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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Report Reference number	ASR 2018
Date	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.**

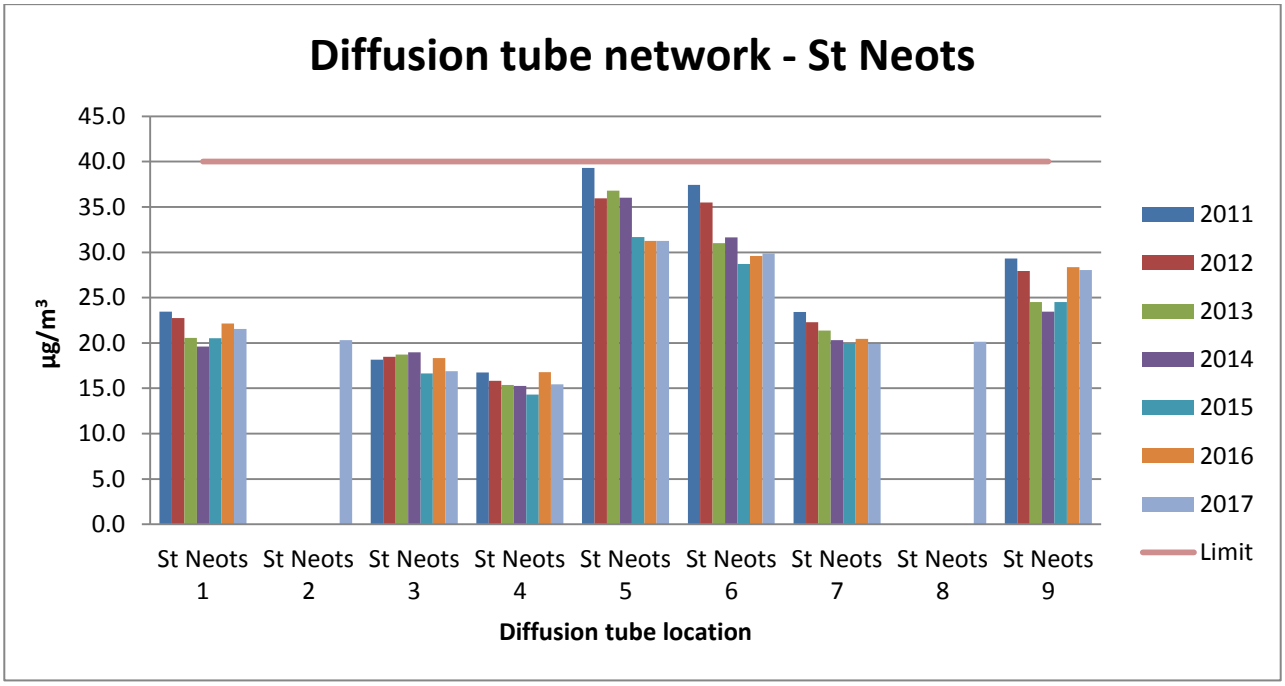
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

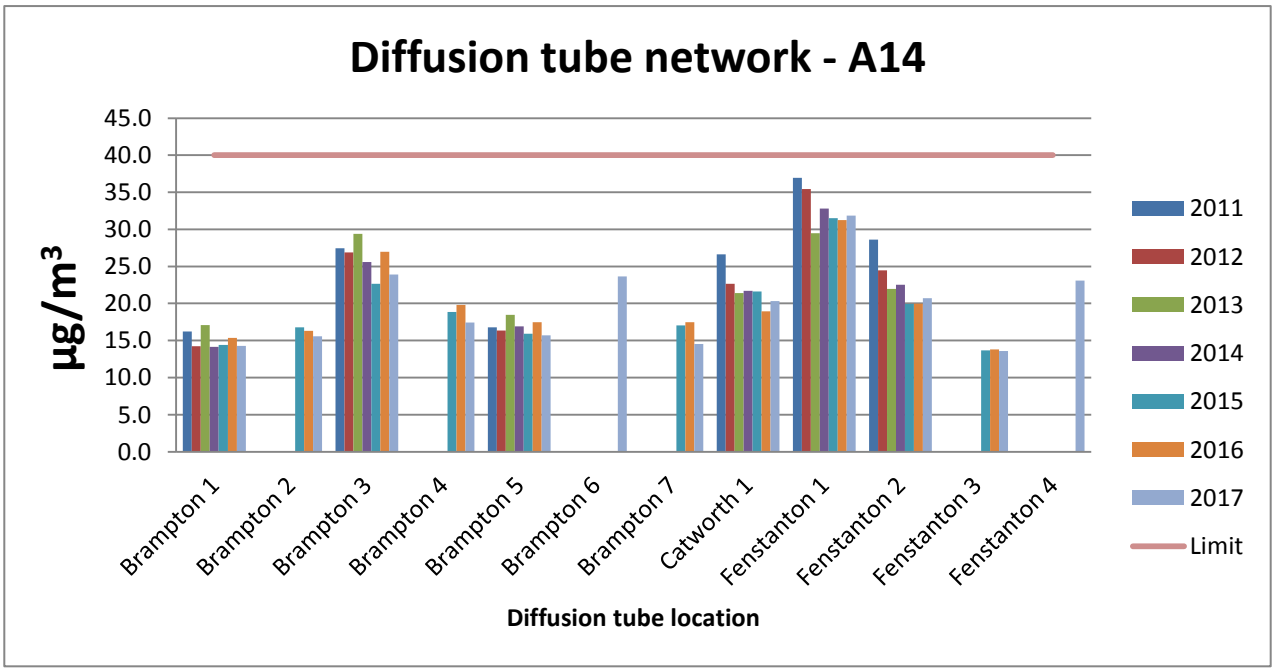
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

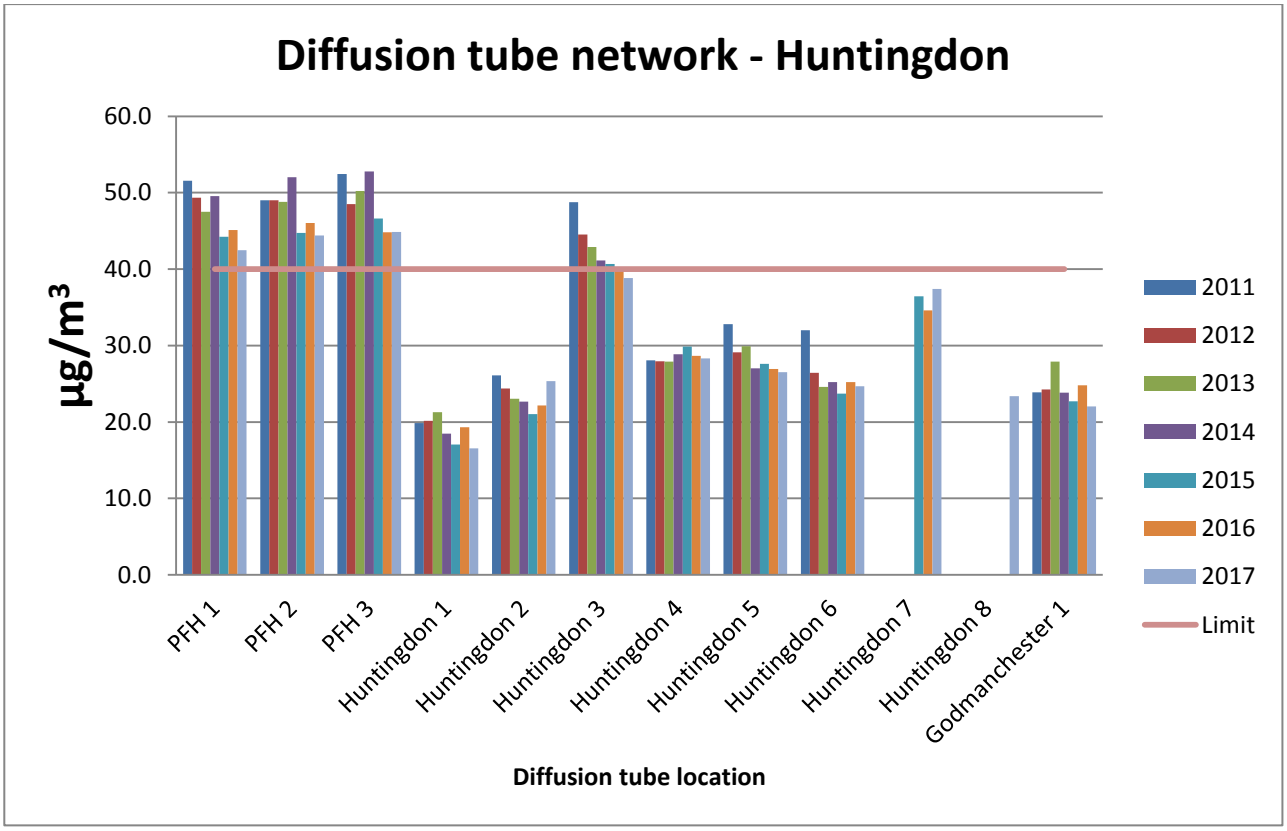
(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

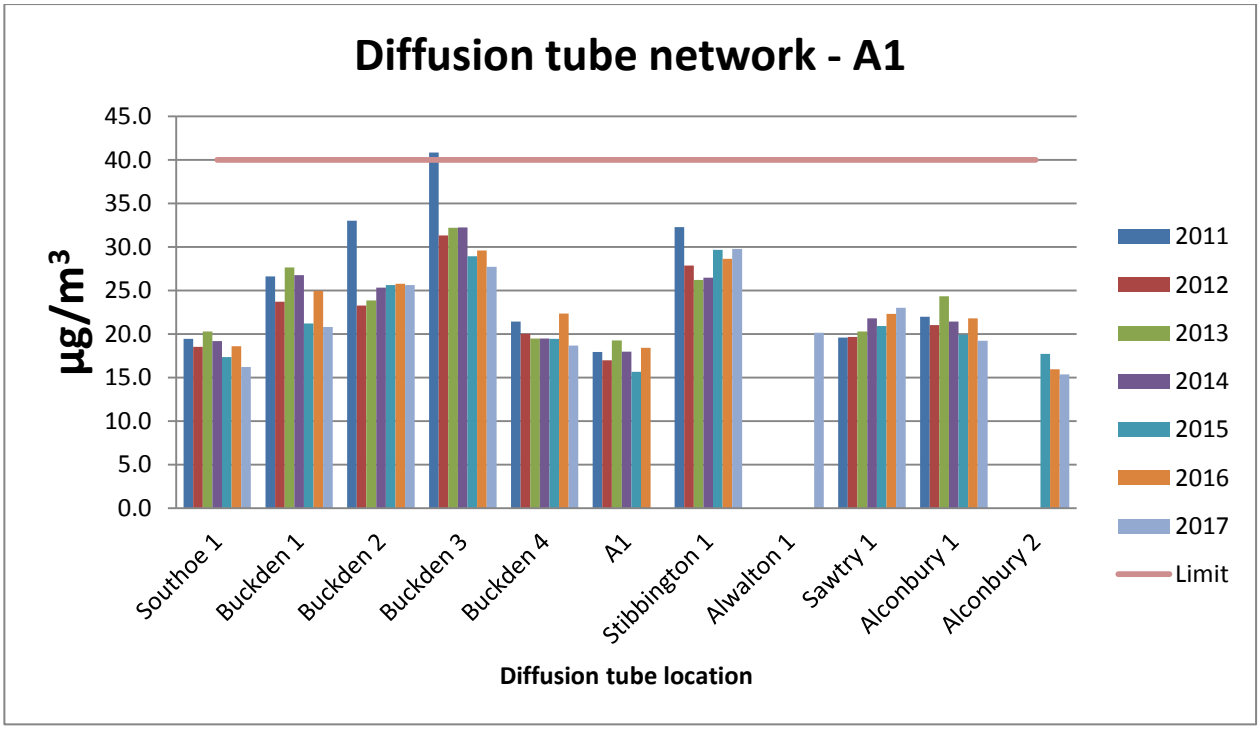
Figure A.1 – Trends in Annual Mean NO_2 Concentrations

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

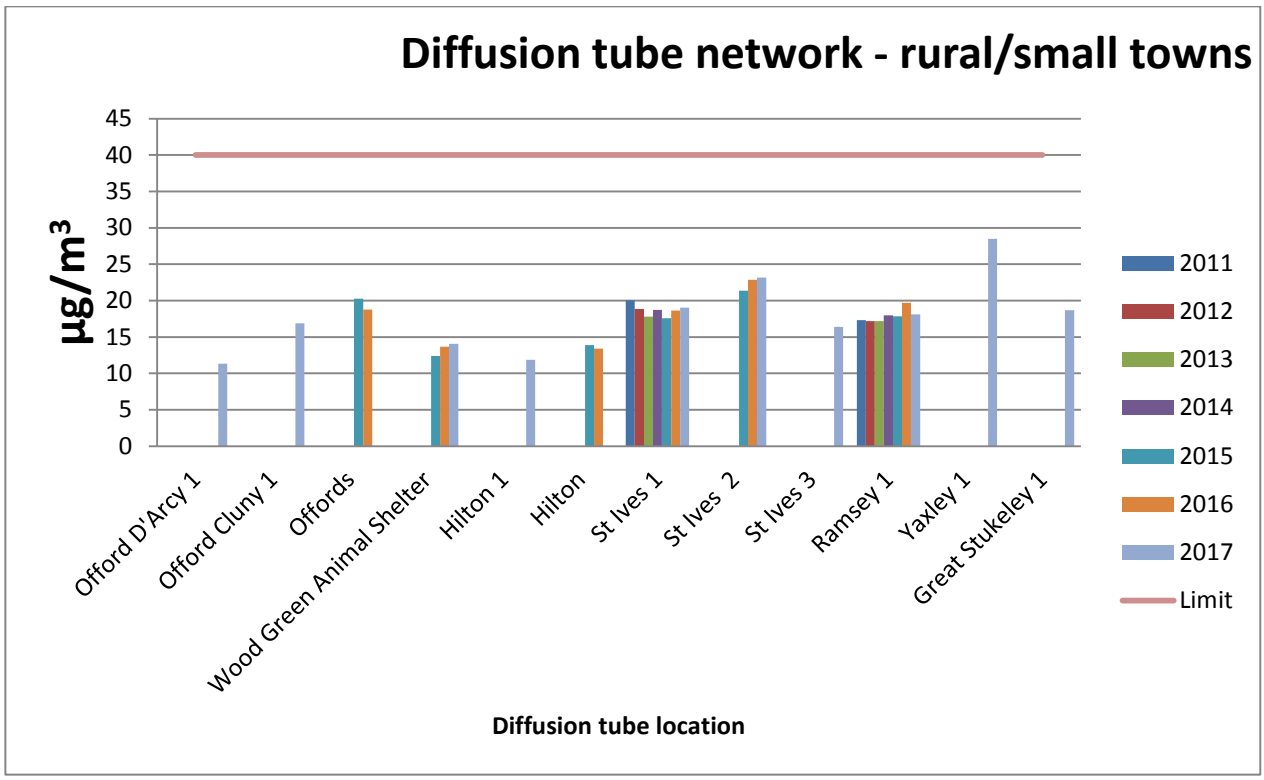

Diffusion tube network - rural/small towns
µg/m³
45
40
35
30
25
20
15
10
5
0
Offord D'Arcy 1
Offord Cluny 1
Offords
Wood Green Animal Shelter
Hilton 1
Hilton
St Ives 1
St Ives 2
St Ives 3
Ramsey 1
Yaxley 1
Great Stukeley 1
2011
2012
2013
2014
2015
2016
2017
Limit
Diffusion tube location

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 99.8th 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

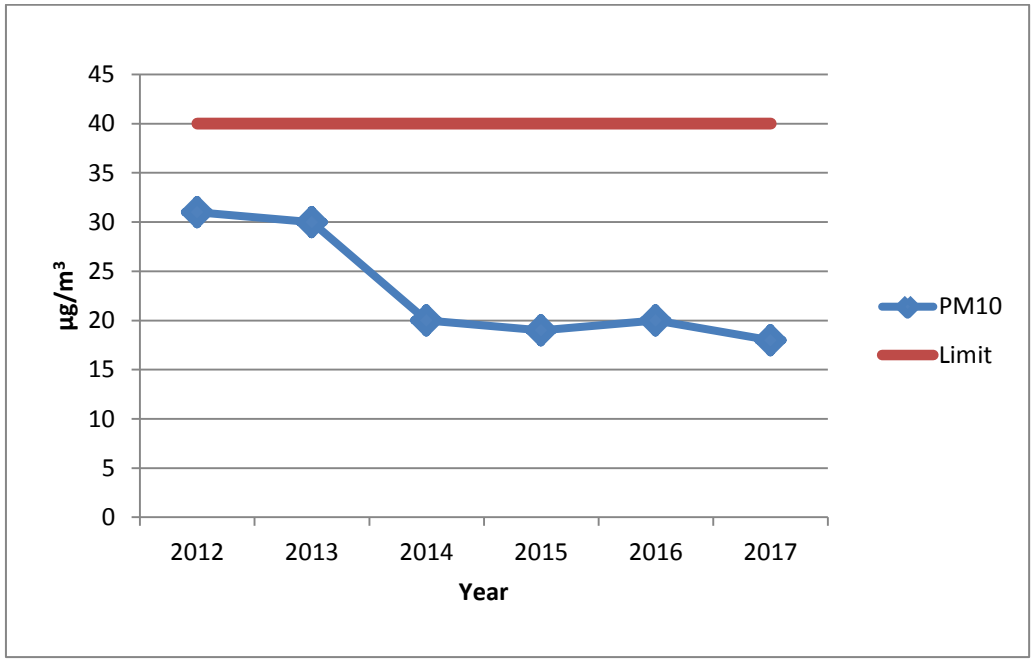


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

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 90.4th 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

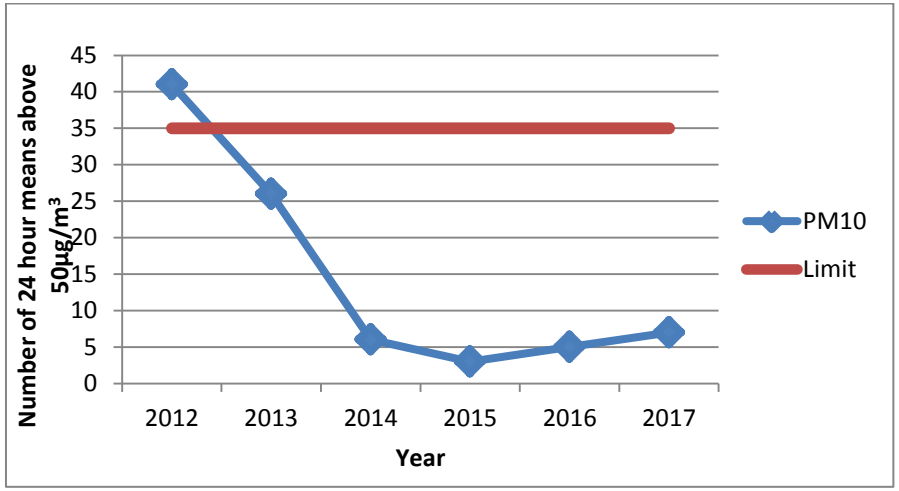


Table A.7 – $PM_{2.5}$ Monitoring Results

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)**

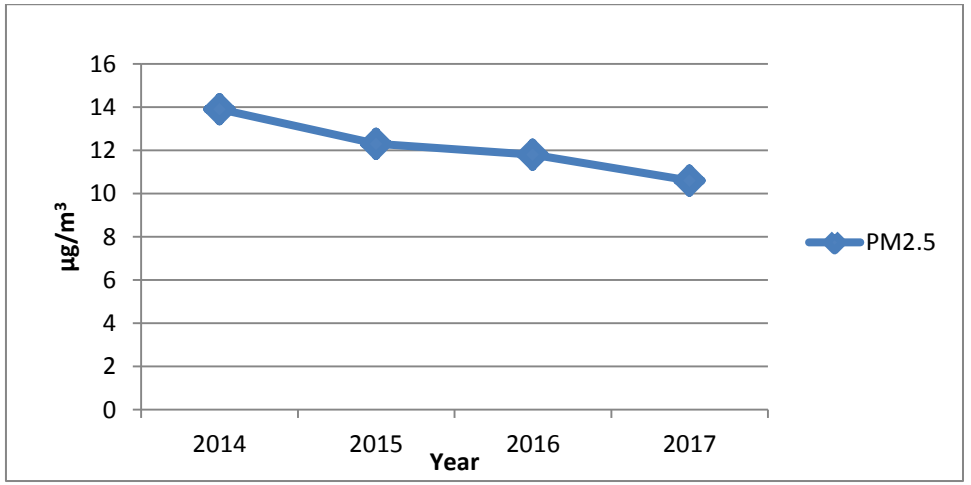
Notes:

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

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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/
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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:

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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
Harwell
Oxfordshire
OX11 0QR, UK

Tel: +44 (0)1235 753 601
E: darren.lane@ricardo.com
W:www.airqualityengland.co.uk/
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.

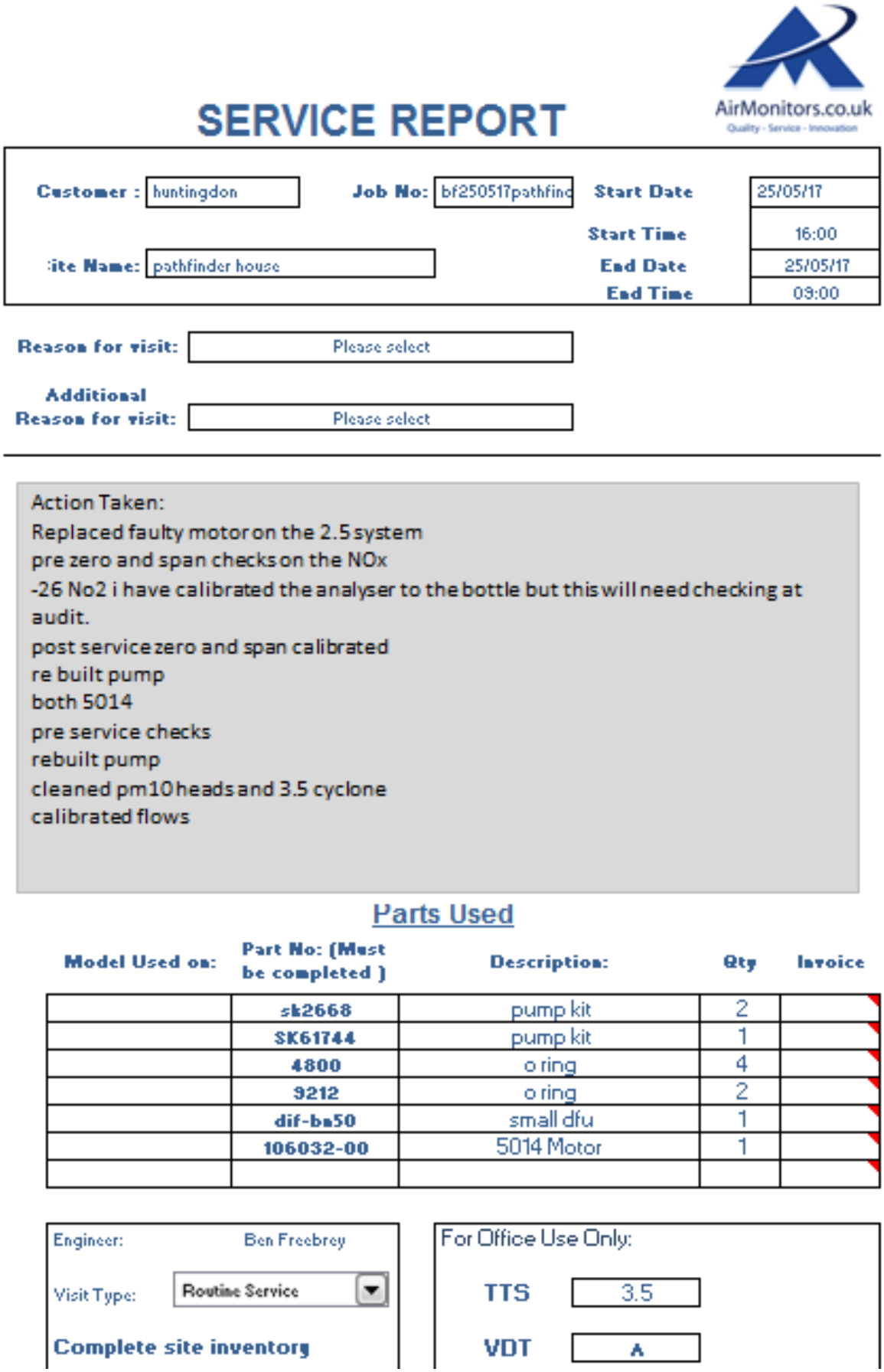
If you have any questions relating to our audit results or wish to discuss any aspect of air pollution monitoring, please don't hesitate to contact me on 01235 753601 or 07425 623526 darren.lane@ricardo.com

Yours sincerely

Darren Lane

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

Figure C.4 AQMS Service Reports:



AirMonitors.co.uk
Quality - Service - Innovation

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

AirMonitors.co.uk
Quality - Service - Innovation

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

AirMonitors.co.uk
Quality - Service - Innovation

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

AirMonitors.co.uk
Quality - Service - Innovation

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:

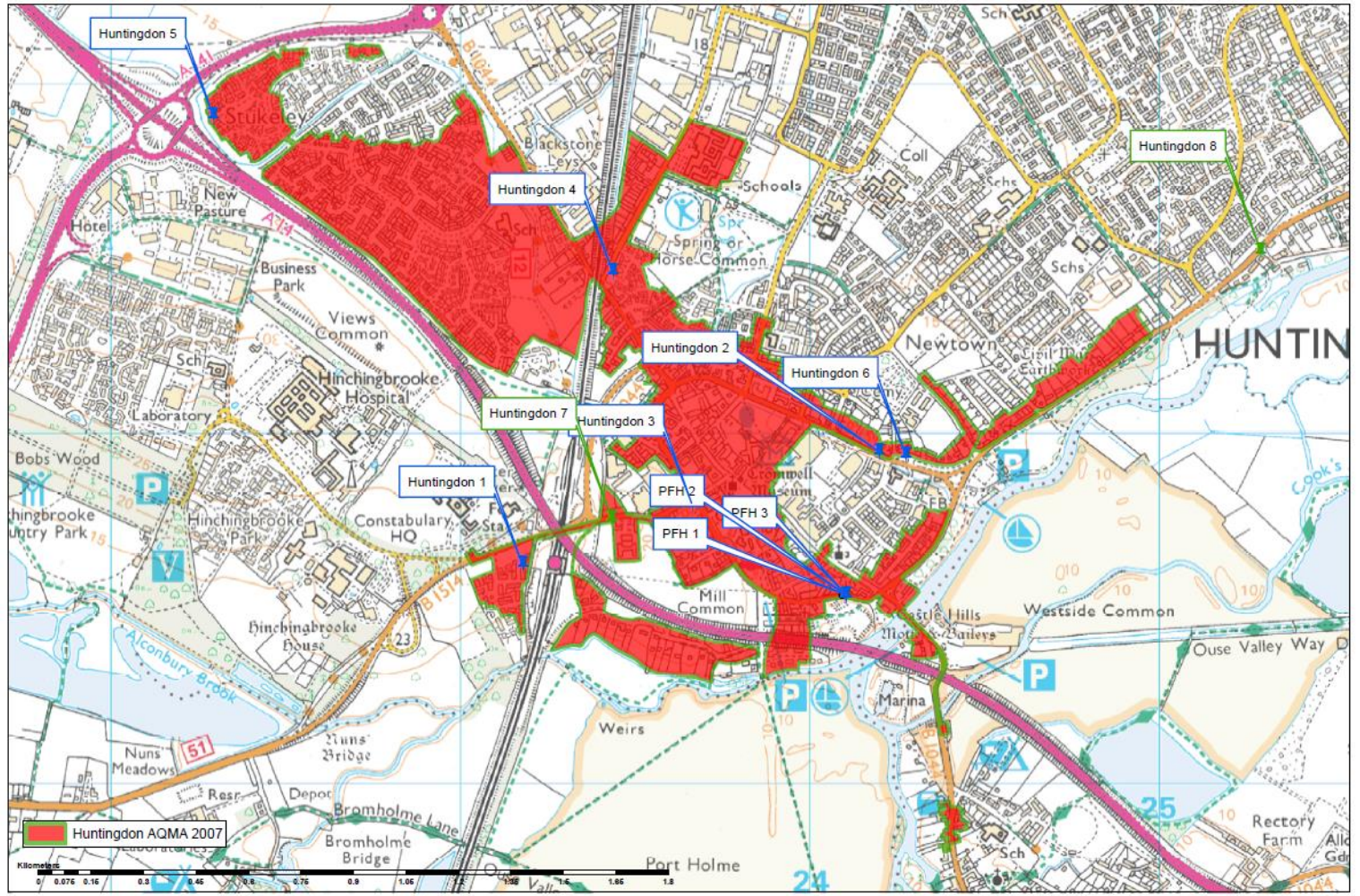


Figure D.6: St Neots AQMA Diffusion Tube NO_2 monitoring locations:

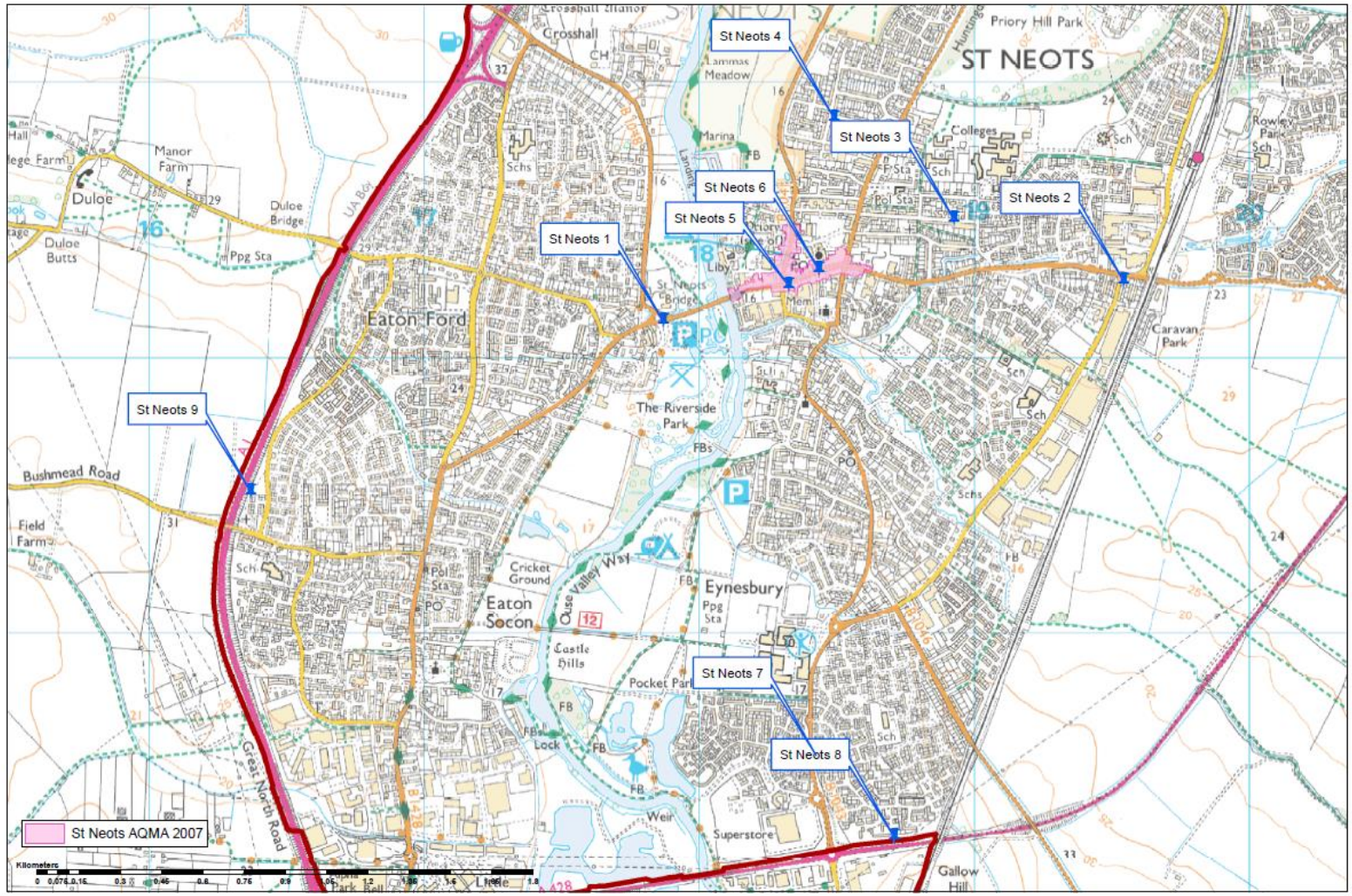


Figure D.7: A14 Fenstanton AQMA Diffusion Tube NO_2 monitoring locations:

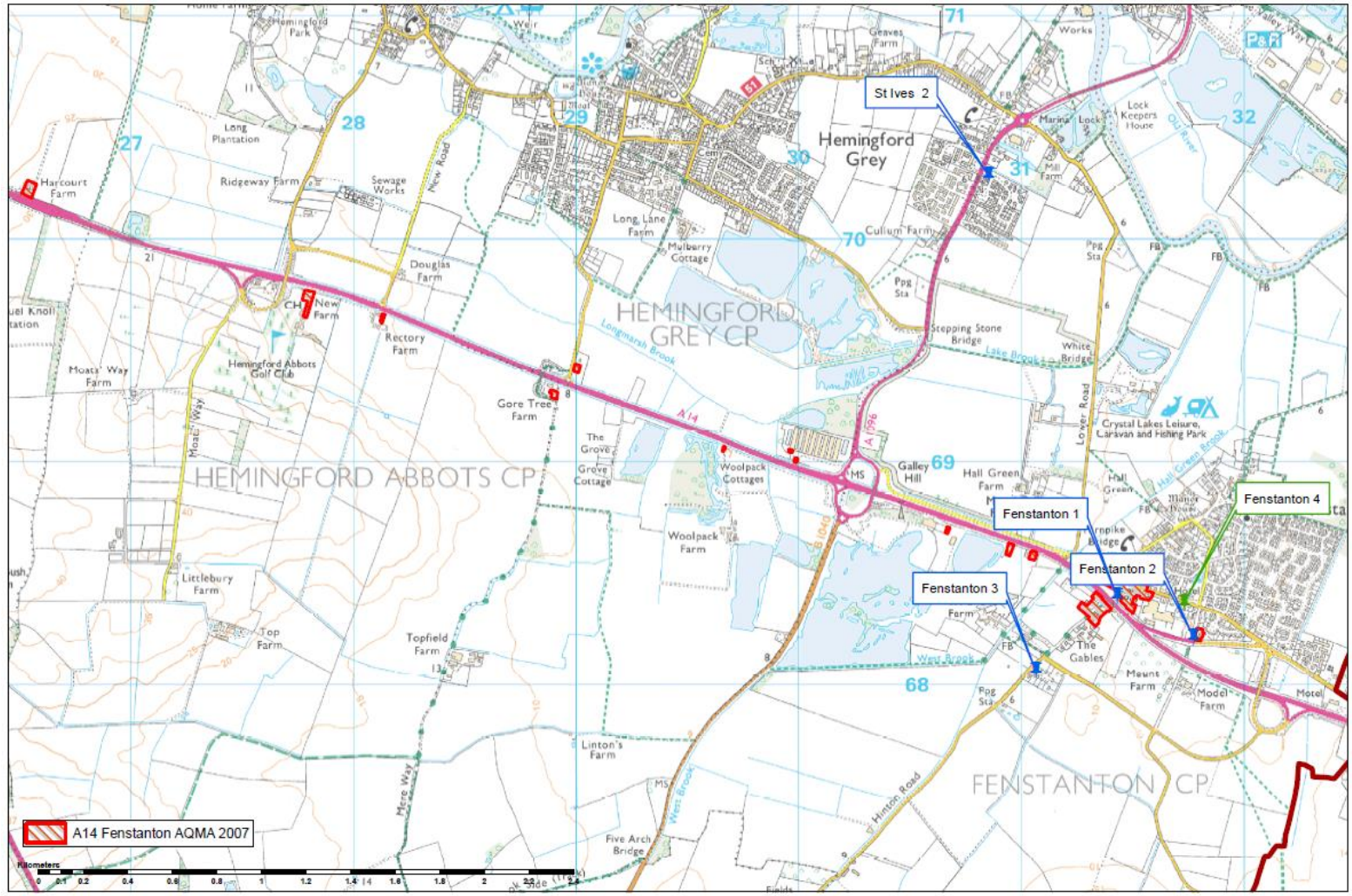
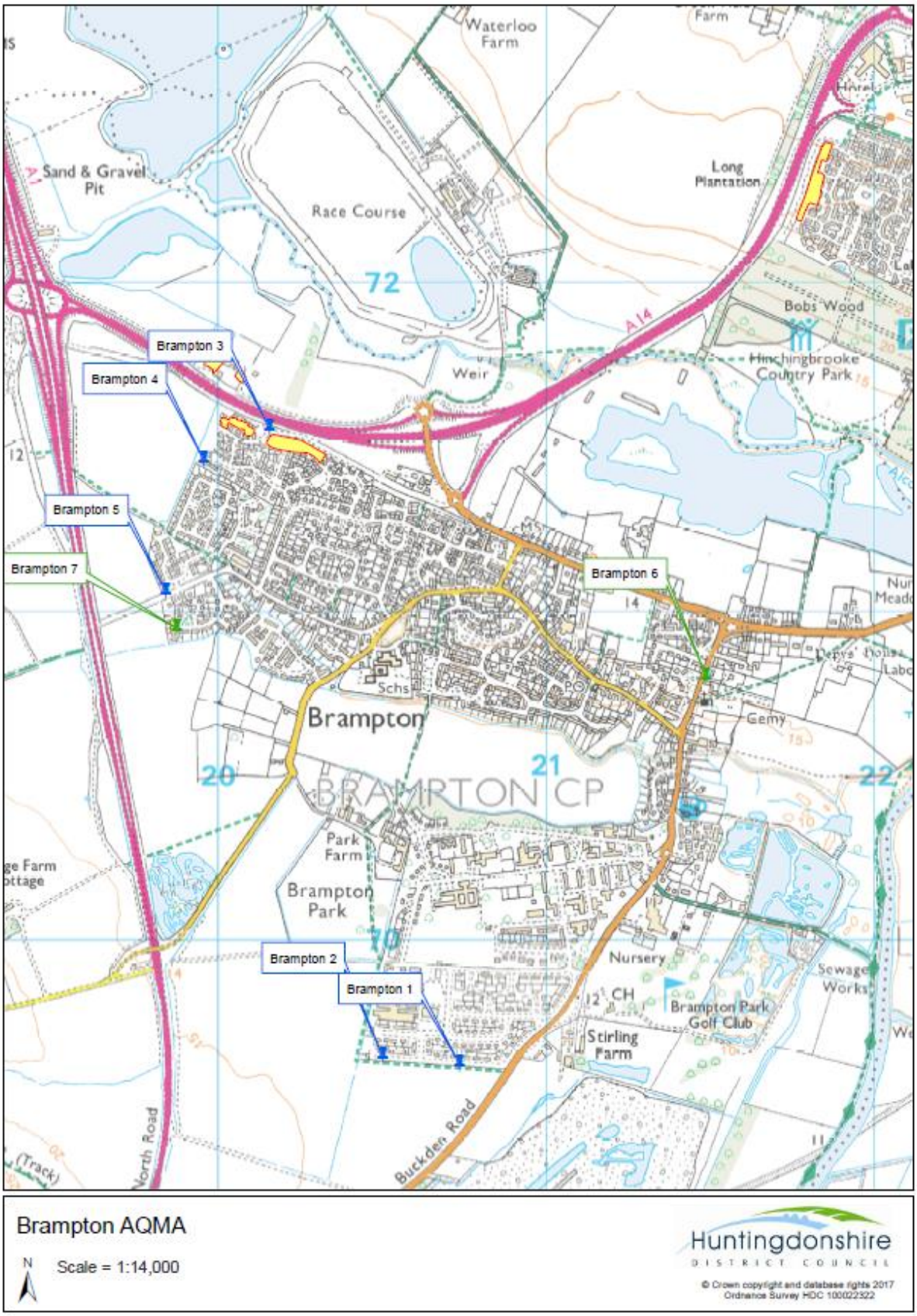


Figure D.8: Brampton AQMA Diffusion Tube NO_2 monitoring locations:



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