



2021 Air Quality Annual Status Report (ASR)

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

Date: October 2021

Information	Welwyn Hatfield Borough Council
Local Authority Officer	Terry Vincent
Department	Public Health and Protection
Address	Council Offices, Campus East, Welwyn Garden City, Hertfordshire AL8 6AE
Telephone	01707 357 000
E-mail	e.health@welhat.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Welwyn Hatfield Borough Council

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

The data for which this report relates (2020) was extremely unusual in that the world was hit by a pandemic. The council continued to monitor air quality during the entire period of 2020. It was important to try and obtain data during a period with minimal road traffic, as this circumstance was unlikely to arise again (hopefully). Due to the pandemic, air quality levels across the borough reduced significantly in all areas. Therefore, the overall trend in relation to previous years shows a reduction in pollution levels. This trend was generally seen nationally but specifically across Hertfordshire. The reduction in pollution levels were relative depending upon location, so our hot spot areas were still higher when compared to locations in less congested areas.

Section 3 of this report summaries the pollution data monitored for 2020. The data tables and trend graphs for the monitoring data is presented in Appendix A and B of this report. The data graphs provide a clear representation of the trends in our monitoring data. The

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

² Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Air quality appraisal: damage cost guidance, July 2020

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

reader is encouraged to study this section which shows how pollution levels are changing relative to historical time periods.

The trends for nitrogen dioxide (diffusion tubes) can be seen under figure A.1 and pages 35 to 40. The graphs show results from 2016 to 2020. In general, the overall trend shows that pollution levels have been decreasing which will possibly be as a result of people being more aware of pollution and vehicles emitting fewer emissions and appliances/equipment being focused on pollution reduction. Whilst there are still improvements to be made, the population is more aware of air quality than ever before. That said, the graphs show some increases in some locations, this is because pollution is likely to fluctuate from time to time and will not always decrease, this will be dependent upon traffic flows fluctuating and local construction projects. However, the trends do not show a significant increase in any location. Increases in pollution levels can also be because diffusion tubes have been removed/stolen in some locations. This results in a reduction of data and results having to be predicted/annualised. To try and improve data collection across the borough, diffusion tubes are relocated on an annual basis. As a result, the annual yearly trends can look confusing because multiple sites will be represented with a data figure of 0. Sites are often relocated when they record low levels of pollution. There is a balance therefore between obtaining trend data in the same locations and relocating monitoring to other areas.

The annual mean trends for PM2.5 can be found under figure A.2 on page 45. Apart from 2016, the trend from 2017 to 2020 has shown a reduction every year. However, the graph is slightly misleading because in 2016, the analyser became operational only part way through the year. Therefore, the data capture was limited which will have affected the overall result. The data capture rates from 2017 to 2020 have been high and consistent which will provide a more accurate representation of the annual mean. It is likely that had the analyser become operational at the start of 2016, the annual mean would have been higher. There is an expectation that the annual mean may increase slightly from 2020 to 2021 as emissions increase from road traffic due to covid and lock down easing.

There are no air quality action areas within the borough, and we have not measured any pollutants that have exceeded any objective levels.

The future years will be vital in terms of data monitoring, because it will be a good comparison to the lock down periods in 2020. The data will show how pollutant levels change for 2021, 2022 and so on compared to measurements in 2019. Whilst staff have returned to some offices during 2021, most companies are planning to set up hybrid

working arrangements. This is likely to mean that there will not be a time when offices are at 100% capacity. This is certainly true for council staff; this will of course significantly reduce staff travel and rush hour traffic levels. The resultant effect should be apparent in data trends going forward with 2020 being an important baseline. With the introduction of more flexible working arrangements, it has been observed that rush hour traffic times have been changing. Instead of there being a specific rush at certain times, observations have shown that rush hours periods have been extended meaning that certain roads do not experience high levels of traffic in a set time period.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy⁵ sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The global pandemic has had a significant impact on how the council was able to operate in 2020. Due to periods of lockdown and staff working at home, many meetings and proposed projects were suspended. The Public health and Protection team, who lead on the air quality within the Council, also had to focus priorities on dealing with new covid responsibilities, contract tracing and learning new legislation and essential taking on a whole new role during the pandemic.

Despite the additional burdens placed on the public health and protection team, they were responding to many pollution complaints, such as bonfires as well as providing advice and guidance on pollution related issues.

⁵ Defra. Clean Air Strategy, 2019

⁶ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

One of the most significant changes has been in relation to planning consultations. A new air quality planning condition has been introduced for developments to provide facilities to promote green travel, such as cycle storage and the provision of electric vehicle charging points. In areas where there are multiple developments a requirement has also been set to ensure that applicants assess the cumulative impacts of multiple sites and mitigate accordingly.

Table 2.2 identifies the actions taken in 2020 to help and improve air quality.

Conclusions and Priorities

No exceedances were noted or recorded during the monitoring period of 2020.

The significant trends show an overall reduction of pollution levels for all monitoring locations and pollutants.

There are currently no air quality action areas declared within the borough.

There have been no proposed developments approved that show a potential for a significant effect on air quality.

The priority going forward is to continue to monitor air quality across the borough, be proactively involved in emission reduction and green travel and to assist the control of pollution through development management.

Local Engagement and How to get Involved

The authority has engaged with Hertfordshire County Council and other stakeholders. There has been regular engagement and communication with the Hertfordshire and Bedfordshire air quality group. Local engagement has come via social media and the air quality schools project. This has included the promotion of air quality, green travel, development control and being aware of the differences that can be made at a local level.

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1 Local Air Quality Management

This report provides an overview of air quality in Welwyn Hatfield Borough Council during 2020. 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 Welwyn Hatfield Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

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 should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Welwyn Hatfield Borough Council currently does not have any declared AQMAs.

Table 2.1 – Declared Air Quality Management Areas

N/A

Progress and Impact of Measures to address Air Quality in Welwyn Hatfield Borough Council

Defra's appraisal of last year's ASR concluded: - Local authority responses in red text

Commentary:

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

1. A national bias adjustment factor has correctly been applied to the 2019 NO₂ monitoring results but the incorrect revision of the national factor spreadsheet has been referenced, 03/20 and not 09/20. The factor utilised has not changed between the releases but the Council should use the correct release of the national factors at the time of the ASRs completion. – This point has been noted and will be addressed for this year's report.
2. Following the installation of the roadside NO₂ automatic monitoring station it is recommended that the Council co-locate a set of triplicate diffusion tubes to enable the calculation of a local bias adjustment factor. – A diffusion tube has been placed close to the analyser but the specifics need to be investigated as to whether it is considered to be co-located. This will be addressed going forward.
3. Distance correction has correctly been applied to the relevant monitoring locations.
4. All monitoring locations are detailed and labelled clearly in the maps presented within the ASR.
5. Although there is a short paragraph relating to monitoring trends within the executive summary there are no comparisons between the monitoring results and relevant objectives presented in Section 3, it would be beneficial to include a written summary of the results within this section. – This has been noted and will be addressed going forward.
6. Valid data capture for the monitoring period column within Table A.3 should be completed in subsequent ASRs. This highlights monitoring sites that have been ceased / established part way through the calendar year, such as in 2018. – This has been noted and will be addressed going forward.

7. The WASP intercomparison scheme is referred to within Appendix C. The WASP scheme has been superseded into the AIR-PT scheme therefore this reference should be updated within the 2021 ASR. - This has been noted and will be addressed going forward.

8. Generally the report is very good, provides a great deal of information and acts as a good first point of reference for members of the Public. The Council should continue their hard work in developing partnerships and improving local air quality.

Welwyn Hatfield Borough Council has taken forward some measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 12 measures are included within Table 2.2, with the type of measure and the progress Welwyn Hatfield Borough Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	AQ schools project	Promoting Travel Alternatives	School Travel Plans	2020	2021	Local Authority Environmental Health, Local Authority Transport Dept.	Local authority/Charity/Volunteer	NO	Fully funded	< £10k	Planning	Reduced vehicle emissions	40%	Ongoing/halted due to pandemic	Diffusion tube monitoring in place for 2020 - Due to pandemic work with students has halted
2	Development control	Policy Guidance and Development Control	Intensive active travel campaign & infrastructure	2020	2021	Local Authority Environmental Health	Environmental health	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	100%	Implementation on-going	For development projects, air quality conditions are being put on applications for provision of cycle storage and electric vehicle charging points
3	Herts Living Lab	Transport Planning and Infrastructure	Other	2020	2022	Environmental Health, Herts County Council, Ocado, Univeristy of Hertfordshire	Multiple project schemes	NO	Funded	£10k - 50k	Planning	Reduced vehicle emissions	10%	Implementation on-going	In planning stages, working with mutiple partners to establish a monitoring network in Hatfield Business Park, obtain data, health indicators, green travel, promotion, highway infrastructure
4	Electric Cars	Alternatives to private vehicle use	Car Clubs	2017	2018	Local authority	Local authority	NO	Funded	< £10k	Completed	Reduced vehicle emissions	80%	Ongoing	Due to the pandemic, the e cars were out of action for some of the diffusion tube runs. However, they were back in use during 2020 and were used for air quality work. Staff are also regularly using them for general and routine work visits. The booking calendar often shows the cars being booked and used.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
5	Working at home	Promoting Travel Alternatives	Encourage / Facilitate home-working	2020	2022	Local authority	Local authority	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	80%	Ongoing	Home working was not promoted by the council prior to the pandemic. However, the pandemic forced the issue and it has become clear that home working can be efficient and very useful. The majority of staff have been home working and only coming into the office when it is essential to do so. Staff travel has reduced significantly. There is a plan to implement a hybrid working strategy to reduce the time spent in the office and to promote and continue with home working where possible.
6	Permits	Environmental Permits	Other measure through permit systems and economic instruments	2020	2022	Local authority	Local authority/consultant	NO	Funded	< £10k	Implementation	Permitted process emission controls	70%	Ongoing	LAPPC Environmental permits, seek assistance of an expert consultant to assist with inspections and permitting processes

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
7	Herts & Beds AQ Group	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	2022	Local authority	Local authority	NO	Funded	£10k - 50k	Implementation	Reduced vehicle emissions	70%	Ongoing	The group meet quarterly through the year and have regular contact at other times - Promotion and implementation of air quality strategies - promotion and sharing knowledge regarding improvements to air quality via development control - sharing new guidance - sharing measures adopted across the county to improve air quality - Links to Hertfordshire County Council Public Health to network and link in with projects to improve and promote public health county wide
8	Air Alert Scheme	Public Information	Via the Internet	2020	2022	Local authority	Local authority	NO	Funded	< £10k	Completed	Awareness of AQ in locality and promotion of green travel	100%	Ongoing	Whilst this is a free alert scheme taken from live analysers, combined with press releases and promotion via social media, it raises awareness regarding local pollution, local monitoring, getting people thinking about air quality, walking/cycling instead of driving

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
9	Electric pool bike scheme	Alternatives to private vehicle use	Other	2021	2023	Local authority	Local authority	NO	Not Funded	< £10k	Planning	Green staff travel in addition to e car scheme	20%	Ongoing	The council currently have a cycle hire scheme, however despite promotion uptake has been minimal. As staff would need them for visits, it would not always be practical to turn up exhausted to a visit from cycling across the district. A plan is being proposed to try and introduce electric bikes, this would hopefully encourage use, make them more convenient and appealing to use, provide a back up when the two e cars are in use and booked
10	Cycle to work scheme	Alternatives to private vehicle use	Other	2020	2021	Local authority	Local authority	NO	Partially Funded	< £10k	Completed	Reducing vehicle emissions	50%	Ongoing	Scheme available for staff to purchase bikes once every 6 months through the subsidised scheme

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	Climate Change Carbon Emission Reduction - Herts County Council Sustainability Partnership	Other	Other	2021	2030	Local authority	Local authority	NO	Partially Funded	£10k - 50k	Planning	Decarbonisation	20%	Ongoing	Most of the changes in how and what the community, (households and businesses) consumes as energy will change radically over the coming decades. Most of that change will depend on central government policy on decarbonisation of electricity production. There will be a switch to electrical heating of homes, as we move to greener electricity production. The Council, as most local authority in the country will have to manage and facilitate this change by providing help to the most vulnerable households, to reduce fuel poverty and offering advice and managing behavioural change as we move to net zero emissions.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
12	Strategic Action Plan Transport - Herts County Council Sustainability Partnership	Promoting Low Emission Transport	Other	2021	2030	Local authority	Local authority	No	Partially Funded	£10k - 50k	Planning	Decarbonisation	20%	Ongoing	<p>Deliver net zero carbon emissions for local authority transport operations by 2030 - Work towards zero carbon emissions for Hertfordshire's transport network by 2050 - Embed sustainable transport policies in Local Plans and prioritise the needs of sustainable travel within every planning decision</p> <ul style="list-style-type: none"> - Only support new developments where they will have full sustainable transport access - Systematically pursue opportunities for active travel in everything we do - Look to reduce air pollution arising from local transport sources - Promote a shift to active travel and public transport through behaviour change campaigns and infrastructure improvements - Facilitate a move to BEV for taxis across the county - Facilitate appropriate EV charging networks across Hertfordshire

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.

Welwyn Hatfield Borough Council is taking the following measures to address PM_{2.5}: The council still operate the electric scheme run by e car. We ensure that the cars are used for as many operational site visits as possible. The cars are booked in advance for each monthly diffusion tube run throughout the year. There has been some impact upon this scheme due to the pandemic, as for a period of time the cars were out of use due to infection control.

Many council staff (with the exception of core services) have been working from home in 2020. This has significantly reduced staff travel to and from the office as well as staff travelling to across county meetings. A lot of meetings have been held over zoom or teams and this includes meetings with other agencies which would have previously required staff travelling long distances. This new way of working has highlighted that there is not always a need to travel many miles to meet in person. Therefore, most online meetings have continued even during periods of lockdown easing. This has seen a marked decrease in staff travel and vehicle use.

The public health and protection team at Welwyn Hatfield always work to minimise pollution through our LAPPC permitting regime whereby commercial operations that can produce pollution are inspected and regulated accordingly.

The team come across a number of pollution incidents relating to bonfires both commercial and domestic and these are dealt with via appropriate legislation and actions with a view to reduce pollution and harm to others.

The air quality schools project has unfortunately been placed on hold due to the pandemic. The project involves visiting the designated schools to give talks, educate and undertake active tasks with the pupils. However, the diffusion tube monitoring continued in 2020 and communication links with the project partners remained active. This is with a view to reinstate the project as soon as the lockdown rules are eased.

Public Health Outcomes Framework - Fraction of mortality attributable to particulate air pollution 2019:

Table extract from: [Public Health Outcomes Framework - Data - PHE](#)

Compared with England: Not compared

Recent trends: Could not be calculated No significant change Increasing Decreasing

D01 - Fraction of mortality attributable to particulate air pollution 2019 Proportion - %

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	—	-	5.1	-	-
East of England region	—	-	5.5	-	-
Luton	—	-	6.2	-	-
Watford	—	-	6.0	-	-
Thurrock	—	-	6.0	-	-
Hertsmere	—	-	5.9	-	-
Broxbourne	—	-	5.9	-	-
Epping Forest	—	-	5.9	-	-
Welwyn Hatfield	—	-	5.8	-	-
St Albans	—	-	5.8	-	-
Three Rivers	—	-	5.8	-	-
Ipswich	—	-	5.7	-	-
Harlow	—	-	5.7	-	-
Brentwood	—	-	5.7	-	-
Stevenage	—	-	5.6	-	-
Dacorum	—	-	5.6	-	-
Central Bedfordshire	—	-	5.6	-	-
Chelmsford	—	-	5.6	-	-
Basildon	—	-	5.6	-	-
North Hertfordshire	—	-	5.6	-	-
Cambridge	—	-	5.6	-	-
East Hertfordshire	—	-	5.5	-	-
Bedford	—	-	5.5	-	-
Peterborough	—	-	5.5	-	-
Norwich	—	-	5.5	-	-
Huntingdonshire	—	-	5.5	-	-
Colchester	—	-	5.4	-	-
Braintree	—	-	5.4	-	-
South Cambridgeshire	—	-	5.4	-	-
Uttlesford	—	-	5.4	-	-
Fenland	—	-	5.3	-	-
Castle Point	—	-	5.3	-	-
Southend-on-Sea	—	-	5.3	-	-
Babergh	—	-	5.3	-	-
East Cambridgeshire	—	-	5.3	-	-
Mid Suffolk	—	-	5.3	-	-
Rochford	—	-	5.3	-	-
Great Yarmouth	—	-	5.3	-	-
Broadland	—	-	5.2	-	-
King's Lynn and West Norfolk	—	-	5.2	-	-
Breckland	—	-	5.2	-	-
South Norfolk	—	-	5.2	-	-
Maldon	—	-	5.2	-	-
Tendring	—	-	5.1	-	-
North Norfolk	—	-	5.0	-	-
Forest Heath	—	-	-	-	-
St. Edmundsbury	—	-	-	-	-
Suffolk Coastal	—	-	-	-	-
Waveney	—	-	-	-	-

The region of Welwyn and Hatfield has a value of 5.8% (which is a slight increase from 5.7% in 2018) and this compares to the East of England region which is 5.5%.

The mortality figure does not take into account locations of previous residences or locations of where people work, or indeed ongoing health conditions. Therefore, it is not overall clear how much local factors have on the overall mortality rate.

Mortality attributed to pollution must be taken seriously and it is a subject that is high on the agenda for the council. Therefore, matters regarding reducing emissions and having a robust monitoring network is vital to do everything we can to reduce and control emissions. Health promotion is a key target as well as trying to manage emissions via the planning consultation process and the local plan.

Whilst the increase is only .1 and is still lower than the figure for 2017, an increase is still a concern and must be monitored. The council regard the reduction of PM2.5 emissions to be a priority, and this will remain the case going forward.

It is not clear what effect the pandemic will have on this dataset going forward and again this must be closely monitored and will be reported when the data becomes available.

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

This section sets out the monitoring undertaken within 2020 by Welwyn Hatfield Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Welwyn Hatfield Borough Council undertook automatic (continuous) monitoring at 2 sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The https://www.airqualityengland.co.uk/local-authority/?la_id=408 page presents automatic monitoring results for Welwyn Hatfield Borough Council with automatic monitoring results also available through the UK-Air website .

Maps showing the location of the monitoring sites 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.

3.1.2 Non-Automatic Monitoring Sites

Welwyn Hatfield Borough Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 51 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. The monitoring data does not show any exceedances in the air quality objectives.

3.1.4 Particulate Matter (PM₁₀)

Welwyn Hatfield Borough Council do not monitor this pollutant.

3.1.5 Particulate Matter (PM_{2.5})

Table A.8 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past five years.

The annual mean trends for PM_{2.5} can be found under figure A.2 on page 45. Apart from 2016, the trend from 2017 to 2020 has shown a reduction every year. However, the graph is slightly misleading because in 2016, the analyser became operational only part way through the year. Therefore, the data capture was limited which will have affected the overall result. The data capture rates from 2017 to 2020 have been high and consistent which will provide a more accurate representation of the annual mean. It is likely that had

the analyser become operational at the start of 2016, the annual mean would have been higher. There is an expectation that the annual mean may increase slightly from 2020 to 2021 as emissions increase from road traffic due to covid and lock down easing.

3.1.6 Sulphur Dioxide (SO₂)

Welwyn Hatfield Borough Council do not monitor this pollutant.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
WHBAM	Great North Rd/A1000	Roadside	51.767657	0.214671	PM2.5	No	Beta Attenuation	10	8	1.5
WHNOX	West View	Roadside	51.77047	0.23175	NO ₂	No	Chemiluminescent	16	3	1.8

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
WH1	Codicote Road, Welwyn	Roadside	522941	216641	NO2	No	10.0	3.0	No	2.0
WH2	Bessemer Road, WGC	Roadside	524340	213087	NO2	No	23.0	2.0	No	2.0
WH3	A1000 Brookmans Park	Roadside	525936	203842	NO2	No	19.0	3.0	No	2.0
WH4	London Rd, Welwyn, Tenterfield Nursery School	Roadside	523146	215700	NO2	No	8.0	2.0	No	2.0
WH5	Cuffley High Street 1	Roadside	530553	202715	NO2	No	16.0	5.0	No	2.0
WH6	Cuffley High Street 2	Roadside	530502	202694	NO2	No	6.0	5.0	No	2.0
WH7	Briars Lane, Hatfield	Roadside	522193	208434	NO2	No	18.0	2.0	No	2.0
WH8	Black Fan Road - Opposite Morrisons	Roadside	525688	212769	NO2	No	14.0	3.0	No	2.0
WH9	Great North Rd Adjacent to A1(M)	Kerbside	522429	212150	NO2	No	13.0	1.0	No	2.0
WH10	Parkside, Welwyn	Near road	523347	216002	NO2	No	9.0	3.0	No	2.0
WH11	Knightsfield, WGC	Roadside	524429	214000	NO2	No	20.0	2.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
WH12	St Albans Road East/Heyford Way, Hatfield	Roadside	523148	209148	NO2	No	6.0	2.0	No	2.0
WH13	St Albans Road West, Hatfield	Urban Background	520760	208193	NO2	No	13.0	17.0	No	2.0
WH14	Campion Road, Hatfield	Roadside	521585	209696	NO2	No	6.0	3.0	No	2.0
WH15	Great North Road, Hatfield	Near road	522604	210859	NO2	No	7.0	5.0	No	2.0
WH16	Standborough Road, Near Stanborough Close	Roadside	523358	211931	NO2	No	9.0	3.0	No	2.0
WH17	Great North Road, Hatfield (A1000)	Near road	523293	209164	NO2	No	15.0	5.0	No	2.0
WH18	B195/Broadwater Road, WGC	Near road	524285	212988	NO2	No	16.0	5.0	No	2.0
WH19	Comet Way on A1001 & A1M	Near road	522144	209516	NO2	No	50.0	5.0	No	2.0
WH20	Wellfield Road, Hatfield	Roadside	522466	208908	NO2	No	13.0	2.0	No	2.0
WH21	Roadside Laybay A414 Essendon	Background	527258	210364	NO2	No	7.0	5.0	No	2.0
WH22	Garden Village, Hatfield	Kerbside	521801	209471	NO2	No	20.0	1.0	No	2.0
WH23	Burrowfield, WGC	Roadside	523921	211698	NO2	No	10.0	2.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
WH24	Ellenbrook Lane @ A1001	Near road	521164	207740	NO2	No	40.0	5.0	No	2.0
WH25	West View, Hatfield	Near road	522093	209431	NO2	No	8.0	5.0	No	2.0
WH26	West View, Hatfield	Near road	522064	209328	NO2	No	24.0	5.0	No	2.0
WH27	West View, Hatfield	Near road	522060	209289	NO2	No	8.0	5.0	No	2.0
WH28	Taxi rank WGC	Near road	523815	212960	NO2	No	15.0	5.0	No	2.0
WH29	Taxi rank Hatfield	Near road	523267	208803	NO2	No	25.0	5.0	No	2.0
WH30	Northaw Road East, Cuffley	Roadside	530424	202589	NO2	No	21.0	3.0	No	2.0
WH31	B197 - Opp The East WGC	Roadside	522579	211012	NO2	No	9.0	2.0	No	2.0
WH32	Clock Hotel, Welwyn	Near road	523438	216512	NO2	No	12.0	5.0	No	2.0
WH33	Maran Avenue, Welwyn	Roadside	523341	215639	NO2	No	18.0	2.0	No	2.0
SCH1	Monks Walk 1	Urban Background	523441	214980	NO2	No	14.0	1.0	No	2.0
SCH2	Monks Walk 2	Urban Background	523482	214966	NO2	No	17.0	3.0	No	2.0
SCH3	Monks Walk 3	Urban Background	523491	215032	NO2	No	24.0	4.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
SCH4	Monks Walk 4	Urban Background	523529	215082	NO2	No	33.0	2.0	No	2.0
SCH5	Monks Walk 5	Urban Background	523480	215086	NO2	No	0.0	26.0	No	2.0
SCH6	Monks Walk 6	Urban Background	523579	215043	NO2	No	4.0	1.0	No	2.0
SCH7	Panshanger Academy 1	Urban Background	525626	213140	NO2	No	29.0	2.0	No	2.0
SCH8	Panshanger Academy 2	Urban Background	525616	213123	NO2	No	21.0	2.0	No	2.0
SCH9	Panshanger Academy 3	Urban Background	525622	213114	NO2	No	11.0	1.0	No	2.0
SCH10	Panshanger Academy 4	Urban Background	525610	213113	NO2	No	25.0	2.0	No	2.0
SCH11	Panshanger Academy 5	Urban Background	525594	213093	NO2	No	19.0	2.0	No	2.0
SCH12	Panshanger Academy 6	Urban Background	525578	213070	NO2	No	20.0	2.0	No	2.0
SCH13	Countess Anne 1	Urban Background	522985	208913	NO2	No	9.0	2.0	No	2.0
SCH14	Countess Anne 2	Urban Background	523003	208919	NO2	No	9.0	2.0	No	2.0
SCH15	Countess Anne 3	Urban Background	523018	208925	NO2	No	14.0	2.0	No	2.0
SCH16	Countess Anne 4	Urban Background	523044	208936	NO2	No	17.0	3.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
SCH17	Countess Anne 5	Urban Background	523086	208961	NO2	No	13.0	2.0	No	2.0
SCH18	Countess Anne 6	Urban Background	523078	208926	NO2	No	8.0	2.0	No	2.0

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.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
WHNOX	51.77047	0.23175	Roadside	27	27	N/A	N/A	N/A	N/A	21

☒ Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16 (confirm by selecting in box).

☒ Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction (confirm by selecting in box).

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
WH1	522941	216641	Roadside	73.1	73.1	22	22	26	26	17.6
WH2	524340	213087	Roadside	92.3	92.3	42	35	21	22	27.4
WH3	525936	203842	Roadside	92.3	92.3	28	27	27	24	19.1
WH4	523146	215700	Roadside	92.3	92.3	31	22	17	19	14.6
WH5	530553	202715	Roadside	92.3	92.3	20	33	28	33	24.5
WH6	530502	202694	Roadside	84.6	84.6	18	36	30	27	19.7
WH7	522193	208434	Roadside	92.3	92.3	30	30	28	28	19.9
WH8	525688	212769	Roadside	92.3	92.3	20	20	17	27	21.2
WH9	522429	212150	Kerbside	92.3	92.3	22	21	19	35	26.8
WH10	523347	216002	Near road	92.3	92.3	22	21	25	26	19.0
WH11	524429	214000	Roadside	92.3	92.3	18	18	28	29	15.7
WH12	523148	209148	Roadside	92.3	92.3	17	17	15	27	19.8
WH13	520760	208193	Urban Background	84.6	84.6	16	17	14	20	14.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
WH14	521585	209696	Roadside	92.3	92.3	29	28	21	25	25.3
WH15	522604	210859	Near road	92.3	92.3	24	22	21	20	14.0
WH16	523358	211931	Roadside	92.3	92.3	25	21	20	38	30.2
WH17	523293	209164	Near road	92.3	92.3	29	32	27	29	20.8
WH18	524285	212988	Near road	92.3	92.3	39	37	35	31	24.0
WH19	522144	209516	Near road	92.3	92.3	55	49	44	42	31.8
WH20	522466	208908	Roadside	92.3	92.3	31	27	23	23	22.3
WH21	527258	210364	Background	92.3	92.3	32	34	31	29	21.6
WH22	521801	209471	Kerbside	92.3	92.3	36	43	35	37	28.1
WH23	523921	211698	Roadside	92.3	92.3	22	22	24	23	19.3
WH24	521164	207740	Near road	92.3	92.3	44	40	38	36	25.2
WH25	522093	209431	Near road	92.3	92.3	44	46	40	36	28.9
WH26	522064	209328	Near road	92.3	92.3	37	39	45	48	35.1
WH27	522060	209289	Near road	59.6	59.6	37	40	34	34	26.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
WH28	523815	212960	Near road	92.3	92.3	32	27	25	24	17.2
WH29	523267	208803	Near road	92.3	92.3	44	40	35	34	25.3
WH30	530424	202589	Roadside	92.3	92.3			23	21	18.4
WH31	522579	211012	Roadside	92.3	92.3			21	34	23.6
WH32	523438	216512	Near road	92.3	92.3			31	31	23.5
WH33	523341	215639	Roadside	75.0	75.0			21	20	15.2
SCH1	523441	214980	Urban Background	76.9	76.9					16.3
SCH2	523482	214966	Urban Background	76.9	76.9					13.4
SCH3	523491	215032	Urban Background	76.9	76.9					11.8
SCH4	523529	215082	Urban Background	76.9	76.9					11.4
SCH5	523480	215086	Urban Background	76.9	76.9					10.4
SCH6	523579	215043	Urban Background	76.9	76.9					10.2
SCH7	525626	213140	Urban Background	76.9	76.9					12.4
SCH8	525616	213123	Urban Background	76.9	76.9					14.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
SCH9	525622	213114	Urban Background	76.9	76.9					12.0
SCH10	525610	213113	Urban Background	76.9	76.9					13.8
SCH11	525594	213093	Urban Background	76.9	76.9					13.5
SCH12	525578	213070	Urban Background	61.5	61.5					14.8
SCH13	522985	208913	Urban Background	76.9	76.9					15.1
SCH14	523003	208919	Urban Background	76.9	76.9					13.6
SCH15	523018	208925	Urban Background	76.9	76.9					13.8
SCH16	523044	208936	Urban Background	69.2	69.2					13.9
SCH17	523086	208961	Urban Background	76.9	76.9					13.0
SCH18	523078	208926	Urban Background	76.9	76.9					13.7

☒ Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16 (confirm by selecting in box).

☒ Diffusion tube data has been bias adjusted (confirm by selecting in box).

☒ Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction (confirm by selecting in box).

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

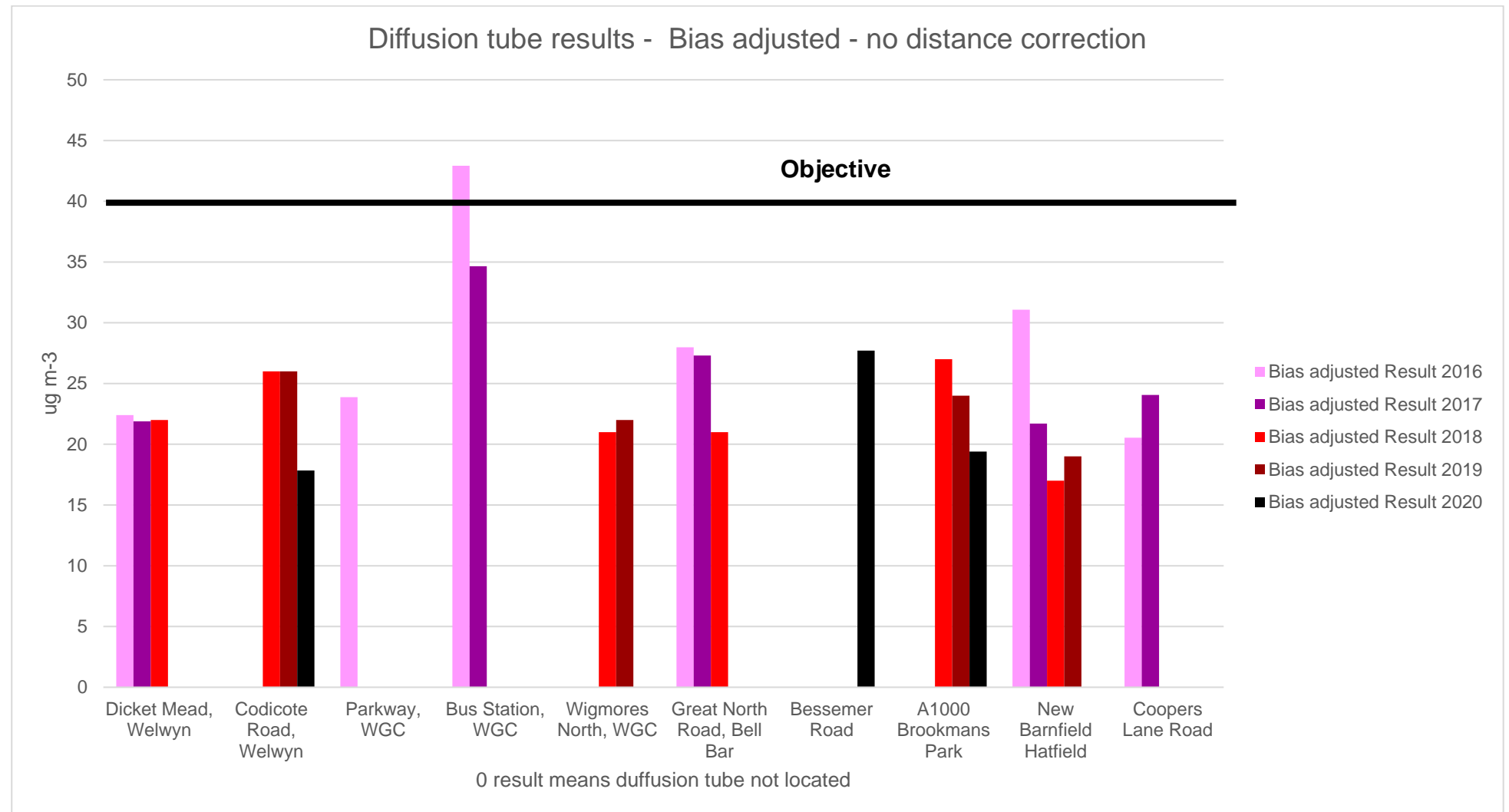
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

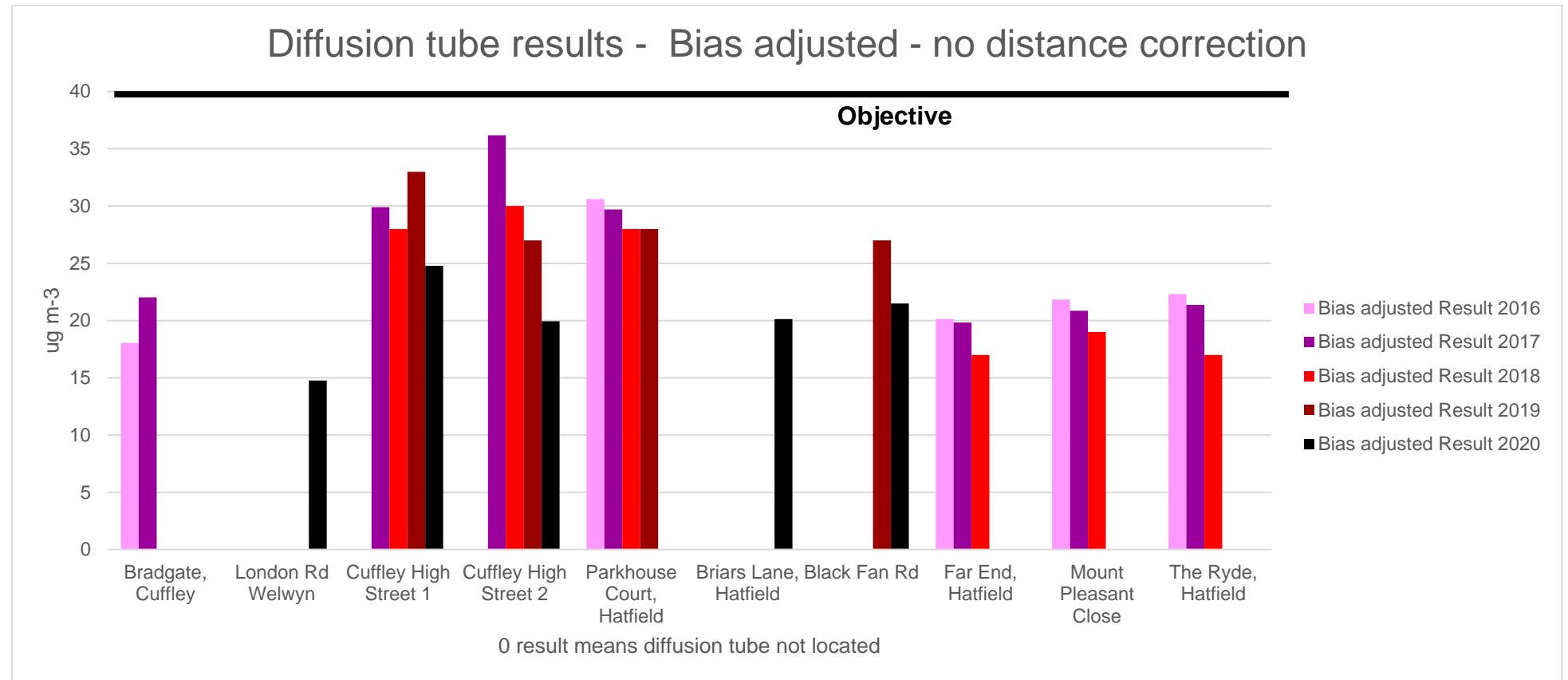
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

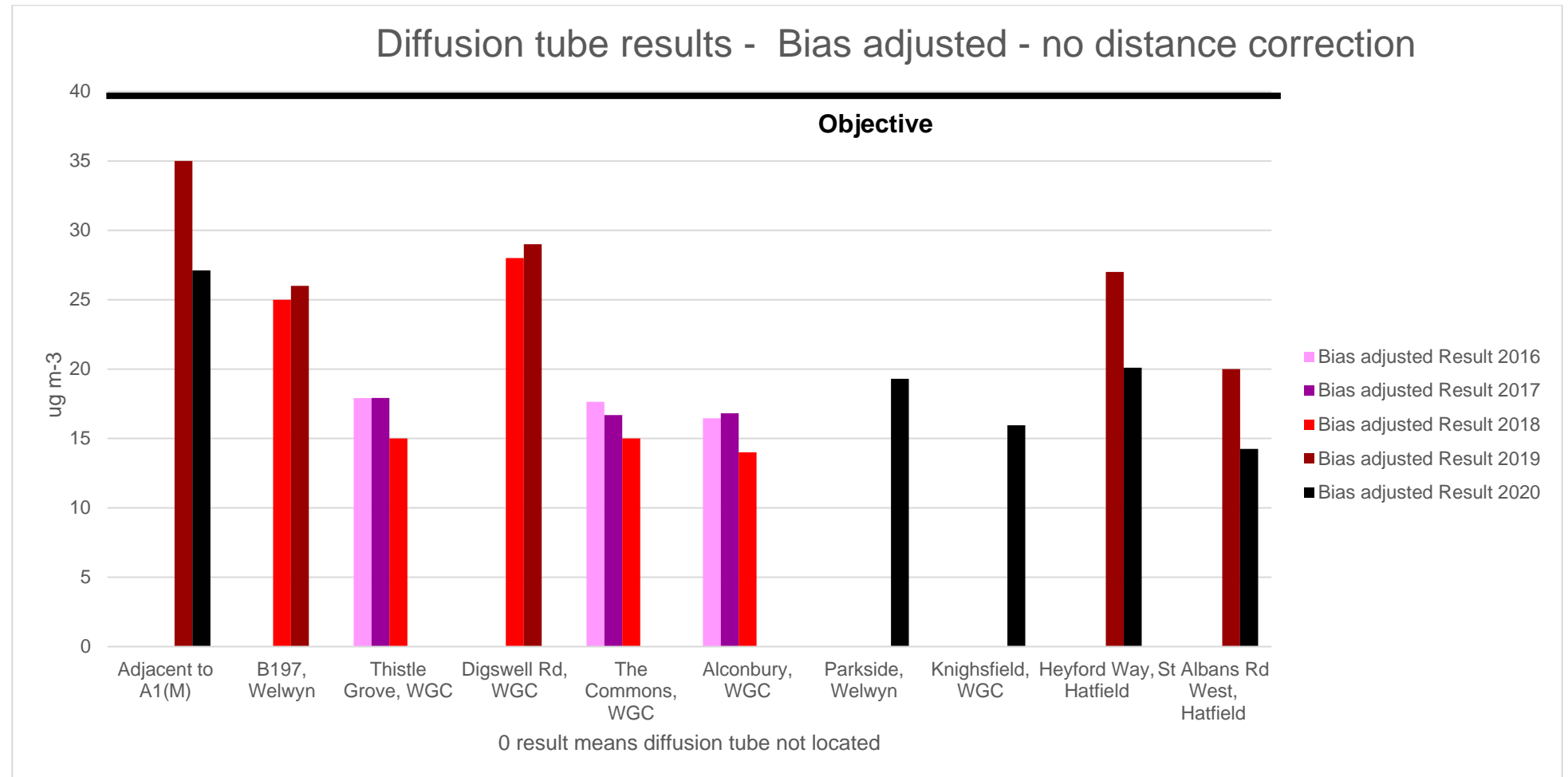
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

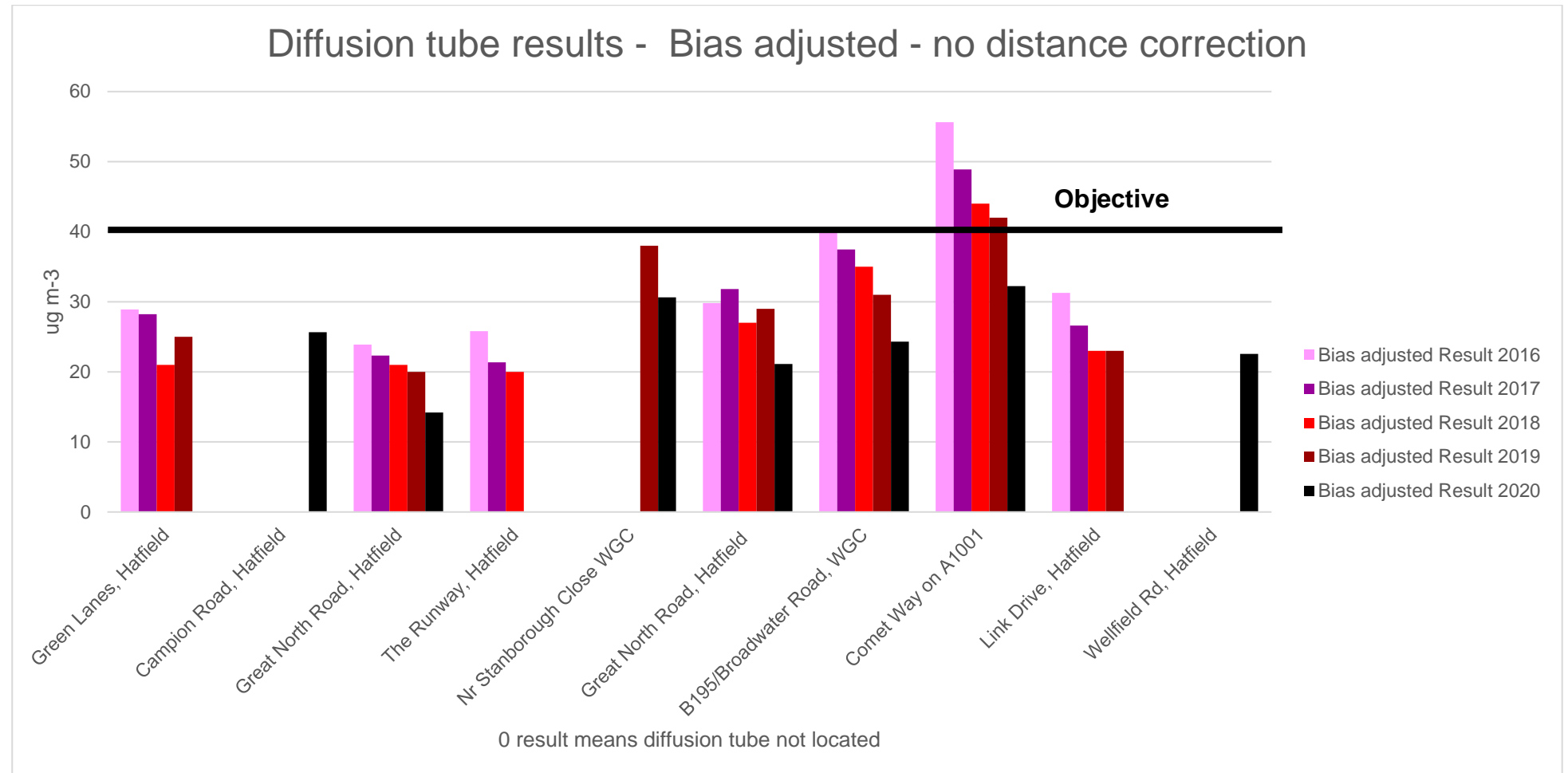
***To condense the size of the table above, The tube reference (WH1,WH2,WH3) and the eastings and northings, are for the diffusion tube locations in 2020. In previous years this table has included multiple rows, for example showing multiple WH1 references. This has made the table very large and complicated, especially when diffusion tubes have been relocated part way through the calendar year. To ascertain how the tube references (WH1,WH2,WH3) correlate with the easting and northings for years 2016 to 2019, please refer to the previous annual status reports. Thank you.**

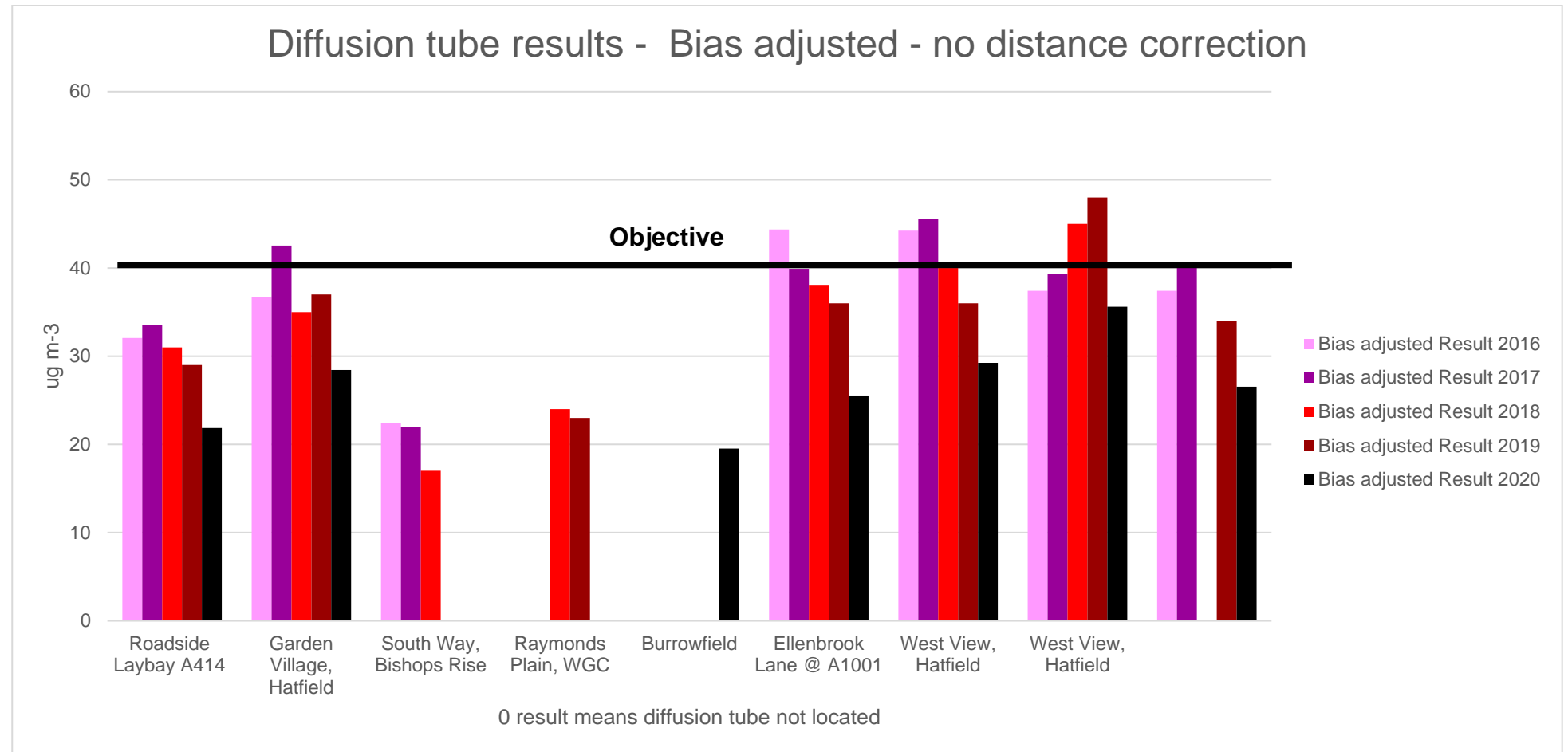
Figure A.1 – Trends in Annual Mean NO₂ Concentrations











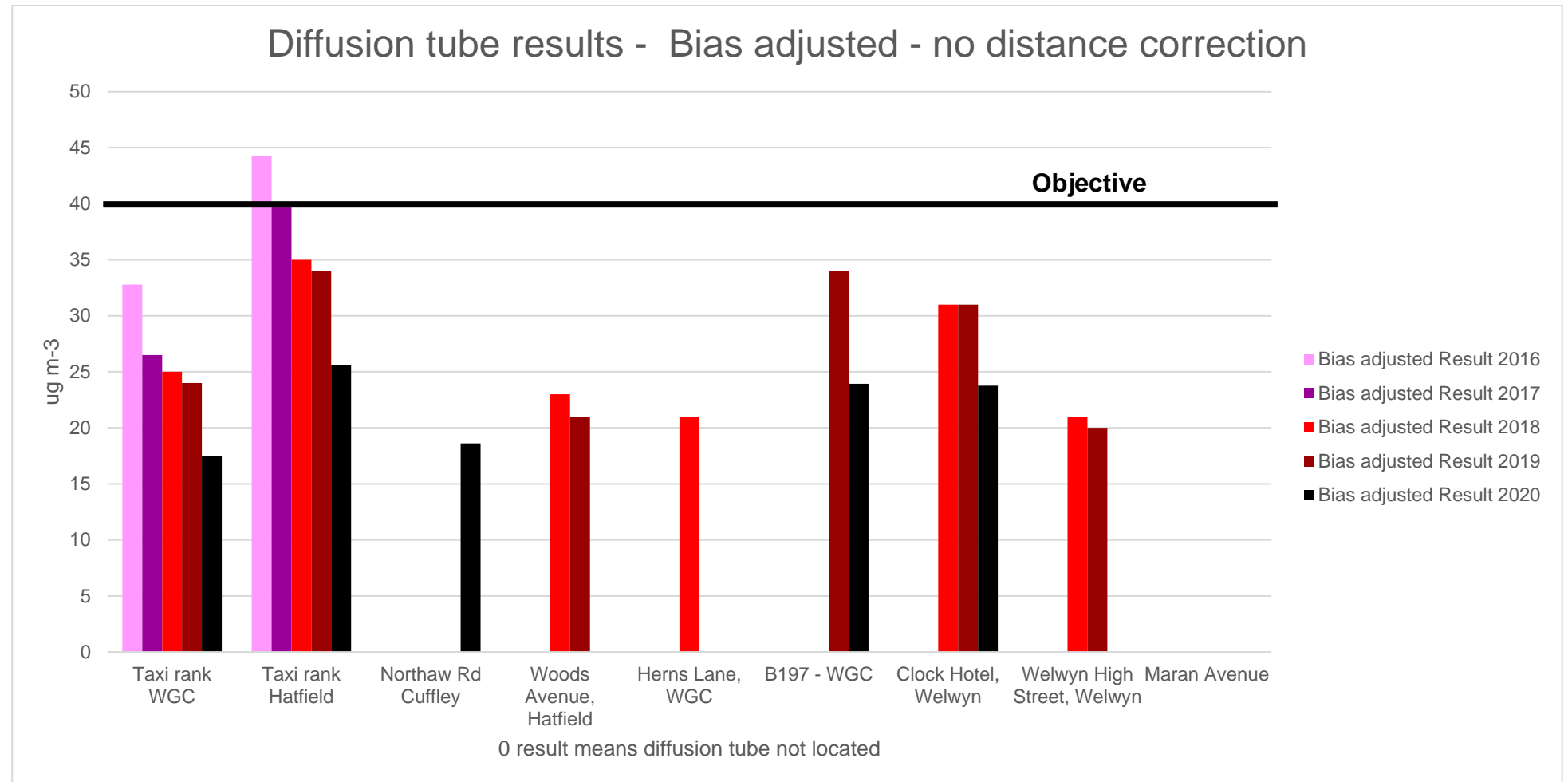


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
WHNOX	51.77047	0.23175	Roadside	27	27	N/A	N/A	N/A	N/A	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

Table A.6 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

PM10 is not monitored.

Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

PM10 is not monitored.

Table A.8 – Annual Mean PM_{2.5} Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
WHBAM	51.767657	0.214671	Roadside	94	94	9	13	11	10	9

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

Notes:

The annual mean concentrations are presented as µg/m³.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Figure A.2 – Trends in Annual Mean PM_{2.5} Concentrations

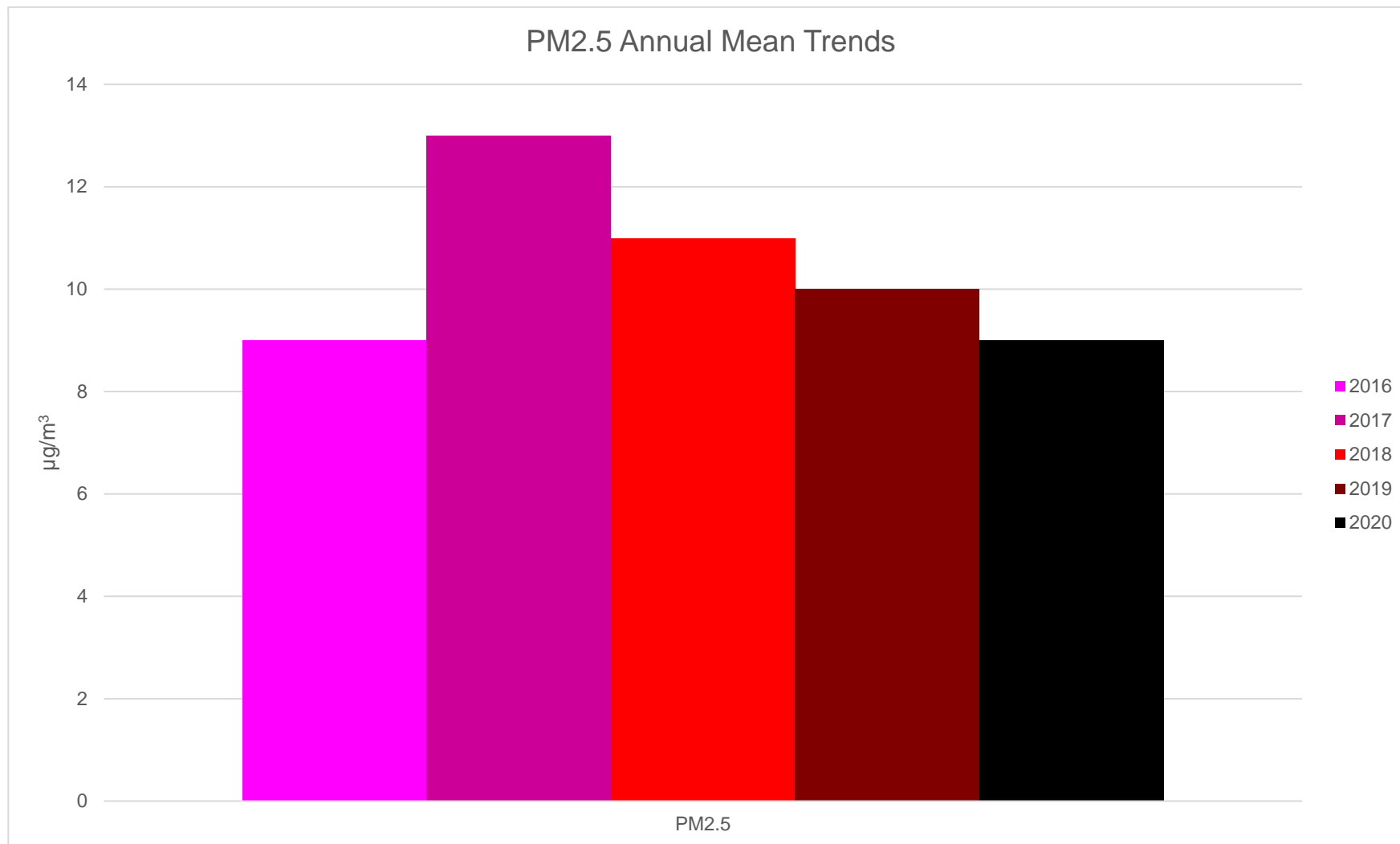


Table A.9 – SO₂ 2020 Monitoring Results, Number of Relevant Instances

Pollutant not monitored.

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ 2020 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
WH1	522941	216641	37.9	27.4		18.2		20.1	15.0	7.5	25.8	23.5	33.1		23.3	17.6	-	
WH2	524340	213087	62.7	46.5		18.3	18.6	24.3	25.4	30.3	36.0	40.5	50.2	43.1	35.8	27.4	-	
WH3	525936	203842	38.9	22.5		18.4	17.9	21.2	14.6	25.4	27.1	26.1	35.0	30.0	25.0	19.1	-	
WH4	523146	215700	31.6	19.0		13.8	12.2	13.8	10.7	15.2	19.9	18.8	29.0	26.9	18.8	14.6	-	
WH5	530553	202715	51.1	37.6		22.2	18.6	28.6	23.6	28.9	32.5	36.5	38.8	35.7	31.6	24.5	-	
WH6	530502	202694	44.4			19.2	17.7	19.8	17.4	24.3	26.1	28.1	36.8	25.2	25.8	19.7	-	
WH7	522193	208434	41.8	32.2		15.4	16.9	16.4	16.3	21.9	29.4	26.7	36.7	33.9	26.5	19.9	-	
WH8	525688	212769	44.4	30.9		17.3	16.7	21.2	19.6	23.4	29.4	31.4	35.6	37.2	27.5	21.2	-	
WH9	522429	212150	51.1	36.1		28.6	26.0	28.3	24.3	35.4	38.0	36.4	41.9	41.2	34.6	26.8	-	
WH10	523347	216002	37.6	26.0		19.1	15.0	22.7	12.1	20.8	23.6	27.8	34.9	36.1	24.9	19.0	-	
WH11	524429	214000	34.4	20.7		15.9	11.6	16.0	12.2	17.1	24.8	20.7	30.1	24.3	20.8	15.7	-	
WH12	523148	209148	44.2	33.2		17.0	14.4	21.3	15.0	18.4	26.4	27.7	36.1	33.5	26.0	19.8	-	
WH13	520760	208193	27.9			14.9	12.2	12.2	10.8	15.5	21.2	19.6	24.9	25.8	18.6	14.1	-	
WH14	521585	209696	55.4	42.9		21.7	19.8	23.7	19.7	24.6	30.8	35.3	50.6	42.0	33.1	25.3	-	
WH15	522604	210859	29.4	19.3		15.5	12.9	14.5	9.8	10.9	18.7	17.2	28.1	26.4	18.3	14.0	-	
WH16	523358	211931	54.6	42.3		31.5	28.5	34.2	26.9	41.2	40.5	45.7	47.3	45.0	38.3	30.2	-	
WH17	523293	209164	48.9	36.7		15.2	14.9	18.0	16.4	21.3	27.4	30.8	38.1	34.0	27.2	20.8	-	
WH18	524285	212988	49.4	30.6		24.5	21.6	24.6	16.4	25.5	33.7	37.1	42.1	41.8	30.9	24.0	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
WH19	522144	209516	63.4	48.1		23.0	35.2	29.8	40.7	40.0	47.1	43.6	48.5	41.1	41.5	31.8	-	
WH20	522466	208908	50.1	37.8		22.4	17.2	20.7	18.6	24.2	28.3	31.6	32.6	38.8	28.9	22.3	-	
WH21	527258	210364	40.8	31.0		23.8	21.8	22.2	21.6	27.4	34.2	28.2	32.8	28.3	28.1	21.6	-	
WH22	521801	209471	61.4	49.3		27.3	22.4	23.0	23.1	29.8	36.9	39.1	48.1	45.9	36.6	28.1	-	
WH23	523921	211698	40.0	29.2		16.2	15.9	18.4	17.7	21.6	26.9	27.4	36.4	29.2	25.1	19.3	-	
WH24	521164	207740	48.8	27.8		26.1	26.6	30.9	16.6	32.7	34.6	37.2	44.2	39.3	33.6	25.2	-	
WH25	522093	209431	58.2	44.3		23.9	27.7	27.6	34.2	33.9	43.2	41.8	42.0	41.1	37.1	28.9	-	
WH26	522064	209328	75.7	57.2		28.5	32.1	30.2	36.8	41.5	48.4	53.2	54.8	50.3	45.3	35.1	-	
WH27	522060	209289	60.2	41.3					31.0	35.0		39.3	34.3	40.3	40.2	26.2	-	
WH28	523815	212960	38.9	24.4		14.7	10.9	15.1	13.1	20.7	20.7	24.1	30.4	36.4	22.3	17.2	-	
WH29	523267	208803	56.4	44.5		17.3	16.6	21.4	19.4	24.7	34.5	40.7	47.9	42.1	32.6	25.3	-	
WH30	530424	202589	36.9	27.2		17.7	15.4	18.4	15.0	21.5	24.6	24.2	33.1	31.8	23.9	18.4	-	
WH31	522579	211012	44.0	32.3		20.0	25.9	30.9	22.7	34.2	37.3	18.2	39.8	36.6	30.5	23.6	-	
WH32	523438	216512	47.3	35.8		20.7	19.7	24.9	20.9	27.7	30.9	32.5	41.5	37.6	30.7	23.5	-	
WH33	523341	215639	30.0	20.8		16.2		10.8		16.5	19.1	20.8	27.1	18.5	19.7	15.2	-	
SCH1	523441	214980				11.3	9.0	11.8	21.5	21.4	24.0	27.3	35.4	30.9	20.7	16.3	-	
SCH2	523482	214966				12.0	10.7	12.3	11.2	14.2	19.6	20.1	31.3	26.9	17.5	13.4	-	
SCH3	523491	215032				10.3	10.0	10.4	10.4	13.4	16.3	16.8	26.4	25.2	15.4	11.8	-	
SCH4	523529	215082				10.4	9.6	11.1	8.5	12.2	15.4	17.1	27.1	24.0	15.0	11.4	-	
SCH5	523480	215086				11.1	9.2	9.2	8.1	11.6	14.2	14.5	24.5	21.0	13.6	10.4	-	
SCH6	523579	215043				10.7	9.1	9.0	8.0	10.3	16.1	15.1	21.8	20.6	13.4	10.2	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
SCH7	525626	213140				11.9	9.3	10.6	13.6	13.3	15.6	17.3	28.0	27.2	16.5	12.4	-	
SCH8	525616	213123				12.7	10.5	12.4	13.1	13.4	20.2	26.0	32.6	24.9	18.7	14.0	-	
SCH9	525622	213114				10.9	8.5	10.4	13.0	10.5	16.5	20.0	28.7	23.6	16.0	12.0	-	
SCH1 0	525610	213113				12.0	9.8	11.7	16.2	13.8	19.9	22.9	30.8	26.2	17.8	13.8	-	
SCH1 1	525594	213093				13.5	10.4	11.7	11.9	14.1	20.5	19.7	30.3	27.2	17.7	13.5	-	
SCH1 2	525578	213070				13.7	11.4			16.0	21.7	23.6	31.7	23.7	20.4	14.8	-	
SCH1 3	522985	208913				12.1	11.8	13.3	14.5	16.6	22.9	26.3	33.0	28.6	20.0	15.1	-	
SCH1 4	523003	208919				12.5	9.5	11.6	13.2	13.9	20.4	20.2	31.3	27.9	17.7	13.6	-	
SCH1 5	523018	208925				14.6	10.5	12.9	11.9	13.7	19.8	23.6	30.3	26.2	18.4	13.8	-	
SCH1 6	523044	208936				11.4	10.6	11.5		13.2	19.4	22.1	29.8	27.5	18.5	13.9	-	
SCH1 7	523086	208961				12.3	10.2	11.7	12.3	13.9	16.6	21.7	27.9	27.0	17.2	13.0	-	
SCH1 8	523078	208926				13.0	10.2	11.1	11.7	13.5	20.6	22.2	31.3	28.1	18.0	13.7	-	

☒ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1

☒ Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16

☐ Local bias adjustment factor used

☒ National bias adjustment factor used

☒ Where applicable, data has been distance corrected for relevant exposure in the final column

☒ confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Welwyn Hatfield Borough Council During 2020

Welwyn Hatfield Borough Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by Welwyn Hatfield Borough Council during 2020

Welwyn Hatfield Borough Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

The samples have been analysed in accordance with Socotec (Didcot) standard operating procedure ANU/SOP/1015 Issue 1. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient NO₂ Monitoring: Practical Guidance.'

The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. All samples were received in good condition, unless otherwise stated in the comments field of results table.

Please note:

(i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values **have** been adjusted to 20°C to allow for direct comparison with EU limits.

(ii) The reported results have not been bias adjusted.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and

assessments requiring exposure details and conditions fall outside the scope of our accreditation.

Contaminated diffusion tubes – March 2020:

I was advised by Socotec that the diffusion tubes for the period of March 2020 were contaminated. Due to this, I have made a decision to exclude the results from the March 2020 diffusion tube exposures to ensure that the annual mean is not affected.

Diffusion Tube Annualisation

Annualisation has been carried out for diffusion tubes with data capture less than 75% but greater than 33%. Details of the calculation process can be seen in tables C2 and C3.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regards to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Welwyn Hatfield Borough Council have applied a national bias adjustment factor of 0.76 to the 2020 monitoring data. A summary of bias adjustment factors used by Welwyn Hatfield Borough Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	06/21	0.76
2019	National	03/20	0.75
2018	National	03/19	0.76
2017	National	03/18	0.77
2016	National	03/17	0.79

National bias adjustment factor :

National Diffusion Tube Bias Adjustment Factor Spreadsheet					Spreadsheet Version Number: 06/21					
Follow the steps below in the correct order to show the results of relevant co-location studies								This spreadsheet will be updated at the end of Sept 2021 LAQM Helpdesk Website		
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 spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.										
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:		Step 2:	Step 3:	Step 4:						
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	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 ² shown in blue at the foot of the final column.						
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data ²	If you have your own co-location study then see footnote ³ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953						
Analysed By ¹	Method ²	Year ²	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁵	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2020	R	East Suffolk Council	12	30	25	19.6%	G	0.84
SOCOTEC Didcot	50% TEA in acetone	2020	UB	Canterbury City Council	10	13	10	28.1%	G	0.78
SOCOTEC Didcot	50% TEA in acetone	2020	R	Canterbury City Council	9	26	20	29.6%	G	0.77
SOCOTEC Didcot	50% TEA in acetone	2020	UB	Kingston upon Hull City Council	12	24	18	34.8%	G	0.74
SOCOTEC Didcot	50% TEA in acetone	2020	R	Ipswich Borough Council	12	27	21	28.5%	G	0.78
SOCOTEC Didcot	50% TEA in acetone	2020	R	Ipswich Borough Council	12	36	26	36.3%	G	0.73
SOCOTEC Didcot	20% TEA in water	2020	R	Rhondda Cynon Taf CBC	9	29	23	22.9%	G	0.81
SOCOTEC Didcot	50% TEA in acetone	2020	R	Thanet District Council	9	20	17	21.2%	G	0.83
SOCOTEC Didcot	50% TEA in acetone	2020	R	Medway Council	12	26	18	41.7%	G	0.71
SOCOTEC Didcot	50% TEA in acetone	2020	B	Medway Council	11	20	10	96.3%	G	0.51
SOCOTEC Didcot	50% TEA in acetone	2020	B	Gravesham Borough Council	12	23	22	5.6%	G	0.95
SOCOTEC Didcot	50% TEA in acetone	2020	B	Gravesham Borough Council	12	27	24	16.1%	G	0.86
SOCOTEC Didcot	50% TEA in acetone	2020	R	Monmouthshire County Council	10	32	24	35.3%	G	0.74
SOCOTEC Didcot	50% TEA in acetone	2020	UI	North Lincolnshire Council	13	18	14	26.6%	G	0.79
SOCOTEC Didcot	50% TEA in acetone	2020	R	City of York Council	12	24	19	29.0%	G	0.78
SOCOTEC Didcot	50% TEA in acetone	2020	R	City of York Council	11	22	17	34.3%	G	0.74
SOCOTEC Didcot	50% TEA in acetone	2020	R	City of York Council	12	33	23	40.4%	G	0.71
SOCOTEC Didcot	50% TEA in acetone	2020	R	Cambridge City Council	10	30	20	47.6%	G	0.68
SOCOTEC Didcot	50% TEA in acetone	2020	R	Wrexham County Borough Council	9	17	13	26.6%	G	0.79
SOCOTEC Didcot	50% TEA in acetone	2020	KS	Marylebone Road Intercomparison	11	59	43	38.0%	G	0.72
SOCOTEC Didcot	20% TEA in water	2020	KS	Marylebone Road Intercomparison	11	57	43	32.7%	G	0.75
SOCOTEC Didcot	20% TEA in water	2020	R	Fife Council	9	22	13	64.5%	G	0.61
SOCOTEC Didcot	20% TEA in water	2020	R	Fife Council	9	22	17	31.4%	G	0.76
SOCOTEC Didcot	20% TEA in water	2020	R	South Oxfordshire District Council	11	32	29	13.5%	G	0.88
Socotec Didcot	50% TEA in acetone	2020	R	Horsham District Council	10	23	23	2.2%	G	0.98
Socotec Didcot	50% TEA in acetone	2020	R	Horsham District Council	12	22	19	18.6%	G	0.84
Socotec Didcot	50% TEA in acetone	2020	R	Horsham District Council	9	25	18	42.0%	G	0.70
Socotec Didcot	20% TEA in water	2020	R	New Forest DC	9	27	18	46.3%	G	0.68
Socotec Didcot	50% TEA in acetone	2020	R	Dacorum Borough Council	10	24	19	25.2%	G	0.80
Socotec Didcot	50% TEA in acetone	2020	R	Huntingdonshire District Council	12	36	25	47.1%	G	0.68
SOCOTEC Didcot	20% TEA in water	2020	Overall Factor ² (6 studies)						Use	0.74
SOCOTEC Didcot	50% TEA in acetone	2020	Overall Factor ² (24 studies)						Use	0.76

NO₂ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO₂ monitoring locations within Welwyn Hatfield Borough Council are required distance correction during 2020.

QA/QC of Automatic Monitoring

PM₁₀ and PM_{2.5} Monitoring Adjustment

The PM_{2.5} (BAM 1020 Analyser) data supplied to Welwyn Hatfield Borough Council is processed by Ricardo Energy and Environment. All data is ratified before it is processed into this report.

Automatic Monitoring Annualisation

The newly installed Nitrogen Dioxide analyser obtained a data capture rate of 27% for 2020. Despite annualization not being required for data capture below 33%, this process was undertaken regardless.

NO₂ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure should be estimated using the NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No automatic NO₂ monitoring locations within Welwyn Hatfield Borough Council required distance correction during 2020.

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Diffusion Tube ID	Annualisation Factor Borehamwood Meadow Park	Annualisation Factor Northampton Spring Park	Annualisation Factor Site 3 Name	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Simple Annual Mean ($\mu\text{g}/\text{m}^3$)	Annualised Data Simple Annual Mean ($\mu\text{g}/\text{m}^3$)
WH27	0.8495	0.8654			0.8574	40.2	34.5
SCH12	0.9530	0.9749			0.9639	20.3	19.5
SCH16	0.9981	1.0180			1.0081	18.2	18.3

Table C.3 – Local Bias Adjustment Calculation

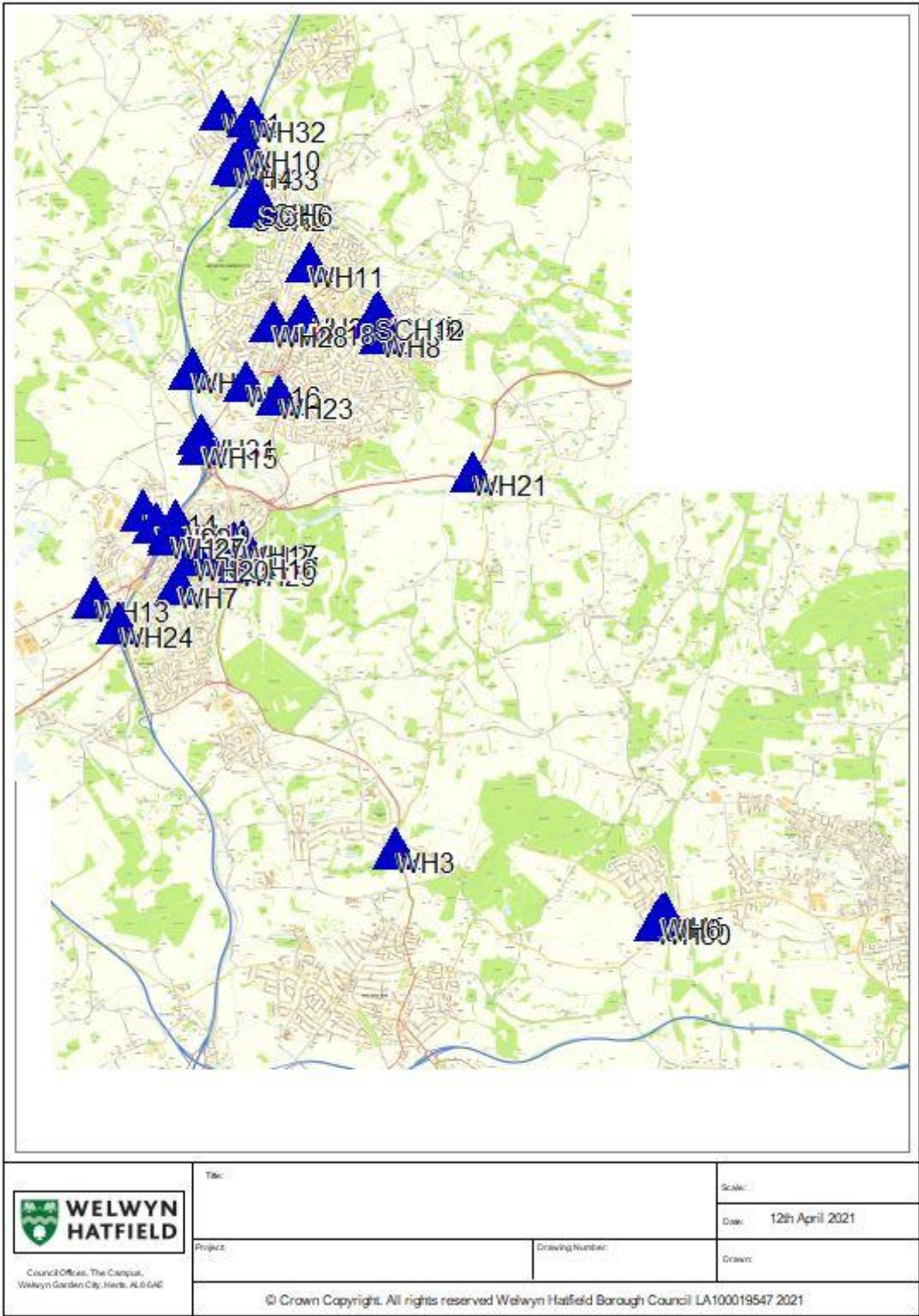
N/A

Table C.4 – NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³)

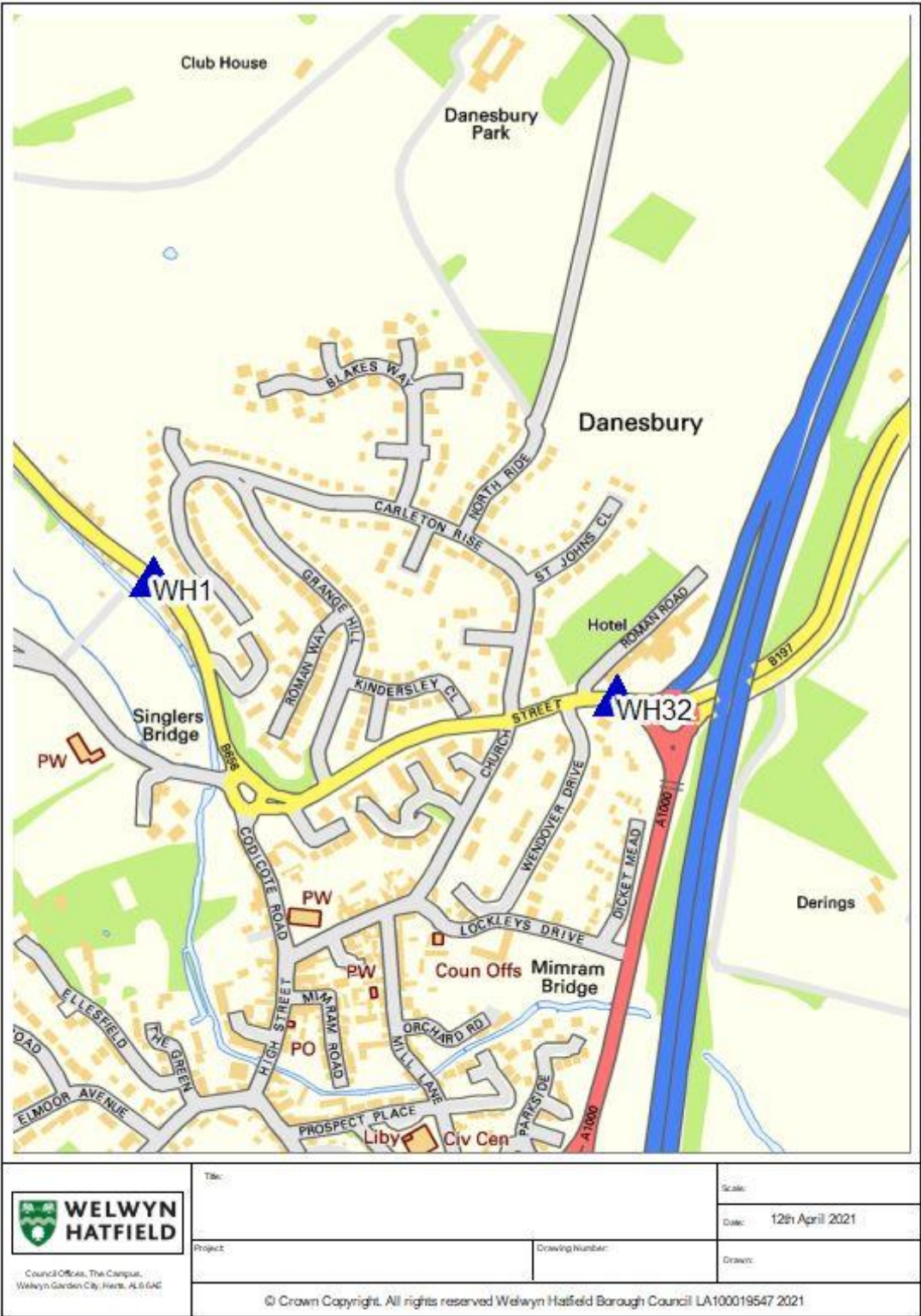
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Appendix D: Map(s) of Monitoring Locations and AQMAs

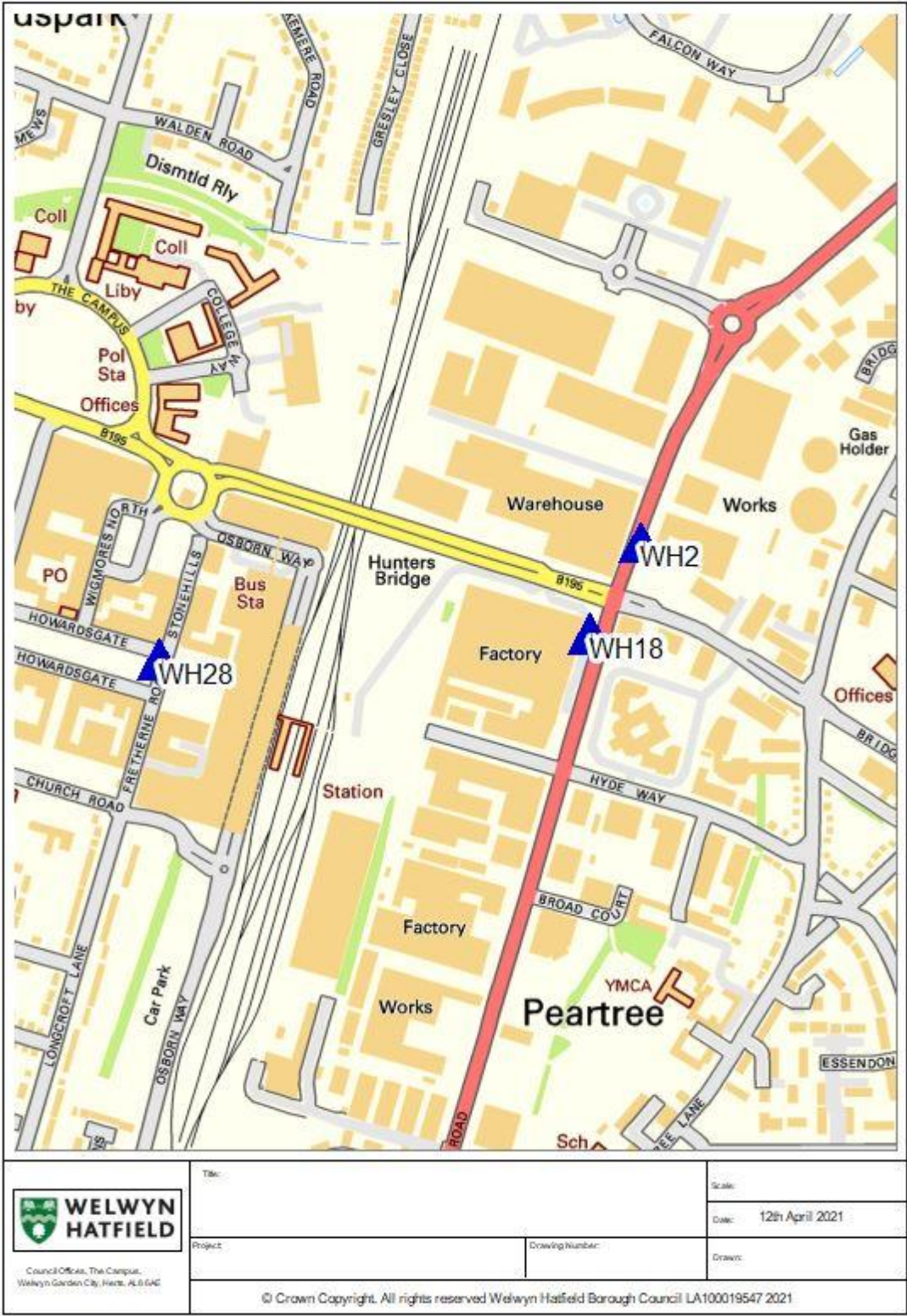
Whole district map



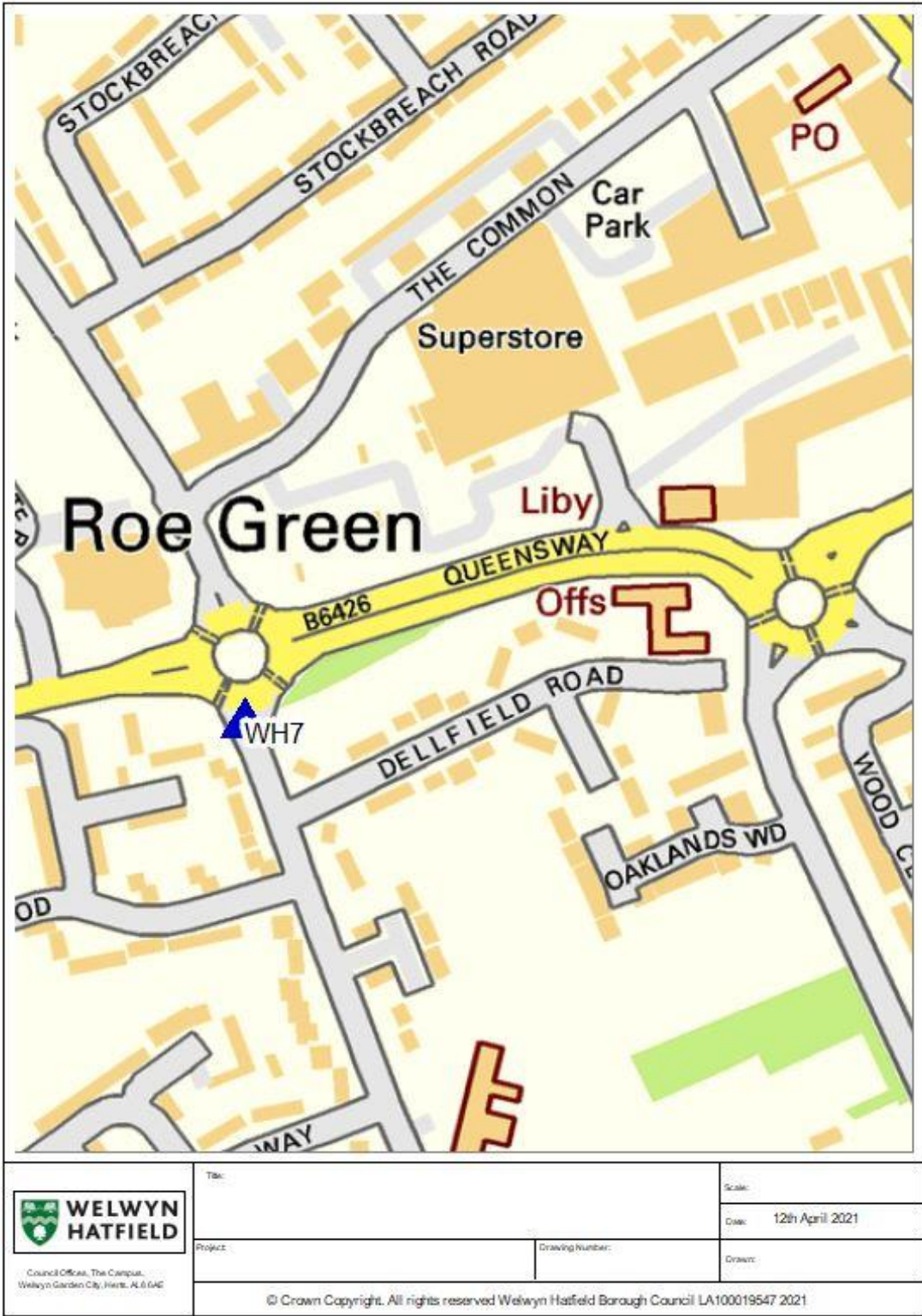
WH1, WH32 - Welwyn



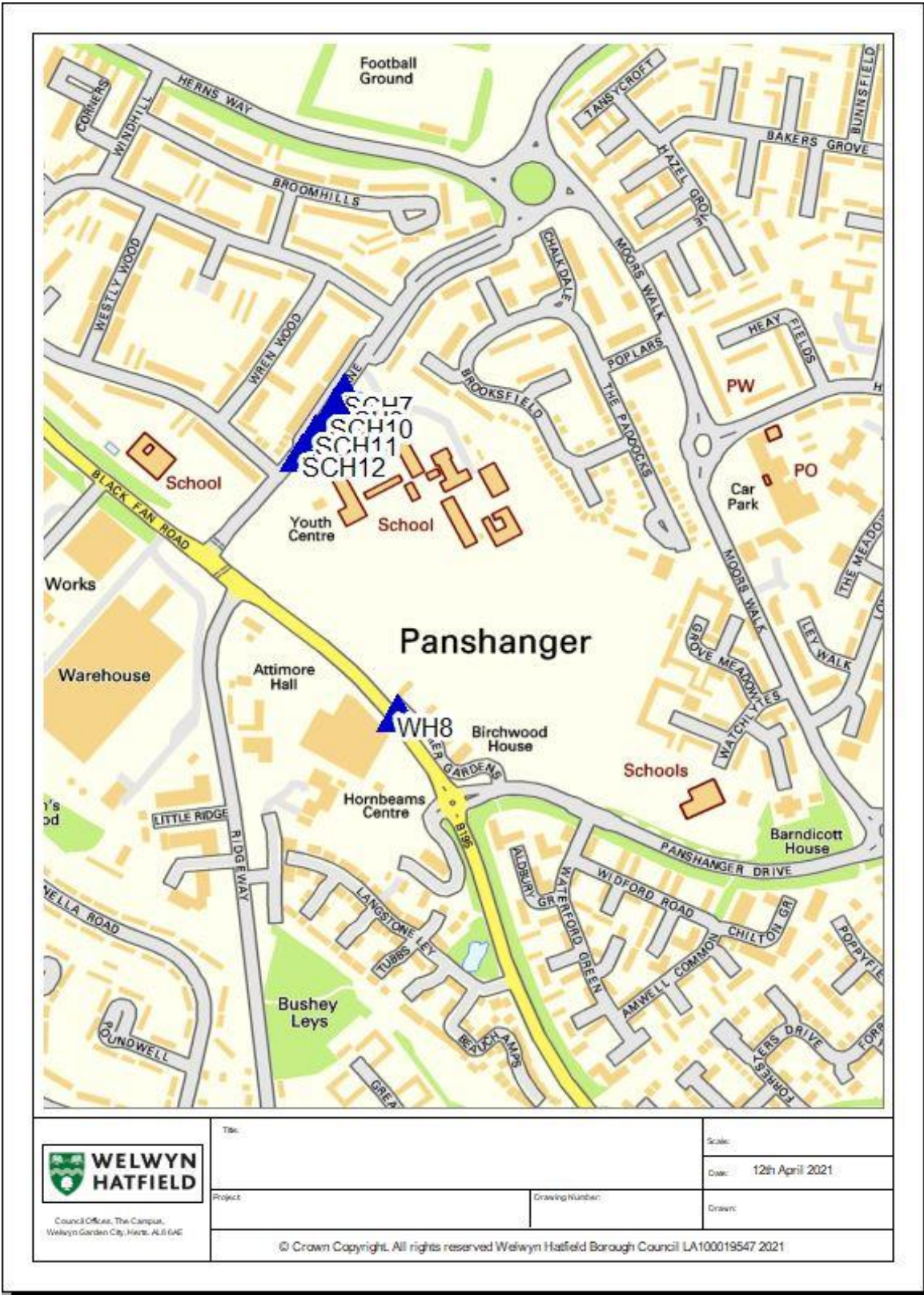
WH2, WH18 & WH28 – Welwyn Garden City



WH7 - Hatfield



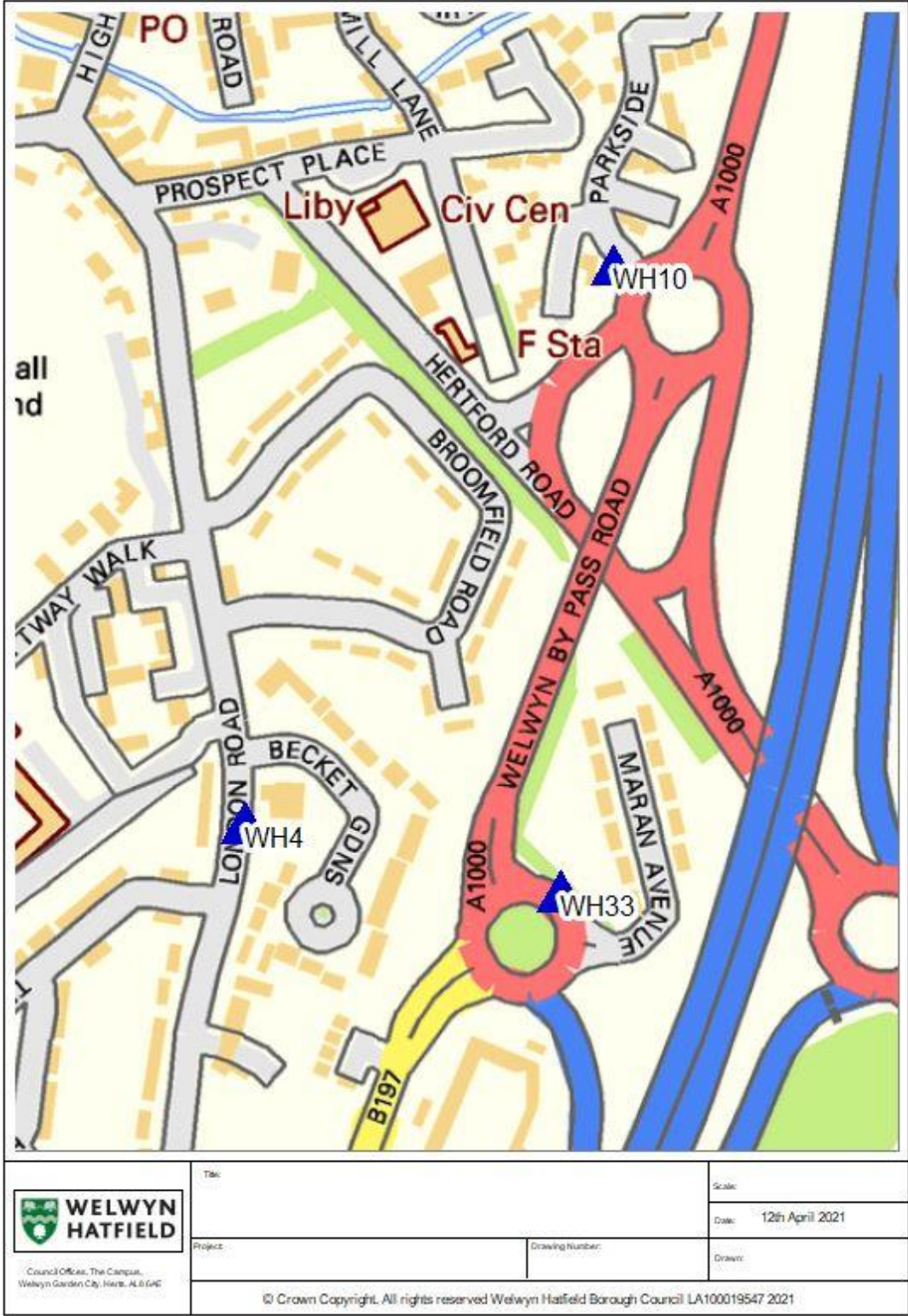
WH8 & Panshanger Academy School Project – Welwyn garden City



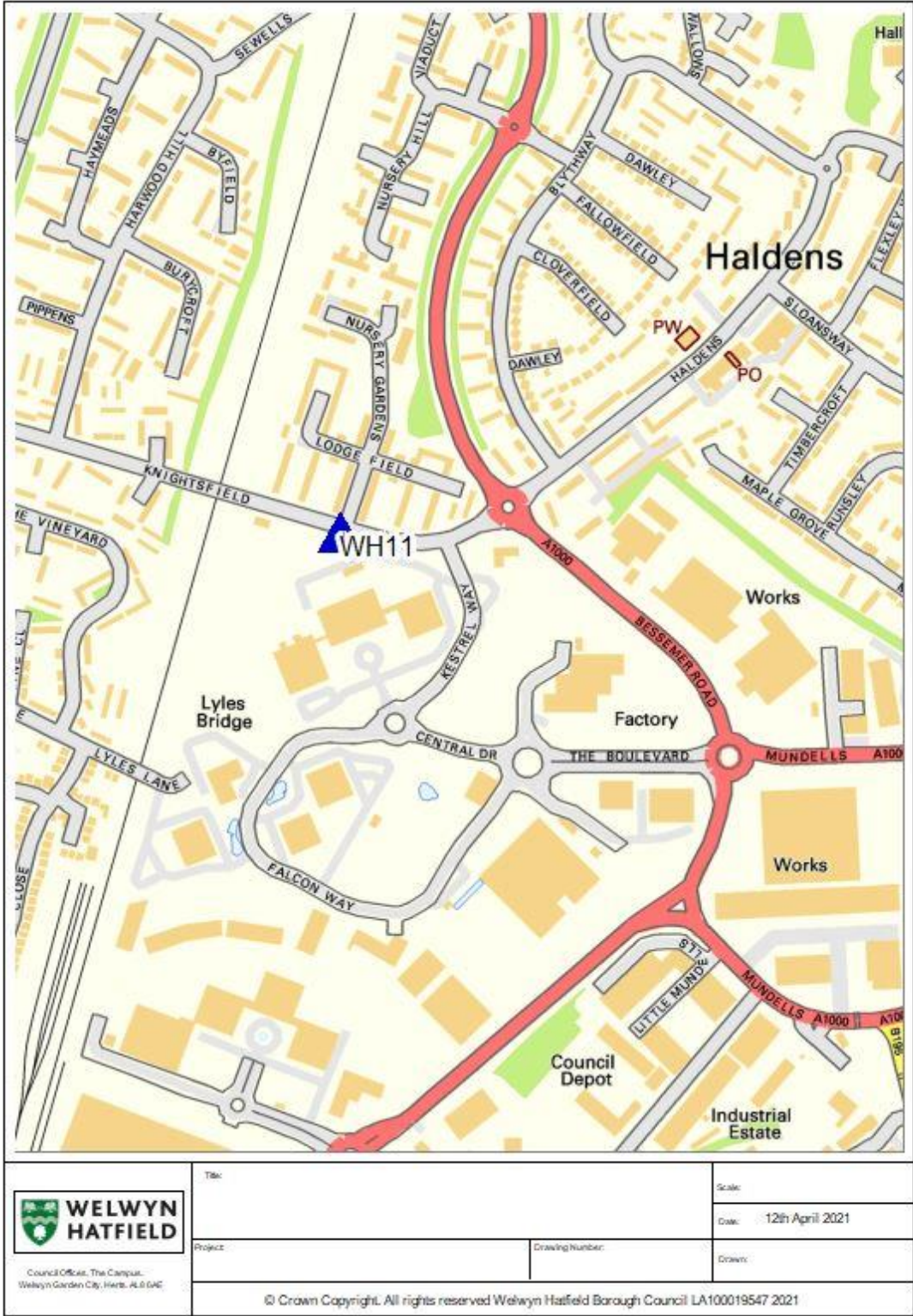
WH9 – Adjacent to A1M - Lemsford



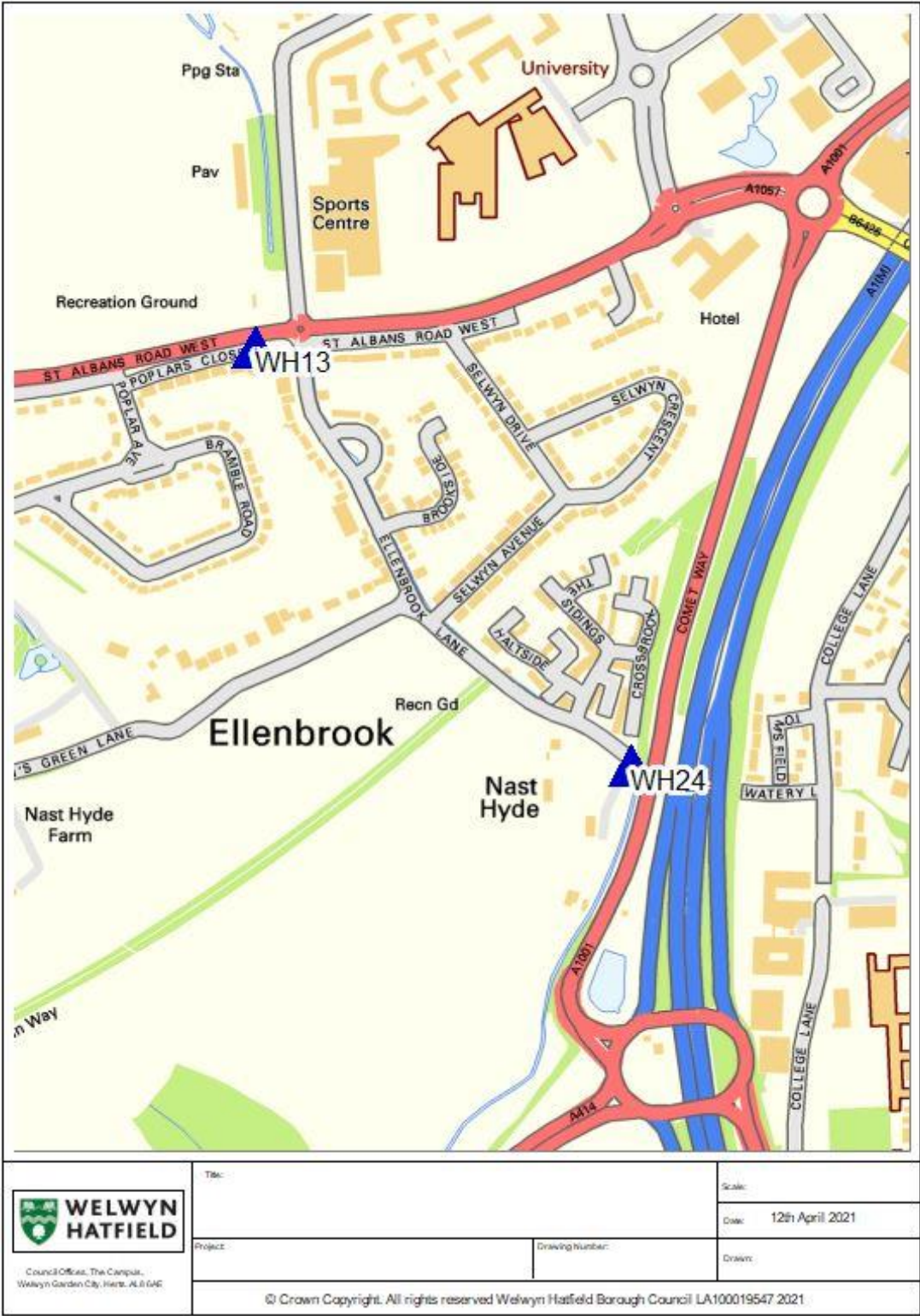
WH10, WH4 & WH33 - Welwyn



WH11 – Welwyn Garden City

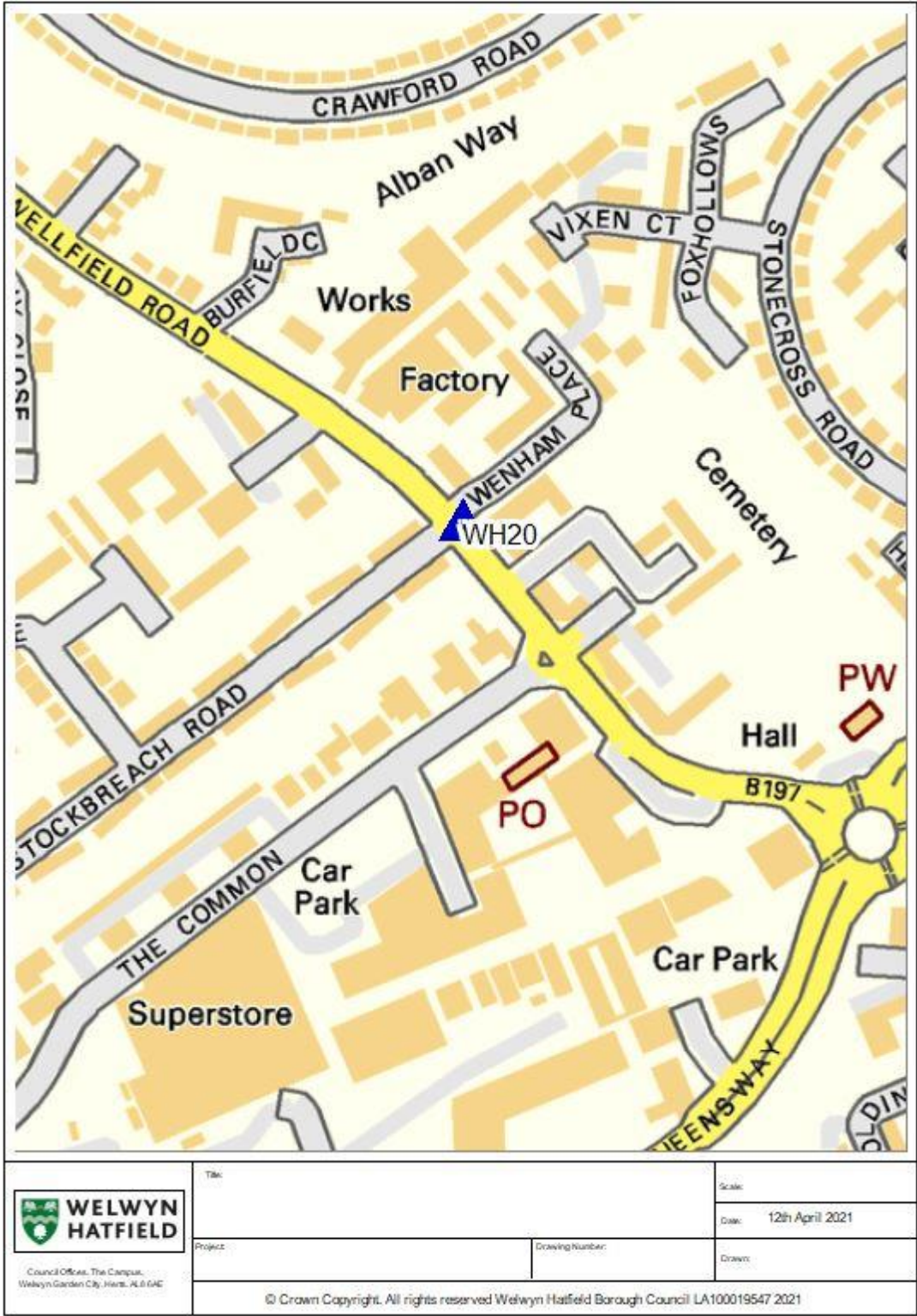


WH13, WH24 – Ellenbrook, Hatfield

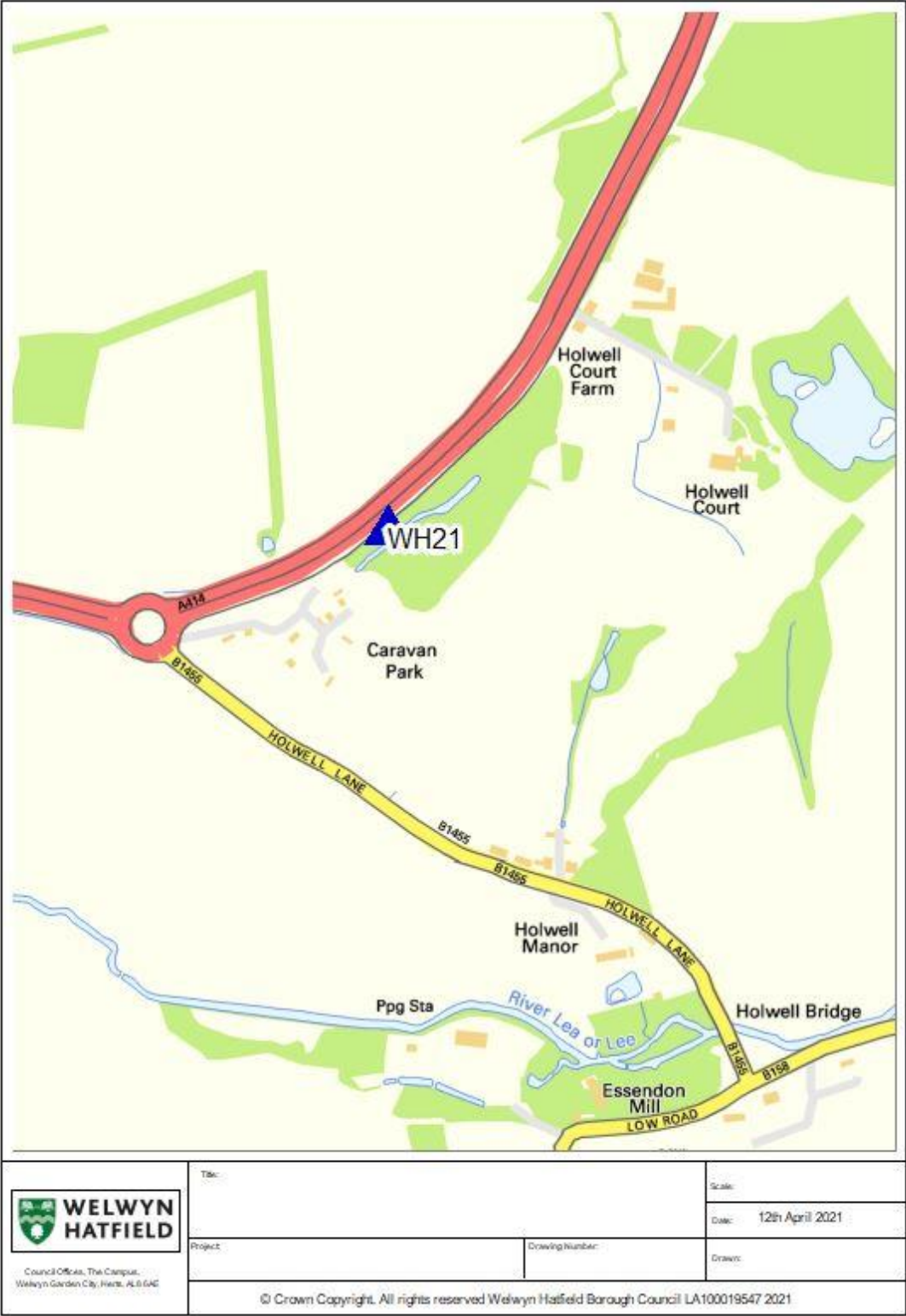




WH20 - Hatfield



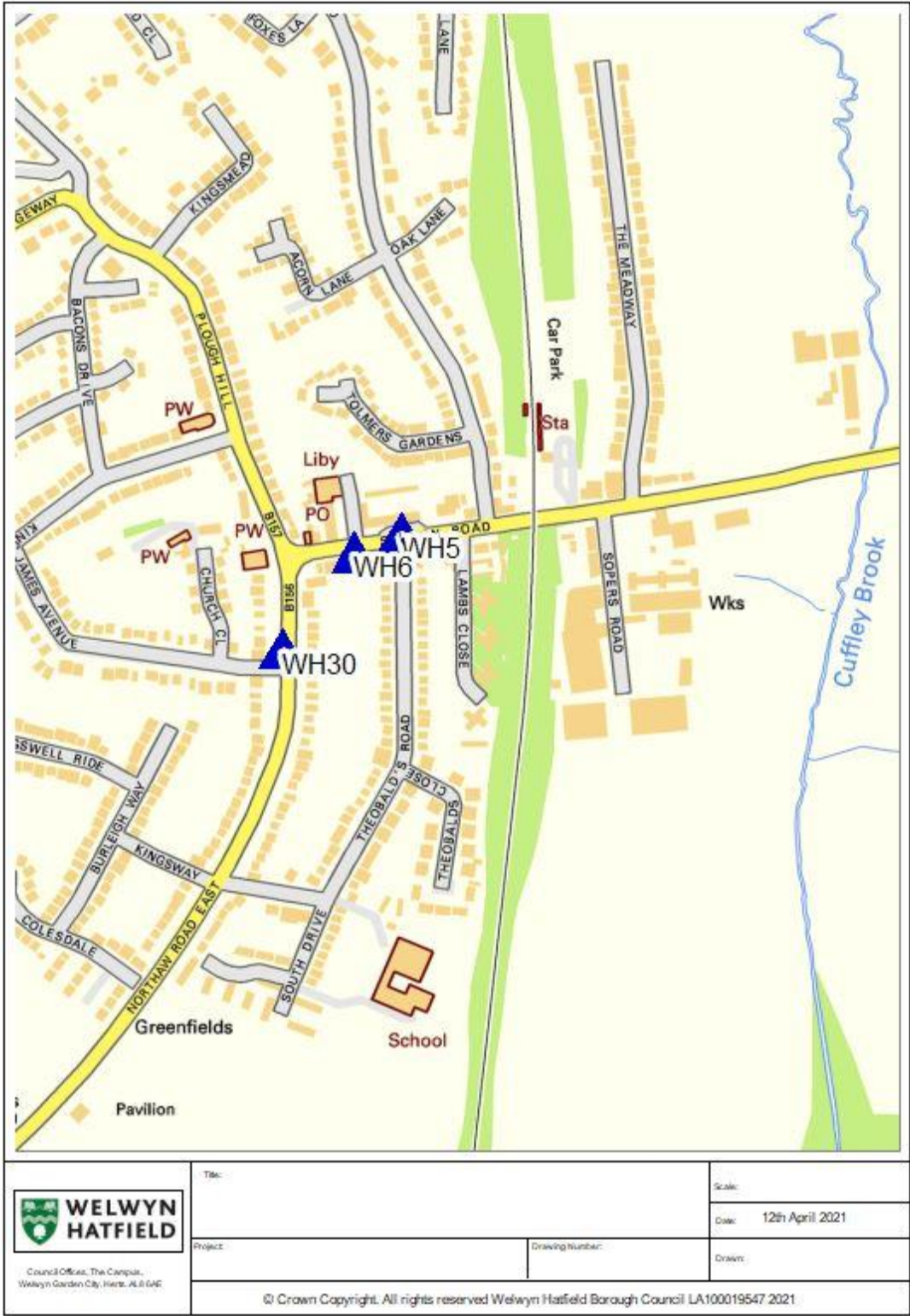
WH21 – A414, Essendon



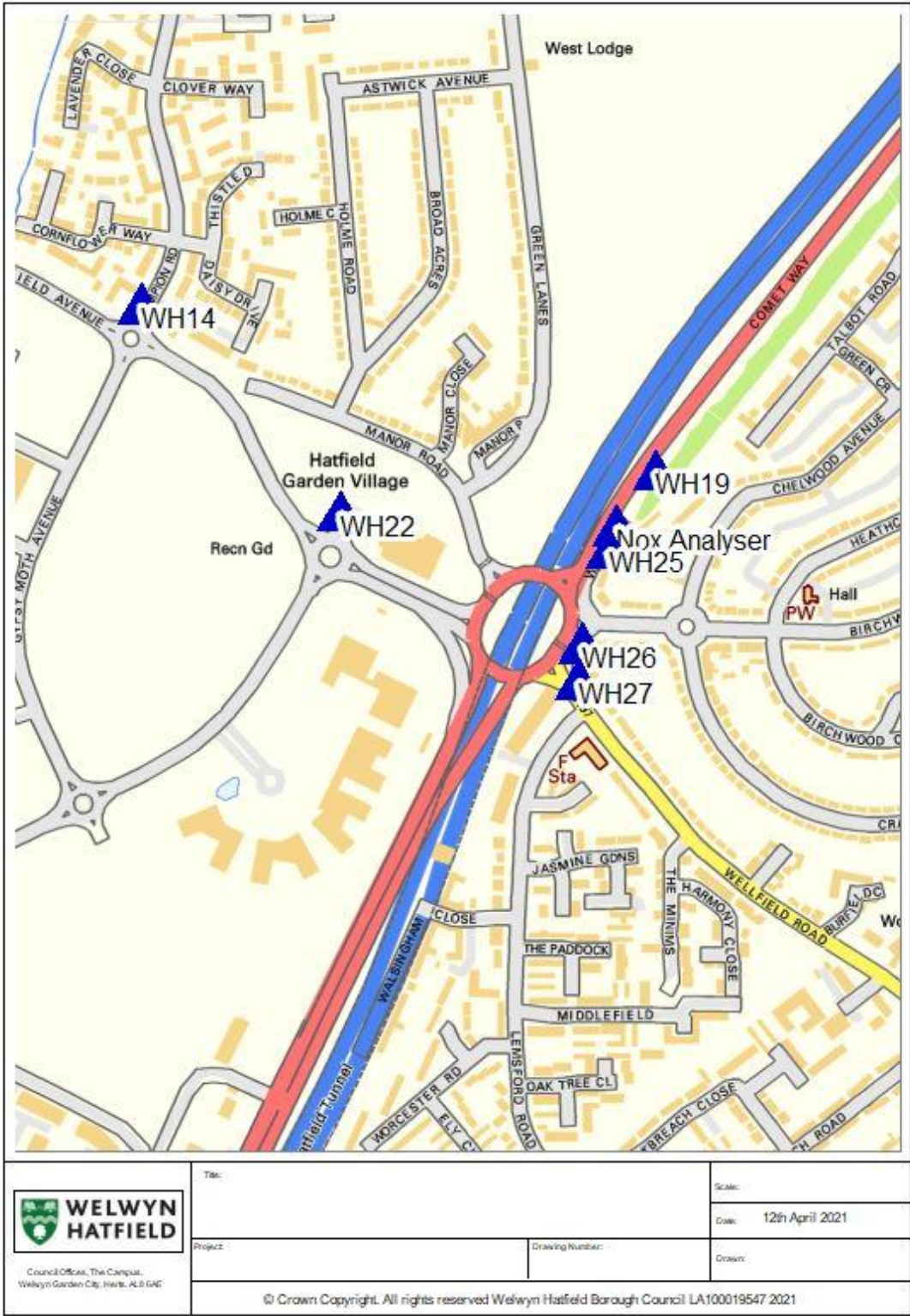
WH31, WH15 - Stanborough



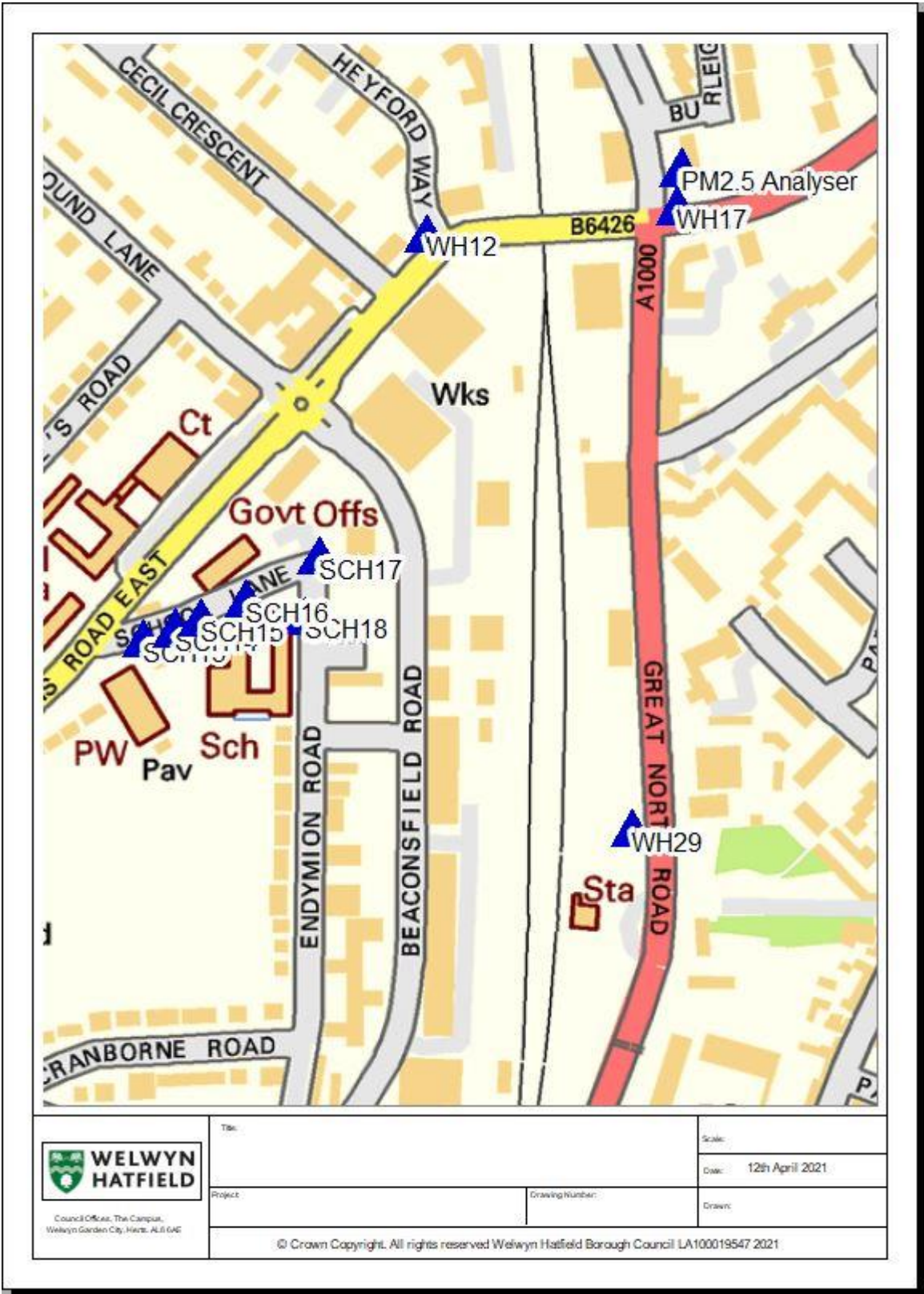
WH5, WH6 & WH30- Cuffley



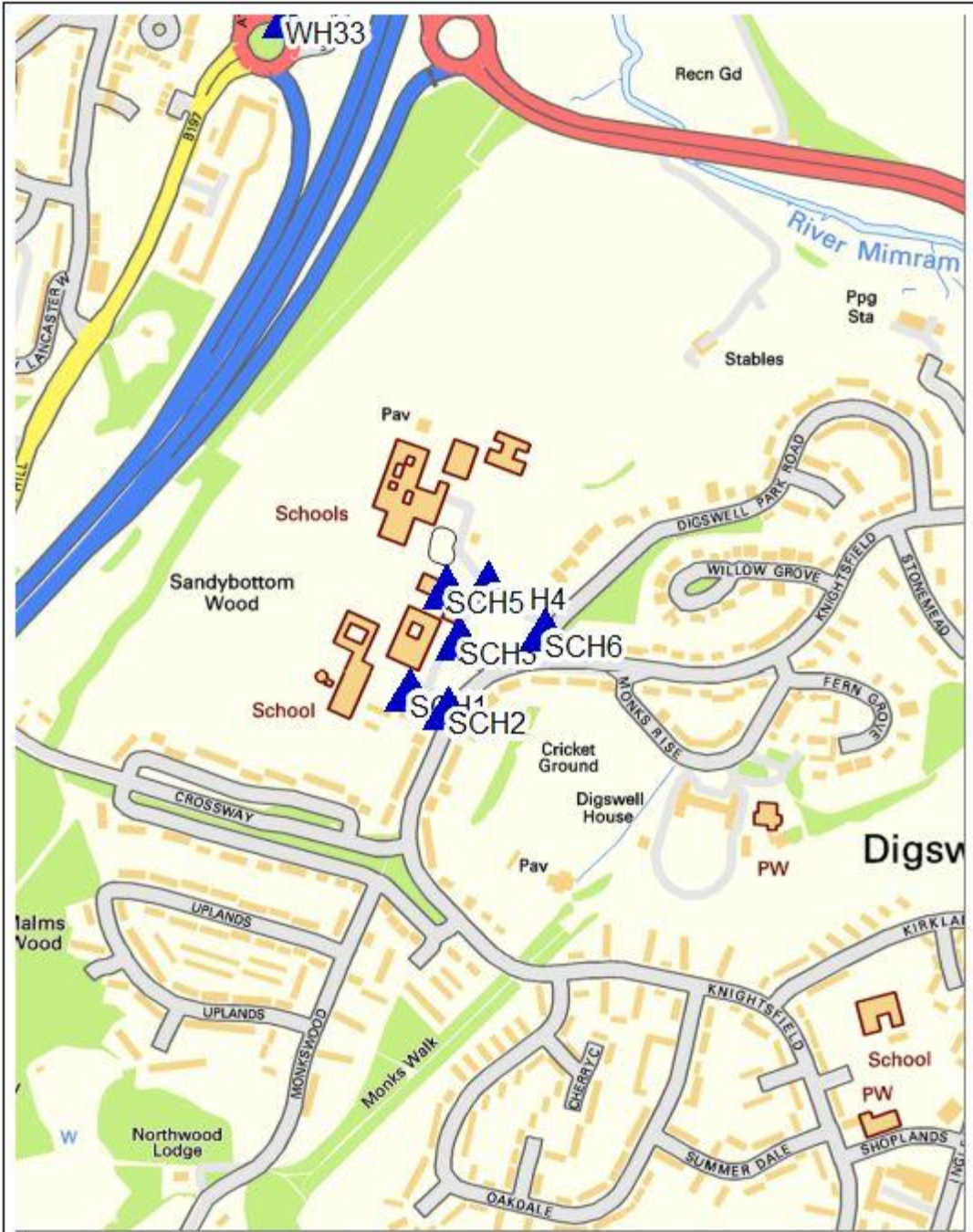
WH14, WH19, WH22, WH25, WH26, WH27 & Nox analyser – Hatfield Business Park



WH12, WH17, WH29, Countess Anne School Project & PM2.5 Analyser - Hatfield



Monks Walk School Project – Welwyn Garden City



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AG

Title:

Project:

Scale:

Date: 12th April 2021

Drawing Number:

Drawn:

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Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO ₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁷ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO₂) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data⁸ suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)⁹ has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean

⁸ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

⁹ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20 $\mu\text{g}/\text{m}^3$ if expressed relative to annual mean averages. During this period, changes in PM_{2.5} concentrations were less marked than those of NO₂. PM_{2.5} concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM_{2.5} concentrations during the initial lockdown period are of the order 2 to 5 $\mu\text{g}/\text{m}^3$ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Welwyn Hatfield Borough Council

The results from all air quality monitoring within the borough have reduced. A decision was taken to include air quality monitoring as an essential task, so monitoring continued throughout 2020. This has provided us with a very important baseline data set showing local pollution levels with significantly reduced traffic and congestion.

Opportunities Presented by COVID-19 upon LAQM within Welwyn Hatfield Borough Council

The key factor of the pandemic and pollution levels is the significant drop in road traffic. This has enabled us to obtain a better idea of local pollution levels with reduced traffic. It has also shown that it is possible for a lot of people to work from home, the IT infrastructure is capable, and this has resulted in people thinking differently. The new way of working is one of a hybrid setup, mixing office and home working. This means that traffic and congestion levels should not return to how they were. It is always a challenge to try and discourage people to use their cars and use greener modes of transport. Simply reducing the need for people to drive during rush hours times is very positive.

During the pandemic, the air quality schools project started. Prior to the pandemic I had arranged for diffusion tube monitoring to take place outside three schools within the borough. This was to obtain baseline data and use it to encourage parents to not drive to school and drop off and pick up their children. This is with a view to promote green travel,

walk or cycle to school. The supply for diffusion tubes had already been paid for so a decision was made to monitor at the school sites despite them being closed. This has turned out to be a positive move because this has provided important baseline data with the schools closed. This can be used for comparisons going forward to see the changes when children return to school full time.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Welwyn Hatfield Borough Council

The air quality monitoring program continued in 2020, staff were still able to distribute diffusion tubes. The introduction of the school air quality project in 2020 meant that an additional 18 diffusion tubes were added to the monitoring schedule. There were issues in using the electric vehicles due to infection control, so staff did use their own vehicles during this time.

In the main, the pandemic restricted air quality projects going ahead because the majority of these projects required site visits and presentations.

The team that are responsible for monitoring air quality were required to regulate and assist with COVID duties, such as track and trace, checking on isolation and assisting those who were isolating with specific care needs. This did have a significant impact on other work as the team had to prioritise work related to COVID.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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
ASR	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
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm 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

References

<https://laqm.defra.gov.uk/review-and-assessment/tools/tools.html>

Air quality data collection website:

https://www.airqualityengland.co.uk/local-authority/?la_id=408

Air quality alert scheme:

<https://www.airqualityengland.co.uk/local-authority/knr-subscriptionv>

Diffusion tube supplier and laboratory:

<https://www.socotec.co.uk/services/laboratory-and-analytical-services/>

Public health indicators:

<https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000006/ati/101/are/E07000241/iid/30101/age/230/sex/4>