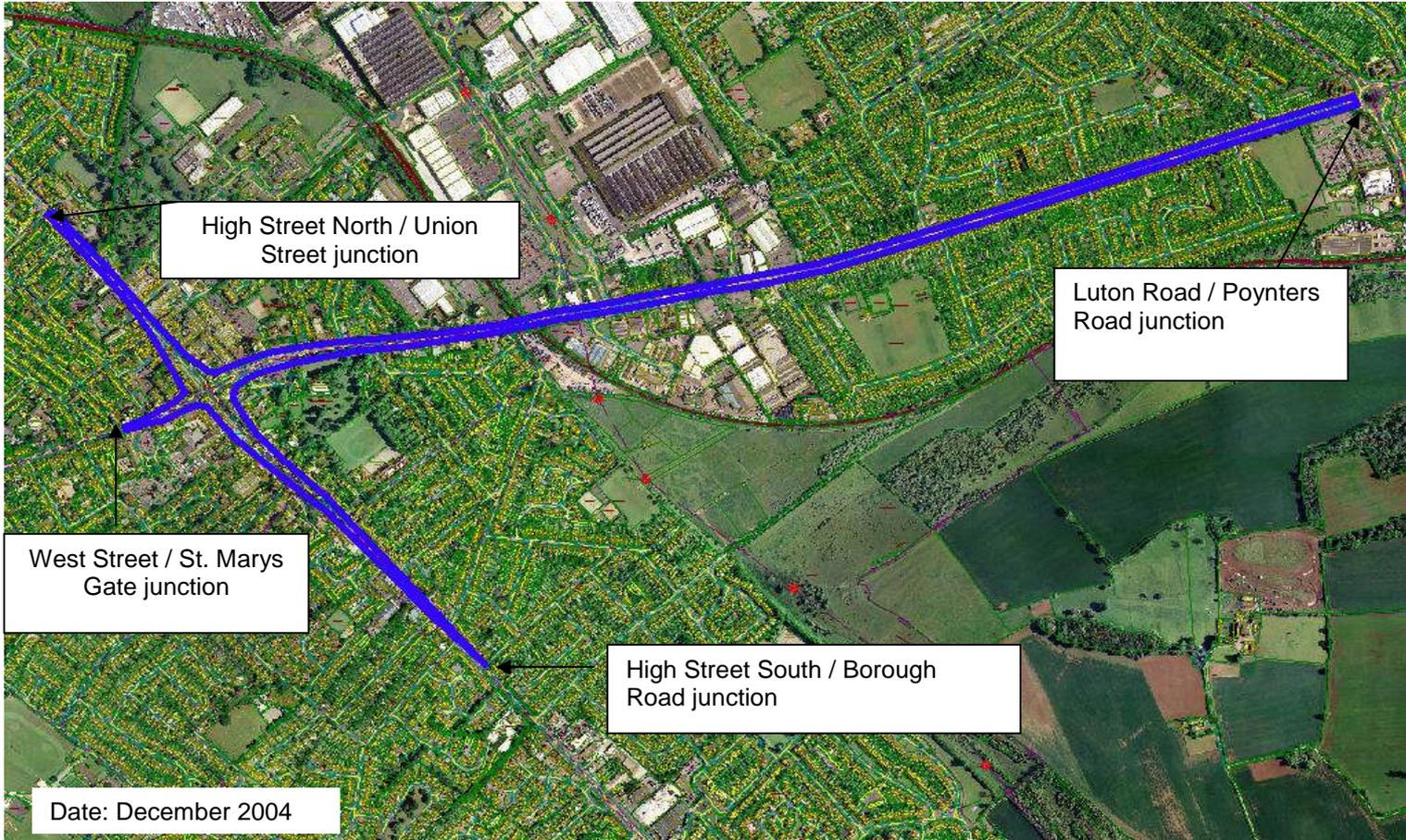
|      |                                                  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|--------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                  |          | <p>of NO<sub>x</sub>. In particular, HGVs are responsible for a large portion of these emissions despite their relatively small flows.</p> <ul style="list-style-type: none"> <li>■ Buses idling at stops contribute large amounts of NO<sub>x</sub> to the immediate surroundings and create small areas of high concentrations that may affect nearby buildings.</li> </ul> <p>Reductions in NO<sub>2</sub> 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<sup>3</sup>.</p> |
| 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 <sub>2</sub> objective likely to be exceeded at 4 receptors out of six. NO <sub>2</sub> hourly objectives unlikely to be breached.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| MBDC | 1 <sup>st</sup> 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 <sub>2</sub> ) and PM <sub>10</sub> were in danger of being breached.                                                                                                                                                                                                                                                                                        |
| MBDC | Detailed Assessment                              | 2004     | Concentrated on ground level ambient concentrations of SO <sub>2</sub> as a result of emissions from Stewartby Brickworks and levels of NO <sub>2</sub> / 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 <sub>2</sub> levels around the brickworks and that more monitoring was required for the A1 Sandy roundabout junction to more accurately assess current levels of NO <sub>2</sub> .                                                                                                             |
| 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 <sub>10</sub> ) 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 <sub>2</sub> 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 AQMA be declared in Sandy and Chalton, both in relation to the annual NO <sub>2</sub> 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 <sub>2</sub> have dropped off dramatically. The data from the Marston Vale Forest Centre indicates that the peaks do not rise above 40 mg/m <sup>3</sup> as a 15 minute average, clearly below the objective level. Additionally, both the 1hour mean and 24hour mean SO <sub>2</sub> 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 <sub>2</sub> 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 1<sup>st</sup> April 2009)

### Figure 1.1 Map of AQMA Boundaries

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.

Central Bedfordshire Council has two realtime analysers sited in Sandy (monitoring NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) and in Marston Moretaine (monitoring Ozone).

The Air Quality Monitoring Station at Dunstable (Dunstable Background) has been decommissioned following continuing breakdown of the old equipment. A new location for a realtime monitoring station has been proposed and work is in progress to obtain permission and install the equipment on site as soon as practicable.

In addition a network of NO<sub>2</sub> 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<sub>10</sub> TEOM and also the installation of a PM<sub>2.5</sub> FDMS TEOM. Data capture for the site was 93% in 2008; 73% in 2009 and 96% in 2010 for NO<sub>2</sub> and 99% in 2008; 91% in 2009 and 86% in 2010 for particulates. NO<sub>2</sub> is measured using an API chemiluminescent NO<sub>x</sub> 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 is ratified by ERG to the AURN standard and QA/QC visits are carried out by Casella at this site.

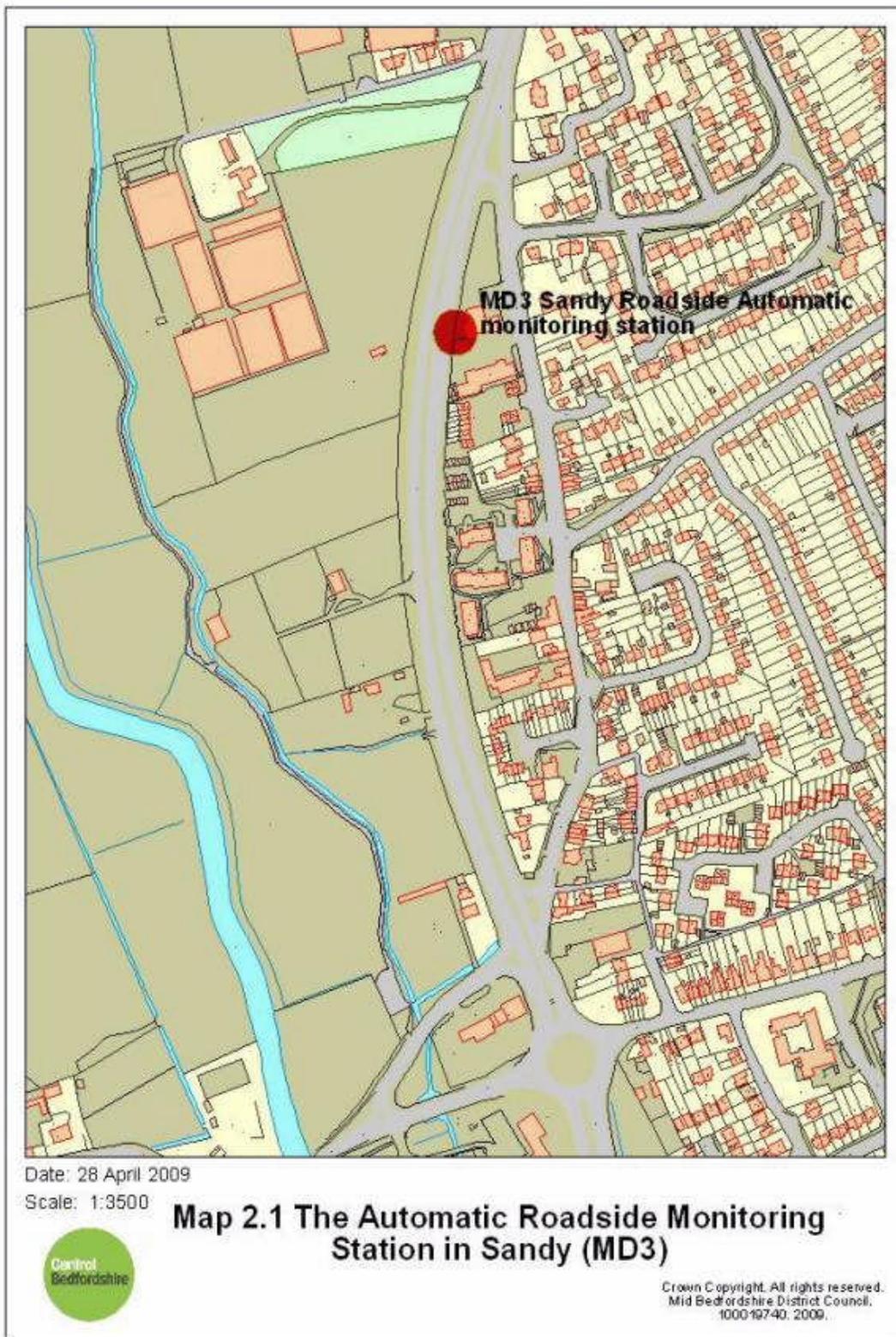
The ozone analysers at the Marston Vale are calibrated every 4 weeks by the local authority. The data from the Marston Vale site is ratified to the HBAQN network standard.

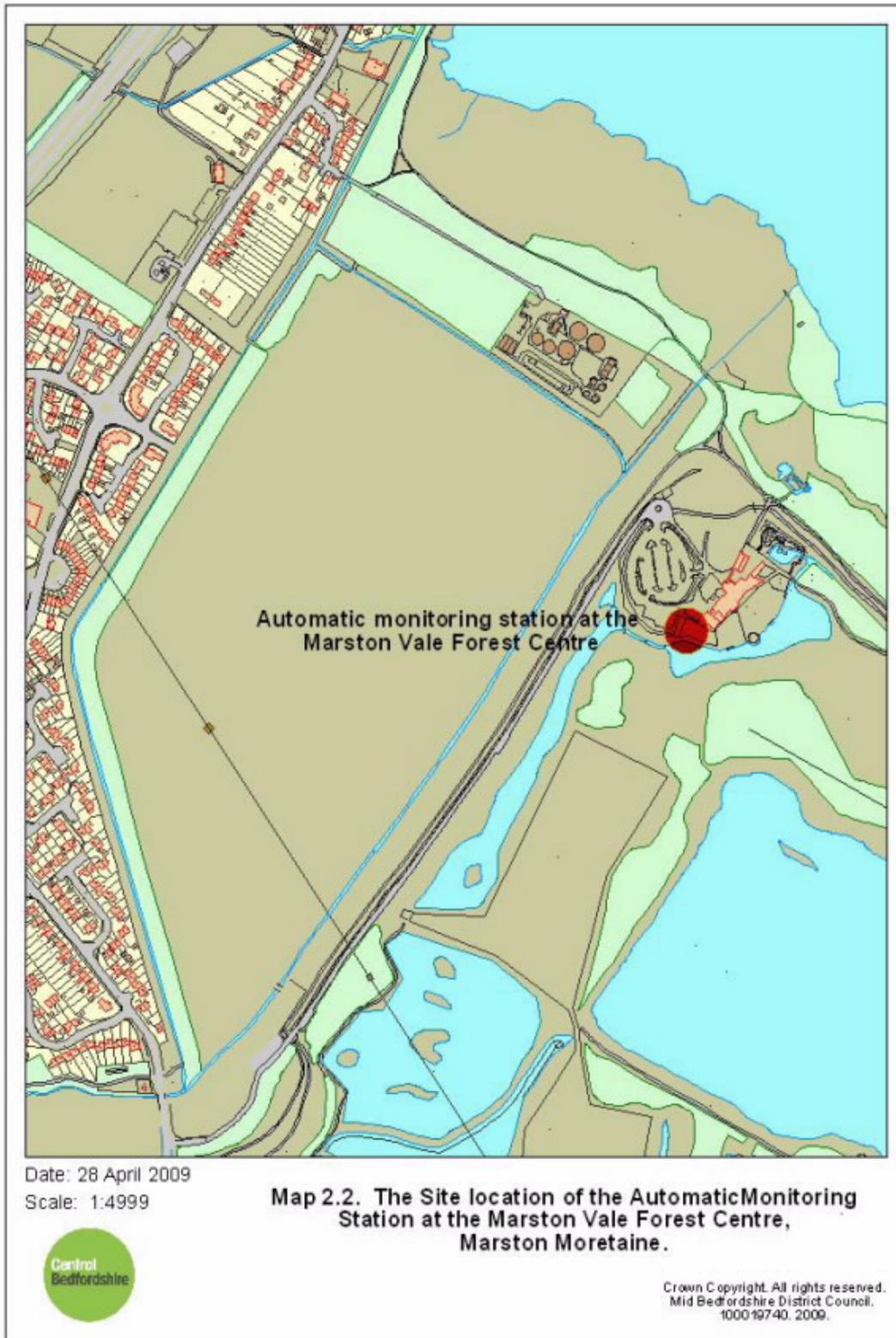
Automatic measurements of PM<sub>10</sub> were made using the Tapered Element Oscillating Microbalance (TEOM) method. The NO<sub>x</sub> and PM<sub>10</sub> instruments are subject to UKAS accredited audit by the AEA Technology four times a year.

See Appendix 4 for details of QA/QC.

In this report PM<sub>10</sub> results from the Dunstable Realtime Analyser have been adjusted using the King's College Volatile Correction Model (VCM) to correct data measured using a Tapered Element Oscillating Microbalance (TEOM). See Appendix 5.

**Figure 2.1 Map(s) of Automatic Monitoring Sites**





**Table 2.1 Details of Automatic Monitoring Sites**

| Site Name     | Site Type | OS Grid Ref |         | Pollutants Monitored                      | Monitoring Technique          | In AQMA ? | Relevant Exposure?<br>(Y/N with distance (m) to relevant exposure) | Distance to kerb of nearest road<br>(N/A if not applicable) | Does this location represent worst-case exposure? |
|---------------|-----------|-------------|---------|-------------------------------------------|-------------------------------|-----------|--------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------|
| Marston (MD4) | Rural     | X500445     | Y241670 | O <sub>3</sub>                            | ultra-violet fluorescence     | N         | N/A                                                                | N/A                                                         | N                                                 |
| Sandy (MD3)   | Roadside  | X516436     | Y249600 | NO / PM <sub>10</sub> / PM <sub>2.5</sub> | Chemiluminescence / FDMS TEOM | N         | N                                                                  | 4m                                                          | N                                                 |

### 2.1.2 Non-Automatic Monitoring

In addition to the continuous monitors, Central Bedfordshire Council measures nitrogen dioxide using 40 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<sub>2</sub>) measured at sites in 2009. 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/](http://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.

**Table 2.2 Details of Non- Automatic Monitoring Sites (NO<sub>2</sub>)**

| Site Name                      | Site Type | OS Grid Ref |             | In AQMA? | Relevant Exposure?<br>relevant exposure distance (m) | Distance to kerb<br>of nearest road | Worst-case<br>Location? |
|--------------------------------|-----------|-------------|-------------|----------|------------------------------------------------------|-------------------------------------|-------------------------|
| A1 Sandy                       | Kerbside  | X 516482    | Y 249212    | N        | Y (3m)                                               | 1m                                  |                         |
| Rose Lane,<br>Biggleswade      | Kerbside  | X 519161    | Y 244651    | N        | Y (4m)                                               | 1m                                  |                         |
| High Street,<br>Biggleswade    | Kerbside  | X 518991    | Y<br>244596 | N        | N                                                    | 1m                                  |                         |
| A1, Beeston                    | Kerbside  | X 517162    | Y 248188    | N        | Y (2m)                                               | 1 m                                 |                         |
| M1, Tingrith                   | Kerbside  | X 501043    | Y 232825    | N        | Y (15m)                                              | 13 m                                |                         |
| Station Road,<br>Temsford      | Kerbside  | X 516277    | Y 253855    | N        | N                                                    | 1m                                  |                         |
| Bedford Road,<br>Sandy         | Kerbside  | X 516619    | Y 249100    | N        | Y (6m)                                               | 2m                                  |                         |
| Highfield Cres,<br>Brogborough | Kerbside  | X 496330    | Y 238300    | N        | Y (10m)                                              | 4m                                  |                         |
| M1, Warren<br>Farm             | Kerbside  | X 500200    | Y 234519    | N        | N                                                    | 36m                                 |                         |
| Hunts Car<br>Company, A1       | Kerbside  | X 516448    | Y 249685    | N        | Y (4m)                                               | 1m                                  |                         |
| Hunts Car<br>Company, A1       | Kerbside  | X 516479    | Y 249704    | N        | N                                                    | 2m                                  |                         |
| Market Square                  | Kerbside  | X 517310    | Y 249228    | N        | Y (3m)                                               | 1m                                  |                         |
| NO <sub>x</sub> co-loc         | Kerbside  | X 516436    | Y 249599    | N        | N                                                    | 4m                                  |                         |
| NO <sub>x</sub> co-loc         | Kerbside  | X 516436    | Y 249599    | N        | N                                                    | 4m                                  |                         |
| NO <sub>x</sub> co-loc         | Kerbside  | X 516436    | Y 249599    | N        | N                                                    | 4m                                  |                         |
| Battlesden                     | Kerbside  | X 495944    | Y 229191    | N        | N                                                    | 1 m                                 |                         |
| Bedford Rd,<br>Sandy 1         | Kerbside  | X 516593    | Y 249083    | N        | Y (12m)                                              | 3m                                  |                         |
| Bedford Rd,<br>Sandy 2         | Kerbside  | X 516569    | Y 249074    | N        | Y (8m)                                               | 2m                                  |                         |
| Eddie's Cott                   | Kerbside  | X 516579    | Y 249078    | N        | Y (0m)                                               | 11m                                 |                         |
| Doorway                        | Kerbside  | X 516582    | Y 249078    | N        | Y (1m)                                               | 3m                                  |                         |

| Site Name              | Site Type      | OS Grid Ref |          | In AQMA | Relevant exposure distance (m) | Distance to kerb of nearest road | Worst case Location |
|------------------------|----------------|-------------|----------|---------|--------------------------------|----------------------------------|---------------------|
| 01 - HSS               | Kerbside       | X 501925    | Y 221829 | Y       | N                              | 1m                               | Y                   |
| 03 - Mardale           | Kerbside       | X 502023    | Y 220725 | N       | Y (3m)                         | 1m                               | N                   |
| 05 - Rowley            | Urban Backgrnd | X 491014    | Y 225777 | N       | Y (in garden)                  | 10m                              | N                   |
| 06 – Barton            | Kerbside       | X 508064    | Y 230873 | N       | Y (5m)                         | 2m                               | N                   |
| 07 – Slip End          | Kerbside       | X 507696    | Y 218374 | N       | Y (3m)                         | 2m                               | N                   |
| 08 – Vimy Rd,          | Kerbside       | X 491642    | Y 225009 | N       | N                              | 2m                               | Y                   |
| 10 – Houghton          | Kerbside       | X 501988    | Y 223954 | N       | N                              | 2m                               | Y                   |
| 13 – Tebworth          | Rural Backgrnd | X 499542    | Y 226940 | N       | N                              | 30m                              | N                   |
| 14 – S'springs         | Rural Backgrnd | X 500525    | Y 218839 | N       | N                              | 50m                              | N                   |
| 15 – Todd'ton          | Kerbside       | X 500946    | Y 228711 | N       | Y (3m)                         | 3m                               | N                   |
| 16 – London / Beech    | Kerbside       | X 503232    | Y 220481 | N       | N                              | 2m                               | N                   |
| 17 – London / Mayfield | Kerbside       | X 502848    | Y 220829 | N       | Y (5m)                         | 3m                               | Y                   |
| 18 - Argos             | Kerbside       | X 501705    | Y 222089 | Y       | N                              | 2m                               | Y                   |
| 19 - SBDC              | Kerbside       | X 501238    | Y 222580 | N       | N                              | 1m                               | N                   |
| 20 - Court Dr          | Kerbside       | X 501797    | Y 222200 | N       | Y (8m)                         | 3m                               | N                   |
| 21 - Frenchs           | Kerbside       | X 500790    | Y 223047 | N       | Y (5m)                         | 3m                               | N                   |
| 26 - West St,          | Kerbside       | X 501571    | Y221742  | N       | N                              | 2m                               | N                   |
| 27 - 89 Luton Rd       | Kerbside       | X 503214    | Y 222123 | Y       | Y (3m)                         | 3m                               | Y                   |
| 28 - Chalton           | Kerbside       | X 503764    | Y 261024 | N       | N                              | 2m                               | Y                   |
| 29 – Cedars / Mentmore | Kerbside       | X 491101    | Y 245377 | N       | Y (2m)                         | 2m                               | N                   |
| 30 - Lindler           | Kerbside       | X 492393    | Y 247896 | N       | Y (4m)                         | 2m                               | N                   |
| 31 - Hockliffe         | Kerbside       | X 497399    | Y 266768 | N       | Y (1m)                         | 3m                               | N                   |
| 32 - Periwinkle        | Kerbside       | X 502406    | Y 213072 | N       | Y (4m)                         | 3m                               | N                   |
| 33 - Church St         | Kerbside       | X 501961    | Y 218842 | Y       | Y (2m)                         | 5m                               | Y                   |
| 34 - 5 HSS             | Kerbside       | X 501910    | Y 218492 | Y       | Y (5m)                         | 1m                               | Y                   |
| 35 - Flint Court       | Kerbside       | X 501504    | Y 222784 | N       | Y (1m)                         | 5m                               | Y                   |
| 36- 247 Luton          | Kerbside       | X 503848    | Y 222325 | Y       | Y (3m)                         | 3m                               | Y                   |
| 37 - 32 Luton          | Kerbside       | X 502838    | Y 222071 | Y       | Y (4m)                         | 3m                               | Y                   |
| 38 - 274 HSN           | Kerbside       | X 500972    | Y 222887 | N       | Y (4m)                         | 2m                               | N                   |
| 39 – H'ton Rd          | Kerbside       | X 501151    | Y 222821 | N       | Y (3m)                         | 2m                               | N                   |
| 40a - West St          | Kerbside       | X 501029    | Y 221488 | N       | Y (3m)                         | 3m                               | N                   |
| 41 - Chalton X         | Kerbside       | X 503922    | Y 225855 | N       | Y (0.5m)                       | 8m                               | Y                   |
| 42 - Halifax           | Kerbside       | X 501809    | Y 221966 | Y       | N                              | 3m                               | Y                   |
| 43 - High St           | Kerbside       | X 491964    | Y 224987 | N       | Y (1m)                         | 1m                               | Y                   |
| 45 – Bil'ton Rd        | Kerbside       | X 492544    | Y 224600 | N       | Y (3m)                         | 2m                               | N                   |

|                |                  |          |          |   |          |    |   |
|----------------|------------------|----------|----------|---|----------|----|---|
| 46 - Church Rd | Kerbside         | X 508194 | Y 218760 | N | N        | 2m | N |
| 47 – Clipstone | Rural<br>backgnd | X 493958 | Y227012  | N | N        | 1m | N |
| RPS – 28 HSS   | Kerbside         | X 501932 | Y 221801 | Y | Y (0.5m) | 3m | Y |

The Alfred Street (4) site closed in April 2010 due to access problems and the Halifax (42) site closed in June 2010 due to the tubes regularly going missing.

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide

A summary of the concentrations monitored during 2009 and 2010 are presented below.

#### Automatic Monitoring Data

**Table 2.3 - Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean & Hourly Objective**

| Site ID | Location | Within AQMA? | % Data capture |      | Annual mean concentration ( $\mu\text{g}/\text{m}^3$ ) |      | No of exceedences of hourly mean ( $200\mu\text{g}/\text{m}^3$ ) If less than 90% of a full year inc 99.8 <sup>th</sup> %ile in ( ) |      |
|---------|----------|--------------|----------------|------|--------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------|------|
|         |          |              | 2009           | 2010 | 2009                                                   | 2010 | 2009                                                                                                                                | 2010 |
| MD3     | A1 Sandy | N            | 73             | 96   | 44                                                     | 38   | 0 (142.1)                                                                                                                           | 1    |

#### Exceedence of the air quality objectives highlighted in red

As can be seen from Table 2.3 the Sandy site recorded an annual mean concentration of  $\text{NO}_2$  over the Air Quality Objective level ( $44\mu\text{g}/\text{m}^3$ ) in 2009. However both sites show levels within the hourly mean objective.

The Marston Vale site does not monitor  $\text{NO}_2$ .

## Diffusion Tube Monitoring Data

Table 2.4 - Results of NO<sub>2</sub> Diffusion Tube monitoring

| Site ID | Location                       | Within AQMA? | Data Capture% |      | Annual mean concentrations             |      |                                |             |
|---------|--------------------------------|--------------|---------------|------|----------------------------------------|------|--------------------------------|-------------|
|         |                                |              | 2009          | 2010 | Adjusted for bias (µg/m <sup>3</sup> ) |      | Adjusted for receptor distance |             |
|         |                                |              |               |      | 2009                                   | 2010 | 2009                           | 2010        |
| N1      | A1, Sandy                      | N            | 100           | 100  | 45                                     | 47   | 38.0                           | 39.3        |
| N2      | Rose Lane, Biggleswade         | N            | 100           | 92   | 27                                     | 27   | -                              | -           |
| N3      | High St, Biggleswade           | N            | 92            | 100  | 37                                     | 42   | No exposure                    | No exposure |
| N4      | A1, Beeston                    | N            | 100           | 100  | 38                                     | 42   | -                              | 37.8        |
| N6      | Bedford Road, Sandy            | N            | 100           | 92   | 35                                     | 41   | -                              | 33.6        |
| N7      | Highfield Crescent Brogborough | N            | 92            | 100  | 40                                     | 42   | 33.8                           | 35.0        |
| N9      | A1 London Rd North 1           | N            | 100           | 100  | 37                                     | 46   | No exposure                    | No exposure |
| N10     | A1 London Rd North 2           | N            | 100           | 92   | 26                                     | 30   | -                              | -           |
| N12     | A1, Hunts Car Company 1        | N            | 100           | 100  | 36                                     | 37   | -                              | -           |
| N13     | Collocated with N12            | N            | 100           | 100  | 36                                     | 39   | -                              | -           |
| N14     | Collocated with N12            | N            | 100           | 100  | 35                                     | 37   | -                              | -           |
| N15     | Battlesden                     | N            | 100           | 92   | 13                                     | 15   | -                              | -           |
| N16     | Bedford Road, Sandy (South 1)  | N            | 92            | 100  | 37                                     | 41   | -                              | 30.7        |
| N17     | Bedford Road, Sandy (South 2)  | N            | 92            | 100  | 43                                     | 44   | 33.3                           | 33.7        |
| N18     | Eddies Cottage, Sandy          | N            | 92            | 100  | 32                                     | 36   | -                              | -           |
| N19     | 53/55 Bedford Rd, Sandy        | N            | 100           | 100  | 39                                     | 41   | -                              | 38.9        |

N.B. Bias adjustment factor for 2009 in Mid Beds DC is 0.86 & 0.92 for 2010

| Site ID | Location                  | Within AQMA? | Data Capture% |      | Annual mean concentrations                     |       |                                |             |
|---------|---------------------------|--------------|---------------|------|------------------------------------------------|-------|--------------------------------|-------------|
|         |                           |              | 2009          | 2010 | Adjusted for bias ( $\mu\text{g}/\text{m}^3$ ) |       | Adjusted for receptor distance |             |
|         |                           |              |               |      | 2009                                           | 2010  | 2009                           | 2010        |
| SB01    | High St South, Dunstable  | Y            | 83            | 100  | 37.82                                          | 49.58 | No exposure                    | No exposure |
| SB02    | Church Close, Dunstable   | N            | 83            | -    | 24.07                                          | -     | -                              | -           |
| SB03    | Mardale Ave, Dunstable    | N            | 83            | 83   | 15.46                                          | 20.53 | -                              | -           |
| SB05    | Rowley Furrows, L/B       | N            | 75            | 92   | 13.37                                          | 14.90 | -                              | -           |
| SB06    | Barton                    | N            | 83            | 100  | 23.05                                          | 26.11 | -                              | -           |
| SB07    | Slip End                  | N            | 83            | 100  | 18.76                                          | 22.29 | -                              | -           |
| SB08    | Vimy Rd, L/Buzzard        | N            | 83            | 92   | 28.36                                          | 29.04 | -                              | -           |
| SB09    | Vandyke Rd, L/Buzzard     | N            | 83            | -    | 17.65                                          | -     | -                              | -           |
| SB10    | Houghton Regis            | N            | 83            | 83   | 33.26                                          | 32.01 | -                              | -           |
| SB13    | Tebworth                  | N            | 75            | 100  | 12.87                                          | 13.74 | -                              | -           |
| SB14    | Sallowsprings, Whipsnade  | N            | 83            | 100  | 10.72                                          | 15.06 | -                              | -           |
| SB15    | Toddington                | N            | 83            | -    | 22.40                                          | -     | -                              | -           |
| SB16    | London/Beech Rd, Duns     | N            | 67            | -    | 30.77                                          | -     | -                              | -           |
| SB17    | London/Mayfield Rd, Du    | N            | 75            | 100  | 33.97                                          | 38.70 | -                              | -           |
| SB18    | Argos, High St North, Du  | Y            | 75            | 100  | 40.57                                          | 46.19 | No exposure                    | No exposure |
| SB19    | SBDC, High St North, Du   | N            | 83            | -    | 37.59                                          | -     | -                              | -           |
| SB20    | Court Drive, Dunstable    | N            | 83            | 100  | 27.10                                          | 30.15 | -                              | -           |
| SB21    | Frenchs Ave, Dunstable    | N            | 83            | 92   | 32.70                                          | 35.55 | -                              | -           |
| SB26    | West St, Dunstable        | N            | 83            | 100  | 30.20                                          | 33.37 | -                              | -           |
| SB27    | 89 Luton Rd, Dunstable    | Y            | 83            | 100  | 32.89                                          | 39.29 | -                              | -           |
| SB28    | Luton Rd, Chalton         | N            | 83            | 100  | 47.21                                          | 48.89 | No exposure                    | No exposure |
| SB29    | Cedars/Mentmore, Lins     | N            | 83            | -    | 25.57                                          | -     | -                              | -           |
| SB30    | Lindler Court, L/B        | N            | 75            | -    | 21.95                                          | -     | -                              | -           |
| SB31    | White Horse Cl, Hockliffe | N            | 83            | -    | 26.66                                          | -     | -                              | -           |
| SB32    | Periwinkle Lane, Dunsta   | N            | 58            | -    | 24.60                                          | -     | -                              | -           |
| SB33    | Church St, Dunstable      | Y            | 83            | 100  | 41.82                                          | 45.03 | 39.1                           | 41.9        |
| SB34    | 5 High St South, Dunsta   | Y            | 83            | 100  | 49.22                                          | 49.84 | 36.8                           | 38.1        |
| SB35    | Flint Court, Dunstable    | N            | 83            | 100  | 36.40                                          | 39.91 | -                              | 31.1        |
| SB36    | 247 Luton Rd, Dunstable   | Y            | 67            | 83   | 39.44                                          | 41.95 | -                              | 37.4        |
| SB37    | 32 Luton Rd, Dunstable    | Y            | 83            | 100  | 42.23                                          | 47.89 | 35.9                           | 41.6        |
| SB38    | 274 High St North, Duns   | N            | 83            | -    | 31.64                                          | 39.35 | -                              | 32.5        |
| SB39    | Houghton Rd, Dunstable    | N            | 83            | 100  | 36.26                                          | 40.48 | -                              | 35.1        |
| SB40a   | Catchacre (West St), Du   | N            | 83            | -    | 25.52                                          | -     | -                              | -           |
| SB41    | Chalton X Cott, Chalton   | N            | 83            | 100  | 40.32                                          | 43.46 | 39.8                           | 42.9        |
| SB42    | Halifax Dunstable         | Y            | 50            | 58   | 43.02                                          | -     | No exposure                    | -           |
| SB43    | High St, Leighton Buzzar  | N            | 83            | -    | 23.60                                          | -     | -                              | -           |
| SB45    | Billington Rd, Leighton B | N            | 83            | -    | 26.62                                          | -     | -                              | -           |
| SB46    | Church Rd, Slip End       | N            | 83            | -    | 24.82                                          | -     | -                              | -           |
| SB47    | Clipstone                 | N            | 83            | 100  | 13.19                                          | 16.04 | -                              | -           |

NB – bias adjustment factor 2009 = 0.90 (gained from review & assessment website)

Bias adjustment factor 2010 = 0.92 (gained from review & assessment website April 2010)

Text in red highlights exceedences of the Air Quality Objective

2009 low data collection due to bad weather and missing tubes - no sites can be annualised in accordance with Technical Guidance LAQM.TG(09) as data capture for all suitable sites in 2009 is less than 90% - therefore 2009 data is for information only.

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 which remained over the objective level in 2010 – 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.

No sites recorded levels of above  $60\mu\text{g}/\text{m}^3$  and therefore all are unlikely to exceed the hourly objective level.

Locations of  $\text{NO}_2$  diffusion tube monitoring sites can be seen in Appendix 2.

Monthly results can be seen in Appendix 3

### 2.2.2 PM<sub>10</sub>

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<sub>2</sub> 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<sub>10</sub>. It was found that PM<sub>10</sub> 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<sub>2</sub> annual objective) monitoring NO<sub>2</sub>, NO, NO<sub>x</sub> and PM<sub>10</sub> has now been decommissioned due to equipment breakdown.

**Table 2.5a Results of PM<sub>10</sub> Automatic Monitoring: Comparison with Annual Mean Objective**

| Site ID | Location     | Within AQMA? | Data Capture for full calendar year % |           | Annual mean concentrations (µg/m <sup>3</sup> ) |      |
|---------|--------------|--------------|---------------------------------------|-----------|-------------------------------------------------|------|
|         |              |              | 2009                                  | 2010      | 2009                                            | 2010 |
|         |              |              | MD3                                   | A1, Sandy | N                                               | 91   |
| SB1     | A5 Dunstable | N            | 96                                    | -         | 19                                              | -    |

**Table 2.5b Results of PM<sub>10</sub> Automatic Monitoring: Comparison with 24-hour Mean Objective**

| Site ID | Location     | Within AQMA? | Data Capture 2009 % | Data Capture 2010 % | Number of Exceedences of daily mean objective (50 µg/m <sup>3</sup> )                      |        |
|---------|--------------|--------------|---------------------|---------------------|--------------------------------------------------------------------------------------------|--------|
|         |              |              |                     |                     | If data capture < 90%, include the 90 <sup>th</sup> percentile of daily means in brackets. |        |
|         |              |              |                     |                     | 2009                                                                                       | 2010   |
| MD3     | A1, Sandy    | N            | 91                  | 86                  | 0                                                                                          | 2 (32) |
| SB1     | A5 Dunstable | N            | 96                  | -                   | 1                                                                                          | -      |

### **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 28<sup>th</sup> 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<sub>2</sub> continued for a period after the closure of the brickworks and showed that SO<sub>2</sub> concentrations met the air quality objectives. The MD4 site ceased monitoring SO<sub>2</sub> in April 2009.

There were no exceedences of any of the SO<sub>2</sub> 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.

### **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**

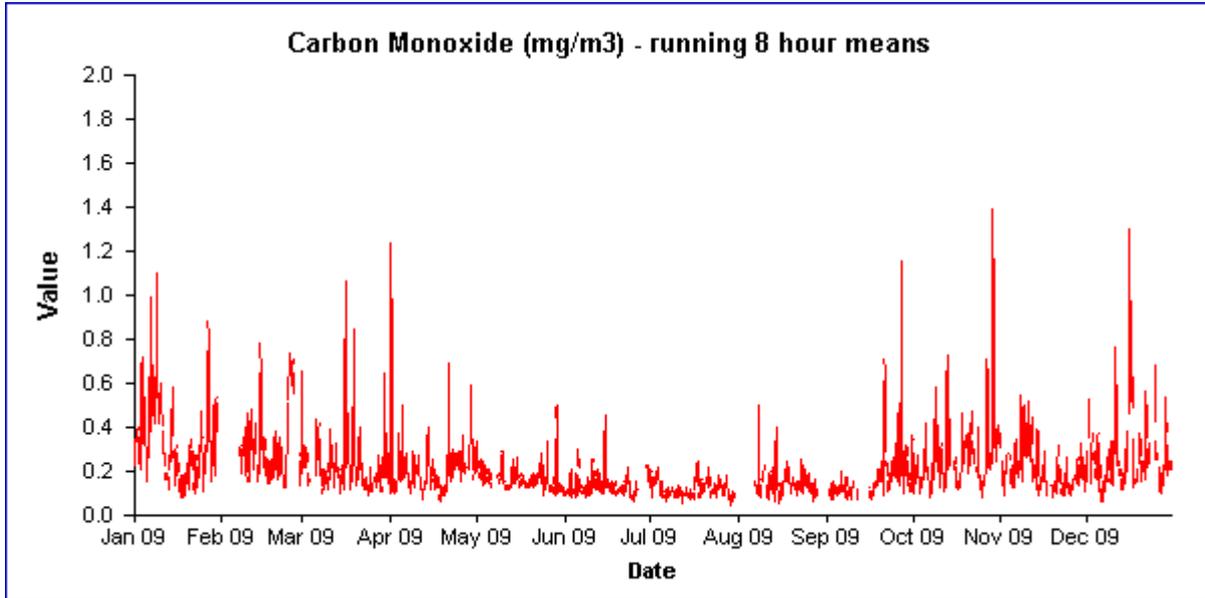
#### **2.2.5.i Carbon Monoxide (CO)**

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

A plot of running 8hour mean carbon monoxide concentrations monitored at the one Hertfordshire and Bedfordshire Network site can be seen in Graphs 2.1 and 2.2.

Graph 2.1

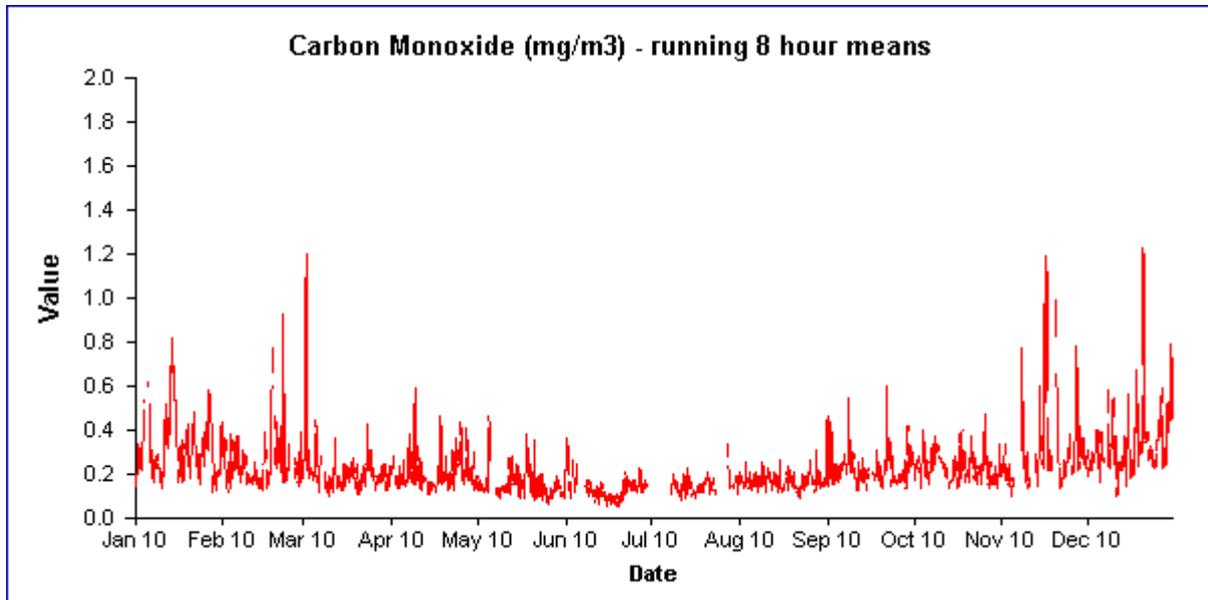
**View Period: 1-jan-2009 to 31-dec-2009**



**Key:** Luton - Challney Community College

Graph 2.2

**View Period: 1-jan-2010 to 31-dec-2010 (Fully Ratified)**



**Key:** Luton - Challney Community College

Data shows that the objective for carbon monoxide has been achieved

### **2.2.5.ii 1,3 Butadiene**

The Government and the Devolved Administrations have adopted a maximum running annual mean concentration of  $2.25\mu\text{g}/\text{m}^3$  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.

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  $0.5\mu\text{g}/\text{m}^3$  to be achieved by the end of 2004 and  $0.25\mu\text{g}/\text{m}^3$  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  $0.06\mu\text{g}/\text{m}^3$ , 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<sub>3</sub>)**

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.

| Pollutant                    | Air Quality Objective          |                                                                                                      | Date to be achieved by |
|------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------|------------------------|
|                              | Concentration                  | Measured as                                                                                          |                        |
| <b>Ozone (O<sub>3</sub>)</b> | 100 µg/m <sup>3</sup> (50 ppb) | Running 8 hour mean daily maximum of running 8hr mean not to be exceeded more than 10 times per year | <b>31/12/2005</b>      |

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

Unlike all of the other pollutants, ozone (O<sub>3</sub>) concentrations across the network have seen a steady increase over the last nine years and this helps to indicate why the reduction in NO<sub>x</sub> is not being directly translated into a similar reduction in NO<sub>2</sub>. 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.

**Table 2.7 Air Quality Strategy Objectives Generated for the 12 month period commencing 1-jan-2009**

| Pollutant                          | Objective                                                     | Result | Achieved Objective? |
|------------------------------------|---------------------------------------------------------------|--------|---------------------|
| <b>Central Beds - Marston Vale</b> |                                                               |        |                     |
| Ozone                              | No more than 10 days where maximum rolling 8hr mean >100ug/m3 | 27     | NO                  |

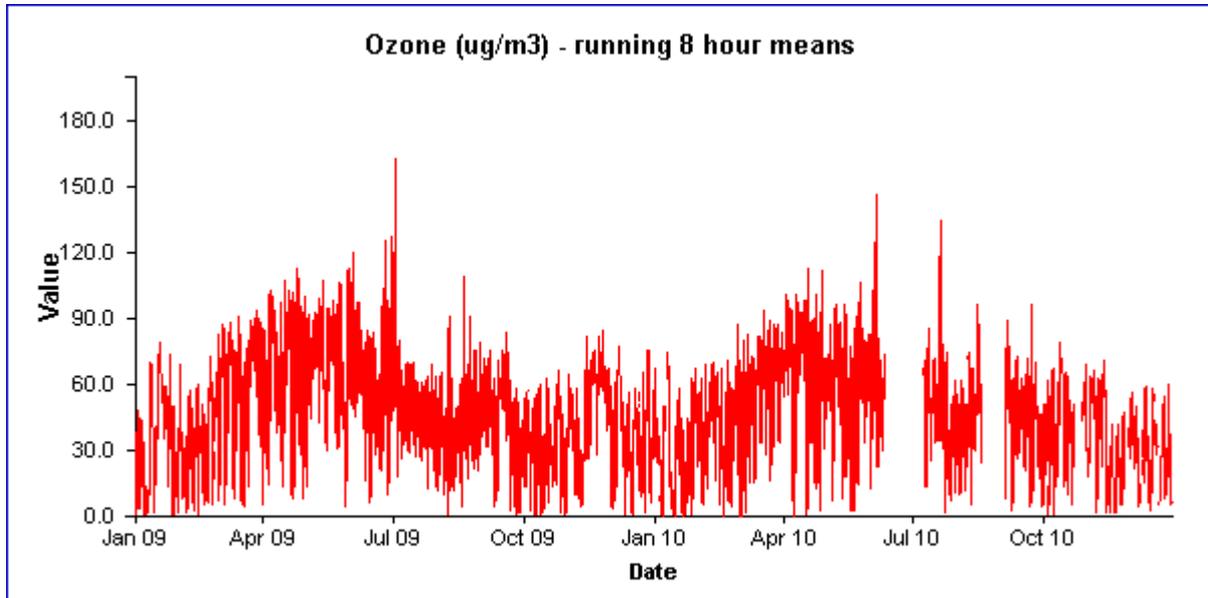
**Table 2.8 Air Quality Strategy Objectives Generated for the 12 month period commencing 1-jan-2010**

| Pollutant                                                                                                                                                                                       | Objective                                                     | Result | Achieved Objective? |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------|---------------------|
| <b>Central Beds - Marston Vale</b>                                                                                                                                                              |                                                               |        |                     |
| Ozone                                                                                                                                                                                           | No more than 10 days where maximum rolling 8hr mean >100ug/m3 | 12     | NO                  |
| Warning: Central Beds - Marston Vale - Ozone achieved a capture rate less than 90% for the year (83%). Results may not be representative of the full year and should be used for guidance only. |                                                               |        |                     |

Graph 2.3 shows the monitoring results for O<sub>3</sub> at the Marston Vale site

Graph 2.3

View Period: 1-jan-2009 to 31-dec-2010 (Fully Ratified)

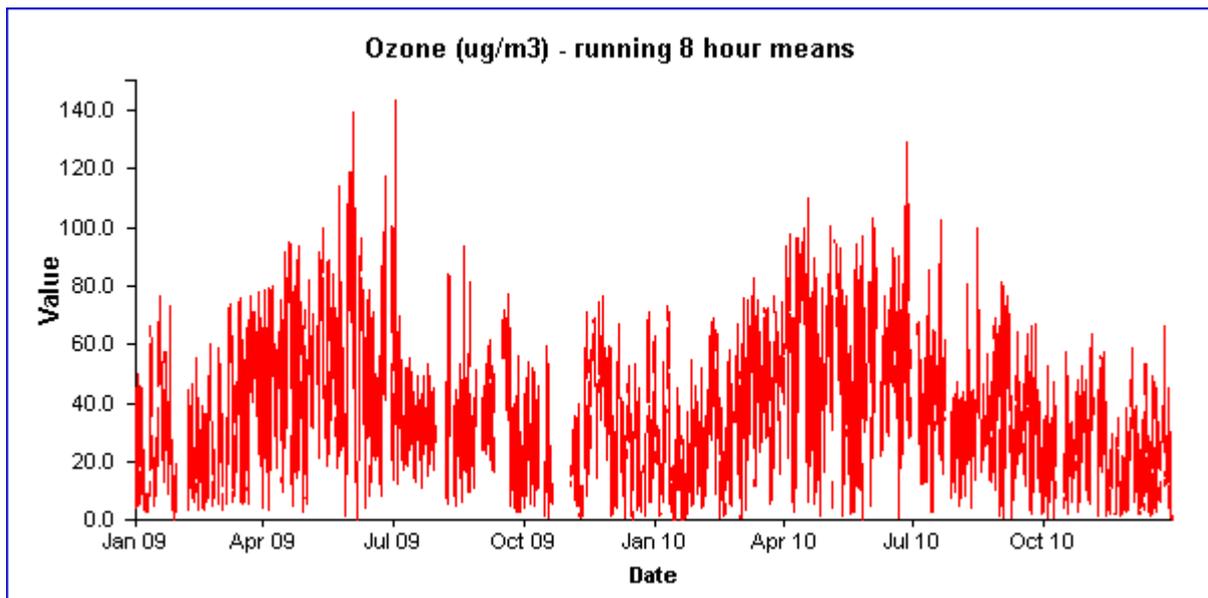


Key: Central Beds - Marston Vale

Graph 2.4 shows the results from 1 of the Herts & Bedfordshire sites (not within Central Bedfordshire Councils district) in 2009 & 2010, which shows the breaches of the objectives.

Graph 2.4

View Period: 1-jan-2009 to 31-dec-2010 (Fully Ratified)



Key: Luton - Challney Community College

The pattern of rising ozone levels is common across the UK. There are a number of possible reasons why, despite falling NO<sub>x</sub> 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<sub>x</sub>. 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 Air Quality Objectives**

Central Bedfordshire Council has measured concentrations of NO<sub>2</sub> 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<sub>2</sub> objective. This work is currently in progress.

## 3 New Local Developments

### 3.1 Road Traffic Sources

#### **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), 2 roads (Bedford Street and Dunstable Street, Amphill) were identified as being narrow congested streets with a flow of above 5,000 vehicles per day and residential properties close to the kerb. As a result monitoring is being carried out at the locations and checks being made to ascertain relevant exposure. Additionally work is in progress to declare an AQMA in this location.

There have been no additional 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 Updating and Screening Assessment.
- Roads with significantly changed traffic flows.
- Bus or coach stations.

### 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 15m.
- Locations with a large number of movements of diesel locomotives and potential long-term relevant exposure within 30m
- 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

#### 3.3.1 Industrial Installations

Central Bedfordshire Council has received proposals for a waste incinerator, which has included an air quality assessment, which is currently being reviewed.

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, or 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

within Central Bedfordshire Council's district.

### **3.5 New Developments with Fugitive or Uncontrolled Sources**

Central Bedfordshire Council has received proposals for a waste incinerator, which has included an air quality assessment, which is currently being reviewed.

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 the next Updating and Screening Assessment, scheduled for 2012.

## **4 Planning Applications**

There is currently one potential development that may have an impact on local air quality:

- A proposal for a planning application for a waste incinerator within Central Bedfordshire is currently being reviewed and a decision is expected soon.

## **5 Air Quality Planning Policies**

A new way of controlling and planning future developments was introduced in 2004. The Local Development Framework will replace the Local Plan as the way development is managed and our local environment and economy is protected over the next 20 years.

The current Local Plan for the South Area will continue to control development until 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.

As the Minerals and Waste planning authority, the Central Bedfordshire Council also has a statutory duty to prepare and review Minerals and Waste Development Framework.

There are two Local Development Frameworks for Central Bedfordshire - one for the North area (former Mid Bedfordshire area) and a joint one for the South area (Luton and former South Bedfordshire area).

## 6 Implementation of Action Plans

### 6.1 Dunstable AQMA

Previous rounds of review and assessment identified parts of Dunstable as needing to be declared as an AQMA in January 2005. Since then progress has been made to work towards improving the air quality within the AQMA. Before 1<sup>st</sup> April 2009, the Highways Agency who is responsible for the A5 and Bedfordshire County Council along with South Bedfordshire District Council produced an AQAP and work started on trying to reduce the pollution levels.

Since 1<sup>st</sup> April 2009, this work has been continued by Central Bedfordshire Council.

An Air Quality Action Plan was drafted by South Bedfordshire District Council in collaboration from colleagues/peers in Transport Strategy, Bedfordshire County Council Highways and the Highways Agency and submitted to Defra for comment in December 2006.

Air quality has not been considered in isolation as the wider social, economic and environmental considerations of proposed actions have been addressed and where possible integrated with wider plans/strategies.

Guidance on air quality action planning requires that the measures included in an AQAP should be ranked and prioritised based on their cost and overall benefit to local air quality. This has proved a difficult task to undertake for all the measures in the South Beds Action Plan as many of the general measures are statements of desired 'outcomes' achievable through a variety of different measures rather than specific schemes with easily quantifiable costs and benefits. In addition air quality issues are being addressed in the Local Transport Plan 2 (LTP2) .

The overall purpose of the key action points have been assigned with regards to six main improvement areas, these are:

1. Transport Planning
  - a. Reducing the need to travel
  - b. Encouraging walking/cycling
  - c. Encouraging use of public transport
  - d. Reducing number of trips within the AQMA
  - e. Improving traffic management and reducing congestion
  - f. Reducing emissions from heavy goods vehicles and buses
  - g. Encouraging use of alternative fuels and more efficient vehicles
2. Land-use Planning
  - a. Reducing the need to travel
  - b. Encouraging walking/cycling
  - c. Encouraging the use of public transport
  - d. Reducing number of trips within the AQMA
  - e. Improving traffic management and reducing congestion
  - f. sustainability
3. Energy Management
  - a. Encouraging use of alternative fuels and more efficient vehicles

- b. Encouraging energy efficiency – turning heating down, insulation, etc
- 4. Local Air Quality Management
  - a. Monitoring
  - b. Partnership working
  - c. Review and Assessment process
- 5. Pollution Control
  - a. Reducing emissions from non-transport related sources
    - i. Industrial emissions – LAPPC, Clean Air Act
    - ii. Nuisance – bonfires, fugitive dust sources, construction dust
- 6. Environmental Promotion
  - a. Dissemination of AQ information – website, consultation, press
  - b. Environmental campaigns

**Table 6.1 Action Plan Progress**

| No | Measure                                          | Focus                                                                                                                                                                                                | Lead authority                              | Indicator                                        | Target annual emission reduction in AQMA | 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.                                                                                                                                                                                                                        |
| 2  | Revise/enhance options for sustainable transport | Identify options to improve or introduce sustainable transport                                                                                                                                       | BCC now CBC                                 | Adopted policies and frequent review & amendment | <1%                                      | SBDC policies developed                                                                                                                 | Since the creation of CBC a new Masterplan for Dunstable is being drawn up to consider such issues due soon                   | 2011                      | Sustainable transport policies will enable implementation of effective schemes 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  | SBDC Green Travel Plan                           | To encourage staff                                                                                                                                                                                   | SBDC now CBC                                | Changes to modes of staff                        | <1%                                      | SBDC produced green travel                                                                                                              | CBC to produce green                                                                                                          | Ongoing                   | As above                                                                                                                                                                                                                                                                                                                                                                                                           |

| No | Measure                                                 | Focus                                               | Lead authority   | Indicator                                           | Target annual emission reduction in AQMA | Progress to date                                                       | Progress in last 12 months                                                   | Estimated completion date | Comments relating to emission reductions                                                                                                    |
|----|---------------------------------------------------------|-----------------------------------------------------|------------------|-----------------------------------------------------|------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                         | to reduce dependence / use of single occupancy cars |                  | travel                                              |                                          | plan & carried out staff surveys to identify how staff travelled & why | travel plan                                                                  |                           |                                                                                                                                             |
| 5  | Generic demand management measurement                   | i.e. Transport innovation fund bid                  | SBDC now CBC     | Successful bids / funding gained                    | <0.5%                                    | Bid was applied for but was not successful on that occasion            |                                                                              | 2008                      | Other bids/grants will be applied for as appropriate.                                                                                       |
| 6  | Encourage walking / cycling and use of public transport | To reduce dependence & use of cars                  | SBDC now CBC     | No of passengers & travel survey / time comparisons | <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                                   |
| 7  | Improve conditions for pedestrians                      | To encourage to walk instead of using cars          | SBDC/BCC now CBC | Amount of work carried out                          | <1%                                      | Works carried out in Dunstable town centre to improve footpaths        | The Masterplan for Dunstable will highlight further work needed in this area | 2011                      | Complete consultation and publish Masterplan                                                                                                |
| 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    | Works continue to identify and improve/increase 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. |
| 9  | Provision of cycle facilities                           | To reduce dependence & use of cars                  | SBDC/BCC now CBC | No & usage of such                                  | <1%                                      | Cycle park/lanes/facilities provided in town centre.                   | Cycle parks outside library and other public buildings                       | 2009                      | Secure places to leave bikes will encourage usage                                                                                           |
| 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 2009 Transport Trends show that national bus usage has risen slightly in the last few years                                             |

| No | Measure                                                   | Focus                                                | Lead authority             | Indicator                                     | Target annual emission reduction in AQMA | Progress to date                                                                                  | Progress in last 12 months                                                                | Estimated completion date | Comments relating to emission reductions                                                                                                                                                      |
|----|-----------------------------------------------------------|------------------------------------------------------|----------------------------|-----------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 | Adopt priorities in Public Transport Information Strategy | To reduce dependence & use of cars                   | SBDC/BCC now CBC           | Review strategy & policies.                   | <0.5                                     | Strategy regularly reviewed and updated                                                           | A new Masterplan for Dunstable is being drawn up to consider such issues due soon         | 2011                      | Complete consultation and publish Masterplan                                                                                                                                                  |
| 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                                     | The senior citizens free bus pass is Conting more users                                           | 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                   | There is no room to add dedicated bus lanes to the road network. Work has been carried out to bus stops and adding services/routes to area.                                                   |
| 14 | Review car parking charges/policy in AQMA                 | To reduce dependence & use of cars                   | SBDC now CBC               | Changes in charges / use of car parks         | <0.5                                     | Difficult to impose/enforce changes for different vehicle types                                   | Charges discourage long term parking                                                      | 2008                      | Although an option worth investigating it was felt that imposing and enforcing a sliding scale of charges based on vehicle types was unmanageable.                                            |
| 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/cycling / car sharing numbers are                                                 | Ongoing                   | DfT 2009 Transport Trends show that the number of walking trips has fallen nationally 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. Announcement of hard shoulder running on M1 between junctions 10-13 | Ongoing                   | Dunstable bypass to go ahead joining with new M1 junction and possibly a link road to the major industrial estate in Dunstable.                                                               |

| No | Measure                                                                                                        | Focus                                                                                                                   | Lead authority             | Indicator                                             | Target annual emission reduction in AQMA | Progress to date                                                                                                                              | Progress in last 12 months                                                                       | Estimated completion date | Comments relating to emission reductions                                                                                                                                                                                        |
|----|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 | Review maintenance schedules for utilities to keep road works to minimum                                       | Improving traffic management and reducing congestion                                                                    | SBDC/BCC & HA now CBC & HA | Road closures/part closures                           | <0.5                                     | Work scheduled to cause minimum disruption to road network                                                                                    | Work scheduled to cause minimum disruption to road network                                       | 2008                      | By ensuring roadworks are scheduled at non-peak times, limiting road closures as so far as possible to minimise disruption to network                                                                                           |
| 18 | Review timings of town centre traffic controls                                                                 | Improving traffic management and reducing congestion                                                                    | SBDC/BCC & HA now CBC & HA | Traffic factors survey/congestion                     | <0.5                                     | A number of trials identified the timings which minimise congestion at junctions                                                              | This is reviewed and changes implemented as necessary                                            | Complete                  | Traffic counts were completed at the junction to ascertain the busiest routes. Trials were undertaken of the timings of the traffic lights to identify the settings minimising congestion whilst allowing pedestrians to cross. |
| 19 | Require TIA/EIA for major developments within/near to AQMA and/or those likely to generate increase in traffic | To raise the importance of AQ issues in the planning process and to ensure that each development has minimal AQ impacts | SBDC now CBC               | Monitoring the planning & development control process | <0.1                                     | SBDC policy to require TIA/EIA for all major developments                                                                                     | Policy to require TIA/EIA for all major developments                                             | Complete                  | Identification of potential problems at the planning stage of development has allowed for changes to be implemented or conditions to be included grant of permission to the benefit of air quality.                             |
| 20 | Encourage fleet updating & /or retrospective adaptations to reduce emissions                                   | Reducing emissions from heavy goods vehicles and buses Encouraging use of alternative fuels and more efficient vehicles | SBDC/BCC now CBC           | No of fleets updated / adaptations done               | <0.5                                     | SBDC has clause in refuse contract to require operator to have latest euro compliant vehicles. Hackney carriages have to be under 5 years old | Credit crunch limiting companies abilities to update fleet or carry out adaptations all at once. | Complete                  | Bus operators slowly updating fleet, greater maintenance and service keeps emissions of pollutants to the minimum                                                                                                               |
| 21 | Enforce engine idling Legislation                                                                              | Reducing emissions from vehicles                                                                                        | SBDC                       | No of vehicle idling engines. Change to AQ            | -                                        | Council not adopted these powers                                                                                                              | Council not adopted these powers                                                                 | complete                  | Council not adopted these powers. Bus operators voluntarily limiting idling stops                                                                                                                                               |

| No | Measure                                                                                | Focus                                                            | Lead authority     | Indicator                                                       | Target annual emission reduction in AQMA | Progress to date                                                                                               | Progress in last 12 months                                         | Estimated completion date | Comments relating to emission reductions                         |
|----|----------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------|-----------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------|------------------------------------------------------------------|
| 22 | Explore benefits of limiting delivery hours in AQMA                                    | Improving traffic management and reducing congestion             | SBDC               | Visual check                                                    | 0.5                                      | A survey of deliveries in the AQMA showed that this was not an issue as generally deliveries not at peak times | Still not an issue                                                 | Completed                 | Completed                                                        |
| 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                  |
| 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.                |
| 25 | Enhance/develop policies to encourage use of alternative fuels/more efficient vehicles | Encouraging use of alternative fuels and more efficient vehicles | SBDC / BCC now CBC | Review policies & make changes as required                      | <0.5                                     | SBDC introduced a top rate for mileage claims. Cars over 1400cc can only claim based on a smaller engined car  | CBC developed a similar policy with a top band of 1000cc & above   | Completed                 | Policies encourage staff to have smaller more efficient vehicles |
| 26 | Ensure AQ is a material planning consideration                                         | Adherence to Gov policy                                          | SBDC now CBC       | Adherence to Gov policy                                         | <1.0                                     | Gov policy adopted and AQ is considered where necessary                                                        | Gov policy adopted and AQ is considered where necessary            | Completed                 | Government policy adhered to.                                    |
| 27 | Encourage use of car clubs/sharing,                                                    | Reducing number of trips within the                              | SBDC now CBC       | No of car clubs etc                                             | <0.5                                     | No demand for car clubs.                                                                                       | No demand for car clubs.                                           | 2010                      | Internet shopping levels are continuing to increase as more      |

| No | Measure                                                                               | Focus                                                        | Lead authority                                | Indicator                                                                | Target annual emission reduction in AQMA | Progress to date                                                                     | Progress in last 12 months                                                           | Estimated completion date | Comments relating to emission reductions                                                                                                                                                                                                                                                           |
|----|---------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | home working, internet shopping                                                       | AQMA<br>Improving traffic management and reducing congestion |                                               |                                                                          |                                          | Council encourages car sharing and home working.                                     | Council encourages car sharing and home working.                                     |                           | people have access to the internet.                                                                                                                                                                                                                                                                |
| 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. |
| 29 | Provide/improve facilities for walking, (safety, routes) on new/existing developments | Encouraging walking/cycling                                  | SBDC now CBC                                  | Planning conditions for new build / work carried out on existing estates | <0.5                                     | Planning conditions for new build / work carried out on existing estates             | Planning conditions for new build / work carried out on existing estates             | completed                 |                                                                                                                                                                                                                                                                                                    |
| 30 | Develop/maintain partnerships to improve services / planning / access                 | To improve services, etc                                     | SBDC/BCC<br>Now CBC<br>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                   |                                                                                                                                                                                                                                                                                                    |
| 31 | Review provision of alternative transportation priority measures                      | To reduce dependence & use of cars                           | SBDC/BCC<br>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                   | There is no room to add dedicated bus lanes to the road network. Work has been carried out to bus stops and adding services/routes to area and go ahead given for guided busway                                                                                                                    |
| 32 | Guided busway Introduction                                                            | To reduce dependence & use                                   | SBDC/BCC<br>now CBC                           | Completion of scheme                                                     | <0.5                                     | Progress has been slow and a                                                         | The scheme is currently under                                                        | 2015                      | Guided busway will give a direct and traffic free route between Dunstable                                                                                                                                                                                                                          |

| No | Measure                                                 | Focus                                                                                      | Lead authority        | Indicator                        | Target annual emission reduction in AQMA | Progress to date                                                                                                 | Progress in last 12 months                                                                | Estimated completion date | Comments relating to emission reductions                                                                                                                               |
|----|---------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------|----------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                         | of cars<br>Encouraging use of public transport<br>Reducing number of trips within the AQMA | and LBC               |                                  |                                          | public enquiry and various consultations have caused delays                                                      | construction                                                                              |                           | and Luton, before joining the normal road network to extend the routes/service provided.                                                                               |
| 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 commenced. Public enquiry re other road schemes (Dunstable bypass etc)                | M1 widening complete. Announcement of hard shoulder running on M1 between junctions 10-13 | 2015                      | Dunstable bypass joining with new M1 junction and possibly a link road to the major industrial estate in Dunstable postponed.                                          |
| 34 | Greater partnership working future traffic/road schemes | To improve services, etc                                                                   | SBDC/BCC now CBC & HA | Inter agency consultation        | <0.5                                     | Ongoing partnership working                                                                                      | Creation of CBC has enhanced working partnerships                                         | Complete                  |                                                                                                                                                                        |
| 35 | Review Hackney Carriage licence conditions              | Encouraging use of alternative fuels and more efficient vehicles<br>Reduction of emissions | SBDC now CBC          | Conditions relating to AQ issues | <0.5                                     | Conditions reviewed. Decision not to introduce scheme for cheaper licenses for more fuel efficient, etc vehicles | Licence conditions to be harmonised in CBC                                                | 2012                      | Currently hackney carriage licences are only issued to vehicles under 5 years old – this means that vehicles will be more efficient and meet more stringent emissions. |
| 36 | Increase energy efficiency                              | Encouraging energy efficiency – turning heating down, insulation, etc                      | SBDC now CBC          | Energy usage                     | <1.0                                     | Policies to encourage energy efficiency                                                                          | CBC launch of every penny counts and continuation of energy policies                      | Completed                 | Ensuring pcs' / thin clients / lights / copiers / printers switched off at night, etc                                                                                  |
| 37 | Promote better                                          | Encouraging                                                                                | SBDC now              |                                  | -                                        | Government                                                                                                       | Government                                                                                | complete                  |                                                                                                                                                                        |

| No | Measure                                                                | Focus                                                                 | Lead authority | Indicator                                                | Target annual emission reduction in AQMA | Progress to date                                                                                  | Progress in last 12 months                                                                              | Estimated completion date | Comments relating to emission reductions                            |
|----|------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------|----------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------|
|    | insulation & efficient appliances                                      | energy efficiency – turning heating down, insulation, etc             | CBC            |                                                          |                                          | campaigns nationally and local promotion of Energy Efficiency Advisory Service                    | campaigns nationally and local promotion of Energy Efficiency Advisory Service                          |                           |                                                                     |
| 38 | Enforce Building Control regs (domestic/commercial)                    | Encouraging energy efficiency – turning heating down, insulation, etc | SBDC now CBC   | Compliance with regs                                     |                                          | Government policy and involvement and local enforcement                                           | Government policy and involvement and local enforcement                                                 | complete                  |                                                                     |
| 39 | Promote affordable warmth grants, etc                                  | Encouraging energy efficiency – turning heating down, insulation, etc | SBDC           | -                                                        | -                                        | SBDC Affordable Warmth Grants no longer available. Government's Warm Front Scheme still available | Government's Warm Front Scheme still available and CBC will direct enquiries to other relevant agencies | Complete                  |                                                                     |
| 40 | Encourage energy policy use                                            | Encouraging energy efficiency – turning heating down, insulation, etc | SBDC now CBC   | Legislation/guidelines                                   |                                          | Companies becoming more environmentally aware and no of such policies increasing                  | Companies becoming more environmentally aware and no of such policies increasing                        | Complete                  |                                                                     |
| 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                   |                                                                     |
| 42 | LAPPC inspections                                                      | Reducing emissions from                                               | SBDC now CBC   | Adhere to guidance / risk                                | <0.5                                     | All inspections carried out as                                                                    | All inspections carried out as                                                                          | Ongoing                   | National legislation ensures that emissions from certain industrial |

| No | Measure                                                | Focus                                                                                                                   | Lead authority | Indicator                       | Target annual emission reduction in AQMA | Progress to date                                                                                                                          | Progress in last 12 months                                                                                    | Estimated completion date | Comments relating to emission reductions                                                                                                                                                             |
|----|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                        | non-transport related sources                                                                                           |                | assessment                      |                                          | per guidelines, new installations identified and permitted                                                                                | per guidelines, new installations identified and permitted                                                    |                           | processes are controlled by either the local authority or the Environment Agency                                                                                                                     |
| 43 | Planning conditions /agreements & development controls | To raise the importance of AQ issues in the planning process and to ensure that each development has minimal AQ impacts | SBDC now CBC   | % conditions etc relating to AQ | <0.5                                     | SBDC policy to require TIA/EIA for all major developments and other agreements as required                                                | Policy to require TIA/EIA for all major developments and other agreements as required                         | Complete                  | Identification of potential problems at the planning stage of development has allowed for changes to be implemented or conditions to be included grant of permission to the benefit of air quality.  |
| 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                   |                                                                                                                                                                                                      |
| 45 | Dissemination of AQ information & campaigns            | Environmental Promotion<br>Dissemination of AQ information – website, consultation, press<br>Environmental campaigns    | SBDC now CBC   | No of such events               | <0.5                                     | Several press releases in local media, interviews, etc, Herts and Beds website and reports, attendance at local events and talks to clubs | As previous and introduction of Air Alert which notifies subscribers to be informed of high pollutant levels. | Ongoing                   | Air Alert allows the Herts & Beds network to be proactive in involving vulnerable people to be informed of forecast pollution levels. Plans to introduce air alert for schools is being investigated |

Since the merger of Central Bedfordshire Council in April 2009 many changes have taken place including the information/statistics gathered. This means that some action points cannot be measured due to a lack of available information. Therefore the Air Quality Action Plan will be reviewed and measurable action points developed in order to continue working towards the improvement of air quality within the AQMA.

## 7 Conclusions and Proposed Actions

### 7.1 Conclusions from New Monitoring Data

New monitoring data highlighted an exceedence of the annual NO<sub>2</sub> objective at the Sandy continuous monitoring site in 2009 with a level of 44µg/m<sup>3</sup> however the 2010 data showed the annual mean to be 38µg/m<sup>3</sup>. However both the PM<sub>10</sub> objectives were met

A bias adjustment factor was applied to results from the NO<sub>2</sub> diffusion tube sites in accordance with Technical Guidance LAQM.TG(09). The national bias adjustment figure was utilised to take into account the uncertainties in this method of monitoring and obtained from [www.uwe.ac.uk/aqm/review](http://www.uwe.ac.uk/aqm/review)

Additionally results which exceeded the air quality objective levels were adjusted to take into account the distance from the receptor, in accordance with Technical Guidance LAQM.TG(09). This resulted in three sites which remained over the objective level in 2010 – 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.

No sites recorded levels of over 60µg/m<sup>3</sup> therefore all are unlikely to exceed the hourly objective.

### 7.2 Conclusions relating to New Local Developments

Two roads were identified as being congested streets with a flow of above 5,000 vehicles per day and residential properties close to the kerb. As a result monitoring is being carried out at the locations and checks being made to ascertain relevant exposure.

Central Bedfordshire Council has identified that there are potential local developments which may impact on air quality in the Local Authority area:

- a proposed waste incinerator at Marston Vale, which is currently being reviewed.

If necessary this will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2012.

### 7.3 Other Conclusions

The current AQAP for the Dunstable AQMA is in need of review and updating following the creation of Central Bedfordshire Council to take into account new policies, etc.

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. Central Bedfordshire Council monitor Ozone at the Marston Vale continuous monitoring site, results of which showed that in 2009 the objective was breached

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

Pending or potential planning applications likely to impact on air quality have been identified and measures will be taken in order to minimise their impact, during the planning process should they proceed.

The new Local Transport Plan is currently being produced, air quality continues to be considered and air quality officer(s) are consulted as a matter of course.

## **7.4 Proposed Actions**

Detailed Assessments were produced in 2008 for sites that were identified as potentially exceeding the annual NO<sub>2</sub> objective. The sites were the A1 roundabout at Sandy and Chalton. Both reports concluded that AQMAs should be declared. Work is progressing to declare AQMAs at these sites.

No monitoring data has identified new areas requiring Detailed Assessments.

The NO<sub>2</sub> continuous analyser at the Dunstable site has now been switched off as the equipment was suffering high levels of breakdown. Funding has been secured to purchase a new NO<sub>2</sub> monitoring and relocate the site to another site representing relevant exposure. The existing TEOM analyser would be moved to the new site. Currently Planners and the Highways Agency are being consulted with regards to potential sites.

## 8 References

- Reports produced for previous rounds of review and assessments – formerly Mid and South Beds District Council and since 1<sup>st</sup> April 2009, Central Bedfordshire Council
- Technical Guidance LAQM.TG(09) - Defra
- [www.airquality.co.uk](http://www.airquality.co.uk)
- [www.hertsbedsair.org.uk/hertsbeds/asp/home.asp](http://www.hertsbedsair.org.uk/hertsbeds/asp/home.asp)
- [www.uwe.ac.uk/aqm/review/](http://www.uwe.ac.uk/aqm/review/)
- <http://laqm.defra.gov.uk>

## **Appendices**

Appendix 1: QA/QC Data

Appendix 2: Location of NO<sub>2</sub> Diffusion Tubes

Appendix 3: Monthly NO<sub>2</sub> diffusion tube results

Appendix 4: Volatile Correction Method (VCM) details

## **Appendix 1: QA:QC Data**

### **Diffusion Tube Bias Adjustment Factors**

Central Bedfordshire Council uses Gradko for the supply and analysis of NO<sub>2</sub> diffusion tubes. The tube preparation used is for 20% TEA/WATER.

The national bias adjustment factors obtained from the R&A Helpdesk Database was used 0.90 for 2009 and 0.92 for 2010 data.

### **QA/QC of diffusion tube monitoring**

In the last round of WASP assessment Gradko was rated good.

### **Factor from Local Co-location Studies (if available)**

Three tubes have been co-located with the air quality monitoring station on the A1 since January 2003 to enable the bias factor to be calculated. All are classed as kerbside sites and are within 4 metres of the road.

As a result of the considerable difference in the performance of diffusion tubes prepared by different laboratories, Technical Guidance LAQM.TG(09) recommends that a bias adjustment factor is determined and applied to the data. LAQM.TG(09) supplies a method for this process which involves the co-location of three diffusion tubes with a chemiluminescent NO<sub>x</sub> analyser.

The calculation of the local bias factor used in 2009 & 2010 was carried out in accordance to the above guidance.

### **Discussion of Choice of Factor to Use**

The former South Bedfordshire District Council has always used the National bias adjustment factor as there was no safe way to co-locate tubes with the continuous analyser. Mid Beds used a local factor calculated in accordance with guidance in 2008. However since the merger of the two authorities it was felt that one bias adjustment factor be used and the national factor was chosen as it provided a worst case scenario.

### **Short-term to Long-term Data adjustment**

No short term to long term data adjustments were necessary.

### **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<sub>10</sub> TEOM and also the installation of a PM<sub>2.5</sub> FDMS TEOM. NO<sub>2</sub> is measured using an API chemiluminescence NO<sub>x</sub> 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<sub>2</sub> 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<sub>x</sub> 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<sub>x</sub> analyser converter efficiency was determined using Gas Phase Titration.

Automatic measurements of PM<sub>10</sub> were made using the Tapered Element Oscillating Microbalance (TEOM) method. Measurements of NO<sub>x</sub> 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 ([www.hertsbedsair.org.uk](http://www.hertsbedsair.org.uk)).

A final measurement data set to the end of 2010 was produced by King's 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 [www.hertsbedsair.org.uk](http://www.hertsbedsair.org.uk).

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<sub>2</sub> 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<sub>2</sub> and PM<sub>10</sub>) were covered by a service and maintenance contract with

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 1<sup>st</sup> January 2010 whereupon the decision was made that due to the age and increasing unreliability of the NO<sub>2</sub> 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<sub>2</sub> 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.

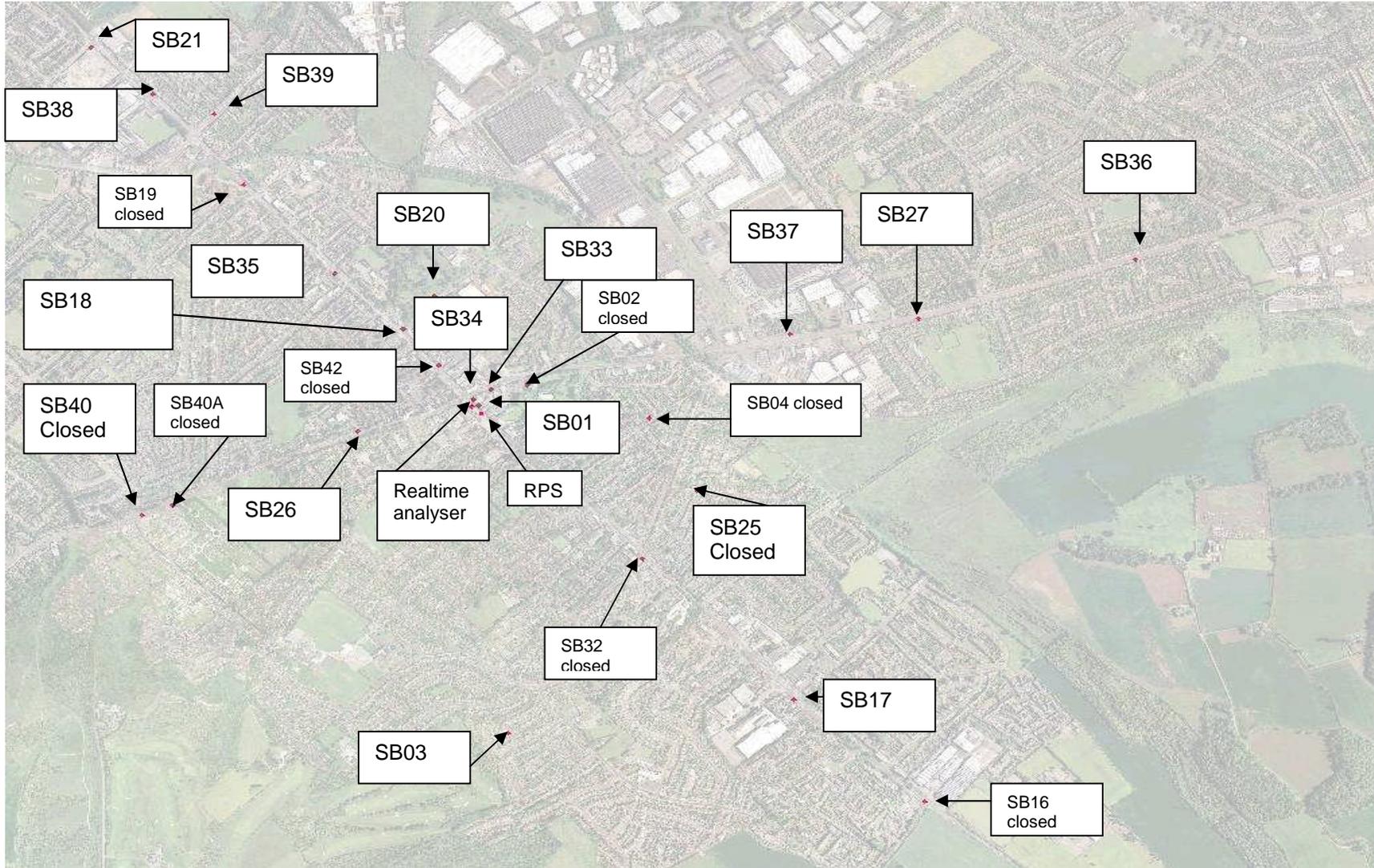
Automatic measurements of PM<sub>10</sub> were made using the Tapered Element Oscillating Microbalance (TEOM) method. In this report PM10 results from the Dunstable analyser were adjusted using Kings College Volatile Correction Model (VCM) to correct data measured using a TEOM.

Measurements of NO<sub>x</sub> 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 ([www.hertsbedsair.org.uk](http://www.hertsbedsair.org.uk)).

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. Details of the monitoring site and the final dataset can be found at [www.hertsbedsair.org.uk](http://www.hertsbedsair.org.uk).

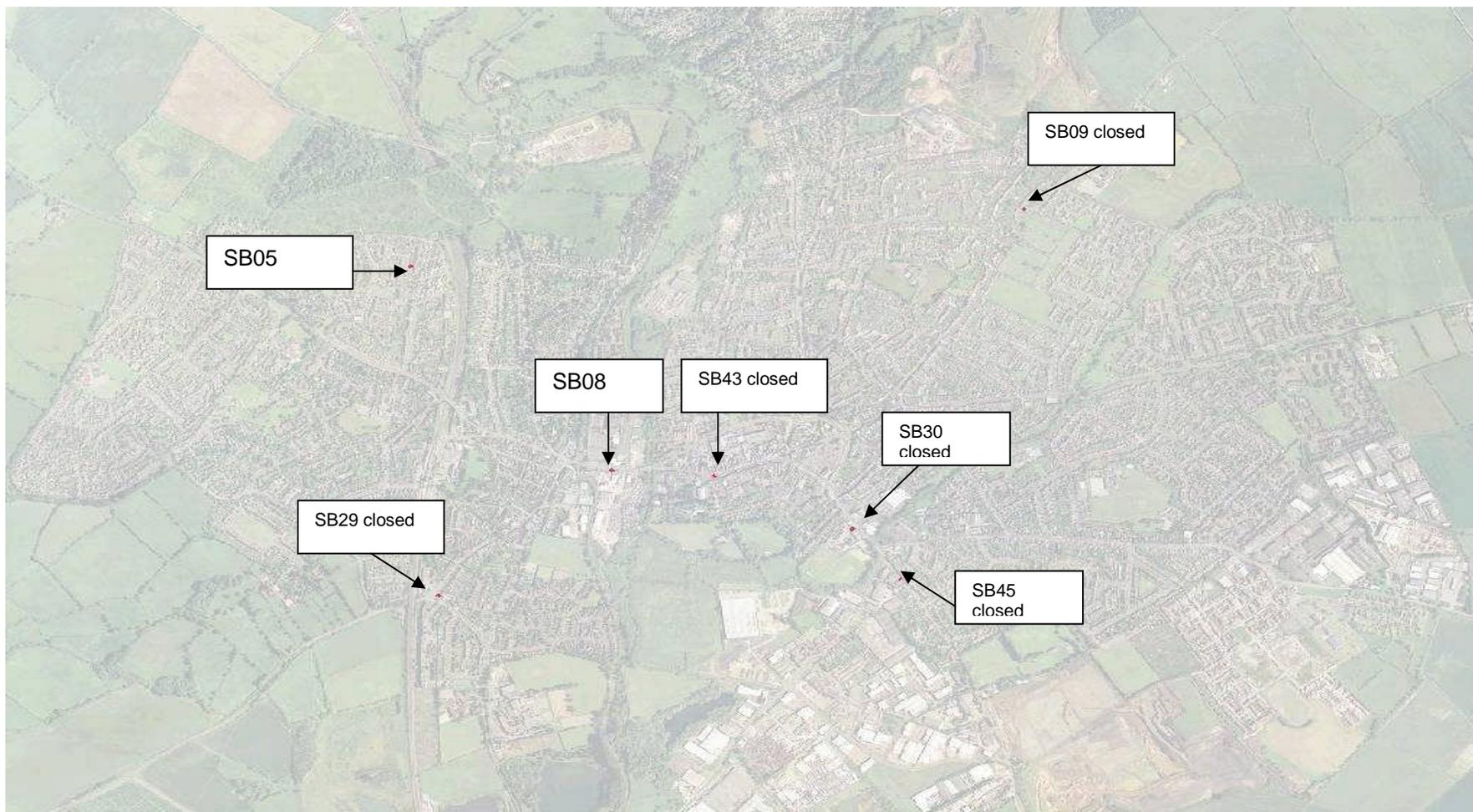
**Appendix 2: Location of NO<sub>2</sub> diffusion tubes**

**NO<sub>2</sub> Diffusion Tube monitoring sites in Dunstable**



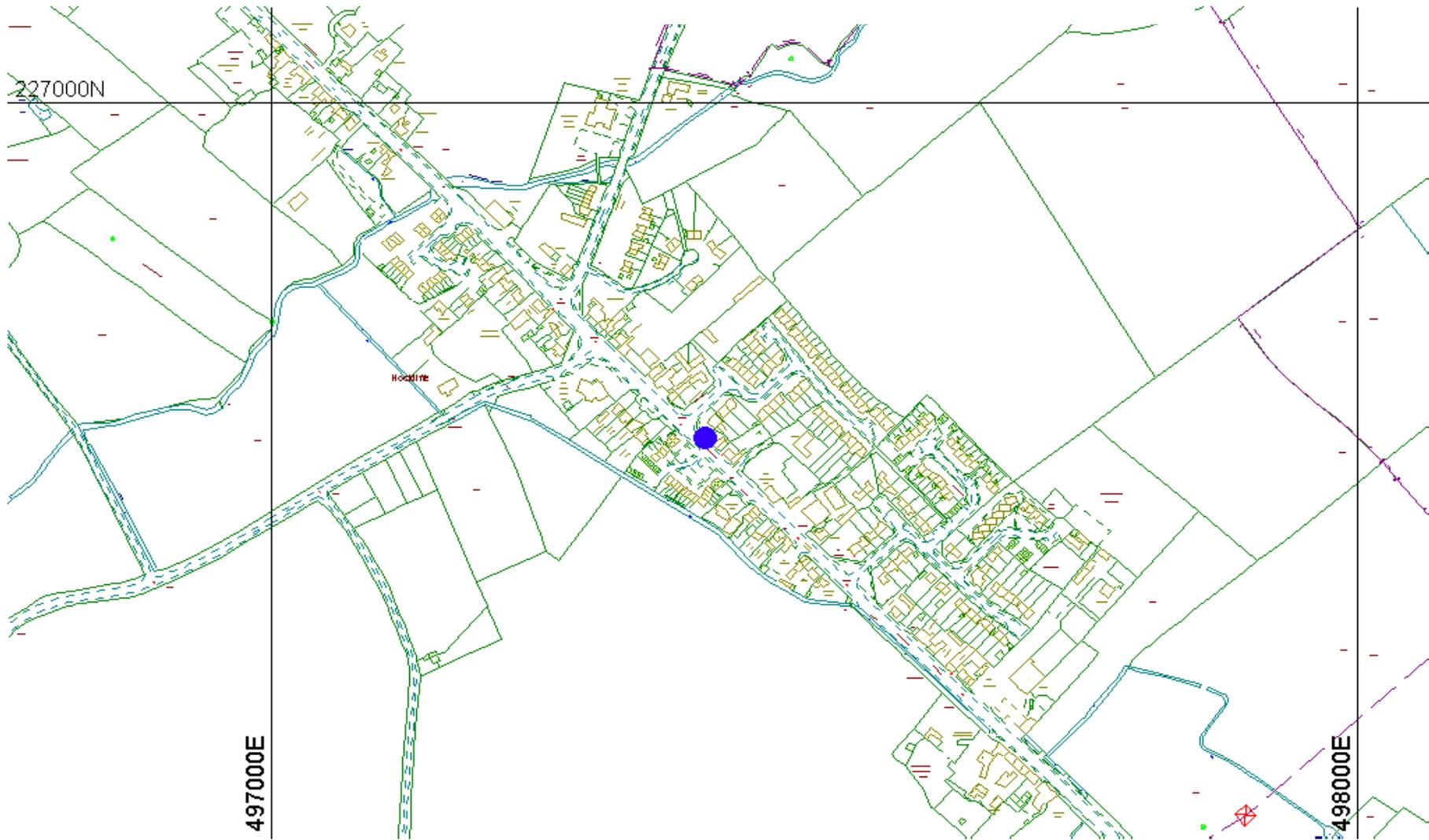
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### NO<sub>2</sub> Diffusion Tube monitoring sites in Leighton Buzzard

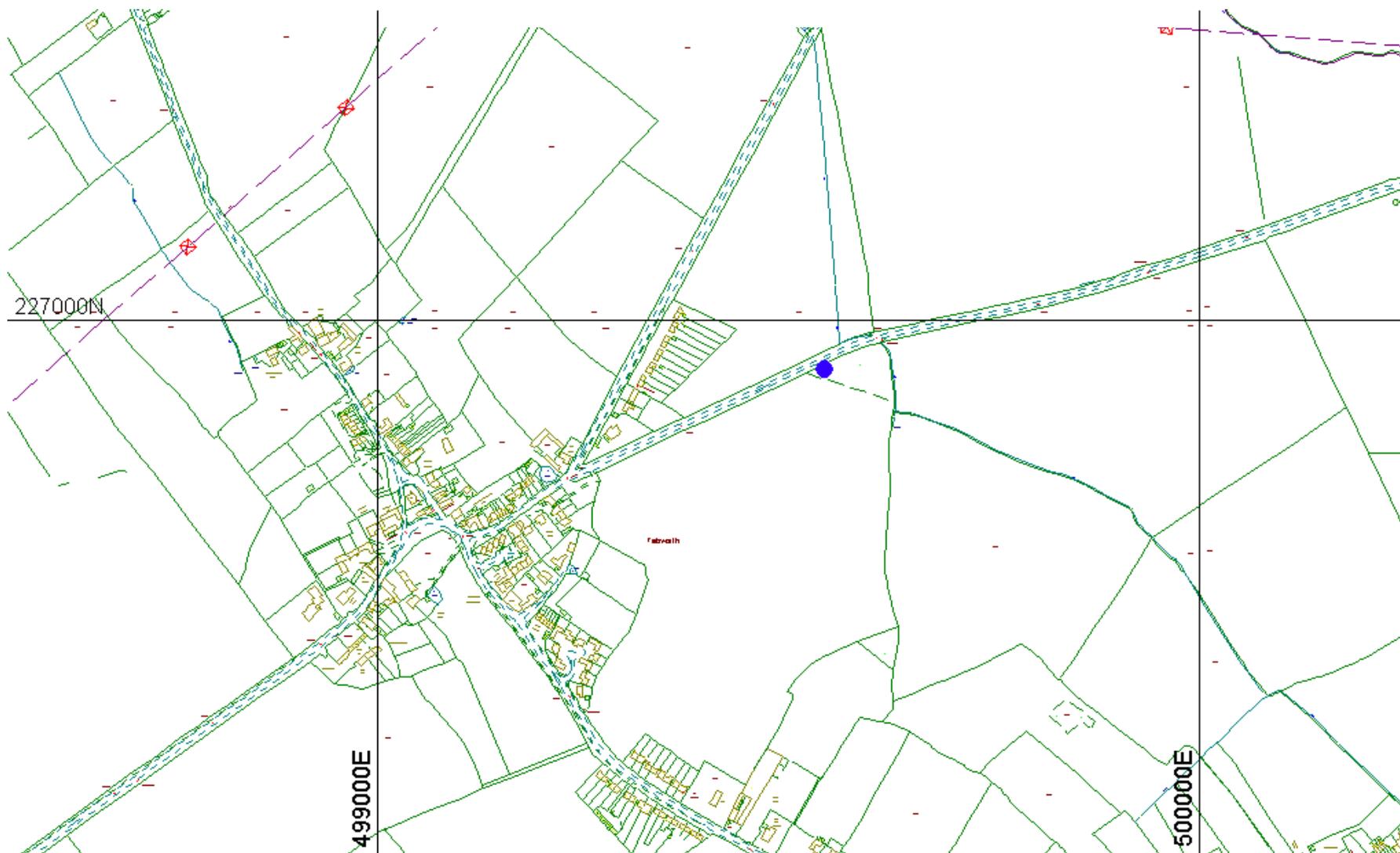


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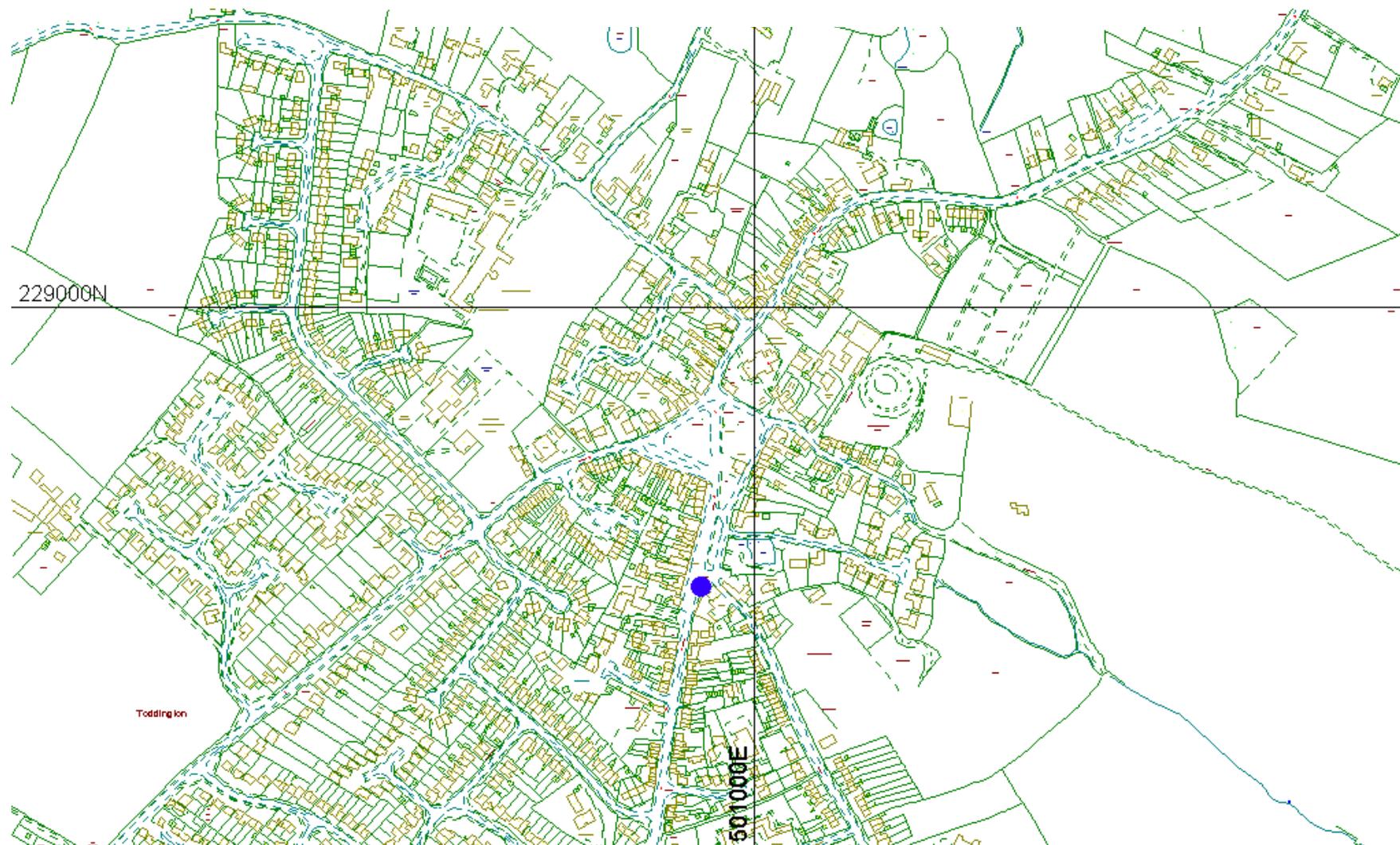
**NO<sub>2</sub> Diffusion Tube monitoring site in Hockliffe (closed)**



**NO<sub>2</sub> Diffusion Tube monitoring site in Tebworth**

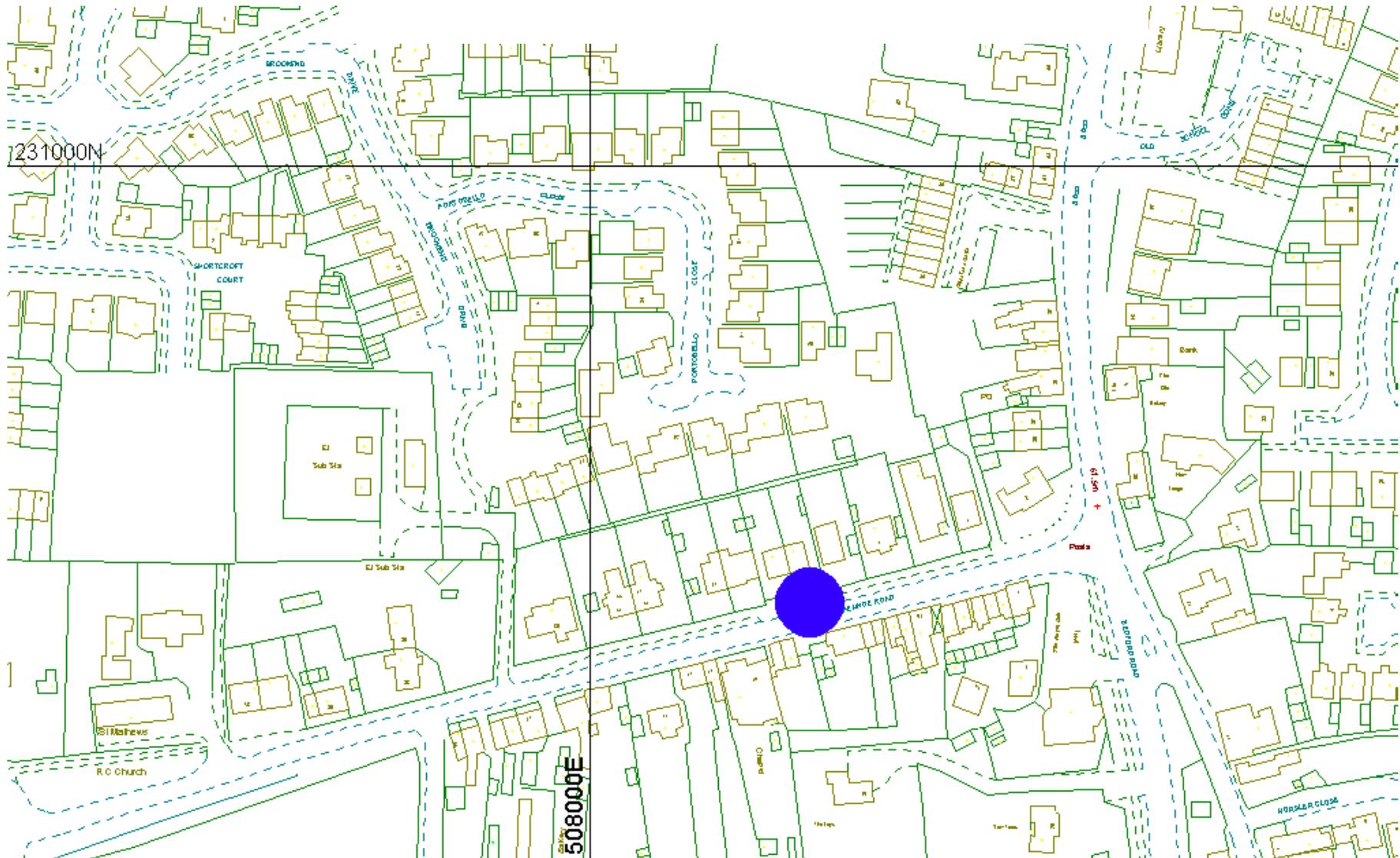


**NO<sub>2</sub> Diffusion Tube monitoring site in Toddington (closed)**

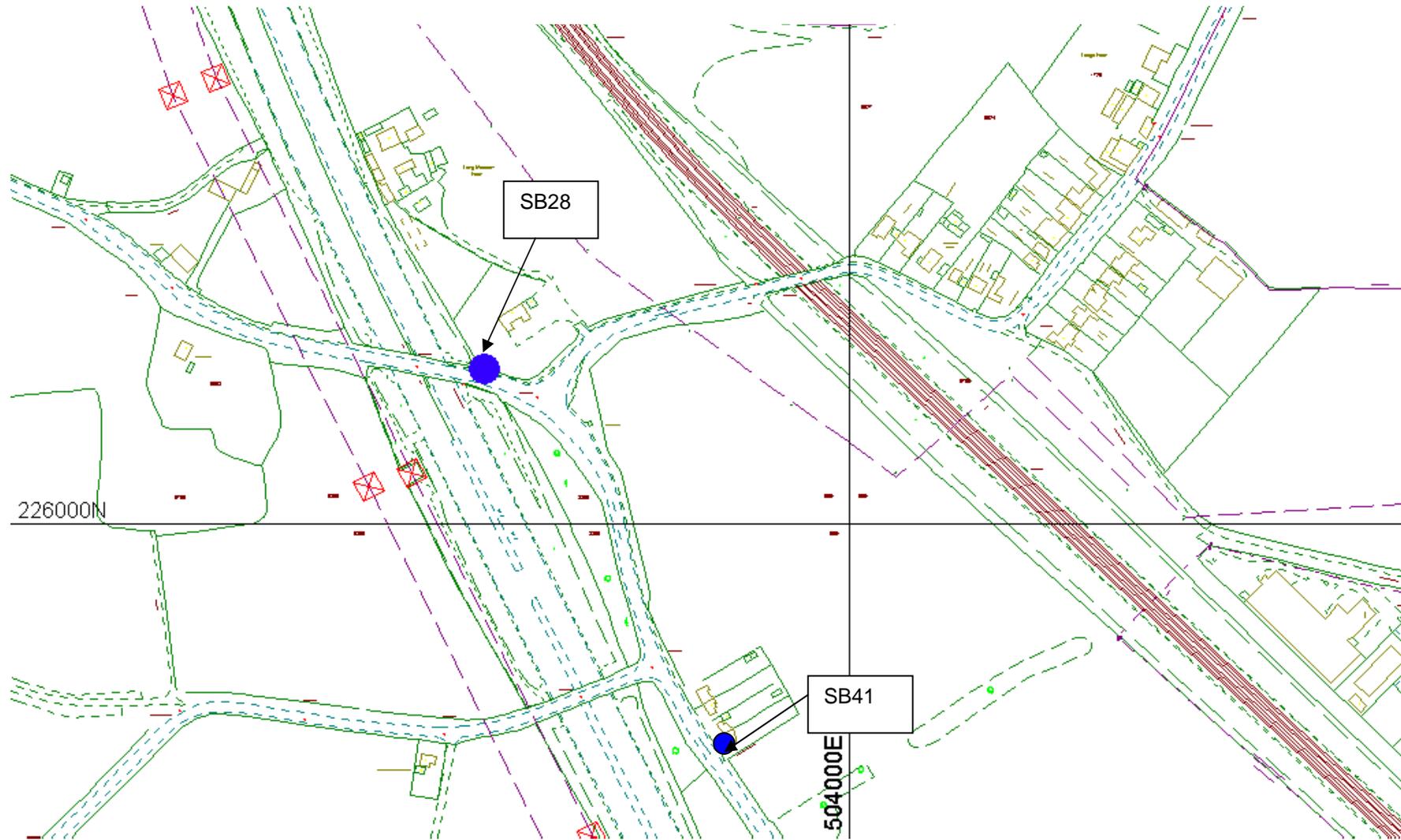


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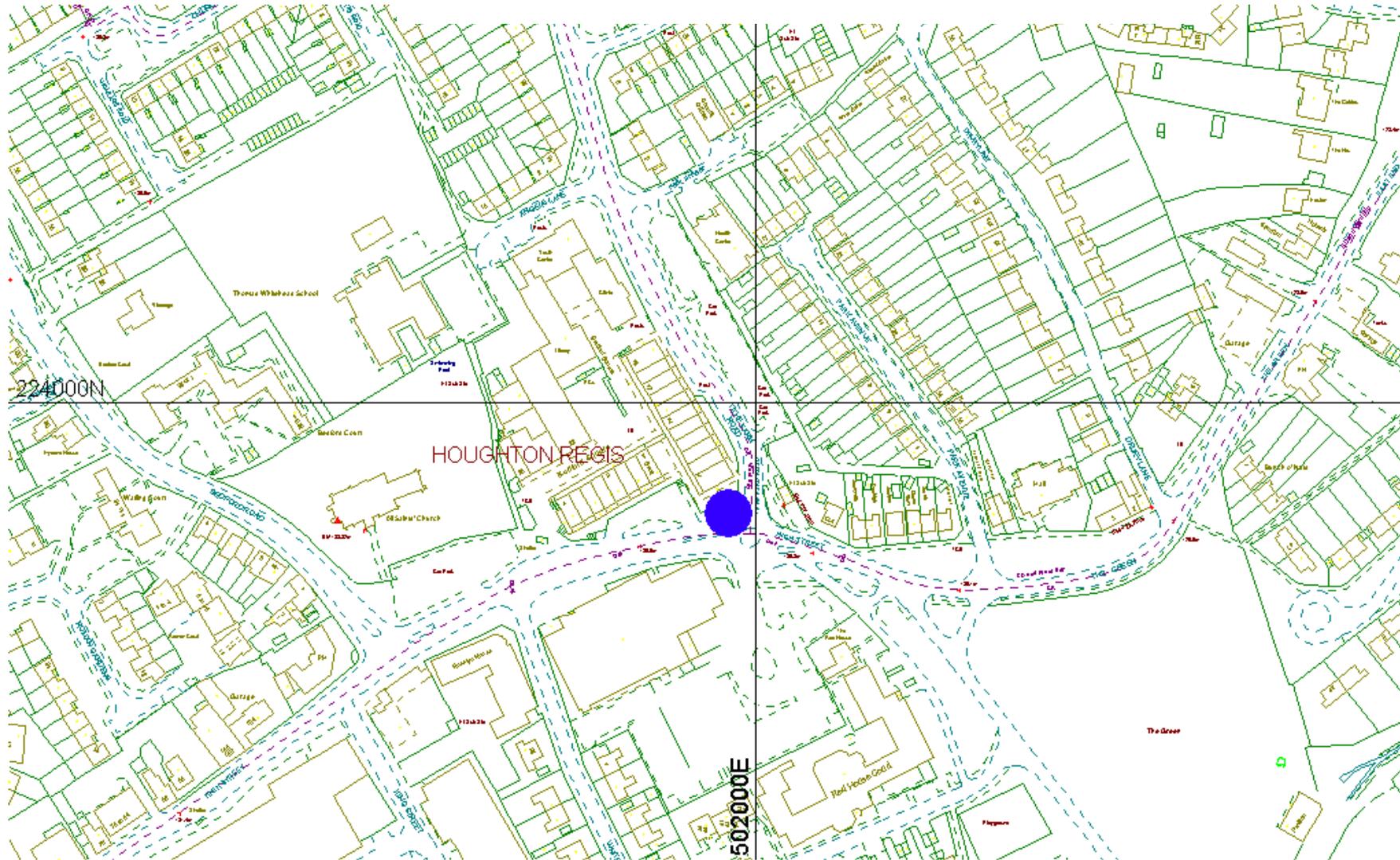
**NO<sub>2</sub> Diffusion Tube monitoring site in Barton**



**NO<sub>2</sub> Diffusion Tube monitoring sites in Chalton**



**NO<sub>2</sub> Diffusion Tube monitoring site in Houghton Regis**



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**NO<sub>2</sub> Diffusion Tube monitoring site in Slip End**





**NO<sub>2</sub> Diffusion Tube monitoring site in Someries**



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N15 - Battlesden 2

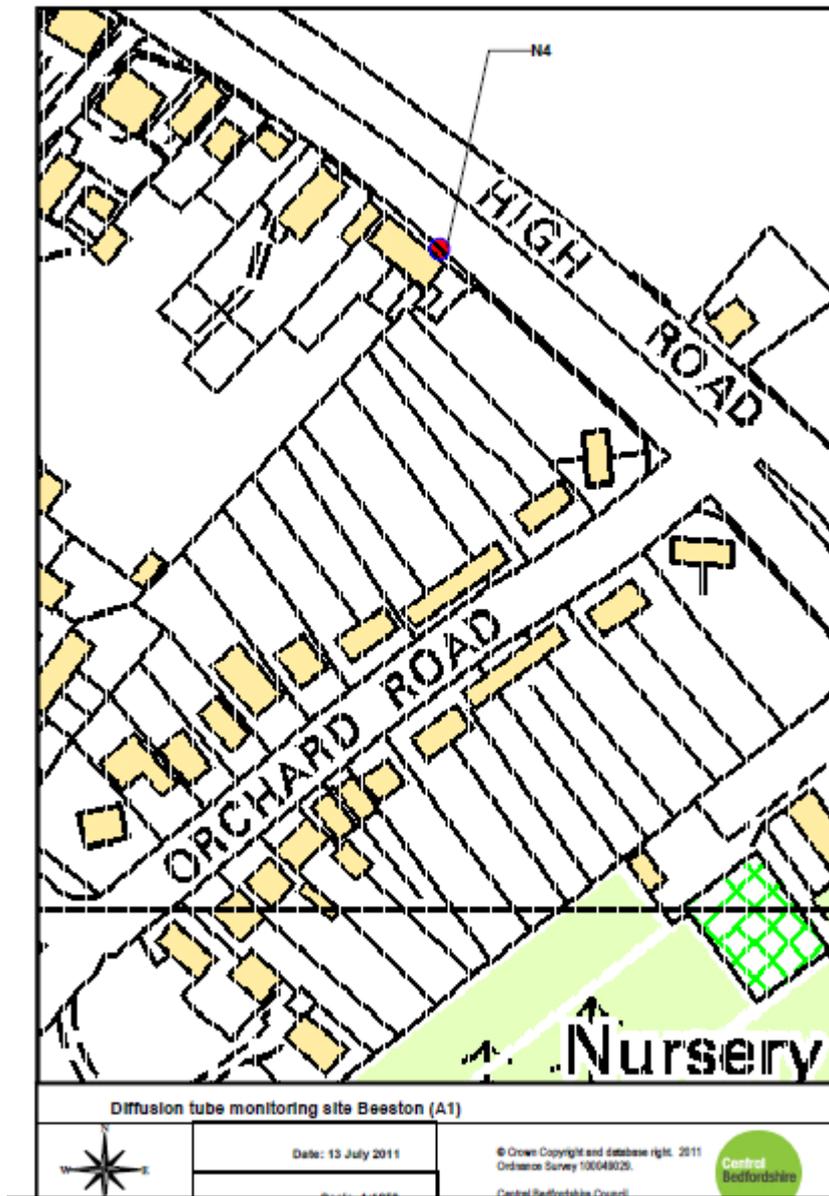


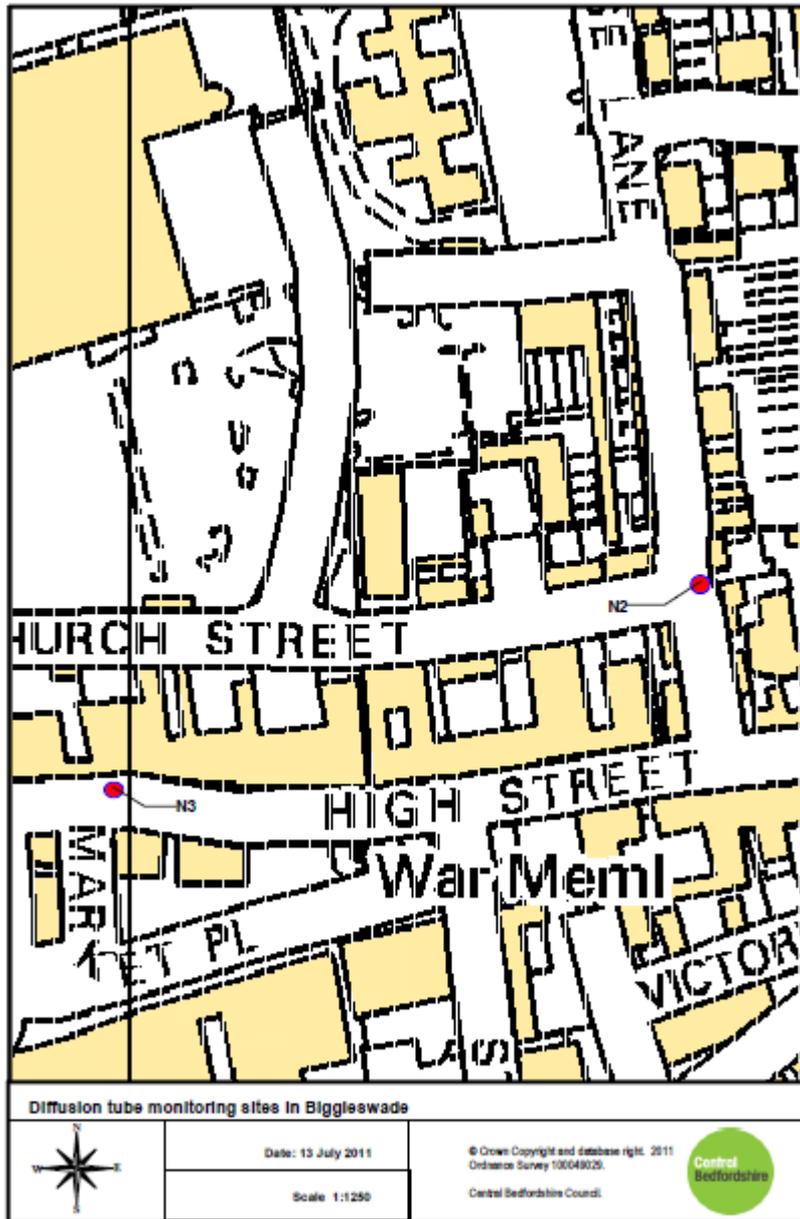
Date: 13 July 2011

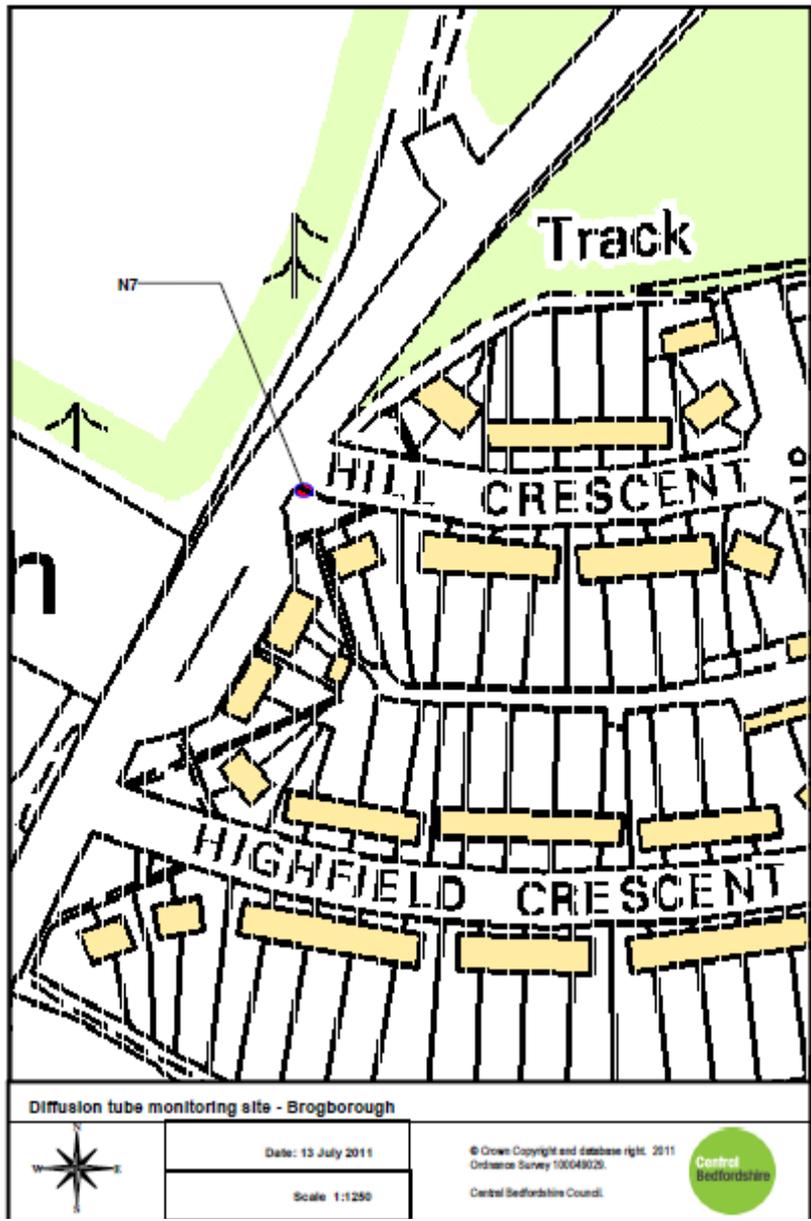
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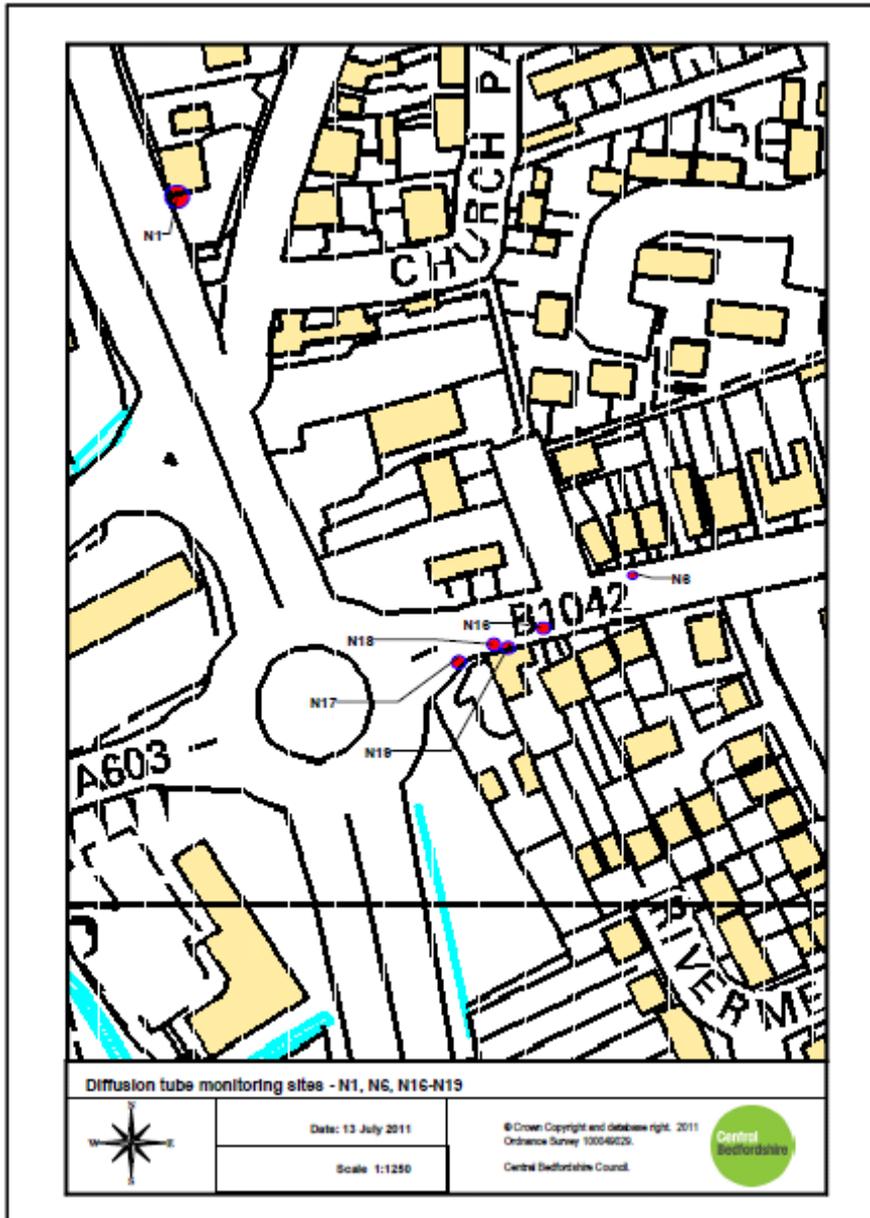
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Central Bedfordshire Council.

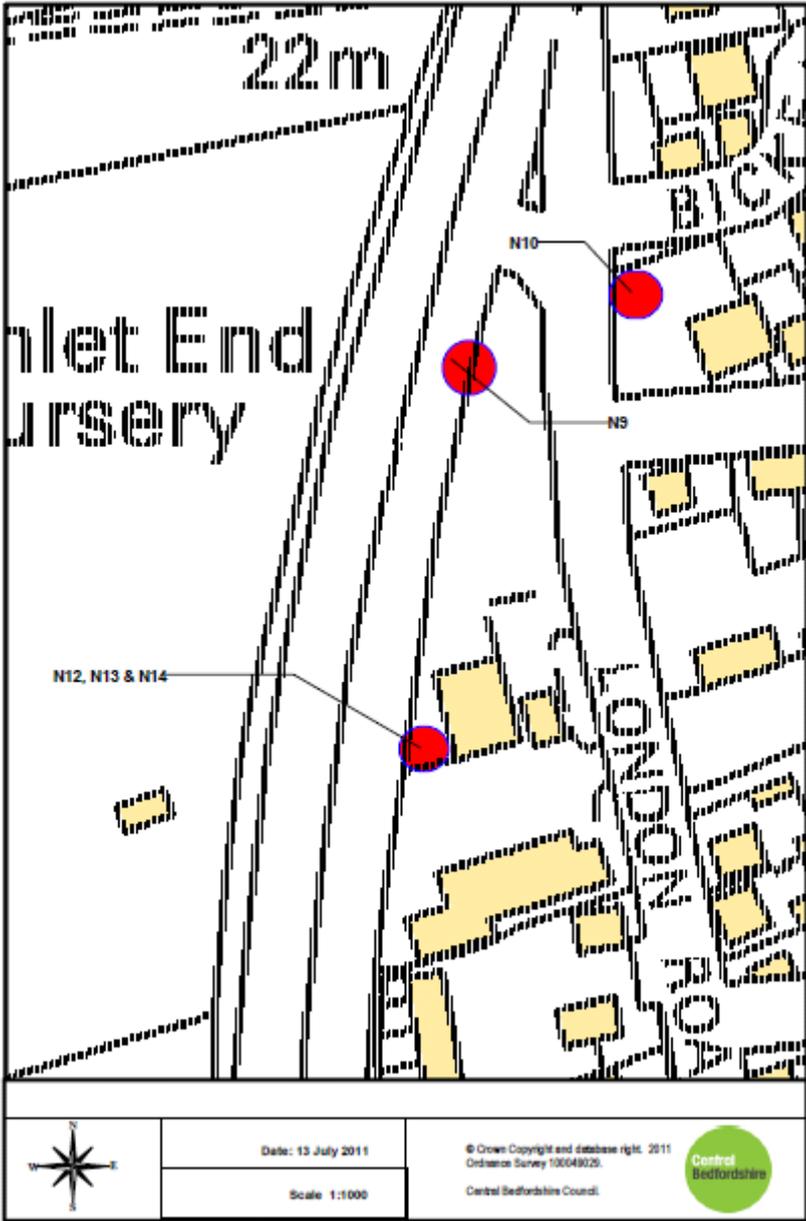
Central Bedfordshire











**Appendix 3: Monthly NO2 diffusion tube data**

| 2009 – no bias adjustment   | Jan | Feb | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   |
|-----------------------------|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SB01 - High St South        |     |     | 46.60 | 56.26 | 38.29 | 62.05 | 37.20 | 35.11 | 50.92 | 51.60 | 33.71 | 45.78 |
| SB02 - Church Close         |     |     | 32.94 | 33.62 | 19.66 | 30.70 | 20.67 | 18.78 | 29.26 | 30.25 | 22.95 | 35.27 |
| SB03 - Mardale Ave          |     |     | 17.12 | 19.96 | 12.29 | 16.15 | 10.06 | 9.98  | 13.38 | 23.47 | 19.18 | 29.32 |
| SB04 - Alfred St            |     |     | 25.88 |       | 15.53 | 17.85 | 12.12 | 12.71 | 17.87 | 24.99 |       |       |
| SB05 - Rowley Furrows       |     |     | 15.70 | 18.41 | 9.71  | 13.03 | 9.78  | 10.69 | 10.66 | 22.73 |       | 12.21 |
| SB06 - Barton               |     |     | 28.97 | 32.39 | 20.27 | 20.42 | 18.13 | 19.93 | 21.69 | 28.56 | 25.84 | 30.87 |
| SB07 - Slip End             |     |     | 23.16 | 26.37 | 14.91 | 17.32 | 11.64 | 14.23 | 17.50 | 25.39 | 22.26 | 39.24 |
| SB08 - Vimy Rd              |     |     | 39.41 | 34.40 | 23.40 | 38.23 | 22.67 | 22.59 | 30.48 | 37.30 | 26.07 | 39.95 |
| SB09 - Vandyke Rd           |     |     | 21.19 | 20.93 | 13.94 | 16.35 | 13.30 | 14.92 | 16.09 | 25.39 | 22.69 | 28.23 |
| SB10 - Houghton Regis       |     |     | 53.46 | 40.46 | 34.75 | 35.92 | 35.47 | 30.55 | 32.62 | 41.93 | 34.76 | 35.54 |
| SB13 - Tebworth             |     |     | 18.05 | 16.22 | 10.30 | 13.11 | 1.98  | 6.04  | 7.77  | 8.48  |       | 21.49 |
| SB14 - Sallowsprings        |     |     | 12.69 | 14.43 | 8.62  | 10.35 | 7.88  | 7.96  | 9.53  | 18.45 | 12.61 | 19.01 |
| SB15 - Toddington           |     |     | 27.01 | 30.96 | 22.07 | 27.44 | 18.93 | 20.57 | 25.15 | 30.19 | 26.37 | 32.47 |
| SB16 - London/Beech         |     |     |       |       | 24.99 | 41.42 | 23.14 | 20.54 | 30.96 | 39.39 | 25.88 | 38.12 |
| SB17 - London/Mayfield Rd   |     |     | 39.95 |       | 33.54 | 43.08 | 31.83 | 35.27 | 40.01 | 47.11 | 34.93 | 38.57 |
| SB18 - Argos (HSN)          |     |     | 47.05 | 54.46 | 40.55 | 61.80 |       | 36.63 | 48.63 | 53.89 | 40.92 | 50.59 |
| SB19 - SBDC (HSN)           |     |     | 52.11 | 53.77 | 45.53 | 47.05 | 41.93 | 40.64 | 44.99 | 42.98 | 42.05 | 41.83 |
| SB20 - Court Drive          |     |     | 35.96 | 35.18 | 30.33 | 29.42 | 28.65 | 26.23 | 26.96 | 38.24 | 31.27 | 36.67 |
| SB21 - HSN/Frenchs Ave      |     |     | 38.60 | 41.18 | 32.86 | 43.31 | 33.69 | 34.84 | 31.79 | 47.74 | 42.50 | 42.86 |
| SB26 - West St (church)     |     |     | 42.06 | 34.68 | 30.77 | 40.66 | 22.98 | 24.69 | 33.17 | 43.06 | 31.12 | 42.58 |
| SB27 - 89 Luton Road,       |     |     | 44.66 | 42.79 | 30.57 | 21.96 | 27.66 | 28.73 | 39.85 | 46.77 | 30.09 | 46.16 |
| SB28 - Luton Road, Chalton  |     |     | 56.57 | 50    | 65.47 | 62.51 | 59.78 | 68.48 | 45.07 | 47.19 | 65.33 | 53.68 |
| SB29 - Cedars/Mentmore Rd,  |     |     | 30.75 | 29.89 | 18.56 | 23.5  | 20    | 21.79 | 22.85 | 35.17 | 25.96 | 32.03 |
| SB30 - Lindler Court        |     |     | 29.28 | 31.98 | 18.23 | 29.32 | 15.94 |       | 22.65 | 33.62 | 25.78 | 34.35 |
| SB31 - Hockliffe            |     |     | 35.97 | 32.69 | 34.62 | 31.35 | 32.07 | 27.28 | 28.03 | 33.66 | 33.69 | 31.60 |
| SB32 - HSS/Periwinkle Lane  |     |     | 29.44 |       |       |       | 21.84 | 20.23 | 26.25 | 42.93 | 27.34 | 36.74 |
| SB33 - 16 Church Street,    |     |     | 53.93 | 49.47 | 44.83 | 54.76 | 45.36 | 39.34 | 44.8  | 37.67 | 50.19 | 42.61 |
| SB34 - 5 High St South      |     |     | 60.81 | 63.27 | 44.33 | 69.98 | 51.93 | 38.15 | 50.05 | 50.89 | 45.39 | 53.37 |
| SB35 - 6 Flint Court, HSN   |     |     | 64.28 | 43.08 | 41.50 | 47.66 | 39.22 | 29.24 | 40.88 | 43.58 | 41.47 | 47.67 |
| SB36 - 247 Luton Road,      |     |     | 55.81 | 43.57 | 33.03 | 59.94 | 31.52 |       | 41.40 |       | 32.95 | 51.11 |
| SB37 - 32 Luton Road,       |     |     | 66.11 | 53.68 | 42.34 | 66.03 | 40.64 | 37.13 | 54.52 | 53.42 | 40.66 | 54.17 |
| SB38 - 274 High St North    |     |     | 49.31 | 40.89 | 30.01 | 38.35 | 31.65 | 25.56 | 32.46 | 40.45 | 25.34 | 37.06 |
| SB39 - 15 Houghton Road     |     |     | 45.94 | 47.62 | 37.18 | 46    | 41.51 | 35.68 | 41    | 49.85 | 42.11 | 45.31 |
| SB40a - West St (catchacre) |     |     | 39    | 32.39 | 22.41 | 33.69 | 19.58 | 19.46 | 33.13 | 39.25 | 26.73 | 28.55 |
| SB41 - 1 Chalton X Cott     |     |     | 64.52 | 47.83 | 41.45 | 44.4  | 44.76 | 41.99 | 45.07 | 49.18 | 48.8  | 47.29 |
| SB42 - Halifax, HSN         |     |     | 44.9  | 70.33 | 46.89 |       |       |       | 49.22 | 54.63 | 39.97 |       |
| SB43 - High St, LB          |     |     | 31.24 | 31.49 | 23.49 | 30.7  | 23.06 | 21.89 | 27.64 | 31.43 | 27.76 | 35.61 |
| SB45 - Billington Rd        |     |     | 34.85 | 33.09 | 23.44 | 32.93 | 25.52 | 24.62 | 27.28 | 38.31 | 31.43 | 36.48 |
| SB46 - Church Rd, Slip End  |     |     | 30.67 | 39.27 | 26.41 | 32.84 | 20.45 | 18.56 | 23.96 | 37.43 | 29.08 | 38.27 |
| SB47 - Clipstone            |     |     | 19.43 | 15.15 | 9.53  | 12.55 | 9.48  | 10.34 | 10.64 | 20.23 | 16.78 | 22.46 |

| 2009 No Bias Adjustment                | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|----------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| N1- A1, Sandy                          | 74.7 | 58.2 | 54.8 | 58.2 | 43.8 | 47.1 | 40.6 | 56.5 | 47.1 | 28.6 | 57.1 | 53.9 |
| N2 -Rose Lane,<br>Biggleswade          | 51.3 | 51   | 33.3 | 35.7 | 25.1 | 25.8 | 20.5 | 26.4 | 26.1 | 13.8 | 32.7 | 33.7 |
| N3 - High St, Biggleswade              | 59.6 | 56.4 | 47.2 | 53.9 | 38.7 |      | 27.4 | 28.6 | 46.6 | 28.9 | 37.9 | 51.6 |
| N4- A1, Beeston                        | 52.2 | 59.1 | 48.9 | 52.8 | 39.5 | 51.9 | 29.8 | 30.8 | 41.8 | 32.2 | 41   | 53.1 |
| N6 - Bedford Road, Sandy               | 59.6 | 51   | 40.3 | 45.3 | 41   | 36.7 | 31.6 | 31.9 | 39.7 | 20.7 | 44   | 50   |
| N7 - Highfield Crescent<br>Brogborough | 58.6 | 52.3 | 58.3 |      | 45.5 | 46.2 | 32.5 | 36.7 | 42.8 | 32.9 | 45.5 | 57   |
| N9 – A1 London Rd North<br>1           | 54   | 53   | 48   | 48   | 40   | 31   | 38   | 38   | 42   | 26   | 46   | 58   |
| N10 – London Rd North 2                | 46   | 31   | 32   | 32   | 23   | 22   | 19   | 25   | 25   | 36   | 32   | 40   |
| N12 Hunts car Co                       | 50   | 63   | 39   | 49   | 35   | 38   | 33   | 34   | 34   | 35   | 42   | 45   |
| N13 collocated with N12                | 52   | 52   | 39   | 54   | 40   | 29   | 32   | 32   | 37   | 40   | 45   | 45   |
| N14 collocated with N12                | 48   | 56   | 40   | 51   | 36   | 34   | 30   | 34   | 38   | 31   | 46   | 40   |
| N15 - Battlesden                       | 36   | 15.7 | 17.5 | 14.8 | 10.5 | 13.3 | 8.4  | 9.6  | 11.4 | 11.1 | 15.1 | 22.7 |
| N16 - Bedford Road,<br>Sandy (South 1) | 55.7 | 63   | 40.9 | 51.6 | 26.9 |      | 41   | 37.9 | 34   | 28.6 | 47.3 | 42.9 |
| N17 - Bedford Road,<br>Sandy (South 2) | 53.3 | 58.8 | 52.8 | 67.2 | 57.8 |      | 61.3 | 31.9 | 45.7 | 26.1 | 47.4 | 51.1 |
| N18 - Eddies Cottage,<br>Sandy         | 50.2 | 48   | 35.9 | 40.8 | 30.5 | 24.9 |      | 52.8 | 31.9 | 19.3 | 38.2 | 42.4 |
| N19 - 53/55 Bedford Rd,<br>Sandy       | 57.5 | 48.3 | 46   | 53.5 | 34.8 | 44.6 | 36.9 | 43   | 36.1 | 38.6 | 60.9 | 46.6 |

|     | 2010 no bias                                            | JAN   | FEB   | MAR   | APR   | MAY   | JUN   | JUL   | AUG   | SEP   | OCT   | NOV   | DEC   |
|-----|---------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | High St South                                           | 45.78 | 56.06 | 53.81 | 57.86 | 53.25 | 54.33 | 38.41 | 45.48 | 59.27 | 58.64 | 53.43 | 70.37 |
| 2   | Church Cl                                               | 35.27 | 40.87 | 32.41 | 30.05 | 27.15 | 21.8  | 9.86  |       |       |       |       |       |
| 3   | Mardale                                                 | 39.32 | 30.79 | 19.74 | 18.19 | 14.91 | 12.44 | 8.52  |       |       | 21.28 | 26.01 | 31.98 |
| 4   | Alfred                                                  |       |       |       |       |       |       |       |       |       |       |       |       |
| 5   | Rowley                                                  | 12.21 | 22.39 | 16.84 | 15.60 |       | 10.46 | 8.52  | 10.15 | 14.05 | 18.47 | 19.9  | 29.62 |
| 6   | Sharpenhoe Road Barton                                  | 30.87 | 34.82 | 32.02 | 28.51 | 25.63 | 20.22 | 19.55 | 15.65 | 25.8  | 29.01 | 35.56 | 42.95 |
| 7   | Claydown                                                | 29.24 | 32.05 | 25.26 | 21.77 | 18.70 | 17.08 | 13.05 | 14.01 | 20.69 | 26.52 | 32.35 | 40.02 |
| 8   | Vimy Rd                                                 | 36.95 | 42.96 | 36.12 | 33.39 |       | 26.77 | 27.4  | 5.75  | 33.3  | 35.08 | 19.74 | 49.75 |
| 9   | Vandyke                                                 | 28.23 | 30.75 | 21.16 | 19.47 |       |       |       |       |       |       |       |       |
| 10  | Houghton                                                | 35.54 | 43.32 | 37.01 | 35.98 | 32.95 | 32.18 | 28.22 | 28.15 | 38.84 | 35.74 |       |       |
| 13  | Tebworth                                                | 21.49 | 21.11 | 16.86 | 12.61 | 6.88  | 10.18 | 9.06  | 2.24  | 13.29 | 14.97 | 22.26 | 28.15 |
| 14  | Sallowspring                                            | 19.01 | 18.48 | 12.85 | 12.55 | 9.21  | 9.74  | 7.94  | 8.37  | 42.14 | 13.97 | 18.25 | 23.93 |
| 15  | Toddington                                              | 32.47 | 39.03 | 32.97 | 29.28 | 26.10 | 23.47 |       |       |       |       |       |       |
| 16  | London/Beech Rd                                         | 38.12 | 44.33 | 32.53 | 36.65 | 31.50 | 32.13 |       |       |       |       |       |       |
| 17  | London/Mayfield Rd                                      | 38.57 | 48.16 | 42.88 | 39.66 | 39.35 | 35.03 | 39.49 | 32.72 | 50.5  | 42.23 | 42.65 | 53.46 |
| 18  | Argos (High St North)                                   | 50.59 | 57.58 | 50.93 | 62.86 | 51.97 | 46.33 | 37.83 | 46.36 | 36.68 | 52.64 | 53.2  | 55.5  |
| 19  | SBDC (High St North)                                    | 41.83 | 50.49 | 46.77 | 47.19 |       |       |       |       |       |       |       |       |
| 20  | Asda (Court Drive)                                      | 36.67 | 41.53 | 34.55 | 30.92 | 28.85 | 24.53 | 23.61 | 25.28 | 33.37 | 30.14 | 40.02 | 43.74 |
| 21  | High St North/Frenchs Ave                               | 42.86 | 45.27 | 43.57 | 38.79 | 31.75 | 30.81 |       | 29.01 | 38.41 | 44.92 | 39.57 | 40.09 |
| 26  | West St, Dunstable                                      | 42.58 | 42.45 | 34.98 | 36.45 | 32.80 | 29.19 | 27.76 | 26.05 | 35.23 | 39.13 | 40.44 | 48.22 |
| 27  | Luton Rd o/s 89, D'ble                                  | 46.16 | 57.89 | 43.63 | 42.03 | 41.65 | 42.2  | 29.76 | 22.3  | 37.07 | 39.97 | 49.93 | 59.92 |
| 28  | Luton Rd, Chalton                                       | 53.68 | 55.93 | 59.21 | 58.50 | 45.39 | 42.9  | 57.2  | 42.48 | 57.1  | 65.27 | 47.6  | 52.42 |
| 29  | Cedars/Mentmore Rd, Lins                                | 32.03 | 36.14 | 30.68 | 28.11 | 23.88 | 22.31 |       |       |       |       |       |       |
| 30  | Lindler Court, L/B                                      | 34.35 | 36.53 | 28.43 | 27.70 | 24.42 | 21.47 |       |       |       |       |       |       |
| 31  | White Horse Close,<br>Hockliffe                         | 31.60 | 33.26 | 33.68 | 31.87 | 28.83 | 29.63 |       |       |       |       |       |       |
| 32  | High St South/Periwinkle<br>Lane                        | 36.74 | 42.17 | 34.16 | 34.16 | 31.53 | 27.21 |       |       |       |       |       |       |
| 33  | 16 Church Street,<br>Dunstable                          | 42.61 | 48.95 | 49.94 | 49.11 | 43.54 | 42.82 | 45.46 | 37.76 | 48.45 | 87.33 | 39.21 | 52.17 |
| 34  | 5 High St South                                         | 53.37 | 62.20 | 51.92 | 56.14 | 49.19 | 54.73 | 45.46 | 43.23 | 66.57 | 49.26 | 52.87 | 65.14 |
| 35  | 6 Flint Court, High St North                            | 47.67 | 50.96 | 50.45 | 49.26 | 38.33 | 37.36 | 36.86 | 29.43 | 42.22 | 46.15 | 33.81 | 58.07 |
| 36  | 247 Luton Road, Dunstable                               | 51.11 | 55.59 | 48.05 | 45.84 | 49.13 | 37.5  |       | 33.33 | 44.88 | 46.61 | 43.96 |       |
| 37  | 32 Luton Road, Dunstable                                | 54.17 | 60.08 | 49.47 | 50.92 | 48.27 | 45.37 | 45.49 | 39.9  | 50.62 | 56.68 | 57.39 | 66.2  |
| 38  | 274 High St North                                       | 37.06 | 54.36 | 45.03 | 46.75 | 37.70 | 35.69 |       |       |       |       |       |       |
| 39  | 15 Houghton Road                                        | 45.31 | 53.46 | 48.55 | 46.44 | 44.19 | 34.9  | 42.43 | 35.64 | 39.95 | 46.08 | 42.46 | 48.62 |
| 40a | West St (o/s 1 catchacre)                               | 38.55 | 39.85 | 34.47 | 30.60 | 28.60 |       |       |       |       |       |       |       |
| 41  | 1 Chalton Cross Cottages                                | 47.29 | 50.36 | 53.30 | 45.59 | 36.10 | 37.19 | 49.91 | 42    | 50.7  | 58.25 | 43.75 | 52.45 |
| 42  | Halifax, High St North                                  |       | 60.41 | 53.69 |       |       | 51.74 | 39.78 |       | 53.75 | 53.95 | 41.47 | 58.39 |
| 43  | High St, Leighton Buzzard                               | 35.61 | 41.17 | 33.36 | 30.74 | 30.15 | 28.09 |       |       |       |       |       |       |
| 45  | Billington Rd, Leighton<br>Buzzard                      | 36.48 | 40.94 | 38.93 | 34.48 | 28.66 | 26.86 |       |       |       |       |       |       |
| 46  | Church Rd, Slip End                                     | 38.27 | 45.00 | 38.57 | 35.96 | 33.42 | 29.36 |       |       |       |       |       |       |
| 47  | Clipstone (lorry street sign<br>at Shenley Hill Rd end) | 22.46 | 23.26 | 17.85 | 14.65 | 12.54 | 10.57 | 9.13  | 11.29 | 15.52 | 18.91 | 25.99 | 27.05 |

Tube changeover done 8/12/10 instead of 1/12/10 so not in line with standard changeover

|                                        | J<br>a<br>n | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|----------------------------------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2010 No Bias Adjustment                |             |     |     |     |     |     |     |     |     |     |     |     |
| N1- A1, Sandy                          | 5<br>8      | 50  | 64  | 46  | 51  | 50  | 50  | 48  | 40  | 48  | 49  | 56  |
| N2 -Rose Lane, Biggleswade             |             | 37  | 33  | 26  | 24  | 22  | 25  | 24  | 29  | 30  | 36  | 41  |
| N3 - High St, Biggleswade              | 6<br>2      | 52  | 53  | 46  | 50  | 40  | 34  | 37  | 41  | 38  | 42  | 57  |
| N4- A1, Beeston                        | 5<br>5      | 58  | 50  | 44  | 47  | 41  | 35  | 36  | 42  | 43  | 42  | 52  |
| N6 - Bedford Road, Sandy               | 5<br>0      | 43  |     | 40  | 70  | 35  | 37  | 37  | 40  | 50  | 43  | 51  |
| N7 - Highfield Crescent<br>Brogborough | 5<br>1      | 48  | 44  | 47  | 44  | 43  | 39  | 40  | 42  | 49  | 54  | 46  |
| N9 – A1 London Rd North 1              | 6<br>7      | 52  | 82  | 44  | 44  | 43  | 45  | 41  | 30  | 46  | 50  | 56  |
| N10 – London Rd North 2                | 4<br>1      |     | 36  | 30  | 25  | 22  | 27  | 26  | 45  | 32  | 34  | 42  |
| N12 Hunts car Co                       | 4<br>4      | 42  | 46  | 35  | 35  | 33  | 39  | 36  | 41  | 47  | 38  | 50  |
| N13 collocated with N12                | 5<br>0      | 45  | 45  | 41  | 36  | 32  | 40  | 42  | 40  | 45  | 39  | 53  |
| N14 collocated with N12                | 5<br>0      | 40  | 46  | 36  | 37  | 31  | 39  | 37  | 42  | 48  | 37  | 46  |
| N15 - Battlesden                       | 2<br>8      | 22  | 16  | 15  | 12  | 8   | 9   | 10  | 14  | 17  |     | 24  |
| N16 - Bedford Road, Sandy<br>(South 1) | 5<br>4      | 49  | 49  | 41  | 37  | 36  | 36  | 41  | 42  | 39  | 40  | 55  |
| N17 - Bedford Road, Sandy<br>(South 2) | 5<br>4      | 53  | 43  | 33  | 48  | 33  | 59  | 51  | 42  | 51  | 44  | 59  |
| N18 - Eddies Cottage, Sandy            | 4<br>6      | 40  | 49  | 43  | 35  | 32  | 41  | 35  | 41  | 39  | 34  | 34  |
| N19 - 53/55 Bedford Rd, Sandy          | 4<br>7      | 47  | 50  | 46  | 40  | 50  | 41  | 40  | 52  | 48  | 31  | 45  |

## **Appendix 4: Volatile Correction Method details**

Central Bedfordshire Council (formerly Mid & South Bed District Councils) use Tapered Element Oscillating Microbalance (TEOM) analysers to monitor PM<sub>10</sub> 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<sub>10</sub> 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).