# 2018 Air Quality Annual Status Report (ASR) for the year 2017

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

July 2018

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# Executive Summary: Air Quality in Our Area

The Environment Act 1995 places a duty on Local Authorities to monitor, assess and take action to improve local air quality under the statutory process of Local Air Quality Management (LAQM). The LAQM system now places greater emphasis on action planning to improve air quality and includes local measures as part of EU reporting requirements, as well as requiring the completion of an air quality Annual Status Report (ASR). This report forms Huntingdonshire District Councils (HDC) 2018 ASR and is a review of air quality in the district for the year 2017.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2]. The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

This ASR relates to data gathered between 1st January and 31st December 2017.

## Air Quality in Huntingdonshire

Nitrogen Dioxide ($NO_2$) continues to be the only pollutant that currently exceeds the objective level within the district. The primary source of $NO_2$ in Huntingdonshire is due to vehicle emissions, mostly originating from the A14 and to a lesser extent the A1 that runs through the district. However, local traffic within the market towns is also causing some elevated levels.

Huntingdonshire currently has four Air Quality Management Areas (AQMA's).

1. Huntingdon,
2. St Neots,
3. Brampton, and
4. A14 Hemingford to Fenstanton.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

These can be viewed on our website at: http://www.huntingdonshire.gov.uk/environmental-issues/noise-nuisance-pollution/air-quality/ and on the Defra website at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=131

As a whole, the level of $NO_2$ continues to fall as it has done so over the last five years, and is mostly below the annual limit. Huntingdon continues to experience a small hotspot, which shows readings above the annual limit and this is predominantly linked with the A14.

## Actions to Improve Air Quality

Due to staffing changes, action taken in 2017 has been limited, however during 2018 so far officers have worked hard to improve partnership working with Public Health and participate in public awareness campaigns such as the Defra guidance on open fires and wood burning stoves and the first National Clean Air day. Further details regarding these and other actions will be provided in next year's ASR.

Meanwhile the re-routing of the A14 is still progressing, the completion of which will move this heavily used road away from large residential areas by the end of 2020. As reported previously, predictions indicate that all areas currently in an AQMA will see their $NO_2$ and $PM_{10}$ levels significantly reduce once the scheme has been built. While some areas of the district will increase slightly, predictions have shown that these will all remain below EU limit values. Huntingdonshire District Council (HDC) took a leading role in securing a satisfactory result for our residents.

Due to consistent compliance of the diffusion tubes within the St Neots AQMA, and following the completion of a detailed modelling assessment demonstrating air quality limits are not being breached, Huntingdonshire District Council is in the process of revoking the St Neots AQMA. This process has been confirmed with Defra and is currently awaiting HDC committee approval, prior to the Order being made. Defra has offered clear support for this proposal and stated the following in their appraisal report of the 2017 ASR:

*'The Council states that they propose to revoke St Neots AQMA. In light of the results this decision is supported, AQ concentrations have been consistently well below objective levels for a number of years'.*

The detailed modelling assessment of $NO_2$ concentrations has been undertaken and can be viewed on or website at: http://www.huntingdonshire.gov.uk/media/3245/st-neots-air-quality-modelling-report.pdf .

Highways England are continuing to investigate the preferred option for improving the A428 which runs south of St Neots and directly affects traffic flows within St Neots. Highways England are proposing to commence works in 2020. More information can be seen at: https://highwaysengland.co.uk/projects/a428-black-cat-to-caxton-gibbet/ HDC will continue to liaise with Highways England on assessing the impact of the scheme on St Neots and other surrounding areas.

Huntingdonshire District Council also provides advice to members of the public regarding sustainability and energy saving measures and is working hard to reduce its own impact by improving energy efficiency of council owned buildings and supporting working from home opportunities, helping to reduce vehicle usage.

## Conclusions and Priorities

Exceedances of the $NO_2$ limit have been identified within the current Huntingdon AQMA, however overall there is a general downward trend in results. The St Neots AQMA is going through the process of being revoked. The production of a new Air Quality Action Plan is not currently considered a priority, this will be reviewed after the completion of the A14 works and assessment of the remaining AQMA's to enable a more focussed and appropriate action plan to be produced, if required.

The re-routed A14 will significantly decrease the pollution levels currently experienced by many residents. Huntingdonshire District Council will continue to liaise with Highways England regarding the progress of this scheme, as well as the proposed upgrade of the A428, to minimise any impact on air quality.

The main priorities for HDC in relation to Air Quality are to ensure the Air Quality Monitoring Station is operating effectively, assess the Diffusion Tube network, review the status of the AQMA's that continue to show monitoring compliance and improve partnership working. These are discussed further in Section 2.2 below.

Huntingdonshire continues to be an area of growth and an ongoing challenge is to ensure that this growth does not cause any exceedances of AQ objectives.

## Local Engagement and How to get Involved

Members of the public can help to improve local air quality by reducing the number of car journeys undertaken, car sharing, using public transport, walking or cycling wherever possible, switching off car engines when stationary, purchasing energy efficient goods, improving energy efficiency at home and choosing to purchase a low emission car. There is further information on our website under 'Sustainability and greener living' http://www.huntingdonshire.gov.uk/. The energy savings trust can also provide further advice at http://www.energysavingtrust.org.uk/.

The use of wood burning stoves and open fires also contributes to air pollution and there are a number of steps members of the public who use these can take to reduce environmental and health impacts. More information can be found on our website here: http://www.huntingdonshire.gov.uk/environmental-issues/noise-nuisance-pollution/air-quality/wood-burning-stoves/ .

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# 1 Local Air Quality Management

This report provides an overview of air quality in the District of Huntingdonshire during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Huntingdonshire District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E. in Appendix E.

# 2 Actions to Improve Air Quality

## 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Huntingdonshire District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=131. Alternatively, see Appendix D: Maps of Monitoring Locations and AQMAs, which provides maps of air quality monitoring locations in relation to the AQMA's.

## Table 2.1 – Declared Air Quality Management Areas

| AQMA Name | Date of Declaration | Pollutants and Air Quality Objectives | City / Town | One Line Description | Is air quality in the AQMA influenced by roads controlled by Highways England? | Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure) | | | | Action Plan | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | At Declaration | | Now | | Name | Date of Publication | Link |
| HDC Air Quality Management Area Order No. 1 (Huntingdon: Nitrogen Dioxide) | 16th November 2005 - amended 29th October 2007 | NO2 Annual Mean | Huntingdon | An area encompassing approximately 2831 domestic properties affected by the A14, A141, B1044, B1514 and Huntingdon Inner Ring Road. | YES | 96 Orthwaite 50.2 (2004) | µg/m3 | 44.9ug/m3 at PFH (3). 40.7ug/m3 at RE (PFH 2) | µg/m3 | Cambridgeshire Joint Air Quality Action Plan | 2009 | www.huntingdonshire.gov.uk/media/3423/2009-joint-air-quality-action-plan.pdf |
| HDC Air Quality Management Area Order No. 2 (St Neots: Nitrogen Dioxide) | 16th November 2005 - amended 29th October 2007 | NO2 Annual Mean | St Neots | An area encompassing approximately 115 domestic properties affected by local traffic in the town centre. | NO | 26 High Street 45.2 (2004) | µg/m3 | 31.2ug/m3 at 8-10 High Street (St Neots 5) & RE | µg/m3 | Cambridgeshire Joint Air Quality Action Plan | 2009 | www.huntingdonshire.gov.uk/media/3423/2009-joint-air-quality-action-plan.pdf |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HDC Air Quality Management Area Order No. 3 (Brampton) | 1st September 2006 - amended 29th October 2007 | NO2 Annual Mean | Brampton | An area encompassing approximately 82 domestic properties affected by the A14. | YES | 16 Wood View 37.2 (2004) | µg/m3 | 23.9ug/m3 at 1 Laws Crescent (Brampton 3). 14ug/m3 at RE | µg/m3 | Cambridgeshire Joint Air Quality Action Plan | 2009 | www.huntingdonshire.gov.uk/media/3423/2009-joint-air-quality-action-plan.pdf |
| HDC Air Quality Management Area Order No. 4 (Hemingford to Fenstanton: Nitrogen Dioxide) | 1st September 2006 | NO2 Annual Mean | Fenstanton | An area encompassing approximately 62 domestic properties affected by the A14. | YES | Slipway, Huntingdon Road 46.2 (2004) | µg/m3 | 31.9ug/m3 at Hilton Road (Fenstanton 1) & RE | µg/m3 | Cambridgeshire Joint Air Quality Action Plan | 2009 | www.huntingdonshire.gov.uk/media/3423/2009-joint-air-quality-action-plan.pdf |

☒ **Huntingdonshire District Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

## 2.2 Progress and Impact of Measures to address Air Quality in Huntingdonshire

Defra's appraisal of last year's ASR concluded the following:

| DEFRA conclusions | Huntingdonshire District Council comments |
|---|---|
| Table 2.1 does not include the levels of exceedance for each AQMA at the point of declaration. Please ensure this table is completed in full. For further guidance please refer to LAQM Technical Guidance 2016 (TG16). | Due to a number of staffing changes since declaration this information cannot be located. Since the last ASR some data has been found for monitoring locations within the AQMA's in 2004. This has been put in table 2.1 however it should be noted that whilst this gives an idea of the levels that may have led to the declaration of the AQMA's they may not be the definitive figures. |
| It is not immediately clear that distance corrections have been applied in full. All results should be corrected for $NO_2$ fall-off distance where possible, for all results above, and those below and within 10% of objective levels. For further guidance please refer to TG16. | The 'Now' figure in table 2.1 has now been distance corrected in this years ASR. The figures in table B1 in last year's ASR had been distance corrected in line with advice gained from Defra and clarified in section C.3 of the 2017 ASR which stated: *'Correspondence with both Fang Lin and Anthony of the LAQM Helpdesk team clarified that a distance calculation is only required for locations with exceedances over the AQ objective and the inclusion of any other sites within 10% is considered good practice, i.e. any above 36µg/m$^3$…'* A copy of this e-mail is included at Appendix C, figure C.5. |

| | |
|---|---|
| The AQAP presented in Table 2.2 is missing a number of details for certain measures. Please ensure states for planning, implementation and completion are included. Moreover objective KPIs and pollution reduction targets should be included for each measure. For further guidance please refer to TG16. | The AQAP is dated and some of the required detail is difficult to complete. This year's table has been completed with as much detail as possible. It is HDC's intention to review the current AQMA's and if required a new Action Plan will be completed once this and the impact of the A14 works has been assessed. |
| The majority of sites have indicated AQ levels far below objective levels for a number of years. The status of AQMAs (2-4), should all be reviewed, and considered for revocation. | This is in progress for AQMA 2 and a priority for 3 and 4. |
| The council may wish to review their monitoring strategy, allocating resources for identified hotspots, or exploring new sites where AQ levels might be of concern to the Council and Public. For further guidance please refer to TG16. | As above, the effective operation of the Air Quality Monitoring Station and a review of the Diffusion Tube network are key priorities for HDC for 2018/2019. |

Huntingdonshire District Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

It should be noted that these measures originate from the Cambridgeshire Air Quality Action Plan and hence have remained the same for a number of years. HDC are in the process of revoking the St Neots AQMA and gaining evidence in order to review the AQMA's in Brampton and Fenstanton. Once the A14 works have been completed the AQMA in Huntingdon will be reviewed and if necessary a new Action Plan, with updated measures provided.

**Key completed measures are:**

**Measurement 1:** The A14 upgrade is currently being constructed with an estimated completion date of 2020.

**Measurement 2:** Implementation of air quality policies in local plan is currently on going.

The proposed Local Plan for Huntingdonshire to the year 2036 has been submitted to the Secretary of State for approval. Within the *'Parking provision and vehicle movement'* section on page 78, paragraph 5.60 states:

*'It is suggested that at least one charging point for an electric vehicle should be provided where a proposal includes 20 or more parking spaces and that 1 charging point is provided for every 50 spaces'.*

It is hoped this will encourage the use of electrically powered vehicles, in line with National Planning Policy.

In an attempt to ensure air quality is considered officers are now advising the LPA, AQ consultants and developers, that the current advice from public health experts is that the health impacts of AQ should be minimised, even if there is no risk that air quality standards will be breached. Therefore even if the effect is judged to be insignificant consideration should be given to the application of good design and good practice measures, including electric vehicle rapid charge points.

**Measurement 3:** Development of an effective freight partnership. Now that the A14 will be moved away from the residential areas it is not expected that freight will cause a significant issue within Huntingdonshire. Therefore no further action will be taken. This will be reassessed once the A14 works have been completed.

**Measurement 4:** Inclusion of Huntingdonshire in the Quality Bus Partnership (QBP). Cambridgeshire County Council has not extended the QBP to outside Cambridge City, and currently has no plan to do so. Therefore no further action will be taken. This will be reassessed once the A14 works have been completed.

**Measurement 5:** The guided bus route is complete and operational.

**Measurement 6:** Smart traffic lights at St Neots have been installed and are operational.

**Huntingdonshire District Council's priorities for the coming year are:**

- The revocation of the St Neots AQMA (AQMA 2). Following a number of years meeting the objectives, and completion of a detailed modelling assessment demonstrating the air quality standards and objectives are being achieved (and are likely throughout the relevant period to be achieved within the designated area) HDC is in the process of revoking the St Neots AQMA. This process has been confirmed with Defra and is currently awaiting HDC committee approval, prior to the Order being made. Defra are in support of this proposal, stating the following in their appraisal report of the 2017 ASR:

  *'The Council states that they propose to revoke St Neots AQMA. In light of the results this decision is supported, AQ concentrations have been consistently well below objective levels for a number of years'.*

  The detailed modelling assessment of $NO_2$ concentrations has been undertaken and can be viewed on our website at: http://www.huntingdonshire.gov.uk/media/3245/st-neots-air-quality-modelling-report.pdf. Due to the size of the report it has not be included in the Appendices.

- Review the status of AQMA's 3 and 4
- Ensure the effective operation of the Air Quality Monitoring Station
- Review the Diffusion Tube network.
- Improve Partnership working.

Huntingdonshire District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA 1 Huntingdon, and continued compliance in AQMA 2 St Neots and AQMA 4 Hemingford to Fenstanton.

Whilst the measures stated above and in Table 2.2 will help to contribute towards the continued compliance of AQMA 3 at Brampton, a further detailed assessment and modelling will be required to indicate if further additional measures not yet prescribed may be required in subsequent years, such as a realignment of the A1 duel carriageway and by-passing the village of Brampton, to maintain compliance and enable the revocation of AQMA 3 in Brampton.

## Table 2.2 – Progress on Measures to Improve Air Quality

| Measure No. | Measure | EU Category | EU Classification | Organisations involved and Funding Source | Planning Phase | Implementation Phase | Key Performance Indicator | Reduction in Pollutant / Emission from Measure | Progress to Date | Estimated / Actual Completion Date | Comments / Barriers to implementation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Re-routing of A14 away from settlements | Traffic Management | Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane | Highways England | Current | Current | Monitoring should indicate a reduction when relocation of road completed | AQMA's 1, 3 & 4 should meet requirements | Scheme being undertaken | 2020 | Lengthy Timescale but expected to improve all AQMA's (after revocation of St Neots) |
| 2 | Implementation of air quality policies in the local plan. | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | Huntingdonshire District Council | Ongoing | Ongoing | N/A | All | Implementation on-going | Ongoing | Highlighting AQ aspects and measures for reduction ongoing |
| 3 | Development of an effective freight partnership | Freight and Delivery Management | Other | Not currently progressing | Not currently progressing | Not currently progressing | N/A | All | None | Unknown | Now the A14 improvement has been agreed and Highways England have opened communication on improving the A428 it is unknown if an effective fright partnership would have any significant effect. This will be re-evaluated once changes have been monitored. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Inclusion of Huntingdonshire in the Quality Bus Partnership | Alternatives to private vehicle use | Other | Cambridgeshire County Council | No current plan for HDC to be included | No current plan for HDC to be included | N/A | All | None | None | At present CCC do not consider that it is feasible to run the QBP outside of the city of Cambridge. This is something we will continue to consider. |
| 5 | Completion and opening of Cambridgeshire Guided Busway | Transport Planning and Infrastructure | Bus route improvements | Cambridgeshire County Council | Completed | Completed | Unknown | All | Completed | Completed | The guided busway was opened in August 2011 from Cambridge Huntingdon and extended to Peterborough in July 2012. |
| 6 | Change to traffic-light system in St Neots High street as specified in the St Neots Markets Town Strategy | Traffic Management | Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane | Cambridgeshire County Council | Completed | Completed | AQ monitoring indicates a reduction | Reduction in AQMA 2 St Neots | Completed | Completed | Works completed in 2013. Modelling undertaken in 2017 demonstrates AQ limits are being met and HDC are in the process of revoking the AQMA. See Section 2.2 |

## 2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Huntingdonshire District Council is taking the following measures to address $PM_{2.5}$:

- The measures discussed above in section and table 2.2 will help to reduce $PM_{2.5}$ as well as other pollutants.
- It is expected that the upgrade to the A14 which will move the trunk road away from major residential areas will reduce $PM_{2.5}$ significantly (Measurement 1 in table 2.2).
- In 2014 Huntingdonshire District Council joined with Public Health England and the other Cambridgeshire authorities to develop the transport and health joint strategic needs survey which focused on $PM_{2.5}$ from transport, see http://www.cambridgeshireinsight.org.uk/file/2552/download
- Huntingdonshire District Council is intending to review and update the Council's Air Quality Action Plan once further assessments of the current AQMAs have been undertaken.
- Liaising with the Local Planning Authority and developers requesting pre-app advice, to ensure air quality mitigation measures are considered for large developments to minimise any impact (Measurement 2 in table 2.2).
- Advising planning conditions to require a Construction Environmental Management Plan when necessary, in order to control dust from demolition and construction activities.
- HDC are monitoring $PM_{2.5}$ with a continuous monitor within the Huntingdon AQMA at the location (PFH) that is currently breaching the $NO_2$ objective and therefore considered to represent a reasonable worst case scenario.

- Informing the public of key advice documents, such as those provided by Defra regarding the reduction of air pollution from the use of wood burning stoves and open fires.
- HDC are working closely with other Local Authorities in Cambridgeshire as well as Public Health colleagues at the County Council and have taken part in various events recently engaging Environmental Health, Transport and Planning Officers, as well as management and Councillors in an attempt to improve partnership working and improve Air Quality collectively.
- Attendance at the quarterly Cambridgeshire Pollution Prevention Group meetings where issues such as AQ are discussed with representatives from other adjoining Local Authorities, The County Council and the EA to discuss best practice.

Some of the above point's link in with the Public Health Outcomes Framework (PHOF) which includes an indicator for air pollution due to the extensive evidence of the health impacts associated with it. The PHOF aims to increase healthy life expectancy, reduce differences in life expectancy and have healthy life expectancy between communities. The indicators are designed to demonstrate how well public health is being improved and protected and encourage partnership working and involvement.

# 3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

## 3.1 Summary of Monitoring Undertaken

### 3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Huntingdonshire District Council undertook automatic (continuous) monitoring at one site during 2017. Table A.1 in Appendix A shows the details of the site.

National monitoring results are available at: https://uk-air.defra.gov.uk/interactive-map.

Maps showing the location of the monitoring site are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

As highlighted in last year's ASR there was some concern regarding the operation of the $NO_2$ monitor and the accuracy of the results, increasing uncertainty. The unit failed the QA/QC audits in 2016 and 2017 so again there is a high degree of uncertainty in relation to these results, HDC therefore utilised the national bias adjustment figure for adjusting the diffusion tube data. After various communications with our service provider and our auditors the issue with the $NO_2$ monitor has been resolved and the unit passed its audit in early 2018.

### 3.1.2 Non-Automatic Monitoring Sites

Huntingdonshire District Council undertook non- automatic (passive) monitoring of $NO_2$ at 55 sites during 2017. Table A.2 in Appendix A shows the details of the sites.

Funding for 11 additional Diffusion Tubes this year has increased the number of monitoring sites from 44 to 55, which will assist in assessing the impact of relocating the A14.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on bias adjustments and distance correction, are included in Appendix C.

## 3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

### 3.2.1 Nitrogen Dioxide ($NO_2$)

Table A.3 in Appendix A compares the ratified and adjusted monitored $NO_2$ annual mean concentrations for the past 5 years with the air quality objective of 40µg/$m^3$.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored $NO_2$ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/$m^3$, not to be exceeded more than 18 times per year.

Both the automatic monitor and diffusion tube network achieved greater than 75% data capture and therefore no annualisation was required. All data has been properly ratified and corrected for bias where applicable. A distance correction has been completed for monitoring locations where an annual mean concentration has been recorded as above the $NO_2$ annual objective of 40µg/$m_3$ as well as those that are within 10% of this figure (i.e. above 36 µg/$m_3$). This is to account for the inherent uncertainty in diffusion tube monitoring concentration data and is in line with government guidance (paragraph 7.78 of TG16). Distance correction data can be seen in Table B.1 and Appendix C.

Table A3 regarding the annual mean $NO_2$ monitoring results, indicates that three diffusion tubes exceeded the AQ objective and a further two were within 10% of it. The three that exceeded (PFH 1 (42.5 µg/$m^3$), PFH 2 (44.4 µg/$m^3$), and PFH 3 (44.9 µg/$m^3$)) are all located at Pathfinderhouse in Huntingdon, co-located on the continious AQ monitor, which indicated a level of 31.9 µg/$m^3$. As discussed earlier there is high uncertainty regarding the results from the continous monitor. The diffusion tubes within 10% of the AQ objective were located in George Street, Huntingdon (Huntingdon 3) and had a result of 38.8 µg/$m^3$ and Brampton Road Huntingdon (Huntingdon 7) with a result of 37.4 µg/$m^3$. Huntingdon 3 monitoring

point is located at the nearest receptor so no distance calculation was required. The Pathfinder House location, along with Huntingdon 7 are not representative of the nearest receptors and therefore a distance calculation was undertaken utilising the Defra calculator, the results of which are shown in table B1. The calculations and additional information regarding this can be found in Appendix C.

There were no annual means greater than 60 µg/m$^3$, indicating that an exceedance of the 1-hour mean objective was unlikely. The 3 diffusion tube exceedances were at a location point within an existing AQMA, as are the two locations within 10% of the AQ objective, and these can be seen in Appendix D.

The overall trend in the district was that the $NO_2$ results continue to indicate a steady decreasing trend for both inside and outside the AQMAs; however some of the 2017 results appear to be slightly higher than 2016, including 2 out of the 3 rural tubes we have. St Ives and Fenstanton have shown a small increase which may be due to construction activities. Some tubes in the northern part of the district have also indicated a slight increase, but no additional locations are exceeding the objectives compared with last year. This can be seen in the graphs in figure A.1 below.

### 3.2.2 Particulate Matter ($PM_{10}$)

Table A.5 in Appendix A compares the ratified and adjusted monitored $PM_{10}$ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m$^3$. Figure A.2 demonstrates this in graph format.

Table A.6 and figure A.3 in Appendix A compares the ratified continuous monitored $PM_{10}$ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m$^3$, not to be exceeded more than 35 times per year.

The results indicate that these AQ objectives have been met at the monitoring location and the general trend appears to indicate that whilst the number of 24-Hour Mean $PM_{10}$ Results above 50µg/m$^3$ has increased by two to 7, it is still well under the objective of 35 exceedances, as shown in figure A.3. The overall $PM_{10}$ has decreased compared to 2016, demonstrated in Figure A.2.

### 3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.

Huntingdonshire District Council has been monitoring $PM_{2.5}$ since 2014 and each year there has been a slight reduction in the levels measured. This is again the case this year and shown in Figure A.4.

# Appendix A: Monitoring Results

## Table A.1 – Details of Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Inlet Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| PFH | Huntingdon | Roadside | 524102 | 271540 | NO2, PM10, PM2.5 | YES | Chemiluminescent Beta Attenuation, Beta Attenuation | 3 | 7 | 2.5 |

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

## Table A.2 – Details of Non-Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube collocated with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| St Neots 1 | The Paddocks | Kerbside | 517869 | 260132 | NO2 | NO | 22 | 22 | NO | 3 |
| St Neots 2 | 18 Cromwell Gardens | Roadside | 519541 | 260280 | NO2 | NO | 8 | 4 | NO | 3 |
| St Neots 3 | 71 Avenue Road | Urban Background | 518925 | 260503 | NO2 | NO | 4 | 1 | NO | 3 |
| St Neots 4 | 20 Harland Road | Urban Background | 518489 | 260871 | NO2 | NO | 3 | 1 | NO | 3 |
| St Neots 5 | 8-10 High Street (Post Office) | Kerbside | 518323 | 260263 | NO2 | YES | 0 | 1 | NO | 3 |
| St Neots 6 | 35 High Street (Traffic lights) | Kerbside | 518433 | 260321 | NO2 | YES | 0 | 1 | NO | 3 |
| St Neots 7 | 17 Arundel Crescent | Suburban | 518424 | 258556 | NO2 | NO | 0 | 17 | NO | 1.75 |
| St Neots 8 | 122 Lindisfarne Close | Suburban | 518707 | 258260 | NO2 | NO | 4 | 31 | NO | 3 |
| St Neots 9 | 5 Duchess Close | Suburban | 516370 | 259514 | NO2 | NO | 3 | 5 (24m to trunk road) | NO | 3 |
| Southoe 1 | 2 Lees Lane | Roadside | 518714 | 264308 | NO2 | NO | 24 | 2 (14m to trunk road) | NO | 1.75 |
| Buckden 1 | 6 Perry Road | Roadside | 518981 | 267370 | NO2 | NO | 0 | 12 (10m to trunk road) | NO | 1.75 |
| Buckden 2 | 4 High Street (Roundabout) | Roadside | 519082 | 267433 | NO2 | NO | 0 | 1 (35m to trunk road) | NO | 1.75 |
| Buckden 3 | 34 High Street (shop) | Roadside | 519161 | 267624 | NO2 | NO | 0 | 1 | NO | 2 |
| Buckden 4 | 11 Taylors Lane | Roadside | 519197 | 267955 | NO2 | NO | 3 | 1 | NO | 3 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Brampton 1 | RAF Brampton (Sparrow Close) | Roadside | 520734 | 269623 | NO2 | NO | 10 | 0.5 | NO | 3 |
| Brampton 2 | RAF Brampton - Sokemans Way | Roadside | 520500 | 269646 | NO2 | NO | 10 | 1.5 | NO | 3 |
| Brampton 3 | 1 Laws Crescent | Roadside | 520155 | 271561 | NO2 | YES | 32 | 2 | No | 3 |
| Brampton 4 | 25 Dorling Way | Roadside | 519956 | 271461 | NO2 | NO | 6 | 1.5 | No | 3 |
| Brampton 5 | 7 Hansell Road | Roadside | 519839 | 271061 | NO2 | NO | 18 | 0.5 | No | 3 |
| Catworth 1 | 1 Thrapston Road | Rural | 508409 | 274876 | NO2 | NO | 42 | 42 (42m to trunk road) | NO | 3 |
| PFH 1 | Pathfinder House | Roadside | 524102 | 271540 | NO2 | YES | 8 | 6 | YES | 3.6 |
| PFH 2 | Pathfinder House | Roadside | 524102 | 271540 | NO2 | YES | 8 | 6 | YES | 3.6 |
| PFH 3 | Pathfinder House | Roadside | 524102 | 271540 | NO2 | YES | 8 | 6 | YES | 3.6 |
| Huntingdon 1 | 23 Lodge Close | Suburban | 523177 | 271627 | NO2 | NO | 3 | 2 | NO | 3 |
| Huntingdon 2 | 19 Nursery Road | Kerbside | 524198 | 271949 | NO2 | YES | 0 | 1 | NO | 1.75 |
| Huntingdon 3 | 6 George Street | Kerbside | 523661 | 271802 | NO2 | YES | 0 | 1 | NO | 3 |
| Huntingdon 4 | 1 St Peters Road | Kerbside | 523435 | 272464 | NO2 | YES | 3 | 1 | NO | 3 |
| Huntingdon 5 | 18 Blethan Drive | Roadside | 522293 | 272909 | NO2 | YES | 3 | 2 | NO | 3 |
| Huntingdon 6 | 40 Hartford Road | Roadside | 524274 | 271939 | NO2 | YES | 4 | 2 | NO | 3 |
| Godmanchester 1 | 25 Cambridge Villas | Roadside | 525319 | 270571 | NO2 | NO | 3 | 12 (34m to trunk road) | NO | 3 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Wood Green Animal Shelter | Goat enclosure | Rural | 526250 | 268264 | NO2 | NO | 0 | 235 | NO | 3 |
| Fenstanton 1 | Hilton Road | Roadside | 531427 | 268397 | NO2 | YES | 20 | 2 (20m to trunk road) | NO | 3 |
| Fenstanton 2 | 20 Connington Road | Roadside | 531770 | 268215 | NO2 | YES | 14 | 2 (23m to trunk road) | NO | 3 |
| Fenstanton 3 | 1 Pear Tree Close | Rural | 531063 | 268063 | NO2 | NO | 6 | 1.5 | NO | 3 |
| St Ives 1 | 2 The Pound | Urban Background | 531206 | 272334 | NO2 | NO | 5 | 1 | NO | 3 |
| St Ives 2 | 59 Greenfields | Suburban | 530850 | 270286 | NO2 | NO | 6 | 1.5 | NO | 3 |
| St Ives 3 | 6 Goldie Close | Roadside | 529866 | 272285 | NO2 | NO | 11 | 6 | NO | 3 |
| Ramsey 1 | 5 Blenheim Road | Urban Background | 528433 | 284936 | NO2 | NO | 4 | 2 | NO | 3 |
| Yaxley 1 | 2 London Road | Roadside | 517480 | 292309 | NO2 | NO | 13 | 2 | NO | 3 |
| Stibbington 1 | 7 Great North Road | Roadside | 508326 | 298684 | NO2 | NO | 22 | 2 (8m to trunk road) | NO | 3 |
| Alwalton 1 | 2 Royce Road | Roadside | 513132 | 295723 | NO2 | NO | 11 | 4 (61m to trunk road) | NO | 3 |
| Sawtry 1 | 81 Fen Lane | Suburban | 517440 | 283443 | NO2 | NO | 4 | 2 | NO | 3 |
| Alconbury 1 | 54 Manor Lane | Roadside | 518954 | 276010 | NO2 | NO | 6 | 2 | NO | 3 |
| Great Stukeley 1 | Church of Jesus Christ - Ermine Street | Roadside | 522000 | 274607 | NO2 | NO | 33 | 1 | NO | 3 |
| Huntingdon 7 | 6 Brampton Road | Roadside | 523432 | 271760 | NO2 | YES | 10 | 2 | NO | 3 |
| Huntingdon 8 | Main Road | Roadside | 525289 | 272525 | NO2 | NO | 27 | 2 | NO | 3 |
| Hilton 1 | 1 Westbrook Close | Suburban | 528836 | 266538 | NO2 | NO | 10 | 1 | NO | 3 |
| Fenstanton 4 | 25 High Street | Roadside | 531729 | 268370 | NO2 | NO | 1.5 | 1 | NO | 3 |
| Alconbury 2 | Lords Ways | Suburban | 518955 | 275520 | NO2 | NO | 10 | 1 | NO | 3 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Brampton 6 | Parish Hall Church Road | Roadside | 521487 | 270803 | NO2 | NO | 19 | 1 | NO | 3 |
| Brampton 7 | 52 Elizabethan Way | Suburban | 519874 | 270948 | NO2 | NO | 7 | 1.5 | NO | 3 |
| Offord D'Arcy 1 | 42 Gravely Road | Suburban | 522127 | 266105 | NO2 | NO | 11 | 3 | NO | 3 |
| Offord Cluny 2 | 168 High Street | Roadside | 521947 | 267178 | NO2 | NO | 11 | 3 | NO | 3 |

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

## Table A.3 – Annual Mean $NO_2$ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2017 (%) (2) | $NO_2$ Annual Mean Concentration (µg/m$^3$) (3) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| PFH | Roadside | Automatic | 100 | 100 | **45** | 38.9 | 32.2 | 39.4 | 31.9 |
| | | | | | | | | | |
| St Neots 1 | Kerbside | Diffusion Tube | 100 | 100 | 20.6 | 19.6 | 20.5 | 22.1 | 21.6 |
| St Neots 2 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 20.3 |
| St Neots 3 | Urban Background | Diffusion Tube | 92 | 92 | 18.7 | 19 | 16.6 | 18.3 | 16.9 |
| St Neots 4 | Urban Background | Diffusion Tube | 100 | 100 | 15.4 | 15.3 | 14.3 | 16.8 | 15.4 |
| St Neots 5 | Kerbside | Diffusion Tube | 100 | 100 | 36.8 | 36 | 31.7 | 31.3 | 31.2 |
| St Neots 6 | Kerbside | Diffusion Tube | 100 | 100 | 31 | 31.6 | 28.7 | 29.6 | 29.9 |
| St Neots 7 | Suburban | Diffusion Tube | 100 | 100 | 21.4 | 20.3 | 19.9 | 20.5 | 19.9 |
| St Neots 8 | Suburban | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 20.1 |
| St Neots 9 | Suburban | Diffusion Tube | 100 | 100 | 24.5 | 23.5 | 24.5 | 28.4 | 28.1 |
| Southoe 1 | Roadside | Diffusion Tube | 100 | 100 | 20.3 | 19.2 | 17.4 | 18.6 | 16.2 |
| Buckden 1 | Roadside | Diffusion Tube | 100 | 100 | 27.6 | 26.8 | 21.2 | 24.9 | 20.8 |
| Buckden 2 | Roadside | Diffusion Tube | 100 | 100 | 23.8 | 25.3 | 25.6 | 25.8 | 25.6 |
| Buckden 3 | Roadside | Diffusion Tube | 100 | 100 | 32.2 | 32.2 | 28.9 | 29.6 | 27.7 |
| Buckden 4 | Roadside | Diffusion Tube | 100 | 100 | 19.5 | 19.5 | 19.4 | 22.3 | 18.7 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Brampton 1 | Roadside | Diffusion Tube | 100 | 100 | 17.1 | 14.1 | 14.4 | 15.4 | 14.3 |
| Brampton 2 | Roadside | Diffusion Tube | 100 | 100 | N/A | N/A | 16.8 | 16.3 | 15.6 |
| Brampton 3 | Roadside | Diffusion Tube | 100 | 100 | 29.4 | 25.6 | 22.7 | 27 | 23.9 |
| Brampton 4 | Roadside | Diffusion Tube | 100 | 100 | N/A | N/A | 18.8 | 19.8 | 17.4 |
| Brampton 5 | Roadside | Diffusion Tube | 100 | 100 | 18.4 | 16.9 | 15.9 | 17.5 | 15.7 |
| Catworth 1 | Rural | Diffusion Tube | 100 | 100 | 21.4 | 21.7 | 21.6 | 18.9 | 20.3 |
| PFH 1 | Roadside | Diffusion Tube | 100 | 100 | **47.5** | **49.5** | **44.2** | **45.1** | **42.5** |
| PFH 2 | Roadside | Diffusion Tube | 100 | 100 | **48.8** | **52** | **44.7** | **46.1** | **44.4** |
| PFH 3 | Roadside | Diffusion Tube | 100 | 100 | **50.2** | **52.8** | **46.6** | **44.8** | **44.9** |
| Huntingdon 1 | Suburban | Diffusion Tube | 100 | 100 | 21.3 | 18.5 | 17.1 | 19.3 | 15.9 |
| Huntingdon 2 | Kerbside | Diffusion Tube | 83 | 83 | 23 | 22.7 | 21 | 22.2 | 25.4 |
| Huntingdon 3 | Kerbside | Diffusion Tube | 100 | 100 | **42.9** | **41.1** | **40.7** | 39.9 | 38.8 |
| Huntingdon 4 | Kerbside | Diffusion Tube | 100 | 100 | 27.9 | 28.9 | 29.9 | 28.7 | 28.3 |
| Huntingdon 5 | Roadside | Diffusion Tube | 92 | 92 | 29.9 | 27 | 27.6 | 26.9 | 26.5 |
| Huntingdon 6 | Roadside | Diffusion Tube | 100 | 100 | 24.6 | 25.2 | 23.7 | 25.2 | 24.7 |
| Godmanchester 1 | Roadside | Diffusion Tube | 75 | 75 | 27.9 | 23.8 | 22.7 | 24.8 | 22.0 |
| Wood Green Animal Shelter | Rural | Diffusion Tube | 100 | 100 | N/A | N/A | 12.4 | 13.7 | 14.1 |
| Fenstanton 1 | Roadside | Diffusion Tube | 100 | 100 | 29.5 | 32.8 | 31.5 | 31.2 | 31.9 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Fenstanton 2 | Roadside | Diffusion Tube | 100 | 100 | 22 | 22.5 | 19.9 | 20 | 20.7 |
| Fenstanton 3 | Rural | Diffusion Tube | 100 | 100 | N/A | N/A | 13.7 | 13.8 | 13.6 |
| St Ives 1 | Urban Background | Diffusion Tube | 83 | 83 | 17.8 | 18.7 | 17.6 | 18.6 | 19.0 |
| St Ives 2 | Suburban | Diffusion Tube | 100 | 100 | N/A | N/A | 21.3 | 22.9 | 23.2 |
| St Ives 3 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 16.4 |
| Ramsey 1 | Urban Background | Diffusion Tube | 100 | 100 | 17.2 | 18 | 17.8 | 19.7 | 18.1 |
| Yaxley 1 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 28.5 |
| Stibbington 1 | Roadside | Diffusion Tube | 100 | 100 | 26.2 | 26.5 | 29.6 | 28.6 | 29.8 |
| Alwalton 1 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 20.1 |
| Sawtry 1 | Suburban | Diffusion Tube | 100 | 100 | 20.3 | 21.8 | 20.9 | 22.3 | 23.0 |
| Alconbury 1 | Roadside | Diffusion Tube | 100 | 100 | 24.3 | 21.4 | 19.9 | 21.8 | 19.2 |
| Great Stukeley 1 | Roadside | Diffusion Tube | 92 | 92 | N/A | N/A | N/A | N/A | 18.7 |
| Huntingdon 7 | Roadside | Diffusion Tube | 90 | 75 | N/A | N/A | 36.4 | 34.6 | 37.4 |
| Huntingdon 8 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 23.4 |
| Hilton 1 | Suburban | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 11.9 |
| Fenstanton 4 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 23.1 |
| Alconbury 2 | Suburban | Diffusion Tube | 75 | 75 | N/A | N/A | 17.7 | 15.9 | 15.4 |
| Brampton 6 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 23.6 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Brampton 7 | Suburban | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 14.5 |
| Offord D'Arcy 1 | Suburban | Diffusion Tube | 90 | 75 | N/A | N/A | N/A | N/A | 11.4 |
| Offord Cluny 2 | Roadside | Diffusion Tube | 100 | 83 | N/A | N/A | N/A | N/A | 16.9 |

☒ **Diffusion tube data has been bias corrected**

☐ **Annualisation has been conducted where data capture is <75% (N/A)**

**Notes:**

Exceedances of the $NO_2$ annual mean objective of 40µg/$m^3$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg/$m^3$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined.**

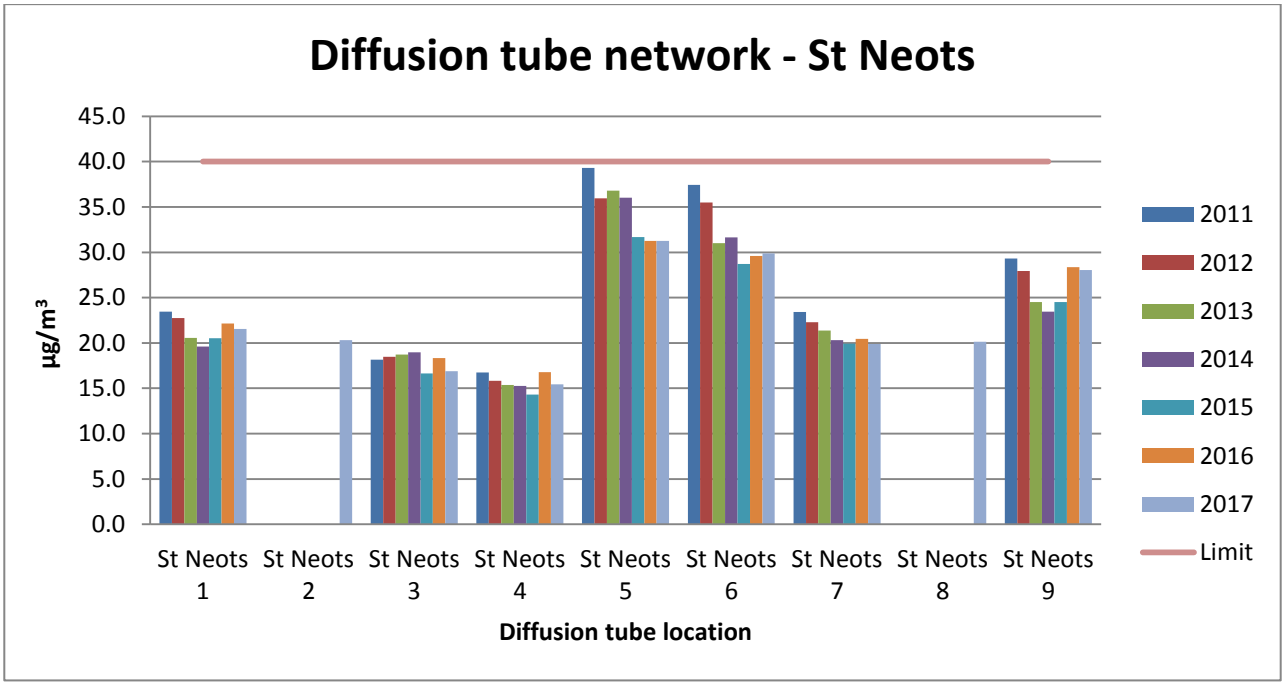
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

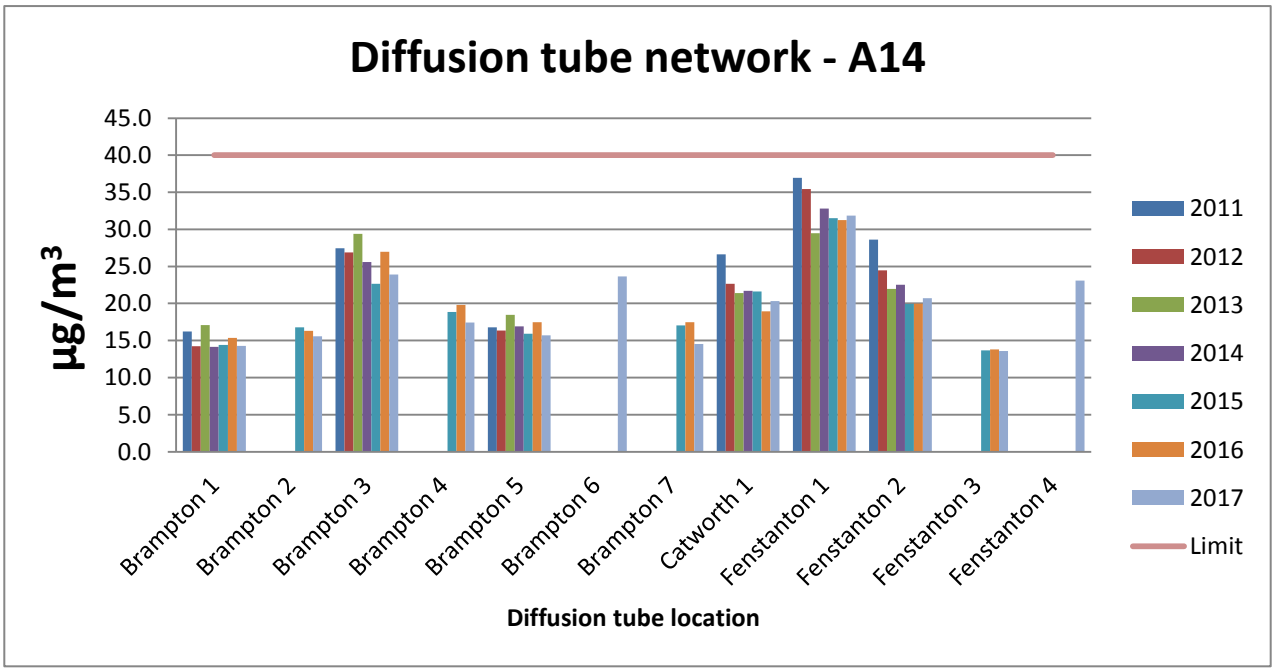
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

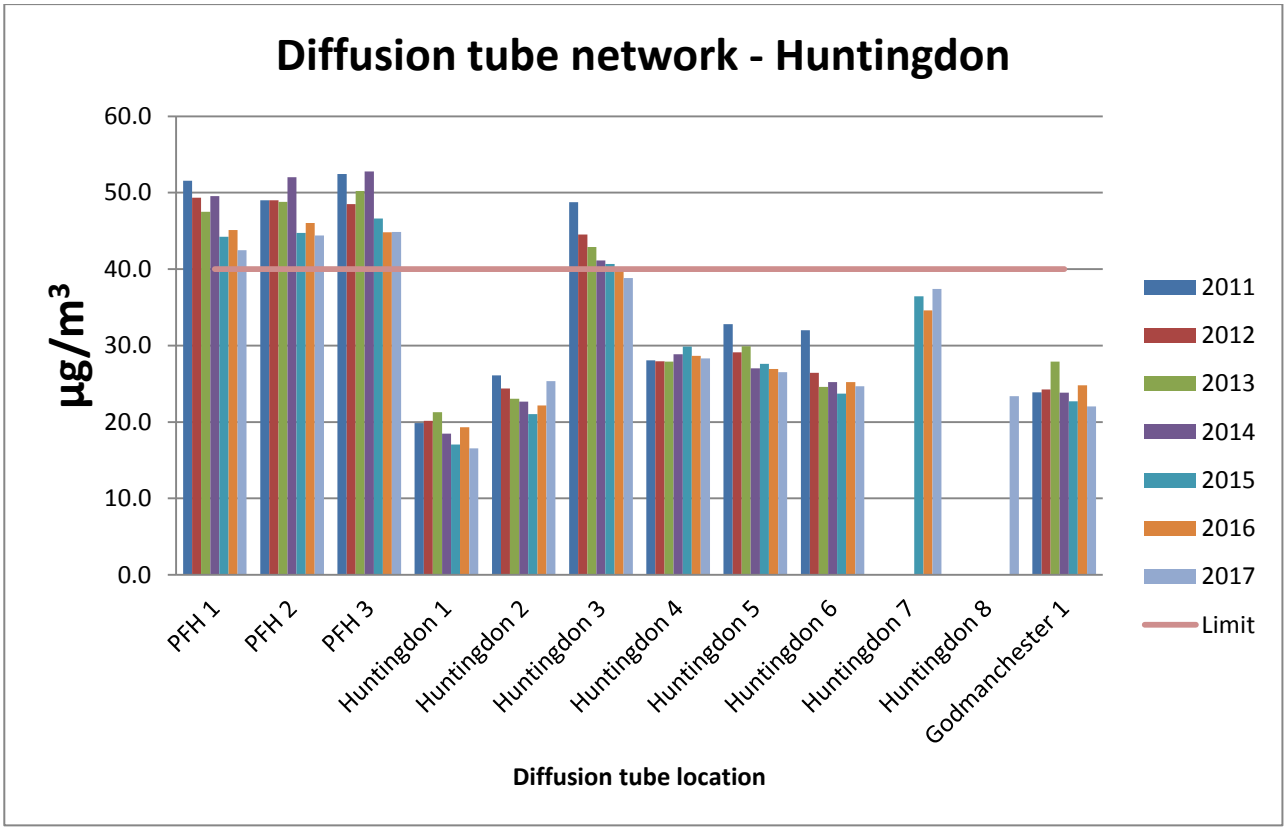
(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

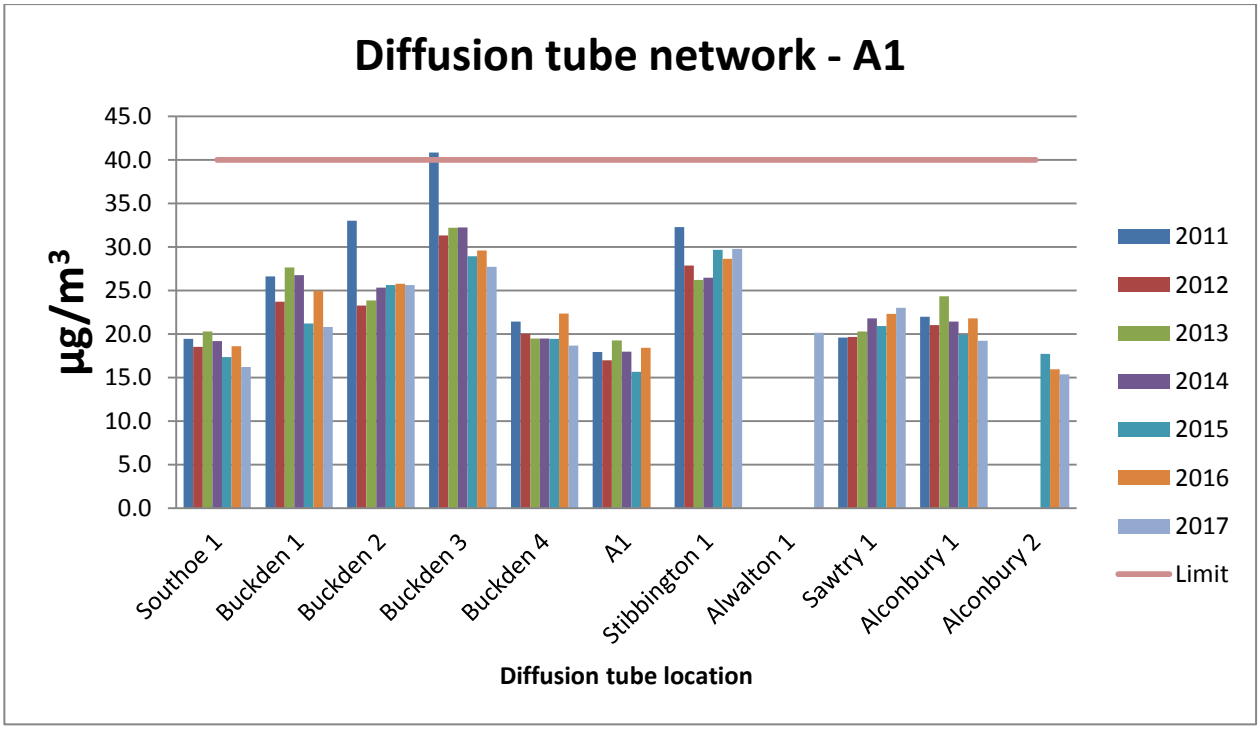
## Figure A.1 – Trends in Annual Mean $NO_2$ Concentrations

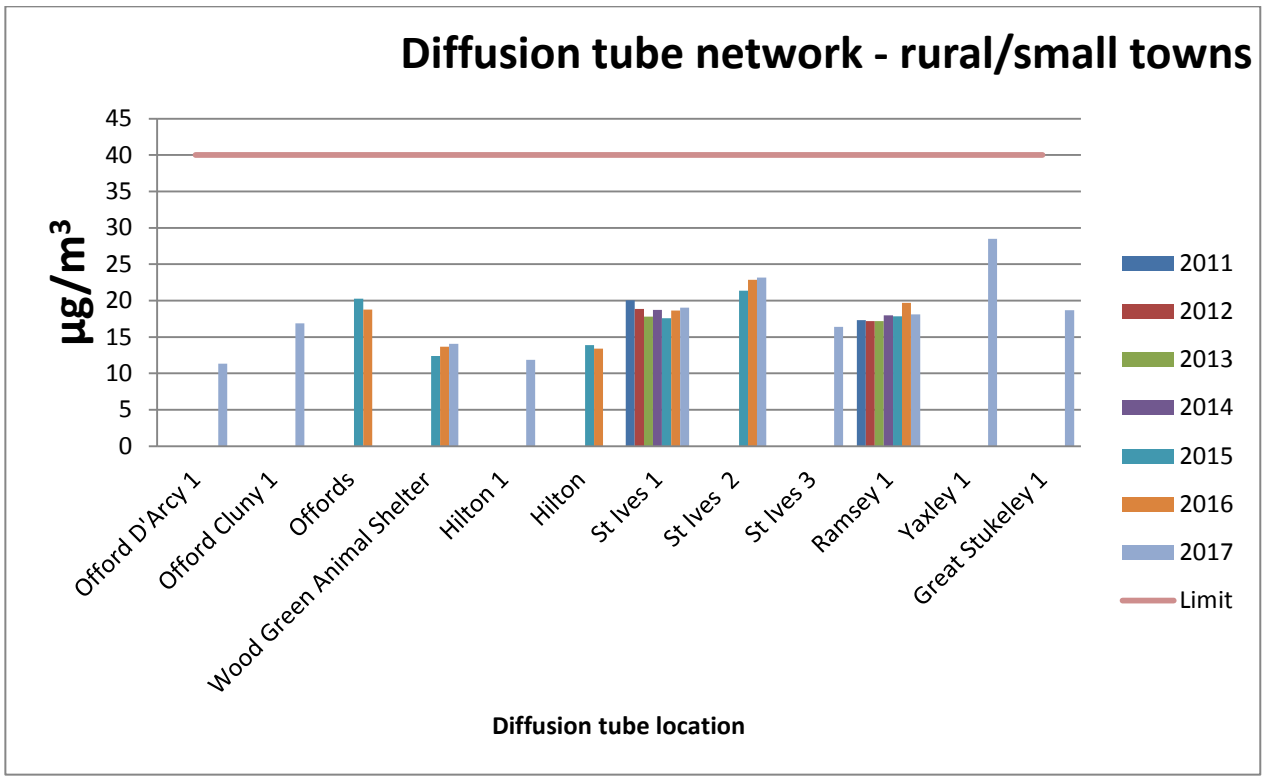
*Please note that the following graphs have been changed compared to last year with the earliest data to the left for each site rather than to the right.*




Diffusion tube network - Huntingdon
60.0
50.0
40.0
30.0
20.0
10.0
0.0
µg/m³
PFH 1
PFH 2
PFH 3
Huntingdon 1
Huntingdon 2
Huntingdon 3
Huntingdon 4
Huntingdon 5
Huntingdon 6
Huntingdon 7
Huntingdon 8
Godmanchester 1
Diffusion tube location
2011
2012
2013
2014
2015
2016
2017
Limit


Diffusion tube network - A1
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
µg/m³
Southoe 1
Buckden 1
Buckden 2
Buckden 3
Buckden 4
A1
Stibbington 1
Alwalton 1
Sawtry 1
Alconbury 1
Alconbury 2
Diffusion tube location
2011
2012
2013
2014
2015
2016
2017
Limit


Diffusion tube network - rural/small towns
µg/m³
45
40
35
30
25
20
15
10
5
0
Offord D'Arcy 1
Offord Cluny 1
Offords
Wood Green Animal Shelter
Hilton 1
Hilton
St Ives 1
St Ives 2
St Ives 3
Ramsey 1
Yaxley 1
Great Stukeley 1
2011
2012
2013
2014
2015
2016
2017
Limit
Diffusion tube location

## Table A.4 – 1-Hour Mean $NO_2$ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) [1] | Valid Data Capture 2017 (%) [2] | $NO_2$ 1-Hour Means > 200µg/m$^3$ [3] | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| PFH | Roadside | Automatic | 99.5 | 99.5 | **0** | **0** | **0** | **0** | **0** |

**Notes:**

Exceedances of the $NO_2$ 1-hour mean objective (200µg/m$^3$ not to be exceeded more than 18 times/year) are shown in **bold.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8$^{th}$ percentile of 1-hour means is provided in bracket

## Table A.5 – Annual Mean $PM_{10}$ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) [1] | Valid Data Capture 2017 (%) [2] | $PM_{10}$ Annual Mean Concentration (µg/m$^3$) [3] | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| PFH | Roadside | 96.44 | 96.44 | 30 | 20.49 | 19.34 | 20.39 | 18.4 |

☐ **Annualisation has been conducted where data capture is <75% (N/A)**

**Notes:**

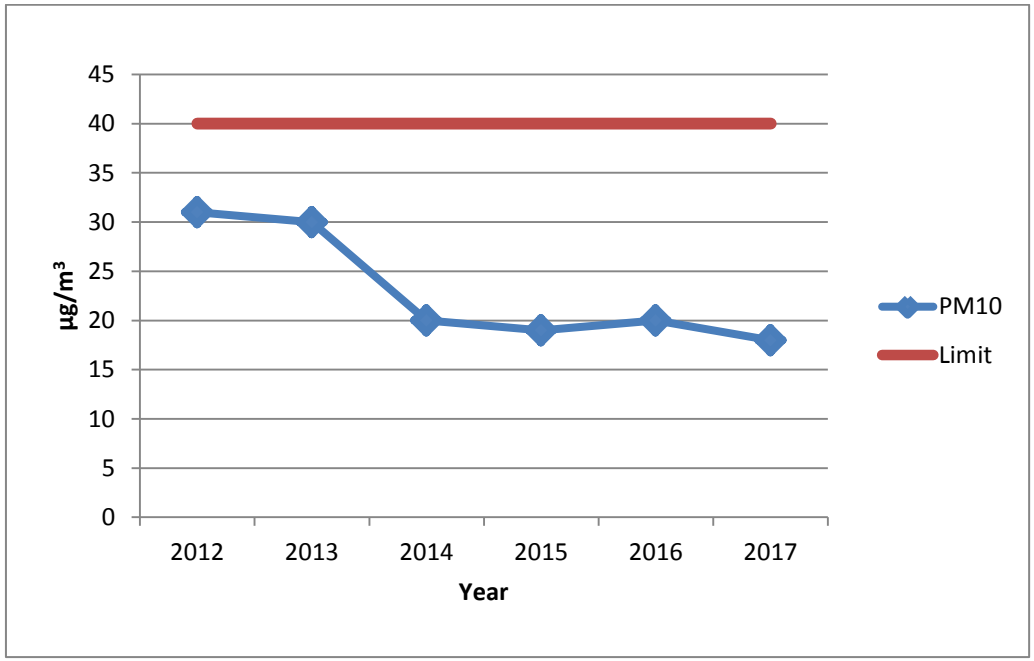
Exceedances of the $PM_{10}$ annual mean objective of 40µg/m$^3$ are shown in **bold.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

## Figure A.2 – Trends in Annual Mean $PM_{10}$ Concentrations



## Table A.6 – 24-Hour Mean $PM_{10}$ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2017 (%) (2) | $PM_{10}$ 24-Hour Means > 50µg/m$^3$ (3) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| PFH | Roadside | 96.44 | 96.44 | 26 | 6 | 3 | 5 | 7 |

**Notes:**

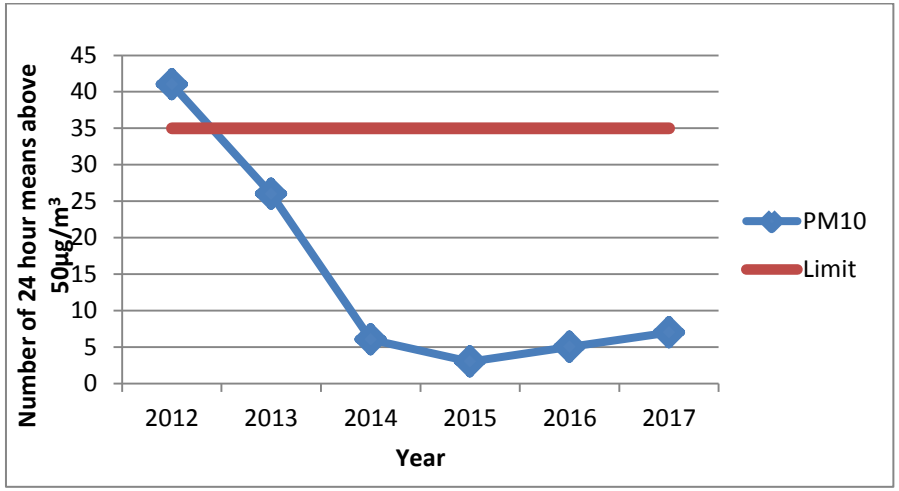
Exceedances of the $PM_{10}$ 24-hour mean objective (50µg/m$^3$ not to be exceeded more than 35 times/year) are shown in **bold.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4$^{th}$ percentile of 24-hour means is provided in brackets.

## Figure A.3 – Trends in Number of 24-Hour Mean $PM_{10}$ Results >50µg/m$^3$



## Table A.7 – $PM_{2.5}$ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2017 (%) (2) | $PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| PFH | Roadside | 90.41 | 90.41 | | 13.9 | 12.3 | 11.8 | 10.6 |

☐ **Annualisation has been conducted where data capture is <75% (N/A)**

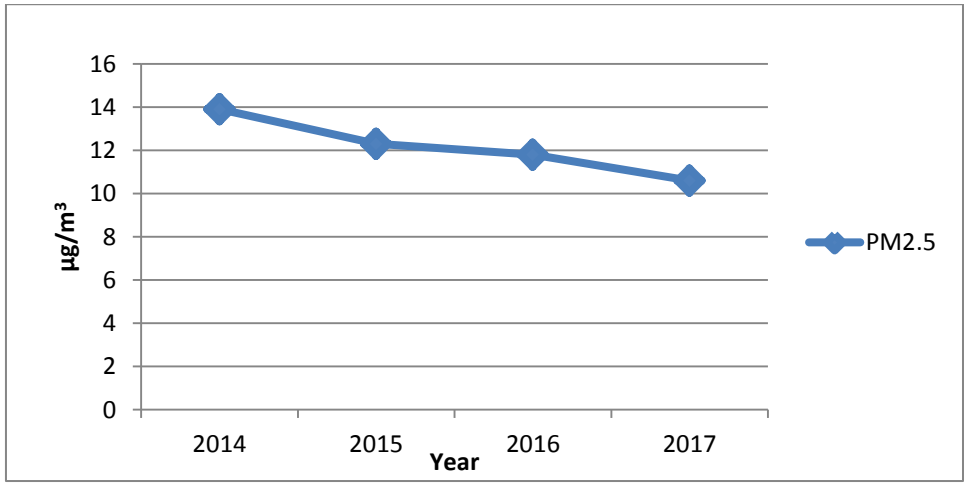
**Notes:**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

## Figure A.4 – Trends in Annual Mean $PM_{2.5}$ Concentrations



# Appendix B: Full Monthly Diffusion Tube Results for 2017

## Table B.2 – $NO_2$ Monthly Diffusion Tube Results - 2017

| Site ID | $NO_2$ Mean Concentrations (µg/m$^3$) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted (0.77) and Annualised (1) | Distance Corrected to Nearest Exposure (2) |
| St Neots 1 | 47.6 | 32.3 | 31.4 | 25.7 | 20.3 | 18.6 | 18.8 | 21.8 | 25 | 26 | 36.6 | 31.9 | 28.0 | 21.6 | |
| St Neots 2 | | | 19.5 | 25.2 | 22.5 | 20.9 | 21.6 | 23 | 26.5 | 27.2 | 42.9 | 34.6 | 26.4 | 20.3 | |
| St Neots 3 | 34.9 | 26 | | 18 | 16.1 | 12.7 | 14.2 | 15.4 | 20.2 | 20.2 | 33.2 | 30.3 | 21.9 | 16.9 | |
| St Neots 4 | 39.3 | 25.6 | 19.7 | 16.2 | 15.9 | 11 | 12.1 | 15 | 19 | 19.9 | 29.7 | 17.1 | 20.0 | 15.4 | |
| St Neots 5 | 56 | 45.2 | 41.3 | 44.5 | 33.5 | 34 | 33.7 | 33.4 | 39.3 | 38.6 | 53.3 | 34.1 | 40.6 | 31.2 | |
| St Neots 6 | 54.1 | 42.2 | 48 | 35.1 | 36.4 | 31 | 33 | 34.3 | 39 | 35.8 | 43 | 34 | 38.8 | 29.9 | |
| St Neots 7 | 45.4 | 29.6 | 25.7 | 26.9 | 18.1 | 12.9 | 17.4 | 18.7 | 22.6 | 26.9 | 36 | 29.5 | 25.8 | 19.9 | |
| St Neots 8 | | | 28.5 | 26.5 | 20.7 | 21 | 18.9 | 24.1 | 25.9 | 28 | 36.7 | 31.2 | 26.2 | 20.1 | |
| St Neots 9 | 53.8 | 45.1 | 41 | 40.1 | 24.7 | 27.1 | 25.6 | 28.3 | 31.5 | 31.4 | 49.1 | 39.5 | 36.4 | 28.1 | |
| Southoe 1 | 39.3 | 31.8 | 25.5 | 18.1 | 21.7 | 13.5 | 15.4 | 13.5 | 18.1 | 14.8 | 21.3 | 19.3 | 21.0 | 16.2 | |
| Buckden 1 | 44 | 37.5 | 35.3 | 20.8 | 33.6 | 23.7 | 21.8 | 21.4 | 22.7 | 21.3 | 21.6 | 20.3 | 27.0 | 20.8 | |
| Buckden 2 | 40.4 | 36.2 | 34.2 | 40.7 | 25.1 | 27.1 | 29.7 | 34.5 | 31.5 | 30.9 | 35.7 | 33 | 33.3 | 25.6 | |
| Buckden 3 | 56.1 | 41.9 | 39.5 | 37.6 | 30.5 | 29.1 | 29 | 31.3 | 35.5 | 36.8 | 39.2 | 25.5 | 36.0 | 27.7 | |
| Buckden 4 | 27.2 | 32.4 | 27 | 27.2 | 19.6 | 15.8 | 18.1 | 20.5 | 22.6 | 25.4 | 31.5 | 23.8 | 24.3 | 18.7 | |
| Brampton 1 | 32.3 | 26.8 | 20.3 | 15.1 | 12.5 | 10.1 | 10.9 | 13.2 | 18.3 | 17.4 | 24.5 | 20.9 | 18.5 | 14.3 | |
| Brampton 2 | 32.8 | 28.9 | 22.5 | 16.7 | 15.5 | 11.7 | 13.3 | 17.4 | 19.5 | 19.8 | 26.3 | 18.5 | 20.2 | 15.6 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brampton 3 | 54.7 | 36.8 | 36.3 | 30.7 | 28.2 | 16.5 | 23.4 | 26.4 | 26.6 | 26.4 | 36.9 | 29.6 | 31.0 | 23.9 | |
| Brampton 4 | 37.1 | 30.9 | 26.2 | 24.4 | 19.7 | 13.3 | 17.8 | 17.2 | 19.4 | 18.2 | 33.9 | 13.2 | 22.6 | 17.4 | |
| Brampton 5 | 39.7 | 23.1 | 22.5 | 23 | 14.5 | 11.5 | 13.7 | 14.4 | 23 | 18 | 22.9 | 18.5 | 20.4 | 15.7 | |
| Catworth 1 | 37.4 | 31.8 | 28.5 | 28.6 | 18.6 | 23.1 | 19.6 | 23.5 | 24.7 | 26.5 | 24.6 | 30 | 26.4 | 20.3 | |
| PFH 1 | 57.7 | 60 | 56.1 | 54.8 | 58.6 | 55.8 | 53.1 | 57.2 | 54.7 | 50 | 57.6 | 46.5 | 55.2 | **42.5** | 38.7 |
| PFH 2 | 72.7 | 65.8 | 56.2 | 59 | 61.6 | 56 | 54.2 | 53.3 | 58.5 | 54.9 | 59 | 40.6 | 57.7 | **44.4** | **40.3** |
| PFH 3 | 70.3 | 63.9 | 57.3 | 56.7 | 60.2 | 56.8 | 55 | 57.5 | 58.2 | 54.6 | 56.7 | 52.3 | 58.3 | **44.9** | **40.7** |
| Huntingdon 1 | 34.9 | 28 | 24.7 | 20 | 19.2 | 12.3 | 15.3 | 15.4 | 20.8 | 19.4 | 26.4 | 21.6 | 21.5 | 16.6 | |
| Huntingdon 2 | 45.8 | 36.7 | 29.6 | 30.5 | 23.4 | 22.5 | | | 33.7 | 30.2 | 41.3 | 35.7 | 32.9 | 25.4 | |
| Huntingdon 3 | 60.9 | 49.5 | 51.2 | 53 | 45.9 | 47.4 | 44.8 | 47.5 | 49.7 | 47.3 | 56.9 | 51.1 | 50.4 | 38.8 | 38.8 |
| Huntingdon 4 | 53.1 | 46 | 30.7 | 43.1 | 30.4 | 31.6 | 29.1 | 30.1 | 39.5 | 44.1 | 45.9 | 18.1 | 36.8 | 28.3 | |
| Huntingdon 5 | 39.5 | | 21.2 | 43.3 | 25.9 | 29.8 | 31.7 | 33.3 | 33.5 | 39.4 | 42.1 | 39 | 34.4 | 26.5 | |
| Huntingdon 6 | 46.2 | 42.1 | 20.2 | 33.6 | 21.2 | 29.1 | 21.4 | 30.6 | 30.3 | 34.4 | 36.4 | 38.9 | 32.0 | 24.7 | |
| Godmanchester 1 | 43.7 | 34.2 | 27.7 | | 19.9 | 16.2 | | | 27.9 | 21.4 | 35.6 | 30.8 | 28.6 | 22.0 | |
| Wood Green Animal Shelter | 40.6 | 23.6 | 18.7 | 15.5 | 11.2 | 8.3 | 10.2 | 10.5 | 15.7 | 18.2 | 24.6 | 22 | 18.3 | 14.1 | |
| Fenstanton 1 | 63.3 | 45.4 | 47.1 | 47.4 | 31.9 | 36.5 | 37.2 | 38.4 | 40.2 | 35.8 | 45.6 | 27.8 | 41.4 | 31.9 | |
| Fenstanton 2 | 40.7 | 34.9 | 29.1 | 27 | 19.1 | 18.4 | 20.7 | 20.6 | 24.3 | 25.9 | 34.4 | 27.4 | 26.9 | 20.7 | |
| Fenstanton 3 | 36.9 | 22.8 | 16.5 | 15.5 | 13.5 | 9.3 | 11.2 | 12.1 | 15.6 | 17.4 | 22.8 | 18.1 | 17.6 | 13.6 | |
| St Ives 1 | 42.5 | 34.3 | 28.2 | 18.6 | 15.2 | 14.9 | 15.6 | 19 | | | 28.6 | 30 | 24.7 | 19.0 | |
| St Ives 2 | 42.7 | 34.7 | 28.8 | 34.1 | 21.4 | 23.7 | 23.4 | 22.9 | 27.5 | 30.1 | 37.9 | 33.6 | 30.1 | 23.2 | |
| St Ives 3 | | | 26 | 20 | 16.7 | 14.4 | 15.8 | 16.3 | 20.9 | 23.9 | 31.9 | 26.7 | 21.3 | 16.4 | |
| Ramsey 1 | 42.1 | 31.7 | 26.4 | 19.7 | 15.8 | 14.2 | 16.5 | 17.3 | 22.6 | 21.9 | 31 | 23.2 | 23.5 | 18.1 | |
| Yaxley 1 | | | 41 | 36.2 | 30.5 | 34.8 | 32.7 | 34.9 | 40.2 | 34.2 | 46 | 39.6 | 37.0 | 28.5 | |
| Stibbington 1 | 60.4 | 46.4 | 42.4 | 41.2 | 30.7 | 36.6 | 30.3 | 32.9 | 37 | 36.9 | 34.8 | 34.4 | 38.7 | 29.8 | |
| Alwalton 1 | | | 20.3 | 32.6 | 23.2 | 25.9 | 14.7 | 26.4 | 27.3 | 28.2 | 34 | 28.7 | 26.1 | 20.1 | |
| Sawtry 1 | 51.2 | 37.2 | 28.9 | 22.4 | 27.5 | 17.6 | 18.7 | 47 | 26.2 | 21.7 | 33.1 | 26.9 | 29.9 | 23.0 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alconbury 1 | 41.6 | 36.1 | 27.3 | 24.4 | 21.8 | 16.9 | 17.6 | 20.5 | 20.9 | 19.1 | 28.7 | 24.7 | 25.0 | 19.2 | |
| Great Stukeley 1 | 31.9 | 30.4 | | 23.3 | 17.7 | 19 | 16.7 | 17.7 | 25.3 | 23.7 | 30.8 | 30.1 | 24.2 | 18.7 | |
| Huntingdon 7 | | | 66.7 | 58.9 | 44.5 | 42.4 | 41.6 | | 39 | 48.4 | 54.9 | 40.7 | 48.6 | 37.4 | 26.4 |
| Huntingdon 8 | | | 38.5 | 28.1 | 23.1 | 24.9 | 26.4 | 28.5 | 24.1 | 34.9 | 40.4 | 34.9 | 30.4 | 23.4 | |
| Hilton 1 | | | 20.6 | 13.7 | 11.5 | 9.4 | 10.4 | 12.5 | 15.1 | 17.4 | 23.9 | 19.6 | 15.4 | 11.9 | |
| Fenstanton 4 | | | 36.3 | 44.3 | 20.4 | 17.6 | 20.9 | 30.7 | 29 | 30.4 | 35.7 | 34.5 | 30.0 | 23.1 | |
| Alconbury 2 | 32.3 | 27.3 | 18.8 | 12.6 | | | 14.7 | 16.8 | 16.6 | 18.7 | 21.8 | | 20.0 | 15.4 | |
| Brampton 6 | | | 35 | 32.2 | 24.7 | 21.1 | 24.5 | 24.3 | 30 | 33.5 | 44.1 | 37.5 | 30.7 | 23.6 | |
| Brampton 7 | | | 24.6 | 21.6 | 14.5 | 12.9 | 13.1 | 15.6 | 18 | 21 | 25.2 | 22.1 | 18.9 | 14.5 | |
| Offord D'Arcy 1 | | | | 15.2 | 11.5 | 8.9 | 10.6 | 13.5 | 14.7 | 18.1 | 24.2 | 16 | 14.7 | 11.4 | |
| Offord Cluny 2 | | | 25.4 | 21.5 | 17 | 14.6 | 16.6 | 19.4 | 22.2 | 25.6 | 33.6 | 23.5 | 21.9 | 16.9 | |

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☐ **Annualisation has been conducted where data capture is <75% (N/A)**

☒ **Where applicable, data has been distance corrected for relevant exposure**

**Notes:**

Exceedances of the $NO_2$ annual mean objective of 40µg/m$^3$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg/m$^3$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure where levels are indicated to be above 36µg/m$^3$, in line with good practice (Objective -10% for uncertainty).

# Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

## C.1 Detailed Dispersion Modelling Report:

Following a number of years of Diffusion Tube monitoring compliance, and following the advice from DEFRA, HDC commissioned an air quality modelling report in 2017 for the St Neots AQMA to assess the viability for revoking the AQMA status. The report and findings can be viewed here: http://www.huntingdonshire.gov.uk/media/3245/st-neots-air-quality-modelling-report.pdf and the intention is to progress with the revocation process. As part of that we would welcome any feedback on this matter from Cambridgeshire County Council's Public Health Directorate and Defra.

## C.2 Diffusion Tubes:

SOCOTEC analyse the nitrogen dioxide tubes for Huntingdonshire District Council at Didcot using the spiking acetone: triethanolamine (50:50) method.

Exposure periods for the diffusion tubes are in line with the recommended Diffusion Tube Monitoring Calendar provided by DEFRA (available at https://laqm.defra.gov.uk/diffusion-tubes/data-entry.html), with the tubes being changed every four or five weeks.

## C.3 Diffusion tube bias adjustment factors:

Diffusion tube values have been multiplied by a bias correction factor of 0.77 gained from the DEFRA LAQM Helpdesk national bias adjustment database (version 03/18 available at https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html) and shown in figure C.1 below.

The national adjustment figure was utilised due to increased uncertainty in figures obtained by Huntingdonshire District Council's NOx monitor.

## Figure C.1: Diffusion Tube Bias Adjustment:

**National Diffusion Tube Bias Adjustment Factor Spreadsheet** — Spreadsheet Version Number: 03/18

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2018
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

**Step 1:** Select the Laboratory that Analyses Your Tubes from the Drop-Down List
If a laboratory is not shown, we have no data for this laboratory.

**Step 2:** Select a Preparation Method from the Drop-Down List
If a preparation method is not shown, we have no data for this method at this laboratory.

**Step 3:** Select a Year from the Drop-Down List
If a year is not shown, we have no data[2]

**Step 4:** Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

| Analysed By[1] | Method (To undo your selection, choose (All) from the pop-up list) | Year[2] (To undo your selection, choose (All)) | Site Type | Local Authority | Length of Study (months) | Diffusion Tube Mean Conc. (Dm) (µg/m³) | Automatic Monitor Mean Conc. (Cm) (µg/m³) | Bias (B) | Tube Precision[5] | Bias Adjustment Factor (A) (Cm/Dm) |
|---|---|---|---|---|---|---|---|---|---|---|
| ESG Didcot | 50% TEA in acetone | 2017 | UB | City of York Council | 12 | 23 | 15 | 53.4% | G | **0.65** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | City of York Council | 10 | 37 | 28 | 30.8% | G | **0.76** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | City of York Council | 11 | 32 | 23 | 41.0% | G | **0.71** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | City of York Council | 12 | 40 | 25 | 58.6% | G | **0.63** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Hambleton District Council | 10 | 21 | 20 | 4.0% | G | **0.96** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Horsham District Council | 11 | 35 | 29 | 18.1% | G | **0.85** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Horsham District Council | 12 | 31 | 26 | 21.3% | G | **0.82** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Horsham District Council | 11 | 33 | 23 | 41.1% | G | **0.71** |
| ESG Didcot | 50% TEA in acetone | 2017 | UC | Leeds City Council 1 | 12 | 41 | 32 | 28.5% | G | **0.78** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Leeds City Council 10 | 11 | 48 | 38 | 25.1% | S | **0.80** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Leeds City Council 2 | 12 | 47 | 35 | 34.4% | S | **0.74** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Leeds City Council 4 | 11 | 56 | 43 | 29.1% | S | **0.77** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Leeds City Council 7 | 11 | 38 | 27 | 39.8% | S | **0.72** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Slough Borough Council | 12 | 45 | 35 | 26.4% | G | **0.79** |
| ESG Didcot | 50% TEA in acetone | 2017 | UB | Slough Borough Council | 12 | 32 | 25 | 28.6% | G | **0.78** |
| ESG Didcot | 50% TEA in acetone | 2017 | UB | Slough Borough Council | 11 | 39 | 33 | 19.2% | G | **0.84** |
| ESG Didcot | 50% TEA in acetone | 2017 | R | Tunbridge Wells | 12 | 56 | 40 | 38.2% | G | **0.72** |
| ESG Didcot | 50% TEA in acetone | 2017 | | **Overall Factor[3] (27 studies)** | | | | **Use** | | **0.77** |

## C.4 Distance correction:

Distance correction has been completed in accordance with the guidance within LAQM Technical Guidance 2016 (TG16) and Correspondance with the LAQM Helpdesk team (see figure  clarified that a distance calculation is only required for locations with exceedances over the AQ objective and the inclusion of any other sites within 10% is considered good practice, i.e. any above 36µg/m$^3$.  The LAQM $NO_2$ fall off with distance calculator was utilised, for the appropriate measurement locations, as the following figures demonstrate. (Please note Huntingdon 3 measurement position is located at the receptor so no distance calculation is required).

## C.5 Automatic Monitoring

QA/QC reports and Service information are attached in figures C.3 and C.4.

## Figure C.2: Multiple distance correction calculation:

Enter data into the pink cells

| Site Name/ID | Distance (m) | | $O_3$ Annual Mean Concentration (µg/m | | | Comment |
|---|---|---|---|---|---|---|
| | Monitoring Site to Kerb | Receptor to Kerb | Background | Monitored at Site | Predicted at Receptor | |
| PFH 1 | 6.0 | 10.0 | 19.0 | 42.5 | 39.7 | Predicted concentration at Receptor within 10% the AQS objective. |
| PFH 2 | 6.0 | 10.0 | 19.0 | 44.4 | **40.3** | Predicted concentration at Receptor above AQS objective. |
| PFH 3 | 6.0 | 10.0 | 19.0 | 44.9 | **40.7** | Predicted concentration at Receptor above AQS objective. |
| Huntingdon 7 | 2.0 | 12.0 | 11.2 | 37.4 | 26.4 | |
| Brampton 3 | 2.0 | 32.0 | 8.7 | 23.9 | 14.0 | Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution. |

## Figure C.3: Third party QA/QC reports:

0401

# CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,

RICARDO



Approved Signatories:

| | |
|---|---|
| ☐ S. Eaton | ☐ B Stacey |
| ☐ D Hector | ☐ S Stratton |
| ☑ N Rand | ☐ A Madle |

Signed:

Date of Issue: 15 Mar 17

Certificate Number: 03556

Customer Name and Address:

Huntingdonshire District Council
Pathfinder House
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

Description: Calibration factors for the air monitoring station at Huntingdon Pathfinder House

Ricardo Energy & Environment ID: ED62657217/February 2017

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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# CERTIFICATE OF CALIBRATION



Date of issue: 10 Mar 17

Certificate Number: 03556

Ricardo Energy & Environment ID: ED62657217/February 2017

Huntingdon Pathfinder House
Date of audit: 10 Feb 2017

| Species | Analyser Serial no | Zero Response[1] | Zero uncertainty ppb | Calibration Factor[2] | Factor uncertainty % | Converter eff. (%)[3] |
|---|---|---|---|---|---|---|
| NOx | 426608503 | -0.7 | 2.5 | 1.0422 | 3.5 | 97.0 |
| NO | 426608503 | -0.1 | 2.5 | 0.9199 | 3.5 | n/a |

Huntingdon Pathfinder House
Date of audit: 10 Feb 2017

| Species | Analyser Serial no | Parameter | Specified Value | Measured Value | Deviation % | Uncertainty % |
|---|---|---|---|---|---|---|
| $PM_{10}$ | CM09510077 | Total Flow[4] | 16.67 | 16.53 | -0.9 | 2.25 |

Huntingdon Pathfinder House
Date of audit: 10 Feb 2017

| Species | Analyser Serial no | Parameter | Specified Value | Measured Value | Deviation % | Uncertainty % |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | CM09510083 | Total Flow[4] | 16.67 | 15.86 | -4.9 | 2.25 |

# CERTIFICATE OF CALIBRATION

0401



| | |
|---|---|
| Date of Issue: | 10 Mar 17 |
| Certificate Number: | 03556 |
| Ricardo Energy & Environment ID: | ED62657217/February 2017 |

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and $k_0$(where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NOx, $SO_2$, $O_3$ and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the $NO_2$ to NO converter within the oxides of nitrogen analyser under test.

[4] The measured main flow rate (where this is applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where this is applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are $l.min^{-1}$, reported at prevailing ambient conditions unless otherwise specified. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

**Dave Bass**
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St Mary's Street
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15th March 2017
Reference 62657217/R21

# AIR MONITORING QA/QC AUDIT RESULTS

**Ambient air monitoring stations: Huntingdon Pathfinder House**

**Date of Audit: 10th February 2017**

Dear Dave,

This report documents the results of quality control audit to Huntingdonshire District Council's Pathfinder House ambient air monitoring station. The work programme is supplied under contract Ricardo Energy & Environment/62657217 for the supply of audit services.

The Huntingdon Pathfinder House monitoring station was audited on 10th February 2017. The equipment audits utilise procedures that are applied within the Department for Environment, Food and Rural Affairs (Defra) national automatic air monitoring network quality control programme.

## AUDIT RESULTS

The following sections provide details of the audit results on a pollutant basis with recommendations for data management action where appropriate.

### Oxides of Nitrogen Analysers

A major factor governing the analyser's performance is the $NO_x$ analyser's converter and its ability to reduce the nitrogen dioxide to nitric oxide. The recommended range for instrumentation in the national automatic air monitoring network is in the range of 98% - 102% efficient. Our tests show the converter in this analyser to be 95.1% efficient with $NO_2$ concentrations of 252 ppb. This result has failed the audit pass criteria. Our second repeat test showed the converter to be 97.0% efficient with an $NO_2$ concentration of 140 ppb, this also failed the audit pass criteria.

In order for $NO_x$ data to be BS EN14211 compliant, $NO_x$ datasets where converter results are less than 98% efficient can be rescaled, provided any impact on data quality is accounted for in the rescaling process. It is the responsibility of the data ratification team to critically assess all evidence including calibrations, audits and equipment support unit reports to quantify this impact. We advised following the audit that you request that your equipment support unit to investigate any underlying reasons for this outlier and to aim to get the converter within the recommended audit pass range.

To ensure that the analysers are sampling only ambient air the instruments were leak checked. The results were satisfactory, indicating that the analyser sampling systems were free of significant leaks. The analysers exhibited good steady state responses to both zero and span (calibration) gases with acceptable levels of variation (noise).

The $NO_x$ analyser sample flow rate was measured using a calibrated flow meter and compared against the analyser's flow rate sensor displayed value to evaluate its accuracy. The analyser's flow rate sensor reading was within 10% of the calibrated flow meter reading and therefore passed this test.

Based on the $NO_x$ analyser's response to the audit standard and audit zero, the concentrations of the stations NO cylinders have been reassessed. This provides an indication of the on-site standards stability (the gas concentration stabilities). For the purpose of these stability checks, the criteria adopted within the national network, and used here, is that the recalculated concentration should lie within 10% of the suppliers stated concentrations. The results of the recalculations are presented below:

| Pathfinder House - NO cylinder 114095C | | | | |
|---|---|---|---|---|
| | $NO_x$ (ppb) | % change from stated | NO (ppb) | % change from stated |
| Manufacturers Stated Concentration | 447 | --- | 447 | -- |
| Recalculated Concentration (10/02/17) | 448 | 0.2 | 442 | -1.2 |

The recalculated results for the site NO cylinder located at Huntingdon Pathfinder House indicate the concentrations are stable, within the definition adopted above, and can therefore reliably be used to scale ambient data.

### Thermo 5014i $PM_{10}$ & $PM_{2.5}$ analysers

To ensure that a true $PM_{10}$ measurement is made, the total flow through the sample inlet must be 16.7 litres per minute. Volumetric flow tests were carried out on the instrument. The measured flows showed good agreement with the system flow set points. To ensure that the analyser was sampling only ambient air, the instrument flow rates were also checked again with a flow restricting test adaptor. The aim here is to identify a leak in the system by comparing these restricted flow readings against the previously recorded unrestricted flow readings. No large discrepancy was found and the instrument was deemed as being free of major leaks.

### Certificate of Calibration

Calibration factors and zeros have been produced on the basis of the audit calibrations conducted. All of these calibrations were conducted with transfer standards traceable to national metrology standards. The attached Certificate of Calibration provides the calibration and zero response factors for the oxides of nitrogen analysers under test on the day of the audits as well as the measured flows for the particulate analysers.

## DATA MANAGEMENT

The following recommendations and comments can be made as a result of these audits:

- Compare the Huntingdonshire District Council database scaling factors for the day of the audits with the factors and zeros on the Certificate of Calibration. If a deviation greater than the uncertainty of the respective factors on the Certificate exists, investigate the underlying reason and implement suitable data management actions.
- Consider the impact of the outlying $NO_x$ converter efficiency result at 97.0%. For data to be BS EN14211 compliant it can be rescaled, provided any impact on data quality is accounted for in the rescaling process. It is the responsibility of the data ratification team to critically assess all evidence including calibrations, audits and

equipment support unit reports to quantify this impact. We advised following the audit that you request that your equipment support unit attend to investigate any underlying reasons for this outlier and to aim to get the converter within the recommended audit pass range.

If you have any questions relating to our audit results or wish to discuss any aspect of air pollution monitoring, please don't hesitate to contact me on 01235 753601 or 07425 623526 darren.lane@ricardo.com

Yours sincerely

**Darren Lane**

**Air Quality - Ricardo Energy and Environment**
www.airqualityengland.co.uk/
ee.ricardo.com

0401

# CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,



Approved Signatories:

- ☐ S. Eaton
- ☐ D Hector
- ☑ N Rand
- ☐ B Stacey
- ☐ S Stratton
- ☐ A Madle

Signed: N. Rand

Date of Issue: 16 Jun 17

Certificate Number: 03720

Customer Name and Address:

Huntingdonshire District Council
Pathfinder House
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

Description: Calibration factors for the air monitoring station at Huntingdon Pathfinder House

Ricardo Energy & Environment ID: 62657217/June 2017

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory

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# CERTIFICATE OF CALIBRATION

0401



Date of issue: 16 Jun 17

Certificate Number: 03720

Ricardo Energy & Environment ID: 62657217/June 2017

Huntingdon Pathfinder House
Date of audit: 07 Jun 2017

| | Species | Analyser Serial no | Zero Response[1] | Zero uncertainty ppb | Calibration Factor[2] | Factor uncertainty % | Converter eff. (%)[3] |
|---|---|---|---|---|---|---|---|
| | NOx | 0426608503 | -1.2 | 2.6 | 1.1076 | 3.5 | 95.2 |
| | NO | 0426608503 | 0.4 | 2.5 | 1.0394 | 3.5 | n/a |

Huntingdon Pathfinder House
Date of audit: 07 Jun 2017

| | Species | Analyser Serial no | Parameter | Specified Value | Measured Value | Deviation % | Uncertainty % |
|---|---|---|---|---|---|---|---|
| Thermo 5014i | $PM_{10}$ | CM09510077 | Total Flow[4] | 16.67 | 16.38 | -1.7 | 2.25 |

Huntingdon Pathfinder House
Date of audit: 07 Jun 2017

| | Species | Analyser Serial no | Parameter | Specified Value | Measured Value | Deviation % | Uncertainty % |
|---|---|---|---|---|---|---|---|
| Thermo 5014i | $PM_{2.5}$ | CM09510083 | Total Flow[4] | 16.67 | 16.57 | -0.6 | 2.25 |

# CERTIFICATE OF CALIBRATION

0401



Date of issue: 16 Jun 17

Certificate Number: 03720

Ricardo Energy & Environment ID: 62657217/June 2017

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and $k_0$(where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NOx, $SO_2$, $O_3$ and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the $NO_2$ to NO converter within the oxides of nitrogen analyser under test.

[4] The measured main flow rate (where this is applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where this is applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are $l.min^{-1}$, reported at prevailing ambient conditions unless otherwise specified. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

**Dave Bass**
**Huntingdonshire District Council**
Pathfinder House
St Mary's Street
Huntingdon
Cambridgeshire
PE29 3TN

**Darren Lane**
**Ricardo Energy & Environment**
Gemini Building
Fermi Avenue
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Oxfordshire
OX11 0QR, UK

Tel: +44 (0)1235 753 601
E: darren.lane@ricardo.com
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W: ee.ricardo.com

16th June 2017
Reference 62657217/R22

# AIR MONITORING QA/QC AUDIT RESULTS

**Ambient air monitoring stations: Huntingdon Pathfinder House**

**Date of Audit: 7th June 2017**

Dear Dave,

This report documents the results of quality control audit to Huntingdonshire District Council's Pathfinder House ambient air monitoring station. The work programme is supplied under contract Ricardo Energy & Environment/62657217 for the supply of audit services.

The Huntingdon Pathfinder House monitoring station was audited on 7th June 2017. The equipment audits utilise procedures that are applied within the Department for Environment, Food and Rural Affairs (Defra) national automatic air monitoring network quality control programme.

## AUDIT RESULTS

The following sections provide details of the audit results on a pollutant basis with recommendations for data management action where appropriate.

### Oxides of Nitrogen Analysers

A major factor governing the analyser's performance is the $NO_x$ analyser's converter and its ability to reduce the nitrogen dioxide to nitric oxide. The recommended range for instrumentation in the national automatic air monitoring network is in the range of 98% - 102% efficient. Our tests show the converter in this analyser to be 94.0% efficient with $NO_2$ concentrations of 274 ppb. This result has failed the audit pass criteria. Our second repeat test showed the converter to be 95.2% efficient with an $NO_2$ concentration of 116 ppb, this also failed the audit pass criteria.

In order for $NO_x$ data to be BS EN14211 compliant, $NO_x$ datasets where converter results are less than 98% efficient can be rescaled, provided any impact on data quality is accounted for in the rescaling process. It is the responsibility of the data ratification team to critically assess all evidence including calibrations, audits and equipment support unit reports to quantify this impact. We advised following the audit that you request that your equipment support unit to investigate any underlying reasons for this outlier and to aim to get the converter within the recommended audit pass range.

To ensure that the analysers are sampling only ambient air the instruments were leak checked. The results were satisfactory, indicating that the analyser sampling systems were free of significant leaks. The analysers exhibited good steady state responses to both zero and span (calibration) gases with acceptable levels of variation (noise).

The $NO_x$ analyser sample flow rate was measured using a calibrated flow meter and compared against the analyser's flow rate sensor displayed value to evaluate its accuracy. The analyser's flow rate sensor reading was within 10% of the calibrated flow meter reading and therefore passed this test.

Based on the $NO_x$ analyser's response to the audit standard and audit zero, the concentrations of the stations NO cylinders have been reassessed. This provides an indication of the on-site standards stability (the gas concentration stabilities). For the purpose of these stability checks, the criteria adopted within the national network, and used here, is that the recalculated concentration should lie within 10% of the suppliers stated concentrations. The results of the recalculations are presented below:

| Pathfinder House - NO cylinder 114095C | | | | |
|---|---|---|---|---|
| | $NO_x$ (ppb) | % change from stated | NO (ppb) | % change from stated |
| Manufacturers Stated Concentration | 447 | --- | 447 | -- |
| Recalculated Concentration (10/02/17) | 448 | 0.2 | 442 | -1.2 |
| Recalculated Concentration (07/06/17) | 450 | 0.7 | 419 | -6.2 |

The recalculated results for the site NO cylinder located at Huntingdon Pathfinder House indicate the concentrations are stable, within the definition adopted above, and can therefore reliably be used to scale ambient data.

During the audit it was noted that the 'span' button on the weblogger does not work. It is recommended that this is brought to the attention of your ESU to investigate and repair the weblogger. The sample inlet was also noted to be dirty and should be cleaned or replaced at the next ESU service as well.

### Thermo 5014i $PM_{10}$ & $PM_{2.5}$ analysers

To ensure that a true $PM_{10}$ measurement is made, the total flow through the sample inlet must be 16.7 litres per minute. Volumetric flow tests were carried out on the instrument. The measured flows showed good agreement with the system flow set points. To ensure that the analyser was sampling only ambient air, the instrument flow rates were also checked again with a flow restricting test adaptor. The aim here is to identify a leak in the system by comparing these restricted flow readings against the previously recorded unrestricted flow readings. No large discrepancy was found and the instrument was deemed as being free of major leaks.

Both $PM_{10}$ and $PM_{2.5}$ inlet heads were deemed as requiring cleaning, this should be carried out at regular intervals by the local site operator and at the Equipment Support Unit (ESU) services.

### Certificate of Calibration

Calibration factors and zeros have been produced on the basis of the audit calibrations conducted. All of these calibrations were conducted with transfer standards traceable to national metrology standards. The attached Certificate of Calibration provides the calibration and zero response factors for the oxides of nitrogen analysers under test on the day of the audits as well as the measured flows for the particulate analysers.

## DATA MANAGEMENT

The following recommendations and comments can be made as a result of these audits:

- Compare the Huntingdonshire District Council database scaling factors for the day of the audits with the factors and zeros on the Certificate of Calibration. If a deviation greater than the uncertainty of the respective factors on the Certificate exists, investigate the underlying reason and implement suitable data management actions.
- Consider the impact of the outlying $NO_x$ converter efficiency result at 95.2%. For data to be BS EN14211 compliant it can be rescaled, provided any impact on data quality is accounted for in the rescaling process. It is the responsibility of the data ratification team to critically assess all evidence including calibrations, audits and equipment support unit reports to quantify this impact. We advised following the audit that you request that your equipment support unit attend to investigate any underlying reasons for this outlier and to aim to get the converter within the recommended audit pass range.

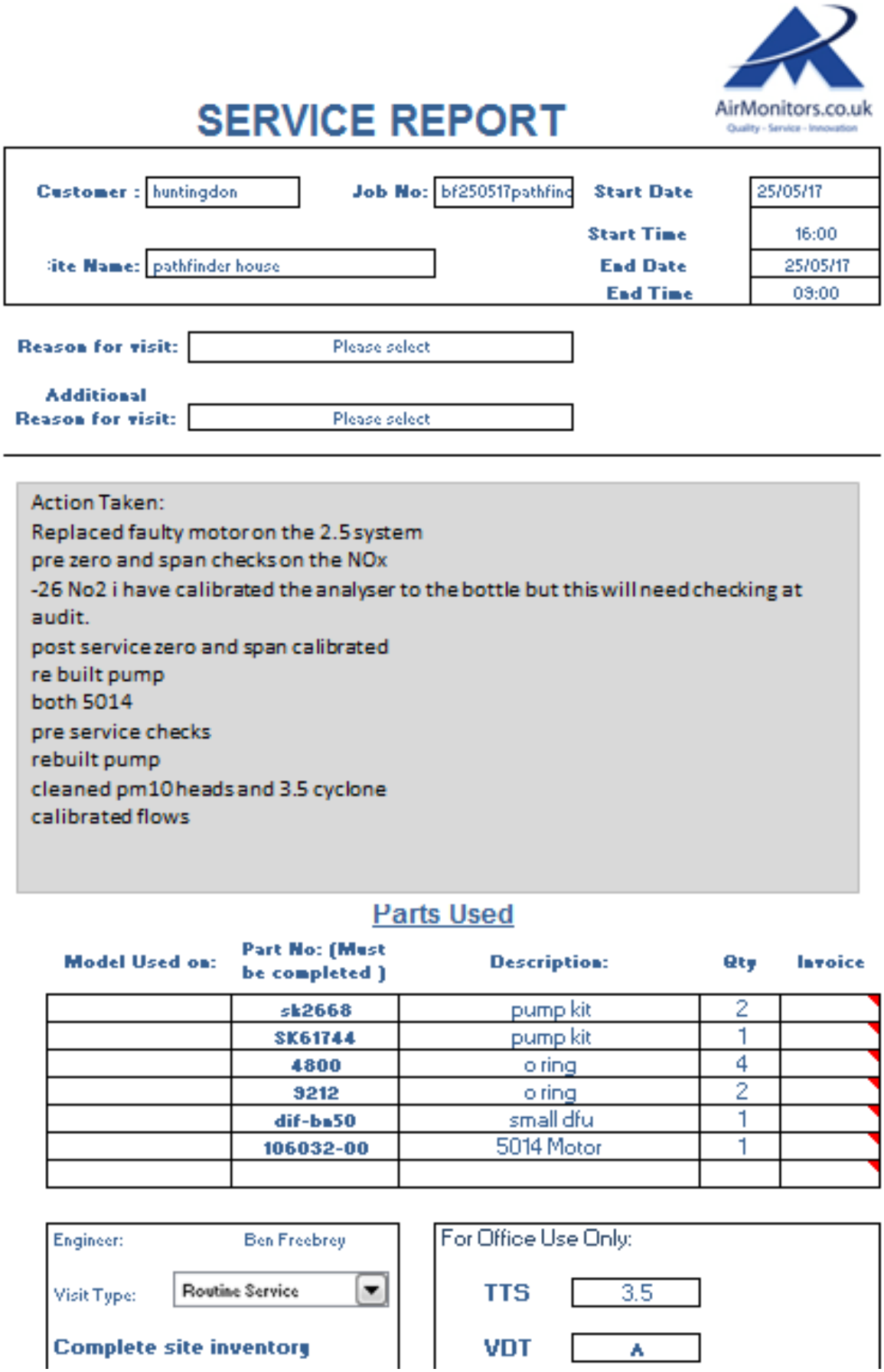
If you have any questions relating to our audit results or wish to discuss any aspect of air pollution monitoring, please don't hesitate to contact me on 01235 753601 or 07425 623526 darren.lane@ricardo.com

Yours sincerely

**Darren Lane**

**Air Quality - Ricardo Energy and Environment**
www.airqualityengland.co.uk/
ee.ricardo.com

## Figure C.4 AQMS Service Reports:



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# SERVICE REPORT

| | | | | | |
|---|---|---|---|---|---|
| **Customer :** | huntingdon | **Job No:** | bf250517pathfind | **Start Date** | 25/05/17 |
| | | | | **Start Time** | 16:00 |
| **Site Name:** | pathfinder house | | | **End Date** | 25/05/17 |
| | | | | **End Time** | 09:00 |

**Reason for visit:** Please select

**Additional Reason for visit:** Please select

Action Taken:
Replaced faulty motor on the 2.5 system
pre zero and span checks on the NOx
-26 No2 i have calibrated the analyser to the bottle but this will need checking at audit.
post service zero and span calibrated
re built pump
both 5014
pre service checks
rebuilt pump
cleaned pm10 heads and 3.5 cyclone
calibrated flows

## Parts Used

| Model Used on: | Part No: (Must be completed ) | Description: | Qty | Invoice |
|---|---|---|---|---|
| | sk2668 | pump kit | 2 | |
| | SK61744 | pump kit | 1 | |
| | 4800 | o ring | 4 | |
| | 9212 | o ring | 2 | |
| | dif-ba50 | small dfu | 1 | |
| | 106032-00 | 5014 Motor | 1 | |
| | | | | |

Engineer: Ben Freebrey

Visit Type: Routine Service

**Complete site inventory**

For Office Use Only:

**TTS** 3.5

**VDT** A

## Thermo NOX


Job Report No: 50517pathfinderhouse-ser
Serial No: 426608503
Fault Message:

| | Pre Statistics | | Post Statistics | |
|---|---|---|---|---|
| Alarm 1 | | | | |
| Alarm 2 | | | | |
| Amb Reading NO | 78.2 | ppb | 31.8 | ppb |
| AmbReading NOx | 128.1 | ppb | 45.5 | ppb |
| Sample flow inst | 0.674 | | 0.651 | |
| Sample flow Act | 0.66 | | 0.65 | |
| Cal Fact NO BKG | 9.1 | | 8.6 | |
| Cal fact NO COEF | 1.303 | | 1.25 | |
| Cal fact NO2 COEF | 1 | | 1 | |
| Cal Fact NOX BKG | 8.9 | | 9.9 | |
| Cal fact NOX COEF | 0.893 | | 0.942 | |
| Pressure | 216.5 | mmHg | 209.7 | mmHg |

## Thermo 5014


Job Report No: 50517pathfinderhouse-ser
Serial No:
Fault Message:

| | Pre Statistics | Post Statistics |
|---|---|---|
| Alarm 1 | | |
| Alarm 2 | | |
| AmbReading PM | 22.8 | |
| Amb RH | 84.3 | 75.7 |
| Sample RH | 55.5 | 54.8 |
| Amb Tmp | 14.3 | 17.8 |
| Sample Tmp | 21.2 | 23.2 |
| Vacuum | 49.8 | 54.8 |
| Flow | 15.81 | 16.62 |

# Thermo 5014

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| | |
|---|---|
| Job Report No: | 60517pathfinderhouse-ser |
| Serial No: | |
| Fault Message: | |

| | Pre Statistics | Post Statistics |
|---|---|---|
| Alarm 1 | | |
| Alarm 2 | | |
| AmbReading PM | 33.1 | |
| Amb RH | 84.5 | 77.6 |
| Sample RH | 40.1 | 45.1 |
| Amb Tmp | 14.6 | 17.9 |
| Sample Tmp | 27.2 | 27.2 |
| Vacuum | 43.8 | 42.3 |
| Flow | 16.08 | 16.65 |

# NOx Analyser
# Calibration/Linearity Report

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**Model:** thermo **Serial No:** 426608503 **Report No.** bf250517

## Pre-Service/ Repair Calibration

| Result / Gas | NO | | NO2 | | NOX | |
|---|---|---|---|---|---|---|
| | PPB | mV | PPB | mV | PPB | mV |
| External Zero | 0.8 | | 1.5 | | 2.3 | |
| Injection of NO | 430 | | -26 | | 403 | |
| Injection of NO2 | | | | | | |

### Span Source Details

| | NO | NO2 |
|---|---|---|
| Cyl. No: | 114095c | |
| Cyl. PSI: | 2500 | |
| Cyl. Conc: | 447 | |

## Post Service/Repair Calibration

| Result / Gas | NO | | NO2 | | NOX | |
|---|---|---|---|---|---|---|
| | PPB | mV | PPB | mV | PPB | mV |
| External Zero | 0 | | 0 | | 0 | |
| Injection of NO | 447 | | 1 | | 448 | |
| Injection of NO2 | | | | | | |

### External Zero Source Details

| | |
|---|---|
| On Site ZAG: | ☑ |
| Cylinder: | ☐ |
| Scrubber: | ☐ |

## GPT Check

| | Display (PPB) | Injected (NO) | Injected (03) |
|---|---|---|---|
| NO | | | 0ppb |
| NO2 | | | |
| NO | | | |
| NO2 | | | |

| | |
|---|---|
| NO | 0 |
| NO2 | 0 |
| Moly Effeciency | #DIV/0! |

## Post Service Linearity Check

| Requested Span Point | Gas Type | V out (mV) | Display (ppb) | Photo-meter (ppb) |
|---|---|---|---|---|
| 200 | NO | | | |
| 160 | NO | | | |
| 120 | NO | | | |
| 80 | NO | | | |
| 40 | NO | | | |
| 0 | ZERO AIR | | | |

# SERVICE REPORT

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| | | | | | |
|---|---|---|---|---|---|
| **Customer :** | huntingdoncc | **Job No:** | bf131117huntingd | **Start Date** | 13/11/17 |
| | | | | **Start Time** | 11:30 |
| **Site Name:** | huntingdon | | | **End Date** | 13/11/17 |
| | | | | **End Time** | 15:15 |

**Reason for visit:** NOX

**Additional Reason for visit:** Please select

**5014i**

Action Taken: Nox
high pressure on arrival
leaked and flow checked
pre zero and span checked
rebuilt pump
serviced analyser
post service zero and span calibrated
5014i
flow checked
serviced analysers
rebuilt pumps
calibrated flow on the 2.5 system.
pm10 system developed a pressure warning after switching it back on. left the analyser off and removed the pressure board
board 5014i pressure sensor 104577

| Model Used on: | Part No: (Must be completed ) | Description: | Qty | Invoice |
|---|---|---|---|---|
| | 4800 | o ring | 4 | |
| | 9212 | o ring | 2 | |
| | dif-ba50 | small dfu | 1 | |
| | sk2668 | pump kit | 2 | |
| | sk61744 | pump kit | 1 | |

Engineer: Ben Freebrey

Visit Type: Routine Service

For Office Use Only:

TTS 3

# Thermo NOX

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| | |
|---|---|
| Job Report No: | 7huntingdon-huntingdoncc |
| Serial No: | 426608503 |
| Fault Message: | |

| | Pre Statistics | | Post Statistics | |
|---|---|---|---|---|
| Alarm 1 | | | | |
| Alarm 2 | | | | |
| Amb Reading NO | 36 | ppb | 18.5 | ppb |
| AmbReading NOx | 42 | ppb | 51 | ppb |
| Sample flow inst | 0.79 | | 0.715 | |
| Sample flow Act | 0.7 | | 0.7 | |
| Cal Fact NO BKG | 8.5 | | 7.4 | |
| Cal fact NO COEF | 1.25 | | 1.066 | |
| Cal fact NO2 COEF | 1 | | 1 | |
| Cal Fact NOX BKG | 9.8 | | 7.8 | |
| Cal fact NOX COEF | 0.942 | | 0.935 | |
| Pressure | 320.2 | mmHg | 186 | mmHg |

## Thermo 5014

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| | |
|---|---|
| Job Report No: | 7huntingdon-huntingdoncc |
| Serial No: | |
| Fault Message: | |

| | Pre Statistics | Post Statistics |
|---|---|---|
| Alarm 1 | | |
| Alarm 2 | | |
| AmbReading PM | 19.23 | 0 |
| Amb RH | 70.2 | 70.9 |
| Sample RH | 27.6 | 33.4 |
| Amb Tmp | 4.5 | 4.6 |
| Sample Tmp | 19.5 | 16.5 |
| Vacuum | 51.9 | 43.1 |
| Flow | 17.32 | 16.74 |

## Thermo 5014

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| | |
|---|---|
| Job Report No: | 7huntingdon-huntingdoncc |
| Serial No: | |
| Fault Message: | |

| | Pre Statistics | Post Statistics |
|---|---|---|
| Alarm 1 | | |
| Alarm 2 | | |
| AmbReading PM | 20.8 | |
| Amb RH | 69.2 | |
| Sample RH | 22.6 | |
| Amb Tmp | 4.7 | |
| Sample Tmp | 22.7 | |
| Vacuum | 49.4 | |
| Flow | 18.2 | |

# NOx Analyser
# Calibration/Linearity Report

AirMonitors.co.uk
Quality - Service - Innovation

**Model:** 42c **Serial No:** 426608503 **Report No.** bf131117h

## Pre-Service/ Repair Calibration

| Result / Gas | NO | | NO2 | | NOX | |
|---|---|---|---|---|---|---|
| | PPB | mV | PPB | mV | PPB | mV |
| External Zero | 0.2 | | -1 | | -0.8 | |
| Injection of NO | | | | | | |
| Injection of NO2 | 241 | | -0.2 | | 239 | |

### Span Source Details

| | NO | NO2 |
|---|---|---|
| Cyl. No: | 114035c | |
| Cyl. PSI: | 2100 | |
| Cyl. Conc: | 447 | |

## Post Service/Repair Calibration

| Result / Gas | NO | | NO2 | | NOX | |
|---|---|---|---|---|---|---|
| | PPB | mV | PPB | mV | PPB | mV |
| External Zero | 0 | | 0 | | 0 | |
| Injection of NO | | | | | | |
| Injection of NO2 | 447 | | 2 | | 449 | |

### External Zero Source Details

| | |
|---|---|
| On Site ZAG: | ☑ |
| Cylinder: | ☐ |
| Scrubber: | ☐ |

## GPT Check

| | Display (PPB) | Injected (NO) | Injected (03) |
|---|---|---|---|
| NO | | | 0ppb |
| NO2 | | | |
| NO | | | |
| NO2 | | | |

| | |
|---|---|
| NO | 0 |
| NO2 | 0 |
| Moly Effeciency | #DIV/0! |

## Post Service Linearity Check

| Requested Span Point | Gas Type | V out (mV) | Display (ppb) | Photo-meter (ppb) |
|---|---|---|---|---|
| 200 | NO | | | |
| 160 | NO | | | |
| 120 | NO | | | |
| 80 | NO | | | |
| 40 | NO | | | |
| 0 | ZERO AIR | | | |

## Blender Details

Blender Model / SN:

## Figure C.5 E-mail from Helpdesk regarding distance calculations:



From: fang.lin@uk.bureauveritas.com on behalf of LAQMHelpdesk@uk.bureauveritas.com
Sent: Thu 07/12/2017 14:09
To: Braybrook, Claire (Env, Health)
Cc:
Subject: Re: 4466_Calculating the NO2 fall off for ASR

Hi Claire,

*Thank you for contacting the LAQM Helpdesk. Your query has been allocated the unique reference code: 4466 and you should use this as a reference for any further follow up regarding the following response.*

We can confirm that a distance calculation is only required for those with exceedances and include any others within 10% for good practice i.e. any above 36.

Regards,
Fang Lin

LAQM Helpdesk Team

Email: LAQMHelpdesk@uk.bureauveritas.com
Website: http://laqm.defra.gov.uk/
FAQs: http://laqm.defra.gov.uk/laqm-faqs/
What's New: http://laqm.defra.gov.uk/whatsnew.html
Telephone: 0800 032 7953

To: LAQMHelpdeskmail@VERITAS
cc:

Attn: Antony Wiatr/GBR/VERITAS

Subject: 4466_Calculating the NO2 fall off for ASR

## Figure C.6 Letter from Public Health Cambridgeshire County Council providing comments on the ASR:

| | |
|---|---|
| My ref: | LR/IG/Hunts ASR 2017-18 |
| Date: | 02 August 2018 |
| Contact: | Dr Liz Robin |
| Telephone: | 01223 715572 |
| E Mail: | Liz.robin@cambridgeshire.gov.uk |

Cambridgeshire County Council

**Public Health Directorate**
Cambridgeshire County Council
Public Health Directorate
Box CC1318
Shire Hall
Castle Court
Cambridge
CB3 0AP

Dear Miss Braybrook

**Huntingdonshire District Council Annual Status Report 2017-18**

Thank you for consulting me on the Huntingdonshire District Council Annual Status Report (ASR) on Air Quality for 2017-18.

I am happy to sign of the annual status report, but would like to make the following comments which you may wish to include in the ASR. I hope you find them of use going forward

1. It would be helpful if the ASR expanded on the reasoning for not reviewing the 2009 Action Plan until after the A14 upgrade takes place, as it is unclear how the changes will impact on the high $NO_2$ readings from the diffusion tubes at Pathfinder House, i.e. are you confident that the $NO_2$ levels will reduce at Pathfinder House after the viaduct is removed and what are the plans to deal with the high $NO_2$ readings in the meantime.

2. Has the possible revocation of the St Neot's AQMA taken into account; the planned growth for the town i.e. Loves Farm 2 and Wintringham Park; the proposed new river crossing; and the Mayor's Blueprint for St Neot's which will increase footfall into St Neots market place.

The ASR also mentions that Public Health England will be consulted on the revocation, should this read Public Health at the County Council rather that Public Health England.

Yours sincerely

Val Thomas
Acting Director of Public Health

## Figure C.7 HDC's response to points raised by Public Health Cambridgeshire County Council:

With regard to the points highlighted I would advise the following:

1 – I have viewed the Air Quality chapter (8) of the Environmental Statement submitted with the application for the A14 realignment (available here: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010018/TR010018-000672-A14%206.1%20ES%20Chapter%2008.pdf ). The modelled results for the Huntingdon AQMA state the following:

Concentrations of $NO_2$, are predicted in the majority to improve across most of the AQMA. The area around Castle Moat Road in 2020 records the highest annual mean concentrations in the modelled area at around 34µg/$m_3$. This is below the air quality objective for this pollutant. There is one location where a small increase in $NO_2$ is predicted. This is at the junction of Edison Bell Way and Ermine Street and will result in a concentration of 22µg/$m_3$, which is well below the objective. The main improvements in the AQMA are around the town centre one way system and along the A14. There are also improvements in the section of AQMA which extends towards Godmanchester.

We are therefore reasonably confident that the realignment of the A14 will result in an improvement in AQ and that limits will be met. We will however continue to consider alternative methods of reduction to continue to improve Air Quality.

2 – When submitting planning applications for new large scale developments it is usual practice for an AQ Impact Assessment to be completed to demonstrate any impact. Whilst these are only predictions they need to follow government guidance and demonstrate that there will be no breach in AQ objectives. We also provide advice on how AQ mitigation measures can be included in the design of developments and ask for these to be considered even if there is no predicted breach. We will continue to monitor at the locations within St Neots, however due to the downward trend and continued compliance for a number of years it is considered the Management Area should be revoked, as advised by Defra.

The reference to Public Health England will be amended accordingly.

# Appendix D: Map(s) of Monitoring Locations and AQMAs

## Figure D.1: Map indicating location of Automatic $NO_2$, $PM_{10}$ and $PM_{2.5}$ monitor:

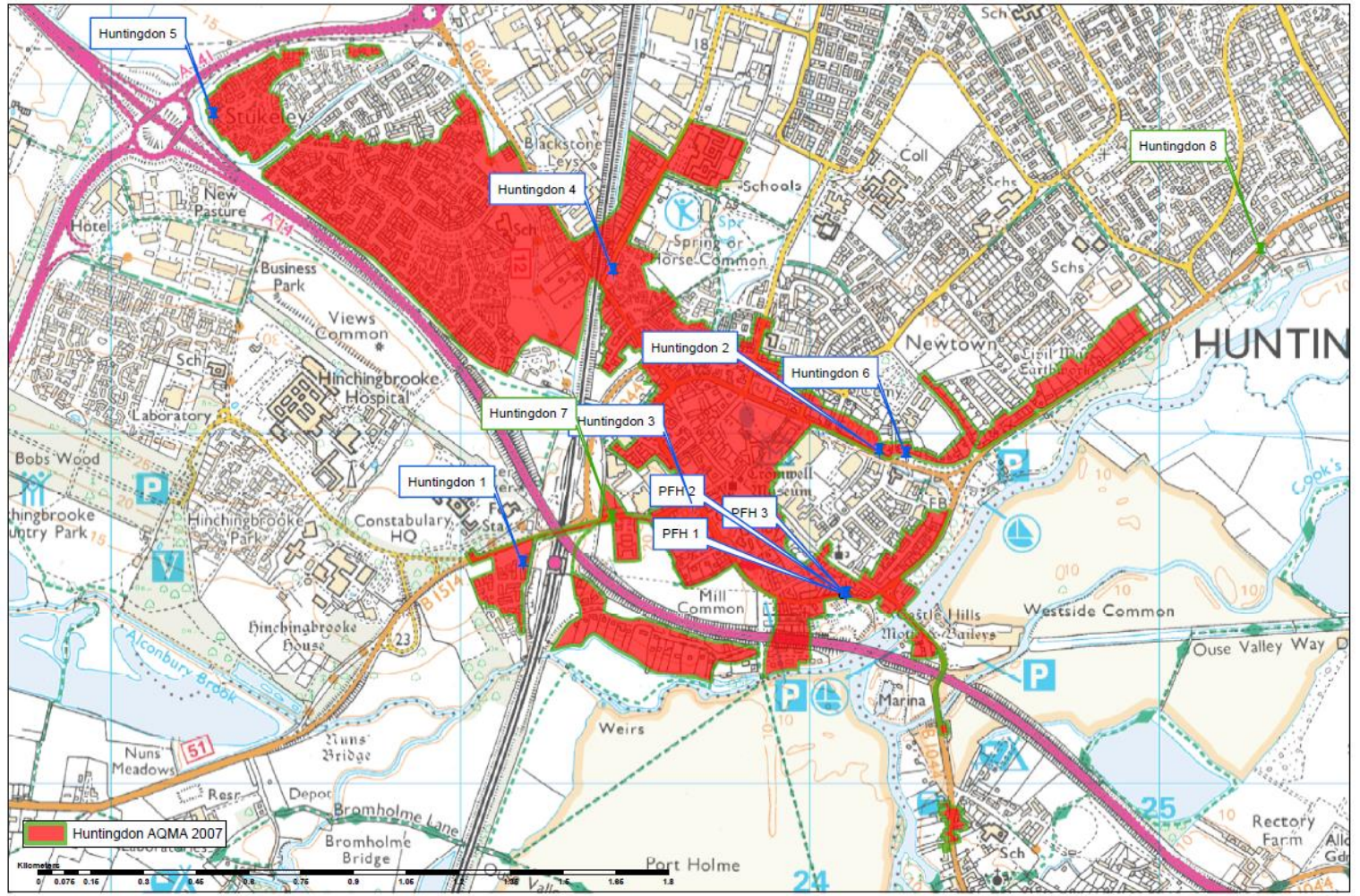
## Figure D.2: Map showing location of Automatic $NO_2$, $PM_{10}$ and $PM_{2.5}$ monitor:


## Figure D.3: Close up of location of Automatic $NO_2$, $PM_{10}$ and $PM_{2.5}$ monitor:

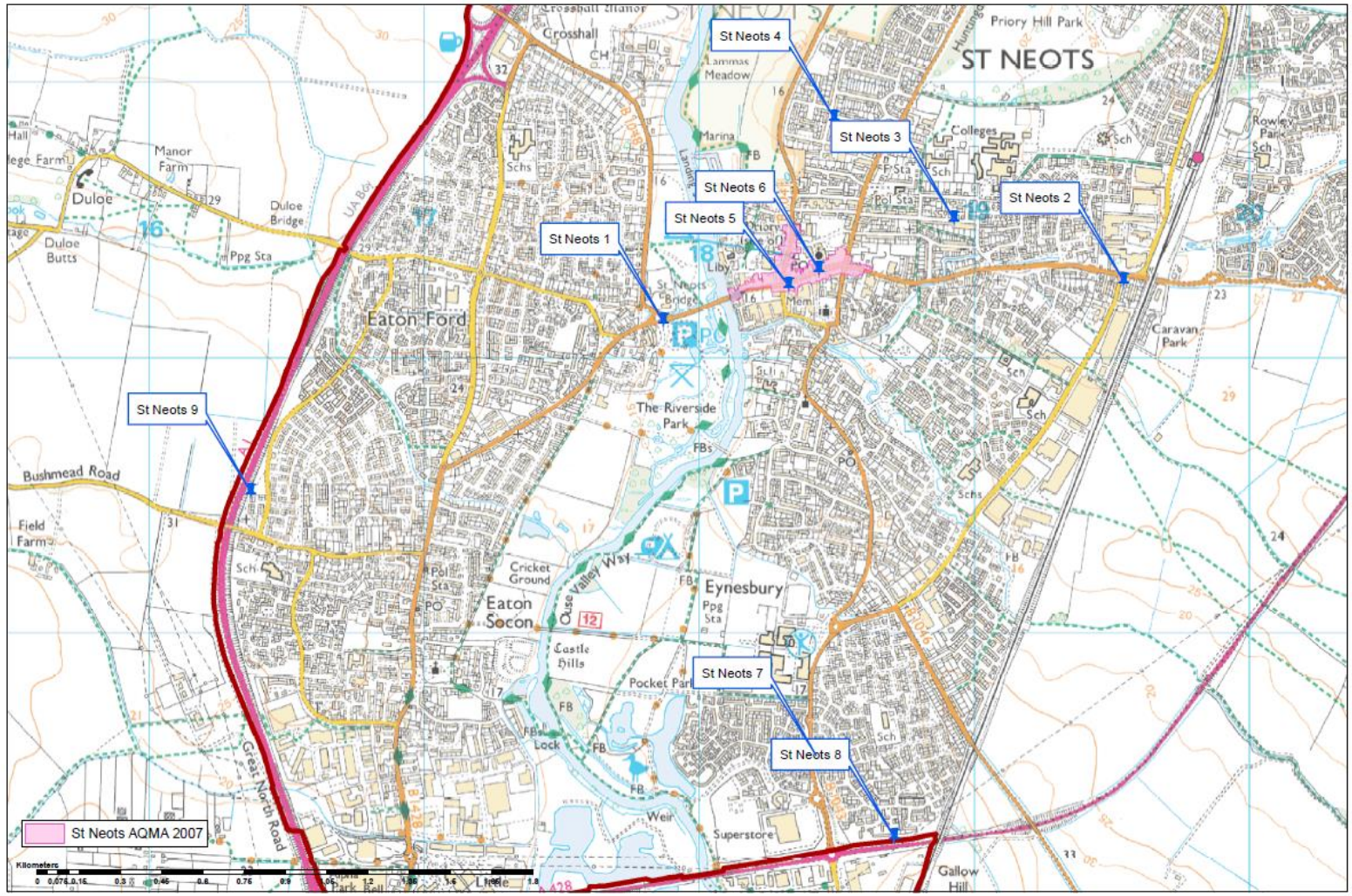

Please note – The AQMS can be seen in relation to the AQMA, on figure D5 as 'PFH'.

## Figure D.4: Map indicating location of non automatic (Diffusion Tube) $NO_2$ monitoring locations:

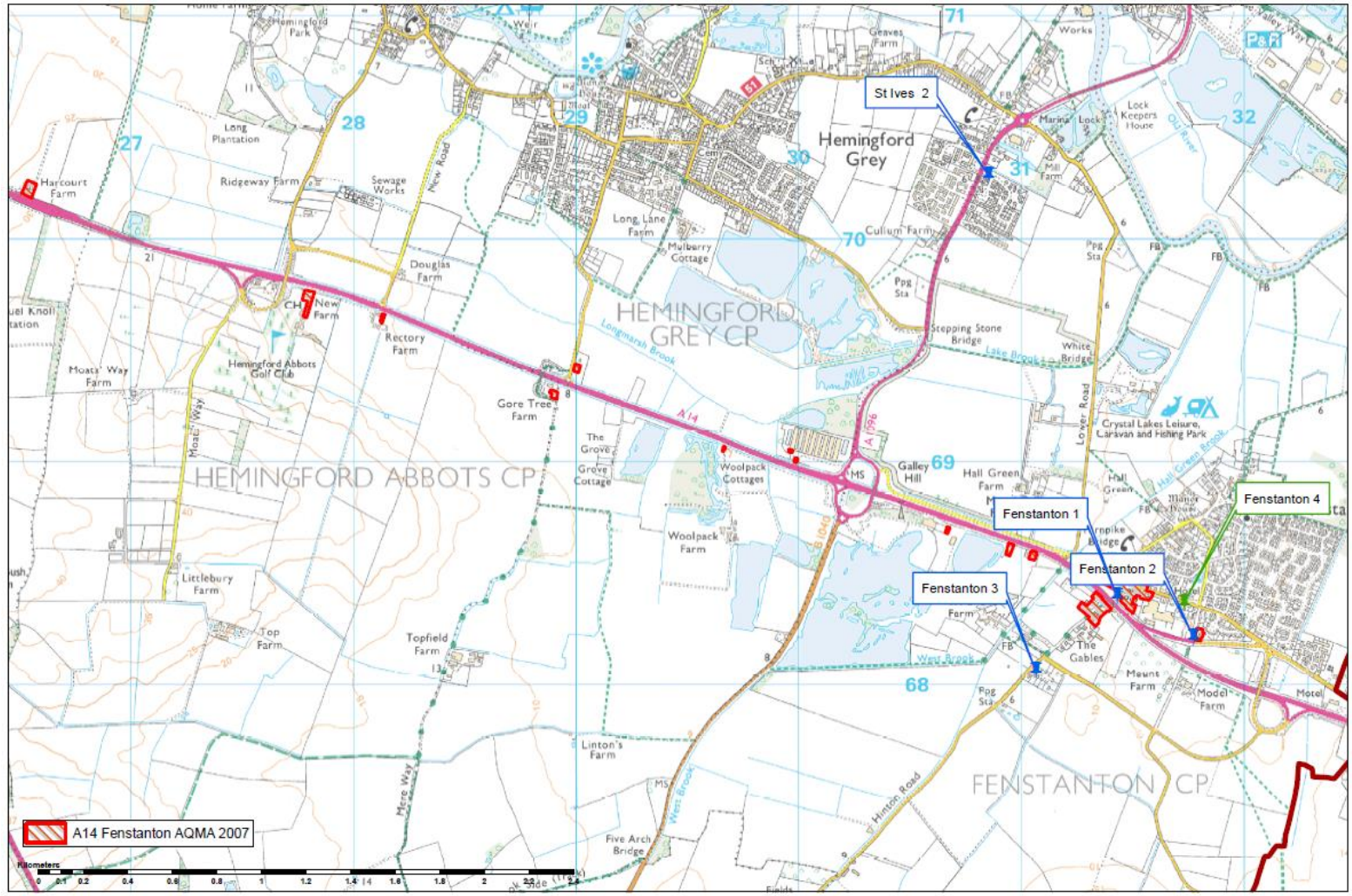
## Figure D.5: Huntingdon AQMA Diffusion Tube $NO_2$ monitoring locations:



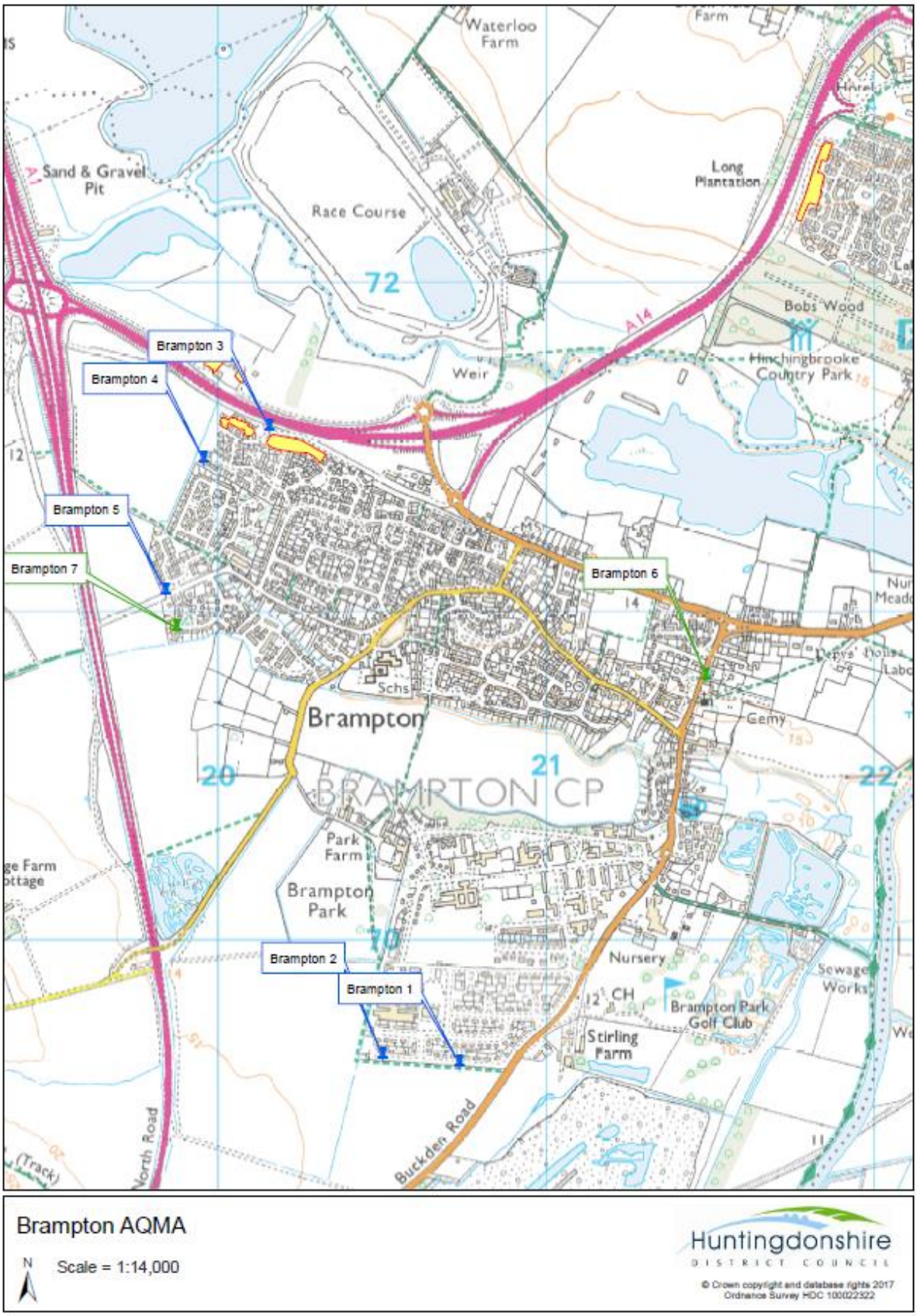
## Figure D.6: St Neots AQMA Diffusion Tube $NO_2$ monitoring locations:



## Figure D.7: A14 Fenstanton AQMA Diffusion Tube $NO_2$ monitoring locations:



## Figure D.8: Brampton AQMA Diffusion Tube $NO_2$ monitoring locations:



# Appendix E: Summary of Air Quality Objectives in England

### Table E.1 – Air Quality Objectives in England

| Pollutant | Air Quality Objective[4] | |
|---|---|---|
| | Concentration | Measured as |
| Nitrogen Dioxide ($NO_2$) | 200 µg/$m^3$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/$m^3$ | Annual mean |
| Particulate Matter ($PM_{10}$) | 50 µg/$m^3$, not to be exceeded more than 35 times a year | 24-hour mean |
| | 40 µg/$m^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 350 µg/$m^3$, not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/$m^3$, not to be exceeded more than 3 times a year | 24-hour mean |
| | 266 µg/$m^3$, not to be exceeded more than 35 times a year | 15-minute mean |

[4] The units are in microgrammes of pollutant per cubic metre of air (µg/$m^3$).

# Glossary of Terms

| Abbreviation | Description |
|---|---|
| AQAP | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values' |
| AQMA | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| AQMS | Air Quality Monitoring Station |
| ASR | Air quality Annual Status Report |
| Defra | Department for Environment, Food and Rural Affairs |
| DMRB | Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England |
| EU | European Union |
| FDMS | Filter Dynamics Measurement System |
| HDC | Huntingdonshire District Council |
| LAQM | Local Air Quality Management |
| $NO_2$ | Nitrogen Dioxide |
| $NO_x$ | Nitrogen Oxides |
| PFH | Pathfinder House (Location of Continuous Monitor) |
| PHOF | Public Health Outcomes Framework |
| $PM_{10}$ | Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less |
| $PM_{2.5}$ | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less |
| QA/QC | Quality Assurance and Quality Control |
| $SO_2$ | Sulphur Dioxide |