Combined 2022 and 2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: March, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in East Hampshire District Council (EHDC)

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 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Air quality within the East Hampshire District is generally good. The latest monitoring data from 2021 and 2022 shows that compliance with the nitrogen dioxide (NO_2) air quality objectives has been achieved. The air quality objectives for all other pollutants are also likely to be achieved throughout East Hampshire. As a result of this, no need to declare an Air Quality Management Area (AQMA) has been identified for any pollutants within the district, instead the Council will work to produce a local Air Quality Strategy (AQS) to ensure that air quality stays good within the area and to enable quick responses to any deterioration in condition.

Despite compliance with the objective in 2021 and 2022, NO_2 (whose main source is road transportation) continues to be the only pollutant that has shown elevated concentrations in East Hampshire. Most notably around Bordon and Whitehill which the A325 passes through. As a result, emphasis has been placed on consideration of this pollutant within the main body of the ASR. The trend in annual mean NO_2 concentrations shows a general decrease up to 2020, there was a slight increase in overall NO_2 concentrations during both

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[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, January 2023

[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

2021 and 2022. This increase is likely due to a rebound in traffic after COVID-19 travel restrictions were released. NO_2 concentrations have not reached pre COVID-19 levels but the council will remain vigilant as traffic levels continue to increase post COVID-19 which could continue to negatively impact NO_2 concentration.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy[6] provides more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[7] details 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 of pollutants heavily influenced by transport emissions.

The Council continues to regularly review potential sources and to monitor air quality across the district for this purpose. EHDC declared a climate emergency in July 2019 and adopted a Climate and Environment Strategy in August 2020[8]. The main priorities of The Strategy are to achieve net-zero carbon emissions by 2050 and to protect and enhance the local environment. The objectives and initiatives set out to achieve these priorities are outlined in Figure 1-1.

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[5] Defra. Environmental Improvement Plan 2023, January 2023

[6] Defra. Air quality strategy: framework for local authority delivery, April 2023

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

[8] East Hampshire District Council. Climate and Environment Strategy 2020-2025, August 2020.

Figure 1-1: Climate Emergency Objectives and Initiatives
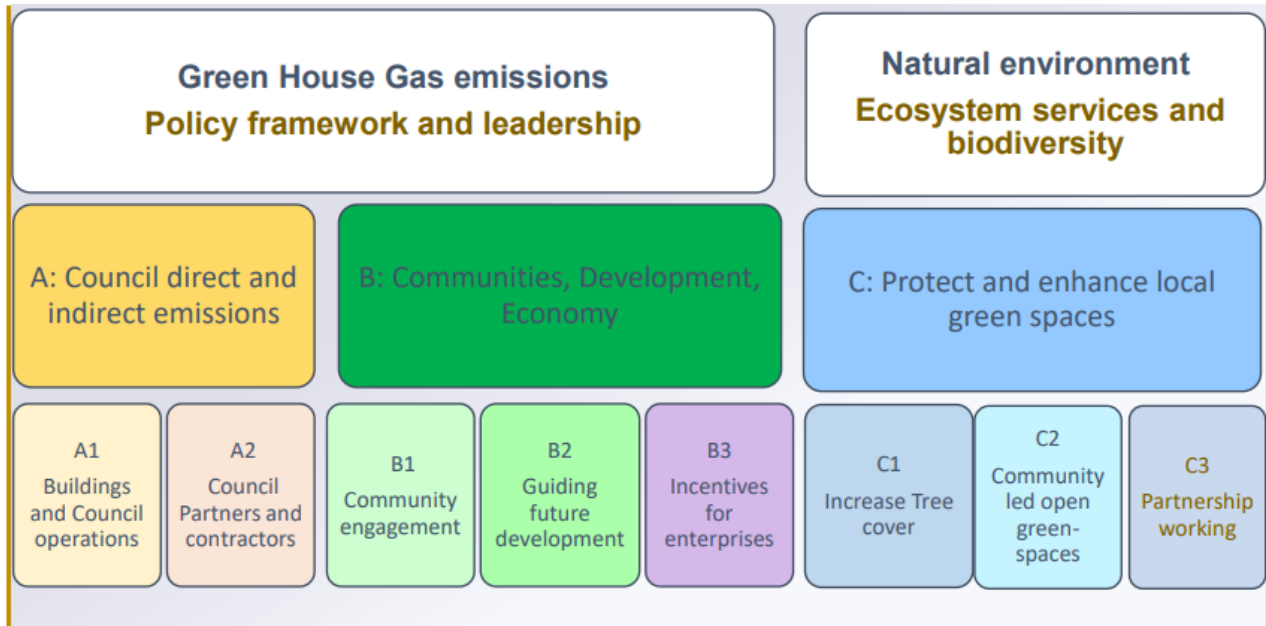
A number of projects listed within the strategy have been initiated which will have a direct benefit to air quality including:

- Harness new technology to embrace a hybrid work culture, reducing the need for road transportation;
- Ensure new developments meet or exceed the conditions and obligations set out within their planning permissions;
- Implementation of plans to support low-carbon transport alternatives including a Local Cycling and Walking Infrastructure Plan (LCWIP).
- Procurement of electric fleet vehicles;
- Installation of an electric vehicle charging network; and
- The Council working towards becoming a green energy supplier.

Complementing this work, the 'Vehicle Parking Standards' Supplementary Planning Document (SPD) was revised and adopted in July 2018 and encourages the provision of electric vehicle charge points in new developments in most parts of the Council area.

An additional project set out in collaboration with Hampshire County Council (HCC) is The Whitehill & Bordon Transportation Green Grid/Green Loop. This consists of implementation of a pedestrian and cycle network around the town to create easier access routes for non-motorised users and encourage sustainable travel by reducing reliance on cars.

Conclusions and Priorities

NO_2 is the primary pollutant of concern but does not exceed air quality objectives, therefore no AQMA is currently declared. Monitoring of NO_2 will continue to ensure this remains the case. Two new monitoring sites were installed in 2022 following concerns about the impact of new local developments in Alton increasing local traffic along Alton High Street however due to the low concentrations observed the sites were decommissioned in early 2023. No new or alternative locations require monitoring as there have been no changes to the monitored sources and previous monitoring data does not suggest the need for further monitoring.

The priorities for the coming year are described below.

- Production of a local AQS;
- Consolidation of Council offices to an environmentally friendly head office;
- The Whitehill & Bordon regeneration project remains a key corporate priority. The intention is to deliver some 3,500 new homes as well as take action to improve the existing housing stock. This project also includes continuing developments to the Whitehill & Bordon Transportation Green Grid/Green Loop; and
- Review of the Local Cycling & Walking Infrastructure Plan (LCWIP).

Local Engagement and How to get Involved

Road traffic gives rise to much of the air pollution in the East Hampshire district. There are a range of ways for people to get involved and help tackle this.

Businesses can:

- Subscribe to schemes such as Easit to obtain discount on travel and electric vehicles: https://www.easit.org.uk/.

Everyone can:

- Walk, cycle, car share or use public transport. For information about journey planning visit http://myjourneyhampshire.com/;
- Switch to low emission vehicles. Grants are still available: https://www.gov.uk/plug-in-car-van-grants/what-youll-get. Further information and advice on electric vehicles and charging locations is available here: https://www.zap-map.com/; and
- Insulate buildings and wherever possible use electric heating system or low NOx emitting boilers to reduce background pollution levels.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of EHDC with the support and agreement of the following officers and departments:

Catherine Rayner, Environmental Health Manager, Environmental Health

Pennie Brown, Strategy Manager – Sustainable Growth, Regeneration and Prosperity Directorate

This ASR has been approved by:

Sam Ings, Environment & Neighbourhoods Lead

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Catherine Rayner at:

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Tables

1 Local Air Quality Management

This report provides an overview of air quality in EHDC during 2021 and 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents[9] [10].

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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by EHDC 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 in Appendix E.

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[9] Defra. Local Air Quality Management Technical Guidance LAQM.TG22, August 2022

[10] Defra. Local Air Quality Management Policy Guidance LAQM.PG22. August 2022

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 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

EHDC currently does not have any declared AQMAs. The council currently do not have a Local Air Quality Strategy (AQS) and measures to prevent and reduce polluting activities are set out within the Climate and Environment Strategy 2020-2025[11] and the councils Joint Core Strategy published in June 2014[12], available at: Adopted local plan | East Hampshire District Council (easthants.gov.uk). Concentrations of NO_2 at all sites have remained well below the relevant threshold at all locations during 2021 and 2022, as such, EHDC need not consider declaring any AQMAs at this stage.

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[11] East Hampshire District Council. Climate and Environment Strategy 2020-2025, August 2020.

[12] East Hampshire District Council. Joint Core Strategy, June 2014

Progress and Impact of Measures to address Air Quality in EHDC

EHDC has taken forward a number of direct measures during the current reporting year of 2021 and 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Twenty measures are included within Table 2.1, with the type of measure and the progress EHDC have made during the reporting year of 2021 and 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1. More detail on these measures can be found within the Climate and Environment Strategy and the Joint Core Strategy. EHDC have worked to implement these measures in partnership with neighbouring authorities such as HCC during 2021 and 2022.

EHDC expects the following measures to be completed over the course of the next reporting year: revision of the Climate and Environment Strategy, review of the LCWIP, and implementation of a bike hire scheme for the Green Loop Project. EHDC's additional priorities for the coming year are to produce an AQS and finish moving to an environmentally friendly head office, as well as continue with the developments to the Whitehill & Bordon Transportation Green Grid/Green Loop.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
3	Modeshift STARS	Promoting Travel Alternatives	School Travel Plans	2017	-	Hampshire County Council & East Hampshire District Council	Hampshire County Council & East Hampshire District Council	NO	Funded	-	Implementation	Not calculated	Number of schools participating. Number of schools achieving an award.	Scheme recommenced following the pandemic and in 2022/23 8 schools in East Hampshire have been STARS accredited.	Further information is available on https://myjourneyhampshire.com/
4	Park and Stride	Traffic Management	Other	2016	-	East Hampshire District Council	East Hampshire District Council	NO	Funded	-	Implementation	Not calculated	-	Advertised on web and scheme in place. School drop off to nearby car parks and then families walk remainder of journey to school reducing congestion.	Scheme is ongoing.
5	Work travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2011	-	Hampshire County Council	0	NO	-	-	Implementation	Not calculated	-	Information published on internet and support available	Sustrans provide implementation for Hampshire County Council. Scheme is ongoing.
7	Super Fast High Speed Broadband Project	Promoting Travel Alternatives	Encourage / Facilitate home-working	2013	2023	Hampshire County Council	Hampshire County Council, DCMS, local authorities	NO	Funded	-	Completed	Not calculated	-	Phase 1 (94% coverage) was completed July 2018. By the end of project in 2023 coverage was 97.8% across Hampshire with an increase from 63% in 2013 to 96.5% in 2023 in East Hampshire by the end of 2023.	Objective 11, Hants Transport Plan 2011-2031

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
8	"My Journey - Helping Hampshire Getting Around" Travel Awareness Campaign	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2011	-	Hampshire County Council	Hampshire County Council	NO	Funded	-	Implementation	Not calculated	-	Website established and published. Includes details of travel planning and car sharing.	Infrastructure is ongoing.
9	Bikeability training	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2011	-	Hampshire County Council	Hampshire County Council	NO	Funded	-	Implementation	Not calculated	-	Advertised on web and scheme in place	Scheme is ongoing.
10	Licensing requirement for taxis	Promoting Low Emission Transport	Taxi Licensing conditions	2016	-	East Hampshire District Council	-	NO	-	-	Implementation	Not calculated	-	Vehicles over six years old are required mechanical vehicle test (MOT) every six months.	Current vehicle standards policy has been in place since 2015, and requirements are ongoing.
11	Hampshire Local Transport Plan	Transport Planning and Infrastructure	Other	2011	-	Hampshire County Council	Hampshire County Council	NO	-	-	Planning	-	TBC	HCC have prepared draft Local Transport Plan 4 (LTP4) to replace outdated LTP3 (2011) which seeks to build on improvements previous achieved such as improvements in older bus fleets. The plan is at the beginning of it's implementation with visions set out for Hampshire 2050. This includes outcomes associated with improving poor AQ and protecting the environment.	High level detail on how HCC will be working to protect AQ is set out in Core Policy 8 of draft LTP4.
12	Active travel scheme - Green Loop Wayfinding project	Promoting Low Emission Transport	Other	2019	2025	EHDC, HCC, WHRC	EM3 LEP funding	NO	Part funded	£1 - 3M	Implementation	Not calculated	Completion of cycling infrastructure	Multiple stages complete and project on time to meet projected	-

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
														completion in 2025.	
13	Revised EV strategy	Promoting Low Emission Transport	Other	2024	2024	EHDC	Strategy Funded	NO	Funded	£5k	Strategy Development	Not calculated	Strategy Agreed, EVCP implemented	Strategy to be developed Spring 2024	Resource and Procurement process to enter framework for delivery
14	Revised Climate & Environment Strategy	Strategy	-	2024	2024	EHDC	Council Funding	No	2024/25 funded	150000	Strategy Development	Not calculated	Strategy Adopted	March 2024 due for decision	Resource
15	Green Loop bike hire scheme	Promoting Travel Alternatives	Promotion of cycling	2024	2024	EHDC	Council Funding	No	Funded	£10k - 50k	Implementation	Not calculated	Scheme adopted and take up of cycle hire	Contracts being signed	Local take up cycle hire
16	Review of the Local cycling & walking infra structure plan (LCWIP)	Promoting Travel Alternatives	Other	2024	2025	EHDC, HCC	TBC	NO	Not Funded	£10k - 50k	Planning	Not calculated	LCWIP adopted	LCWIP prioritisation being carried out by HCC	HCC resource
17	Move to new EHDC offices - new travel plan	Promoting Travel Alternatives	Workplace Travel Planning	2024	2024	EHDC	Council Funding	NO	Partially Funded	< £10k	Planning	Not calculated	change in travel behaviours	Staff survey carried out	New office location, move planned January 2024
18	New 'Work styles 'policy introduced	Other	Other	2024	2024	EHDC	Council Funding	NO	Partially Funded	< £10k	Planning	Not calculated	change in travel behaviours	Staff survey carried out	Facilitated hybrid working, reducing home to work travel
19	Demand responsive transport being investigated for Whitehill & Bordon	Promoting Travel Alternatives	Other	2024	2025	EHDC, HCC, WHRC	TBC	NO	Not Funded	£100k - £500k	Planning	Not calculated	Increase use of public transport	Planning with partners	HCC funding. Lack of engagement/buy in from HCC
20	Revision of Hackney Carriage & Private Hire Vehicle policy	Other	Other	2024	2025	EHDC	EHDC	NO	Not Funded	-	Planning	-	Completion of policy.	At start of revision process.	Policy to be revised, to include environmental considerations in relation to HC & PHV.

PM$_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

The Public Health Outcomes Framework (PHOF) has published statistics on the health effects of exposure of the public to fine particulate pollution[13]. EHDC notes PHOF indicator DO1 – Fraction of mortality attributable to particulate (PM$_{2.5}$) air pollution in 2021 (latest available) gives a value of 5.3% which is slightly below the average for both the South East region (5.4%) and England (5.5%)

It is expected that the measures in Table 2.1 will help directly reduce PM$_{2.5}$ levels within the district. In addition to this EHDC is taking the following measures in relation to PM$_{2.5}$:

- EHDC are continuing to enforce legislation that can have an impact on air quality such as responding to complaints about domestic bonfires and smoke. More information can be found our website: https://www.easthants.gov.uk/environmental-health/nuisance-complaints

- All significant developments are required to produce Construction Environmental Management Plans prior to demolition or construction works commencing, this details measures to minimise fugitive dust emissions and minimise the deposition of dust on the public highway.

- The Pollution Team regulates certain industrial installations under the Environmental Permitting Regulations, including concrete crushers, and cement batching processes, which have the potential to emit significant levels of particulates into the air. EHDC will continue to work with these businesses to ensure fugitive dust emission from these industrial sites are kept to a minimum.

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[13]Public Health Outcomes Framework. D01 – Fraction of mortality attributable to particular air pollution. Available At: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/gid/1000043/pat/6/ati/401/are/E07000214/iid/30101/age/230/sex/4/cid/4/tbm/1/page-options/ovw-do-0_car-do-0

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

This section sets out the monitoring undertaken within 2021 and 2022 by EHDC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

EHDC did not undertake any automatic (continuous) monitoring in 2021 and 2022.

3.1.2 Non-Automatic Monitoring Sites

EHDC undertook non- automatic (i.e. passive) monitoring of NO_2 at 11 sites during 2021 and introduced 2 new monitoring sites AR1 and AR2 for a total of 13 monitoring sites during 2022. These sites were temporarily introduced in response to public and councillors concern regarding increased traffic along Alton High Street in relation to new local developments, they have since been decommissioned as of early 2023. Two sites were decommissioned in early 2021, Site BR1 and Site BR7/BR8 (duplicate location), due to consistently reporting NO_2 concentrations well below the Air Quality Objective. This is in part due to the opening of the A325 relief road in 2019, reducing traffic along the A325 where these diffusion tubes were located. Table A.1 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 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO$_2$ annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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). Annual means have not been reported for AR1 and AR2 as they do not have sufficient data capture to undergo annualisation.

For diffusion tubes, the full 2021 and 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 and Table B.2 includes distance corrected values, only where relevant. It is not considered necessary to undertake this adjustment where concentrations are already below 36 µg/m^3, as per LAQM.TG22 guidance, thus no distance correction has been applied to any of the monitored sites.

There were no exceedances of the annual mean NO$_2$ objective at any monitoring location within East Hampshire during 2021 or 2022. The highest annual mean NO$_2$ concentration was recorded at monitoring location BR4 in 2022, measuring 26.4 µg/m^3. BR4 was also the site of the maximum recorded concentration in 2021 of 25.6 µg/m^3.

Figures A.1 and A.2 present the trends in annual mean NO$_2$ concentrations as East Hampshire monitoring locations since 2018. Sites AR1 and AR2 have been exlcuded from these figures as they have not been monitoring long enough to present a trend. The majority of monitoring locations show an overall decreasing trend in annual mean NO$_2$ concentrations until 2020, after which the annual NO$_2$ concentration generally increases, likely due to rebound in traffic from COVID-19. The annual NO$_2$ concentrations are not at the level of pre COVID-19 concentrations but the council will remain vigillant as traffic levels may continue to increase post COVID-19 which could negatively impact NO$_2$ concentrations.

As none of the diffusion tube sites recorded annual mean NO$_2$ concentrations greater than 60 µg/m^3, it is unlikely that the 1-hour mean NO$_2$ objective was exceeded at any of these locations in 2021 and 2022, which is consistent with previous years' results.

Appendix A: Monitoring Results

Table A.1 – 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)
AB1	Alton. Orchard House	Background	472109	139487	NO$_2$	No	0.0	N/A	No	3.0
BR4	Bordon. Corals, Chalet Hill	Roadside	479666	135345	NO$_2$	No	0.0	2.9	No	2.6
BR2	Bordon. Chalet Court	Roadside	479695	135356	NO$_2$	No	2.0	3.0	No	1.5
BR5	Bordon. High Street	Roadside	479654	135312	NO$_2$	No	2.0	1.9	No	2.3
BU1	Bordon. 18 Bassenthwaite	Background	479795	136267	NO$_2$	No	0.0	N/A	No	1.7
WR1	Whitehill. Petersfield Road	Roadside	479314	134307	NO$_2$	No	2.3	1.0	No	2.0
PB1	Petersfield. Town Hall	Background	474989	123241	NO$_2$	No	0.7	N/A	No	2.0
HR1	Horndean. London Road	Roadside	470554	113582	NO$_2$	No	0.0	2.0	No	2.6
HR7	Horndean - Gales Brewery	Roadside	470665	113259	NO$_2$	No	18.0	2.3	No	2.5
FR1	Four Marks Telegraph Lane	Roadside	467554	135462	NO$_2$	No	22.0	1.5	No	2.5
FR2	Four Marks Lymington Bottom	Roadside	466586	134855	NO$_2$	No	25.0	1.6	No	2.5
AR1	Alton. Peacocks. High Street.	Roadside	471819	139442	NO$_2$	No	3.3	0.5	No	3
AR2	Alton, Alton Infant School	Roadside	472120	139754	NO$_2$	No	5.7	1.8	No	3

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 – Annual Mean NO$_2$ Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period in 2021 (%) [1]	Valid Data Capture for Monitoring Period in 2022 (%) [1]	Valid Data Capture 2021 (%) [2]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
AB1	472109	139487	Background	100.0	92.3	100.0	92.3	11.8	11.4	8.5	9.8	10.7
BR4	479666	135345	Roadside	92.3	100.0	92.3	100.0	37.9	31.7	23.5	25.6	26.4
BR2	479695	135356	Roadside	100.0	92.3	100.0	92.3	21.5	20.3	14.9	16.0	15.8
BR5	479654	135312	Roadside	100.0	82.7	100.0	82.7	35.4	31.1	22.0	24.8	25.0
BU1	479795	136267	Background	92.3	92.3	92.3	92.3	10.3	10.2	7.8	8.6	9.2
WR1	479314	134307	Roadside	100.0	90.4	100.0	90.4	31.8	28.3	20.5	21.9	22.6
PB1	474989	123241	Background	90.4	100.0	100.0	100.0	13.8	12.9	8.7	10.1	10.0
HR1	470554	113582	Roadside	73.1	100.0	73.1	100.0	33.8	32.9	23.3	24.4	23.1
HR7	470665	113259	Roadside	100.0	100.0	100.0	100.0	30.3	30.5	20.4	23.1	24.2
FR1	467554	135462	Roadside	92.3	40.4	92.3	40.4	-	-	10.3	11.1	11.5
FR2	466586	134855	Roadside	73.1	55.8	80.8	55.8	-	-	8.8	10.7	12.7
AR1	471819	139442	Roadside	-	100	-	17.3	-	-	-	-	-
AR2	472120	139754	Roadside	-	100	-	17.3	-	-	-	-	-

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

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

☒ **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**

Notes:

The annual mean concentrations are presented as µg/m^3.

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 **<u>bold and underlined</u>**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations at Alton and Burdon Sites
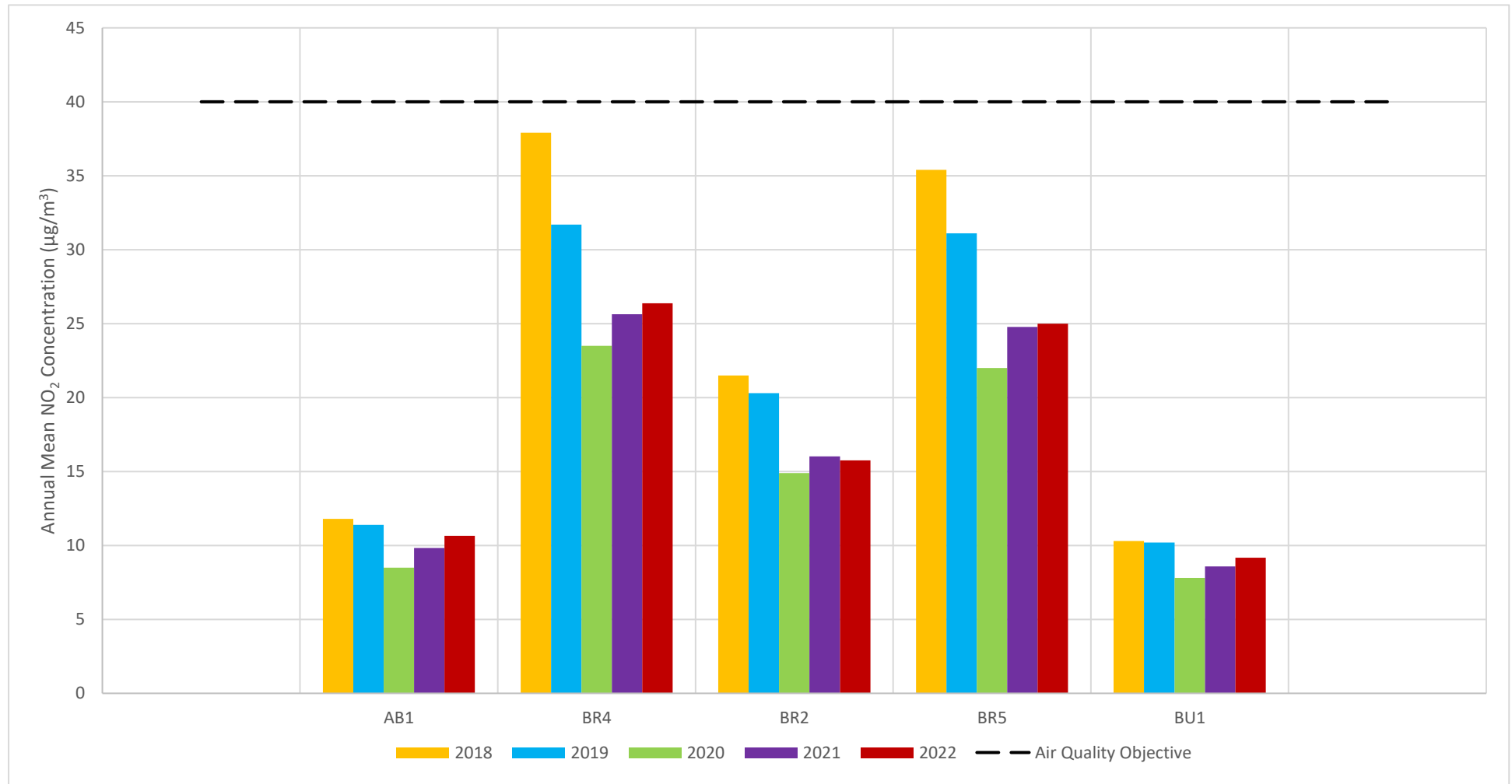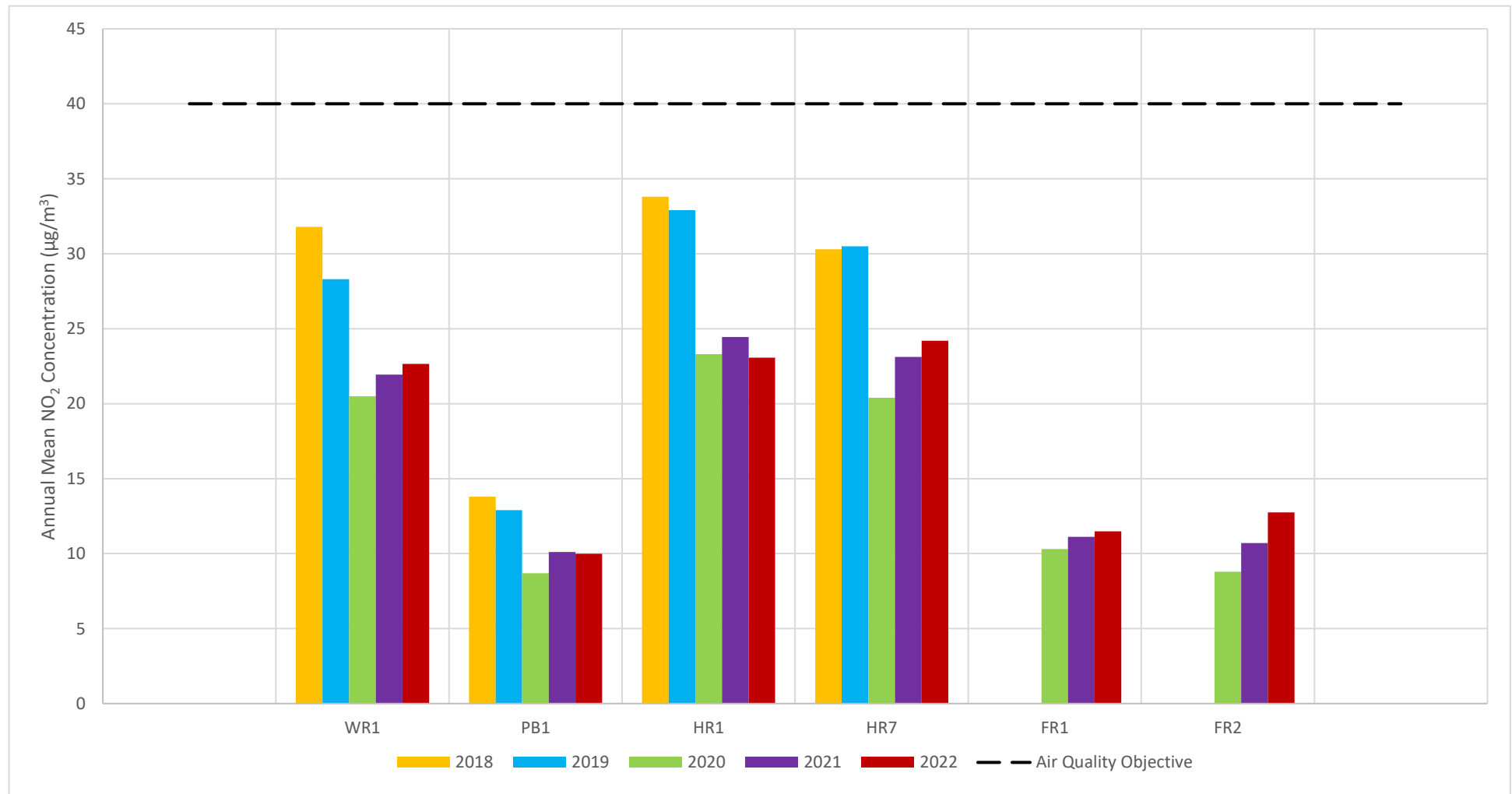
Figure A.2 – Trends in Annual Mean NO₂ Concentrations at Other Sites

Note: Sites have AR1 and AR2 have been excluded due to insufficient data required to show a trend.

Appendix B: Full Monthly Diffusion Tube Results

Table B.1 – NO₂ 2021 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
AB1	472109	139487	14.5	13.0	14.6	12.2	8.9	8.7	8.2	7.3	11.0	14.1	16.8	14.5	12.0	9.8		
BR4	479666	135345	36.9	26.7	33.5	28.8	30.0	31.5	24.4		29.1	36.6	36.1	30.3	31.3	25.6		
BR2	479695	135356	22.1	19.9	21.1	18.4	16.7	18.1	17.0	15.9	19.9	20.8	24.5	20.1	19.5	16.0		
BR5	479654	135312	32.0	35.0	31.5	31.8	27.9	28.5	27.1	25.5	30.7	31.3	35.5	25.7	30.2	24.8		
BU1	479795	136267	12.8	15.0	13.3	10.9	8.3	7.3	7.6	7.1	9.7	10.6		12.4	10.5	8.6		
WR1	479314	134307	29.3	27.4	31.5	28.7	24.0	26.2	22.7	22.0	25.0	28.8	31.5	23.8	26.7	21.9		
PB1	474989	123241	15.2	15.3	14.6	11.5	8.5	10.3		8.7	11.3	11.2	15.5	13.5	12.3	10.1		
HR1	470554	113582	ns	33.3	33.7	29.2	25.7	26.8		23.2	28.7		37.1	30.6	29.8	24.4		
HR7	470665	113259	33.3	32.8	32.4	28.9	24.5	26.6	23.8	18.3	29.6	31.0	31.8	25.5	28.2	23.1		
FR1	467554	135462	13.1	16.9	13.7	16.9	10.9		11.7	10.2	12.1	12.9	17.9	12.7	13.6	11.1		
FR2	466586	134855	15.2	14.5	16.1	12.8	12.2	13.1	5.7	8.2			19.4		13.0	10.7		

☒ **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 >25% in line with LAQM.TG22**

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

☒ **East Hampshire District Council confirm that all 2022 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.

Table B.2 – NO$_2$ 2022 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.82	Annual Mean: Distance Corrected to Nearest Exposure	Comment
AB1	472109	139487	14.5	19.3	11.1	13.9	11.3	11.0	9.1	10.2		11.9	11.9	18.5	13.0	10.7		
BR4	479666	135345	30.3	41.9	27.0	30.7	27.1	29.0	33.9	33.1	36.0	33.9	30.9	32.2	32.2	26.4		
BR2	479695	135356	20.1	24.9		20.3	19.0	17.2	18.6	13.8	19.6	17.1	18.1	22.6	19.2	15.8		
BR5	479654	135312	25.7	39.5			31.0	28.3	34.1	38.3	35.1	30.8	9.8	32.5	30.5	25.0		
BU1	479795	136267	12.4	16.2		13.1	9.5	8.2	7.7	10.5	9.7	9.7	9.3	16.9	11.2	9.2		
WR1	479314	134307	23.8	35.7	22.7		25.5	30.7	24.8	29.8	24.6	24.4	25.0	36.8	27.6	22.6		
PB1	474989	123241	13.5	19.3	9.3	13.5	10.1	8.5	8.8	11.4	11.0	11.5	11.3	17.9	12.2	10.0		
HR1	470554	113582	30.6	41.1	25.4	27.1	23.7	24.8	23.2	20.6	25.5	28.7	32.3	34.4	28.1	23.1		
HR7	470665	113259	25.5	39.3	24.8	34.2	23.6	25.7	28.8	24.9	27.0	29.1	35.6	35.7	29.5	24.2		
FR1	467554	135462	12.7	20.8						16.2	14.7	12.0			15.3	11.5		
FR2	466586	134855	14.6	21.3			12.4	10.2	11.9	13.9	13.8				14.0	12.7		
AR1	471819	139442											24.7	27.2	-	-		
AR2	472120	139754											20.0	29.7	-	-		

☒ **All erroneous data has been removed from the NO$_2$ diffusion tube dataset presented in Table B.1**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

☒ **East Hampshire District Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

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**.

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 EHDC During 2021 and 2022

EHDC has not identified any new sources relating to air quality within the reporting years of 2021 and 2022.

Additional Air Quality Works Undertaken by EHDC During 2021 and 2022

EHDC has not completed any additional works within the reporting years of 2021 and 2022.

QA/QC of Diffusion Tube Monitoring

East Hampshire District Council's NO_2 diffusion tubes are supplied and analysed by Gradko International Ltd using the 50% TEA in Acetone method. This method conforms to the guidelines set out in Defra's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance' document.

Gradko International participates in the AIR NO_2 PT scheme[14]. This scheme forms an integral part of the UK NO_2 Network's QA/QC and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). In AIR NO_2 PT rounds AR053, AR052, AR050, AR049, AR046, AR045 and AR043 (covering periods from May 2021 – October 2022) Gradko achieved 100% satisfactory scores. In the prior AIR NO_2 PT round AR042 (January to February 2021) Gradko achieved 25% satisfactory scores.

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[14] LGC (2022) Summary of Laboratory Performance in AIR NO_2 Proficiency Testing Scheme (May 2020 – June 2022) Available at: https://laqm.defra.gov.uk/wp-content/uploads/2022/07/LAQM-NO2-Performance-data_Up-to-June-2022_V2.1.pdf

Diffusion Tube deployments have been completed in line with the 2021 and 2022 Diffusion Tube monitoring Calendars.

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. All diffusion tube monitoring locations within EHDC recorded data capture of 75% or greater in 2021 therefore it was not required to annualise any monitoring data.

Annualisation was required at two sites in 2022, FR1 and FR2. Site FR1 had a data capture of 40.4%, site FR2 had a 55.8% data capture. Annualisation requires the use of continuous monitors with a data capture of 85% or greater, the AURN Reading New Town monitor was also considered but had insufficient data capture to be used for annualisation.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Portsmouth	Annualisation Factor Southampton Centre	Annualisation Factor Chilbolton Observatory	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)
FR1	0.8859	0.8656	0.9952	0.9155	15.3	14.0
FR2	1.1262	1.0843	1.1141	1.1082	14.0	15.5

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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.TG22 provides guidance with regard 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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

EHDC have applied a national bias adjustment factor of 0.82 to both the 2021 and 2022 monitoring data. A summary of bias adjustment factors used by EHDC over the past five years is presented in Table C.2.

Figure C.1 – National Diffusion Tube Bias Adjustment Spreadsheet Calculation for 2021

Analysed By	Method	Year	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	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	50% TEA in acetone	2021	UC	Falkirk Council	12	35	34	3.5%	G	0.97
Gradko	50% TEA in acetone	2021	UB	Falkirk Council	12	16	13	22.5%	G	0.82
Gradko	50% TEA in acetone	2021	SU	Redcar & Cleveland Borough Council	11	14	11	29.2%	G	0.77
Gradko	50% TEA in acetone	2021	R	Royal Borough of Windsor and Maidenhead	12	29	26	9.3%	G	0.91
Gradko	50% TEA in acetone	2021	R	Royal Borough of Windsor and Maidenhead	11	26	25	7.2%	G	0.93
Gradko	50% TEA in acetone	2021	R	Sandwell MBC	12	37	28	31.4%	G	0.76
Gradko	50% TEA in Acetone	2021	UB	Sandwell Metropolitan Borough Council	11	23	19	22.2%	G	0.82
Gradko	50% TEA in acetone	2021	UB	Middlesbrough	12	18	14	32.6%	G	0.75
Gradko	50% TEA in acetone	2021	R	London Borough of Richmond upon Thames	12	24	21	15.1%	G	0.87
Gradko	50% TEA in acetone	2021	B	London Borough of Richmond upon Thames	9	16	13	21.5%	G	0.82
Gradko	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	10	52	41	24.2%	G	0.81
Gradko	50% TEA in acetone	2021	R	Reading Borough Council	12	30	26	15.9%	G	0.86
Gradko	50% TEA in acetone	2021	R	Merton Council	9	50	32	55.4%	G	0.64
Gradko	50% TEA in acetone	2021	UB	Wandsworth Council	11	29	26	9.8%	G	0.91
Gradko	50% TEA in acetone	2021	R	LB Newham	11	29	23	26.6%	G	0.79
Gradko	50% TEA in acetone	2021	KS	London Borough of Croydon	12	48	39	23.4%	G	0.81
Gradko	50% TEA in acetone	2021		Overall Factor (16 studies)				Use		0.82

Figure C.2 – National Diffusion Tube Bias Adjustment Spreadsheet Calculation for 2022

Analysed By	Method	Year	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	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	50% TEA in Acetone	2022	KS	Adur District Council	10	30	21	41.4%	G	0.71
Gradko	50% TEA in Acetone	2022	UC	Falkirk Council	12	32	26	22.7%	G	0.81
Gradko	50% TEA in Acetone	2022	UB	Falkirk Council	9	15	13	16.4%	G	0.86
Gradko	50% TEA in Acetone	2022	R	LB Newham	12	30	23	29.1%	G	0.77
Gradko	50% TEA in acetone	2022	SU	Redcar & Cleveland Borough Council	12	14	10	44.9%	G	0.69
Gradko	50% TEA in acetone	2022	R	Worthing Borough Council	11	34	26	32.3%	G	0.76
Gradko	50% TEA in acetone	2022	KS	Marylebone Road Intercomparison	12	52	42	23.0%	G	0.81
Gradko	50% TEA in acetone	2022	R	City Of London	11	61	53	15.2%	G	0.87
Gradko	50% TEA in Acetone	2022	UB	City Of London	12	28	23	21.4%	G	0.82
Gradko	50% TEA in Acetone	2022	KS	London Borough of Croydon	12	41	37	11.1%	G	0.90
Gradko	50% TEA in Acetone	2022	R	Royal Borough of Windsor and Maidenhead	12	30	26	13.9%	G	0.88
Gradko	50% TEA in Acetone	2022	R	Royal Borough of Windsor and Maidenhead	12	27	27	-1.0%	G	1.01
Gradko	50% TEA in Acetone	2022	R	Sandwell MBC	12	34	27	27.1%	G	0.79
Gradko	50% TEA in Acetone	2022	UB	Sandwell MBC	12	21	19	11.9%	G	0.89
Gradko	50% TEA in Acetone	2022	UB	Norwich City Council	11	11	9	12.0%	G	0.89
Gradko	50% TEA in Acetone	2022	UB	Westminster City Council	10	29	22	28.4%	G	0.78
Gradko	50% TEA in acetone	2022		Overall Factor (16 studies)				Use		0.82

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	09/23	0.82
2021	National	09/23	0.82
2020	National	03/21	0.82
2019	National	03/21	0.89
2018	National	06/19	0.89

NO$_2$ 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 NO$_2$ concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO$_2$ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO$_2$ concentrations corrected for distance are presented in Table B.1 and Table B.2

No diffusion tube NO$_2$ monitoring locations within East Hampshire District Council required distance correction during 2021 or 2022.

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

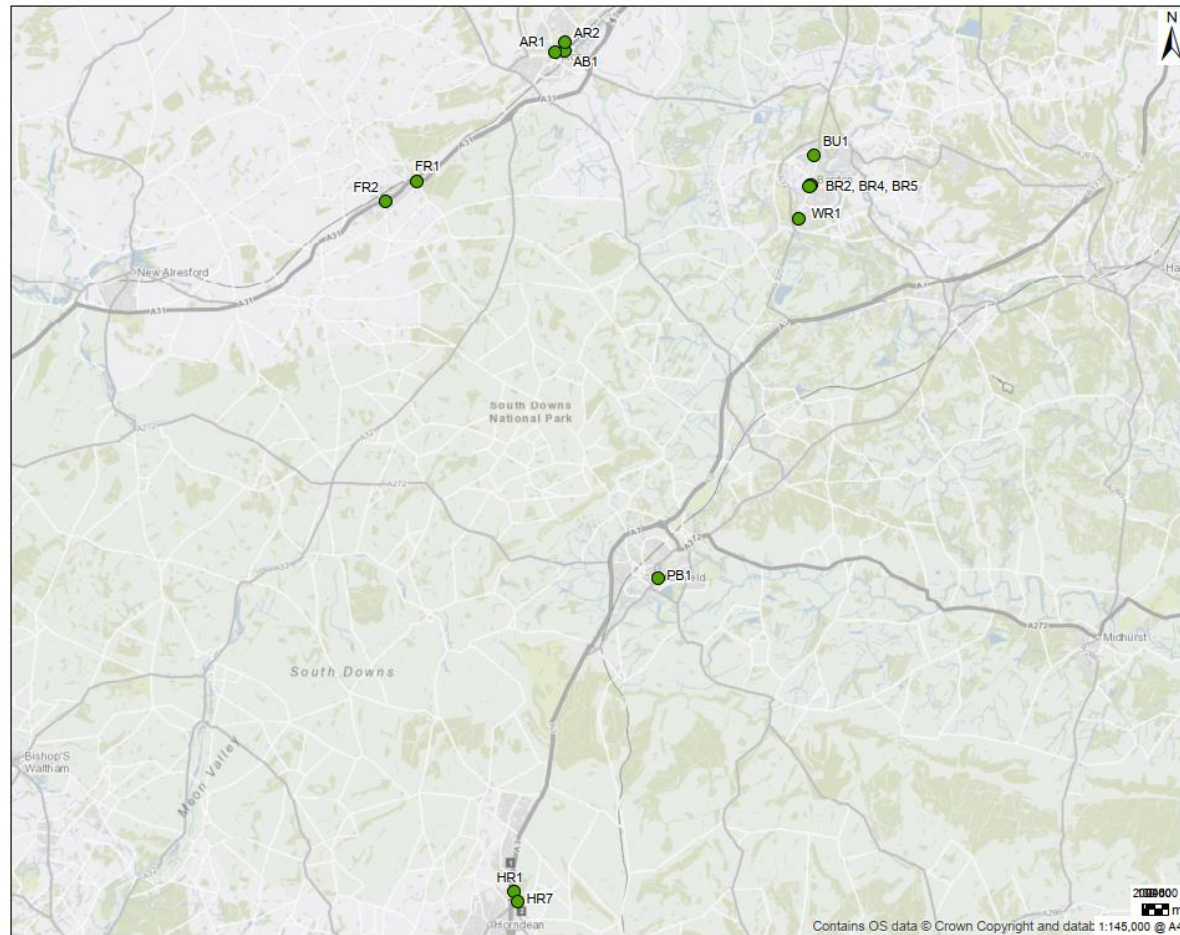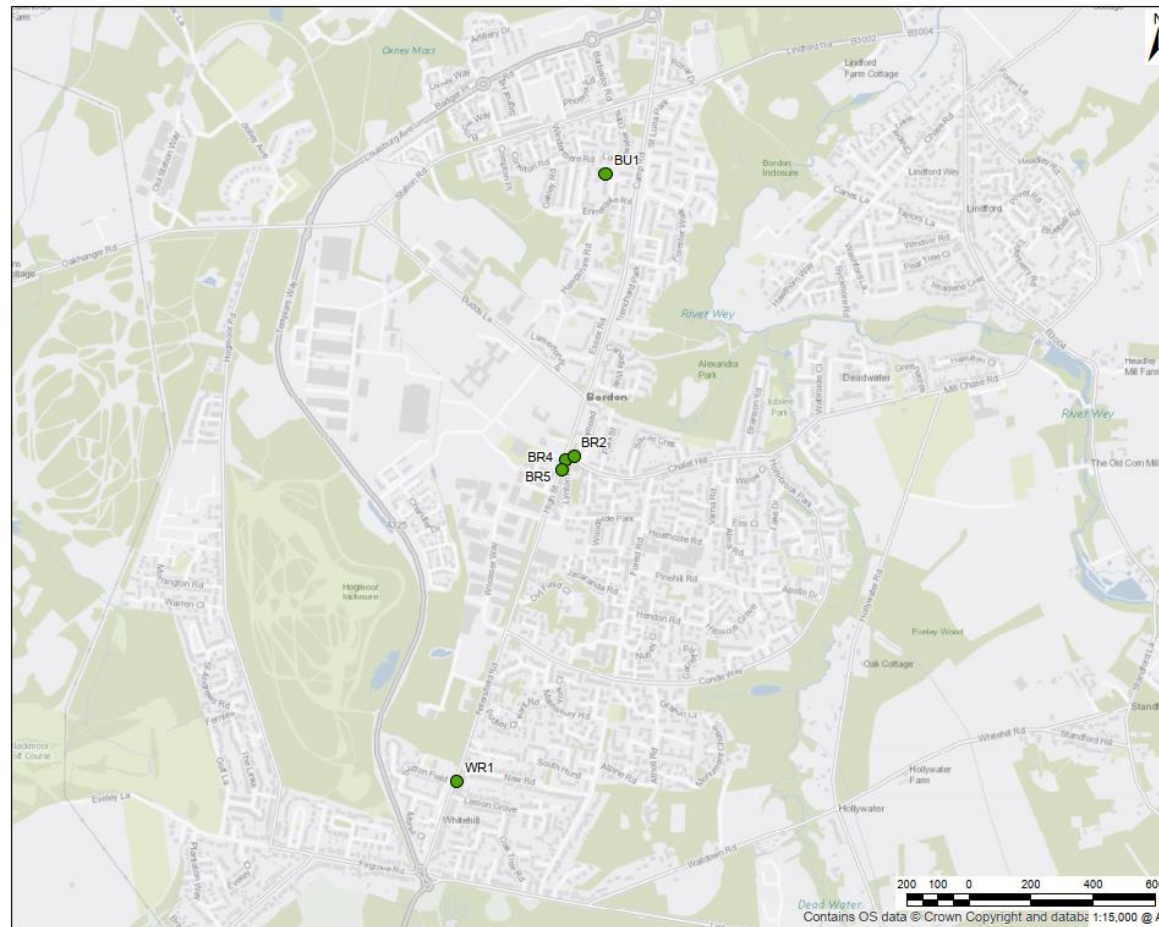**Figure D.1 – Map of Non-Automatic Monitoring Sites in East Hampshire**

Figure D.2 – Map of Non-Automatic Monitoring Sites in Bordon

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[15]

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

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[15] 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
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
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