



***Bournemouth Borough Council  
LAQM Progress Report 2013***

*Bureau Veritas Air Quality*





*March 2013*



***Move Forward with Confidence***



## Document Control Sheet

| Issue/Revision | Issue 1   | Issue 2  |
|----------------|---|--|
| Remarks        | DRAFT   | Final  |
| Date           | March 2013  | April 2013   |
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| Project number | AGGX7351442   | AGGX7351442  |
| File reference | 2850  | 2850   |

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| <b>Report Reference number</b> | Bournemouth APR_13                                |
| <b>Date</b>                    | March 2013  |

## Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Annual Progress Report is a requirement of the Fifth Round of Review and Assessment and is a requirement for all local authorities. The Report has been undertaken in accordance with the Technical Guidance LAQM.TG (09) and associated tools.

This Annual Progress Report considers all new monitoring data and assesses the data against the Air Quality Strategy objectives. It also considers any changes that may have an impact on air quality.

This report confirms that there are no exceedences of the air quality objectives within the Borough outside of the Winton Air Quality Management Area (AQMA). Analysis was also carried out for the Nitrogen Dioxide (NO<sub>2</sub>) diffusion tubes within the AQMA for 2012 and to determine likely pollutant concentrations at the building facades of relevant locations. The findings indicate that levels of all pollutants in the Borough both inside and outside of the AQMA are below the air quality objective levels at all relevant locations.

No detailed Assessments are required at this time.

Proposed actions are therefore:

- Proceed to Annual Progress Report 2014
- Consider revocation of the Winton AQMA

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# 1 Introduction

## 1.1 Description of Local Authority Area

The Borough of Bournemouth is situated in Dorset on the south coast of England. The Borough, is largely urban as it includes the large coastal town of Bournemouth.

The local economy is dominated by the tourist and the banking and finance sectors. There is little remaining “heavy” industry in Bournemouth and any potentially polluting industrial and commercial processes are regulated under the Environmental Permitting Regulations 2010. The main source of air pollution in the district continues to be road traffic emissions from major roads, whilst other pollution sources, including commercial, industrial and domestic sources, also make a contribution to background pollution concentrations.

An Air Quality Management Area (AQMA) was declared in May 2006 at Wimborne Road, Winton, where exceedences of the annual mean Air Quality Strategy (AQS) objective for nitrogen dioxide (NO<sub>2</sub>) were predicted.

## 1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment (USA) reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as USA Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an AQS objective, the local authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

### **1.3 Air Quality Objectives**

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).



**Table 1 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

| Pollutant  | Air Quality Objective  |                     | Date to be achieved by |
|--|--|---------------------|------------------------|
|  | Concentration  | Measured as         |                        |
| Benzene  | 16.25 µg/m <sup>3</sup>  | Running annual mean | 31.12.2003             |
|  | 5.00 µg/m <sup>3</sup>   | Annual mean         | 31.12.2010             |
| 1,3-Butadiene  | 2.25 µg/m <sup>3</sup>   | Running annual mean | 31.12.2003             |
| Carbon monoxide                                      | 10 mg/m <sup>3</sup>   | Running 8-hour mean | 31.12.2003             |
| Lead   | 0.50 µg/m <sup>3</sup>   | Annual mean         | 31.12.2004             |
|  | 0.25 µg/m <sup>3</sup>   | Annual mean         | 31.12.2008             |
| Nitrogen dioxide                                     | 200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year   | 1-hour mean         | 31.12.2005             |
|  | 40 µg/m <sup>3</sup>   | Annual mean         | 31.12.2005             |
| Particulate Matter (PM <sub>10</sub> ) (gravimetric) | 50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year  | 24-hour mean        | 31.12.2004             |
|  | 40 µg/m <sup>3</sup>   | Annual mean         | 31.12.2004             |
| Sulphur dioxide                                      | 350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year | 1-hour mean         | 31.12.2004             |
|  | 125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year  | 24-hour mean        | 31.12.2004             |
|  | 266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year | 15-minute mean      | 31.12.2005             |

## 1.4 Summary of Previous Review and Assessments

Bournemouth Borough Council undertook its first round of Review and Assessment between 1998 and 2002, and concluded that all AQS objectives would be met across the Borough.

The first phase of the second round of Review and Assessment, the USA, was completed in 2003. The USA concluded that the Council should complete a Detailed Assessment for predicted exceedences of the NO<sub>2</sub> annual mean objective at Wimborne Road in Winton.

The Detailed Assessment, completed in 2005, confirmed that the NO<sub>2</sub> annual mean objective would be exceeded at Wimborne Road, Winton. The Detailed Assessment recommended that further NO<sub>2</sub> diffusion tube monitoring be carried out at several sites in the Wimborne Road area and south of the Talbot Road/Wimborne Road junction. In Addition, the Detailed Assessment concluded that the Council should consider declaring an AQMA to include the facades of buildings from the junction of Wimborne Road and Calvin Road, to the junction of Talbot Road and Wimborne Road. An AQMA was declared in May 2006.

In 2006, the Council completed the first phase of the third round of Review and Assessment with a new USA. The 2006 USA concluded that no Detailed Assessment was required for benzene, 1,3-butadiene, carbon monoxide, lead, particles or sulphur dioxide. However, the Council identified several exceedences of the NO<sub>2</sub> annual mean AQS objective and it was recommended that a Detailed Assessment be carried out in 11 areas of Bournemouth. It was advised that this assessment be completed during 2008/2009.

In 2008, the Council completed an Annual Progress Report (APR), before the planned Detailed Assessment. The APR confirmed that the relevant AQS objectives for carbon monoxide, benzene, 1,3 butadiene, lead, sulphur dioxide and particles would be met within Borough. With regard to NO<sub>2</sub>, it was concluded that the 1-hour mean AQS objective would be met, however, it was concluded that the NO<sub>2</sub> annual mean AQS objective remained likely to be exceeded at 10 of the 11 sites identified for Detailed Assessment in Bournemouth Borough Council's 2006 USA report. As

such, the APR confirmed that a Detailed Assessment should be undertaken for the NO<sub>2</sub> annual mean AQS objective at these sites.

The Detailed Assessment was completed in February 2009 for these 10 sites, and concluded that exceedence of the NO<sub>2</sub> annual mean AQS objective at nearby properties was unlikely. Therefore, there was no need to declare any new AQMA in Bournemouth.

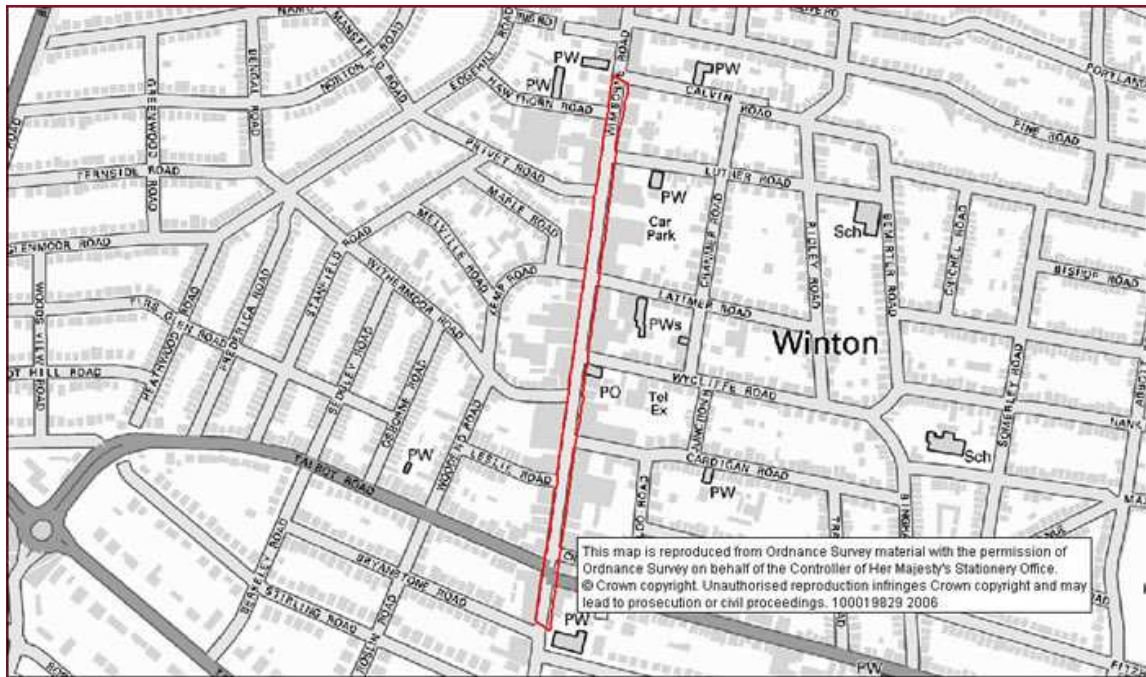
In November 2009, the Council completed a Further Assessment for the Wimborne Road AQMA. The purpose of the assessment was to update the 2005 Detailed Assessment to identify whether or not the current extent of the AQMA in Winton was appropriate and to inform the decision to extend or maintain the AQMA, or look to revoke its status. The assessment concluded that the AQMA should remain and recommended that further NO<sub>2</sub> diffusion tube monitoring in the area was undertaken.

The 2009 USA and 2010 APR were produced as one combined report. This report concluded that the AQS objectives for all pollutants would be met within Bournemouth Borough. Some additional monitoring requirements were identified along the B3063 through the screening of traffic sources. Therefore there was no need to proceed to Detailed Assessment.

The 2011 APR concluded the air quality objectives at all areas outside of the Wimborne Road AQMA would be met.

The 2012 USA concluded the air quality objectives at all areas outside of the Wimborne Road AQMA would be met. Analysis was carried out for the NO<sub>2</sub> diffusion tubes within the AQMA for 2011 and the previous three years to determine likely pollutant concentrations at the building facades of relevant locations. The findings indicate that levels of all pollutants in the Borough both inside and outside of the AQMA are below the air quality objective levels at all relevant locations. The pollutant concentrations in the AQMA will be monitored closely in future years to ensure on going compliance and consider revocation of the AQMA. It was recommended new diffusion tubes are added at the first floor façade in the AQMA.

Figure 1 Map of AQMA – Wimborne Road, Winton



## 2 New Monitoring Data

### 2.1 Summary of Monitoring Undertaken

This section provides details of monitoring carried out in 2012, the year covered by this report.

#### 2.1.1 Automatic Monitoring Sites

There is currently automatic monitoring of NO<sub>2</sub>, particulates (PM<sub>2.5</sub>) and ozone (O<sub>3</sub>) undertaken at one location in the area. This is the Bournemouth background monitoring site in the Defra Automatic Urban and Rural Network (AURN).

**Figure 2 Location Map of Bournemouth Automatic Monitoring Station**

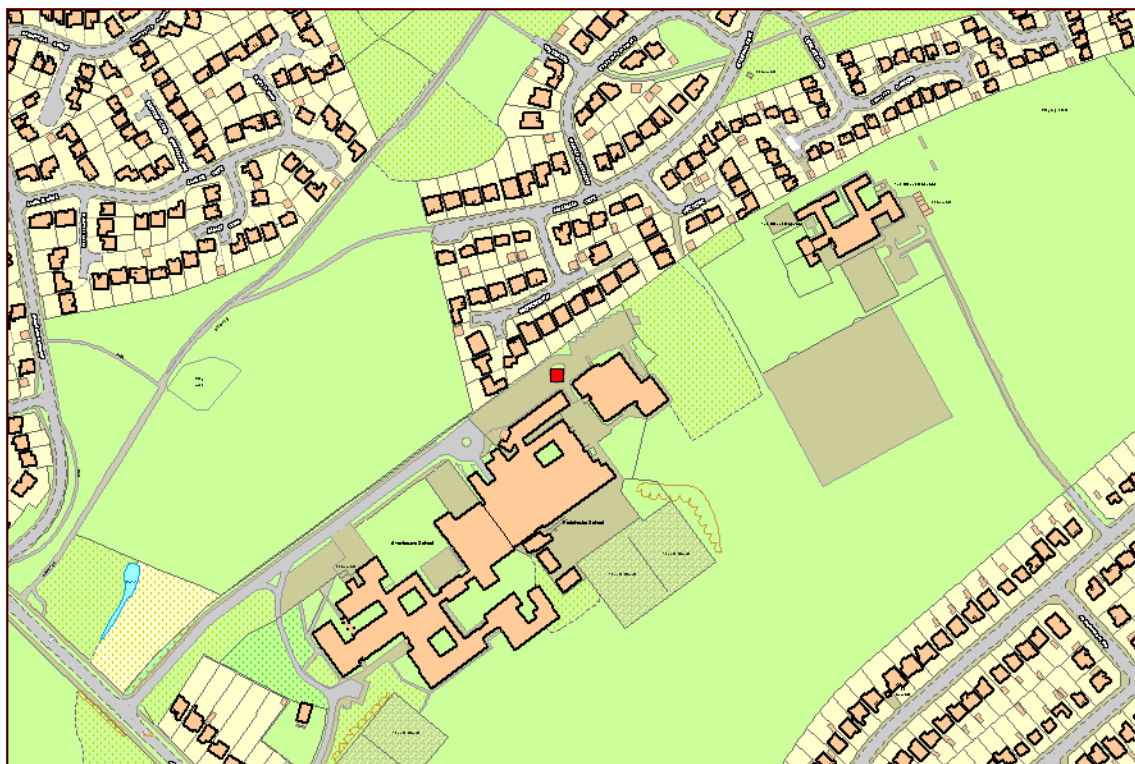


Table 2 Details of Automatic Monitoring Sites

| Site Name        | Site Type        | OS Grid Reference (X,Y) | Pollutants Monitored                                    | In AQMA ? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Worst-Case Location? |
|------------------|------------------|-------------------------|---|-----------|---|--|----------------------|
| Bournemouth AURN | Urban Background | X 412321<br>Y 93345     | NO <sub>x</sub> , PM <sub>2.5</sub> ,<br>O <sub>3</sub> | N         | N   | 48   | N                    |

## 2.1.2 Non-Automatic Monitoring Sites

The Council undertook monitoring of NO<sub>2</sub> using passive diffusion tubes at 34 sites in 2012. No changes to tube locations were made during 2012.

The diffusion tubes are supplied and analysed by Rotherham MBC / South Yorkshire laboratories utilising the 50% Triethanolamine (TEA) in acetone preparation method. The methods meet the guidelines set out in Defra's report "Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance"<sup>1</sup>.

During 2012 the data capture for the triplicate diffusion tubes co-located with the automatic monitoring station was 100% and the exposure periods matched the recommended periods. Due to the improved data collected during 2012 the council are in a position to calculate a local bias factor for 2012. This has been carried out with 'good' data capture for both diffusion tubes and automatic monitoring. A factor of 0.90 is derived from the local bias adjustment spread sheet<sup>2</sup>. This has been used for the results presented in this report.

In order to re-assess the levels of pollution within the Winton AQMA, the distances from the diffusion tubes to the façade of properties representative of relevant exposure were re-measured in order to predict likely NO<sub>2</sub> concentrations at facades using the fall-off with distance calculator<sup>3</sup>.

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<sup>1</sup> Available at [http://laqm.defra.gov.uk/documents/0802141004\\_NO2\\_WG\\_PracticalGuidance\\_Issue1a.pdf](http://laqm.defra.gov.uk/documents/0802141004_NO2_WG_PracticalGuidance_Issue1a.pdf)

<sup>2</sup> <http://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html>

<sup>3</sup> <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

Figure 3 Map of Non-Automatic Monitoring Sites in Bournemouth

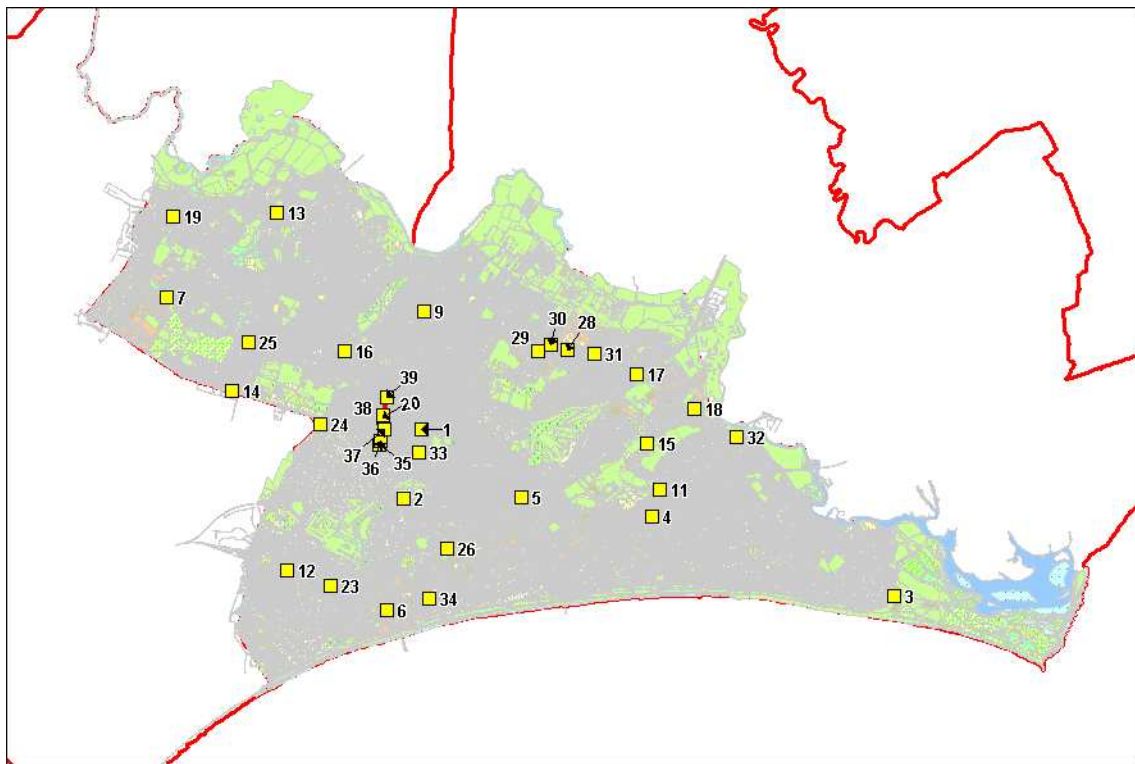




Table 3 Details of Non- Automatic Monitoring Sites

| Site No. | Location                             | Site Type | X      | Y     | Pollutant Monitored | In AQMA ? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Worst-Case Location ? |
|----------|--------------------------------------|-----------|--------|-------|---------------------|-----------|---|--|-----------------------|
| 1        | Somerley Road                        | R         | 409166 | 93539 | NO <sub>2</sub>     | N         | Y - 3.6   | 1.4  | Y                     |
| 2        | Cemetery                             | UB        | 408922 | 92579 | NO <sub>2</sub>     | N         | Y - 0   | 7  | N                     |
| 3        | Hengistbury (Southbourne Coast Road) | R         | 415747 | 91224 | NO <sub>2</sub>     | N         | Y- 27   | 2  | Y                     |
| 4        | Christchurch Road (Pokesdown)        | R         | 412386 | 92337 | NO <sub>2</sub>     | N         | Y – 1.3   | 1.2  | Y                     |
| 5        | Capstone Place                       | K         | 410562 | 92604 | NO <sub>2</sub>     | N         | Y – 5.5   | 0  | Y                     |
| 6        | Lower Gardens                        | UB        | 408689 | 91035 | NO <sub>2</sub>     | N         | N - 44  | N/A  | N                     |
| 7        | Turbary Park Avenue                  | R         | 405626 | 95384 | NO <sub>2</sub>     | N         | Y- 13   | 1.7  | Y                     |
| 9        | Lystra Road                          | R         | 409215 | 95182 | NO <sub>2</sub>     | N         | Y - 4.6   | 2.2  | Y                     |
| 11       | Kings Park Drive                     | R         | 412486 | 92712 | NO <sub>2</sub>     | N         | Y – 3.5   | 1  | Y                     |
| 12       | Surrey Gardens                       | R         | 407295 | 91577 | NO <sub>2</sub>     | N         | Y - 10  | 3  | Y                     |
| 13       | Wimborne Road (Kinson)               | R         | 407160 | 96559 | NO <sub>2</sub>     | N         | Y – 6   | 2  | Y                     |
| 14       | Wallisdown Road                      | K         | 406530 | 94069 | NO <sub>2</sub>     | N         | Y – 7   | 0.4  | Y                     |
| 15       | AQMU Portchester Sch (Harewood Ave)  | UB        | 412319 | 93340 | NO <sub>2</sub>     | N         | N - 48  | N/A  | N                     |
| 16       | Boundary Road                        | R         | 408110 | 94630 | NO <sub>2</sub>     | N         | Y – 13  | 2.6  | Y                     |
| 17       | Castle Lane West (Cooper)            | R         | 412175 | 94308 | NO <sub>2</sub>     | N         | Y- 10   | 3.1  | Y                     |

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| Site No. | Location                                 | Site Type | X      | Y     | Pollutant Monitored | In AQMA ? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Worst-Case Location ? |
|----------|--|-----------|--------|-------|---------------------|-----------|---|--|-----------------------|
|          | Dean)                                    |           |        |       |                     |           |   |  |                       |
| 18       | Castle Lane East (Tesco's)               | R         | 412977 | 93821 | NO <sub>2</sub>     | N         | Y - 31  | 4  | Y                     |
| 19       | Ringwood Road                            | R         | 405720 | 96496 | NO <sub>2</sub>     | N         | Y - 31  | 1.5  | Y                     |
| 20       | Wimborne Road (Winton)                   | R         | 408640 | 93695 | NO <sub>2</sub>     | Y         | Y - 3.38  | 1.1  | Y                     |
| 23       | Cambridge Road                           | K         | 407913 | 91369 | NO <sub>2</sub>     | N         | Y - 31  | 0.5  | Y                     |
| 24       | Talbot Avenue (Boundary Road Roundabout) | K         | 407772 | 93616 | NO <sub>2</sub>     | N         | Y - 26  | 0  | Y                     |
| 25       | Kinson Road (Columbia Road Junction)     | R         | 406775 | 94758 | NO <sub>2</sub>     | N         | Y - 5   | 1  | Y                     |
| 26       | St Pauls Road (Roundabout)               | K         | 409533 | 91884 | NO <sub>2</sub>     | N         | Y - 16  | 0.6  | Y                     |
| 28       | Castlepoint (Castle Lane West)           | R         | 411211 | 94652 | NO <sub>2</sub>     | N         | Y - 8.5   | 9.5  | N                     |
| 29       | Castlepoint West (Castle Lane West)      | R         | 410803 | 94627 | NO <sub>2</sub>     | N         | Y - 20  | 2  | Y                     |
| 30       | Yeomans Road                             | R         | 410977 | 94716 | NO <sub>2</sub>     | N         | Y - 14  | 3  | Y                     |
| 31       | Castlepoint East (Castle Lane West)      | R         | 411432 | 94600 | NO <sub>2</sub>     | N         | Y - 11  | 2  | Y                     |
| 32       | Iford Bridge Roundabout (Christchurch)   | R         | 413556 | 93440 | NO <sub>2</sub>     | N         | Y - 8.3   | 2  | Y                     |
| 33       | Alma Road                                | R         | 409146 | 93228 | NO <sub>2</sub>     | N         | Y - 5.6   | 1  | Y                     |

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| Site No. | Location               | Site Type | X      | Y     | Pollutant Monitored | In AQMA ? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Worst-Case Location ? |
|----------|------------------------|-----------|--------|-------|---------------------|-----------|---|--|-----------------------|
| 34       | Bath Road              | R         | 409286 | 91190 | NO <sub>2</sub>     | N         | Y – 12.4  | 1.5  | Y                     |
| 35       | 299 Wimborne Road      | R         | 408588 | 93329 | NO <sub>2</sub>     | Y         | Y – 2.36  | 1  | Y                     |
| 36       | Wimborne Road Junction | K         | 408606 | 93374 | NO <sub>2</sub>     | Y         | Y – 3.95  | 0  | Y                     |
| 37       | Cardigan Road          | K         | 408649 | 93542 | NO <sub>2</sub>     | N         | Y- 2.71   | 0  | Y                     |
| 38       | Kemp Road              | K         | 408631 | 93744 | NO <sub>2</sub>     | N         | Y – 2.56  | 0  | Y                     |
| 39       | Wimborne Road Lib Club | K         | 408691 | 93979 | NO <sub>2</sub>     | Y         | Y – 7.2   | 0  | Y                     |

(K = Kerbside, R = Roadside, UB = Urban background)

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

#### Automatic Monitoring Data

Automatic monitoring at the AURN Bournemouth Background Site had good data capture (98%) in 2012. The results showed that no exceedences of the AQS objectives were recorded.

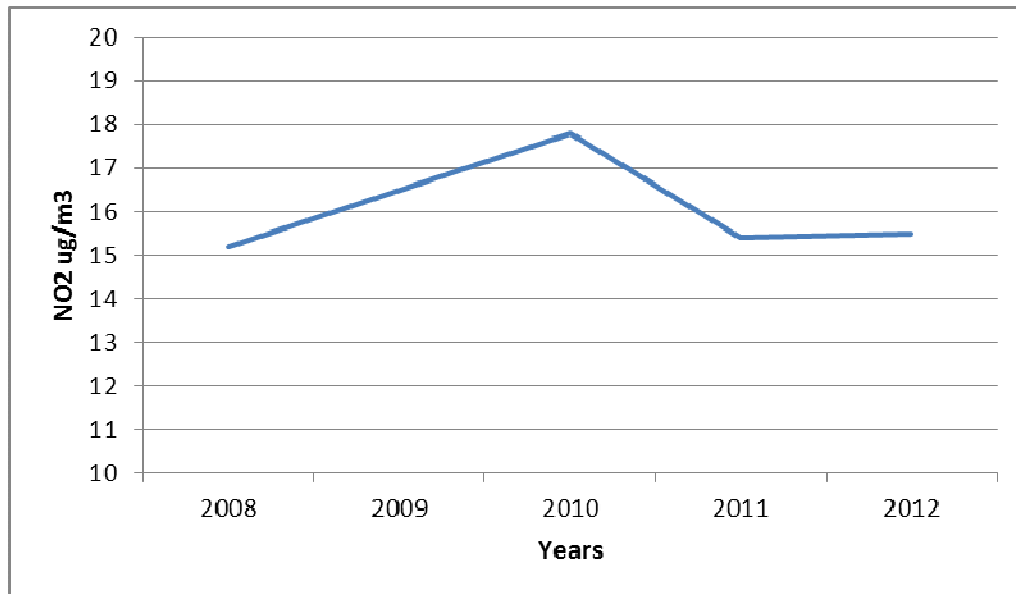
**Table 4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective**

| Location                         | Within AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2012 % | Annual Mean Concentrations (µg/m <sup>3</sup> ) |      |      |      |      |
|----------------------------------|--------------|--------------------------------------|--|---|------|------|------|------|
|                                  |              |                                      |  | 2008  | 2009 | 2010 | 2011 | 2012 |
| AURN Bournemouth Background Site | N            | 98                                   | 98   | 15.2  | 16.5 | 17.8 | 15.4 | 15.5 |

**Table 5 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective**

| Location                         | Within AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2012 % | Number of Hourly Means >200µg/m <sup>3</sup> |      |      |      |      |
|----------------------------------|--------------|--------------------------------------|--|--|------|------|------|------|
|                                  |              |                                      |  | 2008   | 2009 | 2010 | 2011 | 2012 |
| AURN Bournemouth Background Site | N            | 98                                   | 98   | 0  | 0    | 0    | 0    | 0    |

**Figure 4 Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites**



The trend of increasing NO<sub>2</sub> levels in the Borough stopped in 2010. The highest levels in the past four year occurred in 2010 with 17.8µg/m<sup>3</sup>. The levels then fell in 2011 by 2.5µg/m<sup>3</sup> to close to the 2008 recorded concentrations of 15.2µg/m<sup>3</sup>. A very minor increase was recorded form 2011 to 2012. Overall the background has remained fairly stable over the past four years.

## Diffusion Tube Monitoring Data

Diffusion tube data capture was good during 2012, with all tubes being above 75% data capture. Hence there was no need to carry out any annualisation.

During 2012 there were seven diffusion tubes recording levels above  $40\mu\text{g}/\text{m}^3$  (the annual objective for  $\text{NO}_2$ ). Of these seven tubes, four are located outside of the current AQMA.

The four sites located outside of the current AQMA are:

- BK23 Cambridge Road, Roundabout;
- BK26 St Pauls Roundabout;
- BK31 Castlepoint East; and
- BK34 Bath Road.

These sites have been considered using the  $\text{NO}_2$  fall-off with distance calculator<sup>4</sup> provided by Defra on the LAQM Support website. The predicted results at the facades of buildings considered to have relevant exposure are as follows:

- Site 23 – Cambridge Road predicted result at façade is  $22.7\ \mu\text{g}/\text{m}^3$ ;
- Site 26 – St Pauls Roundabout predicted result at façade is  $36.6\ \mu\text{g}/\text{m}^3$ ;
- Site 31 – Castlepoint East predicted result at façade is  $29.4\ \mu\text{g}/\text{m}^3$ ;
- Site 34 – Bath Road predicted result at façade is  $29.6\ \mu\text{g}/\text{m}^3$ .

After using the fall-off with distance calculator, all of the results are below the annual mean objective for  $\text{NO}_2$ , therefore there is no need to progress to Detailed Assessment due to measured exceedences of the AQS objectives.

The council are also interested in analysing the results within the Winton AQMA to assess current concentration of pollution at the facades. The fall-off with distance calculator has been used for the results within the AQMA over  $40\mu\text{g}/\text{m}^3$  in 2012 to assess the likely relevant concentrations.

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<sup>4</sup> Available at <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

- Site 20 – Wimborne Road triplicate predicted result at façade is 36.1 µg/m<sup>3</sup>;
- Site 35 – 299 Wimborne Road predicted result at façade is 34.7 µg/m<sup>3</sup>;
- Site 36 – Wimborne Road Junction predicted result at façade is 30.0 µg/m<sup>3</sup>; and
- Site 39 – Wimborne Road Library predicted result at façade is 23.8 µg/m<sup>3</sup>.

Having put the results from within the AQMA through the fall-off with distance calculator, none of the results exceeded the AQS objective for annual mean NO<sub>2</sub>. The triplicate results at site 20 are still within 10% of the objective levels.

Continuing from the task started in 2011, the past results within the AQMA have been assessed against the objective and presented in the appendix. The results of which show that based on diffusion tube monitoring, the AQS objective for annual mean NO<sub>2</sub> was not exceeded at locations of relevant exposure. The full results can be found in Appendix B.

As the concentrations of NO<sub>2</sub> in the Winton AQMA at relevant locations have been below the objective for five years the council are considering revocation of the AQMA.

**Table 6 Results of Nitrogen Dioxide Diffusion Tubes**

| Site ID | Location                             | Within AQMA? | 2012 % Data Capture | Annual Mean Concentrations (µg/m <sup>3</sup> ) Adjusted For Bias |                          |                          |                          |                          |                          |                          |
|---------|--------------------------------------|--------------|---------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|         |                                      |              |                     | 2006 (Bias Factor: 0.99)  | 2007 (Bias Factor: 0.85) | 2008 (Bias Factor: 0.90) | 2009 (Bias Factor: 0.91) | 2010 (Bias Factor: 0.88) | 2011 (Bias Factor: 0.90) | 2012 (Bias Factor: 0.90) |
| 1       | Somerley Road                        | N            | 92.3                | 20.3  | 18.7                     | 16.5                     | 16.6                     | 19.2                     | 16.5                     | 17.7                     |
| 2       | Cemetery                             | N            | 100.0               | 25.4  | 23.7                     | 21.5                     | 23.3                     | 24.6                     | 23.5                     | 22.8                     |
| 3       | Hengistbury (Southbourne Coast Road) | N            | 100.0               | 18.4  | 16.3                     | 14.7                     | 14.2                     | 17.5                     | 15                       | 15.9                     |
| 4       | Christchurch Road (Pokesdown)        | N            | 84.6                | 38.7  | 33                       | 31.4                     | 31                       | 35.9                     | 33.9                     | 33.5                     |
| 5       | Capstone Place                       | N            | 100.0               | 27.5  | 24.8                     | 24.3                     | 22.5                     | 25.6                     | 23.8                     | 24.4                     |
| 6       | Lower Gardens                        | N            | 84.6                | 23.8  | 20.9                     | 18.7                     | 17.4                     | 20.2                     | 19.5                     | 20.2                     |

## Bureau Veritas Air Quality

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| Site ID | Location                                 | Within AQMA? | 2012 % Data Capture | Annual Mean Concentrations ( $\mu\text{g}/\text{m}^3$ ) Adjusted For Bias |                          |                          |                          |                          |                          |                          |
|---------|--|--------------|---------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|         |  |              |                     | 2006 (Bias Factor: 0.99)  | 2007 (Bias Factor: 0.85) | 2008 (Bias Factor: 0.90) | 2009 (Bias Factor: 0.91) | 2010 (Bias Factor: 0.88) | 2011 (Bias Factor: 0.90) | 2012 (Bias Factor: 0.90) |
| 7       | Turbary Park Avenue                      | N            | 100.0               | 30.8  | 26                       | 26.5                     | 26.4                     | 28.3                     | 28.3                     | 26.7                     |
| 9       | Lystra Road                              | N            | 100.0               | 20.3  | 17.5                     | 17.3                     | 15.7                     | 17.9                     | 16.6                     | 16.1                     |
| 11      | Kings Park Drive                         | N            | 84.6                | 18  | 16.2                     | 16.3                     | 16                       | 17.1                     | 16.2                     | 17.2                     |
| 12      | Surrey Gardens                           | N            | 100.0               | 22  | 18.8                     | 17.9                     | 18.3                     | 20                       | 20                       | 18.9                     |
| 13      | Wimborne Road (Kinson)                   | N            | 100.0               | <b>40.8</b>   | 34.9                     | 33.2                     | 32.7                     | 36                       | 36                       | 35.6                     |
| 14      | Wallisdown Road                          | N            | 100.0               | <b>41.8</b>   | 36.1                     | 36.4                     | 35.4                     | 39.3                     | 33.8                     | 39.0                     |
| 15      | AQMU Portchester Sch (Harewood Ave)      | N            | 100.0               | 18.2  | 15.2                     | 14.7                     | 13.4                     | 16.2                     | 14.6                     | 15.6                     |
| 16      | Boundary Road                            | N            | 100.0               | 29.4  | 26                       | 24.3                     | 23.1                     | 28.2                     | 26.4                     | 28.1                     |
| 17      | Castle Lane West (Cooper Dean)           | N            | 100.0               | <b>40.4</b>   | 33.6                     | 34.3                     | 32.3                     | 33.4                     | 36.3                     | 35.8                     |
| 18      | Castle Lane East (Tesco's)               | N            | 100.0               | 37.1  | 32.8                     | 31.2                     | 33.2                     | 35.7                     | 33.5                     | 35.0                     |
| 19      | Ringwood Road                            | N            | 100.0               | 27.3  | 22.5                     | 21.5                     | 22.3                     | 25.4                     | 24.8                     | 25.8                     |
| 20      | Wimborne Road (Winton)                   | Y            | 100.0               | <b>46.8</b>   | 38.3                     | 37.9                     | 39.7                     | <b>46.2</b>              | <b>45.7</b>              | <b>44.5</b>              |
| 23      | Cambridge Road                           | N            | 100.0               | <b>40.5</b>   | 37.6                     | 38.1                     | 36.4                     | <b>42.9</b>              | <b>40.3</b>              | <b>42.6</b>              |
| 24      | Talbot Avenue (Boundary Road Roundabout) | N            | 92.3                | 38.9  | 34.9                     | 34.6                     | 35.2                     | 39.7                     | 27.1                     | 30.2                     |
| 25      | Kinson Road (Columbia Road Junction)     | N            | 100.0               | <b>41.7</b>   | 36.2                     | 36.6                     | 36.9                     | <b>42.6</b>              | <b>41.5</b>              | 39.5                     |



## Bureau Veritas Air Quality

## Bournemouth Borough Council

| Site ID | Location                               | Within AQMA? | 2012 % Data Capture | Annual Mean Concentrations ( $\mu\text{g}/\text{m}^3$ ) Adjusted For Bias |                          |                          |                          |                          |                          |                          |
|---------|--|--------------|---------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|         |  |              |                     | 2006 (Bias Factor: 0.99)  | 2007 (Bias Factor: 0.85) | 2008 (Bias Factor: 0.90) | 2009 (Bias Factor: 0.91) | 2010 (Bias Factor: 0.88) | 2011 (Bias Factor: 0.90) | 2012 (Bias Factor: 0.90) |
| 26      | St Pauls Road (Roundabout)             | N            | 100.0               | <b>40.6</b>   | 38.6                     | 39.8                     | 37.6                     | <b>44.1</b>              | <b>41.9</b>              | <b>43.7</b>              |
| 28      | Castlepoint (Castle Lane West)         | N            | 92.3                | 35  | 28.1                     | 29.5                     | 28                       | 30.3                     | 31.5                     | 32.3                     |
| 29      | Castlepoint West (Castle Lane West)    | N            | 100.0               | 30.3  | 28.5                     | 28.8                     | 27.7                     | 30.8                     | 29.6                     | 29.6                     |
| 30      | Yeomans Road                           | N            | 76.9                | 33.7  | 28.1                     | 29.7                     | 30                       | 31.1                     | 30.8                     | 30.7                     |
| 31      | Castlepoint East (Castle Lane West)    | N            | 100.0               | 37.3  | 38.1                     | 36                       | 35                       | 37.1                     | <b>41.3</b>              | <b>40.3</b>              |
| 32      | Iford Bridge Roundabout (Christchurch) | N            | 100.0               | <b>41.4</b>   | 35.8                     | 35.5                     | 33.5                     | 36.1                     | 35.4                     | 35.5                     |
| 33      | Alma Road                              | N            | 100.0               | 34.2  | 31.2                     | 30.9                     | 28.7                     | 34.9                     | 30.7                     | 33.5                     |
| 34      | Bath Road                              | N            | 100.0               | <b>47.1</b>   | 37.4                     | <b>40</b>                | 35.9                     | <b>44.1</b>              | 35.5                     | <b>43.0</b>              |
| 35      | 299 Wimborne Road                      | Y            | 92.3                | -   | 37.9                     | 35.2                     | 33.9                     | <b>42.2</b>              | 39.8                     | <b>41.0</b>              |
| 36      | Wimborne Road Junction                 | Y            | 100.0               | -   | 39.7                     | 37.6                     | 37.2                     | <b>43.5</b>              | <b>41.5</b>              | <b>45.0</b>              |
| 37      | Cardigan Road                          | N            | 100.0               | -   | 28.5                     | 25.5                     | 25                       | 29.9                     | 28.2                     | 29.3                     |
| 38      | Kemp Road                              | N            | 100.0               | -   | 24.5                     | 24.4                     | 23.8                     | 28.8                     | 26.8                     | 26.9                     |
| 39      | Wimborne Road Lib Club                 | Y            | 100.0               | -   | 35.8                     | 32.7                     | 33.6                     | 35.9                     | 35.5                     | 35.6                     |

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

### 2.2.2 Particulate Matter (PM<sub>10</sub>)

There was no PM<sub>10</sub> carried out within Bournemouth Borough in 2012. All previous LAQM reports have identified that there is no likely exceedence of the PM<sub>10</sub> AQS objectives.

PM<sub>2.5</sub> is monitored at the AURN background site. PM<sub>2.5</sub> objectives have been set out in the UK Air Quality Regulations. Although there is no requirement for local authorities to review and assess PM<sub>2.5</sub> against these objectives as part of the LAQM regime, results have been reported as recommended by Technical Guidance LAQM.TG(09).

The PM<sub>2.5</sub> results indicate that levels are well below the target value of 25µg/m<sup>3</sup> in 2012.

**Table 7 Results of Automatic Monitoring for Particulates (PM<sub>2.5</sub>)**

| Location  | Within AQMA? | PM <sub>2.5</sub> Annual Mean 2012 * |
|---|--------------|--------------------------------------|
| Bournemouth AURN Background   | No           | 9.6 <sup>b</sup>                     |
| * As a comparison, the UK Air Quality Standard objective for PM <sub>2.5</sub> is 25µg/m <sup>3</sup> (target value) for England<br><sup>b</sup> Data capture was below 75% during 2012 |              |                                      |

### 2.2.3 Sulphur Dioxide (SO<sub>2</sub>)

No monitoring of Sulphur Dioxide takes place in the Borough. All previous LAQM reports have identified that there is no likely exceedence of the Sulphur Dioxide AQS objectives.

### 2.2.4 Benzene

No monitoring of Benzene takes place in the Borough. All previous LAQM reports have identified that there is no likely exceedence of the Benzene AQS objectives.

### 2.2.5 Other Pollutants Monitored

Continuous monitoring of O<sub>3</sub> is undertaken at the Bournemouth AURN Background monitoring site. O<sub>3</sub> is a transboundary pollutant; the sources of O<sub>3</sub> are frequently spatially distant from the measured site of the concentrations. This pollutant is not a prescribed air quality objective for LAQM purposes; however, it has been reported as recommended by Technical Guidance LAQM.TG(09).

The results from 2012 indicate the AQS objective for O<sub>3</sub>, of 10 8-hour running mean exceedences of 100µg/m<sup>3</sup> per year is being exceeded. One amendment from the 2012 USA should be made, an error in calculations reported O<sub>3</sub> concentrations as only marginally exceeding in Bournemouth whereas the number of 8-hour running means greater than 100µg/m<sup>3</sup> was actually 114 in 2011. Therefore the O<sub>3</sub> concentrations in the area have been consistently exceeding the objectives.

**Table 8 Results of Automatic Monitoring for Ozone: Comparison with Objectives**

| Location   | Within AQMA? | Description   | % Data capture 2012 | Number of Exceedences in 2012 |
|--|--------------|---|---------------------|-------------------------------|
| Bournemouth AURN Background  | No           | Maximum 8-hour running mean > 100 µg/m <sup>3</sup> | 98                  | 150                           |
| Exceedence of the ozone AQS objective (100µg/m <sup>3</sup> 10 exceedences allowed per year) |              |   |                     |                               |

### 2.2.6 Summary of Compliance with AQS Objectives

Bournemouth Borough Council have assessed the measured pollutant concentrations in their borough against the AQS objectives. There were four exceedences of measured NO<sub>2</sub> levels outside of the AQMA. However, when projected to relevant façades, the pollutant concentrations fell below the AQS objective levels.

The pollutant levels in the AQMA were also assessed and it was noted that all concentrations at facades are likely to be below the AQS objectives. However some were still within 10% (36µg/m<sup>3</sup>) of the annual mean objective for NO<sub>2</sub>. The NO<sub>2</sub> concentrations have been below the objective in the AQMA for five consecutive years, as such the council may wish to consider revocation of the AQMA.

Overall, there is no need to carry out a Detailed Assessment for measured exceedences of the AQS objectives in the Borough.

Bournemouth Borough Council has examined the results from monitoring in the borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

Bournemouth Borough Council confirms that there are no new/newly identified road traffic sources in the borough.

### **3.2 Other Transport Sources**

Bournemouth Borough Council confirms that there are no new/newly identified non-road transport sources in the borough.

### **3.3 Industrial Sources**

Bournemouth Borough Council confirms that there are no new/newly identified industrial sources in the borough.

### **3.4 Commercial and Domestic Sources**

Bournemouth Borough Council confirms that there are no new/newly identified commercial or domestic sources in the borough.

### 3.5 New Developments with Fugitive or Uncontrolled Sources

Bournemouth Borough Council confirms that there are no new/newly identified fugitive or uncontrolled sources in the borough.

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

Bournemouth Borough Council confirms that all the following have been considered:

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

## **4 Local / Regional Air Quality Strategy**

Bournemouth Borough Council has not developed a Local Air Quality Strategy and the Borough is not part of any regional strategy.

## **5 Planning Applications**

Bournemouth Borough Council has identified one planning application in 2012 which has the potential to impact air quality concentrations in the borough.

- Leyton Mount car park development 7/2011/4319/B (consent granted 2012).



## 6 Air Quality Planning Policies

Bournemouth has developed planning policy which will have a direct influence on air pollution in the borough.

- **Policy CS 35** (Minimising Pollution). In order to protect environmental quality, human health and safety and general amenity development will be required to minimise potential pollution by way of noise, odour, light. Effluent, vibration or any other waste materials. Mitigation measures will be required where pollution is unavoidable. Development that may be sensitive to existing or potential polluting sources will not be sited in proximity to such sources and potentially polluting development will not be sited near to sensitive development.

## **7 Local Transport Plans and Strategies**

Through the LTP3, measures are being implemented as part of the LTP Capital Programme that will have a positive effect on Air Quality in Bournemouth. Additionally, this LTP funding will be supplemented by additional funding that has been secured through the Better Area Bus and Locals Sustainable Transport Funds which aim to encourage and promote walking, cycling and public transport.

## 8 Climate Change Strategies

The “Go Green Bournemouth” Climate Change Strategy outlines the boroughs climate change strategies up to 2026. The Strategy outlines at a high level how the Borough will be adapting to climate change, create a low carbon sustainable Bournemouth and how the people and council of Bournemouth can play their part. Air quality is mentioned under Sustainability Weaknesses, highlighting that their *‘performance on tranquillity and air quality is low compared with other areas and the density of urban living is considered to be having a negative impact on peoples’ physical and mental health’*.

## **9 Implementation of Action Plans**

The AQMA on Wimborne Road has not yet had an action plan published. No updates are available since the last round of review and assessment.

## **10 Conclusions and Proposed Actions**

### **10.1 Conclusions from New Monitoring Data**

Bournemouth Borough Council have assessed the measured pollutant concentrations in their borough against the AQS objectives. There were four exceedences of measured NO<sub>2</sub> levels outside of the AQMA. However when projected to façade of buildings representing relevant exposure, the pollutant concentrations are predicted to be below the AQS objective levels.

Concentrations within the Winton AQMA were also projected to façade. It is noted that using the fall off with distance calculator provides an indication of the objectives within the AQMA being met for the last five years. Due to this, the council may wish to consider revocation of the AQMA.

Overall there is no need to carry out a Detailed Assessment for measured exceedences of the AQS objectives in the Borough.

### **10.2 Conclusions relating to New Local Developments**

Bournemouth Borough Council have checked and considered all potential sources of pollutants within the borough. One new development has been identified as having a potential impact upon air quality.

### **10.3 Other Conclusions**

The council should proceed with finalising the Winton Air Quality Action Plan. Even if the council are considering revocation of the AQMA, an action plan will still be useful as it will help to ensure the concentrations remain below the objective levels. Additionally it should have wider beneficial impacts on air quality in the area.

## 10.4 Proposed Actions

The results from both monitoring and assessment of sources in the Borough indicate all air quality objectives in the borough are currently being met and will continue to be met in the future. As monitoring indicates that NO<sub>2</sub> concentrations at facades representative of relevant exposure may have been below the objective levels for several consecutive years, the council may wish to consider revocation of the AQMA.

Proposed actions are therefore:

- Proceed to Annual Progress Report 2014
- Consider revocation of the Winton AQMA

## 11 References

Defra, 2007. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 1. Defra, London. Cm 7169.

Defra, 2009a. Local Air Quality Management, Technical guidance LAQM.TG09. Defra, London.

Defra, 2009b. Local Air Quality Management, Policy guidance LAQM.PG09. Defra, London

Bournemouth Borough Council (2006). Local Air Quality Management – Updating and Screening Assessment April 2006

Bournemouth Borough Council (2007) Local Air Quality Management – Air Quality Progress Report. 2007

Bournemouth Borough Council (2008) Local Air Quality Management – Air Quality Progress Report. 2008

Bournemouth Borough Council (2009). Local Air Quality Management – Updating and Screening Assessment April 2009

Bournemouth Borough Council (2010) Local Air Quality Management – Air Quality Progress Report. 2010

Bournemouth Borough Council (2011) Local Air Quality Management – Air Quality Progress Report. 2011

Bournemouth Borough Council (2012). Local Air Quality Management – Updating and Screening Assessment April 2012

## **Appendices**

**Appendix A: Quality Assurance / Quality Control (QA/QC) Data**

**Appendix B: Fall Off with Distance Corrected Non-Automatic Monitoring Data**



## Appendix A: QA:QC Data

### Factor from Local Co-location Studies

Bournemouth Borough Council completed a Co-location study at the Bournemouth AURN station in 2012. The result of the study was a factor of 0.90 for 2012.

| Diffusion Tubes Measurements |                          |                        |                               |                               |                               |                    |                       |  |                      |
|------------------------------|--------------------------|------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|-----------------------|--|----------------------|
| Period                       | Start Date<br>dd/mm/yyyy | End Date<br>dd/mm/yyyy | Tube<br>1 $\mu\text{gm}^{-3}$ | Tube<br>2 $\mu\text{gm}^{-3}$ | Tube<br>3 $\mu\text{gm}^{-3}$ | Triplicate<br>Mean | Standard<br>Deviation | Coefficient<br>of<br>Variation<br>(CV) | 95% CI<br>of<br>mean |
| 1                            | 05/01/2012               | 02/02/2012             | 24.9                          | 26.9                          | 26.0                          | 26                 | 1.0                   | 4                                      | 2.5                  |
| 2                            | 02/02/2012               | 01/03/2012             | 23.9                          | 24.2                          | 25.2                          | 24                 | 0.7                   | 3                                      | 1.6                  |
| 3                            | 01/03/2012               | 29/03/2012             | 23.8                          | 25.4                          | 25.1                          | 25                 | 0.8                   | 3                                      | 2.1                  |
| 4                            | 29/03/2012               | 24/05/2012             | 14.6                          | 16.6                          | 13.5                          | 15                 | 1.5                   | 10                                     | 3.8                  |
| 5                            | 24/05/2012               | 21/06/2012             | 13.0                          | 13.6                          | 13.7                          | 13                 | 0.4                   | 3                                      | 0.9                  |
| 6                            | 21/06/2012               | 19/07/2012             | 11.8                          | 11.8                          | 10.4                          | 11                 | 0.8                   | 7                                      | 2.0                  |
| 7                            | 19/07/2012               | 16/08/2012             | 10.1                          | 10.1                          | 9.9                           | 10                 | 0.1                   | 1                                      | 0.2                  |
| 8                            | 16/08/2012               | 13/09/2012             | 14.1                          | 13.3                          | 13.9                          | 14                 | 0.4                   | 3                                      | 1.0                  |
| 9                            | 13/09/2012               | 11/10/2012             | 8.4                           | 9.5                           | 9.6                           | 9                  | 0.7                   | 7                                      | 1.7                  |
| 10                           | 11/10/2012               | 08/11/2012             | 16.3                          | 16.9                          | 15.7                          | 16                 | 0.6                   | 4                                      | 1.4                  |
| 11                           | 08/11/2012               | 06/12/2012             | 16.6                          | 18.1                          | 17.7                          | 17                 | 0.8                   | 4                                      | 1.9                  |
| 12                           | 06/12/2012               | 03/01/2013             | 24.9                          | 26.2                          | 26.1                          | 26                 | 0.7                   | 3                                      | 1.8                  |
| 13                           |                          |                        | 16.3                          | 19.1                          | 18.5                          | 18                 | 1.5                   | 8                                      | 3.7                  |

| Automatic Method |                           |
|------------------|---------------------------|
| Period<br>Mean   | Data<br>Capture<br>(% DC) |
| 19.91158         | 95.98765432               |
| 23.68835         | 94.97126437               |
| 27.31297         | 99.85119048               |
| 16.77198         | 99.85119048               |
| 11.93572         | 99.55357143               |
| 9.665172         | 99.55357143               |
| 8.180328         | 99.85119048               |
| 11.07773         | 99.55357143               |
| 10.01708         | 95.83333333               |
| 11.10543         | 99.38366718               |
| 16.46875         | 99.85141159               |
| 22.04769         | 99.85119048               |
| 14.59254         | 99.70238095               |

| Data Quality Check          |  |
|-----------------------------|--|
| Tubes<br>Precision<br>Check | Automatic<br>Monitor<br>Data<br>Capture<br>Check |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |
| Good                        | Good   |

Overall survey -  
-> 

|                |                 |
|----------------|-----------------|
| Good precision | Good Overall DC |
|----------------|-----------------|

| Accuracy                                 |                      |                                | (with 95% confidence interval) |
|--|----------------------|--------------------------------|--------------------------------|
| without periods with CV larger than 20%  |                      |                                |                                |
| Bias calculated using 13 periods of data |                      |                                |                                |
|  | Bias factor A        | 0.9 (0.82 - 0.99)              |                                |
|  | Bias B               | 11% (1% - 21%)                 |                                |
|  | Diffusion Tubes      |                                | $\mu\text{gm}^{-3}$            |
|  | Mean:                | 17                             |                                |
|  | Mean CV (Precision): | 5                              |                                |
|  | Automatic Mean:      | 16                             | $\mu\text{gm}^{-3}$            |
|  |                      | Data Capture for periods used: | 99%                            |
|  | Adjusted Tubes Mean: | 16 (14 - 17)                   | $\mu\text{gm}^{-3}$            |

### Discussion of Choice of Factor to Use

The locally calculated factor provided a very consistent result in comparison to previous years. Using the local factor is recommended in LAQM TG (09) where possible.

### QA/QC of Automatic Monitoring

QA/QC of automatic monitoring is carried out every six months by AEA. The data ratification reports can be downloaded quarterly from [http://ukair.defra.gov.uk/library/reports?section\\_id=13](http://ukair.defra.gov.uk/library/reports?section_id=13)

### QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Rotherham MBC / South Yorkshire laboratories utilising the 50% Triethanolamine (TEA) in acetone preparation method.

The methods meet the guidelines set out in Defra's report "Diffusion Tubes For Ambient NO<sub>2</sub> Monitoring: Practical Guidance"<sup>1</sup>.

Tube preparation and analysis follows operating procedure HS/WI/1015 (NO<sub>2</sub>). Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for users and laboratories (February 2008).

## Appendix B: Fall Off with Distance Corrected Non-Automatic Monitoring Data

| Tube Location          | Site Number | Within AQMA | Distance from Property (m) | Distance from Kerb (m) | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|-------------|-------------|----------------------------|------------------------|------|------|------|------|------|
| Wimborne Road (Winton) | 20          | Y           | 3.38                       | 1.1                    | 31.3 | 33.0 | 38.0 | 37.0 | 36.1 |
| 299 Wimborne Road      | 35          | Y           | 2.36                       | 1                      | 30.3 | 29.7 | 38.0 | 33.8 | 34.7 |
| Wimborne Road Junction | 36          | Y           | 3.95                       | 0                      | 26.3 | 27.6 | 30.5 | 28.3 | 30.0 |
| Wimborne Road Lib Club | 39          | Y           | 7.2                        | 0                      | 22.4 | 23.5 | 25.2 | 23.7 | 23.8 |